Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Tuesday, 25 June 2013 3:36 PM
To: Carol Walsh; Samples Melbourne
Subject: 210074 South Melbourne Gasworks
Attachments: 210074_CoC_25 June.pdf

Hi Carol,

Please find the attached CoC for the groundwater samples collected this afternoon.

Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0411 374 386
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

CoC received 25/06/13 15:36 RT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E:townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011
PROJECT: 210074 Sth Melbourne Gasworks
ORDER NUMBER:
PROJECT MANAGER: REGIN ORQUIZA — CONTACT PH: 8398 4403
SAMPLER: — SAMPLER MOBILE:
COC emailed to ALS? (YES / NO) — EDD FORMAT (or default):
Email Reports to : rorquiza@eesicontracting.com and sleong@eesi.biz
Email Invoice to : rorquiza@eesicontracting.com
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)
ALS QUOTE NO.: ME/330/13

COC SEQUENCE NUMBER (Circle)
CoC: 1 2 3 4 5 7
OF: 1 2 3 4 5 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No (N/A)
Free ice / frozen ice bricks present upon receipt? (Yes) No N/A
Random Sample Temperature on Receipt: °C
Other comment: 2.8 - 3.6

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		Annie
DATE/TIME: 25/6/13 / 3 pm	DATE/TIME: 25/6/13 3pm	DATE/TIME:	DATE/TIME: 25/6, 1635

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)

LAB ID (ALS USE ONLY)	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes - pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)	field pH	Field temp
1	GW18	25/06/2013	W		8	X	X	X	X	X	X	X		6.89	18
2	GW01	25/06/2013	W		8	X	X	X	X	X	X	X		6.6	17.4
3	GW40	25/06/2013	W		8	X	X	X	X	X	X	X		5.24	18
4	GW28	25/06/2013	W		8	X	X	X	X	X	X	X		5.67	18.8
5	GW35	25/06/2013	W		8	X	X	X	X	X	X	X		6.92	17.8
6	GW22	25/06/2013	W		8	X	X	X	X	X	X	X		6.3	16.5
7	Rinsate 2	25/06/2013	W		2					X	X	X			
8	Trip 2	25/06/2013	W		1					X	X				
9	Trip 3	25/06/2013	W		1					X	X				
	Extra samples:														
10	Dup 2	25/6/13	W	Rec (ALS) 25/6/13											
11	Split 2	25/6/13	W												
TOTAL															

SCANNED

Environmental Division
Melbourne
Work Order
EM1306738
Telephone : + 61-3-8549 9600

Samples sent to lab for
Micro (Nitrate) BOD (pH)
Colour Turbidity (RP)
Other ....
Date 25/6

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Tuesday, 25 June 2013 3:36 PM
To: Carol Walsh; Samples Melbourne
Subject: 210074 South Melbourne Gasworks
Attachments: 210074_CoC_25 June.pdf

Hi Carol,

Please find the attached CoC for the groundwater samples collected this afternoon.

Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0411 374 386
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

Revised CoC received 26/06/13 09:14 RT
CoC received 25/06/13 15:36 RT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd Smithfield NSW 2176 Ph 02 8784 8555 E samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd Warabrook NSW 2304 Ph 02 4968 9433 E samples.newcastle@alsenviro.com
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☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph 07 4796 0600 E ...
☐ Melbourne: 2-4 Westall Rd Springvale VIC 3171 Ph 03 8549 9600 E samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd Pooraka SA 5095 Ph 08 8359 0890 E adelaide@alsenviro.com
☐ Perth: 10 Hod Way Malaga WA 6090 Ph 08 9209 7655 E samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St Launceston TAS 7250 Ph 03 6331 2158 E launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011
PROJECT: 210074 Sth Melbourne Gasworks
ORDER NUMBER:
PROJECT MANAGER: REGIN ORQUIZA — CONTACT PH: 9398 4403
SAMPLER: — SAMPLER MOBILE:
COC emailed to ALS? (YES / NO) — EDD FORMAT (or default):
Email Reports to : rorquiza@eesicontracting.com and sleong@eesi.biz
Email Invoice to : rorquiza@eesicontracting.com
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
ALS QUOTE NO.: ME/330/13

COC SEQUENCE NUMBER (Circle)
CoC: 1 2 3 4 5 7
OF: 1 2 3 4 5 7

RELINQUISHED BY: S.Leong — DATE/TIME: 25/07/13 / 3 pm
RECEIVED BY: ALS Courier — DATE/TIME: 25/6/13 3pm
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY: — DATE/TIME: 25/6, 1635

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 2.8 – 8.6
Other comment:

Environmental Division
Melbourne
Work Order
EM13067
Telephone : +61-3-8549

R5

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - Includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)	field pH	Field temp
1	GW18	25/06/2013	W		8	x	x	x	x	x	x	x		6.89	18
2	GW01	25/06/2013	W		8	x	x	x	x	x	x	x		6.6	17.4
3	GW40	25/06/2013	W		8	x	x	x	x	x	x	x		5.24	18
4	GW28	25/06/2013	W		8	x	x	x	x	x	x	x		5.67	18.8
5	GW35	25/06/2013	W		8	x	x	x	x	x	x	x		6.92	17.8
6	GW22	25/06/2013	W		8	x	x	x	x	x	x	x		6.3	18.5
7	Rinsate 2	25/06/2013	W		2					x	x	x			
8	Trip 2	25/06/2013	W		1					x	x				
9	Trip 3	25/06/2013	W		1					x	x				
	Extra samples:														
10	Dup 2	25/6/13	W	Rec (ALS)				X	X	X	X	X			
11	Split 2	25/6/13	W	25/6/13				X	X	X	X	X			
TOTAL															

Please send to M

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Carol Walsh
Sent: Wednesday, 26 June 2013 9:16 AM
To: Samples Melbourne
Subject: REVISED COC - EM1306738-ENVIROMENTAL EARTH SCIENCES
Attachments: img-626090130.pdf

Importance: High

SEE ATTACHED REVISED COC.

Please send the SPLIT 2 sample to MGT as per COC.

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Wednesday, 26 June 2013 9:14 AM
To: Carol Walsh
Subject: RE: ISSUES - EM1306738-ENVIROMENTAL EARTH SCIENCES

Hi Carol,

Please find the attached updated CoC showing the dup/split 2 required analytes. Please send the Split 2 sample to MGT.

Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0448 888 593
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

-----Original Message-----
From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Wednesday, 26 June 2013 8:50 AM
To: Regin Orquiza
Subject: ISSUES - EM1306738-ENVIROMENTAL EARTH SCIENCES

Regin

For this attached work order, EM1306738, we have received two extra sample - DUP 2 & SPLIT 2 .

Please advise if any analysis is required on these samples, or should SPLIT 2 be sent off to another lab.

Kind Regards

Carol Walsh
Senior Client Services Officer
ALS | Environmental Division
4 Westall Rd
Springvale, VIC. 3171 Australia

How was your customer experience? Please send us your feedback Please see our latest Enviromail 67 - Aqueous Film Forming Foams (AFFFs) March 2013

T +61 3 8549 9600
F +61 3 8549 9626

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Winner of the inaugural CARE Award 2011 - Sustainable Technology & Innovation: Reduction in Sample Volumes - Improving quality, safety, efficiency and sustainability in environmental practices

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306766**	Page	: 1 of 6
y l@i r	: **ENVIRONMENTAL EARTH SCIENCES**	9aLobarobt	: Ei n@boi v ei ral m@G@oi MelLoDbi e
y oi raur	: c ERG Nc OQ@GZ	y oi raur	: y abol A alsW
Zhhbess	: P.N.dNB XX23 FNN5Ty c ZS YG VZQT5c Z9G 3011	Zhhbess	: , A esrall c h T4b@gnale YG ZDsrbal@a 3171
Epv a@	: bob- D@aaz eesCL@	Epv a@	: uabol.@alsWz alsgloLal.uov
5ele4Wbi e	: w61 03 +6871666	5ele4Wbi e	: w61p3p82, + +608
Faus@ @e	: w61 03 +68718, ,	Faus@ @e	: w61p3p82, + +601
Pbojeur	: X1007, TrWMelLoDbi e Ras@bks	Oy 9enel	: I EPM 1+++ TuWehDle d (3) ai h Z9T Oy T3 be- D@ev ei r
Ntbebi Dv Leb	: pppp		
y pNpy i Dv Leb	: pppp	mare Tav 4les c eue@eh	: X6pJQI pX013
Tav 4leb	: TF9/KK	@sDe mare	: 0XpJQ9pX013
T@e	: pppp		
		I o. of sav 4les beue@eh	: ,
ODore i Dv Leb	: ME/330/13	I o. of sav 4les ai alt seh	: ,

5W@ be4obr sD4ebsehes ai t 4ben@Ds be4obr(s) @@W rW@ befebei ue. c esDlrs a44lt ro rWe sav 4le(s) as sDLv @eh. ZII 4ages of rW@ be4obr Wane Leei uWeukeh ai h a44boneh fot belease.

5W@ y ebr@@are of Zi alt s@ uoi ra@s rWe follo@@g @fobv ar@i :

- Rei ebal y ov v ei rs
- Zi alt r@al c esDlrs
- TDdbogare y oi rbol 9@ @s

General Comments

5We ai altr@al 4bouehDbes Dseh Lt rWé Ei n@boi v ei ral m@G@i Wéne Leei henelo4eh fbov esraLIGWeh C@rebi ar@i allt beuogi Q@eh 4bouehDbes sDuW as rWbse 4DLIGWeh Lt rWé QTEPZV ZPHZV ZT ai h I EPM. G WbDse henelo4eh 4bouehDbes abe ev 4lot eh C rWé aLsei ue of houDv ei reh srai hathns obLt ul@i r be- Desr.

A Wébe v oGsrDbe herebv C ar@i Wás Leei 4ebfobv ehVbesDlrs abe be4obreh oi a hbt @e@GWrLasGs.

A Wébe a be4obreh less rWái (<) besDlr G WG@WébrWái rWé 9Nc VrWGs v at Le hDe ro 4bQ abt sav 4le exrbaur/h@esrare h@DrQi ai h/ob@sDffQ@i r sav 4le fobai alt sGs.

A Wébe rWé 9Nc of a be4obreh besDlr h@febs fbov srai hath 9Nc VrWGs v at Le hDe ro W@GWv oGsrDbe uoi rei rV@sDffQ@i r sav 4le (behDueh @e@GWrev 4lot eh) obv arb@ C@rebfebei ue.

A Wéi sav 4l@g rQ e C@fobv ar@i Gs i or 4bom@eh Lt rWé ul@i rVsav 4l@g hares abe sWb@t @@WbDr a rQ e uov 4oi ei r. G rWése C@srai uesVrWé rQ e uov 4oi ei r Wás Leei assDv eh Lt rWé laLobarobt fob4bouess@g 4Db4oses.

Ket : y ZT I Dv Leb= y ZT beg@rbt i Dv Lebfbov haraLase v a@ra@eh Lt y Wév Q@al ZLsrbaurs Tebn@es. 5Wé y Wév Q@al ZLsrbaurs Tebn@e Gs a h@G@i of rWé Zv eb@ai y Wév Q@al Tou@ert .
9Nc = 9Q C@f be4obr@g
^ = 5WGs besDlr Gs uov 4Dreh fbov C h@Q@Dal ai alt re hereur@i s ar ob aLone rWé lenel of be4obr@g

- **EK026SF : EM1306766-002 matrix spike failed for TCN due to possible sample interference. This has been confirmed by re-analysis.**
- **EM1306766-001, 002 and 003: Ammonia as N results have been done by buchi method (EK055)**
- **Ionic Balance out of acceptable limits for sample #1 and #3 due to sample matrix and therefore ionic balance is not applicable. Cations and anions were confirmed by re-analysis.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia and iron for #1, #2 and #3...**

Signatories

5WGs houDv ei r Wás Leei eleurboi Q@allt s@gi eh Lt rWé aDrWob@Qeh s@gi arob@es C h@Qareh Lelo@ Eleurboi Q s@gi C@g Wás Leei uabb@eh oDr C uov 4l@ai ue @@W4bouehDbes s4eu@@eh C X1 y Fc Pabr 11.

Signatories	*Position*	*Accreditation Category*
m@ai CFebi ai ho	Tei @b G obgai Q y Wév Gr	MelLoDbi e G obgai Q s
		MelLoDbi e G obgai Q s
		MelLoDbi e G obgai Q s
I ai ut A ai g	Tei @b Tev @olar@e GsrbDv ei r y Wév Gr	MelLoDbi e N bgai Q s
		MelLoDbi e N bgai Q s
YabsWa Ho A C g	I oi pMerals 5eav 9eaheb	MelLoDbi e G obgai Q s
		MelLoDbi e G obgai Q s
		MelLoDbi e G obgai Q s

Analytical Results

TDLpMarb@: WATER (Marb@: WATER)			Client sample ID	GW08	GW37	GW44	Trip 4	ppp
			Client sampling date / time	X2pJQI pX013 12:00	X2pJQI pX013 12:00	X2pJQI pX013 12:00	X2pJQI pX013 12:00	ppp
Compound	CAS Number	LOR	Unit	EM1306766-001	EM1306766-002	EM1306766-003	EM1306766-004	----
EA005: pH								
pH Value	ppp	0.01	4H Qi @	5.96	6.98	6.48	ppp	ppp
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	ppp	10	v g/9	2360	2080	9310	ppp	ppp
ED037P: Alkalinity by PC Titrator								
Total Alkalinity as CaCO3	ppp	1	v g/9	226	379	996	ppp	ppp
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	1, 808p7+p8	1	v g/9	1450	830	6950	ppp	ppp
ED045G: Chloride Discrete analyser								
Chloride	16887p00p6	1	v g/9	248	289	1220	ppp	ppp
ED093F: Dissolved Major Cations								
Calcium	7, , 0p70pX	1	v g/9	126	53	468	ppp	ppp
Magnesium	7, 3+p+2p,	1	v g/9	44	37	420	ppp	ppp
Sodium	7, , 0pX3p2	1	v g/9	148	91	806	ppp	ppp
Potassium	7, , 0p0+p7	1	v g/9	10	10	61	ppp	ppp
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7, X+p+0p2	0.01	v g/9	<0.01	<0.01	<0.01	ppp	ppp
Arsenic	7, , 0p88pX	0.001	v g/9	0.179	0.211	0.103	ppp	ppp
Cadmium	7, , 0p, 3p+	0.0001	v g/9	0.0002	0.0002	0.0004	ppp	ppp
Cobalt	7, , 0p, 8p,	0.001	v g/9	0.009	0.004	0.028	ppp	ppp
Copper	7, , 0p20p8	0.001	v g/9	0.002	0.001	0.010	ppp	ppp
Lead	7, 3+p+Xp1	0.001	v g/9	0.002	<0.001	0.002	ppp	ppp
Manganese	7, 3+p+6p2	0.001	v g/9	1.32	0.236	19.8	ppp	ppp
Nickel	7, , 0p0Xp0	0.001	v g/9	0.100	0.017	0.064	ppp	ppp
Selenium	778Xp, +pX	0.01	v g/9	<0.01	<0.01	0.01	ppp	ppp
Zinc	7, , 0p66p6	0.002	v g/9	0.137	0.021	0.035	ppp	ppp
Boron	7, , 0p, Xp8	0.02	v g/9	0.80	0.93	0.78	ppp	ppp
Iron	7, 3+p8+p6	0.02	v g/9	36.3	7.10	49.4	ppp	ppp
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	27p1Xp2	0.00,	v g/9	0.029	0.103	0.750	ppp	ppp
EK040P: Fluoride by PC Titrator								
Fluoride	16+8, p, 8p8	0.1	v g/9	0.3	1.3	0.5	ppp	ppp
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	766, p, 1p7	0.01	v g/9	1150	290	286	ppp	ppp

Analytical Results

TDLpMarb2: WATER (Marb2: WATER)			Client sample ID	GW08	GW37	GW44	Trip 4	ppp
			Client sampling date / time	X2pJQl pX013 12:00	X2pJQl pX013 12:00	X2pJQl pX013 12:00	X2pJQl pX013 12:00	ppp
Compound	CAS Number	LOR	Unit	EM1306766-001	EM1306766-002	EM1306766-003	EM1306766-004	----
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	ppp	0.01	v g/9	1150	290	286	ppp	ppp
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	ppp	0.01	v g/9	<0.01	0.07	<0.01	ppp	ppp
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	1, 7+7p22p8	0.01	v g/9	0.28	0.17	<0.01	ppp	ppp
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	1, X62p , pX	0.01	v g/9	<0.01	<0.01	<0.01	ppp	ppp
EN055: Ionic Balance								
Total Anions	ppp	0.01	v e- /9	41.7	33.0	199	ppp	ppp
Total Cations	ppp	0.01	v e- /9	100	30.9	118	ppp	ppp
Ionic Balance	ppp	0.01	%	41.2	3.32	25.7	ppp	ppp
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	ppp	20	µg/9	<20	<20	56000	ppp	ppp
C15 - C28 Fraction	ppp	100	µg/9	<100	<100	2080	ppp	ppp
C29 - C36 Fraction	ppp	20	µg/9	<20	<20	<20	ppp	ppp
^ C10 - C36 Fraction (sum)	ppp	20	µg/9	<20	<20	58100	ppp	ppp
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
>C10 - C16 Fraction	ppp	100	µg/9	<100	<100	48000	ppp	ppp
>C16 - C34 Fraction	ppp	100	µg/9	<100	<100	780	ppp	ppp
>C34 - C40 Fraction	ppp	100	µg/9	<100	<100	<100	ppp	ppp
^ >C10 - C40 Fraction (sum)	ppp	100	µg/9	<100	<100	48800	ppp	ppp
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71p 3pX	1	µg/9	15	38	1120	<1	ppp
Toluene	108p88p3	X	µg/9	2	11	455	<X	ppp
Ethylbenzene	100p 1p	X	µg/9	<X	<X	36	<X	ppp
meta- & para-Xylene	108p38p3 106p Xp3	X	µg/9	<X	3	185	<X	ppp
Styrene	100p Xp2	2	µg/9	<2	<2	<2	<2	ppp
ortho-Xylene	+2p 7p6	X	µg/9	<X	2	112	<X	ppp
Isopropylbenzene	+8p8Xp8	2	µg/9	<2	<2	<2	<2	ppp
n-Propylbenzene	103p62p1	2	µg/9	<2	<2	<2	<2	ppp
1.3.5-Trimethylbenzene	108p67p8	2	µg/9	<2	<2	11	<2	ppp
sec-Butylbenzene	132p+8p8	2	µg/9	<2	<2	<2	<2	ppp
1.2.4-Trimethylbenzene	+2p63p6	2	µg/9	<2	<2	30	<2	ppp

Analytical Results

TDLpMarb2: WATER (Marb2: WATER)			Client sample ID	GW08	GW37	GW44	Trip 4	ppp
			Client sampling date / time	X2pJQl pX013 12:00	X2pJQl pX013 12:00	X2pJQl pX013 12:00	X2pJQl pX013 12:00	ppp
Compound	CAS Number	LOR	Unit	EM1306766-001	EM1306766-002	EM1306766-003	EM1306766-004	----
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
tert-Butylbenzene	+8p06p6	2	µg/9	<2	<2	<2	<2	ppp
p-Isopropyltoluene	++p87p6	2	µg/9	<2	<2	<2	<2	ppp
n-Butylbenzene	10, p21p8	2	µg/9	<2	<2	<2	<2	ppp
EP074H: Naphthalene								
Naphthalene	+1pX0p3	7	µg/9	<7	27	572	<7	ppp
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	ppp	X0	µg/9	<X0	50	1930	ppp	ppp
C10 - C14 Fraction	ppp	20	µg/9	230	390	98300	ppp	ppp
C15 - C28 Fraction	ppp	100	µg/9	930	940	16600	ppp	ppp
C29 - C36 Fraction	ppp	20	µg/9	<20	<20	680	ppp	ppp
^ C10 - C36 Fraction (sum)	ppp	20	µg/9	1160	1330	116000	ppp	ppp
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	ppp	X0	µg/9	<X0	50	1890	ppp	ppp
>C10 - C16 Fraction	ppp	100	µg/9	460	610	81900	ppp	ppp
>C16 - C34 Fraction	ppp	100	µg/9	740	720	12400	ppp	ppp
>C34 - C40 Fraction	ppp	100	µg/9	<100	<100	<100	ppp	ppp
^ >C10 - C40 Fraction (sum)	ppp	100	µg/9	1200	1330	94300	ppp	ppp
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060p07p0	0.1	%	129	128	126	115	ppp
Toluene-D8	X037pX6p2	0.1	%	108	105	106	108	ppp
4-Bromofluorobenzene	, 60p00p,	0.1	%	104	104	99.0	107	ppp
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060p07p0	0.1	%	112	111	126	ppp	ppp
Toluene-D8	X037pX6p2	0.1	%	96.6	93.8	94.9	ppp	ppp
4-Bromofluorobenzene	, 60p00p,	0.1	%	98.6	96.0	100	ppp	ppp

Surrogate Control Limits

TDLpMarbQ: WATER		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060p07p0	6+	133
Toluene-D8	X037pX6p2	7X	1X8
4-Bromofluorobenzene	, 60p00p,	70	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060p07p0	70	13X
Toluene-D8	X037pX6p2	6+	1X2
4-Bromofluorobenzene	, 60p00p,	61	1X+

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1306766**	Page	: 1 of 11
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 26-JUN-2013
Sampler	: SFL/KK	Issue Date	: 02-JUL-2013
Order number	: ----		
		No. of samples received	: 4
Quote number	: ME/330/13	No. of samples analysed	: 4

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

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 less than (<) 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 = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

NATA Accredited Laboratory 825

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*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
		Melbourne Organics
Varsha Ho Wing	Non-Metals Team Leader	Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics

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 (%)*
EA005: pH (QC Lot: 2940672)									
EM1306744-010	Anonymous	EA005: pH Value	---	0.01	pH Unit	5.91	5.89	0.3	0% - 20%
EM1306805-003	Anonymous	EA005: pH Value	---	0.01	pH Unit	8.16	8.15	0.1	0% - 20%
EA015: Total Dissolved Solids (QC Lot: 2938076)									
EM1306757-001	Anonymous	EA015H: Total Dissolved Solids @180°C	---	10	mg/L	2540	2560	1.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 2938742)									
EM1306744-010	Anonymous	ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	1	<1	0.0	No Limit
EM1306779-002	Anonymous	ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	16	16	0.0	0% - 50%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2936991)									
EM1306744-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.0	No Limit
EM1306766-001	GW08	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1340	1320	1.6	0% - 20%
ED045G: Chloride Discrete analyser (QC Lot: 2936990)									
EM1306744-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2	2	0.0	No Limit
EM1306766-001	GW08	ED045G: Chloride	16887-00-6	1	mg/L	256	258	0.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 2936988)									
EM1306744-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	1	1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EM1306766-001	GW08	ED093F: Calcium	7440-70-2	1	mg/L	130	134	2.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	48	47	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	150	150	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	11	11	0.0	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2938865)									
EM1306744-006	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	0.002	0.002	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.002	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	0.596	0.576	3.4	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	0.022	0.013	49.3	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.03	0.03	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.07	0.07	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	7.51	7.49	0.3	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 (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2938865) - continued									
EM1306766-001	GW08	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0002	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.179	0.177	1.2	0% - 20%
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.009	0.009	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.002	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.32	1.38	4.5	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.100	0.100	0.0	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.137	0.131	5.0	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.80	0.89	11.0	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	36.3	38.2	5.2	0% - 20%
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 2936801)									
EM1306766-001	GW08	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	0.029	0.024	16.2	No Limit
EM1306779-006	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 2938741)									
EM1306744-010	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2939102)									
EM1306744-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306807-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.13	0.13	0.0	0% - 50%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2936989)									
EM1306744-010	Anonymous	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306766-001	GW08	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2936993)									
EM1306766-001	GW08	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306779-003	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QC Lot: 2938190)									
EM1306766-001	GW08	EP071SG: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071SG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	0.0	No Limit
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup (QC Lot: 2938190)									
EM1306766-001	GW08	EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2937477)									
EM1306709-006	Anonymous	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit

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 (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2937477) - continued									
EM1306709-006	Anonymous	EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EM1306738-005	Anonymous	EP074: Benzene	71-43-2	1	µg/L	4	4	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EP074H: Naphthalene (QC Lot: 2937477)									
EM1306709-006	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
EM1306738-005	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2937476)									
EM1306709-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1306738-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2938189)									
EM1306766-001	GW08	EP071: C15 - C28 Fraction	----	100	µg/L	930	800	15.7	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	230	200	13.6	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2937476)									
EM1306709-006	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1306738-005	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit

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 (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2938189)									
EM1306766-001	GW08	EP071: >C10 - C16 Fraction	----	100	µg/L	460	410	11.3	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	740	620	17.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit

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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids (QCLot: 2938076)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	99.5	98	104
ED037P: Alkalinity by PC Titrator (QCLot: 2938742)								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	99.0	91	105
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936991)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	108	81	125
ED045G: Chloride Discrete analyser (QCLot: 2936990)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	104	89	117
ED093F: Dissolved Major Cations (QCLot: 2936988)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	102	83	129
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	100	80	124
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.8	77	125
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.9	77	123
EG020F: Dissolved Metals by ICP-MS (QCLot: 2938865)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.8	90	110
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	93	109
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.3	85	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	99.8	87	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.2	86	110
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.8	88	112
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.4	86	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.3	86	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	93.6	85	111
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.1	83	113
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	106	72	126
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.6	88	112
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936801)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	94.9	75	113
EK040P: Fluoride by PC Titrator (QCLot: 2938741)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	102	78	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2939102)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.0 mg/L	100	76	122
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936989)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	100	84	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936993)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	107	84	108
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 2938190)								
EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	52700 µg/L	93.4	58	144
EP071SG: C15 - C28 Fraction	----	100	µg/L	<100	101500 µg/L	73.9	55	133
EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
EP071SG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup (QCLot: 2938190)								
EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2937477)								
EP074: Benzene	71-43-2	1	µg/L	<1	20 µg/L	101	76	122
EP074: Toluene	108-88-3	2	µg/L	<2	20 µg/L	91.9	79	123
EP074: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	88.4	76	118
EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	87.0	75	121
EP074: Styrene	100-42-5	5	µg/L	<5	20 µg/L	82.2	72	118
EP074: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	93.7	80	120
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	20 µg/L	97.3	71	119
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	20 µg/L	90.5	69	113
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	20 µg/L	84.6	70	114
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	20 µg/L	91.8	71	115
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	20 µg/L	83.8	70	114
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	20 µg/L	89.7	72	114
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	20 µg/L	86.7	68	114
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	20 µg/L	85.0	61	115
EP074H: Naphthalene (QCLot: 2937477)								
EP074: Naphthalene	91-20-3	7	µg/L	<7	20 µg/L	87.2	75	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2937476)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	100	60	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2938189)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3610 µg/L	93.4	46	126
EP071: C15 - C28 Fraction	----	100	µg/L	<100	10340 µg/L	98.8	55	125
EP071: C29 - C36 Fraction	----	50	µg/L	<50	3790 µg/L	105	55	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2937476)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	450 µg/L	96.8	56	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2938189)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5070 µg/L	97.6	53	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2938189) - continued								
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	11230 µg/L	105	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1010 µg/L	116	51	137

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	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936991)							
EM1306759-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
ED045G: Chloride Discrete analyser (QCLot: 2936990)							
EM1306759-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	87.2	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2938865)							
EM1306766-001	GW08	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	105	89	139
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	104	75	131
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	94.2	77	129
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.6	71	127
		EG020A-F: Lead	7439-92-1	0.2 mg/L	102	71	123
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	66	132
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	89.5	73	129
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	97.2	68	136
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936801)							
EM1306766-002	GW37	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	# 61.1	70	130
EK040P: Fluoride by PC Titrator (QCLot: 2938741)							
EM1306744-010	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	102	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2939102)							
EM1306744-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	# Not Determined	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936989)							
EM1306759-001	Anonymous	EK057G: Nitrite as N	----	0.5 mg/L	98.2	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936993)							
EM1306766-002	GW37	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	101	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2937477)							
EM1306738-001	Anonymous	EP074: Benzene	71-43-2	20 µg/L	96.7	64	121
		EP074: Toluene	108-88-3	20 µg/L	90.4	63	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2937476)							
EM1306738-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	71.2	46	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2938189)							
EM1306766-002	GW37	EP071: C10 - C14 Fraction	----	3610 µg/L	66.6	40	130
		EP071: C15 - C28 Fraction	----	10340 µg/L	65.5	51	145
		EP071: C29 - C36 Fraction	----	3790 µg/L	66.4	52	144
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2937476)							
EM1306738-001	Anonymous	EP080: C6 - C10 Fraction	----	330 µg/L	70.4	45	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2938189)							
EM1306766-002	GW37	EP071: >C10 - C16 Fraction	----	5070 µg/L	67.3	46	142
		EP071: >C16 - C34 Fraction	----	11230 µg/L	67.9	52	146
		EP071: >C34 - C40 Fraction	----	1010 µg/L	65.8	49	143

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are 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	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936801)										
EM1306766-002	GW37	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	# 61.1	----	70	130	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936989)										
EM1306759-001	Anonymous	EK057G: Nitrite as N	----	0.5 mg/L	98.2	----	70	130	----	----
ED045G: Chloride Discrete analyser (QCLot: 2936990)										
EM1306759-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	87.2	----	70	130	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936991)										
EM1306759-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936993)										
EM1306766-002	GW37	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	101	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2937476)										
EM1306738-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	71.2	----	46	126	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2937476)										

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2937476) - continued										
EM1306738-001	Anonymous	EP080: C6 - C10 Fraction	----	330 µg/L	70.4	----	45	127	----	----
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2937477)										
EM1306738-001	Anonymous	EP074: Benzene	71-43-2	20 µg/L	96.7	----	64	121	----	----
		EP074: Toluene	108-88-3	20 µg/L	90.4	----	63	125	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2938189)										
EM1306766-002	GW37	EP071: C10 - C14 Fraction	----	3610 µg/L	66.6	----	40	130	----	----
		EP071: C15 - C28 Fraction	----	10340 µg/L	65.5	----	51	145	----	----
		EP071: C29 - C36 Fraction	----	3790 µg/L	66.4	----	52	144	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2938189)										
EM1306766-002	GW37	EP071: >C10 - C16 Fraction	----	5070 µg/L	67.3	----	46	142	----	----
		EP071: >C16 - C34 Fraction	----	11230 µg/L	67.9	----	52	146	----	----
		EP071: >C34 - C40 Fraction	----	1010 µg/L	65.8	----	49	143	----	----
EK040P: Fluoride by PC Titrator (QCLot: 2938741)										
EM1306744-010	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	102	----	70	130	----	----
EG020F: Dissolved Metals by ICP-MS (QCLot: 2938865)										
EM1306766-001	GW08	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	105	----	89	139	----	----
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	104	----	75	131	----	----
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	94.2	----	77	129	----	----
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.6	----	71	127	----	----
		EG020A-F: Lead	7439-92-1	0.2 mg/L	102	----	71	123	----	----
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	----	66	132	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	89.5	----	73	129	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	97.2	----	68	136	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2939102)										
EM1306744-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	# Not Determined	----	70	130	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1306766**	Page	: 1 of 10
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
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Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 26-JUN-2013
Sampler	: SFL/KK	Issue Date	: 02-JUL-2013
Order number	: ----		
		No. of samples received	: 4
Quote number	: ME/330/13	No. of samples analysed	: 4

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

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: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: pH							
Clear Plastic Bottle - Natural (EA005) GW08, GW37, GW44	**25-JUN-2013**	**----**	----	----	**28-JUN-2013**	25-JUN-2013	×
EA015: Total Dissolved Solids							
Clear Plastic Bottle - Natural (EA015H) GW08, GW37, GW44	**25-JUN-2013**	**---**	02-JUL-2013	----	**27-JUN-2013**	02-JUL-2013	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) GW08, GW37, GW44	**25-JUN-2013**	**---**	09-JUL-2013	----	**27-JUN-2013**	09-JUL-2013	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) GW08, GW37, GW44	**25-JUN-2013**	**---**	23-JUL-2013	----	**27-JUN-2013**	23-JUL-2013	✓
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle - Natural (ED045G) GW08, GW37, GW44	**25-JUN-2013**	**---**	23-JUL-2013	----	**27-JUN-2013**	23-JUL-2013	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F) GW08, GW37, GW44	**25-JUN-2013**	**---**	02-JUL-2013	----	**27-JUN-2013**	02-JUL-2013	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) GW08, GW37, GW44	**25-JUN-2013**	**---**	22-DEC-2013	----	**28-JUN-2013**	22-DEC-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026SF: Total CN by Segmented Flow Analyser							
White Plastic Bottle-NaOH - Pb Acetate (EK026SF)							
GW08, GW37, GW44	**25-JUN-2013**	---	09-JUL-2013	----	**26-JUN-2013**	09-JUL-2013	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
GW08, GW37, GW44	**25-JUN-2013**	---	23-JUL-2013	----	**27-JUN-2013**	23-JUL-2013	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
GW08, GW37, GW44	**25-JUN-2013**	---	23-JUL-2013	----	**28-JUN-2013**	23-JUL-2013	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
GW08, GW37, GW44	**25-JUN-2013**	---	27-JUN-2013	----	**26-JUN-2013**	27-JUN-2013	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
GW08, GW37, GW44	**25-JUN-2013**	---	27-JUN-2013	----	**26-JUN-2013**	27-JUN-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
GW08, GW37, GW44	**25-JUN-2013**	**27-JUN-2013**	02-JUL-2013	✓	**28-JUN-2013**	06-AUG-2013	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
GW08, GW37, GW44	**25-JUN-2013**	**27-JUN-2013**	02-JUL-2013	✓	**28-JUN-2013**	06-AUG-2013	✓
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
GW08, GW37, GW44	**25-JUN-2013**	**27-JUN-2013**	02-JUL-2013	✓	**28-JUN-2013**	06-AUG-2013	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074)							
GW08, GW37, GW44, Trip 4	**25-JUN-2013**	**26-JUN-2013**	09-JUL-2013	✓	**27-JUN-2013**	09-JUL-2013	✓
EP074H: Naphthalene							
Amber VOC Vial - Sulfuric Acid (EP074)							
GW08, GW37, GW44, Trip 4	**25-JUN-2013**	**26-JUN-2013**	09-JUL-2013	✓	**27-JUN-2013**	09-JUL-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
GW08, GW37, GW44	**25-JUN-2013**	**26-JUN-2013**	09-JUL-2013	✓	**27-JUN-2013**	09-JUL-2013	✓

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(where) 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.

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
Ammonia as N by Discrete analyser	EK055G	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	6	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	10	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	4	**25.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	15	**13.3**	**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
Ammonia as N by Discrete analyser	EK055G	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Chloride by Discrete Analyser	ED045G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	12	**8.3**	**5.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	6	**16.7**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	11	**9.1**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	4	**25.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement

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
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) 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- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. 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	APHA 21st ed., 4500 Cl - G.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 librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um 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) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. 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 QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. 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.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	APHA 4500-CN-O. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. 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)
Ammonium as N	EK055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry 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 chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry 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 Chemical Reduction and direct colourimetry 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 othophosphate 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)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	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)
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	WATER	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	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)

Analytical Methods	Method	Matrix	Method Descriptions
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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. 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 100 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.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

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 SW 846 or ALS-QWI/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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1306759-001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM1306766-001	GW08	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK026SF: Total CN by Segmented Flow Analyser	EM1306766-002	GW37	**Total Cyanide**	57-12-5	61.1 %	70-130%	**Recovery less than lower data quality objective**
EK055G: Ammonia as N by Discrete Analyser	EM1306744-002	Anonymous	**Ammonia as N**	7664-41-7	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

- **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.

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005: pH						
Clear Plastic Bottle - Natural						
GW08, GW37, GW44	----	----	----	28-JUN-2013	25-JUN-2013	**3**

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.**

COC received on 26/6 @ 10:12 Amitha

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E:townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle)		
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)	Custody Seal Intact?	Yes	No / N/A
PROJECT: 210074 Sth Melbourne Gaswords			Free ice / frozen ice bricks present upon receipt?	Yes	No / N/A
ORDER NUMBER:		CC 1 2 3 4 5 7	Random Sample Temperature on Receipt:		°C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1686	O 1 2 3 4 5 7	Other comments:		

SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	S.Leong	ALS Courier		Chris
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME: 26/6 10:55
Email Invoice to : rorquiza@environmentalearthsciences.com		25/6/13 / 5 pm	26/6/13 9 am		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).											Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
1	GW08	25/06/2013	W		8	X	X	X	X	X	X	X	X					5.79	18.7	
2	GW37	25/06/2013	W		8	X	X	X	X	X	X	X	X					6.89	18.2	
3	GW44	25/06/2013	W		8	X	X	X	X	X	X	X	X					6.01	17.7	
4	Trip 4	25/06/2013	W		1					X	X									
				TOTAL																

Samples sent to lab for
Micro Nitrate BOD pH
Colour Turbidity (PH)
Other .....
Date 26/6/13

Environmental Division
Melbourne
Work Order 26/6
EM1306766

Telephone : +61-3-8549 9600

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Ranil Weerakkody

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Wednesday, 26 June 2013 10:12 AM
To: Samples Melbourne
Cc: Carol Walsh
Subject: RE: 210074 South Melbourne Gasworks
Attachments: 210074_CoC_26 June 2013_AM.pdf

Please find the attached CoC of the samples collected this morning.

Thank you.

Regards

Regin

-----Original Message-----
From: Samples Melbourne [mailto:Samples.Melbourne@alsglobal.com]
Sent: Tuesday, 25 June 2013 4:59 PM
To: Regin Orquiza; Carol Walsh
Subject: RE: 210074 South Melbourne Gasworks

Thank you for the CoC, your samples arrived not too long ago.

Kind Regards

Raymond Thai
Sample Receipt Supervisor
ALS | Environmental Division

2-4 Westall Road
Springvale VIC 3171 Australia

T +61 38549 9641
F +61 38549 9617

www.alsglobal.com

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Tuesday, 25 June 2013 3:36 PM
To: Carol Walsh; Samples Melbourne
Subject: 210074 South Melbourne Gasworks

Hi Carol,

Please find the attached CoC for the groundwater samples collected this afternoon.

Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0411 374 386
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306798**	gs: 8	o1.f 9F
Amendment	: **1**		
Ci8nt	o**ENVIRONMENTAL EARTH SCIENCES**	Lsbf rstf ry	oEnvirf nm8ntseDivi if n.M8ebf urn8
Cf ntsct	oMR.REGIN.ORQUIZA	Cf ntsct	oCsrf eWse h
Addr8	ogPOPBOX..2253 l OOTSCRAY.VIC,.AUSTRALIA.3011	Addr8	o4.W8 tseRd.Sprin: vse8.VIC.Au trse8s.3171
E-msie	orf rquizs@8nvirf nm8ntse8srth ci8nc8 Pcf m	E-msie	ocsrf eWse h@se : e bse8cf m
T8e8phf n8	o+61.03.F6a71666	T8e8phf n8	o+61-3-a54F.F60a
l sc imie8	o+61.03.F6a71a44	l sc imie8	o+61-3-a54F.F601
grf j8ct	o210074.Sth.M8ebf urn8.Gs wf rk	QC.L8v8e	oNEgM.1FFF..Sch8due8.B(3).snd.ALS.QCS3.r8quir8m8nt
Ord8r.numb8r	o----		
C-O-C.numb8r	o----	Dst8.Ssmpe8 .R8c8iv8d	o26-JUN-2013
Ssmpe8r	oSl L./.KK	l u8.Dst8	o05-JUL-2013
Sit8	o----		
		Nf Pf 9 smpe8 .r8c8iv8d	oF
Quf t8.numb8r	oME/330/13	Nf Pf 9 smpe8 .snsey 8d	oF

Thi . r8pf rt. up8r 8d8 . sny. pr8vif u . r8pf rt( ). with. thi . r89r8nc8P. R8 ue . sppey. tf . th8. smpe8( ). s . ubmitt8dP. Aee ps: 8 . f 9 thi . r8pf rt. hsv8. b88n. ch8ck8d. snd. spprf v8d. 9f r r8e8s 8P.

Thi .C8rti9cst8.f 9Ansey i .cf ntsin .th8.9f eef win: .in9f rmstif no

- G8n8rseCf mm8nt
- AnseyticseR8 ue
- Surrf : st8.Cf ntrf eLimit

gs: 8	o 2.f 9F
Wf rk.Ord8r	o EM13067Fa.Am8ndm8nt.1
Ce8nt	o ENVIRONMENTAL.EARTH.SCIENCES
grf j8ct	o 210074.Sth.M8ebf urn8.Gs wf rk

General Comments

Th8. snseyticse prf c8dur8 . u 8d. by. th8. Envirf nm8ntse Divi if n. hsv8. b88n. d8v8ef p8d. 9f m. 8 tsbe h8d. int8rnstif nsse. r8cf : niz8d. prf c8dur8 . uch. s . thf 8. pube h8d. by. th8. USEgA,. AgHA,. AS. snd. NEgMP. In. hf u 8 d8v8ef p8d.prf c8dur8 .sr8.8mpef y8d.in.th8.sb 8nc8.f 9df cum8nt8d. tsndsrd .f r.by.ce8nt.r8qu8 tP

Wh8r8.mf i tur8.d8t8rminstif n.hs .b88n.p8r9f rm8d,.r8 ue .sr8.r8pf rt8d.f n.s.dry.w8i: ht.bs i P

Wh8r8.s.r8pf rt8d.e8 .thsn.(<).r8 ue.i .hi: h8r.thsn.th8.LOR,.thi .msy.b8.du8.tf .primsry. smpe8.8xtrsct/di: 8 tst8.die utif n.snd/f r.in u9ci8nt. smpe8.9f r.snsey i P

Wh8r8.th8.LOR.f 9s.r8pf rt8d.r8 ue.di98r .9f m. tsndsrd.LOR,.thi .msy.b8.du8.tf .hi: h.mf i tur8.cf nt8nt,.in u9ci8nt. smpe8.(r8duc8d.w8i: ht.8mpef y8d).f r.mstrix.int8r9r8nc8P

Wh8n. smpein: .tim8.in9f rmstif n.i .nf t.prf vid8d.by.th8.ce8nt,. smpein: .dst8 .sr8. hf wn.withf ut.s.tim8.cf mpf n8ntP.In.th8 8.in tsnc8 ,.th8.tim8.cf mpf n8nt.hs .b88n.s um8d.by.th8.esbf rstf ry.9f r.prf c8 in: .purpf 8 P

K8y.o CAS.Numb8r.=.CAS.r8: i try.numb8r.9f m.dstsbs 8.msintsin8d.by.Ch8micseAb trsct .S8rvic8 P.Th8.Ch8micseAb trsct .S8rvic8.i .s.divi if n.f 9th8.Am8ricsn.Ch8micseSf ci8tyP
LOR.=.Limit.f 9r8pf rtin:
^.=.Thi .r8 ue.i .cf mput8d.9f m.individusesnsey.t8.d8t8ctif n .st.f r.sbf v8.th8.e8v8ef 9r8pf rtin:

- **EM1306798-001, 002 and #6: Ammonia as N results were done by buchi method (EK055)**
- **EP080/074: Particular sample (EM-1306798-001) shows minor hit of btex. Confirmed by re-analysis.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate and nox; and major cations - calcium, magnesium, potassium and sodium for #3.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia #2.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate; and major cations - calcium, magnesium, potassium, sodium, iron and ammonia for #1 and #6 .**
- **This batch was amended to change the sample ID of sample 8 to RIN3 as requested by Regin Orquiza on 5/7/13.**

NATA.Accr8dit8d.Lsbf rstf ry.a25
.
Accr8dit8d.9f r.cf mpesnc8.with.
ISO/IEC.17025P

Signatories

Thi . df cum8nt. hs . b88n. 8e8ctrf nicsey. i: n8d. by. th8. suthf riz8d. i: nstf ri8 . indicst8d. b8ef wP. Ee8ctrf nic. i: nin: . hs . b88n. csrri8d. f ut. in cf mpesnc8.with.prf c8dur8 . p8ci98d.in.21.Cl R.gsrt.11P

Signatories	*Position*	*Accreditation Category*
Diesni.l 8rnsndf	S8nif r.Inf r: snic.Ch8mi t	M8ebf urn8.Inf r: snic
		M8ebf urn8.Inf r: snic
		M8ebf urn8.Inf r: snic
		M8ebf urn8.Inf r: snic
Nsncy.Wsn:	S8nif r.S8mivf estie8.In trum8nt.Ch8mi t	M8ebf urn8.Or: snic
Vsr hs.Hf .Win:	Nf n-M8tse .T8sm.L8sd8r	M8ebf urn8.Inf r: snic
		M8ebf urn8.Inf r: snic
Xin: bin.Lin	S8nif r.Or: snic.Ch8mi t	M8ebf urn8.Or: snic
		M8ebf urn8.Or: snic

Analytical Results

Sub-Mstrix: WATER (Mstrix: WATER)				Client sample ID	GW02	GW07	GW09	GW29	GW30
				Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00
Compound	CAS Number	LOR	Unit		EM1306798-001	EM1306798-002	EM1306798-003	EM1306798-004	EM1306798-005
EA005: pH									
pH Value	---	0P01	pH.Unit		6.68	6.97	6.16	6.94	5.82
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	---	10	m: /L		4200	1460	520	2280	2560
ED037P: Alkalinity by PC Titrator									
Total Alkalinity as CaCO3	---	1	m: /L		414	633	88	497	456
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14a0a-7F-a	1	m: /L		1520	184	72	372	445
ED045G: Chloride Discrete analyser									
Chloride	16aa7-00-6	1	m: /L		926	350	94	725	1000
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	m: /L		236	52	4	69	84
Magnesium	743F-F5-4	1	m: /L		99	43	3	65	74
Sodium	7440-23-5	1	m: /L		420	276	177	705	700
Potassium	7440-0F-7	1	m: /L		27	10	4	9	7
EG020F: Dissolved Metals by ICP-MS									
Aluminium	742F-F0-5	0P01	m: /L		<0P01	<0P01	<0P01	<0P01	<0P01
Arsenic	7440-3a-2	0P001	m: /L		0.126	0.092	0.011	<0P001	0.065
Cadmium	7440-43-F	0P0001	m: /L		<0P0001	0.0004	0.0005	0.0005	0.0005
Cobalt	7440-4a-4	0P001	m: /L		0.002	0.001	<0P001	0.008	0.007
Copper	7440-50-a	0P001	m: /L		0.003	0.002	0.003	0.004	0.003
Lead	743F-F2-1	0P001	m: /L		<0P001	<0P001	<0P001	<0P001	<0P001
Manganese	743F-F6-5	0P001	m: /L		2.17	0.178	0.034	0.449	0.429
Nickel	7440-02-0	0P001	m: /L		0.002	0.050	0.054	0.028	0.038
Selenium	77a2-4F-2	0P01	m: /L		<0P01	<0P01	<0P01	<0P01	<0P01
Zinc	7440-66-6	0P005	m: /L		0.021	0.022	0.036	0.020	0.088
Boron	7440-42-a	0P05	m: /L		0.70	0.95	0.62	0.53	0.55
Iron	743F-aF-6	0P05	m: /L		20.4	0.87	<0P05	<0P05	0.71
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0P004	m: /L		0.018	0.027	<0P004	<0P004	<0P004
EK040P: Fluoride by PC Titrator									
Fluoride	16Fa4-4a-a	0P1	m: /L		1.0	2.0	0.5	1.0	1.9
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0P01	m: /L		399	105	0.05	0.05	0.11

Analytical Results

Sub-Mstrix: **WATER** (Mstrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID: GW02	GW07	GW09	GW29	GW30
			Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00
				EM1306798-001	EM1306798-002	EM1306798-003	EM1306798-004	EM1306798-005
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	----	0P01	m: /L	399	105	0.05	0.05	0.11
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0P01	m: /L	<0P01	0.10	0.03	0.06	0.08
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	147F7-55-a	0P01	m: /L	0.07	1.73	26.1	16.1	3.74
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0P01	m: /L	<0P01	<0P01	0.02	0.03	<0P01
EN055: Ionic Balance								
Total Anions	----	0P01	m8q/L	66.0	26.4	----	38.1	46.6
Total Anions	----	0P01	m8q/L	----	----	7.77	----	----
Total Cations	----	0P01	m8q/L	----	----	8.25	39.7	40.9
Total Cations	----	0P01	m8q/L	68.3	25.8	----	----	----
Ionic Balance	----	0P01	%	----	----	----	1.98	6.51
Ionic Balance	----	0P01	%	1.68	0.98	2.97	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	1	µ: /L	1	<1	<1	<1	<1
Toluene	10a-aa-3	2	µ: /L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µ: /L	<2	<2	<2	<2	<2
meta- & para-Xylene	10a-3a-3.106-42-3	2	µ: /L	<2	<2	<2	<2	<2
Styrene	100-42-5	5	µ: /L	<5	<5	<5	<5	<5
ortho-Xylene	F5-47-6	2	µ: /L	<2	<2	<2	<2	<2
Isopropylbenzene	Fa-a2-a	5	µ: /L	<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µ: /L	<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	10a-67-a	5	µ: /L	<5	<5	<5	<5	<5
sec-Butylbenzene	135-Fa-a	5	µ: /L	<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	F5-63-6	5	µ: /L	<5	<5	<5	<5	<5
tert-Butylbenzene	Fa-06-6	5	µ: /L	<5	<5	<5	<5	<5
p-Isopropyltoluene	FF-a7-6	5	µ: /L	<5	<5	<5	<5	<5
n-Butylbenzene	104-51-a	5	µ: /L	<5	<5	<5	<5	<5
EP074H: Naphthalene								
Naphthalene	F1-20-3	7	µ: /L	<7	<7	<7	<7	<7
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µ: /L	<20	<20	<20	<20	<20

Analytical Results

Sub-Mstrix: WATER (Mstrix: WATER)				Client sample ID	GW02	GW07	GW09	GW29	GW30
				Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00
Compound	CAS Number	LOR	Unit		EM1306798-001	EM1306798-002	EM1306798-003	EM1306798-004	EM1306798-005
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	---	50	µ: /L		110	<50	<50	<50	<50
C15 - C28 Fraction	---	100	µ: /L		700	450	<100	<100	<100
C29 - C36 Fraction	---	50	µ: /L		<50	110	<50	<50	<50
^. C10 - C36 Fraction (sum)	---	50	µ: /L		810	560	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	20	µ: /L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	---	100	µ: /L		270	<100	<100	<100	<100
>C16 - C34 Fraction	---	100	µ: /L		600	490	<100	<100	<100
>C34 - C40 Fraction	---	100	µ: /L		<100	<100	<100	<100	<100
^. >C10 - C40 Fraction (sum)	---	100	µ: /L		870	490	<100	<100	<100
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0Pì	%		84.3	85.4	81.6	85.6	87.2
Toluene-D8	2037-26-5	0Pì	%		118	114	107	106	109
4-Bromofluorobenzene	460-00-4	0Pì	%		110	105	103	103	102
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0Pì	%		80.8	81.7	78.1	82.6	83.7
Toluene-D8	2037-26-5	0Pì	%		106	103	96.5	94.9	97.8
4-Bromofluorobenzene	460-00-4	0Pì	%		106	100	101	96.5	98.0

Analytical Results

Sub-Mstrix: WATER (Mstrix: WATER)				Client sample ID	GW38	RIN 3	RIN 3	TRIP 5	----
				Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	----
Compound	CAS Number	LOR	Unit		EM1306798-006	EM1306798-007	EM1306798-008	EM1306798-009	----
EA005: pH									
pH Value	----	0P01	pH.Unit		6.53	----	----	----	----
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	----	10	m: /L		3440	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Total Alkalinity as CaCO3	----	1	m: /L		514	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14a0a-7F-a	1	m: /L		2070	----	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16aa7-00-6	1	m: /L		230	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	m: /L		185	----	----	----	----
Magnesium	743F-F5-4	1	m: /L		111	----	----	----	----
Sodium	7440-23-5	1	m: /L		196	----	----	----	----
Potassium	7440-0F-7	1	m: /L		19	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	742F-F0-5	0P01	m: /L		<0P01	----	----	----	----
Arsenic	7440-3a-2	0P001	m: /L		0.365	----	----	----	----
Cadmium	7440-43-F	0P0001	m: /L		<0P0001	----	----	----	----
Cobalt	7440-4a-4	0P001	m: /L		0.004	----	----	----	----
Copper	7440-50-a	0P001	m: /L		0.002	----	----	----	----
Lead	743F-F2-1	0P001	m: /L		<0P001	----	----	----	----
Manganese	743F-F6-5	0P001	m: /L		3.64	----	----	----	----
Nickel	7440-02-0	0P001	m: /L		0.003	----	----	----	----
Selenium	77a2-4F-2	0P01	m: /L		<0P01	----	----	----	----
Zinc	7440-66-6	0P005	m: /L		0.013	----	----	----	----
Boron	7440-42-a	0P05	m: /L		0.91	----	----	----	----
Iron	743F-aF-6	0P05	m: /L		35.7	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0P004	m: /L		0.160	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16Fa4-4a-a	0P1	m: /L		1.0	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0P01	m: /L		449	<0P01	----	----	----

Analytical Results

Sub-Mstrix: WATER (Mstrix: WATER)			Client sample ID	GW38	RIN 3	RIN 3	TRIP 5	----
			Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	----
Compound	CAS Number	LOR	Unit	EM1306798-006	EM1306798-007	EM1306798-008	EM1306798-009	----
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	----	0P01	m: /L	449	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0P01	m: /L	0.04	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	147F7-55-a	0P01	m: /L	0.01	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0P01	m: /L	<0P01	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0P01	m8q/L	59.9	----	----	----	----
Total Cations	----	0P01	m8q/L	61.2	----	----	----	----
Ionic Balance	----	0P01	%	1.07	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	----	50	µ: /L	8460	----	----	----	----
C15 - C28 Fraction	----	100	µ: /L	640	----	----	----	----
C29 - C36 Fraction	----	50	µ: /L	<50	----	----	----	----
^. C10 - C36 Fraction (sum)	----	50	µ: /L	9100	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µ: /L	8780	----	----	----	----
>C16 - C34 Fraction	----	100	µ: /L	220	----	----	----	----
>C34 - C40 Fraction	----	100	µ: /L	<100	----	----	----	----
^. >C10 - C40 Fraction (sum)	----	100	µ: /L	9000	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	1	µ: /L	269	----	<1	<1	----
Toluene	10a-aa-3	2	µ: /L	131	----	<2	<2	----
Ethylbenzene	100-41-4	2	µ: /L	15	----	<2	<2	----
meta- & para-Xylene	10a-3a-3.106-42-3	2	µ: /L	76	----	<2	<2	----
Styrene	100-42-5	5	µ: /L	<5	----	<5	<5	----
ortho-Xylene	F5-47-6	2	µ: /L	43	----	<2	<2	----
Isopropylbenzene	Fa-a2-a	5	µ: /L	<5	----	<5	<5	----
n-Propylbenzene	103-65-1	5	µ: /L	<5	----	<5	<5	----
1.3.5-Trimethylbenzene	10a-67-a	5	µ: /L	6	----	<5	<5	----
sec-Butylbenzene	135-Fa-a	5	µ: /L	<5	----	<5	<5	----
1.2.4-Trimethylbenzene	F5-63-6	5	µ: /L	16	----	<5	<5	----

Analytical Results

Sub-Mstrix: WATER (Mstrix: WATER)				Client sample ID	GW38	RIN 3	RIN 3	TRIP 5	----
				Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	----
Compound	CAS Number	LOR	Unit		EM1306798-006	EM1306798-007	EM1306798-008	EM1306798-009	----
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
tert-Butylbenzene	Fa-06-6	5	µ: /L		<5	----	<5	<5	----
p-Isopropyltoluene	FF-a7-6	5	µ: /L		<5	----	<5	<5	----
n-Butylbenzene	104-51-a	5	µ: /L		<5	----	<5	<5	----
EP074H: Naphthalene									
Naphthalene	F1-20-3	7	µ: /L		134	----	<7	<7	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µ: /L		530	----	<20	----	----
C10 - C14 Fraction	----	50	µ: /L		8460	----	<50	----	----
C15 - C28 Fraction	----	100	µ: /L		3370	----	140	----	----
C29 - C36 Fraction	----	50	µ: /L		70	----	100	----	----
^. C10 - C36 Fraction (sum)	----	50	µ: /L		11900	----	240	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	20	µ: /L		530	----	<20	----	----
>C10 - C16 Fraction	----	100	µ: /L		8780	----	<100	----	----
>C16 - C34 Fraction	----	100	µ: /L		2620	----	220	----	----
>C34 - C40 Fraction	----	100	µ: /L		<100	----	<100	----	----
^. >C10 - C40 Fraction (sum)	----	100	µ: /L		11400	----	220	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0Pl	%		99.7	----	81.0	83.7	----
Toluene-D8	2037-26-5	0Pl	%		123	----	103	107	----
4-Bromofluorobenzene	460-00-4	0Pl	%		113	----	98.7	103	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0Pl	%		95.5	----	77.7	----	----
Toluene-D8	2037-26-5	0Pl	%		110	----	92.4	----	----
4-Bromofluorobenzene	460-00-4	0Pl	%		105	----	94.7	----	----

Surrogate Control Limits

Sub-Mstrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	6F	133
Toluene-D8	2037-26-5	72	12a
4-Bromofluorobenzene	460-00-4	70	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70	132
Toluene-D8	2037-26-5	6F	125
4-Bromofluorobenzene	460-00-4	61	12F

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM13067VH**	Page	: 1 of 11
Amendment	: **1**		
Client	: **ENSIRONMENTAL EART| +CIENCE+**	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@environmentalearthsciences.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 86971666	Telephone	: +61-3-9548 8609
Facsimile	: +61 03 86971944	Facsimile	: +61-3-9548 8601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1888 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 26-JUN-2013
Sampler	: SFL / KK	Issue Date	: 05-JUL-2013
Order number	: ----		
		No. of samples received	: 8
Quote number	: ME/330/13	No. of samples analysed	: 8

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

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 less than (<) 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 = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

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*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
		Melbourne Inorganics
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Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Varsha Ho Wing	Non-Metals Team Leader	Melbourne Inorganics
		Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics
		Melbourne Organics

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/39 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 (%)*
EA004: p| (QC Lot: 2V3V343)									
EM1306714-001	Anonymous	EA005: pH Value	----	0.01	pH Unit	7.66	7.65	0.1	0% - 20%
EM1306745-010	Anonymous	EA005: pH Value	----	0.01	pH Unit	6.53	6.53	0.0	0% - 20%
EA004: p| (QC Lot: 2V3V349)									
EM1306789-001	GW02	EA005: pH Value	----	0.01	pH Unit	6.69	6.68	0.1	0% - 20%
EM1306908-001	Anonymous	EA005: pH Value	----	0.01	pH Unit	6.21	6.21	0.0	0% - 20%
EA014: Total Dissolved +olids (QC Lot: 2V90264)									
EM1306771-001	Anonymous	EA015H: Total Dissolved Solids @190°C	----	10	mg/L	2980	2980	0.07	0% - 20%
EM1306795-001	Anonymous	EA015H: Total Dissolved Solids @190°C	----	10	mg/L	5310	5350	0.9	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 2V90H09)									
EM1306755-001	Anonymous	ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.0	No Limit
EM1306789-006	GW39	ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	514	512	0.4	0% - 20%
ED091G: +ulfate (Turbidimetric) as +O9 25by DA (QC Lot: 2V3V0V7)									
EM1306789-001	GW02	ED041G: Sulfate as SO4 - Turbidimetric	14909-78-9	1	mg/L	1520	1540	1.1	0% - 20%
EM1306914-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14909-78-9	1	mg/L	236	234	1.2	0% - 20%
ED094G: Chloride Discrete analyser (QC Lot: 2V3V0V6)									
EM1306789-001	GW02	ED045G: Chloride	16997-00-6	1	mg/L	826	840	1.4	0% - 20%
EM1306914-003	Anonymous	ED045G: Chloride	16997-00-6	1	mg/L	8	8	0.0	No Limit
ED0V3F: Dissolved Major Cations (QC Lot: 2V3V0V3)									
EM1306789-001	GW02	ED083F: Calcium	7440-70-2	1	mg/L	236	228	3.3	0% - 20%
		ED083F: Magnesium	7438-85-4	1	mg/L	88	100	1.5	0% - 20%
		ED083F: Sodium	7440-23-5	1	mg/L	420	425	1.4	0% - 20%
		ED083F: Potassium	7440-08-7	1	mg/L	27	29	0.0	0% - 20%
EM1306914-003	Anonymous	ED083F: Calcium	7440-70-2	1	mg/L	96	96	0.0	0% - 20%
		ED083F: Magnesium	7438-85-4	1	mg/L	8	9	0.0	No Limit
		ED083F: Sodium	7440-23-5	1	mg/L	7	6	0.0	No Limit
		ED083F: Potassium	7440-08-7	1	mg/L	<1	<1	0.0	No Limit
EG020F: Dissolved Metals by ICP5M+ (QC Lot: 2V90V6V)									
EM1306789-001	GW02	EG020A-F: Cadmium	7440-43-8	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-39-2	0.001	mg/L	0.126	0.120	5.1	0% - 20%
		EG020A-F: Cobalt	7440-49-4	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-9	0.001	mg/L	0.003	0.004	0.0	No Limit
		EG020A-F: Lead	7438-82-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7438-86-5	0.001	mg/L	2.17	2.47	13.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	<0.001	91.2	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.021	0.021	0.0	No Limit

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 ICP5M+ (QC Lot: 2V90V6V) 5continued									
EM1306789-001	GW02	EG020A-F: Aluminium	7428-80-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7792-48-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-9	0.05	mg/L	0.70	0.75	6.6	0% - 50%
		EG020A-F: Iron	7438-98-6	0.05	mg/L	20.4	22.1	9.2	0% - 20%
EM1306920-004	Anonymous	EG020A-F: Cadmium	7440-43-8	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-39-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Cobalt	7440-49-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-9	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7438-82-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7438-86-5	0.001	mg/L	0.070	0.066	5.3	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.025	0.022	12.7	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.021	0.020	5.2	No Limit
		EG020A-F: Aluminium	7428-80-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7792-48-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-9	0.05	mg/L	1.61	1.69	4.4	0% - 20%
		EG020A-F: Iron	7438-98-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK026+F: Total CN by +egmented Flow Analyser (QC Lot: 2V3HV7V)									
EM1306744-010	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	0.009	<0.004	62.5	No Limit
EM1306775-010	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK090P: Fluoride by PC Titrator (QC Lot: 2V90H04)									
EM1306755-001	Anonymous	EK040P: Fluoride	16894-49-9	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EM1306789-006	GW39	EK040P: Fluoride	16894-49-9	0.1	mg/L	1.0	1.0	0.0	No Limit
EK044G: Ammonia as N by Discrete Analyser (QC Lot: 2V91136)									
EM1306705-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306906-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.07	0.06	0.0	No Limit
EK047G: Nitrite as N by Discrete Analyser (QC Lot: 2V3V0V9)									
EM1306789-001	GW02	EK057G: Nitrite as N	---	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306914-003	Anonymous	EK057G: Nitrite as N	---	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2V3V0V4)									
EM1306789-001	GW02	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306920-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP079A: Monocyclic Aromatic | ydrocarbons (QC Lot: 2V91733)									
EM1306789-001	GW02	EP074: Benzene	71-43-2	1	µg/L	1	1	0.0	No Limit
		EP074: Toluene	109-99-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	109-39-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	85-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit

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 (%)*
EP079A: Monocyclic Aromatic | ydrocarbons (QC Lot: 2V91733) 5continued									
EM1306789-001	GW02	EP074: Isopropylbenzene	89-92-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	109-67-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-89-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	85-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	89-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	88-97-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-9	5	µg/L	<5	<5	0.0	No Limit
EM1306971-001	Anonymous	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	109-99-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	109-39-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	85-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	89-92-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	109-67-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-89-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	85-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	89-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	88-97-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-9	5	µg/L	<5	<5	0.0	No Limit
EP079| : Naphthalene (QC Lot: 2V91733)									
EM1306789-001	GW02	EP074: Naphthalene	81-20-3	7	µg/L	<7	<7	0.0	No Limit
EM1306971-001	Anonymous	EP074: Naphthalene	81-20-3	7	µg/L	<7	<7	0.0	No Limit
EP0H0/071: Total Petroleum | ydrocarbons (QC Lot: 2V3V067)									
EM1306789-001	GW02	EP071: C15 - C29 Fraction	----	100	µg/L	700	690	2.3	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	110	110	0.0	No Limit
		EP071: C28 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EM1306920-001	Anonymous	EP071: C15 - C29 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C28 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP0H0/071: Total Petroleum | ydrocarbons (QC Lot: 2V91739)									
EM1306789-001	GW02	EP090: C6 - C8 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1306971-001	Anonymous	EP090: C6 - C8 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QC Lot: 2V3V067)									
EM1306789-001	GW02	EP071: >C10 - C16 Fraction	----	100	µg/L	270	290	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	600	590	4.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit

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 (%)*
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QC Lot: 2V3V067) 5continued									
EM1306920-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	120	120	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QC Lot: 2V91739)									
EM1306789-001	GW02	EP090: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1306971-001	Anonymous	EP090: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit

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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA014: Total Dissolved +olids (QCLot: 2V90264)								
EA015H: Total Dissolved Solids @190°C	----	10	mg/L	<10	2000 mg/L	103	89	104
ED037P: Alkalinity by PC Titrator (QCLot: 2V90H09)								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	87.2	81	105
ED091G: +ulfate (Turbidimetric) as +O9 25by DA (QCLot: 2V3V0V7)								
ED041G: Sulfate as SO4 - Turbidimetric	14909-78-9	1	mg/L	<1	25 mg/L	108	91	125
ED094G: Chloride Discrete analyser (QCLot: 2V3V0V6)								
ED045G: Chloride	16997-00-6	1	mg/L	<1	10 mg/L	104	98	117
ED0V3F: Dissolved Major Cations (QCLot: 2V3V0V3)								
ED083F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	100	93	128
ED083F: Magnesium	7438-85-4	1	mg/L	<1	5 mg/L	101	90	124
ED083F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	81.2	77	125
ED083F: Potassium	7440-08-7	1	mg/L	<1	50 mg/L	81.0	77	123
EG020F: Dissolved Metals by ICP5M+ (QCLot: 2V90V6V)								
EG020A-F: Aluminium	7428-80-5	0.01	mg/L	<0.01	0.5 mg/L	101	80	110
EG020A-F: Arsenic	7440-39-2	0.001	mg/L	<0.001	0.1 mg/L	102	83	108
EG020A-F: Cadmium	7440-43-8	0.0001	mg/L	<0.0001	0.1 mg/L	86.9	95	111
EG020A-F: Cobalt	7440-49-4	0.001	mg/L	<0.001	0.1 mg/L	89.8	97	111
EG020A-F: Copper	7440-50-9	0.001	mg/L	<0.001	0.1 mg/L	85.5	96	110
EG020A-F: Lead	7438-82-1	0.001	mg/L	<0.001	0.1 mg/L	89.2	99	112
EG020A-F: Manganese	7438-86-5	0.001	mg/L	<0.001	0.1 mg/L	103	96	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	96	112
EG020A-F: Selenium	7792-48-2	0.01	mg/L	<0.01	0.1 mg/L	101	95	111
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	83.2	93	113
EG020A-F: Boron	7440-42-9	0.05	mg/L	<0.05	0.1 mg/L	89.9	72	126
EG020A-F: Iron	7438-98-6	0.05	mg/L	<0.05	0.5 mg/L	100	99	112
EK026+F: Total CN by +egmented Flow Analyser (QCLot: 2V3HV7V)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	94.8	75	113
EK090P: Fluoride by PC Titrator (QCLot: 2V90H04)								
EK040P: Fluoride	16894-49-9	0.1	mg/L	<0.1	5 mg/L	89.9	79	120
EK044G: Ammonia as N by Discrete Analyser (QCLot: 2V91136)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.0 mg/L	87.0	76	122
EK047G: Nitrite as N by Discrete Analyser (QCLot: 2V3V0V9)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	100	94	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2V3V0V4)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	88.6	94	109
EP071 +G: Total Petroleum | ydrocarbons 5+ilica gel cleanup (QCLot: 2V90HH9)								
EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	62700 µg/L	116	59	144
EP071SG: C15 - C29 Fraction	----	100	µg/L	<100	101500 µg/L	111	55	133
EP071SG: C28 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
EP071SG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP071 +G: Total Recoverable | ydrocarbons (NEPM 2010 draft) 5+ilica gel cleanup (QCLot: 2V90HH9)								
EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
EP079A: Monocyclic Aromatic | ydrocarbons (QCLot: 2V91733)								
EP074: Benzene	71-43-2	1	µg/L	<1	20 µg/L	83.8	76	122
EP074: Toluene	109-99-3	2	µg/L	<2	20 µg/L	85.9	78	123
EP074: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	80.1	76	119
EP074: meta- & para-Xylene	109-39-3 106-42-3	2	µg/L	<2	40 µg/L	83.5	75	121
EP074: Styrene	100-42-5	5	µg/L	<5	20 µg/L	86.2	72	119
EP074: ortho-Xylene	85-47-6	2	µg/L	<2	20 µg/L	82.2	90	120
EP074: Isopropylbenzene	89-92-9	5	µg/L	<5	20 µg/L	97.2	71	118
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	20 µg/L	78.8	68	113
EP074: 1.3.5-Trimethylbenzene	109-67-9	5	µg/L	<5	20 µg/L	93.8	70	114
EP074: sec-Butylbenzene	135-89-9	5	µg/L	<5	20 µg/L	92.2	71	115
EP074: 1.2.4-Trimethylbenzene	85-63-6	5	µg/L	<5	20 µg/L	95.6	70	114
EP074: tert-Butylbenzene	89-06-6	5	µg/L	<5	20 µg/L	94.2	72	114
EP074: p-Isopropyltoluene	88-97-6	5	µg/L	<5	20 µg/L	92.3	69	114
EP074: n-Butylbenzene	104-51-9	5	µg/L	<5	20 µg/L	76.1	61	115
EP079| : Naphthalene (QCLot: 2V91733)								
EP074: Naphthalene	81-20-3	7	µg/L	<7	20 µg/L	82.6	75	121
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V3V067)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3610 µg/L	75.5	46	126
EP071: C15 - C29 Fraction	----	100	µg/L	<100	10340 µg/L	79.1	55	125
EP071: C28 - C36 Fraction	----	50	µg/L	<60	3780 µg/L	78.1	55	128
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V91739)								
EP090: C6 - C8 Fraction	----	20	µg/L	<20	360 µg/L	106	60	126
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V3V067)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5070 µg/L	78.9	53	128
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	11230 µg/L	91.5	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1010 µg/L	79.0	51	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V91739)								
EP090: C6 - C10 Fraction	----	20	µg/L	<20	450 µg/L	104	56	130

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	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED091G: +ulfate (Turbidimetric) as +O9 25by DA (QCLot: 2V3V0V7)							
EM1306789-002	GW07	ED041G: Sulfate as SO4 - Turbidimetric	14909-78-9	10 mg/L	# Not Determined	70	130
ED094G: Chloride Discrete analyser (QCLot: 2V3V0V6)							
EM1306789-002	GW07	ED045G: Chloride	16997-00-6	400 mg/L	88.4	70	130
EG020F: Dissolved Metals by ICP5M+ (QCLot: 2V90V6V)							
EM1306789-001	GW02	EG020A-F: Arsenic	7440-39-2	0.2 mg/L	102	98	138
		EG020A-F: Cadmium	7440-43-8	0.05 mg/L	111	75	131
		EG020A-F: Cobalt	7440-49-4	0.2 mg/L	87.0	77	128
		EG020A-F: Copper	7440-50-9	0.2 mg/L	102	71	127
		EG020A-F: Lead	7438-82-1	0.2 mg/L	104	71	123
		EG020A-F: Manganese	7438-86-5	0.2 mg/L	# Not Determined	66	132
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	86.9	73	128
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	105	69	136
EK026+F: Total CN by +egmented Flow Analyser (QCLot: 2V3HV7V)							
EM1306775-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	90.5	70	130
EK090P: Fluoride by PC Titrator (QCLot: 2V90H04)							
EM1306755-002	Anonymous	EK040P: Fluoride	16894-49-9	5.0 mg/L	117	70	130
EK044G: Ammonia as N by Discrete Analyser (QCLot: 2V91136)							
EM1306705-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	102	70	130
EK047G: Nitrite as N by Discrete Analyser (QCLot: 2V3V0V9)							
EM1306789-002	GW07	EK057G: Nitrite as N	----	0.5 mg/L	101	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2V3V0V4)							
EM1306789-002	GW07	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	104	70	130
EP079A: Monocyclic Aromatic | ydrocarbons (QCLot: 2V91733)							
EM1306789-002	GW07	EP074: Benzene	71-43-2	20 µg/L	85.7	64	121

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP079A: Monocyclic Aromatic | ydrocarbons (QCLot: 2V91733) 5continued							
EM1306789-002	GW07	EP074: Toluene	109-99-3	20 µg/L	103	63	125
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V3V067)							
EM1306789-002	GW07	EP071: C10 - C14 Fraction	----	3610 µg/L	91.0	40	130
		EP071: C15 - C29 Fraction	----	10340 µg/L	95.2	51	145
		EP071: C28 - C36 Fraction	----	3780 µg/L	96.9	52	144
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V91739)							
EM1306789-002	GW07	EP090: C6 - C8 Fraction	----	290 µg/L	95.0	46	126
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V3V067)							
EM1306789-002	GW07	EP071: >C10 - C16 Fraction	----	5070 µg/L	95.7	46	142
		EP071: >C16 - C34 Fraction	----	11230 µg/L	98.0	52	146
		EP071: >C34 - C40 Fraction	----	1010 µg/L	94.9	48	143
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V91739)							
EM1306789-002	GW07	EP090: C6 - C10 Fraction	----	330 µg/L	93.4	45	127

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are 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**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EK026+F: Total CN by +egmented Flow Analyser (QCLot: 2V3HV7V)										
EM1306775-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	90.5	----	70	130	----	----
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V3V067)										
EM1306789-002	GW07	EP071: C10 - C14 Fraction	----	3610 µg/L	91.0	----	40	130	----	----
		EP071: C15 - C29 Fraction	----	10340 µg/L	95.2	----	51	145	----	----
		EP071: C28 - C36 Fraction	----	3780 µg/L	96.9	----	52	144	----	----
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V3V067)										
EM1306789-002	GW07	EP071: >C10 - C16 Fraction	----	5070 µg/L	95.7	----	46	142	----	----
		EP071: >C16 - C34 Fraction	----	11230 µg/L	98.0	----	52	146	----	----
		EP071: >C34 - C40 Fraction	----	1010 µg/L	94.9	----	48	143	----	----
EK047G: Nitrite as N by Discrete Analyser (QCLot: 2V3V0V9)										
EM1306789-002	GW07	EK057G: Nitrite as N	----	0.5 mg/L	101	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2V3V0V4)										
EM1306789-002	GW07	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	104	----	70	130	----	----
ED094G: Chloride Discrete analyser (QCLot: 2V3V0V6)										

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
ED094G: Chloride Discrete analyser (QCLot: 2V3V0V6) 5continued										
EM1306789-002	GW07	ED045G: Chloride	16997-00-6	400 mg/L	88.4	----	70	130	----	----
ED091G: +ulfate (Turbidimetric) as +O9 25by DA (QCLot: 2V3V0V7)										
EM1306789-002	GW07	ED041G: Sulfate as SO4 - Turbidimetric	14909-78-9	10 mg/L	# Not Determined	----	70	130	----	----
EK090P: Fluoride by PC Titrator (QCLot: 2V90H04)										
EM1306755-002	Anonymous	EK040P: Fluoride	16894-49-9	5.0 mg/L	117	----	70	130	----	----
EG020F: Dissolved Metals by ICP5M+ (QCLot: 2V90V6V)										
EM1306789-001	GW02	EG020A-F: Arsenic	7440-39-2	0.2 mg/L	102	----	98	138	----	----
		EG020A-F: Cadmium	7440-43-8	0.05 mg/L	111	----	75	131	----	----
		EG020A-F: Cobalt	7440-49-4	0.2 mg/L	87.0	----	77	128	----	----
		EG020A-F: Copper	7440-50-9	0.2 mg/L	102	----	71	127	----	----
		EG020A-F: Lead	7438-82-1	0.2 mg/L	104	----	71	123	----	----
		EG020A-F: Manganese	7438-86-5	0.2 mg/L	# Not Determined	----	66	132	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	86.9	----	73	128	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	105	----	69	136	----	----
EK044G: Ammonia as N by Discrete Analyser (QCLot: 2V91136)										
EM1306705-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	102	----	70	130	----	----
EP079A: Monocyclic Aromatic | ydrocarbons (QCLot: 2V91733)										
EM1306789-002	GW07	EP074: Benzene	71-43-2	20 µg/L	85.7	----	64	121	----	----
		EP074: Toluene	109-99-3	20 µg/L	103	----	63	125	----	----
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V91739)										
EM1306789-002	GW07	EP090: C6 - C8 Fraction	----	290 µg/L	95.0	----	46	126	----	----
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V91739)										
EM1306789-002	GW07	EP090: C6 - C10 Fraction	----	330 µg/L	93.4	----	45	127	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM13067| H**	Page	: 1 of 10
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
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Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 26-JUN-2013
Sampler	: SFL / KK	Issue Date	: 05-JUL-2013
Order number	: ----		
		No. of samples received	: 9
Quote number	: ME/330/13	No. of samples analysed	: 9

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

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: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA004: p-								
Clear Plastic Bottle 5Natural (EA004)								
GW02,	GW07,	**265JUN52013**	**5655**	----	----	**265JUN52013**	26-JUN-2013	✓
GW09,	GW29,							
GW30,	GW38							
EA014: Total Dissolved Solids								
Clear Plastic Bottle 5Natural (EA014-)								
GW02,	GW07,	**265JUN52013**	**555**	03-JUL-2013	----	**2H5JUN52013**	03-JUL-2013	✓
GW09,	GW29,							
GW30,	GW38							
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle 5Natural (ED0375P)								
GW02,	GW07,	**265JUN52013**	**555**	10-JUL-2013	----	**2H5JUN52013**	10-JUL-2013	✓
GW09,	GW29,							
GW30,	GW38							
ED091G: Sulfate (Turbidimetric) as SO9 25by DA								
Clear Plastic Bottle 5Natural (ED091G)								
GW02,	GW07,	**265JUN52013**	**555**	24-JUL-2013	----	**2H5JUN52013**	24-JUL-2013	✓
GW09,	GW29,							
GW30,	GW38							
ED094G: Chloride Discrete analyser								
Clear Plastic Bottle 5Natural (ED094G)								
GW02,	GW07,	**265JUN52013**	**555**	24-JUL-2013	----	**2H5JUN52013**	24-JUL-2013	✓
GW09,	GW29,							
GW30,	GW38							
ED0| 3F: Dissolved Major Cations								
Clear Plastic Bottle 5Natural (ED0| 3F)								
GW02,	GW07,	**265JUN52013**	**555**	03-JUL-2013	----	**2H5JUN52013**	03-JUL-2013	✓
GW09,	GW29,							
GW30,	GW38							

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GW02, GW07, GW09, GW29, GW30, GW38	26-JUN-2013	27-JUN-2013	23-DEC-2013	----	01-JUL-2013	23-DEC-2013	✓
EK026SF: Total CN by Segmented Flow Analyser							
White Plastic Bottle - NaOH (EK026SF)							
GW38	26-JUN-2013	27-JUN-2013	10-JUL-2013	----	27-JUN-2013	10-JUL-2013	✓
White Plastic Bottle - NaOH + Pb Acetate (EK026SF)							
GW02, GW07, GW09, GW29, GW30	26-JUN-2013	27-JUN-2013	10-JUL-2013	----	27-JUN-2013	10-JUL-2013	✓
EK090P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK090P)							
GW02, GW07, GW09, GW29, GW30, GW38	26-JUN-2013	27-JUN-2013	24-JUL-2013	----	25-JUN-2013	24-JUL-2013	✓
EK044G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK044G)							
GW02, GW07, GW09, GW29, GW30, GW38, RIN 3	26-JUN-2013	27-JUN-2013	24-JUL-2013	----	01-JUL-2013	24-JUL-2013	✓
EK047G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK047G)							
GW02, GW07, GW09, GW29, GW30, GW38	26-JUN-2013	27-JUN-2013	28-JUN-2013	----	27-JUN-2013	28-JUN-2013	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
GW02, GW07, GW09, GW29, GW30, GW38	26-JUN-2013	27-JUN-2013	28-JUN-2013	----	27-JUN-2013	28-JUN-2013	✓
EP070/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
GW02, GW07, GW09, GW29, GW30, GW38, RIN 3	26-JUN-2013	27-JUN-2013	03-JUL-2013	✓	25-JUN-2013	06-AUG-2013	✓
EP071-SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SG)							
GW38	26-JUN-2013	25-JUN-2013	03-JUL-2013	✓	02-JUL-2013	07-AUG-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP071 SG: Total Recoverable - ydrocarbons (NEPM 2010 draft) 5Silica gel cleanup							
Amber Glass Bottle 5Unpreserved (EP071SG)							
GW38	**265JUN52013**	**2H5JUN52013**	03-JUL-2013	✓	**025JUL52013**	07-AUG-2013	✓
EP079A: Monocyclic Aromatic - ydrocarbons							
Amber VOC Vial 5Sulfuric Acid (EP079)							
GW02, GW07, GW09, GW29, GW30, GW38, RIN 3, TRIP 5	**265JUN52013**	**2H5JUN52013**	10-JUL-2013	✓	**2H5JUN52013**	10-JUL-2013	✓
EP079- : Naphthalene							
Amber VOC Vial 5Sulfuric Acid (EP079)							
GW02, GW07, GW09, GW29, GW30, GW38, RIN 3, TRIP 5	**265JUN52013**	**2H5JUN52013**	10-JUL-2013	✓	**2H5JUN52013**	10-JUL-2013	✓
EP0H0/071: Total Recoverable - ydrocarbons 5NEPM 2010 Draft							
Amber VOC Vial 5Sulfuric Acid (EP0H0)							
GW02, GW07, GW09, GW29, GW30, GW38, RIN 3	**265JUN52013**	**2H5JUN52013**	10-JUL-2013	✓	**2H5JUN52013**	10-JUL-2013	✓

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(where) 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.

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
Ammonia as N by Discrete analyser	EK055G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	19	**10.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	14	**19.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	14	**19.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	**4.3**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.1**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**7.1**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**H3**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	1	**100.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	**4.3**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.1**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**7.1**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**H3**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	1	**100.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.1**	**4.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**7.1**	**4.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**H3**	**4.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**4.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement

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
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) 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- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. 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	APHA 21st ed., 4500 Cl - G.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 librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um 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) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. 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 QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. 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.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	APHA 4500-CN-O. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. 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)
Ammonium as N	EK055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry 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 chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry 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 Chemical Reduction and direct colourimetry 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 othophosphate 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)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	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)
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	WATER	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	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)

Analytical Methods	Method	Matrix	Method Descriptions
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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. 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 100 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.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

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 SW 846 or ALS-QWI/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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1306798-002	GW07	**Sulfate as SO9 5 Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 9x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM1306798-001	GW02	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 9x 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

- **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 - olding 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.**

Sample details/Date.

Samples Received without COC

Date/Time Received	26-6-13 16:30
Date/Time Analysis Received	
Client/Sender:	EES Ref: EM1306738
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	8+1
Carrier Company:	
Con-note No:	
Project Details	210074
Sampler/Sampling dates	26-6-13.
Matrix	water.

1. GW02 26-6-13
2. GW07
3. GW09
4. GW29
5. GW30
6. GW38
7. RIN 3
8. RIN 4
9. TRIP 5

Environmental Division
Melbourne
Work Order
EM1306798

Telephone : +61-3-8549 9600

Notified: Carol Date: 26-6-13. 17:22.

Received By:

Samples sent to lab for
~~Micro~~ Nitrate BOD (pH)
Colour Turbidity RP
Other
Date 26-6-13.

Sample details/Date.

Samples Received without COC

Date/Time Received	26.6.13 16:30
Date/Time Analysis Received	27/6/13 09:29.
Client/Sender:	EES Ref: EM1306738
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	8+1
Carrier Company:	
Con-note No:	
Project Details	210074
Sampler/Sampling dates	26.6.13.
Matrix	water.

1. GW02 28.6.13
2. GW07
3. GW09
4. GW29
5. GW30
6. GW38
7. RIN 3
8. RIN 4
9. TRIP 5

Environmental Division
Melbourne
Work Order
EM1306798

Telephone : +61-3-8549 9600

Notified: Carol Date: 26.6.13. 17:22.

Received By:

Samples sent to lab for
~~Micro~~ Nitrate BOD (pH)
Colour Turbidity RP
Other .....
Date 26.6.13.

SCANNED

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2178 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ **Townsville:** 14-15 Desma Cl, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne:** 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide:** 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ **Perth:** 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston:** 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)			FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011				
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)		Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		CC	1 2 3 4 5 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9887 1666	O	1 2 3 4 5 7	Other comments:
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY: / RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	S.Leong	ALS Courier	
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		DATE/TIME:	DATE/TIME:	DATE/TIME: / DATE/TIME:
Email Invoice to : rorquiza@environmentalearthsciences.com		26/6 3pm and 27/6 9am	26/6/13 3 pm and 27/6/13 9am	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CoC received 27/06/13 09:29 R.T

ALS USE ONLY	SAMPLE DETAILS (MATRIX: Solid(S) Water(W))			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) — Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)												Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
	GW38	26/06/2013	W		8	x	x	x	x	x	x	x						6.18	17.4	
	GW02	26/06/2013	W		8	x	x	x	x	x	x	x						6.61	16.4	
	GW30	26/06/2013	W		8	x	x	x	x	x	x	x						6.74	17.2	
	GW29	26/06/2013	W		8	x	x	x	x	x	x	x						6.84	18.8	
	GW09	26/06/2013	W		8	x	x	x	x	x	x	x						5.83	18.5	
	GW07	26/06/2013	W		8	x	x	x	x	x	x	x						6.99	17.2	
	GW24	26/06/2013	W		8	x	x	x	x	x	x	x						7.24	15.6	
	GW06	26/06/2013	W		8	x	x	x	x	x	x	x						6.48	18.8	
	Trip 5	26/06/2013	W		1					x	x									
	Rin 3	26/06/2013	W		3					x	x	x								
				TOTAL																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Carol Walsh
Sent: Thursday, 27 June 2013 9:48 AM
To: Samples Melbourne
Subject: COC - ENVIRONMENTAL EARTH SCIENCES - 210074
Attachments: 210074_CoC_26-27 June 2013.pdf; img-626170730-0001.pdf

Attached is COC for samples that came in yesterday afternoon and for the ones coming in this morning from EES - Gas Park Project.

Please print off.

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Thursday, 27 June 2013 9:29 AM
To: Carol Walsh
Subject: RE: COC REQUIRED - ENVIRONMENTAL EARTH SCIENCES - 210074

Hi Carol,

Please find the attached CoC. I have included the samples that will be collected this morning.

Regards

Regin

Regin Orquiza - Project Manager
PO Box 2255, Footscray, Victoria 3011.
p: 03 8398 4499
m: 0488 888 593
f: 03 9687 1844
rorquiza@eesicontracting.com
www.eesicontracting.com

From: Carol Walsh [Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 8:42 AM
To: Regin Orquiza
Subject: COC REQUIRED - ENVIRONMENTAL EARTH SCIENCES - 210074 - EM1306798

Regin:

Please provide the COC with analysis for samples received yesterday afternoon for the Gas Works Park - see attached.

Kind Regards

Carol Walsh
Senior Client Services Officer
ALS | Environmental Division
4 Westall Rd

Springvale, VIC. 3171 Australia

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F +61 3 8549 9626

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Sample details/Date.

Samples Received without COC

Date/Time Received	26-6-13 16:30
Date/Time Analysis Received	27/6/13 09:29.
Client/Sender:	EES Ref: EM130 6738
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	8+1
Carrier Company:	
Con-note No:	
Project Details	210074
Sampler/Sampling dates	26-6-13.
Matrix	water.

1. GW02 26-6-13
2. GW07
3. GW09
4. GW29
5. GW30
6. GW38
7. RIN 3
8. RIN 4
9. TRIP 5

Environmental Division
Melbourne
Work Order
EM1306798

Telephone : +61-3-8549 9600

Notified: Carol Date: 26-6-13. 17:22.

Received By:

Samples sent to lab for
Micro Nitrate BOD (pH)
Colour Turbidity RP
Other.....
Date 26-6-13.....

SCANNED

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E:[illegible]
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle): COC 1 2 3 4 5 7
ORDER NUMBER:		Random Sample Temperature on Receipt: °C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1666	O 1 2 3 4 5 7
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	Other comment:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		
Email Invoice to : rorquiza@environmentalearthsciences.com		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		
DATE/TIME: 26/6 3pm	DATE/TIME: 26/6/13 3 pm	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CoC received 27/06/13 08:42 RT

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
6	GW38	26/06/2013	W		8	X	X	X	X	X	X	X						6.18	17.4	
1	GW02	26/06/2013	W		8	X	X	X	X	X	X	X						6.61	16.4	
5	GW30	26/06/2013	W		8	X	X	X	X	X	X	X						6.74	17.2	
4	GW29	26/06/2013	W		8	X	X	X	X	X	X	X						6.84	18.6	
3	GW09	26/06/2013	W		8	X	X	X	X	X	X	X						5.83	16.5	
2	GW07	26/06/2013	W		8	X	X	X	X	X	X	X						6.98	17.2	
9	Trip 5	26/06/2013	W		1					X	X									
7	Rin 3	26/06/2013	W		3					X	X	X								
8	Rin 4	26/06/2013	W		3					X	X	X								
				TOTAL																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Carol Walsh
Sent: Thursday, 27 June 2013 10:09 AM
To: Samples Melbourne
Cc: Raymond Thai
Subject: AMENDED COC'S for ENVIRONMENTAL EARTH SCIENCES - 210074 - EM1306798
Attachments: 210074_CoC_27 June 2013 am.pdf; 210074_CoC_26 June 2013 pm.pdf

Ray

Regin has split the samples received from yesterday and today into 2 COC's.

carol

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Thursday, 27 June 2013 10:05 AM
To: Carol Walsh
Subject: RE: COC REQUIRED - ENVIRONMENTAL EARTH SCIENCES - 210074 - EM1306798

Please find the attached updated CoC. I have separated the samples collected last night and this morning.

Thank you.

Regards

Regin Orquiza - Project Manager
PO Box 2255, Footscray, Victoria 3011.
p: 03 8398 4499
m: 0488 888 593
f: 03 9687 1844
rorquiza@eesicontracting.com
www.eesicontracting.com

If you have received this message _____
From: Carol Walsh [Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 8:42 AM
To: Regin Orquiza
Subject: COC REQUIRED - ENVIRONMENTAL EARTH SCIENCES - 210074 - EM1306798

Regin:

Please provide the COC with analysis for samples received yesterday afternoon for the Gas Works Park - see attached.

Kind Regards

Carol Walsh
Senior Client Services Officer
ALS | Environmental Division
4 Westall Rd

Springvale, VIC. 3171 Australia

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Samples Received without COC

Date/Time Received	26-6-13 16:30
Date/Time Analysis Received	27/6/13 09:29.
Client/Sender:	EES Ref: EM1306738
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	8+1
Carrier Company:	
Con-note No:	
Project Details	210074
Sampler/Sampling dates	26-6-13.
Matrix	water.

Sample details/Date.

1. GW02 26-6-13
2. GW07
3. GW09
4. GW29
5. GW30
6. GW38
7. RIN 3
8. RIN 4
9. TRIP 5

Environmental Division
Melbourne
Work Order 1145
EM1306798

Telephone : +61-3-8549 9600

Notified: Carol Date: 26-6-13. 11:22.

Received By:

Samples sent to lab for
~~Micro~~ ~~Nitrate~~ ~~BOD~~ (pH)
Colour Turbidity RP
Other.....
Date 26-6-13.....

SCANNED

R.T 27/6/13.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011	ALS QUOTE NO.: ME/330/13	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	COC SEQUENCE NUMBER (Circle): CC 1 2 3 4 5 7	Random Sample Temperature on Receipt: °C
ORDER NUMBER:		Other comment:
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1666 — O 1 2 3 4 5 7	
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	RELINQUISHED BY: S.Leong — DATE/TIME: 26/6 3pm
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RECEIVED BY: ALS Courier — DATE/TIME: 26/6/13 3 pm
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		RELINQUISHED BY: — DATE/TIME:
Email Invoice to : rorquiza@environmentalearthsciences.com		RECEIVED BY: — DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CoC received 27/06/13 08:42 RT

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
6	GW38	26/06/2013	W		8	X	X	X	X	X	X	X						6.18	17.4	
1	GW02	26/06/2013	W		8	X	X	X	X	X	X	X						6.61	16.4	
5	GW30	26/06/2013	W		8	X	X	X	X	X	X	X						6.74	17.2	
4	GW29	26/06/2013	W		8	X	X	X	X	X	X	X						6.84	18.6	
3	GW09	26/06/2013	W		8	X	X	X	X	X	X	X						5.83	18.5	
2	GW07	26/06/2013	W		8	X	X	X	X	X	X	X						6.99	17.2	
9	Trip 5	26/06/2013	W		1					X	X									
7	Rin 3	26/06/2013	W		3					X	X	X								
8	Rin 4	26/06/2013	W		3					X	X	X								
				TOTAL																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CoC received 28/06/13 09:27 ET

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney 277 Woodpark Rd Smithfield NSW 2176 Ph 02 8784 8555 E samples.sydney@alsenviro.com
☐ Brisbane 32 Shand St Stafford QLD 4053 Ph 07 3243 7222 E samples.brisbane@alsenviro.com
☐ Melbourne 24 Westall Rd Springvale VIC 3171 Ph 03 8549 9600 E samples.melbourne@alsenviro.com
☐ Perth 10 Hod Way Malaga WA 6090 Ph 08 9209 7655 E samples.perth@alsenviro.com
☐ Newcastle 9 Rosegum Rd Warabrook NSW 2304 Ph 02 4968 9433 E samples.newcastle@alsenviro.com
☐ Townsville 14-15 Desma Cl Bohle QLD 4818 Ph 07 4796 0600 E townsville.environmental@alsenviro.com
☐ Adelaide 21 Burma Rd Pooraka SA 5095 Ph 08 8359 0890 E adelaide@alsenviro.com
☐ Launceston 27 Wellington St Launceston TAS 7250 Ph 03 6331 2191 E launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 Sth Melbourne Gasworks	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle) GC 1 2 3 4 5 7
ORDER NUMBER:		Random Sample Temperature on Receipt: °C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1666	O 1 2 3 4 5 7 Other comments:
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	RELINQUISHED BY: S.Leong DATE/TIME: 26/6 3pm
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RECEIVED BY: ALS Courier DATE/TIME: 26/6/13 3 pm
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		RELINQUISHED BY: DATE/TIME:
Email Invoice to : rorquiza@environmentalearthsciences.com		RECEIVED BY: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
	GW38	25/06/2013	W		8	x	x	x	x	x	x	x	X					6.18	17.4	
	GW02	25/06/2013	W		8	x	x	x	x	x	x	x						6.61	16.4	
	GW30	25/06/2013	W		8	x	x	x	x	x	x	x						6.74	17.2	
	GW29	25/06/2013	W		8	x	x	x	x	x	x	x						6.84	16.6	
	GW09	25/06/2013	W		8	x	x	x	x	x	x	x						5.83	16.5	
	GW07	25/06/2013	W		8	x	x	x	x	x	x	x						6.99	17.2	
	Trip 5	25/06/2013	W		1					x	x									
	Rin 3	25/06/2013	W		3					x	x	x								
	Rin 4	25/06/2013	W		3					x	x	x								
				TOTAL																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid-Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Friday, 28 June 2013 9:27 AM
To: Samples Melbourne
Cc: Carol Walsh
Subject: FW: South Melbourne Gasworks
Attachments: img-628084338.pdf

Hi Carol,

Can you please include the silica gel clean-up for the following samples (GW24 and GW38), refer to the attached CoC.

Thank you.

Regards

Regin

From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 4:37 PM
To: Regin Orquiza
Subject: COC FOR SAMPLES RECEIVED THIS AFTERNOON

Regin

Do you have the COC's prepared for samples received this afternoon.

Kind Regards

Carol Walsh

Senior Client Services Officer
ALS | Environmental Division

4 Westall Rd
Springvale, VIC. 3171 Australia

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Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EM1306820	gl :	o1ɗ 9L
i ɑvy	o ENVIRONMENTAL EARTH SCIENCES	bl r f tl yf tC	oEvmtf vD vyl 8u mmefi v8M sr f ctv
i f vyl Ry	oGEI N08QGUZMAW	i f vyl Ry	oi l tf 8h l sed
WBBt ee	og RQRXQ2 8FF53 aQQTSi GWY8/N ,8/ZSTGWbNW8011	WBBt ee	o48h eyl s8GB8Sptrv: mt s 8/N 8/Vceytl st 831. 1
E-Dl rs	otf tqcrzl @ eriPrz	E-Dl rs	oR tf sRvl sed@l se: sf r l sRf D
T s pdf v	o+618038L67. 1666	T s pdf v	o+61-3-754L8L607
al RenDrs	o+618038L67. 1744	al RenDrs	o+61-3-754L8L601
gtf j Ry	oF100. 48Syd8M sr f ctv 8 l ewf tke	Ui 8b m s	oOEgM8lLLL8SRd Bcs 8X(3)8 vB8/VbS8Ui S38 qcrt D vy
QtB t8/cDr t	o----		
i -Q-i 8/cDr t	o----	ul y 8Sl Dps e8G R mm B	oF. -JZO-F013
Sl Dps t	oSab88KK	Nec 8u l y	o04-JZb-F013
Sry	o----		
		Of R 9el Dps e8 R mm B	o6
Ucf y 8/cDr t	oME/330/13	Of R 9el Dps e8 vl sOe B	o6

Tdre8 t pf ty8 ecp te B e8 l vC8 pt mfi ce8 t pf ty(e)8 wnd8 ydre8 t 9 t vR R8 G ecsye8 l ppsC8 yf 8 yd 8 el Dps (e)8 l e8 ecr Dny BR8 Wa8 pl : e8 f 98 ydre8 t pf ty8 dl m 8 r v8 Rd Rk B8 l vB8 l pptf m B8 9f t t s l e R8

Tdre8 tyR y 8 98/Wl sCere8Rf vyl rve8d 8f sf wrv: 8v9 tDl yfi vo

- l v tl s8 f DD vye
- Wl sCynR s8G ecsye
- Scttf : l y 8 f vytf s8nDnye

gl :	o F8f 9L
h ftk8QtB t	o EM13067F0
i snvy	o EOVNGQOMEOTWb8EWGTH8Si NEOi ES
gtfj Ry	o F100. 48Syd8M sf ctv 8 l ewf tke

General Comments

Td 8 l vl sCyR s8 ptf R Bct e8 ce B8 r C8 yd 8 Evmnf vD vy s8 ummenf v8 dl m 8 r v8 B m sf p B8 9f D8 eyl r sed B8 nvy tvl yf vl sC8 t Rf : vnz B8 ptf R Bct e8 ecRd8 l e8 ydf e 8 pcr sed B8 r C8 yd 8 ZSEgW,8 WgHW,8 WS8 l vB8 OEgMR8 Nv8 df ce B m sf p B8 ptf R Bct e8 t 8 DpsfC B8nv8 yd 8 r e vR 8f 98Bf RcD vy B8eyl vBl tBe8f t8 rC8Rsn vy8t qc eyP

h d t 8Dfneyct 8B y tDnvl yf v8dl e8r v8p t9f tD B,8 ecsye8 t 8 pf ty B8f v8 8BtC8v n dy8 l eneP

h d t 8 8 pf ty B8s ee8ydl v8(<)8 ecsy8ne8dn d t8ydl v8yd 8bQG,8ydne8DI C8r 8Bc 8yf 8ptnDI tC8el Dps 8 xytl RyBn eyl y 8Bnscyf v8 vB/f t8nvec9fRn vy8el Dps 8f t8 vl sCeneP

h d t 8yd 8bQG8f 98 8 pf ty B8t ecsy8Bn99 te8f D8eyl vBl tB8bQG,8ydne8DI C8r 8Bc 8yf 8dn d8Dfneyct 8Rf vy vy,8nvec9fRn vy8el Dps 8(t BcR B8v n dy8 DpsfC B)8f t8DI ynx8vy t9 t vR P

h d v8el Dpsnv: 8ynD 8nv9 ftDI yf v8ne8/f y8ptf mnB B8r C8yd 8Rsn vy,8el Dpsnv: 8Bl y e8 t 8edf wv8wnydf cy8 8ynD 8Rf Dpf v vy8BN8yd e 8nveyl vR e,8yd 8ynD 8Rf Dpf v vy8dl e8r v8 eecD B8r C8yd 8l rf tl yf tC8f t8ptf R eenv: 8pctpf e eP

K C8o i WS8OcDr t8=8 WS8 : neytC8vcDr t89f D8Bl yr l e 8DI nvyl nv B8r C8 d DnRs8Wf eytl Rye8S tmnR e8Td 8 d DnRs8Wf eytl Rye8S tmnR 8ne8 8Bnmenf v8f 98yd 8WD tnR v8 d DnRs8Sf RnyCP
bQG8=8onDny6f 98 pf tynv:
^8=8Tdne8 ecsy8ne8Rf Dpcy B89f D8nvBnmBcl s8 l vl sCy 8B y Ryf ve8 y8f t8 rf m 8yd 8s m sf 98 pf tynv:

- **EP074/080: Particular sample EM1306820-003 required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia for #3..**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**

NATA
WORLD RECOGNISED ACCREDITATION

OWTW8WRRt Bny B8bl r f tl yf tC87F5
8
WRRt Bny B8Bf t8Rf Dpsn l vR 8wnyd8
NSQ/NEi 81. 0F5P

Signatories

Tdne8 BfRcD vy8 dl e8 r v8 s Ryf vnRs8C8 en v B8 r C8 yd 8 l cydf tnz B8 en vl yf tn e8 nvBnRy B8 r sf wP8 Es Ryf vnR8 en vnv: 8 dl e8 r v8 Rl ttn B8 f cy8 nv Rf Dpsn l vR 8wnyd8ptf R Bct e8ep R9n B8nv8F18 aG8g l ty8l 1P

Signatories	*Position*	*Accreditation Category*
uns l vn8a tvl vBf	S vnf t8Nf f t: l vnR8 d Dney	M sf ctv 8Nf t: l vnRe
		M sf ctv 8Nf t: l vnRe
		M sf ctv 8Nf t: l vnRe
		M sf ctv 8Nf t: l vnRe
Vl tedl 8-Hf 8n nv:	Of v-M yl se8T l D8o l B t	M sf ctv 8Nf t: l vnRe
2nv: r nv8onv	S vnf t8Qt: l vnR8 d Dney	M sf ctv 8Qt: l vnRe
		M sf ctv 8Qt: l vnRe

Analytical Results

Scr-Ml ytnx: WATER (Ml ytnx: WATER)			Client sample ID	GW34	GW33	GW24	GW06	Trip 6
			Client sampling date / time	F. -JZO-F0138l5c00	F. -JZO-F0138l5c00	F. -JZO-F0138l5c00	F6-JZO-F0138l5c00	F6-JZO-F0138l5c00
Compound	CAS Number	LOR	Unit	EM1306820-001	EM1306820-002	EM1306820-003	EM1306820-004	EM1306820-005
EA005: pH								
pH Value	----	0P01	pH8Zvry	6.95	6.88	7.27	7.02	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	D: /b	4800	6390	4600	1080	----
ED037P: Alkalinity by PC Titrator								
Total Alkalinity as CaCO3	----	1	D: /b	753	346	657	257	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14707-. L-7	1	D: /b	2430	2050	2860	90	----
ED045G: Chloride Discrete analyser								
Chloride	1677. -00-6	1	D: /b	925	2640	37	435	----
ED093F: Dissolved Major Cations								
Calcium	. 440-. 0-F	1	D: /b	85	477	55	52	----
Magnesium	. 43L-L5-4	1	D: /b	160	405	45	44	----
Sodium	. 440-F3-5	1	D: /b	1670	1330	55	253	----
Potassium	. 440-0L-.	1	D: /b	127	152	19	22	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	. 4FL-L0-5	0P01	D: /b	0.02	<0P01	0.02	<0P01	----
Arsenic	. 440-37-F	0P001	D: /b	1.45	0.017	0.017	0.002	----
Cadmium	. 440-43-L	0P0001	D: /b	<0P0001	0.0004	<0P0001	<0P0001	----
Cobalt	. 440-47-4	0P001	D: /b	0.003	0.015	0.002	<0P001	----
Copper	. 440-50-7	0P001	D: /b	0.004	0.006	0.002	0.002	----
Lead	. 43L-LF-1	0P001	D: /b	<0P001	<0P001	0.001	<0P001	----
Manganese	. 43L-L6-5	0P001	D: /b	0.124	0.421	0.035	0.070	----
Nickel	. 440-0F-0	0P001	D: /b	0.074	0.048	0.004	0.025	----
Selenium	. . 7F-4L-F	0P01	D: /b	<0P01	<0P01	<0P01	<0P01	----
Zinc	. 440-66-6	0P005	D: /b	0.010	0.035	0.011	0.021	----
Boron	. 440-4F-7	0P05	D: /b	8.25	4.00	0.60	1.61	----
Iron	. 43L-7L-6	0P05	D: /b	2.33	0.14	0.13	<0P05	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	5. -1F-5	0P004	D: /b	0.255	0.069	0.209	0.005	----
EK040P: Fluoride by PC Titrator								
Fluoride	16L74-47-7	0P1	D: /b	2.5	1.5	0.5	1.4	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	. 664-41-.	0P01	D: /b	0.42	4.91	947	1.10	----

Analytical Results

Scr-Ml ytrx: WATER (Ml ytrx: WATER)

Compound	CAS Number	LOR	Unit	GW34	GW33	GW24	GW06	Trip 6
			Client sampling date / time	F. -JZO-F0138l5o00	F. -JZO-F0138l5o00	F. -JZO-F0138l5o00	F6-JZO-F0138l5o00	F6-JZO-F0138l5o00
				EM1306820-001	**EM1306820-002**	**EM1306820-003**	**EM1306820-004**	**EM1306820-005**
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	----	0P01	D: /b	**0.42**	**4.91**	----	**1.10**	----
Ammonium as N	----	0P01	D: /b	----	----	**943**	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0P01	D: /b	<0P01	**0.01**	**0.12**	<0P01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14. L. -55-7	0P01	D: /b	**0.28**	**4.59**	**29.0**	**0.04**	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14F65-44-F	0P01	D: /b	**0.18**	<0P01	<0P01	<0P01	----
EN055: Ionic Balance								
Total Anions	----	0P01	D q/b	**91.7**	**124**	**73.7**	**19.3**	----
Total Cations	----	0P01	D q/b	**93.3**	**119**	----	**17.8**	----
Total Cations	----	0P01	D q/b	----	----	**76.6**	----	----
Ionic Balance	----	0P01	%	**0.81**	**2.14**	----	**4.05**	----
Ionic Balance	----	0P01	%	----	----	**1.88**	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	----	50	µ: /b	----	----	**11700**	----	----
C15 - C28 Fraction	----	100	µ: /b	----	----	**920**	----	----
C29 - C36 Fraction	----	50	µ: /b	----	----	<50	----	----
^8**C10 - C36 Fraction (sum)**	----	50	µ: /b	----	----	**12600**	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µ: /b	----	----	**10200**	----	----
>C16 - C34 Fraction	----	100	µ: /b	----	----	**390**	----	----
>C34 - C40 Fraction	----	100	µ: /b	----	----	<100	----	----
^8**>C10 - C40 Fraction (sum)**	----	100	µ: /b	----	----	**10600**	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	. 1-43-F	1	µ: /b	<1	<1	**3380**	<1	<1
Toluene	107-77-3	F	µ: /b	<F	<F	<100	<F	<F
Ethylbenzene	100-41-4	F	µ: /b	<F	<F	<100	<F	<F
meta- & para-Xylene	107-37-38l06-4F-3	F	µ: /b	<F	<F	**1100**	<F	<F
Styrene	100-4F-5	5	µ: /b	<5	<5	<100	<5	<5
ortho-Xylene	L5-4. -6	F	µ: /b	<F	<F	**535**	<F	<F
Isopropylbenzene	L7-7F-7	5	µ: /b	<5	<5	<100	<5	<5
n-Propylbenzene	103-65-1	5	µ: /b	<5	<5	<100	<5	<5

Analytical Results

Scr-MI ytrx: WATER (MI ytrx: WATER)			Client sample ID	GW34	GW33	GW24	GW06	Trip 6
			Client sampling date / time	F. -JZO-F0138l5c00	F. -JZO-F0138l5c00	F. -JZO-F0138l5c00	F6-JZO-F0138l5c00	F6-JZO-F0138l5c00
Compound	CAS Number	LOR	Unit	EM1306820-001	EM1306820-002	EM1306820-003	EM1306820-004	EM1306820-005
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
1.3.5-Trimethylbenzene	107-6. -7	5	µ: /b	<5	<5	<100	<5	<5
sec-Butylbenzene	135-L7-7	5	µ: /b	<5	<5	<100	<5	<5
1.2.4-Trimethylbenzene	L5-63-6	5	µ: /b	<5	<5	**160**	<5	<5
tert-Butylbenzene	L7-06-6	5	µ: /b	<5	<5	<100	<5	<5
p-Isopropyltoluene	LL-7. -6	5	µ: /b	<5	<5	<100	<5	<5
n-Butylbenzene	104-51-7	5	µ: /b	<5	<5	<100	<5	<5
EP074H: Naphthalene								
Naphthalene	L1-F0-3	.	µ: /b	<.	<.	**6470**	<.	<.
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	F0	µ: /b	<F0	<F0	**5110**	<F0	----
C10 - C14 Fraction	----	50	µ: /b	<50	<50	**11700**	<50	----
C15 - C28 Fraction	----	100	µ: /b	<100	<100	**3290**	<100	----
C29 - C36 Fraction	----	50	µ: /b	<50	<50	**80**	<50	----
^8C10 - C36 Fraction (sum)	----	50	µ: /b	<50	<50	**15100**	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	F0	µ: /b	<F0	<F0	**5110**	<F0	----
>C10 - C16 Fraction	----	100	µ: /b	<100	<100	**10200**	<100	----
>C16 - C34 Fraction	----	100	µ: /b	**120**	<100	**2350**	<100	----
>C34 - C40 Fraction	----	100	µ: /b	<100	<100	<100	<100	----
^8>C10 - C40 Fraction (sum)	----	100	µ: /b	**120**	<100	**12600**	<100	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1. 060-0. -0	0Pl	%	**112**	**104**	**96.5**	**98.9**	**94.6**
Toluene-D8	F03. -F6-5	0Pl	%	**111**	**104**	**97.3**	**100**	**95.2**
4-Bromofluorobenzene	460-00-4	0Pl	%	**114**	**105**	**104**	**106**	**97.0**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1. 060-0. -0	0Pl	%	**113**	**105**	**99.0**	**99.5**	----
Toluene-D8	F03. -F6-5	0Pl	%	**105**	**98.4**	**92.3**	**95.2**	----
4-Bromofluorobenzene	460-00-4	0Pl	%	**107**	**99.5**	**96.2**	**96.4**	----

Analytical Results

Scr-Ml ytrx: WATER (Ml ytrx: WATER)			Client sample ID	GW26	----	----	----	----
			Client sampling date / time	F6-JZO-F0138l5c00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1306820-006	----	----	----	----
EA005: pH								
pH Value	----	0P01	pH8Zvry	6.72	----	----	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	D: /b	2300	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Total Alkalinity as CaCO3	----	1	D: /b	275	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14707-. L-7	1	D: /b	285	----	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	1677. -00-6	1	D: /b	919	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	. 440-. 0-F	1	D: /b	94	----	----	----	----
Magnesium	. 43L-L5-4	1	D: /b	90	----	----	----	----
Sodium	. 440-F3-5	1	D: /b	472	----	----	----	----
Potassium	. 440-0L-.	1	D: /b	8	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	. 4FL-L0-5	0P01	D: /b	<0P01	----	----	----	----
Arsenic	. 440-37-F	0P001	D: /b	0.072	----	----	----	----
Cadmium	. 440-43-L	0P0001	D: /b	0.0005	----	----	----	----
Cobalt	. 440-47-4	0P001	D: /b	0.034	----	----	----	----
Copper	. 440-50-7	0P001	D: /b	0.003	----	----	----	----
Lead	. 43L-LF-1	0P001	D: /b	<0P001	----	----	----	----
Manganese	. 43L-L6-5	0P001	D: /b	3.46	----	----	----	----
Nickel	. 440-0F-0	0P001	D: /b	0.044	----	----	----	----
Selenium	. . 7F-4L-F	0P01	D: /b	<0P01	----	----	----	----
Zinc	. 440-66-6	0P005	D: /b	0.050	----	----	----	----
Boron	. 440-4F-7	0P05	D: /b	0.47	----	----	----	----
Iron	. 43L-7L-6	0P05	D: /b	1.69	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	5. -1F-5	0P004	D: /b	<0P004	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16L74-47-7	0P1	D: /b	0.7	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	. 664-41-.	0P01	D: /b	1.29	----	----	----	----

Analytical Results

Scr-Ml ytnx: WATER (Ml ytnx: WATER)			Client sample ID	GW26	----	----	----	----
			Client sampling date / time	F6-JZO-F0138l5c00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1306820-006	----	----	----	----
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	----	0R01	D: /b	1.29	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0R01	D: /b	<0R01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14. L. -55-7	0R01	D: /b	0.04	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14F65-44-F	0R01	D: /b	0.04	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0R01	D q/b	37.4	----	----	----	----
Total Cations	----	0R01	D q/b	32.8	----	----	----	----
Ionic Balance	----	0R01	%	6.45	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	. 1-43-F	1	µ: /b	<1	----	----	----	----
Toluene	107-77-3	F	µ: /b	<F	----	----	----	----
Ethylbenzene	100-41-4	F	µ: /b	<F	----	----	----	----
meta- & para-Xylene	107-37-38106-4F-3	F	µ: /b	<F	----	----	----	----
Styrene	100-4F-5	5	µ: /b	<5	----	----	----	----
ortho-Xylene	L5-4. -6	F	µ: /b	<F	----	----	----	----
Isopropylbenzene	L7-7F-7	5	µ: /b	<5	----	----	----	----
n-Propylbenzene	103-65-1	5	µ: /b	<5	----	----	----	----
1.3.5-Trimethylbenzene	107-6. -7	5	µ: /b	<5	----	----	----	----
sec-Butylbenzene	135-L7-7	5	µ: /b	<5	----	----	----	----
1.2.4-Trimethylbenzene	L5-63-6	5	µ: /b	<5	----	----	----	----
tert-Butylbenzene	L7-06-6	5	µ: /b	<5	----	----	----	----
p-Isopropyltoluene	LL-7. -6	5	µ: /b	<5	----	----	----	----
n-Butylbenzene	104-51-7	5	µ: /b	<5	----	----	----	----
EP074H: Naphthalene								
Naphthalene	L1-F0-3	.	µ: /b	<.	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	F0	µ: /b	<F0	----	----	----	----
C10 - C14 Fraction	----	50	µ: /b	<50	----	----	----	----
C15 - C28 Fraction	----	100	µ: /b	<100	----	----	----	----
C29 - C36 Fraction	----	50	µ: /b	<50	----	----	----	----

Analytical Results

Scr -Ml ytrx: WATER (Ml ytrx: WATER)

Compound	CAS Number	LOR	Unit	GW26	----	----	----	----
			Client sampling date / time	F6-JZO-F0138l5o00	----	----	----	----
				EM1306820-006	**----**	**----**	**----**	**----**
EP080/071: Total Petroleum Hydrocarbons - Continued								
^8**C10 - C36 Fraction (sum)**	----	50	µ: /b	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	F0	µ: /b	<F0	----	----	----	----
>C10 - C16 Fraction	----	100	µ: /b	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µ: /b	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µ: /b	<100	----	----	----	----
^8**>C10 - C40 Fraction (sum)**	----	100	µ: /b	<100	----	----	----	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1. 060-0. -0	0Pl	%	**108**	----	----	----	----
Toluene-D8	F03. -F6-5	0Pl	%	**107**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0Pl	%	**108**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1. 060-0. -0	0Pl	%	**109**	----	----	----	----
Toluene-D8	F03. -F6-5	0Pl	%	**102**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0Pl	%	**99.4**	----	----	----	----

Surrogate Control Limits

Scr -Ml ytnx: WATER		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	1. 060-0. -0	6L	133
Toluene-D8	F03. -F6-5	. F	1F7
4-Bromofluorobenzene	460-00-4	. 0	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	1. 060-0. -0	. 0	13F
Toluene-D8	F03. -F6-5	6L	1F5
4-Bromofluorobenzene	460-00-4	61	1FL

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM13067V0**	Page	: 1 of 10
Client	: **ENHIRONMENTAL EARTS | CIENCE|**	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3181
E7mail	: ror- uiqaz eesi.biq	E7mail	: carol.@alshz alsglobal.com
Telephone	: w+1 03 6+981+++	Telephone	: w+1737 9546 6+09
Facsimile	: w+1 03 6+981944	Facsimile	: w+1737 9546 6+01
Project	: 210084 Sth Melbourne Gas@rks	QC Level	: NEPM 1666 Schedule B(3) and ALS QCS3 re- uirement
Site	: 7777		
C7O7C number	: 7777	Date Samples Received	: 287JUN72013
Sampler	: SFL / KK	Issue Date	: 047JUL72013
Order number	: 7777		
		No. of samples received	: +
Quote number	: ME/330/13	No. of samples analysed	: +

This report supersedes any previous report(s) @th 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 follo@ng 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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recogniqed 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 re- uest.

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

Where a reported less than (<) 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 @eight employed) or matrix interference.

Key : Anonymous = Refers to samples @hich are not specifically part of this @rk order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

NATA Accredited Laboratory 925

Accredited for compliance @th ISO/IEC 18025.

Signatories

This document has been electronically signed by the authoriqed signatories indicated belo@ Electronic signing has been carried out in compliance @th procedures specified in 21 CFR Part 11.

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Laboratory Duplicate (DUP) Report

The -uality 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 QWI7EN/39 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:7 No Limit; Result bet@een 10 and 20 times LOR:70% 750%; Result > 20 times LOR:70% 720%.

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005: pS (QC Lot: V9393542									
EM130+8697001	Anonymous	EA005: pH Value	7777	0.01	pH Unit	+.+9	+.+6	0.1	0% 720%
EM130+9067001	Anonymous	EA005: pH Value	7777	0.01	pH Unit	+.21	+.21	0.0	0% 720%
EA005: pS (QC Lot: V9393552									
EM130+9207003	GW24	EA005: pH Value	7777	0.01	pH Unit	8.28	8.28	0.0	0% 720%
EA005: pS (QC Lot: V9406) V2									
EM130+8447010	Anonymous	EA005: pH Value	7777	0.01	pH Unit	5.61	5.96	0.3	0% 720%
EM130+9057003	Anonymous	EA005: pH Value	7777	0.01	pH Unit	9.1+	9.15	0.1	0% 720%
EA015: Total Dissolved | olids (QC Lot: V940V672									
EM130+90+7001	Anonymous	EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	1+0	1+4	2.5	0% 750%
EM130+9067002	Anonymous	EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	11600	11500	3.4	0% 720%
ED03) P: Alkalinity by PC Titrator (QC Lot: V9407042									
EM130+8557001	Anonymous	ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	<1	<1	0.0	No Limit
EM130+869700+	Anonymous	ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	514	512	0.4	0% 720%
ED041G: | ulfate (Turbidimetric2as | O4 V8by DA (QC Lot: V93909) 2									
EM130+8697001	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	14909786 79	1	mg/L	1520	1540	1.1	0% 720%
EM130+9147003	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	14909786 79	1	mg/L	23+	234	1.2	0% 720%
ED045G: Chloride Discrete analyser (QC Lot: V9390962									
EM130+8697001	Anonymous	ED045G: Chloride	1+9987007+	1	mg/L	62+	640	1.4	0% 720%
EM130+9147003	Anonymous	ED045G: Chloride	1+9987007+	1	mg/L	6	6	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: V9390932									
EM130+8697001	Anonymous	ED063F: Calcium	84407807 2	1	mg/L	23+	226	3.3	0% 720%
		ED063F: Magnesium	84367657 4	1	mg/L	66	100	1.5	0% 720%
		ED063F: Sodium	84407237 5	1	mg/L	420	425	1.4	0% 720%
		ED063F: Potassium	84407067 8	1	mg/L	28	29	0.0	0% 720%
EM130+9147003	Anonymous	ED063F: Calcium	84407807 2	1	mg/L	9+	9+	0.0	0% 720%
		ED063F: Magnesium	84367657 4	1	mg/L	6	9	0.0	No Limit
		ED063F: Sodium	84407237 5	1	mg/L	8	+	0.0	No Limit
		ED063F: Potassium	84407067 8	1	mg/L	<1	<1	0.0	No Limit
EG0V0F: Dissolved Metals by ICP8M| (QC Lot: V9409692									
EM130+8697001	Anonymous	EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A7F: Arsenic	84407397 2	0.001	mg/L	0.12+	0.120	5.1	0% 720%
		EG020A7F: Cobalt	84407497 4	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A7F: Copper	84407507 9	0.001	mg/L	0.003	0.004	0.0	No Limit
		EG020A7F: Lead	84367627 1	0.001	mg/L	<0.001	<0.001	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG0V0F: Dissolved Metals by ICP8M| (QC Lot: V9409692 8continued									
EM130+8697001	Anonymous	EG020A7F: Manganese	843676+75	0.001	mg/L	2.18	2.48	13.0	0% 720%
		EG020A7F: Nickel	84407027 0	0.001	mg/L	0.002	<0.001	91.2	No Limit
		EG020A7F: Zinc	84407++7+	0.005	mg/L	0.021	0.021	0.0	No Limit
		EG020A7F: Aluminium	842676075	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Selenium	889274672	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	84407427 9	0.05	mg/L	0.80	0.85	+.+	0% 750%
		EG020A7F: Iron	84367967+	0.05	mg/L	20.4	22.1	9.2	0% 720%
EM130+9207004	GW0+	EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A7F: Arsenic	84407397 2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A7F: Cobalt	84407497 4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Copper	84407507 9	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A7F: Lead	843676271	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Manganese	843676+75	0.001	mg/L	0.080	0.0++	5.3	0% 720%
		EG020A7F: Nickel	84407027 0	0.001	mg/L	0.025	0.022	12.8	0% 720%
		EG020A7F: Zinc	84407++7+	0.005	mg/L	0.021	0.020	5.2	No Limit
		EG020A7F: Aluminium	842676075	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Selenium	889274672	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	84407427 9	0.05	mg/L	1.+1	1.+9	4.4	0% 720%
		EG020A7F: Iron	84367967+	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK0V6| F: Total CN by | egmented Flow Analyser (QC Lot: V9391592									
EM130+9207001	GW34	EK02+SF: Total Cyanide	5871275	0.004	mg/L	0.255	0.248	3.2	0% 720%
EK040P: Fluoride by PC Titrator (QC Lot: V9407052									
EM130+8557001	Anonymous	EK040P: Fluoride	1+6947497 9	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EM130+8697001	Anonymous	EK040P: Fluoride	1+6947497 9	0.1	mg/L	1.0	1.0	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: V9394432									
EM130+8457003	Anonymous	EK055G: Ammonia as N	8++474178	0.01	mg/L	94.4	99.8	5.0	0% 720%
EM130+8867004	Anonymous	EK055G: Ammonia as N	8++474178	0.01	mg/L	0.0+	0.05	0.0	No Limit
EK05) G: Nitrite as N by Discrete Analyser (QC Lot: V9390942									
EM130+8697001	Anonymous	EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM130+9147003	Anonymous	EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK0) 1G: Reactive Phosphorus as P by discrete analyser (QC Lot: V9390952									
EM130+8697001	Anonymous	EK081G: Reactive Phosphorus as P	142+574472	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM130+9207004	GW0+	EK081G: Reactive Phosphorus as P	142+574472	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QC Lot: V9404432									
EM130+9207001	GW34	EP084: Benqene	8174372	1	µg/L	<1	<1	0.0	No Limit
		EP084: Toluene	1097997 3	2	µg/L	<2	<2	0.0	No Limit
		EP084: Ethylbenqene	1007417 4	2	µg/L	<2	<2	0.0	No Limit
		EP084: meta7& para7Xylene	1097397 3 10+74273	2	µg/L	<2	<2	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QC Lot: V9404432 8continued									
EM130+9207001	GW34	EP084: ortho7Xylene	657487+	2	µg/L	<2	<2	0.0	No Limit
		EP084: Styrene	1007427 5	5	µg/L	<5	<5	0.0	No Limit
		EP084: Isopropylbenqene	697927 9	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Propylbenqene	1037+571	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.3.57Trimethylbenqene	1097+879	5	µg/L	<5	<5	0.0	No Limit
		EP084: sec7Butylbenqene	1357697 9	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.2.47Trimethylbenqene	657+37+	5	µg/L	<5	<5	0.0	No Limit
		EP084: tert7Butylbenqene	6970+7+	5	µg/L	<5	<5	0.0	No Limit
		EP084: p7Isopropyltoluene	667987+	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Butylbenqene	1047517 9	5	µg/L	<5	<5	0.0	No Limit
EP0) 4S: Naphthalene (QC Lot: V9404432									
EM130+9207001	GW34	EP084: Naphthalene	617207 3	8	µg/L	<8	<8	0.0	No Limit
EP070/0) 1: Total Petroleum Sydrocarbons (QC Lot: V93906) 2									
EM130+8697001	Anonymous	EP081: C15 7C29 Fraction	7777	100	µg/L	800	+90	2.3	No Limit
		EP081: C10 7C14 Fraction	7777	50	µg/L	110	110	0.0	No Limit
		EP081: C26 7C3+ Fraction	7777	50	µg/L	<50	<50	0.0	No Limit
EM130+9207001	GW34	EP081: C15 7C29 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: C10 7C14 Fraction	7777	50	µg/L	<50	<50	0.0	No Limit
		EP081: C26 7C3+ Fraction	7777	50	µg/L	<50	<50	0.0	No Limit
EP070/0) 1: Total Petroleum Sydrocarbons (QC Lot: V9404442									
EM130+9207001	GW34	EP090: C+ 7C6 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
EM130+9317028	Anonymous	EP090: C+ 7C6 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QC Lot: V93906) 2									
EM130+8697001	Anonymous	EP081: >C10 7C1+ Fraction	7777	100	µg/L	280	290	0.0	No Limit
		EP081: >C1+ 7C34 Fraction	7777	100	µg/L	+00	590	4.0	No Limit
		EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
EM130+9207001	GW34	EP081: >C10 7C1+ Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: >C1+ 7C34 Fraction	7777	100	µg/L	120	120	0.0	No Limit
		EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QC Lot: V9404442									
EM130+9207001	GW34	EP090: C+ 7C10 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
EM130+9317028	Anonymous	EP090: C+ 7C10 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit

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

The -uality control term Method / Laboratory Blank refers to an analyte free matrix to @hich 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 -uality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a kno@n interference free matrix spiked @th 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.

Sub7Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved | olids (QCLot: V940V672								
EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	<10	2000 mg/L	101	69	104
ED03) P: Alkalinity by PC Titrator (QCLot: V9407042								
ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	7777	200 mg/L	68.2	61	105
ED041G: | ulfate (Turbidimetric2as | O4 V8by DA (QCLot: V93909) 2								
ED041G: Sulfate as SO4 7Turbidimetric	149097867 9	1	mg/L	<1	25 mg/L	106	91	125
ED045G: Chloride Discrete analyser (QCLot: V9390962								
ED045G: Chloride	1+9987007+	1	mg/L	<1	10 mg/L	104	96	118
ED093F: Dissolved Major Cations (QCLot: V9390932								
ED063F: Calcium	84407807 2	1	mg/L	<1	5 mg/L	100	93	126
ED063F: Magnesium	84367657 4	1	mg/L	<1	5 mg/L	101	90	124
ED063F: Sodium	84407237 5	1	mg/L	<1	50 mg/L	61.2	88	125
ED063F: Potassium	84407067 8	1	mg/L	<1	50 mg/L	61.0	88	123
EG0V0F: Dissolved Metals by ICP8M| (QCLot: V9409692								
EG020A7F: Aluminium	84267607 5	0.01	mg/L	<0.01	0.5 mg/L	101	60	110
EG020A7F: Arsenic	84407397 2	0.001	mg/L	<0.001	0.1 mg/L	102	63	106
EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	0.1 mg/L	6+.9	95	111
EG020A7F: Cobalt	84407497 4	0.001	mg/L	<0.001	0.1 mg/L	69.6	98	111
EG020A7F: Copper	84407507 9	0.001	mg/L	<0.001	0.1 mg/L	65.5	9+	110
EG020A7F: Lead	84367627 1	0.001	mg/L	<0.001	0.1 mg/L	69.2	99	112
EG020A7F: Manganese	84367+75	0.001	mg/L	<0.001	0.1 mg/L	103	9+	110
EG020A7F: Nickel	84407027 0	0.001	mg/L	<0.001	0.1 mg/L	102	9+	112
EG020A7F: Selenium	88927467 2	0.01	mg/L	<0.01	0.1 mg/L	101	95	111
EG020A7F: Zinc	84407++7+	0.005	mg/L	<0.005	0.1 mg/L	63.2	93	113
EG020A7F: Boron	84407427 9	0.05	mg/L	<0.05	0.1 mg/L	69.9	82	12+
EG020A7F: Iron	84367967+	0.05	mg/L	<0.05	0.5 mg/L	100	99	112
EK0V6| F: Total CN by | egmented Flow Analyser (QCLot: V9391592								
EK02+SF: Total Cyanide	587127 5	0.004	mg/L	<0.004	0.2 mg/L	8+.2	85	113
EK040P: Fluoride by PC Titrator (QCLot: V9407052								
EK040P: Fluoride	1+69474979	0.1	mg/L	<0.1	5 mg/L	69.9	89	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: V9394432								
EK055G: Ammonia as N	8++474178	0.01	mg/L	<0.01	1.0 mg/L	111	8+	122
EK05) G: Nitrite as N by Discrete Analyser (QCLot: V9390942								
EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	0.5 mg/L	100	94	112

Sub7Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK0) 1G: Reactive Phosphorus as P by discrete analyser (QCLot: V9390952								
EK081G: Reactive Phosphorus as P	142+574472	0.01	mg/L	<0.01	0.5 mg/L	66.+	94	109
EP0) 1 | G: Total Petroleum Sydrocarbons 8| ilica gel cleanup (QCLot: V9410792								
EP081SG: C10 7C14 Fraction	7777	50	µg/L	<50	+2800 µg/L	11+	59	144
EP081SG: C15 7C29 Fraction	7777	100	µg/L	<100	101500 µg/L	111	55	133
EP081SG: C26 7C3+ Fraction	7777	50	µg/L	<50	7777	7777	7777	7777
EP081SG: C10 7C3+ Fraction (sum)	7777	50	µg/L	<50	7777	7777	7777	7777
EP0) 1 | G: Total Recoverable Sydrocarbons (NEPM V010 draft28| ilica gel cleanup (QCLot: V9410792								
EP081SG: >C10 7C1+ Fraction	7777	100	µg/L	<100	7777	7777	7777	7777
EP081SG: >C1+ 7C34 Fraction	7777	100	µg/L	<100	7777	7777	7777	7777
EP081SG: >C34 7C40 Fraction	7777	100	µg/L	<100	7777	7777	7777	7777
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QCLot: V9404432								
EP084: Benqene	8174372	1	µg/L	<1	20 µg/L	66.1	8+	122
EP084: Toluene	1079973	2	µg/L	<2	20 µg/L	66.9	86	123
EP084: Ethylbenqene	1007+174	2	µg/L	<2	20 µg/L	66.9	8+	119
EP084: meta7& para7Xylene	1097397 3 10+74273	2	µg/L	<2	40 µg/L	101	85	121
EP084: Styrene	1007+275	5	µg/L	<5	20 µg/L	68.4	82	119
EP084: ortho7Xylene	657+87+	2	µg/L	<2	20 µg/L	103	90	120
EP084: Isopropylbenqene	679279	5	µg/L	<5	20 µg/L	6+.9	81	116
EP084: n7Propylbenqene	1037+571	5	µg/L	<5	20 µg/L	62.1	+6	113
EP084: 1.3.57Trimethylbenqene	1097+879	5	µg/L	<5	20 µg/L	63.0	80	114
EP084: sec7Butylbenqene	1357+979	5	µg/L	<5	20 µg/L	63.4	81	115
EP084: 1.2.47Trimethylbenqene	657+37+	5	µg/L	<5	20 µg/L	62.3	80	114
EP084: tert7Butylbenqene	6970+7+	5	µg/L	<5	20 µg/L	63.2	82	114
EP084: p7Isopropyltoluene	667987+	5	µg/L	<5	20 µg/L	63.6	+9	114
EP084: n7Butylbenqene	1047+179	5	µg/L	<5	20 µg/L	63.+	+1	115
EP0) 4S: Naphthalene (QCLot: V9404432								
EP084: Naphthalene	617+073	8	µg/L	<8	20 µg/L	100	85	121
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V93906) 2								
EP081: C10 7C14 Fraction	7777	50	µg/L	<50	3+10 µg/L	85.5	4+	12+
EP081: C15 7C29 Fraction	7777	100	µg/L	<100	10340 µg/L	89.1	55	125
EP081: C26 7C3+ Fraction	7777	50	µg/L	<+0	3860 µg/L	86.1	55	126
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V9404442								
EP090: C+ 7C6 Fraction	7777	20	µg/L	<20	3+0 µg/L	10+	+0	12+
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V93906) 2								
EP081: >C10 7C1+ Fraction	7777	100	µg/L	<100	5080 µg/L	86.9	53	126
EP081: >C1+ 7C34 Fraction	7777	100	µg/L	<100	11230 µg/L	91.5	5+	132
EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	1010 µg/L	89.0	51	138

Sub7Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V9404442								
EP090: C+ 7C10 Fraction	7777	20	µg/L	<20	450 µg/L	103	5+	130

Matrix Spike (MS) Report

The -uality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked @th 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 @aived in the event of sample matrix interference.

Sub7Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: | ulfate (Turbidimetric2as | O4 V8by DA (QCLot: V93909) 2							
EM130+8697002	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	1490978679	10 mg/L	# Not Determined	80	130
ED045G: Chloride Discrete analyser (QCLot: V9390962							
EM130+8697002	Anonymous	ED045G: Chloride	1+9987007+	400 mg/L	66.4	80	130
EG0V0F: Dissolved Metals by ICP8M| (QCLot: V9409692							
EM130+8697001	Anonymous	EG020A7F: Arsenic	84407397 2	0.2 mg/L	102	96	136
		EG020A7F: Cadmium	84407437 6	0.05 mg/L	111	85	131
		EG020A7F: Cobalt	84407497 4	0.2 mg/L	68.0	88	126
		EG020A7F: Copper	84407507 9	0.2 mg/L	102	81	128
		EG020A7F: Lead	84367627 1	0.2 mg/L	104	81	123
		EG020A7F: Manganese	84367 6+75	0.2 mg/L	# Not Determined	++	132
		EG020A7F: Nickel	84407027 0	0.2 mg/L	6+.9	83	126
		EG020A7F: Zinc	84407++7+	0.2 mg/L	105	+9	13+
EK0V6| F: Total CN by | egmented Flow Analyser (QCLot: V9391592							
EM130+9207002	GW33	EK02+SF: Total Cyanide	5871275	0.2 mg/L	62.2	80	130
EK040P: Fluoride by PC Titrator (QCLot: V9407052							
EM130+8557002	Anonymous	EK040P: Fluoride	1+69474979	5.0 mg/L	118	80	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: V9394432							
EM130+8457004	Anonymous	EK055G: Ammonia as N	8++474178	1.0 mg/L	# Not Determined	80	130
EK05) G: Nitrite as N by Discrete Analyser (QCLot: V9390942							
EM130+8697002	Anonymous	EK058G: Nitrite as N	7777	0.5 mg/L	101	80	130
EK0) 1G: Reactive Phosphorus as P by discrete analyser (QCLot: V9390952							
EM130+8697002	Anonymous	EK081G: Reactive Phosphorus as P	142+574472	0.5 mg/L	104	80	130
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QCLot: V9404432							

Sub7Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Recovery Limits (%) Low	Matrix Spike (MS) Report: Recovery Limits (%) High
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QCLot: V9404432 8continued							
EM130+9207002	GW33	EP084: Benqene	8174372	20 µg/L	111	+4	121
		EP084: Toluene	10979973	20 µg/L	112	+3	125
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V93906) 2							
EM130+8697002	Anonymous	EP081: C10 7C14 Fraction	7777	3+10 µg/L	91.0	40	130
		EP081: C15 7C29 Fraction	7777	10340 µg/L	95.2	51	145
		EP081: C26 7C3+ Fraction	7777	3860 µg/L	9+.9	52	144
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V9404442							
EM130+9207002	GW33	EP090: C+ 7C6 Fraction	7777	290 µg/L	104	4+	12+
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V93906) 2							
EM130+8697002	Anonymous	EP081: >C10 7C1+ Fraction	7777	5080 µg/L	95.8	4+	142
		EP081: >C1+ 7C34 Fraction	7777	11230 µg/L	96.0	52	14+
		EP081: >C34 7C40 Fraction	7777	1010 µg/L	94.9	46	143
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V9404442							
EM130+9207002	GW33	EP090: C+ 7C10 Fraction	7777	330 µg/L	101	45	128

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The -uality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked @th a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be @aived in the event of sample matrix interference.

Sub7Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPDs (%) Value	RPDs (%) Control Limit
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V93906) 2										
EM130+8697002	Anonymous	EP081: C10 7C14 Fraction	7777	3+10 µg/L	91.0	7777	40	130	7777	7777
		EP081: C15 7C29 Fraction	7777	10340 µg/L	95.2	7777	51	145	7777	7777
		EP081: C26 7C3+ Fraction	7777	3860 µg/L	9+.9	7777	52	144	7777	7777
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V93906) 2										
EM130+8697002	Anonymous	EP081: >C10 7C1+ Fraction	7777	5080 µg/L	95.8	7777	4+	142	7777	7777
		EP081: >C1+ 7C34 Fraction	7777	11230 µg/L	96.0	7777	52	14+	7777	7777
		EP081: >C34 7C40 Fraction	7777	1010 µg/L	94.9	7777	46	143	7777	7777
EK05) G: Nitrite as N by Discrete Analyser (QCLot: V9390942										
EM130+8697002	Anonymous	EK058G: Nitrite as N	7777	0.5 mg/L	101	7777	80	130	7777	7777
EK0) 1G: Reactive Phosphorus as P by discrete analyser (QCLot: V9390952										
EM130+8697002	Anonymous	EK081G: Reactive Phosphorus as P	142+574472	0.5 mg/L	104	7777	80	130	7777	7777
ED045G: Chloride Discrete analyser (QCLot: V9390962										
EM130+8697002	Anonymous	ED045G: Chloride	1+9987007+	400 mg/L	66.4	7777	80	130	7777	7777

Sub7Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
ED041G: | ulfate (Turbidimetric2as | O4 V8by DA (QCLot: V93909) 2										
EM130+8697002	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	149097867 9	10 mg/L	# Not Determined	7777	80	130	7777	7777
EK0V6| F: Total CN by | egmented Flow Analyser (QCLot: V9391592										
EM130+9207002	GW33	EK02+SF: Total Cyanide	5871275	0.2 mg/L	62.2	7777	80	130	7777	7777
EK055G: Ammonia as N by Discrete Analyser (QCLot: V9394432										
EM130+8457004	Anonymous	EK055G: Ammonia as N	8++474178	1.0 mg/L	# Not Determined	7777	80	130	7777	7777
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QCLot: V9404432										
EM130+9207002	GW33	EP084: Benqene	8174372	20 µg/L	111	7777	+4	121	7777	7777
		EP084: Toluene	1097973	20 µg/L	112	7777	+3	125	7777	7777
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V9404442										
EM130+9207002	GW33	EP090: C+ 7C6 Fraction	7777	290 µg/L	104	7777	4+	12+	7777	7777
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V9404442										
EM130+9207002	GW33	EP090: C+ 7C10 Fraction	7777	330 µg/L	101	7777	45	128	7777	7777
EK040P: Fluoride by PC Titrator (QCLot: V9407052										
EM130+8557002	Anonymous	EK040P: Fluoride	1+6947497 9	5.0 mg/L	118	7777	80	130	7777	7777
EG0V0F: Dissolved Metals by ICP8M| (QCLot: V9409692										
EM130+8697001	Anonymous	EG020A7F: Arsenic	8440739 72	0.2 mg/L	102	7777	96	136	7777	7777
		EG020A7F: Cadmium	8440743 76	0.05 mg/L	111	7777	85	131	7777	7777
		EG020A7F: Cobalt	8440749 74	0.2 mg/L	68.0	7777	88	126	7777	7777
		EG020A7F: Copper	8440750 79	0.2 mg/L	102	7777	81	128	7777	7777
		EG020A7F: Lead	8436762 71	0.2 mg/L	104	7777	81	123	7777	7777
		EG020A7F: Manganese	843676+75	0.2 mg/L	# Not Determined	7777	++	132	7777	7777
		EG020A7F: Nickel	8440702 70	0.2 mg/L	6+.9	7777	83	126	7777	7777
		EG020A7F: Zinc	84407++7+	0.2 mg/L	105	7777	+9	13+	7777	7777

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM13067| 0**	Page	: 1 of 10
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 27-JUN-2013
Sampler	: SFL / KK	Issue Date	: 04-JUL-2013
Order number	: ----		
		No. of samples received	: 6
Quote number	: ME/330/13	No. of samples analysed	: 6

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

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: p+							
Clear Plastic Bottle 8Natural (EA005)							
GW06, GW26							
Clear Plastic Bottle 8Natural (EA005)							
GW34, GW33, GW24							
EA015: Total Dissolved Solids							
Clear Plastic Bottle 8Natural (EA015+)							
GW06, GW26							
Clear Plastic Bottle 8Natural (EA015+)							
GW34, GW33, GW24							
ED03JP: Alkalinity by PC Titrator							
Clear Plastic Bottle 8Natural (ED03J8P)							
GW06, GW26							
Clear Plastic Bottle 8Natural (ED03J8P)							
GW34, GW33, GW24							
ED041G: Sulfate (Turbidimetric) as SO4 | 8by DA							
Clear Plastic Bottle 8Natural (ED041G)							
GW06, GW26							
Clear Plastic Bottle 8Natural (ED041G)							
GW34, GW33, GW24							
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle 8Natural (ED045G)							
GW06, GW26							
Clear Plastic Bottle 8Natural (ED045G)							
GW34, GW33, GW24							

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations								
Clear Plastic Bottle 8Natural (ED093F)								
GW06,	GW26	**| 682UN§ 013**	888	03-JUL-2013	----	**| 782UN§ 013**	03-JUL-2013	✓
Clear Plastic Bottle 8Natural (ED093F)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	04-JUL-2013	----	**| 782UN§ 013**	04-JUL-2013	✓
EG0| 0F: Dissolved Metals by ICP8MS								
Clear Plastic Bottle 8Nitric Acid; Filtered (EG0| 0A8F)								
GW06,	GW26	**| 682UN§ 013**	888	23-DEC-2013	----	**0182UL§ 013**	23-DEC-2013	✓
Clear Plastic Bottle 8Nitric Acid; Filtered (EG0| 0A8F)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	24-DEC-2013	----	**0182UL§ 013**	24-DEC-2013	✓
EK0| 6SF: Total CN by Segmented Flow Analyser								
White Plastic Bottle8NaO+ (EK0| 6SF)								
GW06,	GW26	**| 682UN§ 013**	888	10-JUL-2013	----	**| J82UN§ 013**	10-JUL-2013	✓
White Plastic Bottle8NaO+ (EK0| 6SF)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	11-JUL-2013	----	**| J82UN§ 013**	11-JUL-2013	✓
EK040P: Fluoride by PC Titrator								
Clear Plastic Bottle 8Natural (EK040P)								
GW06,	GW26	**| 682UN§ 013**	888	24-JUL-2013	----	**| 782UN§ 013**	24-JUL-2013	✓
Clear Plastic Bottle 8Natural (EK040P)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	25-JUL-2013	----	**| 782UN§ 013**	25-JUL-2013	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle 8Sulfuric Acid (EK055G)								
GW06,	GW26	**| 682UN§ 013**	888	24-JUL-2013	----	**| 782UN§ 013**	24-JUL-2013	✓
Clear Plastic Bottle 8Sulfuric Acid (EK055G)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	25-JUL-2013	----	**| 782UN§ 013**	25-JUL-2013	✓
EK05JG: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle 8Natural (EK05JG)								
GW06,	GW26	**| 682UN§ 013**	888	28-JUN-2013	----	**| J82UN§ 013**	28-JUN-2013	✓
Clear Plastic Bottle 8Natural (EK05JG)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	29-JUN-2013	----	**| J82UN§ 013**	29-JUN-2013	✓
EK0J1G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle 8Natural (EK0J1G)								
GW06,	GW26	**| 682UN§ 013**	888	28-JUN-2013	----	**| J82UN§ 013**	28-JUN-2013	✓
Clear Plastic Bottle 8Natural (EK0J1G)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	29-JUN-2013	----	**| J82UN§ 013**	29-JUN-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP070/0J1: Total Recoverable +ydrocarbons 8NEPM | 010 Draft								
Amber Glass Bottle 8Unpreserved (EP0J1)								
GW06,	GW26	| 682UN8 013	| J82UN8 013	03-JUL-2013	✓	| 782UN8 013	06-AUG-2013	✓
Amber Glass Bottle 8Unpreserved (EP0J1)								
GW34, GW24	GW33,	| J82UN8 013	| J82UN8 013	04-JUL-2013	✓	| 782UN8 013	06-AUG-2013	✓
EP0J1 SG: Total Petroleum +ydrocarbons 8Silica gel cleanup								
Amber Glass Bottle 8Unpreserved (EP0J1SG)								
GW24		| J82UN8 013	| 782UN8 013	04-JUL-2013	✓	0| 82UL8 013	07-AUG-2013	✓
EP0J1 SG: Total Recoverable +ydrocarbons (NEPM | 010 draft) 8Silica gel cleanup								
Amber Glass Bottle 8Unpreserved (EP0J1SG)								
GW24		| J82UN8 013	| 782UN8 013	04-JUL-2013	✓	0| 82UL8 013	07-AUG-2013	✓
EP0J4A: Monocyclic Aromatic +ydrocarbons								
Amber VOC Vial 8Sulfuric Acid (EP0J4)								
GW06, GW26	Trip 6,	| 682UN8 013	| 782UN8 013	10-JUL-2013	✓	| 782UN8 013	10-JUL-2013	✓
Amber VOC Vial 8Sulfuric Acid (EP0J4)								
GW34, GW24	GW33,	| J82UN8 013	| 782UN8 013	11-JUL-2013	✓	| 782UN8 013	11-JUL-2013	✓
EP0J4+ : Naphthalene								
Amber VOC Vial 8Sulfuric Acid (EP0J4)								
GW06, GW26	Trip 6,	| 682UN8 013	| 782UN8 013	10-JUL-2013	✓	| 782UN8 013	10-JUL-2013	✓
Amber VOC Vial 8Sulfuric Acid (EP0J4)								
GW34, GW24	GW33,	| J82UN8 013	| 782UN8 013	11-JUL-2013	✓	| 782UN8 013	11-JUL-2013	✓
EP070/0J1: Total Recoverable +ydrocarbons 8NEPM | 010 Draft								
Amber VOC Vial 8Sulfuric Acid (EP070)								
GW06,	GW26	| 682UN8 013	| 782UN8 013	10-JUL-2013	✓	| 782UN8 013	10-JUL-2013	✓
Amber VOC Vial 8Sulfuric Acid (EP070)								
GW34, GW24	GW33,	| J82UN8 013	| 782UN8 013	11-JUL-2013	✓	| 782UN8 013	11-JUL-2013	✓

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(where) 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.

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
Ammonia as N by Discrete analyser	EK055G	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	1	**| 00.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	5	47	**10.6**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	12	**16.J**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	17	**11.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	**10.0**	**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
Ammonia as N by Discrete analyser	EK055G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**J.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**7.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**J.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**7.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**J.1**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**7.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement

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
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) 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- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. 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	APHA 21st ed., 4500 Cl - G.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 librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um 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) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. 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 QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. 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.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	APHA 4500-CN-O. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. 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)
Ammonium as N	EK055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry 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 chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry 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 Chemical Reduction and direct colourimetry 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 othophosphate 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)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	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)
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	WATER	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	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)

Analytical Methods	Method	Matrix	Method Descriptions
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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. 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 100 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.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

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 SW 846 or ALS-QWI/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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1306798-002	Anonymous	**Sulfate as SO4 8 Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM1306798-001	Anonymous	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK055G: Ammonia as N by Discrete Analyser	EM1306745-004	Anonymous	**Ammonia as N**	7664-41-7	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

- **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.

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	**Days overdue**	Date analysed	Due for analysis	**Days overdue**
EA005: p+						
Clear Plastic Bottle 8 Natural						
GW06, GW26	----	----	----	28-JUN-2013	26-JUN-2013	1

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.**

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
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☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne:** 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
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☐ **Launceston:** 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	**TURNAROUND REQUIREMENTS :** standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact: Yes / No / N/A; Free ice / Cooling Units present upon receipt: Yes / No / N/A; Random Sample Temperature on Receipt: 0
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		
PROJECT: 210074 Sth Melbourne Gaswords	**ALS QUOTE NO.:** ME/330/13	**COC SEQUENCE NUMBER (Circle)**
ORDER NUMBER:		COC: 1 2 3 4 5 7
PROJECT MANAGER: REGIN ORQUIZA	**CONTACT PH:** 9687 1666	O: 1 2 3 4 5 7 — Other comment: 4°
SAMPLER: SFL / KK	**SAMPLER MOBILE:** 0488 339 025	**RELINQUISHED BY:** S.Leong; **RECEIVED BY:** ALS Courier; **RELINQUISHED BY:**; **RECEIVED BY:**
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	**DATE/TIME:** 27/6 9 am; **DATE/TIME:** 27/6 9am; **DATE/TIME:**; **DATE/TIME:** 27/6, 10:05
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		
Email Invoice to : rorquiza@environmentalearthsciences.com		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CoC received 27/06/13 0842 RT

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).												Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
1	GW34	27/06/2013	W		8	x	x	x	x	x	x	x						6.85	17	
2	GW33	27/06/2013	W		8	x	x	x	x	x	x	x						6.5	18.1	
3	GW24 27/6	26/06/2013	W		8	x	x	x	x	x	x	x						7.24	15.6	
4	GW06	26/06/2013	W		8	x	x	x	x	x	x	x						6.84	18.6	
5	Trip 6 27/6	26/06/2013	W							x	x									
6	gw26	26/6			8	x	x	x	x	x	x	x						6.66	18.4	
		An 27/6																		
				TOTAL																

Environmental Division
LB Melbourne
11:10 Work Order
EM1306820

Telephone : +61-3-8549 9600

Samples sent to lab for
Micro Nitrate BOD pH
Colour Turbidity EP
Other
Date 27/6 BN

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = S Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

served; AP - Airfreight Unpreserved Plastic
l preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle)
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		Custody Seal Intact? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	Free ice / frozen ice bricks present upon arrival? Yes No
ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) COC 1 2 3 4 5 7	Random Sample Temperature on Receipt: 4.2 °C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1666 O 1 2 3 4 5 7	Other comment:
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		
Email Invoice to : rorquiza@environmentalearthsciences.com		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		
DATE/TIME: 27/6 9 am	DATE/TIME: 27/6 9am	DATE/TIME:	DATE/TIME: 27/6, 10-05

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CoC received 27/06/13 0842 R.T

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).											Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - Includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)				field pH	Field temp	
1	GW34	27/06/2013	W		8	X	X	X	X	X	X	X					6.85	17	
2	GW33	27/06/2013	W		8	X	X	X	X	X	X	X					6.5	18.1	
3	GW24 27/6	26/06/2013	W		8	X	X	X	X	X	X	X					7.24	15.6	
4	GW06	26/06/2013	W		8	X	X	X	X	X	X	X					6.84	18.6	
5	Trip 6 27/6	26/06/2013	W							X	X								
6	gw26	26/6			8	X	X	X	X	X	X	X					6.66	18.4	
		An 27/6																	
				TOTAL															

SCANNED

Environmental Division Melbourne
Work Order EM1306820
Telephone : +61-3-8549 9600

Samples sent to lab for Micro Nitrate BOD pH Colour Turbidity RP

Other

Date 27/6 BN

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sterile Glass; AP - Airfreight Unpreserved Plastic; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; ...l preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese...

R.T. 27/6/13

CoC received 28/06/13 09:27 R.T

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☐ Brisbane 32 Shand St Stafford QLD 4053 Ph 07 3243 7222 E samples.brisbane@alsenviro.com
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☐ Melbourne 2-4 Westall Rd Springvale VIC 3171 Ph 03 8549 9600 E samples.melbourne@alsenviro.com
☐ Adelaide: 7-1 Burma Rd Pooraka SA 5095 Ph 08 8359 0890 E adelaide@alsenviro.com
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☐ Launceston: 27 Wellington St Launceston TAS 7250 Ph 03 6334 1549 E launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle)
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011			Custody Seal Intact? Yes / No / N/A
PROJECT: 210074 Sth Melbourne Gasworks	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice packs present upon receipt? Yes / No / N/A
ORDER NUMBER:		CC 1 2 3 4 5 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: .REGIN ORQUIZA	CONTACT PH: 9887 1666	O 1 2 3 4 5 7	Other comments:
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	S.Leong	ALS Courier
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		DATE/TIME: 27/6 9 am	DATE/TIME: 27/6 9am
Email Invoice to : rorquiza@environmentalearthsciences.com		RELINQUISHED BY: DATE/TIME:	RECEIVED BY: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).													Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - Includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
	GW34	27/06/2013	W		8	x	x	x	x	x	x	x						6.85	17	
	GW33	27/06/2013	W		8	x	x	x	x	x	x	x						6.5	16.1	
	GW24	26/06/2013	W		8	x	x	x	x	x	x	x	X					7.24	15.6	
	GW06	26/06/2013	W		8	x	x	x	x	x	x	x						6.84	16.6	
	Trip 6	26/06/2013	W							x	x									
	gw26				8	x	x	x	x	x	x	x						6.66	16.4	
					TOTAL															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Friday, 28 June 2013 9:27 AM
To: Samples Melbourne
Cc: Carol Walsh
Subject: FW: South Melbourne Gasworks
Attachments: img-628084338.pdf

Hi Carol,

Can you please include the silica gel clean-up for the following samples (GW24 and GW38), refer to the attached CoC.

Thank you.

Regards

Regin

From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 4:37 PM
To: Regin Orquiza
Subject: COC FOR SAMPLES RECEIVED THIS AFTERNOON

Regin

Do you have the COC's prepared for samples received this afternoon.

Kind Regards

Carol Walsh

Senior Client Services Officer
ALS | Environmental Division

4 Westall Rd
Springvale, VIC. 3171 Australia

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Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EM1306871	[illegible]	: [illegible]
[illegible]	: **ENVIRONMENTAL EARTH SCIENCES**	[illegible]	: [illegible]
[illegible]	: [illegible]	[illegible]	: [illegible]
[illegible]	: P.N. [illegible]	[illegible]	: [illegible]
[illegible]	: [illegible]	[illegible]	: [illegible]
[illegible]	: [illegible]	[illegible]	: [illegible]
[illegible]	: [illegible]	[illegible]	: [illegible]
[illegible]	: [illegible]	[illegible]	: [illegible]
[illegible]	: [illegible]		
[illegible]	: [illegible]	[illegible]	: [illegible]
[illegible]	: [illegible]	[illegible]	: [illegible]
[illegible]	: [illegible]		
		[illegible]	: 6
[illegible]	: [illegible]	[illegible]	: 6

[illegible]

[illegible]:

- [illegible]
- [illegible]
- [illegible]

[illegible]	:	[illegible]
[illegible]	:	EM13067F1
[illegible]	:	[illegible]
[illegible]	:	[illegible]

General Comments

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

- **EK026SF : EM1306825-002 matrix spike failed for TCN due to possible sample interference. This has been confirmed by re-analysis.**
- **Ionic Balance out of acceptable limits due to analytes not quantified in this report.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**

WORLD RECOGNISED ACCREDITATION

[illegible]

Signatories

[illegible]

Signatories	Position	Accreditation Category
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

Analytical Results

TDLpMI rb8: WATER (MI rb8: WATER)

Compound	CAS Number	LOR	Unit	GW10	GW31	GW32	GW36	RIN4
Client sampling date / time				XFpJQI pX0138I2:00	XFpJQI pX0138I2:00	XFpJQI pX0138I2:00	XFpJQI pX0138I2:00	XFpJQI pX0138I2:00
				EM1306871-001	EM1306871-002	EM1306871-003	EM1306871-004	EM1306871-005
EA005: pH								
pH Value	ppp	0.01	4H8Qi C	3.66	7.44	7.29	7.13	ppp
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	ppp	10	v gl9	680	2400	936	3060	ppp
ED037P: Alkalinity by PC Titrator								
Total Alkalinity as CaCO3	ppp	1	v gl9	<1	370	584	743	ppp
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	1, 707pF+p7	1	v gl9	314	314	206	549	ppp
ED045G: Chloride Discrete analyser								
Chloride	1677Fp00p6	1	v gl9	24	954	40	1040	ppp
ED093F: Dissolved Major Cations								
Calcium	F, , 0pF0pX	1	v gl9	3	78	122	80	ppp
Magnesium	F, 3+p+2p	1	v gl9	2	73	58	99	ppp
Sodium	F, , 0pX3p2	1	v gl9	137	592	80	854	ppp
Potassium	F, , 0p0+pF	1	v gl9	4	50	35	34	ppp
EG020F: Dissolved Metals by ICP-MS								
Aluminium	F, X+p+0p2	0.01	v gl9	0.03	<0.01	<0.01	0.10	ppp
Arsenic	F, , 0p37pX	0.001	v gl9	0.018	0.425	1.39	0.067	ppp
Cadmium	F, , 0p 3p+	0.0001	v gl9	0.0003	0.0001	0.0004	0.0004	ppp
Cobalt	F, , 0p 7p	0.001	v gl9	0.002	0.002	<0.001	0.002	ppp
Copper	F, , 0p20p7	0.001	v gl9	0.002	0.001	0.002	0.004	ppp
Lead	F, 3+p+Xp1	0.001	v gl9	<0.001	<0.001	0.011	0.002	ppp
Manganese	F, 3+p+6p2	0.001	v gl9	0.017	0.190	0.162	0.242	ppp
Nickel	F, , 0p0Xp0	0.001	v gl9	0.067	0.094	0.027	0.054	ppp
Selenium	FF7Xp +pX	0.01	v gl9	<0.01	<0.01	<0.01	<0.01	ppp
Zinc	F, , 0p66p6	0.002	v gl9	0.067	0.025	0.018	0.018	ppp
Boron	F, , 0p Xp7	0.02	v gl9	0.34	3.03	0.99	1.62	ppp
Iron	F, 3+p7+p6	0.02	v gl9	0.96	0.60	1.26	0.49	ppp
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	2Fp1Xp2	0.00,	v gl9	<0.00,	0.212	0.141	0.053	ppp
EK040P: Fluoride by PC Titrator								
Fluoride	16+7, p 7p7	0.1	v gl9	<0.1	3.6	2.4	3.0	ppp
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	F66, p 1pF	0.01	v gl9	<0.01	5.58	16.3	<0.01	ppp

Pl g : , 8ofF
A otk8Ntth b : EM13067F1
y sCi r : El YG NI MEI 5Z98EZc 5H8Ty GEl y ET
Pboj ur : X001F, 8TrW8M sLoDti 8Rl e@ptke

Analytical Results

TDLpMl rb2: WATER (Ml rb2: WATER)			Client sample ID	GW10	GW31	GW32	GW36	RIN4
			Client sampling date / time	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00
Compound	CAS Number	LOR	Unit	EM1306871-001	EM1306871-002	EM1306871-003	EM1306871-004	EM1306871-005
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	ppp	0.01	v gk9	<0.01	**5.49**	**16.2**	<0.01	ppp
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	ppp	0.01	v gk9	<0.01	<0.01	<0.01	**0.10**	ppp
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	1, F+Fp22p7	0.01	v gk9	**0.01**	**0.14**	**0.31**	**3.03**	ppp
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	1, X62p , pX	0.01	v gk9	<0.01	<0.01	<0.01	<0.01	ppp
EN055: Ionic Balance								
Total Anions	ppp	0.01	v - k9	**7.21**	**40.8**	**17.1**	**55.6**	ppp
Total Cations	ppp	0.01	v - k9	**6.38**	**36.9**	**15.2**	**50.2**	ppp
Ionic Balance	ppp	0.01	%	**6.22**	**5.04**	**5.72**	**5.18**	ppp
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	F1p 3pX	1	µgk9	<1	<1	**69**	<1	<1
Toluene	107p77p3	X	µgk9	<X	<X	<X	<X	<X
Ethylbenzene	100p 1p	X	µgk9	<X	<X	**3**	<X	<X
meta- & para-Xylene	107p37p38l06p Xp3	X	µgk9	<X	<X	<X	<X	<X
Styrene	100p Xp2	2	µgk9	<2	<2	<2	<2	<2
ortho-Xylene	+2p Fp6	X	µgk9	<X	<X	<X	<X	<X
Isopropylbenzene	+7p7Xp7	2	µgk9	<2	<2	<2	<2	<2
n-Propylbenzene	103p62p1	2	µgk9	<2	<2	<2	<2	<2
1.3.5-Trimethylbenzene	107p6Fp7	2	µgk9	<2	<2	<2	<2	<2
sec-Butylbenzene	132p+7p7	2	µgk9	<2	<2	<2	<2	<2
1.2.4-Trimethylbenzene	+2p63p6	2	µgk9	<2	<2	<2	<2	<2
tert-Butylbenzene	+7p06p6	2	µgk9	<2	<2	<2	<2	<2
p-Isopropyltoluene	++p7Fp6	2	µgk9	<2	<2	<2	<2	<2
n-Butylbenzene	10, p21p7	2	µgk9	<2	<2	<2	<2	<2
EP074H: Naphthalene								
Naphthalene	+1pX0p3	F	µgk9	<F	<F	<F	<F	<F
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	ppp	X0	µgk9	<X0	<X0	**70**	<X0	<X0
C10 - C14 Fraction	ppp	20	µgk9	<20	<20	<20	<20	<20
C15 - C28 Fraction	ppp	100	µgk9	<100	**110**	**120**	<100	<100
C29 - C36 Fraction	ppp	20	µgk9	**50**	<20	<20	<20	<20

Pl g	:	2&of8F
A otk8Ntth b	:	EM13067F1
y s&i r	:	El YG&NI MEI 5Z98EZc 5H8Ty G&l y ET
Pboj ur	:	X001F, 8TrW8M sLoDti 8Rl e@ptke

Analytical Results

TDLpMl rb&: WATER (Ml rb&: WATER)			Client sample ID	GW10	GW31	GW32	GW36	RIN4
			Client sampling date / time	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00
Compound	*CAS Number*	*LOR*	*Unit*	**EM1306871-001**	**EM1306871-002**	**EM1306871-003**	**EM1306871-004**	**EM1306871-005**
EP080/071: Total Petroleum Hydrocarbons - Continued								
^8**C10 - C36 Fraction (sum)**	ppp	20	µgk9	**50**	**110**	**120**	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	ppp	X0	µgk9	<X0	<X0	**70**	<X0	<X0
>C10 - C16 Fraction	ppp	100	µgk9	<100	<100	<100	<100	<100
>C16 - C34 Fraction	ppp	100	µgk9	**130**	**120**	**180**	<100	<100
>C34 - C40 Fraction	ppp	100	µgk9	<100	<100	<100	<100	<100
^8**>C10 - C40 Fraction (sum)**	ppp	100	µgk9	**130**	**120**	**180**	<100	<100
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1F060p0Fp0	0.1	%	**87.1**	**83.8**	**90.0**	**90.8**	**85.7**
Toluene-D8	X03FpX6p2	0.1	%	**108**	**105**	**108**	**110**	**104**
4-Bromofluorobenzene	, 60p00p,	0.1	%	**104**	**101**	**102**	**102**	**99.6**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1F060p0Fp0	0.1	%	**83.4**	**80.2**	**86.2**	**87.5**	**82.0**
Toluene-D8	X03FpX6p2	0.1	%	**96.9**	**94.3**	**97.2**	**98.4**	**93.4**
4-Bromofluorobenzene	, 60p00p,	0.1	%	**98.9**	**92.4**	**99.4**	**98.4**	**93.7**

Analytical Results

TDLpMI rb2: WATER (MI rb2: WATER)

Compound	CAS Number	LOR	Unit	Trip 7	[illegible]	[illegible]	[illegible]	[illegible]
			Client sampling date / time	XFpJQI pX013812:00	[illegible]	[illegible]	[illegible]	[illegible]
				EM1306871-006	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	F1p 3pX	1	µgl9	<1	[illegible]	[illegible]	[illegible]	[illegible]
Toluene	107p77p3	X	µgl9	<X	[illegible]	[illegible]	[illegible]	[illegible]
Ethylbenzene	100p 1p	X	µgl9	<X	[illegible]	[illegible]	[illegible]	[illegible]
meta- & para-Xylene	107p87p38106p Xp3	X	µgl9	<X	[illegible]	[illegible]	[illegible]	[illegible]
Styrene	100p Xp2	2	µgl9	<2	[illegible]	[illegible]	[illegible]	[illegible]
ortho-Xylene	+2p Fp6	X	µgl9	<X	[illegible]	[illegible]	[illegible]	[illegible]
Isopropylbenzene	+7p7Xp7	2	µgl9	<2	[illegible]	[illegible]	[illegible]	[illegible]
n-Propylbenzene	103p62p1	2	µgl9	<2	[illegible]	[illegible]	[illegible]	[illegible]
1.3.5-Trimethylbenzene	107p6Fp7	2	µgl9	<2	[illegible]	[illegible]	[illegible]	[illegible]
sec-Butylbenzene	132p+7p7	2	µgl9	<2	[illegible]	[illegible]	[illegible]	[illegible]
1.2.4-Trimethylbenzene	+2p63p6	2	µgl9	<2	[illegible]	[illegible]	[illegible]	[illegible]
tert-Butylbenzene	+7p06p6	2	µgl9	<2	[illegible]	[illegible]	[illegible]	[illegible]
p-Isopropyltoluene	++p7Fp6	2	µgl9	<2	[illegible]	[illegible]	[illegible]	[illegible]
n-Butylbenzene	10, p21p7	2	µgl9	<2	[illegible]	[illegible]	[illegible]	[illegible]
EP074H: Naphthalene								
Naphthalene	+1pX0p3	F	µgl9	<F	[illegible]	[illegible]	[illegible]	[illegible]
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1F060p0Fp0	0.1	%	**86.4**	[illegible]	[illegible]	[illegible]	[illegible]
Toluene-D8	X03FpX6p2	0.1	%	**98.5**	[illegible]	[illegible]	[illegible]	[illegible]
4-Bromofluorobenzene	, 60p00p	0.1	%	**94.6**	[illegible]	[illegible]	[illegible]	[illegible]

Surrogate Control Limits

TDLpMl rb2: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	1F060p0Fp0	6+	133
Toluene-D8	X03FpX6p2	FX	1X7
4-Bromofluorobenzene	, 60p00p,	F0	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	1F060p0Fp0	F0	13X
Toluene-D8	X03FpX6p2	6+	1X2
4-Bromofluorobenzene	, 60p00p,	61	1X+

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM13067V1**	Page	: 8 1o88
ylGi r	: **ENHIRONMENTAL EARTS | CIENCE|**	f aL1bar1bt	: ni EGb1i v ei ral mGEGSGi DelL1Mbi e
y 1i raur	: Dc c nRG: Nc OQGUZ	y 1i raur	: yab1l A alsW
Zhhbess	: P.N.dNB XX25 FNN3Ty c ZS YGy VZQT3 c Zf GZ 5088	Zhhbess	: , A esrall c h T4bGgEale YGy ZMsrbalGa 58p8
n7v aG	: b1b- MGqaz ei EGb1i v ei raleabrWsuGi ues.u1v	n7v aG	: uab1l.@alsWz alsgl1Lal.u1v
3ele4Wli e	: w+8 05 6+9p8+++	3ele4Wli e	: w+875792, 6 6+09
FausGv Ge	: w+8 05 6+9p89, ,	FausGv Ge	: w+875792, 6 6+08
Pb1jeur	: X008p, TrWDelL1Mbi e Ras@lbks	Oy f eEel	: I nPD 8666 TuWehMe d(5) ai h Zf T Oy T5 be- MGev ei r
TGe	: 7777		
y7N7y i Mv Leb	: 7777	mare Tav 4les c eueGeh	: Xp7JQI 7X085
Tav 4leb	: TFf V/ /	GsMe mare	: 0, 7JQf 7X085
NGhebi Mv Leb	: 7777		
		I 1. 1osav 4les beueGeh	: +
OMlre i Mv Leb	: Dnk650k85	I 1. 1osav 4les ai alt seh	: +

3WS be41br sM4lebsehes ai t 4beEGMs be41br(s) @GW rWS beoebei ue. c esMrs a44lt r1 rWe sav 4le(s) as sMLv Greh. ZII 4ages 1o rWS be41br WaEe Leei uWeukeh ai h a44b1Eeh olt belease.

3WS OMalGt y 1i rb1l c e41br u1i raGs rWe olll1@GCg GGo1bv arGi :

- f aL1bar1bt mM4lGare (mQP) c e41br; c elarGe Pebuei rage mGebei ue (c Pm) ai h Zuue4rai ue f Gv Gs
- DerWlh dlai k (Dd) ai h f aL1bar1bt y 1i rb1l T4Ge (f y T) c e41br; c eu1Eebt ai h Zuue4rai ue f Gv Gs
- Darb@ T4Ge (DT) c e41br; c eu1Eebt ai h Zuue4rai ue f Gv Gs

General Comments

3We ai alt rQal 4b1uehMtes Mseh Lt rWe ni EC1i v ei ral mGSCi WaEe Leei heEel14eh db1v esraLIGWeh Crebi arCi allt beu1gi Qeh 4b1uehMtes sMuW as rWIse 4MLIGWeh Lt rWe QTnPZV ZPHZV ZT ai h I nPD. G WlMse heEel14eh 4b1uehMtes abe ev 4l1t eh C rWe aLsei ue 1oh1uMv ei reh srai hatbs 1bLt ulGi r be- Mesr.

A Wbe v 1GrMbe herebv CarCi Was Leei 4ebo1bv ehVbesMrs abe be41breh 1i a hbt @eGW LasG.

A Wbe a be41breh less rWai (<) besMr G WGWebrWai rWe f Nc VrWS v at Le hMe r1 4bO abt sav 4le exrbaurKGesrare hCMCi ai hK1bCsMbCGi r sav 4le o1bai alt sG.

A Wbe rWe f Nc 1oa be41breh besMr hCebs db1v srai hatb f Nc VrWS v at Le hMe r1 WGWv 1GrMbe u1i rei rVCsMbCGi r sav 4le (behMueh @eGW ev 4l1t eh) 1bv arbCi Crebebei ue.

/ et : Zi 1i t v 1Ms = c eoebs r1 sav 4les @MCWabe i 1r s4euCCallt 4abr 1orWS @1tk 1btebLMr o1bv eh 4abr 1orWe Oy 4b1uess I1r
y ZT I Mv Leb= y ZT begGrbt i Mv Lebo1v haraLase v aCraCeh Lt y Wev Qal ZLsrbaurs TebEQes. 3We y Wev Qal ZLsrbaurs TebEQe G a hCESCi 1orWe Zv ebQai y Wev Qal T1uGrt .
f Nc = f Q C1obe41brCg
c Pm = c elarGe Pebuei rage mCebei ue
= GhCares oaCeh Oy

WORLD RECOGNISED ACCREDITATION

I Z3Z Zuubeh@eh f aL1bar1bt 9X2

Zuubeh@eh o1b u1v 4lGai ue @GW GNKGy 8p0X2.

Signatories

3WS h1uMv ei r Was Leei eleurb1i Qallt sQi eh Lt rWe aMWbQeh sQi ar1bGs ChQareh Lel1@ nleurb1i Q sQi Cg Was Leei uabbGeh 1Mr C u1v 4lGai ue @CV 4b1uehMtes s4euQGeh C X8 y Fc Pabr 88.

Signatories	Position	Accreditation Category
mQai CFebi ai h1	Tei QbG1bgai Q y Wev Gr	DelL1Mbi e G1bgai Qs
		DelL1Mbi e G1bgai Qs
Hebv ai f C	f aL1bar1bt y 11btCar1b	DelL1Mbi e G1bgai Qs
		DelL1Mbi e G1bgai Qs
		DelL1Mbi e G1bgai Qs
		DelL1Mbi e G1bgai Qs
I ai ut A ai g	Tei QbTev CE1larQe GsrbMv ei r y Wev Gr	DelL1Mbi e Nbgai Qs
YabsWa H1 A Cg	I 1i 7Derals 3eav f eaheb	DelL1Mbi e G1bgai Qs
		DelL1Mbi e G1bgai Qs
BCgLC f C	Tei QbNbgai Q y Wev Gr	DelL1Mbi e Nbgai Qs
		DelL1Mbi e Nbgai Qs

Laboratory Duplicate (DUP) Report

3We - MalGt u1i rb1l rebv f aL1bar1bt mM4lQare becebs r1 a bai h1v lt seleureh CrbalaL1bar1bt s4lG f aL1bar1bt hM4lQares 4b1EGe Cotbv arCi begathCg v erWh 4beuGCi ai h sav 4le Werebi1gei eGt . 3We 4ebv Greh bai ges otb rWe c elarGe Pebuei r meEGarCi (c Pm) 1o f aL1bar1bt mM4lQares abe s4euGGh C ZfT DerWh OA GhI K69 ai h abe he4ei hei r 1i rWe v agi GMhe 1o besMrs C u1v 4abS1i r1 rWe leEel 1o be41brCg: c esMr < 80 rQ es f Nc :7 I 1 f Q C; c esMr Ler@ei 80 ai h X0 rQ es f Nc :70% 720%; c esMr > X0 rQ es f Nc :70% 7X0%.

TML7D arbQ: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA005: pS (QC Lot: 2941402)									
nD850+9p87008	RA 80	nZ002: 4H YalMe	7777	0.08	4H Qi C	5.++	5.+9	0.2	0% 7X0%
nD850+9p+700+	Zi 1i t v 1Ms	nZ002: 4H YalMe	7777	0.08	4H Qi C	p.8p	p.X0	0.,	0% 7X0%
EA015: Total Dissolved | olids (QC Lot: 29425V1)									
nD850+p997008	Zi 1i t v 1Ms	nZ082H: 31ral mGs1lEeh T1lGs z 890°y	7777	80	v gK	+, X	+, 0	0.5	0% 7X0%
nD850+9+X700,	Zi 1i t v 1Ms	nZ082H: 31ral mGs1lEeh T1lGs z 890°y	7777	80	v gK	86+	X00	X.0	0% 720%
ED03VP: Alkalinity by PC Titrator (QC Lot: 2943214)									
nD850+9807008	Zi 1i t v 1Ms	nm05p7P: 31ral ZlkalCGt as y ay N5	7777	8	v gK	, X8	, X0	0.0	0% 7X0%
nD850+99, 700X	Zi 1i t v 1Ms	nm05p7P: 31ral ZlkalCGt as y ay N5	7777	8	v gK	920	9, 9	0.X	0% 7X0%
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QC Lot: 2941244)									
nD850+9p87008	RA 80	nm0, 8R: TMGare as TN, 73MLGGQ erbQ	8, 9097p679	8	v gK	58,	58,	0.0	0% 7X0%
nD850+9p+7002	Zi 1i t v 1Ms	nm0, 8R: TMGare as TN, 73MLGGQ erbQ	8, 9097p679	8	v gK	566	56,	8.X	0% 7X0%
ED045G: Chloride Discrete analyser (QC Lot: 2941247)									
nD850+9p87008	RA 80	nm0, 2R: y W1bGe	8+99p7007+	8	v gK	X,	X5	0.0	0% 7X0%
nD850+9p+7002	Zi 1i t v 1Ms	nm0, 2R: y W1bGe	8+99p7007+	8	v gK	9	9	0.0	I 1 f Q C
ED093F: Dissolved Major Cations (QC Lot: 2941245)									
nD850+9p87008	RA 80	nm065F: y aluGM	p, , 07p07X	8	v gK	5	5	0.0	I 1 f Q C
		nm065F: Dagi esGM	p, 567627,	8	v gK	X	X	0.0	I 1 f Q C
		nm065F: T1hGM	p, , 07X572	8	v gK	85p	856	8.2	0% 7X0%
		nm065F: P1rassGM	p, , 07067p	8	v gK	,	,	0.0	I 1 f Q C
nD850+9p+7002	Zi 1i t v 1Ms	nm065F: y aluGM	p, , 07p07X	8	v gK	886	886	0.0	0% 7X0%
		nm065F: Dagi esGM	p, 567627,	8	v gK	52	52	0.0	0% 7X0%
		nm065F: T1hGM	p, , 07X572	8	v gK	X9	Xp	0.0	0% 7X0%
		nm065F: P1rassGM	p, , 07067p	8	v gK	80	80	0.0	0% 720%
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2943613)									
nD850+p997008	Zi 1i t v 1Ms	nR0X0Z7F: y ahv GM	p, , 07, 576	0.0008	v gK	<0.0008	<0.0008	0.0	I 1 f Q C
		nR0X0Z7F: Zbsei Q	p, , 07597X	0.008	v gK	0.00p	0.009	0.0	I 1 f Q C
		nR0X0Z7F: y 1Lalr	p, , 07, 97,	0.008	v gK	<0.008	<0.008	0.0	I 1 f Q C
		nR0X0Z7F: y 144eb	p, , 072079	0.008	v gK	0.00,	0.00,	0.0	I 1 f Q C
		nR0X0Z7F: f eah	p, 5676X78	0.008	v gK	<0.008	<0.008	0.0	I 1 f Q C
		nR0X0Z7F: Dai gai ese	p, 5676+72	0.008	v gK	0.052	0.05+	5.X	0% 7X0%
		nR0X0Z7F: I Gkel	p, , 070X70	0.008	v gK	0.00p	0.009	85.0	I 1 f Q C
		nR0X0Z7F: UCu	p, , 07++7+	0.002	v gK	0.058	0.05X	5.+	I 1 f Q C
		nR0X0Z7F: ZIMv CGM	p, X676072	0.08	v gK	0.0X	0.0X	0.0	I 1 f Q C
		nR0X0Z7F: Telei GM	pp9X7, 67X	0.08	v gK	<0.08	<0.08	0.0	I 1 f Q C
		nR0X0Z7F: d 1b1i	p, , 07, X79	0.02	v gK	8.0p	8.8X	2.0	0% 7X0%

TML7D arb2: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2943613) 8continued									
nD850+p997008	Zi 1i t v 1Ms	nR0X0Z7F: G1i	p, 567967+	0.02	v gK	<0.02	<0.02	0.0	I 1 f Q C
nD850+9+X700,	Zi 1i t v 1Ms	nR0X0Z7F: y ahv CW	p, , 07, 576	0.0008	v gK	<0.0008	<0.0008	0.0	I 1 f Q C
		nR0X0Z7F: Zbsei Q	p, , 07597X	0.008	v gK	<0.008	<0.008	0.0	I 1 f Q C
		nR0X0Z7F: y 1Lalr	p, , 07, 97,	0.008	v gK	<0.008	<0.008	0.0	I 1 f Q C
		nR0X0Z7F: y 144eb	p, , 072079	0.008	v gK	0.002	0.002	0.0	I 1 f Q C
		nR0X0Z7F: f eah	p, 5676X78	0.008	v gK	<0.008	<0.008	0.0	I 1 f Q C
		nR0X0Z7F: Dai gai ese	p, 5676+72	0.008	v gK	0.0+X	0.026	, .p	0% 7X0%
		nR0X0Z7F: I Qkel	p, , 070X70	0.008	v gK	0.008	0.008	0.0	I 1 f Q C
		nR0X0Z7F: UCu	p, , 07++7+	0.002	v gK	0.08,	0.085	9.,	I 1 f Q C
		nR0X0Z7F: ZIMv CCW	p, X676072	0.08	v gK	0.06	0.80	0.0	0% 720%
		nR0X0Z7F: Telei CW	pp9X7, 67X	0.08	v gK	<0.08	<0.08	0.0	I 1 f Q C
		nR0X0Z7F: d 1b1i	p, , 07, X79	0.02	v gK	<0.02	<0.02	0.0	I 1 f Q C
		nR0X0Z7F: G1i	p, 567967+	0.02	v gK	0., 6	0., 9	0.0	I 1 f Q C
EK026| F: Total CN by | egmented Flow Analyser (QC Lot: 2941314)									
nD850+9X27008	Zi 1i t v 1Ms	n/ 0X+TF: 31ral y t ai Qe	2p78X72	0.00,	v gK	<0.00,	<0.00,	0.0	I 1 f Q C
nD850+9X2708X	Zi 1i t v 1Ms	n/ 0X+TF: 31ral y t ai Qe	2p78X72	0.00,	v gK	<0.00,	<0.00,	0.0	I 1 f Q C
EK040P: Fluoride by PC Titrator (QC Lot: 2943213)									
nD850+p997008	Zi 1i t v 1Ms	n/ 0, 0P: FIM1bQe	8+69, 7, 979	0.8	v gK	0.6	0.6	0.0	I 1 f Q C
nD850+9807008	Zi 1i t v 1Ms	n/ 0, 0P: FIM1bQe	8+69, 7, 979	0.8	v gK	0.+	0.+	0.0	I 1 f Q C
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2941453)									
nD850+95p7008	Zi 1i t v 1Ms	n/ 022R: Zv v 1i Q as I	p++, 7, 87p	0.08	v gK	8X.,	8X+	8.0	0% 7X0%
nD850+9p+7002	Zi 1i t v 1Ms	n/ 022R: Zv v 1i Q as I	p++, 7, 87p	0.08	v gK	0.89	0.89	0.0	0% 720%
EK05VG: Nitrite as N by Discrete Analyser (QC Lot: 2941246)									
nD850+9p87008	RA 80	n/ 02pR: I Q1Qe as I	7777	0.08	v gK	<0.08	<0.08	0.0	I 1 f Q C
nD850+9p+7002	Zi 1i t v 1Ms	n/ 02pR: I Q1Qe as I	7777	0.08	v gK	<0.08	<0.08	0.0	I 1 f Q C
EK0V1G: Reactive Phosphorus as P by discrete analyser (QC Lot: 294124V)									
nD850+9p87008	RA 80	n/ 0p8R: c eaurGe PWIs4W1bMs as P	8, X+27, , 7X	0.08	v gK	<0.08	<0.08	0.0	I 1 f Q C
nD850+9p+7002	Zi 1i t v 1Ms	n/ 0p8R: c eaurGe PWIs4W1bMs as P	8, X+27, , 7X	0.08	v gK	0.09	0.09	0.0	I 1 f Q C
EP0V4A: Monocyclic Aromatic Sydrocarbons (QC Lot: 2941V33)									
nD850+p697008	Zi 1i t v 1Ms	nP0p, : dei qei e	p87, 57X	8	µgK	8	8	0.0	I 1 f Q C
		nP0p, : 31IMei e	80979975	X	µgK	<X	<X	0.0	I 1 f Q C
		nP0p, : nrWILei qei e	8007, 87,	X	µgK	<X	<X	0.0	I 1 f Q C
		nP0p, : v era7& 4aba7Bt lei e	80975975 80+7, X75	X	µgK	<X	<X	0.0	I 1 f Q C
		nP0p, : 1bW17Bt lei e	627, p7+	X	µgK	<X	<X	0.0	I 1 f Q C
		nP0p, : Trt bei e	8007, X72	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : G14b14t ILei qei e	6979X79	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : i 7Pb14t ILei qei e	8057+278	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : 8.5.273bQ erWILei qei e	8097+p79	2	µgK	<2	<2	0.0	I 1 f Q C

TML7Darb2: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP0V4A: Monocyclic Aromatic Sydrocarbons (QC Lot: 2941V33) 8continued									
nD850+p697008	Zi 1i t v 1Ms	nP0p, : seu7d Mt lLei qei e	8527697 9	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : 8.X, 73b0 erWlLei qei e	627+57+	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : reb7d Mt lLei qei e	6970+7+	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : 47G14b14t lr1lMei e	6679p7+	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : i 7d Mt lLei qei e	80, 7287 9	2	µgK	<2	<2	0.0	I 1 f Q C
nD850+9p87008	RA 80	nP0p, : d ei qei e	p87, 57X	8	µgK	<8	<8	0.0	I 1 f Q C
		nP0p, : 3 1lMei e	8097997 5	X	µgK	<X	<X	0.0	I 1 f Q C
		nP0p, : nrWlLei qei e	8007, 87,	X	µgK	<X	<X	0.0	I 1 f Q C
		nP0p, : v era7& 4aba7Bt lei e	8097597 5 80+7, X7 5	X	µgK	<X	<X	0.0	I 1 f Q C
		nP0p, : 1bWl7Bt lei e	627, p7+	X	µgK	<X	<X	0.0	I 1 f Q C
		nP0p, : Trt bei e	8007, X72	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : G14b14t lLei qei e	6979X7 9	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : i 7Pb14t lLei qei e	8057+27 8	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : 8.5.273b0 erWlLei qei e	8097+p7 9	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : seu7d Mt lLei qei e	8527697 9	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : 8.X, 73b0 erWlLei qei e	627+57+	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : reb7d Mt lLei qei e	6970+7+	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : 47G14b14t lr1lMei e	6679p7+	2	µgK	<2	<2	0.0	I 1 f Q C
		nP0p, : i 7d Mt lLei qei e	80, 7287 9	2	µgK	<2	<2	0.0	I 1 f Q C
EP0V4S: Naphthalene (QC Lot: 2941V33)									
nD850+p697008	Zi 1i t v 1Ms	nP0p, : I a4WWalei e	687X07 5	p	µgK	<p	<p	0.0	I 1 f Q C
nD850+9p87008	RA 80	nP0p, : I a4WWalei e	687X07 5	p	µgK	<p	<p	0.0	I 1 f Q C
EP070/0V1: Total Petroleum Sydrocarbons (QC Lot: 2941011)									
nD850+9p87008	RA 80	nP0p8: y 82 7y X9 FbaurGi	7777	800	µgK	<800	<800	0.0	I 1 f Q C
		nP0p8: y 80 7y 8, FbaurGi	7777	20	µgK	<20	<20	0.0	I 1 f Q C
		nP0p8: y X6 7y 5+ FbaurGi	7777	20	µgK	20	20	0.0	I 1 f Q C
nD850+9p87005	RA 5X	nP0p8: y 82 7y X9 FbaurGi	7777	800	µgK	8X0	<800	X8.+	I 1 f Q C
		nP0p8: y 80 7y 8, FbaurGi	7777	20	µgK	<20	<20	0.0	I 1 f Q C
		nP0p8: y X6 7y 5+ FbaurGi	7777	20	µgK	<20	<20	0.0	I 1 f Q C
EP070/0V1: Total Petroleum Sydrocarbons (QC Lot: 2941V34)									
nD850+p697008	Zi 1i t v 1Ms	nP090: y + 7y 6 FbaurGi	7777	X0	µgK	<X0	<X0	0.0	I 1 f Q C
nD850+9p87008	RA 80	nP090: y + 7y 6 FbaurGi	7777	X0	µgK	<X0	<X0	0.0	I 1 f Q C
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QC Lot: 2941011)									
nD850+9p87008	RA 80	nP0p8: >y 80 7y 8+ FbaurGi	7777	800	µgK	<800	<800	0.0	I 1 f Q C
		nP0p8: >y 8+ 7y 5, FbaurGi	7777	800	µgK	850	850	0.0	I 1 f Q C
		nP0p8: >y 5, 7y , 0 FbaurGi	7777	800	µgK	<800	<800	0.0	I 1 f Q C
nD850+9p87005	RA 5X	nP0p8: >y 80 7y 8+ FbaurGi	7777	800	µgK	<800	<800	0.0	I 1 f Q C
		nP0p8: >y 8+ 7y 5, FbaurGi	7777	800	µgK	890	880	, , .X	I 1 f Q C
		nP0p8: >y 5, 7y , 0 FbaurGi	7777	800	µgK	<800	<800	0.0	I 1 f Q C

TML7D arb2: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QC Lot: 2941V34)									
nD850+p697008	Zi 1i t v 1Ms	nP090: y + 7y 80 Fbaur@i	7777	X0	µg/K	<X0	<X0	0.0	I 1 f @ C
nD850+9p87008	RA 80	nP090: y + 7y 80 Fbaur@i	7777	X0	µg/K	<X0	<X0	0.0	I 1 f @ C

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

3We - MalG u1i rb1l rebv DerWh K f aL1bar1bt dlai k beebs r1 ai ai alt re dee v arb r1 @W all beagei rs abe ahheh C rWe sav e E1lMv es 1b 4b141brGi s as Mseh C srai hath sav 4le 4be4abarGi . 3We 4Mb41se 1o rWS Oy 4abav ereb G r1 v 1i C1b 41rei rGal laL1bar1bt u1i rav CarGi . 3We - MalG u1i rb1l rebv f aL1bar1bt y 1i rb1l Tav 4le (f y T) beebs r1 a uebrGeh beebei ue v arebalV 1b a ki 1@ Crebebei ue dee v arb s4Geh @W rabger ai alt res. 3We 4Mb41se 1orWS Oy 4abav erebG r1 v 1i C1bv erWh 4beuGGi ai h auuMbaut Che4ei hei r 1osav 4le v arb. mt i av Q c eu1Ebt f Q Gs abe Laseh 1i srarGrQal eEalMarGi 1o4b1uesseh f y T.

TML7D arb: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EA015: Total Dissolved | olids (QCLot: 29425V1)								
nZ082H: 31ral mGs1lEeh T1lGs z 890°y	7777	80	v gK	<80	X000 v gK	805	69	80,
ED03VP: Alkalinity by PC Titrator (QCLot: 2943214)								
nm05p7P: 31ral ZlkalCt as y ay N5	7777	8	v gK	7777	X00 v gK	6p.2	68	802
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2941244)								
nm0, 8R: TMare as TN, 73ML0 erbQ	8, 9097p679	8	v gK	<8	X2 v gK	802	98	8X2
ED045G: Chloride Discrete analyser (QCLot: 2941247)								
nm0, 2R: y W1bCe	8+99p7007+	8	v gK	<8	80 v gK	805	96	88p
ED093F: Dissolved Major Cations (QCLot: 2941245)								
nm065F: y aluCW	p, , 07p07X	8	v gK	<8	2 v gK	6p.+	95	8X6
nm065F: Dagi esCW	p, 567627,	8	v gK	<8	2 v gK	6p.5	90	8X,
nm065F: T1hCW	p, , 07X572	8	v gK	<8	20 v gK	80,	pp	8X2
nm065F: P1rassCW	p, , 07067p	8	v gK	<8	20 v gK	80p	pp	8X5
EG020F: Dissolved Metals by ICP8M| (QCLot: 2943613)								
nR0X0Z7F: ZlMv CCW	p, X676072	0.08	v gK	<0.08	0.2 v gK	66.0	60	880
nR0X0Z7F: Zbsei Q	p, , 07597X	0.008	v gK	<0.008	0.8 v gK	80X	65	806
nR0X0Z7F: y ahv CW	p, , 07, 576	0.0008	v gK	<0.0008	0.8 v gK	62.2	92	888
nR0X0Z7F: y 1Lalr	p, , 07, 97,	0.008	v gK	<0.008	0.8 v gK	6, .0	9p	888
nR0X0Z7F: y 144eb	p, , 072079	0.008	v gK	<0.008	0.8 v gK	800	9+	880
nR0X0Z7F: f eah	p, 5676X78	0.008	v gK	<0.008	0.8 v gK	808	99	88X
nR0X0Z7F: Dai gai ese	p, 5676+72	0.008	v gK	<0.008	0.8 v gK	66.8	9+	880
nR0X0Z7F: I Qkel	p, , 070X70	0.008	v gK	<0.008	0.8 v gK	69.,	9+	88X
nR0X0Z7F: Telei CW	pp9X7, 67X	0.08	v gK	<0.08	0.8 v gK	69.,	92	888
nR0X0Z7F: UCu	p, , 07++7+	0.002	v gK	<0.002	0.8 v gK	800	95	885
nR0X0Z7F: d 1b1i	p, , 07, X79	0.02	v gK	<0.02	0.8 v gK	62.X	pX	8X+
nR0X0Z7F: G1i	p, 567967+	0.02	v gK	<0.02	0.2 v gK	80X	99	88X
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2941314)								
n/ 0X+TF: 31ral y t ai Ce	2p78X72	0.00,	v gK	<0.00,	0.X v gK	6+.0	p2	885
EK040P: Fluoride by PC Titrator (QCLot: 2943213)								
n/ 0, 0P: FlM1bCe	8+69, 7, 979	0.8	v gK	<0.8	2 v gK	808	p9	8X0
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2941453)								
n/ 022R: Zv v 1i @ as I	p++, 7, 87p	0.08	v gK	<0.08	8.0 v gK	6+.X	p+	8XX
EK05VG: Nitrite as N by Discrete Analyser (QCLot: 2941246)								
n/ 02pR: I CbCe as I	7777	0.08	v gK	<0.08	0.2 v gK	802	9,	88X

TML7Darb0&: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK0V1G: Reactive Phosphorus as P by discrete analyser (QCLot: 294124V)								
n/ 0p8R: c eaurGEe PWls4WlbMs as P	8, X+27, , 7X	0.08	v gK	<0.08	0.2 v gK	808	9,	809
EP0V4A: Monocyclic Aromatic Sydrocarbons (QCLot: 2941V33)								
n P0p, : dei qei e	p87, 57X	8	µgK	<8	X0 µgK	65.6	p+	8XX
n P0p, : 31lMei e	80979975	X	µgK	<X	X0 µgK	62.9	p6	8X5
n P0p, : nrWlLei qei e	8007, 87,	X	µgK	<X	X0 µgK	60.8	p+	889
n P0p, : v era7& 4aba7Btlei e	80975975 80+7, X75	X	µgK	<X	, 0 µgK	65.2	p2	8X8
n P0p, : Trtbei e	8007, X72	2	µgK	<2	X0 µgK	6+.X	pX	889
n P0p, : 1brWl7Btlei e	627, p7+	X	µgK	<X	X0 µgK	6X.X	90	8X0
n P0p, : G14b14tlLei qei e	6979X79	2	µgK	<2	X0 µgK	9p.X	p8	886
n P0p, : i 7Pb14tlLei qei e	8057+278	2	µgK	<2	X0 µgK	p6.6	+6	885
n P0p, : 8.5.273bQ erWlLei qei e	8097+p79	2	µgK	<2	X0 µgK	95.6	p0	88,
n P0p, : seu7dMtlLei qei e	85276979	2	µgK	<2	X0 µgK	9X.X	p8	882
n P0p, : 8.X., 73bQ erWlLei qei e	627+57+	2	µgK	<2	X0 µgK	92.+	p0	88,
n P0p, : reb7dMtlLei qei e	6970+7+	2	µgK	<2	X0 µgK	9, .X	pX	88,
n P0p, : 47G14b14tlr1lMei e	6679p7+	2	µgK	<2	X0 µgK	9X.5	+9	88,
n P0p, : i 7dMtlLei qei e	80, 72879	2	µgK	<2	X0 µgK	p+.8	+8	882
EP0V4S: Naphthalene (QCLot: 2941V33)								
n P0p, : I a4WWalei e	687X075	p	µgK	<p	X0 µgK	6X.+	p2	8X8
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941011)								
n P0p8: y 80 7y 8, FbaurGi	7777	20	µgK	<20	5+80 µgK	p2.6	, +	8X+
n P0p8: y 82 7y X9 FbaurGi	7777	800	µgK	<800	805, 0 µgK	92.p	22	8X2
n P0p8: y X6 7y 5+ FbaurGi	7777	20	µgK	<20	5p60 µgK	99.5	22	8X6
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941V34)								
n P090: y + 7y 6 FbaurGi	7777	X0	µgK	<X0	5+0 µgK	80+	+0	8X+
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941011)								
n P0p8: >y 80 7y 8+ FbaurGi	7777	800	µgK	<800	20p0 µgK	9, .8	25	8X6
n P0p8: >y 8+ 7y 5, FbaurGi	7777	800	µgK	<800	88X50 µgK	96.2	2+	85X
n P0p8: >y 5, 7y , 0 FbaurGi	7777	800	µgK	<800	8080 µgK	p9.+	28	85p
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941V34)								
n P090: y + 7y 80 FbaurGi	7777	X0	µgK	<X0	, 20 µgK	80,	2+	850

Matrix Spike (MS) Report

3We -MalGt u1i rb1l reb/ Darb0& T4Ge (DT) beeebs r1 ai GrbalaL1bar1bt s4lGc sav 4le s4Geh @G0/ a be4besei ranGEe ser 1o rabger ai alt res. 3We 4Mb41se 1o rWS Oy 4abav ereb Gs r1 v 1i Gc1b 41rei rGl v arb0& eoeeurs 1i ai alt re beu1Eebes. Trar0 c eu1Eebt f0 Gs as 4eblaL1bar1bt mara OMalGt NLjeurGEes (mONs). Geal beu1Eebt bai ges srareh v at Le @aGEeh C rWe eEei r 1osav 4le v arb0& Crebeebei ue.

TML7Darb0&: **WATER**

Matrix Spike (MS) Report		
Spike	SpikeRecovery(%)	Recovery Limits (%)

TML7Darb@: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2941244)							
nD850+9p8700X	RA 58	nm0, 8R: TMcare as TN, 73MbLCbV erb@	8, 9097p679	80 v gK	# I 1r mereby C eh	p0	850
ED045G: Chloride Discrete analyser (QCLot: 2941247)							
nD850+9p8700X	RA 58	nm0, 2R: y W1b@e	8+99p7007+	, 00 v gK	p6.5	p0	850
EG020F: Dissolved Metals by ICP8M| (QCLot: 2943613)							
nD850+p997008	Zi 1i t v 1Ms	nR0X0Z7F: Zbsei @	p, , 07597X	0.X v gK	888	96	856
		nR0X0Z7F: y ahv @V	p, , 07, 576	0.02 v gK	88X	p2	858
		nR0X0Z7F: y 1Lalr	p, , 07, 97,	0.X v gK	880	pp	8X6
		nR0X0Z7F: y 144eb	p, , 072079	0.X v gK	880	p8	8Xp
		nR0X0Z7F: f eah	p, 5676X78	0.X v gK	885	p8	8X5
		nR0X0Z7F: Dai gai ese	p, 5676+72	0.X v gK	880	++	85X
		nR0X0Z7F: I @kel	p, , 070X70	0.X v gK	880	p5	8X6
		nR0X0Z7F: U@u	p, , 07++7+	0.X v gK	888	+9	85+
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2941314)							
nD850+9X2700X	Zi 1i t v 1Ms	n/ 0X+TF: 31ral y t ai @e	2p78X72	0.X v gK	# 28.6	p0	850
EK040P: Fluoride by PC Titrator (QCLot: 2943213)							
nD850+9p87008	RA 80	n/ 0, 0P: FlM1b@e	8+69, 7, 979	2.0 v gK	80+	p0	850
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2941453)							
nD850+9p87008	RA 80	n/ 022R: Zv v 1i @a s l	p++, 7, 87p	8.0 v gK	880	p0	850
EK05VG: Nitrite as N by Discrete Analyser (QCLot: 2941246)							
nD850+9p8700X	RA 58	n/ 02pR: I @b@e as l	7777	0.2 v gK	805	p0	850
EK0V1G: Reactive Phosphorus as P by discrete analyser (QCLot: 294124V)							
nD850+9p8700X	RA 58	n/ 0p8R: c eaur@e PW1s4W1bMs as P	8, X+27, , 7X	0.2 v gK	809	p0	850
EP0V4A: Monocyclic Aromatic Sydrocarbons (QCLot: 2941V33)							
nD850+p69700X	Zi 1i t v 1Ms	nP0p, : dei qei e	p87, 57X	X0 µgK	62.p	+,	8X8
		nP0p, : 31IMei e	80979975	X0 µgK	805	+5	8X2
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941011)							
nD850+9p8700X	RA 58	nP0p8: y 80 7y 8, Fbaur@i	7777	5+80 µgK	9p.,	, 0	850
		nP0p8: y 82 7y X9 Fbaur@i	7777	805, 0 µgK	68.p	28	8, 2
		nP0p8: y X6 7y 5+ Fbaur@i	7777	5p60 µgK	6, .,	2X	8, ,
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941V34)							
nD850+p69700X	Zi 1i t v 1Ms	nP090: y + 7y 6 Fbaur@i	7777	X90 µgK	92.0	, +	8X+
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941011)							
nD850+9p8700X	RA 58	nP0p8: >y 80 7y 8+ Fbaur@i	7777	20p0 µgK	65.,	, +	8, X
		nP0p8: >y 8+ 7y 5, Fbaur@i	7777	88X50 µgK	62.,	2X	8, +

TM.7D arb2: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941011) 8continued							
nD850+9p8700X	RA 58	nP0p8: >y 5, 7y , 0 FbaurCi	7777	8080 µgK	95.p	, 6	8, 5
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941V34)							
nD850+p69700X	Zi 1i t v 1Ms	nP090: y + 7y 80 FbaurCi	7777	550 µgK	95.,	, 2	8Xp

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

3We - MalCt u1i rb1l rebv Darb2 T4Ce (DT) ai h Darb2 T4Ce mM4lOare (DTm) beebs r1 CrbalaL1bar1bt s4lC sav 4les s4Ceh @CW a be4besei rarCe ser 1o rabger ai alt res. 3We 4Mb41se 1o rWese Oy 4abav erebs abe r1 v 1i C1b41rei rCl v arb2 eoeurs 1i ai alt re beu1EebGs. TrarO c eu1Eebt f O Gs as 4eblaL1bar1bt mara OMalCt NLjeurGes (mONs). Geal beu1Eebt bai ges srareh v at Le @aGeh C rWe eEei r 1osav 4le v arb2 Crebebei ue.

TM.7D arb2: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report Spike Concentration	Spike Recovery (%) MS	MSD	Recovery Limits (%) Low	High	RPDs (%) Value	Control Limit
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941011)										
nD850+9p8700X	RA 58	nP0p8: y 80 7y 8, FbaurCi	7777	5+80 µgK	9p.,	7777	, 0	850	7777	7777
		nP0p8: y 82 7y X9 FbaurCi	7777	805, 0 µgK	68.p	7777	28	8, 2	7777	7777
		nP0p8: y X6 7y 5+ FbaurCi	7777	5p60 µgK	6, .,	7777	2X	8, ,	7777	7777
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941011)										
nD850+9p8700X	RA 58	nP0p8: >y 80 7y 8+ FbaurCi	7777	20p0 µgK	65.,	7777	, +	8, X	7777	7777
		nP0p8: >y 8+ 7y 5, FbaurCi	7777	88X50 µgK	62.,	7777	2X	8, +	7777	7777
		nP0p8: >y 5, 7y , 0 FbaurCi	7777	8080 µgK	95.p	7777	, 6	8, 5	7777	7777
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2941244)										
nD850+9p8700X	RA 58	nm0, 8R: TMare as TN, 73MLCO erbO	8, 9097p679	80 v gK	# I 1r merebv Ceh	7777	p0	850	7777	7777
EK05VG: Nitrite as N by Discrete Analyser (QCLot: 2941246)										
nD850+9p8700X	RA 58	n/ 02pR: I Coe as I	7777	0.2 v gK	805	7777	p0	850	7777	7777
EK0V1G: Reactive Phosphorus as P by discrete analyser (QCLot: 294124V)										
nD850+9p8700X	RA 58	n/ 0p8R: c eaurCe PWs4WbMs as P	8, X+27, , 7X	0.2 v gK	809	7777	p0	850	7777	7777
ED045G: Chloride Discrete analyser (QCLot: 2941247)										
nD850+9p8700X	RA 58	nm0, 2R: y W1bOe	8+99p7007+	, 00 v gK	p6.5	7777	p0	850	7777	7777
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2941314)										
nD850+9X2700X	Zi 1i t v 1Ms	n/ 0X+TF: 31ral y t ai Oe	2p78X72	0.Xv gK	# 28.6	7777	p0	850	7777	7777
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2941453)										
nD850+9p87008	RA 80	n/ 022R: Zv v 1i @ as I	p++, 7, 87p	8.0 v gK	880	7777	p0	850	7777	7777
EP0V4A: Monocyclic Aromatic Sydrocarbons (QCLot: 2941V33)										
nD850+p69700X	Zi 1i t v 1Ms	nP0p, : dei qei e	p87, 57X	X0 µgK	62.p	7777	+,	8X8	7777	7777
		nP0p, : 31IMei e	80979975	X0 µgK	805	7777	+5	8X2	7777	7777
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941V34)										
nD850+p69700X	Zi 1i t v 1Ms	nP090: y + 7y 6 FbaurCi	7777	X90 µgK	92.0	7777	, +	8X+	7777	7777

TML7Darb&: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941V34)										
nD850+p69700X	Zi 1i t v 1Ms	nP090: y + 7y 80 Fbaur3i	7777	550 µgK	95.,	7777	, 2	8Xp	7777	7777
EK040P: Fluoride by PC Titrator (QCLot: 2943213)										
nD850+9p87008	RA 80	n/ 0, 0P: FlM1b2e	8+69, 7, 979	2.0 v gK	80+	7777	p0	850	7777	7777
EG020F: Dissolved Metals by ICP8M| (QCLot: 2943613)										
nD850+p997008	Zi 1i t v 1Ms	nR0X0Z7F: Zbsei 0	p, , 07597X	0.X v gK	888	7777	96	856	7777	7777
		nR0X0Z7F: y ahv 0W	p, , 07, 576	0.02 v gK	88X	7777	p2	858	7777	7777
		nR0X0Z7F: y 1Lalr	p, , 07, 97,	0.X v gK	880	7777	pp	8X6	7777	7777
		nR0X0Z7F: y 144eb	p, , 072079	0.X v gK	880	7777	p8	8Xp	7777	7777
		nR0X0Z7F: f eah	p, 5676X78	0.X v gK	885	7777	p8	8X5	7777	7777
		nR0X0Z7F: Dai gai ese	p, 5676+72	0.X v gK	880	7777	++	85X	7777	7777
		nR0X0Z7F: I 0kel	p, , 070X70	0.X v gK	880	7777	p5	8X6	7777	7777
		nR0X0Z7F: UCu	p, , 07++74	0.X v gK	888	7777	+9	85+	7777	7777

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM13067| 1**	Page	: 1 of 0
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3411	Address	: p Westall Rd S7ringvale VIC Australia 31- 1
Eqmail	: rorzui@w environmentalearthsciences.com	Eqmail	: carol.+alshw alsglobal.com
Tele7hone	: 691 43 098- 1999	Tele7hone	: 691cβcβ5p0 0948
Facsimile	: 691 43 098- 18pp	Facsimile	: 691cβcβ5p0 0941
Project	: 2441- p Sth Melbourne Gas+ orks	QC Level	: NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Site	: qqq		
CqOqC number	: qqq	Date Sam7les Received	: 2- qJUNq2413
Sam7ler	: SFL, / /	Issue Date	: 4pqJULq2413
Order number	: qqq		
		No. of sam7les received	: 9
Quote number	: MEk834Kl3	No. of sam7les analysed	: 9

This re7ort su7ersedes any 7revious re7ort(s) +ith this reference. Results a77ly to the sam7le(s) as submitted. All 7ages of this re7ort have been checked and a77roved for release.

This Inter7retive Quality Control Re7ort contains the follo+ing information:

- Analysis Holding Time Com7liance
- Quality Control Parameter Frezuency Com7liance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The follo+ing re7ort summarises extraction K 7re7aration and analysis times and com7ares +ith recommended holding times. Dates re7orted re7resent first date of extraction or analysis and 7recludes subsezuent dilutions and reruns. Information is also 7rovided re the sam7le container (7reservative) from +hich the analysis alizuot +as taken. Ela7sed 7eriod to analysis re7resents number of days from sam7ling +here no extraction K digestion is involved or 7eriod from extraction K digestion +here this is 7resent. For com7osite sam7les, sam7ling date is assumed to be that of the oldest sam7le contributing to the com7osite. Sam7le date for laboratory 7roduced leachates is assumed as the com7letion date of the leaching 7rocess. Outliers for holding time are based on USEPA SW 8p9, APHA, AS and NEPM (1000). A listing of breaches is 7rovided 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 qvolatile analytes, the holding time com7liance assessment com7ares the leach date +ith the shortest analyte holding time for the ezuivalent soil method. These soil holding times are: Organics (1p days); Mercury (28 days) & other metals (184 days). A recorded breach therefore does not guarantee a breach for all nonqvolatile 7arameters.

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: p+							
Clear Plastic Bottle 8Natural (EA005)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	8888	qqqq	qqqq	**2| 8JUN82013**	2- qJUNq2413	✓
EA015: Total Dissolved Solids							
Clear Plastic Bottle 8Natural (EA015+)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	4pqJULq2413	qqqq	**018JUL82013**	4pqJULq2413	✓
ED03| P: Alkalinity by PC Titrator							
Clear Plastic Bottle 8Natural (ED03| 8P)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	11qJULq2413	qqqq	**018JUL82013**	11qJULq2413	✓
ED041G: Sulfate (Turbidimetric) as SO4 28by DA							
Clear Plastic Bottle 8Natural (ED041G)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	25qJULq2413	qqqq	**018JUL82013**	25qJULq2413	✓
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle 8Natural (ED045G)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	25qJULq2413	qqqq	**018JUL82013**	25qJULq2413	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle 8Natural (ED093F)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	4pqJULq2413	qqqq	**018JUL82013**	4pqJULq2413	✓
EG020F: Dissolved Metals by ICP8MS							
Clear Plastic Bottle 8Nitric Acid; Filtered (EG020A8F)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	2pqDECq2413	qqqq	**028JUL82013**	2pqDECq2413	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026SF: Total CN by Segmented Flow Analyser								
White Plastic Bottle 8NaO+ 8Pb Acetate (EK026SF)								
GW14,	GW31,	**2| 8JUN82013**	**88**	11qJULq2413	qqq	**278JUN82013**	11qJULq2413	✓
GW32,	GW39							
EK040P: Fluoride by PC Titrator								
Clear Plastic Bottle 8Natural (EK040P)								
GW14,	GW31,	**2| 8JUN82013**	**88**	25qJULq2413	qqq	**018JUL82013**	25qJULq2413	✓
GW32,	GW39							
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle 8Sulfuric Acid (EK055G)								
GW14,	GW31,	**2| 8JUN82013**	**88**	25qJULq2413	qqq	**018JUL82013**	25qJULq2413	✓
GW32,	GW39							
EK05| G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle 8Natural (EK05| G)								
GW14,	GW31,	**2| 8JUN82013**	**88**	20qJUNq2413	qqq	**278JUN82013**	20qJUNq2413	✓
GW32,	GW39							
EK0| 1G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle 8Natural (EK0| 1G)								
GW14,	GW31,	**2| 8JUN82013**	**88**	20qJUNq2413	qqq	**278JUN82013**	20qJUNq2413	✓
GW32,	GW39							
EP070/0| 1: Total Petroleum +ydrocarbons								
Amber Glass Bottle 8Unpreserved (EP0| 1)								
GW14,	GW31,	**2| 8JUN82013**	**278JUN82013**	4pqJULq2413	✓	**018JUL82013**	4- qAUGq2413	✓
GW32,	GW39,							
RINp								
EP0| 4A: Monocyclic Aromatic +ydrocarbons								
Amber VOC Vial 8Sulfuric Acid (EP0| 4)								
GW14,	GW31,	**2| 8JUN82013**	**278JUN82013**	11qJULq2413	✓	**278JUN82013**	11qJULq2413	✓
GW32,	GW39,							
RINp,	Tri7 -							
EP0| 4+ : Naphthalene								
Amber VOC Vial 8Sulfuric Acid (EP0| 4)								
GW14,	GW31,	**2| 8JUN82013**	**278JUN82013**	11qJULq2413	✓	**278JUN82013**	11qJULq2413	✓
GW32,	GW39,							
RINp,	Tri7 -							
EP070/0| 1: Total Recoverable +ydrocarbons 8NEPM 2010 Draft								
Amber VOC Vial 8Sulfuric Acid (EP070)								
GW14,	GW31,	**2| 8JUN82013**	**278JUN82013**	11qJULq2413	✓	**278JUN82013**	11qJULq2413	✓
GW32,	GW39,							
RINp								

Quality Control Parameter Frequency Compliance

The follo+ ing re7ort summarises the frezuency of laboratory QC sam7les analysed +ithin the analytical lot(s) in +hich the submitted sam7le(s) +as(+here) 7rocessed. Actual rate should be greater than or ezual to the ex7ected rate. A listing of breaches is 7rovided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frezuency not +ithin s7ecification ; ✓ = Quality Control frezuency +ithin s7ecification.

Quality Control Sam7le Ty7e		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Du7licates (DUP)							
Alkalinity by PC Titrator	ED43- qP	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Ammonia as N by Discrete analyser	E/ 455G	2	14	**20.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Fluoride by PC Titrator	E/ 4p4P	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	E/ 450G	2	1p	**14.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	E/ 45- G	2	19	**12.5**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
7H	EA445	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	E/ 4- 1G	2	14	**20.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	E/ 429SF	2	1p	**14.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	2	19	**12.5**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH VolatileskBTEX	EP484	2	15	**13.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Laboratory Control Sam7les (LCS)							
Alkalinity by PC Titrator	ED43- qP	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Ammonia as N by Discrete analyser	E/ 455G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Fluoride by PC Titrator	E/ 4p4P	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	E/ 450G	1	1p	**| .1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	E/ 45- G	1	19	**6.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	E/ 4- 1G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	E/ 429SF	1	1p	**| .1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	19	**6.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH VolatileskBTEX	EP484	1	15	**6.|**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	E/ 455G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement

Matrix: **WATER**

Evaluation: × = Quality Control frezuency not +ithin s7ecification ; ✓ = Quality Control frezuency +ithin s7ecification.

Quality Control Sam7le Ty7e		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) qContinued							
Fluoride by PC Titrator	E/ 4p4P	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	E/ 450G	1	1p	**| .1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	E/ 45- G	1	19	**6.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	E/ 4- 1G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	E/ 429SF	1	1p	**| .1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	19	**6.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH VolatilesKBTEX	EP484	1	15	**6.|**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Matrix S7ikes (MS)							
Ammonia as N by Discrete analyser	E/ 455G	1	14	**10.0**	**5.0**	✓	ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Fluoride by PC Titrator	E/ 4p4P	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	E/ 450G	1	1p	**| .1**	**5.0**	✓	ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	E/ 45- G	1	19	**6.3**	**5.0**	✓	ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	E/ 4- 1G	1	14	**10.0**	**5.0**	✓	ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	E/ 429SF	1	1p	**| .1**	**5.0**	✓	ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	19	**6.3**	**5.0**	✓	ALS QCS3 rezuirement
TPH VolatilesKBTEX	EP484	1	15	**6.|**	**5.0**	✓	ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement

Brief Method Summaries

The analytical 7rocedures used by the Environmental Division have been develo7ed from established internationally recogni@ed 7rocedures such as those 7ublished by the US EPA, APHA, AS and NEPM. In house develo7ed 7rocedures are em7loyed in the absence of documented standards or by client rezuest. The follo+ing re7ort 7rovides brief descri7tions of the analytical 7rocedures em7loyed for results re7orted in the Certificate of Analysis. Sources from +hich ALS methods have been develo7ed are 7rovided + ithin the Method Descri7tions.

Analytical Methods	Method	Matrix	Method Descriptions
7H	EA445	WATER	APHA 21st ed. p544 H6 B. 7H of + ater sam7les is determined by ISE either manually or by automated 7H meter. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Total Dissolved Solids (High Level)	EA415H	WATER	InqHouse, APHA 21st ed., 25p4C A gravimetric 7rocedure that determines the amount of `filterable` residue in an azueous sam7le. A + ellqmixed sam7le is filtered through a glass fibre filter (1.2um). The filtrate is eva7orated to dryness and dried to constant + eight at 1846K5C. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Alkalinity by PC Titrator	ED43- dP	WATER	APHA 21st ed., 2324 B This 7rocedure determines alkalinity by automated measurement (e.g. PC Titrate) using 7H p.5 for indicating the total alkalinity endq7oint. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	WATER	APHA 21st ed., p544qSOp Dissolved sulfate is determined in a 4.p5um filtered sam7le. Sulfate ions are converted to a barium sulfate sus7ension in an acetic acid medium + ith barium chloride. Light absorbance of the BaSOp sus7ension is measured by a 7hotometer and the SOpq2 concentration is determined by com7arison of the reading + ith a standard curve. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Chloride by Discrete Analyser	ED4p5G	WATER	APHA 21st ed., p544 Cl qG.The thiocyanate ion is liberated from mercuric thiocyanate through sezuestration of mercury by the chloride ion to form nonqonised mercuric chloride.in the 7resence of ferric ions the librated thiocynate forms highlyqcoloured ferric thiocynate + hich is measured at p84 nm APHA 21st edition seal method 2 41- q1q_ a7ril 2443
Major Cations qDissolved	ED403F	WATER	Major Cations is determined based on APHA 21st ed., 3124; USEPA SW 8p9 q9414 The ICPAES technizue ionises the 4.p5um filtered sam7le atoms emitting a characteristic s7ectrum. This s7ectrum is then com7ared against matrix matched standards for zuantification. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2) Sodium Adsor7tion Ratio is calculated from Ca, Mg and Na + hich determined by ALS in house method QWIqENKED403F. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2) Hardness 7arameters are calculated based on APHA 21st ed., 23p4 B. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Dissolved Metals by ICPqMS qSuite A	EG424AqF	WATER	(APHA 21st ed., 3125; USEPA SW8p9 q9424, ALS QWIqENKEG424): Sam7les are 4.p5 um filtered 7rior to analysis. The ICPMS technizue utili@es a highly efficient argon 7lasma to ioni@e selected elements. Ions are then 7assed into a high vacuum mass s7ectrometer, + hich se7arates the analytes based on their distinct mass to charge ratios 7rior to their measurement by a discrete dynode ion detector.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flo+ Analyser	E/ 429SF	WATER	APHA p544qCNqO. Sodium hydroxide 7reserved sam7les are introduced into an automated segmented flo+ analyser. Com7lex bound cyanide is decom7osed in a continuously flo+ing stream, at a 7H of 3.8, by the effect of UV light. A UVqB lam7 (312 nm) and a decom7osition s7iral of borosilicate glass are used to filter out UV light +ith a +avelength of less than 204 nm thus 7reventing the conversion of thiocyanate into cyanide. The hydrogen cyanide 7resent at a 7H of 3.8 is se7arated by gas dialysis. The hydrogen cyanide is then determined 7hotometrically, based on the reaction of cyanide +ith chloramineqT to form cyanogen chloride. This then reacts +ith pq7yridine carboxylic acid and 1,3qdimethylbarbituric acid to give a red colour +hich is measured at 944 nm. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Fluoride by PC Titrator	E/ 4p4P	WATER	APHA 21st ed., p544 FqC CDTA is added to the sam7le to 7rovide a uniform ionic strength background, adjust 7H, and break u7 com7lexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ammonia as N by Discrete analyser	E/ 455G	WATER	APHA 21st ed., p544qNH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ammonium as N	E/ 455GqNHp	WATER	Ammonium in the sam7le is re7orted as the ionised Kunionised fractions by the use of a nomogra7h and the initial 7H and Tem7erature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., p544qNH3 G. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrite as N by Discrete Analyser	E/ 45- G	WATER	APHA 21st ed., p544qNO2qB. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrate as N by Discrete Analyser	E/ 458G	WATER	APHA 21st ed., p544qNO3qF. Nitrate is reduced to nitrite by +ay of a chemical reduction follo+ed by zuantification by Discrete Analyser. Nitrite is determined se7erately by direct colourimetry and result for Nitrate calculated as the difference bet+een the t+o results. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	E/ 450G	WATER	APHA 21st ed., p544qNO3qF. Combined oxidised Nitrogen (NO26NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Reactive Phos7horus as PqBy Discrete Analyser	E/ 4- 1G	WATER	APHA 21st ed., p544qP F Ammonium molybdate and 7otassium antimonyl tartrate reacts in acid medium +ith otho7hos7hate to form a hetero7oly acid q7hos7homolybdic acid q+hich is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ionic Balance by PCT DA and Turbi SOp DA	EN455 qPG	WATER	APHA 21st Ed. 1434F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate +hich determined by PCT and DA. The Cations are determined by Turbi SOp by DA. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
TPH qSemivolatile Fraction	EP4- 1	WATER	USEPA SW 8p9 q8415A The sam7le extract is analysed by Ca7illary GCKFID and zuantification is by com7arison against an established 5 7oint calibration curve of nqAlkane standards. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Volatile Organic Com7ounds	EP4- p	WATER	USEPA SW 8p9 q8294B Water sam7les are directly 7urged 7rior to analysis by Ca7illary GCKMS and zuantification is by com7arison against an established 5 7oint calibration curve. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
TPH VolatileskBTEX	EP484	WATER	USEPA SW 8p9 q8294B Water sam7les are directly 7urged 7rior to analysis by Ca7illary GCKMS and zuantification is by com7arison against an established 5 7oint calibration curve. Alternatively, a sam7le is ezuilibrated in a heads7ace vial and a 7ortion of the heads7ace determined by GCMS analysis. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Se7aratory Funnel Extraction of Lizuids	ORG1ɒ	WATER	USEPA SW 8p9 q3514B 144 mL to 1L of sam7le is transferred to a se7aratory funnel and serially extracted three times using 94mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2). ALS default excludes sediment + hich may be resident in the container.
Volatiles Water Pre7aration	ORG19ɑW	WATER	A 5 mL alizuot or 5 mL of a diluted sam7le is added to a p4 mL VOC vial for s7arging.

Summary of Outliers

Outliers : Quality Control Samples

The follo+ing re7ort highlights outliers flagged in the Quality Control (QC) Re7ort. Surrogate recovery limits are static and based on USEPA SW8p9 or ALSqQWIHENK8 (in the absence of s7ecific USEPA limits). This re7ort dis7lays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Com7ound Grou7 Name	Laboratory Sam7le ID	Client Sam7le ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED4p1G: Sulfate (Turbidimetric) as SOp 2qby DA	EM13498-1q442	GW31	**Sulfate as SO4 8 Turbidimetric**	1p848q-0q8	Not Determined	qqq	**MS recovery not determined, background level greater than or equal to 4x spike level.**
E/429SF: Total CN by Segmented Flo+ Analyser	EM1349825q442	Anonymous	**Total Cyanide**	5-q12q5	51.0 %	-4q134%	**Recovery less than lower data quality objective**

- **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

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

Outliers : Analysis Holding Time Compliance

This re7ort dis7lays Holding Time breaches only. Only the res7ective Extraction K7re7aration andK7or Analysis com7onent isK7are dis7layed.

- **No Analysis +olding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The follo+ing re7ort highlights breaches in the Frezuency of Quality Control Sam7les.

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

Samples Received without COC

Date/Time Received	27-6-13 16:15
Date/Time Analysis Received	
Client/Sender:	Enviro Earth Sciences — Ref: EM1306798
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	
Carrier Company:	
Con-note No:	
Project Details	
Sampler/Sampling dates	27.6.13
Matrix	water.

ID date

1. GW1D 27-6-13.
2. GW31
3. GW32
4. GW36
5. RIN4
6. TRIP 7

Environmental Division
Melbourne
C-M 27/6
Work Order
EM1306871

Telephone : +61-3-8549 9600

Notified: _____ **Date:** _____

Received By: _____

Samples sent to lab for

Micro Nitrate BOD (pH)

Colour Turbidity RP

Other .....

Date C-M 27/6

Samples Received without COC

Date/Time Received	27-6-13 16:15
Date/Time Analysis Received	
Client/Sender:	Enviro Earth Sciences — Ref: EM1306798
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	
Carrier Company:	
Con-note No:	
Project Details	
Sampler/Sampling dates	27.6.13
Matrix	water.

ID Date

1. GW1D 27.6.13.
2. GW31
3. GW32
4. GW36
5. RIN4
6. TRIP 7

SCANNED

Environmental Division
Melbourne
C.M 27/6 Work Order
EM1306871

Telephone : +61-3-8549 9600

Notified: _____ Date: _____

Received By: _____

Samples sent to lab for

Micro Nitrate BOD (pH)

Colour Turbidity RP

Other .....

Date C.M 27/6

CoC received 28/06/13 08:57 RT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E:townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES

OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011

PROJECT: 210074 Sth Melbourne Gaswords

ORDER NUMBER:

PROJECT MANAGER: REGIN ORQUIZA — CONTACT PH: 9687 1666

SAMPLER: SFL / KK — SAMPLER MOBILE: 0488 339 025

COC emailed to ALS? (YES / NO) — EDD FORMAT (or default):

Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com

Email Invoice to : rorquiza@environmentalearthsciences.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : standard TAT
(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)

ALS QUOTE NO.: ME/330/13

COC SEQUENCE NUMBER (Circle)
CoC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		Kpora
DATE/TIME: 27/63 pm	DATE/TIME: 27/63 pm	DATE/TIME:	DATE/TIME: 28/6 16:25

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION											Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes - pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)	field pH	Field temp
1	GW10	27/06/2013	W		8	x	x	x	x	x	x	x		5.07	19.1
2	GW31	27/06/2013	W		8	x	x	x	x	x	x	x		7.2	17.9
4	GW36	27/06/2013	W		8	x	x	x	x	x	x	x		6.82	17.2
3	GW32	27/06/2013	W		8	x	x	x	x	x	x	x		7.02	17.7
5	RIN 4	27/06/2013	W		4					x	x	x			
6	Trip 7	27/06/2013	W							x	x				
				TOTAL											

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Friday, 28 June 2013 8:57 AM
To: Carol Walsh
Cc: Samples Melbourne
Subject: RE: COC FOR SAMPLES RECEIVED THIS AFTERNOON
Attachments: 210074_CoC_27 June 2013 pm.pdf; 210074_CoC_28 June 2013 am.pdf

Hi Carol,

Please find the attached CoC for the samples collected yesterday and the CoC for the samples to be collected this morning.

Thank you.

Regards

Regin

From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 4:37 PM
To: Regin Orquiza
Subject: COC FOR SAMPLES RECEIVED THIS AFTERNOON

Regin

Do you have the COC's prepared for samples received this afternoon.

Kind Regards

Carol Walsh

Senior Client Services Officer
ALS | Environmental Division

4 Westall Rd
Springvale, VIC. 3171 Australia

How was your customer experience? Please send us your feedback

Please see our latest Enviromail 67 - Aqueous Film Forming Foams (AFFFs) March 2013

T +61 3 8549 9600
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Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306706**	Page	: 1 of 6
y l@i r	: **EN8IRONMENTAL EARTV SCIENCES**	9aLobarobt	: Ei n@boi v ei ral m@G@oi MelLoDbi e
y oi raur	: c ERG Nc OQ@GZ	y oi raur	: y abol A alsW
Zhhbess	: P.N.dNB XX23 FNN5Ty c ZS YQ VZQT5c Z9G 3011	Zhhbess	: , A esrall c h T4b@gnale YQ ZDsrbal@ 3181
Epv a@	: bob- D@aaz eesCL@	Epv a@	: uabol.@alsWz alsgloLal.uov
5ele4Wbi e	: w61 03 76+81666	5ele4Wbi e	: w61p3p+2, 7 760+
Faus@ @e	: w61 03 76+81+, ,	Faus@ @e	: w61p3p+2, 7 7601
Pbojeur	: X0018, TrWMelLoDbi e Ras@bks	Oy 9enel	: I EPM 1777 TuWehDle d (3) ai h Z9T Oy T3 be- D@ev ei r
Nbhebi Dv Leb	: ppp		
y pNpy i Dv Leb	: ppp	mare Tav 4les c eue@eh	: X+pJQI pX013
Tav 4leb	: TF9/KK	@sDe mare	: 0, pJQ9pX013
T@e	: ppp		
		I o. of sav 4les beue@eh	: ,
ODore i Dv Leb	: ME/330/13	I o. of sav 4les ai alt seh	: ,

5W@ be4obr sD4ebsehes ai t 4ben@Ds be4obr(s) @@W rW@ befebei ue. c esDlrs a44lt ro rWe sav 4le(s) as sDLv @eh. ZII 4ages of rW@ be4obr Wane Leei uWeukeh ai h a44boneh fot belease.

5W@ y ebr@@are of Zi alt s@ uoi ra@s rWe follo@@g @fobv ar@i :

- Rei ebal y ov v ei rs
- Zi alt r@al c esDlrs
- TDbbogare y oi rbol 9@ @s

General Comments

5We ai alt rOal 4bouehDoes Dseh Lt rWe Ei nObi v ei ral mOGGOi Wane Leei henelo4eh fbov esraLIGWeh Crebi arOi allt beuogi Qeh 4bouehDoes sDuW as rWose 4DLIGWeh Lt rWe QTEPZV ZPHZV ZT ai h I EPM. G WoDse henelo4eh 4bouehDoes abe ev 4lot eh C rWe aLsei ue of houDv ei reh srai habhs obLt ulGi r be- Desr.

A Webe v oGrDbe herebv CarOi Was Leei 4ebfobv ehVbesDlrs abe be4obreh oi a hbt @eQW LasG.

A Webe a be4obreh less rWai (<) besDlr G WQWebrWai rWe 9Nc VrWS v at Le hDe ro 4bO abt sav 4le exrbaur/hQesrare hODrOi ai h/obCsDffOGi r sav 4le fobai alt sG.

A Webe rWe 9Nc of a be4obreh besDlr hOfebs fbov srai habh 9Nc VrWS v at Le hDe ro WQWv oGrDbe uoi rei rVCsDffOGi r sav 4le (behDueh @eQW ev 4lot eh) obv arbX Crebfebei ue.

A Wei sav 4lCg rO e Cfobv arOi G i or 4bonOeh Lt rWe ulGi rVsav 4lCg hares abe sWb@ @GWbDr a rO e uov 4oi ei r. G rWese Csrai uesVrWe rO e uov 4oi ei r Was Leei assDv eh Lt rWe laLobarobt fob4bouessCg 4Db4oses.

Ket :
y ZT I Dv Leb= y ZT begGrbt i Dv Lebfbov haraLase v aCraCeh Lt y Wev Oal ZLsrbaurs TebnOes. 5We y Wev Oal ZLsrbaurs TebnOe G a hOGGOi of rWe Zv ebOai y Wev Oal TouGrt .
9Nc = 9O Cof be4obCg
I = 5WS besDlr G uov 4Dreh fbov ChOOCDal ai alt re hereurOi s ar obaLone rWe lenel of be4obCg

- E^0K6SF : EM1306704-006 i 92rd Hxdke p9cad por TCN df e 2b xoHHcura H9i xra cb2erperebaenT. dH. 9H ueeb aobpri ed uh re-9b9rhHdHn
- EM1306706-003: Ai i obc9 9HN reHf r2y 9H dobe uh uf a. ci e2 od vE^055(
- E| 0) 1: | 9r2af r9r H9i xraH EM1306706-001, D| U0KUMv . 9ge LOR r9dHed df e 2b r9uor92orh u9akBrof bdn
- E| 0) 4: | oHc2ge v TE# reHf r2por H9i xra EM1306706-003 aobpri ed uh re-9b9rhHdHn
- lobca v 9r9bae of 2op9aaex29ura rdi c2H por H9i xra q3 df e 2b 9b9rh2eH bo2j f 9b2pced cb 2 dH rexor2n
- lobca u9r9baeHy ere a9raf r92ed f HdbB: i 9;or 9bcobH+a. rorcdeU9rk9rdbc2h 9bd Hf rp92eG9bd i 9;or a92cobH+a9racf i Ui 9BbeHdf i Uxo29HHdf i 9bd Hodcf i n
- lobca u9r9baeHy ere a9raf r92ed f HdbB: i 9;or 9bcobH+a. rorcdeU9rk9rdbc2h 9bd Hf rp92eG9bd i 9;or a92cobH+a9racf i Ui 9BbeHdf i Uxo29HHdf i UHodcf i U9i i obc9 9bd crob q3n
- T, S uh i e2 od EA-015 i 9h uc9H. cB. df e 2b 2 e xreHebae oppcbe x9r2af r92e i 922erUy . ca. i 9h x9HH2 rof B. 2 e xreHarcued @F°C x9xern

I Z5Z Zuubeh0eh 9aLobarobt +X2

Zuubeh0eh fobuov 4lGi ue @GW GTN/GEy 180X2.

Signatories

5WS houDv ei r Was Leei eleurbi Oallt sQi eh Lt rWe aDrWobQeh sQi arobGs ChOareh Lelo@ Eleurbi O sQi Cg Was Leei uabbGeh oDr C uov 4lGi ue @GW4bouehDbes s4euGOeh C X1 y Fc Pabr 11.

Signatories	Position	Accreditation Category
mGai CFebi ai ho	Tei Ob GobgaiO y Wev Gr	MelLoDti e Gobgai Os MelLoDti e Gobgai Os MelLoDti e Gobgai Os MelLoDti e Gobgai Os
YabsWa Ho A Cg	I oi pMerals 5eav 9eaheb	MelLoDti e Gobgai Os
BCgLC 9C	Tei Ob Nbgai O y Wev Gr	MelLoDti e Nbgai Os MelLoDti e Nbgai Os

Analytical Results

TDLpMarb2: WATER wMarb2: WATER(			Client sample ID	@W15	@WK5	@W05	Trox -	ppp
			Client sampling date / time	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	ppp
Compound	CAS Number	LOR	Unit	EM1306706+001	EM1306706+00K	EM1306706+003	EM1306706+004	++++
EA005: xV								
xV 89rhe	ppp	0.01	4H Qi C	6r11	6r47	6r8)	ppp	ppp
EA015: To29m, d-Horged SomdH								
To29m, d-Horged SomdH Z 1-0zC	ppp	10	v g/9	560	564	47K0	ppp	ppp
E, 03) | : Ark9rnbo2h uh | C Tc2r92or								
To29mArk9rnbo2h 9H C9CO3	ppp	1	v g/9	4K	-1	1)7	ppp	ppp
E, 041@: Sf rp92e wTf ruodi e2rca(9H SO4 K+uh , A								
Sf rp92e 9H SO4 +Tf ruodi e2rca	1, +0+p87p+	1	v g/9	K16	15-	K350	ppp	ppp
E, 045@: C. rorode , d-Hare2e 9b9rhHer								
C. rorode	16++8p00p6	1	v g/9	K1	K)	34	ppp	ppp
E, 073F: , d-Horged M9;or C92obH								
C9radf i	8, , 0p80pX	1	v g/9	1K	1-	304	ppp	ppp
M9BbeHdf i	8, 37p72p	1	v g/9	14	)	)6	ppp	ppp
Sodcf i	8, , 0pX3p2	1	v g/9	-K	-K	56	ppp	ppp
| o29HHdf i	8, , 0p07p8	1	v g/9	11	-	40	ppp	ppp
E@0K0F: , d-Horged Me29rhl uh IC| +MS								
Arhi obcf i	8, X7p70p2	0.01	v g/9	<0.01	<0.01	0r0K	ppp	ppp
ArHebca	8, , 0p8+pX	0.001	v g/9	<0.001	0r034	0rK-1	ppp	ppp
C9di cf i	8, , 0p 3p7	0.0001	v g/9	0r0004	0r0004	0r000-	ppp	ppp
Cou9r2	8, , 0p +p	0.001	v g/9	0r010	0r00K	0r0K6	ppp	ppp
Coxxer	8, , 0p20p+	0.001	v g/9	0r003	0r003	0r001	ppp	ppp
Le9d	8, 37p7Xp1	0.001	v g/9	<0.001	<0.001	<0.001	ppp	ppp
M9bB9beHe	8, 37p76p2	0.001	v g/9	0r10K	0r063	3r41	ppp	ppp
Ncakem	8, , 0p0Xp0	0.001	v g/9	0r036	0r066	0r05-	ppp	ppp
Semabcf i	88+Xp 7pX	0.01	v g/9	<0.01	<0.01	<0.01	ppp	ppp
&dba	8, , 0p66p6	0.002	v g/9	0r031	0r040	0r04)	ppp	ppp
v orob	8, , 0p Xp+	0.02	v g/9	1r51	1r8-	1r11	ppp	ppp
lrob	8, 37p+7p6	0.02	v g/9	<0.02	0r83	13r6	ppp	ppp
E^0K6SF: To29mCN uh SeBi eb2ed Fray Ab9rhHer								
To29mCh9bcde	28p1Xp2	0.00,	v g/9	0r004	0r004	0r101	ppp	ppp
E^040| : Frhorcde uh | C Tc2r92or								
Frhorcde	167+, p +p+	0.1	v g/9	<0.1	0r1	4r5	ppp	ppp
E^055@: Ai i obc9 9H N uh , d-Hare2e Ab9rhHer								
Ai i obc9 9H N	866, p 1p8	0.01	v g/9	0r16	0r6)	4K)	ppp	ppp

Analytical Results

TDLpMarb2: WATER wMarb2: WATER(	Client sample ID	@W15	@WK5	@W05	Trox -	ppp
	Client sampling date / time	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	ppp
Compound	CAS Number / LOR / Unit	EM1306706-001	EM1306706-00K	EM1306706-003	EM1306706-004	++++
E^055@+NV4: Ai i obcf i 9HN uh , A						
Ai i obcf i 9HN	ppp / 0.01 / v g/9	0r16	0r6)	4K)	ppp	ppp
E^05) @: Nc2rc2e 9HN uh , d-Hare2e Ab9rhHer						
Nc2rc2e 9HN	ppp / 0.01 / v g/9	<0.01	<0.01	<0.01	ppp	ppp
E^05-@: Nc2r92e 9HN uh , d-Hare2e Ab9rhHer						
Nc2r92e 9HN	1, 878p22p+ / 0.01 / v g/9	0r04	0r01	0r05	ppp	ppp
E^0) 1@: Re9a2tge | . oHx. orf H9H| uh dd-Hare2e 9b9rhHer						
Re9a2tge | . oHx. orf H9H|	1, X62p , pX / 0.01 / v g/9	<0.01	<0.01	<0.01	ppp	ppp
EN055: Iobca v9r@bae						
To29rnAbcobH	ppp / 0.01 / v e- /9	5r73	5r6)	53r5	ppp	ppp
To29rnC92cobH	ppp / 0.01 / v e- /9	5r60	5rK5	ppp	ppp	ppp
To29rnC92cobH	ppp / 0.01 / v e- /9	ppp	ppp	4- r8	ppp	ppp
Iobca v9r@bae	ppp / 0.01 / %	Kn 7	3r71	ppp	ppp	ppp
Iobca v9r@bae	ppp / 0.01 / %	ppp	ppp	5r10	ppp	ppp
E| 0) 4A: Moboaharca Aroi 92a Vhdroa9ruobH						
vebXebe	81p 3pX / 1 / µg/9	<1	<1	)	<1	ppp
Tornebe	10+p+-+p3 / X / µg/9	<X	<X	4	<X	ppp
E2 hrnebXebe	100p 1p, / X / µg/9	<X	<X	<X	<X	ppp
i e29+/ x9r9+#hrnabe	10+p3+p3 106p Xp3 / X / µg/9	<X	<X	<X	<X	ppp
S2hrebe	100p Xp2 / 2 / µg/9	<2	<2	<2	<2	ppp
or2 o+#hrnabe	72p 8p6 / X / µg/9	<X	<X	<X	<X	ppp
IHoxroxhrnebXebe	7+p+Xp+ / 2 / µg/9	<2	<2	<2	<2	ppp
b+| roxhrnebXebe	103p62p1 / 2 / µg/9	<2	<2	<2	<2	ppp
1r8r5+Trd e2 hrnebXebe	10+p68p+ / 2 / µg/9	<2	<2	<2	<2	ppp
Hea+vf 2hrnebXebe	132p7+p+ / 2 / µg/9	<2	<2	<2	<2	ppp
1rKr4+Trd e2 hrnebXebe	72p63p6 / 2 / µg/9	<2	<2	<2	<2	ppp
2er2+vf 2hrnebXebe	7+p06p6 / 2 / µg/9	<2	<2	<2	<2	ppp
x+IHoxroxhr@orhebe	77p+8p6 / 2 / µg/9	<2	<2	<2	<2	ppp
b+vf 2hrnebXebe	10, p21p+ / 2 / µg/9	<2	<2	<2	<2	ppp
E| 0) 4V: N9x. 2 9rnabe						
N9x. 2 9rnabe	71pX0p3 / 8 / µg/9	<8	<8	<8	<8	ppp
E| 0-0°0) 1: To29rn\ e2roraf i Vhdroa9ruobH						
C6 +C7 Fr9a2cob	ppp / X0 / µg/9	<X0	<X0	<X0	ppp	ppp
C10 +C14 Fr9a2cob	ppp / 20 / µg/9	<20	<20	50	ppp	ppp

Analytical Results

TDLpMarb2: WATER wMarb2: WATER(	Client sample ID	@W15	@WK5	@W05	Trcx -	ppp
	Client sampling date / time	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	ppp
Compound CAS Number LOR Unit		EM1306706-001	EM1306706-00K	EM1306706-003	EM1306706-004	----
E| 0-0°0) 1: To29m) e2romaf i Vhdroa9ruobH+Cob2bf ed						
C15 +CK- Fr9a2cob	ppp 100 µg/9	<100	<100	--0	ppp	ppp
CK7 +C36 Fr9a2cob	ppp 20 µg/9	<20	<100	100	ppp	ppp
^ C10 +C36 Fr9a2cob whf i (	ppp 20 µg/9	<20	<20	1030	ppp	ppp
E| 0-0°0) 1: To29mReaoger9uma Vhdroa9ruobH+NE| M K010 , r9p2						
C6 +C10 Fr9a2cob	ppp X0 µg/9	<X0	<X0	k0	ppp	ppp
>C10 +C16 Fr9a2cob	ppp 100 µg/9	<100	<100	3-0	ppp	ppp
>C16 +C34 Fr9a2cob	ppp 100 µg/9	<100	<170	670	ppp	ppp
>C34 +C40 Fr9a2cob	ppp 100 µg/9	<100	<100	<100	ppp	ppp
^ >C10 +C40 Fr9a2cob whf i (	ppp 100 µg/9	<100	<100	10)0	ppp	ppp
E| 0)4S: 8OC Sf rroB92eH						
1rK+; ca. roroe2 9be+; 4	18060p08p0 0.1 %	-)n-	73r8	101	7K)	ppp
Tornebe+; -	X038pX6p2 0.1 %	103	10)	104	100	ppp
4+v roi opnorouebXebe	,60p00p, 0.1 %	101	103	103	77r0	ppp
E| 0-0S: T| Vv8(°v TE# Sf rroB92eH						
1rK+; ca. roroe2 9be+; 4	18060p08p0 0.1 %	-3n-	-7r6	106	ppp	ppp
Tornebe+; -	X038pX6p2 0.1 %	--r6	71rK	76r4	ppp	ppp
4+v roi opnorouebXebe	,60p00p, 0.1 %	76r6	77r4	104	ppp	ppp

Surrogate Control Limits

TDLpMarbQ: WATER		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
E| 0) 4S: 8OC Sf rroB92eH			
1rK+; ca. roroe2 9be+; 4	18060p08p0	67	133
Torhebe+; -	X038pX6p2	8X	1X+
4+v roi opfhorouebXebe	, 60p00p,	80	130
E| 0- 0S: T| Vv8(°v TE# Sf rroB92eH			
1rK+; ca. roroe2 9be+; 4	18060p08p0	80	13X
Torhebe+; -	X038pX6p2	67	1X2
4+v roi opfhorouebXebe	, 60p00p,	61	1X7

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1306706**	Page	: 1 of 11
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3181
E7mail	: ror- uiqaz eesi.biq	E7mail	: carol.@alshz alsglobal.com
Telephone	: w+1 03 6+981+++	Telephone	: w+1737 9546 6+09
Facsimile	: w+1 03 6+981944	Facsimile	: w+1737 9546 6+01
Project	: 200184 Sth Melbourne Gas@rks	QC Level	: NEPM 1666 Schedule B(3) and ALS QCS3 re- uirement
Site	: 7777		
C7O7C number	: 7777	Date Samples Received	: 297JUN72013
Sampler	: SFL/KK	Issue Date	: 047JUL72013
Order number	: 7777		
		No. of samples received	: 4
Quote number	: ME/330/13	No. of samples analysed	: 4

This report supersedes any previous report(s) @th 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 follo@ng 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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recogniqed 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 re- uest.

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

Where a reported less than (<) 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 @eight employed) or matrix interference.

Key : Anonymous = Refers to samples @hich are not specifically part of this @rk order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

NATA Accredited Laboratory 925

Accredited for compliance @th ISO/IEC 18025.

Signatories

This document has been electronically signed by the authoriqed signatories indicated belo@ Electronic signing has been carried out in compliance @th procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
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Laboratory Duplicate (DUP) Report

The -uality 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 QWI7EN/39 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:7 No Limit; Result bet@een 10 and 20 times LOR:70% 750%; Result > 20 times LOR:70% 720%.

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005: cH pQC Lot: (74(352)									
EM130+8997001	Anonymous	EA005: pH Value	7777	0.01	pH Unit	9.51	9.52	0.1	0% 720%
EM130+6047002	Anonymous	EA005: pH Value	7777	0.01	pH Unit	8.51	8.52	0.1	0% 720%
EA015: Total Dissolved Solids pQC Lot: (744620)									
EM130+9657001	Anonymous	EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	66+0	6640	0.2	0% 720%
EM130+9687009	Anonymous	EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	319	330	3.8	0% 720%
ED032P: Alkalinity by PC Titrator pQC Lot: (743(15)									
EM130+9687005	Anonymous	ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	541	542	0.3	0% 720%
EM130+6147002	Anonymous	ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	33	32	0.0	0% 720%
ED041G: Sulfate pTurbidimetriF) as SO4 (-by DA pQC Lot: (74(670)									
EM130+9607001	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	14909786 79	1	mg/L	6+9	6+0	0.6	0% 720%
EM130+6017005	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	14909786 79	1	mg/L	239	23+	0.8	0% 720%
ED041G: Sulfate pTurbidimetriF) as SO4 (-by DA pQC Lot: (74(67()									
EM130+60+7003	GW05	ED041G: Sulfate as SO4 7Turbidimetric	14909786 79	1	mg/L	2350	2+60	13.5	0% 720%
ED045G: Chloride DisFrete analyser pQC Lot: (74(687)									
EM130+9607001	Anonymous	ED045G: Chloride	1+9987007+	1	mg/L	83+	82+	1.4	0% 720%
EM130+60+7003	GW05	ED045G: Chloride	1+9987007+	1	mg/L	34	35	3.0	0% 720%
ED0739: Dissolved Major Cations pQC Lot: (74(682)									
EM130+9607001	Anonymous	ED063F: Calcium	84407807 2	1	mg/L	92	95	2.8	0% 720%
		ED063F: Magnesium	84367657 4	1	mg/L	231	239	3.2	0% 720%
		ED063F: Sodium	84407237 5	1	mg/L	28+	295	3.0	0% 720%
		ED063F: Potassium	84407067 8	1	mg/L	15	1+	0.0	0% 750%
EG0(09: Dissolved Metals by ICP-MS pQC Lot: (743615)									
EM130+9837001	Anonymous	EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A7F: Arsenic	84407397 2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Cobalt	84407497 4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Copper	84407507 9	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A7F: Lead	84367627 1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Manganese	84367 6+75	0.001	mg/L	0.009	0.008	0.0	No Limit
		EG020A7F: Nickel	84407027 0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Zinc	84407++7+	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A7F: Aluminium	84267607 5	0.01	mg/L	0.03	0.03	0.0	No Limit
		EG020A7F: Selenium	88927467 2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	84407427 9	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A7F: Iron	84367967+	0.05	mg/L	0.1+	0.1+	0.0	No Limit
EM130+98+7005	Anonymous	EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG0(09: Dissolved Metals by ICP-MS pQC Lot: (743615) - Fontinued									
EM130+98+7005	Anonymous	EG020A7F: Arsenic	84407 3972	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Cobalt	84407 4974	0.001	mg/L	0.014	0.014	0.0	0% 750%
		EG020A7F: Copper	84407 5079	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Lead	84367 6271	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Manganese	84367 6+75	0.001	mg/L	+.50	+.00	9.0	0% 720%
		EG020A7F: Nickel	84407 0270	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A7F: Zinc	84407 ++7+	0.005	mg/L	0.010	0.010	0.0	No Limit
		EG020A7F: Aluminium	84267 6075	0.01	mg/L	0.02	0.02	0.0	No Limit
		EG020A7F: Selenium	88927 4672	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	84407 4279	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A7F: Iron	84367 967+	0.05	mg/L	0.98	0.9+	1.9	0% 750%
EK0(6S9: Total CN by Segmented 9low Analyser pQC Lot: (743708)									
EM130+6047005	Anonymous	EK02+SF: Total Cyanide	5871275	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM130+6117004	Anonymous	EK02+SF: Total Cyanide	5871275	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK040P: 9luoride by PC Titrator pQC Lot: (743(13)									
EM130+8997001	Anonymous	EK040P: Fluoride	1+6947 4979	0.1	mg/L	0.6	0.6	0.0	No Limit
EM130+9107001	Anonymous	EK040P: Fluoride	1+6947 4979	0.1	mg/L	0.+	0.+	0.0	No Limit
EK055G: Ammonia as N by DisFrete Analyser pQC Lot: (743204)									
EM130+9607001	Anonymous	EK055G: Ammonia as N	8++47 4178	0.01	mg/L	0.08	0.08	0.0	No Limit
EM130+6147001	Anonymous	EK055G: Ammonia as N	8++47 4178	0.01	mg/L	0.09	0.09	0.0	No Limit
EK052G: Nitrite as N by DisFrete Analyser pQC Lot: (74(688)									
EM130+9607001	Anonymous	EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM130+6017005	Anonymous	EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK052G: Nitrite as N by DisFrete Analyser pQC Lot: (74(671)									
EM130+60+7003	GW05	EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK021G: ReaFtive Phoschorus as P by disFrete analyser pQC Lot: (74(686)									
EM130+9607001	Anonymous	EK081G: Reactive Phosphorus as P	142+57447 2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM130+60+7003	GW05	EK081G: Reactive Phosphorus as P	142+57447 2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP024A: MonoFyFliF AromatiF HydroFarbons pQC Lot: (744(43)									
EM130+60+7001	GW15	EP084: Benqene	817437 2	1	µg/L	<1	<1	0.0	No Limit
		EP084: Toluene	1097 9973	2	µg/L	<2	<2	0.0	No Limit
		EP084: Ethylbenqene	1007 4174	2	µg/L	<2	<2	0.0	No Limit
		EP084: meta7& para7Xylene	1097 3973 10+7 4273	2	µg/L	<2	<2	0.0	No Limit
		EP084: ortho7Xylene	657 487+	2	µg/L	<2	<2	0.0	No Limit
		EP084: Styrene	1007 4275	5	µg/L	<5	<5	0.0	No Limit
		EP084: Isopropylbenqene	697 9279	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Propylbenqene	1037+571	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.3.57Trimethylbenqene	1097+879	5	µg/L	<5	<5	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP024A: MonoFyFliF AromatiF HydroFarbons pQC Lot: (744(43) - Fontinued									
EM130+60+7001	GW15	EP084: sec7Butylbenqene	1357697 9	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.2.47Trimethylbenqene	657+37+	5	µg/L	<5	<5	0.0	No Limit
		EP084: tert7Butylbenqene	6970+7+	5	µg/L	<5	<5	0.0	No Limit
		EP084: p7Isopropyltoluene	667987+	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Butylbenqene	1047517 9	5	µg/L	<5	<5	0.0	No Limit
EM130+6267001	Anonymous	EP084: Benqene	817437 2	1	µg/L	<1	<1	0.0	No Limit
		EP084: Toluene	1097997 3	2	µg/L	<2	<2	0.0	No Limit
		EP084: Ethylbenqene	1007417 4	2	µg/L	<2	<2	0.0	No Limit
		EP084: meta7& para7Xylene	1097397 3 10+74273	2	µg/L	<2	<2	0.0	No Limit
		EP084: ortho7Xylene	657487+	2	µg/L	<2	<2	0.0	No Limit
		EP084: Styrene	1007427 5	5	µg/L	<5	<5	0.0	No Limit
		EP084: Isopropylbenqene	697927 9	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Propylbenqene	1037+571	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.3.57Trimethylbenqene	1097+879	5	µg/L	<5	<5	0.0	No Limit
		EP084: sec7Butylbenqene	1357697 9	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.2.47Trimethylbenqene	657+37+	5	µg/L	<5	<5	0.0	No Limit
		EP084: tert7Butylbenqene	6970+7+	5	µg/L	<5	<5	0.0	No Limit
		EP084: p7Isopropyltoluene	667987+	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Butylbenqene	1047517 9	5	µg/L	<5	<5	0.0	No Limit
EP024H: Nachthalene pQC Lot: (744(43)									
EM130+60+7001	GW15	EP084: Naphthalene	617207 3	8	µg/L	<8	<8	0.0	No Limit
EM130+6267001	Anonymous	EP084: Naphthalene	617207 3	8	µg/L	<8	<8	0.0	No Limit
EP080/021: Total Petroleum HydroFarbons pQC Lot: (74(614)									
EM130+6047001	Anonymous	EP081: C15 7C29 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: C10 7C14 Fraction	7777	50	µg/L	<50	<50	0.0	No Limit
		EP081: C26 7C3+ Fraction	7777	50	µg/L	<90	<50	45.2	No Limit
EM130+60+7001	GW15	EP081: C15 7C29 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: C10 7C14 Fraction	7777	50	µg/L	<50	<50	0.0	No Limit
		EP081: C26 7C3+ Fraction	7777	50	µg/L	<50	<90	4+.2	No Limit
EP080/021: Total Petroleum HydroFarbons pQC Lot: (744(44)									
EM130+60+7001	GW15	EP090: C+ 7C6 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQC Lot: (74(614)									
EM130+6047001	Anonymous	EP081: >C10 7C1+ Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: >C1+ 7C34 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
EM130+60+7001	GW15	EP081: >C10 7C1+ Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: >C1+ 7C34 Fraction	7777	100	µg/L	<100	<140	3+.4	No Limit
		EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQC Lot: (744(44)									

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQC Lot: (744(44) - Fontinued									
EM130+60+7001	GW15	EP090: C+ 7C10 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit

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

The -uality control term Method / Laboratory Blank refers to an analyte free matrix to @hich 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 -uality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a kno@n interference free matrix spiked @th 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.

Sub7Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids pQCLot: (744620)								
EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	<10	2000 mg/L	100	69	104
ED032P: Alkalinity by PC Titrator pQCLot: (743(15)								
ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	7777	200 mg/L	68.5	61	105
ED041G: Sulfate pTurbidimetriF) as SO4 (- by DA pQCLot: (74(670)								
ED041G: Sulfate as SO4 7Turbidimetric	149097867 9	1	mg/L	<1	25 mg/L	105	91	125
ED041G: Sulfate pTurbidimetriF) as SO4 (- by DA pQCLot: (74(67( )								
ED041G: Sulfate as SO4 7Turbidimetric	149097867 9	1	mg/L	<1	25 mg/L	109	91	125
ED045G: Chloride DisFrete analyser pQCLot: (74(687)								
ED045G: Chloride	1+9987007+	1	mg/L	<1	10 mg/L	104	96	118
ED0739: Dissolved Major Cations pQCLot: (74(682)								
ED063F: Calcium	84407807 2	1	mg/L	<1	5 mg/L	10+	93	126
ED063F: Magnesium	84367657 4	1	mg/L	<1	5 mg/L	102	90	124
ED063F: Sodium	84407237 5	1	mg/L	<1	50 mg/L	66.3	88	125
ED063F: Potassium	84407067 8	1	mg/L	<1	50 mg/L	65.+	88	123
EG0(09: Dissolved Metals by ICP-MS pQCLot: (743615)								
EG020A7F: Aluminium	84267607 5	0.01	mg/L	<0.01	0.5 mg/L	100	60	110
EG020A7F: Arsenic	84407397 2	0.001	mg/L	<0.001	0.1 mg/L	102	63	106
EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	0.1 mg/L	63.9	95	111
EG020A7F: Cobalt	84407497 4	0.001	mg/L	<0.001	0.1 mg/L	66.9	98	111
EG020A7F: Copper	84407507 9	0.001	mg/L	<0.001	0.1 mg/L	61.+	9+	110
EG020A7F: Lead	84367627 1	0.001	mg/L	<0.001	0.1 mg/L	103	99	112
EG020A7F: Manganese	84367 6+75	0.001	mg/L	<0.001	0.1 mg/L	65.9	9+	110
EG020A7F: Nickel	84407027 0	0.001	mg/L	<0.001	0.1 mg/L	65.+	9+	112
EG020A7F: Selenium	88927467 2	0.01	mg/L	<0.01	0.1 mg/L	66.6	95	111
EG020A7F: Zinc	84407++7+	0.005	mg/L	<0.005	0.1 mg/L	64.3	93	113
EG020A7F: Boron	84407427 9	0.05	mg/L	<0.05	0.1 mg/L	106	82	12+
EG020A7F: Iron	84367967+	0.05	mg/L	<0.05	0.5 mg/L	69.0	99	112
EK0(6S9: Total CN by Segmented 9low Analyser pQCLot: (743708)								
EK02+SF: Total Cyanide	587127 5	0.004	mg/L	<0.004	0.2 mg/L	99.1	85	113
EK040P: 9luoride by PC Titrator pQCLot: (743(13)								
EK040P: Fluoride	1+6947497 9	0.1	mg/L	<0.1	5 mg/L	101	89	120
EK055G: Ammonia as N by DisFrete Analyser pQCLot: (743204)								
EK055G: Ammonia as N	8++47417 8	0.01	mg/L	<0.01	1.0 mg/L	101	8+	122

Sub7Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)
				Result	Concentration	LCS	Low	High
EK052G: Nitrite as N by DisFrete Analyser pQCLot: (74(688)								
EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	0.5 mg/L	10+	94	112
EK052G: Nitrite as N by DisFrete Analyser pQCLot: (74(671)								
EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	0.5 mg/L	104	94	112
EK021G: ReaFtive Phoschorus as P by disFrete analyser pQCLot: (74(686)								
EK081G: Reactive Phosphorus as P	142+574472	0.01	mg/L	<0.01	0.5 mg/L	100	94	109
EP024A: MonoFyFliF AromatiF HydroFarbons pQCLot: (744(43)								
EP084: Benqene	8174372	1	µg/L	<1	20 µg/L	103	8+	122
EP084: Toluene	1097993	2	µg/L	<2	20 µg/L	10+	86	123
EP084: Ethylbenqene	1007417	2	µg/L	<2	20 µg/L	103	8+	119
EP084: meta7& para7Xylene	1097393 10+74273	2	µg/L	<2	40 µg/L	10+	85	121
EP084: Styrene	1007427	5	µg/L	<5	20 µg/L	69.9	82	119
EP084: ortho7Xylene	657487+	2	µg/L	<2	20 µg/L	10+	90	120
EP084: Isopropylbenqene	697927	5	µg/L	<5	20 µg/L	104	81	116
EP084: n7Propylbenqene	1037+57	5	µg/L	<5	20 µg/L	63.9	+6	113
EP084: 1.3.57Trimethylbenqene	1097+87	5	µg/L	<5	20 µg/L	62.+	80	114
EP084: sec7Butylbenqene	1357697	5	µg/L	<5	20 µg/L	69.5	81	115
EP084: 1.2.47Trimethylbenqene	657+37+	5	µg/L	<5	20 µg/L	66.0	80	114
EP084: tert7Butylbenqene	697+7+	5	µg/L	<5	20 µg/L	63.8	82	114
EP084: p7Isopropyltoluene	667987+	5	µg/L	<5	20 µg/L	69.3	+9	114
EP084: n7Butylbenqene	1047517	5	µg/L	<5	20 µg/L	69.2	+1	115
EP024H: Nachthalene pQCLot: (744(43)								
EP084: Naphthalene	617207	8	µg/L	<8	20 µg/L	6+.1	85	121
EP080/021: Total Petroleum HydroFarbons pQCLot: (74(614)								
EP081: C10 7C14 Fraction	7777	50	µg/L	<50	3+10 µg/L	63.4	4+	12+
EP081: C15 7C29 Fraction	7777	100	µg/L	<110	10340 µg/L	69.5	55	125
EP081: C26 7C3+ Fraction	7777	50	µg/L	<100	3860 µg/L	101	55	126
EP080/021: Total Petroleum HydroFarbons pQCLot: (744(44)								
EP090: C+ 7C6 Fraction	7777	20	µg/L	<20	3+0 µg/L	64.1	+0	12+
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (74(614)								
EP081: >C10 7C1+ Fraction	7777	100	µg/L	<100	5080 µg/L	101	53	126
EP081: >C1+ 7C34 Fraction	7777	100	µg/L	<160	11230 µg/L	10+	5+	132
EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	1010 µg/L	63.9	51	138
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (744(44)								
EP090: C+ 7C10 Fraction	7777	20	µg/L	<20	450 µg/L	61.9	5+	130

Matrix Spike (MS) Report

The -uality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked @th 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 @aived in the event of sample matrix interference.

Sub7Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate pTurbidimetriF) as SO4 (- by DA pQCLot: (74(670)							
EM130+9607002	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	1490978679	10 mg/L	# Not Determined	80	130
ED045G: Chloride DisFrete analyser pQCLot: (74(687)							
EM130+9607002	Anonymous	ED045G: Chloride	1+9987007+	400 mg/L	85.2	80	130
EG0(09: Dissolved Metals by ICP-MS pQCLot: (743615)							
EM130+9837001	Anonymous	EG020A7F: Arsenic	84407397 2	0.2 mg/L	112	96	136
		EG020A7F: Cadmium	84407437 6	0.05 mg/L	108	85	131
		EG020A7F: Cobalt	84407497 4	0.2 mg/L	68.4	88	126
		EG020A7F: Copper	84407507 9	0.2 mg/L	102	81	128
		EG020A7F: Lead	84367627 1	0.2 mg/L	113	81	123
		EG020A7F: Manganese	84367 6+75	0.2 mg/L	103	++	132
		EG020A7F: Nickel	84407027 0	0.2 mg/L	68.+	83	126
		EG020A7F: Zinc	84407++7+	0.2 mg/L	111	+9	13+
EK0(6S9: Total CN by Segmented 9low Analyser pQCLot: (743708)							
EM130+604700+	Anonymous	EK02+SF: Total Cyanide	5871275	0.2 mg/L	# +5.3	80	130
EK040P: 9luoride by PC Titrator pQCLot: (743(13)							
EM130+9817001	Anonymous	EK040P: Fluoride	1+69474979	5.0 mg/L	10+	80	130
EK055G: Ammonia as N by DisFrete Analyser pQCLot: (743204)							
EM130+9607002	Anonymous	EK055G: Ammonia as N	8++474178	1.0 mg/L	111	80	130
EK052G: Nitrite as N by DisFrete Analyser pQCLot: (74(688)							
EM130+9607002	Anonymous	EK058G: Nitrite as N	7777	0.5 mg/L	6+.+	80	130
EK021G: ReaFtive Phoschorus as P by disFrete analyser pQCLot: (74(686)							
EM130+9607002	Anonymous	EK081G: Reactive Phosphorus as P	142+574472	0.5 mg/L	66.+	80	130
EP024A: MonoFyFliF AromatiF HydroFarbons pQCLot: (744(43)							
EM130+60+7002	GW25	EP084: Benqene	8174372	20 µg/L	91.6	+4	121
		EP084: Toluene	10979973	20 µg/L	63.8	+3	125
EP080/021: Total Petroleum HydroFarbons pQCLot: (74(614)							
EM130+604700+	Anonymous	EP081: C10 7C14 Fraction	7777	3+10 µg/L	60.9	40	130
		EP081: C15 7C29 Fraction	7777	10340 µg/L	64.6	51	145
		EP081: C26 7C3+ Fraction	7777	3860 µg/L	68.6	52	144
EP080/021: Total Petroleum HydroFarbons pQCLot: (744(44)							
EM130+60+7002	GW25	EP090: C+ 7C6 Fraction	7777	290 µg/L	+8.2	4+	12+
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (74(614)							

Sub7Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (74(614) - Fontinued							
EM130+604700+	Anonymous	EP081: >C10 7C1+ Fraction	7777	5080 µg/L	68.2	4+	142
		EP081: >C1+ 7C34 Fraction	7777	11230 µg/L	102	52	14+
		EP081: >C34 7C40 Fraction	7777	1010 µg/L	6+.0	46	143
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (744(44)							
EM130+60+7002	GW25	EP090: C+ 7C10 Fraction	7777	330 µg/L	+4.4	45	128

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The -uality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked @th a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be @aived in the event of sample matrix interference.

Sub7Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP080/021: Total Petroleum HydroFarbons pQCLot: (74(614)										
EM130+604700+	Anonymous	EP081: C10 7C14 Fraction	7777	3+10 µg/L	60.9	7777	40	130	7777	7777
		EP081: C15 7C29 Fraction	7777	10340 µg/L	64.6	7777	51	145	7777	7777
		EP081: C26 7C3+ Fraction	7777	3860 µg/L	68.6	7777	52	144	7777	7777
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (74(614)										
EM130+604700+	Anonymous	EP081: >C10 7C1+ Fraction	7777	5080 µg/L	68.2	7777	4+	142	7777	7777
		EP081: >C1+ 7C34 Fraction	7777	11230 µg/L	102	7777	52	14+	7777	7777
		EP081: >C34 7C40 Fraction	7777	1010 µg/L	6+.0	7777	46	143	7777	7777
EK021G: ReaFtive Phoschorus as P by disFrete analyser pQCLot: (74(686)										
EM130+9607002	Anonymous	EK081G: Reactive Phosphorus as P	142+574472	0.5 mg/L	66.+	7777	80	130	7777	7777
EK052G: Nitrite as N by DisFrete Analyser pQCLot: (74(688)										
EM130+9607002	Anonymous	EK058G: Nitrite as N	7777	0.5 mg/L	6+.+	7777	80	130	7777	7777
ED045G: Chloride DisFrete analyser pQCLot: (74(687)										
EM130+9607002	Anonymous	ED045G: Chloride	1+9987007+	400 mg/L	85.2	7777	80	130	7777	7777
ED041G: Sulfate pTurbidimetriF) as SO4 (- by DA pQCLot: (74(670)										
EM130+9607002	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	149097867 9	10 mg/L	# Not Determined	7777	80	130	7777	7777
EK040P: 9luoride by PC Titrator pQCLot: (743(13)										
EM130+9817001	Anonymous	EK040P: Fluoride	1+6947497 9	5.0 mg/L	10+	7777	80	130	7777	7777
EG0(09: Dissolved Metals by ICP-MS pQCLot: (743615)										
EM130+9837001	Anonymous	EG020A7F: Arsenic	844073972	0.2 mg/L	112	7777	96	136	7777	7777
		EG020A7F: Cadmium	844074376	0.05 mg/L	108	7777	85	131	7777	7777
		EG020A7F: Cobalt	844074974	0.2 mg/L	68.4	7777	88	126	7777	7777
		EG020A7F: Copper	844075079	0.2 mg/L	102	7777	81	128	7777	7777

Sub7Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EG0(09: Dissolved Metals by ICP-MS pQCLot: (743615) - Fontinued										
EM130+9837001	Anonymous	EG020A7F: Lead	84367627l	0.2 mg/L	113	7777	81	123	7777	7777
		EG020A7F: Manganese	843676+75	0.2 mg/L	103	7777	++	132	7777	7777
		EG020A7F: Nickel	84407027O	0.2 mg/L	68.+	7777	83	126	7777	7777
		EG020A7F: Zinc	84407++7+	0.2 mg/L	111	7777	+9	13+	7777	7777
EK055G: Ammonia as N by DisFrete Analyser pQCLot: (743204)										
EM130+9607002	Anonymous	EK055G: Ammonia as N	8++47417l8	1.0 mg/L	111	7777	80	130	7777	7777
EK0(6S9: Total CN by Segmented 9low Analyser pQCLot: (743708)										
EM130+604700+	Anonymous	EK02+SF: Total Cyanide	587127S	0.2 mg/L	# +5.3	7777	80	130	7777	7777
EP024A: MonoFyFliF AromatiF HydroFarbons pQCLot: (744(43)										
EM130+60+7002	GW25	EP084: Benqene	8174372	20 µg/L	91.6	7777	+4	121	7777	7777
		EP084: Toluene	1097997S	20 µg/L	63.8	7777	+3	125	7777	7777
EP080/021: Total Petroleum HydroFarbons pQCLot: (744(44)										
EM130+60+7002	GW25	EP090: C+ 7C6 Fraction	7777	290 µg/L	+8.2	7777	4+	12+	7777	7777
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (744(44)										
EM130+60+7002	GW25	EP090: C+ 7C10 Fraction	7777	330 µg/L	+4.4	7777	45	128	7777	7777

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1306706**	Page	: 1 of 0
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3411	Address	: p Westall Rd S7ringvale VIC Australia 31- 1
Eqmail	: rorzui@w eesi.bi@	Eqmail	: carol.+alshw alsglobal.com
Tele7hone	: 691 43 098- 1999	Tele7hone	: 691ɕ3ɕ85p0 0948
Facsimile	: 691 43 098- 18pp	Facsimile	: 691ɕ3ɕ85p0 0941
Project	: 2441- p Sth Melbourne Gas+ orks	QC Level	: NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Site	: ɋɋɋ		
CɋOɋC number	: ɋɋɋ	Date Sam7les Received	: 28ɋJUNɋ2413
Sam7ler	: SFL/KK	Issue Date	: 4pɋJULɋ2413
Order number	: ɋɋɋ		
		No. of sam7les received	: p
Quote number	: ME/334/13	No. of sam7les analysed	: p

This re7ort su7ersedes any 7revious re7ort(s) +ith this reference. Results a77ly to the sam7le(s) as submitted. All 7ages of this re7ort have been checked and a77roved for release.

This Inter7retive Quality Control Re7ort contains the follo+ing information:

- Analysis Holding Time Com7liance
- Quality Control Parameter Frezuency Com7liance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The follo+ing re7ort summarises extraction / 7re7aration and analysis times and com7ares +ith recommended holding times. Dates re7orted re7resent first date of extraction or analysis and 7recludes subsezuent dilutions and reruns. Information is also 7rovided re the sam7le container (7reservative) from +hich the analysis alizuot +as taken. Ela7sed 7eriod to analysis re7resents number of days from sam7ling +here no extraction / digestion is involved or 7eriod from extraction / digestion +here this is 7resent. For com7osite sam7les, sam7ling date is assumed to be that of the oldest sam7le contributing to the com7osite. Sam7le date for laboratory 7roduced leachates is assumed as the com7letion date of the leaching 7rocess. Outliers for holding time are based on USEPA SW 8p9, APHA, AS and NEPM (1000). A listing of breaches is 7rovided 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 qolatile analytes, the holding time com7liance assessment com7ares the leach date +ith the shortest analyte holding time for the ezuivalent soil method. These soil holding times are: Organics (1p days); Mercury (28 days) & other metals (184 days). A recorded breach therefore does not guarantee a breach for all nonqolatile 7arameters.

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: cH								
Clear PlastiF p ottle - NatBral uEA005(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**----**	qqqq	qqqq	**) 7-2UN-) 013**	2- qJUNq2413	×
EA015: Total Dissolved Solids								
Clear PlastiF p ottle - NatBral uEA015H(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	4pqJULq2413	qqqq	**0) -2UL-) 013**	4pqJULq2413	✓
ED03JP: Alkalinity by PC Titrator								
Clear PlastiF p ottle - NatBral uED03J-P(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	11qJULq2413	qqqq	**01-2UL-) 013**	11qJULq2413	✓
ED041G: SBlfate uTBrbidimetriF(as SO4) - by DA								
Clear PlastiF p ottle - NatBral uED041G(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	25qJULq2413	qqqq	**01-2UL-) 013**	25qJULq2413	✓
ED045G: Chloride DisFrete analyser								
Clear PlastiF p ottle - NatBral uED045G(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	25qJULq2413	qqqq	**01-2UL-) 013**	25qJULq2413	✓
ED0739: Dissolved Major Cations								
Clear PlastiF p ottle - NatBral uED0739(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	4pqJULq2413	qqqq	**0) -2UL-) 013**	4pqJULq2413	✓
EG0) 09: Dissolved Metals by ICP-MS								
Clear PlastiF p ottle - NitriF AFid; 9iltered uEG0) 0A-9(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	2pqDECq2413	qqqq	**0) -2UL-) 013**	2pqDECq2413	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK0) 6S9: Total CN by Segmented 9low Analyser							
White PlastiF p ottle-NaOH ιEK0) 6S9(							
GW15	**) J-2UN-) 013**	**---**	11qJULq2413	qqqq	**01-2UL-) 013**	11qJULq2413	✓
White PlastiF p ottle-NaOH - Pb AFetate ιEK0) 6S9(							
GW25, GW45	**) J-2UN-) 013**	**---**	11qJULq2413	qqqq	**01-2UL-) 013**	11qJULq2413	✓
EK040P: 9IBoride by PC Titrator							
Clear PlastiF p ottle - NatBral ιEK040P(							
GW15, GW25, GW45	**) J-2UN-) 013**	**---**	25qJULq2413	qqqq	**01-2UL-) 013**	25qJULq2413	✓
EK055G: Ammonia as N by DisFrete Analyser							
Clear PlastiF p ottle - SBlfBriF AFid ιEK055G(							
GW15, GW25, GW45	**) J-2UN-) 013**	**---**	25qJULq2413	qqqq	**0) -2UL-) 013**	25qJULq2413	✓
EK05JG: Nitrite as N by DisFrete Analyser							
Clear PlastiF p ottle - NatBral ιEK05JG(							
GW15, GW25, GW45	**) J-2UN-) 013**	**---**	20qJUNq2413	qqqq	**) 8-2UN-) 013**	20qJUNq2413	✓
EK0J1G: ReaFtive PhoschorBs as P by disFrete analyser							
Clear PlastiF p ottle - NatBral ιEK0J1G(							
GW15, GW25, GW45	**) J-2UN-) 013**	**---**	20qJUNq2413	qqqq	**) 8-2UN-) 013**	20qJUNq2413	✓
EP080/0J1: Total ReFoverable HydroFarbons - NEPM) 010 Draft							
Amber Glass p ottle - Uncreserved ιEP0J1(							
GW15, GW25, GW45	**) J-2UN-) 013**	**01-2UL-) 013**	4pqJULq2413	✓	**0) -2UL-) 013**	14qAUGq2413	✓
EP0J4A: MonoFyFliF AromatiF HydroFarbons							
Amber VOC Vial - SBlfBriF AFid ιEP0J4(							
GW15, GW25, GW45, Tri7 8	**) J-2UN-) 013**	**01-2UL-) 013**	11qJULq2413	✓	**0) -2UL-) 013**	11qJULq2413	✓
EP0J4H: Nachthalene							
Amber VOC Vial - SBlfBriF AFid ιEP0J4(							
GW15, GW25, GW45, Tri7 8	**) J-2UN-) 013**	**01-2UL-) 013**	11qJULq2413	✓	**0) -2UL-) 013**	11qJULq2413	✓
EP080/0J1: Total ReFoverable HydroFarbons - NEPM) 010 Draft							
Amber VOC Vial - SBlfBriF AFid ιEP080(							
GW15, GW25, GW45	**) J-2UN-) 013**	**01-2UL-) 013**	11qJULq2413	✓	**0) -2UL-) 013**	11qJULq2413	✓

Quality Control Parameter Frequency Compliance

The follo+ ing re7ort summarises the frezuency of laboratory QC sam7les analysed +ithin the analytical lot(s) in +hich the submitted sam7le(s) +as(+here) 7rocessed. Actual rate should be greater than or ezual to the ex7ected rate. A listing of breaches is 7rovided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frezuency not +ithin s7ecification ; ✓ = Quality Control frezuency +ithin s7ecification.

Quality Control Sam7le Ty7e		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Du7licates (DUP)							
Alkalinity by PC Titrator	ED43- qP	2	15	**13.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Ammonia as N by Discrete analyser	EK455G	2	12	**16.J**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	2	13	**15.4**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Fluoride by PC Titrator	EK4p4P	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	1	9	**16.J**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK450G	2	1p	**14.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	EK45- G	3	5	**60.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
7H	EA445	2	10	**10.5**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	EK4- 1G	2	14	**) 0.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	3	21	**14.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	EK429SF	2	14	**) 0.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	2	1-	**11.8**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH Volatiles/BTEX	EP484	1	14	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	2	1p	**14.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Laboratory Control Sam7les (LCS)							
Alkalinity by PC Titrator	ED43- qP	1	15	**6.J**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Ammonia as N by Discrete analyser	EK455G	1	12	**8.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	2	13	**15.4**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Fluoride by PC Titrator	EK4p4P	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	1	9	**16.J**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK450G	1	1p	**J.1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	EK45- G	2	5	**40.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	EK4- 1G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	2	21	**7.5**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	EK429SF	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	1-	**5.7**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH Volatiles/BTEX	EP484	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	1p	**J.1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK455G	1	12	**8.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	1	13	**J.J**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement

Matrix: **WATER**

Evaluation: × = Quality Control frezuency not +ithin s7ecification ; ✓ = Quality Control frezuency +ithin s7ecification.

Quality Control Sam7le Ty7e		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) qContinued							
Fluoride by PC Titrator	EK4p4P	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	1	9	**16.J**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK450G	1	1p	**J.1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	EK45- G	2	5	**40.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	EK4- 1G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	2	21	**7.5**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	EK429SF	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	1-	**5.7**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH Volatiles/BTEX	EP484	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	1p	**J.1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Matrix S7ikes (MS)							
Ammonia as N by Discrete analyser	EK455G	1	12	**8.3**	**5.0**	✓	ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	1	13	**J.J**	**5.0**	✓	ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Fluoride by PC Titrator	EK4p4P	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK450G	1	1p	**J.1**	**5.0**	✓	ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	EK45- G	1	p	**) 5.0**	**5.0**	✓	ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	EK4- 1G	1	14	**10.0**	**5.0**	✓	ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	EK429SF	1	14	**10.0**	**5.0**	✓	ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	1-	**5.7**	**5.0**	✓	ALS QCS3 rezuirement
TPH Volatiles/BTEX	EP484	1	14	**10.0**	**5.0**	✓	ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	1p	**J.1**	**5.0**	✓	ALS QCS3 rezuirement

Brief Method Summaries

The analytical 7rocedures used by the Environmental Division have been develo7ed from established internationally recogni@ed 7rocedures such as those 7ublished by the US EPA, APHA, AS and NEPM. In house develo7ed 7rocedures are em7loyed in the absence of documented standards or by client rezuest. The follo+ing re7ort 7rovides brief descri7tions of the analytical 7rocedures em7loyed for results re7orted in the Certificate of Analysis. Sources from +hich ALS methods have been develo7ed are 7rovided + ithin the Method Descri7tions.

Analytical Methods	Method	Matrix	Method Descriptions
7H	EA445	WATER	APHA 21st ed. p544 H6 B. 7H of + ater sam7les is determined by ISE either manually or by automated 7H meter. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Total Dissolved Solids (High Level)	EA415H	WATER	InqHouse, APHA 21st ed., 25p4C A gravimetric 7rocedure that determines the amount of `filterable` residue in an azueous sam7le. A + ellqmixed sam7le is filtered through a glass fibre filter (1.2um). The filtrate is eva7orated to dryness and dried to constant + eight at 1846/q5C. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Alkalinity by PC Titrator	ED43- qP	WATER	APHA 21st ed., 2324 B This 7rocedure determines alkalinity by automated measurement (e.g. PC Titrate) using 7H p.5 for indicating the total alkalinity endq7oint. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	WATER	APHA 21st ed., p544qSOp Dissolved sulfate is determined in a 4.p5um filtered sam7le. Sulfate ions are converted to a barium sulfate sus7ension in an acetic acid medium + ith barium chloride. Light absorbance of the BaSOp sus7ension is measured by a 7hotometer and the SOpq2 concentration is determined by com7arison of the reading + ith a standard curve. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Chloride by Discrete Analyser	ED4p5G	WATER	APHA 21st ed., p544 Cl qG.The thiocyanate ion is liberated from mercuric thiocyanate through sezuestration of mercury by the chloride ion to form nonqonised mercuric chloride.in the 7resence of ferric ions the librated thiocynate forms highlyqcoloured ferric thiocynate + hich is measured at p84 nm APHA 21st edition seal method 2 41- q1q_ a7ril 2443
Major Cations qDissolved	ED403F	WATER	Major Cations is determined based on APHA 21st ed., 3124; USEPA SW 8p9 q9414 The ICPAES technizue ionises the 4.p5um filtered sam7le atoms emitting a characteristic s7ectrum. This s7ectrum is then com7ared against matrix matched standards for zuantification. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2) Sodium Adsor7tion Ratio is calculated from Ca, Mg and Na + hich determined by ALS in house method QWIqEN/ED403F. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2) Hardness 7arameters are calculated based on APHA 21st ed., 23p4 B. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Dissolved Metals by ICPqMS qSuite A	EG424AqF	WATER	(APHA 21st ed., 3125; USEPA SW8p9 q9424, ALS QWIqEN/EG424): Sam7les are 4.p5 um filtered 7rior to analysis. The ICPMS technizue utili@es a highly efficient argon 7lasma to ioni@e selected elements. Ions are then 7assed into a high vacuum mass s7ectrometer, + hich se7arates the analytes based on their distinct mass to charge ratios 7rior to their measurement by a discrete dynode ion detector.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flo+ Analyser	EK429SF	WATER	APHA p544qCNqO. Sodium hydroxide 7reserved sam7les are introduced into an automated segmented flo+ analyser. Com7lex bound cyanide is decom7osed in a continuously flo+ing stream, at a 7H of 3.8, by the effect of UV light. A UVqB lam7 (312 nm) and a decom7osition s7iral of borosilicate glass are used to filter out UV light +ith a +avelength of less than 204 nm thus 7reventing the conversion of thiocyanate into cyanide. The hydrogen cyanide 7resent at a 7H of 3.8 is se7arated by gas dialysis. The hydrogen cyanide is then determined 7hotometrically, based on the reaction of cyanide +ith chloramineqT to form cyanogen chloride. This then reacts +ith pq7yridine carboxylic acid and 1,3qdimethylbarbituric acid to give a red colour +hich is measured at 944 nm. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Fluoride by PC Titrator	EK4p4P	WATER	APHA 21st ed., p544 FqC CDTA is added to the sam7le to 7rovide a uniform ionic strength background, adjust 7H, and break u7 com7lexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ammonia as N by Discrete analyser	EK455G	WATER	APHA 21st ed., p544qNH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ammonium as N	EK455GqNHp	WATER	Ammonium in the sam7le is re7orted as the ionised / unionised fractions by the use of a nomogra7h and the initial 7H and Tem7erature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., p544qNH3 G. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrite as N by Discrete Analyser	EK45- G	WATER	APHA 21st ed., p544qNO2qB. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrate as N by Discrete Analyser	EK458G	WATER	APHA 21st ed., p544qNO3qF. Nitrate is reduced to nitrite by +ay of a chemical reduction follo+ed by zuantification by Discrete Analyser. Nitrite is determined se7erately by direct colourimetry and result for Nitrate calculated as the difference bet+een the t+o results. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK450G	WATER	APHA 21st ed., p544qNO3qF. Combined oxidised Nitrogen (NO26NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Reactive Phos7horus as PqBy Discrete Analyser	EK4- 1G	WATER	APHA 21st ed., p544qP F Ammonium molybdate and 7otassium antimonyl tartrate reacts in acid medium +ith otho7hos7hate to form a hetero7oly acid q7hos7homolybdic acid q+hich is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ionic Balance by PCT DA and Turbi SOp DA	EN455 qPG	WATER	APHA 21st Ed. 1434F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate +hich determined by PCT and DA. The Cations are determined by Turbi SOp by DA. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
TPH qSemivolatile Fraction	EP4- 1	WATER	USEPA SW 8p9 q8415A The sam7le extract is analysed by Ca7illary GC/FID and zuantification is by com7arison against an established 5 7oint calibration curve of nqAlkane standards. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Volatile Organic Com7ounds	EP4- p	WATER	USEPA SW 8p9 q8294B Water sam7les are directly 7urged 7rior to analysis by Ca7illary GC/MS and zuantification is by com7arison against an established 5 7oint calibration curve. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
TPH Volatiles/BTEX	EP484	WATER	USEPA SW 8p9 q8294B Water sam7les are directly 7urged 7rior to analysis by Ca7illary GC/MS and zuantification is by com7arison against an established 5 7oint calibration curve. Alternatively, a sam7le is ezuilibrated in a heads7ace vial and a 7ortion of the heads7ace determined by GCMS analysis. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Se7aratory Funnel Extraction of Lizuids	ORG1ɒ	WATER	USEPA SW 8p9 q3514B 144 mL to 1L of sam7le is transferred to a se7aratory funnel and serially extracted three times using 94mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2). ALS default excludes sediment + hich may be resident in the container.
Volatiles Water Pre7aration	ORG19ɑW	WATER	A 5 mL alizuot or 5 mL of a diluted sam7le is added to a p4 mL VOC vial for s7arging.

Summary of Outliers

Outliers : Quality Control Samples

The follo+ing re7ort highlights outliers flagged in the Quality Control (QC) Re7ort. Surrogate recovery limits are static and based on USEPA SW 8p9 or ALSqQWI/EN/38 (in the absence of s7ecific USEPA limits). This re7ort dis7lays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Com7ound Grou7 Name	Laboratory Sam7le ID	Client Sam7le ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Scike uMS(ReFoveries							
ED4p1G: Sulfate (Turbidimetric) as SOp 2qby DA	EM1349804q442	Anonymous	**SBlfate as SO4 - TBrbidimetriF**	1p848q- 0q8	Not Determined	qqqq	**MS reFovery not determined, baFkgroBnd level greater than or eqBal to 4x scike level.**
EK429SF: Total CN by Segmented Flo+ Analyser	EM134904pq449	Anonymous	**Total Cyanide**	5- q12q5	95.3 %	- 4q134%	**ReFovery less than lower data qBality objeFtive**

- **9or all matriFes, no Method plank valBe oBtliers oFFBr.**
- **9or all matriFes, no DBcliFate oBtliers oFFBr.**
- **9or all matriFes, no Laboratory Control oBtliers oFFBr.**

Regular Sample Surrogates

- **9or all regBlar samcle matriFes, no sBrrogate reFovery oBtliers oFFBr.**

Outliers : Analysis Holding Time Compliance

This re7ort dis7lays Holding Time breaches only. Only the res7ective Extraction / Pre7aration and/or Analysis com7onent is/are dis7layed.

Matrix: **WATER**

Method		Extraction / Preparation			Analysis		
Container / Client Sam7le ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005: cH							
Clear PlastiF pottle - NatBral							
GW15, GW45	GW25,	qqqq	qqqq	qqqq	20qJUNq2413	2- qJUNq2413	)

Outliers : Frequency of Quality Control Samples

The follo+ing re7ort highlights breaches in the Frezuency of Quality Control Sam7les.

- **No QBality Control Samcle 9reqBenFy OBtliers exist.**

CoC received 28/06/13 08:57 R.T

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: [illegible]
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS: Standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle)
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		Custody Seal Intact? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) CC 1 2 3 4 5 7	Random Sample Temperature on Receipt °C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1666 O 1 2 3 4 5 7	Other comment:
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		
Email Invoice to : rorquiza@environmentalearthsciences.com		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		Chris
DATE/TIME: 28/6 9 am	DATE/TIME: 28/6 9 am	DATE/TIME:	DATE/TIME: 28/6 13:10

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
1	GW15	27/06/2013	W		8	x	x	x	x	x	x	x						5.54	18	
2	GW25	27/06/2013	W		8	x	x	x	x	x	x	x						6.49	17.8	
3	GW05	27/06/2013	W		8	x	x	x	x	x	x	x						6.74	19.3	
4	Trip/8 C-M 28/6	27/06/2013	W		2					x	x									
				TOTAL																

Environmental Division
LB Melbourne LB
15:43 Work Order 15:43
EM1306906

Telephone : +61-3-8549 9600

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Friday, 28 June 2013 8:57 AM
To: Carol Walsh
Cc: Samples Melbourne
Subject: RE: COC FOR SAMPLES RECEIVED THIS AFTERNOON
Attachments: 210074_CoC_27 June 2013 pm.pdf; 210074_CoC_28 June 2013 am.pdf

Hi Carol,

Please find the attached CoC for the samples collected yesterday and the CoC for the samples to be collected this morning.

Thank you.

Regards

Regin

From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 4:37 PM
To: Regin Orquiza
Subject: COC FOR SAMPLES RECEIVED THIS AFTERNOON

Regin

Do you have the COC's prepared for samples received this afternoon.

Kind Regards

Carol Walsh

Senior Client Services Officer
ALS | Environmental Division

4 Westall Rd
Springvale, VIC. 3171 Australia

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F +61 3 8549 9626

www.alsglobal.com

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306677**	Page	: 1 of 9
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@environmentalearthsciences.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 24-JUN-2013
Sampler	: SFL/KK	Issue Date	: 01-JUL-2013
Site	: ----		
		No. of samples received	: 9
Quote number	: ME/330/13	No. of samples analysed	: 9

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 Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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 less than (<) 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.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG020F: Results for EM1306677-005 have been confirmed by re-preparation and re-analysis.**
- **EG020F: Zinc and copper results for EM1306677-001 and 002 have been confirmed by re-preparation and re-analysis.**
- **EK026SF : EM1306677-002 matrix spike failed for TCN due to possible sample interference. This has been confirmed by re-analysis.**
- **EK055G: Ammonia was analysed by buchi method for #4 (EK055).**
- **EM1306677-003, 004, 006 and 007: Ammonia as N results were done by buchi method (EK055).**
- **EP071SG: Particular sample EM1306677-007 has LOR raised due to laboratory background.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate ; and major cations - calcium, magnesium, potassium, sodium and ammonia for #2 , #4 and #6..**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate ; and major cations - calcium, magnesium, potassium, sodium, iron and ammonia for #3 and #7..**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**

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*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
		Melbourne Organics
Varsha Ho Wing	Non-Metals Team Leader	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	GW43	GW42D	GW41	GW23	GW19
				Client sampling date / time	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00
					EM1306677-001	EM1306677-004	EM1306677-005	EM1306677-006	EM1306677-007
EA005: pH									
pH Value	----	0.01	pH Unit		5.82	5.76	6.90	6.83	6.12
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	----	10	mg/L		18200	27000	4400	1120	2780
ED037P: Alkalinity by PC Titrator									
Total Alkalinity as CaCO3	----	1	mg/L		425	181	229	348	97
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1200	14400	503	411	1280
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	1	mg/L		9670	6190	2000	35	816
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		433	567	530	23	231
Magnesium	7439-95-4	1	mg/L		638	1060	221	3	93
Sodium	7440-23-5	1	mg/L		4950	3530	530	29	264
Potassium	7440-09-7	1	mg/L		175	220	53	7	47
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	0.45	<0.01	0.02	0.04
Arsenic	7440-38-2	0.001	mg/L		0.003	0.016	0.030	0.554	2.06
Cadmium	7440-43-9	0.0001	mg/L		0.0007	0.0002	0.0006	<0.0001	0.0003
Cobalt	7440-48-4	0.001	mg/L		0.060	7.79	0.002	0.002	0.094
Copper	7440-50-8	0.001	mg/L		0.006	0.018	0.004	0.001	0.003
Lead	7439-92-1	0.001	mg/L		0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		6.69	24.6	0.409	0.041	10.3
Nickel	7440-02-0	0.001	mg/L		0.062	2.22	0.013	0.002	0.040
Selenium	7782-49-2	0.01	mg/L		<0.01	0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		0.048	0.143	0.024	0.012	0.025
Boron	7440-42-8	0.05	mg/L		0.99	0.28	0.84	1.57	1.51
Iron	7439-89-6	0.05	mg/L		0.26	13.3	0.18	3.72	255
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		<0.004	0.025	0.035	0.054	0.060
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.4	0.6	1.4	0.2	0.7
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		1.33	2410	0.80	193	83.2

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	GW43	GW42D	GW41	GW23	GW19
				Client sampling date / time	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00
					EM1306677-001	EM1306677-004	EM1306677-005	EM1306677-006	EM1306677-007
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	----	0.01	mg/L		1.33	2410	0.80	193	83.2
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	----	0.01	mg/L		<0.01	<0.01	<0.01	0.04	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	<0.01	1.12	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		0.08	0.02	<0.01	<0.01	<0.01
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		306	478	71.5	16.5	51.6
Total Cations	----	0.01	meq/L		294	----	69.0	----	----
Total Cations	----	0.01	meq/L		----	446	----	16.5	52.0
Ionic Balance	----	0.01	%		2.07	----	1.70	0.10	----
Ionic Balance	----	0.01	%		----	3.48	----	----	0.37
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		----	<50	----	170	90
C15 - C28 Fraction	----	100	µg/L		----	<100	----	480	320
C29 - C36 Fraction	----	50	µg/L		----	<50	----	<50	<60
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	<50	----	650	410
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L		----	<100	----	290	270
>C16 - C34 Fraction	----	100	µg/L		----	<100	----	380	220
>C34 - C40 Fraction	----	100	µg/L		----	<100	----	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	<100	----	670	490
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	425	<1	61	<1
Toluene	108-88-3	2	µg/L		<2	38	<2	3	<2
Ethylbenzene	100-41-4	2	µg/L		<2	4	<2	52	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	16	<2	3	<2
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
ortho-Xylene	95-47-6	2	µg/L		<2	11	<2	12	<2
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	10	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	GW43	GW42D	GW41	GW23	GW19
				Client sampling date / time	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00
					EM1306677-001	EM1306677-004	EM1306677-005	EM1306677-006	EM1306677-007
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	**19**	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	<5
EP074H: Naphthalene									
Naphthalene	91-20-3	7	µg/L		<7	**31**	<7	<7	<7
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	20	µg/L		<20	**480**	<20	**200**	<20
C10 - C14 Fraction	---	50	µg/L		<50	**760**	<50	**730**	**140**
C15 - C28 Fraction	---	100	µg/L		<100	**340**	**330**	**1020**	**1530**
C29 - C36 Fraction	---	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	---	50	µg/L		<50	**1100**	**330**	**1750**	**1670**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	20	µg/L		<20	**440**	<20	**260**	<20
>C10 - C16 Fraction	---	100	µg/L		<100	**670**	**250**	**780**	**650**
>C16 - C34 Fraction	---	100	µg/L		<100	**180**	**100**	**820**	**1130**
>C34 - C40 Fraction	---	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	100	µg/L		<100	**850**	**350**	**1600**	**1780**
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**116**	**131**	**115**	**119**	**103**
Toluene-D8	2037-26-5	0.1	%		**110**	**107**	**108**	**118**	**111**
4-Bromofluorobenzene	460-00-4	0.1	%		**107**	**112**	**113**	**120**	**104**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**114**	**131**	**112**	**113**	**97.4**
Toluene-D8	2037-26-5	0.1	%		**105**	**104**	**105**	**103**	**97.3**
4-Bromofluorobenzene	460-00-4	0.1	%		**105**	**108**	**108**	**118**	**110**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID: DUP1	GW39	Rinsate 1	Trip 1	----
				Client sampling date / time: 24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	----
				EM1306677-002	EM1306677-003	EM1306677-008	EM1306677-009	----
EA005: pH								
pH Value	----	0.01	pH Unit	----	**6.67**	----	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	mg/L	----	**2660**	----	----	----
ED037P: Alkalinity by PC Titrator								
Total Alkalinity as CaCO3	----	1	mg/L	----	**362**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**1210**	**1570**	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	----	**43**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	----	**226**	----	----	----
Magnesium	7439-95-4	1	mg/L	----	**77**	----	----	----
Sodium	7440-23-5	1	mg/L	----	**60**	----	----	----
Potassium	7440-09-7	1	mg/L	----	**16**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	----	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.682**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.0009**	**0.0004**	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**0.064**	**0.044**	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.022**	**0.004**	----	----	----
Lead	7439-92-1	0.001	mg/L	**0.002**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L	**7.00**	**3.82**	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.072**	**0.059**	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L	**0.110**	**0.032**	----	----	----
Boron	7440-42-8	0.05	mg/L	**1.08**	**1.57**	----	----	----
Iron	7439-89-6	0.05	mg/L	**0.24**	**67.8**	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	**0.116**	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	----	**1.7**	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**1.39**	**290**	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	DUP1	GW39	Rinsate 1	Trip 1	----
				Client sampling date / time	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	----
					EM1306677-002	EM1306677-003	EM1306677-008	EM1306677-009	----
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	----	0.01	mg/L		----	**290**	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	----	0.01	mg/L		----	**0.04**	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		----	**0.08**	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	<0.01	----	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		----	**41.1**	----	----	----
Total Cations	----	0.01	meq/L		----	**45.0**	----	----	----
Ionic Balance	----	0.01	%		----	**4.43**	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		----	**190**	----	----	----
C15 - C28 Fraction	----	100	µg/L		----	**130**	----	----	----
C29 - C36 Fraction	----	50	µg/L		----	<50	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		----	**320**	----	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L		----	**310**	----	----	----
>C16 - C34 Fraction	----	100	µg/L		----	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		----	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		----	**310**	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	**72**	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	**7**	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	**4**	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	**7**	<2	<2	----
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	----
ortho-Xylene	95-47-6	2	µg/L		<2	**6**	<2	<2	----
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	----
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	DUP1	GW39	Rinsate 1	Trip 1	----
				Client sampling date / time	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	----
Compound	CAS Number	LOR	Unit		EM1306677-002	EM1306677-003	EM1306677-008	EM1306677-009	----
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	----
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	----
EP074H: Naphthalene									
Naphthalene	91-20-3	7	µg/L		<7	**19**	<7	<7	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	**100**	<20	----	----
C10 - C14 Fraction	----	50	µg/L		<50	**500**	<50	----	----
C15 - C28 Fraction	----	100	µg/L		<100	**1570**	<100	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	**2070**	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	20	µg/L		<20	**110**	<20	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	**940**	<100	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	**1220**	<100	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	**2160**	<100	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**110**	**126**	**102**	**103**	----
Toluene-D8	2037-26-5	0.1	%		**103**	**123**	**96.6**	**96.4**	----
4-Bromofluorobenzene	460-00-4	0.1	%		**106**	**126**	**94.0**	**101**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**106**	**119**	**99.7**	----	----
Toluene-D8	2037-26-5	0.1	%		**99.3**	**107**	**93.7**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**106**	**125**	**92.1**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	69	133
Toluene-D8	2037-26-5	72	128
4-Bromofluorobenzene	460-00-4	70	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70	132
Toluene-D8	2037-26-5	69	125
4-Bromofluorobenzene	460-00-4	61	129

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	69	133
Toluene-D8	2037-26-5	72	128
4-Bromofluorobenzene	460-00-4	70	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70	132
Toluene-D8	2037-26-5	69	125
4-Bromofluorobenzene	460-00-4	61	129

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1306677**	Page	: 1 of 11
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@environmentalearthsciences.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-JUN-2013
Sampler	: SFL/KK	Issue Date	: 01-JUL-2013
Order number	: ----		
		No. of samples received	: 9
Quote number	: ME/330/13	No. of samples analysed	: 9

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

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 less than (<) 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 = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

NATA Accredited Laboratory 825

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*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
		Melbourne Organics
Varsha Ho Wing	Non-Metals Team Leader	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

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 (%)*
EA005: pH (QC Lot: 2936555)									
EM1306663-001	Anonymous	EA005: pH Value	---	0.01	pH Unit	7.96	7.94	0.2	0% - 20%
EM1306685-001	Anonymous	EA005: pH Value	---	0.01	pH Unit	6.72	6.73	0.1	0% - 20%
EA015: Total Dissolved Solids (QC Lot: 2935788)									
EM1306657-001	Anonymous	EA015H: Total Dissolved Solids @180°C	---	10	mg/L	46200	46300	0.1	0% - 20%
EM1306657-010	Anonymous	EA015H: Total Dissolved Solids @180°C	---	10	mg/L	23400	23400	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 2936332)									
EM1306539-001	Anonymous	ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	29	30	0.0	0% - 20%
EM1306653-001	Anonymous	ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	912	906	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2936017)									
EM1306677-001	GW43	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1200	1220	0.9	0% - 20%
EM1306704-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	158	159	0.0	0% - 20%
ED045G: Chloride Discrete analyser (QC Lot: 2936015)									
EM1306677-001	GW43	ED045G: Chloride	16887-00-6	1	mg/L	9670	9830	1.7	0% - 20%
EM1306718-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2990	3070	2.6	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 2936011)									
EM1306677-001	GW43	ED093F: Calcium	7440-70-2	1	mg/L	433	460	6.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	638	674	5.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	4950	5170	4.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	175	184	5.2	0% - 50%
EM1306718-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	23	23	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	306	300	1.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1150	1160	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	20	19	0.0	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2936508)									
EM1306623-001	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	0.009	0.008	14.9	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.024	0.022	5.7	0% - 20%
		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	0.024	0.027	11.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.015	0.014	7.5	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.032	0.031	4.9	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	1.47	1.69	13.9	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 (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2936508) - continued									
EM1306623-001	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM1306677-007	GW19	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0003	0.0003	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	2.06	2.07	0.4	0% - 20%
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.094	0.089	5.0	0% - 20%
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.003	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	10.3	10.8	4.3	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.040	0.037	9.2	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.025	0.025	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.04	0.05	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	1.51	1.63	7.2	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	255	308	18.6	0% - 20%
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 2936566)									
EM1306677-001	GW43	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM1306716-003	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 2936333)									
EM1306539-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.1	0.0	No Limit
EM1306638-008	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.4	0.4	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2936860)									
EM1306677-001	GW43	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.33	1.39	4.4	0% - 20%
EM1306716-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.08	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2936012)									
EM1306677-001	GW43	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306718-002	Anonymous	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2936013)									
EM1306677-001	GW43	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.08	0.08	0.0	No Limit
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QC Lot: 2935863)									
EM1306677-003	GW39	EP071SG: C15 - C28 Fraction	----	100	µg/L	130	<100	23.3	No Limit
		EP071SG: C10 - C14 Fraction	----	50	µg/L	190	<50	118	No Limit
		EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071SG: C10 - C36 Fraction (sum)	----	50	µg/L	320	<50	146	No Limit
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup (QC Lot: 2935863)									
EM1306677-003	GW39	EP071SG: >C10 - C16 Fraction	----	100	µg/L	310	<100	102	No Limit
		EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2935893)									
EM1306677-001	GW43	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit

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 (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2935893) - continued									
EM1306677-001	GW43	EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EM1306685-002	Anonymous	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EP074H: Naphthalene (QC Lot: 2935893)									
EM1306677-001	GW43	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
EM1306685-002	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2935862)									
EM1306677-001	GW43	EP071: C15 - C28 Fraction	---	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
EM1306677-005	GW41	EP071: C15 - C28 Fraction	---	100	µg/L	330	300	7.5	No Limit
		EP071: C10 - C14 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2935894)									
EM1306677-001	GW43	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	No Limit

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 (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2935894) - continued									
EM1306685-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2935862)									
EM1306677-001	GW43	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EM1306677-005	GW41	EP071: >C10 - C16 Fraction	----	100	µg/L	250	220	12.1	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	100	100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2935894)									
EM1306677-001	GW43	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1306685-002	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit

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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids (QCLot: 2935788)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	99.6	98	104
ED037P: Alkalinity by PC Titrator (QCLot: 2936332)								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	97.4	91	105
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936017)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	12.5 mg/L	104	81	125
ED045G: Chloride Discrete analyser (QCLot: 2936015)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	89	117
ED093F: Dissolved Major Cations (QCLot: 2936011)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	97.0	83	129
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	94.4	80	124
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	92.9	77	125
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.3	77	123
EG020F: Dissolved Metals by ICP-MS (QCLot: 2936508)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	101	90	110
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	93	109
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.9	85	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	97.7	87	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.0	86	110
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	103	88	112
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	106	86	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.6	86	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	96.0	85	111
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.2	83	113
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	101	72	126
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	88	112
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936566)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	105	75	113
EK040P: Fluoride by PC Titrator (QCLot: 2936333)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	105	78	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936860)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.0 mg/L	104	76	122
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936012)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	99.8	84	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936013)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	107	84	108
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 2935863)								
EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	62700 µg/L	102	58	144
EP071SG: C15 - C28 Fraction	----	100	µg/L	<100	101500 µg/L	96.9	55	133
EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
EP071SG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup (QCLot: 2935863)								
EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2935893)								
EP074: Benzene	71-43-2	1	µg/L	<1	20 µg/L	91.4	76	122
EP074: Toluene	108-88-3	2	µg/L	<2	20 µg/L	92.1	79	123
EP074: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	91.6	76	118
EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	93.4	75	121
EP074: Styrene	100-42-5	5	µg/L	<5	20 µg/L	97.0	72	118
EP074: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	97.4	80	120
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	20 µg/L	99.1	71	119
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	20 µg/L	85.0	69	113
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	20 µg/L	86.4	70	114
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	20 µg/L	84.8	71	115
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	20 µg/L	87.3	70	114
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	20 µg/L	86.3	72	114
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	20 µg/L	85.1	68	114
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	20 µg/L	84.7	61	115
EP074H: Naphthalene (QCLot: 2935893)								
EP074: Naphthalene	91-20-3	7	µg/L	<7	20 µg/L	96.6	75	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935862)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3610 µg/L	91.4	46	126
EP071: C15 - C28 Fraction	----	100	µg/L	<100	10340 µg/L	96.6	55	125
EP071: C29 - C36 Fraction	----	50	µg/L	<50	3790 µg/L	99.1	55	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935894)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	98.1	60	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935862)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5070 µg/L	97.7	53	129
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	11230 µg/L	103	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1010 µg/L	97.9	51	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935894)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	450 µg/L	94.8	56	130

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	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936017)							
EM1306677-003	GW39	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
ED045G: Chloride Discrete analyser (QCLot: 2936015)							
EM1306677-003	GW39	ED045G: Chloride	16887-00-6	400 mg/L	112	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2936508)							
EM1306623-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	110	89	139
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	75	131
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	110	77	129
		EG020A-F: Copper	7440-50-8	0.2 mg/L	114	71	127
		EG020A-F: Lead	7439-92-1	0.2 mg/L	114	71	123
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	100	66	132
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	103	73	129
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	111	68	136
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936566)							
EM1306677-002	DUP1	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	# 56.1	70	130
EK040P: Fluoride by PC Titrator (QCLot: 2936333)							
EM1306539-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	107	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936860)							
EM1306677-002	DUP1	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	118	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936012)							
EM1306677-003	GW39	EK057G: Nitrite as N	----	0.5 mg/L	96.2	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936013)							
EM1306677-003	GW39	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	94.7	70	130
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 2935863)							
EM1306677-004	GW42D	EP071SG: C10 - C14 Fraction	----	62700 µg/L	128	65	149
		EP071SG: C15 - C28 Fraction	----	101500 µg/L	120	56	148

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2935893)							
EM1306677-002	DUP1	EP074: Benzene	71-43-2	20 µg/L	94.4	64	121
		EP074: Toluene	108-88-3	20 µg/L	100	63	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935862)							
EM1306677-002	DUP1	EP071: C10 - C14 Fraction	----	3610 µg/L	77.7	40	130
		EP071: C15 - C28 Fraction	----	10340 µg/L	82.7	51	145
		EP071: C29 - C36 Fraction	----	3790 µg/L	85.6	52	144
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935894)							
EM1306677-002	DUP1	EP080: C6 - C9 Fraction	----	280 µg/L	77.6	46	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935862)							
EM1306677-002	DUP1	EP071: >C10 - C16 Fraction	----	5070 µg/L	82.9	46	142
		EP071: >C16 - C34 Fraction	----	11230 µg/L	88.4	52	146
		EP071: >C34 - C40 Fraction	----	1010 µg/L	87.6	49	143
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935894)							
EM1306677-002	DUP1	EP080: C6 - C10 Fraction	----	330 µg/L	76.0	45	127

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are 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	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935862)										
EM1306677-002	DUP1	EP071: C10 - C14 Fraction	----	3610 µg/L	77.7	----	40	130	----	----
		EP071: C15 - C28 Fraction	----	10340 µg/L	82.7	----	51	145	----	----
		EP071: C29 - C36 Fraction	----	3790 µg/L	85.6	----	52	144	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935862)										
EM1306677-002	DUP1	EP071: >C10 - C16 Fraction	----	5070 µg/L	82.9	----	46	142	----	----
		EP071: >C16 - C34 Fraction	----	11230 µg/L	88.4	----	52	146	----	----
		EP071: >C34 - C40 Fraction	----	1010 µg/L	87.6	----	49	143	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 2935863)										
EM1306677-004	GW42D	EP071SG: C10 - C14 Fraction	----	62700 µg/L	128	----	65	149	----	----
		EP071SG: C15 - C28 Fraction	----	101500 µg/L	120	----	56	148	----	----
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2935893)										
EM1306677-002	DUP1	EP074: Benzene	71-43-2	20 µg/L	94.4	----	64	121	----	----
		EP074: Toluene	108-88-3	20 µg/L	100	----	63	125	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935894)										

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935894) - continued										
EM1306677-002	DUP1	EP080: C6 - C9 Fraction	----	280 µg/L	77.6	----	46	126	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935894)										
EM1306677-002	DUP1	EP080: C6 - C10 Fraction	----	330 µg/L	76.0	----	45	127	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936012)										
EM1306677-003	GW39	EK057G: Nitrite as N	----	0.5 mg/L	96.2	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936013)										
EM1306677-003	GW39	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	94.7	----	70	130	----	----
ED045G: Chloride Discrete analyser (QCLot: 2936015)										
EM1306677-003	GW39	ED045G: Chloride	16887-00-6	400 mg/L	112	----	70	130	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936017)										
EM1306677-003	GW39	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
EK040P: Fluoride by PC Titrator (QCLot: 2936333)										
EM1306539-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	107	----	70	130	----	----
EG020F: Dissolved Metals by ICP-MS (QCLot: 2936508)										
EM1306623-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	110	----	89	139	----	----
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	----	75	131	----	----
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	110	----	77	129	----	----
		EG020A-F: Copper	7440-50-8	0.2 mg/L	114	----	71	127	----	----
		EG020A-F: Lead	7439-92-1	0.2 mg/L	114	----	71	123	----	----
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	100	----	66	132	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	103	----	73	129	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	111	----	68	136	----	----
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936566)										
EM1306677-002	DUP1	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	# 56.1	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936860)										
EM1306677-002	DUP1	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	118	----	70	130	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1306677**	Page	: 1 of 10
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@environmentalearthsciences.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-JUN-2013
Sampler	: SFL/KK	Issue Date	: 01-JUL-2013
Order number	: ----		
		No. of samples received	: 9
Quote number	: ME/330/13	No. of samples analysed	: 9

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

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: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: pH							
Clear Plastic Bottle - Natural (EA005)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**----**	----	----	**26-JUN-2013**	24-JUN-2013	×
EA015: Total Dissolved Solids							
Clear Plastic Bottle - Natural (EA015H)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**---**	01-JUL-2013	----	**26-JUN-2013**	01-JUL-2013	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**---**	08-JUL-2013	----	**26-JUN-2013**	08-JUL-2013	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**---**	22-JUL-2013	----	**26-JUN-2013**	22-JUL-2013	✓
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle - Natural (ED045G)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**---**	22-JUL-2013	----	**26-JUN-2013**	22-JUL-2013	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**---**	01-JUL-2013	----	**26-JUN-2013**	01-JUL-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	---	21-DEC-2013	----	**27-JUN-2013**	21-DEC-2013	✓
EK026SF: Total CN by Segmented Flow Analyser							
White Plastic Bottle-NaOH (EK026SF)							
GW23	**24-JUN-2013**	---	08-JUL-2013	----	**26-JUN-2013**	08-JUL-2013	✓
White Plastic Bottle-NaOH - Pb Acetate (EK026SF)							
GW43, DUP1, GW39, GW42D, GW41, GW19	**24-JUN-2013**	---	08-JUL-2013	----	**26-JUN-2013**	08-JUL-2013	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	---	22-JUL-2013	----	**26-JUN-2013**	22-JUL-2013	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	---	22-JUL-2013	----	**27-JUN-2013**	22-JUL-2013	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	---	26-JUN-2013	----	**25-JUN-2013**	26-JUN-2013	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	---	26-JUN-2013	----	**25-JUN-2013**	26-JUN-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19, Rinsate 1	**24-JUN-2013**	**26-JUN-2013**	01-JUL-2013	✓	**26-JUN-2013**	05-AUG-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
GW39, GW42D, GW23, GW19	**24-JUN-2013**	**26-JUN-2013**	01-JUL-2013	✓	**26-JUN-2013**	05-AUG-2013	✓
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
GW39, GW42D, GW23, GW19	**24-JUN-2013**	**26-JUN-2013**	01-JUL-2013	✓	**26-JUN-2013**	05-AUG-2013	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19, Rinsate 1, Trip 1	**24-JUN-2013**	**26-JUN-2013**	08-JUL-2013	✓	**26-JUN-2013**	08-JUL-2013	✓
EP074H: Naphthalene							
Amber VOC Vial - Sulfuric Acid (EP074)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19, Rinsate 1, Trip 1	**24-JUN-2013**	**26-JUN-2013**	08-JUL-2013	✓	**26-JUN-2013**	08-JUL-2013	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber VOC Vial - Sulfuric Acid (EP080)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19, Rinsate 1	**24-JUN-2013**	**26-JUN-2013**	08-JUL-2013	✓	**26-JUN-2013**	08-JUL-2013	✓

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(where) 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.

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
Ammonia as N by Discrete analyser	EK055G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	1	**200.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	4	**25.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	12	**16.7**	**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
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	11	**9.1**	**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- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Chloride by Discrete Analyser	ED045G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	11	**9.1**	**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- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	12	**8.3**	**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	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	11	**9.1**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	**16.7**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	4	**25.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	12	**8.3**	**5.0**	✓	ALS QCS3 requirement

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
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) 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- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. 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	APHA 21st ed., 4500 Cl - G.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 librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um 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) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. 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 QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. 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.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	APHA 4500-CN-O. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. 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)
Ammonium as N	EK055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry 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 chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry 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 Chemical Reduction and direct colourimetry 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 othophosphate 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)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	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)
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	WATER	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	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)

Analytical Methods	Method	Matrix	Method Descriptions
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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. 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 100 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.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

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 SW 846 or ALS-QWI/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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1306677-003	GW39	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK026SF: Total CN by Segmented Flow Analyser	EM1306677-002	DUP1	**Total Cyanide**	57-12-5	56.1 %	70-130%	**Recovery less than lower data quality objective**

- **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

- **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.

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA005: pH						
Clear Plastic Bottle - Natural GW43, GW39, GW42D, GW41, GW23, GW19	----	----	----	26-JUN-2013	24-JUN-2013	**2**

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.**

Samples Received without COC

Date/Time Received	24.6.13 16:20.
Date/Time Analysis Received	
Client/Sender:	
Contact Name:	SCANNED
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	5
Carrier Company:	
Con-note No:	
Project Details	210074 (Ref).
Sampler/Sampling dates	KK / 24.6.13 & 23.6.13.
Matrix	water

Sample details..

1. GW43 23-6-13
2. SPLT1 "
3. GW39 24.6.13.
4. GW42D "
5. DUP1 "
6. Rin 1 "
7. Trip Blank(Rin1) "

PR 25/6/13

Environmental Division
Melbourne
25/6. Work Order
EM1306677

Telephone : +61-3-8549 9600

Samples sent to lab for
Micro ~~Nitrate~~ BOD pH
Colour Turbidity ~~RB~~
Other.....
Date 25/6 R.T

Notified: _____ Date: _____

Received By: [signature] 24/6/13

Amended COC rec'd 25-6-13. 3:01 pm

CHAIN OF CUSTODY

ALS Laboratory, please tick →

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g., Ultra Trace Organics) Standard
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011	
PROJECT: 210074 Sth Melbourne Gasworks	ALS QUOTE NO.: ME/330/13
ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) CC 1 2 3 4 5 7 / O 1 2 3 4 5 7
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8398 4403
SAMPLER: SFL / ICK	SAMPLER MOBILE:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):
Email Reports to : rorquiza@environmentalearthsciences.com and sloong@environmentalearthsciences.com	
Email Invoice to : rorquiza@environmentalearthsciences.com	

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
SFL	Courier		
DATE/TIME: 23/6	DATE/TIME: 23/6/13	DATE/TIME:	DATE/TIME:

FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Free ice / frozen ice bricks present upon receipt? Random Sample Temperature on Receipt: Other comment:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)

LAB ID (ALS USE ONLY)	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - Includes - pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	~~Ammonium (field pH and field temp must be recorded on the COC)~~	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TPH (C7)	~~TRH (C10-C40)~~	Ammonia & Sulphate	BTEX	Trimethylbenzene	field pH	Field temp
1	GW43	24/6	W		8	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	5.46	18.4
2	Dup1	24/6			8		[illegible]	✓	✓	✓	✓	✓		✓	✓	✓	✓		
→	Split → Please forward to MGT-Labmark.	24/6			8			✓	✓	✓	✓	✓		✓	✓	✓	✓		
3	GW39	24/6			8	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	6.67	16.7
4 (Note: High EC 27,000)	GW42D				8	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	5.55	16.4
5	GW41	24/6			8	✓	✓	✓	✓	✓	✓	✓						6.57	17.8
6	GW23	24/6			8	✓	✓	✓	✓	✓	✓	✓	✓					6.88	16.8
7	GW19	24/6			8	✓	✓	✓	✓	✓	✓	✓	✓					6.05	16.4
9	Rinsate 1	24/6			2					✓	✓	✓				✓	✓		
9	Tap 1	24/6			1					✓	✓					✓	✓		
				TOTAL	67														

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved

COC received on 25/6 @ 8:34 Anita

CHAIN OF CUSTODY

ALS Laboratory: please tick →

Sydney: 277 Woodpark Rd Smithfield NSW 2176 · Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 · Brisbane: 32 Shand St Stafford QLD 4053 · Townsville: 14-15 Desma Ct Bohle QLD 4818 · Melbourne: 2-4 Westall Rd Springvale VIC 3171 · Adelaide: 2-1 Burma Rd Pooraka SA 5095 · Perth: 10 Hod Way Malaga WA 6090 · Launceston: 27 Wellington St Launceston TAS 7250

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS: Standard (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011	
PROJECT: 210074 Sth Melbourne Gasworks	ALS QUOTE NO.: ME/330/13
ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) CC 1 2 3 4 5 7 / O 1 2 3 4 5 7
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8398 4403
SAMPLER: SFL / ICK	SAMPLER MOBILE:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):
Email Reports to: rorquiza@environmentalearthsciences.com and sleong@environmentalearthsciences.com	
Email Invoice to: rorquiza@environmentalearthsciences.com	

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
SFL	Courier		[signature] ALS
DATE/TIME: 23/6	DATE/TIME: 23/6/13	DATE/TIME:	DATE/TIME: 25/6/13 10:40am

FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A · Free ice / frozen ice bricks present upon receipt? Yes No N/A · Random Sample Temperature on Receipt: · Other comment:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes - pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	~~Ammonium (field pH and field temp must be recorded on the COC)~~	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TPH (C?)	~~TPH (C10-C40)~~	Ammonia & sulphate	BTEX	Trimethylbenzene	field pH	Field temp	Additional Information
1	GW43	24/6	W		8	✓		✓	✓		✓	✓		✓		✓	✓	5.46	18	4
2	Dup1	24/6			8			✓	✓		✓	✓		✓	✓	✓	✓			
→	Split	24/6 Please forward to MGT-Labmark.			8			✓	✓		✓	✓		✓	✓	✓	✓			
3	GW39	24/6			8	✓		✓	✓		✓	✓	✓	✓		✓	✓	6.67	16.7	
Note: High EC 27,000 4	GW42D				8	✓		✓	✓		✓	✓	✓	✓		✓	✓	5.55	16.4	
5	GW41	24/6			8	✓		✓	✓		✓	✓						6.57	17.8	
6	GW23	24/6			8	✓		✓	✓		✓	✓	✓					6.88	16.8	
7	GW19	24/6			8	✓		✓	✓		✓	✓	✓					6.09	16.4	
8	Rinsate 1	24/6			2						✓	✓				✓	✓			
9	TAP 1	24/6			1						✓					✓	✓			
				TOTAL	67															

Rec'd 24/6/13 PR (samples 1–3, Split)

Rec'd 25/6/13 PR (samples 5–7)

Rec'd 24/6/13 PR (samples 8–9)

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306738**	Pl g	: 1 of 9
Cs nt	: **ENVIRONMENTAL EARTH SCIENCES**	Ll borl tory	: Environm ntl s Divieion M sbourn
Contl ct	: REGIN ORQUIZA	Contl ct	: Cl ros Wl seh
Addr ee	: P.O.BOX 2253 aOOTSCRAY ,VIC, AUSTRALIA 3011	Addr ee	: 4 W etl s Rd Springvl s ,VIC Auetrl sl 3171
E-ml is	: rorquizl @ ei.biz	E-ml is	: cl roswl seh@l segsobl scom
T s phon	: +61 3 96F71666	T s phon	: +61-3-F5499960F
al ceimis	: +61 3 96F71F44	al ceimis	: +61-3-F5499601
Proj ct	: 210074 Sth M sbourn Gl eworke	QC L v s	: NEPM 1999 Sch dus B(3) nd ALS QCS3 quir m nt
Ord r numb r	: ----		
C-O-C numb r	: ----	Dl t Sl mps e R c iv d	: 25-JUN-2013
Sl mps r	: ----	leeu Dl t	: 01-JUL-2013
Sit	: ----		
		No. of l mps e c iv d	: 10
Quot numb r	: ME/330/13	No. of l mps e nl sye d	: 10

Thie r port eup re d e l ny pr vioue r port(e) with thie r f r nc . R euste l ppsy to th el mps (e) l e eubmitt d. Ass pl g e of thie r port hl v b n ch ck d l nd l pprov d for r s l e .

Thie C rtificl t of Anl syeie contl ine th fosowing nforml tion:

- G n rl s Comm nte
- Anl syticl s R euste
- Surrogl t Contros Limite

General Comments

Th l nl sytic l s proc dur e ue d by th Environm ntl s Divieion hl v b n d v sop d from etl bsieh d int rnl tionl sy r cogniz d proc dur e euch l e thoe pubsieh d by th USEPA, APKA, AS l nd NEPM. In houe d v sop d proc dur e r mpsoy d nth be nc of ocum nt d etl ndl rde or by cs nt r qu et.

Wh r moietur d t rminl tion hl e b n p rform d, r eus e r port d on d ry v ight bl eie.

Wh r r port d s ee hl n (H) r eus e high r hl n th LOR, hie ml y b du o priml ry el mps < rl ct/dig etl t dlisution nd/or neuffici nt el mps for nl syeie.

Wh r th LOR of r port d r eus diff re from etl ndl rd LOR, hie ml y b du o high moietur cont nt, neuffici nt el mps (r duc d v ight mpsoy d) or ml tri< nt rf r nc .

Wh n el mpsing im nform l tion e not provid d by th cs nt, el mpsing dl t e r ehown without im compon nt. n th e netl nc e, th im compon nt hl e b n eeum d by th l borl tory for proc eeing purpoe e.

= y CAS Numb r x CAS gietry numb r from dl tl bl e ml intl in d by Ch micl sAbetrl cte S rvic e. Th Ch micl sAbetrl cte S rvic e l divieion of th Am ricl n Ch micl s Soci ty.
LOR x Limit of porting
^ x Thie eus e comput d from individul sl nl syt dl t ctione t or bov th s v s of porting

- **EK026SF : EM1306718-002 matrix spike failed for TCN due to possible sample interference. This has been confirmed by re-analysis.**
- **EM1306738-004: Ammonia as N results were done by buchi method (EK055).**
- **EP071: Particular samples EM1306738-001,001DUP,010 have LOR raised due to laboratory background.**
- **EP071: Sample EM1306738-010 was extracted using volatiles vials instead of unpreserved amber bottle due to laboratory preparation error.**
- **Ionic Balance out of acceptable limits for sample #1 and #5 due to analytes not quantified in this report.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate ; and major cations - calcium, magnesium, potassium, sodium and ammonia #4.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**

NATA Accr dit d L borl tory F25 8
Accr dit d for compsil nc with ISO/IEC 17025.

Signatories

Thie docum nt hl e b n s ctronicl sy eign d by th l uthoriz d eignl tori e indicl t d b sow. Es ctronic eigning hl e b n cl rri d out in compsil nc with proc dur e ep cifi d n 21 CaR Pl rt 11.

Signatories	Position	Accreditation Category
Dis ni a rnl ndo	S nior norgl nic Ch miet	M sbourn norgl nice
		M sbourn norgl nice
		M sbourn norgl nice
		M sbourn norgl nice
Nl ncy Wl ng	S nior S mivos tis netrum nt Ch miet	M sbourn Orgl nice
		M sbourn Orgl nice
Vl rehl Ko Wing	Non-M tl se T l m L l d r	M sbourn norgl nice
		M sbourn norgl nice

Analytical Results

Sub-Mi tri<: WATER (Mi tri<: WATER)				Client sample ID	GW18	GW01	GW40	GW28	GW35
				Client sampling date / time	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00
Compound	CAS Number	LOR	Unit		EM1306738-001	EM1306738-002	EM1306738-003	EM1306738-004	EM1306738-005
EA005: pH									
pH Value	---	0.01	pK&Unit		6.83	6.73	5.57	7.18	6.87
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	---	10	mg/L		15600	3920	5300	1180	5370
ED037P: Alkalinity by PC Titrator									
Total Alkalinity as CaCO3	---	1	mg/L		460	654	201	404	515
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14F0F-79-F	1	mg/L		1280	178	314	220	403
ED045G: Chloride Discrete analyser									
Chloride	16FF7-00-6	1	mg/L		9710	1890	3450	302	3330
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		968	345	466	33	160
Magnesium	7439-95-4	1	mg/L		727	287	151	25	199
Sodium	7440-23-5	1	mg/L		3590	607	1400	251	1710
Potassium	7440-09-7	1	mg/L		204	78	60	6	59
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.01	H0.01	0.04	H0.01	H0.01
Arsenic	7440-3F-2	0.001	mg/L		0.004	0.478	0.010	0.314	1.11
Cadmium	7440-43-9	0.0001	mg/L		H0.0001	0.0001	0.0002	H0.0001	0.0003
Cobalt	7440-4F-4	0.001	mg/L		0.002	0.003	0.006	H0.001	0.003
Copper	7440-50-F	0.001	mg/L		0.004	0.002	0.065	H0.001	0.002
Lead	7439-92-1	0.001	mg/L		H0.001	H0.001	H0.001	H0.001	H0.001
Manganese	7439-96-5	0.001	mg/L		1.10	0.266	0.862	0.175	0.741
Nickel	7440-02-0	0.001	mg/L		H0.001	0.056	0.041	0.018	0.020
Selenium	77F2-49-2	0.01	mg/L		H0.01	H0.01	H0.01	H0.01	H0.01
Zinc	7440-66-6	0.005	mg/L		0.010	0.039	0.331	0.005	0.014
Boron	7440-42-F	0.05	mg/L		1.01	1.37	0.67	0.81	1.08
Iron	7439-F9-6	0.05	mg/L		H0.05	2.76	0.39	2.20	7.56
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		0.028	0.017	H0.004	0.016	0.015
EK040P: Fluoride by PC Titrator									
Fluoride	169F4-4F-F	0.1	mg/L		0.7	1.4	0.6	1.8	2.2
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		7.02	3.32	0.16	84.6	2.57

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW18	GW01	GW40	GW28	GW35
				Client sampling date / time	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit		EM1306738-001	EM1306738-002	EM1306738-003	EM1306738-004	EM1306738-005
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	----	0.01	mg/L		7.02	3.32	0.16	84.6	2.57
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	----	0.01	mg/L		0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-F	0.01	mg/L		0.15	0.06	1.39	0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EN055: Ionic Balance									
Total Anions	----	0.01	m q/L		310	70.1	108	21.2	113
Total Cations	----	0.01	m q/L		270	69.2	98.1	----	100
Total Cations	----	0.01	m q/L		----	----	----	19.2	----
Ionic Balance	----	0.01	%		6.94	0.60	4.73	----	5.82
Ionic Balance	----	0.01	%		----	----	----	4.86	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	4
Toluene	10F-FF-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	10F-3F-38 106-42-3	2	µg/L		<2	<2	<2	<2	<2
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
Isopropylbenzene	9F-F2-F	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	10F-67-F	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-9F-F	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	9F-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-F7-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-F	5	µg/L		<5	<5	<5	<5	<5
EP074H: Naphthalene									
Naphthalene	91-20-3	7	µg/L		<7	<7	<7	<7	<7
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50

Analytical Results

Sub-Mi tri<: WATER (Mi tri<: WATER)				Client sample ID	GW18	GW01	GW40	GW28	GW35
				Client sampling date / time	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00
Compound	CAS Number	LOR	Unit		EM1306738-001	EM1306738-002	EM1306738-003	EM1306738-004	EM1306738-005
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	---	100	µg/L		H100	**200**	H100	**160**	**300**
C29 - C36 Fraction	---	50	µg/L		H60	H50	H50	H50	H50
^8C10 - C36 Fraction (sum)	---	50	µg/L		H50	**200**	H50	**160**	**300**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	20	µg/L		H20	H20	H20	H20	H20
>C10 - C16 Fraction	---	100	µg/L		H100	H100	H100	H100	**180**
>C16 - C34 Fraction	---	100	µg/L		H140	**200**	H100	**170**	**160**
>C34 - C40 Fraction	---	100	µg/L		H100	H100	H100	H100	H100
^8>C10 - C40 Fraction (sum)	---	100	µg/L		H100	**200**	H100	**170**	**340**
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**122**	**130**	**119**	**119**	**115**
Toluene-D8	2037-26-5	0.1	%		**111**	**109**	**111**	**100**	**110**
4-Bromofluorobenzene	460-00-4	0.1	%		**102**	**103**	**109**	**99.5**	**109**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**122**	**112**	**119**	**103**	**115**
Toluene-D8	2037-26-5	0.1	%		**97.9**	**99.2**	**98.9**	**90.4**	**98.8**
4-Bromofluorobenzene	460-00-4	0.1	%		**98.9**	**99.1**	**103**	**94.6**	**100**

Analytical Results

Sub-Mi tri<: WATER (Mi tri<: WATER)				Client sample ID	GW22	Rinsate 2	Trip 2	Trip 3	Dup 2
				Client sampling date / time	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00
Compound	CAS Number	LOR	Unit		EM1306738-006	EM1306738-007	EM1306738-008	EM1306738-009	EM1306738-010
EA005: pH									
pH Value	----	0.01	pK&Unit		6.99	----	----	----	----
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	----	10	mg/L		596	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Total Alkalinity as CaCO3	----	1	mg/L		227	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14F0F-79-F	1	mg/L		256	----	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16FF7-00-6	1	mg/L		44	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		85	----	----	----	----
Magnesium	7439-95-4	1	mg/L		28	----	----	----	----
Sodium	7440-23-5	1	mg/L		76	----	----	----	----
Potassium	7440-09-7	1	mg/L		28	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		H0.01	----	----	----	H0.01
Arsenic	7440-3F-2	0.001	mg/L		0.010	----	----	----	0.308
Cadmium	7440-43-9	0.0001	mg/L		0.0004	----	----	----	H0.0001
Cobalt	7440-4F-4	0.001	mg/L		0.003	----	----	----	H0.001
Copper	7440-50-F	0.001	mg/L		0.002	----	----	----	H0.001
Lead	7439-92-1	0.001	mg/L		0.002	----	----	----	H0.001
Manganese	7439-96-5	0.001	mg/L		0.047	----	----	----	0.173
Nickel	7440-02-0	0.001	mg/L		0.053	----	----	----	0.017
Selenium	77F2-49-2	0.01	mg/L		H0.01	----	----	----	H0.01
Zinc	7440-66-6	0.005	mg/L		0.035	----	----	----	H0.005
Boron	7440-42-F	0.05	mg/L		0.88	----	----	----	0.86
Iron	7439-F9-6	0.05	mg/L		0.07	----	----	----	2.12
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		0.140	----	----	----	0.018
EK040P: Fluoride by PC Titrator									
Fluoride	169F4-4F-F	0.1	mg/L		0.7	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.71	----	----	----	----

Analytical Results

Sub-Mi tri<: WATER (Mi tri<: WATER)

Compound	CAS Number	LOR	Unit	Client sample ID: GW22	Rinsate 2	Trip 2	Trip 3	Dup 2
				Client sampling date / time: 25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
				EM1306738-006	EM1306738-007	EM1306738-008	EM1306738-009	EM1306738-010
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	----	0.01	mg/L	**0.71**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0.01	mg/L	H 0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-F	0.01	mg/L	**0.82**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	H 0.01	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0.01	m q/L	**11.1**	----	----	----	----
Total Cations	----	0.01	m q/L	**10.6**	----	----	----	----
Ionic Balance	----	0.01	%	**2.48**	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	1	µg/L	H 1	H 1	H 1	H 1	H 1
Toluene	10F-FF-3	2	µg/L	H 2	H 2	H 2	H 2	H 2
Ethylbenzene	100-41-4	2	µg/L	H 2	H 2	H 2	H 2	H 2
meta- & para-Xylene	10F-3F-38 106-42-3	2	µg/L	H 2	H 2	H 2	H 2	H 2
Styrene	100-42-5	5	µg/L	H 5	H 5	H 5	H 5	H 5
ortho-Xylene	95-47-6	2	µg/L	H 2	H 2	H 2	H 2	H 2
Isopropylbenzene	9F-F2-F	5	µg/L	H 5	H 5	H 5	H 5	H 5
n-Propylbenzene	103-65-1	5	µg/L	H 5	H 5	H 5	H 5	H 5
1.3.5-Trimethylbenzene	10F-67-F	5	µg/L	H 5	H 5	H 5	H 5	H 5
sec-Butylbenzene	135-9F-F	5	µg/L	H 5	H 5	H 5	H 5	H 5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	H 5	H 5	H 5	H 5	H 5
tert-Butylbenzene	9F-06-6	5	µg/L	H 5	H 5	H 5	H 5	H 5
p-Isopropyltoluene	99-F7-6	5	µg/L	H 5	H 5	H 5	H 5	H 5
n-Butylbenzene	104-51-F	5	µg/L	H 5	H 5	H 5	H 5	H 5
EP074H: Naphthalene								
Naphthalene	91-20-3	7	µg/L	H 7	H 7	H 7	H 7	H 7
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	H 20	H 20	----	----	H 20
C10 - C14 Fraction	----	50	µg/L	H 50	H 50	----	----	H 50
C15 - C28 Fraction	----	100	µg/L	H 100	H 100	----	----	**160**
C29 - C36 Fraction	----	50	µg/L	H 50	H 50	----	----	H F0

Analytical Results

Sub-Ml tri<: **WATER** (Ml tri<: **WATER**)

				Client sample ID	GW22	Rinsate 2	Trip 2	Trip 3	Dup 2
				Client sampling date / time	25-JUN-20138l5:00	25-JUN-20138l5:00	25-JUN-20138l5:00	25-JUN-20138l5:00	25-JUN-20138l5:00
Compound	*CAS Number*	*LOR*	*Unit*		**EM1306738-006**	**EM1306738-007**	**EM1306738-008**	**EM1306738-009**	**EM1306738-010**
EP080/071: Total Petroleum Hydrocarbons - Continued									
^8**C10 - C36 Fraction (sum)**	----	50	µg/L		H50	H50	----	----	**160**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	20	µg/L		H20	H20	----	----	H20
>C10 - C16 Fraction	----	100	µg/L		H100	H100	----	----	H100
>C16 - C34 Fraction	----	100	µg/L		H100	H100	----	----	**240**
>C34 - C40 Fraction	----	100	µg/L		H100	H100	----	----	H100
^8**>C10 - C40 Fraction (sum)**	----	100	µg/L		H100	H100	----	----	**240**
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**118**	**115**	**109**	**115**	**120**
Toluene-D8	2037-26-5	0.1	%		**98.4**	**97.8**	**96.0**	**112**	**101**
4-Bromofluorobenzene	460-00-4	0.1	%		**93.9**	**94.1**	**99.1**	**111**	**99.2**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**102**	**100**	----	----	**105**
Toluene-D8	2037-26-5	0.1	%		**88.3**	**88.5**	----	----	**90.9**
4-Bromofluorobenzene	460-00-4	0.1	%		**93.0**	**88.6**	----	----	**95.5**

Surrogate Control Limits

Sub-Ml tri<: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	69	133
Toluene-D8	2037-26-5	72	12F
4-Bromofluorobenzene	460-00-4	70	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70	132
Toluene-D8	2037-26-5	69	125
4-Bromofluorobenzene	460-00-4	61	129

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM130673V**	Page	: 1 of 1L
i lneEy	: **ENHIRONMENTAL EARTS | CIENCE|**	bar otayotC	: v EmtoED eEyal MmmsroE u elr octEe
i oEyaRy	: Gv l ND QGUZMAW	i oEyaRy	: i atol h alsd
WBBtess	: P.Q.XQ2 LL53 FQQTSi GWY VNl , WZSTGWbNW3011	WBBtess	: 4 h esyall GB SptnEgmale VNl Wcsytalma 3171
v -Darl	: totqcnza@eesnr nz	v -Darl	: Ratol.walsd@alsglor al.RoD
TelepdoEe	: +61 03 96871666	TelepdoEe	: +61-3-8549 9608
FaRsnDrle	: +61 03 96871844	FaRsnDrle	: +61-3-8549 9601
PtojeRy	: L10074 Syd u elr octEe l aswotks	Ui bemel	: Ov Pu 1999 SRdeBcle X(3) aEB WbS Ui S3 teqcrteD eEy
Sne	: ----		
i -Q-i EcDr et	: ----	Maye SaDples GeRemeB	: L5-JZO-L013
SaDplet	: ----	Nssce Maye	: 01-JZb-L013
QtBet EcDr et	: ----		
		Oo. of saDples teRemeB	: 10
Ucoye EcDr et	: u v /330/13	Oo. of saDples aEalCseB	: 10

Tdns tepoty scpetseBes aEC ptemmocs tepoty(s) wnyd ydns tefeteERe. Gesclys applC yo yde saDple(s) as scr DnyeB. Wl pages of ydns tepoty dame r eeE RdeRkeB aEB apptomeB fot telease.

Tdns UcalnyCi oEytol GepotyRoEyanEs yde followrEg nEfotDayroE:

- bar otayotCMcplnRaye (MZP) GepotyKGelaymne PetReEyage MnffeteERe (GPM) aEB WRRepyaERe brDnys
- u eydoB XlaEk (u X) aEB bar otayotCi oEytol Spnke (bi S) GepotyKGeRometCaEB WRRepyaERe brDnys
- u aytn Spnke (u S) GepotyKGeRometCaEB WRRepyaERe brDnys

General Comments

Tde aEalOyRal ptoReBctes cseB r C yde v EmtioEDeEyal MmmsmoE dame reeE BemelopeB ftoD esyarlnsdeB nEyetEayoEallC teRogEnzeB ptoReBctes scRd as ydose pcrlnsdeB r C yde ZSvPW, WPx W, WS aEB OvPu . NE docse BemelopeB ptoReBctes ate eDploCeB nE yde ar seERe of BoRcDeEyeB syaEBatBs ot r CRneEyteqcesy.

h dete Dorsycte BeyetDnEayoE das r eeE petfotDeB, tesclys ate tepotyeB oE a BtCwergdyr asns.

h dete a tepotyeB less ydaE (H) tesclyns drgdet ydaE yde bQG, ydns DaCr e Bce yo ptnDatCsaDple e; ytaRyBrgesyaye BrncyoE aEB/ot nEscffnRneEysaDple fot aEalCsns.

h dete yde bQG of a tepotyeB tesclyBrffets ftoD syaEBatB bQG, ydns DaCr e Bce yo drgd Dorsycte RoEyeEy, nEscffnRneEysaDple (teBcReB wergdyeDploCeB) ot Dayln nEyetfeteERe.

#eC: WEoECDocs < Gefets yo saDples wdnRd ate EoyspeRfnRallCpatyof ydns wotk otBet r cyfotDeB patyof yde Ui ptoRess loy
i WS OcDr et < i WS tegrnsytCEcDr et ftoD Bayar ase DarEyanEeB r Ci deDnRal Wr sytaRys SetmnRes. Tde i deDnRal Wr sytaRys SetmnRe rns a BrnmsmoE of yde WDetnRaE i deDnRal SoRneyC.
bQG < bnDnyof tepotynEg
GPM < Gelaynne PetReEyage MnffeteERe
= < NEBnRayes fanleB Ui

OWTWWRReBnyeB bar otayotC8L5

WRReBnyeB fot RoDplraERe wnyd NSQ/Nvi 170L5.

Signatories

Tdns BoRcDeEy das r eeE eleRytoEnRallC snglEeB r C yde acydotnzeB snglEayotnes nEBnRayeB r elow. vleRytoEnR snglEnEg das r eeE RattneB ocy nE RoDplraERe wnyd ptoReBctes speRfneB nE L1 i FG Paty11.

Signatories	*Position*	*Accreditation Category*
MnaEnFetEaEBo	SeEnot NEotgaEnRi deDnsy	u elr octEe NEotgaEnRs
		u elr octEe NEotgaEnRs
		u elr octEe NEotgaEnRs
		u elr octEe NEotgaEnRs
OaERCh aEg	SeEnot SeDnnolayne NEsytcDeEy	u elr octEe QtgaEnRs
	i deDnsy	u elr octEe QtgaEnRs
Vatsda x o h nEg	OoE-u eyals TeaD beaBet	u elr octEe NEotgaEnRs
		u elr octEe NEotgaEnRs

Laboratory Duplicate (DUP) Report

Tde qcalnyC RoEytol yetD bar otayotC McplnRaye tefets yo a taEBoDIC seleRyeB nEytalar otayotC splny. bar otayotC BcplnRayes ptomBe nEfotDaymE tegatBnEg DeydoB pteRnsmE aEB saDple deyetogeEenyC. Tde petDnyeB taEges fot yde Gelaynne PetReEy MemtaymE (GPM) of bar otayotC McplnRayes ate speRfneB nE WbS u eydoB Uh NvO/38 aEB ate BepeEBeEy oE yde DagEnycBe of tesclys nE RoDpatnsoE yo yde lemel of tepotynEg: Gescly H 10 ynDes bQG:- Oo bnDnyKGesclyr eyweeE 10 aEB L0 ynDes bQG:- 0% - 50%KGescly> L0 ynDes bQG:- 0% - L0%.

Scr-u ayt n : **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005: pS (QC Lot: 2937310)									
v u 1306738-001	I h 18	v W005: px Valce	----	0.01	px ZEny	6.83	6.85	0.3	0% - L0%
v u 1306756-00L	WEoECDocs	v W005: px Valce	----	0.01	px ZEny	5.95	5.95	0.0	0% - L0%
EA015: Total Dissolved | olids (QC Lot: 293V071)									
v u 13067L6-008	WEoECDocs	v W015x: Toyal MnssolneB SolnBs @180°i	----	10	Dg/b	L18	LL0	0.9	0% - L0%
v u 1306738-001	I h 18	v W015x: Toyal MnssolneB SolnBs @180°i	----	10	Dg/b	15600	15400	1.5	0% - L0%
ED037P: Alkalinity by PC Titrator (QC Lot: 2936336)									
v u 13067L6-009	WEoECDocs	v M037-P: Toyal WlkalnEnyCas i ai Q3	----	1	Dg/b	L18	L18	0.0	0% - L0%
v u 1306738-003	I h 40	v M037-P: Toyal WlkalnEnyCas i ai Q3	----	1	Dg/b	L01	198	1.1	0% - L0%
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QC Lot: 2936451)									
v u 1306738-001	I h 18	v M041I : Sclfaye as SQ4 - Tctr nBnDeytnR	14808-79-8	1	Dg/b	1L80	1300	0.9	0% - L0%
v u 1306756-00L	WEoECDocs	v M041I : Sclfaye as SQ4 - Tctr nBnDeytnR	14808-79-8	1	Dg/b	33	33	0.0	0% - L0%
ED045G: Chloride Discrete analyser (QC Lot: 2936449)									
v u 1306717-001	WEoECDocs	v M045I : i dlotnBe	16887-00-6	1	Dg/b	9860	9950	0.9	0% - L0%
v u 13067L6-001	WEoECDocs	v M045I : i dlotnBe	16887-00-6	1	Dg/b	18	19	0.0	0% - 50%
ED045G: Chloride Discrete analyser (QC Lot: 2936453)									
v u 1306738-001	I h 18	v M045I : i dlotnBe	16887-00-6	1	Dg/b	9710	9880	1.7	0% - L0%
v u 1306756-00L	WEoECDocs	v M045I : i dlotnBe	16887-00-6	1	Dg/b	354	355	0.0	0% - L0%
ED093F: Dissolved Major Cations (QC Lot: 2936450)									
v u 13067L6-001	WEoECDocs	v M093F: i alRncD	7440-70-L	1	Dg/b	3	4	0.0	Oo bnDny
		v M093F: u agEesncD	7439-95-4	1	Dg/b	4	4	0.0	Oo bnDny
		v M093F: SoBncD	7440-L3-5	1	Dg/b	1L	1L	0.0	0% - 50%
		v M093F: PoyassncD	7440-09-7	1	Dg/b	1	1	0.0	Oo bnDny
v u 1306756-00L	WEoECDocs	v M093F: i alRncD	7440-70-L	1	Dg/b	L4	L5	0.0	0% - L0%
		v M093F: u agEesncD	7439-95-4	1	Dg/b	L7	L7	0.0	0% - L0%
		v M093F: SoBncD	7440-L3-5	1	Dg/b	18L	188	L.9	0% - L0%
		v M093F: PoyassncD	7440-09-7	1	Dg/b	8	8	0.0	Oo bnDny
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2936513)									
v u 1306468-098	WEoECDocs	v I 0L0W-F: i aBDncD	7440-43-9	0.0001	Dg/b	H0.0001	H0.0001	0.0	Oo bnDny
		v I 0L0W-F: WtseEnR	7440-38-L	0.001	Dg/b	H0.001	H0.001	0.0	Oo bnDny
		v I 0L0W-F: i oraly	7440-48-4	0.001	Dg/b	H0.001	H0.001	0.0	Oo bnDny
		v I 0L0W-F: i oppet	7440-50-8	0.001	Dg/b	H0.001	0.00L	7L.0	Oo bnDny
		v I 0L0W-F: beaB	7439-9L-1	0.001	Dg/b	H0.001	H0.001	0.0	Oo bnDny
		v I 0L0W-F: u aEgaEese	7439-96-5	0.001	Dg/b	H0.001	H0.001	0.0	Oo bnDny
		v I 0L0W-F: OnRkel	7440-0L-0	0.001	Dg/b	H0.001	H0.001	0.0	Oo bnDny
		v I 0L0W-F: AnER	7440-66-6	0.005	Dg/b	H0.005	H0.005	0.0	Oo bnDny

Scr-u ayt n : **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2936513) 8continued									
v u 1306468-098	WEoECDocs	v l 0L0W-F: WcDrnErcD	74L9-90-5	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: SeleErcD	778L-49-L	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: XotoE	7440-4L-8	0.05	Dg/b	H0.05	H0.05	0.0	Oo brDry
		v l 0L0W-F: NtoE	7439-89-6	0.05	Dg/b	H0.05	H0.05	0.0	Oo brDry
v u 1306685-001	WEoECDocs	v l 0L0W-F: i aBDrcD	7440-43-9	0.0001	Dg/b	H0.0001	H0.0001	0.0	Oo brDry
		v l 0L0W-F: WtseErR	7440-38-L	0.001	Dg/b	0.003	0.003	0.0	Oo brDry
		v l 0L0W-F: i or aly	7440-48-4	0.001	Dg/b	0.006	0.006	0.0	Oo brDry
		v l 0L0W-F: i oppet	7440-50-8	0.001	Dg/b	0.005	0.005	0.0	Oo brDry
		v l 0L0W-F: beaB	7439-9L-1	0.001	Dg/b	H0.001	H0.001	0.0	Oo brDry
		v l 0L0W-F: u aEgaEese	7439-96-5	0.001	Dg/b	0.140	0.146	4.0	0% - L0%
		v l 0L0W-F: OrRkel	7440-0L-0	0.001	Dg/b	0.0L4	0.0L4	0.0	0% - L0%
		v l 0L0W-F: AnER	7440-66-6	0.005	Dg/b	0.111	0.113	L.1	0% - L0%
		v l 0L0W-F: WcDrnErcD	74L9-90-5	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: SeleErcD	778L-49-L	0.01	Dg/b	0.03	0.03	0.0	Oo brDry
		v l 0L0W-F: XotoE	7440-4L-8	0.05	Dg/b	0.L9	0.3L	8.7	Oo brDry
		v l 0L0W-F: NtoE	7439-89-6	0.05	Dg/b	H0.05	H0.05	0.0	Oo brDry
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2936515)									
v u 1306738-00L	l h 01	v l 0L0W-F: i aBDrcD	7440-43-9	0.0001	Dg/b	0.0001	H0.0001	0.0	Oo brDry
		v l 0L0W-F: WtseErR	7440-38-L	0.001	Dg/b	0.478	0.503	5.0	0% - L0%
		v l 0L0W-F: i or aly	7440-48-4	0.001	Dg/b	0.003	0.003	0.0	Oo brDry
		v l 0L0W-F: i oppet	7440-50-8	0.001	Dg/b	0.00L	0.003	0.0	Oo brDry
		v l 0L0W-F: beaB	7439-9L-1	0.001	Dg/b	H0.001	H0.001	0.0	Oo brDry
		v l 0L0W-F: u aEgaEese	7439-96-5	0.001	Dg/b	0.L66	0.308	14.6	0% - L0%
		v l 0L0W-F: OrRkel	7440-0L-0	0.001	Dg/b	0.056	0.058	3.0	0% - L0%
		v l 0L0W-F: AnER	7440-66-6	0.005	Dg/b	0.039	0.04L	7.6	Oo brDry
		v l 0L0W-F: WcDrnErcD	74L9-90-5	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: SeleErcD	778L-49-L	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: XotoE	7440-4L-8	0.05	Dg/b	1.37	1.37	0.0	0% - L0%
		v l 0L0W-F: NtoE	7439-89-6	0.05	Dg/b	L.76	L.88	4.5	0% - L0%
v u 1306756-001	WEoECDocs	v l 0L0W-F: i aBDrcD	7440-43-9	0.0001	Dg/b	H0.0001	H0.0001	0.0	Oo brDry
		v l 0L0W-F: WtseErR	7440-38-L	0.001	Dg/b	0.005	0.005	0.0	Oo brDry
		v l 0L0W-F: i or aly	7440-48-4	0.001	Dg/b	0.001	0.001	0.0	Oo brDry
		v l 0L0W-F: i oppet	7440-50-8	0.001	Dg/b	0.00L	0.00L	0.0	Oo brDry
		v l 0L0W-F: beaB	7439-9L-1	0.001	Dg/b	H0.001	H0.001	0.0	Oo brDry
		v l 0L0W-F: u aEgaEese	7439-96-5	0.001	Dg/b	0.3L6	0.351	7.4	0% - L0%
		v l 0L0W-F: OrRkel	7440-0L-0	0.001	Dg/b	0.003	0.003	0.0	Oo brDry
		v l 0L0W-F: AnER	7440-66-6	0.005	Dg/b	0.007	0.006	0.0	Oo brDry
		v l 0L0W-F: WcDrnErcD	74L9-90-5	0.01	Dg/b	1.66	1.66	0.0	0% - L0%
		v l 0L0W-F: SeleErcD	778L-49-L	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: XotoE	7440-4L-8	0.05	Dg/b	0.LL	0.LL	0.0	Oo brDry

Scr-u ayt n : **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2936515) 8continued									
v u 1306756-001	WEoECDocs	v l 0L0W-F: NtoE	7439-89-6	0.05	Dg/b	L0.5	LL.L	8.0	0% - L0%
EK026| F: Total CN by | egmented Flow Analyser (QC Lot: 2936567)									
v u 1306718-001	WEoECDocs	v#0L6SF: Toyal i CaEnBe	57-1L-5	0.004	Dg/b	H0.004	H0.004	0.0	Oo brDry
v u 1306738-010	Mcp L	v#0L6SF: Toyal i CaEnBe	57-1L-5	0.004	Dg/b	0.018	0.017	0.0	Oo brDry
EK040P: Fluoride by PC Titrator (QC Lot: 2936334)									
v u 1306701-00L	WEoECDocs	v#040P: FlcotnBe	16984-48-8	0.1	Dg/b	0.3	0.3	0.0	Oo brDry
v u 1306738-003	I h 40	v#040P: FlcotnBe	16984-48-8	0.1	Dg/b	0.6	0.6	0.0	Oo brDry
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2936V60)									
v u 1306677-001	WEoECDocs	v#055I : WD DoEna as O	7664-41-7	0.01	Dg/b	1.33	1.39	4.4	0% - L0%
v u 1306716-003	WEoECDocs	v#055I : WD DoEna as O	7664-41-7	0.01	Dg/b	0.08	0.08	0.0	Oo brDry
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2936V62)									
v u 1306738-005	I h 35	v#055I : WD DoEna as O	7664-41-7	0.01	Dg/b	L.57	L.45	4.6	0% - L0%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2936447)									
v u 1306716-001	WEoECDocs	v#057I : Onytnye as O	----	0.01	Dg/b	0.01	0.01	0.0	Oo brDry
v u 1306756-00L	WEoECDocs	v#057I : Onytnye as O	----	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2936452)									
v u 1306738-001	I h 18	v#071I : GeaRymne Pdospdotcs as P	14L65-44-L	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
v u 1306756-00L	WEoECDocs	v#071I : GeaRymne Pdospdotcs as P	14L65-44-L	0.01	Dg/b	0.0L	0.0L	0.0	Oo brDry
EP074A: Monocyclic Aromatic Sydrocarbons (QC Lot: 2937477)									
v u 1306709-006	WEoECDocs	v P074: XeEzeEe	71-43-L	1	µg/b	H1	H1	0.0	Oo brDry
		v P074: TolceEe	108-88-3	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: v ydCr eEzeEe	100-41-4	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: Deya- & pata-2 CeEe	108-38-3 106-4L-3	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: otydo-2 CeEe	95-47-6	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: SyCteEe	100-4L-5	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: NsoptopCr eEzeEe	98-8L-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: E-PtopCr eEzeEe	103-65-1	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: 1.3.5-TtnDeydCr eEzeEe	108-67-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: seR-XcyCr eEzeEe	135-98-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: 1.L.4-TtnDeydCr eEzeEe	95-63-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: yety-XcyCr eEzeEe	98-06-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: p-NsoptopCtyolceEe	99-87-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: E-XcyCr eEzeEe	104-51-8	5	µg/b	H5	H5	0.0	Oo brDry
v u 1306738-005	I h 35	v P074: XeEzeEe	71-43-L	1	µg/b	4	4	0.0	Oo brDry
		v P074: TolceEe	108-88-3	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: v ydCr eEzeEe	100-41-4	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: Deya- & pata-2 CeEe	108-38-3 106-4L-3	L	µg/b	HL	HL	0.0	Oo brDry

Scr-u ayt n : **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074A: Monocyclic Aromatic Sydrocarbons (QC Lot: 2937477) 8continued									
v u 1306738-005	l h 35	v P074: otydo-2 CleEe	95-47-6	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: SyCteEe	100-4L-5	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: N\optopCr eEzeEe	98-8L-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: E-PtopCr eEzeEe	103-65-1	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: 1.3.5-TtnDeydCr eEzeEe	108-67-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: seR-XcyCr eEzeEe	135-98-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: 1.L.4-TtnDeydCr eEzeEe	95-63-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: yety-XcyCr eEzeEe	98-06-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: p-N\optopCyolceEe	99-87-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: E-XcyCr eEzeEe	104-51-8	5	µg/b	H5	H5	0.0	Oo brDry
EP074S: Naphthalene (QC Lot: 2937477)									
v u 1306709-006	WEoECDocs	v P074: OapdydaleEe	91-L0-3	7	µg/b	H7	H7	0.0	Oo brDry
v u 1306738-005	l h 35	v P074: OapdydaleEe	91-L0-3	7	µg/b	H7	H7	0.0	Oo brDry
EP0V0/071: Total Petroleum Sydrocarbons (QC Lot: 29363V6)									
v u 1306717-001	WEoECDocs	v P071: i 15 - i L8 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
		v P071: i 10 - i 14 FtaRyroE	----	50	µg/b	H50	H50	0.0	Oo brDry
		v P071: i L9 - i 36 FtaRyroE	----	50	µg/b	H50	H50	0.0	Oo brDry
v u 1306738-001	l h 18	v P071: i 15 - i L8 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
		v P071: i 10 - i 14 FtaRyroE	----	50	µg/b	H50	H50	0.0	Oo brDry
		v P071: i L9 - i 36 FtaRyroE	----	50	µg/b	H60	H60	0.0	Oo brDry
EP0V0/071: Total Petroleum Sydrocarbons (QC Lot: 2937476)									
v u 1306709-006	WEoECDocs	v P080: i 6 - i 9 FtaRyroE	----	L0	µg/b	HL0	HL0	0.0	Oo brDry
v u 1306738-005	l h 35	v P080: i 6 - i 9 FtaRyroE	----	L0	µg/b	HL0	HL0	0.0	Oo brDry
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QC Lot: 29363V6)									
v u 1306717-001	WEoECDocs	v P071: >i 10 - i 16 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
		v P071: >i 16 - i 34 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
		v P071: >i 34 - i 40 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
v u 1306738-001	l h 18	v P071: >i 10 - i 16 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
		v P071: >i 16 - i 34 FtaRyroE	----	100	µg/b	H140	H140	0.0	Oo brDry
		v P071: >i 34 - i 40 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QC Lot: 2937476)									
v u 1306709-006	WEoECDocs	v P080: i 6 - i 10 FtaRyroE	----	L0	µg/b	HL0	HL0	0.0	Oo brDry
v u 1306738-005	l h 35	v P080: i 6 - i 10 FtaRyroE	----	L0	µg/b	HL0	HL0	0.0	Oo brDry

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

Tde qcalnyC RoEytol yetD u eydoB / bar otayotC XlaEk tefets yo aE aEalOye ftee Daytn yo wdnRd all teageEys ate aBBeB nE yde saDe molcDes ot ptopotynoEs as cseB nE syaEBatB saDple ptepataynoE. Tde pctpose of ydns Ui pataDeyet ns yo DoEnyot poyeEynal lar otayotC RoEyaDnEaynoE. Tde qcalnyC RoEytol yetD bar otayotC i oEytol SaDple (bi S) tefets yo a RetyfneB tefeteERe Dayetnal, ot a kEowE nEyetfeteERe ftee Daytn, sprkeB wnyd yatgey aEalOyes. Tde pctpose of ydns Ui pataDeyet ns yo DoEnyot DeydoB pteRsnoE aEB aRRctaRCnEBepeEBeEyof saDple Daytn. MCEaDnRGeRonetCbnDns ate r aseB oE syaynsyRal emalcaynoE of ptoResseB bi S.

Scr-u aytn : **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EA015: Total Dissolved | olids (QCLot: 293V071)								
v W015x : Toyal MnssolneB SolnBs @180°i	----	10	Dg/b	H10	L000 Dg/b	100	98	104
ED037P: Alkalinity by PC Titrator (QCLot: 2936336)								
v M037-P: Toyal WkalnEnyCas i ai Q3	----	1	Dg/b	----	L00 Dg/b	98.4	91	105
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2936451)								
v M041l : Sclfaye as SQ4 - Tctr nBnDeytnR	14808-79-8	1	Dg/b	H1	L5 Dg/b	111	81	1L5
ED045G: Chloride Discrete analyser (QCLot: 2936449)								
v M045l : i dlotnBe	16887-00-6	1	Dg/b	H1	1000 Dg/b	109	89	117
ED045G: Chloride Discrete analyser (QCLot: 2936453)								
v M045l : i dlotnBe	16887-00-6	1	Dg/b	H1	1000 Dg/b	110	89	117
ED093F: Dissolved Major Cations (QCLot: 2936450)								
v M093F: i alRncD	7440-70-L	1	Dg/b	H1	5 Dg/b	105	83	1L9
v M093F: u agEesncD	7439-95-4	1	Dg/b	H1	5 Dg/b	10L	80	1L4
v M093F: SoBncD	7440-L3-5	1	Dg/b	H1	50 Dg/b	94.7	77	1L5
v M093F: PoyassncD	7440-09-7	1	Dg/b	H1	50 Dg/b	95.L	77	1L3
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936513)								
v I 0L0WF: WcDnEncD	74L9-90-5	0.01	Dg/b	H0.01	0.5 Dg/b	99.4	90	110
v I 0L0WF: WtseEnR	7440-38-L	0.001	Dg/b	H0.001	0.1 Dg/b	99.6	93	109
v I 0L0WF: i aBDncD	7440-43-9	0.0001	Dg/b	H0.0001	0.1 Dg/b	97.L	85	111
v I 0L0WF: i or aly	7440-48-4	0.001	Dg/b	H0.001	0.1 Dg/b	99.4	87	111
v I 0L0WF: i oppet	7440-50-8	0.001	Dg/b	H0.001	0.1 Dg/b	95.4	86	110
v I 0L0WF: beaB	7439-9L-1	0.001	Dg/b	H0.001	0.1 Dg/b	10L	88	11L
v I 0L0WF: u aEgaEese	7439-96-5	0.001	Dg/b	H0.001	0.1 Dg/b	98.4	86	110
v I 0L0WF: OnRkel	7440-0L-0	0.001	Dg/b	H0.001	0.1 Dg/b	97.3	86	11L
v I 0L0WF: SeleEncD	778L-49-L	0.01	Dg/b	H0.01	0.1 Dg/b	97.0	85	111
v I 0L0WF: AnER	7440-66-6	0.005	Dg/b	H0.005	0.1 Dg/b	9L.6	83	113
v I 0L0WF: XotoE	7440-4L-8	0.05	Dg/b	H0.05	0.1 Dg/b	10L	7L	1L6
v I 0L0WF: NtoE	7439-89-6	0.05	Dg/b	H0.05	0.5 Dg/b	98.9	88	11L
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515)								
v I 0L0WF: WcDnEncD	74L9-90-5	0.01	Dg/b	H0.01	0.5 Dg/b	99.3	90	110
v I 0L0WF: WtseEnR	7440-38-L	0.001	Dg/b	H0.001	0.1 Dg/b	99.7	93	109
v I 0L0WF: i aBDncD	7440-43-9	0.0001	Dg/b	H0.0001	0.1 Dg/b	97.9	85	111
v I 0L0WF: i or aly	7440-48-4	0.001	Dg/b	H0.001	0.1 Dg/b	99.8	87	111
v I 0L0WF: i oppet	7440-50-8	0.001	Dg/b	H0.001	0.1 Dg/b	96.6	86	110
v I 0L0WF: beaB	7439-9L-1	0.001	Dg/b	H0.001	0.1 Dg/b	99.3	88	11L

Scr-u ayt,n : **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515) 8continued								
v l 0L0W-F: u aEgaEese	7439-96-5	0.001	Dg/b	H0.001	0.1 Dg/b	96.8	86	110
v l 0L0W-F: OnRkel	7440-0L-0	0.001	Dg/b	H0.001	0.1 Dg/b	99.3	86	11L
v l 0L0W-F: SeleEnc D	778L-49-L	0.01	Dg/b	H0.01	0.1 Dg/b	94.1	85	111
v l 0L0W-F: AnER	7440-66-6	0.005	Dg/b	H0.005	0.1 Dg/b	9L.6	83	113
v l 0L0W-F: XotoE	7440-4L-8	0.05	Dg/b	H0.05	0.1 Dg/b	107	7L	1L6
v l 0L0W-F: NtoE	7439-89-6	0.05	Dg/b	H0.05	0.5 Dg/b	99.6	88	11L
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2936567)								
v#0L6SF: Toyal i CaEnBe	57-1L-5	0.004	Dg/b	H0.004	0.L Dg/b	81.9	75	113
EK040P: Fluoride by PC Titrator (QCLot: 2936334)								
v#040P: FlcotnBe	16984-48-8	0.1	Dg/b	H0.1	5 Dg/b	96.0	78	1L0
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V60)								
v#055I : WD DoEna as O	7664-41-7	0.01	Dg/b	H0.01	1.0 Dg/b	104	76	1LL
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V62)								
v#055I : WD DoEna as O	7664-41-7	0.01	Dg/b	H0.01	1.0 Dg/b	100	76	1LL
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936447)								
v#057I : Onytye as O	----	0.01	Dg/b	H0.01	0.5 Dg/b	95.1	84	11L
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936452)								
v#071I : GeaRyme Pdospdotcs as P	14L65-44-L	0.01	Dg/b	H0.01	0.5 Dg/b	101	84	108
EP074A: Monocyclic Aromatic Sydrocarbons (QCLot: 2937477)								
v P074: XeEzeEe	71-43-L	1	µg/b	H1	L0 µg/b	101	76	1LL
v P074: TolceEe	108-88-3	L	µg/b	HL	L0 µg/b	91.9	79	1L3
v P074: v ydCr eEzeEe	100-41-4	L	µg/b	HL	L0 µg/b	88.4	76	118
v P074: D eya- & pata-2CleEe	108-38-3 106-4L-3	L	µg/b	HL	40 µg/b	87.0	75	1L1
v P074: SyCteEe	100-4L-5	5	µg/b	H5	L0 µg/b	8L.L	7L	118
v P074: otydo-2CleEe	95-47-6	L	µg/b	HL	L0 µg/b	93.7	80	1L0
v P074: NsloptopCr eEzeEe	98-8L-8	5	µg/b	H5	L0 µg/b	97.3	71	119
v P074: E-PtopCr eEzeEe	103-65-1	5	µg/b	H5	L0 µg/b	90.5	69	113
v P074: 1.3.5-TtnD eydCr eEzeEe	108-67-8	5	µg/b	H5	L0 µg/b	84.6	70	114
v P074: seR-XcyCr eEzeEe	135-98-8	5	µg/b	H5	L0 µg/b	91.8	71	115
v P074: 1.L.4-TtnD eydCr eEzeEe	95-63-6	5	µg/b	H5	L0 µg/b	83.8	70	114
v P074: yety-XcyCr eEzeEe	98-06-6	5	µg/b	H5	L0 µg/b	89.7	7L	114
v P074: p-NsloptopCyolceEe	99-87-6	5	µg/b	H5	L0 µg/b	86.7	68	114
v P074: E-XcyCr eEzeEe	104-51-8	5	µg/b	H5	L0 µg/b	85.0	61	115
EP074S: Naphthalene (QCLot: 2937477)								
v P074: OapdydaleEe	91-L0-3	7	µg/b	H7	L0 µg/b	87.L	75	1L1
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 29363V6)								
v P071: i 10 - i 14 FtaRyroE	----	50	µg/b	H50	3610 µg/b	87.9	46	1L6

Scr-u aytn : **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Recovery Limits (%): Low	Recovery Limits (%): High
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 29363V6) 8continued								
v P071: i 15 - i L8 FtaRyroE	----	100	µg/b	H100	10340 µg/b	99.4	55	1L5
v P071: i L9 - i 36 FtaRyroE	----	50	µg/b	H50	3790 µg/b	104	55	1L9
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 2937476)								
v P080: i 6 - i 9 FtaRyroE	----	L0	µg/b	HL0	360 µg/b	100	60	1L6
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 29363V6)								
v P071: >i 10 - i 16 FtaRyroE	----	100	µg/b	H100	5070 µg/b	98.L	53	1L9
v P071: >i 16 - i 34 FtaRyroE	----	100	µg/b	H100	11L30 µg/b	106	56	13L
v P071: >i 34 - i 40 FtaRyroE	----	100	µg/b	H100	1010 µg/b	100	51	137
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2937476)								
v P080: i 6 - i 10 FtaRyroE	----	L0	µg/b	HL0	450 µg/b	96.8	56	130

Matrix Spike (MS) Report

Tde qcalnyC RoEytol yetD u aytn Spnke (u S) tefets yo aE nEytalarotayotC splry saDple spnkeB wnyd a tepteseEyaynne sey of yatgey aEalOyes. Tde pctpose of ydns Ui pataDeyet ns yo DoEnyot poyeEyal Daytn effeRys oE aEalOye teRometres. SyayRGeRometCbnDns as pet lar otayotCMaya UcalnyCQr jeRymes (MUQs). NBeal teRometCtaEges syayeB DaCr e wannneB rEyde emeEyof saDple Daytn rEyetfeteERe.

Scr-u aytn : **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2936451)							
v u 1306738-004	l h L8	v M041l : Sclfaye as SQ4 - Tctr rBrDeytnR	14808-79-8	10 Dg/b	= Ooy MeyetDnEeB	70	130
ED045G: Chloride Discrete analyser (QCLot: 2936449)							
v u 1306717-00L	WEoECDocs	v M045l : i dlotnBe	16887-00-6	400 Dg/b	= Ooy MeyetDnEeB	70	130
ED045G: Chloride Discrete analyser (QCLot: 2936453)							
v u 1306738-004	l h L8	v M045l : i dlotnBe	16887-00-6	400 Dg/b	106	70	130
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936513)							
v u 1306468-098	WEoECDocs	v l 0L0W-F: WtseEnR	7440-38-L	0.L Dg/b	107	89	139
		v l 0L0W-F: i aBDrcD	7440-43-9	0.05 Dg/b	113	75	131
		v l 0L0W-F: i or aly	7440-48-4	0.L Dg/b	113	77	1L9
		v l 0L0W-F: i oppet	7440-50-8	0.L Dg/b	110	71	1L7
		v l 0L0W-F: beaB	7439-9L-1	0.L Dg/b	95.5	71	1L3
		v l 0L0W-F: u aEgaEese	7439-96-5	0.L Dg/b	11L	66	13L
		v l 0L0W-F: OnRkel	7440-0L-0	0.L Dg/b	111	73	1L9
		v l 0L0W-F: ArtER	7440-66-6	0.L Dg/b	107	68	136
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515)							
v u 1306738-00L	l h 01	v l 0L0W-F: WtseEnR	7440-38-L	0.L Dg/b	101	89	139

Scr-u ayt,n : **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515) 8continued							
v u 1306738-00L	l h 01	v l 0L0W-F: i aBDrcD	7440-43-9	0.05 Dg/b	113	75	131
		v l 0L0W-F: i or aly	7440-48-4	0.L Dg/b	113	77	1L9
		v l 0L0W-F: i oppet	7440-50-8	0.L Dg/b	109	71	1L7
		v l 0L0W-F: beaB	7439-9L-1	0.L Dg/b	114	71	1L3
		v l 0L0W-F: u aEgaEese	7439-96-5	0.L Dg/b	99.L	66	13L
		v l 0L0W-F: OnRkel	7440-0L-0	0.L Dg/b	113	73	1L9
		v l 0L0W-F: ArER	7440-66-6	0.L Dg/b	1L6	68	136
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2936567)							
v u 1306718-00L	WEoECDocs	v#0L6SF: Toyal i CaEnBe	57-1L-5	0.L Dg/b	= 65.L	70	130
EK040P: Fluoride by PC Titrator (QCLot: 2936334)							
v u 1306699-001	WEoECDocs	v#040P: FlcotnBe	16984-48-8	5.0 Dg/b	10L	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V60)							
v u 1306677-00L	WEoECDocs	v#055I : WD DoEna as O	7664-41-7	1.0 Dg/b	118	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V62)							
v u 1306738-006	l h LL	v#055I : WD DoEna as O	7664-41-7	1.0 Dg/b	96.7	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936447)							
v u 1306717-00L	WEoECDocs	v#057I : Onytne as O	----	0.5 Dg/b	100	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936452)							
v u 1306738-004	l h L8	v#071I : GeaRyme Pdospdotcs as P	14L65-44-L	0.5 Dg/b	99.4	70	130
EP074A: Monocyclic Aromatic Sydrocarbons (QCLot: 2937477)							
v u 1306738-001	l h 18	v P074: XeEzeEe	71-43-L	L0 µg/b	96.7	64	1L1
		v P074: TolceEe	108-88-3	L0 µg/b	90.4	63	1L5
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 29363V6)							
v u 1306738-00L	l h 01	v P071: i 10 - i 14 FtaRyroE	----	3610 µg/b	109	40	130
		v P071: i 15 - i L8 FtaRyroE	----	10340 µg/b	115	51	145
		v P071: i L9 - i 36 FtaRyroE	----	3790 µg/b	119	5L	144
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 2937476)							
v u 1306738-001	l h 18	v P080: i 6 - i 9 FtaRyroE	----	L80 µg/b	71.L	46	1L6
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 29363V6)							
v u 1306738-00L	l h 01	v P071: >i 10 - i 16 FtaRyroE	----	5070 µg/b	119	46	14L
		v P071: >i 16 - i 34 FtaRyroE	----	11L30 µg/b	1LL	5L	146
		v P071: >i 34 - i 40 FtaRyroE	----	1010 µg/b	115	49	143
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2937476)							
v u 1306738-001	l h 18	v P080: i 6 - i 10 FtaRyroE	----	330 µg/b	70.4	45	1L7

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Tde qcalnyC RoEytol yetD u aytn; Spnke (u S) aEB u aytn; Spnke McplnRaye (u SM) tefets yo nEytalar otayotC splny saDples spnkeB wnyd a tepteseEyaynne sey of yatgey aEalOyes. Tde pctpose of ydese Ui pataDeyets ate yo DoEnyot poyeEyral Daytn; effeRys oE aEalOye teRometres. SyaynRGeRometCbnDnys as pet lar otayotCMaya UcalnyCQrjeRynnes (MUQs). NBeal teRometCtaEges syayeB DaCr e wannneB nEyde enneEyof saDple Daytn; nEyetfeteERe.

Scr-u aytn: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	*Spike Recovery (%)*		*Recovery Limits (%)*		*RPDs (%)*	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*MSD*	*Low*	*High*	*Value*	*Control Limit*
EK040P: Fluoride by PC Titrator (QCLot: 2936334)										
v u 1306699-001	WEoECDocs	v#040P: FlcotnBe	16984-48-8	5.0 Dg/b	10L	----	70	130	----	----
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 29363V6)										
v u 1306738-00L	l h 01	v P071: i 10 - i 14 FtaRymoE	----	3610 µg/b	109	----	40	130	----	----
		v P071: i 15 - i L8 FtaRymoE	----	10340 µg/b	115	----	51	145	----	----
		v P071: i L9 - i 36 FtaRymoE	----	3790 µg/b	119	----	5L	144	----	----
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 29363V6)										
v u 1306738-00L	l h 01	v P071: >i 10 - i 16 FtaRymoE	----	5070 µg/b	119	----	46	14L	----	----
		v P071: >i 16 - i 34 FtaRymoE	----	11L30 µg/b	1LL	----	5L	146	----	----
		v P071: >i 34 - i 40 FtaRymoE	----	1010 µg/b	115	----	49	143	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936447)										
v u 1306717-00L	WEoECDocs	v#057l : Onytnye as O	----	0.5 Dg/b	100	----	70	130	----	----
ED045G: Chloride Discrete analyser (QCLot: 2936449)										
v u 1306717-00L	WEoECDocs	v M045l : i dlotnBe	16887-00-6	400 Dg/b	= Ooy MeyetDnEeB	----	70	130	----	----
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2936451)										
v u 1306738-004	l h L8	v M041l : Sclfaye as SQ4 - TctrnBnDeytnR	14808-79-8	10 Dg/b	= Ooy MeyetDnEeB	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936452)										
v u 1306738-004	l h L8	v#071l : GeaRymne Pdospdotcs as P	14L65-44-L	0.5 Dg/b	99.4	----	70	130	----	----
ED045G: Chloride Discrete analyser (QCLot: 2936453)										
v u 1306738-004	l h L8	v M045l : i dlotnBe	16887-00-6	400 Dg/b	106	----	70	130	----	----
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936513)										
v u 1306468-098	WEoECDocs	v l 0L0W-F: WtseEnR	7440-38-L	0.L Dg/b	107	----	89	139	----	----
		v l 0L0W-F: i aBDmcD	7440-43-9	0.05 Dg/b	113	----	75	131	----	----
		v l 0L0W-F: i or aly	7440-48-4	0.L Dg/b	113	----	77	1L9	----	----
		v l 0L0W-F: i oppet	7440-50-8	0.L Dg/b	110	----	71	1L7	----	----
		v l 0L0W-F: beaB	7439-9L-1	0.L Dg/b	95.5	----	71	1L3	----	----
		v l 0L0W-F: u aEgaEese	7439-96-5	0.L Dg/b	11L	----	66	13L	----	----
		v l 0L0W-F: OnRkel	7440-0L-0	0.L Dg/b	111	----	73	1L9	----	----
		v l 0L0W-F: AnER	7440-66-6	0.L Dg/b	107	----	68	136	----	----
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515)										
v u 1306738-00L	l h 01	v l 0L0W-F: WtseEnR	7440-38-L	0.L Dg/b	101	----	89	139	----	----
		v l 0L0W-F: i aBDmcD	7440-43-9	0.05 Dg/b	113	----	75	131	----	----

Scr-u ayt n : **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*MSD*	*Low*	*High*	*Value*	*Control Limit*
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515) 8continued										
v u 1306738-00L	l h 01	v l 0L0W-F: i or aly	7440-48-4	0.L Dg/b	113	----	77	1L9	----	----
		v l 0L0W-F: i oppet	7440-50-8	0.L Dg/b	109	----	71	1L7	----	----
		v l 0L0W-F: beaB	7439-9L-1	0.L Dg/b	114	----	71	1L3	----	----
		v l 0L0W-F: u aEgaEese	7439-96-5	0.L Dg/b	99.L	----	66	13L	----	----
		v l 0L0W-F: OnRkel	7440-0L-0	0.L Dg/b	113	----	73	1L9	----	----
		v l 0L0W-F: AnER	7440-66-6	0.L Dg/b	1L6	----	68	136	----	----
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2936567)										
v u 1306718-00L	WEoECDocs	v#0L6SF: Toyal i CaErBe	57-1L-5	0.L Dg/b	= 65.L	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V60)										
v u 1306677-00L	WEoECDocs	v#055l : WDDoEra as O	7664-41-7	1.0 Dg/b	118	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V62)										
v u 1306738-006	l h LL	v#055l : WDDoEra as O	7664-41-7	1.0 Dg/b	96.7	----	70	130	----	----
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 2937476)										
v u 1306738-001	l h 18	v P080: i 6 - i 9 FtaRyoE	----	L80 µg/b	71.L	----	46	1L6	----	----
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2937476)										
v u 1306738-001	l h 18	v P080: i 6 - i 10 FtaRyoE	----	330 µg/b	70.4	----	45	1L7	----	----
EP074A: Monocyclic Aromatic Sydrocarbons (QCLot: 2937477)										
v u 1306738-001	l h 18	v P074: XeEzeEe	71-43-L	L0 µg/b	96.7	----	64	1L1	----	----
		v P074: TolceEe	108-88-3	L0 µg/b	90.4	----	63	1L5	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM130673|**	Page	: 1 of 10
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 25-JUN-2013
Sampler	: ----	Issue Date	: 01-JUL-2013
Order number	: ----		
		No. of samples received	: 10
Quote number	: ME/330/13	No. of samples analysed	: 10

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

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)x Mercury (28 days) ; other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **WATER** Evaluation: × & Holding time breach x ✓ & Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: p+								
Clear Plastic Bottle 8Natural (EA005)								
GW18,	GW01,	**25-JUN-2013**	**----**	----	----	**25-JUN-2013**	25-JUN-2013	✓
GW40,	GW28,							
GW35,	GW22							
EA015: Total Dissolved Solids								
Clear Plastic Bottle 8Natural (EA015+)								
GW18,	GW01,	**25-JUN-2013**	**----**	02-JUL-2013	----	**27-JUN-2013**	02-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22							
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle 8Natural (ED037P)								
GW18,	GW01,	**25-JUN-2013**	**----**	09-JUL-2013	----	**26-JUN-2013**	09-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22							
ED041G: Sulfate (Turbidimetric) as SO4 2-by DA								
Clear Plastic Bottle 8Natural (ED041G)								
GW18,	GW01,	**25-JUN-2013**	**----**	23-JUL-2013	----	**26-JUN-2013**	23-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22							
ED045G: Chloride Discrete analyser								
Clear Plastic Bottle 8Natural (ED045G)								
GW18,	GW01,	**25-JUN-2013**	**----**	23-JUL-2013	----	**26-JUN-2013**	23-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle 8Natural (ED093F)								
GW18,	GW01,	**25-JUN-2013**	**----**	02-JUL-2013	----	**27-JUN-2013**	02-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22							

MatriK: **WATER** Evaluation: × & Holding time breach x ✓ & Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP8MS							
Clear Plastic Bottle 8Nitric Acid; Filtered (EG020A8F)							
GW18, GW01, GW40, GW28, GW35, GW22, Dup 2	**258JUN82013**	888	22-DEC-2013	----	**278JUN82013**	22-DEC-2013	✓
EK026SF: Total CN by Segmented Flow Analyser							
White Plastic Bottle8NaO+ (EK026SF)							
GW18, GW35, Dup 2	**258JUN82013**	888	09-JUL-2013	----	**268JUN82013**	09-JUL-2013	✓
White Plastic Bottle8NaO+ 8Pb Acetate (EK026SF)							
GW01, GW40, GW28, GW22	**258JUN82013**	888	09-JUL-2013	----	**268JUN82013**	09-JUL-2013	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle 8Natural (EK040P)							
GW18, GW01, GW40, GW28, GW35, GW22	**258JUN82013**	888	23-JUL-2013	----	**268JUN82013**	23-JUL-2013	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle 8Sulfuric Acid (EK055G)							
GW18, GW01, GW40, GW28, GW35, GW22	**258JUN82013**	888	23-JUL-2013	----	**278JUN82013**	23-JUL-2013	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle 8Natural (EK057G)							
GW18, GW01, GW40, GW28, GW35, GW22	**258JUN82013**	888	27-JUN-2013	----	**258JUN82013**	27-JUN-2013	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle 8Natural (EK071G)							
GW18, GW01, GW40, GW28, GW35, GW22	**258JUN82013**	888	27-JUN-2013	----	**258JUN82013**	27-JUN-2013	✓
EP0| 0/071: Total Recoverable +ydrocarbons 8NEPM 2010 Draft							
Amber Glass Bottle 8Unpreserved (EP071)							
GW18, GW01, GW40, GW28, GW35, GW22, Rinsate 2, Dup 2	**258JUN82013**	**268JUN82013**	02-JUL-2013	✓	**278JUN82013**	05-AUG-2013	✓

MatriK: **WATER**

Evaluation: × & Holding time breach x ✓ & Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074A: Monocyclic Aromatic +ydrocarbons								
Amber VOC Vial 8Sulfuric Acid (EP074)								
GW18,	GW01,	**258JUN82013**	**268JUN82013**	09-JUL-2013	✓	**278JUN82013**	09-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22,							
Rinsate 2,	Trip 2,							
Trip 3,	Dup 2							
EP074+ : Naphthalene								
Amber VOC Vial 8Sulfuric Acid (EP074)								
GW18,	GW01,	**258JUN82013**	**268JUN82013**	09-JUL-2013	✓	**278JUN82013**	09-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22,							
Rinsate 2,	Trip 2,							
Trip 3,	Dup 2							
EP0| 0/071: Total Recoverable +ydrocarbons 8NEPM 2010 Draft								
Amber VOC Vial 8Sulfuric Acid (EP0| 0)								
GW18,	GW01,	**258JUN82013**	**268JUN82013**	09-JUL-2013	✓	**278JUN82013**	09-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22,							
Rinsate 2,	Dup 2							

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(where) processed. Actual rate should be greater than or equal to the eKpected rate. A listing of breaches is provided in the Summary of Outliers.

MatriK: **WATER**

Evaluation: × & Quality Control frequency not within specification x ✓ & Quality Control frequency within specification.

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	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	E=055G	3	26	**11.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	30	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	4	33	**12.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	E=040P	2	17	**11.|**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOK) by Discrete Analyser	E=059G	2	10	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	E=057G	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	E=071G	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	E=026SF	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	17	**11.|**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	E=055G	2	26	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	30	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	E=040P	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOK) by Discrete Analyser	E=059G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	E=057G	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	E=071G	1	12	**| .3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	E=026SF	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	E=055G	2	26	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	30	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

MatriK: **WATER**

Evaluation: × & Quality Control frequency not within specification x ✓ & Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Fluoride by PC Titrator	E=040P	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOK) by Discrete Analyser	E=059G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	E=057G	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	E=071G	1	12	**| .3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	E=026SF	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
MatriK Spikes (MS)							
Ammonia as N by Discrete analyser	E=055G	2	26	**7.7**	**5.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	30	**6.7**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	33	**6.1**	**5.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	E=040P	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOK) by Discrete Analyser	E=059G	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	E=057G	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	E=071G	1	12	**| .3**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	E=026SF	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement

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
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-miKed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. 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) (AppdK 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G.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 librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120xUSEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matriKmatched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125xUSEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. 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.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flow Analyser	E=026SF	WATER	APHA 4500-CN-O. Sodium hydroKide preserved samples are introduced into an automated segmented flow analyser. CompleK bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboKylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Fluoride by PC Titrator	E=040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up compleKes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Ammonia as N by Discrete analyser	E=055G	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) (AppdK 2)
Ammonium as N	E=055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Nitrite as N by Discrete Analyser	E=057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Nitrate as N by Discrete Analyser	E=058G	WATER	APHA 21st ed., 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Nitrite and Nitrate as N (NOK) by Discrete Analyser	E=059G	WATER	APHA 21st ed., 4500-NO3- F. Combined oKidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Reactive Phosphorus as P-By Discrete Analyser	E=071G	WATER	APHA 21st ed., 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate 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) (AppdK 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample eKtract 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) (AppdK 2)
Volatile Organic Compounds	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) (AppdK 2)
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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 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.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

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 SW 846 or ALS-QWI/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

MatriK: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
ED045G: Chloride Discrete analyser	3491176-042	---	**Chloride**	16887-00-6	1.1 %	89-117%	**Recovery less than lower control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1306738-004	GW28	**Sulfate as SO4 8 Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride Discrete analyser	EM1306717-002	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
E=026SF: Total CN by Segmented Flow Analyser	EM1306718-002	Anonymous	**Total Cyanide**	57-12-5	65.2 %	70-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate 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 EKtraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis + olding 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.**

CoC received 25/06/13 15:36 RT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4958 9433 E:samples.newcastle@alsenviro.com
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☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E:[illegible]
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011			Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)	Random Sample Temperature on Receipt: °C
ORDER NUMBER:		CC 1 2 3 4 5 7	Other comment: Ref – 3.6
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8398 4403	O 1 2 3 4 5 7	
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY: S.Leong	RECEIVED BY: ALS Courier
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 25/6/13 / 3 pm	DATE/TIME: 25/6/13 3pm
Email Reports to : rorquiza@eesicontracting.com and sleong@eesi.biz		RELINQUISHED BY:	RECEIVED BY: ALS
Email Invoice to : rorquiza@eesicontracting.com		DATE/TIME:	DATE/TIME: 25/6, 1635

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Environmental Division Melbourne
Work Order
EM1306738

Telephone : +61-3-8549 9600

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional I	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
(1)	GW18	25/06/2013	W		8	X	X	X	X	X	X	X						6.89	18	
(2)	GW01	25/06/2013	W		8	X	X	X	X	X	X	X						6.6	17.4	
(3)	GW40	25/06/2013	W		8	X	X	X	X	X	X	X						5.24	18	
(4)	GW28	25/06/2013	W		8	X	X	X	X	X	X	X						5.67	18.8	
(5)	GW35	25/06/2013	W		8	X	X	X	X	X	X	X						6.92	17.8	
(6)	GW22	25/06/2013	W		8	X	X	X	X	X	X	X						6.3	18.5	
(7)	Rinsate 2	25/06/2013	W		2					X	X	X								
(8)	Trip 2	25/06/2013	W		1					X	X									
(9)	Trip 3	25/06/2013	W		1					X	X									
	Extra cups:																			
(10)	Dup2	25/6/13	W	Ice (ALS)																
(11)	Spl1+2	25/6/13	W	25/6/13																
				TOTAL																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CoC received 25/06/13 15:36 RT

CHAIN OF CUSTODY

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☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
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☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011			Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)	Random Sample Temperature on Receipt: °C
ORDER NUMBER:		CC 1 2 3 4 5 7	Other comment: 0.8 – 3.6
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8398 4403	D 1 2 3 4 5 7	
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY: S.Leong	RECEIVED BY: ALS Courier
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 25/6/13 / 3 pm	DATE/TIME: 25/6/13 3pm
Email Reports to : rorquiza@eesicontracting.com and sleong@eesi.biz		RELINQUISHED BY:	RECEIVED BY: Patrick
Email Invoice to : rorquiza@eesicontracting.com		DATE/TIME:	DATE/TIME: 25/6, 1635

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Environmental Division Melbourne
Work Order
EM1306738
Telephone : +61-3-8549 9600

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)												Additional I	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes - pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
(1)	GW18	25/06/2013	W		8	X	X	X	X	X	X	X						6.89	18	
(2)	GW01	25/06/2013	W		8	X	X	X	X	X	X	X						6.6	17.4	
(3)	GW40	25/06/2013	W		8	X	X	X	X	X	X	X						5.24	18	
(4)	GW28	25/06/2013	W		8	X	X	X	X	X	X	X						5.67	18.8	
(5)	GW35	25/06/2013	W		8	X	X	X	X	X	X	X						6.92	17.8	
(6)	GW22	25/06/2013	W		8	X	X	X	X	X	X	X						6.3	16.5	
(7)	Rinsate 2	25/06/2013	W		2					X	X	X								
(8)	Trip 2	25/06/2013	W		1					X	X									
(9)	Trip 3	25/06/2013	W		1					X	X									
	Extra cups:																			
(10)	Dup 2	25/6/13	W	Ice (ALS)																
(11)	Rinsate 2	25/6/13	W	25/6/13																
					TOTAL															

SCANNED

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Tuesday, 25 June 2013 3:36 PM
To: Carol Walsh; Samples Melbourne
Subject: 210074 South Melbourne Gasworks
Attachments: 210074_CoC_25 June.pdf

Hi Carol,

Please find the attached CoC for the groundwater samples collected this afternoon.

Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0411 374 386
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

CoC received 25/06/13 15:36 RT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
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☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011
PROJECT: 210074 Sth Melbourne Gaswords
ORDER NUMBER:
PROJECT MANAGER: REGIN ORQUIZA — CONTACT PH: 8398 4403
SAMPLER: — SAMPLER MOBILE:
COC emailed to ALS? (YES / NO) — EDD FORMAT (or default):
Email Reports to : rorquiza@eesicontracting.com and sleong@eesi.biz
Email Invoice to : rorquiza@eesicontracting.com
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)
ALS QUOTE NO.: ME/330/13

COC SEQUENCE NUMBER (Circle)
CC 1 2 3 4 5 7
O 1 2 3 4 5 7

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		Patrick
DATE/TIME: 25/6/13 / 3 pm	DATE/TIME: 25/6/13 3pm	DATE/TIME:	DATE/TIME: 25/6, 1635

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A (N/A circled)
Free ice / frozen ice bricks present upon receipt? Yes No N/A (Yes circled)
Random Sample Temperature on Receipt: °C
Other comment: 2.8 – 3.6

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes - pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)	field pH	Field temp
1	GW18	25/06/2013	W		8	x	x	x	x	x	x	x		6.89	18
2	GW01	25/06/2013	W		8	x	x	x	x	x	x	x		6.6	17.4
3	GW40	25/06/2013	W		8	x	x	x	x	x	x	x		5.24	18
4	GW28	25/06/2013	W		8	x	x	x	x	x	x	x		5.67	18.8
5	GW35	25/06/2013	W		8	x	x	x	x	x	x	x		6.92	17.8
6	GW22	25/06/2013	W		8	x	x	x	x	x	x	x		6.3	16.5
7	Rinsate 2	25/06/2013	W		2					x	x	x			
8	Trip 2	25/06/2013	W		1					x	x				
9	Trip 3	25/06/2013	W		1					x	x				
	Extra samples:														
10	Dup 2	25/6/13	W	Rn (ALS) 25/6/13											
11	Split 2	25/6/13	W												
TOTAL															

SCANNED

Environmental Division
Melbourne
Work Order
EM1306738
Telephone : + 61-3-8549 9600

R5

Samples sent to lab for
Micro Nitrate BOD pH
Colour Turbidity RP
Other ....
Date 25/6

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Attachments: 210074_CoC_25 June.pdf

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Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0411 374 386
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

Revised CoC received 26/06/13 09:14 RT

CoC received 25/06/13 15:36 RT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐ Townsville: 14-15 Desma Ct Bohle QLD 4818 Ph 07 4796 0600 E [illegible]
☐ Melbourne: 2-4 Westall Rd Springvale VIC 3171 Ph 03 8549 9600 E samples.melbourne@alsenviro.com
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☐ Perth: 10 Hod Way Malaga WA 6090 Ph 08 9209 7655 E samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St Launceston TAS 7250 Ph 03 6331 2158 E launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011
PROJECT: 210074 Sth Melbourne Gasworks
ORDER NUMBER:
PROJECT MANAGER: REGIN ORQUIZA CONTACT PH: 9398 4403
SAMPLER: SAMPLER MOBILE:
COC emailed to ALS? (YES / NO) EDD FORMAT (or default):
Email Reports to : rorquiza@eesicontracting.com and sleong@eesi.biz
Email Invoice to : rorquiza@eesicontracting.com
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
ALS QUOTE NO.: ME/330/13

COC SEQUENCE NUMBER (Circle)
CoC: 1 2 3 4 5 7
OF: 1 2 3 4 5 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: [illegible]
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		[illegible signature]
DATE/TIME: 25/06/13 / 3 pm	DATE/TIME: 25/6/13 3pm	DATE/TIME:	DATE/TIME: 25/6, 1635

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)

LAB ID (ALS USE ONLY)	SAMPLE ID (SAMPLE DETAILS MATRIX: Solid(S) Water(W))	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below) (CONTAINER INFORMATION)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - Includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)	field pH (Additional)	Field temp
1	GW18	25/06/2013	W		8	x	x	x	x	x	x	x		6.89	18
2	GW01	25/06/2013	W		8	x	x	x	x	x	x	x		6.6	17.4
3	GW40	25/06/2013	W		8	x	x	x	x	x	x	x		5.24	18
4	GW28	25/06/2013	W		8	x	x	x	x	x	x	x		5.67	18.8
5	GW35	25/06/2013	W		8	x	x	x	x	x	x	x		6.92	17.8
6	GW22	25/06/2013	W		8	x	x	x	x	x	x	x		5.3	18.5
7	Rinsate 2	25/06/2013	W		2					x	x	x			
8	Trip 2	25/06/2013	W		1					x	x				
9	Trip 3	25/06/2013	W		1					x	x				
	Extra samples:														
10	Dup 2	25/6/13	W	Rn (Ac)				X	X	X	X	X			
11	Split 2	25/6/13	W	25/6/13				X	X	X	X	X			
				TOTAL											

Please Send to M

Environmental Division
Melbourne
Work Order
EM13067[illegible]
Telephone : +61-3-8549

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Carol Walsh
Sent: Wednesday, 26 June 2013 9:16 AM
To: Samples Melbourne
Subject: REVISED COC - EM1306738-ENVIROMENTAL EARTH SCIENCES
Attachments: img-626090130.pdf

Importance: High

SEE ATTACHED REVISED COC.

Please send the SPLIT 2 sample to MGT as per COC.

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Wednesday, 26 June 2013 9:14 AM
To: Carol Walsh
Subject: RE: ISSUES - EM1306738-ENVIROMENTAL EARTH SCIENCES

Hi Carol,

Please find the attached updated CoC showing the dup/split 2 required analytes. Please send the Split 2 sample to MGT.

Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0448 888 593
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

-----Original Message-----
From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Wednesday, 26 June 2013 8:50 AM
To: Regin Orquiza
Subject: ISSUES - EM1306738-ENVIROMENTAL EARTH SCIENCES

Regin

For this attached work order, EM1306738, we have received two extra sample - DUP 2 & SPLIT 2 .

Please advise if any analysis is required on these samples, or should SPLIT 2 be sent off to another lab.

Kind Regards

Carol Walsh
Senior Client Services Officer
ALS | Environmental Division
4 Westall Rd
Springvale, VIC. 3171 Australia

How was your customer experience? Please send us your feedback Please see our latest Enviromail 67 - Aqueous Film Forming Foams (AFFFs) March 2013

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Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306766**	Page	: 1 of 6
y l@i r	: **ENVIRONMENTAL EARTH SCIENCES**	9aLobarobt	: Ei n@boi v ei ral m@G@oi MelLoDbi e
y oi raur	: c ERG Nc OQ@GZ	y oi raur	: y abol A alsW
Zhhbess	: P.N.dNB XX23 FNN5Ty c ZS YG VZQT5c Z9G 3011	Zhhbess	: , A esrall c h T4b@gnale YG ZDsrbal@a 3171
Epv a@	: bob- D@aaz eesCL@	Epv a@	: uabol.@alsWz alsgloLal.uov
5ele4Wbi e	: w61 03 +6871666	5ele4Wbi e	: w61p3p82, + +608
Faus@ @e	: w61 03 +68718, ,	Faus@ @e	: w61p3p82, + +601
Pbojeur	: X1007, TrWMelLoDbi e Ras@bks	Oy 9enel	: I EPM 1+++ TuWehDle d (3) ai h Z9T Oy T3 be- D@ev ei r
Ntbebi Dv Leb	: pppp		
y pNpy i Dv Leb	: pppp	mare Tav 4les c eue@eh	: X6pJQI pX013
Tav 4leb	: TF9/KK	@sDe mare	: 0XpJQ9pX013
T@e	: pppp		
		I o. of sav 4les beue@eh	: ,
ODore i Dv Leb	: ME/330/13	I o. of sav 4les ai alt seh	: ,

5W@ be4obr sD4ebsehes ai t 4ben@Ds be4obr(s) @@W rW@ befebei ue. c esDlrs a44lt ro rWe sav 4le(s) as sDLv @eh. ZII 4ages of rW@ be4obr Wane Leei uWeukeh ai h a44boneh fot belease.

5W@ y ebr@@are of Zi alt s@ uoi ra@s rWe follo@@g @fobv ar@i :

- Rei ebal y ov v ei rs
- Zi alt r@al c esDlrs
- TDdbogare y oi rbol 9@ @s

General Comments

5We ai altr@al 4bouehDbes Dseh Lt rWé Ei n@boi v ei ral m@G@i Wéne Leei henelo4eh fbov esraLIGWeh C@rebi ar@i allt beuogi Q@eh 4bouehDbes sDuW as rWbse 4DLIGWeh Lt rWé QTEPZV ZPHZV ZT ai h I EPM. G WbDse henelo4eh 4bouehDbes abe ev 4lot eh C rWé aLsei ue of houDv ei reh srai hathns obLt ul@i r be- Desr.

A Wébe v oGsrDbe herebv C ar@i Wás Leei 4ebfobv ehVbesDlrs abe be4obreh oi a hbt @e@GWrLasGs.

A Wébe a be4obreh less rWái (<) besDlr G WG@WébrWái rWé 9Nc VrWGs v at Le hDe ro 4bQ abt sav 4le exrbaur/h@esrare h@DrQi ai h/ob@sDffQ@i r sav 4le fobai alt sGs.

A Wébe rWé 9Nc of a be4obreh besDlr h@febs fbov srai hath 9Nc VrWGs v at Le hDe ro W@GWv oGsrDbe uoi rei rV@sDffQ@i r sav 4le (behDueh @e@GWrev 4lot eh) obv arb@ C@rebfebei ue.

A Wéi sav 4l@g rQ e C@fobv ar@i Gs i or 4bom@eh Lt rWé ul@i rVsav 4l@g hares abe sWb@t @@WbDr a rQ e uov 4oi ei r. G rWése C@srai uesVrWé rQ e uov 4oi ei r Wás Leei assDv eh Lt rWé laLobarobt fob4bouess@g 4Db4oses.

Ket : y ZT I Dv Leb= y ZT beg@rbt i Dv Lebfbov haraLase v a@ra@eh Lt y Wév Q@al ZLsrbaurs Tebn@es. 5Wé y Wév Q@al ZLsrbaurs Tebn@e Gs a h@G@i of rWé Zv eb@ai y Wév Q@al Tou@ert .
9Nc = 9Q C@f be4obr@g
^ = 5WGs besDlr Gs uov 4Dreh fbov C h@Q@Dal ai alt re hereur@i s ar ob aLone rWé lenel of be4obr@g

- **EK026SF : EM1306766-002 matrix spike failed for TCN due to possible sample interference. This has been confirmed by re-analysis.**
- **EM1306766-001, 002 and 003: Ammonia as N results have been done by buchi method (EK055)**
- **Ionic Balance out of acceptable limits for sample #1 and #3 due to sample matrix and therefore ionic balance is not applicable. Cations and anions were confirmed by re-analysis.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia and iron for #1, #2 and #3...**

Signatories

5WGs houDv ei r Wás Leei eleurboi Q@allt s@gi eh Lt rWé aDrWob@Qeh s@gi arob@es C h@Qareh Lelo@ Eleurboi Q s@gi C@g Wás Leei uabb@eh oDr C uov 4l@ai ue @@W4bouehDbes s4eu@@eh C X1 y Fc Pabr 11.

Signatories	*Position*	*Accreditation Category*
m@ai CFebi ai ho	Tei @b G obgai Q y Wév Gr	MelLoDbi e G obgai Q s
		MelLoDbi e G obgai Q s
		MelLoDbi e G obgai Q s
I ai ut A ai g	Tei @b Tev @olar@e GsrbDv ei r y Wév Gr	MelLoDbi e N bgai Q s
		MelLoDbi e N bgai Q s
YabsWa Ho A C g	I oi pMerals 5eav 9eaheb	MelLoDbi e G obgai Q s
		MelLoDbi e G obgai Q s
		MelLoDbi e G obgai Q s

Analytical Results

TDLpMarb@: WATER (Marb@: WATER)			Client sample ID	GW08	GW37	GW44	Trip 4	ppp
			Client sampling date / time	X2pJQI pX013 12:00	X2pJQI pX013 12:00	X2pJQI pX013 12:00	X2pJQI pX013 12:00	ppp
Compound	CAS Number	LOR	Unit	EM1306766-001	EM1306766-002	EM1306766-003	EM1306766-004	----
EA005: pH								
pH Value	ppp	0.01	4H Qi @	5.96	6.98	6.48	ppp	ppp
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	ppp	10	v g/9	2360	2080	9310	ppp	ppp
ED037P: Alkalinity by PC Titrator								
Total Alkalinity as CaCO3	ppp	1	v g/9	226	379	996	ppp	ppp
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	1, 808p7+p8	1	v g/9	1450	830	6950	ppp	ppp
ED045G: Chloride Discrete analyser								
Chloride	16887p00p6	1	v g/9	248	289	1220	ppp	ppp
ED093F: Dissolved Major Cations								
Calcium	7, , 0p70pX	1	v g/9	126	53	468	ppp	ppp
Magnesium	7, 3+p+2p,	1	v g/9	44	37	420	ppp	ppp
Sodium	7, , 0pX3p2	1	v g/9	148	91	806	ppp	ppp
Potassium	7, , 0p0+p7	1	v g/9	10	10	61	ppp	ppp
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7, X+p+0p2	0.01	v g/9	<0.01	<0.01	<0.01	ppp	ppp
Arsenic	7, , 0p88pX	0.001	v g/9	0.179	0.211	0.103	ppp	ppp
Cadmium	7, , 0p, 3p+	0.0001	v g/9	0.0002	0.0002	0.0004	ppp	ppp
Cobalt	7, , 0p, 8p,	0.001	v g/9	0.009	0.004	0.028	ppp	ppp
Copper	7, , 0p20p8	0.001	v g/9	0.002	0.001	0.010	ppp	ppp
Lead	7, 3+p+Xp1	0.001	v g/9	0.002	<0.001	0.002	ppp	ppp
Manganese	7, 3+p+6p2	0.001	v g/9	1.32	0.236	19.8	ppp	ppp
Nickel	7, , 0p0Xp0	0.001	v g/9	0.100	0.017	0.064	ppp	ppp
Selenium	778Xp, +pX	0.01	v g/9	<0.01	<0.01	0.01	ppp	ppp
Zinc	7, , 0p66p6	0.002	v g/9	0.137	0.021	0.035	ppp	ppp
Boron	7, , 0p, Xp8	0.02	v g/9	0.80	0.93	0.78	ppp	ppp
Iron	7, 3+p8+p6	0.02	v g/9	36.3	7.10	49.4	ppp	ppp
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	27p1Xp2	0.00,	v g/9	0.029	0.103	0.750	ppp	ppp
EK040P: Fluoride by PC Titrator								
Fluoride	16+8, p, 8p8	0.1	v g/9	0.3	1.3	0.5	ppp	ppp
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	766, p, 1p7	0.01	v g/9	1150	290	286	ppp	ppp

Analytical Results

TDLpMarb2: WATER (Marb2: WATER)			Client sample ID	GW08	GW37	GW44	Trip 4	ppp
			Client sampling date / time	X2pJQl pX013 12:00	X2pJQl pX013 12:00	X2pJQl pX013 12:00	X2pJQl pX013 12:00	ppp
Compound	CAS Number	LOR	Unit	EM1306766-001	EM1306766-002	EM1306766-003	EM1306766-004	----
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	ppp	0.01	v g/9	1150	290	286	ppp	ppp
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	ppp	0.01	v g/9	<0.01	0.07	<0.01	ppp	ppp
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	1, 7+7p22p8	0.01	v g/9	0.28	0.17	<0.01	ppp	ppp
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	1, X62p , pX	0.01	v g/9	<0.01	<0.01	<0.01	ppp	ppp
EN055: Ionic Balance								
Total Anions	ppp	0.01	v e- /9	41.7	33.0	199	ppp	ppp
Total Cations	ppp	0.01	v e- /9	100	30.9	118	ppp	ppp
Ionic Balance	ppp	0.01	%	41.2	3.32	25.7	ppp	ppp
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	ppp	20	µg/9	<20	<20	56000	ppp	ppp
C15 - C28 Fraction	ppp	100	µg/9	<100	<100	2080	ppp	ppp
C29 - C36 Fraction	ppp	20	µg/9	<20	<20	<20	ppp	ppp
^ C10 - C36 Fraction (sum)	ppp	20	µg/9	<20	<20	58100	ppp	ppp
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
>C10 - C16 Fraction	ppp	100	µg/9	<100	<100	48000	ppp	ppp
>C16 - C34 Fraction	ppp	100	µg/9	<100	<100	780	ppp	ppp
>C34 - C40 Fraction	ppp	100	µg/9	<100	<100	<100	ppp	ppp
^ >C10 - C40 Fraction (sum)	ppp	100	µg/9	<100	<100	48800	ppp	ppp
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71p 3pX	1	µg/9	15	38	1120	<1	ppp
Toluene	108p88p3	X	µg/9	2	11	455	<X	ppp
Ethylbenzene	100p 1p	X	µg/9	<X	<X	36	<X	ppp
meta- & para-Xylene	108p38p3 106p Xp3	X	µg/9	<X	3	185	<X	ppp
Styrene	100p Xp2	2	µg/9	<2	<2	<2	<2	ppp
ortho-Xylene	+2p 7p6	X	µg/9	<X	2	112	<X	ppp
Isopropylbenzene	+8p8Xp8	2	µg/9	<2	<2	<2	<2	ppp
n-Propylbenzene	103p62p1	2	µg/9	<2	<2	<2	<2	ppp
1.3.5-Trimethylbenzene	108p67p8	2	µg/9	<2	<2	11	<2	ppp
sec-Butylbenzene	132p+8p8	2	µg/9	<2	<2	<2	<2	ppp
1.2.4-Trimethylbenzene	+2p63p6	2	µg/9	<2	<2	30	<2	ppp

Analytical Results

TDLpMarb2: WATER (Marb2: WATER)			Client sample ID	GW08	GW37	GW44	Trip 4	ppp
			Client sampling date / time	X2pJQl pX013 12:00	X2pJQl pX013 12:00	X2pJQl pX013 12:00	X2pJQl pX013 12:00	ppp
Compound	CAS Number	LOR	Unit	EM1306766-001	EM1306766-002	EM1306766-003	EM1306766-004	----
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
tert-Butylbenzene	+8p06p6	2	µg/9	<2	<2	<2	<2	ppp
p-Isopropyltoluene	++p87p6	2	µg/9	<2	<2	<2	<2	ppp
n-Butylbenzene	10, p21p8	2	µg/9	<2	<2	<2	<2	ppp
EP074H: Naphthalene								
Naphthalene	+1pX0p3	7	µg/9	<7	27	572	<7	ppp
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	ppp	X0	µg/9	<X0	50	1930	ppp	ppp
C10 - C14 Fraction	ppp	20	µg/9	230	390	98300	ppp	ppp
C15 - C28 Fraction	ppp	100	µg/9	930	940	16600	ppp	ppp
C29 - C36 Fraction	ppp	20	µg/9	<20	<20	680	ppp	ppp
^ C10 - C36 Fraction (sum)	ppp	20	µg/9	1160	1330	116000	ppp	ppp
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	ppp	X0	µg/9	<X0	50	1890	ppp	ppp
>C10 - C16 Fraction	ppp	100	µg/9	460	610	81900	ppp	ppp
>C16 - C34 Fraction	ppp	100	µg/9	740	720	12400	ppp	ppp
>C34 - C40 Fraction	ppp	100	µg/9	<100	<100	<100	ppp	ppp
^ >C10 - C40 Fraction (sum)	ppp	100	µg/9	1200	1330	94300	ppp	ppp
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060p07p0	0.1	%	129	128	126	115	ppp
Toluene-D8	X037pX6p2	0.1	%	108	105	106	108	ppp
4-Bromofluorobenzene	, 60p00p,	0.1	%	104	104	99.0	107	ppp
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060p07p0	0.1	%	112	111	126	ppp	ppp
Toluene-D8	X037pX6p2	0.1	%	96.6	93.8	94.9	ppp	ppp
4-Bromofluorobenzene	, 60p00p,	0.1	%	98.6	96.0	100	ppp	ppp

Surrogate Control Limits

TDLpMarbQ: WATER		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060p07p0	6+	133
Toluene-D8	X037pX6p2	7X	1X8
4-Bromofluorobenzene	, 60p00p,	70	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060p07p0	70	13X
Toluene-D8	X037pX6p2	6+	1X2
4-Bromofluorobenzene	, 60p00p,	61	1X+

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1306766**	Page	: 1 of 11
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 26-JUN-2013
Sampler	: SFL/KK	Issue Date	: 02-JUL-2013
Order number	: ----		
		No. of samples received	: 4
Quote number	: ME/330/13	No. of samples analysed	: 4

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

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 less than (<) 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 = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

NATA Accredited Laboratory 825

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*
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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 (%)*
EA005: pH (QC Lot: 2940672)									
EM1306744-010	Anonymous	EA005: pH Value	---	0.01	pH Unit	5.91	5.89	0.3	0% - 20%
EM1306805-003	Anonymous	EA005: pH Value	---	0.01	pH Unit	8.16	8.15	0.1	0% - 20%
EA015: Total Dissolved Solids (QC Lot: 2938076)									
EM1306757-001	Anonymous	EA015H: Total Dissolved Solids @180°C	---	10	mg/L	2540	2560	1.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 2938742)									
EM1306744-010	Anonymous	ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	1	<1	0.0	No Limit
EM1306779-002	Anonymous	ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	16	16	0.0	0% - 50%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2936991)									
EM1306744-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.0	No Limit
EM1306766-001	GW08	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1340	1320	1.6	0% - 20%
ED045G: Chloride Discrete analyser (QC Lot: 2936990)									
EM1306744-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2	2	0.0	No Limit
EM1306766-001	GW08	ED045G: Chloride	16887-00-6	1	mg/L	256	258	0.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 2936988)									
EM1306744-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	1	1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EM1306766-001	GW08	ED093F: Calcium	7440-70-2	1	mg/L	130	134	2.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	48	47	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	150	150	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	11	11	0.0	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2938865)									
EM1306744-006	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	0.002	0.002	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.002	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	0.596	0.576	3.4	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	0.022	0.013	49.3	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.03	0.03	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.07	0.07	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	7.51	7.49	0.3	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 (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2938865) - continued									
EM1306766-001	GW08	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0002	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.179	0.177	1.2	0% - 20%
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.009	0.009	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.002	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.32	1.38	4.5	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.100	0.100	0.0	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.137	0.131	5.0	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.80	0.89	11.0	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	36.3	38.2	5.2	0% - 20%
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 2936801)									
EM1306766-001	GW08	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	0.029	0.024	16.2	No Limit
EM1306779-006	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 2938741)									
EM1306744-010	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2939102)									
EM1306744-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306807-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.13	0.13	0.0	0% - 50%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2936989)									
EM1306744-010	Anonymous	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306766-001	GW08	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2936993)									
EM1306766-001	GW08	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306779-003	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QC Lot: 2938190)									
EM1306766-001	GW08	EP071SG: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071SG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	0.0	No Limit
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup (QC Lot: 2938190)									
EM1306766-001	GW08	EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2937477)									
EM1306709-006	Anonymous	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit

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 (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2937477) - continued									
EM1306709-006	Anonymous	EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EM1306738-005	Anonymous	EP074: Benzene	71-43-2	1	µg/L	4	4	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EP074H: Naphthalene (QC Lot: 2937477)									
EM1306709-006	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
EM1306738-005	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2937476)									
EM1306709-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1306738-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2938189)									
EM1306766-001	GW08	EP071: C15 - C28 Fraction	----	100	µg/L	930	800	15.7	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	230	200	13.6	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2937476)									
EM1306709-006	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1306738-005	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit

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 (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2938189)									
EM1306766-001	GW08	EP071: >C10 - C16 Fraction	----	100	µg/L	460	410	11.3	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	740	620	17.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit

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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids (QCLot: 2938076)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	99.5	98	104
ED037P: Alkalinity by PC Titrator (QCLot: 2938742)								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	99.0	91	105
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936991)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	108	81	125
ED045G: Chloride Discrete analyser (QCLot: 2936990)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	104	89	117
ED093F: Dissolved Major Cations (QCLot: 2936988)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	102	83	129
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	100	80	124
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.8	77	125
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.9	77	123
EG020F: Dissolved Metals by ICP-MS (QCLot: 2938865)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.8	90	110
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	93	109
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.3	85	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	99.8	87	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.2	86	110
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.8	88	112
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.4	86	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.3	86	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	93.6	85	111
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.1	83	113
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	106	72	126
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.6	88	112
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936801)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	94.9	75	113
EK040P: Fluoride by PC Titrator (QCLot: 2938741)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	102	78	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2939102)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.0 mg/L	100	76	122
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936989)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	100	84	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936993)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	107	84	108
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 2938190)								
EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	52700 µg/L	93.4	58	144
EP071SG: C15 - C28 Fraction	----	100	µg/L	<100	101500 µg/L	73.9	55	133
EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
EP071SG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup (QCLot: 2938190)								
EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2937477)								
EP074: Benzene	71-43-2	1	µg/L	<1	20 µg/L	101	76	122
EP074: Toluene	108-88-3	2	µg/L	<2	20 µg/L	91.9	79	123
EP074: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	88.4	76	118
EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	87.0	75	121
EP074: Styrene	100-42-5	5	µg/L	<5	20 µg/L	82.2	72	118
EP074: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	93.7	80	120
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	20 µg/L	97.3	71	119
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	20 µg/L	90.5	69	113
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	20 µg/L	84.6	70	114
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	20 µg/L	91.8	71	115
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	20 µg/L	83.8	70	114
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	20 µg/L	89.7	72	114
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	20 µg/L	86.7	68	114
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	20 µg/L	85.0	61	115
EP074H: Naphthalene (QCLot: 2937477)								
EP074: Naphthalene	91-20-3	7	µg/L	<7	20 µg/L	87.2	75	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2937476)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	100	60	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2938189)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3610 µg/L	93.4	46	126
EP071: C15 - C28 Fraction	----	100	µg/L	<100	10340 µg/L	98.8	55	125
EP071: C29 - C36 Fraction	----	50	µg/L	<50	3790 µg/L	105	55	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2937476)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	450 µg/L	96.8	56	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2938189)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5070 µg/L	97.6	53	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2938189) - continued								
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	11230 µg/L	105	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1010 µg/L	116	51	137

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	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936991)							
EM1306759-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
ED045G: Chloride Discrete analyser (QCLot: 2936990)							
EM1306759-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	87.2	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2938865)							
EM1306766-001	GW08	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	105	89	139
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	104	75	131
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	94.2	77	129
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.6	71	127
		EG020A-F: Lead	7439-92-1	0.2 mg/L	102	71	123
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	66	132
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	89.5	73	129
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	97.2	68	136
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936801)							
EM1306766-002	GW37	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	# 61.1	70	130
EK040P: Fluoride by PC Titrator (QCLot: 2938741)							
EM1306744-010	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	102	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2939102)							
EM1306744-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	# Not Determined	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936989)							
EM1306759-001	Anonymous	EK057G: Nitrite as N	----	0.5 mg/L	98.2	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936993)							
EM1306766-002	GW37	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	101	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2937477)							
EM1306738-001	Anonymous	EP074: Benzene	71-43-2	20 µg/L	96.7	64	121
		EP074: Toluene	108-88-3	20 µg/L	90.4	63	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2937476)							
EM1306738-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	71.2	46	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2938189)							
EM1306766-002	GW37	EP071: C10 - C14 Fraction	----	3610 µg/L	66.6	40	130
		EP071: C15 - C28 Fraction	----	10340 µg/L	65.5	51	145
		EP071: C29 - C36 Fraction	----	3790 µg/L	66.4	52	144
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2937476)							
EM1306738-001	Anonymous	EP080: C6 - C10 Fraction	----	330 µg/L	70.4	45	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2938189)							
EM1306766-002	GW37	EP071: >C10 - C16 Fraction	----	5070 µg/L	67.3	46	142
		EP071: >C16 - C34 Fraction	----	11230 µg/L	67.9	52	146
		EP071: >C34 - C40 Fraction	----	1010 µg/L	65.8	49	143

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are 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	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936801)										
EM1306766-002	GW37	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	# 61.1	----	70	130	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936989)										
EM1306759-001	Anonymous	EK057G: Nitrite as N	----	0.5 mg/L	98.2	----	70	130	----	----
ED045G: Chloride Discrete analyser (QCLot: 2936990)										
EM1306759-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	87.2	----	70	130	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936991)										
EM1306759-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936993)										
EM1306766-002	GW37	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	101	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2937476)										
EM1306738-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	71.2	----	46	126	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2937476)										

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2937476) - continued										
EM1306738-001	Anonymous	EP080: C6 - C10 Fraction	----	330 µg/L	70.4	----	45	127	----	----
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2937477)										
EM1306738-001	Anonymous	EP074: Benzene	71-43-2	20 µg/L	96.7	----	64	121	----	----
		EP074: Toluene	108-88-3	20 µg/L	90.4	----	63	125	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2938189)										
EM1306766-002	GW37	EP071: C10 - C14 Fraction	----	3610 µg/L	66.6	----	40	130	----	----
		EP071: C15 - C28 Fraction	----	10340 µg/L	65.5	----	51	145	----	----
		EP071: C29 - C36 Fraction	----	3790 µg/L	66.4	----	52	144	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2938189)										
EM1306766-002	GW37	EP071: >C10 - C16 Fraction	----	5070 µg/L	67.3	----	46	142	----	----
		EP071: >C16 - C34 Fraction	----	11230 µg/L	67.9	----	52	146	----	----
		EP071: >C34 - C40 Fraction	----	1010 µg/L	65.8	----	49	143	----	----
EK040P: Fluoride by PC Titrator (QCLot: 2938741)										
EM1306744-010	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	102	----	70	130	----	----
EG020F: Dissolved Metals by ICP-MS (QCLot: 2938865)										
EM1306766-001	GW08	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	105	----	89	139	----	----
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	104	----	75	131	----	----
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	94.2	----	77	129	----	----
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.6	----	71	127	----	----
		EG020A-F: Lead	7439-92-1	0.2 mg/L	102	----	71	123	----	----
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	----	66	132	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	89.5	----	73	129	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	97.2	----	68	136	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2939102)										
EM1306744-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	# Not Determined	----	70	130	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1306766**	Page	: 1 of 10
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 26-JUN-2013
Sampler	: SFL/KK	Issue Date	: 02-JUL-2013
Order number	: ----		
		No. of samples received	: 4
Quote number	: ME/330/13	No. of samples analysed	: 4

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

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: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: pH							
Clear Plastic Bottle - Natural (EA005) GW08, GW37, GW44	**25-JUN-2013**	**----**	----	----	**28-JUN-2013**	25-JUN-2013	×
EA015: Total Dissolved Solids							
Clear Plastic Bottle - Natural (EA015H) GW08, GW37, GW44	**25-JUN-2013**	**---**	02-JUL-2013	----	**27-JUN-2013**	02-JUL-2013	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) GW08, GW37, GW44	**25-JUN-2013**	**---**	09-JUL-2013	----	**27-JUN-2013**	09-JUL-2013	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) GW08, GW37, GW44	**25-JUN-2013**	**---**	23-JUL-2013	----	**27-JUN-2013**	23-JUL-2013	✓
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle - Natural (ED045G) GW08, GW37, GW44	**25-JUN-2013**	**---**	23-JUL-2013	----	**27-JUN-2013**	23-JUL-2013	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F) GW08, GW37, GW44	**25-JUN-2013**	**---**	02-JUL-2013	----	**27-JUN-2013**	02-JUL-2013	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) GW08, GW37, GW44	**25-JUN-2013**	**---**	22-DEC-2013	----	**28-JUN-2013**	22-DEC-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026SF: Total CN by Segmented Flow Analyser							
White Plastic Bottle-NaOH - Pb Acetate (EK026SF)							
GW08, GW37, GW44	**25-JUN-2013**	---	09-JUL-2013	----	**26-JUN-2013**	09-JUL-2013	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
GW08, GW37, GW44	**25-JUN-2013**	---	23-JUL-2013	----	**27-JUN-2013**	23-JUL-2013	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
GW08, GW37, GW44	**25-JUN-2013**	---	23-JUL-2013	----	**28-JUN-2013**	23-JUL-2013	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
GW08, GW37, GW44	**25-JUN-2013**	---	27-JUN-2013	----	**26-JUN-2013**	27-JUN-2013	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
GW08, GW37, GW44	**25-JUN-2013**	---	27-JUN-2013	----	**26-JUN-2013**	27-JUN-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
GW08, GW37, GW44	**25-JUN-2013**	**27-JUN-2013**	02-JUL-2013	✓	**28-JUN-2013**	06-AUG-2013	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
GW08, GW37, GW44	**25-JUN-2013**	**27-JUN-2013**	02-JUL-2013	✓	**28-JUN-2013**	06-AUG-2013	✓
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
GW08, GW37, GW44	**25-JUN-2013**	**27-JUN-2013**	02-JUL-2013	✓	**28-JUN-2013**	06-AUG-2013	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074)							
GW08, GW37, GW44, Trip 4	**25-JUN-2013**	**26-JUN-2013**	09-JUL-2013	✓	**27-JUN-2013**	09-JUL-2013	✓
EP074H: Naphthalene							
Amber VOC Vial - Sulfuric Acid (EP074)							
GW08, GW37, GW44, Trip 4	**25-JUN-2013**	**26-JUN-2013**	09-JUL-2013	✓	**27-JUN-2013**	09-JUL-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
GW08, GW37, GW44	**25-JUN-2013**	**26-JUN-2013**	09-JUL-2013	✓	**27-JUN-2013**	09-JUL-2013	✓

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(where) 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.

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
Ammonia as N by Discrete analyser	EK055G	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	6	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	10	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	4	**25.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	15	**13.3**	**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
Ammonia as N by Discrete analyser	EK055G	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Chloride by Discrete Analyser	ED045G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	12	**8.3**	**5.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	6	**16.7**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	11	**9.1**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	4	**25.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement

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
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) 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- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. 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	APHA 21st ed., 4500 Cl - G.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 librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um 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) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. 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 QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. 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.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	APHA 4500-CN-O. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. 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)
Ammonium as N	EK055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry 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 chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry 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 Chemical Reduction and direct colourimetry 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 othophosphate 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)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	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)
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	WATER	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	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)

Analytical Methods	Method	Matrix	Method Descriptions
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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. 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 100 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.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

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 SW 846 or ALS-QWI/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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1306759-001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM1306766-001	GW08	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK026SF: Total CN by Segmented Flow Analyser	EM1306766-002	GW37	**Total Cyanide**	57-12-5	61.1 %	70-130%	**Recovery less than lower data quality objective**
EK055G: Ammonia as N by Discrete Analyser	EM1306744-002	Anonymous	**Ammonia as N**	7664-41-7	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

- **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.

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005: pH						
Clear Plastic Bottle - Natural						
GW08, GW37, GW44	----	----	----	28-JUN-2013	25-JUN-2013	**3**

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.**

COC received on 26/6 @ 10:12 Amitha

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E:townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle)		
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)	Custody Seal Intact?	Yes	No / N/A
PROJECT: 210074 Sth Melbourne Gaswords			Free ice / frozen ice bricks present upon receipt?	Yes	No / N/A
ORDER NUMBER:		CC 1 2 3 4 5 7	Random Sample Temperature on Receipt:		°C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1686	O 1 2 3 4 5 7	Other comments:		

SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	S.Leong	ALS Courier		Chris
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME: 26/6 10:55
Email Invoice to : rorquiza@environmentalearthsciences.com		25/6/13 / 5 pm	26/6/13 9 am		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).											Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
1	GW08	25/06/2013	W		8	X	X	X	X	X	X	X	X					5.79	18.7	
2	GW37	25/06/2013	W		8	X	X	X	X	X	X	X	X					6.89	18.2	
3	GW44	25/06/2013	W		8	X	X	X	X	X	X	X	X					6.01	17.7	
4	Trip 4	25/06/2013	W		1					X	X									
				TOTAL																

Samples sent to lab for
Micro Nitrate BOD pH
Colour Turbidity (PH)
Other .....
Date 26/6/13

Environmental Division
Melbourne
Work Order 26/6
EM1306766

Telephone : +61-3-8549 9600

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Ranil Weerakkody

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Wednesday, 26 June 2013 10:12 AM
To: Samples Melbourne
Cc: Carol Walsh
Subject: RE: 210074 South Melbourne Gasworks
Attachments: 210074_CoC_26 June 2013_AM.pdf

Please find the attached CoC of the samples collected this morning.

Thank you.

Regards

Regin

-----Original Message-----
From: Samples Melbourne [mailto:Samples.Melbourne@alsglobal.com]
Sent: Tuesday, 25 June 2013 4:59 PM
To: Regin Orquiza; Carol Walsh
Subject: RE: 210074 South Melbourne Gasworks

Thank you for the CoC, your samples arrived not too long ago.

Kind Regards

Raymond Thai
Sample Receipt Supervisor
ALS | Environmental Division

2-4 Westall Road
Springvale VIC 3171 Australia

T +61 38549 9641
F +61 38549 9617

www.alsglobal.com

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Tuesday, 25 June 2013 3:36 PM
To: Carol Walsh; Samples Melbourne
Subject: 210074 South Melbourne Gasworks

Hi Carol,

Please find the attached CoC for the groundwater samples collected this afternoon.

Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0411 374 386
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306798**	gs: 8	o1.f 9F
Amendment	: **1**		
Ci8nt	o**ENVIRONMENTAL EARTH SCIENCES**	Lsbf rstf ry	oEnvirf nm8ntseDivi if n.M8ebf urn8
Cf ntsct	oMR.REGIN.ORQUIZA	Cf ntsct	oCsrf eWse h
Addr8	ogPOPBOX..2253 l OOTSCRAY.VIC,.AUSTRALIA.3011	Addr8	o4.W8 tseRd.Sprin: vse8.VIC.Au trse8s.3171
E-msie	orf rquizs@8nvirf nm8ntse8srth ci8nc8 Pcf m	E-msie	ocsrf eWse h@se : e bse8cf m
T8e8phf n8	o+61.03.F6a71666	T8e8phf n8	o+61-3-a54F.F60a
l sc imie8	o+61.03.F6a71a44	l sc imie8	o+61-3-a54F.F601
grf j8ct	o210074.Sth.M8ebf urn8.Gs wf rk	QC.L8v8e	oNEgM.1FFF..Sch8due8.B(3).snd.ALS.QCS3.r8quir8m8nt
Ord8r.numb8r	o----		
C-O-C.numb8r	o----	Dst8.Ssmpe8 .R8c8iv8d	o26-JUN-2013
Ssmpe8r	oSl L./.KK	l u8.Dst8	o05-JUL-2013
Sit8	o----		
		Nf Pf 9 smpe8 .r8c8iv8d	oF
Quf t8.numb8r	oME/330/13	Nf Pf 9 smpe8 .snsey 8d	oF

Thi . r8pf rt. up8r 8d8 . sny. pr8vif u . r8pf rt( ). with. thi . r89r8nc8P. R8 ue . sppey. tf . th8. smpe8( ). s . ubmitt8dP. Aee ps: 8 . f 9 thi . r8pf rt. hsv8. b88n. ch8ck8d. snd. spprf v8d. 9f r r8e8s 8P.

Thi .C8rti9cst8.f 9Ansey i .cf ntsin .th8.9f eef win: .in9f rmstif no

- G8n8rseCf mm8nt
- AnseyticseR8 ue
- Surrf : st8.Cf ntrf eLimit

gs: 8	o 2.f 9F
Wf rk.Ord8r	o EM13067Fa.Am8ndm8nt.1
Ce8nt	o ENVIRONMENTAL.EARTH.SCIENCES
grf j8ct	o 210074.Sth.M8ebf urn8.Gs wf rk

General Comments

Th8. snseyticse prf c8dur8 . u 8d. by. th8. Envirf nm8ntse Divi if n. hsv8. b88n. d8v8ef p8d. 9f m. 8 tsbe h8d. int8rnstif nsse. r8cf : niz8d. prf c8dur8 . uch. s . thf 8. pube h8d. by. th8. USEgA,. AgHA,. AS. snd. NEgMP. In. hf u 8 d8v8ef p8d.prf c8dur8 .sr8.8mpef y8d.in.th8.sb 8nc8.f 9df cum8nt8d. tsndsrd .f r.by.ce8nt.r8qu8 tP

Wh8r8.mf i tur8.d8t8rminstif n.hs .b88n.p8r9f rm8d,.r8 ue .sr8.r8pf rt8d.f n.s.dry.w8i: ht.bs i P

Wh8r8.s.r8pf rt8d.e8 .thsn.(<).r8 ue.i .hi: h8r.thsn.th8.LOR,.thi .msy.b8.du8.tf .primsry. smpe8.8xtrsct/di: 8 tst8.die utif n.snd/f r.in u9ci8nt. smpe8.9f r.snsey i P

Wh8r8.th8.LOR.f 9s.r8pf rt8d.r8 ue.di98r .9f m. tsndsrd.LOR,.thi .msy.b8.du8.tf .hi: h.mf i tur8.cf nt8nt,.in u9ci8nt. smpe8.(r8duc8d.w8i: ht.8mpef y8d).f r.mstrix.int8r9r8nc8P

Wh8n. smpein: .tim8.in9f rmstif n.i .nf t.prf vid8d.by.th8.ce8nt,. smpein: .dst8 .sr8. hf wn.withf ut.s.tim8.cf mpf n8ntP.In.th8 8.in tsnc8 ,.th8.tim8.cf mpf n8nt.hs .b88n.s um8d.by.th8.esbf rstf ry.9f r.prf c8 in: .purpf 8 P

K8y.o CAS.Numb8r.=.CAS.r8: i try.numb8r.9f m.dstsbs 8.msintsin8d.by.Ch8micseAb trsct .S8rvic8 P.Th8.Ch8micseAb trsct .S8rvic8.i .s.divi if n.f 9th8.Am8ricsn.Ch8micseSf ci8tyP
LOR.=.Limit.f 9r8pf rtin:
^.=.Thi .r8 ue.i .cf mput8d.9f m.individusesnsey.t8.d8t8ctif n .st.f r.sbf v8.th8.e8v8ef 9r8pf rtin:

- **EM1306798-001, 002 and #6: Ammonia as N results were done by buchi method (EK055)**
- **EP080/074: Particular sample (EM-1306798-001) shows minor hit of btex. Confirmed by re-analysis.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate and nox; and major cations - calcium, magnesium, potassium and sodium for #3.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia #2.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate; and major cations - calcium, magnesium, potassium, sodium, iron and ammonia for #1 and #6 .**
- **This batch was amended to change the sample ID of sample 8 to RIN3 as requested by Regin Orquiza on 5/7/13.**

NATA.Accr8dit8d.Lsbf rstf ry.a25
.
Accr8dit8d.9f r.cf mpesnc8.with.
ISO/IEC.17025P

Signatories

Thi . df cum8nt. hs . b88n. 8e8ctrf nicsey. i: n8d. by. th8. suthf riz8d. i: nstf ri8 . indicst8d. b8ef wP. Ee8ctrf nic. i: nin: . hs . b88n. csrri8d. f ut. in cf mpesnc8.with.prf c8dur8 . p8ci98d.in.21.Cl R.gsrt.11P

Signatories	*Position*	*Accreditation Category*
Diesni.l 8rnsndf	S8nif r.Inf r: snic.Ch8mi t	M8ebf urn8.Inf r: snic
		M8ebf urn8.Inf r: snic
		M8ebf urn8.Inf r: snic
		M8ebf urn8.Inf r: snic
Nsncy.Wsn:	S8nif r.S8mivf estie8.In trum8nt.Ch8mi t	M8ebf urn8.Or: snic
Vsr hs.Hf .Win:	Nf n-M8tse .T8sm.L8sd8r	M8ebf urn8.Inf r: snic
		M8ebf urn8.Inf r: snic
Xin: bin.Lin	S8nif r.Or: snic.Ch8mi t	M8ebf urn8.Or: snic
		M8ebf urn8.Or: snic

Analytical Results

Sub-Mstrix: WATER (Mstrix: WATER)				Client sample ID	GW02	GW07	GW09	GW29	GW30
				Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00
Compound	CAS Number	LOR	Unit		EM1306798-001	EM1306798-002	EM1306798-003	EM1306798-004	EM1306798-005
EA005: pH									
pH Value	---	0P01	pH.Unit		6.68	6.97	6.16	6.94	5.82
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	---	10	m: /L		4200	1460	520	2280	2560
ED037P: Alkalinity by PC Titrator									
Total Alkalinity as CaCO3	---	1	m: /L		414	633	88	497	456
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14a0a-7F-a	1	m: /L		1520	184	72	372	445
ED045G: Chloride Discrete analyser									
Chloride	16aa7-00-6	1	m: /L		926	350	94	725	1000
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	m: /L		236	52	4	69	84
Magnesium	743F-F5-4	1	m: /L		99	43	3	65	74
Sodium	7440-23-5	1	m: /L		420	276	177	705	700
Potassium	7440-0F-7	1	m: /L		27	10	4	9	7
EG020F: Dissolved Metals by ICP-MS									
Aluminium	742F-F0-5	0P01	m: /L		<0P01	<0P01	<0P01	<0P01	<0P01
Arsenic	7440-3a-2	0P001	m: /L		0.126	0.092	0.011	<0P001	0.065
Cadmium	7440-43-F	0P0001	m: /L		<0P0001	0.0004	0.0005	0.0005	0.0005
Cobalt	7440-4a-4	0P001	m: /L		0.002	0.001	<0P001	0.008	0.007
Copper	7440-50-a	0P001	m: /L		0.003	0.002	0.003	0.004	0.003
Lead	743F-F2-1	0P001	m: /L		<0P001	<0P001	<0P001	<0P001	<0P001
Manganese	743F-F6-5	0P001	m: /L		2.17	0.178	0.034	0.449	0.429
Nickel	7440-02-0	0P001	m: /L		0.002	0.050	0.054	0.028	0.038
Selenium	77a2-4F-2	0P01	m: /L		<0P01	<0P01	<0P01	<0P01	<0P01
Zinc	7440-66-6	0P005	m: /L		0.021	0.022	0.036	0.020	0.088
Boron	7440-42-a	0P05	m: /L		0.70	0.95	0.62	0.53	0.55
Iron	743F-aF-6	0P05	m: /L		20.4	0.87	<0P05	<0P05	0.71
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0P004	m: /L		0.018	0.027	<0P004	<0P004	<0P004
EK040P: Fluoride by PC Titrator									
Fluoride	16Fa4-4a-a	0P1	m: /L		1.0	2.0	0.5	1.0	1.9
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0P01	m: /L		399	105	0.05	0.05	0.11

Analytical Results

Sub-Mstrix: **WATER** (Mstrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID: GW02	GW07	GW09	GW29	GW30
			Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00
				EM1306798-001	EM1306798-002	EM1306798-003	EM1306798-004	EM1306798-005
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	----	0P01	m: /L	399	105	0.05	0.05	0.11
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0P01	m: /L	<0P01	0.10	0.03	0.06	0.08
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	147F7-55-a	0P01	m: /L	0.07	1.73	26.1	16.1	3.74
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0P01	m: /L	<0P01	<0P01	0.02	0.03	<0P01
EN055: Ionic Balance								
Total Anions	----	0P01	m8q/L	66.0	26.4	----	38.1	46.6
Total Anions	----	0P01	m8q/L	----	----	7.77	----	----
Total Cations	----	0P01	m8q/L	----	----	8.25	39.7	40.9
Total Cations	----	0P01	m8q/L	68.3	25.8	----	----	----
Ionic Balance	----	0P01	%	----	----	----	1.98	6.51
Ionic Balance	----	0P01	%	1.68	0.98	2.97	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	1	µ: /L	1	<1	<1	<1	<1
Toluene	10a-aa-3	2	µ: /L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µ: /L	<2	<2	<2	<2	<2
meta- & para-Xylene	10a-3a-3.106-42-3	2	µ: /L	<2	<2	<2	<2	<2
Styrene	100-42-5	5	µ: /L	<5	<5	<5	<5	<5
ortho-Xylene	F5-47-6	2	µ: /L	<2	<2	<2	<2	<2
Isopropylbenzene	Fa-a2-a	5	µ: /L	<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µ: /L	<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	10a-67-a	5	µ: /L	<5	<5	<5	<5	<5
sec-Butylbenzene	135-Fa-a	5	µ: /L	<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	F5-63-6	5	µ: /L	<5	<5	<5	<5	<5
tert-Butylbenzene	Fa-06-6	5	µ: /L	<5	<5	<5	<5	<5
p-Isopropyltoluene	FF-a7-6	5	µ: /L	<5	<5	<5	<5	<5
n-Butylbenzene	104-51-a	5	µ: /L	<5	<5	<5	<5	<5
EP074H: Naphthalene								
Naphthalene	F1-20-3	7	µ: /L	<7	<7	<7	<7	<7
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µ: /L	<20	<20	<20	<20	<20

Analytical Results

Sub-Mstrix: WATER (Mstrix: WATER)				Client sample ID	GW02	GW07	GW09	GW29	GW30
				Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00
Compound	CAS Number	LOR	Unit		EM1306798-001	EM1306798-002	EM1306798-003	EM1306798-004	EM1306798-005
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	---	50	µ: /L		110	<50	<50	<50	<50
C15 - C28 Fraction	---	100	µ: /L		700	450	<100	<100	<100
C29 - C36 Fraction	---	50	µ: /L		<50	110	<50	<50	<50
^. C10 - C36 Fraction (sum)	---	50	µ: /L		810	560	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	20	µ: /L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	---	100	µ: /L		270	<100	<100	<100	<100
>C16 - C34 Fraction	---	100	µ: /L		600	490	<100	<100	<100
>C34 - C40 Fraction	---	100	µ: /L		<100	<100	<100	<100	<100
^. >C10 - C40 Fraction (sum)	---	100	µ: /L		870	490	<100	<100	<100
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0Pì	%		84.3	85.4	81.6	85.6	87.2
Toluene-D8	2037-26-5	0Pì	%		118	114	107	106	109
4-Bromofluorobenzene	460-00-4	0Pì	%		110	105	103	103	102
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0Pì	%		80.8	81.7	78.1	82.6	83.7
Toluene-D8	2037-26-5	0Pì	%		106	103	96.5	94.9	97.8
4-Bromofluorobenzene	460-00-4	0Pì	%		106	100	101	96.5	98.0

Analytical Results

Sub-Mstrix: WATER (Mstrix: WATER)				Client sample ID	GW38	RIN 3	RIN 3	TRIP 5	----
				Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	----
Compound	CAS Number	LOR	Unit		EM1306798-006	EM1306798-007	EM1306798-008	EM1306798-009	----
EA005: pH									
pH Value	----	0P01	pH.Unit		6.53	----	----	----	----
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	----	10	m: /L		3440	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Total Alkalinity as CaCO3	----	1	m: /L		514	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14a0a-7F-a	1	m: /L		2070	----	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16aa7-00-6	1	m: /L		230	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	m: /L		185	----	----	----	----
Magnesium	743F-F5-4	1	m: /L		111	----	----	----	----
Sodium	7440-23-5	1	m: /L		196	----	----	----	----
Potassium	7440-0F-7	1	m: /L		19	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	742F-F0-5	0P01	m: /L		<0P01	----	----	----	----
Arsenic	7440-3a-2	0P001	m: /L		0.365	----	----	----	----
Cadmium	7440-43-F	0P0001	m: /L		<0P0001	----	----	----	----
Cobalt	7440-4a-4	0P001	m: /L		0.004	----	----	----	----
Copper	7440-50-a	0P001	m: /L		0.002	----	----	----	----
Lead	743F-F2-1	0P001	m: /L		<0P001	----	----	----	----
Manganese	743F-F6-5	0P001	m: /L		3.64	----	----	----	----
Nickel	7440-02-0	0P001	m: /L		0.003	----	----	----	----
Selenium	77a2-4F-2	0P01	m: /L		<0P01	----	----	----	----
Zinc	7440-66-6	0P005	m: /L		0.013	----	----	----	----
Boron	7440-42-a	0P05	m: /L		0.91	----	----	----	----
Iron	743F-aF-6	0P05	m: /L		35.7	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0P004	m: /L		0.160	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16Fa4-4a-a	0P1	m: /L		1.0	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0P01	m: /L		449	<0P01	----	----	----

Analytical Results

Sub-Mstrix: WATER (Mstrix: WATER)			Client sample ID	GW38	RIN 3	RIN 3	TRIP 5	----
			Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	----
Compound	CAS Number	LOR	Unit	EM1306798-006	EM1306798-007	EM1306798-008	EM1306798-009	----
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	----	0P01	m: /L	449	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0P01	m: /L	0.04	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	147F7-55-a	0P01	m: /L	0.01	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0P01	m: /L	<0P01	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0P01	m8q/L	59.9	----	----	----	----
Total Cations	----	0P01	m8q/L	61.2	----	----	----	----
Ionic Balance	----	0P01	%	1.07	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	----	50	µ: /L	8460	----	----	----	----
C15 - C28 Fraction	----	100	µ: /L	640	----	----	----	----
C29 - C36 Fraction	----	50	µ: /L	<50	----	----	----	----
^. C10 - C36 Fraction (sum)	----	50	µ: /L	9100	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µ: /L	8780	----	----	----	----
>C16 - C34 Fraction	----	100	µ: /L	220	----	----	----	----
>C34 - C40 Fraction	----	100	µ: /L	<100	----	----	----	----
^. >C10 - C40 Fraction (sum)	----	100	µ: /L	9000	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	1	µ: /L	269	----	<1	<1	----
Toluene	10a-aa-3	2	µ: /L	131	----	<2	<2	----
Ethylbenzene	100-41-4	2	µ: /L	15	----	<2	<2	----
meta- & para-Xylene	10a-3a-3.106-42-3	2	µ: /L	76	----	<2	<2	----
Styrene	100-42-5	5	µ: /L	<5	----	<5	<5	----
ortho-Xylene	F5-47-6	2	µ: /L	43	----	<2	<2	----
Isopropylbenzene	Fa-a2-a	5	µ: /L	<5	----	<5	<5	----
n-Propylbenzene	103-65-1	5	µ: /L	<5	----	<5	<5	----
1.3.5-Trimethylbenzene	10a-67-a	5	µ: /L	6	----	<5	<5	----
sec-Butylbenzene	135-Fa-a	5	µ: /L	<5	----	<5	<5	----
1.2.4-Trimethylbenzene	F5-63-6	5	µ: /L	16	----	<5	<5	----

Analytical Results

Sub-Mstrix: WATER (Mstrix: WATER)				Client sample ID	GW38	RIN 3	RIN 3	TRIP 5	----
				Client sampling date / time	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	26-JUN-2013.15d00	----
Compound	CAS Number	LOR	Unit		EM1306798-006	EM1306798-007	EM1306798-008	EM1306798-009	----
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
tert-Butylbenzene	Fa-06-6	5	µ: /L		<5	----	<5	<5	----
p-Isopropyltoluene	FF-a7-6	5	µ: /L		<5	----	<5	<5	----
n-Butylbenzene	104-51-a	5	µ: /L		<5	----	<5	<5	----
EP074H: Naphthalene									
Naphthalene	F1-20-3	7	µ: /L		134	----	<7	<7	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µ: /L		530	----	<20	----	----
C10 - C14 Fraction	----	50	µ: /L		8460	----	<50	----	----
C15 - C28 Fraction	----	100	µ: /L		3370	----	140	----	----
C29 - C36 Fraction	----	50	µ: /L		70	----	100	----	----
^. C10 - C36 Fraction (sum)	----	50	µ: /L		11900	----	240	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	20	µ: /L		530	----	<20	----	----
>C10 - C16 Fraction	----	100	µ: /L		8780	----	<100	----	----
>C16 - C34 Fraction	----	100	µ: /L		2620	----	220	----	----
>C34 - C40 Fraction	----	100	µ: /L		<100	----	<100	----	----
^. >C10 - C40 Fraction (sum)	----	100	µ: /L		11400	----	220	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0Pl	%		99.7	----	81.0	83.7	----
Toluene-D8	2037-26-5	0Pl	%		123	----	103	107	----
4-Bromofluorobenzene	460-00-4	0Pl	%		113	----	98.7	103	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0Pl	%		95.5	----	77.7	----	----
Toluene-D8	2037-26-5	0Pl	%		110	----	92.4	----	----
4-Bromofluorobenzene	460-00-4	0Pl	%		105	----	94.7	----	----

Surrogate Control Limits

Sub-Mstrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	6F	133
Toluene-D8	2037-26-5	72	12a
4-Bromofluorobenzene	460-00-4	70	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70	132
Toluene-D8	2037-26-5	6F	125
4-Bromofluorobenzene	460-00-4	61	12F

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM13067VH**	Page	: 1 of 11
Amendment	: **1**		
Client	: **ENSIRONMENTAL EART| +CIENCE+**	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
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Telephone	: +61 03 86971666	Telephone	: +61-3-9548 8609
Facsimile	: +61 03 86971944	Facsimile	: +61-3-9548 8601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1888 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 26-JUN-2013
Sampler	: SFL / KK	Issue Date	: 05-JUL-2013
Order number	: ----		
		No. of samples received	: 8
Quote number	: ME/330/13	No. of samples analysed	: 8

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

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 less than (<) 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 = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

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*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
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Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Varsha Ho Wing	Non-Metals Team Leader	Melbourne Inorganics
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Xingbin Lin	Senior Organic Chemist	Melbourne Organics
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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/39 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 (%)*
EA004: p| (QC Lot: 2V3V343)									
EM1306714-001	Anonymous	EA005: pH Value	----	0.01	pH Unit	7.66	7.65	0.1	0% - 20%
EM1306745-010	Anonymous	EA005: pH Value	----	0.01	pH Unit	6.53	6.53	0.0	0% - 20%
EA004: p| (QC Lot: 2V3V349)									
EM1306789-001	GW02	EA005: pH Value	----	0.01	pH Unit	6.69	6.68	0.1	0% - 20%
EM1306908-001	Anonymous	EA005: pH Value	----	0.01	pH Unit	6.21	6.21	0.0	0% - 20%
EA014: Total Dissolved +olids (QC Lot: 2V90264)									
EM1306771-001	Anonymous	EA015H: Total Dissolved Solids @190°C	----	10	mg/L	2980	2980	0.07	0% - 20%
EM1306795-001	Anonymous	EA015H: Total Dissolved Solids @190°C	----	10	mg/L	5310	5350	0.9	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 2V90H09)									
EM1306755-001	Anonymous	ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.0	No Limit
EM1306789-006	GW39	ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	514	512	0.4	0% - 20%
ED091G: +ulfate (Turbidimetric) as +O9 25by DA (QC Lot: 2V3V0V7)									
EM1306789-001	GW02	ED041G: Sulfate as SO4 - Turbidimetric	14909-78-9	1	mg/L	1520	1540	1.1	0% - 20%
EM1306914-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14909-78-9	1	mg/L	236	234	1.2	0% - 20%
ED094G: Chloride Discrete analyser (QC Lot: 2V3V0V6)									
EM1306789-001	GW02	ED045G: Chloride	16997-00-6	1	mg/L	826	840	1.4	0% - 20%
EM1306914-003	Anonymous	ED045G: Chloride	16997-00-6	1	mg/L	8	8	0.0	No Limit
ED0V3F: Dissolved Major Cations (QC Lot: 2V3V0V3)									
EM1306789-001	GW02	ED083F: Calcium	7440-70-2	1	mg/L	236	228	3.3	0% - 20%
		ED083F: Magnesium	7438-85-4	1	mg/L	88	100	1.5	0% - 20%
		ED083F: Sodium	7440-23-5	1	mg/L	420	425	1.4	0% - 20%
		ED083F: Potassium	7440-08-7	1	mg/L	27	29	0.0	0% - 20%
EM1306914-003	Anonymous	ED083F: Calcium	7440-70-2	1	mg/L	96	96	0.0	0% - 20%
		ED083F: Magnesium	7438-85-4	1	mg/L	8	9	0.0	No Limit
		ED083F: Sodium	7440-23-5	1	mg/L	7	6	0.0	No Limit
		ED083F: Potassium	7440-08-7	1	mg/L	<1	<1	0.0	No Limit
EG020F: Dissolved Metals by ICP5M+ (QC Lot: 2V90V6V)									
EM1306789-001	GW02	EG020A-F: Cadmium	7440-43-8	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-39-2	0.001	mg/L	0.126	0.120	5.1	0% - 20%
		EG020A-F: Cobalt	7440-49-4	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-9	0.001	mg/L	0.003	0.004	0.0	No Limit
		EG020A-F: Lead	7438-82-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7438-86-5	0.001	mg/L	2.17	2.47	13.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	<0.001	91.2	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.021	0.021	0.0	No Limit

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 ICP5M+ (QC Lot: 2V90V6V) 5continued									
EM1306789-001	GW02	EG020A-F: Aluminium	7428-80-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7792-48-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-9	0.05	mg/L	0.70	0.75	6.6	0% - 50%
		EG020A-F: Iron	7438-98-6	0.05	mg/L	20.4	22.1	9.2	0% - 20%
EM1306920-004	Anonymous	EG020A-F: Cadmium	7440-43-8	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-39-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Cobalt	7440-49-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-9	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7438-82-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7438-86-5	0.001	mg/L	0.070	0.066	5.3	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.025	0.022	12.7	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.021	0.020	5.2	No Limit
		EG020A-F: Aluminium	7428-80-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7792-48-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-9	0.05	mg/L	1.61	1.69	4.4	0% - 20%
		EG020A-F: Iron	7438-98-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK026+F: Total CN by +egmented Flow Analyser (QC Lot: 2V3HV7V)									
EM1306744-010	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	0.009	<0.004	62.5	No Limit
EM1306775-010	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK090P: Fluoride by PC Titrator (QC Lot: 2V90H04)									
EM1306755-001	Anonymous	EK040P: Fluoride	16894-49-9	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EM1306789-006	GW39	EK040P: Fluoride	16894-49-9	0.1	mg/L	1.0	1.0	0.0	No Limit
EK044G: Ammonia as N by Discrete Analyser (QC Lot: 2V91136)									
EM1306705-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306906-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.07	0.06	0.0	No Limit
EK047G: Nitrite as N by Discrete Analyser (QC Lot: 2V3V0V9)									
EM1306789-001	GW02	EK057G: Nitrite as N	---	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306914-003	Anonymous	EK057G: Nitrite as N	---	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2V3V0V4)									
EM1306789-001	GW02	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306920-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP079A: Monocyclic Aromatic | ydrocarbons (QC Lot: 2V91733)									
EM1306789-001	GW02	EP074: Benzene	71-43-2	1	µg/L	1	1	0.0	No Limit
		EP074: Toluene	109-99-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	109-39-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	85-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit

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 (%)*
EP079A: Monocyclic Aromatic | ydrocarbons (QC Lot: 2V91733) 5continued									
EM1306789-001	GW02	EP074: Isopropylbenzene	89-92-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	109-67-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-89-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	85-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	89-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	88-97-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-9	5	µg/L	<5	<5	0.0	No Limit
EM1306971-001	Anonymous	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	109-99-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	109-39-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	85-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	89-92-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	109-67-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-89-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	85-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	89-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	88-97-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-9	5	µg/L	<5	<5	0.0	No Limit
EP079| : Naphthalene (QC Lot: 2V91733)									
EM1306789-001	GW02	EP074: Naphthalene	81-20-3	7	µg/L	<7	<7	0.0	No Limit
EM1306971-001	Anonymous	EP074: Naphthalene	81-20-3	7	µg/L	<7	<7	0.0	No Limit
EP0H0/071: Total Petroleum | ydrocarbons (QC Lot: 2V3V067)									
EM1306789-001	GW02	EP071: C15 - C29 Fraction	----	100	µg/L	700	690	2.3	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	110	110	0.0	No Limit
		EP071: C28 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EM1306920-001	Anonymous	EP071: C15 - C29 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C28 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP0H0/071: Total Petroleum | ydrocarbons (QC Lot: 2V91739)									
EM1306789-001	GW02	EP090: C6 - C8 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1306971-001	Anonymous	EP090: C6 - C8 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QC Lot: 2V3V067)									
EM1306789-001	GW02	EP071: >C10 - C16 Fraction	----	100	µg/L	270	290	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	600	590	4.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit

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 (%)*
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QC Lot: 2V3V067) 5continued									
EM1306920-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	120	120	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QC Lot: 2V91739)									
EM1306789-001	GW02	EP090: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1306971-001	Anonymous	EP090: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit

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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA014: Total Dissolved +olids (QCLot: 2V90264)								
EA015H: Total Dissolved Solids @190°C	----	10	mg/L	<10	2000 mg/L	103	89	104
ED037P: Alkalinity by PC Titrator (QCLot: 2V90H09)								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	87.2	81	105
ED091G: +ulfate (Turbidimetric) as +O9 25by DA (QCLot: 2V3V0V7)								
ED041G: Sulfate as SO4 - Turbidimetric	14909-78-9	1	mg/L	<1	25 mg/L	108	91	125
ED094G: Chloride Discrete analyser (QCLot: 2V3V0V6)								
ED045G: Chloride	16997-00-6	1	mg/L	<1	10 mg/L	104	98	117
ED0V3F: Dissolved Major Cations (QCLot: 2V3V0V3)								
ED083F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	100	93	128
ED083F: Magnesium	7438-85-4	1	mg/L	<1	5 mg/L	101	90	124
ED083F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	81.2	77	125
ED083F: Potassium	7440-08-7	1	mg/L	<1	50 mg/L	81.0	77	123
EG020F: Dissolved Metals by ICP5M+ (QCLot: 2V90V6V)								
EG020A-F: Aluminium	7428-80-5	0.01	mg/L	<0.01	0.5 mg/L	101	80	110
EG020A-F: Arsenic	7440-39-2	0.001	mg/L	<0.001	0.1 mg/L	102	83	108
EG020A-F: Cadmium	7440-43-8	0.0001	mg/L	<0.0001	0.1 mg/L	86.9	95	111
EG020A-F: Cobalt	7440-49-4	0.001	mg/L	<0.001	0.1 mg/L	89.8	97	111
EG020A-F: Copper	7440-50-9	0.001	mg/L	<0.001	0.1 mg/L	85.5	96	110
EG020A-F: Lead	7438-82-1	0.001	mg/L	<0.001	0.1 mg/L	89.2	99	112
EG020A-F: Manganese	7438-86-5	0.001	mg/L	<0.001	0.1 mg/L	103	96	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	96	112
EG020A-F: Selenium	7792-48-2	0.01	mg/L	<0.01	0.1 mg/L	101	95	111
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	83.2	93	113
EG020A-F: Boron	7440-42-9	0.05	mg/L	<0.05	0.1 mg/L	89.9	72	126
EG020A-F: Iron	7438-98-6	0.05	mg/L	<0.05	0.5 mg/L	100	99	112
EK026+F: Total CN by +egmented Flow Analyser (QCLot: 2V3HV7V)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	94.8	75	113
EK090P: Fluoride by PC Titrator (QCLot: 2V90H04)								
EK040P: Fluoride	16894-49-9	0.1	mg/L	<0.1	5 mg/L	89.9	79	120
EK044G: Ammonia as N by Discrete Analyser (QCLot: 2V91136)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.0 mg/L	87.0	76	122
EK047G: Nitrite as N by Discrete Analyser (QCLot: 2V3V0V9)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	100	94	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2V3V0V4)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	88.6	94	109
EP071 +G: Total Petroleum | ydrocarbons 5+ilica gel cleanup (QCLot: 2V90HH9)								
EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	62700 µg/L	116	59	144
EP071SG: C15 - C29 Fraction	----	100	µg/L	<100	101500 µg/L	111	55	133
EP071SG: C28 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
EP071SG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP071 +G: Total Recoverable | ydrocarbons (NEPM 2010 draft) 5+ilica gel cleanup (QCLot: 2V90HH9)								
EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
EP079A: Monocyclic Aromatic | ydrocarbons (QCLot: 2V91733)								
EP074: Benzene	71-43-2	1	µg/L	<1	20 µg/L	83.8	76	122
EP074: Toluene	109-99-3	2	µg/L	<2	20 µg/L	85.9	78	123
EP074: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	80.1	76	119
EP074: meta- & para-Xylene	109-39-3 106-42-3	2	µg/L	<2	40 µg/L	83.5	75	121
EP074: Styrene	100-42-5	5	µg/L	<5	20 µg/L	86.2	72	119
EP074: ortho-Xylene	85-47-6	2	µg/L	<2	20 µg/L	82.2	90	120
EP074: Isopropylbenzene	89-92-9	5	µg/L	<5	20 µg/L	97.2	71	118
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	20 µg/L	78.8	68	113
EP074: 1.3.5-Trimethylbenzene	109-67-9	5	µg/L	<5	20 µg/L	93.8	70	114
EP074: sec-Butylbenzene	135-89-9	5	µg/L	<5	20 µg/L	92.2	71	115
EP074: 1.2.4-Trimethylbenzene	85-63-6	5	µg/L	<5	20 µg/L	95.6	70	114
EP074: tert-Butylbenzene	89-06-6	5	µg/L	<5	20 µg/L	94.2	72	114
EP074: p-Isopropyltoluene	88-97-6	5	µg/L	<5	20 µg/L	92.3	69	114
EP074: n-Butylbenzene	104-51-9	5	µg/L	<5	20 µg/L	76.1	61	115
EP079| : Naphthalene (QCLot: 2V91733)								
EP074: Naphthalene	81-20-3	7	µg/L	<7	20 µg/L	82.6	75	121
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V3V067)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3610 µg/L	75.5	46	126
EP071: C15 - C29 Fraction	----	100	µg/L	<100	10340 µg/L	79.1	55	125
EP071: C28 - C36 Fraction	----	50	µg/L	<60	3780 µg/L	78.1	55	128
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V91739)								
EP090: C6 - C8 Fraction	----	20	µg/L	<20	360 µg/L	106	60	126
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V3V067)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5070 µg/L	78.9	53	128
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	11230 µg/L	91.5	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1010 µg/L	79.0	51	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V91739)								
EP090: C6 - C10 Fraction	----	20	µg/L	<20	450 µg/L	104	56	130

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	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED091G: +ulfate (Turbidimetric) as +O9 25by DA (QCLot: 2V3V0V7)							
EM1306789-002	GW07	ED041G: Sulfate as SO4 - Turbidimetric	14909-78-9	10 mg/L	# Not Determined	70	130
ED094G: Chloride Discrete analyser (QCLot: 2V3V0V6)							
EM1306789-002	GW07	ED045G: Chloride	16997-00-6	400 mg/L	88.4	70	130
EG020F: Dissolved Metals by ICP5M+ (QCLot: 2V90V6V)							
EM1306789-001	GW02	EG020A-F: Arsenic	7440-39-2	0.2 mg/L	102	98	138
		EG020A-F: Cadmium	7440-43-8	0.05 mg/L	111	75	131
		EG020A-F: Cobalt	7440-49-4	0.2 mg/L	87.0	77	128
		EG020A-F: Copper	7440-50-9	0.2 mg/L	102	71	127
		EG020A-F: Lead	7438-82-1	0.2 mg/L	104	71	123
		EG020A-F: Manganese	7438-86-5	0.2 mg/L	# Not Determined	66	132
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	86.9	73	128
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	105	69	136
EK026+F: Total CN by +egmented Flow Analyser (QCLot: 2V3HV7V)							
EM1306775-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	90.5	70	130
EK090P: Fluoride by PC Titrator (QCLot: 2V90H04)							
EM1306755-002	Anonymous	EK040P: Fluoride	16894-49-9	5.0 mg/L	117	70	130
EK044G: Ammonia as N by Discrete Analyser (QCLot: 2V91136)							
EM1306705-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	102	70	130
EK047G: Nitrite as N by Discrete Analyser (QCLot: 2V3V0V9)							
EM1306789-002	GW07	EK057G: Nitrite as N	----	0.5 mg/L	101	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2V3V0V4)							
EM1306789-002	GW07	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	104	70	130
EP079A: Monocyclic Aromatic | ydrocarbons (QCLot: 2V91733)							
EM1306789-002	GW07	EP074: Benzene	71-43-2	20 µg/L	85.7	64	121

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP079A: Monocyclic Aromatic | ydrocarbons (QCLot: 2V91733) 5continued							
EM1306789-002	GW07	EP074: Toluene	109-99-3	20 µg/L	103	63	125
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V3V067)							
EM1306789-002	GW07	EP071: C10 - C14 Fraction	----	3610 µg/L	91.0	40	130
		EP071: C15 - C29 Fraction	----	10340 µg/L	95.2	51	145
		EP071: C28 - C36 Fraction	----	3780 µg/L	96.9	52	144
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V91739)							
EM1306789-002	GW07	EP090: C6 - C8 Fraction	----	290 µg/L	95.0	46	126
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V3V067)							
EM1306789-002	GW07	EP071: >C10 - C16 Fraction	----	5070 µg/L	95.7	46	142
		EP071: >C16 - C34 Fraction	----	11230 µg/L	98.0	52	146
		EP071: >C34 - C40 Fraction	----	1010 µg/L	94.9	48	143
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V91739)							
EM1306789-002	GW07	EP090: C6 - C10 Fraction	----	330 µg/L	93.4	45	127

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are 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**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EK026+F: Total CN by +egmented Flow Analyser (QCLot: 2V3HV7V)										
EM1306775-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	90.5	----	70	130	----	----
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V3V067)										
EM1306789-002	GW07	EP071: C10 - C14 Fraction	----	3610 µg/L	91.0	----	40	130	----	----
		EP071: C15 - C29 Fraction	----	10340 µg/L	95.2	----	51	145	----	----
		EP071: C28 - C36 Fraction	----	3780 µg/L	96.9	----	52	144	----	----
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V3V067)										
EM1306789-002	GW07	EP071: >C10 - C16 Fraction	----	5070 µg/L	95.7	----	46	142	----	----
		EP071: >C16 - C34 Fraction	----	11230 µg/L	98.0	----	52	146	----	----
		EP071: >C34 - C40 Fraction	----	1010 µg/L	94.9	----	48	143	----	----
EK047G: Nitrite as N by Discrete Analyser (QCLot: 2V3V0V9)										
EM1306789-002	GW07	EK057G: Nitrite as N	----	0.5 mg/L	101	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2V3V0V4)										
EM1306789-002	GW07	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	104	----	70	130	----	----
ED094G: Chloride Discrete analyser (QCLot: 2V3V0V6)										

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
ED094G: Chloride Discrete analyser (QCLot: 2V3V0V6) 5continued										
EM1306789-002	GW07	ED045G: Chloride	16997-00-6	400 mg/L	88.4	----	70	130	----	----
ED091G: +ulfate (Turbidimetric) as +O9 25by DA (QCLot: 2V3V0V7)										
EM1306789-002	GW07	ED041G: Sulfate as SO4 - Turbidimetric	14909-78-9	10 mg/L	# Not Determined	----	70	130	----	----
EK090P: Fluoride by PC Titrator (QCLot: 2V90H04)										
EM1306755-002	Anonymous	EK040P: Fluoride	16894-49-9	5.0 mg/L	117	----	70	130	----	----
EG020F: Dissolved Metals by ICP5M+ (QCLot: 2V90V6V)										
EM1306789-001	GW02	EG020A-F: Arsenic	7440-39-2	0.2 mg/L	102	----	98	138	----	----
		EG020A-F: Cadmium	7440-43-8	0.05 mg/L	111	----	75	131	----	----
		EG020A-F: Cobalt	7440-49-4	0.2 mg/L	87.0	----	77	128	----	----
		EG020A-F: Copper	7440-50-9	0.2 mg/L	102	----	71	127	----	----
		EG020A-F: Lead	7438-82-1	0.2 mg/L	104	----	71	123	----	----
		EG020A-F: Manganese	7438-86-5	0.2 mg/L	# Not Determined	----	66	132	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	86.9	----	73	128	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	105	----	69	136	----	----
EK044G: Ammonia as N by Discrete Analyser (QCLot: 2V91136)										
EM1306705-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	102	----	70	130	----	----
EP079A: Monocyclic Aromatic | ydrocarbons (QCLot: 2V91733)										
EM1306789-002	GW07	EP074: Benzene	71-43-2	20 µg/L	85.7	----	64	121	----	----
		EP074: Toluene	109-99-3	20 µg/L	103	----	63	125	----	----
EP0H0/071: Total Petroleum | ydrocarbons (QCLot: 2V91739)										
EM1306789-002	GW07	EP090: C6 - C8 Fraction	----	290 µg/L	95.0	----	46	126	----	----
EP0H0/071: Total Recoverable | ydrocarbons 5NEPM 2010 Draft (QCLot: 2V91739)										
EM1306789-002	GW07	EP090: C6 - C10 Fraction	----	330 µg/L	93.4	----	45	127	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM13067| H**	Page	: 1 of 10
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
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Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 26-JUN-2013
Sampler	: SFL / KK	Issue Date	: 05-JUL-2013
Order number	: ----		
		No. of samples received	: 9
Quote number	: ME/330/13	No. of samples analysed	: 9

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

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: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA004: p-								
Clear Plastic Bottle 5Natural (EA004)								
GW02,	GW07,	**265JUN52013**	**5655**	----	----	**265JUN52013**	26-JUN-2013	✓
GW09,	GW29,							
GW30,	GW38							
EA014: Total Dissolved Solids								
Clear Plastic Bottle 5Natural (EA014-)								
GW02,	GW07,	**265JUN52013**	**555**	03-JUL-2013	----	**2H5JUN52013**	03-JUL-2013	✓
GW09,	GW29,							
GW30,	GW38							
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle 5Natural (ED0375P)								
GW02,	GW07,	**265JUN52013**	**555**	10-JUL-2013	----	**2H5JUN52013**	10-JUL-2013	✓
GW09,	GW29,							
GW30,	GW38							
ED091G: Sulfate (Turbidimetric) as SO9 25by DA								
Clear Plastic Bottle 5Natural (ED091G)								
GW02,	GW07,	**265JUN52013**	**555**	24-JUL-2013	----	**2H5JUN52013**	24-JUL-2013	✓
GW09,	GW29,							
GW30,	GW38							
ED094G: Chloride Discrete analyser								
Clear Plastic Bottle 5Natural (ED094G)								
GW02,	GW07,	**265JUN52013**	**555**	24-JUL-2013	----	**2H5JUN52013**	24-JUL-2013	✓
GW09,	GW29,							
GW30,	GW38							
ED0| 3F: Dissolved Major Cations								
Clear Plastic Bottle 5Natural (ED0| 3F)								
GW02,	GW07,	**265JUN52013**	**555**	03-JUL-2013	----	**2H5JUN52013**	03-JUL-2013	✓
GW09,	GW29,							
GW30,	GW38							

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GW02, GW07, GW09, GW29, GW30, GW38	26-JUN-2013	27-JUN-2013	23-DEC-2013	----	01-JUL-2013	23-DEC-2013	✓
EK026SF: Total CN by Segmented Flow Analyser							
White Plastic Bottle - NaOH (EK026SF)							
GW38	26-JUN-2013	27-JUN-2013	10-JUL-2013	----	27-JUN-2013	10-JUL-2013	✓
White Plastic Bottle - NaOH + Pb Acetate (EK026SF)							
GW02, GW07, GW09, GW29, GW30	26-JUN-2013	27-JUN-2013	10-JUL-2013	----	27-JUN-2013	10-JUL-2013	✓
EK090P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK090P)							
GW02, GW07, GW09, GW29, GW30, GW38	26-JUN-2013	27-JUN-2013	24-JUL-2013	----	25-JUN-2013	24-JUL-2013	✓
EK044G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK044G)							
GW02, GW07, GW09, GW29, GW30, GW38, RIN 3	26-JUN-2013	27-JUN-2013	24-JUL-2013	----	01-JUL-2013	24-JUL-2013	✓
EK047G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK047G)							
GW02, GW07, GW09, GW29, GW30, GW38	26-JUN-2013	27-JUN-2013	28-JUN-2013	----	27-JUN-2013	28-JUN-2013	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
GW02, GW07, GW09, GW29, GW30, GW38	26-JUN-2013	27-JUN-2013	28-JUN-2013	----	27-JUN-2013	28-JUN-2013	✓
EP070/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
GW02, GW07, GW09, GW29, GW30, GW38, RIN 3	26-JUN-2013	27-JUN-2013	03-JUL-2013	✓	25-JUN-2013	06-AUG-2013	✓
EP071-SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SG)							
GW38	26-JUN-2013	25-JUN-2013	03-JUL-2013	✓	02-JUL-2013	07-AUG-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP071 SG: Total Recoverable - ydrocarbons (NEPM 2010 draft) 5Silica gel cleanup							
Amber Glass Bottle 5Unpreserved (EP071SG)							
GW38	**265JUN52013**	**2H5JUN52013**	03-JUL-2013	✓	**025JUL52013**	07-AUG-2013	✓
EP079A: Monocyclic Aromatic - ydrocarbons							
Amber VOC Vial 5Sulfuric Acid (EP079)							
GW02, GW07, GW09, GW29, GW30, GW38, RIN 3, TRIP 5	**265JUN52013**	**2H5JUN52013**	10-JUL-2013	✓	**2H5JUN52013**	10-JUL-2013	✓
EP079- : Naphthalene							
Amber VOC Vial 5Sulfuric Acid (EP079)							
GW02, GW07, GW09, GW29, GW30, GW38, RIN 3, TRIP 5	**265JUN52013**	**2H5JUN52013**	10-JUL-2013	✓	**2H5JUN52013**	10-JUL-2013	✓
EP0H0/071: Total Recoverable - ydrocarbons 5NEPM 2010 Draft							
Amber VOC Vial 5Sulfuric Acid (EP0H0)							
GW02, GW07, GW09, GW29, GW30, GW38, RIN 3	**265JUN52013**	**2H5JUN52013**	10-JUL-2013	✓	**2H5JUN52013**	10-JUL-2013	✓

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(where) 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.

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
Ammonia as N by Discrete analyser	EK055G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	19	**10.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	14	**19.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	14	**19.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	**4.3**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.1**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**7.1**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**H3**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	1	**100.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	**4.3**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.1**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**7.1**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**H3**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	1	**100.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	**4.0**	**4.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	14	**7.1**	**4.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**7.1**	**4.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**H3**	**4.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**4.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	**4.0**	**4.0**	✓	ALS QCS3 requirement

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
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) 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- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. 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	APHA 21st ed., 4500 Cl - G.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 librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um 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) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. 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 QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. 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.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	APHA 4500-CN-O. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. 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)
Ammonium as N	EK055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry 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 chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry 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 Chemical Reduction and direct colourimetry 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 othophosphate 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)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	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)
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	WATER	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	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)

Analytical Methods	Method	Matrix	Method Descriptions
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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. 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 100 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.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

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 SW 846 or ALS-QWI/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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1306798-002	GW07	**Sulfate as SO9 5 Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 9x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM1306798-001	GW02	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 9x 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

- **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 - olding 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.**

Sample details/Date.

Samples Received without COC

Date/Time Received	26-6-13 16:30
Date/Time Analysis Received	
Client/Sender:	EES Ref: EM1306738
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	8+1
Carrier Company:	
Con-note No:	
Project Details	210074
Sampler/Sampling dates	26-6-13.
Matrix	water.

1. GW02 26-6-13
2. GW07
3. GW09
4. GW29
5. GW30
6. GW38
7. RIN 3
8. RIN 4
9. TRIP 5

Environmental Division
Melbourne
Work Order
EM1306798

Telephone : +61-3-8549 9600

Notified: Carol Date: 26-6-13. 17:22.

Received By:

Samples sent to lab for
~~Micro~~ Nitrate BOD (pH)
Colour Turbidity RP
Other
Date 26-6-13.

Sample details/Date.

Samples Received without COC

Date/Time Received	26.6.13 16:30
Date/Time Analysis Received	27/6/13 09:29.
Client/Sender:	EES Ref: EM1306738
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	8+1
Carrier Company:	
Con-note No:	
Project Details	210074
Sampler/Sampling dates	26.6.13.
Matrix	water.

1. GW02 28.6.13
2. GW07
3. GW09
4. GW29
5. GW30
6. GW38
7. RIN 3
8. RIN 4
9. TRIP 5

Environmental Division
Melbourne
Work Order
EM1306798

Telephone : +61-3-8549 9600

Notified: Carol Date: 26.6.13. 17:22.

Received By:

Samples sent to lab for
~~Micro~~ Nitrate BOD (pH)
Colour Turbidity RP
Other .....
Date 26.6.13.

SCANNED

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2178 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ **Townsville:** 14-15 Desma Cl, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne:** 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide:** 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ **Perth:** 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston:** 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)			FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011				
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)		Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		CC	1 2 3 4 5 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9887 1666	O	1 2 3 4 5 7	Other comments:
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY: / RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	S.Leong	ALS Courier	
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		DATE/TIME:	DATE/TIME:	DATE/TIME: / DATE/TIME:
Email Invoice to : rorquiza@environmentalearthsciences.com		26/6 3pm and 27/6 9am	26/6/13 3 pm and 27/6/13 9am	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CoC received 27/06/13 09:29 R.T

ALS USE ONLY	SAMPLE DETAILS (MATRIX: Solid(S) Water(W))			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) — Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)												Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
	GW38	26/06/2013	W		8	x	x	x	x	x	x	x						6.18	17.4	
	GW02	26/06/2013	W		8	x	x	x	x	x	x	x						6.61	16.4	
	GW30	26/06/2013	W		8	x	x	x	x	x	x	x						6.74	17.2	
	GW29	26/06/2013	W		8	x	x	x	x	x	x	x						6.84	18.8	
	GW09	26/06/2013	W		8	x	x	x	x	x	x	x						5.83	18.5	
	GW07	26/06/2013	W		8	x	x	x	x	x	x	x						6.99	17.2	
	GW24	26/06/2013	W		8	x	x	x	x	x	x	x						7.24	15.6	
	GW06	26/06/2013	W		8	x	x	x	x	x	x	x						6.48	18.8	
	Trip 5	26/06/2013	W		1					x	x									
	Rin 3	26/06/2013	W		3					x	x	x								
				TOTAL																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Carol Walsh
Sent: Thursday, 27 June 2013 9:48 AM
To: Samples Melbourne
Subject: COC - ENVIRONMENTAL EARTH SCIENCES - 210074
Attachments: 210074_CoC_26-27 June 2013.pdf; img-626170730-0001.pdf

Attached is COC for samples that came in yesterday afternoon and for the ones coming in this morning from EES - Gas Park Project.

Please print off.

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Thursday, 27 June 2013 9:29 AM
To: Carol Walsh
Subject: RE: COC REQUIRED - ENVIRONMENTAL EARTH SCIENCES - 210074

Hi Carol,

Please find the attached CoC. I have included the samples that will be collected this morning.

Regards

Regin

Regin Orquiza - Project Manager
PO Box 2255, Footscray, Victoria 3011.
p: 03 8398 4499
m: 0488 888 593
f: 03 9687 1844
rorquiza@eesicontracting.com
www.eesicontracting.com

From: Carol Walsh [Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 8:42 AM
To: Regin Orquiza
Subject: COC REQUIRED - ENVIRONMENTAL EARTH SCIENCES - 210074 - EM1306798

Regin:

Please provide the COC with analysis for samples received yesterday afternoon for the Gas Works Park - see attached.

Kind Regards

Carol Walsh
Senior Client Services Officer
ALS | Environmental Division
4 Westall Rd

Springvale, VIC. 3171 Australia

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Sample details/Date.

Samples Received without COC

Date/Time Received	26-6-13 16:30
Date/Time Analysis Received	27/6/13 09:29.
Client/Sender:	EES Ref: EM130 6738
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	8+1
Carrier Company:	
Con-note No:	
Project Details	210074
Sampler/Sampling dates	26-6-13.
Matrix	water.

1. GW02 26-6-13
2. GW07
3. GW09
4. GW29
5. GW30
6. GW38
7. RIN 3
8. RIN 4
9. TRIP 5

Environmental Division
Melbourne
Work Order
EM1306798

Telephone : +61-3-8549 9600

Notified: Carol Date: 26-6-13. 17:22.

Received By:

Samples sent to lab for
Micro Nitrate BOD (pH)
Colour Turbidity RP
Other.....
Date 26-6-13.....

SCANNED

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E:[illegible]
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle): COC 1 2 3 4 5 7
ORDER NUMBER:		Random Sample Temperature on Receipt: °C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1666	O 1 2 3 4 5 7
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	Other comment:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		
Email Invoice to : rorquiza@environmentalearthsciences.com		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		
DATE/TIME: 26/6 3pm	DATE/TIME: 26/6/13 3 pm	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CoC received 27/06/13 08:42 RT

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
6	GW38	26/06/2013	W		8	X	X	X	X	X	X	X						6.18	17.4	
1	GW02	26/06/2013	W		8	X	X	X	X	X	X	X						6.61	16.4	
5	GW30	26/06/2013	W		8	X	X	X	X	X	X	X						6.74	17.2	
4	GW29	26/06/2013	W		8	X	X	X	X	X	X	X						6.84	18.6	
3	GW09	26/06/2013	W		8	X	X	X	X	X	X	X						5.83	16.5	
2	GW07	26/06/2013	W		8	X	X	X	X	X	X	X						6.98	17.2	
9	Trip 5	26/06/2013	W		1					X	X									
7	Rin 3	26/06/2013	W		3					X	X	X								
8	Rin 4	26/06/2013	W		3					X	X	X								
				TOTAL																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Carol Walsh
Sent: Thursday, 27 June 2013 10:09 AM
To: Samples Melbourne
Cc: Raymond Thai
Subject: AMENDED COC'S for ENVIRONMENTAL EARTH SCIENCES - 210074 - EM1306798
Attachments: 210074_CoC_27 June 2013 am.pdf; 210074_CoC_26 June 2013 pm.pdf

Ray

Regin has split the samples received from yesterday and today into 2 COC's.

carol

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Thursday, 27 June 2013 10:05 AM
To: Carol Walsh
Subject: RE: COC REQUIRED - ENVIRONMENTAL EARTH SCIENCES - 210074 - EM1306798

Please find the attached updated CoC. I have separated the samples collected last night and this morning.

Thank you.

Regards

Regin Orquiza - Project Manager
PO Box 2255, Footscray, Victoria 3011.
p: 03 8398 4499
m: 0488 888 593
f: 03 9687 1844
rorquiza@eesicontracting.com
www.eesicontracting.com

If you have received this message _____
From: Carol Walsh [Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 8:42 AM
To: Regin Orquiza
Subject: COC REQUIRED - ENVIRONMENTAL EARTH SCIENCES - 210074 - EM1306798

Regin:

Please provide the COC with analysis for samples received yesterday afternoon for the Gas Works Park - see attached.

Kind Regards

Carol Walsh
Senior Client Services Officer
ALS | Environmental Division
4 Westall Rd

Springvale, VIC. 3171 Australia

How was your customer experience? Please send us your feedback Please see our latest Enviromail 67 - Aqueous Film Forming Foams (AFFFs) March 2013

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Samples Received without COC

Date/Time Received	26-6-13 16:30
Date/Time Analysis Received	27/6/13 09:29.
Client/Sender:	EES Ref: EM1306738
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	8+1
Carrier Company:	
Con-note No:	
Project Details	210074
Sampler/Sampling dates	26-6-13.
Matrix	water.

Sample details/Date.

1. GW02 26-6-13
2. GW07
3. GW09
4. GW29
5. GW30
6. GW38
7. RIN 3
8. RIN 4
9. TRIP 5

Environmental Division
Melbourne
Work Order 1145
EM1306798

Telephone : +61-3-8549 9600

Notified: Carol Date: 26-6-13. 11:22.

Received By:

Samples sent to lab for
~~Micro~~ ~~Nitrate~~ ~~BOD~~ (pH)
Colour Turbidity RP
Other.....
Date 26-6-13.....

SCANNED

R.T 27/6/13.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011	ALS QUOTE NO.: ME/330/13	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	COC SEQUENCE NUMBER (Circle): CC 1 2 3 4 5 7	Random Sample Temperature on Receipt: °C
ORDER NUMBER:		Other comment:
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1666 — O 1 2 3 4 5 7	
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	RELINQUISHED BY: S.Leong — DATE/TIME: 26/6 3pm
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RECEIVED BY: ALS Courier — DATE/TIME: 26/6/13 3 pm
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		RELINQUISHED BY: — DATE/TIME:
Email Invoice to : rorquiza@environmentalearthsciences.com		RECEIVED BY: — DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CoC received 27/06/13 08:42 RT

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
6	GW38	26/06/2013	W		8	X	X	X	X	X	X	X						6.18	17.4	
1	GW02	26/06/2013	W		8	X	X	X	X	X	X	X						6.61	16.4	
5	GW30	26/06/2013	W		8	X	X	X	X	X	X	X						6.74	17.2	
4	GW29	26/06/2013	W		8	X	X	X	X	X	X	X						6.84	18.6	
3	GW09	26/06/2013	W		8	X	X	X	X	X	X	X						5.83	18.5	
2	GW07	26/06/2013	W		8	X	X	X	X	X	X	X						6.99	17.2	
9	Trip 5	26/06/2013	W		1					X	X									
7	Rin 3	26/06/2013	W		3					X	X	X								
8	Rin 4	26/06/2013	W		3					X	X	X								
				TOTAL																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CoC received 28/06/13 09:27 ET

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney 277 Woodpark Rd Smithfield NSW 2176 Ph 02 8784 8555 E samples.sydney@alsenviro.com
☐ Brisbane 32 Shand St Stafford QLD 4053 Ph 07 3243 7222 E samples.brisbane@alsenviro.com
☐ Melbourne 24 Westall Rd Springvale VIC 3171 Ph 03 8549 9600 E samples.melbourne@alsenviro.com
☐ Perth 10 Hod Way Malaga WA 6090 Ph 08 9209 7655 E samples.perth@alsenviro.com
☐ Newcastle 9 Rosegum Rd Warabrook NSW 2304 Ph 02 4968 9433 E samples.newcastle@alsenviro.com
☐ Townsville 14-15 Desma Cl Bohle QLD 4818 Ph 07 4796 0600 E townsville.environmental@alsenviro.com
☐ Adelaide 21 Burma Rd Pooraka SA 5095 Ph 08 8359 0890 E adelaide@alsenviro.com
☐ Launceston 27 Wellington St Launceston TAS 7250 Ph 03 6331 2191 E launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 Sth Melbourne Gasworks	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle) GC 1 2 3 4 5 7
ORDER NUMBER:		Random Sample Temperature on Receipt: °C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1666	O 1 2 3 4 5 7 Other comments:
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	RELINQUISHED BY: S.Leong DATE/TIME: 26/6 3pm
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RECEIVED BY: ALS Courier DATE/TIME: 26/6/13 3 pm
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		RELINQUISHED BY: DATE/TIME:
Email Invoice to : rorquiza@environmentalearthsciences.com		RECEIVED BY: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
	GW38	25/06/2013	W		8	x	x	x	x	x	x	x	X					6.18	17.4	
	GW02	25/06/2013	W		8	x	x	x	x	x	x	x						6.61	16.4	
	GW30	25/06/2013	W		8	x	x	x	x	x	x	x						6.74	17.2	
	GW29	25/06/2013	W		8	x	x	x	x	x	x	x						6.84	16.6	
	GW09	25/06/2013	W		8	x	x	x	x	x	x	x						5.83	16.5	
	GW07	25/06/2013	W		8	x	x	x	x	x	x	x						6.99	17.2	
	Trip 5	25/06/2013	W		1					x	x									
	Rin 3	25/06/2013	W		3					x	x	x								
	Rin 4	25/06/2013	W		3					x	x	x								
				TOTAL																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid-Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Friday, 28 June 2013 9:27 AM
To: Samples Melbourne
Cc: Carol Walsh
Subject: FW: South Melbourne Gasworks
Attachments: img-628084338.pdf

Hi Carol,

Can you please include the silica gel clean-up for the following samples (GW24 and GW38), refer to the attached CoC.

Thank you.

Regards

Regin

From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 4:37 PM
To: Regin Orquiza
Subject: COC FOR SAMPLES RECEIVED THIS AFTERNOON

Regin

Do you have the COC's prepared for samples received this afternoon.

Kind Regards

Carol Walsh

Senior Client Services Officer
ALS | Environmental Division

4 Westall Rd
Springvale, VIC. 3171 Australia

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Please see our latest Enviromail 67 - Aqueous Film Forming Foams (AFFFs) March 2013

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Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306820**	gl :	o1f9L
i sn vy	o**ENVIRONMENTAL EARTH SCIENCES**	bl r f tl yf tC	oEvmtf vD vyl s8u mmenf v8M sr f ctv
i f vyl Ry	oGEI N08QGUZMAW	i f vyl Ry	oi l tf s8h l sed
WBBt ee	og RQPXQ2 8FF53 aQQTSi GWY8/N ,8VZSTGWbNW8011	WBBt ee	o48h eyl s8GB8Sptrv: ml s 8/N 8Vceytl sl 831. 1
E-Dl ls	otf tqcrzl @ enPrz	E-Dl ls	oR tf sRvl sed@l se: sf r l sRRf D
T s pdf v	o+618038L67. 1666	T s pdf v	o+61-3-754L8L607
al RenDrs	o+618038L67. 1744	al RenDrs	o+61-3-754L8L601
gtf j Ry	oF100. 48Syd8M sr f ctv 8 l ewf tke	Ui 8o m s	oOEg M8lLLL8SRd Bcs 8X(3)8 vB8VbS8Ui S38 qcnl D vy
QtB t8vcDr t	o----		
i -Q-i 8vcDr t	o----	ul y 8Sl Dps e8G R mm B	oF. -JZO-F013
Sl Dps t	oSab8KK	Nec 8ul y	o04-JZb-F013
Sry	o----		
		Of R8 9el Dps e8 R mm B	o6
Ucf y 8vcDr t	oME/330/13	Of R8 9el Dps e8 vl sOe B	o6

Tdne8 t pf ty8 ecp te B e8 l vC8 pt mfi ce8 t pf ty(e)8 wnyd8 ydne8 t 9 t vR R8 G ecsye8 l ppsC8 yf 8 yd 8 el Dps (e)8 l e8 ecr Dny BR8 Ws8 pl : e8 f 9 ydne8 t pf ty8 dl m 8 r v8 Rd Rk B8 l vB8 l pptf m B8 9f t t s l e R8

Tdne8 tyRR y 8f 9Wl sCene8Rf vyl nve8d 8f sf wrv: 8v9f tDl yfi vo

- l v tl s8 f DD vye
- Wl sCyR s8G ecsye
- Scttf : l y 8 f vytf s8nDnye

gl :	o F8f 9L
h ftk8QtB t	o EM13067F0
i snvy	o EOVNGQOMEOTWb8EWGTH8Si NEOi ES
gtfj Ry	o F100. 48Syd8M sf ctv 8 l ewf tke

General Comments

Td 8 l vl sCyR s8 ptf R Bct e8 ce B8 r C8 yd 8 Evmnf vD vy s8 ummenf v8 dl m 8 r v8 B m sf p B8 9f D8 eyl r sed B8 nvy tvl yf vl sC8 t Rf : vnz B8 ptf R Bct e8 ecRd8 l e8 ydf e 8 pcr sed B8 r C8 yd 8 ZSEgW,8 WgHW,8 WS8 l vB8 OEgMR8 Nv8 df ce B m sf p B8 ptf R Bct e8 t 8 DpsfC B8nv8 yd 8 r e vR 8f 98Bf RcD vy B8eyl vBl tBe8f t8 rC8Rsn vy8t qc eyP

h d t 8Dfneyct 8B y tDnvl yf v8dl e8r v8p t9f tD B,8 ecsye8 t 8 pf ty B8f v8 8BtC8v n dy8 l eneP

h d t 8 8 pf ty B8s ee8ydl v8(<)8 ecsy8ne8dn d t8ydl v8yd 8bQG,8ydne8DI C8r 8Bc 8yf 8ptnDI tC8el Dps 8 xytl RyBn eyl y 8Bnscyf v8 vB/f t8nvec9fRn vy8el Dps 8f t8 vl sCeneP

h d t 8yd 8bQG8f 98 8 pf ty B8t ecsy8Bn99 te8f D8eyl vBl tB8bQG,8ydne8DI C8r 8Bc 8yf 8dn d8Dfneyct 8Rf vy vy,8nvec9fRn vy8el Dps 8(t BcR B8v n dy8 DpsfC B)8f t8DI ynx8vy t9 t vR P

h d v8el Dpsnv: 8ynD 8nv9 ftDI yf v8ne8/f y8ptf mnB B8r C8yd 8Rsn vy,8el Dpsnv: 8Bl y e8 t 8edf wv8wnydf cy8 8ynD 8Rf Dpf v vy8BN8yd e 8nveyl vR e,8yd 8ynD 8Rf Dpf v vy8dl e8r v8 eecD B8r C8yd 8l rf tl yf tC8f t8ptf R eenv: 8pctpf e eP

K C8o i WS8OcDr t8=8 WS8 : neytC8vcDr t89f D8Bl yr l e 8DI nvyl nv B8r C8 d DnRs8Wf eytl Rye8S tmnR e8Td 8 d DnRs8Wf eytl Rye8S tmnR 8ne8 8Bnmenf v8f 98yd 8WD tnR v8 d DnRs8Sf RnyCP
bQG8=8onDny6f 98 pf tynv:
^8=8Tdne8 ecsy8ne8Rf Dpcy B89f D8nvBnmBcl s8 l vl sCy 8B y Ryf ve8 y8f t8 rf m 8yd 8s m sf 98 pf tynv:

- **EP074/080: Particular sample EM1306820-003 required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia for #3..**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**

NATA
WORLD RECOGNISED ACCREDITATION

OWTW8WRRt Bny B8bl r f tl yf tC87F5
8
WRRt Bny B8Bf t8Rf Dpsn l vR 8wnyd8
NSQ/NEi 81. 0F5P

Signatories

Tdne8 BfRcD vy8 dl e8 r v8 s Ryf vnRs8C8 en v B8 r C8 yd 8 l cydf tnz B8 en vl yf tn e8 nvBnRy B8 r sf wP8 Es Ryf vnR8 en vnv: 8 dl e8 r v8 Rl ttn B8 f cy8 nv Rf Dpsn l vR 8wnyd8ptf R Bct e8ep R9n B8nv8F18 aG8g l ty8l 1P

Signatories	*Position*	*Accreditation Category*
uns l vn8a tvl vBf	S vnf t8Nf f t: l vnR8 d Dney	M sf ctv 8Nf t: l vnRe
		M sf ctv 8Nf t: l vnRe
		M sf ctv 8Nf t: l vnRe
		M sf ctv 8Nf t: l vnRe
Vl tedl 8-Hf 8n nv:	Of v-M yl se8T l D8o l B t	M sf ctv 8Nf t: l vnRe
2nv: r nv8onv	S vnf t8Qt: l vnR8 d Dney	M sf ctv 8Qt: l vnRe
		M sf ctv 8Qt: l vnRe

Analytical Results

Scr-Ml ytnx: WATER (Ml ytnx: WATER)			Client sample ID	GW34	GW33	GW24	GW06	Trip 6
			Client sampling date / time	F. -JZO-F0138l5c00	F. -JZO-F0138l5c00	F. -JZO-F0138l5c00	F6-JZO-F0138l5c00	F6-JZO-F0138l5c00
Compound	CAS Number	LOR	Unit	EM1306820-001	EM1306820-002	EM1306820-003	EM1306820-004	EM1306820-005
EA005: pH								
pH Value	----	0P01	pH8Zvry	6.95	6.88	7.27	7.02	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	D: /b	4800	6390	4600	1080	----
ED037P: Alkalinity by PC Titrator								
Total Alkalinity as CaCO3	----	1	D: /b	753	346	657	257	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14707-. L-7	1	D: /b	2430	2050	2860	90	----
ED045G: Chloride Discrete analyser								
Chloride	1677. -00-6	1	D: /b	925	2640	37	435	----
ED093F: Dissolved Major Cations								
Calcium	. 440-. 0-F	1	D: /b	85	477	55	52	----
Magnesium	. 43L-L5-4	1	D: /b	160	405	45	44	----
Sodium	. 440-F3-5	1	D: /b	1670	1330	55	253	----
Potassium	. 440-0L-.	1	D: /b	127	152	19	22	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	. 4FL-L0-5	0P01	D: /b	0.02	<0P01	0.02	<0P01	----
Arsenic	. 440-37-F	0P001	D: /b	1.45	0.017	0.017	0.002	----
Cadmium	. 440-43-L	0P0001	D: /b	<0P0001	0.0004	<0P0001	<0P0001	----
Cobalt	. 440-47-4	0P001	D: /b	0.003	0.015	0.002	<0P001	----
Copper	. 440-50-7	0P001	D: /b	0.004	0.006	0.002	0.002	----
Lead	. 43L-LF-1	0P001	D: /b	<0P001	<0P001	0.001	<0P001	----
Manganese	. 43L-L6-5	0P001	D: /b	0.124	0.421	0.035	0.070	----
Nickel	. 440-0F-0	0P001	D: /b	0.074	0.048	0.004	0.025	----
Selenium	. . 7F-4L-F	0P01	D: /b	<0P01	<0P01	<0P01	<0P01	----
Zinc	. 440-66-6	0P005	D: /b	0.010	0.035	0.011	0.021	----
Boron	. 440-4F-7	0P05	D: /b	8.25	4.00	0.60	1.61	----
Iron	. 43L-7L-6	0P05	D: /b	2.33	0.14	0.13	<0P05	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	5. -1F-5	0P004	D: /b	0.255	0.069	0.209	0.005	----
EK040P: Fluoride by PC Titrator								
Fluoride	16L74-47-7	0P1	D: /b	2.5	1.5	0.5	1.4	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	. 664-41-.	0P01	D: /b	0.42	4.91	947	1.10	----

Analytical Results

Scr -Ml ytrx: WATER (Ml ytrx: WATER)

Compound	CAS Number	LOR	Unit	GW34	GW33	GW24	GW06	Trip 6
			Client sampling date / time	F. -JZO-F0138l5o00	F. -JZO-F0138l5o00	F. -JZO-F0138l5o00	F6-JZO-F0138l5o00	F6-JZO-F0138l5o00
				EM1306820-001	EM1306820-002	EM1306820-003	EM1306820-004	EM1306820-005
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	----	0Ꝑ01	D: /b	0.42	4.91	----	1.10	----
Ammonium as N	----	0Ꝑ01	D: /b	----	----	943	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0Ꝑ01	D: /b	<0Ꝑ01	0.01	0.12	<0Ꝑ01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14. L. -55-7	0Ꝑ01	D: /b	0.28	4.59	29.0	0.04	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14F65-44-F	0Ꝑ01	D: /b	0.18	<0Ꝑ01	<0Ꝑ01	<0Ꝑ01	----
EN055: Ionic Balance								
Total Anions	----	0Ꝑ01	D q/b	91.7	124	73.7	19.3	----
Total Cations	----	0Ꝑ01	D q/b	93.3	119	----	17.8	----
Total Cations	----	0Ꝑ01	D q/b	----	----	76.6	----	----
Ionic Balance	----	0Ꝑ01	%	0.81	2.14	----	4.05	----
Ionic Balance	----	0Ꝑ01	%	----	----	1.88	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	----	50	µ: /b	----	----	11700	----	----
C15 - C28 Fraction	----	100	µ: /b	----	----	920	----	----
C29 - C36 Fraction	----	50	µ: /b	----	----	<50	----	----
^8C10 - C36 Fraction (sum)	----	50	µ: /b	----	----	12600	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µ: /b	----	----	10200	----	----
>C16 - C34 Fraction	----	100	µ: /b	----	----	390	----	----
>C34 - C40 Fraction	----	100	µ: /b	----	----	<100	----	----
^8>C10 - C40 Fraction (sum)	----	100	µ: /b	----	----	10600	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	. 1-43-F	1	µ: /b	<1	<1	3380	<1	<1
Toluene	107-77-3	F	µ: /b	<F	<F	<100	<F	<F
Ethylbenzene	100-41-4	F	µ: /b	<F	<F	<100	<F	<F
meta- & para-Xylene	107-37-38l06-4F-3	F	µ: /b	<F	<F	1100	<F	<F
Styrene	100-4F-5	5	µ: /b	<5	<5	<100	<5	<5
ortho-Xylene	L5-4. -6	F	µ: /b	<F	<F	535	<F	<F
Isopropylbenzene	L7-7F-7	5	µ: /b	<5	<5	<100	<5	<5
n-Propylbenzene	103-65-1	5	µ: /b	<5	<5	<100	<5	<5

Analytical Results

Scr-MI ytrx: WATER (MI ytrx: WATER)			Client sample ID	GW34	GW33	GW24	GW06	Trip 6
			Client sampling date / time	F. -JZO-F0138l5c00	F. -JZO-F0138l5c00	F. -JZO-F0138l5c00	F6-JZO-F0138l5c00	F6-JZO-F0138l5c00
Compound	CAS Number	LOR	Unit	EM1306820-001	EM1306820-002	EM1306820-003	EM1306820-004	EM1306820-005
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
1.3.5-Trimethylbenzene	107-6. -7	5	µ: /b	<5	<5	<100	<5	<5
sec-Butylbenzene	135-L7-7	5	µ: /b	<5	<5	<100	<5	<5
1.2.4-Trimethylbenzene	L5-63-6	5	µ: /b	<5	<5	**160**	<5	<5
tert-Butylbenzene	L7-06-6	5	µ: /b	<5	<5	<100	<5	<5
p-Isopropyltoluene	LL-7. -6	5	µ: /b	<5	<5	<100	<5	<5
n-Butylbenzene	104-51-7	5	µ: /b	<5	<5	<100	<5	<5
EP074H: Naphthalene								
Naphthalene	L1-F0-3	.	µ: /b	<.	<.	**6470**	<.	<.
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	F0	µ: /b	<F0	<F0	**5110**	<F0	----
C10 - C14 Fraction	----	50	µ: /b	<50	<50	**11700**	<50	----
C15 - C28 Fraction	----	100	µ: /b	<100	<100	**3290**	<100	----
C29 - C36 Fraction	----	50	µ: /b	<50	<50	**80**	<50	----
^8C10 - C36 Fraction (sum)	----	50	µ: /b	<50	<50	**15100**	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	F0	µ: /b	<F0	<F0	**5110**	<F0	----
>C10 - C16 Fraction	----	100	µ: /b	<100	<100	**10200**	<100	----
>C16 - C34 Fraction	----	100	µ: /b	**120**	<100	**2350**	<100	----
>C34 - C40 Fraction	----	100	µ: /b	<100	<100	<100	<100	----
^8>C10 - C40 Fraction (sum)	----	100	µ: /b	**120**	<100	**12600**	<100	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1. 060-0. -0	0Pl	%	**112**	**104**	**96.5**	**98.9**	**94.6**
Toluene-D8	F03. -F6-5	0Pl	%	**111**	**104**	**97.3**	**100**	**95.2**
4-Bromofluorobenzene	460-00-4	0Pl	%	**114**	**105**	**104**	**106**	**97.0**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1. 060-0. -0	0Pl	%	**113**	**105**	**99.0**	**99.5**	----
Toluene-D8	F03. -F6-5	0Pl	%	**105**	**98.4**	**92.3**	**95.2**	----
4-Bromofluorobenzene	460-00-4	0Pl	%	**107**	**99.5**	**96.2**	**96.4**	----

Analytical Results

Scr-Ml ytrx: WATER (Ml ytrx: WATER)			Client sample ID	GW26	----	----	----	----
			Client sampling date / time	F6-JZO-F0138l5c00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1306820-006	----	----	----	----
EA005: pH								
pH Value	----	0P01	pH8Zvry	6.72	----	----	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	D: /b	2300	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Total Alkalinity as CaCO3	----	1	D: /b	275	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14707-. L-7	1	D: /b	285	----	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	1677. -00-6	1	D: /b	919	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	. 440-. 0-F	1	D: /b	94	----	----	----	----
Magnesium	. 43L-L5-4	1	D: /b	90	----	----	----	----
Sodium	. 440-F3-5	1	D: /b	472	----	----	----	----
Potassium	. 440-0L-.	1	D: /b	8	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	. 4FL-L0-5	0P01	D: /b	<0P01	----	----	----	----
Arsenic	. 440-37-F	0P001	D: /b	0.072	----	----	----	----
Cadmium	. 440-43-L	0P0001	D: /b	0.0005	----	----	----	----
Cobalt	. 440-47-4	0P001	D: /b	0.034	----	----	----	----
Copper	. 440-50-7	0P001	D: /b	0.003	----	----	----	----
Lead	. 43L-LF-1	0P001	D: /b	<0P001	----	----	----	----
Manganese	. 43L-L6-5	0P001	D: /b	3.46	----	----	----	----
Nickel	. 440-0F-0	0P001	D: /b	0.044	----	----	----	----
Selenium	. . 7F-4L-F	0P01	D: /b	<0P01	----	----	----	----
Zinc	. 440-66-6	0P005	D: /b	0.050	----	----	----	----
Boron	. 440-4F-7	0P05	D: /b	0.47	----	----	----	----
Iron	. 43L-7L-6	0P05	D: /b	1.69	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	5. -1F-5	0P004	D: /b	<0P004	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16L74-47-7	0P1	D: /b	0.7	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	. 664-41-.	0P01	D: /b	1.29	----	----	----	----

Analytical Results

Scr-Ml ytnx: WATER (Ml ytnx: WATER)			Client sample ID	GW26	----	----	----	----
			Client sampling date / time	F6-JZO-F0138l5c00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1306820-006	----	----	----	----
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	----	0R01	D: /b	1.29	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0R01	D: /b	<0R01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14. L. -55-7	0R01	D: /b	0.04	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14F65-44-F	0R01	D: /b	0.04	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0R01	D q/b	37.4	----	----	----	----
Total Cations	----	0R01	D q/b	32.8	----	----	----	----
Ionic Balance	----	0R01	%	6.45	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	. 1-43-F	1	µ: /b	<1	----	----	----	----
Toluene	107-77-3	F	µ: /b	<F	----	----	----	----
Ethylbenzene	100-41-4	F	µ: /b	<F	----	----	----	----
meta- & para-Xylene	107-37-38106-4F-3	F	µ: /b	<F	----	----	----	----
Styrene	100-4F-5	5	µ: /b	<5	----	----	----	----
ortho-Xylene	L5-4. -6	F	µ: /b	<F	----	----	----	----
Isopropylbenzene	L7-7F-7	5	µ: /b	<5	----	----	----	----
n-Propylbenzene	103-65-1	5	µ: /b	<5	----	----	----	----
1.3.5-Trimethylbenzene	107-6. -7	5	µ: /b	<5	----	----	----	----
sec-Butylbenzene	135-L7-7	5	µ: /b	<5	----	----	----	----
1.2.4-Trimethylbenzene	L5-63-6	5	µ: /b	<5	----	----	----	----
tert-Butylbenzene	L7-06-6	5	µ: /b	<5	----	----	----	----
p-Isopropyltoluene	LL-7. -6	5	µ: /b	<5	----	----	----	----
n-Butylbenzene	104-51-7	5	µ: /b	<5	----	----	----	----
EP074H: Naphthalene								
Naphthalene	L1-F0-3	.	µ: /b	<.	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	F0	µ: /b	<F0	----	----	----	----
C10 - C14 Fraction	----	50	µ: /b	<50	----	----	----	----
C15 - C28 Fraction	----	100	µ: /b	<100	----	----	----	----
C29 - C36 Fraction	----	50	µ: /b	<50	----	----	----	----

Analytical Results

Scr -Ml ytrx: WATER (Ml ytrx: WATER)

Compound	CAS Number	LOR	Unit	Client sample ID: GW26	----	----	----	----
			Client sampling date / time	F6-JZO-F0138l5o00	----	----	----	----
				EM1306820-006	**----**	**----**	**----**	**----**
EP080/071: Total Petroleum Hydrocarbons - Continued								
^8**C10 - C36 Fraction (sum)**	----	50	µ: /b	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	F0	µ: /b	<F0	----	----	----	----
>C10 - C16 Fraction	----	100	µ: /b	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µ: /b	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µ: /b	<100	----	----	----	----
^8**>C10 - C40 Fraction (sum)**	----	100	µ: /b	<100	----	----	----	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1. 060-0. -0	0Fl	%	**108**	----	----	----	----
Toluene-D8	F03. -F6-5	0Fl	%	**107**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0Fl	%	**108**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1. 060-0. -0	0Fl	%	**109**	----	----	----	----
Toluene-D8	F03. -F6-5	0Fl	%	**102**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0Fl	%	**99.4**	----	----	----	----

Surrogate Control Limits

Scr -Ml ytnx: WATER		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	1. 060-0. -0	6L	133
Toluene-D8	F03. -F6-5	. F	1F7
4-Bromofluorobenzene	460-00-4	. 0	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	1. 060-0. -0	. 0	13F
Toluene-D8	F03. -F6-5	6L	1F5
4-Bromofluorobenzene	460-00-4	61	1FL

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM13067V0**	Page	: 1 of 10
Client	: **ENHIRONMENTAL EARTS | CIENCE|**	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3181
E7mail	: ror- uiqaz eesi.biq	E7mail	: carol.@alshz alsglobal.com
Telephone	: w+1 03 6+981+++	Telephone	: w+1737 9546 6+09
Facsimile	: w+1 03 6+981944	Facsimile	: w+1737 9546 6+01
Project	: 210084 Sth Melbourne Gas@rks	QC Level	: NEPM 1666 Schedule B(3) and ALS QCS3 re- uirement
Site	: 7777		
C7O7C number	: 7777	Date Samples Received	: 287JUN72013
Sampler	: SFL / KK	Issue Date	: 047JUL72013
Order number	: 7777		
		No. of samples received	: +
Quote number	: ME/330/13	No. of samples analysed	: +

This report supersedes any previous report(s) @th 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 follo@ng 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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recogniqed 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 re- uest.

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

Where a reported less than (<) 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 @eight employed) or matrix interference.

Key : Anonymous = Refers to samples @hich are not specifically part of this @rk order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

NATA Accredited Laboratory 925

Accredited for compliance @th ISO/IEC 18025.

Signatories

This document has been electronically signed by the authoriqed signatories indicated belo@ Electronic signing has been carried out in compliance @th procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
Varsha Ho Wing	Non7Metals Team Leader	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics
		Melbourne Organics

Laboratory Duplicate (DUP) Report

The -uality 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 QWI7EN/39 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:7 No Limit; Result bet@een 10 and 20 times LOR:70% 750%; Result > 20 times LOR:70% 720%.

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005: pS (QC Lot: V9393542									
EM130+8697001	Anonymous	EA005: pH Value	7777	0.01	pH Unit	+.+9	+.+6	0.1	0% 720%
EM130+9067001	Anonymous	EA005: pH Value	7777	0.01	pH Unit	+.21	+.21	0.0	0% 720%
EA005: pS (QC Lot: V9393552									
EM130+9207003	GW24	EA005: pH Value	7777	0.01	pH Unit	8.28	8.28	0.0	0% 720%
EA005: pS (QC Lot: V9406) V2									
EM130+8447010	Anonymous	EA005: pH Value	7777	0.01	pH Unit	5.61	5.96	0.3	0% 720%
EM130+9057003	Anonymous	EA005: pH Value	7777	0.01	pH Unit	9.1+	9.15	0.1	0% 720%
EA015: Total Dissolved | olids (QC Lot: V940V672									
EM130+90+7001	Anonymous	EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	1+0	1+4	2.5	0% 750%
EM130+9067002	Anonymous	EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	11600	11500	3.4	0% 720%
ED03) P: Alkalinity by PC Titrator (QC Lot: V9407042									
EM130+8557001	Anonymous	ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	<1	<1	0.0	No Limit
EM130+869700+	Anonymous	ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	514	512	0.4	0% 720%
ED041G: | ulfate (Turbidimetric2as | O4 V8by DA (QC Lot: V93909) 2									
EM130+8697001	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	14909786 79	1	mg/L	1520	1540	1.1	0% 720%
EM130+9147003	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	14909786 79	1	mg/L	23+	234	1.2	0% 720%
ED045G: Chloride Discrete analyser (QC Lot: V9390962									
EM130+8697001	Anonymous	ED045G: Chloride	1+9987007+	1	mg/L	62+	640	1.4	0% 720%
EM130+9147003	Anonymous	ED045G: Chloride	1+9987007+	1	mg/L	6	6	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: V9390932									
EM130+8697001	Anonymous	ED063F: Calcium	84407807 2	1	mg/L	23+	226	3.3	0% 720%
		ED063F: Magnesium	84367657 4	1	mg/L	66	100	1.5	0% 720%
		ED063F: Sodium	84407237 5	1	mg/L	420	425	1.4	0% 720%
		ED063F: Potassium	84407067 8	1	mg/L	28	29	0.0	0% 720%
EM130+9147003	Anonymous	ED063F: Calcium	84407807 2	1	mg/L	9+	9+	0.0	0% 720%
		ED063F: Magnesium	84367657 4	1	mg/L	6	9	0.0	No Limit
		ED063F: Sodium	84407237 5	1	mg/L	8	+	0.0	No Limit
		ED063F: Potassium	84407067 8	1	mg/L	<1	<1	0.0	No Limit
EG0V0F: Dissolved Metals by ICP8M| (QC Lot: V9409692									
EM130+8697001	Anonymous	EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A7F: Arsenic	84407397 2	0.001	mg/L	0.12+	0.120	5.1	0% 720%
		EG020A7F: Cobalt	84407497 4	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A7F: Copper	84407507 9	0.001	mg/L	0.003	0.004	0.0	No Limit
		EG020A7F: Lead	84367627 1	0.001	mg/L	<0.001	<0.001	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG0V0F: Dissolved Metals by ICP8M| (QC Lot: V9409692 8continued									
EM130+8697001	Anonymous	EG020A7F: Manganese	843676+75	0.001	mg/L	2.18	2.48	13.0	0% 720%
		EG020A7F: Nickel	84407027 0	0.001	mg/L	0.002	<0.001	91.2	No Limit
		EG020A7F: Zinc	84407++7+	0.005	mg/L	0.021	0.021	0.0	No Limit
		EG020A7F: Aluminium	842676075	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Selenium	889274672	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	84407427 9	0.05	mg/L	0.80	0.85	+.+	0% 750%
		EG020A7F: Iron	84367967+	0.05	mg/L	20.4	22.1	9.2	0% 720%
EM130+9207004	GW0+	EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A7F: Arsenic	84407397 2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A7F: Cobalt	84407497 4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Copper	84407507 9	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A7F: Lead	843676271	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Manganese	843676+75	0.001	mg/L	0.080	0.0++	5.3	0% 720%
		EG020A7F: Nickel	84407027 0	0.001	mg/L	0.025	0.022	12.8	0% 720%
		EG020A7F: Zinc	84407++7+	0.005	mg/L	0.021	0.020	5.2	No Limit
		EG020A7F: Aluminium	842676075	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Selenium	889274672	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	84407427 9	0.05	mg/L	1.+1	1.+9	4.4	0% 720%
		EG020A7F: Iron	84367967+	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK0V6| F: Total CN by | egmented Flow Analyser (QC Lot: V9391592									
EM130+9207001	GW34	EK02+SF: Total Cyanide	5871275	0.004	mg/L	0.255	0.248	3.2	0% 720%
EK040P: Fluoride by PC Titrator (QC Lot: V9407052									
EM130+8557001	Anonymous	EK040P: Fluoride	1+6947497 9	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EM130+8697001	Anonymous	EK040P: Fluoride	1+6947497 9	0.1	mg/L	1.0	1.0	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: V9394432									
EM130+8457003	Anonymous	EK055G: Ammonia as N	8++474178	0.01	mg/L	94.4	99.8	5.0	0% 720%
EM130+8867004	Anonymous	EK055G: Ammonia as N	8++474178	0.01	mg/L	0.0+	0.05	0.0	No Limit
EK05) G: Nitrite as N by Discrete Analyser (QC Lot: V9390942									
EM130+8697001	Anonymous	EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM130+9147003	Anonymous	EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK0) 1G: Reactive Phosphorus as P by discrete analyser (QC Lot: V9390952									
EM130+8697001	Anonymous	EK081G: Reactive Phosphorus as P	142+574472	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM130+9207004	GW0+	EK081G: Reactive Phosphorus as P	142+574472	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QC Lot: V9404432									
EM130+9207001	GW34	EP084: Benqene	8174372	1	µg/L	<1	<1	0.0	No Limit
		EP084: Toluene	1097997 3	2	µg/L	<2	<2	0.0	No Limit
		EP084: Ethylbenqene	1007417 4	2	µg/L	<2	<2	0.0	No Limit
		EP084: meta7& para7Xylene	1097397 3 10+74273	2	µg/L	<2	<2	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QC Lot: V9404432 8continued									
EM130+9207001	GW34	EP084: ortho7Xylene	657487+	2	µg/L	<2	<2	0.0	No Limit
		EP084: Styrene	1007427 5	5	µg/L	<5	<5	0.0	No Limit
		EP084: Isopropylbenqene	697927 9	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Propylbenqene	1037+571	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.3.57Trimethylbenqene	1097+879	5	µg/L	<5	<5	0.0	No Limit
		EP084: sec7Butylbenqene	1357697 9	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.2.47Trimethylbenqene	657+37+	5	µg/L	<5	<5	0.0	No Limit
		EP084: tert7Butylbenqene	6970+7+	5	µg/L	<5	<5	0.0	No Limit
		EP084: p7Isopropyltoluene	667987+	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Butylbenqene	1047517 9	5	µg/L	<5	<5	0.0	No Limit
EP0) 4S: Naphthalene (QC Lot: V9404432									
EM130+9207001	GW34	EP084: Naphthalene	617207 3	8	µg/L	<8	<8	0.0	No Limit
EP070/0) 1: Total Petroleum Sydrocarbons (QC Lot: V93906) 2									
EM130+8697001	Anonymous	EP081: C15 7C29 Fraction	7777	100	µg/L	800	+90	2.3	No Limit
		EP081: C10 7C14 Fraction	7777	50	µg/L	110	110	0.0	No Limit
		EP081: C26 7C3+ Fraction	7777	50	µg/L	<50	<50	0.0	No Limit
EM130+9207001	GW34	EP081: C15 7C29 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: C10 7C14 Fraction	7777	50	µg/L	<50	<50	0.0	No Limit
		EP081: C26 7C3+ Fraction	7777	50	µg/L	<50	<50	0.0	No Limit
EP070/0) 1: Total Petroleum Sydrocarbons (QC Lot: V9404442									
EM130+9207001	GW34	EP090: C+ 7C6 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
EM130+9317028	Anonymous	EP090: C+ 7C6 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QC Lot: V93906) 2									
EM130+8697001	Anonymous	EP081: >C10 7C1+ Fraction	7777	100	µg/L	280	290	0.0	No Limit
		EP081: >C1+ 7C34 Fraction	7777	100	µg/L	+00	590	4.0	No Limit
		EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
EM130+9207001	GW34	EP081: >C10 7C1+ Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: >C1+ 7C34 Fraction	7777	100	µg/L	120	120	0.0	No Limit
		EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QC Lot: V9404442									
EM130+9207001	GW34	EP090: C+ 7C10 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
EM130+9317028	Anonymous	EP090: C+ 7C10 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit

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

The -uality control term Method / Laboratory Blank refers to an analyte free matrix to @hich 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 -uality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a kno@n interference free matrix spiked @th 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.

Sub7Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved | olids (QCLot: V940V672								
EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	<10	2000 mg/L	101	69	104
ED03) P: Alkalinity by PC Titrator (QCLot: V9407042								
ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	7777	200 mg/L	68.2	61	105
ED041G: | ulfate (Turbidimetric2as | O4 V8by DA (QCLot: V93909) 2								
ED041G: Sulfate as SO4 7Turbidimetric	149097867 9	1	mg/L	<1	25 mg/L	106	91	125
ED045G: Chloride Discrete analyser (QCLot: V9390962								
ED045G: Chloride	1+9987007+	1	mg/L	<1	10 mg/L	104	96	118
ED093F: Dissolved Major Cations (QCLot: V9390932								
ED063F: Calcium	84407807 2	1	mg/L	<1	5 mg/L	100	93	126
ED063F: Magnesium	84367657 4	1	mg/L	<1	5 mg/L	101	90	124
ED063F: Sodium	84407237 5	1	mg/L	<1	50 mg/L	61.2	88	125
ED063F: Potassium	84407067 8	1	mg/L	<1	50 mg/L	61.0	88	123
EG0V0F: Dissolved Metals by ICP8M| (QCLot: V9409692								
EG020A7F: Aluminium	84267607 5	0.01	mg/L	<0.01	0.5 mg/L	101	60	110
EG020A7F: Arsenic	84407397 2	0.001	mg/L	<0.001	0.1 mg/L	102	63	106
EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	0.1 mg/L	6+.9	95	111
EG020A7F: Cobalt	84407497 4	0.001	mg/L	<0.001	0.1 mg/L	69.6	98	111
EG020A7F: Copper	84407507 9	0.001	mg/L	<0.001	0.1 mg/L	65.5	9+	110
EG020A7F: Lead	84367627 1	0.001	mg/L	<0.001	0.1 mg/L	69.2	99	112
EG020A7F: Manganese	84367+75	0.001	mg/L	<0.001	0.1 mg/L	103	9+	110
EG020A7F: Nickel	84407027 0	0.001	mg/L	<0.001	0.1 mg/L	102	9+	112
EG020A7F: Selenium	88927467 2	0.01	mg/L	<0.01	0.1 mg/L	101	95	111
EG020A7F: Zinc	84407++7+	0.005	mg/L	<0.005	0.1 mg/L	63.2	93	113
EG020A7F: Boron	84407427 9	0.05	mg/L	<0.05	0.1 mg/L	69.9	82	12+
EG020A7F: Iron	84367967+	0.05	mg/L	<0.05	0.5 mg/L	100	99	112
EK0V6| F: Total CN by | egmented Flow Analyser (QCLot: V9391592								
EK02+SF: Total Cyanide	587127 5	0.004	mg/L	<0.004	0.2 mg/L	8+.2	85	113
EK040P: Fluoride by PC Titrator (QCLot: V9407052								
EK040P: Fluoride	1+69474979	0.1	mg/L	<0.1	5 mg/L	69.9	89	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: V9394432								
EK055G: Ammonia as N	8++474178	0.01	mg/L	<0.01	1.0 mg/L	111	8+	122
EK05) G: Nitrite as N by Discrete Analyser (QCLot: V9390942								
EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	0.5 mg/L	100	94	112

Sub7Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK0) 1G: Reactive Phosphorus as P by discrete analyser (QCLot: V9390952								
EK081G: Reactive Phosphorus as P	142+574472	0.01	mg/L	<0.01	0.5 mg/L	66.+	94	109
EP0) 1 | G: Total Petroleum Sydrocarbons 8| ilica gel cleanup (QCLot: V9410792								
EP081SG: C10 7C14 Fraction	7777	50	µg/L	<50	+2800 µg/L	11+	59	144
EP081SG: C15 7C29 Fraction	7777	100	µg/L	<100	101500 µg/L	111	55	133
EP081SG: C26 7C3+ Fraction	7777	50	µg/L	<50	7777	7777	7777	7777
EP081SG: C10 7C3+ Fraction (sum)	7777	50	µg/L	<50	7777	7777	7777	7777
EP0) 1 | G: Total Recoverable Sydrocarbons (NEPM V010 draft28| ilica gel cleanup (QCLot: V9410792								
EP081SG: >C10 7C1+ Fraction	7777	100	µg/L	<100	7777	7777	7777	7777
EP081SG: >C1+ 7C34 Fraction	7777	100	µg/L	<100	7777	7777	7777	7777
EP081SG: >C34 7C40 Fraction	7777	100	µg/L	<100	7777	7777	7777	7777
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QCLot: V9404432								
EP084: Benqene	8174372	1	µg/L	<1	20 µg/L	66.1	8+	122
EP084: Toluene	1079973	2	µg/L	<2	20 µg/L	66.9	86	123
EP084: Ethylbenqene	1007+174	2	µg/L	<2	20 µg/L	66.9	8+	119
EP084: meta7& para7Xylene	1097397 3 10+74273	2	µg/L	<2	40 µg/L	101	85	121
EP084: Styrene	1007+275	5	µg/L	<5	20 µg/L	68.4	82	119
EP084: ortho7Xylene	657+87+	2	µg/L	<2	20 µg/L	103	90	120
EP084: Isopropylbenqene	679279	5	µg/L	<5	20 µg/L	6+.9	81	116
EP084: n7Propylbenqene	1037+571	5	µg/L	<5	20 µg/L	62.1	+6	113
EP084: 1.3.57Trimethylbenqene	1097+879	5	µg/L	<5	20 µg/L	63.0	80	114
EP084: sec7Butylbenqene	1357+979	5	µg/L	<5	20 µg/L	63.4	81	115
EP084: 1.2.47Trimethylbenqene	657+37+	5	µg/L	<5	20 µg/L	62.3	80	114
EP084: tert7Butylbenqene	6970+7+	5	µg/L	<5	20 µg/L	63.2	82	114
EP084: p7Isopropyltoluene	667987+	5	µg/L	<5	20 µg/L	63.6	+9	114
EP084: n7Butylbenqene	1047+179	5	µg/L	<5	20 µg/L	63.+	+1	115
EP0) 4S: Naphthalene (QCLot: V9404432								
EP084: Naphthalene	617+073	8	µg/L	<8	20 µg/L	100	85	121
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V93906) 2								
EP081: C10 7C14 Fraction	7777	50	µg/L	<50	3+10 µg/L	85.5	4+	12+
EP081: C15 7C29 Fraction	7777	100	µg/L	<100	10340 µg/L	89.1	55	125
EP081: C26 7C3+ Fraction	7777	50	µg/L	<+0	3860 µg/L	86.1	55	126
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V9404442								
EP090: C+ 7C6 Fraction	7777	20	µg/L	<20	3+0 µg/L	10+	+0	12+
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V93906) 2								
EP081: >C10 7C1+ Fraction	7777	100	µg/L	<100	5080 µg/L	86.9	53	126
EP081: >C1+ 7C34 Fraction	7777	100	µg/L	<100	11230 µg/L	91.5	5+	132
EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	1010 µg/L	89.0	51	138

Sub7Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V9404442								
EP090: C+ 7C10 Fraction	7777	20	µg/L	<20	450 µg/L	103	5+	130

Matrix Spike (MS) Report

The -uality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked @th 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 @aived in the event of sample matrix interference.

Sub7Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: | ulfate (Turbidimetric2as | O4 V8by DA (QCLot: V93909) 2							
EM130+8697002	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	1490978679	10 mg/L	# Not Determined	80	130
ED045G: Chloride Discrete analyser (QCLot: V9390962							
EM130+8697002	Anonymous	ED045G: Chloride	1+9987007+	400 mg/L	66.4	80	130
EG0V0F: Dissolved Metals by ICP8M| (QCLot: V9409692							
EM130+8697001	Anonymous	EG020A7F: Arsenic	84407397 2	0.2 mg/L	102	96	136
		EG020A7F: Cadmium	84407437 6	0.05 mg/L	111	85	131
		EG020A7F: Cobalt	84407497 4	0.2 mg/L	68.0	88	126
		EG020A7F: Copper	84407507 9	0.2 mg/L	102	81	128
		EG020A7F: Lead	84367627 1	0.2 mg/L	104	81	123
		EG020A7F: Manganese	84367 6+75	0.2 mg/L	# Not Determined	++	132
		EG020A7F: Nickel	84407027 0	0.2 mg/L	6+.9	83	126
		EG020A7F: Zinc	84407++7+	0.2 mg/L	105	+9	13+
EK0V6| F: Total CN by | egmented Flow Analyser (QCLot: V9391592							
EM130+9207002	GW33	EK02+SF: Total Cyanide	5871275	0.2 mg/L	62.2	80	130
EK040P: Fluoride by PC Titrator (QCLot: V9407052							
EM130+8557002	Anonymous	EK040P: Fluoride	1+69474979	5.0 mg/L	118	80	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: V9394432							
EM130+8457004	Anonymous	EK055G: Ammonia as N	8++474178	1.0 mg/L	# Not Determined	80	130
EK05) G: Nitrite as N by Discrete Analyser (QCLot: V9390942							
EM130+8697002	Anonymous	EK058G: Nitrite as N	7777	0.5 mg/L	101	80	130
EK0) 1G: Reactive Phosphorus as P by discrete analyser (QCLot: V9390952							
EM130+8697002	Anonymous	EK081G: Reactive Phosphorus as P	142+574472	0.5 mg/L	104	80	130
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QCLot: V9404432							

Sub7Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Recovery Limits (%) Low	Matrix Spike (MS) Report: Recovery Limits (%) High
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QCLot: V9404432 8continued							
EM130+9207002	GW33	EP084: Benqene	8174372	20 µg/L	111	+4	121
		EP084: Toluene	10979973	20 µg/L	112	+3	125
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V93906) 2							
EM130+8697002	Anonymous	EP081: C10 7C14 Fraction	7777	3+10 µg/L	91.0	40	130
		EP081: C15 7C29 Fraction	7777	10340 µg/L	95.2	51	145
		EP081: C26 7C3+ Fraction	7777	3860 µg/L	9+.9	52	144
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V9404442							
EM130+9207002	GW33	EP090: C+ 7C6 Fraction	7777	290 µg/L	104	4+	12+
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V93906) 2							
EM130+8697002	Anonymous	EP081: >C10 7C1+ Fraction	7777	5080 µg/L	95.8	4+	142
		EP081: >C1+ 7C34 Fraction	7777	11230 µg/L	96.0	52	14+
		EP081: >C34 7C40 Fraction	7777	1010 µg/L	94.9	46	143
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V9404442							
EM130+9207002	GW33	EP090: C+ 7C10 Fraction	7777	330 µg/L	101	45	128

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The -uality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked @th a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be @aived in the event of sample matrix interference.

Sub7Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPDs (%) Value	RPDs (%) Control Limit
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V93906) 2										
EM130+8697002	Anonymous	EP081: C10 7C14 Fraction	7777	3+10 µg/L	91.0	7777	40	130	7777	7777
		EP081: C15 7C29 Fraction	7777	10340 µg/L	95.2	7777	51	145	7777	7777
		EP081: C26 7C3+ Fraction	7777	3860 µg/L	9+.9	7777	52	144	7777	7777
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V93906) 2										
EM130+8697002	Anonymous	EP081: >C10 7C1+ Fraction	7777	5080 µg/L	95.8	7777	4+	142	7777	7777
		EP081: >C1+ 7C34 Fraction	7777	11230 µg/L	96.0	7777	52	14+	7777	7777
		EP081: >C34 7C40 Fraction	7777	1010 µg/L	94.9	7777	46	143	7777	7777
EK05) G: Nitrite as N by Discrete Analyser (QCLot: V9390942										
EM130+8697002	Anonymous	EK058G: Nitrite as N	7777	0.5 mg/L	101	7777	80	130	7777	7777
EK0) 1G: Reactive Phosphorus as P by discrete analyser (QCLot: V9390952										
EM130+8697002	Anonymous	EK081G: Reactive Phosphorus as P	142+574472	0.5 mg/L	104	7777	80	130	7777	7777
ED045G: Chloride Discrete analyser (QCLot: V9390962										
EM130+8697002	Anonymous	ED045G: Chloride	1+9987007+	400 mg/L	66.4	7777	80	130	7777	7777

Sub7Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
ED041G: | ulfate (Turbidimetric2as | O4 V8by DA (QCLot: V93909) 2										
EM130+8697002	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	149097867 9	10 mg/L	# Not Determined	7777	80	130	7777	7777
EK0V6| F: Total CN by | egmented Flow Analyser (QCLot: V9391592										
EM130+9207002	GW33	EK02+SF: Total Cyanide	5871275	0.2 mg/L	62.2	7777	80	130	7777	7777
EK055G: Ammonia as N by Discrete Analyser (QCLot: V9394432										
EM130+8457004	Anonymous	EK055G: Ammonia as N	8++474178	1.0 mg/L	# Not Determined	7777	80	130	7777	7777
EP0) 4A: Monocyclic Aromatic Sydrocarbons (QCLot: V9404432										
EM130+9207002	GW33	EP084: Benqene	8174372	20 µg/L	111	7777	+4	121	7777	7777
		EP084: Toluene	1097973	20 µg/L	112	7777	+3	125	7777	7777
EP070/0) 1: Total Petroleum Sydrocarbons (QCLot: V9404442										
EM130+9207002	GW33	EP090: C+ 7C6 Fraction	7777	290 µg/L	104	7777	4+	12+	7777	7777
EP070/0) 1: Total Recoverable Sydrocarbons 8NEPM V010 Draft (QCLot: V9404442										
EM130+9207002	GW33	EP090: C+ 7C10 Fraction	7777	330 µg/L	101	7777	45	128	7777	7777
EK040P: Fluoride by PC Titrator (QCLot: V9407052										
EM130+8557002	Anonymous	EK040P: Fluoride	1+6947497 9	5.0 mg/L	118	7777	80	130	7777	7777
EG0V0F: Dissolved Metals by ICP8M| (QCLot: V9409692										
EM130+8697001	Anonymous	EG020A7F: Arsenic	8440739 72	0.2 mg/L	102	7777	96	136	7777	7777
		EG020A7F: Cadmium	8440743 76	0.05 mg/L	111	7777	85	131	7777	7777
		EG020A7F: Cobalt	8440749 74	0.2 mg/L	68.0	7777	88	126	7777	7777
		EG020A7F: Copper	8440750 79	0.2 mg/L	102	7777	81	128	7777	7777
		EG020A7F: Lead	8436762 71	0.2 mg/L	104	7777	81	123	7777	7777
		EG020A7F: Manganese	843676+75	0.2 mg/L	# Not Determined	7777	++	132	7777	7777
		EG020A7F: Nickel	8440702 70	0.2 mg/L	6+.9	7777	83	126	7777	7777
		EG020A7F: Zinc	84407++7+	0.2 mg/L	105	7777	+9	13+	7777	7777

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM13067| 0**	Page	: 1 of 10
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 27-JUN-2013
Sampler	: SFL / KK	Issue Date	: 04-JUL-2013
Order number	: ----		
		No. of samples received	: 6
Quote number	: ME/330/13	No. of samples analysed	: 6

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

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: p+							
Clear Plastic Bottle 8Natural (EA005)							
GW06, GW26							
Clear Plastic Bottle 8Natural (EA005)							
GW34, GW33, GW24							
EA015: Total Dissolved Solids							
Clear Plastic Bottle 8Natural (EA015+)							
GW06, GW26							
Clear Plastic Bottle 8Natural (EA015+)							
GW34, GW33, GW24							
ED03JP: Alkalinity by PC Titrator							
Clear Plastic Bottle 8Natural (ED03J8P)							
GW06, GW26							
Clear Plastic Bottle 8Natural (ED03J8P)							
GW34, GW33, GW24							
ED041G: Sulfate (Turbidimetric) as SO4 | 8by DA							
Clear Plastic Bottle 8Natural (ED041G)							
GW06, GW26							
Clear Plastic Bottle 8Natural (ED041G)							
GW34, GW33, GW24							
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle 8Natural (ED045G)							
GW06, GW26							
Clear Plastic Bottle 8Natural (ED045G)							
GW34, GW33, GW24							

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations								
Clear Plastic Bottle 8Natural (ED093F)								
GW06,	GW26	**| 682UN§ 013**	888	03-JUL-2013	----	**| 782UN§ 013**	03-JUL-2013	✓
Clear Plastic Bottle 8Natural (ED093F)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	04-JUL-2013	----	**| 782UN§ 013**	04-JUL-2013	✓
EG0| 0F: Dissolved Metals by ICP8MS								
Clear Plastic Bottle 8Nitric Acid; Filtered (EG0| 0A8F)								
GW06,	GW26	**| 682UN§ 013**	888	23-DEC-2013	----	**0182UL§ 013**	23-DEC-2013	✓
Clear Plastic Bottle 8Nitric Acid; Filtered (EG0| 0A8F)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	24-DEC-2013	----	**0182UL§ 013**	24-DEC-2013	✓
EK0| 6SF: Total CN by Segmented Flow Analyser								
White Plastic Bottle8NaO+ (EK0| 6SF)								
GW06,	GW26	**| 682UN§ 013**	888	10-JUL-2013	----	**| J82UN§ 013**	10-JUL-2013	✓
White Plastic Bottle8NaO+ (EK0| 6SF)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	11-JUL-2013	----	**| J82UN§ 013**	11-JUL-2013	✓
EK040P: Fluoride by PC Titrator								
Clear Plastic Bottle 8Natural (EK040P)								
GW06,	GW26	**| 682UN§ 013**	888	24-JUL-2013	----	**| 782UN§ 013**	24-JUL-2013	✓
Clear Plastic Bottle 8Natural (EK040P)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	25-JUL-2013	----	**| 782UN§ 013**	25-JUL-2013	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle 8Sulfuric Acid (EK055G)								
GW06,	GW26	**| 682UN§ 013**	888	24-JUL-2013	----	**| 782UN§ 013**	24-JUL-2013	✓
Clear Plastic Bottle 8Sulfuric Acid (EK055G)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	25-JUL-2013	----	**| 782UN§ 013**	25-JUL-2013	✓
EK05JG: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle 8Natural (EK05JG)								
GW06,	GW26	**| 682UN§ 013**	888	28-JUN-2013	----	**| J82UN§ 013**	28-JUN-2013	✓
Clear Plastic Bottle 8Natural (EK05JG)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	29-JUN-2013	----	**| J82UN§ 013**	29-JUN-2013	✓
EK0J1G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle 8Natural (EK0J1G)								
GW06,	GW26	**| 682UN§ 013**	888	28-JUN-2013	----	**| J82UN§ 013**	28-JUN-2013	✓
Clear Plastic Bottle 8Natural (EK0J1G)								
GW34, GW24	GW33,	**| J82UN§ 013**	888	29-JUN-2013	----	**| J82UN§ 013**	29-JUN-2013	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP070/0J1: Total Recoverable +ydrocarbons 8NEPM | 010 Draft								
Amber Glass Bottle 8Unpreserved (EP0J1)								
GW06,	GW26	| 682UN8 013	| J82UN8 013	03-JUL-2013	✓	| 782UN8 013	06-AUG-2013	✓
Amber Glass Bottle 8Unpreserved (EP0J1)								
GW34, GW24	GW33,	| J82UN8 013	| J82UN8 013	04-JUL-2013	✓	| 782UN8 013	06-AUG-2013	✓
EP0J1 SG: Total Petroleum +ydrocarbons 8Silica gel cleanup								
Amber Glass Bottle 8Unpreserved (EP0J1SG)								
GW24		| J82UN8 013	| 782UN8 013	04-JUL-2013	✓	0| 82UL8 013	07-AUG-2013	✓
EP0J1 SG: Total Recoverable +ydrocarbons (NEPM | 010 draft) 8Silica gel cleanup								
Amber Glass Bottle 8Unpreserved (EP0J1SG)								
GW24		| J82UN8 013	| 782UN8 013	04-JUL-2013	✓	0| 82UL8 013	07-AUG-2013	✓
EP0J4A: Monocyclic Aromatic +ydrocarbons								
Amber VOC Vial 8Sulfuric Acid (EP0J4)								
GW06, GW26	Trip 6,	| 682UN8 013	| 782UN8 013	10-JUL-2013	✓	| 782UN8 013	10-JUL-2013	✓
Amber VOC Vial 8Sulfuric Acid (EP0J4)								
GW34, GW24	GW33,	| J82UN8 013	| 782UN8 013	11-JUL-2013	✓	| 782UN8 013	11-JUL-2013	✓
EP0J4+ : Naphthalene								
Amber VOC Vial 8Sulfuric Acid (EP0J4)								
GW06, GW26	Trip 6,	| 682UN8 013	| 782UN8 013	10-JUL-2013	✓	| 782UN8 013	10-JUL-2013	✓
Amber VOC Vial 8Sulfuric Acid (EP0J4)								
GW34, GW24	GW33,	| J82UN8 013	| 782UN8 013	11-JUL-2013	✓	| 782UN8 013	11-JUL-2013	✓
EP070/0J1: Total Recoverable +ydrocarbons 8NEPM | 010 Draft								
Amber VOC Vial 8Sulfuric Acid (EP070)								
GW06,	GW26	| 682UN8 013	| 782UN8 013	10-JUL-2013	✓	| 782UN8 013	10-JUL-2013	✓
Amber VOC Vial 8Sulfuric Acid (EP070)								
GW34, GW24	GW33,	| J82UN8 013	| 782UN8 013	11-JUL-2013	✓	| 782UN8 013	11-JUL-2013	✓

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(where) 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.

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
Ammonia as N by Discrete analyser	EK055G	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	1	**| 00.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	5	47	**10.6**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	12	**16.J**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	17	**11.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	**10.0**	**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
Ammonia as N by Discrete analyser	EK055G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**J.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**7.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**J.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**7.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	14	**J.1**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	**7.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement

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
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) 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- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. 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	APHA 21st ed., 4500 Cl - G.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 librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um 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) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. 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 QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. 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.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	APHA 4500-CN-O. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. 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)
Ammonium as N	EK055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry 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 chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry 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 Chemical Reduction and direct colourimetry 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 othophosphate 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)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	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)
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	WATER	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	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)

Analytical Methods	Method	Matrix	Method Descriptions
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. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. 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 100 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.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

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 SW 846 or ALS-QWI/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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1306798-002	Anonymous	**Sulfate as SO4 8 Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020F: Dissolved Metals by ICP-MS	EM1306798-001	Anonymous	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK055G: Ammonia as N by Discrete Analyser	EM1306745-004	Anonymous	**Ammonia as N**	7664-41-7	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

- **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.

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	**Days overdue**	Date analysed	Due for analysis	**Days overdue**
EA005: p+						
Clear Plastic Bottle 8 Natural						
GW06, GW26	----	----	----	28-JUN-2013	26-JUN-2013	1

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.**

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne:** 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide:** 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ **Perth:** 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7855 E: samples.perth@alsenviro.com
☐ **Launceston:** 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	**TURNAROUND REQUIREMENTS :** standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact: Yes / No / N/A; Free ice / Cooling Units present upon receipt: Yes / No / N/A; Random Sample Temperature on Receipt: 0
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		
PROJECT: 210074 Sth Melbourne Gaswords	**ALS QUOTE NO.:** ME/330/13	**COC SEQUENCE NUMBER (Circle)**
ORDER NUMBER:		COC: 1 2 3 4 5 7
PROJECT MANAGER: REGIN ORQUIZA	**CONTACT PH:** 9687 1666	O: 1 2 3 4 5 7 — Other comment: 4°
SAMPLER: SFL / KK	**SAMPLER MOBILE:** 0488 339 025	**RELINQUISHED BY:** S.Leong; **RECEIVED BY:** ALS Courier; **RELINQUISHED BY:**; **RECEIVED BY:**
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	**DATE/TIME:** 27/6 9 am; **DATE/TIME:** 27/6 9am; **DATE/TIME:**; **DATE/TIME:** 27/6, 10:05
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		
Email Invoice to : rorquiza@environmentalearthsciences.com		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CoC received 27/06/13 0842 RT

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).												Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
1	GW34	27/06/2013	W		8	x	x	x	x	x	x	x						6.85	17	
2	GW33	27/06/2013	W		8	x	x	x	x	x	x	x						6.5	18.1	
3	GW24 27/6	26/06/2013	W		8	x	x	x	x	x	x	x						7.24	15.6	
4	GW06	26/06/2013	W		8	x	x	x	x	x	x	x						6.84	18.6	
5	Trip 6 27/6	26/06/2013	W							x	x									
6	gw26	26/6			8	x	x	x	x	x	x	x						6.66	18.4	
		An 27/6																		
				TOTAL																

Environmental Division
LB Melbourne
11:10 Work Order
EM1306820

Telephone : +61-3-8549 9600

Samples sent to lab for
Micro Nitrate BOD pH
Colour Turbidity EP
Other
Date 27/6 BN

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = S Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

served; AP - Airfreight Unpreserved Plastic
l preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐ **Launceston:** 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle)
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		Custody Seal Intact? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	Free ice / frozen ice bricks present upon arrival? Yes No
ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) COC 1 2 3 4 5 7	Random Sample Temperature on Receipt: 4.2 °C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1666 O 1 2 3 4 5 7	Other comment:
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		
Email Invoice to : rorquiza@environmentalearthsciences.com		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		
DATE/TIME: 27/6 9 am	DATE/TIME: 27/6 9am	DATE/TIME:	DATE/TIME: 27/6, 10-05

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CoC received 27/06/13 0842 R.T

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).											Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - Includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)				field pH	Field temp	
1	GW34	27/06/2013	W		8	X	X	X	X	X	X	X					6.85	17	
2	GW33	27/06/2013	W		8	X	X	X	X	X	X	X					6.5	18.1	
3	GW24 27/6	26/06/2013	W		8	X	X	X	X	X	X	X					7.24	15.6	
4	GW06	26/06/2013	W		8	X	X	X	X	X	X	X					6.84	18.6	
5	Trip 6 27/6	26/06/2013	W							X	X								
6	gw26	26/6			8	X	X	X	X	X	X	X					6.66	18.4	
		An 27/6																	
				TOTAL															

SCANNED

Environmental Division Melbourne
Work Order EM1306820
Telephone : +61-3-8549 9600

Samples sent to lab for Micro Nitrate BOD pH Colour Turbidity RP

Other

Date 27/6 BN

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sterile Glass; AP - Airfreight Unpreserved Plastic; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; ...l preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese...

R.T. 27/6/13

CoC received 28/06/13 09:27 R.T

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney 277 Woodpark Rd Smithfield NSW 2176 Ph 02 8784 8555 E samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd Warabrook NSW 2304 Ph 02 4968 9433 E samples.newcastle@alsenviro.com
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☐ Townsville: 14-15 Desma Ct Garbutt QLD 4814 Ph 07 4796 0600 E townsville.environmental@alsenviro.com
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☐ Launceston: 27 Wellington St Launceston TAS 7250 Ph 03 6334 1549 E launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle)
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011			Custody Seal Intact? Yes / No / N/A
PROJECT: 210074 Sth Melbourne Gasworks	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice packs present upon receipt? Yes / No / N/A
ORDER NUMBER:		CC 1 2 3 4 5 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: .REGIN ORQUIZA	CONTACT PH: 9887 1666	O 1 2 3 4 5 7	Other comments:
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	S.Leong	ALS Courier
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		DATE/TIME: 27/6 9 am	DATE/TIME: 27/6 9am
Email Invoice to : rorquiza@environmentalearthsciences.com		RELINQUISHED BY: DATE/TIME:	RECEIVED BY: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).													Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - Includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
	GW34	27/06/2013	W		8	x	x	x	x	x	x	x						6.85	17	
	GW33	27/06/2013	W		8	x	x	x	x	x	x	x						6.5	16.1	
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	GW06	26/06/2013	W		8	x	x	x	x	x	x	x						6.84	16.6	
	Trip 6	26/06/2013	W							x	x									
	gw26				8	x	x	x	x	x	x	x						6.66	16.4	
					TOTAL															

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V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Friday, 28 June 2013 9:27 AM
To: Samples Melbourne
Cc: Carol Walsh
Subject: FW: South Melbourne Gasworks
Attachments: img-628084338.pdf

Hi Carol,

Can you please include the silica gel clean-up for the following samples (GW24 and GW38), refer to the attached CoC.

Thank you.

Regards

Regin

From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 4:37 PM
To: Regin Orquiza
Subject: COC FOR SAMPLES RECEIVED THIS AFTERNOON

Regin

Do you have the COC's prepared for samples received this afternoon.

Kind Regards

Carol Walsh

Senior Client Services Officer
ALS | Environmental Division

4 Westall Rd
Springvale, VIC. 3171 Australia

How was your customer experience? Please send us your feedback

Please see our latest Enviromail 67 - Aqueous Film Forming Foams (AFFFs) March 2013

T +61 3 8549 9600
F +61 3 8549 9626

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ALS Group

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306871**	Pl g	: 1ofF
y Ci r	: **ENVIRONMENTAL EARTH SCIENCES**	9l Lot rob	: Ei n oi v i rl m i M LoD
y oi rl ur	: Mc ERG Nc OQGZ	y oi rl ur	: y l bos A l eW
Zhhb ee	: P.N.d NB XX23 aNN5Ty c ZS YG VZQT5c Z9GZ 011	Zhhb ee	: , A erl c h T4 Cgnl s YG ZDer C 1F1
Ep l G	: bob-DQl z i n oi v i rl s l b Ci u e.uov	Ep l G	: ul bos@ eW l egsoLl suov
5 s 4W i	: w61 03 67F1666	5 s 4W i	: w61p p72, + 607
al ue G	: w61 03 67F17, ,	al ue G	: w61p p72, + 601
Pboj ur	: X001F, T rW M LoD Rl e@ ke	Oy n s	: l EPM l+++ T uW hDs d(3) i h Z9T Oy T3 - D v i r
Nth Dv L b	: pppp		
y pNpy Dv L b	: pppp	ml r Tl v 4s e u h	: XFpJQI pX013
Tl v 4s b	: Ta9V /	eD ml r	: 0, pJQ9pX013
T	: pppp		
		l o. of l v 4s e u h	: 6
ODor Dv L b	: MEK30K13	l o. of l v 4s e l s e h	: 6

5W b 4ob eD4 be h e l i t 4b n De b 4ob(e) @ W rW b f b i u . c eDs l 44 ro rW el v 4s (e) l e eDLv h. Zs 4l g e of rW b 4ob W n L i uW uk h l i h l 44bon h fo b s l e .

5W y b Ql r of Zi l s e uoi rl Ce W fo o@ g fob l r i :

- R i b y ov v i re
- Zi l s Ql s eDse
- TDbogl r y oi r bs 9 e

General Comments

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

- EK026SF : EM1306825-002 matrix spike failed for TCN due to possible sample interference. This has been confirmed by re-analysis.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.

WORLD RECOGNISED ACCREDITATION

[illegible]

Signatories

[illegible]

Signatories	Position	Accreditation Category
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

Analytical Results

TDLpMI rb2: WATER (MI rb2: WATER)

Compound	CAS Number	LOR	Unit	GW10	GW31	GW32	GW36	RIN4
			Client sampling date / time	XFpJQI pX0138l2:00	XFpJQI pX0138l2:00	XFpJQI pX0138l2:00	XFpJQI pX0138l2:00	XFpJQI pX0138l2:00
				EM1306871-001	EM1306871-002	EM1306871-003	EM1306871-004	EM1306871-005
EA005: pH								
pH Value	ppp	0.01	4H8Qi C	3.66	7.44	7.29	7.13	ppp
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	ppp	10	v gl9	680	2400	936	3060	ppp
ED037P: Alkalinity by PC Titrator								
Total Alkalinity as CaCO3	ppp	1	v gl9	<1	370	584	743	ppp
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	1, 707pF+p7	1	v gl9	314	314	206	549	ppp
ED045G: Chloride Discrete analyser								
Chloride	1677Fp00p6	1	v gl9	24	954	40	1040	ppp
ED093F: Dissolved Major Cations								
Calcium	F, , 0pF0pX	1	v gl9	3	78	122	80	ppp
Magnesium	F, 3+p+2p	1	v gl9	2	73	58	99	ppp
Sodium	F, , 0pX3p2	1	v gl9	137	592	80	854	ppp
Potassium	F, , 0p0+pF	1	v gl9	4	50	35	34	ppp
EG020F: Dissolved Metals by ICP-MS								
Aluminium	F, X+p+0p2	0.01	v gl9	0.03	<0.01	<0.01	0.10	ppp
Arsenic	F, , 0p37pX	0.001	v gl9	0.018	0.425	1.39	0.067	ppp
Cadmium	F, , 0p 3p+	0.0001	v gl9	0.0003	0.0001	0.0004	0.0004	ppp
Cobalt	F, , 0p 7p	0.001	v gl9	0.002	0.002	<0.001	0.002	ppp
Copper	F, , 0p20p7	0.001	v gl9	0.002	0.001	0.002	0.004	ppp
Lead	F, 3+p+Xp1	0.001	v gl9	<0.001	<0.001	0.011	0.002	ppp
Manganese	F, 3+p+6p2	0.001	v gl9	0.017	0.190	0.162	0.242	ppp
Nickel	F, , 0p0Xp0	0.001	v gl9	0.067	0.094	0.027	0.054	ppp
Selenium	FF7Xp +pX	0.01	v gl9	<0.01	<0.01	<0.01	<0.01	ppp
Zinc	F, , 0p66p6	0.002	v gl9	0.067	0.025	0.018	0.018	ppp
Boron	F, , 0p Xp7	0.02	v gl9	0.34	3.03	0.99	1.62	ppp
Iron	F, 3+p7+p6	0.02	v gl9	0.96	0.60	1.26	0.49	ppp
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	2Fp1Xp2	0.00,	v gl9	<0.00,	0.212	0.141	0.053	ppp
EK040P: Fluoride by PC Titrator								
Fluoride	16+7, p 7p7	0.1	v gl9	<0.1	3.6	2.4	3.0	ppp
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	F66, p 1pF	0.01	v gl9	<0.01	5.58	16.3	<0.01	ppp

Pl g : , 8ofF
A otk8Ntth b : EM13067F1
y sCi r : El YG NI MEI 5Z98EZc 5H8Ty GEl y ET
Pboj ur : X001F, 8TrW8M sLoDti 8Rl e@ptke

Analytical Results

TDLpMl rb2: WATER (Ml rb2: WATER)			Client sample ID	GW10	GW31	GW32	GW36	RIN4
			Client sampling date / time	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00
Compound	CAS Number	LOR	Unit	EM1306871-001	EM1306871-002	EM1306871-003	EM1306871-004	EM1306871-005
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	ppp	0.01	v gk9	<0.01	**5.49**	**16.2**	<0.01	ppp
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	ppp	0.01	v gk9	<0.01	<0.01	<0.01	**0.10**	ppp
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	1, F+Fp22p7	0.01	v gk9	**0.01**	**0.14**	**0.31**	**3.03**	ppp
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	1, X62p , pX	0.01	v gk9	<0.01	<0.01	<0.01	<0.01	ppp
EN055: Ionic Balance								
Total Anions	ppp	0.01	v - k9	**7.21**	**40.8**	**17.1**	**55.6**	ppp
Total Cations	ppp	0.01	v - k9	**6.38**	**36.9**	**15.2**	**50.2**	ppp
Ionic Balance	ppp	0.01	%	**6.22**	**5.04**	**5.72**	**5.18**	ppp
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	F1p 3pX	1	µgk9	<1	<1	**69**	<1	<1
Toluene	107p77p3	X	µgk9	<X	<X	<X	<X	<X
Ethylbenzene	100p 1p	X	µgk9	<X	<X	**3**	<X	<X
meta- & para-Xylene	107p37p38l06p Xp3	X	µgk9	<X	<X	<X	<X	<X
Styrene	100p Xp2	2	µgk9	<2	<2	<2	<2	<2
ortho-Xylene	+2p Fp6	X	µgk9	<X	<X	<X	<X	<X
Isopropylbenzene	+7p7Xp7	2	µgk9	<2	<2	<2	<2	<2
n-Propylbenzene	103p62p1	2	µgk9	<2	<2	<2	<2	<2
1.3.5-Trimethylbenzene	107p6Fp7	2	µgk9	<2	<2	<2	<2	<2
sec-Butylbenzene	132p+7p7	2	µgk9	<2	<2	<2	<2	<2
1.2.4-Trimethylbenzene	+2p63p6	2	µgk9	<2	<2	<2	<2	<2
tert-Butylbenzene	+7p06p6	2	µgk9	<2	<2	<2	<2	<2
p-Isopropyltoluene	++p7Fp6	2	µgk9	<2	<2	<2	<2	<2
n-Butylbenzene	10, p21p7	2	µgk9	<2	<2	<2	<2	<2
EP074H: Naphthalene								
Naphthalene	+1pX0p3	F	µgk9	<F	<F	<F	<F	<F
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	ppp	X0	µgk9	<X0	<X0	**70**	<X0	<X0
C10 - C14 Fraction	ppp	20	µgk9	<20	<20	<20	<20	<20
C15 - C28 Fraction	ppp	100	µgk9	<100	**110**	**120**	<100	<100
C29 - C36 Fraction	ppp	20	µgk9	**50**	<20	<20	<20	<20

Pl g	:	2&of8F
A otk8Ntth b	:	EM13067F1
y s&i r	:	El YG&NI MEI 5Z98EZc 5H8Ty G&l y ET
Pboj ur	:	X001F, 8TrW8M sLoDti 8Rl e@ptke

Analytical Results

TDLpMl rb&: WATER (Ml rb&: WATER)			Client sample ID	GW10	GW31	GW32	GW36	RIN4
			Client sampling date / time	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00	XFpJQl pX0138l2:00
Compound	*CAS Number*	*LOR*	*Unit*	**EM1306871-001**	**EM1306871-002**	**EM1306871-003**	**EM1306871-004**	**EM1306871-005**
EP080/071: Total Petroleum Hydrocarbons - Continued								
^8**C10 - C36 Fraction (sum)**	ppp	20	µgk9	**50**	**110**	**120**	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	ppp	X0	µgk9	<X0	<X0	**70**	<X0	<X0
>C10 - C16 Fraction	ppp	100	µgk9	<100	<100	<100	<100	<100
>C16 - C34 Fraction	ppp	100	µgk9	**130**	**120**	**180**	<100	<100
>C34 - C40 Fraction	ppp	100	µgk9	<100	<100	<100	<100	<100
^8**>C10 - C40 Fraction (sum)**	ppp	100	µgk9	**130**	**120**	**180**	<100	<100
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1F060p0Fp0	0.1	%	**87.1**	**83.8**	**90.0**	**90.8**	**85.7**
Toluene-D8	X03FpX6p2	0.1	%	**108**	**105**	**108**	**110**	**104**
4-Bromofluorobenzene	, 60p00p,	0.1	%	**104**	**101**	**102**	**102**	**99.6**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1F060p0Fp0	0.1	%	**83.4**	**80.2**	**86.2**	**87.5**	**82.0**
Toluene-D8	X03FpX6p2	0.1	%	**96.9**	**94.3**	**97.2**	**98.4**	**93.4**
4-Bromofluorobenzene	, 60p00p,	0.1	%	**98.9**	**92.4**	**99.4**	**98.4**	**93.7**

Analytical Results

TDLpMI rb2: WATER (MI rb2: WATER)			Client sample ID	Trip 7	----	----	----	----
			Client sampling date / time	XFpJQI pX01381 2:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1306871-006	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	F1p 3pX	1	µgI9	<1	----	----	----	----
Toluene	107p77p3	X	µgI9	<X	----	----	----	----
Ethylbenzene	100p 1p	X	µgI9	<X	----	----	----	----
meta- & para-Xylene	107p37p38I 06p Xp3	X	µgI9	<X	----	----	----	----
Styrene	100p Xp2	2	µgI9	<2	----	----	----	----
ortho-Xylene	+2p Fp6	X	µgI9	<X	----	----	----	----
Isopropylbenzene	+7p7Xp7	2	µgI9	<2	----	----	----	----
n-Propylbenzene	103p62p1	2	µgI9	<2	----	----	----	----
1.3.5-Trimethylbenzene	107p6Fp7	2	µgI9	<2	----	----	----	----
sec-Butylbenzene	132p+7p7	2	µgI9	<2	----	----	----	----
1.2.4-Trimethylbenzene	+2p63p6	2	µgI9	<2	----	----	----	----
tert-Butylbenzene	+7p06p6	2	µgI9	<2	----	----	----	----
p-Isopropyltoluene	++p7Fp6	2	µgI9	<2	----	----	----	----
n-Butylbenzene	10, p21p7	2	µgI9	<2	----	----	----	----
EP074H: Naphthalene								
Naphthalene	+1pX0p3	F	µgI9	<F	----	----	----	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1F060p0Fp0	0.1	%	**86.4**	----	----	----	----
Toluene-D8	X03FpX6p2	0.1	%	**98.5**	----	----	----	----
4-Bromofluorobenzene	, 60p00p	0.1	%	**94.6**	----	----	----	----

Surrogate Control Limits

TDLpMl rb2: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	1F060p0Fp0	6+	133
Toluene-D8	X03FpX6p2	FX	1X7
4-Bromofluorobenzene	, 60p00p,	F0	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	1F060p0Fp0	F0	13X
Toluene-D8	X03FpX6p2	6+	1X2
4-Bromofluorobenzene	, 60p00p,	61	1X+

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM13067V1**	Page	: 8 1o88
ylGi r	: **ENHIRONMENTAL EARTS | CIENCE|**	f aL1bar1bt	: ni EGb1i v ei ral mGEGSGi DelL1Mbi e
y 1i raur	: Dc c nRG: Nc OQGUZ	y 1i raur	: yab1l A alsW
Zhhbess	: P.N.dNB XX25 FNN3Ty c ZS YGy VZQT3 c Zf GZ 5088	Zhhbess	: , A esrall c h T4bGgEale YGy ZMsrbalGa 58p8
n7v aG	: b1b- MGqaz ei EGb1i v ei raleabrWsuGi ues.u1v	n7v aG	: uab1l.@alsWz alsgl1Lal.u1v
3ele4Wli e	: w+8 05 6+9p8+++	3ele4Wli e	: w+875792, 6 6+09
FausGv Ge	: w+8 05 6+9p89, ,	FausGv Ge	: w+875792, 6 6+08
Pb1jeur	: X008p, TrWDelL1Mbi e Ras@lbks	Oy f eEel	: I nPD 8666 TuWehMe d(5) ai h Zf T Oy T5 be- MGev ei r
TGe	: 7777		
y7N7y i Mv Leb	: 7777	mare Tav 4les c eueGeh	: Xp7JQI 7X085
Tav 4leb	: TFf V/ /	GsMe mare	: 0, 7JQf 7X085
NGhebi Mv Leb	: 7777		
		I 1. 1osav 4les beueGeh	: +
OMlre i Mv Leb	: Dnk650k85	I 1. 1osav 4les ai alt seh	: +

3WS be41br sM4lebsehes ai t 4beEGMs be41br(s) @GW rWS beoebei ue. c esMrs a44lt r1 rWe sav 4le(s) as sMLv Greh. ZII 4ages 1o rWS be41br WaEe Leei uWeukeh ai h a44b1Eeh olt belease.

3WS OMalGt y 1i rb1l c e41br u1i raGs rWe olll1@GCg GGo1bv arGi :

- f aL1bar1bt mM4lGare (mQP) c e41br; c elarGe Pebuei rage mGebei ue (c Pm) ai h Zuue4rai ue f Gv Gs
- DerWlh dlai k (Dd) ai h f aL1bar1bt y 1i rb1l T4Ge (f y T) c e41br; c eu1Eebt ai h Zuue4rai ue f Gv Gs
- Darb@ T4Ge (DT) c e41br; c eu1Eebt ai h Zuue4rai ue f Gv Gs

General Comments

3We ai alt rQal 4b1uehMbes Mseh Lt rWe ni E01i v ei ral mGSCi WaEe Leei heEel14eh db1v esraLIGWeh Crebi arCi allt beu1gi Qeh 4b1uehMbes sMuW as rWIse 4MLIGWeh Lt rWe QTnPZV ZPHZV ZT ai h I nPD. G WIMse heEel14eh 4b1uehMbes abe ev 4l1t eh C rWe aLsei ue 1oh1uMv ei reh srai hatbs 1bLt ulGi r be- Mesr.

A Webe v 1GrMbe herebv CarCi Was Leei 4ebo1bv ehVbesMrs abe be41breh 1i a hbt @eGW LasG.

A Webe a be41breh less rWai (<) besMr G WGWebrWai rWe f Nc VrWS v at Le hMe r1 4bO abt sav 4le exrbaurKGesrare hCMCi ai hK1bCsMbOGi r sav 4le d bai alt sG.

A Webe rWe f Nc 1oa be41breh besMr hObebs db1v srai hatbh f Nc VrWS v at Le hMe r1 WGWv 1GrMbe u1i rei rVCsMbOGi r sav 4le (behMueh @eGW ev 4l1t eh) 1bv arbQ Crebebei ue.

/ et :

Zi 1i t v 1Ms = c eoebs r1 sav 4les @MWabe i 1r s4euQallt 4abr 1orWS @1tk 1thebLMr d bv eh 4abr 1orWe Oy 4b1uess l1r

y ZT I Mv Leb= y ZT begGrbt i Mv Lebdb1v haraLase v aCraCeh Lt y Wev Qal ZLsrbaurs TebEOes. 3We y Wev Qal ZLsrbaurs TebEOe G a hCSCi 1orWe Zv ebQai y Wev Qal T1uGrt .

f Nc = f Q C 1obe41brCg

c Pm = c elarGe Pebuei rage mObebei ue

= GhQares aQeh Oy

I Z3Z Zuubeh@eh f aL1bar1bt 9X2

Zuubeh@eh d b u1v 4lGi ue @GW GNKGy 8p0X2.

Signatories

3WS h1uMv ei r Was Leei eleurb1i Qallt sQi eh Lt rWe aMWbQeh sQi ar1bGs ChQareh Lel1@ nleurb1i Q sQi Cg Was Leei uabbGeh 1Mr C u1v 4lGi ue @CV 4b1uehMbes s4euQeh C X8 y Fc Pabr 88.

Signatories	Position	Accreditation Category
mCai CFebi ai h1	Tei CbG1bgai Q y Wev Gr	DelL1Mbi e G1bgai Qs
		DelL1Mbi e G1bgai Qs
Hebv ai f C	f aL1bar1bt y 11bhCar1b	DelL1Mbi e G1bgai Qs
		DelL1Mbi e G1bgai Qs
		DelL1Mbi e G1bgai Qs
		DelL1Mbi e G1bgai Qs
I ai ut A ai g	Tei CbTev E1larGe GsrbMv ei r y Wev Gr	DelL1Mbi e Nbgai Qs
YabsWa H1 A Cg	I 1i 7Derals 3eav f eaheb	DelL1Mbi e G1bgai Qs
		DelL1Mbi e G1bgai Qs
BCgLC f C	Tei CbNbgai Q y Wev Gr	DelL1Mbi e Nbgai Qs
		DelL1Mbi e Nbgai Qs

Laboratory Duplicate (DUP) Report

3We -Mal@t u1i rb1l rebv f aL1bar1bt mM4lQare beebs r1 a bai h1v lt seleureh CrbalaL1bar1bt s4lC f aL1bar1bt hM4lQares 4b1EQe Col bv arCi begathCg v erWh 4beuGCi ai h sav 4le Werebi gei eCt. 3We 4ebv Creh bai ges olb rWe celarCe Pebuei r meECarCi (c Pm) 1o f aL1bar1bt mM4lQares abe s4eu@h C ZfT DerWh OA GhI K9 ai h abe he4ei hei r 1i rWe v agi CMhe 1o besMrs C u1v 4abS1i r1 rWe leEel 1o be41brCg: c esMr < 80 rQ es f Nc:7 I 1 f Q C, c esMr Ler@eei 80 ai h X0 rQ es f Nc:70% 720%; c esMr > X0 rQ es f Nc:70% 7X0%.

TML7Darb@: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA005: pS (QC Lot: 2941402)									
nD850+9p87008	RA 80	nZ002: 4H YalMe	7777	0.08	4H Qi C	5.++	5.+9	0.2	0% 7X0%
nD850+9p+700+	Zi 1i t v 1Ms	nZ002: 4H YalMe	7777	0.08	4H Qi C	p.8p	p.X0	0.,	0% 7X0%
EA015: Total Dissolved | olids (QC Lot: 29425V1)									
nD850+p997008	Zi 1i t v 1Ms	nZ082H: 31ral mGs1lEeh T1lCs z 890°y	7777	80	v gK	+, X	+, 0	0.5	0% 7X0%
nD850+9+X700,	Zi 1i t v 1Ms	nZ082H: 31ral mGs1lEeh T1lCs z 890°y	7777	80	v gK	86+	X00	X.0	0% 720%
ED03VP: Alkalinity by PC Titrator (QC Lot: 2943214)									
nD850+9807008	Zi 1i t v 1Ms	nm05p7P: 31ral ZlkalCCt as y ay N5	7777	8	v gK	, X8	, X0	0.0	0% 7X0%
nD850+99, 700X	Zi 1i t v 1Ms	nm05p7P: 31ral ZlkalCCt as y ay N5	7777	8	v gK	920	9, 9	0.X	0% 7X0%
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QC Lot: 2941244)									
nD850+9p87008	RA 80	nm0, 8R: TMcare as TN, 73MLCQ erbQ	8, 9097p679	8	v gK	58,	58,	0.0	0% 7X0%
nD850+9p+7002	Zi 1i t v 1Ms	nm0, 8R: TMcare as TN, 73MLCQ erbQ	8, 9097p679	8	v gK	566	56,	8.X	0% 7X0%
ED045G: Chloride Discrete analyser (QC Lot: 2941247)									
nD850+9p87008	RA 80	nm0, 2R: y W1bCe	8+99p7007+	8	v gK	X,	X5	0.0	0% 7X0%
nD850+9p+7002	Zi 1i t v 1Ms	nm0, 2R: y W1bCe	8+99p7007+	8	v gK	9	9	0.0	I 1 f Q C
ED093F: Dissolved Major Cations (QC Lot: 2941245)									
nD850+9p87008	RA 80	nm065F: y aluCMv	p, , 07p07X	8	v gK	5	5	0.0	I 1 f Q C
		nm065F: Dagi esCMv	p, 567627,	8	v gK	X	X	0.0	I 1 f Q C
		nm065F: T1hCMv	p, , 07X572	8	v gK	85p	856	8.2	0% 7X0%
		nm065F: P1rassCMv	p, , 07067p	8	v gK	,	,	0.0	I 1 f Q C
nD850+9p+7002	Zi 1i t v 1Ms	nm065F: y aluCMv	p, , 07p07X	8	v gK	886	886	0.0	0% 7X0%
		nm065F: Dagi esCMv	p, 567627,	8	v gK	52	52	0.0	0% 7X0%
		nm065F: T1hCMv	p, , 07X572	8	v gK	X9	Xp	0.0	0% 7X0%
		nm065F: P1rassCMv	p, , 07067p	8	v gK	80	80	0.0	0% 720%
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2943613)									
nD850+p997008	Zi 1i t v 1Ms	nR0X0Z7F: y ahv CMv	p, , 07, 576	0.0008	v gK	<0.0008	<0.0008	0.0	I 1 f Q C
		nR0X0Z7F: Zbsei Q	p, , 07597X	0.008	v gK	0.00p	0.009	0.0	I 1 f Q C
		nR0X0Z7F: y 1Lalr	p, , 07, 97,	0.008	v gK	<0.008	<0.008	0.0	I 1 f Q C
		nR0X0Z7F: y 144eb	p, , 072079	0.008	v gK	0.00,	0.00,	0.0	I 1 f Q C
		nR0X0Z7F: f eah	p, 5676X78	0.008	v gK	<0.008	<0.008	0.0	I 1 f Q C
		nR0X0Z7F: Dai gai ese	p, 5676+72	0.008	v gK	0.052	0.05+	5.X	0% 7X0%
		nR0X0Z7F: I Ckel	p, , 070X70	0.008	v gK	0.00p	0.009	85.0	I 1 f Q C
		nR0X0Z7F: UCu	p, , 07++7+	0.002	v gK	0.058	0.05X	5.+	I 1 f Q C
		nR0X0Z7F: ZIMv CCMv	p, X676072	0.08	v gK	0.0X	0.0X	0.0	I 1 f Q C
		nR0X0Z7F: Telei CMv	pp9X7, 67X	0.08	v gK	<0.08	<0.08	0.0	I 1 f Q C
		nR0X0Z7F: d1b1i	p, , 07, X79	0.02	v gK	8.0p	8.8X	2.0	0% 7X0%

TML7Darb@: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2943613) 8continued									
nD850+p997008	Zi 1i t v 1Ms	nR0X0Z7F: @1i	p, 567967+	0.02	v gK	<0.02	<0.02	0.0	I 1 f @ C
nD850+9+X700,	Zi 1i t v 1Ms	nR0X0Z7F: y ahv @V	p, , 07, 576	0.0008	v gK	<0.0008	<0.0008	0.0	I 1 f @ C
		nR0X0Z7F: Zbsei @	p, , 07597X	0.008	v gK	<0.008	<0.008	0.0	I 1 f @ C
		nR0X0Z7F: y 1Lalr	p, , 07, 97,	0.008	v gK	<0.008	<0.008	0.0	I 1 f @ C
		nR0X0Z7F: y 144eb	p, , 072079	0.008	v gK	0.002	0.002	0.0	I 1 f @ C
		nR0X0Z7F: f eah	p, 5676X78	0.008	v gK	<0.008	<0.008	0.0	I 1 f @ C
		nR0X0Z7F: Dai gai ese	p, 5676+72	0.008	v gK	0.0+X	0.026	, .p	0% 7X0%
		nR0X0Z7F: I @kel	p, , 070X70	0.008	v gK	0.008	0.008	0.0	I 1 f @ C
		nR0X0Z7F: U@u	p, , 07++7+	0.002	v gK	0.08,	0.085	9.,	I 1 f @ C
		nR0X0Z7F: ZIM C@V	p, X676072	0.08	v gK	0.06	0.80	0.0	0% 720%
		nR0X0Z7F: Telei @V	pp9X7, 67X	0.08	v gK	<0.08	<0.08	0.0	I 1 f @ C
		nR0X0Z7F: d 1b1i	p, , 07, X79	0.02	v gK	<0.02	<0.02	0.0	I 1 f @ C
		nR0X0Z7F: @1i	p, 567967+	0.02	v gK	0., 6	0., 9	0.0	I 1 f @ C
EK026| F: Total CN by | egmented Flow Analyser (QC Lot: 2941314)									
nD850+9X27008	Zi 1i t v 1Ms	n/ 0X+TF: 31ral y t ai @e	2p78X72	0.00,	v gK	<0.00,	<0.00,	0.0	I 1 f @ C
nD850+9X2708X	Zi 1i t v 1Ms	n/ 0X+TF: 31ral y t ai @e	2p78X72	0.00,	v gK	<0.00,	<0.00,	0.0	I 1 f @ C
EK040P: Fluoride by PC Titrator (QC Lot: 2943213)									
nD850+p997008	Zi 1i t v 1Ms	n/ 0, 0P: FIM1b@e	8+69, 7, 979	0.8	v gK	0.6	0.6	0.0	I 1 f @ C
nD850+9807008	Zi 1i t v 1Ms	n/ 0, 0P: FIM1b@e	8+69, 7, 979	0.8	v gK	0.+	0.+	0.0	I 1 f @ C
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2941453)									
nD850+95p7008	Zi 1i t v 1Ms	n/ 022R: Zv v 1i @ as I	p++, 7, 87p	0.08	v gK	8X.,	8X+	8.0	0% 7X0%
nD850+9p+7002	Zi 1i t v 1Ms	n/ 022R: Zv v 1i @ as I	p++, 7, 87p	0.08	v gK	0.89	0.89	0.0	0% 720%
EK05VG: Nitrite as N by Discrete Analyser (QC Lot: 2941246)									
nD850+9p87008	RA 80	n/ 02pR: I @b@e as I	7777	0.08	v gK	<0.08	<0.08	0.0	I 1 f @ C
nD850+9p+7002	Zi 1i t v 1Ms	n/ 02pR: I @b@e as I	7777	0.08	v gK	<0.08	<0.08	0.0	I 1 f @ C
EK0V1G: Reactive Phosphorus as P by discrete analyser (QC Lot: 294124V)									
nD850+9p87008	RA 80	n/ 0p8R: c eaur@e PWIs4W1bMs as P	8, X+27, , 7X	0.08	v gK	<0.08	<0.08	0.0	I 1 f @ C
nD850+9p+7002	Zi 1i t v 1Ms	n/ 0p8R: c eaur@e PWIs4W1bMs as P	8, X+27, , 7X	0.08	v gK	0.09	0.09	0.0	I 1 f @ C
EP0V4A: Monocyclic Aromatic Sydrocarbons (QC Lot: 2941V33)									
nD850+p697008	Zi 1i t v 1Ms	nP0p, : dei qei e	p87, 57X	8	µgK	8	8	0.0	I 1 f @ C
		nP0p, : 31IMei e	80979975	X	µgK	<X	<X	0.0	I 1 f @ C
		nP0p, : nWILei qei e	8007, 87,	X	µgK	<X	<X	0.0	I 1 f @ C
		nP0p, : v era7& 4aba7Bt lei e	80975975 80+7, X75	X	µgK	<X	<X	0.0	I 1 f @ C
		nP0p, : 1bW17Bt lei e	627, p7+	X	µgK	<X	<X	0.0	I 1 f @ C
		nP0p, : Trt bei e	8007, X72	2	µgK	<2	<2	0.0	I 1 f @ C
		nP0p, : @14b14t ILei qei e	6979X79	2	µgK	<2	<2	0.0	I 1 f @ C
		nP0p, : i 7Pb14t ILei qei e	8057+278	2	µgK	<2	<2	0.0	I 1 f @ C
		nP0p, : 8.5.273b@ erWILei qei e	8097+p79	2	µgK	<2	<2	0.0	I 1 f @ C

TML7D arb2: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP0V4A: Monocyclic Aromatic Sydrocarbons (QC Lot: 2941V33) 8continued									
nD850+p697008	Zi 1i t v 1Ms	nP0p, : seu7d Mt lLei qei e	8527697 9	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : 8.X, 73bQ erWlLei qei e	627+57+	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : reb7d Mt lLei qei e	6970+7+	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : 47G14b14t lr1lMei e	6679p7+	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : i 7d Mt lLei qei e	80, 7287 9	2	µg/K	<2	<2	0.0	I 1 f Q C
nD850+9p87008	RA 80	nP0p, : d ei qei e	p87, 57X	8	µg/K	<8	<8	0.0	I 1 f Q C
		nP0p, : 3 1lMei e	8097997 5	X	µg/K	<X	<X	0.0	I 1 f Q C
		nP0p, : nrWlLei qei e	8007, 87,	X	µg/K	<X	<X	0.0	I 1 f Q C
		nP0p, : v era7& 4aba7Bt lei e	8097597 5 80+7, X75	X	µg/K	<X	<X	0.0	I 1 f Q C
		nP0p, : 1bW17Bt lei e	627, p7+	X	µg/K	<X	<X	0.0	I 1 f Q C
		nP0p, : Trt bei e	8007, X72	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : G14b14t lLei qei e	6979X79	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : i 7Pb14t lLei qei e	8057+27 8	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : 8.5.273bQ erWlLei qei e	8097+p79	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : seu7d Mt lLei qei e	8527697 9	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : 8.X, 73bQ erWlLei qei e	627+57+	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : reb7d Mt lLei qei e	6970+7+	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : 47G14b14t lr1lMei e	6679p7+	2	µg/K	<2	<2	0.0	I 1 f Q C
		nP0p, : i 7d Mt lLei qei e	80, 7287 9	2	µg/K	<2	<2	0.0	I 1 f Q C
EP0V4S: Naphthalene (QC Lot: 2941V33)									
nD850+p697008	Zi 1i t v 1Ms	nP0p, : I a4WWalei e	687X07 5	p	µg/K	<p	<p	0.0	I 1 f Q C
nD850+9p87008	RA 80	nP0p, : I a4WWalei e	687X07 5	p	µg/K	<p	<p	0.0	I 1 f Q C
EP070/0V1: Total Petroleum Sydrocarbons (QC Lot: 2941011)									
nD850+9p87008	RA 80	nP0p8: y 82 7y X9 FbaurGi	7777	800	µg/K	<800	<800	0.0	I 1 f Q C
		nP0p8: y 80 7y 8, FbaurGi	7777	20	µg/K	<20	<20	0.0	I 1 f Q C
		nP0p8: y X6 7y 5+ FbaurGi	7777	20	µg/K	20	20	0.0	I 1 f Q C
nD850+9p87005	RA 5X	nP0p8: y 82 7y X9 FbaurGi	7777	800	µg/K	8X0	<800	X8.+	I 1 f Q C
		nP0p8: y 80 7y 8, FbaurGi	7777	20	µg/K	<20	<20	0.0	I 1 f Q C
		nP0p8: y X6 7y 5+ FbaurGi	7777	20	µg/K	<20	<20	0.0	I 1 f Q C
EP070/0V1: Total Petroleum Sydrocarbons (QC Lot: 2941V34)									
nD850+p697008	Zi 1i t v 1Ms	nP090: y + 7y 6 FbaurGi	7777	X0	µg/K	<X0	<X0	0.0	I 1 f Q C
nD850+9p87008	RA 80	nP090: y + 7y 6 FbaurGi	7777	X0	µg/K	<X0	<X0	0.0	I 1 f Q C
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QC Lot: 2941011)									
nD850+9p87008	RA 80	nP0p8: >y 80 7y 8+ FbaurGi	7777	800	µg/K	<800	<800	0.0	I 1 f Q C
		nP0p8: >y 8+ 7y 5, FbaurGi	7777	800	µg/K	850	850	0.0	I 1 f Q C
		nP0p8: >y 5, 7y , 0 FbaurGi	7777	800	µg/K	<800	<800	0.0	I 1 f Q C
nD850+9p87005	RA 5X	nP0p8: >y 80 7y 8+ FbaurGi	7777	800	µg/K	<800	<800	0.0	I 1 f Q C
		nP0p8: >y 8+ 7y 5, FbaurGi	7777	800	µg/K	890	880	, , .X	I 1 f Q C
		nP0p8: >y 5, 7y , 0 FbaurGi	7777	800	µg/K	<800	<800	0.0	I 1 f Q C

TML7Darb@: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QC Lot: 2941V34)									
nD850+p697008	Zi 1i t v 1Ms	nP090: y + 7y 80 FbaurCi	7777	X0	µg/K	<X0	<X0	0.0	I 1 f Q C
nD850+9p87008	RA 80	nP090: y + 7y 80 FbaurCi	7777	X0	µg/K	<X0	<X0	0.0	I 1 f Q C

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

3We - MalQt u1i rb1l rebv DerWh K f aL1bar1bt dlai k beebs r1 ai ai alt re dbee v arb& r1 @WW all beagei rs abe ahheh C rWe sav e E1IMv es 1b 4b141brGi s as Mseh C srai hath sav 4le 4be4abarGi . 3We 4Mb41se 1o rWS Oy 4abav ereb G r1 v 1i C1b 41rei rGl laL1bar1bt u1i rav CarGi . 3We - MalQt u1i rb1l rebv f aL1bar1bt y 1i rb1l Tav 4le (f y T) beebs r1 a uebrGeh beebei ue v arebalV 1b a ki 1@ Crebebei ue dbee v arb& s4Geh @GW rabger ai alt res. 3We 4Mb41se 1orWS Oy 4abav erebG r1 v 1i C1bv erWh 4beuGGi ai h auuMaut Che4ei hei r 1osav 4le v arb&. mt i av Q c eu1Ebt f Q Gs abe Laseh 1i srarGrQal eEalMarGi 1o4b1uesseh f y T.

TML7D arb&: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EA015: Total Dissolved | olids (QCLot: 29425V1)								
nZ082H: 31ral mGs1lEeh T1lQs z 890°y	7777	80	v gK	<80	X000 v gK	805	69	80,
ED03VP: Alkalinity by PC Titrator (QCLot: 2943214)								
nm05p7P: 31ral ZlkalCQt as y ay N5	7777	8	v gK	7777	X00 v gK	6p.2	68	802
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2941244)								
nm0, 8R: TMoare as TN, 73MLQQ erbQ	8, 9097p679	8	v gK	<8	X2 v gK	802	98	8X2
ED045G: Chloride Discrete analyser (QCLot: 2941247)								
nm0, 2R: y W1bQe	8+99p7007+	8	v gK	<8	80 v gK	805	96	88p
ED093F: Dissolved Major Cations (QCLot: 2941245)								
nm065F: y aluQW	p, , 07p07X	8	v gK	<8	2 v gK	6p.+	95	8X6
nm065F: Dagi esQW	p, 567627,	8	v gK	<8	2 v gK	6p.5	90	8X,
nm065F: T1hQW	p, , 07X572	8	v gK	<8	20 v gK	80,	pp	8X2
nm065F: P1rassQW	p, , 07067p	8	v gK	<8	20 v gK	80p	pp	8X5
EG020F: Dissolved Metals by ICP8M| (QCLot: 2943613)								
nR0X0Z7F: ZlMv CQW	p, X676072	0.08	v gK	<0.08	0.2 v gK	66.0	60	880
nR0X0Z7F: Zbsei Q	p, , 07597X	0.008	v gK	<0.008	0.8 v gK	80X	65	806
nR0X0Z7F: y ahv QW	p, , 07, 576	0.0008	v gK	<0.0008	0.8 v gK	62.2	92	888
nR0X0Z7F: y 1Lalr	p, , 07, 97,	0.008	v gK	<0.008	0.8 v gK	6, .0	9p	888
nR0X0Z7F: y 144eb	p, , 072079	0.008	v gK	<0.008	0.8 v gK	800	9+	880
nR0X0Z7F: f eah	p, 5676X78	0.008	v gK	<0.008	0.8 v gK	808	99	88X
nR0X0Z7F: Dai gai ese	p, 5676+72	0.008	v gK	<0.008	0.8 v gK	66.8	9+	880
nR0X0Z7F: I Qkel	p, , 070X70	0.008	v gK	<0.008	0.8 v gK	69.,	9+	88X
nR0X0Z7F: Telei QW	pp9X7, 67X	0.08	v gK	<0.08	0.8 v gK	69.,	92	888
nR0X0Z7F: UQu	p, , 07++7+	0.002	v gK	<0.002	0.8 v gK	800	95	885
nR0X0Z7F: d 1b1i	p, , 07, X79	0.02	v gK	<0.02	0.8 v gK	62.X	pX	8X+
nR0X0Z7F: Q1i	p, 567967+	0.02	v gK	<0.02	0.2 v gK	80X	99	88X
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2941314)								
n/ 0X+TF: 31ral y t ai Qe	2p78X72	0.00,	v gK	<0.00,	0.X v gK	6+.0	p2	885
EK040P: Fluoride by PC Titrator (QCLot: 2943213)								
n/ 0, 0P: FlMbQe	8+69, 7, 979	0.8	v gK	<0.8	2 v gK	808	p9	8X0
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2941453)								
n/ 022R: Zv v 1i Q as I	p++, 7, 87p	0.08	v gK	<0.08	8.0 v gK	6+.X	p+	8XX
EK05VG: Nitrite as N by Discrete Analyser (QCLot: 2941246)								
n/ 02pR: I QbQe as I	7777	0.08	v gK	<0.08	0.2 v gK	802	9,	88X

TML7Darb0&: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK0V1G: Reactive Phosphorus as P by discrete analyser (QCLot: 294124V)								
n/ 0p8R: c eaurGEe PWls4WlbMs as P	8, X+27, , 7X	0.08	v gK	<0.08	0.2 v gK	808	9,	809
EP0V4A: Monocyclic Aromatic Sydrocarbons (QCLot: 2941V33)								
n P0p, : dei qei e	p87, 57X	8	µgK	<8	X0 µgK	65.6	p+	8XX
n P0p, : 31lMei e	80979975	X	µgK	<X	X0 µgK	62.9	p6	8X5
n P0p, : nrWlLei qei e	8007, 87,	X	µgK	<X	X0 µgK	60.8	p+	889
n P0p, : v era7& 4aba7Btlei e	80975975 80+7, X75	X	µgK	<X	, 0 µgK	65.2	p2	8X8
n P0p, : Trtbei e	8007, X72	2	µgK	<2	X0 µgK	6+.X	pX	889
n P0p, : 1brWl7Btlei e	627, p7+	X	µgK	<X	X0 µgK	6X.X	90	8X0
n P0p, : G14b14tlLei qei e	6979X79	2	µgK	<2	X0 µgK	9p.X	p8	886
n P0p, : i 7Pb14tlLei qei e	8057+278	2	µgK	<2	X0 µgK	p6.6	+6	885
n P0p, : 8.5.273bQ erWlLei qei e	8097+p79	2	µgK	<2	X0 µgK	95.6	p0	88,
n P0p, : seu7dMtlLei qei e	85276979	2	µgK	<2	X0 µgK	9X.X	p8	882
n P0p, : 8.X., 73bQ erWlLei qei e	627+57+	2	µgK	<2	X0 µgK	92.+	p0	88,
n P0p, : reb7dMtlLei qei e	6970+7+	2	µgK	<2	X0 µgK	9, .X	pX	88,
n P0p, : 47G14b14tlr1lMei e	6679p7+	2	µgK	<2	X0 µgK	9X.5	+9	88,
n P0p, : i 7dMtlLei qei e	80, 72879	2	µgK	<2	X0 µgK	p+.8	+8	882
EP0V4S: Naphthalene (QCLot: 2941V33)								
n P0p, : I a4WWalei e	687X075	p	µgK	<p	X0 µgK	6X.+	p2	8X8
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941011)								
n P0p8: y 80 7y 8, FbaurGi	7777	20	µgK	<20	5+80 µgK	p2.6	, +	8X+
n P0p8: y 82 7y X9 FbaurGi	7777	800	µgK	<800	805, 0 µgK	92.p	22	8X2
n P0p8: y X6 7y 5+ FbaurGi	7777	20	µgK	<20	5p60 µgK	99.5	22	8X6
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941V34)								
n P090: y + 7y 6 FbaurGi	7777	X0	µgK	<X0	5+0 µgK	80+	+0	8X+
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941011)								
n P0p8: >y 80 7y 8+ FbaurGi	7777	800	µgK	<800	20p0 µgK	9, .8	25	8X6
n P0p8: >y 8+ 7y 5, FbaurGi	7777	800	µgK	<800	88X50 µgK	96.2	2+	85X
n P0p8: >y 5, 7y , 0 FbaurGi	7777	800	µgK	<800	8080 µgK	p9.+	28	85p
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941V34)								
n P090: y + 7y 80 FbaurGi	7777	X0	µgK	<X0	, 20 µgK	80,	2+	850

Matrix Spike (MS) Report

3We -MalGt u1i rb1l reb/ Darb0& T4Ge (DT) beeebs r1 ai GrbalaL1bar1bt s4lGc sav 4le s4Geh @G0/ a be4besei ranGEe ser 1o rabger ai alt res. 3We 4Mb41se 1o rWS Oy 4abav ereb Gs r1 v 1i Gc1b 41rei rGl v arb0& eoeeurs 1i ai alt re beu1Eebes. Trar0 c eu1Eebt f0 Gs as 4eblaL1bar1bt mara OMalGt NLjeurGEes (mONs). Geal beu1Eebt bai ges srareh v at Le @aGEeh C rWe eEei r 1osav 4le v arb0& Crebeebei ue.

TML7Darb0&: **WATER**

Matrix Spike (MS) Report		
Spike	SpikeRecovery(%)	Recovery Limits (%)

TML7Darb@: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2941244)							
nD850+9p8700X	RA 58	nm0, 8R: TMcare as TN, 73MbLCbV erb@	8, 9097p679	80 v gK	# I 1r mereby C eh	p0	850
ED045G: Chloride Discrete analyser (QCLot: 2941247)							
nD850+9p8700X	RA 58	nm0, 2R: y W1b@e	8+99p7007+	, 00 v gK	p6.5	p0	850
EG020F: Dissolved Metals by ICP8M| (QCLot: 2943613)							
nD850+p997008	Zi 1i t v 1Ms	nR0X0Z7F: Zbsei @	p, , 07597X	0.X v gK	888	96	856
		nR0X0Z7F: y ahv @V	p, , 07, 576	0.02 v gK	88X	p2	858
		nR0X0Z7F: y 1Lalr	p, , 07, 97,	0.X v gK	880	pp	8X6
		nR0X0Z7F: y 144eb	p, , 072079	0.X v gK	880	p8	8Xp
		nR0X0Z7F: f eah	p, 5676X78	0.X v gK	885	p8	8X5
		nR0X0Z7F: Dai gai ese	p, 5676+72	0.X v gK	880	++	85X
		nR0X0Z7F: I @kel	p, , 070X70	0.X v gK	880	p5	8X6
		nR0X0Z7F: U@u	p, , 07++7+	0.X v gK	888	+9	85+
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2941314)							
nD850+9X2700X	Zi 1i t v 1Ms	n/ 0X+TF: 31ral y t ai @e	2p78X72	0.X v gK	# 28.6	p0	850
EK040P: Fluoride by PC Titrator (QCLot: 2943213)							
nD850+9p87008	RA 80	n/ 0, 0P: FlM1b@e	8+69, 7, 979	2.0 v gK	80+	p0	850
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2941453)							
nD850+9p87008	RA 80	n/ 022R: Zv v 1i @a s l	p++, 7, 87p	8.0 v gK	880	p0	850
EK05VG: Nitrite as N by Discrete Analyser (QCLot: 2941246)							
nD850+9p8700X	RA 58	n/ 02pR: I @b@e as l	7777	0.2 v gK	805	p0	850
EK0V1G: Reactive Phosphorus as P by discrete analyser (QCLot: 294124V)							
nD850+9p8700X	RA 58	n/ 0p8R: c eaur@e PW1s4W1bMs as P	8, X+27, , 7X	0.2 v gK	809	p0	850
EP0V4A: Monocyclic Aromatic Sydrocarbons (QCLot: 2941V33)							
nD850+p69700X	Zi 1i t v 1Ms	nP0p, : dei qei e	p87, 57X	X0 µgK	62.p	+,	8X8
		nP0p, : 31IMei e	80979975	X0 µgK	805	+5	8X2
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941011)							
nD850+9p8700X	RA 58	nP0p8: y 80 7y 8, Fbaur@i	7777	5+80 µgK	9p.,	, 0	850
		nP0p8: y 82 7y X9 Fbaur@i	7777	805, 0 µgK	68.p	28	8, 2
		nP0p8: y X6 7y 5+ Fbaur@i	7777	5p60 µgK	6, .,	2X	8, ,
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941V34)							
nD850+p69700X	Zi 1i t v 1Ms	nP090: y + 7y 6 Fbaur@i	7777	X90 µgK	92.0	, +	8X+
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941011)							
nD850+9p8700X	RA 58	nP0p8: >y 80 7y 8+ Fbaur@i	7777	20p0 µgK	65.,	, +	8, X
		nP0p8: >y 8+ 7y 5, Fbaur@i	7777	88X50 µgK	62.,	2X	8, +

TML7D arb@: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941011) 8continued							
nD850+9p8700X	RA 58	nP0p8: >y 5, 7y , 0 FbaurGi	7777	8080 µgK	95.p	, 6	8, 5
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941V34)							
nD850+p69700X	Zi 1i t v 1Ms	nP090: y + 7y 80 FbaurGi	7777	550 µgK	95.,	, 2	8Xp

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

3We -MalG u1i rb1l reb/ Darb@ T4Ge (DT) ai h Darb@ T4Ge mM4lGare (DTm) beebs r1 CrbalaL1bar1bt s4lC sav 4les s4Geh @GW a be4besei rarGe ser 1o rabger ai alt res. 3We 4Mb41se 1o rWese Oy 4abav erebs abe r1 v 1i C1b41rei r@l v arb@ eoeeurs 1i ai alt re beu1EebGs. TrarQ c eu1Eebt f Q Gs as 4eblaL1bar1bt mara OMalGt NLjeurGes (mONs). Geal beu1Eebt bai ges srareh v at Le @aGeh C rWe eEei r 1osav 4le v arb@ Crebebei ue.

TML7D arb@: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPDs (%) Value	RPDs (%) Control Limit
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941011)										
nD850+9p8700X	RA 58	nP0p8: y 80 7y 8, FbaurGi	7777	5+80 µgK	9p.,	7777	, 0	850	7777	7777
		nP0p8: y 82 7y X9 FbaurGi	7777	805, 0 µgK	68.p	7777	28	8, 2	7777	7777
		nP0p8: y X6 7y 5+ FbaurGi	7777	5p60 µgK	6, .,	7777	2X	8, ,	7777	7777
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941011)										
nD850+9p8700X	RA 58	nP0p8: >y 80 7y 8+ FbaurGi	7777	20p0 µgK	65.,	7777	, +	8, X	7777	7777
		nP0p8: >y 8+ 7y 5, FbaurGi	7777	88X50 µgK	62.,	7777	2X	8, +	7777	7777
		nP0p8: >y 5, 7y , 0 FbaurGi	7777	8080 µgK	95.p	7777	, 6	8, 5	7777	7777
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2941244)										
nD850+9p8700X	RA 58	nm0, 8R: TMare as TN, 73MLGG erbQ	8, 9097p679	80 v gK	# I 1r merebv Ceh	7777	p0	850	7777	7777
EK05VG: Nitrite as N by Discrete Analyser (QCLot: 2941246)										
nD850+9p8700X	RA 58	n/ 02pR: I Gbe as I	7777	0.2 v gK	805	7777	p0	850	7777	7777
EK0V1G: Reactive Phosphorus as P by discrete analyser (QCLot: 294124V)										
nD850+9p8700X	RA 58	n/ 0p8R: c eaurGe PWls4WlbMs as P	8, X+27, , 7X	0.2 v gK	809	7777	p0	850	7777	7777
ED045G: Chloride Discrete analyser (QCLot: 2941247)										
nD850+9p8700X	RA 58	nm0, 2R: y Wl1bGe	8+99p7007+	, 00 v gK	p6.5	7777	p0	850	7777	7777
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2941314)										
nD850+9X2700X	Zi 1i t v 1Ms	n/ 0X+TF: 31ral y t ai Ge	2p78X72	0.X v gK	# 28.6	7777	p0	850	7777	7777
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2941453)										
nD850+9p87008	RA 80	n/ 022R: Zv v 1i Ga as I	p++, 7, 87p	8.0 v gK	880	7777	p0	850	7777	7777
EP0V4A: Monocyclic Aromatic Sydrocarbons (QCLot: 2941V33)										
nD850+p69700X	Zi 1i t v 1Ms	nP0p, : dei qei e	p87, 57X	X0 µgK	62.p	7777	+,	8X8	7777	7777
		nP0p, : 31lMei e	80979975	X0 µgK	805	7777	+5	8X2	7777	7777
EP070/0V1: Total Petroleum Sydrocarbons (QCLot: 2941V34)										
nD850+p69700X	Zi 1i t v 1Ms	nP090: y + 7y 6 FbaurGi	7777	X90 µgK	92.0	7777	, +	8X+	7777	7777

TML7Darb&: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
EP070/0V1: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2941V34)										
nD850+p69700X	Zi 1i t v 1Ms	nP090: y + 7y 80 Fbaur3i	7777	550 µgK	95.,	7777	, 2	8Xp	7777	7777
EK040P: Fluoride by PC Titrator (QCLot: 2943213)										
nD850+9p87008	RA 80	n/ 0, 0P: FlM1b2e	8+69, 7, 979	2.0 v gK	80+	7777	p0	850	7777	7777
EG020F: Dissolved Metals by ICP8M| (QCLot: 2943613)										
nD850+p997008	Zi 1i t v 1Ms	nR0X0Z7F: Zbsei 0	p, , 07597X	0.X v gK	888	7777	96	856	7777	7777
		nR0X0Z7F: y ahv 0W	p, , 07, 576	0.02 v gK	88X	7777	p2	858	7777	7777
		nR0X0Z7F: y 1Lalr	p, , 07, 97,	0.X v gK	880	7777	pp	8X6	7777	7777
		nR0X0Z7F: y 144eb	p, , 072079	0.X v gK	880	7777	p8	8Xp	7777	7777
		nR0X0Z7F: f eah	p, 5676X78	0.X v gK	885	7777	p8	8X5	7777	7777
		nR0X0Z7F: Dai gai ese	p, 5676+72	0.X v gK	880	7777	++	85X	7777	7777
		nR0X0Z7F: I 0kel	p, , 070X70	0.X v gK	880	7777	p5	8X6	7777	7777
		nR0X0Z7F: UCu	p, , 07++74	0.X v gK	888	7777	+9	85+	7777	7777

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM13067| 1**	Page	: 1 of 0
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3411	Address	: p Westall Rd S7ringvale VIC Australia 31- 1
Eqmail	: rorzui@w environmentalearthsciences.com	Eqmail	: carol.+alshw alsglobal.com
Tele7hone	: 691 43 098- 1999	Tele7hone	: 691cβcβ5p0 0948
Facsimile	: 691 43 098- 18pp	Facsimile	: 691cβcβ5p0 0941
Project	: 2441- p Sth Melbourne Gas+ orks	QC Level	: NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Site	: qqq		
CqOqC number	: qqq	Date Sam7les Received	: 2- qJUNq2413
Sam7ler	: SFL, / /	Issue Date	: 4pqJULq2413
Order number	: qqq		
		No. of sam7les received	: 9
Quote number	: MEk834Kl3	No. of sam7les analysed	: 9

This re7ort su7ersedes any 7revious re7ort(s) +ith this reference. Results a77ly to the sam7le(s) as submitted. All 7ages of this re7ort have been checked and a77roved for release.

This Inter7retive Quality Control Re7ort contains the follo+ing information:

- Analysis Holding Time Com7liance
- Quality Control Parameter Frezuency Com7liance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The follo+ing re7ort summarises extraction K 7re7aration and analysis times and com7ares +ith recommended holding times. Dates re7orted re7resent first date of extraction or analysis and 7recludes subsezuent dilutions and reruns. Information is also 7rovided re the sam7le container (7reservative) from +hich the analysis alizuot +as taken. Ela7sed 7eriod to analysis re7resents number of days from sam7ling +here no extraction K digestion is involved or 7eriod from extraction K digestion +here this is 7resent. For com7osite sam7les, sam7ling date is assumed to be that of the oldest sam7le contributing to the com7osite. Sam7le date for laboratory 7roduced leachates is assumed as the com7letion date of the leaching 7rocess. Outliers for holding time are based on USEPA SW 8p9, APHA, AS and NEPM (1000). A listing of breaches is 7rovided 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 qvolatile analytes, the holding time com7liance assessment com7ares the leach date +ith the shortest analyte holding time for the ezuivalent soil method. These soil holding times are: Organics (1p days); Mercury (28 days) & other metals (184 days). A recorded breach therefore does not guarantee a breach for all nonqvolatile 7arameters.

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: p+							
Clear Plastic Bottle 8Natural (EA005)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	8888	qqqq	qqqq	**2| 8JUN82013**	2- qJUNq2413	✓
EA015: Total Dissolved Solids							
Clear Plastic Bottle 8Natural (EA015+)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	4pqJULq2413	qqqq	**018JUL82013**	4pqJULq2413	✓
ED03| P: Alkalinity by PC Titrator							
Clear Plastic Bottle 8Natural (ED03| 8P)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	11qJULq2413	qqqq	**018JUL82013**	11qJULq2413	✓
ED041G: Sulfate (Turbidimetric) as SO4 28by DA							
Clear Plastic Bottle 8Natural (ED041G)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	25qJULq2413	qqqq	**018JUL82013**	25qJULq2413	✓
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle 8Natural (ED045G)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	25qJULq2413	qqqq	**018JUL82013**	25qJULq2413	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle 8Natural (ED093F)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	4pqJULq2413	qqqq	**018JUL82013**	4pqJULq2413	✓
EG020F: Dissolved Metals by ICP8MS							
Clear Plastic Bottle 8Nitric Acid; Filtered (EG020A8F)							
GW14, GW31, GW32, GW39	**2| 8JUN82013**	888	2pqDECq2413	qqqq	**028JUL82013**	2pqDECq2413	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026SF: Total CN by Segmented Flow Analyser								
White Plastic Bottle 8NaO+ 8Pb Acetate (EK026SF)								
GW14,	GW31,	**2| 8JUN82013**	**88**	11qJULq2413	qqq	**278JUN82013**	11qJULq2413	✓
GW32,	GW39							
EK040P: Fluoride by PC Titrator								
Clear Plastic Bottle 8Natural (EK040P)								
GW14,	GW31,	**2| 8JUN82013**	**88**	25qJULq2413	qqq	**018JUL82013**	25qJULq2413	✓
GW32,	GW39							
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle 8Sulfuric Acid (EK055G)								
GW14,	GW31,	**2| 8JUN82013**	**88**	25qJULq2413	qqq	**018JUL82013**	25qJULq2413	✓
GW32,	GW39							
EK05| G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle 8Natural (EK05| G)								
GW14,	GW31,	**2| 8JUN82013**	**88**	20qJUNq2413	qqq	**278JUN82013**	20qJUNq2413	✓
GW32,	GW39							
EK0| 1G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle 8Natural (EK0| 1G)								
GW14,	GW31,	**2| 8JUN82013**	**88**	20qJUNq2413	qqq	**278JUN82013**	20qJUNq2413	✓
GW32,	GW39							
EP070/0| 1: Total Petroleum +ydrocarbons								
Amber Glass Bottle 8Unpreserved (EP0| 1)								
GW14,	GW31,	**2| 8JUN82013**	**278JUN82013**	4pqJULq2413	✓	**018JUL82013**	4- qAUGq2413	✓
GW32,	GW39,							
RINp								
EP0| 4A: Monocyclic Aromatic +ydrocarbons								
Amber VOC Vial 8Sulfuric Acid (EP0| 4)								
GW14,	GW31,	**2| 8JUN82013**	**278JUN82013**	11qJULq2413	✓	**278JUN82013**	11qJULq2413	✓
GW32,	GW39,							
RINp,	Tri7 -							
EP0| 4+ : Naphthalene								
Amber VOC Vial 8Sulfuric Acid (EP0| 4)								
GW14,	GW31,	**2| 8JUN82013**	**278JUN82013**	11qJULq2413	✓	**278JUN82013**	11qJULq2413	✓
GW32,	GW39,							
RINp,	Tri7 -							
EP070/0| 1: Total Recoverable +ydrocarbons 8NEPM 2010 Draft								
Amber VOC Vial 8Sulfuric Acid (EP070)								
GW14,	GW31,	**2| 8JUN82013**	**278JUN82013**	11qJULq2413	✓	**278JUN82013**	11qJULq2413	✓
GW32,	GW39,							
RINp								

Quality Control Parameter Frequency Compliance

The follo+ ing re7ort summarises the frezuency of laboratory QC sam7les analysed +ithin the analytical lot(s) in +hich the submitted sam7le(s) +as(+here) 7rocessed. Actual rate should be greater than or ezual to the ex7ected rate. A listing of breaches is 7rovided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frezuency not +ithin s7ecification ; ✓ = Quality Control frezuency +ithin s7ecification.

Quality Control Sam7le Ty7e		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Du7licates (DUP)							
Alkalinity by PC Titrator	ED43- qP	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Ammonia as N by Discrete analyser	E/ 455G	2	14	**20.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Fluoride by PC Titrator	E/ 4p4P	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	E/ 450G	2	1p	**14.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	E/ 45- G	2	19	**12.5**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
7H	EA445	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	E/ 4- 1G	2	14	**20.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	E/ 429SF	2	1p	**14.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	2	19	**12.5**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH VolatileskBTEX	EP484	2	15	**13.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Laboratory Control Sam7les (LCS)							
Alkalinity by PC Titrator	ED43- qP	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Ammonia as N by Discrete analyser	E/ 455G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Fluoride by PC Titrator	E/ 4p4P	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	E/ 450G	1	1p	**| .1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	E/ 45- G	1	19	**6.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	E/ 4- 1G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	E/ 429SF	1	1p	**| .1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	19	**6.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH VolatileskBTEX	EP484	1	15	**6.|**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	E/ 455G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement

Matrix: **WATER**

Evaluation: × = Quality Control frezuency not +ithin s7ecification ; ✓ = Quality Control frezuency +ithin s7ecification.

Quality Control Sam7le Ty7e		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) qContinued							
Fluoride by PC Titrator	E/ 4p4P	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	E/ 450G	1	1p	**| .1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	E/ 45- G	1	19	**6.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	E/ 4- 1G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	E/ 429SF	1	1p	**| .1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	19	**6.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH VolatilesKBTEX	EP484	1	15	**6.|**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Matrix S7ikes (MS)							
Ammonia as N by Discrete analyser	E/ 455G	1	14	**10.0**	**5.0**	✓	ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Fluoride by PC Titrator	E/ 4p4P	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	E/ 450G	1	1p	**| .1**	**5.0**	✓	ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	E/ 45- G	1	19	**6.3**	**5.0**	✓	ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	E/ 4- 1G	1	14	**10.0**	**5.0**	✓	ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	E/ 429SF	1	1p	**| .1**	**5.0**	✓	ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	19	**6.3**	**5.0**	✓	ALS QCS3 rezuirement
TPH VolatilesKBTEX	EP484	1	15	**6.|**	**5.0**	✓	ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement

Brief Method Summaries

The analytical 7rocedures used by the Environmental Division have been develo7ed from established internationally recogni@ed 7rocedures such as those 7ublished by the US EPA, APHA, AS and NEPM. In house develo7ed 7rocedures are em7loyed in the absence of documented standards or by client rezuest. The follo+ing re7ort 7rovides brief descri7tions of the analytical 7rocedures em7loyed for results re7orted in the Certificate of Analysis. Sources from +hich ALS methods have been develo7ed are 7rovided + ithin the Method Descri7tions.

Analytical Methods	Method	Matrix	Method Descriptions
7H	EA445	WATER	APHA 21st ed. p544 H6 B. 7H of + ater sam7les is determined by ISE either manually or by automated 7H meter. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Total Dissolved Solids (High Level)	EA415H	WATER	InqHouse, APHA 21st ed., 25p4C A gravimetric 7rocedure that determines the amount of `filterable` residue in an azueous sam7le. A + ellqmixed sam7le is filtered through a glass fibre filter (1.2um). The filtrate is eva7orated to dryness and dried to constant + eight at 1846K5C. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Alkalinity by PC Titrator	ED43- dP	WATER	APHA 21st ed., 2324 B This 7rocedure determines alkalinity by automated measurement (e.g. PC Titrate) using 7H p.5 for indicating the total alkalinity endq7oint. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	WATER	APHA 21st ed., p544qSOp Dissolved sulfate is determined in a 4.p5um filtered sam7le. Sulfate ions are converted to a barium sulfate sus7ension in an acetic acid medium + ith barium chloride. Light absorbance of the BaSOp sus7ension is measured by a 7hotometer and the SOpq2 concentration is determined by com7arison of the reading + ith a standard curve. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Chloride by Discrete Analyser	ED4p5G	WATER	APHA 21st ed., p544 Cl qG.The thiocyanate ion is liberated from mercuric thiocyanate through sezuestration of mercury by the chloride ion to form nonqonised mercuric chloride.in the 7resence of ferric ions the librated thiocynate forms highlyqcoloured ferric thiocynate + hich is measured at p84 nm APHA 21st edition seal method 2 41- q1q_ a7ril 2443
Major Cations qDissolved	ED403F	WATER	Major Cations is determined based on APHA 21st ed., 3124; USEPA SW 8p9 q9414 The ICPAES technizue ionises the 4.p5um filtered sam7le atoms emitting a characteristic s7ectrum. This s7ectrum is then com7ared against matrix matched standards for zuantification. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2) Sodium Adsor7tion Ratio is calculated from Ca, Mg and Na + hich determined by ALS in house method QWIqENKED403F. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2) Hardness 7arameters are calculated based on APHA 21st ed., 23p4 B. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Dissolved Metals by ICPqMS qSuite A	EG424AqF	WATER	(APHA 21st ed., 3125; USEPA SW8p9 q9424, ALS QWIqENKEG424): Sam7les are 4.p5 um filtered 7rior to analysis. The ICPMS technizue utili@es a highly efficient argon 7lasma to ioni@e selected elements. Ions are then 7assed into a high vacuum mass s7ectrometer, + hich se7arates the analytes based on their distinct mass to charge ratios 7rior to their measurement by a discrete dynode ion detector.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flo+ Analyser	E/ 429SF	WATER	APHA p544qCNqO. Sodium hydroxide 7reserved sam7les are introduced into an automated segmented flo+ analyser. Com7lex bound cyanide is decom7osed in a continuously flo+ing stream, at a 7H of 3.8, by the effect of UV light. A UVqB lam7 (312 nm) and a decom7osition s7iral of borosilicate glass are used to filter out UV light +ith a +avelength of less than 204 nm thus 7reventing the conversion of thiocyanate into cyanide. The hydrogen cyanide 7resent at a 7H of 3.8 is se7arated by gas dialysis. The hydrogen cyanide is then determined 7hotometrically, based on the reaction of cyanide +ith chloramineqT to form cyanogen chloride. This then reacts +ith pq7yridine carboxylic acid and 1,3qdimethylbarbituric acid to give a red colour +hich is measured at 944 nm. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Fluoride by PC Titrator	E/ 4p4P	WATER	APHA 21st ed., p544 FqC CDTA is added to the sam7le to 7rovide a uniform ionic strength background, adjust 7H, and break u7 com7lexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ammonia as N by Discrete analyser	E/ 455G	WATER	APHA 21st ed., p544qNH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ammonium as N	E/ 455GqNHp	WATER	Ammonium in the sam7le is re7orted as the ionised Kunionised fractions by the use of a nomogra7h and the initial 7H and Tem7erature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., p544qNH3 G. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrite as N by Discrete Analyser	E/ 45- G	WATER	APHA 21st ed., p544qNO2qB. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrate as N by Discrete Analyser	E/ 458G	WATER	APHA 21st ed., p544qNO3qF. Nitrate is reduced to nitrite by +ay of a chemical reduction follo+ed by zuantification by Discrete Analyser. Nitrite is determined se7erately by direct colourimetry and result for Nitrate calculated as the difference bet+een the t+o results. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	E/ 450G	WATER	APHA 21st ed., p544qNO3qF. Combined oxidised Nitrogen (NO26NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Reactive Phos7horus as PqBy Discrete Analyser	E/ 4- 1G	WATER	APHA 21st ed., p544qP F Ammonium molybdate and 7otassium antimonyl tartrate reacts in acid medium +ith otho7hos7hate to form a hetero7oly acid q7hos7homolybdic acid q+hich is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ionic Balance by PCT DA and Turbi SOp DA	EN455 qPG	WATER	APHA 21st Ed. 1434F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate +hich determined by PCT and DA. The Cations are determined by Turbi SOp by DA. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
TPH qSemivolatile Fraction	EP4- 1	WATER	USEPA SW 8p9 q8415A The sam7le extract is analysed by Ca7illary GCKFID and zuantification is by com7arison against an established 5 7oint calibration curve of nqAlkane standards. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Volatile Organic Com7ounds	EP4- p	WATER	USEPA SW 8p9 q8294B Water sam7les are directly 7urged 7rior to analysis by Ca7illary GCKMS and zuantification is by com7arison against an established 5 7oint calibration curve. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
TPH VolatileskBTEX	EP484	WATER	USEPA SW 8p9 q8294B Water sam7les are directly 7urged 7rior to analysis by Ca7illary GCKMS and zuantification is by com7arison against an established 5 7oint calibration curve. Alternatively, a sam7le is ezuilibrated in a heads7ace vial and a 7ortion of the heads7ace determined by GCMS analysis. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Se7aratory Funnel Extraction of Lizuids	ORG1ɒ	WATER	USEPA SW 8p9 q3514B 144 mL to 1L of sam7le is transferred to a se7aratory funnel and serially extracted three times using 94mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2). ALS default excludes sediment + hich may be resident in the container.
Volatiles Water Pre7aration	ORG19ɑW	WATER	A 5 mL alizuot or 5 mL of a diluted sam7le is added to a p4 mL VOC vial for s7arging.

Summary of Outliers

Outliers : Quality Control Samples

The follo+ing re7ort highlights outliers flagged in the Quality Control (QC) Re7ort. Surrogate recovery limits are static and based on USEPA SW8p9 or ALSqQWIHENK8 (in the absence of s7ecific USEPA limits). This re7ort dis7lays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Com7ound Grou7 Name	Laboratory Sam7le ID	Client Sam7le ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED4p1G: Sulfate (Turbidimetric) as SOp 2qby DA	EM13498-1q442	GW31	**Sulfate as SO4 8 Turbidimetric**	1p848q-0q8	Not Determined	qqq	**MS recovery not determined, background level greater than or equal to 4x spike level.**
E/429SF: Total CN by Segmented Flo+ Analyser	EM1349825q442	Anonymous	**Total Cyanide**	5-q12q5	51.0 %	-4q134%	**Recovery less than lower data quality objective**

- **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

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

Outliers : Analysis Holding Time Compliance

This re7ort dis7lays Holding Time breaches only. Only the res7ective Extraction K7re7aration andK7or Analysis com7onent isK7are dis7layed.

- **No Analysis +olding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The follo+ing re7ort highlights breaches in the Frezuency of Quality Control Sam7les.

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

Samples Received without COC

Date/Time Received	27-6-13 16:15
Date/Time Analysis Received	
Client/Sender:	Enviro Earth Sciences — Ref: EM1306798
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	
Carrier Company:	
Con-note No:	
Project Details	
Sampler/Sampling dates	27.6.13
Matrix	water.

ID date

1. GW1D 27-6-13.
2. GW31
3. GW32
4. GW36
5. RIN4
6. TRIP 7

Environmental Division
Melbourne
C-M 27/6
Work Order
EM1306871

Telephone : +61-3-8549 9600

Notified: _____ **Date:** _____

Received By: _____

Samples sent to lab for

Micro Nitrate BOD (pH)

Colour Turbidity RP

Other .....

Date C-M 27/6

Samples Received without COC

Date/Time Received	27-6-13 16:15
Date/Time Analysis Received	
Client/Sender:	Enviro Earth Sciences — Ref: EM1306798
Contact Name:	
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	
Carrier Company:	
Con-note No:	
Project Details	
Sampler/Sampling dates	27.6.13
Matrix	water.

ID Date

1. GW1D 27.6.13.
2. GW31
3. GW32
4. GW36
5. RIN4
6. TRIP 7

SCANNED

Environmental Division
Melbourne
C.M 27/6 Work Order
EM1306871

Telephone : +61-3-8549 9600

Notified: _____ Date: _____

Received By: _____

Samples sent to lab for

Micro Nitrate BOD (pH)

Colour Turbidity RP

Other .....

Date C.M 27/6

CoC received 28/06/13 08:57 RT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011
PROJECT: 210074 Sth Melbourne Gasworks
ORDER NUMBER:
PROJECT MANAGER: REGIN ORQUIZA — CONTACT PH: 9687 1666
SAMPLER: SFL / KK — SAMPLER MOBILE: 0488 339 025
COC emailed to ALS? (YES / NO) — EDD FORMAT (or default):
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com
Email Invoice to : rorquiza@environmentalearthsciences.com

TURNAROUND REQUIREMENTS : standard TAT
(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
ALS QUOTE NO.: ME/330/13

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 7
OF: 1 2 3 4 5 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		[illegible]
DATE/TIME: 27/63 pm	DATE/TIME: 27/63 pm	DATE/TIME:	DATE/TIME: 28/6 16:25

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY: LAB ID	SAMPLE DETAILS MATRIX: Solid(S) Water(W): SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION: TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes - pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	Additional Information
1	GW10	27/06/2013	W		8	x	x	x	x	x	x	x						5.07	19.1	
2	GW31	27/06/2013	W		8	x	x	x	x	x	x	x						7.2	17.9	
4	GW36	27/06/2013	W		8	x	x	x	x	x	x	x						6.82	17.2	
3	GW32	27/06/2013	W		8	x	x	x	x	x	x	x						7.02	17.7	
5	RIN 4	27/06/2013	W		4					x	x	x								
6	Trip 7	27/06/2013	W							x	x									
					TOTAL															

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Friday, 28 June 2013 8:57 AM
To: Carol Walsh
Cc: Samples Melbourne
Subject: RE: COC FOR SAMPLES RECEIVED THIS AFTERNOON
Attachments: 210074_CoC_27 June 2013 pm.pdf; 210074_CoC_28 June 2013 am.pdf

Hi Carol,

Please find the attached CoC for the samples collected yesterday and the CoC for the samples to be collected this morning.

Thank you.

Regards

Regin

From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 4:37 PM
To: Regin Orquiza
Subject: COC FOR SAMPLES RECEIVED THIS AFTERNOON

Regin

Do you have the COC's prepared for samples received this afternoon.

Kind Regards

Carol Walsh

Senior Client Services Officer
ALS | Environmental Division

4 Westall Rd
Springvale, VIC. 3171 Australia

How was your customer experience? Please send us your feedback

Please see our latest Enviromail 67 - Aqueous Film Forming Foams (AFFFs) March 2013

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F +61 3 8549 9626

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Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306706**	Page	: 1 of 6
y l@i r	: **EN8IRONMENTAL EARTV SCIENCES**	9aLobarobt	: Ei n@boi v ei ral m@G@oi MelLoDbi e
y oi raur	: c ERG Nc OQ@GZ	y oi raur	: y abol A alsW
Zhhbess	: P.N.dNB XX23 FNN5Ty c ZS YQ VZQT5c Z9G 3011	Zhhbess	: , A esrall c h T4b@gnale YQ ZDsrbal@ 3181
Epv a@	: bob- D@aaz eesCL@	Epv a@	: uabol.@alsWz alsgloLal.uov
5ele4Wbi e	: w61 03 76+81666	5ele4Wbi e	: w61p3p+2, 7 760+
Faus@ @e	: w61 03 76+81+, ,	Faus@ @e	: w61p3p+2, 7 7601
Pbojeur	: X0018, TrWMelLoDbi e Ras@bks	Oy 9enel	: I EPM 1777 TuWehDle d (3) ai h Z9T Oy T3 be- D@ev ei r
Nbhebi Dv Leb	: ppp		
y pNpy i Dv Leb	: ppp	mare Tav 4les c eue@eh	: X+pJQI pX013
Tav 4leb	: TF9/KK	@sDe mare	: 0, pJQ9pX013
T@e	: ppp		
		I o. of sav 4les beue@eh	: ,
ODore i Dv Leb	: ME/330/13	I o. of sav 4les ai alt seh	: ,

5W@ be4obr sD4ebsehes ai t 4ben@Ds be4obr(s) @@W rW@ befebei ue. c esDlrs a44lt ro rWe sav 4le(s) as sDLv @eh. ZII 4ages of rW@ be4obr Wane Leei uWeukeh ai h a44boneh fot belease.

5W@ y ebr@@are of Zi alt s@ uoi ra@s rWe follo@@g @fobv ar@i :

- Rei ebal y ov v ei rs
- Zi alt r@al c esDlrs
- TDbbogare y oi rbol 9@ @s

General Comments

5We ai alt rQal 4bouehDtes Dseh Lt rWe Ei nQbi v ei ral mQGGi Wane Leei henelo4eh fbov esraLIGWeh Crebi arQi allt beuogi Qeh 4bouehDtes sDuW as rWose 4DLIGWeh Lt rWe QTEPZV ZPHZV ZT ai h I EPM. G WoDse henelo4eh 4bouehDtes abe ev 4lot eh C rWe aLsei ue of houDv ei reh srai hatbs obLt ulGi r be- Desr.

A Webe v oGrDte herebv CarQi Was Leei 4ebfobv ehVtesDrs abe be4obreh oi a htt @eQW LasG.

A Webe a be4obreh less rWai (<) besDr G WQWebrWai rWe 9Nc VrWS v at Le hDe ro 4bQ att sav 4le exrbaur/hQesrare hQDrQi ai h/obCsDffQGi r sav 4le fobai alt sG.

A Webe rWe 9Nc of a be4obreh besDr hQfebs fbov srai hatb 9Nc VrWS v at Le hDe ro WQWv oGrDte uoi rei rVCsDffQGi r sav 4le (behDueh @eQW ev 4lot eh) obv arbQ Crebfebei ue.

A Wei sav 4lCg rQ e Cfobv arQi G i or 4bonQeh Lt rWe ulGi rVsav 4lCg hares abe sWo@ @QWDr a rQ e uov 4oi ei r. G rWese Csrai uesVrWe rQ e uov 4oi ei r Was Leei assDv eh Lt rWe laLobarotl fob4bouessCg 4Db4oses.

Ket : y ZT I Dv Leb= y ZT begGrtt i Dv Lebfbov haraLase v aCraCeh Lt y Wev Qal ZLsrbaurs TebnQes. 5We y Wev Qal ZLsrbaurs TebnQe G a hQGGi of rWe Zv ebQai y Wev Qal TouQrt .
9Nc = 9Q Cof be4obCg
I = 5WS besDr G uov 4Dreh fbov ChQQDal ai alt re hereurQi s ar obaLone rWe lenel of be4obCg

- **E^0K6SF : EM1306704-006 i 92rd Hxdke p9oad por TCN df e 2b xoHHoura H9i xra db2erperebaenT. dH. 9H ueeb aobpri ed uh re-9b9rhHdHn**
- **EM1306706-003: Ai i obd9 9H N reHf n2y 9H dobe uh uf a. ci e2 od wE^055(**
- **E| 0) 1: | 9r2af n9r H9i xraH EM1306706-001, D| U0KUMv . 9ge LOR r9dHed df e 2b n9uor92brh u9akBrof bdn**
- **E| 0) 4: | oH2ge v TE# reHf n2por H9i xra EM1306706-003 aobpri ed uh re-9b9rhHdHn**
- **lobca v 9n9bae of 2op9aaex29ura ni d2H por H9i xra q3 df e 2b 9b9rh2eH bo2j f 9b2pred db 2 dHrexor2n**
- **lobca u9n9baeH y ere a9naf n92ed f HdbB: i 9;or 9bobH+a. rorodeU9rh9rdb2h 9bd Hf n92eG9bd i 9;or a92obH+a9naf i Ui 9BbeHdf i Uxo29HHdf i 9bd Hodf i n**
- **lobca u9n9baeH y ere a9naf n92ed f HdbB: i 9;or 9bobH+a. rorodeU9rh9rdb2h 9bd Hf n92eG9bd i 9;or a92obH+a9naf i Ui 9BbeHdf i Uxo29HHdf i UHodf i U9i i obd9 9bd drob q3n**
- **T, S uh i e2 od EA-015 i 9h ud9H. dB. df e 2b 2 e xreHebae oppbe x9r2af n92e i 922erUy . da. i 9h x9HH2 rof B. 2 e xreHaroued @F°C x9xern**

I Z5Z Zuubeh Qeh 9aLobarotl +X2

Zuubeh Qeh fobuov 4lGi ue @QW GTN/GEy 180X2.

Signatories

5WS houDv ei r Was Leei eleurboi Qallt sQi eh Lt rWe aDrWobQeh sQi arobGs ChQareh LeloQ Eleurboi Q sQi Cg Was Leei uabbQeh oDr C uov 4lGi ue @QW 4bouehDtes s4euQGeh C X1 y Fc Pabr 11.

Signatories	Position	Accreditation Category
mQai CFebi ai ho	Tei QbGobgai Q y Wev Gr	MelLoDti e Gobgai Qs MelLoDti e Gobgai Qs MelLoDti e Gobgai Qs MelLoDti e Gobgai Qs
YabsWa Ho A Cg	I oi pMerals 5eav 9eaheb	MelLoDti e Gobgai Qs
BCgLC 9C	Tei QbNbgai Q y Wev Gr	MelLoDti e Nbgai Qs MelLoDti e Nbgai Qs

Analytical Results

TDLpMarb2: WATER wMarb2: WATER(			Client sample ID	@W15	@WK5	@W05	Trox -	ppp
			Client sampling date / time	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	ppp
Compound	CAS Number	LOR	Unit	EM1306706+001	EM1306706+00K	EM1306706+003	EM1306706+004	++++
EA005: xV								
xV 89rhe	ppp	0.01	4H Qi C	6r11	6r47	6r8)	ppp	ppp
EA015: To29m, d-Horged SomdH								
To29m, d-Horged SomdH Z 1-0zC	ppp	10	v g/9	560	564	47K0	ppp	ppp
E, 03) | : Ark9rnbo2h uh | C Tc2r92or								
To29mArk9rnbo2h 9H C9CO3	ppp	1	v g/9	4K	-1	1)7	ppp	ppp
E, 041@: Sf rp92e wTf ruodi e2rca(9H SO4 K+uh , A								
Sf rp92e 9H SO4 +Tf ruodi e2rca	1, +0+p87p+	1	v g/9	K16	15-	K350	ppp	ppp
E, 045@: C. rorode , d-Hare2e 9b9rhHer								
C. rorode	16++8p00p6	1	v g/9	K1	K)	34	ppp	ppp
E, 073F: , d-Horged M9;or C92obH								
C9radf i	8, , 0p80pX	1	v g/9	1K	1-	304	ppp	ppp
M9BbeHdf i	8, 37p72p	1	v g/9	14	)	)6	ppp	ppp
Sodcf i	8, , 0pX3p2	1	v g/9	-K	-K	56	ppp	ppp
| o29HHdf i	8, , 0p07p8	1	v g/9	11	-	40	ppp	ppp
E@0K0F: , d-Horged Me29rhl uh IC| +MS								
Arhi obcf i	8, X7p70p2	0.01	v g/9	<0.01	<0.01	0r0K	ppp	ppp
ArHebca	8, , 0p8+pX	0.001	v g/9	<0.001	0r034	0rK-1	ppp	ppp
C9di cf i	8, , 0p 3p7	0.0001	v g/9	0r0004	0r0004	0r000-	ppp	ppp
Cou9r2	8, , 0p +p	0.001	v g/9	0r010	0r00K	0r0K6	ppp	ppp
Coxxer	8, , 0p20p+	0.001	v g/9	0r003	0r003	0r001	ppp	ppp
Le9d	8, 37p7Xp1	0.001	v g/9	<0.001	<0.001	<0.001	ppp	ppp
M9bB9beHe	8, 37p76p2	0.001	v g/9	0r10K	0r063	3r41	ppp	ppp
Ncakem	8, , 0p0Xp0	0.001	v g/9	0r036	0r066	0r05-	ppp	ppp
Semabcf i	88+Xp 7pX	0.01	v g/9	<0.01	<0.01	<0.01	ppp	ppp
&dba	8, , 0p66p6	0.002	v g/9	0r031	0r040	0r04)	ppp	ppp
v orob	8, , 0p Xp+	0.02	v g/9	1r51	1r8-	1r11	ppp	ppp
lrob	8, 37p+7p6	0.02	v g/9	<0.02	0r83	13r6	ppp	ppp
E^0K6SF: To29mCN uh SeBi eb2ed Fray Ab9rhHer								
To29mCh9bcde	28p1Xp2	0.00,	v g/9	0r004	0r004	0r101	ppp	ppp
E^040| : Frhorcde uh | C Tc2r92or								
Frhorcde	167+, p +p+	0.1	v g/9	<0.1	0r1	4r5	ppp	ppp
E^055@: Ai i obc9 9H N uh , d-Hare2e Ab9rhHer								
Ai i obc9 9H N	866, p 1p8	0.01	v g/9	0r16	0r6)	4K)	ppp	ppp

Analytical Results

TDLpMarb2: WATER wMarb2: WATER(	Client sample ID	@W15	@WK5	@W05	Trox -	ppp
	Client sampling date / time	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	ppp
Compound	CAS Number / LOR / Unit	EM1306706-001	EM1306706-00K	EM1306706-003	EM1306706-004	++++
E^055@+NV4: Ai i obcf i 9HN uh , A						
Ai i obcf i 9HN	ppp / 0.01 / v g/9	0r16	0r6)	4K)	ppp	ppp
E^05) @: Nc2rc2e 9HN uh , d-Hare2e Ab9rhHer						
Nc2rc2e 9HN	ppp / 0.01 / v g/9	<0.01	<0.01	<0.01	ppp	ppp
E^05-@: Nc2r92e 9HN uh , d-Hare2e Ab9rhHer						
Nc2r92e 9HN	1, 878p22p+ / 0.01 / v g/9	0r04	0r01	0r05	ppp	ppp
E^0) 1@: Re9a2tge | . oHx. orf H9H| uh dd-Hare2e 9b9rhHer						
Re9a2tge | . oHx. orf H9H|	1, X62p , pX / 0.01 / v g/9	<0.01	<0.01	<0.01	ppp	ppp
EN055: Iobca v9r@bae						
To29rnAbcobH	ppp / 0.01 / v e- /9	5r73	5r6)	53r5	ppp	ppp
To29rnC92cobH	ppp / 0.01 / v e- /9	5r60	5rK5	ppp	ppp	ppp
To29rnC92cobH	ppp / 0.01 / v e- /9	ppp	ppp	4- r8	ppp	ppp
Iobca v9r@bae	ppp / 0.01 / %	Kn 7	3r71	ppp	ppp	ppp
Iobca v9r@bae	ppp / 0.01 / %	ppp	ppp	5r10	ppp	ppp
E| 0) 4A: Moboaharca Aroi 92a Vhdroa9ruobH						
vebXebe	81p 3pX / 1 / µg/9	<1	<1	)	<1	ppp
Tornebe	10+p+-+p3 / X / µg/9	<X	<X	4	<X	ppp
E2 hrnebXebe	100p 1p, / X / µg/9	<X	<X	<X	<X	ppp
i e29+/ x9r9+#hrnabe	10+p3+p3 106p Xp3 / X / µg/9	<X	<X	<X	<X	ppp
S2hrebe	100p Xp2 / 2 / µg/9	<2	<2	<2	<2	ppp
or2 o+#hrnabe	72p 8p6 / X / µg/9	<X	<X	<X	<X	ppp
IHoxroxhrnebXebe	7+p+Xp+ / 2 / µg/9	<2	<2	<2	<2	ppp
b+| roxhrnebXebe	103p62p1 / 2 / µg/9	<2	<2	<2	<2	ppp
1r8r5+Trd e2 hrnebXebe	10+p68p+ / 2 / µg/9	<2	<2	<2	<2	ppp
Hea+vf 2hrnebXebe	132p7+p+ / 2 / µg/9	<2	<2	<2	<2	ppp
1rKr4+Trd e2 hrnebXebe	72p63p6 / 2 / µg/9	<2	<2	<2	<2	ppp
2er2+vf 2hrnebXebe	7+p06p6 / 2 / µg/9	<2	<2	<2	<2	ppp
x+IHoxroxhr@orhebe	77p+8p6 / 2 / µg/9	<2	<2	<2	<2	ppp
b+vf 2hrnebXebe	10, p21p+ / 2 / µg/9	<2	<2	<2	<2	ppp
E| 0) 4V: N9x. 2 9rnabe						
N9x. 2 9rnabe	71pX0p3 / 8 / µg/9	<8	<8	<8	<8	ppp
E| 0-0°0) 1: To29rn\ e2roraf i Vhdroa9ruobH						
C6 +C7 Fr9a2cob	ppp / X0 / µg/9	<X0	<X0	<X0	ppp	ppp
C10 +C14 Fr9a2cob	ppp / 20 / µg/9	<20	<20	50	ppp	ppp

Analytical Results

TDLpMarb2: WATER wMarb2: WATER(	Client sample ID	@W15	@WK5	@W05	Trcx -	ppp
	Client sampling date / time	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	X8pJQI pX013 12:00	ppp
Compound CAS Number LOR Unit		EM1306706-001	EM1306706-00K	EM1306706-003	EM1306706-004	----
E| 0-0°0) 1: To29m) e2romaf i Vhdroa9ruobH+Cob2bf ed						
C15 +CK- Fr9a2cob	ppp 100 µg/9	<100	<100	--0	ppp	ppp
CK7 +C36 Fr9a2cob	ppp 20 µg/9	<20	<100	100	ppp	ppp
^ C10 +C36 Fr9a2cob whf i (	ppp 20 µg/9	<20	<20	1030	ppp	ppp
E| 0-0°0) 1: To29mReaoger9uma Vhdroa9ruobH+NE| M K010 , r9p2						
C6 +C10 Fr9a2cob	ppp X0 µg/9	<X0	<X0	k0	ppp	ppp
>C10 +C16 Fr9a2cob	ppp 100 µg/9	<100	<100	3-0	ppp	ppp
>C16 +C34 Fr9a2cob	ppp 100 µg/9	<100	<170	670	ppp	ppp
>C34 +C40 Fr9a2cob	ppp 100 µg/9	<100	<100	<100	ppp	ppp
^ >C10 +C40 Fr9a2cob whf i (	ppp 100 µg/9	<100	<100	10)0	ppp	ppp
E| 0)4S: 8OC Sf rroB92eH						
1rK+; ca. roroe2 9be+; 4	18060p08p0 0.1 %	-)n-	73r8	101	7K)	ppp
Tornebe+; -	X038pX6p2 0.1 %	103	10)	104	100	ppp
4+v roi opnorouebXebe	,60p00p, 0.1 %	101	103	103	77r0	ppp
E| 0-0S: T| Vv8(°v TE# Sf rroB92eH						
1rK+; ca. roroe2 9be+; 4	18060p08p0 0.1 %	-3n-	-7r6	106	ppp	ppp
Tornebe+; -	X038pX6p2 0.1 %	--r6	71rK	76r4	ppp	ppp
4+v roi opnorouebXebe	,60p00p, 0.1 %	76r6	77r4	104	ppp	ppp

Surrogate Control Limits

TDLpMarbQ: WATER		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
E| 0) 4S: 8OC Sf rroB92eH			
1rK+; ca. roroe2 9be+; 4	18060p08p0	67	133
Torhebe+; -	X038pX6p2	8X	1X+
4+v roi opfhorouebXebe	, 60p00p,	80	130
E| 0- 0S: T| Vv8(°v TE# Sf rroB92eH			
1rK+; ca. roroe2 9be+; 4	18060p08p0	80	13X
Torhebe+; -	X038pX6p2	67	1X2
4+v roi opfhorouebXebe	, 60p00p,	61	1X7

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1306706**	Page	: 1 of 11
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3181
E7mail	: ror- uiqaz eesi.biq	E7mail	: carol.@alshz alsglobal.com
Telephone	: w+1 03 6+981+++	Telephone	: w+1737 9546 6+09
Facsimile	: w+1 03 6+981944	Facsimile	: w+1737 9546 6+01
Project	: 200184 Sth Melbourne Gas@rks	QC Level	: NEPM 1666 Schedule B(3) and ALS QCS3 re- uirement
Site	: 7777		
C7O7C number	: 7777	Date Samples Received	: 297JUN72013
Sampler	: SFL/KK	Issue Date	: 047JUL72013
Order number	: 7777		
		No. of samples received	: 4
Quote number	: ME/330/13	No. of samples analysed	: 4

This report supersedes any previous report(s) @th 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 follo@ng 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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recogniqed 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 re- uest.

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

Where a reported less than (<) 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 @eight employed) or matrix interference.

Key : Anonymous = Refers to samples @hich are not specifically part of this @rk order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

NATA Accredited Laboratory 925

Accredited for compliance @th ISO/IEC 18025.

Signatories

This document has been electronically signed by the authoriqed signatories indicated belo@ Electronic signing has been carried out in compliance @th procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
Varsha Ho Wing	Non7Metals Team Leader	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics
		Melbourne Organics

Laboratory Duplicate (DUP) Report

The -uality 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 QWI7EN/39 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:7 No Limit; Result bet@een 10 and 20 times LOR:70% 750%; Result > 20 times LOR:70% 720%.

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005: cH pQC Lot: (74(352)									
EM130+8997001	Anonymous	EA005: pH Value	7777	0.01	pH Unit	9.51	9.52	0.1	0% 720%
EM130+6047002	Anonymous	EA005: pH Value	7777	0.01	pH Unit	8.51	8.52	0.1	0% 720%
EA015: Total Dissolved Solids pQC Lot: (744620)									
EM130+9657001	Anonymous	EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	66+0	6640	0.2	0% 720%
EM130+9687009	Anonymous	EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	319	330	3.8	0% 720%
ED032P: Alkalinity by PC Titrator pQC Lot: (743(15)									
EM130+9687005	Anonymous	ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	541	542	0.3	0% 720%
EM130+6147002	Anonymous	ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	33	32	0.0	0% 720%
ED041G: Sulfate pTurbidimetriF) as SO4 (-by DA pQC Lot: (74(670)									
EM130+9607001	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	14909786 79	1	mg/L	6+9	6+0	0.6	0% 720%
EM130+6017005	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	14909786 79	1	mg/L	239	23+	0.8	0% 720%
ED041G: Sulfate pTurbidimetriF) as SO4 (-by DA pQC Lot: (74(67()									
EM130+60+7003	GW05	ED041G: Sulfate as SO4 7Turbidimetric	14909786 79	1	mg/L	2350	2+60	13.5	0% 720%
ED045G: Chloride DisFrete analyser pQC Lot: (74(687)									
EM130+9607001	Anonymous	ED045G: Chloride	1+9987007+	1	mg/L	83+	82+	1.4	0% 720%
EM130+60+7003	GW05	ED045G: Chloride	1+9987007+	1	mg/L	34	35	3.0	0% 720%
ED0739: Dissolved Major Cations pQC Lot: (74(682)									
EM130+9607001	Anonymous	ED063F: Calcium	84407807 2	1	mg/L	92	95	2.8	0% 720%
		ED063F: Magnesium	84367657 4	1	mg/L	231	239	3.2	0% 720%
		ED063F: Sodium	84407237 5	1	mg/L	28+	295	3.0	0% 720%
		ED063F: Potassium	84407067 8	1	mg/L	15	1+	0.0	0% 750%
EG0(09: Dissolved Metals by ICP-MS pQC Lot: (743615)									
EM130+9837001	Anonymous	EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A7F: Arsenic	84407397 2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Cobalt	84407497 4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Copper	84407507 9	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A7F: Lead	84367627 1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Manganese	84367 6+75	0.001	mg/L	0.009	0.008	0.0	No Limit
		EG020A7F: Nickel	84407027 0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Zinc	84407++7+	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A7F: Aluminium	84267607 5	0.01	mg/L	0.03	0.03	0.0	No Limit
		EG020A7F: Selenium	88927467 2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	84407427 9	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A7F: Iron	84367967+	0.05	mg/L	0.1+	0.1+	0.0	No Limit
EM130+98+7005	Anonymous	EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG0(09: Dissolved Metals by ICP-MS pQC Lot: (743615) - Fontinued									
EM130+98+7005	Anonymous	EG020A7F: Arsenic	84407 3972	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Cobalt	84407 4974	0.001	mg/L	0.014	0.014	0.0	0% 750%
		EG020A7F: Copper	84407 5079	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Lead	84367 6271	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Manganese	84367 6+75	0.001	mg/L	+.50	+.00	9.0	0% 720%
		EG020A7F: Nickel	84407 0270	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A7F: Zinc	84407 ++7+	0.005	mg/L	0.010	0.010	0.0	No Limit
		EG020A7F: Aluminium	84267 6075	0.01	mg/L	0.02	0.02	0.0	No Limit
		EG020A7F: Selenium	88927 4672	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	84407 4279	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A7F: Iron	84367 967+	0.05	mg/L	0.98	0.9+	1.9	0% 750%
EK0(6S9: Total CN by Segmented 9low Analyser pQC Lot: (743708)									
EM130+6047005	Anonymous	EK02+SF: Total Cyanide	5871275	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM130+6117004	Anonymous	EK02+SF: Total Cyanide	5871275	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK040P: 9luoride by PC Titrator pQC Lot: (743(13)									
EM130+8997001	Anonymous	EK040P: Fluoride	1+6947 4979	0.1	mg/L	0.6	0.6	0.0	No Limit
EM130+9107001	Anonymous	EK040P: Fluoride	1+6947 4979	0.1	mg/L	0.+	0.+	0.0	No Limit
EK055G: Ammonia as N by DisFrete Analyser pQC Lot: (743204)									
EM130+9607001	Anonymous	EK055G: Ammonia as N	8++47 4178	0.01	mg/L	0.08	0.08	0.0	No Limit
EM130+6147001	Anonymous	EK055G: Ammonia as N	8++47 4178	0.01	mg/L	0.09	0.09	0.0	No Limit
EK052G: Nitrite as N by DisFrete Analyser pQC Lot: (74(688)									
EM130+9607001	Anonymous	EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM130+6017005	Anonymous	EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK052G: Nitrite as N by DisFrete Analyser pQC Lot: (74(671)									
EM130+60+7003	GW05	EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK021G: ReaFtive Phoschorus as P by disFrete analyser pQC Lot: (74(686)									
EM130+9607001	Anonymous	EK081G: Reactive Phosphorus as P	142+57447 2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM130+60+7003	GW05	EK081G: Reactive Phosphorus as P	142+57447 2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP024A: MonoFyFliF AromatiF HydroFarbons pQC Lot: (744(43)									
EM130+60+7001	GW15	EP084: Benqene	817437 2	1	µg/L	<1	<1	0.0	No Limit
		EP084: Toluene	1097 9973	2	µg/L	<2	<2	0.0	No Limit
		EP084: Ethylbenqene	1007 4174	2	µg/L	<2	<2	0.0	No Limit
		EP084: meta7& para7Xylene	1097 3973 10+7 4273	2	µg/L	<2	<2	0.0	No Limit
		EP084: ortho7Xylene	657 487+	2	µg/L	<2	<2	0.0	No Limit
		EP084: Styrene	1007 4275	5	µg/L	<5	<5	0.0	No Limit
		EP084: Isopropylbenqene	697 9279	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Propylbenqene	1037+571	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.3.57Trimethylbenqene	1097+879	5	µg/L	<5	<5	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP024A: MonoFyFliF AromatiF HydroFarbons pQC Lot: (744(43) - Fontinued									
EM130+60+7001	GW15	EP084: sec7Butylbenqene	1357697 9	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.2.47Trimethylbenqene	657+37+	5	µg/L	<5	<5	0.0	No Limit
		EP084: tert7Butylbenqene	6970+7+	5	µg/L	<5	<5	0.0	No Limit
		EP084: p7Isopropyltoluene	667987+	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Butylbenqene	1047517 9	5	µg/L	<5	<5	0.0	No Limit
EM130+6267001	Anonymous	EP084: Benqene	817437 2	1	µg/L	<1	<1	0.0	No Limit
		EP084: Toluene	1097997 3	2	µg/L	<2	<2	0.0	No Limit
		EP084: Ethylbenqene	1007417 4	2	µg/L	<2	<2	0.0	No Limit
		EP084: meta7& para7Xylene	1097397 3 10+74273	2	µg/L	<2	<2	0.0	No Limit
		EP084: ortho7Xylene	657487+	2	µg/L	<2	<2	0.0	No Limit
		EP084: Styrene	1007427 5	5	µg/L	<5	<5	0.0	No Limit
		EP084: Isopropylbenqene	697927 9	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Propylbenqene	1037+571	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.3.57Trimethylbenqene	1097+879	5	µg/L	<5	<5	0.0	No Limit
		EP084: sec7Butylbenqene	1357697 9	5	µg/L	<5	<5	0.0	No Limit
		EP084: 1.2.47Trimethylbenqene	657+37+	5	µg/L	<5	<5	0.0	No Limit
		EP084: tert7Butylbenqene	6970+7+	5	µg/L	<5	<5	0.0	No Limit
		EP084: p7Isopropyltoluene	667987+	5	µg/L	<5	<5	0.0	No Limit
		EP084: n7Butylbenqene	1047517 9	5	µg/L	<5	<5	0.0	No Limit
EP024H: Nachthalene pQC Lot: (744(43)									
EM130+60+7001	GW15	EP084: Naphthalene	617207 3	8	µg/L	<8	<8	0.0	No Limit
EM130+6267001	Anonymous	EP084: Naphthalene	617207 3	8	µg/L	<8	<8	0.0	No Limit
EP080/021: Total Petroleum HydroFarbons pQC Lot: (74(614)									
EM130+6047001	Anonymous	EP081: C15 7C29 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: C10 7C14 Fraction	7777	50	µg/L	<50	<50	0.0	No Limit
		EP081: C26 7C3+ Fraction	7777	50	µg/L	<90	<50	45.2	No Limit
EM130+60+7001	GW15	EP081: C15 7C29 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: C10 7C14 Fraction	7777	50	µg/L	<50	<50	0.0	No Limit
		EP081: C26 7C3+ Fraction	7777	50	µg/L	<50	<90	4+.2	No Limit
EP080/021: Total Petroleum HydroFarbons pQC Lot: (744(44)									
EM130+60+7001	GW15	EP090: C+ 7C6 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQC Lot: (74(614)									
EM130+6047001	Anonymous	EP081: >C10 7C1+ Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: >C1+ 7C34 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
EM130+60+7001	GW15	EP081: >C10 7C1+ Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
		EP081: >C1+ 7C34 Fraction	7777	100	µg/L	<100	<140	3+.4	No Limit
		EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	<100	0.0	No Limit
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQC Lot: (744(44)									

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQC Lot: (744(44) - Fontinued									
EM130+60+7001	GW15	EP090: C+ 7C10 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit

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

The -uality control term Method / Laboratory Blank refers to an analyte free matrix to @hich 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 -uality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a kno@n interference free matrix spiked @th 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.

Sub7Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids pQCLot: (744620)								
EA015H: Total Dissolved Solids z 190°C	7777	10	mg/L	<10	2000 mg/L	100	69	104
ED032P: Alkalinity by PC Titrator pQCLot: (743(15)								
ED0387P: Total Alkalinity as CaCO3	7777	1	mg/L	7777	200 mg/L	68.5	61	105
ED041G: Sulfate pTurbidimetriF) as SO4 (- by DA pQCLot: (74(670)								
ED041G: Sulfate as SO4 7Turbidimetric	149097867 9	1	mg/L	<1	25 mg/L	105	91	125
ED041G: Sulfate pTurbidimetriF) as SO4 (- by DA pQCLot: (74(67( )								
ED041G: Sulfate as SO4 7Turbidimetric	149097867 9	1	mg/L	<1	25 mg/L	109	91	125
ED045G: Chloride DisFrete analyser pQCLot: (74(687)								
ED045G: Chloride	1+9987007+	1	mg/L	<1	10 mg/L	104	96	118
ED0739: Dissolved Major Cations pQCLot: (74(682)								
ED063F: Calcium	84407807 2	1	mg/L	<1	5 mg/L	10+	93	126
ED063F: Magnesium	84367657 4	1	mg/L	<1	5 mg/L	102	90	124
ED063F: Sodium	84407237 5	1	mg/L	<1	50 mg/L	66.3	88	125
ED063F: Potassium	84407067 8	1	mg/L	<1	50 mg/L	65.+	88	123
EG0(09: Dissolved Metals by ICP-MS pQCLot: (743615)								
EG020A7F: Aluminium	84267607 5	0.01	mg/L	<0.01	0.5 mg/L	100	60	110
EG020A7F: Arsenic	84407397 2	0.001	mg/L	<0.001	0.1 mg/L	102	63	106
EG020A7F: Cadmium	84407437 6	0.0001	mg/L	<0.0001	0.1 mg/L	63.9	95	111
EG020A7F: Cobalt	84407497 4	0.001	mg/L	<0.001	0.1 mg/L	66.9	98	111
EG020A7F: Copper	84407507 9	0.001	mg/L	<0.001	0.1 mg/L	61.+	9+	110
EG020A7F: Lead	84367627 1	0.001	mg/L	<0.001	0.1 mg/L	103	99	112
EG020A7F: Manganese	84367 6+75	0.001	mg/L	<0.001	0.1 mg/L	65.9	9+	110
EG020A7F: Nickel	84407027 0	0.001	mg/L	<0.001	0.1 mg/L	65.+	9+	112
EG020A7F: Selenium	88927467 2	0.01	mg/L	<0.01	0.1 mg/L	66.6	95	111
EG020A7F: Zinc	84407++7+	0.005	mg/L	<0.005	0.1 mg/L	64.3	93	113
EG020A7F: Boron	84407427 9	0.05	mg/L	<0.05	0.1 mg/L	106	82	12+
EG020A7F: Iron	84367967+	0.05	mg/L	<0.05	0.5 mg/L	69.0	99	112
EK0(6S9: Total CN by Segmented 9low Analyser pQCLot: (743708)								
EK02+SF: Total Cyanide	587127 5	0.004	mg/L	<0.004	0.2 mg/L	99.1	85	113
EK040P: 9luoride by PC Titrator pQCLot: (743(13)								
EK040P: Fluoride	1+6947497 9	0.1	mg/L	<0.1	5 mg/L	101	89	120
EK055G: Ammonia as N by DisFrete Analyser pQCLot: (743204)								
EK055G: Ammonia as N	8++47417 8	0.01	mg/L	<0.01	1.0 mg/L	101	8+	122

Sub7Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)
				Result	Concentration	LCS	Low	High
EK052G: Nitrite as N by DisFrete Analyser pQCLot: (74(688)								
EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	0.5 mg/L	10+	94	112
EK052G: Nitrite as N by DisFrete Analyser pQCLot: (74(671)								
EK058G: Nitrite as N	7777	0.01	mg/L	<0.01	0.5 mg/L	104	94	112
EK021G: ReaFtive Phoschorus as P by disFrete analyser pQCLot: (74(686)								
EK081G: Reactive Phosphorus as P	142+574472	0.01	mg/L	<0.01	0.5 mg/L	100	94	109
EP024A: MonoFyFliF AromatiF HydroFarbons pQCLot: (744(43)								
EP084: Benqene	8174372	1	µg/L	<1	20 µg/L	103	8+	122
EP084: Toluene	1097993	2	µg/L	<2	20 µg/L	10+	86	123
EP084: Ethylbenqene	1007417	2	µg/L	<2	20 µg/L	103	8+	119
EP084: meta7& para7Xylene	1097393 10+74273	2	µg/L	<2	40 µg/L	10+	85	121
EP084: Styrene	1007427	5	µg/L	<5	20 µg/L	69.9	82	119
EP084: ortho7Xylene	657487+	2	µg/L	<2	20 µg/L	10+	90	120
EP084: Isopropylbenqene	697927	5	µg/L	<5	20 µg/L	104	81	116
EP084: n7Propylbenqene	1037+57	5	µg/L	<5	20 µg/L	63.9	+6	113
EP084: 1.3.57Trimethylbenqene	1097+87	5	µg/L	<5	20 µg/L	62.+	80	114
EP084: sec7Butylbenqene	1357697	5	µg/L	<5	20 µg/L	69.5	81	115
EP084: 1.2.47Trimethylbenqene	657+37+	5	µg/L	<5	20 µg/L	66.0	80	114
EP084: tert7Butylbenqene	697+7+	5	µg/L	<5	20 µg/L	63.8	82	114
EP084: p7Isopropyltoluene	667987+	5	µg/L	<5	20 µg/L	69.3	+9	114
EP084: n7Butylbenqene	1047517	5	µg/L	<5	20 µg/L	69.2	+1	115
EP024H: Nachthalene pQCLot: (744(43)								
EP084: Naphthalene	617207	8	µg/L	<8	20 µg/L	6+.1	85	121
EP080/021: Total Petroleum HydroFarbons pQCLot: (74(614)								
EP081: C10 7C14 Fraction	7777	50	µg/L	<50	3+10 µg/L	63.4	4+	12+
EP081: C15 7C29 Fraction	7777	100	µg/L	<110	10340 µg/L	69.5	55	125
EP081: C26 7C3+ Fraction	7777	50	µg/L	<100	3860 µg/L	101	55	126
EP080/021: Total Petroleum HydroFarbons pQCLot: (744(44)								
EP090: C+ 7C6 Fraction	7777	20	µg/L	<20	3+0 µg/L	64.1	+0	12+
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (74(614)								
EP081: >C10 7C1+ Fraction	7777	100	µg/L	<100	5080 µg/L	101	53	126
EP081: >C1+ 7C34 Fraction	7777	100	µg/L	<160	11230 µg/L	10+	5+	132
EP081: >C34 7C40 Fraction	7777	100	µg/L	<100	1010 µg/L	63.9	51	138
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (744(44)								
EP090: C+ 7C10 Fraction	7777	20	µg/L	<20	450 µg/L	61.9	5+	130

Matrix Spike (MS) Report

The -uality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked @th 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 @aived in the event of sample matrix interference.

Sub7Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate pTurbidimetriF) as SO4 (- by DA pQCLot: (74(670)							
EM130+9607002	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	1490978679	10 mg/L	# Not Determined	80	130
ED045G: Chloride DisFrete analyser pQCLot: (74(687)							
EM130+9607002	Anonymous	ED045G: Chloride	1+9987007+	400 mg/L	85.2	80	130
EG0(09: Dissolved Metals by ICP-MS pQCLot: (743615)							
EM130+9837001	Anonymous	EG020A7F: Arsenic	84407397 2	0.2 mg/L	112	96	136
		EG020A7F: Cadmium	84407437 6	0.05 mg/L	108	85	131
		EG020A7F: Cobalt	84407497 4	0.2 mg/L	68.4	88	126
		EG020A7F: Copper	84407507 9	0.2 mg/L	102	81	128
		EG020A7F: Lead	84367627 1	0.2 mg/L	113	81	123
		EG020A7F: Manganese	84367 6+75	0.2 mg/L	103	++	132
		EG020A7F: Nickel	84407027 0	0.2 mg/L	68.+	83	126
		EG020A7F: Zinc	84407++7+	0.2 mg/L	111	+9	13+
EK0(6S9: Total CN by Segmented 9low Analyser pQCLot: (743708)							
EM130+604700+	Anonymous	EK02+SF: Total Cyanide	5871275	0.2 mg/L	# +5.3	80	130
EK040P: 9luoride by PC Titrator pQCLot: (743(13)							
EM130+9817001	Anonymous	EK040P: Fluoride	1+69474979	5.0 mg/L	10+	80	130
EK055G: Ammonia as N by DisFrete Analyser pQCLot: (743204)							
EM130+9607002	Anonymous	EK055G: Ammonia as N	8++474178	1.0 mg/L	111	80	130
EK052G: Nitrite as N by DisFrete Analyser pQCLot: (74(688)							
EM130+9607002	Anonymous	EK058G: Nitrite as N	7777	0.5 mg/L	6+.+	80	130
EK021G: ReaFtive Phoschorus as P by disFrete analyser pQCLot: (74(686)							
EM130+9607002	Anonymous	EK081G: Reactive Phosphorus as P	142+574472	0.5 mg/L	66.+	80	130
EP024A: MonoFyFliF AromatiF HydroFarbons pQCLot: (744(43)							
EM130+60+7002	GW25	EP084: Benqene	8174372	20 µg/L	91.6	+4	121
		EP084: Toluene	10979973	20 µg/L	63.8	+3	125
EP080/021: Total Petroleum HydroFarbons pQCLot: (74(614)							
EM130+604700+	Anonymous	EP081: C10 7C14 Fraction	7777	3+10 µg/L	60.9	40	130
		EP081: C15 7C29 Fraction	7777	10340 µg/L	64.6	51	145
		EP081: C26 7C3+ Fraction	7777	3860 µg/L	68.6	52	144
EP080/021: Total Petroleum HydroFarbons pQCLot: (744(44)							
EM130+60+7002	GW25	EP090: C+ 7C6 Fraction	7777	290 µg/L	+8.2	4+	12+
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (74(614)							

Sub7Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (74(614) - Fontinued							
EM130+604700+	Anonymous	EP081: >C10 7C1+ Fraction	7777	5080 µg/L	68.2	4+	142
		EP081: >C1+ 7C34 Fraction	7777	11230 µg/L	102	52	14+
		EP081: >C34 7C40 Fraction	7777	1010 µg/L	6+.0	46	143
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (744(44)							
EM130+60+7002	GW25	EP090: C+ 7C10 Fraction	7777	330 µg/L	+4.4	45	128

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The -uality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked @th a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be @aived in the event of sample matrix interference.

Sub7Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP080/021: Total Petroleum HydroFarbons pQCLot: (74(614)										
EM130+604700+	Anonymous	EP081: C10 7C14 Fraction	7777	3+10 µg/L	60.9	7777	40	130	7777	7777
		EP081: C15 7C29 Fraction	7777	10340 µg/L	64.6	7777	51	145	7777	7777
		EP081: C26 7C3+ Fraction	7777	3860 µg/L	68.6	7777	52	144	7777	7777
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (74(614)										
EM130+604700+	Anonymous	EP081: >C10 7C1+ Fraction	7777	5080 µg/L	68.2	7777	4+	142	7777	7777
		EP081: >C1+ 7C34 Fraction	7777	11230 µg/L	102	7777	52	14+	7777	7777
		EP081: >C34 7C40 Fraction	7777	1010 µg/L	6+.0	7777	46	143	7777	7777
EK021G: ReaFtive Phoschorus as P by disFrete analyser pQCLot: (74(686)										
EM130+9607002	Anonymous	EK081G: Reactive Phosphorus as P	142+574472	0.5 mg/L	66.+	7777	80	130	7777	7777
EK052G: Nitrite as N by DisFrete Analyser pQCLot: (74(688)										
EM130+9607002	Anonymous	EK058G: Nitrite as N	7777	0.5 mg/L	6+.+	7777	80	130	7777	7777
ED045G: Chloride DisFrete analyser pQCLot: (74(687)										
EM130+9607002	Anonymous	ED045G: Chloride	1+9987007+	400 mg/L	85.2	7777	80	130	7777	7777
ED041G: Sulfate pTurbidimetriF) as SO4 (- by DA pQCLot: (74(670)										
EM130+9607002	Anonymous	ED041G: Sulfate as SO4 7Turbidimetric	149097867 9	10 mg/L	# Not Determined	7777	80	130	7777	7777
EK040P: 9luoride by PC Titrator pQCLot: (743(13)										
EM130+9817001	Anonymous	EK040P: Fluoride	1+6947497 9	5.0 mg/L	10+	7777	80	130	7777	7777
EG0(09: Dissolved Metals by ICP-MS pQCLot: (743615)										
EM130+9837001	Anonymous	EG020A7F: Arsenic	844073972	0.2 mg/L	112	7777	96	136	7777	7777
		EG020A7F: Cadmium	844074376	0.05 mg/L	108	7777	85	131	7777	7777
		EG020A7F: Cobalt	844074974	0.2 mg/L	68.4	7777	88	126	7777	7777
		EG020A7F: Copper	844075079	0.2 mg/L	102	7777	81	128	7777	7777

Sub7Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EG0(09: Dissolved Metals by ICP-MS pQCLot: (743615) - Fontinued										
EM130+9837001	Anonymous	EG020A7F: Lead	84367627l	0.2 mg/L	113	7777	81	123	7777	7777
		EG020A7F: Manganese	843676+75	0.2 mg/L	103	7777	++	132	7777	7777
		EG020A7F: Nickel	84407027O	0.2 mg/L	68.+	7777	83	126	7777	7777
		EG020A7F: Zinc	84407++7+	0.2 mg/L	111	7777	+9	13+	7777	7777
EK055G: Ammonia as N by DisFrete Analyser pQCLot: (743204)										
EM130+9607002	Anonymous	EK055G: Ammonia as N	8++47417l8	1.0 mg/L	111	7777	80	130	7777	7777
EK0(6S9: Total CN by Segmented 9low Analyser pQCLot: (743708)										
EM130+604700+	Anonymous	EK02+SF: Total Cyanide	587127S	0.2 mg/L	# +5.3	7777	80	130	7777	7777
EP024A: MonoFyFliF AromatiF HydroFarbons pQCLot: (744(43)										
EM130+60+7002	GW25	EP084: Benqene	8174372	20 µg/L	91.6	7777	+4	121	7777	7777
		EP084: Toluene	1097997S	20 µg/L	63.8	7777	+3	125	7777	7777
EP080/021: Total Petroleum HydroFarbons pQCLot: (744(44)										
EM130+60+7002	GW25	EP090: C+ 7C6 Fraction	7777	290 µg/L	+8.2	7777	4+	12+	7777	7777
EP080/021: Total ReFoverable HydroFarbons - NEPM (010 Draft pQCLot: (744(44)										
EM130+60+7002	GW25	EP090: C+ 7C10 Fraction	7777	330 µg/L	+4.4	7777	45	128	7777	7777

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1306706**	Page	: 1 of 0
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3411	Address	: p Westall Rd S7ringvale VIC Australia 31- 1
Eqmail	: rorzui@w eesi.bi@	Eqmail	: carol.+alshw alsglobal.com
Tele7hone	: 691 43 098- 1999	Tele7hone	: 691ɕ3ɕ85p0 0948
Facsimile	: 691 43 098- 18pp	Facsimile	: 691ɕ3ɕ85p0 0941
Project	: 2441- p Sth Melbourne Gas+ orks	QC Level	: NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Site	: ɋɋɋ		
CɋOɋC number	: ɋɋɋ	Date Sam7les Received	: 28ɋJUNɋ2413
Sam7ler	: SFL/KK	Issue Date	: 4pɋJULɋ2413
Order number	: ɋɋɋ		
		No. of sam7les received	: p
Quote number	: ME/334/13	No. of sam7les analysed	: p

This re7ort su7ersedes any 7revious re7ort(s) +ith this reference. Results a77ly to the sam7le(s) as submitted. All 7ages of this re7ort have been checked and a77roved for release.

This Inter7retive Quality Control Re7ort contains the follo+ing information:

- Analysis Holding Time Com7liance
- Quality Control Parameter Frezuency Com7liance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The follo+ing re7ort summarises extraction / 7re7aration and analysis times and com7ares +ith recommended holding times. Dates re7orted re7resent first date of extraction or analysis and 7recludes subsezuent dilutions and reruns. Information is also 7rovided re the sam7le container (7reservative) from +hich the analysis alizuot +as taken. Ela7sed 7eriod to analysis re7resents number of days from sam7ling +here no extraction / digestion is involved or 7eriod from extraction / digestion +here this is 7resent. For com7osite sam7les, sam7ling date is assumed to be that of the oldest sam7le contributing to the com7osite. Sam7le date for laboratory 7roduced leachates is assumed as the com7letion date of the leaching 7rocess. Outliers for holding time are based on USEPA SW 8p9, APHA, AS and NEPM (1000). A listing of breaches is 7rovided 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 qolatile analytes, the holding time com7liance assessment com7ares the leach date +ith the shortest analyte holding time for the ezuivalent soil method. These soil holding times are: Organics (1p days); Mercury (28 days) & other metals (184 days). A recorded breach therefore does not guarantee a breach for all nonqolatile 7arameters.

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: cH								
Clear PlastiF p ottle - NatBral uEA005(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**----**	qqqq	qqqq	**) 7-2UN-) 013**	2- qJUNq2413	×
EA015: Total Dissolved Solids								
Clear PlastiF p ottle - NatBral uEA015H(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	4pqJULq2413	qqqq	**0) -2UL-) 013**	4pqJULq2413	✓
ED03JP: Alkalinity by PC Titrator								
Clear PlastiF p ottle - NatBral uED03J-P(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	11qJULq2413	qqqq	**01-2UL-) 013**	11qJULq2413	✓
ED041G: SBlfate uTBrbidimetriF(as SO4) - by DA								
Clear PlastiF p ottle - NatBral uED041G(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	25qJULq2413	qqqq	**01-2UL-) 013**	25qJULq2413	✓
ED045G: Chloride DisFrete analyser								
Clear PlastiF p ottle - NatBral uED045G(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	25qJULq2413	qqqq	**01-2UL-) 013**	25qJULq2413	✓
ED0739: Dissolved Major Cations								
Clear PlastiF p ottle - NatBral uED0739(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	4pqJULq2413	qqqq	**0) -2UL-) 013**	4pqJULq2413	✓
EG0) 09: Dissolved Metals by ICP-MS								
Clear PlastiF p ottle - NitriF AFid; 9iltered uEG0) 0A-9(								
GW15, GW45	GW25,	**) J-2UN-) 013**	**---**	2pqDECq2413	qqqq	**0) -2UL-) 013**	2pqDECq2413	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK0) 6S9: Total CN by Segmented 9low Analyser							
White PlastiF p ottle-NaOH ιEK0) 6S9(							
GW15	**) J-2UN-) 013**	**---**	11qJULq2413	qqqq	**01-2UL-) 013**	11qJULq2413	✓
White PlastiF p ottle-NaOH - Pb AFetate ιEK0) 6S9(							
GW25, GW45	**) J-2UN-) 013**	**---**	11qJULq2413	qqqq	**01-2UL-) 013**	11qJULq2413	✓
EK040P: 9IBoride by PC Titrator							
Clear PlastiF p ottle - NatBral ιEK040P(							
GW15, GW25, GW45	**) J-2UN-) 013**	**---**	25qJULq2413	qqqq	**01-2UL-) 013**	25qJULq2413	✓
EK055G: Ammonia as N by DisFrete Analyser							
Clear PlastiF p ottle - SBlfBriF AFid ιEK055G(							
GW15, GW25, GW45	**) J-2UN-) 013**	**---**	25qJULq2413	qqqq	**0) -2UL-) 013**	25qJULq2413	✓
EK05JG: Nitrite as N by DisFrete Analyser							
Clear PlastiF p ottle - NatBral ιEK05JG(							
GW15, GW25, GW45	**) J-2UN-) 013**	**---**	20qJUNq2413	qqqq	**) 8-2UN-) 013**	20qJUNq2413	✓
EK0J1G: ReaFtive PhoschorBs as P by disFrete analyser							
Clear PlastiF p ottle - NatBral ιEK0J1G(							
GW15, GW25, GW45	**) J-2UN-) 013**	**---**	20qJUNq2413	qqqq	**) 8-2UN-) 013**	20qJUNq2413	✓
EP080/0J1: Total ReFoverable HydroFarbons - NEPM) 010 Draft							
Amber Glass p ottle - Uncreserved ιEP0J1(							
GW15, GW25, GW45	**) J-2UN-) 013**	**01-2UL-) 013**	4pqJULq2413	✓	**0) -2UL-) 013**	14qAUGq2413	✓
EP0J4A: MonoFyFliF AromatiF HydroFarbons							
Amber VOC Vial - SBlfBriF AFid ιEP0J4(							
GW15, GW25, GW45, Tri7 8	**) J-2UN-) 013**	**01-2UL-) 013**	11qJULq2413	✓	**0) -2UL-) 013**	11qJULq2413	✓
EP0J4H: Nachthalene							
Amber VOC Vial - SBlfBriF AFid ιEP0J4(							
GW15, GW25, GW45, Tri7 8	**) J-2UN-) 013**	**01-2UL-) 013**	11qJULq2413	✓	**0) -2UL-) 013**	11qJULq2413	✓
EP080/0J1: Total ReFoverable HydroFarbons - NEPM) 010 Draft							
Amber VOC Vial - SBlfBriF AFid ιEP080(							
GW15, GW25, GW45	**) J-2UN-) 013**	**01-2UL-) 013**	11qJULq2413	✓	**0) -2UL-) 013**	11qJULq2413	✓

Quality Control Parameter Frequency Compliance

The follo+ ing re7ort summarises the frezuency of laboratory QC sam7les analysed +ithin the analytical lot(s) in +hich the submitted sam7le(s) +as(+here) 7rocessed. Actual rate should be greater than or ezual to the ex7ected rate. A listing of breaches is 7rovided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frezuency not +ithin s7ecification ; ✓ = Quality Control frezuency +ithin s7ecification.

Quality Control Sam7le Ty7e		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Du7licates (DUP)							
Alkalinity by PC Titrator	ED43- qP	2	15	**13.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Ammonia as N by Discrete analyser	EK455G	2	12	**16.J**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	2	13	**15.4**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Fluoride by PC Titrator	EK4p4P	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	1	9	**16.J**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK450G	2	1p	**14.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	EK45- G	3	5	**60.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
7H	EA445	2	10	**10.5**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	EK4- 1G	2	14	**) 0.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	3	21	**14.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	EK429SF	2	14	**) 0.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	2	24	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	2	1-	**11.8**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH Volatiles/BTEX	EP484	1	14	**10.0**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	2	1p	**14.3**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Laboratory Control Sam7les (LCS)							
Alkalinity by PC Titrator	ED43- qP	1	15	**6.J**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Ammonia as N by Discrete analyser	EK455G	1	12	**8.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	2	13	**15.4**	**10.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Fluoride by PC Titrator	EK4p4P	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	1	9	**16.J**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK450G	1	1p	**J.1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	EK45- G	2	5	**40.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	EK4- 1G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	2	21	**7.5**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	EK429SF	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	1-	**5.7**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH Volatiles/BTEX	EP484	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	1p	**J.1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK455G	1	12	**8.3**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	1	13	**J.J**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement

Matrix: **WATER**

Evaluation: × = Quality Control frezuency not +ithin s7ecification ; ✓ = Quality Control frezuency +ithin s7ecification.

Quality Control Sam7le Ty7e		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) qContinued							
Fluoride by PC Titrator	EK4p4P	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Major Cations qDissolved	ED403F	1	9	**16.J**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK450G	1	1p	**J.1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	EK45- G	2	5	**40.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	EK4- 1G	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	2	21	**7.5**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	EK429SF	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Total Dissolved Solids (High Level)	EA415H	1	24	**5.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	1-	**5.7**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
TPH Volatiles/BTEX	EP484	1	14	**10.0**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	1p	**J.1**	**5.0**	✓	NEPM 1000 Schedule B(3) and ALS QCS3 rezuirement
Matrix S7ikes (MS)							
Ammonia as N by Discrete analyser	EK455G	1	12	**8.3**	**5.0**	✓	ALS QCS3 rezuirement
Chloride by Discrete Analyser	ED4p5G	1	13	**J.J**	**5.0**	✓	ALS QCS3 rezuirement
Dissolved Metals by ICPqMS qSuite A	EG424AqF	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Fluoride by PC Titrator	EK4p4P	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK450G	1	1p	**J.1**	**5.0**	✓	ALS QCS3 rezuirement
Nitrite as N by Discrete Analyser	EK45- G	1	p	**) 5.0**	**5.0**	✓	ALS QCS3 rezuirement
Reactive Phos7horus as PqBy Discrete Analyser	EK4- 1G	1	14	**10.0**	**5.0**	✓	ALS QCS3 rezuirement
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	1	24	**5.0**	**5.0**	✓	ALS QCS3 rezuirement
Total Cyanide by Segmented Flo+ Analyser	EK429SF	1	14	**10.0**	**5.0**	✓	ALS QCS3 rezuirement
TPH qSemivolatile Fraction	EP4- 1	1	1-	**5.7**	**5.0**	✓	ALS QCS3 rezuirement
TPH Volatiles/BTEX	EP484	1	14	**10.0**	**5.0**	✓	ALS QCS3 rezuirement
Volatile Organic Com7ounds	EP4- p	1	1p	**J.1**	**5.0**	✓	ALS QCS3 rezuirement

Brief Method Summaries

The analytical 7rocedures used by the Environmental Division have been develo7ed from established internationally recogni@ed 7rocedures such as those 7ublished by the US EPA, APHA, AS and NEPM. In house develo7ed 7rocedures are em7loyed in the absence of documented standards or by client rezuest. The follo+ing re7ort 7rovides brief descri7tions of the analytical 7rocedures em7loyed for results re7orted in the Certificate of Analysis. Sources from +hich ALS methods have been develo7ed are 7rovided + ithin the Method Descri7tions.

Analytical Methods	Method	Matrix	Method Descriptions
7H	EA445	WATER	APHA 21st ed. p544 H6 B. 7H of + ater sam7les is determined by ISE either manually or by automated 7H meter. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Total Dissolved Solids (High Level)	EA415H	WATER	InqHouse, APHA 21st ed., 25p4C A gravimetric 7rocedure that determines the amount of `filterable` residue in an azueous sam7le. A + ellqmixed sam7le is filtered through a glass fibre filter (1.2um). The filtrate is eva7orated to dryness and dried to constant + eight at 1846/q5C. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Alkalinity by PC Titrator	ED43- qP	WATER	APHA 21st ed., 2324 B This 7rocedure determines alkalinity by automated measurement (e.g. PC Titrate) using 7H p.5 for indicating the total alkalinity endq7oint. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Sulfate (Turbidimetric) as SOp 2qby Discrete Analyser	ED4p1G	WATER	APHA 21st ed., p544qSOp Dissolved sulfate is determined in a 4.p5um filtered sam7le. Sulfate ions are converted to a barium sulfate sus7ension in an acetic acid medium + ith barium chloride. Light absorbance of the BaSOp sus7ension is measured by a 7hotometer and the SOpq2 concentration is determined by com7arison of the reading + ith a standard curve. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Chloride by Discrete Analyser	ED4p5G	WATER	APHA 21st ed., p544 Cl qG.The thiocyanate ion is liberated from mercuric thiocyanate through sezuestration of mercury by the chloride ion to form nonqonised mercuric chloride.in the 7resence of ferric ions the librated thiocynate forms highlyqcoloured ferric thiocynate + hich is measured at p84 nm APHA 21st edition seal method 2 41- q1q_ a7ril 2443
Major Cations qDissolved	ED403F	WATER	Major Cations is determined based on APHA 21st ed., 3124; USEPA SW 8p9 q9414 The ICPAES technizue ionises the 4.p5um filtered sam7le atoms emitting a characteristic s7ectrum. This s7ectrum is then com7ared against matrix matched standards for zuantification. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2) Sodium Adsor7tion Ratio is calculated from Ca, Mg and Na + hich determined by ALS in house method QWIqEN/ED403F. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2) Hardness 7arameters are calculated based on APHA 21st ed., 23p4 B. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2)
Dissolved Metals by ICPqMS qSuite A	EG424AqF	WATER	(APHA 21st ed., 3125; USEPA SW8p9 q9424, ALS QWIqEN/EG424): Sam7les are 4.p5 um filtered 7rior to analysis. The ICPMS technizue utili@es a highly efficient argon 7lasma to ioni@e selected elements. Ions are then 7assed into a high vacuum mass s7ectrometer, + hich se7arates the analytes based on their distinct mass to charge ratios 7rior to their measurement by a discrete dynode ion detector.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flo+ Analyser	EK429SF	WATER	APHA p544qCNqO. Sodium hydroxide 7reserved sam7les are introduced into an automated segmented flo+ analyser. Com7lex bound cyanide is decom7osed in a continuously flo+ing stream, at a 7H of 3.8, by the effect of UV light. A UVqB lam7 (312 nm) and a decom7osition s7iral of borosilicate glass are used to filter out UV light +ith a +avelength of less than 204 nm thus 7reventing the conversion of thiocyanate into cyanide. The hydrogen cyanide 7resent at a 7H of 3.8 is se7arated by gas dialysis. The hydrogen cyanide is then determined 7hotometrically, based on the reaction of cyanide +ith chloramineqT to form cyanogen chloride. This then reacts +ith pq7yridine carboxylic acid and 1,3qdimethylbarbituric acid to give a red colour +hich is measured at 944 nm. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Fluoride by PC Titrator	EK4p4P	WATER	APHA 21st ed., p544 FqC CDTA is added to the sam7le to 7rovide a uniform ionic strength background, adjust 7H, and break u7 com7lexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ammonia as N by Discrete analyser	EK455G	WATER	APHA 21st ed., p544qNH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ammonium as N	EK455GqNHp	WATER	Ammonium in the sam7le is re7orted as the ionised / unionised fractions by the use of a nomogra7h and the initial 7H and Tem7erature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., p544qNH3 G. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrite as N by Discrete Analyser	EK45- G	WATER	APHA 21st ed., p544qNO2qB. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrate as N by Discrete Analyser	EK458G	WATER	APHA 21st ed., p544qNO3qF. Nitrate is reduced to nitrite by +ay of a chemical reduction follo+ed by zuantification by Discrete Analyser. Nitrite is determined se7erately by direct colourimetry and result for Nitrate calculated as the difference bet+een the t+o results. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK450G	WATER	APHA 21st ed., p544qNO3qF. Combined oxidised Nitrogen (NO26NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Reactive Phos7horus as PqBy Discrete Analyser	EK4- 1G	WATER	APHA 21st ed., p544qP F Ammonium molybdate and 7otassium antimonyl tartrate reacts in acid medium +ith otho7hos7hate to form a hetero7oly acid q7hos7homolybdic acid q+hich is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Ionic Balance by PCT DA and Turbi SOp DA	EN455 qPG	WATER	APHA 21st Ed. 1434F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate +hich determined by PCT and DA. The Cations are determined by Turbi SOp by DA. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
TPH qSemivolatile Fraction	EP4- 1	WATER	USEPA SW 8p9 q8415A The sam7le extract is analysed by Ca7illary GC/FID and zuantification is by com7arison against an established 5 7oint calibration curve of nqAlkane standards. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
Volatile Organic Com7ounds	EP4- p	WATER	USEPA SW 8p9 q8294B Water sam7les are directly 7urged 7rior to analysis by Ca7illary GC/MS and zuantification is by com7arison against an established 5 7oint calibration curve. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)
TPH Volatiles/BTEX	EP484	WATER	USEPA SW 8p9 q8294B Water sam7les are directly 7urged 7rior to analysis by Ca7illary GC/MS and zuantification is by com7arison against an established 5 7oint calibration curve. Alternatively, a sam7le is ezuilibrated in a heads7ace vial and a 7ortion of the heads7ace determined by GCMS analysis. This method is com7liant +ith NEPM (1000) Schedule B(3) (A77dx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Se7aratory Funnel Extraction of Lizuids	ORG1ɒ	WATER	USEPA SW 8p9 q3514B 144 mL to 1L of sam7le is transferred to a se7aratory funnel and serially extracted three times using 94mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is com7liant + ith NEPM (1000) Schedule B(3) (A77dx. 2). ALS default excludes sediment + hich may be resident in the container.
Volatiles Water Pre7aration	ORG19ɑW	WATER	A 5 mL alizuot or 5 mL of a diluted sam7le is added to a p4 mL VOC vial for s7arging.

Summary of Outliers

Outliers : Quality Control Samples

The follo+ing re7ort highlights outliers flagged in the Quality Control (QC) Re7ort. Surrogate recovery limits are static and based on USEPA SW 8p9 or ALSqQWI/EN/38 (in the absence of s7ecific USEPA limits). This re7ort dis7lays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Com7ound Grou7 Name	Laboratory Sam7le ID	Client Sam7le ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Scike uMS(ReFoveries							
ED4p1G: Sulfate (Turbidimetric) as SOp 2qby DA	EM1349804q442	Anonymous	**SBlfate as SO4 - TBrbidimetriF**	1p848q- 0q8	Not Determined	qqqq	**MS reFovery not determined, baFkgroBnd level greater than or eqBal to 4x scike level.**
EK429SF: Total CN by Segmented Flo+ Analyser	EM134904pq449	Anonymous	**Total Cyanide**	5- q12q5	95.3 %	- 4q134%	**ReFovery less than lower data qBality objeFtive**

- **9or all matriFes, no Method plank valBe oBtliers oFFBr.**
- **9or all matriFes, no DBcliFate oBtliers oFFBr.**
- **9or all matriFes, no Laboratory Control oBtliers oFFBr.**

Regular Sample Surrogates

- **9or all regBlar samcle matriFes, no sBrrogate reFovery oBtliers oFFBr.**

Outliers : Analysis Holding Time Compliance

This re7ort dis7lays Holding Time breaches only. Only the res7ective Extraction / Pre7aration and/or Analysis com7onent is/are dis7layed.

Matrix: **WATER**

Method		Extraction / Preparation			Analysis		
Container / Client Sam7le ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005: cH							
Clear PlastiF pottle - NatBral							
GW15, GW45	GW25,	qqqq	qqqq	qqqq	20qJUNq2413	2- qJUNq2413	)

Outliers : Frequency of Quality Control Samples

The follo+ing re7ort highlights breaches in the Frezuency of Quality Control Sam7les.

- **No QBality Control Samcle 9reqBenFy OBtliers exist.**

CoC received 28/06/13 08:57 R.T

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: [illegible]
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS: Standard TAT (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle)
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		Custody Seal Intact? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) CC 1 2 3 4 5 7	Random Sample Temperature on Receipt °C
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9687 1666 O 1 2 3 4 5 7	Other comment:
SAMPLER: SFL / KK	SAMPLER MOBILE: 0488 339 025	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to : rorquiza@eesicontracting.com and sleong@environmentalearthsciences.com		
Email Invoice to : rorquiza@environmentalearthsciences.com		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
S.Leong	ALS Courier		Chris
DATE/TIME: 28/6 9 am	DATE/TIME: 28/6 9 am	DATE/TIME:	DATE/TIME: 28/6 13:10

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
1	GW15	27/06/2013	W		8	x	x	x	x	x	x	x						5.54	18	
2	GW25	27/06/2013	W		8	x	x	x	x	x	x	x						6.49	17.8	
3	GW05	27/06/2013	W		8	x	x	x	x	x	x	x						6.74	19.3	
4	Trip/8 C-M 28/6	27/06/2013	W		2					x	x									
				TOTAL																

Environmental Division
LB Melbourne LB
15:43 Work Order 15:43
EM1306906

Telephone : +61-3-8549 9600

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Prese
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Raymond Thai

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Friday, 28 June 2013 8:57 AM
To: Carol Walsh
Cc: Samples Melbourne
Subject: RE: COC FOR SAMPLES RECEIVED THIS AFTERNOON
Attachments: 210074_CoC_27 June 2013 pm.pdf; 210074_CoC_28 June 2013 am.pdf

Hi Carol,

Please find the attached CoC for the samples collected yesterday and the CoC for the samples to be collected this morning.

Thank you.

Regards

Regin

From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Thursday, 27 June 2013 4:37 PM
To: Regin Orquiza
Subject: COC FOR SAMPLES RECEIVED THIS AFTERNOON

Regin

Do you have the COC's prepared for samples received this afternoon.

Kind Regards

Carol Walsh

Senior Client Services Officer
ALS | Environmental Division

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