Aerial Imagery 1943

Corner Olympic Drive & Church Street, Lidcombe, NSW 2141

Scale: 0 25 50 100 Meters	Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)	Coordinate System: GDA 1994 MGA Zone 56	Date: 26/11/2015

Appendix C
Borehole Logs

coffey

Engineering Log - Borehole

Borehole ID.	**BH01**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**23 Nov 2015**
date completed:	**24 Nov 2015**
logged by:	**TO**
checked by:	**AH**

position: E: 309956; N: 6270732 (Datum Not Specified) surface elevation: 14.66 m (AHD) angle from horizontal: 90° DCP id.:

drill model: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
AD/T CASING		Not Observable	E					**FILL: ASPHALT**: 40mm thickness.	D				**ASPHALT**
			E	14				**FILL: Gravelly Clayey SAND**: fine to medium grained, brown, fine to medium sub-angular to angular gravel.					**FILL** PID(0.05-0.2m) =3.7ppm, no odours or staining observed
			E SPT 5, 7, 8 N*=15		1.0		CH	**Silty CLAY**: high plasticity, red brown mottled pale grey.	<Wp	VSt			**RESIDUAL SOIL** PID(0.5-0.6m) =4.6ppm
				13				1.3 m: becoming with some sandstone/ silstone, brown					
					2.0								
			SPT 19, 14, 25/130mm HB N*=R	12									
					3.0			**SILTSTONE**: brown and grey, extremely to highly weathered, estimated very low to low strength.					**WEATHERED BEDROCK**
				11									
								Borehole BH01 continued as cored hole					
					4.0								
				10									
					5.0								
				9									
					6.0								
				8									
					7.0								
				7									

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:57

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH01**
		sheet:	2 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**23 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**24 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 309956; N: 6270732 (Datum Not Specified) surface elevation: 14.66 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		14	1.0								
		13	2.0								
		12	3.0								
		11			start coring at 3.80m						
NMLC	Not Observabl 01/12/15 07:30	10	4.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: siltstone (40%) and sandstone (60%), sandstone is fine grained, pale grey, siltstone is dark grey.	SW		a=2.88 d=1.82	100%		PT, 0 - 5°, IR, RO, Fe SN
		9	5.0			FR		a=1.50 d=1.48	98%		PT, 5 - 15°, CU, RO, CN
		8	6.0					a=1.42 d=1.24			
		7	7.0					a=1.58 d=1.05	99%		PT, 5 - 15°, IR, RO, CN

Defects are:PT, 0 - 10°, PL, RO, CN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH01**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**23 Nov 2015**
date completed:	**24 Nov 2015**
logged by:	**TO**
checked by:	**AH**

position: E: 309956; N: 6270732 (Datum Not Specified) surface elevation: 14.66 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	6	9.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: siltstone (40%) and sandstone (60%), sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=2.91 d=1.11			
		5	10.0		**LAMINITE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey.			a=1.06 d=0.94	99%		PT, 0 - 5°, UN, RO, CN PT, 0°, IR, RO, CN
		4	11.0					a=1.15 d=0.90			
		3	12.0					a=2.31 d=1.11	99%		PT, 0 - 5°, IR, RO, CN
		2	13.0					a=1.92 d=0.89			PT, 0 - 5°, UN, RO, CN
		1	14.0					a=0.62 d=0.56			
		0	15.0		14.66 to 14.82 m: fine grained sandstone band			a=0.96 d=0.57	92%		JT, 55 - 65°, IR, RO, CN JT, 70 - 80°, UN, RO, CN PT, 0 - 5°, IR, RO, CN JT, 0 - 90°, IR, RO, CN
		-1						a=0.75 d=0.53			PT, 0°, PL, RO, Silty clay VN

Defects are:PT, 0 - 10°, PL, RO, CN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH01**
sheet:	4 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**23 Nov 2015**
date completed:	**24 Nov 2015**
logged by:	**TO**
checked by:	**AH**

position: E: 309956; N: 6270732 (Datum Not Specified) surface elevation: 14.66 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	-2	17.0		**LAMINITE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=5.66 d=2.67	92%		CS, 0°, Silty clay, 120 mm PT, 0 - 5°, IR, RO, CN multiple defects, Jts at 65-80°
		-3	18.0					a=0.98 d=0.74	96%		Defects are:PT, 0 - 10°, PL, RO, CN, unless otherwise described
		-4	19.0					a=2.00 d=0.78			
		-5	20.0		Borehole BH01 terminated at 19.40 m Target depth			a=0.76 d=0.72			
		-6	21.0								
		-7	22.0								
		-8	23.0								
		-9									

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Piezometer Installation Log

		Hole ID.	***BH01***
		sheet:	1 of 1
		project no.	***GEOTLCOV25554AA***
client:	***Bouygues Construction Australia***	date started:	***23 Nov 2015***
principal:	***Dooleys Lidcombe Catholic Club***	date completed:	***24 Nov 2015***
project:	***Dooleys Lidcombe Club & Hotel Development***	logged by:	***TO***
location:	***24-28 John St, Lidcombe NSW 2141***	checked by:	***AH***

position: E: 309956; N: 6270732 (Datum Not Specified) surface elevation: 14.66 m (AHD) angle from horizontal: 90°

equipment type: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance** | **piezometer construction details**

method & support	water	RL (m)	depth (m)	graphic log	material name
AD/T, CASING	Not Observable	12			FILL: ASPHALT
					FILL: Gravelly Clayey SAND
					Silty CLAY
					SILTSTONE
	01/12/15 07:30	8	4		INTERBEDDED SILTSTONE AND SANDSTONE
NMLC		4	8		
		0	12		LAMINITE
		-4	16		
					Borehole BH01 terminated at 19.40 m Target depth

BH01

bore construction license:
drilling company:
driller:
driller's permit no.:

Concrete
Sand
Bentonite
3.00 m
Sand
14.90 m
Bentonite
Cuttings

method & support
see engineering log for details

water
- 10-Oct-12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

ID	type	stick up & RL	tip depth & RL	install. date	water level
BH01	standpipe		14.90 m -0.24 m AHD		

coffey

Engineering Log - Borehole

Borehole ID.	**BH02**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**20 Nov 2015**
date completed:	**23 Nov 2015**
logged by:	**TO**
checked by:	**AH**

position: E: 318949; N: 6251435 (Datum Not Specified) surface elevation: 13.69 m (AHD) angle from horizontal: 90° DCP id.:

drill model: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
AD/T CASING		Not Observable		13				**FILL: ASPHALT**: 20mm thickness.	D				**ASPHALT**
								FILL: Sandy Clayey GRAVEL: fine to medium grained, sub-rounded to angular, brown, sand is fine to medium grained.					**FILL** no odours or staining observed
							CH	**CLAY**: high plasticity, brown mottled red brown.	<Wp	St / VSt			**RESIDUAL SOIL**
			SPT 14, 20, 23 N*=43	12	1.0			1.2 m: with some extremely weathered silstone, brown		VSt / Fb			
			SPT 24/110mm HB N*=R	11	2.0			**SILTSTONE**: brown grey, extremely to highly weathered, estimated very low strength..					**WEATHERED BEDROCK**
			SPT 15/90mm HB N*=R	10	3.0								
				9	4.0			Borehole BH02 continued as cored hole					
				8	5.0								
				7	6.0								
				6	7.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:57

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH02**
sheet:	2 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**20 Nov 2015**
date completed:	**23 Nov 2015**
logged by:	**TO**
checked by:	**AH**

position: E: 318949; N: 6251435 (Datum Not Specified) surface elevation: 13.69 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		13	1.0								
		12	2.0								
		11	3.0								
		10	4.0		start coring at 4.20m						
NMLC	Not Observable	9	5.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. 4.2 to 4.25 m: sandstone, fine to medium grained, pale grey	MW SW		a=1.09 d=0.91	89%		JT, 70°, partially annealed PT, 5°, IR, RO, CN PT, 0°, IR, RO, Fe SN JT, 85 - 90°, IR, RO, Clay VN
		8	6.0		5.28 to 5.46 m: interbedded siltstone and sandstone band **LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. 6.3 to 6.4 m: grey fine grained sandstone band	FR		a=0.96 d=0.56 a=0.64 d=0.18	77%		JT, 30 - 45°, IR, RO, CN JT, 50 - 90°, CU, RO, CN
		7	7.0								
		6						a=0.60 d=0.77	77%		multiple partings

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH02**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**20 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**23 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**AH**

position: E: 318949; N: 6251435 (Datum Not Specified) surface elevation: 13.69 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular	general
NMLC	Not Observable	5	9.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.80 d=0.40			JT, 45°, IR, RO, CN PT, 0 - 5°, UN, RO, CN	
		4	10.0					a=0.98 d=0.55	77%		JT, 40 - 60°, IR, RO, CN SM, 5 - 10°, Silty clay, 10 mm JT, 85 - 90°, PL, RO, CN	
		3	11.0					a=0.63 d=0.69			PT, 5 - 10°, UN, RO, CN JT, 0°, PL, RO, CN CS, 0°, 10 mm	
		2	12.0					a=0.46 d=0.35	98%			Defects are:PT, 0 - 10°, PL - IR, RO, CN, unless otherwise described
		1	13.0					a=0.54 d=0.69				
		0	14.0					a=0.58 d=0.52			JT, 70 - 90°, IR, RO, CN	
		-1	15.0					a=2.99 d=0.99	97%			
		-2						a=0.90 d=0.53				

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH02**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**20 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**23 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318949; N: 6251435 (Datum Not Specified) surface elevation: 13.69 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	-3	17.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.53 d=0.44	97%		
		-4	18.0					a=0.37 d=0.27	90%		CS, 0 - 5°, 10 mm multiple defects
		-5	19.0					a=0.66 d=0.56			CS, 0 - 10°, IR, 30 mm JT, 35 - 50°, CU, RO, CN SM, 0 - 5°, CU, 50 mm CS, 90 mm Defects are:PT, 0 - 10°, PL - IR, RO, CN, unless otherwise described
		-6	20.0		Borehole BH02 terminated at 19.40 m Target depth						
		-7	21.0								
		-8	22.0								
		-9	23.0								
		-10									

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Borehole

		Borehole ID.	**BH03**
		sheet:	1 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**19 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**19 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318929; N: 6251470 (Datum Not Specified) surface elevation: 13.20 m (AHD) angle from horizontal: 90° DCP id.:

drill model: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
AD/T HA AD/T CASING		Not Observable	E E E SPT 5, 12, 26 N*=38 SPT 20, 8, 13 N*=21 SPT 25 HB N*=R	13 12 11 10 9 8 7 6	1.0 2.0 3.0 4.0 5.0 6.0 7.0		CH	**FILL: ASPHALT**: 30mm thickness. **FILL: Gravelly SAND**: fine to medium grained, fine to medium sub-angular to angular gravel. **Silty CLAY**: high plasticity, brown mottled red brown and pale grey. 1 to 1.3 m: remoulds to silty clay **SILTSTONE**: brown and pale grey, extremely weathered, estimated very low strength. Borehole BH03 continued as cored hole	<Wp	VSt / H			**ASPHALT** **FILL** PID(0.05-0.2m) = 0.0ppm, no odours or staining observed PID(0.5-0.6m) =0.0ppm **RESIDUAL SOIL** **WEATHERED BEDROCK**

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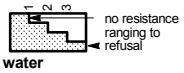
method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

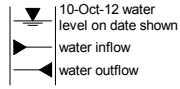
support
- M mud
- C casing
- N nil

penetration



no resistance ranging to refusal

water


10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remoulded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH03**
sheet:	2 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**19 Nov 2015**
date completed:	**19 Nov 2015**
logged by:	**TO**
checked by:	**AH**

position: E: 318929; N: 6251470 (Datum Not Specified) surface elevation: 13.20 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		13									
			1.0								
		12									
			2.0								
		11									
			3.0								
		10									
			4.0		start coring at 4.15m						
NMLC	01/12/15 07:25 Not Observable	9			**INTERBEDDED SILTSTONE AND SANDSTONE**: fine grained, pale grey to dark grey, siltstone (70%) and sandstone (30%), distinctly bedded at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey.	HW MW		a=1.03 d=0.33	97%		SM, 5°, IR, Clay filled, 20 mm PT, 0 - 5°, IR, RO, CN
		8	5.0								JT, 70 - 85°, IR, RO, CN
						SW		a=1.11 d=0.37			
		7	6.0								CS, 0 - 15°, RO, Fe SN
					LAMINITE: fine grained, pale grey, siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey.	FR		a=0.73 d=0.40	96%		
		6	7.0					a=0.91 d=0.57	100%		multiple partings

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

Engineering Log - Cored Borehole

Borehole ID.	**BH03**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**19 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**19 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**AH**

position: E: 318929; N: 6251470 (Datum Not Specified) surface elevation: 13.20 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	5	9.0		**LAMINITE**: fine grained, pale grey, siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=1.47 d=0.56			SM, 0 - 10°, Clay filled, 20 mm
		4									SM, 0°, Clay filled, 20 mm
											JT, 10°, UN, SO, Pyrite VN
									100%		
			10.0					a=0.72 d=0.46			
		3									
								a=0.79 d=0.48			
			11.0								
		2						a=0.72 d=0.46			CS, 0°, PL
			12.0						100%		
		1						a=0.46 d=0.52			
			13.0								
		0						a=0.69 d=0.56			
			14.0								PT, 0°, PL, RO, Clay VN PT, 0°, PL, RO, Clay VN
		-1									
								a=1.26 d=0.47	97%		
			15.0								
		-2						a=0.52 d=0.25			
											JT, 75°, UN, SO, CN
											JT, 75°, UN, SO, CN

Defects are:PT, 0 - 10°, PL, RO, CN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH03**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**19 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**19 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318929; N: 6251470 (Datum Not Specified) surface elevation: 13.20 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information				material substance						rock mass defects		
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC		-3				FR	O X		97%		
					Borehole BH03 terminated at 16.50 m Target depth			a=0.87 d=0.36			
			17.0								
		-4									
			18.0								
		-5									
			19.0								
		-6									
			20.0								
		-7									
			21.0								
		-8									
			22.0								
		-9									
			23.0								
		-10									

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method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Piezometer Installation Log

Hole ID.	***BH03***
sheet:	1 of 1
project no.	***GEOTLCOV25554AA***
client: ***Bouygues Construction Australia***	date started: ***19 Nov 2015***
principal: ***Dooleys Lidcombe Catholic Club***	date completed: ***19 Nov 2015***
project: ***Dooleys Lidcombe Club & Hotel Development***	logged by: ***TO***
location: ***24-28 John St, Lidcombe NSW 2141***	checked by: ***AH***

position: E: 318929; N: 6251470 (Datum Not Specified) surface elevation: 13.20 m (AHD) angle from horizontal: 90°

equipment type: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance** | **piezometer construction details**

method & support	water	RL (m)	depth (m)	graphic log	material name
HA AD/T		12			FILL: ASPHALT
					FILL: Gravelly SAND
					Silty CLAY
AD/T CASING	Not Observable				SILTSTONE
	01/12/15 07:25	8	4		INTERBEDDED SILTSTONE AND SANDSTONE
NMLC		4			LAMINITE
		0	8		
			12		
		-4	16		Borehole BH03 terminated at 16.50 m Target depth

bore construction license:
drilling company:
driller:
driller's permit no.:

BH03

Concrete
Sand
Bentonite
3.00 m
Sand
8.00 m
Bentonite
Cuttings

method & support
see engineering log for details

water
- 10-Oct-12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

ID	type	stick up & RL	tip depth & RL	install. date	water level
BH03	standpipe		8.00 m 5.20 m AHD		

CDF_0_9_04BB.GLB Log COF PIEZOMETER INSTALLATION LOG GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

coffey

Engineering Log - Borehole

Borehole ID.	**BH04**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**AH**

position: E: 318954; N: 6251461 (Datum Not Specified) surface elevation: 14.00 m (AHD) angle from horizontal: 90° DCP id.:

drill model: DRILLTECH 550, Truck mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
AD/T, CASING		Not Observable	E E	14				**FILL: ASPHALT**	D to M				**ASPHALT**
								FILL: Gravelly SAND: fine to medium grained, brown, gravel is fine to medium grained, sub-rounded. becoming dark brown, gravel is , medium to coarse grained, sub-rounded to sub-angular	<Wp				**FILL** PID(0.2m) = 0.0ppm, no odours or staining observed PID(0.4m) = 5.2ppm
				13	1.0		CH	**CLAY**: high plasticity, brown mottled pale grey.		VSt to H			**RESIDUAL SOIL**
			E SPT 2, 7, 21 N*=28					becoming pale grey					PID(1.5m) = 2.3ppm
				12	2.0								
				11	3.0			**INTERBEDDED SANDSTONE AND SILTSTONE**: pale grey to dark grey, extremely weathered, very low strength.					**WEATHERED BEDROCK**
				10	4.0								
								Borehole BH04 continued as cored hole					
				9	5.0								
				8	6.0								
				7	7.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:58

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH04**
sheet:	2 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**26 Nov 2015**
date completed:	**26 Nov 2015**
logged by:	**NM**
checked by:	**AH**

position: E: 318954; N: 6251461 (Datum Not Specified) surface elevation: 14.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		14									
		13	1.0								
		12	2.0								
		11	3.0								
		10	4.0		start coring at 4.10m						
HQ	Not Observable	9	5.0		**INTERLAMINATED SILTSTONE AND SANDSTONE**: siltstone (50%) and sandstone (50%), distinctly bedded at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. iron staining on the joints and partings	HW SW FR		a=0.57 d=0.09 a=0.98 d=0.40 a=5.71 d=3.99 a=0.67 d=0.58	71% 91%		JT, 0°, ST, RO, Fe SN SM, CL Clay, 8 mm PT, 0°, PL, SO, Pyrite VN PT, 0°, PL, SO, CN JT, 5°, ST, RO, CN PT, 0°, UN, RO, Fe SN PT, 0°, PL, RO, Fe SN PT, 0°, PL, RO, Fe SN CS, SN, 10 mm PT, 0°, PL, RO, Fe SN PT, 0°, PL, RO, Fe SN PT, 0°, PL, RO, CN PT, 0°, PL, SO, Pyrite VN PT, 0°, PL, SO, CN PT, 0°, PL, SO, Pyrite VN SM, CL Clay, 5 mm JT, 80°, UN, RO, Fe SN JT, 5°, UN, RO, CN JT, 80°, ST, RO, CN JT, 90°, IR, RO, CN Defects are:PT, 0°, PL, SO, Fe SN, unless otherwise described
		8	6.0								
		7	7.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH04**
		sheet:	3 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318954; N: 6251461 (Datum Not Specified) surface elevation: 14.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (O = diametral; X = axial) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	14.0 5 9.0 4 10.0 3 11.0 2 12.0 1 13.0 0 14.0 -1 15.0			**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey.	FR		a=0.89 d=0.14 a=0.66 d=0.33 a=0.51 d=0.30 a=0.55 d=0.12 a=0.63 d=0.40 a=0.54 d=0.32 a=2.57 d=0.60 a=0.95 d=0.47	91% 98% 94% 92% 98%		PT, 0°, PL, SO, Pyrite VN JT, 80 - 85°, PL, SO, CN JT, 40°, UN, RO, CN JT, 80 - 85°, UN, RO, CN Defects are:PT, 0 - 10°, PL, SO, CN, unless otherwise described

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method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH04**
sheet:	4 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**AH**

position: E: 318954; N: 6251461 (Datum Not Specified) surface elevation: 14.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information				material substance					rock mass defects		
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	-3	17.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=2.34 d=0.71	98%		
		-4	18.0					a=0.69 d=0.35			
		-5	19.0					a=0.84 d=0.43	92%		JT, 90°, IR, RO, CN JT, 80°, UN, RO, CN
		-6	20.0					a=1.23 d=0.38			JT, 70°, UN, RO, CN JT, 80°, UN, RO, CN
					Borehole BH04 terminated at 20.00 m Target depth						Defects are:PT, 0 - 10°, PL, SO, CN, unless otherwise described
		-7	21.0								
		-8	22.0								
		-9	23.0								

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method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Borehole

Borehole ID.	***BH05***
sheet:	1 of 4
project no.	***GEOTLCOV25554AA***
client:	***Bouygues Construction Australia***
date started:	***25 Nov 2015***
principal:	***Dooleys Lidcombe Catholic Club***
date completed:	***25 Nov 2015***
project:	***Dooleys Lidcombe Club & Hotel Development***
logged by:	***TO***
location:	***24-28 John St, Lidcombe NSW 2141***
checked by:	***MF***

position: E: 318977; N: 6251499 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90° DCP id.:

drill model: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (**SOIL TYPE**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
AD/T CASING		Not Observable	E	15				**FILL: ASPHALT**	D to M				**ASPHALT**
								FILL: Gravelly SAND: fine to medium grained, gravel is fine to medium grained, sub angular to angular.					**FILL**
			E SPT 5, 5, 6 N*=11		1.0		CH	**Silty CLAY**: high plasticity, pale grey mottled red brown.	<Wp	St to VSt			**RESIDUAL SOIL**
			E	14						VSt to H			
			SPT 10, 20/100mm HB N*=R	13	2.0			**SILTSTONE**: brown, extremely weathered, very low strength. becoming brown-grey, extremely to highly weathered, estimated very low to low strength					**WEATHERED BEDROCK**
				12	3.0			Borehole BH05 continued as cored hole					
				11	4.0								
				10	5.0								
				9	6.0								
				8	7.0								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH05**
		sheet:	2 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 318977; N: 6251499 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		15									
			1.0								
		14									
			2.0								
		13									
			3.0		start coring at 3.00m						
NMLC	Not Observable	12			**SANDSTONE**: fine to medium grained, pale grey to orange brown, indistinctly laminated.	MW		a=2.27 d=0.48	99%		SM, 0°, PL, CL Clay, 20 mm PT, 5°, CU, RO, CN PT, 0 - 5°, UN, RO, CN
			4.0		**INTERBEDDED SANDSTONE AND SILTSTONE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey.	SW		a=0.32 d=0.21			SM, 0 - 5°, IR, Clay
		11				MW					
		10	5.0					a=2.36 d=0.54			PT, 0 - 5°, IR, RO, Fe SN
	01/12/15 07:35		6.0			MW to HW			91%		CS, 0°, 30 mm SZ, Fe SN, 30 mm JT, 90°, PL, RO, Fe SN PT, 0 - 15°, IR, RO, Fe SN
		9				SW		a=1.06 d=0.26			Defects are: PT, 0 - 10°, PL, RO, Fe SN, unless otherwise described
			7.0								
		8				FR		a=1.58 d=0.43			JT, 80 - 90°, IR, RO, Pyrite SN
									92%		JT, 60 - 85°, IR, RO, CN

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH05**
		sheet:	3 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 318977; N: 6251499 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	7	9.0		**INTERBEDDED SANDSTONE AND SILTSTONE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=1.70 d=0.56			PT, 0°, RO, CN, 30 mm, multiple partings
		6	10.0		**LAMINITE**: siltstone (60%) and sandstone (40%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey.			a=1.02 d=0.64	92%		PT, 0°, RO, CN, 30 mm, multiple partings PT, 0 - 5°, IR, RO, CN
		5	11.0					a=0.70 d=0.73			PT, 0 - 5°, IR, RO, CN
		4	12.0					a=0.96 d=0.67			
		3	13.0		sandstone band, fine grained, grey			a=0.90 d=0.89	98%		
		2	14.0					a=1.42 d=1.03			
		1	15.0					a=0.77 d=0.58	97%		PT, IR, multiple partings
		0						a=0.81 d=0.67			

Defects are:PT, 0 - 10°, PL, RO, Fe SN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH05**
sheet:	4 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**25 Nov 2015**
date completed:	**25 Nov 2015**
logged by:	**TO**
checked by:	**MF**

position: E: 318977; N: 6251499 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information				material substance						rock mass defects		
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular general
NMLC					**LAMINITE**: siltstone (60%) and sandstone (40%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR	X	a=1.08 d=0.49	97%		
		-1	17.0		Borehole BH05 terminated at 16.45 m Target depth						
		-2	18.0								
		-3	19.0								
		-4	20.0								
		-5	21.0								
		-6	22.0								
		-7	23.0								
		-8									

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method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

Piezometer Installation Log

Hole ID.	**BH05**
sheet:	1 of 1
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**25 Nov 2015**
date completed:	**25 Nov 2015**
logged by:	**TO**
checked by:	**MF**

position: E: 318977; N: 6251499 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

equipment type: GEO205, Track mounted hole diameter : 100 mm

drilling information				material substance		piezometer construction details
method & support	water	RL (m)	depth (m)	graphic log	material name	bore construction license: drilling company: driller: driller's permit no.:
AD/T CASING	Not Observable	12	4		FILL: ASPHALT FILL: Gravelly SAND Silty CLAY	BH05 Cuttings Bentonite
					SILTSTONE	2.50 m
					SANDSTONE	
					INTERBEDDED SANDSTONE AND SILTSTONE	Sand
NMLC	01/12/15 07:35	8	8			8.00 m Bentonite
		4	12		LAMINITE	Cuttings
		0	16			
		-4			Borehole BH05 terminated at 16.45 m Target depth	

CDF_0_9_04BB.GLB Log COF PIEZOMETER INSTALLATION LOG GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
see engineering log for details

water
- 10-Oct-12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

ID	type	stick up & RL	tip depth & RL	install. date	water level
BH05	standpipe piezo.		8.00 m 7.60 m AHD		

coffey

Engineering Log - Borehole

Borehole ID.	***BH06***
sheet:	1 of 4
project no.	***GEOTLCOV25554AA***
client:	***Bouygues Construction Australia***
date started:	***25 Nov 2015***
principal:	***Dooleys Lidcombe Catholic Club***
date completed:	***25 Nov 2015***
project:	***Dooleys Lidcombe Club & Hotel Development***
logged by:	***NM***
location:	***24-28 John St, Lidcombe NSW 2141***
checked by:	***MF***

position: E: 318931; N: 6251513 (Datum Not Specified) surface elevation: 12.00 m (AHD) angle from horizontal: 90° DCP id.:

drill model: DRILLTECH 550, Truck mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
AD/T CASING		Not Observable	E	12	0.0		CH	**FILL: Gravelly SAND**: fine grained, dark brown, gravel is medium to coarse grained, with a trace of clay.	D to M				**FILL**
			E					**CLAY**: high plasticity, brown mottled grey.	<Wp	St to VSt			**RESIDUAL SOIL** PID(0.2m) = 0.2ppm, no odours or staining observed PID(0.5m) = 0.4ppm
			E	11	1.0								PID(1.0m) = 0.5ppm
			SPT 9, 30, HB N*=30	10	2.0					VSt to H			
				9	3.0			**INTERBEDDED SILTSTONE AND SANDSTONE**: extremely weathered, very low strength. with fragments of siltstone and sandstone					**WEATHERED BEDROCK**
				8	4.0			Borehole BH06 continued as cored hole					
				7	5.0								
				6	6.0								
				5	7.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:58

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH06**
sheet:	2 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**MF**

position: E: 318931; N: 6251513 (Datum Not Specified) surface elevation: 12.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information				material substance						rock mass defects		
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		12	0.0								
		11	1.0								
		10	2.0								
		9	3.0								
		8	4.0		start coring at 4.00m						
HQ	Not Observable	7	5.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. iron staining in the joints and partings	HW SW		a=0.47 d=0.11	76%		PT, 0°, UN, SO, Fe SN JT, 85 - 90°, UN, SO, Fe SN SM, Clay, 10 mm JT, 30°, UN, RO, Fe SN CS, Fe SN, 6 mm SM, CL Clay, 5 mm CS, Fe SN, 5 mm
		6	6.0		sandstone band	FR		a=0.59 d=0.20	86%		PT, 0°, PL, SO, Pyrite VN PT, 0°, PL, SO, Pyrite VN PT, 0°, PL, SO, Pyrite VN JT, 20°, UN, SO, Pyrite VN PT, 0°, PL, SO, Pyrite VN PT, 0°, PL, SO, CN
		5	7.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey.			a=0.69 d=0.33 a=0.76 d=0.30	95%		Defects are;PT, 0°, PL, SO, Fe SN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn
- RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH06**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**MF**

position: E: 318931; N: 6251513 (Datum Not Specified) surface elevation: 12.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information				material substance					rock mass defects		
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	4 3 2 1 0 -1 -2 -3	9.0 10.0 11.0 12.0 13.0 14.0 15.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.43 d=0.30 a=0.98 d=0.36 a=0.91 d=0.32 a=0.53 d=0.30 a=0.56 d=0.15 a=0.56 d=0.11 a=1.07 d=0.40 a=0.90 d=0.44	95% 100% 100% 97% 98% 100%		SM, Clay, 2 mm Defects are:PT, 0 - 10°, PL, SO, CN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH06**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 318931; N: 6251513 (Datum Not Specified) surface elevation: 12.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information				material substance						rock mass defects		
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	4			**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.79 d=0.40	100%		
		-5	17.0					a=0.61 d=0.28			
		-6	18.0								
		-7	19.0					a=1.23 d=0.31	97%		
		-8	20.0		Borehole BH06 terminated at 20.00 m Target depth			a=0.94 d=0.35			SM, Clay, 5 mm Defects are:PT, 0 - 10°, PL, SO, CN, unless otherwise described
		-9	21.0								
		-10	22.0								
		-11	23.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Borehole

Borehole ID.	**BH07**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**24 Nov 2015**
date completed:	**24 Nov 2015**
logged by:	**NM**
checked by:	**MF**

position: E: 318935; N: 6251535 (Datum Not Specified) surface elevation: 12.30 m (AHD) angle from horizontal: 90° DCP id.:

drill model: DRILLTECH 550, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
AD/T CASING		Not Observable	E	12	0.0		CH	**FILL: Gravelly SAND**: fine to medium grained, dark brown, gravel is medium to coarse grained, with a trace of silt.	D to M				**FILL**
								CLAY: high plasticity, brown mottled grey.	<Wp	St to VSt			**RESIDUAL SOIL** PID(0.2m) = 0.0ppm, no odours or staining observed
			E	11	1.0					VSt to H			PID(1.0m) = 0.0ppm
			SPT 4, 11, 30 HB N*=41	10	2.0			becoming pale grey					PID(1.5m) = 0.0ppm
				9	3.0			**INTERBEDDED SILTSTONE AND SANDSTONE**: extremely weathered, very low strength.					**WEATHERED BEDROCK**
				8	4.0			Borehole BH07 continued as cored hole					
				7	5.0								
				6	6.0								
				5	7.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:58

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH07**
		sheet:	2 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**24 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**24 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 318935; N: 6251535 (Datum Not Specified) surface elevation: 12.30 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		12									
			1.0								
		11									
			2.0								
		10									
			3.0								
		9									
			4.0		start coring at 4.00m						
HQ	Not Observable	8			**INTERBEDDED SILTSTONE AND SANDSTONE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. iron staining in the joints and partings	HW to MW MW	O X	a=0.60 d=0.24			JT, 85 - 90°, UN, RO, Fe SN PT, 0°, UN, SO, Fe SN PT, 0°, UN, SO, Fe SN SM, Clay, 3 mm
			5.0			SW			81%		SM, CL Clay, 5 mm JT, 80°, PL, SO, Fe SN
		7									PT, 0°, PL, SO, Fe SN PT, 0°, PL, SO, Fe SN
					sandstone band, pale grey	FR	X	a=1.71 d=1.19			PT, 0°, PL, SO, Fe SN
		6	6.0				O X	a=1.60 d=0.13			
					sandstone band, pale grey						JT, 45°, UN, SO, CN
			7.0						95%		
		5			**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey.		O X	a=0.98 d=0.23			

Defects are:PT, 0°, PL, SO, Fe SN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH07**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**24 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**24 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**MF**

position: E: 318935; N: 6251535 (Datum Not Specified) surface elevation: 12.30 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	4	9.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.58 d=0.33	95%		Defects are:PT, 0 - 10°, PL, SO, CN, unless otherwise described
		3	10.0					a=1.41 d=0.40			
		2	11.0					a=0.87 d=0.51	97%		
		1	12.0					a=1.47 d=0.56			
		0	13.0					a=0.67 d=0.21			
		-1	14.0					a=0.73 d=0.11	100%		
		-2	15.0					a=1.91 d=0.51			SM, Clay, 10 mm
		-3						a=0.86 d=0.19	100%		

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH07**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**24 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**24 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 318935; N: 6251535 (Datum Not Specified) surface elevation: 12.30 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	-4			**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.97 d=0.30			
			17.0						100%		
		-5						a=1.00 d=0.59			
			18.0								
		-6						a=1.15 d=0.65			JT, 40°, IR, RO, CN JT, 70°, IR, SO, CN
			19.0		**LAMINITE**: siltstone (30%) and sandstone (70%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey.				95%		JT, 80°, IR, SO, CN
		-7						a=1.83 d=0.30			
			20.0		Borehole BH07 terminated at 20.00 m Target depth						
		-8									
			21.0								
		-9									
			22.0								
		-10									
			23.0								
		-11									

Defects are:PT, 0 - 10°, PL, SO, CN, unless otherwise described

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Borehole

Borehole ID.	**BH08**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**MF**

position: E: 319010; N: 6251500 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90° DCP id.:

drill model: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
HA		Not Observable	E					**FILL: Gravelly CLAY**: fine to medium grained, high plasticity, brown to dark brown, smell of fertiliser.	~Wp				**FILL** PID(0.2m) = 4.5ppm, no odours or staining observed PID(0.05-0.7m) = 4.7ppm
			E	15									
			E				CH	**CLAY**: high plasticity, pale grey mottled red brown.	<Wp	St to VSt			**RESIDUAL SOIL** PID(1.0-1.1m) = 4.4ppm
AD/T CASING			SPT 3, 4, 5 N*=9	14	1.0			with ironstone gravel					
					2.0					VSt to H			
			SPT 6, 12, 23 N*=35	13									
				12	3.0			**SILTSTONE**: grey and brown, extremely weathered, estimated very low strength.					**BEDROCK**
								Borehole BH08 continued as cored hole					
				11	4.0								
					5.0								
				10									
					6.0								
				9									
					7.0								
				8									

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:58

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH08**
		sheet:	2 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 319010; N: 6251500 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		15									
			1.0								
		14									
			2.0								
		13									
			3.0								
		12			start coring at 3.61m						
NMLC	Not Observable		4.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: Siltstone (60%) dark grey and Sandstone (40%), distinctly distinctly bedded at 0-10, sandstone is fine grained, pale grey, siltstone is dark grey.	MW	O X	a=1.32 d=0.59	90%		CS, 0 - 10°, IR, 10 mm PT, 0 - 10°, IR, RO, Fe SN PT, 0 - 5°, CU, RO, CN PT, 5°, UN, RO, CN PT, 5°, IR, RO, CN
		11					O X	a=0.79 d=0.10			
			5.0								JT, 80 - 90°, PL, RO, Fe SN CS, 0 - 5°, IR, RO, CN
		10									PT, 0°, IR, RO, Fe SN PT, 0 - 5°, IR, RO, CN
			6.0		becoming grey and dark grey		O X	a=1.22 d=0.57	59%		CS, 0°, IR, RO, Fe SN, 35 mm CS, 0°, IR, RO, Fe SN, 10 mm
		9				SW		a=1.34 d=0.79			PT, 0°, IR, RO, Fe SN PT, 0°, IR, RO, Fe SN
			7.0								SM
											JT, 90°, IR, RO, Fe SN PT, 5°, IR, RO, Clay CO
		8				FR	O X	a=2.56 d=0.34	92%		PT, 0°, IR, RO, Fe SN PT, 0°, IR, RO, CN

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH08**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**MF**

position: E: 319010; N: 6251500 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	7	9.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: Siltstone (60%) dark grey and Sandstone (40%), distinctly distinctly bedded at 0-10, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.53 d=0.71			PT, 5°, IR, RO, CN JT, 85 - 90°, UN, RO, CN PT, 0 - 5°, IR, RO, CN PT, 10°, CU, RO, CN PT, 0°, IR, RO, CN
		6			**LAMINITE**: Siltstone (60%) dark grey and Sandstone (40%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. fine grained sandstone band, 150 mm, pale grey			a=0.78 d=0.33	92%		
		5	10.0					a=0.61 d=0.27			
		4	11.0					a=0.70 d=0.45			
		3	12.0					a=1.32 d=0.33	100%		
		2	13.0					a=0.64 d=0.43			
		1	14.0					a=0.60 d=0.28	94%		JT, 70°, IR, RO, CN PT, 0 - 5°, CU, RO, CN JT, 75 - 85°, IR, RO, CN
		0	15.0					a=0.67 d=0.54			Defects are:PT, 0 - 10°, PL, RO, CN, unless otherwise described

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH08**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 319010; N: 6251500 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information				material substance						rock mass defects		
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC						FR	X O	a=0.83 d=0.49	94%		
		-1			Borehole BH08 terminated at 16.50 m Target depth						
			17.0								
		-2									
			18.0								
		-3									
			19.0								
		-4									
			20.0								
		-5									
			21.0								
		-6									
			22.0								
		-7									
			23.0								
		-8									

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

Appendix D
Field Notes & Equipment Calibration Certificates

ThermoFisher SCIENTIFIC

The world leader in serving science

RENTALS

Equipment Report - MINIRAE 2000 PID

This Gas Meter has been performance checked and calibrated as follows:

Lamp	Compound	Concentration	Zero	Span	Traceability Lot #	Pass?
10.6 eV	Isobutylene	100 ppm	0.0 ppm	99.9 ppm	180579209	☑

Alarm Limits

High	100 ppm
Low	50 ppm

Bump Test

Date	Target Gas	Reading	Pass?
18/11/2015	100 ppm	99.3 ppm	☑

☑ Battery Status 100% (5.5V)
☑ 10 minutes test complete
☑ Spare battery status (Min 5.5 volts)
☑ Electrical Safety Tag attached (AS/NZS 3760)

Tag No: 000305

Valid to: 21/01/2016

☑ Performance check (pump, lamp, sensor)
☑ Data cleared
☑ Filters checked

Date: 18/11/2015

Signed: Miles Law

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☑	☐	MiniRAE 2000 PID / Operational Check / Battery Status 5.5V
☑	☐	Lamp 10.6 eV, Compound Set to: ISOBUTYLENE Factor: 1
☑	☐	Protective yellow rubber boot
☑	☐	Inlet probe (attached to PID)
☑	☐	Spare water trap filter(s) Qty 1
☑	☐	Charger 240V to 12V 500mA
☑	☐	Instruction Manual behind foam on the lid of case "
☑	☐	Quick Guide Sheet behind foam on the lid of case "
☑	☐	Spare Alkaline Battery Compartment with batteries
☑	☐	Inline Moisture trap Filter Guide Laminated
☑	☐	Calibration regulator & tubing (optional) AL813SI
☑	☐	Data cable and Software CD (optional)
☑	☐	Carry Case
☑	☐	Check to confirm electrical safety (tag must be valid)

Date: 18/11/2015

Signed: Miles Law

TFS Reference	CS003727	Return Date:	/ /
Customer Reference		Return Time:	
Equipment ID	PIDMINISV	Condition on return:	
Equipment Serial No.	110008544		

coffey environments
SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

Project No.	GL 25554 AA
Date:	19/11/15
Page	1 of 1

FIELD QUALITY CONTROL LOG

Project Name: POOLEYS.

Field Personnel (Initials): AR

Project Manager (Initials): ML

Field QC Sample ID	Sampling Date/ Time	QC Type	Sample Matrix	Details of laboratory supplied UHP water (if used)	
				Batch No.	Grade
(example) QC7	8/04/2006; 0900	Duplicate of SB1/4.0	soil	batch #	
TB/TS	19/11/15	Trip blank + spike	water		
RB1	" "	Rinsate off HA.	Water.		
DUP01/01A	" "	Dup/trip of HA4_0.1-0.2	Soil		
DUP02	" "	Dup of HA6_0.1-0.2	Soil		

UHP grades: V- VOC, S-SVOC, M, metals and inorganics.

coffey environments

Well Gauging Form

PROJECT NAME: Dooleys

PROJECT NUMBER: Coloth.ou 25554AA

FIELD PERSONNEL: AR

DATE: 1/12/15.

PROJECT MANAGER: ML

FIELD EQUIPMENT:

Equipment Used: IP meter. IP Serial Number: SOL122-7

REFER TO SOPs WHEN GAUGING WELLS:

SOP - Monitoring Well Gauging and SOP – Decontamination of Sampling Equipment

Time of Day	Well ID	Well Diameter	Total Well Depth **note 1**	Depth to PSH (NAPL) [A]	Depth to Groundwater [B]	PSH Thickness [B-A]	Height of Well Stick-Up	COMMENTS (**note 2**) ODOUR, COLOUR, SHEEN, NAPL (and its colour), REMEDIATION SYSTEM, etc
		mm	m	mBTOC	mBTOC	mm	m	
725	BH03	50mm	7.900	-	4.312	-	GATIC	No observed odour or sheen
730	BH01	↓	12.400	-	4.812	-	↓	" "
735.	BH05	↓	7.160	-	5.950	-	↓	

Notes: 1 Indicate in 'Comments' column if measured Total Well Depth differs from log. 2 Do not attempt to sniff the monitoring well to detect any odours, only note any apparent odour when the well cap is opened

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Groundwater Sampling Form (A) - General

PROJECT NAME: Dooleys **PROJECT NUMBER:** GEOTLOU25554AA

FIELD PERSONNEL: AR **DATE:** 1/12/15

PROJECT MANAGER: ML

WELL ID: BH01 **METER ID:** Rental **TOTAL WELL DEPTH:** 12.400 **SCREEN INTERVAL:**

EQUIPMENT USED: BAILER ☐ WATERRA ☐ OTHER **WELL DIAMETER:** **WELL STICK-UP:**

WELL GAUGING AND PURGE VOLUME CALCULATIONS

(TOTAL WELL DEPTH) – (DEPTH TO WATER) = (WATER COLUMN)

12.400 m - 4.812 ≈ 7.6 m

Use water column calculation together with the procedures in 'SOP- Groundwater Sampling - Bailers' to determine the correct volume to be purged from the well (enter this value in the field to the right)

LITRES PER 1 WELL VOLUME

x3.6 = 27 L

WELL HEADSPACE PID READING

PID READING

PPM:

TIME OF DAY	CYCLE/ PUMP RATE (ml/min)	VOLUME (L)	DEPTH TO WATER (m)	DISSOLVED OXYGEN (mg/l)		ELECTRICAL CONDUCTIVITY (mS or µS/cm)		pH (pH units)		REDOX POTENTIAL (mV)		TEMPERATURE (°C)		CLARITY – tick one					COMMENTS
				READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE	Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	ODOUR, COLOUR, SEDIMENTS, PSH COLLECTED, etc
0	NA	1		1.91		12240		6.82		52		23.2		✓					No color, no odor.
		15		1.07		11320		6.92		-12		23.8				✓			brown, no odor.
		~~30~~																	
		~~45~~																	
		60																	
				2.52		10800		7.11		-50		25.0			✓				(+ brown, no odor.
STABILISATION CRITERIA (3 readings within following ranges)				± 10%		± 3%		± 0.1 unit		± 10mV		± 0.2°C							

DUPLICATE COLLECTED: Y ☒ N ☐ DUPLICATE ID: DUP01 **TRIPLICATE COLLECTED:** Y ☐ N ☒ TRIPLICATE ID:

WERE METALS FIELD FILTERED? Y ☒ N ☐ UNFILTERED SAMPLES MUST NOT BE PUT INTO A PRESERVED CONTAINER (IE. 'METALS' BOTTLE)

coffey environments

Groundwater Sampling Form (A) - General

PROJECT NAME: Dooleys
PROJECT NUMBER: GEOTEOU25554
FIELD PERSONNEL: AR
DATE: 1/12/15
PROJECT MANAGER: ML

WELL ID: B1to3
METER ID: Horiba
TOTAL WELL DEPTH: 7.900
SCREEN INTERVAL:
EQUIPMENT USED: BAILER ☐ WATERRA ☐ OTHER
WELL DIAMETER: 50mm
WELL STICK-UP:

WELL GAUGING AND PURGE VOLUME CALCULATIONS

(TOTAL WELL DEPTH) – (DEPTH TO WATER) = (WATER COLUMN)

7.900 m - 4.312 ≈ 4.5 m

Use water column calculation together with the procedures in 'SOP- Groundwater Sampling - Bailers' to determine the correct volume to be purged from the well (enter this value in the field to the right)

LITRES PER 1 WELL VOLUME: x3.6 = 16.2 L

WELL HEADSPACE PID READING

PID READING

PPM:

TIME OF DAY	CYCLE/ PUMP RATE (ml/min)	VOLUME (L)	DEPTH TO WATER (m)	DISSOLVED OXYGEN (mg/l) READING	DISSOLVED OXYGEN (mg/l) CHANGE*	ELECTRICAL CONDUCTIVITY (mS or µS/cm) READING	ELECTRICAL CONDUCTIVITY (mS or µS/cm) CHANGE*	pH (pH units) READING	pH (pH units) CHANGE*	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE*	TEMPERATURE (°C) READING	TEMPERATURE (°C) CHANGE	CLARITY – tick one: Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	COMMENTS: ODOUR, COLOUR, SEDIMENTS, PSH COLLECTED, etc
1705	NA	1		2.35		3180		7.05		102		25.7			✓				lt brown, no odour
		8		1.39		3490		6.98		36	-	23.5						✓	brown, no odour, sediments
		16			DRY		10C												
		24																	
		32																	
					Sampled		@ 1320												
				1.53		5120		7.07		4		23.5				✓			brown, no odour
STABILISATION CRITERIA (3 readings within following ranges)				± 10%		± 3%		± 0.1 unit		± 10mV		± 0.2°C							

DUPLICATE COLLECTED: Y ☐ N ☑ DUPLICATE ID:

TRIPLICATE COLLECTED: Y ☐ N ☑ TRIPLICATE ID:

WERE METALS FIELD FILTERED? Y ☑ N ☐ UNFILTERED SAMPLES MUST NOT BE PUT INTO A PRESERVED CONTAINER (IE. 'METALS' BOTTLE)

coffey environments

Groundwater Sampling Form (A) - General

PROJECT NAME: Dooleys **PROJECT NUMBER:** GEOTLCOV25554AA

FIELD PERSONNEL: AR **DATE:** 1/12/17

PROJECT MANAGER: ML

WELL ID: BH05 **METER ID:** Kenta1 **TOTAL WELL DEPTH:** 7.160 **SCREEN INTERVAL:**

EQUIPMENT USED: BAILER [X] WATERRA [ ] OTHER **WELL DIAMETER:** 50mm **WELL STICK-UP:** CAT 1C

WELL GAUGING AND PURGE VOLUME CALCULATIONS

(TOTAL WELL DEPTH) – (DEPTH TO WATER) = (WATER COLUMN)

7.160 m - 5.950 = 1 m

Use water column calculation together with the procedures in 'SOP- Groundwater Sampling - Bailers' to determine the correct volume to be purged from the well (enter this value in the field to the right)

LITRES PER 1 WELL VOLUME

x3.6 3.6 L

WELL HEADSPACE PID READING

PID READING

PPM: ✓

TIME OF DAY	CYCLE/ PUMP RATE (ml/min)	VOLUME (L)	DEPTH TO WATER (m)	DISSOLVED OXYGEN (mg/l)		ELECTRICAL CONDUCTIVITY (mS or µS/cm)		pH (pH units)		REDOX POTENTIAL (mV)		TEMPERATURE (°C)		CLARITY – tick one					COMMENTS
				READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE	Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	ODOUR, COLOUR, SEDIMENTS, PSH COLLECTED, etc
805	NA	1		2.29		4460		7.00		220		21.8				✓			lt brown, no odour.
		B/S			DRY @		2.8L												
		6																	
		7																	
					Sampled @		12:05												
					Not enough water for parameters.														
STABILISATION CRITERIA (3 readings within following ranges)				± 10%		± 3%		± 0.1 unit		± 10mV		± 0.2°C							

DUPLICATE COLLECTED: Y [ ] N [X] DUPLICATE ID:

TRIPLICATE COLLECTED: Y [ ] N [X] TRIPLICATE ID:

WERE METALS FIELD FILTERED? Y [X] N [ ] UNFILTERED SAMPLES MUST NOT BE PUT INTO A PRESERVED CONTAINER (IE. 'METALS' BOTTLE)

Coffey Geotechnics Pty Ltd
ABN 93 056 929 483

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Borehole/Piezometer: BH01
Sheet: 1 of 1

Slug Test Logging Field Sheet (using data logger)

Client:	Dooleys BCA.	Job No.:	GEOTLCOV25554AA
Principal:		Date:	1/12/15
Project:	Dooleys	Tested by:	AR.
Location:	BH01 (deep)	Checked by:	

For borehole data please see attached **Groundwater Data Logging Field Sheet**

FIELD OPERATIONS:

(please tick (✓) boxes when action is completed)

- ▶ 1) Synchronise personal timing device to logger, up to 5 second accuracy may be required ✓ 1sec
- ▶ 2) Launch logger (usually at a 1 or 2 second interval) ☑ logging interval:
- ▶ 3) Has logger been correctly launched (on computer)? (Y) N
- ▶ 4) Place logger in hole ☑
- ▶ 5) **IMPORTANT:** Dip to top of casing (to record initial water level) Dip: 4.796 Time: 752
- ▶ 6) Place slug in hole ☑ 4.450 Time: 753
- ▶ 7) Dip to top of casing (immediately after slug placed in hole) Dip: ~~4.796~~ Time: 754
- ▶ 8) Dip occasionaly if required to understand how fast water level is changing Dip: 4.635 Time: 800.
- ▶ 9) Remove slug from hole (once water level appears to be at 90% recovery) 4.774 Time: 820
- ▶ 10) Dip occasionaly if required to understand how fast water level is changing Dip: 5.145 Time: 821
- ▶ 11) **IMPORTANT:** Dip to top of casing (just before logger is removed from hole) pre-groundwater: Dip: 4.823 Time: 930
- ▶ 12) Remove logger from hole ☑ → start GW. post GW: 5.400 @ 1010
- ▶ 13) Connect to computer and download ☑
- ▶ 14) Plot results ☑
- ▶ 15) Return to **Groundwater Data Logging Field Sheet** (if logging data at this borehole) ✓

▶ **PLEASE CHECK THAT <u>ALL</u> OF THE ABOVE STEPS HAVE BEEN COMPLETED**

NOTES:

Additional measurements only.

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Aquifer Rising-Head/Falling-Head Test Data Sheet

PROJECT NAME: Dooleys
PROJECT NUMBER: GEOTLOU25554AA
FIELD PERSONNEL: AR
DATE: 1/12/15
PROJECT MANAGER: mc.
WEATHER: Fine.

WELL ID: BH01 **DIAMETER:** 50 mm **WELL DEPTH:** 12.4 m **SCREEN INTERVAL:** _____ to _____ mBTOC **STICK-UP:** _____ mm **INITIAL SWL:** 4.812 m pre-logger. 4.796 w/ logger

FIELD EQUIPMENT
Water Level Meter ID: /
Water Quality Meter ID: _____
Other: /

LOGGER DETAILS
Datalogger Serial Number: _____
Time Datalogger Placed in Well: 752
Datalogger Depth in Well: 12.385 mBTOC
Datalogger Depth Below SWL: ~~12.385~~ 7.589 m
Datalogger Recording Interval: 1 sec
Time Datalogger Removed from Well: 1010

TEST TYPE
Slug Type: Sand filled slug
Slug Volume: _____
Time Slug Added/Removed From Well: 753 / ~~820~~ 820 Falso

TIME (hh:mm:ss)	DEPTH TO WATER (mBTOC)	COMMENTS	TIME (hh:mm:ss)	DEPTH TO WATER (mBTOC)	COMMENTS	TIME (hh:mm:ss)	DEPTH TO WATER (mBTOC)	COMMENTS
802	4.671							
812	4.743							
819	4.771	Slug removed						
821	5.145							
825	5.050							
836	4.907							
845	4.871							
855	4.843							
903	4.835							
921	4.824							
930	4.823	Pre-Purge	(gw monitoring).					
945	11.400							
950	8.900							
959	6.390							
1006	5.596							
1010	5.400	pulled out	loggers.					

Coffey Geotechnics Pty Ltd
ABN 93 056 929 483

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Borehole/Piezometer: B1103
Sheet: 1 of 1

Slug Test Logging Field Sheet (using data logger)

Client:	Dooleys - BCA	Job No.:	GEOTCOU25554AA
Principal:		Date:	1/12/11
Project:	Dooleys	Tested by:	AA
Location:	B1103	Checked by:	

For borehole data please see attached **Groundwater Data Logging Field Sheet**

FIELD OPERATIONS:

(please tick (✓) boxes when action is completed)

- ► 1) Synchronise personal timing device to logger, up to 5 second accuracy may be required ✓
- ► 2) Launch logger (usually at a 1 or 2 second interval) ☑ logging interval: 1 sec
- ► 3) Has logger been correctly launched (on computer)? (Y) / N
- ► 4) Place logger in hole ☑
- ► 5) **IMPORTANT:** Dip to top of casing (to record initial water level) Dip: 4.273 Time: 1035
- ► 6) Place slug in hole ☑ Time: 1039
- ► 7) Dip to top of casing (immediately after slug placed in hole) Dip: 4.005 Time: 1039
- ► 8) Dip occasionaly if required to understand how fast water level is changing Dip: 4.202 Time: 1058
- ► 9) Remove slug from hole (once water level appears to be at 90% recovery) 4.273 Time: 1151
- ► 10) Dip occasionaly if required to understand how fast water level is changing Dip: 4.465 Time: 1290
- ► 11) **IMPORTANT:** Dip to top of casing (just before logger is removed from hole) Pre-GW Dip: 4.340 Time: 1232
- ► 12) Remove logger from hole ☐ Post GW: 4.816 time: 1305
- ► 13) Connect to computer and download ☐
- ► 14) Plot results ☐
- ► 15) Return to **Groundwater Data Logging Field Sheet** (if logging data at this borehole)

► **PLEASE CHECK THAT ALL OF THE ABOVE STEPS HAVE BEEN COMPLETED**

NOTES:

Additional Measurements

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Aquifer Rising-Head/Falling-Head Test Data Sheet

PROJECT NAME: Dooleys
FIELD PERSONNEL: AR
PROJECT MANAGER: ML
PROJECT NUMBER: GEOTLOU 25554AA
DATE: 1/12/15
WEATHER: Fine.

WELL ID: BH03 DIAMETER: 50 mm WELL DEPTH: 7.900 m SCREEN INTERVAL: _____ to _____ mBTOC STICK-UP: 0.315 mm INITIAL SWL: 4.312 m (pre-slug) logger)
4.273 (w/ logger).

FIELD EQUIPMENT
Water Level Meter ID: /
Water Quality Meter ID: /
Other: /

LOGGER DETAILS
Datalogger Serial Number: _____
Time Datalogger Placed in Well: 1035
Datalogger Depth in Well: 7.800 mBTOC
Datalogger Depth Below SWL: 3.527 m
Datalogger Recording Interval: 1 sec
Time Datalogger Removed from Well: _____

TEST TYPE
Slug Type: sand filled bailer
Slug Volume: _____
Time Slug Added/Removed From Well: 1039 / 1151

TIME (hh:mm:ss)	DEPTH TO WATER (mBTOC)	COMMENTS	TIME (hh:mm:ss)	DEPTH TO WATER (mBTOC)	COMMENTS	TIME (hh:mm:ss)	DEPTH TO WATER (mBTOC)	COMMENTS
1045	4.117							
1058	4.202							
1118	4.247							
1128	4.258							
1150	4.272							
1151	4.273	- reached	equilibrium	- took out slug.				
1152	4.605							
1200	4.465							
1215	4.386							
1232	4.340	- begin	GW monitoring.					
1240	7.350	- lost GW	purge.					
1253	5.320							
1305	4.816	- took out logger		- begin	GW sampling.			

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Project No.	GEOTLC00255SCAM
Date:	1/12/15
Page	1 of 1

FIELD QUALITY CONTROL LOG

Project Name: DOOLEYS

Field Personnel (Initials): AR **Project Manager (Initials):** MC

Field QC Sample ID	Sampling Date/ Time	QC Type	Sample Matrix	Details of laboratory supplied UHP water (if used)	
				Batch No.	Grade
(example) QC7	8/04/2006; 0900	Duplicate of SB1/4.0	soil	batch #	
Rinsate	1/12/15	Rinsate	water		
TB1/15	" "	Trip blank/trip spike.	↓		
DUP01	" "	Dup of BH01	↓		

UHP grades: V- VOC, S-SVOC, M, metals and inorganics.

ThermoFisher SCIENTIFIC

The world leader in serving science

RENTALS

Equipment Report – Solinst Model 122 Interface Meter

This Meter has been performance checked / calibrated* as follows:

Cleaned/Tested **Pass?** ☑ **Yes** ☐ **No**

☑ Probe

☑ Tape/Reel

☐ Performance Test & Battery Voltage Check (8.9 v) 8.0v minimum

Date: 30/11/15 Checked by: MD

Signed: _____

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
☑	☐	☐	Operations check OK
☑	☐	☐	Plastic Box / Bag
☑	☐	☐	Spare 9V Battery Qty 1
☑	☐	☐	Probe Cleaning Brush
☒	☐	☐	Decon
☑	☐	☐	Instruction leaflet
☑	☐	☐	Tape Guide
☐	☐	☐	

Processors Signature/ Initials _____

Quote Reference	CS0038406	Condition on return
Customer Ref		
Equipment ID	SOL122-7	
Equipment serial no.	224694	
Return Date	/ /	
Return Time		

ThermoFisher SCIENTIFIC

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RENTALS

Equipment Certification Report – TPS 90FLMV Water Quality Meter

This Water Quality Meter has been performance checked and calibrated as follows:

Sensor	Concentration	Span 1	Span 2	Traceability Lot #	Pass?
pH	7.00H / pH 4.00	7.00 pH	4.00 pH	/	☑
Conductivity	12.88 mS/cm	0.00 mS/cm	12.88 mS/cm		☑
TDS	36 ppk	N/A ppk	N/A ppk	Check only	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.00 ppm in Sodium Sulphite	8.35 ppm Saturation in Air		☑

Check only

Redox (ORP) *	Electrode operability test	240mV +/- 10%	235 mV		☑

* This meter uses an Ag/AgCl ORP electrode. To convert readings to SHE (Standard Hydrogen Electrode), add 199mV to the mV reading.

☑ Battery Status 7.4 (min 7.2V)
☐ Electrical Safety Tag attached (AS/NZS 3760)

☑ Temperature 21.7 °C
☑ Electrodes Cleaned and checked

Tag No: 000250

Valid to: 04/12/2015

Date: 27/11/2015

Signed: [signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☐	☐	90FLMV Unit. Ops check/Battery status: 8.0
☐	☐	pH sensor with wetting cap, 5m
☐	☐	Conductivity/TDS/Temperature K=10 sensor, 5m
☐	☐	Dissolved oxygen YSI5739 sensor with wetting cap, 5m
☐	☐	Redox (ORP) sensor with wetting cap, 5m
☐	☐	Power supply 240V to 12V DC 200mA
☐	☐	Instruction Manual
☐	☐	Quick Guide
☐	☐	Plastic container with storage solution for pH and ORP sensors
☐	☐	Carry Case
☐	☐	Check to confirm electrical safety (tag must be valid)

Date: 27/11/2015

Signed: [signature]

TFS Reference	CS003806	Return Date:	/ /
Customer Reference		Return Time:	
Equipment ID	90FLMV – 4	Condition on return:	
Equipment Serial No.	WL48		

Appendix E
Data Validation Assessment

Coffey Environments Australia Pty Ltd

A.B.N. 65 140 765 902

DATA VALIDATION REPORT

Job No: GEOTLCOV25554AA

Soil Analysis - Lab Batch References: 48050, 480882, 480934, 481308, 481681, 482920, and ES1537023

Groundwater Analysis - Lab Batch References – 481647 and ES1537701

I. SAMPLE HANDLING

	Yes	No (Comment below)
1. Were the sample **holding times** met?	☒	☐
2. Were the samples in **proper custody** between the field and reaching the laboratory?	☒	☐
3. Were the samples **properly and adequately** preserved? *This includes keeping the samples chilled, where applicable.*	☒	☐
4. Were the samples received by the laboratory in good condition?	☒	☐

COMMENTS:

Sample Handling was: ☒ Satisfactory ☐ Partially Satisfactory ☐ Unsatisfactory

Coffey Environments Australia Pty Ltd

A.B.N. 65 140 765 902

DATA VALIDATION REPORT

Job No: GEOTLCOV25554AA

Soil Analysis - Lab Batch References: 48050, 480882, 480934, 481308, 481681, 482920, and ES1537023

Groundwater Analysis - Lab Batch References – 481647 and ES1537701

II PRECISION/ACCURACY ASSESSMENT

	Yes	No (Comment below)
1. Was a NATA registered laboratory used?	☒	☐
2. Did the laboratory perform the requested tests?	☒	☐
3. Were the laboratory methods adopted NATA endorsed?	☒	☐
4. Were the appropriate test procedures followed?	☒	☐
5. Were the reporting limits satisfactory?	☐	☒
6. Was the NATA Seal on the reports?	☒	☐
7. Were the reports signed by an authorised person?	☒	☐

COMMENTS:

The limits of reporting (LOR) for certain PAH compounds in groundwater were above the adopted assessment criteria. The increased LOR is reportedly associated with the method adopted by the laboratory to conduct the analysis. The LOR was adopted as the alternate assessment criteria, which is consistent with the guidance provided in ANZECC (2000).

Precision/Accuracy of the Laboratory Report	☒ Satisfactory	☐ Unsatisfactory
	☐ Partially Satisfactory	

Coffey Environments Australia Pty Ltd

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DATA VALIDATION REPORT

Job No: GEOTLCOV25554AA

Soil Analysis - Lab Batch References: 48050, 480882, 480934, 481308, 481681, 482920, and ES1537023

Groundwater Analysis - Lab Batch References – 481647 and ES1537701

III. FIELD QA/QC

1. Number of Samples Analysed — Soil 25; Groundwater: 3

2. Number of Days of Sampling: 5

3. Number and Type of QA/QC Samples Collected:

Quality Control Sample Type	No.	% Total No. Samples
Intra-lab Duplicates (Soil)	2	8%
Inter-lab Duplicates (Soil)	1	4.0%
Intra-lab Duplicates (Groundwater)	1	33.33%
Inter-lab Duplicates (Groundwater)	0	0%
Trip Blanks	2	-
Trip Spike	2	-
Equipment Rinsate	2	-

4. FIELD DUPLICATES

	Yes	**No** (Comment below)
A. Were an Adequate Number of field duplicates analysed for each chemical?	☐	☒
B. Were RPDs within Control Limits?		
a. Organics (No limit (<10 x LOR); 50% (10-20 x LOR); 30% (>20 x LOR))	☐	☒
b. Metals/Inorganics (No limit (<10 x LOR); 50% (10-20 x LOR); 30% (>20 x LOR))	☐	☒
c. Volatile & semi volatile organics (No limit (<10 x LOR); 50% (10-20 x LOR); 30% (>20 x LOR))	☐	☒

Coffey Environments Australia Pty Ltd

A.B.N. 65 140 765 902

DATA VALIDATION REPORT

Job No: GEOTLCOV25554AA

Soil Analysis - Lab Batch References: 48050, 480882, 480934, 481308, 481681, 482920, and ES1537023

Groundwater Analysis - Lab Batch References – 481647 and ES1537701

COMMENTS:

The number of inter-lab duplicate samples was slightly less than the 5% recommended within AS4482.1 (2005). This is not expected to directly influence the usability of the data.

Calculated RPDs have been presented in Tables 5 and 6 in Appendix F. In general the comparison of primary and duplicate samples demonstrated good reproducibility, when the LOR was considered. The observed variability reported between the primary and duplicate samples is assessed to be attributable to the heterogeneity of the fill material within the site. It is further noted that in order to minimise the loss of volatiles, soil samples are not mixed prior to splitting.

Coffey Environments Australia Pty Ltd

A.B.N. 65 140 765 902

DATA VALIDATION REPORT

Job No: GEOTLCOV25554AA

Soil Analysis - Lab Batch References: 48050, 480882, 480934, 481308, 481681, 482920, and ES1537023

Groundwater Analysis - Lab Batch References – 481647 and ES1537701

IV. TRIP BLANKS (TB) AND TRIP SPIKES (TS)

	Yes	No (Comment below)
A. Were an Adequate Number of trip blanks and spikes analysed?	☒	☐
B. Were the trip blanks free of contaminants and trip spike were within acceptance limit?	☒	☐
C. Were the trip spikes reported within acceptable recoveries?	☒	☐

COMMENTS:

6. EQUIPMENT RINSATE SAMPLES

	Yes	No (Comment below)
A. Were an adequate number of Equipment Rinsate Samples collected?	☒	☐
B. Were the Equipment Rinsate Samples free of contaminants?	☒	☐

Field QA/QC was:	☒ Satisfactory	☐ Unsatisfactory
	☐ Partially Satisfactory	

Coffey Environments Australia Pty Ltd

A.B.N. 65 140 765 902

DATA VALIDATION REPORT

Job No: GEOTLCOV25554AA

Soil Analysis - Lab Batch References: 48050, 480882, 480934, 481308, 481681, 482920, and ES1537023

Groundwater Analysis - Lab Batch References – 481647 and ES1537701

V LABORATORY INTERNAL QUALITY CONTROL PROCEDURES

1. Type of QA/QC Samples

	Yes	No
Laboratory Blanks/Reagent Blanks	☒	☐
Laboratory Duplicates	☒	☐
Matrix Spikes/Matrix Spike Duplicates	☒	☐
Laboratory Control Spike	☒	☐
Surrogate (where appropriate)*	☒	☐

	Yes	**No** (Comment below)
2 Were the laboratory blanks/reagents blanks free of contamination?	☒	☐
3. Were the spike recoveries within control limits?		
a. Organics (70% to 130%)	☐	☒
b. Metals/Inorganic (70% to 130%)	☒	☐
4. Were the RPDs of the laboratory duplicates within control limits?	☐	☒
5. Were the surrogate recoveries within control limits?	☒	☐

COMMENTS:

- Lab RPDs between primary and duplicate samples were within the control limits when consideration of the reported concentrations and the laboratory limit of reporting with the exception of arsenic and lead in reports 480822 and 480934, and arsenic, copper, chromium and zinc in report 481308. The variability reported in samples of fill provided to the laboratory is considered attributable to the variability within the soil matrix. Eurofins MGT report the RPD passes their internal QA acceptance criteria.

5. The laboratory internal QA/QC was:	☒ Satisfactory	☐ Unsatisfactory
	☐ Partially Satisfactory	

Coffey Environments Australia Pty Ltd

A.B.N. 65 140 765 902

DATA VALIDATION REPORT

Job No: GEOTLCOV25554AA

Soil Analysis - Lab Batch References: 48050, 480882, 480934, 481308, 481681, 482920, and ES1537023

Groundwater Analysis - Lab Batch References – 481647 and ES1537701

VI DATA USABILITY

1.	Data Directly Usable	☒
2.	Data Usable with the following considerations	☐
3.	Data Not Usable.	☐

COMMENTS:

Appendix F
Laboratory Results: Summary Tables

TABLE 1
ANALYTICAL SOIL RESULTS - HEALTH

BOUYGUES CONSTRUCTION AUSTRALIA - DOOLEYS
GEOTLCOV25554AA

						Field_ID	BH01_0.5-0.6	BH01_1.0-1.45	BH03_0.5-0.6	BH03_1.0-1.1	BH05_0.05-0.2	BH05_1.0-1.45	BH4A (0.2m)	BH4B (0.4m)	BH4C (1.5m)	HA1_0.1-0.2
						Sampled_Date-Time	23/11/2015	23/11/2015	19/11/2015	19/11/2015	25/11/2015	25/11/2015	26/11/2015	26/11/2015	26/11/2015	19/11/2015
				NEPM 1999 HILs Residential A Soil (Existing Residential Dwellings North of Board St)	NEPM 1999 HILs Commercial/ Industrial D Soil											
Chem_Group	**ChemName**	**Units**	**EQL**													
BTEX	Benzene	mg/kg	0.1	0.5	3		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1
	Ethylbenzene	mg/kg	0.1	55	2700		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1
	Toluene	mg/kg	0.1	160	99,000		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1
	Xylene (m & p)	mg/kg	0.2				<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	<0.2
	Xylene (o)	mg/kg	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1
	Xylene Total	mg/kg	0.3	40	230		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	-	<0.3
	C6-C10 less BTEX (F1)	mg/kg	20	45	260		<20	<20	<20	<20	<20	<20	<20	-	-	<20
Inorganics	Moisture Content (dried @ 103°C)	%	0.1				13	14	15	14	11	16	26	-	-	27
Metals	Arsenic	mg/kg	2	100	3000		9.1	6.6	7.8	4.6	2.3	<2	4.9	2.9	4.6	11
	Cadmium	mg/kg	0.4	20	900		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.5
	Chromium	mg/kg	5	100	3600		15	<5	16	<5	12	<5	22	14	<5	24
	Copper	mg/kg	5	6000	240000		20	24	330	6.9	26	16	28	21	27	44
	Lead	mg/kg	5	300	1500		15	9	82	<5	20	6.7	19	20	6.9	140
	Mercury	mg/kg	0.05	40	730		<0.05	<0.05	0.07	<0.05	0.06	<0.05	0.05	<0.05	<0.05	0.1
	Nickel	mg/kg	5	400	6000		<5	<5	23	<5	10	<5	16	12	<5	11
	Zinc	mg/kg	5	7400	400000		22	23	290	12	41	24	48	47	33	100
OCP	4,4-DDE	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	a-BHC	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Aldrin + Dieldrin	mg/kg		6	45		<0.1	-	-	-	<0.1	-	<0.1	<0.1	<0.1	<0.1
	b-BHC	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Chlordane	mg/kg	0.1	50	530		<0.1	-	-	-	<0.1	-	<0.1	<0.1	<0.1	<0.2
	d-BHC	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	DDD	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	DDT	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	DDT+DDE+DDD	mg/kg		240	3600		<0.15	-	-	-	<0.15	-	<0.15	<0.15	<0.15	<0.15
	Dieldrin	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Endosulfan I	mg/kg	0.05	270	2000		<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Endosulfan II	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Endosulfan sulphate	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Endrin	mg/kg	0.05	10	100		<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Endrin aldehyde	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Endrin ketone	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	g-BHC (Lindane)	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.05	6	50		<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.05				<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene	mg/kg	0.05	10	80		<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05
	Methoxychlor	mg/kg	0.2	300	2500		<0.2	-	-	-	<0.2	-	<0.2	<0.2	<0.2	<0.2
	Toxaphene	mg/kg	1	20	160		<1	-	-	-	<1	-	<1	<1	<1	<1
PAH	Acenaphthene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5
	Acenaphthylene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5
	Anthracene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5
	Benzo(a)anthracene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	-	-	<0.5
	Benzo(a)pyrene	mg/kg	0.5				<0.5	<0.5	0.7	<0.5	1	<0.5	<0.5	-	-	<0.5
	Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5				<0.5	<0.5	0.9	<0.5	1.3	<0.5	<0.5	-	-	<0.5
	Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5				0.6	0.6	1.2	0.6	1.6	0.6	0.6	-	-	0.6
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	3	40		1.2	1.2	1.5	1.2	1.9	1.2	1.2	-	-	1.2
	Benzo(g,h,i)perylene	mg/kg	0.5				<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	-	-	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5				<0.5	<0.5	0.6	<0.5	1	<0.5	<0.5	-	-	<0.5
	Chrysene	mg/kg	0.5				<0.5	<0.5	0.6	<0.5	1	<0.5	<0.5	-	-	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5				<0.5	<0.5	0.6	<0.5	1	<0.5	<0.5	-	-	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5
	Fluoranthene	mg/kg	0.5				<0.5	<0.5	0.9	<0.5	2.4	<0.5	0.9	-	-	<0.5
	Fluorene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5				<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	-	-	<0.5
	Naphthalene	mg/kg	0.5	3	11,000		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5
	Phenanthrene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	-	-	<0.5
	Pyrene	mg/kg	0.5				<0.5	<0.5	1	<0.5	2.5	<0.5	0.9	-	-	<0.5
	Total PAHs	mg/kg	0.5	300	4000		<0.5	<0.5	6.2	<0.5	11	<0.5	1.8	-	-	<0.5
TPH	F2-NAPHTHALENE	mg/kg	50	110	20,000		<50	<50	<50	<50	<50	<50	<50	-	-	<50
	C6 - C9	mg/kg	20				<20	<20	<20	<20	<20	<20	<20	-	-	<20
	C10 - C14	mg/kg	20				<20	<20	<20	<20	<20	<20	<20	-	-	<20
	C15 - C28	mg/kg	50				<50	<50	<50	<50	84	<50	<50	-	-	140
	C29 - C36	mg/kg	50				<50	<50	130	<50	290	<50	140	-	-	<50
	C10 - C36 (Sum of total)	mg/kg	50				<50	<50	130	<50	370	<50	140	-	-	140
	C10-C16	mg/kg	50				<20	<20	<50	<50	<50	<50	<50	-	-	<50
	C16-C34 (F3)	mg/kg	100	4500	27,000		<100	<100	110	<100	250	<100	110	-	-	160
	C34-C40 (F4)	mg/kg	100	6300	38,000		<100	<100	<100	<100	240	<100	250	-	-	<100
	C6 - C10	mg/kg	20				<20	<20	<20	<20	<20	<20	<20	-	-	<20
Asbestos	Asbestos	D/ND		Detection	Detection		-	-	-	-	ND	-	ND	ND	ND	ND

						Field_ID	HA1_0.9-1.0	HA2_0.1-0.2	HA2_0.9-1.0	HA3_0.1-0.2	HA3_0.9-1.0	HA4_0.1-0.2	HA4_0.9-1.0	HA5_0.1-0.2	HA5_0.9-1.0	HA6_0.1-0.2	HA6_0.9-1.0	HA7_0.1-0.2	HA7_0.9-1.0	HA8_0.1-0.2	HA8_0.9-1.0
						Sampled_Date-Time	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015
				NEPM 1999 HILs Residential A Soil (Existing Residential Dwellings North of Board St)	NEPM 1999 HILs Commercial/ Industrial D Soil																
Chem_Group	**ChemName**	**Units**	**EQL**																		
BTEX	Benzene	mg/kg	0.1	0.5	3		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1	55	2700		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.1	160	99,000		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2				<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3	40	230		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
	C6-C10 less BTEX (F1)	mg/kg	20	45	260		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Inorganics	Moisture Content (dried @ 103°C)	%	0.1				21	23	25	24	19	16	22	20	23	17	22	18	22	20	26
Metals	Arsenic	mg/kg	2	100	3000		11	17	18	4.8	12	31	7.3	25	12	36	17	52	11	5.2	15
	Cadmium	mg/kg	0.4	20	900		<0.4	0.5	<0.4	<0.4	<0.4	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1.4	<0.4	<0.4	<0.4
	Chromium	mg/kg	5	100	3600		25	27	29	11	25	9.8	13	17	20	13	21	33	22	12	25
	Copper	mg/kg	5	6000	240000		12	38	13	29	10	20	11	32	15	34	16	71	14	13	22
	Lead	mg/kg	5	300	1500		18	170	19	170	21	210	16	130	20	56	16	1300	83	30	17
	Mercury	mg/kg	0.05	40	730		<0.05	0.09	<0.05	0.12	<0.05	0.06	<0.05	0.06	<0.05	0.09	<0.05	0.43	<0.05	0.07	<0.05
	Nickel	mg/kg	5	400	6000		<5	7.9	<5	<5	<5	<5	<5	8.3	<5	6.8	<5	11	<5	9.5	<5
	Zinc	mg/kg	5	7400	400000		9.4	280	7.9	140	13	82	8.6	140	11	140	31	1600	32	75	45
OCP	4,4-DDE	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	a-BHC	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Aldrin	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Aldrin + Dieldrin	mg/kg		6	45		-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-
	b-BHC	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Chlordane	mg/kg	0.1	50	530		-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-
	d-BHC	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	DDD	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	DDT	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	DDT+DDE+DDD	mg/kg		240	3600		-	<0.15	-	<0.15	-	<0.15	-	<0.15	-	<0.15	-	<0.15	-	<0.15	-
	Dieldrin	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Endosulfan I	mg/kg	0.05	270	2000		-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Endosulfan II	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Endosulfan sulphate	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Endrin	mg/kg	0.05	10	100		-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Endrin aldehyde	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Endrin ketone	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	g-BHC (Lindane)	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Heptachlor	mg/kg	0.05	6	50		-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Heptachlor epoxide	mg/kg	0.05				-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Hexachlorobenzene	mg/kg	0.05	10	80		-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
	Methoxychlor	mg/kg	0.2	300	2500		-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-
	Toxaphene	mg/kg	1	20	160		-	<1	-	<1	-	<1	-	<1	-	<1	-	<1	-	<1	-
PAH	Acenaphthene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)anthracene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5				0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	3	40		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	Benzo(g,h,i)perylene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluorene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Naphthalene	mg/kg	0.5	3	11,000		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Pyrene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total PAHs	mg/kg	0.5	300	4000		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TPH	F2-NAPHTHALENE	mg/kg	50	110	20,000		<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C6 - C9	mg/kg	20				<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C14	mg/kg	20				<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C15 - C28	mg/kg	50				<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C29 - C36	mg/kg	50				<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C10 - C36 (Sum of total)	mg/kg	50				<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C10-C16	mg/kg	50				<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C16-C34 (F3)	mg/kg	100	4500	27,000		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C34-C40 (F4)	mg/kg	100	6300	38,000		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C6 - C10	mg/kg	20				<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Asbestos	Asbestos	D/ND		Detection	Detection		-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-

				Field_ID	BH01_0.5-0.6	BH01_1.0-1.45	BH03_0.5-0.6	BH03_1.0-1.1	BH05_0.05-0.2	BH05_1.0-1.45	BH4A	BH4B	BH4C	HA1_0.1-0.2	HA1_0.9-1.0	HA2_0.1-0.2	HA2_0.9-1.0
				Sampled_Date-Time	23/11/2015	23/11/2015	19/11/2015	19/11/2015	25/11/2015	25/11/2015	26/11/2015	26/11/2015	26/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015
				NEPM 2013 Mgmt Limits Commercial and industrial, Coarse Soil													
Chem_Group	**ChemName**	**Units**	**EQL**														
TPH	C6-C10 less BTEX (F1)	mg/kg	20	700	<20	<20	<20	<20	<20	<20	<20	-	-	<20	<20	<20	<20
	F2-NAPHTHALENE	mg/kg	50	1000	<50	<50	<50	<50	<50	<50	<50	-	-	<50	<50	<50	<50
	C16-C34 (F3)	mg/kg	100	3500	<100	<100	110	<100	250	<100	110	-	-	160	<100	<100	<100
	C34-C40 (F4)	mg/kg	100	10000	<100	<100	<100	<100	240	<100	250	-	-	<100	<100	<100	<100

				HA3_0.1-0.2	HA3_0.9-1.0	HA4_0.1-0.2	HA4_0.9-1.0	HA5_0.1-0.2	HA5_0.9-1.0	HA6_0.1-0.2	HA6_0.9-1.0	HA7_0.1-0.2	HA7_0.9-1.0	HA8_0.1-0.2	HA8_0.9-1.0
				19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015
Chem_Group	**ChemName**	**Units**	**EQL**												
TPH	C6-C10 less BTEX (F1)	mg/kg	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	F2-NAPHTHALENE	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C16-C34 (F3)	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C34-C40 (F4)	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100

								Field_ID	BH01_0.5-0.6	BH01_1.0-1.45	BH03_0.5-0.6	BH03_1.0-1.1	BH05_0.05-0.2	BH05_1.0-1.45	BH4A (0.2m)	BH4B (0.4m)	BH4C (1.5m)	HA1_0.1-0.2	HA1_0.9-1.0
								Sampled_Date-Time	23/11/2015	23/11/2015	19/11/2015	19/11/2015	25/11/2015	25/11/2015	26/11/2015	26/11/2015	26/11/2015	19/11/2015	19/11/2015
			CT1 NSW 2014 General Solid Waste (No Leaching)	CT2 NSW 2014 Restricted Solid Waste (No Leaching)	SCC1 NSW 2014 General Solid Waste Specific Contaminant Concentration	TCLP1 NSW 2014 General Solid Waste Leachable Concentration	SCC2 NSW 2014 Restricted Solid Waste Specific Contaminant Concentration	TCLP2 NSW 2014 Restricted Solid Waste Leachable Concentration	Fill	Residual Soil	Fill	Residual Soil	Fill	Residual Soil	Fill	Fill	Residual Soil	Fill	Residual Soil
ChemName	**Units**	**EQL**																	
Benzene	mg/kg	0.1	10	40	18		72		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	600	2400	1080		4320		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1
Toluene	mg/kg	0.1	288	1152	518		2073		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2							<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	<0.2	<0.2
Xylene (o)	mg/kg	0.1							<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1
Xylene Total	mg/kg	0.3	1000	4000	1800		7200		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	-	<0.3	<0.3
C6-C10 less BTEX (F1)	mg/kg	20							<20	<20	<20	<20	<20	<20	<20	-	-	<20	<20
Moisture Content (dried @ 103°C)	%	0.1							13	14	15	14	11	16	26	-	-	27	21
Arsenic	mg/kg	2	100	400	500		2000		9.1	6.6	7.8	4.6	2.3	<2	4.9	2.9	4.6	11	11
Cadmium	mg/kg	0.4	20	80	100		400		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.5	<0.4
Chromium	mg/kg	5	100		1900		7600		15	<5	16	<5	12	<5	22	14	<5	24	25
Copper	mg/kg	5							20	24	330	6.9	26	16	28	21	27	44	12
Lead	mg/kg	5	100	400	1500		6000		15	9	82	<5	20	6.7	19	20	6.9	140	18
Lead TCLP	mg/L					5		20										0.01	
Mercury	mg/kg	0.05	4	16	50		200		<0.05	<0.05	0.07	<0.05	0.06	<0.05	0.05	<0.05	<0.05	0.1	<0.05
Nickel	mg/kg	5	40	160	1050		4200		<5	<5	23	<5	10	<5	16	12	<5	11	<5
Zinc	mg/kg	5							22	23	290	12	41	24	48	47	33	100	9.4
4,4-DDE	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
a-BHC	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Aldrin	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Aldrin + Dieldrin	mg/kg								<0.1	-	-	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	-
b-BHC	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Chlordane	mg/kg	0.1							<0.1	-	-	-	<0.1	-	<0.1	<0.1	<0.1	<0.2	-
d-BHC	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
DDD	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
DDT	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
DDT+DDE+DDD	mg/kg								<0.15	-	-	-	<0.15	-	<0.15	<0.15	<0.15	<0.15	-
Dieldrin	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Endosulfan I	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Endosulfan II	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Endosulfan sulphate	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Endrin	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Endrin aldehyde	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Endrin ketone	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
g-BHC (Lindane)	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Heptachlor	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Heptachlor epoxide	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Hexachlorobenzene	mg/kg	0.05							<0.05	-	-	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-
Methoxychlor	mg/kg	0.2							<0.2	-	-	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	-
Toxaphene	mg/kg	1							<1	-	-	-	<1	-	<1	<1	<1	<1	-
Acenaphthene	mg/kg	0.5							<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5
Acenaphthylene	mg/kg	0.5							<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5
Anthracene	mg/kg	0.5							<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5
Benzo(a)anthracene	mg/kg	0.5							<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	-	-	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5	0.8	3.2	10		23		<0.5	<0.5	0.7	<0.5	1	<0.5	<0.5	-	-	<0.5	<0.5
Benzo(a)pyrene TCLP	mg/L	0.001				0.04		0.16					<0.001						
Benzo(g,h,i)perylene	mg/kg	0.5							<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5							<0.5	<0.5	0.6	<0.5	1	<0.5	<0.5	-	-	<0.5	<0.5
Chrysene	mg/kg	0.5							<0.5	<0.5	0.6	<0.5	1	<0.5	<0.5	-	-	<0.5	<0.5
Benzo[b+j]fluoranthene	mg/kg	0.5							<0.5	<0.5	0.6	<0.5	1	<0.5	<0.5	-	-	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5							<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5
Fluoranthene	mg/kg	0.5							<0.5	<0.5	0.9	<0.5	2.4	<0.5	0.9	-	-	<0.5	<0.5
Fluorene	mg/kg	0.5							<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5							<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5
Naphthalene	mg/kg	0.5							<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5
Phenanthrene	mg/kg	0.5							<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	-	-	<0.5	<0.5
Pyrene	mg/kg	0.5							<0.5	<0.5	1	<0.5	2.5	<0.5	0.9	-	-	<0.5	<0.5
Total PAHs	mg/kg	0.5	200	800	200		800		<0.5	<0.5	6.2	<0.5	11	<0.5	1.8	-	-	<0.5	<0.5
F2-NAPHTHALENE	mg/kg	50							<50	<50	<50	<50	<50	<50	<50	-	-	<50	<50
C6 - C9	mg/kg	20	650	2600	650		2600		<20	<20	<20	<20	<20	<20	<20	-	-	<20	<20
C10 - C14	mg/kg	20							<20	<20	<20	<20	<20	<20	<20	-	-	<20	<20
C15 - C28	mg/kg	50							<50	<50	<50	<50	84	<50	<50	-	-	140	<50
C29 - C36	mg/kg	50							<50	<50	130	<50	290	<50	140	-	-	<50	<50
C10 - C36 (Sum of total)	mg/kg	50	10000	40000	10000		40000		<50	<50	130	<50	370	<50	140	-	-	140	<50
C10-C16	mg/kg	50							<20	<20	<50	<50	<50	<50	<50	-	-	<50	<50
C16-C34	mg/kg	100							<100	<100	110	<100	250	<100	110	-	-	160	<100
C34-C40	mg/kg	100							<100	<100	<100	<100	240	<100	250	-	-	<100	<100
C6 - C10	mg/kg	20							<20	<20	<20	<20	<20	<20	<20	-	-	<20	<20

TABLE 3
ANALYTICAL SOIL RESULTS - WASTE CLASSIFICATION

BOUYGUES CONSTRUCTION AUSTRALIA - DOOLEYS
GEOTLCOV25554AA

									Field_ID	HA2_0.1-0.2	HA2_0.9-1.0	HA3_0.1-0.2	HA3_0.9-1.0	HA4_0.1-0.2	HA4_0.9-1.0	HA5_0.1-0.2	HA5_0.9-1.0	HA6_0.1-0.2	HA6_0.9-1.0	HA7_0.1-0.2	HA7_0.9-1.0
									Sampled_Date-Time	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015	19/11/2015
			CT1 NSW 2014 General Solid Waste (No Leaching)	CT2 NSW 2014 Restricted Solid Waste (No Leaching)	SCC1 NSW 2014 General Solid Waste Specific Contaminant Concentration	TCLP1 NSW 2014 General Solid Waste Leachable Concentration	SCC2 NSW 2014 Restricted Solid Waste Specific Contaminant Concentration	TCLP2 NSW 2014 Restricted Solid Waste Leachable Concentration		Fill	Residual Soil	Fill	Fill	Fill	Residual Soil	Fill	Residual Soil	Fill	Residual Soil	Fill	Residual Soil
ChemName	**Units**	**EQL**																					
Benzene	mg/kg	0.1	10	40	18		72			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	600	2400	1080		4320			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	288	1152	518		2073			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2								<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene (o)	mg/kg	0.1								<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene Total	mg/kg	0.3	1000	4000	1800		7200			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
C6-C10 less BTEX (F1)	mg/kg	20								<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Moisture Content (dried @ 103°C)	%	0.1								23	25	24	19	16	22	20	23	17	22	18	22
Arsenic	mg/kg	2	100	400	500		2000			17	18	4.8	12	31	7.3	25	12	36	17	52	11
Cadmium	mg/kg	0.4	20	80	100		400			0.5	<0.4	<0.4	<0.4	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1.4	<0.4
Chromium	mg/kg	5	100		1900		7600			27	29	11	25	9.8	13	17	20	13	21	33	22
Copper	mg/kg	5								38	13	29	10	20	11	32	15	34	16	71	14
Lead	mg/kg	5	100	400	1500		6000			170	19	170	21	210	16	130	20	56	16	1300	83
Lead TCLP	mg/L					5		20		<0.01		<0.01		0.06		0.01				0.71	
Mercury	mg/kg	0.05	4	16	50		200			0.09	<0.05	0.12	<0.05	0.06	<0.05	0.06	<0.05	0.09	<0.05	0.43	<0.05
Nickel	mg/kg	5	40	160	1050		4200			7.9	<5	<5	<5	<5	<5	8.3	<5	6.8	<5	11	<5
Zinc	mg/kg	5								280	7.9	140	13	82	8.6	140	11	140	31	1600	32
4,4-DDE	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
a-BHC	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Aldrin	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Aldrin + Dieldrin	mg/kg									<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-
b-BHC	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Chlordane	mg/kg	0.1								<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-
d-BHC	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
DDD	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
DDT	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
DDT+DDE+DDD	mg/kg									<0.15	-	<0.15	-	<0.15	-	<0.15	-	<0.15	-	<0.15	-
Dieldrin	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Endosulfan I	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Endosulfan II	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Endosulfan sulphate	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Endrin	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Endrin aldehyde	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Endrin ketone	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
g-BHC (Lindane)	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Heptachlor	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Heptachlor epoxide	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Hexachlorobenzene	mg/kg	0.05								<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Methoxychlor	mg/kg	0.2								<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-
Toxaphene	mg/kg	1								<1	-	<1	-	<1	-	<1	-	<1	-	<1	-
Acenaphthene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)anthracene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5	0.8	3.2	10		23			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TCLP	mg/L	0.001				0.04		0.16													
Benzo(g,h,i)perylene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo[b+j]fluoranthene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total PAHs	mg/kg	0.5	200	800	200		800			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
F2-NAPHTHALENE	mg/kg	50								<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C6 - C9	mg/kg	20	650	2600	650		2600			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
C10 - C14	mg/kg	20								<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
C15 - C28	mg/kg	50								<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C29 - C36	mg/kg	50								<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C10 - C36 (Sum of total)	mg/kg	50	10000	40000	10000		40000			<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C10-C16	mg/kg	50								<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C16-C34	mg/kg	100								<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C34-C40	mg/kg	100								<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C6 - C10	mg/kg	20								<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20

								Field_ID	HA8_0.1-0.2	HA8_0.9-1.0
								Sampled_Date-Time	19/11/2015	19/11/2015
			CT1 NSW 2014 General Solid Waste (No Leaching)	CT2 NSW 2014 Restricted Solid Waste (No Leaching)	SCC1 NSW 2014 General Solid Waste Specific Contaminant Concentration	TCLP1 NSW 2014 General Solid Waste Leachable Concentration	SCC2 NSW 2014 Restricted Solid Waste Specific Contaminant Concentration	TCLP2 NSW 2014 Restricted Solid Waste Leachable Concentration	Fill	Residual Soil
ChemName	**Units**	**EQL**								
Benzene	mg/kg	0.1	10	40	18		72		<0.1	<0.1
Ethylbenzene	mg/kg	0.1	600	2400	1080		4320		<0.1	<0.1
Toluene	mg/kg	0.1	288	1152	518		2073		<0.1	<0.1
Xylene (m & p)	mg/kg	0.2							<0.2	<0.2
Xylene (o)	mg/kg	0.1							<0.1	<0.1
Xylene Total	mg/kg	0.3	1000	4000	1800		7200		<0.3	<0.3
C6-C10 less BTEX (F1)	mg/kg	20							<20	<20
Moisture Content (dried @ 103°C)	%	0.1							20	26
Arsenic	mg/kg	2	100	400	500		2000		5.2	15
Cadmium	mg/kg	0.4	20	80	100		400		<0.4	<0.4
Chromium	mg/kg	5	100		1900		7600		12	25
Copper	mg/kg	5							13	22
Lead	mg/kg	5	100	400	1500		6000		30	17
Lead TCLP	mg/L					5		20		
Mercury	mg/kg	0.05	4	16	50		200		0.07	<0.05
Nickel	mg/kg	5	40	160	1050		4200		9.5	<5
Zinc	mg/kg	5							75	45
4,4-DDE	mg/kg	0.05							<0.05	-
a-BHC	mg/kg	0.05							<0.05	-
Aldrin	mg/kg	0.05							<0.05	-
Aldrin + Dieldrin	mg/kg								<0.1	-
b-BHC	mg/kg	0.05							<0.05	-
Chlordane	mg/kg	0.1							<0.1	-
d-BHC	mg/kg	0.05							<0.05	-
DDD	mg/kg	0.05							<0.05	-
DDT	mg/kg	0.05							<0.05	-
DDT+DDE+DDD	mg/kg								<0.15	-
Dieldrin	mg/kg	0.05							<0.05	-
Endosulfan I	mg/kg	0.05							<0.05	-
Endosulfan II	mg/kg	0.05							<0.05	-
Endosulfan sulphate	mg/kg	0.05							<0.05	-
Endrin	mg/kg	0.05							<0.05	-
Endrin aldehyde	mg/kg	0.05							<0.05	-
Endrin ketone	mg/kg	0.05							<0.05	-
g-BHC (Lindane)	mg/kg	0.05							<0.05	-
Heptachlor	mg/kg	0.05							<0.05	-
Heptachlor epoxide	mg/kg	0.05							<0.05	-
Hexachlorobenzene	mg/kg	0.05							<0.05	-
Methoxychlor	mg/kg	0.2							<0.2	-
Toxaphene	mg/kg	1							<1	-
Acenaphthene	mg/kg	0.5							<0.5	<0.5
Acenaphthylene	mg/kg	0.5							<0.5	<0.5
Anthracene	mg/kg	0.5							<0.5	<0.5
Benzo(a)anthracene	mg/kg	0.5							<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5	0.8	3.2	10		23		<0.5	<0.5
Benzo(a)pyrene TCLP	mg/L	0.001				0.04		0.16		
Benzo(g,h,i)perylene	mg/kg	0.5							<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5							<0.5	<0.5
Chrysene	mg/kg	0.5							<0.5	<0.5
Benzo[b+j]fluoranthene	mg/kg	0.5							<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5							<0.5	<0.5
Fluoranthene	mg/kg	0.5							<0.5	<0.5
Fluorene	mg/kg	0.5							<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5							<0.5	<0.5
Naphthalene	mg/kg	0.5							<0.5	<0.5
Phenanthrene	mg/kg	0.5							<0.5	<0.5
Pyrene	mg/kg	0.5							<0.5	<0.5
Total PAHs	mg/kg	0.5	200	800	200		800		<0.5	<0.5
F2-NAPHTHALENE	mg/kg	50							<50	<50
C6 - C9	mg/kg	20	650	2600	650		2600		<20	<20
C10 - C14	mg/kg	20							<20	<20
C15 - C28	mg/kg	50							<50	<50
C29 - C36	mg/kg	50							<50	<50
C10 - C36 (Sum of total)	mg/kg	50	10000	40000	10000		40000		<50	<50
C10-C16	mg/kg	50							<50	<50
C16-C34	mg/kg	100							<100	<100
C34-C40	mg/kg	100							<100	<100
C6 - C10	mg/kg	20							<20	<20

				Field_ID	BH01	BH03	BH05
				Sampled_Date-Time	1/12/2015	1/12/2015	1/12/2015
				Matrix_Type	WATER	WATER	WATER
				ANZECC Freshwater GIL			
Chem_Group	**ChemName**	**Units**	**EQL**				
BTEX	Benzene	µg/L	1	950	<1	<1	<1
	Ethylbenzene	µg/L	1	80	<1	<1	<1
	Toluene	µg/L	1	180	<1	<1	<1
	Xylene (m & p)	µg/L	2	75	4	<2	<2
	Xylene (o)	µg/L	1	350	2	<1	<1
	Xylene Total	µg/L	3		5	<3	<3
	C6-C10 less BTEX (F1)	mg/L	0.02		0.04	<0.02	0.04
Metals	Arsenic (Filtered)	mg/L	0.001	0.013	0.001	0.003	0.003
	Cadmium (Filtered)	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001
	Chromium (Filtered)	mg/L	0.001	0.001	<0.001	<0.001	<0.001
	Copper (Filtered)	mg/L	0.001	0.0014	<0.001	<0.001	<0.001
	Lead (Filtered)	mg/L	0.001	0.0034	<0.001	<0.001	<0.001
	Mercury (Filtered)	mg/L	0.0001	0.0006	<0.0001	<0.0001	<0.0001
	Nickel (Filtered)	mg/L	0.001	0.011	0.003	0.003	0.11
	Zinc (Filtered)	mg/L	0.005	0.008	0.007	<0.005	0.012
PAH	Acenaphthene	µg/L	1		<1	<1	<1
	Acenaphthylene	µg/L	1		<1	<1	<1
	Anthracene	µg/L	1	1	<1	<1	<1
	Benzo(a)anthracene	µg/L	1		<1	<1	<1
	Benzo(a)pyrene	µg/L	1	1	<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1		<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1		<1	<1	<1
	Chrysene	µg/L	1		<1	<1	<1
	Benzo[b+j]fluoranthene	µg/L	1		<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1		<1	<1	<1
	Fluoranthene	µg/L	1	1	<1	<1	<1
	Fluorene	µg/L	1		<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1	<1
	Naphthalene	µg/L	1	16	<1	<1	<1
	Phenanthrene	µg/L	1	1	<1	<1	<1
	Pyrene	µg/L	1		<1	<1	<1
	Total PAHs	µg/L	1		<1	<1	<1
TPH	F2-NAPHTHALENE	mg/L	0.05		<0.05	<0.05	<0.05
	C6 - C9	µg/L	20	20	20	<20	<20
	C10 - C14	µg/L	50	50	<50	<50	<50
	C15 - C28	µg/L	100	100	<100	<100	<100
	C29 - C36	µg/L	100	100	<100	<100	<100
	C10 - C36 (Sum of total)	µg/L	100		<100	<100	<100
	C10-C16	mg/L	0.05		<0.05	<0.05	<0.05
	C16-C34	mg/L	0.1		<0.1	<0.1	<0.1
	C34-C40	mg/L	0.1		<0.1	<0.1	<0.1
	C6 - C10	mg/L	0.02		0.05	<0.02	0.04

Field Duplicates (SOIL)
Filter: ALL

SDG	0210-11	0210-11		0210-11	0210-11		0210-11	Interlab_D	
Field ID	HA4_0.1-0.2	DUP01	RPD	HA6_0.1-0.2	DUP02	RPD	HA4_0.1-0.2	DUP01A	RPD
Sampled Date/Time	19/11/2015	19/11/2015		19/11/2015	19/11/2015		19/11/2015	19/11/2015	

Chem_Group	ChemName	Units	EQL									
BTEX	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	-	<0.1	<0.1	0	<0.1	<0.2	0
	Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	-	<0.1	<0.1	0	<0.1	<0.5	0
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	-	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	-	<0.2	<0.2	0	<0.2	<0.5	0
	Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	-	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	-	<0.3	<0.3	0	<0.3	<0.5	0
	C6-C10 less BTEX (F1)	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	-	<20.0	<20.0	0	<20.0	<10.0	0
Inorganics	Moisture Content (dried @ 103°C)	%	0.1	**16.0**	**22.0**	**32**	17.0	21.0	21	16.0		
Metals	Arsenic	mg/kg	2 (Primary): 5 (Interlab)	**31.0**	**49.0**	**45**	**36.0**	**59.0**	**48**	31.0	49.0	45
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	0.4	0.7	55	<0.4	<0.4	0	0.4	<1.0	0
	Chromium	mg/kg	5 (Primary): 2 (Interlab)	9.8	18.0	59	13.0	20.0	42	9.8	19.0	64
	Copper	mg/kg	5	20.0	40.0	67	34.0	22.0	43	20.0	44.0	75
	Lead	mg/kg	5	**210.0**	**310.0**	**38**	56.0	51.0	9	**210.0**	**338.0**	**47**
	Mercury	mg/kg	0.05 (Primary): 0.1 (Interlab)	0.06	0.18	100	0.09	0.11	20	0.06	0.1	50
	Nickel	mg/kg	5 (Primary): 2 (Interlab)	<5.0	6.7	-	6.8	7.1	4	<5.0	8.0	46
	Zinc	mg/kg	5	**82.0**	**470.0**	**141**	140.0	170.0	19	**82.0**	**555.0**	**149**
OCP	4,4-DDE	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	a-BHC	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Aldrin	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	b-BHC	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Chlordane	mg/kg	0.1 (Primary): 0.05 (Interlab)	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.05	-
	d-BHC	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	DDD	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	DDT	mg/kg	0.05 (Primary): 0.2 (Interlab)	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.2	-
	Dieldrin	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Endosulfan I	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Endosulfan II	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Endosulfan sulphate	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Endrin	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Endrin ketone	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	g-BHC (Lindane)	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Heptachlor	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Hexachlorobenzene	mg/kg	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
	Methoxychlor	mg/kg	0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	-
	Toxaphene	mg/kg	1	<1.0	<1.0	-	<1.0	<1.0	-	<1.0		-
PAH	Acenaphthene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Anthracene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Benzo(a)anthracene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Chrysene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Benzo[b+j]fluoranthene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	0.6	-
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Fluoranthene	mg/kg	0.5	<0.5	1.1	-	<0.5	<0.5	-	<0.5	0.9	-
	Fluorene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Phenanthrene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
	Pyrene	mg/kg	0.5	<0.5	1.1	-	<0.5	<0.5	-	<0.5	0.8	-
	Total PAHs	mg/kg	0.5	<0.5	2.2	-	<0.5	<0.5	-	<0.5	2.3	-
TPH	F2-NAPHTHALENE	mg/kg	50	<50.0	<50.0	-	<50.0	<50.0	-	<50.0	<50.0	-
	C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	-	<20.0	<20.0	-	<20.0	<10.0	-
	C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	-	<20.0	<20.0	-	<20.0	<50.0	-
	C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	-	<50.0	<50.0	-	<50.0	<100.0	-
	C29 - C36	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	-	<50.0	<50.0	-	<50.0	<100.0	-
	C10 - C36 (Sum of total)	mg/kg	50	<50.0	<50.0	-	<50.0	<50.0	-	<50.0	<50.0	-
	C10-C16	mg/kg	50	<50.0	<50.0	-	<50.0	<50.0	-	<50.0	<50.0	-
	C16-C34	mg/kg	100	<100.0	<100.0	-	<100.0	<100.0	-	<100.0	<100.0	-
	C34-C40	mg/kg	100	<100.0	<100.0	-	<100.0	<100.0	-	<100.0	<100.0	-
	C6 - C10	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	-	<20.0	<20.0	-	<20.0	<10.0	-

*RPDs have only been considered where a concentration is greater than 0 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (0-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

SDG	8010	8010	
Field ID	BH01	DUP01	**RPD**
Sampled Date/Time	1/12/2015	1/12/2015	

Chem_Group	ChemName	Units	EQL			
BTEX	Benzene	µg/l	1	<1.0	<1.0	0
	Ethylbenzene	µg/l	1	<1.0	<1.0	0
	Toluene	µg/l	1	<1.0	<1.0	0
	Xylene (m & p)	µg/l	2	4.0	4.0	0
	Xylene (o)	µg/l	1	2.0	2.0	0
	Xylene Total	µg/l	3	5.0	6.0	18
	C6-C10 less BTEX (F1)	mg/l	0.02	0.04	0.07	55
Metals	Arsenic (Filtered)	mg/l	0.001	0.001	0.001	0
	Cadmium (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
	Chromium (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Copper (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Lead (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Mercury (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
	Nickel (Filtered)	mg/l	0.001	0.003	0.003	0
	Zinc (Filtered)	mg/l	0.005	0.007	<0.005	33
PAH	Acenaphthene	µg/l	1	<1.0	<1.0	0
	Acenaphthylene	µg/l	1	<1.0	<1.0	0
	Anthracene	µg/l	1	<1.0	<1.0	0
	Benzo(a)anthracene	µg/l	1	<1.0	<1.0	0
	Benzo(a)pyrene	µg/l	1	<1.0	<1.0	0
	Benzo(g,h,i)perylene	µg/l	1	<1.0	<1.0	0
	Benzo(k)fluoranthene	µg/l	1	<1.0	<1.0	0
	Chrysene	µg/l	1	<1.0	<1.0	0
	Benzo[b+j]fluoranthene	mg/l	0.001	<0.001	<0.001	0
	Dibenz(a,h)anthracene	µg/l	1	<1.0	<1.0	0
	Fluoranthene	µg/l	1	<1.0	<1.0	0
	Fluorene	µg/l	1	<1.0	<1.0	0
	Indeno(1,2,3-c,d)pyrene	µg/l	1	<1.0	<1.0	0
	Naphthalene	µg/l	10	<10.0	<10.0	0
	Naphthalene	µg/l	1	<1.0	<1.0	0
	Phenanthrene	µg/l	1	<1.0	<1.0	0
	Pyrene	µg/l	1	<1.0	<1.0	0
	Total PAHs	µg/l	1	<1.0	<1.0	0
TPH	F2-NAPHTHALENE	mg/l	0.05	<0.05	<0.05	0
	C6 - C9	µg/l	20	20.0	40.0	67
	C10 - C14	µg/l	50	<50.0	<50.0	0
	C15 - C28	µg/l	100	<100.0	<100.0	0
	C29 - C36	µg/l	100	<100.0	<100.0	0
	C10 - C36 (Sum of total)	µg/l	100	<100.0	<100.0	0
	C10-C16	mg/l	0.05	<0.05	<0.05	0
	C16-C34	mg/l	0.1	<0.1	<0.1	0
	C34-C40	mg/l	0.1	<0.1	<0.1	0
	C6 - C10	mg/l	0.02	0.05	0.08	46

*RPDs have only been considered where a concentration is greater than 0 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (0-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

TABLE 7
TRIP RINSATE BLANK TABLE

Field Blanks (WATER)
Filter: ALL

SDG	8010	0210-11	8010	0210-11
Field ID	RINSATE	RB1	TRIP BLANK	TRIP BLANK
Sampled_Date/Time	1/12/2015	19/11/2015	1/12/2015	19/11/2015
Sample Type	Rinsate	Rinsate	Trip_B	Trip_B

Chem_Group	ChemName	Units	EQL				
BTEX	Benzene	µg/l	1	<1	<1	<1	<1
	Ethylbenzene	µg/l	1	<1	<1	<1	<1
	Toluene	µg/l	1	<1	<1	<1	<1
	Xylene (m & p)	µg/l	2	<2	<2	<2	<2
	Xylene (o)	µg/l	1	<1	<1	<1	<1
	Xylene Total	µg/l	3	<3	<3	<3	<3
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	<0.02	<0.02
Metals	Arsenic	mg/l	0.001	<0.005	<0.001		
	Arsenic (Filtered)	mg/l	0.001				
	Cadmium	mg/l	0.0002	<0.0005	<0.0002		
	Cadmium (Filtered)	mg/l	0.0001				
	Chromium	mg/l	0.001	<0.005	<0.001		
	Chromium (Filtered)	mg/l	0.001				
	Copper	mg/l	0.001	<0.005	<0.001		
	Copper (Filtered)	mg/l	0.001				
	Lead	mg/l	0.001	<0.005	<0.001		
	Lead (Filtered)	mg/l	0.001				
	Mercury	mg/l	0.0001	<0.0001	<0.0001		
	Mercury (Filtered)	mg/l	0.0001				
	Nickel	mg/l	0.001	<0.005	<0.001		
	Nickel (Filtered)	mg/l	0.001				
	Zinc	mg/l	0.001	<0.005	<0.001		
	Zinc (Filtered)	mg/l	0.005				
PAH	Acenaphthene	µg/l	1	<1	<1		
	Acenaphthylene	µg/l	1	<1	<1		
	Anthracene	µg/l	1	<1	<1		
	Benzo(a)anthracene	µg/l	1	<1	<1		
	Benzo(a)pyrene	µg/l	1	<1	<1		
	Benzo(g,h,i)perylene	µg/l	1	<1	<1		
	Benzo(k)fluoranthene	µg/l	1	<1	<1		
	Chrysene	µg/l	1	<1	<1		
	Benzo[b+j]fluoranthene	mg/l	0.001	<0.001	<0.001		
	Dibenz(a,h)anthracene	µg/l	1	<1	<1		
	Fluoranthene	µg/l	1	<1	<1		
	Fluorene	µg/l	1	<1	<1		
	Indeno(1,2,3-c,d)pyrene	µg/l	1	<1	<1		
	Naphthalene	µg/l	1	<10	<10	<10	<10
	Phenanthrene	µg/l	1	<1	<1		
	Pyrene	µg/l	1	<1	<1		
	Total PAHs	µg/l	1	<1	<1		
TPH	F2-NAPHTHALENE	mg/l	0.05	<0.05	<0.05		
	C6 - C9	µg/l	20	<20	<20	<20	<20
	C10 - C14	µg/l	50	<50	<50		
	C15 - C28	µg/l	100	<100	<100		
	C29 - C36	µg/l	100	<100	<100		
	C10 - C36 (Sum of total)	µg/l	100	<100	<100		
	C10-C16	mg/l	0.05	<0.05	<0.05		
	C16-C34	mg/l	0.1	<0.1	<0.1		
	C34-C40	mg/l	0.1	<0.1	<0.1		
	C6 - C10	mg/l	0.02	<0.02	<0.02	<0.02	<0.02

		Benzene	Toluene	Ethylbenzene	m&p-Xylenes	o-Xylene	Xylenes - Total	TRH C6-C9
Sample ID	**Date Sampled**							
TRIP SPIKE	19/11/2015	91%	89%	87%	85%	89%	86%	88%
TRIP SPIKE	1/12/2015	102%	95%	90%	92%	93%	92%	74%

Appendix G
Rising Head Test Data

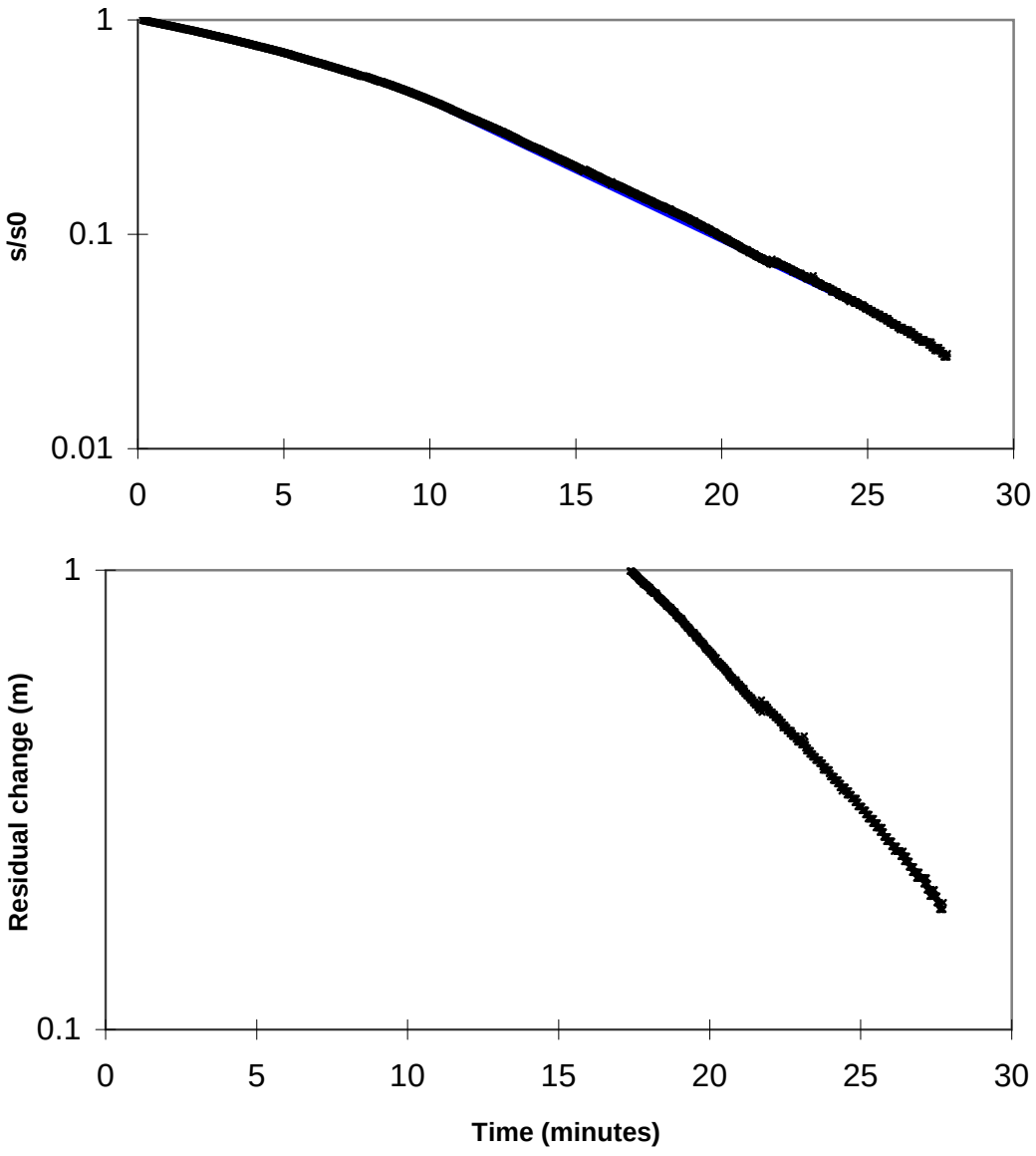
RISING OR FALLING HEAD TEST ANALYSIS

Bore Data	Units	Value
Initial groundwater level	m	4.796
Groundwater level at t=0	m	11.6
Casing radius (r)	m	0.025
Bore radius (R)	m	0.01
Screened interval length (L)	m	9.9
Match time start	min	10
Match time end	min	25
Characteristic Time (t_0)	**min**	**6.67**
Hydraulic Conductivity (K)	**m/day**	**0.0470**

Borehole: BH01

Method Developed by Hvorslev (1951)

$$K = \frac{r^2 \ln(L/R)}{2Lt_0}$$



Reference: Hvorslev, M.J. (1951), Time lag and soil permeability in ground water observations. U.S. Army Corps of Engineers Waterway Experimentation Station, Bulletin 36.

drawn	BR		client:	Bouygues Construction Australia
approved			project:	Dooleys Lidcombe Club & Hotel Development
date	9 Dec 2015		title:	Rising Head Test at BH01
scale	AS SHOWN		project no:	GEOTLCOV25554AA
original size	A4			Figure A1

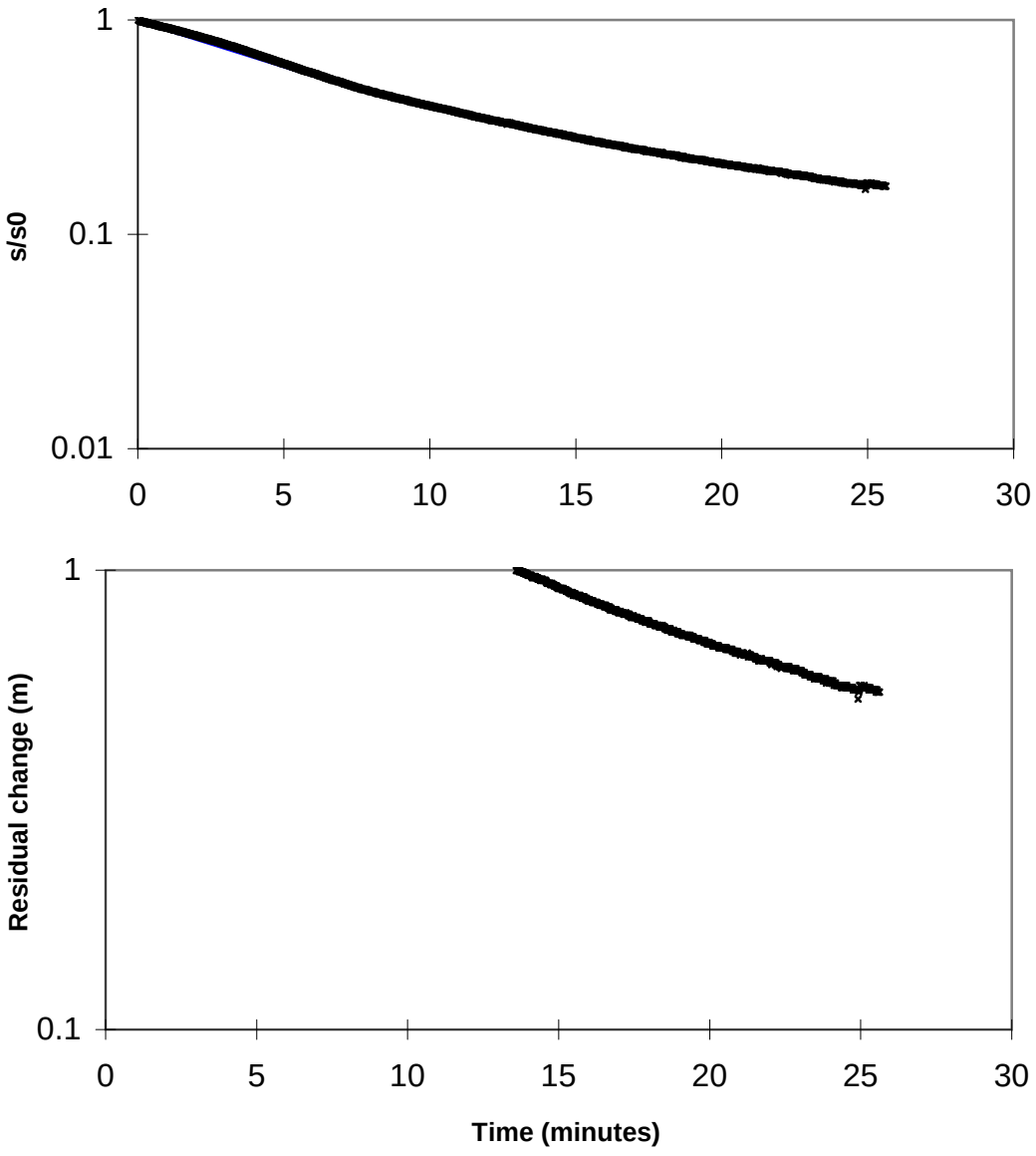
RISING OR FALLING HEAD TEST ANALYSIS

Bore Data	Units	Value
Initial groundwater level	m	4.273
Groundwater level at t=0	m	7.51
Casing radius (r)	m	0.025
Bore radius (R)	m	0.05
Screened interval length (L)	m	3.2
Match time start	min	1
Match time end	min	7
Characteristic Time (t_0)	**min**	**9.95**
Hydraulic Conductivity (K)	**m/day**	**0.0588**

Borehole: BH03

Method Developed by Hvorslev (1951)

$$K = \frac{r^2 \ln(L/R)}{2Lt_0}$$



Reference: Hvorslev, M.J. (1951), Time lag and soil permeability in ground water observations. U.S. Army Corps of Engineers Waterway Experimentation Station, Bulletin 36.

drawn	**BR**		client:	**Bouygues Construction Australia**
approved			project:	**Dooleys Lidcombe Club & Hotel Development**
date	**9 Dec 2015**			
scale	**AS SHOWN**		title:	**Rising Head Test at BH03**
original size	**A4**		project no:	**GEOTLCOV25554AA** **Figure A1**

Appendix H
Laboratory Analytical Certificates & Chain of Custody Documentation

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

coffey

Consigning Office:	CHATSWOOD
Report Results to:	MATTHEW LOCKE
Mobile:	
Email:	@coffey.com
Invoices to:	/ /
Phone:	
Email:	@coffey.com

Project No:	GEOTCLOV 25551AA	Task No:	ENVIRONMENTS
Project Name:	Dooleys	Laboratory:	MGT
Sampler's Name:	Alex Rutter	Project Manager:	ML
Special Instructions:	SEE PS1		

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	SUITE B4 (TPH/BTEX/PAH)	SUITE M8 (METALS 8)	OCP	ASBESTOS	BTEX	TPH C6-C9	NOTES
	HA7_0.1-0.2	19/11		Soil	1J, 1Z	Std							
	_0.5-0.6	↓		↓	↓	↓							
	_0.9-1.0						/	/					
	HA8_0.1-0.2						/	/	/	/			
	_0.5-0.6												
	_0.9-1.0						/	/					
	RB1			WATER	2V, 1G, 2P		/	/					
	Trip blank			↓	2V						/	/	
	Trip spike			↓	2V						/	/	
	Dup01			Soil	1J		/	/	/				
	Dup01A			↓	↓		/	/	/				SEND DUP01A TO ALS
	Dup02			↓	↓	↓	/	/	/				
	BH03_0.5-0.6			SOIL	1 JAR / 1ZP		/	/					
	BH03_0.05-0.2			"	"								
	BH03_1.0-1.1			"	1 JAR		/	/					

RELINQUISHED BY		RECEIVED BY	
Name: A. Rutter	Date: 19/11/15	Name: SG	Date: 2/11
Coffey Environments	Time: 14:10	Company: EFMGT	Time: 5:40
Name:	Date:	Name: Simack	Date: 23/11
Company:	Time:	Company: EFMGT	Time: 1436

Sample Receipt Advice: (Lab Use Only)

- All Samples Recieved in Good Condition ☑
- All Documentation is in Proper Order ☑
- Samples Received Properly Chilled ☑
- Lab. Ref/Batch No. 480540

*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, O - Other Preservative

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

coffey

Consigning Office:	HATSWOOD
Report Results to:	MATTHEW LOCKE
Mobile:	
Email:	@coffey.com
Invoices to:	" "
Phone:	
Email:	@coffey.com

Project No:	GEOTLCOV25554AA	Task No:	ENVIRONMENTS
Project Name:	Dudleys	Laboratory:	MGT
Sampler's Name:	Alex Ruthings	Project Manager:	ML
Special Instructions:	email Matt Locke for analysis		

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section: SUITE B4 (TPH BTEX PAH METALS 8), SUITE M8 (METALS 8), OCP, ASBESTOS

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	NOTES
	MA1_0.1-0.2	[illegible]		Soil	J, I	5 day	
	MA1_0.5-0.6						
	MA1_0.5-1.0						
	MA2_0.1-0.2						
	MA2_0.5-0.6						
	MA2_0.9-1.0						
	MA3_0.1-0.2						
	MA3_0.5-0.6						
	MA3_0.9-1.0						
	[illegible]						
	[illegible]						
	[illegible]						
	[illegible] 0.2						
	[illegible] 0.6						
	[illegible]						
	[illegible] 0.2						
	0.5 - 0.6						
	0.9 - 1.0						

RELINQUISHED BY				RECEIVED BY			
Name:	A Ruthings	Date:	[illegible]	Name:	[illegible]	Date:	[illegible]
Coffey Environments		Time:	[illegible]	Company:	[illegible]	Time:	[illegible]
Name:		Date:		Name:	Siamak	Date:	23/11
Company:		Time:		Company:	EFMGT	Time:	14:36

Sample Receipt Advice: (Lab Use Only)

- All Samples Recieved in Good Condition ☑
- All Documentation is in Proper Order ☑
- Samples Received Properly Chilled ☑
- Lab. Ref/Batch No. 480540

*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, O - Other Preservative

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2x Fisky.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

 0210

coffey

Consigning Office: CHATSWOOD

Report Results to: MATTHEW LOCKE Mobile: Email: @coffey.com

Invoices to: " " Phone: Email: @coffey.com

Project No: GEOTLCOU25554AA Task No: ENVIRONMENTS

Project Name: Dooley's Laboratory: MGT

Sampler's Name: Alex. Ruthing Project Manager: ML.

Special Instructions: email Matt Locke for analysis

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Analysis Request Section / NOTES
	HA1_0.1-0.2	15/11		Soil	1S, 1Z	5day	
	" _0.5-0.6						
	" _0.9-1.0						
	HA2_0.1-0.2						
	" _0.5-0.6						
	" _0.9-1.0						
	HA3_0.1-0.2						
	" _0.5-0.6						
	" _0.9-1.0						
	HA4_0.1-0.2						
	_0.5-0.6						
	_0.9-1.0						
	HA5_0.1-0.2						
	_0.5-0.6						
	_0.9-1.0						
	HA6_0.1-0.2						
	_0.5-0.6						
	_0.9-1.0						

RELINQUISHED BY

Name: A. Ruthing Date: 19/11/15

Coffey Environments Time: 1540

Name: Date:

Company: Time:

RECEIVED BY

Name: Sean Date: 19/11

Company: EFINGA Time: 3:40

Name: Date:

Company: Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No. 480540.

*Container Type / Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- [illegible] Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid [illegible]served, S - Sulphuric Ac[illegible]reserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, [illegible] - Other Preservative

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

 0211

coffey

Consigning Office: CHATSWOOD

Report Results to: MATTHEW COCKE Mobile: Email: @coffey.com

Invoices to: " " Phone: Email: @coffey.com

Project No: GEOTLCOV25554AA Task No: ENVIRONMENTS.

Project Name: Dooleys Laboratory: MGT

Sampler's Name: Alex Ruddys Project Manager: ML.

Special Instructions: SEE PS1

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	NOTES
	HA7 0.1-0.2	19/11		Soil	15, 12	5day	
	0.5-0.6						
	0.9-1.0						
	HA8 0.1-0.2						
	0.5-0.6						
	0.9-1.0						
	RB1			WATER	2v, 1G, 2P		
	Trip blank				2v		
	Trip spike				2v		
	dup01			Soil	15		
	dup01A						
	dup02						

RELINQUISHED BY

Name: Alex Ruddys Date: 19/11/15

Coffey Environments Time: 1540

Name: Date:

Company: Time:

RECEIVED BY

Name: Sean Date: 19/11

Company: EF/MGT Time: 3:40

Name: Date:

Company: Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No. 480540

*Container Type/Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- [illegible] Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid [illegible]served, S - Sulphuric Ac[illegible]reserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, [illegible] - Other Preservative

eurofins | mgt

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Unit F3, Building F
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Lane Cove West NSW 2066
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NATA # 1261 Site # 18217

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

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Matthew Locke
Project name:	GEOTLCOV25554AA
Project ID:	DOOLEYS
COC number:	0210-11
Turn around time:	5 Day
Date/Time received:	Nov 23, 2015 2:36 PM
Eurofins | mgt reference:	**480540**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 6.3 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Sample DUP01A forwarded to ALS

Contact notes

If you have any questions with respect to these samples please contact:

Charl Du Preez on Phone : +61 (2) 9900 8400 or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to Matthew Locke - Matthew_Locke@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

eurofins | mgt

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Matthew Locke**

Report **480540-S**
Project name GEOTLCOV25554AA
Project ID DOOLEYS
Received Date Nov 23, 2015

Client Sample ID			**HA1_0.1-0.2**	**HA1_0.9-1.0**	**HA2_0.1-0.2**	**HA2_0.9-1.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-No18308**	**S15-No18310**	**S15-No18311**	**S15-No18313**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	140	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	140	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	73	79	77	76
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			HA1_0.1-0.2	HA1_0.9-1.0	HA2_0.1-0.2	HA2_0.9-1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-No18308**	**S15-No18310**	**S15-No18311**	**S15-No18313**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	85	102	94	97
p-Terphenyl-d14 (surr.)	1	%	86	103	96	98
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.2	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	111	-	102	-
Tetrachloro-m-xylene (surr.)	1	%	107	-	97	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	160	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	11	11	17	18
Cadmium	0.4	mg/kg	0.5	< 0.4	0.5	< 0.4
Chromium	5	mg/kg	24	25	27	29
Copper	5	mg/kg	44	12	38	13
Lead	5	mg/kg	140	18	170	19
Mercury	0.05	mg/kg	0.10	< 0.05	0.09	< 0.05
Nickel	5	mg/kg	11	< 5	7.9	< 5
Zinc	5	mg/kg	100	9.4	280	7.9
% Moisture	0.1	%	27	21	23	25

Client Sample ID			HA3_0.1-0.2	HA3_0.9-1.0	HA4_0.1-0.2	HA4_0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-No18314	S15-No18316	S15-No18317	S15-No18319
Date Sampled			Nov 19, 2015	Nov 19, 2015	Nov 19, 2015	Nov 19, 2015
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	81	77	78	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	81	83	91	112
p-Terphenyl-d14 (surr.)	1	%	122	72	95	102
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-

Client Sample ID			HA3_0.1-0.2	HA3_0.9-1.0	HA4_0.1-0.2	HA4_0.9-1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-No18314**	**S15-No18316**	**S15-No18317**	**S15-No18319**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	94	-	88	-
Tetrachloro-m-xylene (surr.)	1	%	95	-	90	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	4.8	12	31	7.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	0.4	< 0.4
Chromium	5	mg/kg	11	25	9.8	13
Copper	5	mg/kg	29	10	20	11
Lead	5	mg/kg	170	21	210	16
Mercury	0.05	mg/kg	0.12	< 0.05	0.06	< 0.05
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	140	13	82	8.6
% Moisture	0.1	%	24	19	16	22

Client Sample ID			HA5_0.1-0.2	HA5_0.9-1.0	HA6_0.1-0.2	HA6_0.9-1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-No18320**	**S15-No18322**	**S15-No18323**	**S15-No18325**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			HA5_0.1-0.2	HA5_0.9-1.0	HA6_0.1-0.2	HA6_0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-No18320	S15-No18322	S15-No18323	S15-No18325
Date Sampled			Nov 19, 2015	Nov 19, 2015	Nov 19, 2015	Nov 19, 2015
Test/Reference	LOR	Unit				
BTEX						
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	81	81	80	75
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	85	88	97	98
p-Terphenyl-d14 (surr.)	1	%	82	77	96	101
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-

Client Sample ID			HA5_0.1-0.2	HA5_0.9-1.0	HA6_0.1-0.2	HA6_0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-No18320	S15-No18322	S15-No18323	S15-No18325
Date Sampled			Nov 19, 2015	Nov 19, 2015	Nov 19, 2015	Nov 19, 2015
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	96	-	101	-
Tetrachloro-m-xylene (surr.)	1	%	95	-	110	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	25	12	36	17
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	17	20	13	21
Copper	5	mg/kg	32	15	34	16
Lead	5	mg/kg	130	20	56	16
Mercury	0.05	mg/kg	0.06	< 0.05	0.09	< 0.05
Nickel	5	mg/kg	8.3	< 5	6.8	< 5
Zinc	5	mg/kg	140	11	140	31
% Moisture	0.1	%	20	23	17	22

Client Sample ID			HA7_0.1-0.2	HA7_0.9-1.0	HA8_0.1-0.2	HA8_0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-No18326	S15-No18328	S15-No18329	S15-No18331
Date Sampled			Nov 19, 2015	Nov 19, 2015	Nov 19, 2015	Nov 19, 2015
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	79	78	76	77
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			HA7_0.1-0.2	HA7_0.9-1.0	HA8_0.1-0.2	HA8_0.9-1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-No18326**	**S15-No18328**	**S15-No18329**	**S15-No18331**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	98	93	95	91
p-Terphenyl-d14 (surr.)	1	%	100	94	96	80
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	110	-	91	-
Tetrachloro-m-xylene (surr.)	1	%	112	-	93	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			HA7_0.1-0.2	HA7_0.9-1.0	HA8_0.1-0.2	HA8_0.9-1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-No18326**	**S15-No18328**	**S15-No18329**	**S15-No18331**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	52	11	5.2	15
Cadmium	0.4	mg/kg	1.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	33	22	12	25
Copper	5	mg/kg	71	14	13	22
Lead	5	mg/kg	1300	83	30	17
Mercury	0.05	mg/kg	0.43	< 0.05	0.07	< 0.05
Nickel	5	mg/kg	11	< 5	9.5	< 5
Zinc	5	mg/kg	1600	32	75	45
% Moisture	0.1	%	18	22	20	26

Client Sample ID			DUP01	DUP02	BH03_0.5-0.6	BH03_1.0-1.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-No18335**	**S15-No18336**	**S15-No18337**	**S15-No18339**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	130	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	130	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	95	94	96	97
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	0.9	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	1.2	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.5	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	0.7	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	1.1	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5

Client Sample ID			DUP01	DUP02	BH03_0.5-0.6	BH03_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-No18335	S15-No18336	S15-No18337	S15-No18339
Date Sampled			Nov 19, 2015	Nov 19, 2015	Nov 19, 2015	Nov 19, 2015
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	1.1	< 0.5	0.9	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	0.7	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	1.1	< 0.5	1.0	< 0.5
Total PAH*	0.5	mg/kg	2.2	< 0.5	6.2	< 0.5
2-Fluorobiphenyl (surr.)	1	%	91	97	95	101
p-Terphenyl-d14 (surr.)	1	%	84	88	90	88
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	-
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	-
Toxaphene	1	mg/kg	< 1	< 1	-	-
Dibutylchlorendate (surr.)	1	%	94	94	-	-
Tetrachloro-m-xylene (surr.)	1	%	105	102	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	110	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	49	59	7.8	4.6
Cadmium	0.4	mg/kg	0.7	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	18	20	16	< 5
Copper	5	mg/kg	40	22	330	6.9
Lead	5	mg/kg	310	51	82	< 5
Mercury	0.05	mg/kg	0.18	0.11	0.07	< 0.05
Nickel	5	mg/kg	6.7	7.1	23	< 5
Zinc	5	mg/kg	470	170	290	12
% Moisture	0.1	%	22	21	15	14

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Nov 24, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Nov 24, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 24, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins | mgt Suite B4			
Polycyclic Aromatic Hydrocarbons	Sydney	Nov 24, 2015	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 24, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Organochlorine Pesticides	Sydney	Nov 24, 2015	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Metals M8	Sydney	Nov 24, 2015	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
% Moisture	Sydney	Nov 23, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

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Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Nov 23, 2015 2:36 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	480540	**Due:**	Nov 30, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	GEOTLCOV25554AA				
Project ID:	DOOLEYS				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Metals M8	Moisture Set	Eurofins | mgt Suite B4	BTEX and Volatile TRH
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
HA1_0.1-0.2	Nov 19, 2015		Soil	S15-No18308	X		X		X	X	X	
HA1_0.5-0.6	Nov 19, 2015		Soil	S15-No18309		X						
HA1_0.9-1.0	Nov 19, 2015		Soil	S15-No18310					X	X	X	
HA2_0.1-0.2	Nov 19, 2015		Soil	S15-No18311	X		X		X	X	X	
HA2_0.5-0.6	Nov 19, 2015		Soil	S15-No18312		X						
HA2_0.9-1.0	Nov 19, 2015		Soil	S15-No18313					X	X	X	
HA3_0.1-0.2	Nov 19, 2015		Soil	S15-No18314	X		X		X	X	X	
HA3_0.5-0.6	Nov 19, 2015		Soil	S15-No18315		X						
HA3_0.9-1.0	Nov 19, 2015		Soil	S15-No18316					X	X	X	

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Site # 1254 & 14271

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

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Nov 23, 2015 2:36 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	480540	**Due:**	Nov 30, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	GEOTLCOV25554AA				
Project ID:	DOOLEYS				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Metals M8	Moisture Set	Eurofins | mgt Suite B4	BTEX and Volatile TRH
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
HA4_0.1-0.2	Nov 19, 2015		Soil	S15-No18317	X		X		X	X	X	
HA4_0.5-0.6	Nov 19, 2015		Soil	S15-No18318		X						
HA4_0.9-1.0	Nov 19, 2015		Soil	S15-No18319					X	X	X	
HA5_0.1-0.2	Nov 19, 2015		Soil	S15-No18320	X		X		X	X	X	
HA5_0.5-0.6	Nov 19, 2015		Soil	S15-No18321		X						
HA5_0.9-1.0	Nov 19, 2015		Soil	S15-No18322					X	X	X	
HA6_0.1-0.2	Nov 19, 2015		Soil	S15-No18323	X		X		X	X	X	
HA6_0.5-0.6	Nov 19, 2015		Soil	S15-No18324		X						
HA6_0.9-1.0	Nov 19, 2015		Soil	S15-No18325					X	X	X	
HA7_0.1-0.2	Nov 19, 2015		Soil	S15-No18326	X		X		X	X	X	

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Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Metals M8	Moisture Set	Eurofins | mgt Suite B4	BTEX and Volatile TRH
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
HA7_0.5-0.6	Nov 19, 2015		Soil	S15-No18327		X						
HA7_0.9-1.0	Nov 19, 2015		Soil	S15-No18328					X	X	X	
HA8_0.1-0.2	Nov 19, 2015		Soil	S15-No18329	X		X		X	X	X	
HA8_0.5-0.6	Nov 19, 2015		Soil	S15-No18330		X						
HA8_0.9-1.0	Nov 19, 2015		Soil	S15-No18331					X	X	X	
RB1	Nov 19, 2015		Water	S15-No18332				X			X	
TRIP BLANK	Nov 19, 2015		Water	S15-No18333								X
TRIP SPIKE	Nov 19, 2015		Water	S15-No18334								X
DUP01	Nov 19, 2015		Soil	S15-No18335			X		X	X	X	
DUP02	Nov 19, 2015		Soil	S15-No18336			X		X	X	X	

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Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Metals M8	Moisture Set	Eurofins | mgt Suite B4	BTEX and Volatile TRH
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
BH03_0.5-0.6	Nov 19, 2015		Soil	S15-No18337					X	X	X	
BH03_0.05-0.2	Nov 19, 2015		Soil	S15-No18338		X						
BH03_1.0-1.1	Nov 19, 2015		Soil	S15-No18339					X	X	X	

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

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

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	70			70-130	Pass	
TRH C10-C14	%	104			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	87			70-130	Pass	
Toluene	%	86			70-130	Pass	
Ethylbenzene	%	83			70-130	Pass	
m&p-Xylenes	%	81			70-130	Pass	
o-Xylene	%	83			70-130	Pass	
Xylenes - Total	%	82			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	99			70-130	Pass	
TRH C6-C10	%	74			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	103			70-130	Pass	
Acenaphthylene	%	92			70-130	Pass	
Anthracene	%	102			70-130	Pass	
Benz(a)anthracene	%	93			70-130	Pass	
Benzo(a)pyrene	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	%	97			70-130	Pass	
Benzo(g.h.i)perylene	%	77			70-130	Pass	
Benzo(k)fluoranthene	%	100			70-130	Pass	
Chrysene	%	104			70-130	Pass	
Dibenz(a.h)anthracene	%	82			70-130	Pass	
Fluoranthene	%	99			70-130	Pass	
Fluorene	%	99			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	80			70-130	Pass	
Naphthalene	%	104			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenanthrene	%	104			70-130	Pass	
Pyrene	%	100			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	109			70-130	Pass	
4.4'-DDD	%	111			70-130	Pass	
4.4'-DDE	%	116			70-130	Pass	
4.4'-DDT	%	130			70-130	Pass	
a-BHC	%	98			70-130	Pass	
Aldrin	%	110			70-130	Pass	
b-BHC	%	101			70-130	Pass	
d-BHC	%	90			70-130	Pass	
Dieldrin	%	112			70-130	Pass	
Endosulfan I	%	108			70-130	Pass	
Endosulfan II	%	117			70-130	Pass	
Endosulfan sulphate	%	106			70-130	Pass	
Endrin	%	125			70-130	Pass	
Endrin aldehyde	%	120			70-130	Pass	
Endrin ketone	%	126			70-130	Pass	
g-BHC (Lindane)	%	98			70-130	Pass	
Heptachlor	%	127			70-130	Pass	
Heptachlor epoxide	%	106			70-130	Pass	
Hexachlorobenzene	%	99			70-130	Pass	
Methoxychlor	%	130			70-130	Pass	
Toxaphene	%	85			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	110			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	90			70-130	Pass	
Cadmium	%	91			70-130	Pass	
Chromium	%	92			70-130	Pass	
Copper	%	93			70-130	Pass	
Lead	%	87			70-130	Pass	
Mercury	%	107			70-130	Pass	
Nickel	%	93			70-130	Pass	
Zinc	%	93			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S15-No17282	NCP	%	114			70-130	Pass	
4.4'-DDD	S15-No17282	NCP	%	117			70-130	Pass	
4.4'-DDE	S15-No17282	NCP	%	121			70-130	Pass	
4.4'-DDT	S15-No17282	NCP	%	128			70-130	Pass	
a-BHC	S15-No17282	NCP	%	100			70-130	Pass	
Aldrin	S15-No17282	NCP	%	111			70-130	Pass	
b-BHC	S15-No17282	NCP	%	106			70-130	Pass	
d-BHC	S15-No17282	NCP	%	92			70-130	Pass	
Dieldrin	S15-No17282	NCP	%	119			70-130	Pass	
Endosulfan I	S15-No17282	NCP	%	113			70-130	Pass	
Endosulfan II	S15-No17282	NCP	%	120			70-130	Pass	
Endosulfan sulphate	S15-No17282	NCP	%	109			70-130	Pass	
Endrin	S15-No17282	NCP	%	129			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	S15-No17282	NCP	%	114			70-130	Pass	
Endrin ketone	S15-No17282	NCP	%	130			70-130	Pass	
g-BHC (Lindane)	S15-No17282	NCP	%	100			70-130	Pass	
Heptachlor	S15-No17282	NCP	%	129			70-130	Pass	
Heptachlor epoxide	S15-No17282	NCP	%	111			70-130	Pass	
Hexachlorobenzene	S15-No17282	NCP	%	99			70-130	Pass	
Methoxychlor	S15-No17282	NCP	%	127			70-130	Pass	
Toxaphene	S15-No18697	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S15-No18313	CP	%	98			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S15-No18313	CP	%	97			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-No18313	CP	%	78			70-130	Pass	
Cadmium	S15-No18313	CP	%	99			70-130	Pass	
Chromium	S15-No18313	CP	%	70			70-130	Pass	
Copper	S15-No18313	CP	%	97			70-130	Pass	
Lead	S15-No18313	CP	%	79			70-130	Pass	
Mercury	S15-No18313	CP	%	107			70-130	Pass	
Nickel	S15-No18313	CP	%	97			70-130	Pass	
Zinc	S15-No18313	CP	%	100			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-No18316	CP	%	108			70-130	Pass	
Acenaphthylene	S15-No18316	CP	%	101			70-130	Pass	
Anthracene	S15-No18316	CP	%	104			70-130	Pass	
Benz(a)anthracene	S15-No18316	CP	%	90			70-130	Pass	
Benzo(a)pyrene	S15-No18316	CP	%	106			70-130	Pass	
Benzo(b&j)fluoranthene	S15-No18316	CP	%	95			70-130	Pass	
Benzo(g.h.i)perylene	S15-No18316	CP	%	105			70-130	Pass	
Benzo(k)fluoranthene	S15-No18316	CP	%	113			70-130	Pass	
Chrysene	S15-No18316	CP	%	106			70-130	Pass	
Dibenz(a.h)anthracene	S15-No18316	CP	%	94			70-130	Pass	
Fluoranthene	S15-No18316	CP	%	97			70-130	Pass	
Fluorene	S15-No18316	CP	%	103			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-No18316	CP	%	101			70-130	Pass	
Naphthalene	S15-No18316	CP	%	107			70-130	Pass	
Phenanthrene	S15-No18316	CP	%	102			70-130	Pass	
Pyrene	S15-No18316	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-No18328	CP	%	73			70-130	Pass	
TRH C10-C14	S15-No18328	CP	%	117			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-No18328	CP	%	78			70-130	Pass	
Toluene	S15-No18328	CP	%	75			70-130	Pass	
Ethylbenzene	S15-No18328	CP	%	74			70-130	Pass	
m&p-Xylenes	S15-No18328	CP	%	71			70-130	Pass	
o-Xylene	S15-No18328	CP	%	72			70-130	Pass	
Xylenes - Total	S15-No18328	CP	%	72			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-No18328	CP	%	71			70-130	Pass	
TRH C6-C10	S15-No18328	CP	%	76			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S15-No18328	CP	%	117			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-No18328	CP	%	110			70-130	Pass	
Cadmium	S15-No18328	CP	%	99			70-130	Pass	
Chromium	S15-No18328	CP	%	87			70-130	Pass	
Copper	S15-No18328	CP	%	100			70-130	Pass	
Mercury	S15-No18328	CP	%	96			70-130	Pass	
Nickel	S15-No18328	CP	%	105			70-130	Pass	
Zinc	S15-No18328	CP	%	105			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-No18331	CP	%	113			70-130	Pass	
Acenaphthylene	S15-No18331	CP	%	103			70-130	Pass	
Anthracene	S15-No18331	CP	%	107			70-130	Pass	
Benz(a)anthracene	S15-No18331	CP	%	94			70-130	Pass	
Benzo(a)pyrene	S15-No18331	CP	%	110			70-130	Pass	
Benzo(b&j)fluoranthene	S15-No18331	CP	%	96			70-130	Pass	
Benzo(g.h.i)perylene	S15-No18331	CP	%	104			70-130	Pass	
Benzo(k)fluoranthene	S15-No18331	CP	%	108			70-130	Pass	
Chrysene	S15-No18331	CP	%	110			70-130	Pass	
Dibenz(a.h)anthracene	S15-No18331	CP	%	99			70-130	Pass	
Fluoranthene	S15-No18331	CP	%	101			70-130	Pass	
Fluorene	S15-No18331	CP	%	109			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-No18331	CP	%	101			70-130	Pass	
Naphthalene	S15-No18331	CP	%	113			70-130	Pass	
Phenanthrene	S15-No18331	CP	%	108			70-130	Pass	
Pyrene	S15-No18331	CP	%	102			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S15-No17295	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S15-No17295	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S15-No17295	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S15-No17295	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S15-No17295	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S15-No17295	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-No18311	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-No18311	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S15-No18311	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S15-No18311	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S15-No18311	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
o-Xylene	S15-No18311	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S15-No18311	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-No18311	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S15-No18311	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-No18311	CP	mg/kg	17	19	9.0	30%	Pass	
Cadmium	S15-No18311	CP	mg/kg	0.5	< 0.4	20	30%	Pass	
Chromium	S15-No18311	CP	mg/kg	27	34	21	30%	Pass	
Copper	S15-No18311	CP	mg/kg	38	31	19	30%	Pass	
Lead	S15-No18311	CP	mg/kg	170	140	16	30%	Pass	
Mercury	S15-No18311	CP	mg/kg	0.09	0.08	8.0	30%	Pass	
Nickel	S15-No18311	CP	mg/kg	7.9	7.5	6.0	30%	Pass	
Zinc	S15-No18311	CP	mg/kg	280	230	20	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-No18311	CP	%	23	26	16	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S15-No18314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S15-No18320	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
g-BHC (Lindane)	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S15-No18320	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S15-No18320	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S15-No18320	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-No18326	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-No18326	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S15-No18326	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S15-No18326	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S15-No18326	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S15-No18326	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S15-No18326	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-No18326	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S15-No18326	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-No18326	CP	mg/kg	52	55	6.0	30%	Pass	
Cadmium	S15-No18326	CP	mg/kg	1.4	1.2	12	30%	Pass	
Chromium	S15-No18326	CP	mg/kg	33	30	9.0	30%	Pass	
Copper	S15-No18326	CP	mg/kg	71	77	8.0	30%	Pass	
Lead	S15-No18326	CP	mg/kg	1300	1200	8.0	30%	Pass	
Mercury	S15-No18326	CP	mg/kg	0.43	0.38	13	30%	Pass	
Nickel	S15-No18326	CP	mg/kg	11	11	<1	30%	Pass	
Zinc	S15-No18326	CP	mg/kg	1600	1600	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-No18326	CP	%	18	18	1.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S15-No18329	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Charl Du Preez	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention:	Matthew Locke
Report	480540-AID
Project Name	GEOTLCOV25554AA
Project ID	DOOLEYS
Received Date	Nov 23, 2015
Date Reported	Nov 30, 2015

Methodology:

Asbestos ID	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004.
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name GEOTLCOV25554AA
Project ID DOOLEYS
Date Sampled Nov 19, 2015
Report 480540-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
HA1_0.1-0.2	15-No18308	Nov 19, 2015	Approximate Sample 34g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
HA2_0.1-0.2	15-No18311	Nov 19, 2015	Approximate Sample 36g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
HA3_0.1-0.2	15-No18314	Nov 19, 2015	Approximate Sample 84g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
HA4_0.1-0.2	15-No18317	Nov 19, 2015	Approximate Sample 168g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected. Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.
HA5_0.1-0.2	15-No18320	Nov 19, 2015	Approximate Sample 42g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
HA6_0.1-0.2	15-No18323	Nov 19, 2015	Approximate Sample 109g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
HA7_0.1-0.2	15-No18326	Nov 19, 2015	Approximate Sample 121g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
HA8_0.1-0.2	15-No18329	Nov 19, 2015	Approximate Sample 98g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Nov 23, 2015	Indefinite

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Melbourne
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Site # 1254 & 14271

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

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

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: GEOTLCOV25554AA
Project ID: DOOLEYS

Order No.:
Report #: 480540
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Nov 23, 2015 2:36 PM
Due: Nov 30, 2015
Priority: 5 Day
Contact Name: Matthew Locke

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Metals M8	Moisture Set	Eurofins | mgt Suite B4	BTEX and Volatile TRH
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
HA1_0.1-0.2	Nov 19, 2015		Soil	S15-No18308	X		X		X	X	X	
HA1_0.5-0.6	Nov 19, 2015		Soil	S15-No18309		X						
HA1_0.9-1.0	Nov 19, 2015		Soil	S15-No18310					X	X	X	
HA2_0.1-0.2	Nov 19, 2015		Soil	S15-No18311	X		X		X	X	X	
HA2_0.5-0.6	Nov 19, 2015		Soil	S15-No18312		X						
HA2_0.9-1.0	Nov 19, 2015		Soil	S15-No18313					X	X	X	
HA3_0.1-0.2	Nov 19, 2015		Soil	S15-No18314	X		X		X	X	X	
HA3_0.5-0.6	Nov 19, 2015		Soil	S15-No18315		X						
HA3_0.9-1.0	Nov 19, 2015		Soil	S15-No18316					X	X	X	

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

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

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: GEOTLCOV25554AA
Project ID: DOOLEYS

Order No.:
Report #: 480540
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Nov 23, 2015 2:36 PM
Due: Nov 30, 2015
Priority: 5 Day
Contact Name: Matthew Locke

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Metals M8	Moisture Set	Eurofins | mgt Suite B4	BTEX and Volatile TRH
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
HA4_0.1-0.2	Nov 19, 2015		Soil	S15-No18317	X		X		X	X	X	
HA4_0.5-0.6	Nov 19, 2015		Soil	S15-No18318		X						
HA4_0.9-1.0	Nov 19, 2015		Soil	S15-No18319					X	X	X	
HA5_0.1-0.2	Nov 19, 2015		Soil	S15-No18320	X		X		X	X	X	
HA5_0.5-0.6	Nov 19, 2015		Soil	S15-No18321		X						
HA5_0.9-1.0	Nov 19, 2015		Soil	S15-No18322					X	X	X	
HA6_0.1-0.2	Nov 19, 2015		Soil	S15-No18323	X		X		X	X	X	
HA6_0.5-0.6	Nov 19, 2015		Soil	S15-No18324		X						
HA6_0.9-1.0	Nov 19, 2015		Soil	S15-No18325					X	X	X	
HA7_0.1-0.2	Nov 19, 2015		Soil	S15-No18326	X		X		X	X	X	

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

Brisbane
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: GEOTLCOV25554AA
Project ID: DOOLEYS

Order No.:
Report #: 480540
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Nov 23, 2015 2:36 PM
Due: Nov 30, 2015
Priority: 5 Day
Contact Name: Matthew Locke

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Metals M8	Moisture Set	Eurofins | mgt Suite B4	BTEX and Volatile TRH
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
HA7_0.5-0.6	Nov 19, 2015		Soil	S15-No18327		X						
HA7_0.9-1.0	Nov 19, 2015		Soil	S15-No18328					X	X	X	
HA8_0.1-0.2	Nov 19, 2015		Soil	S15-No18329	X		X		X	X	X	
HA8_0.5-0.6	Nov 19, 2015		Soil	S15-No18330		X						
HA8_0.9-1.0	Nov 19, 2015		Soil	S15-No18331					X	X	X	
RB1	Nov 19, 2015		Water	S15-No18332				X			X	
TRIP BLANK	Nov 19, 2015		Water	S15-No18333								X
TRIP SPIKE	Nov 19, 2015		Water	S15-No18334								X
DUP01	Nov 19, 2015		Soil	S15-No18335			X		X	X	X	
DUP02	Nov 19, 2015		Soil	S15-No18336			X		X	X	X	

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Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Metals M8	Moisture Set	Eurofins | mgt Suite B4	BTEX and Volatile TRH
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
BH03_0.5-0.6	Nov 19, 2015		Soil	S15-No18337					X	X	X	
BH03_0.05-0.2	Nov 19, 2015		Soil	S15-No18338		X						
BH03_1.0-1.1	Nov 19, 2015		Soil	S15-No18339					X	X	X	

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
COC	Chain of custody
SRA	Sample Receipt Advice
ISO	International Stardards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Matthew Locke**

Report **480540-W**
Project name GEOTLCOV25554AA
Project ID DOOLEYS
Received Date Nov 23, 2015

Client Sample ID			**RB1**	**TRIP BLANK**	**TRIP SPIKE**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S15-No18332**	**S15-No18333**	**S15-No18334**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit			
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	< 0.02	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	88%
TRH C10-C14	0.05	mg/L	< 0.05	-	-
TRH C15-C28	0.1	mg/L	< 0.1	-	-
TRH C29-C36	0.1	mg/L	< 0.1	-	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	-	-
BTEX					
Benzene	0.001	mg/L	< 0.001	< 0.001	91%
Toluene	0.001	mg/L	< 0.001	< 0.001	89%
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	87%
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	85%
o-Xylene	0.001	mg/L	< 0.001	< 0.001	89%
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	86%
4-Bromofluorobenzene (surr.)	1	%	90	88	100
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH C6-C10	0.02	mg/L	-	< 0.02	104%
Volatile Organics					
Naphthalene[N02]	0.01	mg/L	-	< 0.01	82%
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	< 0.01	-	-
TRH C6-C10	0.02	mg/L	< 0.02	-	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	-	-
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	< 0.001	-	-
Acenaphthylene	0.001	mg/L	< 0.001	-	-
Anthracene	0.001	mg/L	< 0.001	-	-
Benz(a)anthracene	0.001	mg/L	< 0.001	-	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	-	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	-	-
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	-	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	-	-
Chrysene	0.001	mg/L	< 0.001	-	-
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	-	-

Client Sample ID			RB1	TRIP BLANK	TRIP SPIKE
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S15-No18332**	**S15-No18333**	**S15-No18334**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Fluoranthene	0.001	mg/L	< 0.001	-	-
Fluorene	0.001	mg/L	< 0.001	-	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	-	-
Naphthalene	0.001	mg/L	< 0.001	-	-
Phenanthrene	0.001	mg/L	< 0.001	-	-
Pyrene	0.001	mg/L	< 0.001	-	-
Total PAH*	0.001	mg/L	< 0.001	-	-
2-Fluorobiphenyl (surr.)	1	%	93	-	-
p-Terphenyl-d14 (surr.)	1	%	128	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	0.05	mg/L	< 0.05	-	-
TRH >C16-C34	0.1	mg/L	< 0.1	-	-
TRH >C34-C40	0.1	mg/L	< 0.1	-	-
Heavy Metals					
Arsenic	0.001	mg/L	< 0.001	-	-
Cadmium	0.0002	mg/L	< 0.0002	-	-
Chromium	0.001	mg/L	< 0.001	-	-
Copper	0.001	mg/L	< 0.001	-	-
Lead	0.001	mg/L	< 0.001	-	-
Mercury	0.0001	mg/L	< 0.0001	-	-
Nickel	0.001	mg/L	< 0.001	-	-
Zinc	0.001	mg/L	< 0.001	-	-

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
TRH C6-C10 less BTEX (F1)	Sydney	Nov 23, 2015	14 Day
- Method: LM-LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Nov 25, 2015	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Nov 23, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 25, 2015	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Volatile Organics	Sydney	Nov 25, 2015	7 Day
- Method: E016 Volatile Organic Compounds (VOC)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 23, 2015	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins | mgt Suite B4			
Polycyclic Aromatic Hydrocarbons	Sydney	Nov 25, 2015	7 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 25, 2015	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Nov 23, 2015	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			

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Phone : +61 7 3902 4600
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Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Nov 23, 2015 2:36 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	480540	**Due:**	Nov 30, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	GEOTLCOV25554AA				
Project ID:	DOOLEYS				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Metals M8	Moisture Set	Eurofins | mgt Suite B4	BTEX and Volatile TRH
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
HA1_0.1-0.2	Nov 19, 2015		Soil	S15-No18308	X		X		X	X	X	
HA1_0.5-0.6	Nov 19, 2015		Soil	S15-No18309		X						
HA1_0.9-1.0	Nov 19, 2015		Soil	S15-No18310					X	X	X	
HA2_0.1-0.2	Nov 19, 2015		Soil	S15-No18311	X		X		X	X	X	
HA2_0.5-0.6	Nov 19, 2015		Soil	S15-No18312		X						
HA2_0.9-1.0	Nov 19, 2015		Soil	S15-No18313					X	X	X	
HA3_0.1-0.2	Nov 19, 2015		Soil	S15-No18314	X		X		X	X	X	
HA3_0.5-0.6	Nov 19, 2015		Soil	S15-No18315		X						
HA3_0.9-1.0	Nov 19, 2015		Soil	S15-No18316					X	X	X	

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Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
HA4_0.1-0.2	Nov 19, 2015		Soil	S15-No18317	X		X		X	X	X	
HA4_0.5-0.6	Nov 19, 2015		Soil	S15-No18318		X						
HA4_0.9-1.0	Nov 19, 2015		Soil	S15-No18319					X	X	X	
HA5_0.1-0.2	Nov 19, 2015		Soil	S15-No18320	X		X		X	X	X	
HA5_0.5-0.6	Nov 19, 2015		Soil	S15-No18321		X						
HA5_0.9-1.0	Nov 19, 2015		Soil	S15-No18322					X	X	X	
HA6_0.1-0.2	Nov 19, 2015		Soil	S15-No18323	X		X		X	X	X	
HA6_0.5-0.6	Nov 19, 2015		Soil	S15-No18324		X						
HA6_0.9-1.0	Nov 19, 2015		Soil	S15-No18325					X	X	X	
HA7_0.1-0.2	Nov 19, 2015		Soil	S15-No18326	X		X		X	X	X	

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Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271								X				
Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
HA7_0.5-0.6	Nov 19, 2015		Soil	S15-No18327		X						
HA7_0.9-1.0	Nov 19, 2015		Soil	S15-No18328					X	X	X	
HA8_0.1-0.2	Nov 19, 2015		Soil	S15-No18329	X		X		X	X	X	
HA8_0.5-0.6	Nov 19, 2015		Soil	S15-No18330		X						
HA8_0.9-1.0	Nov 19, 2015		Soil	S15-No18331					X	X	X	
RB1	Nov 19, 2015		Water	S15-No18332				X			X	
TRIP BLANK	Nov 19, 2015		Water	S15-No18333								X
TRIP SPIKE	Nov 19, 2015		Water	S15-No18334								X
DUP01	Nov 19, 2015		Soil	S15-No18335			X		X	X	X	
DUP02	Nov 19, 2015		Soil	S15-No18336			X		X	X	X	

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Sydney Laboratory - NATA Site # 18217					X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
BH03_0.5-0.6	Nov 19, 2015		Soil	S15-No18337					X	X	X	
BH03_0.05-0.2	Nov 19, 2015		Soil	S15-No18338		X						
BH03_1.0-1.1	Nov 19, 2015		Soil	S15-No18339					X	X	X	

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Volatile Organics							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Zinc	mg/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	86			70-130	Pass	
TRH C10-C14	%	82			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	93			70-130	Pass	
Ethylbenzene	%	91			70-130	Pass	
m&p-Xylenes	%	90			70-130	Pass	
o-Xylene	%	92			70-130	Pass	
Xylenes - Total	%	91			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	93			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
Naphthalene	%	92			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	106			70-130	Pass	
Acenaphthylene	%	104			70-130	Pass	
Anthracene	%	113			70-130	Pass	
Benz(a)anthracene	%	92			70-130	Pass	
Benzo(a)pyrene	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	%	104			70-130	Pass	
Benzo(g.h.i)perylene	%	102			70-130	Pass	
Benzo(k)fluoranthene	%	122			70-130	Pass	
Chrysene	%	116			70-130	Pass	
Dibenz(a.h)anthracene	%	106			70-130	Pass	
Fluoranthene	%	112			70-130	Pass	
Fluorene	%	105			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	101			70-130	Pass	
Naphthalene	%	99			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	110			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	83			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	97			80-120	Pass	
Cadmium	%	93			80-120	Pass	
Chromium	%	95			80-120	Pass	
Copper	%	95			80-120	Pass	
Lead	%	94			80-120	Pass	
Mercury	%	88			75-125	Pass	
Nickel	%	95			80-120	Pass	
Zinc	%	92			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-No20057	NCP	%	77			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-No20057	NCP	%	97			70-130	Pass	
Toluene	S15-No20057	NCP	%	96			70-130	Pass	
Ethylbenzene	S15-No20057	NCP	%	93			70-130	Pass	
m&p-Xylenes	S15-No20057	NCP	%	92			70-130	Pass	
o-Xylene	S15-No20057	NCP	%	94			70-130	Pass	
Xylenes - Total	S15-No20057	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	S15-No20057	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
Naphthalene	S15-No20057	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M15-No17785	NCP	%	102			75-125	Pass	
Cadmium	M15-No17785	NCP	%	95			75-125	Pass	
Chromium	M15-No17785	NCP	%	96			75-125	Pass	
Copper	M15-No17785	NCP	%	95			75-125	Pass	
Lead	M15-No17785	NCP	%	94			75-125	Pass	
Mercury	M15-No17785	NCP	%	98			70-130	Pass	
Nickel	M15-No17785	NCP	%	77			75-125	Pass	
Zinc	M15-No17785	NCP	%	93			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-No20054	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-No20054	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S15-No20054	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S15-No20054	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S15-No20054	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S15-No20054	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S15-No20054	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C10	S15-No20054	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Naphthalene	S15-No20054	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M15-No17785	NCP	mg/L	0.004	0.004	12	30%	Pass	
Cadmium	M15-No17785	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M15-No17785	NCP	mg/L	0.013	0.013	2.0	30%	Pass	
Copper	M15-No17785	NCP	mg/L	0.003	0.003	13	30%	Pass	
Lead	M15-No17785	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M15-No17785	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M15-No17785	NCP	mg/L	0.12	0.11	6.0	30%	Pass	
Zinc	M15-No17785	NCP	mg/L	0.018	0.018	1.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Charl Du Preez	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

 0212

coffey

Consigning Office:

Report Results to: Matt Locke + Alex Ruettinger Mobile: 9406 1193 Email: MATTHEW.LOCKE @coffey.com

Invoices to: Phone: Email: ALEX.RUETTINGER @coffey.com

Project No: GEOTLCOV25554 Task No:

Project Name: DOOLEYS LIDCOME Laboratory:

Sampler's Name: TO Project Manager: Matt Locke

Special Instructions: Email COC to matthew.locke@coffey.com

Relevant agreements Eurofins COF_ENAUABTF00952AA_MSA1 , ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	BH01 0.05-0.2m	23/11		Soil	Jar + Bag	
	BH01 0.5-0.6m	"		"	Jar + Bag	
	BH01 1.0-1.45	"		"	Jar	

SUITE BA (TPH BTEX PAH) | SUITE M8 (METALS 8) | OCP | ASBESTOS

NOTES

RELINQUISHED BY		RECEIVED BY		Sample Receipt Advice: (Lab Use Only)	
Name: T Olsen	Date: 24/11/15	Name: Siamak	Date: 24/11/15	All Samples Recieved in Good Condition	☐
Coffey Environments	Time:	Company: EFM07	Time: 16:05	All Documentation is In Proper Order	☐
Name:	Date:	Name: Siamak	Date: 25/11/15	Samples Received Properly Chilled	☐
Company:	Time:	Company: EFM07	Time: 11:26 am	Lab. Ref/Batch No.	480822

*Container Type / Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- [illegible] Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid [illegible] served, S - Sulphuric Ac[illegible] reserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, [illegible] - Other Preservative

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

0212

coffey

Consigning Office:

Report Results to: Matt Locke + Alex Ruetting Mobile: 9406 1193 Email: MATTHEW.LOCKE @coffey.com

Invoices to: Phone: Email: ALEX.RUETTINGER @coffey.com

Project No: GEOTLCOV25554 Task No:

Project Name: DOOLEYS LIDCOME Laboratory:

Sampler's Name: TO Project Manager: Matt Locke

Special Instructions: Email COC to matthew.locke@coffey.com

Relevant agreements. Eurofins COF_ENAUABTF00952AA_MSA1 , ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	BH01 – 0.05-0.2m	23/11		Soil	Jar + Bag	
	BH01 – 0.5-0.6m	"		"	Jar + Bag	
	BH01 – 1.0-1.45	"		"	Jar	

Analysis Request Section

NOTES

RELINQUISHED BY		RECEIVED BY	
Name: T. Quinn	Date: 24/11/15	Name: Siamak	Date: 24/11/15
Coffey Environments	Time:	Company: EFM	Time: 16:05
Name:	Date:	Name:	Date:
Company:	Time:	Company:	Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No.

*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- [illegible] Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid [illegible] served, S - Sulphuric Ac[illegible] reserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, [illegible] - Other Preservative

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Sample Receipt 1 Syd

From: Sample Receipt 1 Syd
Sent: Tuesday, 24 November 2015 4:56 PM
To: Alex Ructtinger
Cc: Matthew_Locke@coffey.com; EnviroSampleNSW
Subject: Dooleys Lidcome
Attachments: Dooleys Lidcome GEOTLCOV25554.pdf

Hi Alex & Matt,
Could you provide analysis for the above project received today, thank you gentlemen.
Ellen

Sample Receipt 1 Syd

Eurofins | mgt
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone : +61 2 9900 8400
Fax : +61 2 9420 2977

Email : sample_syd_1@eurofins.com.au
Website : environment.eurofins.com.au

Eurofins | mgt add Illicit Drug analysis to our Brisbane Laboratory to assist the clean-up of clandestine drug labs in Australia & New Zealand.
Additionally PFBA added to PFASs analysis - for more information click here

eurofins | mgt

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

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NATA # 1261 Site # 18217

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

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Matthew Locke
Project name:	DOOLEYS LIDCOME
Project ID:	GEOTLCOV25554
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 25, 2015 11:26 AM
Eurofins | mgt reference:	**480822**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 12.8 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Charl Du Preez on Phone : +61 (2) 9900 8400 or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to Matthew Locke - Matthew_Locke@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

eurofins | mgt

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Matthew Locke**

Report **480822-S**
Project name DOOLEYS LIDCOME
Project ID GEOTLCOV25554
Received Date Nov 25, 2015

Client Sample ID			**BH01_0.5-0.6m**	**BH01_1.0-1.45m**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-No20691**	**S15-No20692**
Date Sampled			**Nov 23, 2015**	**Nov 23, 2015**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	126	113
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5

Client Sample ID			BH01_0.5-0.6m	BH01_1.0-1.45m
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			S15-No20691	S15-No20692
Date Sampled			Nov 23, 2015	Nov 23, 2015
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	98	89
p-Terphenyl-d14 (surr.)	1	%	118	110
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-
Toxaphene	1	mg/kg	< 1	-
Dibutylchlorendate (surr.)	1	%	72	-
Tetrachloro-m-xylene (surr.)	1	%	102	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
Heavy Metals				
Arsenic	2	mg/kg	9.1	6.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	15	< 5
Copper	5	mg/kg	20	24
Lead	5	mg/kg	15	9.0
Mercury	0.05	mg/kg	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5
Zinc	5	mg/kg	22	23
% Moisture	0.1	%	13	14

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Nov 26, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Nov 26, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 26, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Nov 26, 2015	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 26, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Organochlorine Pesticides	Sydney	Nov 26, 2015	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Metals M8	Sydney	Nov 26, 2015	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
% Moisture	Sydney	Nov 25, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

eurofins | mgt

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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Nov 25, 2015 11:26 AM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	480822	**Due:**	Dec 2, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	DOOLEYS LIDCOME				
Project ID:	GEOTLCOV25554				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
External Laboratory										
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
BH01_0.05-0.2m	Nov 23, 2015		Soil	S15-No20690		X				
BH01_0.5-0.6m	Nov 23, 2015		Soil	S15-No20691	X		X	X	X	X
BH01_1.0-1.45m	Nov 23, 2015		Soil	S15-No20692				X	X	X

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

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

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	97			70-130	Pass	
TRH C10-C14	%	87			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	101			70-130	Pass	
Toluene	%	96			70-130	Pass	
Ethylbenzene	%	98			70-130	Pass	
m&p-Xylenes	%	103			70-130	Pass	
o-Xylene	%	105			70-130	Pass	
Xylenes - Total	%	104			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	109			70-130	Pass	
TRH C6-C10	%	99			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	107			70-130	Pass	
Acenaphthylene	%	101			70-130	Pass	
Anthracene	%	104			70-130	Pass	
Benz(a)anthracene	%	95			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	%	94			70-130	Pass	
Benzo(g.h.i)perylene	%	72			70-130	Pass	
Benzo(k)fluoranthene	%	114			70-130	Pass	
Chrysene	%	107			70-130	Pass	
Dibenz(a.h)anthracene	%	80			70-130	Pass	
Fluoranthene	%	105			70-130	Pass	
Fluorene	%	104			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	79			70-130	Pass	
Naphthalene	%	104			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenanthrene	%	99			70-130	Pass	
Pyrene	%	107			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	105			70-130	Pass	
4.4'-DDD	%	109			70-130	Pass	
4.4'-DDE	%	104			70-130	Pass	
4.4'-DDT	%	118			70-130	Pass	
a-BHC	%	114			70-130	Pass	
Aldrin	%	111			70-130	Pass	
b-BHC	%	119			70-130	Pass	
d-BHC	%	113			70-130	Pass	
Dieldrin	%	105			70-130	Pass	
Endosulfan I	%	107			70-130	Pass	
Endosulfan II	%	108			70-130	Pass	
Endosulfan sulphate	%	117			70-130	Pass	
Endrin	%	104			70-130	Pass	
Endrin aldehyde	%	115			70-130	Pass	
Endrin ketone	%	109			70-130	Pass	
g-BHC (Lindane)	%	109			70-130	Pass	
Heptachlor	%	124			70-130	Pass	
Heptachlor epoxide	%	107			70-130	Pass	
Hexachlorobenzene	%	108			70-130	Pass	
Methoxychlor	%	115			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	84			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	99			70-130	Pass	
Cadmium	%	103			70-130	Pass	
Chromium	%	103			70-130	Pass	
Copper	%	107			70-130	Pass	
Lead	%	115			70-130	Pass	
Mercury	%	118			70-130	Pass	
Nickel	%	106			70-130	Pass	
Zinc	%	98			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S15-No20230	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-No19881	NCP	%	107			70-130	Pass	
Acenaphthylene	S15-No19881	NCP	%	104			70-130	Pass	
Anthracene	S15-No19881	NCP	%	103			70-130	Pass	
Benz(a)anthracene	S15-No19881	NCP	%	95			70-130	Pass	
Benzo(a)pyrene	S15-No19881	NCP	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	S15-No19881	NCP	%	98			70-130	Pass	
Benzo(g.h.i)perylene	S15-No19881	NCP	%	80			70-130	Pass	
Benzo(k)fluoranthene	S15-No19881	NCP	%	114			70-130	Pass	
Chrysene	S15-No19881	NCP	%	106			70-130	Pass	
Dibenz(a.h)anthracene	S15-No19881	NCP	%	86			70-130	Pass	
Fluoranthene	S15-No19881	NCP	%	106			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluorene	S15-No19881	NCP	%	103			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-No19881	NCP	%	86			70-130	Pass	
Naphthalene	S15-No19881	NCP	%	106			70-130	Pass	
Phenanthrene	S15-No19881	NCP	%	101			70-130	Pass	
Pyrene	S15-No19881	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S15-No20691	CP	%	101			70-130	Pass	
4.4'-DDD	S15-No20691	CP	%	110			70-130	Pass	
4.4'-DDE	S15-No20691	CP	%	101			70-130	Pass	
4.4'-DDT	S15-No20691	CP	%	102			70-130	Pass	
a-BHC	S15-No20691	CP	%	113			70-130	Pass	
Aldrin	S15-No20691	CP	%	103			70-130	Pass	
b-BHC	S15-No20691	CP	%	100			70-130	Pass	
d-BHC	S15-No20691	CP	%	103			70-130	Pass	
Dieldrin	S15-No20691	CP	%	103			70-130	Pass	
Endosulfan I	S15-No20691	CP	%	103			70-130	Pass	
Endosulfan II	S15-No20691	CP	%	105			70-130	Pass	
Endosulfan sulphate	S15-No20691	CP	%	109			70-130	Pass	
Endrin	S15-No20691	CP	%	100			70-130	Pass	
Endrin aldehyde	S15-No20691	CP	%	107			70-130	Pass	
Endrin ketone	S15-No20691	CP	%	109			70-130	Pass	
g-BHC (Lindane)	S15-No20691	CP	%	100			70-130	Pass	
Heptachlor	S15-No20691	CP	%	107			70-130	Pass	
Heptachlor epoxide	S15-No20691	CP	%	102			70-130	Pass	
Hexachlorobenzene	S15-No20691	CP	%	104			70-130	Pass	
Methoxychlor	S15-No20691	CP	%	110			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S15-No20230	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-No20239	NCP	%	86			70-130	Pass	
Cadmium	S15-No20239	NCP	%	89			70-130	Pass	
Chromium	S15-No20239	NCP	%	83			70-130	Pass	
Copper	S15-No20239	NCP	%	92			70-130	Pass	
Lead	S15-No20239	NCP	%	94			70-130	Pass	
Mercury	S15-No20239	NCP	%	105			70-130	Pass	
Nickel	S15-No20239	NCP	%	90			70-130	Pass	
Zinc	S15-No20239	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-No20692	CP	%	95			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-No20692	CP	%	86			70-130	Pass	
Toluene	S15-No20692	CP	%	114			70-130	Pass	
Ethylbenzene	S15-No20692	CP	%	115			70-130	Pass	
m&p-Xylenes	S15-No20692	CP	%	123			70-130	Pass	
o-Xylene	S15-No20692	CP	%	124			70-130	Pass	
Xylenes - Total	S15-No20692	CP	%	123			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-No20692	CP	%	123			70-130	Pass	
TRH C6-C10	S15-No20692	CP	%	99			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-No20691	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S15-No18501	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S15-No18501	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S15-No18501	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-No20691	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S15-No20691	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S15-No20691	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S15-No20691	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S15-No20691	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S15-No20691	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-No20691	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S15-No20691	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S15-No23310	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S15-No23310	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S15-No23310	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S15-No23310	NCP	mg/kg	1.1	1.1	4.0	30%	Pass	
Benzo(a)pyrene	S15-No23310	NCP	mg/kg	1.5	1.5	1.0	30%	Pass	
Benzo(b&j)fluoranthene	S15-No23310	NCP	mg/kg	1.3	1.2	10	30%	Pass	
Benzo(g.h.i)perylene	S15-No23310	NCP	mg/kg	0.9	0.9	1.0	30%	Pass	
Benzo(k)fluoranthene	S15-No23310	NCP	mg/kg	1.2	1.4	17	30%	Pass	
Chrysene	S15-No23310	NCP	mg/kg	1.2	1.2	2.0	30%	Pass	
Dibenz(a.h)anthracene	S15-No23310	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S15-No23310	NCP	mg/kg	2.4	2.3	4.0	30%	Pass	
Fluorene	S15-No23310	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S15-No23310	NCP	mg/kg	0.7	0.7	1.0	30%	Pass	
Naphthalene	S15-No23310	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S15-No23310	NCP	mg/kg	1.3	1.3	3.0	30%	Pass	
Pyrene	S15-No23310	NCP	mg/kg	2.4	2.3	4.0	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S15-No19881	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Heptachlor	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S15-No19881	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S15-No19881	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S15-No19881	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S15-No18501	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S15-No18501	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S15-No18501	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-No20234	NCP	mg/kg	26	17	41	30%	Fail	Q15
Cadmium	S15-No20234	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S15-No20234	NCP	mg/kg	12	11	6.0	30%	Pass	
Copper	S15-No20234	NCP	mg/kg	28	22	26	30%	Pass	
Lead	S15-No20234	NCP	mg/kg	66	48	31	30%	Fail	Q15
Mercury	S15-No20234	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S15-No20234	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S15-No20234	NCP	mg/kg	41	35	17	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-No07138	NCP	%	24	23	2.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Charl Du Preez	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention:	Matthew Locke
Report	480822-AID
Project Name	DOOLEYS LIDCOME
Project ID	GEOTLCOV25554
Received Date	Nov 25, 2015
Date Reported	Dec 02, 2015

Methodology:

Asbestos ID	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004.
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name DOOLEYS LIDCOME
Project ID GEOTLCOV25554
Date Sampled Nov 23, 2015
Report 480822-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
BH01_0.5-0.6m	15-No20691	Nov 23, 2015	Approximate Sample 151g Sample consisted of: Red-brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Nov 25, 2015	Indefinite

eurofins | mgt

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

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3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: DOOLEYS LIDCOME
Project ID: GEOTLCOV25554

Order No.:
Report #: 480822
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Nov 25, 2015 11:26 AM
Due: Dec 2, 2015
Priority: 5 Day
Contact Name: Matthew Locke

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
External Laboratory										
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
BH01_0.05-0.2m	Nov 23, 2015		Soil	S15-No20690		X				
BH01_0.5-0.6m	Nov 23, 2015		Soil	S15-No20691	X		X	X	X	X
BH01_1.0-1.45m	Nov 23, 2015		Soil	S15-No20692				X	X	X

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
COC	Chain of custody
SRA	Sample Receipt Advice
ISO	International Stardards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

4

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1 0213

coffey

Consigning Office: CHATSWOOD

Report Results to: Matt Locke Mobile: 0427202493 Email: MATTHEW.LOCKE @coffey.com

Invoices to: " " Phone: Email: ALEXANDER.RUETTINGER@coffey.com

Project No: GEOTLCOV25554AA Task No:

Project Name: DOOLEYS LIDCOMBE Laboratory:

Sampler's Name: TO Project Manager:

Special Instructions: Email COC to Matt Locke

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 , ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	SUITE B4	SUITE B8	OCP	ASBESTOS	METALS 4	BTEX	TPH	PAH	NOTES
	BH05_0.05-0.2m	25/11		Soil	Bag+Jar		X	X	X	X					
	BH05_0.5-0.6m	"		"	"										
	BH05_1.0-1.45m	"		"	"		X	X							

RELINQUISHED BY

Name: T. Mann Date: 25/11/15

Coffey Environments Time:

Name: Date:

Company: Time:

RECEIVED BY

Name: Slamek Date: 25/11/15

Company: EFM Time: 12:18/14

Name: Sean Date: 25/11

Company: EF/MS Time: 4:16

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No. 480934

*Container Type / Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, O - Other Preservative

DOWANS PRINTING (02) 9755 3545

Enquiries Syd

From: Enquiries Syd
Sent: Wednesday, 25 November 2015 12:24 PM
To: Matthew Locke
Cc: EnviroSampleNSW
Subject: Dooleys Lidcombe
Attachments: 25112015112124-0001.pdf

Hi Matthew

The samples for this job have arrived. Awaiting analysis.

Thanks
Siamak

Enquiries Syd

Eurofins | mgt
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone : +61 2 9900 8400
Fax : +61 2 9420 2977

Email : EnquiriesSyd@eurofins.com.au
Website : http://environment.eurofins.com.au

-----Original Message-----
From: PLAC01 [mailto:PLAC01@mgtlabmark.com.au]
Sent: Wednesday, 25 November 2015 12:21 PM
To: Enquiries Syd
Subject: Scan Data from PLAC01

Number of Images: 1
Attachment File Type: PDF

Device Name: PLAC01
Device Location: Lane Cove

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

0213

coffey

Consigning Office:

Report Results to: Matt Locke Mobile: Email: MATTHEW.LOCKE @coffey.com

Invoices to: Phone: Email: ALEXANDER.RULTTINGER@coffey.com

Project No: GEOTLCOV25554AA Task No:

Project Name: DOOLEYS LIDCOMBE Laboratory:

Sampler's Name: TO Project Manager:

Special Instructions: Email COC to Matt Locke

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	NOTES
	BH05_0.05-0.2m	25/11		Soil	Bag + Jar		
	BH05_0.5-0.6m	"		"	"		
	BH05_1.0-1.45m	"		"	"		

RELINQUISHED BY		RECEIVED BY		Sample Receipt Advice: (Lab Use Only)	
Name: T. [illegible]	Date: 25/11/15	Name: Siamak [illegible]	Date: 25/11/15	All Samples Recieved in Good Condition	☐
Coffey Environments	Time:	Company: EFM	Time: 12:18	All Documentation is in Proper Order	☐
Name:	Date:	Name:	Date:	Samples Received Properly Chilled	☐
Company:	Time:	Company:	Time:	Lab. Ref/Batch No.	

*Container Type & Preservation Codes: **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- [illegible] **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid [illegible]served, **S** - Sulphuric Ac[illegible]reserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **O** - Other Preservative

eurofins | mgt

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

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NATA # 1261
Site # 1254 & 14271

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

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

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Matthew Locke
Project name:	DOOLEYS LIDCOMBE
Project ID:	GEOTLCOV25554AA
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 25, 2015 4:10 PM
Eurofins | mgt reference:	**480934**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 14.1 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Charl Du Preez on Phone : +61 (2) 9900 8400 or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to Matthew Locke - Matthew_Locke@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

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Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Matthew Locke**

Report **480934-S**
Project name DOOLEYS LIDCOMBE
Project ID GEOTLCOV25554AA
Received Date Nov 25, 2015

Client Sample ID			**BH05_0.05-0.2**	**BH05_1.0-1.45**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-No21703**	**S15-No21705**
Date Sampled			**Nov 25, 2015**	**Nov 25, 2015**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	84	< 50
TRH C29-C36	50	mg/kg	290	< 50
TRH C10-36 (Total)	50	mg/kg	370	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	95	96
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	1.3	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.9	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	1.0	< 0.5
Benzo(a)pyrene	0.5	mg/kg	1.0	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	1.0	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	1.0	< 0.5
Chrysene	0.5	mg/kg	1.0	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	2.4	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5

Client Sample ID			BH05_0.05-0.2	BH05_1.0-1.45
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			S15-No21703	S15-No21705
Date Sampled			Nov 25, 2015	Nov 25, 2015
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	1.5	< 0.5
Pyrene	0.5	mg/kg	2.5	< 0.5
Total PAH*	0.5	mg/kg	11	< 0.5
2-Fluorobiphenyl (surr.)	1	%	92	89
p-Terphenyl-d14 (surr.)	1	%	108	100
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-
Toxaphene	1	mg/kg	< 1	-
Dibutylchlorendate (surr.)	1	%	72	-
Tetrachloro-m-xylene (surr.)	1	%	78	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	250	< 100
TRH >C34-C40	100	mg/kg	240	< 100
Heavy Metals				
Arsenic	2	mg/kg	2.3	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	12	< 5
Copper	5	mg/kg	26	16
Lead	5	mg/kg	20	6.7
Mercury	0.05	mg/kg	0.06	< 0.05
Nickel	5	mg/kg	10	< 5
Zinc	5	mg/kg	41	24
% Moisture	0.1	%	11	16

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Nov 27, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Nov 27, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 27, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Nov 27, 2015	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 27, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Organochlorine Pesticides	Sydney	Nov 27, 2015	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Metals M8	Sydney	Nov 27, 2015	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
% Moisture	Sydney	Nov 26, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

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

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

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Nov 25, 2015 4:10 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	480934	**Due:**	Dec 2, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	DOOLEYS LIDCOMBE				
Project ID:	GEOTLCOV25554AA				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
External Laboratory										
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
BH05_0.05-0.2	Nov 25, 2015		Soil	S15-No21703	X		X	X	X	X
BH05_0.5-0.6	Nov 25, 2015		Soil	S15-No21704		X				
BH05_1.0-1.45	Nov 25, 2015		Soil	S15-No21705				X	X	X

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

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

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	112			70-130	Pass	
TRH C10-C14	%	107			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	115			70-130	Pass	
Ethylbenzene	%	119			70-130	Pass	
m&p-Xylenes	%	129			70-130	Pass	
o-Xylene	%	130			70-130	Pass	
Xylenes - Total	%	129			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	109			70-130	Pass	
TRH C6-C10	%	114			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	104			70-130	Pass	
Acenaphthylene	%	99			70-130	Pass	
Anthracene	%	98			70-130	Pass	
Benz(a)anthracene	%	91			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	%	98			70-130	Pass	
Benzo(g.h.i)perylene	%	93			70-130	Pass	
Benzo(k)fluoranthene	%	110			70-130	Pass	
Chrysene	%	103			70-130	Pass	
Dibenz(a.h)anthracene	%	94			70-130	Pass	
Fluoranthene	%	100			70-130	Pass	
Fluorene	%	101			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	96			70-130	Pass	
Naphthalene	%	101			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenanthrene	%	97			70-130	Pass	
Pyrene	%	102			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	108			70-130	Pass	
4.4'-DDD	%	104			70-130	Pass	
4.4'-DDE	%	106			70-130	Pass	
4.4'-DDT	%	109			70-130	Pass	
a-BHC	%	103			70-130	Pass	
Aldrin	%	108			70-130	Pass	
b-BHC	%	100			70-130	Pass	
d-BHC	%	112			70-130	Pass	
Dieldrin	%	107			70-130	Pass	
Endosulfan I	%	107			70-130	Pass	
Endosulfan II	%	106			70-130	Pass	
Endosulfan sulphate	%	111			70-130	Pass	
Endrin	%	107			70-130	Pass	
Endrin aldehyde	%	114			70-130	Pass	
Endrin ketone	%	106			70-130	Pass	
g-BHC (Lindane)	%	106			70-130	Pass	
Heptachlor	%	107			70-130	Pass	
Heptachlor epoxide	%	106			70-130	Pass	
Hexachlorobenzene	%	100			70-130	Pass	
Methoxychlor	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	114			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	89			70-130	Pass	
Cadmium	%	92			70-130	Pass	
Chromium	%	91			70-130	Pass	
Copper	%	92			70-130	Pass	
Lead	%	96			70-130	Pass	
Mercury	%	96			70-130	Pass	
Nickel	%	92			70-130	Pass	
Zinc	%	86			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-No21100	NCP	%	75			70-130	Pass	
TRH C10-C14	S15-No21164	NCP	%	99			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-No21100	NCP	%	91			70-130	Pass	
Toluene	S15-No21100	NCP	%	86			70-130	Pass	
Ethylbenzene	S15-No21100	NCP	%	83			70-130	Pass	
m&p-Xylenes	S15-No21100	NCP	%	90			70-130	Pass	
o-Xylene	S15-No21100	NCP	%	90			70-130	Pass	
Xylenes - Total	S15-No21100	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-No21100	NCP	%	82			70-130	Pass	
TRH C6-C10	S15-No21100	NCP	%	77			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-No19835	NCP	%	112			70-130	Pass	
Acenaphthylene	S15-No19835	NCP	%	115			70-130	Pass	
Anthracene	S15-No19835	NCP	%	113			70-130	Pass	
Benz(a)anthracene	S15-No19835	NCP	%	98			70-130	Pass	
Benzo(a)pyrene	S15-No19835	NCP	%	108			70-130	Pass	
Benzo(b&j)fluoranthene	S15-No19835	NCP	%	124			70-130	Pass	
Benzo(g.h.i)perylene	S15-No19835	NCP	%	93			70-130	Pass	
Benzo(k)fluoranthene	S15-No19835	NCP	%	120			70-130	Pass	
Chrysene	S15-No19835	NCP	%	103			70-130	Pass	
Dibenz(a.h)anthracene	S15-No19835	NCP	%	109			70-130	Pass	
Fluoranthene	S15-No19835	NCP	%	101			70-130	Pass	
Fluorene	S15-No19835	NCP	%	113			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-No19835	NCP	%	100			70-130	Pass	
Naphthalene	S15-No19835	NCP	%	111			70-130	Pass	
Phenanthrene	S15-No19835	NCP	%	103			70-130	Pass	
Pyrene	S15-No19835	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S15-No23138	NCP	%	100			70-130	Pass	
4.4'-DDD	S15-No23138	NCP	%	115			70-130	Pass	
4.4'-DDE	S15-No23138	NCP	%	98			70-130	Pass	
4.4'-DDT	S15-No23138	NCP	%	85			70-130	Pass	
a-BHC	S15-No23138	NCP	%	99			70-130	Pass	
Aldrin	S15-No23138	NCP	%	92			70-130	Pass	
b-BHC	S15-No23138	NCP	%	85			70-130	Pass	
d-BHC	S15-No23138	NCP	%	100			70-130	Pass	
Dieldrin	S15-No23138	NCP	%	101			70-130	Pass	
Endosulfan I	S15-No23138	NCP	%	99			70-130	Pass	
Endosulfan II	S15-No23138	NCP	%	97			70-130	Pass	
Endosulfan sulphate	S15-No23138	NCP	%	101			70-130	Pass	
Endrin	S15-No23138	NCP	%	100			70-130	Pass	
Endrin aldehyde	S15-No23138	NCP	%	108			70-130	Pass	
Endrin ketone	S15-No23138	NCP	%	105			70-130	Pass	
g-BHC (Lindane)	S15-No23138	NCP	%	93			70-130	Pass	
Heptachlor	S15-No23138	NCP	%	106			70-130	Pass	
Heptachlor epoxide	S15-No23138	NCP	%	98			70-130	Pass	
Hexachlorobenzene	S15-No23138	NCP	%	95			70-130	Pass	
Methoxychlor	S15-No23138	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S15-No21164	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-No23436	NCP	%	83			70-130	Pass	
Cadmium	S15-No23436	NCP	%	92			70-130	Pass	
Chromium	S15-No23436	NCP	%	78			70-130	Pass	
Copper	S15-No23436	NCP	%	93			70-130	Pass	
Lead	S15-No23436	NCP	%	99			70-130	Pass	
Mercury	S15-No23436	NCP	%	98			70-130	Pass	
Nickel	S15-No23436	NCP	%	90			70-130	Pass	
Zinc	S15-No23436	NCP	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-No21137	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-No21137	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S15-No21137	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S15-No21137	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S15-No21137	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S15-No21137	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S15-No21137	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-No21137	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S15-No21137	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S15-No23134	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S15-No23134	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S15-No23134	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S15-No23134	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-No21082	NCP	mg/kg	8.7	5.8	41	30%	Fail	Q15
Cadmium	S15-No21082	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S15-No21082	NCP	mg/kg	22	19	12	30%	Pass	
Copper	S15-No21082	NCP	mg/kg	29	25	15	30%	Pass	
Lead	S15-No21082	NCP	mg/kg	40	28	36	30%	Fail	Q15
Mercury	S15-No21082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S15-No21082	NCP	mg/kg	17	16	6.0	30%	Pass	
Zinc	S15-No21082	NCP	mg/kg	100	97	7.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-No15491	NCP	%	3.9	4.2	7.0	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S15-No21705	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S15-No21705	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S15-No21705	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S15-No21705	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S15-No21705	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S15-No21705	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S15-No21705	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Charl Du Preez	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention:	Matthew Locke
Report	480934-AID
Project Name	DOOLEYS LIDCOMBE
Project ID	GEOTLCOV25554AA
Received Date	Nov 25, 2015
Date Reported	Dec 02, 2015

Methodology:

Asbestos ID	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004.
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name DOOLEYS LIDCOMBE
Project ID GEOTLCOV25554AA
Date Sampled Nov 25, 2015
Report 480934-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
BH05_0.05-0.2	15-No21703	Nov 25, 2015	Approximate Sample 122g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Nov 26, 2015	Indefinite

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

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: DOOLEYS LIDCOMBE
Project ID: GEOTLCOV25554AA

Order No.:
Report #: 480934
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Nov 25, 2015 4:10 PM
Due: Dec 2, 2015
Priority: 5 Day
Contact Name: Matthew Locke

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	HOLD	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
External Laboratory										
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
BH05_0.05-0.2	Nov 25, 2015		Soil	S15-No21703	X		X	X	X	X
BH05_0.5-0.6	Nov 25, 2015		Soil	S15-No21704		X				
BH05_1.0-1.45	Nov 25, 2015		Soil	S15-No21705				X	X	X

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
COC	Chain of custody
SRA	Sample Receipt Advice
ISO	International Stardards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

 8029

coffey

Consigning Office: CHATSWOOD

Report Results to: Alex. R + Matt. L Mobile: Email: @coffey.com

Invoices to: " " Phone: Email. @coffey.com

Project No: GEOTLCOV 25552AA Task No: LAB TESTING - ENVIRO.

Project Name: DOOLEYS Laboratory: MGT.

Sampler's Name: Nick. Project Manager: ML

Special Instructions:

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	SUITE B11 METALS MB OCP ASBESTOS	NOTES
	BH4A	26/11/15		SOIL	15, 12	5DAY		
	B	↓		↓	↓	↓		
	C							

RELINQUISHED BY

Name: Alex. R Date: 27/11/15. →

Coffey Environments Time: 1500

Name: Date: →

Company: Time:

RECEIVED BY

Name: Siamak Date: 27/11/15

Company: ENG Time: 3:53 pm

Name: Date:

Company: Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No. 484308

*Container Type & Preservation Codes: **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

eurofins | mgt

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

Melbourne
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Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Matthew Locke
Project name:	DOOLEYS
Project ID:	GEOTLCOV25554AA
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 27, 2015 3:53 PM
Eurofins | mgt reference:	**481308**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 5.3 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Charl Du Preez on Phone : +61 (2) 9900 8400 or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to Matthew Locke - Matthew_Locke@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Matthew Locke**

Report **481308-S**
Project name DOOLEYS
Project ID GEOTLCOV25554AA
Received Date Nov 27, 2015

Client Sample ID			**BH4A**	**BH4B**	**BH4C**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-No25017**	**S15-No25018**	**S15-No25019**
Date Sampled			**Nov 26, 2015**	**Nov 26, 2015**	**Nov 26, 2015**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	-	-
TRH C29-C36	50	mg/kg	140	-	-
TRH C10-36 (Total)	50	mg/kg	140	-	-
BTEX					
Benzene	0.1	mg/kg	< 0.1	-	-
Toluene	0.1	mg/kg	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	84	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-
Fluoranthene	0.5	mg/kg	0.9	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-

Client Sample ID			BH4A	BH4B	BH4C
Sample Matrix			Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-No25017	S15-No25018	S15-No25019
Date Sampled			Nov 26, 2015	Nov 26, 2015	Nov 26, 2015
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Naphthalene	0.5	mg/kg	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-
Pyrene	0.5	mg/kg	0.9	-	-
Total PAH*	0.5	mg/kg	1.8	-	-
2-Fluorobiphenyl (surr.)	1	%	113	-	-
p-Terphenyl-d14 (surr.)	1	%	125	-	-
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1
Dibutylchlorendate (surr.)	1	%	73	76	68
Tetrachloro-m-xylene (surr.)	1	%	85	81	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	50	mg/kg	< 50	-	-
TRH >C16-C34	100	mg/kg	110	-	-
TRH >C34-C40	100	mg/kg	250	-	-
Heavy Metals					
Arsenic	2	mg/kg	4.9	2.9	4.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	22	14	< 5
Copper	5	mg/kg	28	21	27
Lead	5	mg/kg	19	20	6.9
Mercury	0.05	mg/kg	0.05	< 0.05	< 0.05
Nickel	5	mg/kg	16	12	< 5
Zinc	5	mg/kg	48	47	33
% Moisture	0.1	%	26	-	-

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Dec 01, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Dec 01, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 01, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Dec 01, 2015	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 01, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Organochlorine Pesticides	Sydney	Dec 01, 2015	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Metals M8	Sydney	Dec 01, 2015	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
% Moisture	Sydney	Nov 27, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Nov 27, 2015 3:53 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	481308	**Due:**	Dec 4, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	DOOLEYS				
Project ID:	GEOTLCOV25554AA				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Laboratory where analysis is conducted									
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794									
External Laboratory									
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
BH4A	Nov 26, 2015		Soil	S15-No25017	X	X	X	X	X
BH4B	Nov 26, 2015		Soil	S15-No25018	X	X	X		
BH4C	Nov 26, 2015		Soil	S15-No25019	X	X	X		

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	96			70-130	Pass	
TRH C10-C14	%	85			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
o-Xylene	%	102			70-130	Pass	
Xylenes - Total	%	100			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	97			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	127			70-130	Pass	
Acenaphthylene	%	94			70-130	Pass	
Anthracene	%	121			70-130	Pass	
Benz(a)anthracene	%	97			70-130	Pass	
Benzo(a)pyrene	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	%	117			70-130	Pass	
Benzo(g.h.i)perylene	%	82			70-130	Pass	
Benzo(k)fluoranthene	%	125			70-130	Pass	
Chrysene	%	125			70-130	Pass	
Dibenz(a.h)anthracene	%	87			70-130	Pass	
Fluoranthene	%	111			70-130	Pass	
Fluorene	%	109			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	87			70-130	Pass	
Naphthalene	%	112			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenanthrene	%	115			70-130	Pass	
Pyrene	%	109			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	102			70-130	Pass	
4.4'-DDD	%	101			70-130	Pass	
4.4'-DDE	%	98			70-130	Pass	
4.4'-DDT	%	93			70-130	Pass	
a-BHC	%	105			70-130	Pass	
Aldrin	%	98			70-130	Pass	
b-BHC	%	98			70-130	Pass	
d-BHC	%	109			70-130	Pass	
Dieldrin	%	103			70-130	Pass	
Endosulfan I	%	100			70-130	Pass	
Endosulfan II	%	98			70-130	Pass	
Endosulfan sulphate	%	100			70-130	Pass	
Endrin	%	99			70-130	Pass	
Endrin aldehyde	%	97			70-130	Pass	
Endrin ketone	%	97			70-130	Pass	
g-BHC (Lindane)	%	105			70-130	Pass	
Heptachlor	%	106			70-130	Pass	
Heptachlor epoxide	%	99			70-130	Pass	
Hexachlorobenzene	%	100			70-130	Pass	
Methoxychlor	%	95			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	90			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	103			70-130	Pass	
Cadmium	%	102			70-130	Pass	
Chromium	%	109			70-130	Pass	
Copper	%	113			70-130	Pass	
Lead	%	112			70-130	Pass	
Mercury	%	102			70-130	Pass	
Nickel	%	109			70-130	Pass	
Zinc	%	105			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-No25433	NCP	%	89			70-130	Pass	
TRH C10-C14	S15-De01974	NCP	%	82			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-No25433	NCP	%	97			70-130	Pass	
Toluene	S15-No25433	NCP	%	95			70-130	Pass	
Ethylbenzene	S15-No25433	NCP	%	93			70-130	Pass	
m&p-Xylenes	S15-No25433	NCP	%	99			70-130	Pass	
o-Xylene	S15-No25433	NCP	%	99			70-130	Pass	
Xylenes - Total	S15-No25433	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-No25433	NCP	%	90			70-130	Pass	
TRH C6-C10	S15-No25433	NCP	%	90			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-No23415	NCP	%	126			70-130	Pass	
Acenaphthylene	S15-No23415	NCP	%	100			70-130	Pass	
Anthracene	S15-No23415	NCP	%	117			70-130	Pass	
Benz(a)anthracene	S15-No23415	NCP	%	104			70-130	Pass	
Benzo(a)pyrene	S15-No23415	NCP	%	104			70-130	Pass	
Benzo(b&j)fluoranthene	S15-No23415	NCP	%	111			70-130	Pass	
Benzo(g.h.i)perylene	S15-No23415	NCP	%	92			70-130	Pass	
Benzo(k)fluoranthene	S15-No23415	NCP	%	111			70-130	Pass	
Chrysene	S15-No23415	NCP	%	128			70-130	Pass	
Dibenz(a.h)anthracene	S15-No23415	NCP	%	93			70-130	Pass	
Fluoranthene	S15-No23415	NCP	%	116			70-130	Pass	
Fluorene	S15-No23415	NCP	%	115			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-No23415	NCP	%	96			70-130	Pass	
Naphthalene	S15-No23415	NCP	%	119			70-130	Pass	
Phenanthrene	S15-No23415	NCP	%	123			70-130	Pass	
Pyrene	S15-No23415	NCP	%	120			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S15-No24273	NCP	%	94			70-130	Pass	
4.4'-DDD	S15-No24273	NCP	%	101			70-130	Pass	
4.4'-DDE	S15-No24273	NCP	%	93			70-130	Pass	
4.4'-DDT	S15-No24273	NCP	%	92			70-130	Pass	
a-BHC	S15-No24273	NCP	%	94			70-130	Pass	
Aldrin	S15-No24273	NCP	%	91			70-130	Pass	
b-BHC	S15-No24273	NCP	%	88			70-130	Pass	
d-BHC	S15-No24273	NCP	%	101			70-130	Pass	
Dieldrin	S15-No24273	NCP	%	99			70-130	Pass	
Endosulfan I	S15-No24273	NCP	%	94			70-130	Pass	
Endosulfan II	S15-No24273	NCP	%	95			70-130	Pass	
Endosulfan sulphate	S15-No24273	NCP	%	101			70-130	Pass	
Endrin	S15-No24273	NCP	%	98			70-130	Pass	
Endrin aldehyde	S15-No24273	NCP	%	98			70-130	Pass	
Endrin ketone	S15-No24273	NCP	%	104			70-130	Pass	
g-BHC (Lindane)	S15-No24273	NCP	%	97			70-130	Pass	
Heptachlor	S15-No24273	NCP	%	99			70-130	Pass	
Heptachlor epoxide	S15-No24273	NCP	%	92			70-130	Pass	
Hexachlorobenzene	S15-No24273	NCP	%	91			70-130	Pass	
Methoxychlor	S15-No24273	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S15-De01974	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-No24307	NCP	%	92			70-130	Pass	
Cadmium	S15-No24307	NCP	%	94			70-130	Pass	
Chromium	S15-No24307	NCP	%	106			70-130	Pass	
Copper	S15-No24307	NCP	%	94			70-130	Pass	
Lead	S15-No24307	NCP	%	102			70-130	Pass	
Mercury	S15-No24307	NCP	%	96			70-130	Pass	
Nickel	S15-No24307	NCP	%	101			70-130	Pass	
Zinc	S15-No24307	NCP	%	92			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-No25084	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S15-No25123	NCP	mg/kg	3700	3100	18	30%	Pass	
TRH C15-C28	S15-No25123	NCP	mg/kg	13000	13000	5.0	30%	Pass	
TRH C29-C36	S15-No25123	NCP	mg/kg	78	67	16	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-No25084	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S15-No25084	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S15-No25084	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S15-No25084	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S15-No25084	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S15-No25084	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-No25084	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S15-No25084	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S15-No24810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S15-No24272	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Heptachlor	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S15-No24272	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S15-No24272	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S15-No24272	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S15-No25123	NCP	mg/kg	7800	7300	7.0	30%	Pass	
TRH >C16-C34	S15-No25123	NCP	mg/kg	7300	7700	5.0	30%	Pass	
TRH >C34-C40	S15-No25123	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-No24306	NCP	mg/kg	2.2	< 2	110	30%	Fail	Q15
Cadmium	S15-No24306	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S15-No24306	NCP	mg/kg	< 5	6.0	78	30%	Fail	Q15
Copper	S15-No24306	NCP	mg/kg	11	18	46	30%	Fail	Q15
Lead	S15-No24306	NCP	mg/kg	14	15	12	30%	Pass	
Mercury	S15-No24306	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S15-No24306	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S15-No24306	NCP	mg/kg	7.4	22	98	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-No09584	NCP	%	21	23	7.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Charl Du Preez	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention:	Matthew Locke
Report	481308-AID
Project Name	DOOLEYS
Project ID	GEOTLCOV25554AA
Received Date	Nov 27, 2015
Date Reported	Dec 04, 2015

Methodology:

Asbestos ID	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004.
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name DOOLEYS
Project ID GEOTLCOV25554AA
Date Sampled Nov 26, 2015
Report 481308-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
BH4A	15-No25017	Nov 26, 2015	Approximate Sample 155g Sample consisted of: Grey coarse grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH4B	15-No25018	Nov 26, 2015	Approximate Sample 146g Sample consisted of: Grey coarse grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH4C	15-No25019	Nov 26, 2015	Approximate Sample 130g Sample consisted of: Grey coarse grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Nov 27, 2015	Indefinite

eurofins | mgt

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

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NATA # 1261
Site # 1254 & 14271

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

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

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: DOOLEYS
Project ID: GEOTLCOV25554AA

Order No.:
Report #: 481308
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Nov 27, 2015 3:53 PM
Due: Dec 4, 2015
Priority: 5 Day
Contact Name: Matthew Locke

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Asbestos Absence /Presence	Organochlorine Pesticides	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Laboratory where analysis is conducted									
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794									
External Laboratory									
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
BH4A	Nov 26, 2015		Soil	S15-No25017	X	X	X	X	X
BH4B	Nov 26, 2015		Soil	S15-No25018	X	X	X		
BH4C	Nov 26, 2015		Soil	S15-No25019	X	X	X		

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
COC	Chain of custody
SRA	Sample Receipt Advice
ISO	International Stardards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

8010

coffey

Consigning Office:	CHATSWOOD
Report Results to:	Alex.R. + Matt.L
Invoices to:	" "

Mobile:

Email: @coffey.com

Phone:

Email: @coffey.com

Project No:	GEOTLCOV25554AA	Task No:	ENVIRO Lab.
Project Name:	DOOCEYS.	Laboratory:	MGT
Sampler's Name:	Alex. R.	Project Manager:	ML.

Special Instructions:

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B7 (TRH/PAH/BTEX)	Metals M8	BTEX + C6-C9	NOTES
	BH01	1/12/15		WATER	2V, 1G, 3P	5 DAY	X	X		
	BH03	↓		↓	↓	↓	X	X		
	BH05	↓		↓	↓	↓	X	X		
	DUP01	↓		↓	↓	↓	X	X		
	Rinsate	↓		↓	↓	↓	X	X		
	trip blank	↓		↓	2V	↓			X	
	trip spike	↓		↓	" "	↓			X	

RELINQUISHED BY				RECEIVED BY			
Name: Alex. Rodthigs	Date:	1/12/15	→	Name: Sianek [signature]		Date:	1/12/15
Coffey Environments	Time:	1400.		Company: EF MGT		Time:	13:57
Name:	Date:		→	Name:		Date:	
Company:	Time:			Company:		Time:	

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition	☑
All Documentation is in Proper Order	☑
Samples Received Properly Chilled	☑
Lab. Ref/Batch No.	481647

***Container Type & Preservation Codes:** P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, OP - Other Preservative

eurofins | mgt

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NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Matthew Locke
Project name:	DOOLEYS
Project ID:	GEOTLCOV25554AA
COC number:	8010
Turn around time:	5 Day
Date/Time received:	Dec 1, 2015
Eurofins | mgt reference:	**481647**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 2.1 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Charl Du Preez on Phone : +61 (2) 9900 8400 or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to Matthew Locke - Matthew_Locke@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

eurofins | mgt

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Matthew Locke**

Report **481647-W**
Project name DOOLEYS
Project ID GEOTLCOV25554AA
Received Date Dec 01, 2015

Client Sample ID			**BH01**	**BH03**	**BH05**	**DUP01**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S15-De01371**	**S15-De01372**	**S15-De01373**	**S15-De01374**
Date Sampled			**Dec 01, 2015**	**Dec 01, 2015**	**Dec 01, 2015**	**Dec 01, 2015**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	0.02	< 0.02	< 0.02	0.04
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	0.004	< 0.002	< 0.002	0.004
o-Xylene	0.001	mg/L	0.002	< 0.001	< 0.001	0.002
Xylenes - Total	0.003	mg/L	0.005	< 0.003	< 0.003	0.006
4-Bromofluorobenzene (surr.)	1	%	94	83	83	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	0.05	< 0.02	0.04	0.08
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	0.04	< 0.02	0.04	0.07
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			BH01	BH03	BH05	DUP01
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S15-De01371	S15-De01372	S15-De01373	S15-De01374
Date Sampled			Dec 01, 2015	Dec 01, 2015	Dec 01, 2015	Dec 01, 2015
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	91	89	90	92
p-Terphenyl-d14 (surr.)	1	%	103	122	124	124
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	0.001	0.003	0.003	0.001
Cadmium (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.003	0.003	0.11	0.003
Zinc (filtered)	0.005	mg/L	0.007	< 0.005	0.012	< 0.005

Client Sample ID			RINSATE	TRIP BLANK	TRIP SPIKE
Sample Matrix			Water	Water	Water
Eurofins | mgt Sample No.			S15-De01375	S15-De01376	S15-De01377
Date Sampled			Dec 01, 2015	Dec 01, 2015	Dec 01, 2015
Test/Reference	LOR	Unit			
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	< 0.02	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	74%
TRH C10-C14	0.05	mg/L	< 0.05	-	-
TRH C15-C28	0.1	mg/L	< 0.1	-	-
TRH C29-C36	0.1	mg/L	< 0.1	-	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	-	-
BTEX					
Benzene	0.001	mg/L	< 0.001	< 0.001	102%
Toluene	0.001	mg/L	< 0.001	< 0.001	95%
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	90%
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	92%
o-Xylene	0.001	mg/L	< 0.001	< 0.001	93%
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	92%
4-Bromofluorobenzene (surr.)	1	%	82	81	100
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH C6-C10	0.02	mg/L	-	< 0.02	87%
Volatile Organics					
Naphthalene[N02]	0.01	mg/L	-	< 0.01	98%
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	< 0.01	-	-
TRH C6-C10	0.02	mg/L	< 0.02	-	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	-	-

Client Sample ID			RINSATE	TRIP BLANK	TRIP SPIKE
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S15-De01375**	**S15-De01376**	**S15-De01377**
Date Sampled			**Dec 01, 2015**	**Dec 01, 2015**	**Dec 01, 2015**
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	< 0.001	-	-
Acenaphthylene	0.001	mg/L	< 0.001	-	-
Anthracene	0.001	mg/L	< 0.001	-	-
Benz(a)anthracene	0.001	mg/L	< 0.001	-	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	-	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	-	-
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	-	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	-	-
Chrysene	0.001	mg/L	< 0.001	-	-
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	-	-
Fluoranthene	0.001	mg/L	< 0.001	-	-
Fluorene	0.001	mg/L	< 0.001	-	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	-	-
Naphthalene	0.001	mg/L	< 0.001	-	-
Phenanthrene	0.001	mg/L	< 0.001	-	-
Pyrene	0.001	mg/L	< 0.001	-	-
Total PAH*	0.001	mg/L	< 0.001	-	-
2-Fluorobiphenyl (surr.)	1	%	89	-	-
p-Terphenyl-d14 (surr.)	1	%	126	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	0.05	mg/L	< 0.05	-	-
TRH >C16-C34	0.1	mg/L	< 0.1	-	-
TRH >C34-C40	0.1	mg/L	< 0.1	-	-
Heavy Metals					
Arsenic	0.005	mg/L	< 0.005	-	-
Cadmium	0.0005	mg/L	< 0.0005	-	-
Chromium	0.005	mg/L	< 0.005	-	-
Copper	0.005	mg/L	< 0.005	-	-
Lead	0.005	mg/L	< 0.005	-	-
Mercury	0.0001	mg/L	< 0.0001	-	-
Nickel	0.005	mg/L	< 0.005	-	-
Zinc	0.005	mg/L	< 0.005	-	-

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
TRH C6-C10 less BTEX (F1)	Sydney	Dec 01, 2015	14 Day
- Method: LM-LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Dec 02, 2015	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Dec 01, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 02, 2015	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Volatile Organics	Sydney	Dec 02, 2015	7 Day
- Method: E016 Volatile Organic Compounds (VOC)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 01, 2015	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins | mgt Suite B4			
Polycyclic Aromatic Hydrocarbons	Sydney	Dec 02, 2015	7 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 02, 2015	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Sydney	Dec 08, 2015	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			
Metals M8 filtered	Sydney	Dec 01, 2015	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			

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Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Dec 1, 2015 12:00 AM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	481647	**Due:**	Dec 8, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	DOOLEYS				
Project ID:	GEOTLCOV25554AA				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Metals M8	Metals M8 filtered	Eurofins | mgt Suite B4	BTEX and Volatile TRH
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217					X	X	X	X
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
BH01	Dec 01, 2015		Water	S15-De01371		X	X	
BH03	Dec 01, 2015		Water	S15-De01372		X	X	
BH05	Dec 01, 2015		Water	S15-De01373		X	X	
DUP01	Dec 01, 2015		Water	S15-De01374		X	X	
RINSATE	Dec 01, 2015		Water	S15-De01375	X		X	
TRIP BLANK	Dec 01, 2015		Water	S15-De01376				X
TRIP SPIKE	Dec 01, 2015		Water	S15-De01377				X

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

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

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Volatile Organics							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.005			0.005	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0005			0.0005	Pass	
Cadmium (filtered)	mg/L	< 0.0001			0.0001	Pass	
Chromium	mg/L	< 0.005			0.005	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.005			0.005	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.005			0.005	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	89			70-130	Pass	
TRH C10-C14	%	83			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	105			70-130	Pass	
Toluene	%	100			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	99			70-130	Pass	
o-Xylene	%	101			70-130	Pass	
Xylenes - Total	%	100			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	110			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
Naphthalene	%	111			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	117			70-130	Pass	
Acenaphthylene	%	103			70-130	Pass	
Anthracene	%	106			70-130	Pass	
Benz(a)anthracene	%	88			70-130	Pass	
Benzo(a)pyrene	%	103			70-130	Pass	
Benzo(b&j)fluoranthene	%	95			70-130	Pass	
Benzo(g.h.i)perylene	%	81			70-130	Pass	
Benzo(k)fluoranthene	%	121			70-130	Pass	
Chrysene	%	118			70-130	Pass	
Dibenz(a.h)anthracene	%	73			70-130	Pass	
Fluoranthene	%	109			70-130	Pass	
Fluorene	%	112			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	78			70-130	Pass	
Naphthalene	%	108			70-130	Pass	
Phenanthrene	%	95			70-130	Pass	
Pyrene	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	79			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	90			70-130	Pass	
Arsenic (filtered)	%	103			70-130	Pass	
Cadmium	%	92			70-130	Pass	
Cadmium (filtered)	%	105			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium			%	87			70-130	Pass	
Chromium (filtered)			%	106			70-130	Pass	
Copper			%	85			70-130	Pass	
Copper (filtered)			%	108			70-130	Pass	
Lead			%	90			70-130	Pass	
Lead (filtered)			%	105			70-130	Pass	
Mercury			%	90			70-130	Pass	
Mercury (filtered)			%	93			70-130	Pass	
Nickel			%	85			70-130	Pass	
Nickel (filtered)			%	105			70-130	Pass	
Zinc			%	92			70-130	Pass	
Zinc (filtered)			%	105			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-De01372	CP	%	75			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-De01372	CP	%	103			70-130	Pass	
Toluene	S15-De01372	CP	%	96			70-130	Pass	
Ethylbenzene	S15-De01372	CP	%	90			70-130	Pass	
m&p-Xylenes	S15-De01372	CP	%	87			70-130	Pass	
o-Xylene	S15-De01372	CP	%	92			70-130	Pass	
Xylenes - Total	S15-De01372	CP	%	89			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	S15-De01372	CP	%	78			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S15-De01372	CP	%	108			70-130	Pass	
Cadmium (filtered)	S15-De01372	CP	%	100			70-130	Pass	
Chromium (filtered)	S15-De01372	CP	%	102			70-130	Pass	
Copper (filtered)	S15-De01372	CP	%	85			70-130	Pass	
Lead (filtered)	S15-De01372	CP	%	76			70-130	Pass	
Nickel (filtered)	S15-De01372	CP	%	92			70-130	Pass	
Zinc (filtered)	S15-De01372	CP	%	88			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-De06309	NCP	%	89			70-130	Pass	
Cadmium	S15-De06309	NCP	%	89			70-130	Pass	
Chromium	S15-De06309	NCP	%	86			70-130	Pass	
Copper	S15-De06309	NCP	%	84			70-130	Pass	
Lead	S15-De06309	NCP	%	89			70-130	Pass	
Mercury	S15-De06309	NCP	%	89			70-130	Pass	
Nickel	S15-De06309	NCP	%	84			70-130	Pass	
Zinc	S15-De06309	NCP	%	91			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S15-De01371	CP	mg/L	0.001	< 0.001	19	30%	Pass	
Cadmium (filtered)	S15-De01371	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Chromium (filtered)	S15-De01371	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S15-De01371	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead (filtered)	S15-De01371	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S15-De01371	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S15-De01371	CP	mg/L	0.003	0.003	5.0	30%	Pass	
Zinc (filtered)	S15-De01371	CP	mg/L	0.007	0.007	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-De01375	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Cadmium	S15-De01375	CP	mg/L	< 0.0005	< 0.0005	<1	30%	Pass	
Chromium	S15-De01375	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Copper	S15-De01375	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Lead	S15-De01375	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Mercury	S15-De01375	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S15-De01375	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc	S15-De01375	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Charl Du Preez	Analytical Services Manager
Ivan Taylor	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

481681

Sample Receipt 1 Syd

From: Nibha Vaidya
Sent: Tuesday, 1 December 2015 4:35 PM
To: EnviroSampleNSW
Subject: FW: Eurofins | mgt Test Results, Invoice - Report 480540 : Site GEOTLCOV25554AA (DOOLEYS)

Additional TCLP please.

Nibha Vaidya
Phone : +61 2 9900 8415
Email : NibhaVaidya@eurofins.com.au

-----Original Message-----
From: Alex Ructtinger [mailto:Alexander.Ructtinger@coffey.com]
Sent: Tuesday, 1 December 2015 4:34 PM
To: Charl DuPreez; Nibha Vaidya
Cc: Matthew Locke
Subject: RE: Eurofins | mgt Test Results, Invoice - Report 480540 : Site GEOTLCOV25554AA (DOOLEYS)

Could I please schedule the following samples for analysis of TCLP (Lead) on a 5 day turnaround:

Dup01
HA1_0.1-0.2
HA2_0.1-0.2
HA3_0.1-0.2
HA4_0.1-0.2
HA5_0.1-0.2
HA7_0.1-0.2

Kind Regards,

Alex Ructtinger
Environmental Scientist

Level 19, Tower B - Citadel Tower,
799 Pacific Highway, Chatswood, NSW 2067

t: +61 2 9406 1052
f: +61 2 9406 1002
m: +61 427 235 873

-----Original Message-----
From: charldupreez@eurofins.com.au [mailto:charldupreez@eurofins.com.au]
Sent: Monday, 30 November 2015 5:19 PM

eurofins | mgt

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

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Alex Ructtinger
Project name:	ADDITIONAL: GEOTLCOV25554AA
Project ID:	DOOLEYS
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Dec 1, 2015 4:35 PM
Eurofins | mgt reference:	**481681**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 6.3 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Additional from 480540

Contact notes

If you have any questions with respect to these samples please contact:

Charl Du Preez on Phone : +61 (2) 9900 8400 or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to Alex Ructtinger - alexander.ructtinger@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Alex Ructtinger**

Report **481681-L**
Project name ADDITIONAL: GEOTLCOV25554AA
Project ID DOOLEYS
Received Date Dec 01, 2015

Client Sample ID			**HA1_0.1-0.2**	**HA2_0.1-0.2**	**HA3_0.1-0.2**	**HA4_0.1-0.2**
Sample Matrix			**TCLP**	**TCLP**	**TCLP**	**TCLP**
Eurofins | mgt Sample No.			**S15-De01523**	**S15-De01524**	**S15-De01525**	**S15-De01526**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	0.01	mg/L	0.01	< 0.01	< 0.01	0.08
USA Leaching Procedure						
Leachate Fluid[C01]		comment	1.0	1.0	1.0	1.0
pH (initial)	0.1	pH Units	6.7	7.3	6.8	6.6
pH (off)	0.1	pH Units	5.6	5.7	6.6	5.9
pH (USA HCl addition)	0.1	pH Units	1.9	2.0	2.0	2.0

Client Sample ID			**HA5_0.1-0.2**	**HA7_0.1-0.2**
Sample Matrix			**TCLP**	**TCLP**
Eurofins | mgt Sample No.			**S15-De01527**	**S15-De01528**
Date Sampled			**Nov 19, 2015**	**Nov 19, 2015**
Test/Reference	LOR	Unit		
Heavy Metals				
Lead	0.01	mg/L	0.01	0.71
USA Leaching Procedure				
Leachate Fluid[C01]		comment	1.0	1.0
pH (initial)	0.1	pH Units	7.1	6.6
pH (off)	0.1	pH Units	5.7	5.6
pH (USA HCl addition)	0.1	pH Units	2.1	2.1

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Heavy Metals	Sydney	Dec 02, 2015	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
USA Leaching Procedure	Sydney	Dec 02, 2015	14 Day
- Method: E019 TCLP Preparation			

eurofins | mgt

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

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Dec 1, 2015 4:35 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	481681	**Due:**	Dec 8, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Alex Ructtinger
Project Name:	ADDITIONAL: GEOTLCOV25554AA				
Project ID:	DOOLEYS				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Lead	USA Leaching Procedure
Laboratory where analysis is conducted						
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217					X	X
Brisbane Laboratory - NATA Site # 20794						
External Laboratory						
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
HA1_0.1-0.2	Nov 19, 2015		TCLP	S15-De01523	X	X
HA2_0.1-0.2	Nov 19, 2015		TCLP	S15-De01524	X	X
HA3_0.1-0.2	Nov 19, 2015		TCLP	S15-De01525	X	X
HA4_0.1-0.2	Nov 19, 2015		TCLP	S15-De01526	X	X
HA5_0.1-0.2	Nov 19, 2015		TCLP	S15-De01527	X	X
HA7_0.1-0.2	Nov 19, 2015		TCLP	S15-De01528	X	X

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

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

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC Data General Comments

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

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Lead			mg/L	< 0.01			0.01	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	S15-De01528	CP	%	85			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	S15-De01527	CP	mg/L	0.01	0.01	7.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised By

Charl Du Preez	Analytical Services Manager
Ivan Taylor	Senior Analyst-Metal (NSW)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

Sample Receipt 1 Syd

Subject: FW: Dooleys Lidcombe TCLP Analysis Request

From: Alex Ructtinger [mailto:Alexander.Ructtinger@coffey.com]
Sent: Thursday, 10 December 2015 10:33 AM
To: EnviroSampleNSW; Nibha Vaidya
Cc: Matthew Locke
Subject: Dooleys Lidcombe TCLP Analysis Request

Hi Nibha,

Could we please schedule BH05_0.05-0.2 for TCLP B(a)P please. It is located within report 480934.

Could we please have results by Monday 14th December?

Thanks,

Kind Regards,

Alex Ructtinger
Environmental Scientist

Level 19, Tower B - Citadel Tower,
799 Pacific Highway, Chatswood, NSW 2067

t: +61 2 9406 1052
f: +61 2 9406 1002
m: +61 427 235 873

coffey

#482920

eurofins | mgt

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

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Matthew Locke
Project name:	ADDITONAL: DOOLEYS LIDCOMBE
Project ID:	GEOTLCOV25554AA
COC number:	Not provided
Turn around time:	2 Day
Date/Time received:	Dec 10, 2015 10:33 AM
Eurofins | mgt reference:	**482920**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 14.1 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

B(a)P conducted outside of holding time

Contact notes

If you have any questions with respect to these samples please contact:

Charl Du Preez on Phone : +61 (2) 9900 8400 or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to Matthew Locke - Matthew_Locke@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Matthew Locke**

Report **482920-L**
Project name ADDITONAL: DOOLEYS LIDCOMBE
Project ID GEOTLCOV25554AA
Received Date Dec 10, 2015

Client Sample ID			**BH05_0.05-0.2**
Sample Matrix			**TCLP**
Eurofins | mgt Sample No.			**S15-De10503**
Date Sampled			**Nov 25, 2015**
Test/Reference	LOR	Unit	
Benzo[a]pyrene			
Benzo(a)pyrene	0.001	mg/L	< 0.001
p-Terphenyl-d14 (surr.)	1	%	119
2-Fluorobiphenyl (surr.)	1	%	100
USA Leaching Procedure			
Leachate Fluid[C01]		comment	1.0
pH (initial)	0.1	pH Units	11
pH (off)	0.1	pH Units	5.5
pH (USA HCl addition)	0.1	pH Units	3.2

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Benzo[a]pyrene	Sydney	Dec 11, 2015	7 Day
- Method: E007 Benzo[a]pyrene			
USA Leaching Procedure	Sydney	Dec 10, 2015	14 Day
- Method: E019 TCLP Preparation			

eurofins | mgt

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NATA # 1261 Site # 18217

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

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Dec 10, 2015 10:33 AM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	482920	**Due:**	Dec 14, 2015
		Phone:	+61 2 9406 1000	**Priority:**	2 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	ADDITONAL: DOOLEYS LIDCOMBE				
Project ID:	GEOTLCOV25554AA				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					USA Leaching Procedure	Benzo[a]pyrene
Laboratory where analysis is conducted						
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217					X	X
Brisbane Laboratory - NATA Site # 20794						
External Laboratory						
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
BH05_0.05-0.2	Nov 25, 2015		TCLP	S15-De10503	X	X

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

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

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC Data General Comments

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

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Benzo[a]pyrene									
Benzo(a)pyrene			mg/L	< 0.001			0.001	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Benzo[a]pyrene				Result 1					
Benzo(a)pyrene	S15-De06711	NCP	%	111			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Benzo[a]pyrene				Result 1	Result 2	RPD			
Benzo(a)pyrene	S15-De06710	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised By

Charl Du Preez	Analytical Services Manager
Ryan Hamilton	Senior Analyst-Organic (NSW)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1537023**	Page	: 1 of 5
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MATTHEW LOCKE	Contact	:
Address	: LEVEL 19, 799 PACIFIC HIGHWAY Tower B - Citadel Tower CHATSWOOD NSW, AUSTRALIA 2067	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: matthew.locke@coffey.com	E-mail	:
Telephone	: +61 02 9911 1000	Telephone	: +61-2-8784 8555
Facsimile	: +61 +61 9911 1001	Facsimile	: +61-2-8784 8500
Project	: GEOTLCOV25554AA DOOLEYS	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 24-Nov-2015 12:30
C-O-C number	: 0211	Date Analysis Commenced	: 24-Nov-2015
Sampler	: ----	Issue Date	: 01-Dec-2015 13:42
Site	: ----		
		No. of samples received	: 1
Quote number	: ----	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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*
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

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
ø = ALS is not NATA accredited for these tests.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	DUP01A	----	----	----	----
				Client sampling date / time	[19-Nov-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1537023-001	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		**21.9**	----	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**49**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		**19**	----	----	----	----
Copper	7440-50-8	5	mg/kg		**44**	----	----	----	----
Lead	7439-92-1	5	mg/kg		**338**	----	----	----	----
Nickel	7440-02-0	2	mg/kg		**8**	----	----	----	----
Zinc	7440-66-6	5	mg/kg		**555**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		**0.1**	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	----	----	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg		<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	DUP01A	----	----	----	----
				Client sampling date / time	[19-Nov-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1537023-001	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		**0.9**	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		**0.8**	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		**0.6**	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		**2.3**	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	DUP01A	----	----	----	----
				Client sampling date / time	[19-Nov-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1537023-001	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		89.3	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		85.9	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		111	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		97.8	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		107	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		87.4	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		110	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		97.0	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		89.0	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		83.0	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		86.2	----	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1537023**	Page	: 1 of 10
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MATTHEW LOCKE	Contact	:
Address	: LEVEL 19, 799 PACIFIC HIGHWAY Tower B - Citadel Tower CHATSWOOD NSW, AUSTRALIA 2067	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: matthew.locke@coffey.com	E-mail	:
Telephone	: +61 02 9911 1000	Telephone	: +61-2-8784 8555
Facsimile	: +61 +61 9911 1001	Facsimile	: +61-2-8784 8500
Project	: GEOTLCOV25554AA DOOLEYS	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 24-Nov-2015
C-O-C number	: 0211	Date Analysis Commenced	: 24-Nov-2015
Sampler	: ----	Issue Date	: 01-Dec-2015
Site	: ----	No. of samples received	: 1
Quote number	: ----	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

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

NATA WORLD RECOGNISED ACCREDITATION

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 ir compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

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

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

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 288021)									
ES1536988-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	11.4	12.0	4.99	0% - 50%
ES1536989-011	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	13.0	13.1	0.886	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 291257)									
ES1536986-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	26	22	14.0	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	14	12	13.9	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	16	16	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	126	112	11.7	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	87	70	21.3	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	204	175	15.2	0% - 20%
ES1537039-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	58	49	17.5	0% - 20%
		EG005T: Chromium	7440-47-3	2	mg/kg	973	984	1.10	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	266	240	10.4	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	22	20	8.90	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	809	842	3.91	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	778	678	13.8	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	32800	29700	9.99	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 291258)									
ES1536986-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1537039-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.4	0.3	37.8	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 287753)									
ES1536986-004	Anonymous	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 287753) - continued									
ES1536986-004	Anonymous	EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES1536913-041	Anonymous	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 287752)									
ES1536986-004	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.8	<0.8	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 287752) - continued									
ES1536986-004	Anonymous	EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.8	<0.8	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1536913-041	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	0.9	55.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	0.6	22.1	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	0.8	47.9	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	2.3	128	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 287751)									
ES1536986-004	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	2590	2590	0.00	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	3130	3120	0.491	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	110	110	0.00	No Limit
ES1536913-041	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 288003)									
ES1536976-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1536980-023	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 287751)									

Sub-Matrix: **SOIL**

				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 2013 Fractions (QC Lot: 287751) - continued									
ES1536986-004	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	4700	4680	0.456	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	1560	1560	0.00	0% - 50%
		EP071: >C10 - C16 Fraction	----	50	mg/kg	240	240	0.00	No Limit
ES1536913-041	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 288003)									
ES1536976-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1536980-023	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 288003)									
ES1536976-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1536980-023	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	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: **SOIL**

				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
EG005T: Total Metals by ICP-AES (QCLot: 291257)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	109	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	100.0	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	88.3	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	107	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	97.8	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	101	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	94.3	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 291258)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	79.7	70	105
EP068A: Organochlorine Pesticides (OC) (QCLot: 287753)								
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	110	69	121
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	108	67	115
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	101	66	120
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	98.6	69	115
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.1	69	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	66	116
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	93.8	67	119
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	103	69	115
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	103	64	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.5	65	117
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	98.6	66	116
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	106	62	124
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	67	123
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	98.3	56	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	96.1	64	122
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.1	68	116
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	67	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	100	62	118
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.3	65	117
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	87.4	54	130
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	63	117
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 287752)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	92.9	73	127
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	95.7	72	124

Sub-Matrix: **SOIL**

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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 287752) - continued								
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	96.6	77	127
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	91.1	69	123
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	92.2	70	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	91.4	68	116
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	89.8	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	96.8	74	126
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	96.8	75	127
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	87.6	62	118
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	96.3	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	90.0	72	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	89.5	61	121
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	97.4	77	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	96.1	75	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	96.2	74	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 287751)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	101	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	107	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	102	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 288003)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	84.8	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 287751)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	106	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	112	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	94.3	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 288003)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	83.5	68	128
EP080: BTEXN (QCLot: 288003)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	91.5	62	116
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	88.0	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	92.1	66	118
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	90.2	63	119
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	96.9	68	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	93.8	67	121

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: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 291257)							
ES1536985-006	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	104	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	110	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	110	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	122	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	102	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	107	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 291258)							
ES1536986-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	98.2	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 287753)							
ES1536913-041	Anonymous	EP068: 4.4`-DDT	50-29-3	2 mg/kg	82.0	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	99.2	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	86.3	70	130
		EP068: Endrin	72-20-8	2 mg/kg	81.6	70	130
		EP068: gamma-BHC	58-89-9	0.5 mg/kg	104	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	97.2	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 287752)							
ES1536913-041	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	90.4	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.1	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 287751)							
ES1536913-041	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	102	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	102	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	124	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 288003)							
ES1536976-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	91.5	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 287751)							
ES1536913-041	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	91.5	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	121	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	113	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 288003)							
ES1536976-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	86.6	70	130
EP080: BTEXN (QCLot: 288003)							
ES1536976-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	80.0	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.1	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 288003) - continued							
ES1536976-001	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	87.4	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.1	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	92.6	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	82.4	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1537023**	Page	: 1 of 4
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MATTHEW LOCKE	Telephone	: +61-2-8784 8555
Project	: GEOTLCOV25554AA DOOLEYS	Date Samples Received	: 24-Nov-2015
Site	: ----	Issue Date	: 01-Dec-2015
Sampler	: ----	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

Matrix: **SOIL**

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
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
DUP01A	**19-Nov-2015**	**----**	----	----	**24-Nov-2015**	03-Dec-2015	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
DUP01A	**19-Nov-2015**	**26-Nov-2015**	17-May-2016	✓	**27-Nov-2015**	17-May-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
DUP01A	**19-Nov-2015**	**26-Nov-2015**	17-Dec-2015	✓	**30-Nov-2015**	17-Dec-2015	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
DUP01A	**19-Nov-2015**	**25-Nov-2015**	03-Dec-2015	✓	**27-Nov-2015**	04-Jan-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
DUP01A	**19-Nov-2015**	**25-Nov-2015**	03-Dec-2015	✓	**27-Nov-2015**	04-Jan-2016	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
DUP01A	**19-Nov-2015**	**25-Nov-2015**	03-Dec-2015	✓	**27-Nov-2015**	04-Jan-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
DUP01A	**19-Nov-2015**	**25-Nov-2015**	03-Dec-2015	✓	**26-Nov-2015**	03-Dec-2015	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1537701**	Page	: 1 of 4
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR ALEX RUCTTINGER	Contact	:
Address	: LEVEL 19, 799 PACIFIC HIGHWAY Tower B - Citadel Tower CHATSWOOD NSW, AUSTRALIA 2067	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: alexander.ructtinger@coffey.com	E-mail	:
Telephone	: +61 02 9406 1000	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: GEOTLCOV25554AA DOOLEYS	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 01-Dec-2015 17:00
C-O-C number	: ----	Date Analysis Commenced	: 03-Dec-2015
Sampler	: ----	Issue Date	: 09-Dec-2015 12:15
Site	: ----		
		No. of samples received	: 1
Quote number	: ----	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics

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
ø = ALS is not NATA accredited for these tests.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**DUP01A**	**----**	**----**	**----**	**----**
			Client sampling date / time	[19-Nov-2015]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1537701-001**	**--------**	**--------**	**--------**	**--------**
				Result	Result	Result	Result	Result
EN33: TCLP Leach								
Initial pH	----	0.1	pH Unit	**6.6**	**----**	**----**	**----**	**----**
After HCl pH	----	0.1	pH Unit	**1.7**	**----**	**----**	**----**	**----**
Extraction Fluid Number	----	1	-	**1**	**----**	**----**	**----**	**----**
Final pH	----	0.1	pH Unit	**5.0**	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: **TCLP LEACHATE** (Matrix: **WATER**)			Client sample ID	**DUP01A**	**----**	**----**	**----**	**----**
			Client sampling date / time	[19-Nov-2015]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1537701-001**	**--------**	**--------**	**--------**	**--------**
				Result	Result	Result	Result	Result
EG005C: Leachable Metals by ICPAES								
Lead	7439-92-1	0.1	mg/L	<0.1	**----**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1537701**	Page	: 1 of 4
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR ALEX RUCTTINGER	Contact	:
Address	: LEVEL 19, 799 PACIFIC HIGHWAY Tower B - Citadel Tower CHATSWOOD NSW, AUSTRALIA 2067	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: alexander.ructtinger@coffey.com	E-mail	:
Telephone	: +61 02 9406 1000	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: GEOTLCOV25554AA DOOLEYS	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 01-Dec-2015
C-O-C number	: ----	Date Analysis Commenced	: 03-Dec-2015
Sampler	: ----	Issue Date	: 09-Dec-2015
Site	: ----	No. of samples received	: 1
Quote number	: ----	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

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

NATA WORLD RECOGNISED ACCREDITATION

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 ir compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics

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

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

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 (%)*
EG005C: Leachable Metals by ICPAES (QC Lot: 300213)									
ES1537469-001	Anonymous	EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.00	No Limit
ES1537820-003	Anonymous	EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.00	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: **SOIL**

				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
EN33: TCLP Leach (QCLot: 297500)								
EN33a: After HCl pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a: Final pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a: Initial pH	----	0.1	pH Unit	1.0	----	----	----	----

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
EG005C: Leachable Metals by ICPAES (QCLot: 300213)								
EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	0.1 mg/L	93.4	80	118

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**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005C: Leachable Metals by ICPAES (QCLot: 300213)							
ES1537469-002	Anonymous	EG005C: Lead	7439-92-1	1 mg/L	95.6	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1537701**	Page	: 1 of 4
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR ALEX RUCTTINGER	Telephone	: +61-2-8784 8555
Project	: GEOTLCOV25554AA DOOLEYS	Date Samples Received	: 01-Dec-2015
Site	: ----	Issue Date	: 09-Dec-2015
Sampler	: ----	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Method Blanks (MB)					
TCLP for Non & Semivolatile Analytes	0	11	0.00	9.09	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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*
EG005C: Leachable Metals by ICPAES							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG005C)							
DUP01A	**03-Dec-2015**	**05-Dec-2015**	31-May-2016	✓	**07-Dec-2015**	31-May-2016	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB)							
TCLP for Non & Semivolatile Analytes	EN33a	0	11	**0.00**	**9.09**	×	NEPM 2013 B3 & ALS QC Standard

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)							
Leachable Metals by ICPAES	EG005C	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Leachable Metals by ICPAES	EG005C	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Leachable Metals by ICPAES	EG005C	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Leachable Metals by ICPAES	EG005C	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

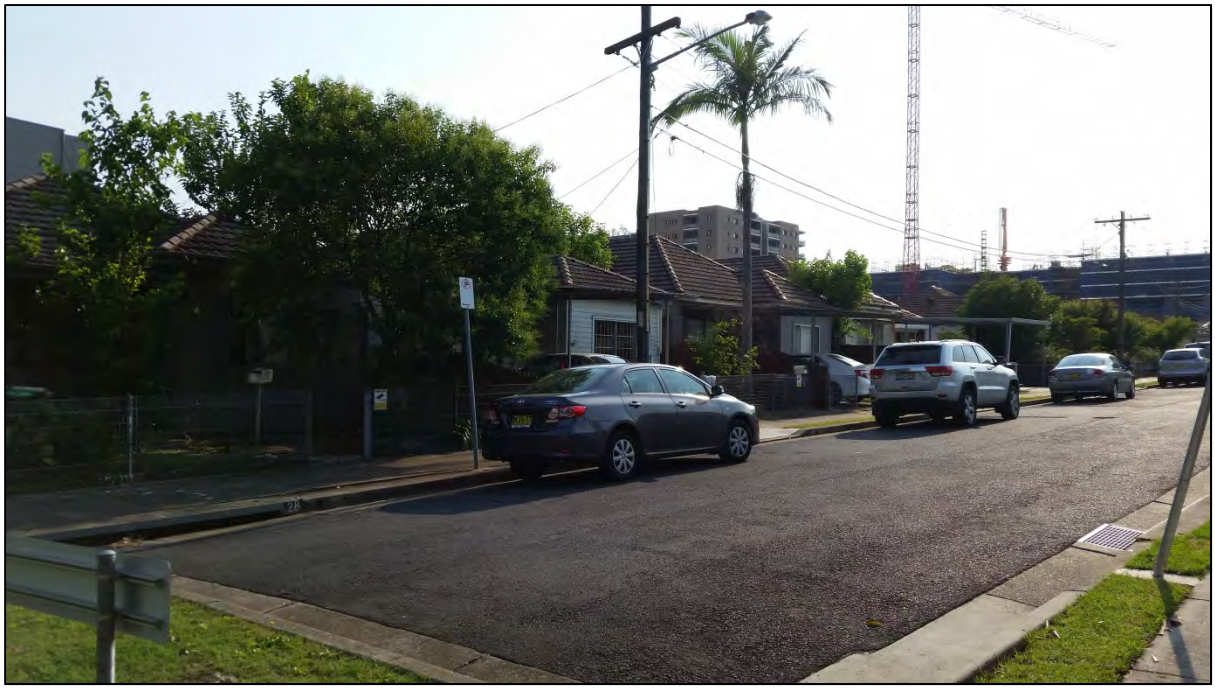
The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The 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
Leachable Metals by ICPAES	EG005C	SOIL	In house: referenced to APHA 3120; USEPA SW 846 - 6010: The ICPAES technique ionises leachate sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
TCLP for Non & Semivolatile Analytes	EN33a	SOIL	In house QWI-EN/33 referenced to USEPA SW846-1311: The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters.

Appendix I
Site Photographs

Photograph 1. Southern section of site – Dooley's Catholic Club Car Park.



Photograph 2. Residential dwellings on northern section of site, with Board Street in the foreground.

Photograph 3. Fragments of cement sheeting suspected to contain asbestos. Fragments present on surface soil of rear yard of no.26 Board Street.

Photograph 4. Rail corridor and Lidcombe Station to the south of the site.

Photograph 5. Light commercial businesses on John Street.

Appendix J
Health Risk Screening Assessment

Level 1, 436 Johnston Street
Abbotsford
VIC 3067 Australia

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coffey.com

30 March 2016

Our ref: GEOTLCOV25554AA-Al

Bouygues Construction Australia
Olympic Drive, Lidcombe, Sydney, NSW

Attention: George Pontifix

Dear George

Limited Health Risk Screening Assessment - Groundwater Seepage at Proposed Development at Olympic Drive, Lidcombe, Sydney, NSW

1. Background

A limited risk assessment was conducted to address potential impacts to human health associated with groundwater seepage into a basement structure based on the proposed redevelopment at Olympic Drive, Lidcombe, NSW, referred to further as the 'site'.

The proposed development includes a two level basement structure that will extend approximately 6 m below ground surface (mbgs). The development will include a club area (gaming, dining, bar, reception), business/conference area and a hotel. The current (December 2015) water level has been recorded to range between 4.3mbgs and 6.0mbgs at monitoring well BH05 and the lower basement level is likely to intersect the water table. Based on the development plans provided, it is understood the lower basement level will be used for a range of purposes:

- Car parking
- Plant equipment /system rooms
- Storage (including food & beverages, linen, garbage bins and compactors)
- Offices (administration and security)
- Staff rooms (toilets/change rooms, kitchen and dining)
- Delivery docks

Groundwater infiltrating into the proposed basement is understood to be collected via a floor drainage system and pumped to stormwater drains for discharge.

Hydrocarbon impact in groundwater was detected in the December 2015 monitoring event with maximum hydrocarbon concentrations of TPH (F1 fraction) 40 μg/L (at monitoring wells BH01 and

BH05) and xylenes 5 µg/L (BH01). All other hydrocarbon analytes were reported at concentrations below the limit of reporting.

2. Purpose

The purpose of this basement screening evaluation was to determine the likely health risks to future site users associated with the identified hydrocarbon impacted groundwater.

The screening assessment was conducted in accordance with the Schedule B4 of the NEPM (2013) "Site-Specific Health Risk Assessment Methodology".

3. Exposure assessment

Based on the proposed usage of the lower basement level, the selected receptors include car park users, club and hotel employees (commercial workers), workers involved in the maintenance and repair of the drainage and sump/pump systems, and construction workers within a basement excavation during site development.

The identified hydrocarbon contaminants in groundwater are considered to be volatile; therefore, lower basement users may be exposed via the inhalation of hydrocarbon vapours associated with impacted groundwater seeping into the basement structure. Similarly, maintenance and construction workers may be exposed via the inhalation of hydrocarbon vapours, in addition to incidental ingestion or dermal contact with impacted water whilst conducting drainage/sump works or construction of the proposed basement.

It is assumed the floor drains will be inaccessible to general car park users or commercial workers, thereby preventing direct contact exposures. The identified exposure pathways are summarised in Table 3-1.

Table 3-1: Exposure Pathway Evaluation

On-site Receptor	Source	Point of Exposure	Complete exposure pathway/Scenario		
			Inhalation	Dermal Contact	Incidental ingestion
Lower basement car park /store room user / commercial worker	Groundwater seepage & volatilisation	Basement car park	✓	×	×
Maintenance worker		Basement drainage/sump area	✓	✓	✓
Construction Worker		Basement excavation	✓	✓	✓

✓ *Pathway potentially complete*
× *Pathway incomplete*

4. Screening Assessment

The selection of appropriate screening criteria for groundwater associated with seepage into a basement is based on the identified potentially complete exposure scenarios in Table 3-1.

Screening criteria deemed protective of future construction and maintenance workers and users of a basement structure (particularly intersecting the watertable) have not been established in the amended NEPM for the identified potentially complete exposure pathways.

Australian and international sources of screening criteria for TPH fractions are limited given they are based on mixtures rather than individual compounds. Two guideline sources were selected based on the following:

Drinking water guidelines - World Health Organisation (WHO)

Petroleum Products in Drinking-Water. Background document for development of WHO Guidelines for Drinking water Quality (WHO, 2008).

- Drinking water guidelines were derived by the WHO that are protective of health associated with the ingestion of petroleum hydrocarbon impacted water. The guidelines are not considered to address aesthetic impacts; however, given the groundwater is not intended for drinking water purposes, the consideration of aesthetics is not considered relevant for the groundwater seepage scenarios identified.

- The drinking water guideline assumes 2.0 L is consumed per day for 365 days/year which is conservative given incidental ingestion is likely to be less than 0.1 L/day for 40 days/year for workers in the identified scenarios.

- The guideline includes a conservative assumption that 90% of exposure to the contaminant is associated with other background sources such as in air, food and direct contact. Given the low concentrations reported in groundwater at the site, the guideline is considered to be protective of exposures via other pathways such as dermal contact.

Regional Screening Levels (RSLs) for Tapwater – United States Environmental Protection Agency, (USEPA, 2015) (http://www.epa.gov/risk/regional-screening-levels-rsls -generic-tables-november-2015)

- Tapwater RSLs are generally derived to be protective of the inhalation (volatilisation of compounds during bathing/showering), ingestion and dermal contact pathways, where appropriate (i.e. if sufficiently volatile at room temperature), and where toxicity criteria is available.

- The RSLs for tapwater are intended to be protective of children.

- Exposure parameters adopted to derive criteria are based on daily domestic use of the water which is significantly higher than exposure parameters expected in the scenarios identified in this assessment. For example, residential exposures, assumed to occur 365 days/year for 30 years and are based on the physical parameters for children, are considered to overestimate exposures relating to an adult worker exposed for 10 days/year over a 30 year period (maintenance),40 days/year over a 1 year period (construction) or 240 days/year over a 30 year period (commercial).

- It is noted the published RSLs for the low aliphatic TPH fraction is only based on the inhalation pathway, and the medium aliphatic TPH fraction is based on the inhalation and ingestion pathways. The low and medium aromatic fractions however have included the inhalation, dermal and ingestion pathways in the RSL derivation.

The maximum reported hydrocarbon concentrations and selected screening criteria are presented in Table 4-1.

Table 4-1: Screening Criteria Selection

TPH fraction	WHO drinking water criteria ug/L	USEPA Tapwater criteria ug/L	Maximum Groundwater Concentration µg/L
TPH Aliphatic EC >5 – EC 8	300 (1)	13,000 (2)	40
TPH Aliphatic EC >9 – EC 16	300 (1)	100 (1),(2)	
Xylenes	500 (1)	190 (1) (2) (3)	5

(1) *Protective of ingestion pathway*
(2) *Protective of inhalation pathway*
(3) *Protective of dermal contact pathway.*

The comparison of the maximum reported concentrations with the selected screening criteria indicates scenarios involving inhalation and/or ingestion exposures are considered to be acceptable. On this basis, car park users where only inhalation is expected to be the complete exposure pathway, no exceedances of the screening criteria were noted.

Whilst the dermal contact exposure pathway was not specifically evaluated in the development of the USEPA tapwater RSLs for the TPH aliphatic fractions associated with the F1 fraction, the selected criteria are considered appropriate based on the following:

- Conservative background exposures incorporated into the derivation of the WHO screening criteria are considered to be sufficiently protective of acute or subchronic dermal exposures by commercial, maintenance and construction workers.
- The exposure periods generally associated with commercial, maintenance and construction workers are considerably less than those assumed in deriving tapwater RSLs for domestic usage, and adopted physical parameters for children are also considered conservative.
- Preliminary studies conducted by Coffey and other consultants (Hanson, 2015) have evaluated the use of drinking water guidelines, developed based on 90% background exposures (i.e. WHO and the Australian Drinking Water Guidelines (ADWG)), to screen for other exposure pathways based on recreational or maintenance scenarios. The preliminary outcomes indicate the WHO and ADWG guidelines were protective of recreational or maintenance trench scenarios (which include inhalation, ingestion and dermal contact pathways).

5. Conclusions

The limited site specific health risk screening evaluation was undertaken to assess the potential health risks to site users of the proposed future development where hydrocarbon impacted groundwater infiltrates into a basement or construction excavation.

Based on the information provided, receptors of concern included car park users, commercial workers, maintenance workers and construction workers. Although limited screening criteria have been specifically established for the TPH F1 fraction and identified exposure scenarios by international agencies, protective screening criteria were selected based on the pathways included in their derivation and the conservative assumptions adopted. The health risks associated with the exposure scenarios evaluated are summarised in Table 5-1.

Table 5-1: Exposure Pathway – Risk Evaluation

On-site Receptor	Source	Point of Exposure	Exposure Scenario – Risk Evaluation		
			Inhalation	Dermal Contact	Incidental ingestion
Lower basement car park / store room user, commercial worker	Infiltration of groundwater	Basement car park	Low & Acceptable	NA	NA
Maintenance worker		Basement drainage systems	Low & Acceptable		
Construction Worker		Basement excavation	Low & Acceptable		

NA – Not applicable as pathway not considered complete based on managed limited access.

Based on the current concentrations of hydrocarbons detected in groundwater at the site, the seepage of groundwater into a lower basement structure or construction excavation is considered to present a low and acceptable health risk to future basement car park users, commercial workers, drainage/sump maintenance workers and construction workers within a basement excavation.

For and on behalf of Coffey

Karen Teague
Principal

Attachment: Statement of Limitations

References

Hanson, K. (2015). RISK-BASED SCREENING CRITERIA. *CleanUp 2015* (pp. 258-259). Melbourne: CRC Care.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1).* Canberra: National Environment Protection Council.

NHMRC & NRMMC. (2015). *Australian Drinking Water Guidelines 6 Version 3.1.* Canberra: National Health and Medical Research Council and Natural Resource Management Ministerial Council.

USEPA. (2015). *Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. Summary Table (TR=1E-6, HQ=0.1), June 2015.* U.S. Environmental Protection Agency.

WHO. (2008). *Petroleum Products in Drinking-water. Background document for development of WHO Guidelines for Drinking-water Quality.* Geneva: World Health Organisation.

Important information about your **Coffey** Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice,

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but

steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.