Summary of Soil Analytical Results

Project No 137632097
Project: Sunshine Coast Airport - Land Resources Assessment
Location: Sunshine Coast Airport

Sample Location	Depth (m)	Laboratory Batch	Date	Moisture	pH	EC	Baseline Chemistry									Soil Fertility														DTPA Extractable Metals			
							Exchangeable Calcium	Exchangeable Magnesium	Exchangeable Potassium	Exchangeable Sodium	Exchangeable Aluminium	Cation Exchange Capacity	Exchangeable Sodium Percent	Calcium:Magnesium	Soluble Chloride	Soluble Sulfate	Soluble Calcium	Soluble Magnesium	Soluble Sodium	Soluble Potassium	Total Potassium	Total Sulfur	NOx (Soluble N)	TKN	Total Nitrogen	Bicarbonate Extractable Phosphorus	Total Phosphorus	Acid Extractable Potassium	Organic Matter	Copper	Iron	Manganese	Zinc
			Units	%	pH unit	mS/cm	meq/100g						%	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg
			Laboratory Limits of Reporting	1.0	0.1	0.001	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	10	10	10	10	10	50	0.01	0.1	20	20	2.0	2.0	100	0.5	1.0	1.0	1.0	1.0
TP5	0.0-0.15	EB1223841	28/08/2012	3.4	4.9	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	1.0	<10	<10	<10	<10	<10	<10	<50	0.01	1.4	290	290	<2	22	<100	1.1	<1.00	55.2	1.31	<1.00
TP5	0.25-0.35	EB1223841	28/08/2012	20.1	4.4	0.013	0.2	0.1	<0.1	<0.1	<0.1	0.3	2.8	2.0	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP5	0.55-0.65	EB1223841	28/08/2012	12.8	4.8	0.005	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	1.0	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP5	0.9-1.0	EB1223841	28/08/2012	18.9	4.9	0.011	<0.1	0.1	<0.1	<0.1	<0.1	0.2	<0.1	1.0	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP5	1.1-1.2	EB1223841	28/08/2012	20.4	5.6	0.011	0.7	1.9	<0.1	<0.1	<0.1	2.6	0.7	0.4	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8	0.0-0.15	EB1223841	29/08/2012	22.2	4.4	0.017	0.2	1.0	<0.1	<0.1	<0.1	1.3	3.3	0.2	10.0	<10	<10	<10	<10	<10	<50	0.04	<0.1	1840	1840	<2	41	<100	7.6	<1.00	90.4	<1.00	<1.00
TP8	0.25-0.35	EB1223841	29/08/2012	13.1	4.6	0.006	<0.1	0.3	<0.1	<0.1	<0.1	0.4	<0.1	0.3	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8	0.55-0.65	EB1223841	29/08/2012	18.0	4.6	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.0	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8	0.9-1.0	EB1223841	29/08/2012	19.1	4.8	0.009	<0.1	0.2	<0.1	<0.1	<0.1	0.3	<0.1	0.5	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8	1.1-1.2	EB1223841	29/08/2012	18.1	4.9	0.015	0.4	1.2	<0.1	<0.1	<0.1	1.5	0.7	0.3	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14	0.0-0.15	EB1223841	29/08/2012	24.6	5.2	0.025	0.6	1.0	<0.1	0.2	0.8	1.8	9.5	0.6	<10	30	<10	<10	20	<10	240	0.04	1.5	1650	1650	25	170	100	5.3	<1.00	181	<1.00	<1.00
TP14	0.25-0.35	EB1223841	29/08/2012	23.4	5.2	0.031	0.9	0.8	<0.1	0.2	0.8	1.9	8.4	1.1	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14	0.55-0.65	EB1223841	29/08/2012	20.1	5.3	0.022	0.4	2.3	<0.1	0.2	<0.1	3.0	7.1	0.2	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14	0.9-1.0	EB1223841	29/08/2012	15.6	5.3	0.004	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.0	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14	1.1-1.2	EB1223841	29/08/2012	13.2	5.1	0.004	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	1.0	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17	0.0-0.15	EB1223841	29/08/2012	25.4	5.5	0.445	3.5	3.2	0.2	0.9	0.2	7.8	11.3	1.1	860	190	10	10	540	<10	400	0.07	0.6	1740	1740	47	306	300	6.5	<1.00	249	<1.00	<1.00
TP17	0.25-0.35	EB1223841	29/08/2012	18.2	4.5	0.565	1.0	2.8	0.2	0.5	0.3	4.4	11.7	0.4	1620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17	0.55-0.65	EB1223841	29/08/2012	23.7	6.1	1.170	1.0	2.9	0.2	0.3	0.2	4.4	7.3	0.3	2250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17	0.9-1.0	EB1223841	29/08/2012	23.1	6.6	1.010	1.2	3.1	0.2	0.4	0.2	4.9	8.8	0.4	1940	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17	1.1-1.2	EB1223841	29/08/2012	36.0	6.1	1.120	1.2	1.6	<0.1	<0.1	0.2	2.9	2.4	0.8	2460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP22	0.0-0.15	EB1223841	29/08/2012	29.9	4.7	0.013	1.1	1.5	0.2	0.1	0.8	2.9	4.1	0.7	<10	<10	<10	<10	10	<10	460	0.05	1.2	3030	3030	27	375	200	7.2	<1.00	235	<1.00	<1.00
TP22	0.25-0.35	EB1223841	29/08/2012	29.2	5.2	0.016	0.6	2.4	0.1	0.1	0.8	3.2	3.6	0.3	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP22	0.55-0.65	EB1223841	29/08/2012	17.8	5.5	0.008	0.5	1.3	<0.1	<0.1	0.2	1.8	1.4	0.4	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP22	0.9-1.0	EB1223841	29/08/2012	12.2	5.2	0.004	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	1.0	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP22	1.1-1.2	EB1223841	29/08/2012	19.5	4.9	0.016	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.0	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16	0.25-0.35	EB1223841	28/08/2012	-	4.7	0.012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16	0.5-0.6	EB1223841	28/08/2012	-	4.7	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP21	0.35-0.45	EB1223841	29/08/2012	-	4.5	0.016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP21	0.55-0.65	EB1223841	29/08/2012	-	4.9	0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP23	0.2-0.3	EB1223841	28/08/2012	-	4.6	0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP23	0.55-0.65	EB1223841	28/08/2012	-	4.6	0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2	0.25-0.35	EB1223841	29/08/2012	-	4.7	0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2	0.55-0.65	EB1223841	29/08/2012	-	4.4	0.007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11	0.2-0.3	EB1223841	27/08/2012	-	4.3	0.022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11	0.55-0.65	EB1223841	27/08/2012	-	4.4	0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18	0.25-0.35	EB1223841	29/08/2012	-	4.5	0.040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18	0.55-0.65	EB1223841	29/08/2012	-	5.2	0.036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19	0.25-0.35	EB1223841	29/08/2012	-	4.7	0.034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19	0.50-0.60	EB1223841	29/08/2012	-	4.7	0.027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Topsoil Baseline range (0-0.15m)				3.4-29.9	4.4-5.5	0.008-0.445	<0.1 - 3.5	<0.1 - 3.2	<0.1 - 0.1	<0.1 - 0.9	<0.1 - 0.8	0.2-7.8	<0.1-11.3	0.6-1.1	<10-860	<10-190	<10-10	<10-10	<10 - 540	<10	<50 - 460	0.01-0.07	<0.1 - 1.5	290-3030	290-3030	<2-47	22-375	<100 - 300	1.1-7.6	<1.00	55.2-249	<1 - 1.31	<1.00
Subsoil Baseline range				12.2-36.0	4.4-6.6	0.004-1.120	<0.1 - 1.2	<0.1-3.1	<0.1 - 0.5	<0.1-0.5	<0.1-0.8	<0.1-3.2	<0.1-11.7	0.2-2.0	<10-2460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

"-" Denotes analysis not requested for this sample
"<" - Below laboratory limits of reporting
"--" Laboratory unable to run analysis

Golder Associates

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Strategic Cropping Land Detailed Site Analysis
Project No: 137632097
Project: SCA Expansion Project - Land Resources Assessment
Location: Sunshine Coast Airport

Site	TP 1			TP2			TP3		
Land use/cover	Grassland			Open woodland			Open woodland		
Location(coordinates) (MGA94 Zone 56)	508639 m E; 7056786 m N			508506 m E; 7057303 m N			508309 m E; 7057637 m N		
Soil Classification	Podosols			Podosols			Podosols		
Soil map unit name	Soil A (Polygon 1)			Soil A (Polygon 1)			Soil A (Polygon 1)		
Soil type correlation (refence[1])	*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)		
Surface Rock	Nil			Nil			Nil		
Gilgai microrelief	Nil			Nil			Nil		
Slope and Landform	<1% Level			<1%			<1%		
Surface Conditions	Loose			Loose			Loose		
Soil profile description									
A1	0-400 mm Sand, fine to medium, well sorted subrounded to subangular clear quartz, very dark grey (10YR 3/1), common rootlets, moist, medium dense			0-300 mm Sand, fine to medium well sorted subrounded to subangular clear quartz, dark grey (7.5 YR 4/1), moist, loose to medium dense			0-300 mm Sand, fine to medium, well sorted subrounded to subangular, dark grey to black (10 YR 2/1), common roots and rootlets, with organic staining, moist, loose		
B1	400- 900 mm Sand, fine to medium, well sorted subrounded to subangular clear quartz, grey (10YR 5/1), few rootlets, moist, medium dense			300- 500 mm Sand, fine to medium well sorted subrounded to subangular clear quartz, very dark grey (7.5 YR 3/1), moist, medium dense			300-800 mm Sand, fine to medium, well sorted subrounded to subangular, grey (7.5 YR 6/1), common roots and rootlets, with organic staining, moist, loose		
B2	900- 1100 mm Sand, fine to medium, well sorted subrounded to subangular clear quartz, very dark greyish brown (10YR 3/2), few rootlets, moist, medium dense			500- 1100 mm Sand, fine to coarse moderately sorted subrounded to subangular clear quartz, greyish brown (10 YR 5/2), moist, medium dense			800-1100 mm Sand, fine to medium, well sorted subrounded to subangular, black (7.5 YR 2.5/1), common roots and rootlets, with organic staining, wet, loose		
B3	1100-1200 mm Indurated Sand, fine to medium, well sorted clear quartz, black (10YR2/1), moist, dense			1100- 1200 mm Sand, fine to coarse moderately sorted, very dark grey to black (10 YR 2/1), moist, medium dense			1100-1200mm Indurated Sand, fine to medium, black (7.5 YR 2.5/1), wet, dense		
SCL Assessment									
SCL zone	Coastal Zone			Coastal Zone			Coastal Zone		
SCL status on trigger map	Not SCL			Not SCL			Not SCL		
SCL Critieria[2]	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail
Slope	<1%	Contour map	P	<1%	Contour map	P	<1%	Contour map	P
Rockiness	Nil	-	P	Nil	-	P	Nil	-	P
Gilgai microrelief	Nil	-	P	Nil	-	P	Nil	-	P
Soil depth	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P
Soil wetness	Favorable, Moderatly Well	-	P	Favorable, Well	-	P	Favorable, Well	-	P
Soil pH (criteria - pH 5.1 - 8.9 @ <600 mm)	Not tested	Field Readings	P	4.7 @ 300 mm 4.4 @ 600 mm	Laboratory	F	Not tested	Field Readings	P
$EC_{1:5}$ <0.56mS/cm within 600mm of the soil surface	Not tested	Field Readings	P	0.006 @ 300 mm 0.007 @ 600 mm	Field test	P	Not tested	Field Readings	P
Soil Water Storage	40mm	Based on soil texture	**F**	12mm	Based on soil texture and depth of physico-chemical limitation	**F**	40mm	Based on soil texture	**F**

[1] From Capelin (1987) DPI, Horticulture Land Suitability Study Sunshine Coast Southeast Queensland

[2] Based on Field and Laboratory analysis

Criteria that fail are highlighted in orange

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Strategic Cropping Land Detailed Site Analysis
Project No: 137632097
Project: SCA Expansion Project - Land Resources Assessment
Location: Sunshine Coast Airport

Site	TP 4			TP5			TP6		
Land use/cover	Grassland			Grassland			Open grassland with isolated trees		
Location(coordinates) (MGA94 Zone 56)	508421 m E; 7057684 m N			508890 m E; 7057672 m N			508962 m E; 7058611 m N		
Soil Classification	Podosols			Podosols			Podosols		
Soil map unit name	Soil A (Polygon 1)			Soil A (Polygon 1)			Soil A (Polygon 1)		
Soil type correlation (refence[1])	*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)		
Surface Rock	Nil			Nil			Nil		
Gilgai microrelief	Nil			Nil			Nil		
Slope and Landform	<1% Level			<1% Leevel			<1%		
Surface Conditions	Firm			Loose			Loose		
Soil profile description									
A1	0-800 mm FILL - Sand, fine to medium grained, well sorted subrounded to subangular clear quartz, black (10YR 2/1), fine to medium subangular gravel, with many rootlets, dry, medium dense (Fill No Horizon)			0-200mm SAND, fine to medium sand, well sorted subrounded to subangular quartz, grey (10YR5/1), with common rootlets, slightly moist, moderately dense,			0-200 mm Sand, fine to medium grained, well sorted subrounded to subangular clear quartz, black (10YR 2/1), common rootlets, moist, medium dense		
B1	800- 1200mm FILL - Sandy Clayey Loam, low to medium plasticity, very dark grey (7.5 YR 3/1), common ochre mottling, fine to medium grained well sorted sand, with a trace of fine to medium subangualr gravel, (Fill No Horizon)			200-500mm Sand, fine to medium, well sorted, subrounded to sub-angular clear quartz, black (2.5Y2.5/1) slightly moist, moderately dense,			200-1200 mm Sand, fine to medium grained, well sorted subrounded to subangular clear quartz, grey (10YR 2/1), many rootlets decreasing with depth, moist, medium dense		
B2				500-1100 mm Sand, fine to medium, well sorted, subrounded to sub-angular clear quartz, grey (7.5Y4/1) and becoming very dark grey (7.5Y3/1) moist, moderately dense					
B3				1100-1200mm Sand, weakly indurated, fine to medium, well sorted, black (10YR2/1), moist to wet, moderately dense					
SCL Assessment									
SCL zone	Coastal Zone			Coastal Zone			Coastal Zone		
SCL status on trigger map	Not SCL			Not SCL			Not SCL		
SCL Critieria[2]	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail
Slope	<1%	Contour map	P	<1%	Contour map	P	<1%	Contour map	P
Rockiness	Nil	-	P	Nil	-	P	Nil	-	P
Gilgai microrelief	Nil	-	P	Nil	-	P	Nil	-	P
Soil depth	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P
Soil wetness	Favorable, Well	-	P	Favorable, Moderatly Well	-	P	Favorable, Moderatly Well	-	P
Soil pH (criteria - pH 5.1 - 8.9 @ <600 mm)	Not tested	Field Readings	P	4.9 @ Surface 4.4 @ 300 mm 4.8 @ 600 mm	Laboratory	**F**	Not tested	Field Readings	P
EC1:5 <0.56mS/cm within 600mm of the soil surface	Not tested	Field Readings	**P**	0.008 @ Surface 0.013 @ 300 mm 0.005 @ 600 mm	Laboratory	P	Not tested	Field Readings	P
Soil Water Storage	44mm	Based on soil texture	**F**	40	Based on depth of physico-chemical limitation	**F**	40mm	Based on soil texture	**F**

[1] From Capelin (1987) DPI, Horticulture Land Suitability Study Sunshine Coast Southeast Queensland

[2] Based on Field and Laboratory analysis

Criteria that fail are highlighted in orange

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Strategic Cropping Land Detailed Site Analysis
Project No: 137632097
Project: SCA Expansion Project - Land Resources Assessment
Location: Sunshine Coast Airport

Site	TP 7			TP8			TP9		
Land use/cover	Open grassland with isolated trees			Closed Woodland			Open grassland with isolated trees		
Location(coordinates) (MGA94 Zone 56)	508966 m E; 7058611 m N			0508487 m E; 7058789 m N			508479 m E; 7058362 m N		
Soil Classification	Podosols			Podosols			Podosols		
Soil map unit name	Soil A (Polygon 1)			Soil A (Polygon 1)			Soil A (Polygon 1)		
Soil type correlation (refence[1])	*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)		
Surface Rock	Nil			Nil			Nil		
Gilgai microrelief	Nil			Nil			Nil		
Slope and Landform	<1% Level			<1% Level			<1%		
Surface Conditions	Loose			Loose			Loose		
Soil profile description									
A1	0-300 mm Sand, fine to medium grained, well sorted subrounded to subangular clear quartz, black (7.5YR 2.5/1), with common rootlets, moist, medium dense			0-250mm Sand, fine to medium, well sorted quartz, black (10YR2/1) with many roots and common rootlets moist, moderately dense			0-200 mm Sand, fine to medium grained, well sorted subrounded to subangular clear quartz, black (10YR 2/1), common rootlets, moist, medium dense		
B2	300-1100mm Sand, fine to medium grained, well sorted subrounded to subangular clear quartz, dark grey (5YR 4/1), with common rootlets, moist to wet, medium dense			250-800mm Sand, fine to medium, well sorted clear quartz, very dark grey (10YR3/1), becoming grey (10YR5/1) moist, moderately dense,			200-500 mm Sand, fine to medium grained, well sorted subrounded to subangular clear quartz, grey (10YR 2/1),few rootlets, moist, medium dense		
B3	1100-1200mm Sand, weakly indurated, fine to medium grained clear quartz, black (7.5YR 2.5/1), moist to wet, medium dense			800-1200mm Sand, weakly indurated, fine to medium, well sorted, black (10YR2/1), strong organic staining, few to many rootlets, moist, moderately dense			500-1200 mm Sand, indurated, fine to medium grained, well sorted clear quartz, black(10YR 2/1), moist, dense		
SCL Assessment									
SCL zone	Coastal Zone			Coastal Zone			Coastal Zone		
SCL status on trigger map	Not SCL			Not SCL			Not SCL		
SCL Critieria[2]	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail
Slope	<1%	Contour map	P	<1%	Contour map	P	<1%	Contour map	P
Rockiness	Nil	-	P	Nil	-	P	Nil	-	P
Gilgai microrelief	Nil	-	P	Nil	-	P	Nil	-	P
Soil depth	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P
Soil wetness	Favorable, Moderatly Well	-	P	Favorable, Moderatly Well	-	P	Favorable, Moderatly Well	-	P
Soil pH (criteria - pH 5.1 - 8.9 @ <600 mm)	Not Tested	Field test	P	4.4 @ Surface 4.6@ 300 mm 4.6 @ 600 mm	Laboratory	**F**	Not Tested	Field test	P
EC1:5 <0.56mS/cm within 600mm of the soil surface	Not Tested	Field test	P	0.017 @ Surface 0.006@ 300 mm 0.008 @ 600 mm	Laboratory	P	Not Tested	Field test	P
Soil Water Storage	40mm	Based on soil texture	**F**	40mm	Based on depth of physico-chemical limitation	**F**	40mm	Based on soil texture	**F**

[1] From Capelin (1987) DPI, Horticulture Land Suitability Study Sunshine Coast Southeast Queensland

[2] Based on Field and Laboratory analysis

Criteria that fail are highlighted in orange

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Strategic Cropping Land Detailed Site Analysis
Project No: 137632097
Project: SCA Expansion Project - Land Resources Assessment
Location: Sunshine Coast Airport

Site	TP 10			TP11			TP12		
Land use/cover	Grassland			Grassland			Open grassland with isolated trees		
Location(coordinates) (MGA94 Zone 56)	508487 m E; 7058789 m N			508570 m E; 7058003 m N			507604 m E; 7058393		
Soil Classification	Podosols			Podosols			Podosols		
Soil map unit name	Soil A (Polygon 1)			Soil A (Polygon 1)			Soil A (Polygon 1)		
Soil type correlation (refence[1])	*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)		
Surface Rock	Nil			Nil			Nil		
Gilgai microrelief	Nil			Nil			Nil		
Slope and Landform	<1% Level			<1% Level			<1%		
Surface Conditions	Loose			Loose			Loose		
Soil profile description									
Fill layer	0-700mm Sand, fine to medium, well sorted subrounded to subangular clear quartz, black (7.5 2.5/1), common rootlets, moist, medium dense								
A1	700-1000mm Sand, fine to medium, well sorted subrounded to subangular clear quartz, black (7.5 2.5/1), common rootlets, moist, dense			0-300 mm Sand, fine to medium grained, well sorted subrounded to subangular clear quartz, black (10 YR 2/1), common rootlets, moist, medium dense			0-400 mm Sand, fine to medium grained, well sorted subrounded to subangular clear quartz,yellowish brown (10 YR 5/8), common rootlets, moist, medium dense		
B2	1000- 1200mm Sand, fine to medium, well sorted subrounded to subangular clear quartz, light grey (10 YR7/2), few to many rootlets, moist, dense			300- 700 mm Sand, fine to medium grained, well sorted subrounde to subangular clear quartz, light grey (10 YR 7/2), common rootlets, moist, medium dense			400-800 mm Sand, fine to medium grained, well sorted subrounded to subangular clear quartz, white (2.5 YR 8/1), common rootlets, moist, medium dense		
B3				700- 1200 mm Sand, weakyl indurated segements, fine to medium grained, well sorted subrounded to subangular clear quartz, black (10 YR 2/1), common rootlets, moist to wet, medium dense			800-1200 mm Sand, indurated, fine to medium grained, well sorted clear quartz, black (10 YR 2/1) organic staining, moist, dense		
SCL Assessment									
SCL zone	Coastal Zone			Coastal Zone			Coastal Zone		
SCL status on trigger map	Not SCL			Not SCL			Not SCL		
SCL Critieria[2]	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail
Slope	<1%	Contour map	P	<1%	Contour map	P	<1%	Contour map	P
Rockiness	Nil	-	P	Nil	-	P	Nil	-	P
Gilgai microrelief	Nil	-	P	Nil	-	P	Nil	-	P
Soil depth	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P
Soil wetness	Favorable, Well	-	P	Favorable, Moderatly Well	-	P	Favorable, Moderatly Well	-	P
Soil pH (criteria - pH 5.1 - 8.9 @ <600 mm)	Not Tested	Field test	P	4.3 @ 300 mm 4.4 @ 600 mm	Laboratory	**F**	Not Tested	Field test	P
EC1:5 <0.56mS/cm within 600mm of the soil surface	Not Tested	Field test	P	0.022 @ 300 mm 0.010 @ 600 mm	Laboratory	P	Not Tested	Field test	P
Soil Water Storage	40mm	Based on soil texture	**F**	40	Based on depth of physico-chemical limitation	**F**	40mm	Based on soil texture	**F**

[1] From Capelin (1987) DPI, Horticulture Land Suitability Study Sunshine Coast Southeast Queensland

[2] Based on Field and Laboratory analysis

Criteria that fail are highlighted in orange

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Strategic Cropping Land Detailed Site Analysis
Project No: 137632097
Project: SCA Expansion Project - Land Resources Assessment
Location: Sunshine Coast Airport

Site	TP 13			TP14			TP15		
Land use/cover	Grassland			Grassland			Open grassland		
Location(coordinates) (MGA94 Zone 56)	508018 m E; 7058393 m N			507337 m E; 7058464 m N			507604 m E; 7058393		
Soil Classification	Podosols			Podosols			Podosols		
Soil map unit name	Soil A (Polygon 1)			Soil C (Polygon 2)			Soil B (Polygon 3)		
Soil type correlation (refence[1])	*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)		
Surface Rock	Nil			Nil			Nil		
Gilgai microrelief	Nil			Nil			Nil		
Slope and Landform	<1% Level			<1%			<1%		
Surface Conditions	Loose			Loose			Loose		
Soil profile description									
A1	0-500mm Sand, fine to medium grained, well sorted, very dark grey (10YR 3/1), with common rootlets, moist, medium dense			0-350 mm Loam, fine to medium, well sorted clear quartz, black (10YR2/1), common rootlets, moist, medium dense			0-400 mm Sandy Loam, fine to medium grained, well sorted subrounded to subangular clear quartz, black (7.5 YR 2/1), common rootlets, moist, medium dense		
B1	500-9000mm Sand, fine to medium grained, well sorted, dark brown (10YR 3/3), becoming black (10YR 2/1) with depth, with few to many rootlets, moist, medium dense								
B2	900-1200mm Sand, fine to medium grained, well sorted, light grey (10YR 7/2), becoming dark yellowish brown (10 YR 4/4), moist, medium dense			350-700mm Clay Loam, high plasticity, very dark grey (10YR3/1), common ochre mottling, with fine to medium sandmany to common rootlets, moist, firm			400-800 mm Sand, fine to medium grained clear quartz, light grey (10 YR 7/1), with yellow brown organic staining, few rootlets, moist, medium dense		
B3				700-1200mm Sand, fine to medium, well sorted subrounded to subangular clear quartz, light grey (10YR7/1), moist, medium dense,			800-1200 mm Sand, indurated, fine to medium grained, well sorted clear quartz, grey (10 YR 5/1) organic staining, moist, dense		
SCL Assessment									
SCL zone	Coastal Zone			Coastal Zone			Coastal Zone		
SCL status on trigger map	Not SCL			Not SCL			Not SCL		
SCL Critieria[2]	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail
Slope	<1%	Contour map	P	<1%	Contour map	P	<1%	Contour map	P
Rockiness	Nil	-	P	Nil	-	P	Nil	-	P
Gilgai microrelief	Nil	-	P	Nil	-	P	Nil	-	P
Soil depth	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P
Soil wetness	Favorable, Moderatly Well	-	P	Favorable, Moderatly Well	-	P	Favorable, Moderatly Well	-	P
Soil pH (criteria - pH 5.1 - 8.9 @ <600 mm)	Not Tested	Field test	P	5.2 @ Surface 5.2 @ 300 mm 5.3 @ 600 mm	Laboratory	P	Not Tested	Field test	P
EC1:5 <0.56mS/cm within 600mm of the soil surface	Not Tested	Field test	P	0.025 @ surface 0.031 @ 300 mm 0.022 @ 600 mm	Laboratory	P	Not Tested	Field test	P
Soil Water Storage	40mm	Based on soil texture	**F**	66 mm	Based on soil texture	**F**	44mm	Based on soil texture	**F**

[1] From Capelin (1987) DPI, Horticulture Land Suitability Study Sunshine Coast Southeast Queensland

[2] Based on Field and Laboratory analysis

Criteria that fail are highlighted in orange

Strategic Cropping Land Detailed Site Analysis
Project No: 137632097
Project: SCA Expansion Project - Land Resources Assessment
Location: Sunshine Coast Airport

Site	TP 16			TP17			TP18		
Land use/cover	Grassland			Grassland			Open grassland with isolated trees		
Location(coordinates) (MGA94 Zone 56)	507261 m E; 7059312 m N			507444 m E; 7059690 m N			507056 m E; 7060232 m N		
Soil Classification	Podosols			Podosols			Podosols		
Soil map unit name	Soil B (Polygon 3)			Soil D (Polygon 3)			Soil B (Polygon 3)		
Soil type correlation (refence[1])	*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)		
Surface Rock	Nil			Nil			Nil		
Gilgai microrelief	Nil			Nil			Nil		
Slope and Landform	<1% Level			<1%			<1%		
Surface Conditions	Loose			Loose			Loose		
Soil profile description									
Fill Layer							0-100mm Clayey Sand, fine to coarse grained, poorly sorted, yellowish red (5 YR 5/8), common rootlets, with some fine to medium subangualr gravels and cobbles, moist, medium dense		
A1	0-500mm Loamy Sand, fine to medium grained, well sorted, very dark grey (10YR 3/1), with common rootlets, moist, medium dense			0-350 mm Sandy Clay Loam, fine to medium, subrounded to subangular well sorted clear quartz, black (10YR2/1), common rootlets, moist, medium dense,			100-500 mm Loamy Sand, fine to medium, clear quartz, black (10YR2/1), many rootlets, moist medium dense		
A2	400-600mm Sandy Clayey Loam, high plasticity, dark grey (10YR 4/1) with ochre mottling, with many rootlets								
B1	500-900mm Sand, fine to medium grained, well sorted clear quartz, grey (10YR 5/2), light grey (10YR7/2), moist, medium dense						500-800 mm Sandy Clayey Loam, fine to medium grained clear quartz, black (10 YR 2/1), many rootlets, moist, medium dense		
B2	900-1200mm Sand, fine to medium grained, well sorted clear quartz, gvery dark grey/ black (10YR1/2), with organic staining			350-1200 mm Clayey Sand, fine to medium, well sorted clear quartz, grey (10YR 5/1),with ochre mottling, many rootlets, intercalated with grey clay and silt lenses moist, medium dense, becoming dark grey (10YR4/1)			800-1200 mm Sand, fine to medium grained, moderately sorted clear quartz, grey (10 YR 5/1), yellow mottlnig, moist, moderately dense		
SCL Assessment									
SCL zone	Coastal Zone			Coastal Zone			Coastal Zone		
SCL status on trigger map	Not SCL			Not SCL			Not SCL		
SCL Critieria[2]	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail
Slope	<1%	Contour map	P	<1%	Contour map	P	<1%	Contour map	P
Rockiness	Nil	-	P	Nil	-	P	Nil	-	P
Gilgai microrelief	Nil	-	P	Nil	-	P	Nil	-	P
Soil depth	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P
Soil wetness	Favorable, Moderatly Well	-	P	Favorable, Well	-	P	Favorable, Moderatly Well	-	P
Soil pH (criteria - pH 5.1 - 8.9 @ <600 mm)	4.7 @ 300 mm 4.7 @ 600 mm	Laboratory	**F**	5.5 @ Surface 4.5 @ 300 mm 6.1 @ 600 mm	Laboratory	**F**	4.5 @ 300 mm 5.2 @ 600 mm	Laboratory	**F**
EC1:5 <0.56mS/cm within 600mm of the soil surface	0.012 @ 300 mm 0.014 @ 600 mm	Laboratory	P	0.445 @ Surface 0.565 @ 300 mm 1.170 @ 600 mm	Laboratory	**F**	0.04 @ 300 mm 0.036 @ 600 mm	Laboratory	P
Soil Water Storage	44mm	Based on soil texture and depth of physico-chemical limitation	**F**	10mm	Based on depth of physico-chemical limitation	**F**	46mm	Based on soil texture	**F**

[1] From Capelin (1987) DPI, Horticulture Land Suitability Study Sunshine Coast Southeast Queensland

[2] Based on Field and Laboratory analysis

Criteria that fail are highlighted in orange

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Strategic Cropping Land Detailed Site Analysis
Project No: 137632097
Project: SCA Expansion Project - Land Resources Assessment
Location: Sunshine Coast Airport

Site	TP19			TP20			TP21		
Land use/cover	Open grassland			Open grassland			Open grassland		
Location(coordinates) (MGA94 Zone 56)	507607m E; 7060096 m N			507754 m E; 7059826 m N			508003 m E; 7059574 m N		
Soil Classification	Podosols			Podosols			Podosols		
Soil map unit name	Soil B (Polygon 3)			Soil B (Polygon 3)			Soil B (Polygon 3)		
Soil type correlation (refence[1])	*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)		
Surface Rock	Nil			Nil			Nil		
Gilgai microrelief	Nil			Nil			Nil		
Slope and Landform	<1% Level			<1% Level			<1% Level		
Surface Conditions	Loose			Loose			Loose		
Soil profile description									
A1	0-250mm Loamy Sand, fine to medium grained, well sorted clear quartz, black (10YR 2/1), with common rootlets, moist, medium dense			0-400mm Loamy Sand, fine to medium grained clear quartz, black (10YR 2/1), with common rootlets, moist, medium dense			0-350mm Loamy Sand, fine to medium grained clear quartz, black (10YR 2/1), with common rootlets, moist, medium dense		
B1	250-600mm Sand, fine to medium grained, well sorted clear quartz, greyish brown (10YR 5/2), with common ochre mottling, moist, medium dense			400-550mm Sand, fine to medium grained, well sorted clear quartz, dark greyish brown (10YR 4/2), moist, medium dense			350-550mm Sand, fine to medium grained, well sorted clear quartz, yellowish brown (10YR 5/4), moist, medium dense		
B2	600-1200mm Sand, fine to medium grained, well sorted, light grey (10YR 7/2), moist, medium dense			600-1200mm Sand, fine to medium grained, light grey (10YR 7/2), with common ochre mottling (organics), moist, medium dense			550-900mm Sand, fine to medium grained, white (2.5YR 8/1), moist medium dense		
B3							900-1200mm Sand, fine to medium grained, black (10YR 2/1)), moist medium dense		
SCL Assessment									
SCL zone	Coastal Zone			Coastal Zone			Coastal Zone		
SCL status on trigger map	Not SCL			Not SCL			Not SCL		
SCL Critieria[2]	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail
Slope	<1%	Contour map	P	<1%	Contour map	P	<1%	Contour map	P
Rockiness	Nil	-	P	Nil	-	P	Nil	-	P
Gilgai microrelief	Nil	-	P	Nil	-	P	Nil	-	P
Soil depth	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P
Soil wetness	Favorable, Moderatly	-	P	Favorable, Moderatly	-	P	Favorable, Moderatly	-	P
Soil pH (criteria - pH 5.1 - 8.9 @ <600 mm)	4.7 @ 300 mm 4.7 @ 600 mm	Laboratory	**F**	Not Tested	Field Readings	P	4.5 @ 300 mm 4.9 @ 600 mm	Laboratory	**F**
EC1:5 <0.56mS/cm within 600mm of the soil surface	0.034 @ 300 mm 0.027 @ 600 mm	Laboratory	P	Not Tested	Field Readings	P	0.016 @ 300 mm 0.006@ 600 mm	Laboratory	P
Soil Water Storage	40 mm	Based on soil texture and depth of physico-chemical limitation	**F**	40 mm	Based on soil texture	**F**	40 mm	Based on soil texture and depth of physico-chemical limitation	**F**

[1] From Capelin (1987) DPI, Horticulture Land Suitability Study Sunshine Coast Southeast Queensland

[2] Based on Field and Laboratory analysis

Criteria that fail are highlighted in orange

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Strategic Cropping Land Detailed Site Analysis
Project No: 137632097
Project: SCA Expansion Project - Land Resources Assessment
Location: Sunshine Coast Airport

Site	TP22			TP23		
Land use/cover	Open grassland with isolated trees			open Woodland		
Location(coordinates) (MGA94 Zone 56)	507900 m E; 7059185 m N			507715 m E; 7058834 m N		
Soil Classification	Podosols			Podosols		
Soil map unit name	Soil C (Polygon 2)			Soil A (Polygon 1)		
Soil type correlation (refence[1])	*Unsuitable lowlands and stream channels*, from Capelin (1987)			*Unsuitable lowlands and stream channels*, from Capelin (1987)		
Surface Rock	Nil			Nil		
Gilgai microrelief	Nil			Nil		
Slope and Landform	<1% Level			<1% Level		
Surface Conditions	Loose			Loose		
Soil profile description						
A1	0-300mm Silty Clayey Loam, medium plasticity, black (10YR2/1), with fine to medium grained sand, common rootlets, moist, soft to firm			0-300mm Sand, fine to medium well sorted clear quartz sand, very dark grey (10YR 3/1) , moist, medium dense		
B1	300-500mm Clay Loam, Sandy, high plasiticty clay, grey (10YR5/1), with fine to medium grained sand, common ochre mottling, many rootlets, moist, firm			300-700mm Sand, fine to medium well sorted clear quartz sand, pale brown (10YR 6/3) , moist, medium dense		
B2	500-850 mm Clayey Sand, fine to medium well sorted subrounded to subangular sand, grey (7.5Y5/1), with a few rootlets, moist, medium dense			700-1000mm Sand, fine to medium well sorted clear quartz sand, black (10 YR 2/1) , moist, medium dense		
B3	850-1200mm Sand, fine to medium well sorted subrounded to subangular sand, grey (10YR6/1) to dark grey (10YR 4/1) moist, medium dense			1000-1200mm Indurated Sand, fine to medium well sorted clear quartz sand, black (10 YR 2/1) , moist, medium dense to dense		
SCL Assessment						
SCL zone	Coastal Zone			Coastal Zone		
SCL status on trigger map	Not SCL			Not SCL		
SCL Critieria[2]	Threshold Assessed	Assessment Method	Pass or Fail	Threshold Assessed	Assessment Method	Pass or Fail
Slope	<1%	Contour map	P	<1%	Contour map	P
Rockiness	Nil	-	P	Nil	-	P
Gilgai microrelief	Nil	-	P	Nil	-	P
Soil depth	1200mm	Excavated test pit	P	1200mm	Excavated test pit	P
Soil wetness	Favorable, Moderatly Well	-	P	Favorable, Moderatly Well	-	P
Soil pH (criteria - pH 5.1 - 8.9 @ <600 mm)	4.7 @ Surface 5.2 @ 300 mm 5.5 @ 600 mm	Laboratory	P	4.6 @ 300 mm 4.6 @ 600 mm	Laboratory	**F**
EC1:5 <0.56mS/cm within 600mm of the soil surface	0.013 @ Surface 0.008 @ 300 mm 0.004 @ 600 mm	Laboratory	P	0.006 @ 300 mm 0.010 @ 600 mm	Laboratory	P
Soil Water Storage	60mm	Based on soil texture	**F**	40 mm	Based on soil texture and depth of physico-chemical limitation	**F**

[1] From Capelin (1987) DPI, Horticulture Land Suitability Study Sunshine Coast Southeast Queensland

[2] Based on Field and Laboratory analysis

Criteria that fail are highlighted in orange

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Description and Laboratory Analysis of Good Quality Agricultural Land Representative Sites

Project No.: 137632097
Project: SCA Expansion Project - Land Resources Assessment
Location: Sunshine Coast Airport

Site No:	**TP-8**	Microrelief:	Nil
Location (coordinates) (MGA94 Zone 56):	508487 m E; 7058789 m N	Erosion:	Not evident
Run-off:	Moderately rapid	Surface coarse fragments:	None present
Permeability:	Moderately permeable	Rock outcrop:	None present
Drainage:	Moderately well drained	Substrate*:	Weathered Sandstone
Landform:	Level, Flat Plain	Groundwater*:	Groundwater encountered at 1.2 m
Vegetation:	Closed Woodland	Surface conditions:	Loose, Sand
Site distrubance:	No effective disturbance - Natural	Soil classification:	Podosol

Soil description

Horizon	Depth	Boundary	Colour	Mottles	Texture	Course Fragments	Structures	Segregations	Field pH
A1	0-0.25 m	Diffuse colour	Black (10YR2/1)	-	Sand	-	apedal	-	4.5 @ 0.0 -0.15
B1	0.25 - 0.5 m	Diffuse colour	Very dark grey (10YR3/1)	-	Sand	-	apedal	-	4.7 @ 0.25 - 0.35
B2	0.5 - 0.8 m	Distinct colour	Grey (10YR5/1)	-	Sand	-	apedal	-	5.2 @ 0.55 - 0.65
B3	0.8 - 1.2 m		Black (10YR2/1)	-	Sand, partly indurated	-	apedal	-	5.1 @ 0.9 - 1.0 5.3 @ 1.1 - 1.2

Laboratory Data:				Exchangeable cations					
Lab No.	Depth	pH	EC (mS/cm)	Cation Exchange Capacity (meq/100g)	Calcium (meq/100g)	Magnesium (meq/100g)	Potassium (meq/100g)	Sodium (meq/100g)	Exchangeable Sodium Percent
EB1223841	0.0 - 0.15	4.4	0.017	0.8	0.2	1.0	<0.1	<0.1	3.3
EB1223841	0.25 - 0.35	4.6	0.006	0.4	<0.1	0.3	<0.1	<0.1	<0.1
EB1223841	0.55 - 0.65	4.6	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EB1223841	0.9 - 1.0	4.8	0.009	0.3	<0.1	0.2	<0.1	<0.1	<0.1
EB1223841	1.1 - 1.2	4.9	0.015	1.5	0.4	1.2	<0.1	<0.1	0.7

* Based on a geotechnical investigation at the same location. Other information based on soil assessment field and laboratory analysis

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APPENDIX B3:E

Test Pit ID	Horizon Start Depth (m)	Horizon Base Depth (m)	Soil Texture	Physo Chemical Limitations	Estimated SWS per 100 mm depth of soil (mm)*	SWS per soil texture (mm)	Total SWS (mm)
TP1/12	0	1	S	Nil	4	40	40
TP2/12	0	1	S	Nil	4	40	40
TP3/12	0	1	S	Nil	4	40	40
TP4/12	0	0.8	S	Nil	4	32	44
TP4/12	0.8	1	SCL	Nil	6	12	
TP5/12	0	1	S	Nil	4	40	40
TP6/12	0	1	S	Nil	4	40	40
TP7/12	0	1	S	Nil	4	40	40
TP8/12	0	1	S	Nil	4	40	40
TP9/12	0	1	S	Nil	4	40	40
TP10/12	0	1	S	Nil	4	40	40
TP11/12	0	1	S	Nil	4	40	40
TP12/12	0	1	S	Nil	4	40	40
TP13/12	0	1	S	Nil	4	40	40
TP14/12	0	0.35	L	Nil	6	21	61
TP14/12	0.35	0.7	CL	Nil	8	28	
TP14/12	0.7	1	S	Nil	4	12	
TP15/12	0	1	S	Nil	4	40	40
TP16/12	0	0.4	S	Nil	4	16	44
TP16/12	0.4	0.6	SCL	Nil	6	12	
TP16/12	0.6	1	S	Nil	4	16	
TP17/12	0	0.25	S	pH, EC	4	10	10
TP18/12	0	0.1	CS	Nil	4	4	46
TP18/12	0.1	0.5	LS	Nil	4	16	
TP18/12	0.5	0.8	SCL	Nil	6	18	
TP18/12	0.8	1	S	Nil	4	8	
TP19/12	0	0.25	LS	Nil	4	10	40
TP19/12	0.25	1	S	Nil	4	30	
TP20/12	0	0.4	LS	Nil	4	16	40
TP20/12	0.4	1	S	Nil	4	24	
TP21/12	0	0.35	LS	Nil	4	14	40
TP21/12	0.35	1	S	Nil	4	26	
TP22/12	0	0.3	ZCL	Nil	8	24	56
TP22/12	0.3	0.5	SCL	Nil	6	12	
TP22/12	0.5	0.85	CS	Nil	4	14	
TP22/12	0.85	1	S	Nil	4	6	
TP23/12	0	1	S	Nil	4	40	40

* From: Department of Environment and Resource Management (2011), Protecting Queensland's strategic cropping land, Proposed criteria for identifying strategic cropping lands; released on 8 September 2011.

APPENDIX B3:E

Estimated Average SWS per 100 mm soil depth increments for soil texture grades

Field Texture	ASC Short form	Estimated SWS per 100 mm depth of Soil*
Sand; Clayey Sand; Loamy Sand	S; CS; LS	4 mm
Sandy Loam	SL	5 mm
Loam; Silty Loam; Sandy Clay Loam	L; ZL; SCL	6 mm
Clay Loam; Clay Loam, Sandy; Silty Clay Loam	CL; CLS; ZCL	8 mm
Light Clay; Light Medium Clay,	LC;LMC	10 mm
Medium Clay, Medium Heavy Clay; Heavy Clay	MC;MHC;HC	12 mm

* From: Department of Environment and Resource Management (2011), Protecting Queensland's strategic cropping land, Proposed criteria for identifying cropping lands; released on 8 September 2011

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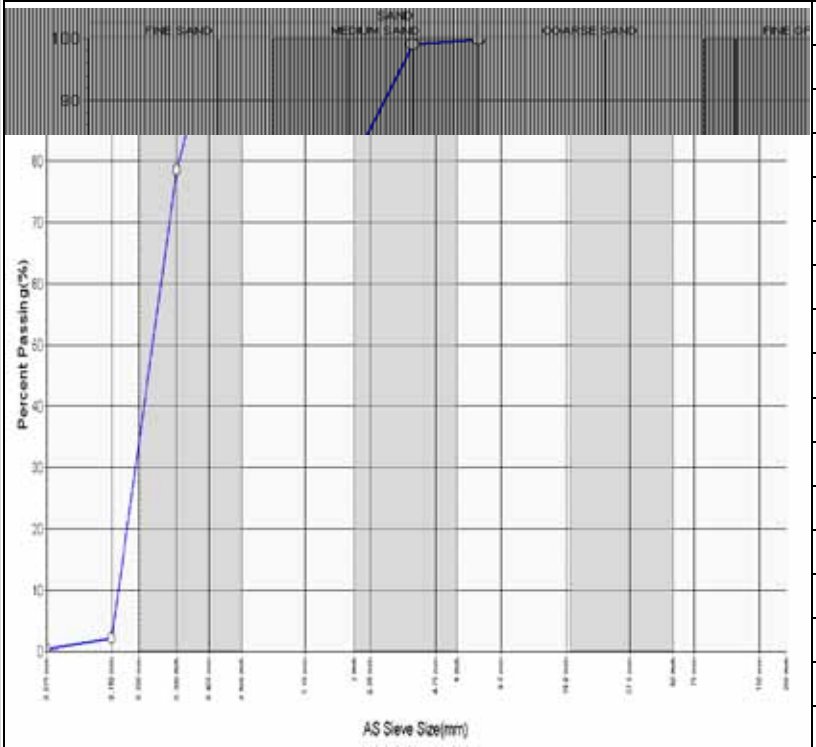
Particle Size Distribution Report

Client:	**Sunshine Coast Council**	Job Number:	**127683017**
Client Address:	**11-13 Ocean Street Maroochydore QLD**	Report Number:	**127683017 - 1**
Project:	**SCA Expansion**	Report Date:	**17/09/2012**
Location	**SC Airport ,**		**Page 1 of 3**
Lab No:	**12304259**	Sample Location	
Date Sampled / Received:	**5/09/2012**	TP-5 (0.55-0.65m)	
Date Tested:	**13/09/2012**		
Sampled By:	**Golder**		
Sample Method:	**-**		
Material Source:	**-**		
For Use As:	**-**		
Remarks:	-		

Test Method: **AS1289.3.6.1**



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	
1.18 mm	
0.600 mm	**100**
0.425 mm	**99**
0.300 mm	**78**
0.150 mm	**2**
0.075 mm	**0**
Moisture Content (%)	

Visual Classification:

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Approved Signatory

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Form Number : R77-RL-16

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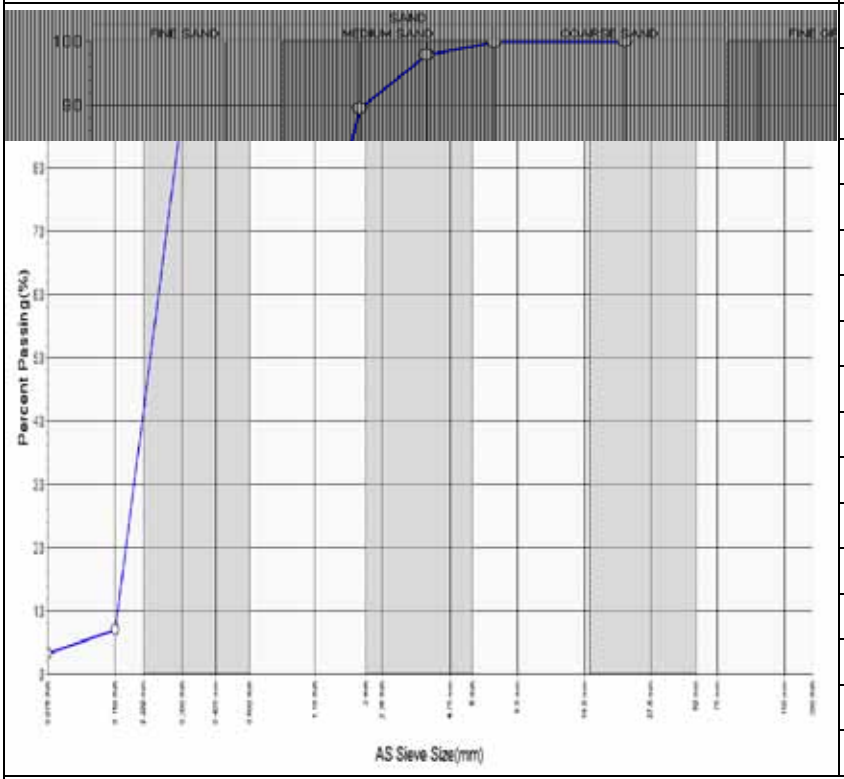
Particle Size Distribution Report

Client:	**Sunshine Coast Council**	Job Number:	**127683017**
Client Address:	**11-13 Ocean Street Maroochydore QLD**	Report Number:	**127683017 - 1**
Project:	**SCA Expansion**	Report Date:	**17/09/2012**
Location	**SC Airport ,**		**Page 2 of 3**
Lab No:	**12304260**	Sample Location	
Date Sampled / Received:	**5/09/2012**	TP-8 (0.25-0.35m)	
Date Tested:	**13/09/2012**		
Sampled By:	**Golder**		
Sample Method:	**-**		
Material Source:	**-**		
For Use As:	**-**		
Remarks:	-		

Test Method: **AS1289.3.6.1**



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	
1.18 mm	
0.600 mm	**100**
0.425 mm	**98**
0.300 mm	**90**
0.150 mm	**7**
0.075 mm	**3**
Moisture Content (%)	

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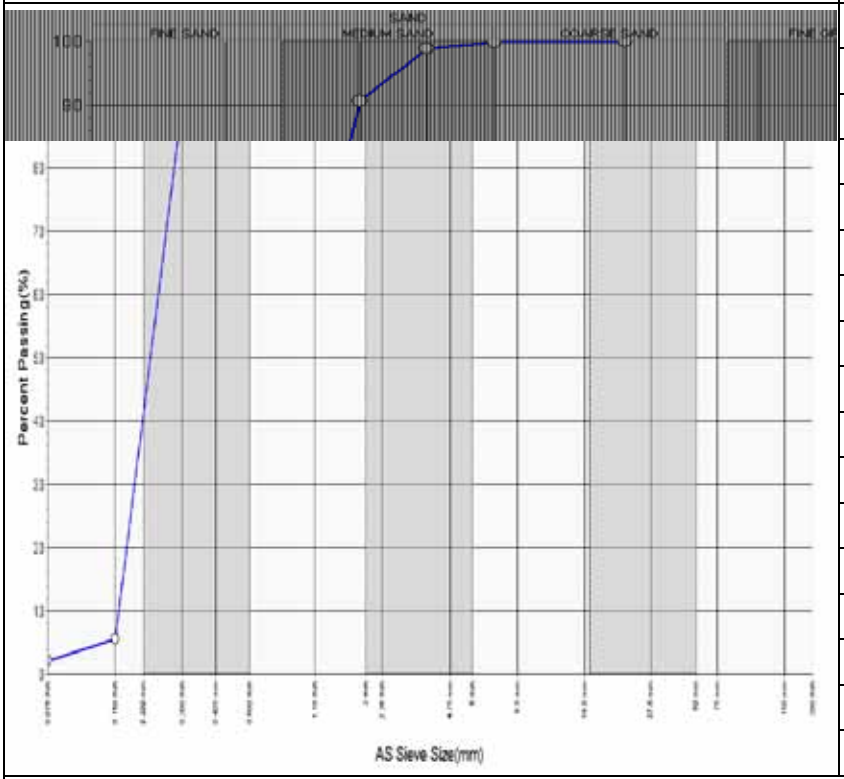
Particle Size Distribution Report

Client:	**Sunshine Coast Council**	Job Number:	**127683017**
Client Address:	**11-13 Ocean Street Maroochydore QLD**	Report Number:	**127683017 - 1**
Project:	**SCA Expansion**	Report Date:	**17/09/2012**
Location	**SC Airport ,**		**Page 3 of 3**
Lab No:	**12304261**	Sample Location	
Date Sampled / Received:	**5/09/2012**	TP-8 (0.55-0.65m)	
Date Tested:	**13/09/2012**		
Sampled By:	**Golder**		
Sample Method:	**-**		
Material Source:	**-**		
For Use As:	**-**		
Remarks:	-		

Test Method: **AS1289.3.6.1**



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	
1.18 mm	
0.600 mm	**100**
0.425 mm	**99**
0.300 mm	**91**
0.150 mm	**6**
0.075 mm	**2**
Moisture Content (%)	

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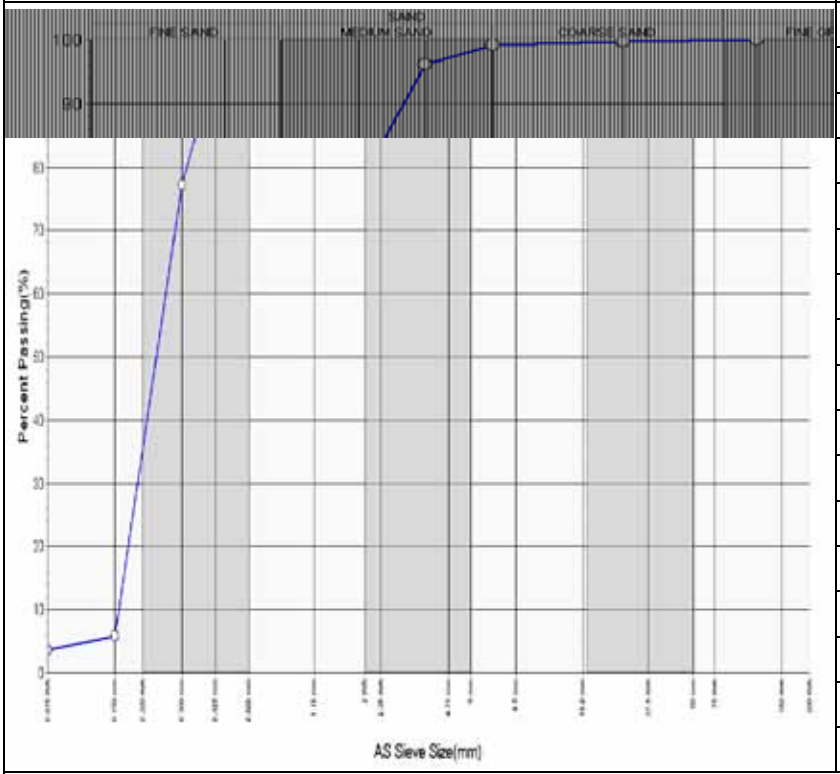
Particle Size Distribution Report

Client:	**Sunshine Coast Council**	Job Number:	**127683017**
Client Address:	**11-13 Ocean Street Maroochydore QLD**	Report Number:	**127683017 - 2**
Project:	**SCA Expansion**	Report Date:	**19/09/2012**
Location	**SC Airport ,**		**Page 1 of 6**
Lab No:	**12304312**	Sample Location	
Date Sampled / Received:	**7/09/2012**	TP5 (0 - 0.15m)	
Date Tested:	**12/09/2012**	28/08/2012	
Sampled By:	**Golder**		
Sample Method:	**-**		
Material Source:	**-**		
For Use As:	**-**		
Remarks:	-		

Test Method: **AS1289.3.6.1**



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	**100**
1.18 mm	**100**
0.600 mm	**99**
0.425 mm	**96**
0.300 mm	**77**
0.150 mm	**6**
0.075 mm	**4**
Moisture Content (%)	

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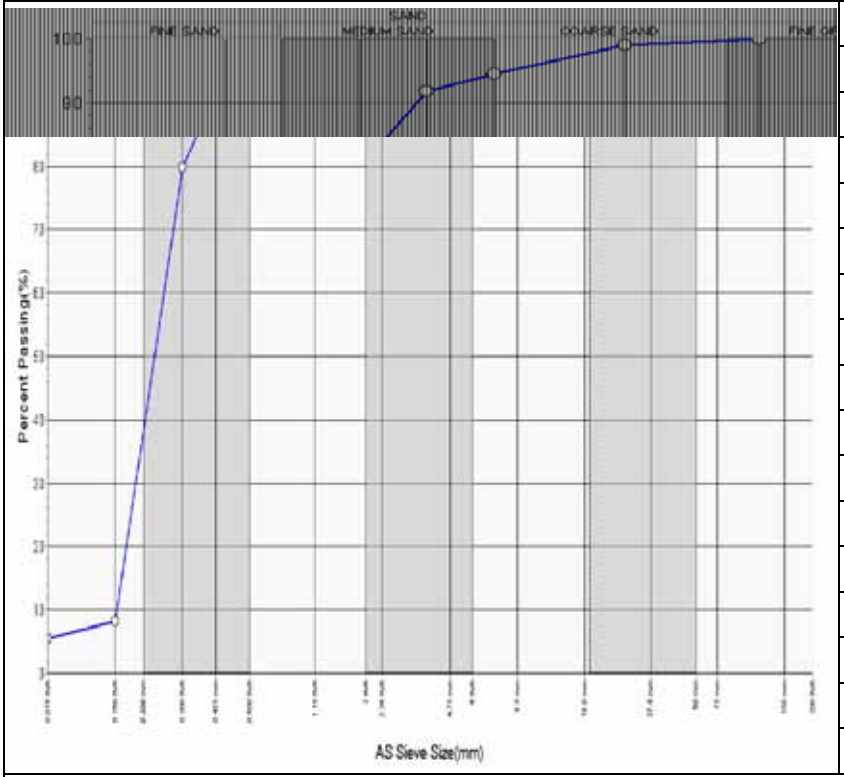
Particle Size Distribution Report

Client:	**Sunshine Coast Council**	Job Number:	**127683017**
Client Address:	**11-13 Ocean Street Maroochydore QLD**	Report Number:	**127683017 - 2**
Project:	**SCA Expansion**	Report Date:	**19/09/2012**
Location	**SC Airport ,**		**Page 2 of 6**
Lab No:	**12304313**	Sample Location	
Date Sampled / Received:	**7/09/2012**	TP8 (0 - 0.15m)	
Date Tested:	**12/09/2012**	29/08/2012	
Sampled By:	**Golder**		
Sample Method:	**-**		
Material Source:	**-**		
For Use As:	**-**		
Remarks:	-		

Test Method: **AS1289.3.6.1**



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	**100**
1.18 mm	**99**
0.600 mm	**95**
0.425 mm	**92**
0.300 mm	**80**
0.150 mm	**8**
0.075 mm	**5**
Moisture Content (%)	

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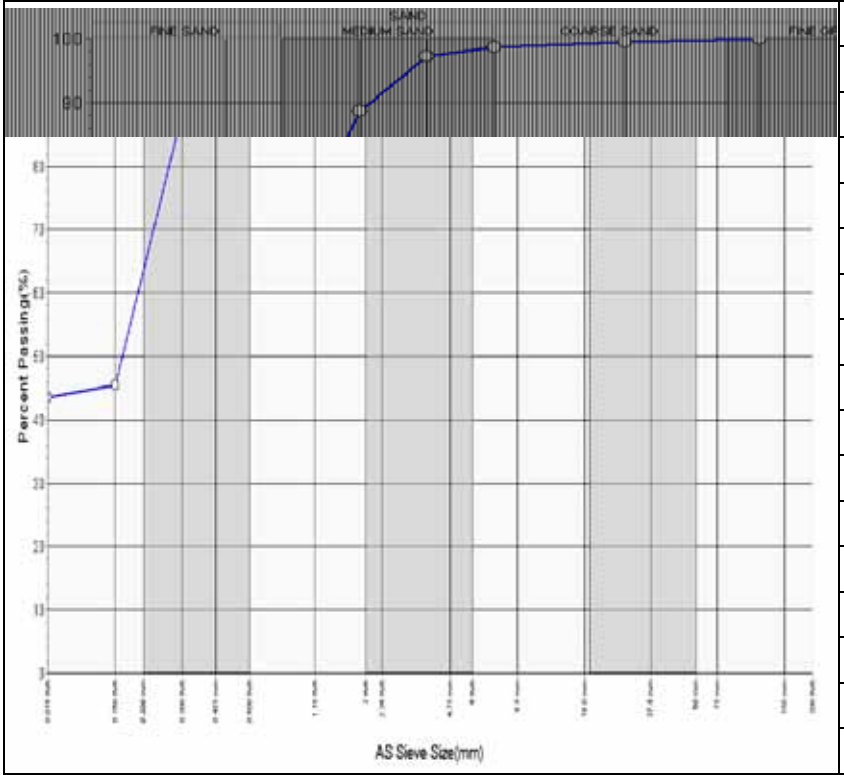
Particle Size Distribution Report

Client:	**Sunshine Coast Council**	Job Number:	**127683017**
Client Address:	**11-13 Ocean Street Maroochydore QLD**	Report Number:	**127683017 - 2**
Project:	**SCA Expansion**	Report Date:	**19/09/2012**
Location	**SC Airport ,**		**Page 3 of 6**
Lab No:	**12304314**	Sample Location	
Date Sampled / Received:	**7/09/2012**	TP14 (0.55 - 0.65m)	
Date Tested:	**12/09/2012**	19/08/2012	
Sampled By:	**Golder**		
Sample Method:	**-**		
Material Source:	**-**		
For Use As:	**-**		
Remarks:	-		

Test Method: **AS1289.3.6.1**



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	**100**
1.18 mm	**100**
0.600 mm	**99**
0.425 mm	**97**
0.300 mm	**89**
0.150 mm	**45**
0.075 mm	**44**
Moisture Content (%)	

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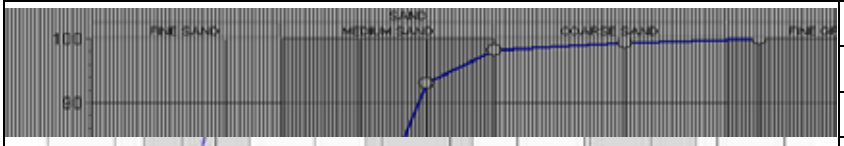
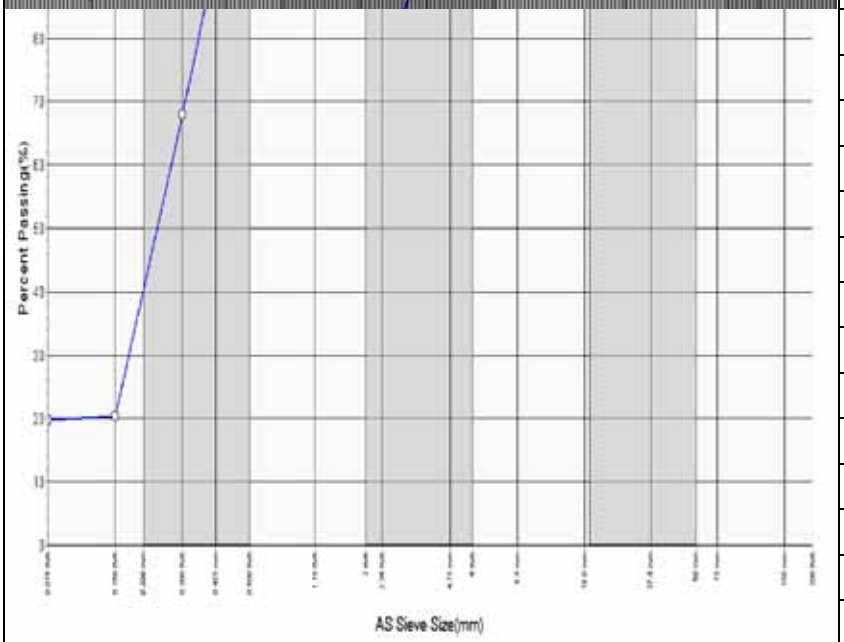
Particle Size Distribution Report

Client:	**Sunshine Coast Council**	Job Number:	**127683017**
Client Address:	**11-13 Ocean Street Maroochydore QLD**	Report Number:	**127683017 - 2**
Project:	**SCA Expansion**	Report Date:	**19/09/2012**
Location	**SC Airport ,**		**Page 4 of 6**
Lab No:	**12304316**	Sample Location	
Date Sampled / Received:	**7/09/2012**	TP18 (0.25 - 0.35m)	
Date Tested:	**12/09/2012**	19/08/2012	
Sampled By:	**Golder**		
Sample Method:	**-**		
Material Source:	**-**		
For Use As:	**-**		
Remarks:	-		

Test Method: **AS1289.3.6.1**





A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	**100**
1.18 mm	**99**
0.600 mm	**98**
0.425 mm	**93**
0.300 mm	**68**
0.150 mm	**20**
0.075 mm	**20**
Moisture Content (%)	

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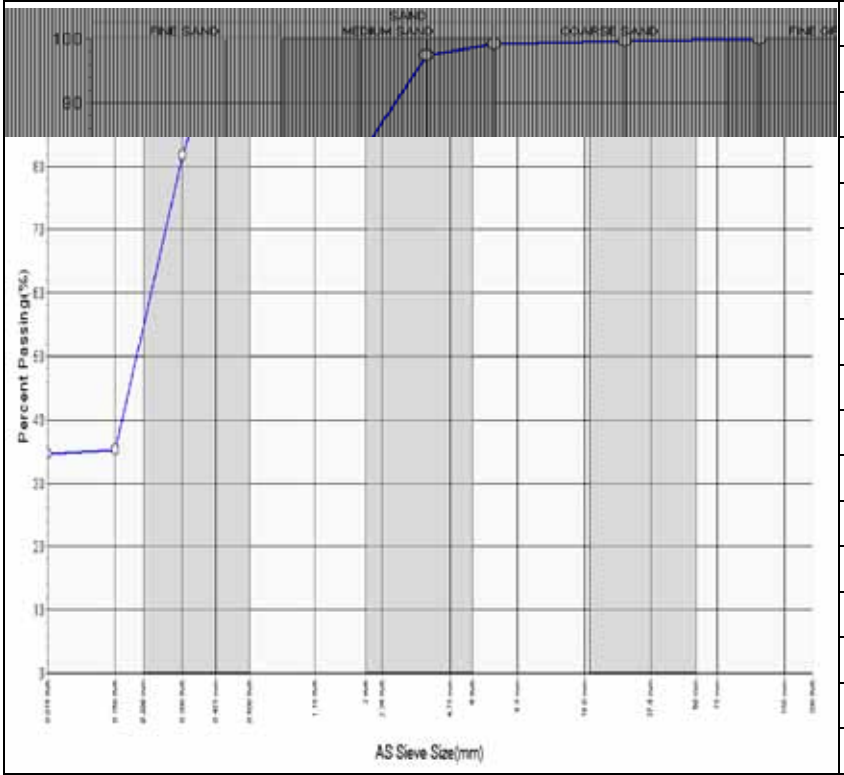
Particle Size Distribution Report

Client:	**Sunshine Coast Council**	Job Number:	**127683017**
Client Address:	**11-13 Ocean Street Maroochydore QLD**	Report Number:	**127683017 - 2**
Project:	**SCA Expansion**	Report Date:	**19/09/2012**
Location	**SC Airport ,**		**Page 5 of 6**
Lab No:	**12304317**	Sample Location	
Date Sampled / Received:	**7/09/2012**	TP18 (0.55 - 0.65m)	
Date Tested:	**17/09/2012**	19/08/2012	
Sampled By:	**Golder**		
Sample Method:	**-**		
Material Source:	**-**		
For Use As:	**-**		
Remarks:	-		

Test Method: **AS1289.3.6.1**



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	**100**
1.18 mm	**100**
0.600 mm	**99**
0.425 mm	**97**
0.300 mm	**82**
0.150 mm	**35**
0.075 mm	**35**
Moisture Content (%)	

Visual Classification:

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Geoff Hooper - Senior Technical Officer

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Form Number : R77-RL-16

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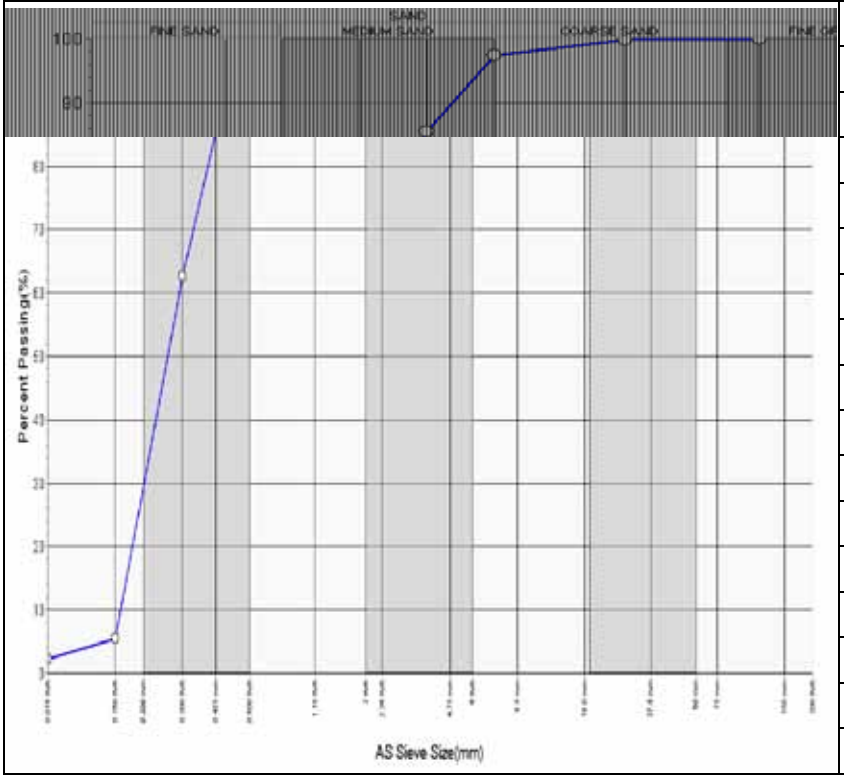
Particle Size Distribution Report

Client:	**Sunshine Coast Council**	Job Number:	**127683017**
Client Address:	**11-13 Ocean Street Maroochydore QLD**	Report Number:	**127683017 - 2**
Project:	**SCA Expansion**	Report Date:	**19/09/2012**
Location	**SC Airport ,**		**Page 6 of 6**
Lab No:	**12304319**	Sample Location	
Date Sampled / Received:	**7/09/2012**	TP23 (1.1 - 1.2m)	
Date Tested:	**17/09/2012**	28/08/2012	
Sampled By:	**Golder**		
Sample Method:	**-**		
Material Source:	**-**		
For Use As:	**-**		
Remarks:	-		

Test Method: **AS1289.3.6.1**



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	**100**
1.18 mm	**100**
0.600 mm	**97**
0.425 mm	**85**
0.300 mm	**63**
0.150 mm	**6**
0.075 mm	**2**
Moisture Content (%)	

Visual Classification:

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Approved Signatory

Geoff Hooper - Senior Technical Officer

NATA Accred No:1961

Form Number : R77-RL-16

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Emerson Class Number Report

Client :	**Sunshine Coast Council**	Report Number:	**127683017 - 3**
Address :	**11-13 Ocean Street Maroochydore QLD**	Report Date:	**19/09/2012**
Job Number :	**127683017**	Order Number:	
Project :	**SCA Expansion**	Test Method:	**AS1289.3.8.1**
Location :	**SC Airport ,**		

Lab No :	12304312	12304313	12304314	12304315
ID No :	-	-	-	-
Lot No :	-	-	-	-
Item No :	-	-	-	-
Sampling Method :	-	-	-	-
Date Sampled/Received :	7/9/2012	7/9/2012	7/9/2012	7/9/2012
Date Tested :	13/9/2012	13/9/2012	13/9/2012	13/9/2012
Material Source :	-	-	-	-
For Use As :	-	-	-	-
Sample Location :	TP5 (0 - 0.15m) 28/08/2012	TP8 (0 - 0.15m) 29/08/2012	TP14 (0.55 - 0.65m) 19/08/2012	TP17 (0.25 - 0.35m) 29/08/2012
Soil Description :	**(SM) Silty SAND,grey**	**(SM) Silty SAND,dark grey**	**(SC) Clayey SAND,brown**	**(CH) Silty CLAY, brown**
Type of Water Used :	**Distilled Water**	**Distilled Water**	**Distilled Water**	**Distilled Water**
Temperature of Water (°C) :	**20**	**20**	**20**	**20**
Emerson Class Number :	**Class 5**	**Class 5**	**Class 5**	**Class 1**
Remarks :				

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APPROVED SIGNATORY

Nick Farrer - Senior Technical Officer
NATA Accred No:1961

FORM NUMBER : R58-RL-12

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Emerson Class Number Report

Client :	**Sunshine Coast Council**	Report Number:	**127683017 - 3**
Address :	**11-13 Ocean Street Maroochydore QLD**	Report Date:	**19/09/2012**
Job Number :	**127683017**	Order Number:	
Project :	**SCA Expansion**	Test Method:	**AS1289.3.8.1**
Location :	**SC Airport ,**		

Lab No :	12304316	12304317	12304318	12304319
ID No :	-	-	-	-
Lot No :	-	-	-	-
Item No :	-	-	-	-
Sampling Method :	-	-	-	-
Date Sampled/Received :	7/9/2012	7/9/2012	7/9/2012	7/9/2012
Date Tested :	13/9/2012	13/9/2012	13/9/2012	13/9/2012
Material Source :	-	-	-	-
For Use As :	-	-	-	-
Sample Location :	TP18 (0.25 - 0.35m) 19/08/2012	TP18 (0.55 - 0.65m) 19/08/2012	TP22 (0.3 - 0.4m) 29/08/2012	TP23 (1.1 - 1.2m) 28/08/2012
Soil Description :	**(SM) Silty SAND,dark brown**	**(SC) Clayey SAND,brown**	**(CI) Silty CLAY, brown**	**(SM) Silty SAND,dark brown**
Type of Water Used :	**Distilled Water**	**Distilled Water**	**Distilled Water**	**Distilled Water**
Temperature of Water (°C) :	**20**	**20**	**20**	**20**
Emerson Class Number :	**Class 5**	**Class 5**	**Class 5**	**Class 3**
Remarks :				

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APPROVED SIGNATORY

Nick Farrer - Senior Technical Officer
NATA Accred No:1961

FORM NUMBER : R58-RL-12

APPENDIX B3:E

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BRISBANE LABORATORY

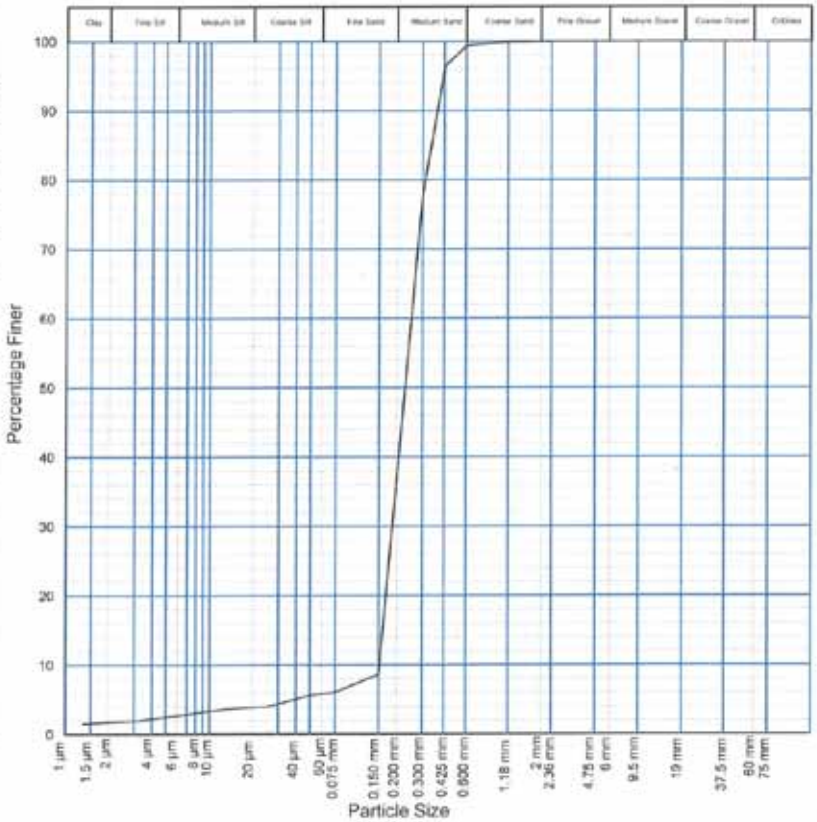
28 Bank Street, West End QLD 4101
PO Box 3427 South Brisbane BC QLD 4101
Phone (07) 3840 9500 Fax (07) 3840 9501
www.golder.com.au

PARTICLE SIZE DISTRIBUTION BY HYDROMETER

Client :	Sunshine Coast Council	Report No. :	R13857
Address :	11-13 Ocean Street, Maroochydore	Job No. :	127683017
Project :	SCA Expansion	Reg'n No. :	12304258
Sample ID :	TP-5 0.25-0.35m	Senders No. :	
		Date Received :	4/09/2012
		Sampled By :	GAP

SIZE FRACTIONS AS PER AUSTRALIAN STANDARDS AS 1726

Particle Size (mm)	Percent Passing
150	
75	
37.5	
19.0	
9.5	
4.75	
2.36	100.0
1.18	99.9
0.600	99.4
0.425	96.5
0.300	78.1
0.150	8.6
0.075	6.0
Particle Size (Microns)	Percent Passing
51.7	5.6
36.6	4.8
26.0	4.0
13.0	3.6
9.2	3.2
6.5	2.8
4.6	2.4
3.3	2.0
1.3	1.6



Pretreatment	Tested as received	Soil Particle Density (assumed)	2.70 t/m³
Loss in Pretreatment (%)	-	Type of Hydrometer	ASTM E100
Method of Dispersion	Mixer		
Material Description :	(SM) Silty SAND, brown.		
Test Procedure :	AS 1289.3.6.3	Variations to test method a)assumed particle density used b) testing up to 24 hours	
Prepared by :	KB	Checked by :	

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19/9/12

Nick Farrer
Approved Signatory

Senior Technical Officer
NATA Accred. No. : 1951

Golder Form No. R08 Hydrometer

APPENDIX B3:E

Golder Associates Pty Ltd
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Brisbane Laboratory
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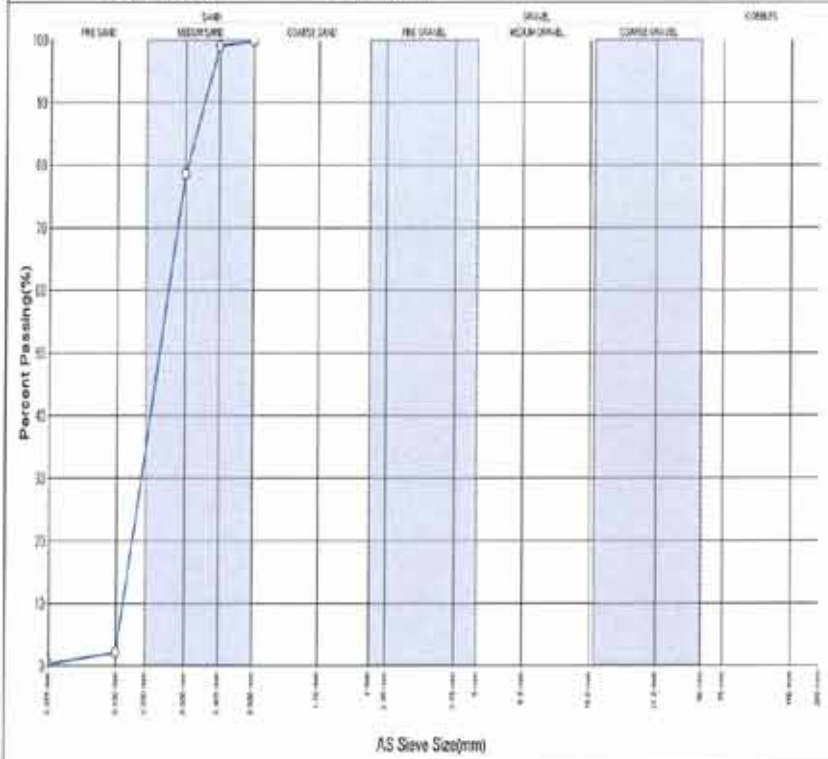
(PO Box 3247 South Brisbane BC QLD 4101)
T: (61-7) 3840 9500
F: (61-7) 3840 9501
E: BNELab@golder.com.au

Particle Size Distribution Report

Client:	Sunshine Coast Council	Job Number:	127683017
Client Address:	11-13 Ocean Street Maroochydore QLD	Report Number:	127683017 - 1
Project:	SCA Expansion	Report Date:	17/09/2012
Location	SC Airport ,		Page 1 of 3
Lab No:	12304259		Sample Location
Date Sampled / Received:	5/09/2012		TP-5 (0.55-0.65m)
Date Tested:	13/09/2012		
Sampled By:	Golder		
Sample Method:	-		
Material Source:	-		
For Use As:	-		
Remarks:	-		

Test Method: AS1289.3.6.1



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	
1.18 mm	
0.600 mm	100
0.425 mm	99
0.300 mm	78
0.150 mm	2
0.075 mm	0
Moisture Content (%)	

Visual Classification:

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Approved Signatory

Geoff Hooper - Senior Technical Officer

NATA Accred No:1961

Form Number : R77-RL-16

APPENDIX B3:E

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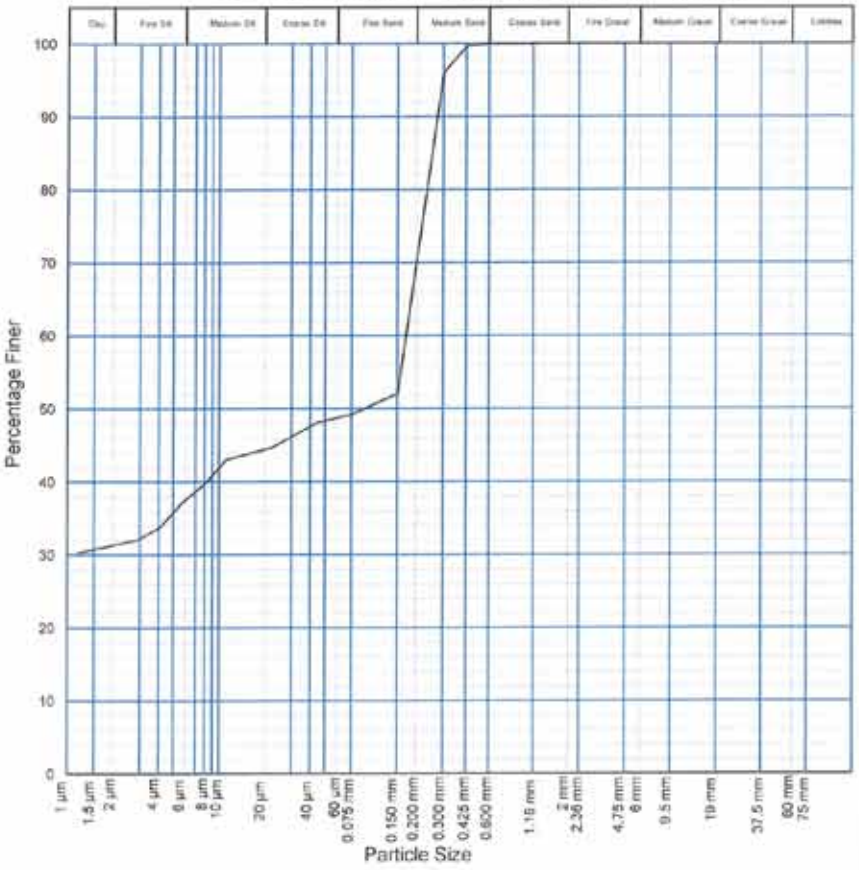
PARTICLE SIZE DISTRIBUTION BY HYDROMETER

Client :	Sunshine Coast Council	Report No. :	R13862
Address :	11-13 Ocean Street, Maroochydore	Job No. :	127683017
Project :	SCA Expansion	Reg'n No. :	12304266
Sample ID :	TP-22 0.3-0.4m	Senders No. :	
		Date Received :	4/09/2012
		Sampled By :	GAP

SIZE FRACTIONS AS PER AUSTRALIAN STANDARDS AS 1726

Particle Size (mm)	Percent Passing
150	
75	
37.5	
19.0	
9.5	
4.75	
2.36	
1.18	100.0
0.600	99.9
0.425	99.6
0.300	96.1
0.150	52.1
0.075	49.2
Particle Size (Microns)	Percent Passing
44.2	48.1
31.5	46.4
22.4	44.7
11.1	43.0
7.9	39.6
5.7	37.1
4.1	33.7
2.9	32.0
1.2	30.3



Pretreatment	Tested as received	Soil Particle Density (assumed)	2.70 t/m³
Loss in Pretreatment (%)	-	Type of Hydrometer	ASTM E100
Method of Dispersion	Mixer		
Material Description :	(SC) Clayey SAND, brown.		
Test Procedure :	AS 1289.3.6.3	- Variations to test method a)assumed particle density used b) testing up to 24 hours	
Prepared by :	KB	Checked by :	

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Nick Farrer
Approved Signatory

Senior Technical Officer
NATA Accred. No. : 1961

Golder Form No. R08 Hydrometer
RL3 - 09/03/2012

APPENDIX B3:E

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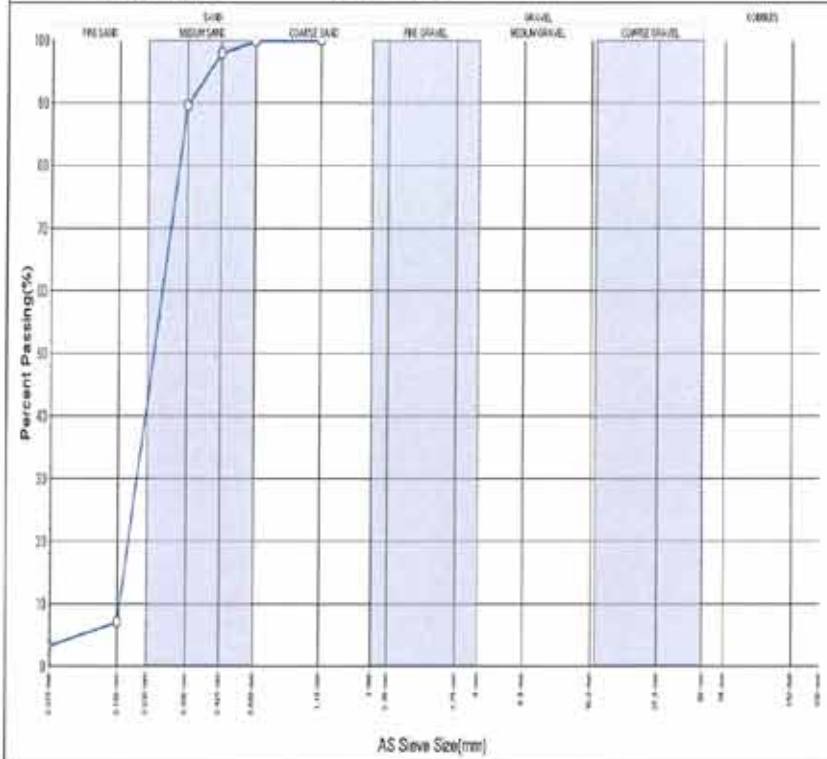
E: BNELab@golder.com.au

Particle Size Distribution Report

Client:	Sunshine Coast Council	Job Number:	127683017
Client Address:	11-13 Ocean Street Maroochydore QLD	Report Number:	127683017 - 1
Project:	SCA Expansion	Report Date:	17/09/2012
Location	SC Airport ,		Page 2 of 3
Lab No:	12304260		Sample Location
Date Sampled / Received:	5/09/2012		TP-8 (0.25-0.35m)
Date Tested:	13/09/2012		
Sampled By:	Golder		
Sample Method:	-		
Material Source:	-		
For Use As:	-		
Remarks:	-		

Test Method: AS1289.3.6.1



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	
1.18 mm	
0.600 mm	100
0.425 mm	98
0.300 mm	90
0.150 mm	7
0.075 mm	3
Moisture Content (%)	

Visual Classification:

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Approved Signatory

Geoff Hooper - Senior Technical Officer

NATA Accred No:1961

Form Number R77-RL-16

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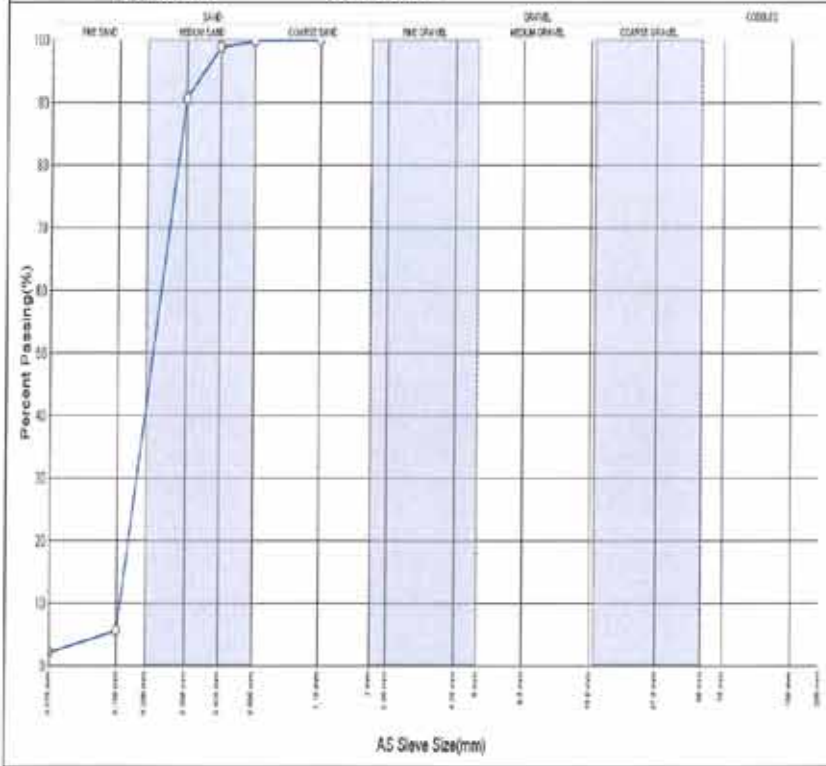
F: (61-7) 3840 9501
E: BNELab@golder.com.au

Particle Size Distribution Report

Client:	Sunshine Coast Council	Job Number:	127683017
Client Address:	11-13 Ocean Street Maroochydore QLD	Report Number:	127683017 - 1
Project:	SCA Expansion	Report Date:	17/09/2012
Location	SC Airport ,		Page 3 of 3
Lab No:	12304261	Sample Location	
Date Sampled / Received:	5/09/2012	TP-8 (0.55-0.65m)	
Date Tested:	13/09/2012		
Sampled By:	Golder		
Sample Method:	-		
Material Source:	-		
For Use As:	-		
Remarks:	-		

Test Method: AS1289.3.6.1



A.S. Sieve Sizes	Percent Passing
75.00 mm	
53.00 mm	
37.50 mm	
26.50 mm	
19.00 mm	
13.2 mm	
9.50 mm	
4.75 mm	
2.36 mm	
1.18 mm	
0.600 mm	100
0.425 mm	99
0.300 mm	91
0.150 mm	6
0.075 mm	2
Moisture Content (%)	

Visual Classification:

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Approved Signatory

Geoff Hooper - Senior Technical Officer

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Form Number : R77-RL-16

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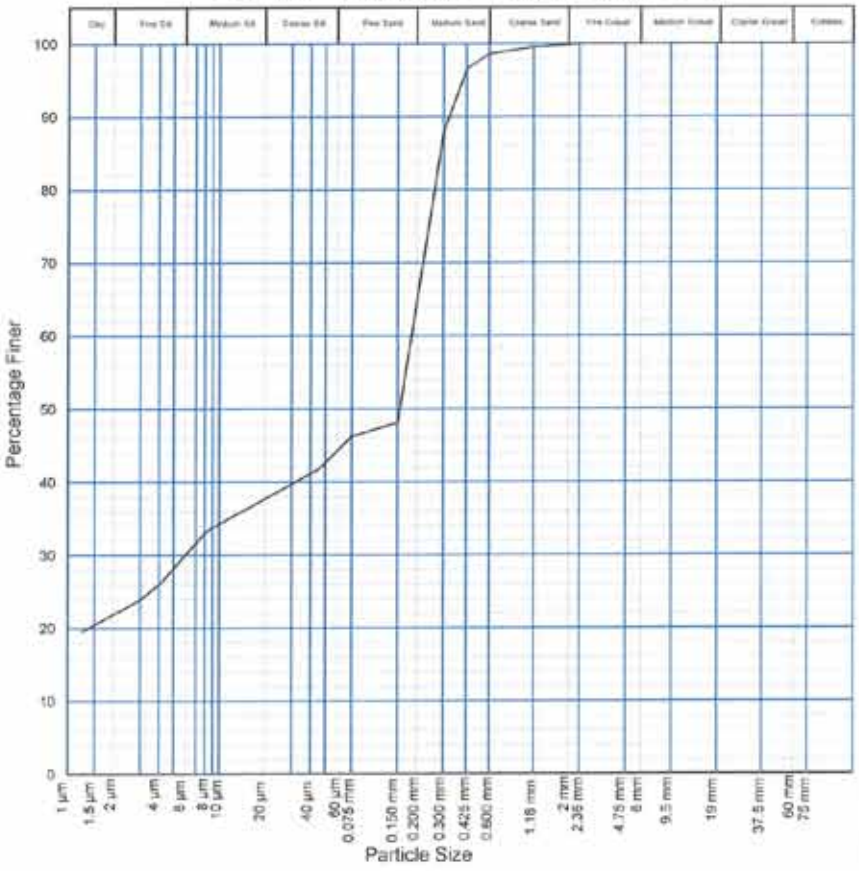
PARTICLE SIZE DISTRIBUTION BY HYDROMETER

Client :	Sunshine Coast Council	Report No. :	R13858
Address :	11-13 Ocean Street, Maroochydore	Job No. :	127683017
Project :	SCA Expansion	Reg'n No. :	12304262
Sample ID :	TP-14 0.25-0.35m	Senders No. :	
		Date Received :	4/09/2012
		Sampled By :	GAP

SIZE FRACTIONS AS PER AUSTRALIAN STANDARDS AS 1726

Particle Size (mm)	Percent Passing
150	
75	
37.5	
19.0	
9.5	
4.75	
2.36	100.0
1.18	99.5
0.600	98.6
0.425	96.6
0.300	88.0
0.150	48.1
0.075	46.2
Particle Size (Microns)	Percent Passing
45.6	41.8
32.4	40.1
23.1	38.4
11.5	35.0
8.2	33.2
5.9	29.8
4.2	26.4
3.0	23.8
1.2	19.6



Pretreatment	Tested as received	Soil Particle Density (assumed)	2.70 t/m³
Loss in Pretreatment (%)	-	Type of Hydrometer	ASTM E100
Method of Dispersion	Mixer		
Material Description :	(SC) Clayey SAND, brown.		
Test Procedure :	AS 1289.3.6.3	- Variations to test method assumed particle density used to testing up to 24 hours	
Prepared by :	KB	Checked by :	

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19/9/12

Nick Farrer
Approved Signatory

Senior Technical Officer
NATA Accred. No. : 1961

Golder Form No. R08 Hydrometer
RL3 - 09/03/2012

APPENDIX B3:E

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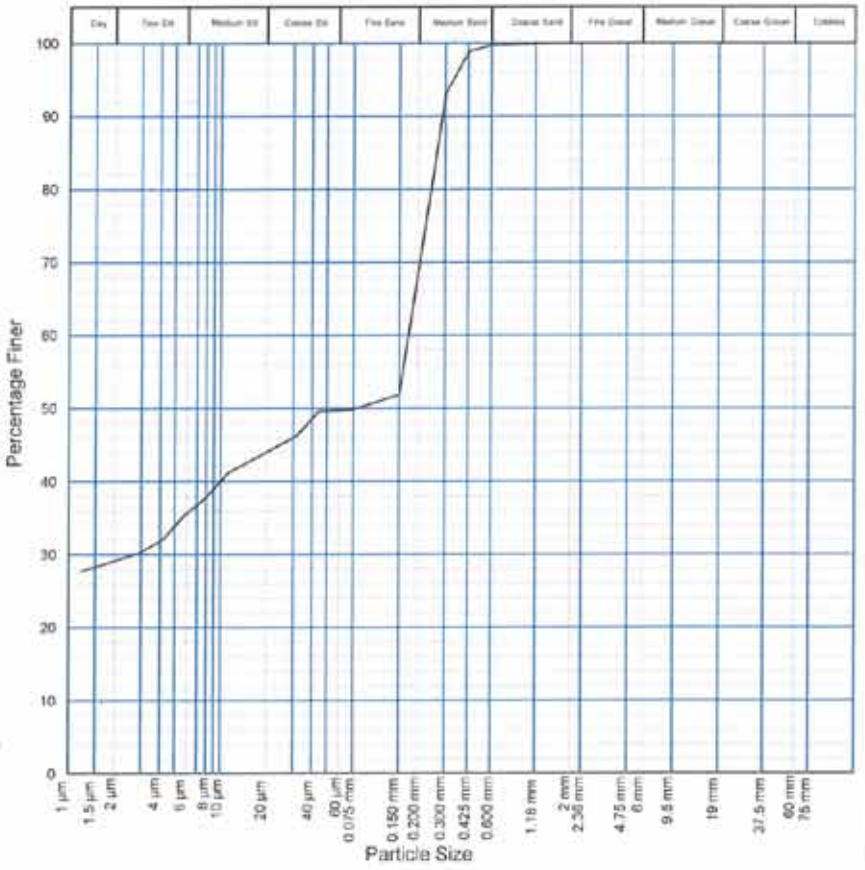
PARTICLE SIZE DISTRIBUTION BY HYDROMETER

Client :	Sunshine Coast Council	Report No. :	R13859
Address :	11-13 Ocean Street, Maroochydore	Job No. :	127683017
Project :	SCA Expansion	Reg'n No. :	12304263
Sample ID :	TP-14 0.55-0.65m	Senders No. :	
		Date Received :	4/09/2012
		Sampled By :	GAP

SIZE FRACTIONS AS PER AUSTRALIAN STANDARDS AS 1726

Particle Size (mm)	Percent Passing
150	
75	
37.5	
19.0	
9.5	
4.75	
2.36	100.0
1.18	99.9
0.600	99.7
0.425	98.9
0.300	93.1
0.150	51.9
0.075	49.9
Particle Size (Microns)	Percent Passing
44.0	49.6
31.6	46.2
22.5	44.5
11.2	41.2
8.0	37.8
5.7	35.3
4.1	31.9
2.9	30.2
1.2	27.7



Pretreatment	Tested as received	Soil Particle Density (assumed)	2.70 t/m³
Loss in Pretreatment (%)	-	Type of Hydrometer	ASTM E100
Method of Dispersion	Mixer		
Material Description :	(SC) Clayey SAND, brown.		
Test Procedure :	AS 1289.3.6.3	- Variations to test method a)assumed particle density used b) testing up to 24 hours	
Prepared by :	KB	Checked by	AH

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Nick Farrer
Approved Signatory

Senior Technical Officer
NATA Accred. No. : 1961

Golder Form No. R08 Hydrometer
RL3 - 09/03/2012

APPENDIX B3:E

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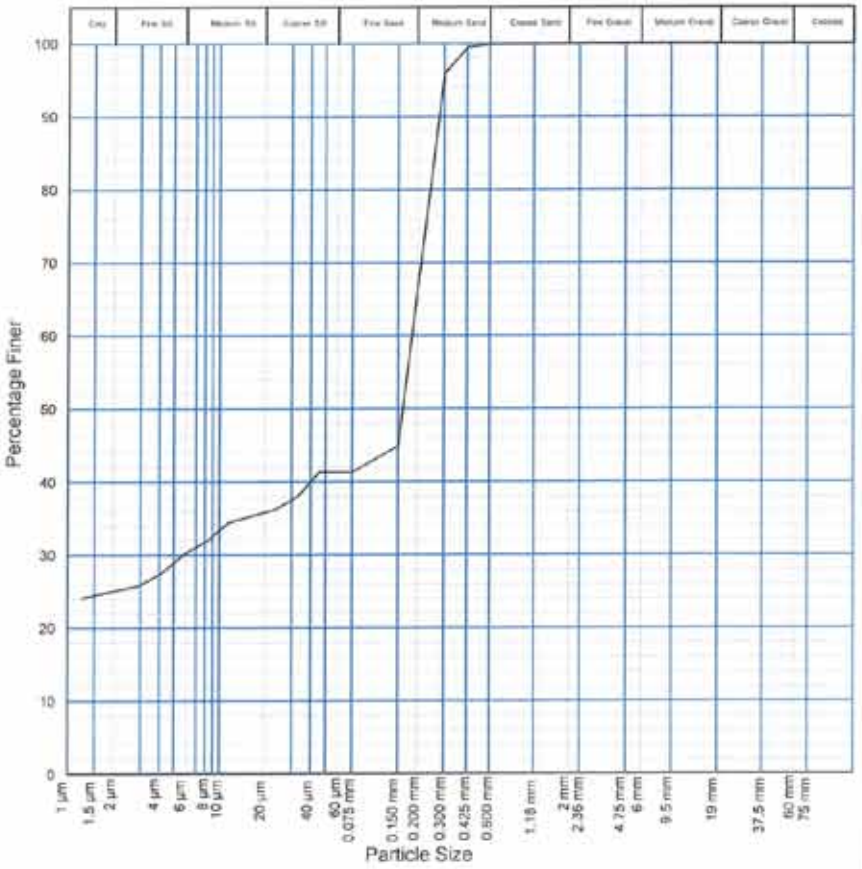
PARTICLE SIZE DISTRIBUTION BY HYDROMETER

Client :	Sunshine Coast Council	Report No. :	R13860
Address :	11-13 Ocean Street, Maroochydore	Job No. :	127683017
Project :	SCA Expansion	Reg'n No. :	12304264
Sample ID :	TP-17 0.25-0.35m	Senders No. :	
		Date Received :	4/09/2012
		Sampled By :	GAP

SIZE FRACTIONS AS PER AUSTRALIAN STANDARDS AS 1726

Particle Size (mm)	Percent Passing
150	
75	
37.5	
19.0	
9.5	
4.75	
2.36	100.0
1.18	99.9
0.600	99.9
0.425	99.5
0.300	95.9
0.150	44.9
0.075	41.3
Particle Size (Microns)	**Percent Passing**
45.6	41.4
32.6	37.9
23.2	36.2
11.5	34.4
8.2	31.9
5.9	30.1
4.2	27.5
3.0	25.8
1.2	24.1



Pretreatment	Tested as received	Soil Particle Density (assumed)	2.70 t/m³
Loss in Pretreatment (%)	-	Type of Hydrometer	ASTM E100
Method of Dispersion	Mixer		
Material Description :	(SC) Clayey SAND, brown.		
Test Procedure :	AS 1289.3.6.3	- Variations to test method assessed particle density used to testing up to 24 hours	
Prepared by :	KB	Checked by :	GH

This document is issued in accordance with NATA's accreditation requirements

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19/9/12

Nick Farrer
Approved Signatory

Senior Technical Officer
NATA Accred. No. 1961

Golder Form No. R08 Hydrometer
RL3 - 09/03/2012

APPENDIX B3:E

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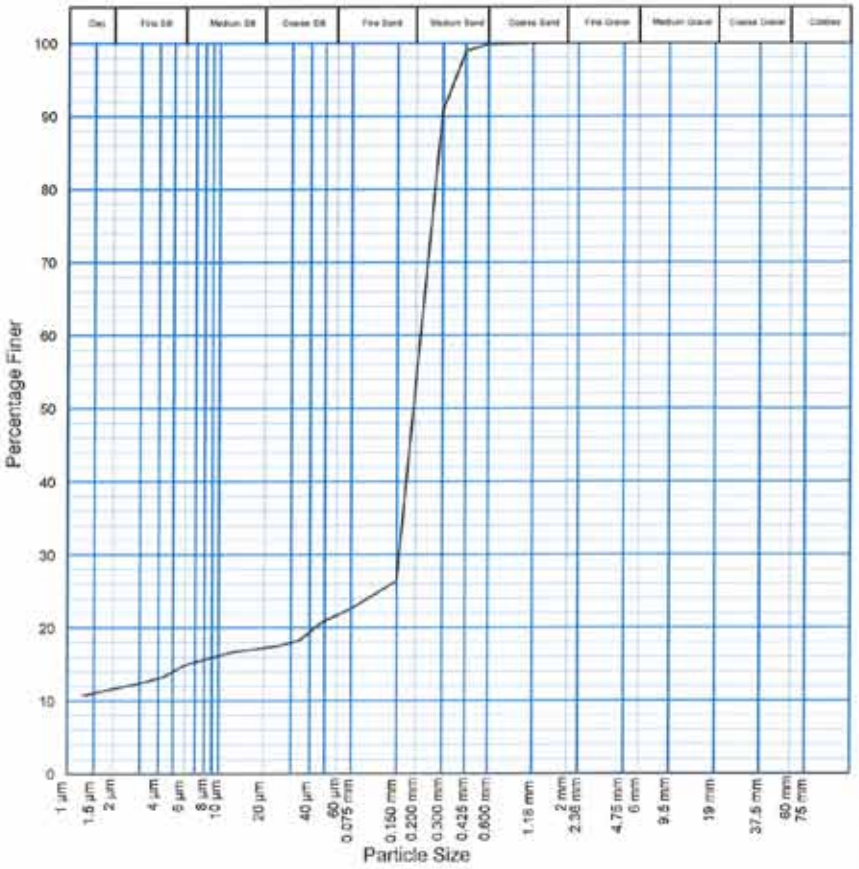
PARTICLE SIZE DISTRIBUTION BY HYDROMETER

Client :	Sunshine Coast Council	Report No. :	R13861
Address :	11-13 Ocean Street, Maroochydore	Job No. :	127683017
Project :	SCA Expansion	Reg'n No. :	12304265
Sample ID :	TP-17 0.55-0.65m	Senders No. :	
		Date Received :	4/09/2012
		Sampled By :	GAP

SIZE FRACTIONS AS PER AUSTRALIAN STANDARDS AS 1725

Particle Size (mm)	Percent Passing
150	
75	
37.5	
19.0	
9.5	
4.75	
2.36	
1.18	100.0
0.600	99.9
0.425	99.0
0.300	90.8
0.150	26.4
0.075	22.6
Particle Size (Microns)	**Percent Passing**
48.5	20.8
34.6	18.3
24.6	17.5
12.2	16.6
8.7	15.8
6.1	15.0
4.4	13.3
3.1	12.5
1.3	10.8



Pretreatment	Tested as received	Soil Particle Density (assumed)	2.70 t/m³
Loss in Pretreatment (%)	-	Type of Hydrometer	ASTM E100
Method of Dispersion	Mixer		
Material Description :	(SC) Clayey SAND, brown.		
Test Procedure :	AS 1289.3.6.3	- Variations to test method a)assumed particle density used b) testing up to 24 hours	
Prepared by :	KB	Checked by :	

This document is issued in accordance with NATA's accreditation requirements.

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Nick Farrer
Approved Signatory

Senior Technical Officer
NATA Accred. No. : 1961

Golder Form No. R08 Hydrometer
RL3 - 09/03/2012

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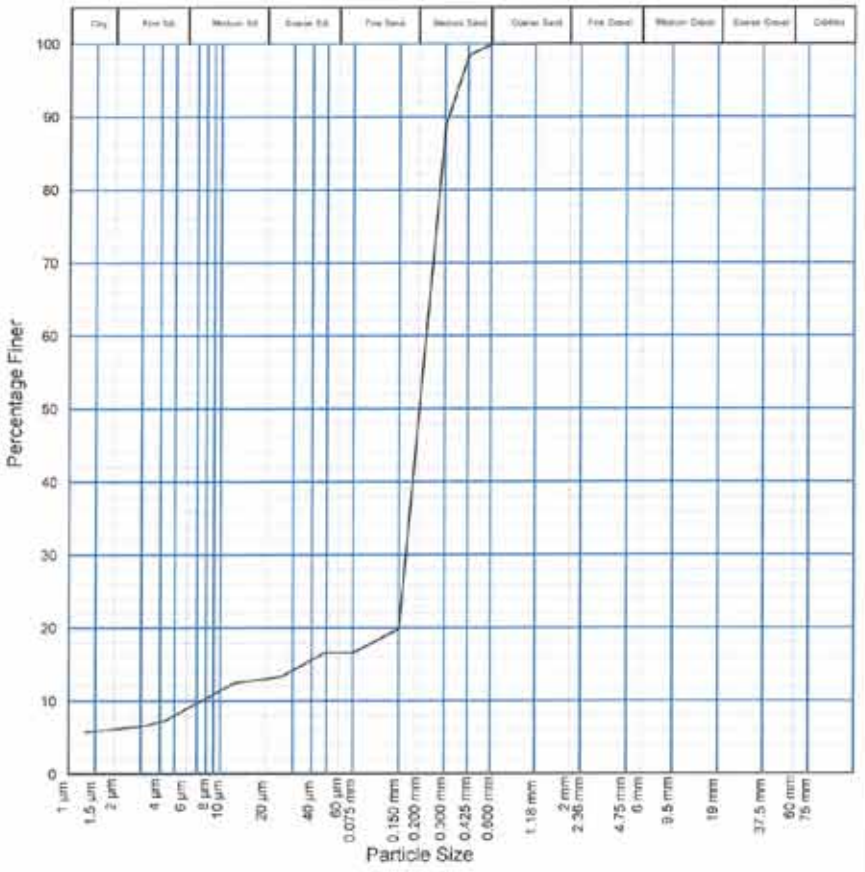
PARTICLE SIZE DISTRIBUTION BY HYDROMETER

Client :	Sunshine Coast Council	Report No. :	R13863
Address :	11-13 Ocean Street, Maroochydore	Job No. :	127683017
Project :	SCA Expansion	Reg'n No. :	12304267
Sample ID :	TP-22 0.55-0.65m	Senders No. :	
		Date Received :	4/09/2012
		Sampled By :	GAP

SIZE FRACTIONS AS PER AUSTRALIAN STANDARDS AS 1726

Particle Size (mm)	Percent Passing
150	
75	
37.5	
19.0	
9.5	
4.75	
2.36	
1.18	100.0
0.600	99.9
0.425	98.4
0.300	88.9
0.150	19.9
0.075	16.6
Particle Size (Microns)	**Percent Passing**
49.3	16.6
35.0	14.9
24.9	13.3
12.4	12.4
8.8	10.8
6.3	9.1
4.5	7.4
3.2	6.6
1.3	5.8



Pretreatment	Tested as received	Soil Particle Density (assumed)	2.70 t/m³
Loss in Pretreatment (%)	-	Type of Hydrometer	ASTM E100
Method of Dispersion	Mixer		
Material Description :	(SC) Clayey SAND, brown.		
Test Procedure :	AS 1289.3.6.3	- Variations to test method (assumed particle density used to testing up to 24 hours	
Prepared by :	KB	Checked by :	GB

This document is issued in accordance with NATA's accreditation requirements.

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19/9/12

Nick Farrer
Aporoved Signatory

Senior Technical Officer
NATA Accred. No. : 1961

Golder Form No. R08 Hydrometer
RL3 - 09/03/2012

ALS Group

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EB1223841**	Page	: 1 of 15
Amendment	: **1**		
Client	: **GOLDER ASSOCIATES**	Laboratory	: Environmental Division Brisbane
Contact	: MR NEIL UNDERHILL	Contact	: Carsten Emrich
Address	: P O BOX 1734 MILTON QLD, AUSTRALIA 4064	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: nunderhill@golder.com.au	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 07 3721 5400	Telephone	: +61 7 3243 7123
Facsimile	: +61 07 3721 5401	Facsimile	: +61 7 3243 7218
Project	: 127683017 4000	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ---		
C-O-C number	: ---	Date Samples Received	: 07-SEP-2012
Sampler	: Lyndon Gordon	Issue Date	: 24-SEP-2012
Site	: SCA Expansion Soil Assessment		
		No. of samples received	: 40
Quote number	: EN/002/11	No. of samples analysed	: 39

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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*
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
Andrew Epps	Metals Production Chemist	Stafford Minerals - AY
Matt Frost	Senior Organic Chemist	Brisbane 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

- **ED008 (Exchangeable Cations with pre-treatment): Unable to calculate Exchangeable Sodium Percent results for Sample EB1223841 - 003 (TP5 0.55-0.65m), 015 (TP14 1.1-1.2m) & 024 (TP22 0.9-1.0m) as required Calcium, Magnesium, Potassium & Sodium results are < LOR.**
- **This report has been amended following changes to the analytical data reported. The quality system is being utilised to resolve this issue. The specific data affected includes exchangeable cation results for sample EB1223841-006 (TP8 0-0.15m).**

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Client	:	GOLDER ASSOCIATES
Project	:	127683017 4000

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	TP5 0-0.15m	TP5 0.25-0.35m	TP5 0.55-0.65m	TP5 0.9-1.0m	TP5 1.1-1.2m
				Client sampling date / time	28-AUG-2012 15:00	28-AUG-2012 15:00	28-AUG-2012 15:00	28-AUG-2012 15:00	28-AUG-2012 15:00
					EB1223841-001	EB1223841-002	EB1223841-003	EB1223841-004	EB1223841-005
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit		4.9	4.4	4.8	4.9	5.6
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		8	13	5	11	11
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		3.4	20.1	12.8	18.9	20.4
ED008: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g		<0.1	0.2	<0.1	<0.1	0.7
Exchangeable Magnesium	----	0.1	meq/100g		<0.1	0.1	<0.1	0.1	1.9
Exchangeable Potassium	----	0.1	meq/100g		<0.1	<0.1	<0.1	<0.1	<0.1
Exchangeable Sodium	----	0.1	meq/100g		<0.1	<0.1	<0.1	<0.1	<0.1
Exchangeable Aluminium	----	0.1	meq/100g		<0.1	<0.1	<0.1	<0.1	<0.1
Cation Exchange Capacity	----	0.1	meq/100g		0.2	0.3	<0.1	0.2	2.6
Exchangeable Sodium Percent	----	0.1	%		<0.1	2.8	----	<0.1	0.7
ED022: Acid Extractable Pottasium (Skene)									
Acid Extractable K (Skene)	----	100	mg/kg		<100	----	----	----	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	----	----	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	----	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	10	<10
ED092: DTPA Extractable Metals									
Copper	7440-50-8	1.00	mg/kg		<1.00	----	----	----	----
Iron	7439-89-6	1.00	mg/kg		55.2	----	----	----	----
Manganese	7439-96-5	1.00	mg/kg		1.31	----	----	----	----
Zinc	7440-66-6	1.00	mg/kg		<1.00	----	----	----	----
ED093S: Soluble Major Cations									
Calcium	7440-70-2	10	mg/kg		<10	----	----	----	----
Magnesium	7439-95-4	10	mg/kg		<10	----	----	----	----
Sodium	7440-23-5	10	mg/kg		<10	----	----	----	----
Potassium	7440-09-7	10	mg/kg		<10	----	----	----	----
EG005T: Total Metals by ICP-AES									
Potassium	7440-09-7	50	mg/kg		<50	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP5 0-0.15m	TP5 0.25-0.35m	TP5 0.55-0.65m	TP5 0.9-1.0m	TP5 1.1-1.2m
			Client sampling date / time	28-AUG-2012 15:00	28-AUG-2012 15:00	28-AUG-2012 15:00	28-AUG-2012 15:00	28-AUG-2012 15:00
Compound	CAS Number	LOR	Unit	EB1223841-001	EB1223841-002	EB1223841-003	EB1223841-004	EB1223841-005
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	1.4	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	290	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	290	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	22	----	----	----	----
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	2	mg/kg	<2	----	----	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	1.1	----	----	----	----

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Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	TP8 0-0.15m	TP8 0.25-0.35m	TP8 0.55-0.65m	TP8 0.9-1.0m	TP8 1.1-1.2m
				Client sampling date / time	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00
					EB1223841-006	EB1223841-007	EB1223841-008	EB1223841-009	EB1223841-010
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit		4.4	4.6	4.6	4.8	4.9
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		17	6	8	9	15
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		22.2	13.1	18.0	19.1	18.1
ED008: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g		0.2	<0.1	<0.1	<0.1	0.4
Exchangeable Magnesium	----	0.1	meq/100g		1.0	0.3	<0.1	0.2	1.2
Exchangeable Potassium	----	0.1	meq/100g		<0.1	<0.1	<0.1	<0.1	<0.1
Exchangeable Sodium	----	0.1	meq/100g		<0.1	<0.1	<0.1	<0.1	<0.1
Exchangeable Aluminium	----	0.1	meq/100g		<0.1	<0.1	<0.1	<0.1	<0.1
Cation Exchange Capacity	----	0.1	meq/100g		1.3	0.4	<0.1	0.3	1.5
Exchangeable Sodium Percent	----	0.1	%		3.3	<0.1	<0.1	<0.1	0.7
ED022: Acid Extractable Pottasium (Skene)									
Acid Extractable K (Skene)	----	100	mg/kg		<100	----	----	----	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	----	----	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.04	----	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	10	mg/kg		10	<10	<10	<10	<10
ED092: DTPA Extractable Metals									
Copper	7440-50-8	1.00	mg/kg		<1.00	----	----	----	----
Iron	7439-89-6	1.00	mg/kg		90.4	----	----	----	----
Manganese	7439-96-5	1.00	mg/kg		<1.00	----	----	----	----
Zinc	7440-66-6	1.00	mg/kg		<1.00	----	----	----	----
ED093S: Soluble Major Cations									
Calcium	7440-70-2	10	mg/kg		<10	----	----	----	----
Magnesium	7439-95-4	10	mg/kg		<10	----	----	----	----
Sodium	7440-23-5	10	mg/kg		<10	----	----	----	----
Potassium	7440-09-7	10	mg/kg		<10	----	----	----	----
EG005T: Total Metals by ICP-AES									
Potassium	7440-09-7	50	mg/kg		<50	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP8 0-0.15m	TP8 0.25-0.35m	TP8 0.55-0.65m	TP8 0.9-1.0m	TP8 1.1-1.2m
			Client sampling date / time	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00
Compound	CAS Number	LOR	Unit	EB1223841-006	EB1223841-007	EB1223841-008	EB1223841-009	EB1223841-010
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	**1840**	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	**1840**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	**41**	----	----	----	----
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	2	mg/kg	<2	----	----	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	**7.6**	----	----	----	----

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Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	TP14 0-0.15m	TP14 0.25-0.35m	TP14 0.55-0.65m	TP14 0.9-1.0m	TP14 1.1-1.2m
				Client sampling date / time	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00
					EB1223841-011	EB1223841-012	EB1223841-013	EB1223841-014	EB1223841-015
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit		5.2	5.2	5.3	5.3	5.1
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		25	31	22	4	4
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		24.6	23.4	20.1	15.6	13.2
ED008: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g		0.6	0.9	0.4	<0.1	<0.1
Exchangeable Magnesium	----	0.1	meq/100g		1.0	0.8	2.3	<0.1	<0.1
Exchangeable Potassium	----	0.1	meq/100g		<0.1	<0.1	<0.1	<0.1	<0.1
Exchangeable Sodium	----	0.1	meq/100g		0.2	0.2	0.2	<0.1	<0.1
Exchangeable Aluminium	----	0.1	meq/100g		0.8	0.8	<0.1	<0.1	<0.1
Cation Exchange Capacity	----	0.1	meq/100g		1.8	1.9	3.0	<0.1	<0.1
Exchangeable Sodium Percent	----	0.1	%		9.5	8.4	7.1	<0.1	----
ED022: Acid Extractable Pottasium (Skene)									
Acid Extractable K (Skene)	----	100	mg/kg		100	----	----	----	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		30	----	----	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.04	----	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	10	mg/kg		<10	20	<10	<10	<10
ED092: DTPA Extractable Metals									
Copper	7440-50-8	1.00	mg/kg		<1.00	----	----	----	----
Iron	7439-89-6	1.00	mg/kg		181	----	----	----	----
Manganese	7439-96-5	1.00	mg/kg		<1.00	----	----	----	----
Zinc	7440-66-6	1.00	mg/kg		<1.00	----	----	----	----
ED093S: Soluble Major Cations									
Calcium	7440-70-2	10	mg/kg		<10	----	----	----	----
Magnesium	7439-95-4	10	mg/kg		<10	----	----	----	----
Sodium	7440-23-5	10	mg/kg		20	----	----	----	----
Potassium	7440-09-7	10	mg/kg		<10	----	----	----	----
EG005T: Total Metals by ICP-AES									
Potassium	7440-09-7	50	mg/kg		240	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP14 0-0.15m	TP14 0.25-0.35m	TP14 0.55-0.65m	TP14 0.9-1.0m	TP14 1.1-1.2m
			Client sampling date / time	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00
Compound	CAS Number	LOR	Unit	EB1223841-011	EB1223841-012	EB1223841-013	EB1223841-014	EB1223841-015
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	1.5	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1650	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1650	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	170	----	----	----	----
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	2	mg/kg	25	----	----	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	5.3	----	----	----	----

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Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	TP17 0-0.15m	TP17 0.25-0.35m	TP17 0.55-0.65m	TP17 0.9-1.0m	TP17 1.1-1.2m
				Client sampling date / time	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00
					EB1223841-016	EB1223841-017	EB1223841-018	EB1223841-019	EB1223841-020
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit		5.5	4.5	6.1	6.6	6.1
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		445	565	1170	1010	1120
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		25.4	18.2	23.7	23.1	36.0
ED008: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g		3.5	1.0	1.0	1.2	1.2
Exchangeable Magnesium	----	0.1	meq/100g		3.2	2.8	2.9	3.1	1.6
Exchangeable Potassium	----	0.1	meq/100g		0.2	0.2	0.2	0.2	<0.1
Exchangeable Sodium	----	0.1	meq/100g		0.9	0.5	0.3	0.4	<0.1
Exchangeable Aluminium	----	0.1	meq/100g		0.2	0.3	0.2	0.2	0.2
Cation Exchange Capacity	----	0.1	meq/100g		7.8	4.4	4.4	4.9	2.9
Exchangeable Sodium Percent	----	0.1	%		11.3	11.7	7.3	8.8	2.4
ED022: Acid Extractable Pottasium (Skene)									
Acid Extractable K (Skene)	----	100	mg/kg		300	----	----	----	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		190	----	----	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.07	----	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	10	mg/kg		860	1620	2250	1940	2460
ED092: DTPA Extractable Metals									
Copper	7440-50-8	1.00	mg/kg		<1.00	----	----	----	----
Iron	7439-89-6	1.00	mg/kg		249	----	----	----	----
Manganese	7439-96-5	1.00	mg/kg		<1.00	----	----	----	----
Zinc	7440-66-6	1.00	mg/kg		<1.00	----	----	----	----
ED093S: Soluble Major Cations									
Calcium	7440-70-2	10	mg/kg		10	----	----	----	----
Magnesium	7439-95-4	10	mg/kg		10	----	----	----	----
Sodium	7440-23-5	10	mg/kg		540	----	----	----	----
Potassium	7440-09-7	10	mg/kg		<10	----	----	----	----
EG005T: Total Metals by ICP-AES									
Potassium	7440-09-7	50	mg/kg		400	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP17 0-0.15m	TP17 0.25-0.35m	TP17 0.55-0.65m	TP17 0.9-1.0m	TP17 1.1-1.2m
			Client sampling date / time	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00
Compound	CAS Number	LOR	Unit	EB1223841-016	EB1223841-017	EB1223841-018	EB1223841-019	EB1223841-020
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.6	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1740	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1740	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	306	----	----	----	----
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	2	mg/kg	47	----	----	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	6.5	----	----	----	----

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Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	TP22 0-0.15m	TP22 0.3-0.4m	TP22 0.55-0.65m	TP22 0.9-1.0m	TP22 1.1-1.2m
				Client sampling date / time	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00
					EB1223841-021	EB1223841-022	EB1223841-023	EB1223841-024	EB1223841-025
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit		4.7	5.2	5.5	5.2	4.9
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		13	16	8	4	16
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		29.9	29.2	17.8	12.2	19.5
ED008: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g		1.1	0.6	0.5	<0.1	<0.1
Exchangeable Magnesium	----	0.1	meq/100g		1.5	2.4	1.3	<0.1	<0.1
Exchangeable Potassium	----	0.1	meq/100g		0.2	0.1	<0.1	<0.1	<0.1
Exchangeable Sodium	----	0.1	meq/100g		0.1	0.1	<0.1	<0.1	<0.1
Exchangeable Aluminium	----	0.1	meq/100g		0.8	0.8	0.2	<0.1	<0.1
Cation Exchange Capacity	----	0.1	meq/100g		2.9	3.2	1.8	<0.1	<0.1
Exchangeable Sodium Percent	----	0.1	%		4.1	3.6	1.4	----	<0.1
ED022: Acid Extractable Pottasium (Skene)									
Acid Extractable K (Skene)	----	100	mg/kg		200	----	----	----	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	----	----	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.05	----	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
ED092: DTPA Extractable Metals									
Copper	7440-50-8	1.00	mg/kg		<1.00	----	----	----	----
Iron	7439-89-6	1.00	mg/kg		235	----	----	----	----
Manganese	7439-96-5	1.00	mg/kg		<1.00	----	----	----	----
Zinc	7440-66-6	1.00	mg/kg		<1.00	----	----	----	----
ED093S: Soluble Major Cations									
Calcium	7440-70-2	10	mg/kg		<10	----	----	----	----
Magnesium	7439-95-4	10	mg/kg		<10	----	----	----	----
Sodium	7440-23-5	10	mg/kg		10	----	----	----	----
Potassium	7440-09-7	10	mg/kg		<10	----	----	----	----
EG005T: Total Metals by ICP-AES									
Potassium	7440-09-7	50	mg/kg		460	----	----	----	----

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Client	:	GOLDER ASSOCIATES
Project	:	127683017 4000

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP22 0-0.15m	TP22 0.3-0.4m	TP22 0.55-0.65m	TP22 0.9-1.0m	TP22 1.1-1.2m
			Client sampling date / time	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00
Compound	CAS Number	LOR	Unit	EB1223841-021	EB1223841-022	EB1223841-023	EB1223841-024	EB1223841-025
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	1.2	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	3030	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	3030	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	375	----	----	----	----
EK080: Bicarbonate Extractable Phosphorus (Colwell)								
Bicarbonate Ext. P (Colwell)	----	2	mg/kg	27	----	----	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	7.2	----	----	----	----

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Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	TP16 0.25-0.35m	TP16 0.5-0.6m	TP21 0.35-0.45m	TP21 0.55-0.65m	TP23 0.2-0.3m
				Client sampling date / time	28-AUG-2012 15:00	28-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	28-AUG-2012 15:00
					EB1223841-026	EB1223841-027	EB1223841-028	EB1223841-029	EB1223841-030
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit		4.7	4.7	4.5	4.9	4.6
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		12	14	16	6	6

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Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	TP23 0.55-0.65m	TP2 0.25-0.35m	TP2 0.55-0.65m	TP11 0.20-0.30m	TP11 0.55-0.65m
				Client sampling date / time	28-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	27-AUG-2012 15:00	27-AUG-2012 15:00
					EB1223841-031	EB1223841-032	EB1223841-033	EB1223841-034	EB1223841-035
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit		**4.6**	**4.7**	**4.4**	**4.3**	**4.4**
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		**10**	**6**	**7**	**22**	**10**

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP18 0.25-0.35m	TP18 0.55-0.65m	TP19 0.25-0.35m	TP19 0.50-060m	-----
			Client sampling date / time	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	29-AUG-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1223841-036	EB1223841-037	EB1223841-038	EB1223841-039	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	4.5	5.2	4.7	4.7	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	40	36	34	27	----

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EB1223841**	Page	: 1 of 8
Amendment	: **1**		
Client	: **GOLDER ASSOCIATES**	Laboratory	: Environmental Division Brisbane
Contact	: MR NEIL UNDERHILL	Contact	: Carsten Emrich
Address	: P O BOX 1734 MILTON QLD, AUSTRALIA 4064	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: nunderhill@golder.com.au	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 07 3721 5400	Telephone	: +61 7 3243 7123
Facsimile	: +61 07 3721 5401	Facsimile	: +61 7 3243 7218
Project	: 127683017 4000	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: SCA Expansion Soil Assessment		
C-O-C number	: ----	Date Samples Received	: 07-SEP-2012
Sampler	: Lyndon Gordon	Issue Date	: 24-SEP-2012
Order number	: ----		
		No. of samples received	: 40
Quote number	: EN/002/11	No. of samples analysed	: 39

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

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

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*
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
Andrew Epps	Metals Production Chemist	Stafford Minerals - AY
Matt Frost	Senior Organic Chemist	Brisbane Inorganics

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Work Order	:	EB1223841 Amendment 1
Client	:	GOLDER ASSOCIATES
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General Comments

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

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

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

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

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

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Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA002 : pH (Soils) (QC Lot: 2490950)									
EB1223841-001	TP5 0-0.15m	EA002: pH Value	----	0.1	pH Unit	4.9	4.8	0.0	0% - 20%
EB1223841-011	TP14 0-0.15m	EA002: pH Value	----	0.1	pH Unit	5.2	5.3	0.0	0% - 20%
EA002 : pH (Soils) (QC Lot: 2490956)									
EB1223841-021	TP22 0-0.15m	EA002: pH Value	----	0.1	pH Unit	4.7	5.1	7.7	0% - 20%
EB1223841-031	TP23 0.55-0.65m	EA002: pH Value	----	0.1	pH Unit	4.6	4.5	0.0	0% - 20%
EA010: Conductivity (QC Lot: 2490952)									
EB1223841-001	TP5 0-0.15m	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	8	9	11.8	No Limit
EB1223841-011	TP14 0-0.15m	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	25	25	0.0	0% - 20%
EA010: Conductivity (QC Lot: 2490958)									
EB1223841-021	TP22 0-0.15m	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	13	13	0.0	0% - 50%
EB1223841-031	TP23 0.55-0.65m	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	10	11	9.5	0% - 50%
EA055: Moisture Content (QC Lot: 2490948)									
EB1223801-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	34.0	31.4	7.9	0% - 20%
EB1223841-006	TP8 0-0.15m	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	22.2	22.0	1.3	0% - 20%
EA055: Moisture Content (QC Lot: 2490949)									
EB1223841-019	TP17 0.9-1.0m	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	23.1	20.8	10.6	0% - 20%
EB1223841-025	TP22 1.1-1.2m	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	19.5	20.4	4.4	0% - 20%
ED008: Exchangeable Cations (QC Lot: 2491026)									
EB1223841-001	TP5 0-0.15m	ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
EB1223841-009	TP8 0.9-1.0m	ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	0.2	0.3	0.0	No Limit
		ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
ED008: Exchangeable Cations (QC Lot: 2491027)									
EB1223841-021	TP22 0-0.15m	ED008: Exchangeable Calcium	----	0.1	meq/100g	1.1	1.2	0.0	0% - 50%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	1.5	1.5	0.0	0% - 50%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.0	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.1	0.1	0.0	No Limit
		ED008: Exchangeable Aluminium	----	0.1	meq/100g	0.8	0.8	0.0	No Limit

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Project : 127683017 4000

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 (%)
ED008: Exchangeable Cations (QC Lot: 2508582)									
EB1223841-006	TP8 0-0.15m	ED008: Exchangeable Calcium	----	0.1	meq/100g	0.2	0.2	0.0	No Limit
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	1.0	1.0	0.0	0% - 50%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
ED022 : Acid Extractable Potassium (Skene) (QC Lot: 2494055)									
EB1223841-001	TP5 0-0.15m	ED022: Acid Extractable K (Skene)	----	100	mg/kg	<100	<100	0.0	No Limit
ED040S: Soluble Major Anions (QC Lot: 2490951)									
EB1223841-001	TP5 0-0.15m	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	<10	0.0	No Limit
ED040S: Soluble Major Anions (QC Lot: 2490957)									
EB1223841-021	TP22 0-0.15m	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	<10	0.0	No Limit
ED042T: Total Sulfur by LECO (QC Lot: 2492157)									
EB1223841-001	TP5 0-0.15m	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.01	0.01	0.0	No Limit
ED045G: Chloride Discrete analyser (QC Lot: 2490955)									
EB1223841-001	TP5 0-0.15m	ED045G: Chloride	16887-00-6	10	mg/kg	<10	<10	0.0	No Limit
EB1223841-011	TP14 0-0.15m	ED045G: Chloride	16887-00-6	10	mg/kg	<10	<10	0.0	No Limit
ED045G: Chloride Discrete analyser (QC Lot: 2490961)									
EB1223841-021	TP22 0-0.15m	ED045G: Chloride	16887-00-6	10	mg/kg	<10	<10	0.0	No Limit
ED092: DTPA Extractable Metals (QC Lot: 2491035)									
EB1223841-001	TP5 0-0.15m	ED092: Copper	7440-50-8	1.00	mg/kg	<1.00	<1.00	0.0	No Limit
		ED092: Iron	7439-89-6	1.00	mg/kg	55.2	50.2	9.4	0% - 20%
		ED092: Manganese	7439-96-5	1.00	mg/kg	1.31	1.41	7.6	No Limit
		ED092: Zinc	7440-66-6	1.00	mg/kg	<1.00	<1.00	0.0	No Limit
ED093S: Soluble Major Cations (QC Lot: 2490953)									
EB1223841-001	TP5 0-0.15m	ED093S: Calcium	7440-70-2	10	mg/kg	<10	<10	0.0	No Limit
		ED093S: Magnesium	7439-95-4	10	mg/kg	<10	<10	0.0	No Limit
		ED093S: Sodium	7440-23-5	10	mg/kg	<10	<10	0.0	No Limit
		ED093S: Potassium	7440-09-7	10	mg/kg	<10	<10	0.0	No Limit
ED093S: Soluble Major Cations (QC Lot: 2490959)									
EB1223841-021	TP22 0-0.15m	ED093S: Calcium	7440-70-2	10	mg/kg	<10	<10	0.0	No Limit
		ED093S: Magnesium	7439-95-4	10	mg/kg	<10	<10	0.0	No Limit
		ED093S: Sodium	7440-23-5	10	mg/kg	10	10	0.0	No Limit
		ED093S: Potassium	7440-09-7	10	mg/kg	<10	<10	0.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 2490936)									
EB1223841-001	TP5 0-0.15m	EG005T: Potassium	7440-09-7	50	mg/kg	<50	<50	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2490954)									
EB1223841-001	TP5 0-0.15m	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	1.4	1.3	0.0	0% - 50%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2490960)									

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Client : GOLDER ASSOCIATES
Project : 127683017 4000

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 (%)*
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2490960) - continued									
EB1223841-021	TP22 0-0.15m	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	1.2	1.2	0.0	0% - 50%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2492781)									
EB1223841-001	TP5 0-0.15m	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	290	320	9.8	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2492782)									
EB1223841-001	TP5 0-0.15m	EK067G: Total Phosphorus as P	----	2	mg/kg	22	26	18.0	0% - 50%
EK080: Bicarbonate Extractable Phosphorus (Colwell) (QC Lot: 2492708)									
EB1223841-001	TP5 0-0.15m	EK080: Bicarbonate Ext. P (Colwell)	----	2	mg/kg	<2	<2	0.0	No Limit
EP004: Organic Matter (QC Lot: 2492714)									
EB1223841-001	TP5 0-0.15m	EP004: Organic Matter	----	0.5	%	1.1	1.2	0.0	No Limit

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

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

Sub-Matrix: **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
EA002 : pH (Soils) (QCLot: 2490950)								
EA002: pH Value	----	0.1	pH Unit	----	4.00 pH Unit	100	98	102
EA002 : pH (Soils) (QCLot: 2490956)								
EA002: pH Value	----	0.1	pH Unit	----	4.00 pH Unit	100	98	102
EA010: Conductivity (QCLot: 2490952)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	100	86	110
EA010: Conductivity (QCLot: 2490958)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	100	86	110
ED008: Exchangeable Cations (QCLot: 2491026)								
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	101	70	130
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.666 meq/100g	101	70	130
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.519 meq/100g	95.5	70	130
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.870 meq/100g	102	70	130
ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	----	----	----
ED008: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	4.055 meq/100g	100	77	130
ED008: Exchangeable Cations (QCLot: 2491027)								
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	100	70	130
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.666 meq/100g	101	70	130
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.519 meq/100g	96.2	70	130
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.870 meq/100g	102	70	130
ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	----	----	----
ED008: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	4.055 meq/100g	100	77	130
ED008: Exchangeable Cations (QCLot: 2508582)								
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	98.1	70	130
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.666 meq/100g	99.2	70	130
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.519 meq/100g	93.9	70	130
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.870 meq/100g	101	70	130
ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	----	----	----
ED008: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	4.055 meq/100g	98.6	77	130
ED022 : Acid Extractable Potassium (Skene) (QCLot: 2494055)								
ED022: Acid Extractable K (Skene)	----	100	mg/kg	<100	----	----	----	----

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Client	:	GOLDER ASSOCIATES
Project	:	127683017 4000

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
ED040S: Soluble Major Anions (QCLot: 2490951)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	476 mg/kg	105	77	117
ED040S: Soluble Major Anions (QCLot: 2490957)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	476 mg/kg	101	77	117
ED042T: Total Sulfur by LECO (QCLot: 2492157)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	100 %	112	70	130
ED045G: Chloride Discrete analyser (QCLot: 2490955)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	5000 mg/kg	90.4	77	115
ED045G: Chloride Discrete analyser (QCLot: 2490961)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	5000 mg/kg	90.8	77	115
ED092: DTPA Extractable Metals (QCLot: 2491035)								
ED092: Copper	7440-50-8	1	mg/kg	<1.00	2 mg/kg	110	70	130
ED092: Iron	7439-89-6	1	mg/kg	<1.00	5 mg/kg	109	70	130
ED092: Manganese	7439-96-5	1	mg/kg	<1.00	----	----	----	----
ED092: Zinc	7440-66-6	1	mg/kg	<1.00	2.5 mg/kg	107	70	130
ED093S: Soluble Major Cations (QCLot: 2490953)								
ED093S: Calcium	7440-70-2	10	mg/kg	<10	----	----	----	----
ED093S: Magnesium	7439-95-4	10	mg/kg	<10	----	----	----	----
ED093S: Sodium	7440-23-5	10	mg/kg	<10	----	----	----	----
ED093S: Potassium	7440-09-7	10	mg/kg	<10	----	----	----	----
ED093S: Soluble Major Cations (QCLot: 2490959)								
ED093S: Calcium	7440-70-2	10	mg/kg	<10	----	----	----	----
ED093S: Magnesium	7439-95-4	10	mg/kg	<10	----	----	----	----
ED093S: Sodium	7440-23-5	10	mg/kg	<10	----	----	----	----
ED093S: Potassium	7440-09-7	10	mg/kg	<10	----	----	----	----
EG005T: Total Metals by ICP-AES (QCLot: 2490936)								
EG005T: Potassium	7440-09-7	50	mg/kg	<50	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2490954)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.50 mg/kg	103	72	124
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2490960)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.50 mg/kg	102	72	124
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2492781)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	75.0	70	118
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2492782)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	420 mg/kg	93.8	74	124
EK080: Bicarbonate Extractable Phosphorus (Colwell) (QCLot: 2492708)								
EK080: Bicarbonate Ext. P (Colwell)	----	100	mg/kg	<100	----	----	----	----
EP004: Organic Matter (QCLot: 2492714)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Recovery Limits (%): Low	Recovery Limits (%): High
EP004: Organic Matter (QCLot: 2492714) - continued								
EP004: Organic Matter	----	0.5	%	<1.0	2.3 %	94.3	85	115

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**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Spike Recovery (%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2490954)							
EB1223841-006	TP8 0-0.15m	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.0 mg/kg	83.0	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2492781)							
EB1223841-006	TP8 0-0.15m	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	106	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2492782)							
EB1223841-006	TP8 0-0.15m	EK067G: Total Phosphorus as P	----	100 mg/kg	122	70	130

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

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2490954)										
EB1223841-006	TP8 0-0.15m	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.0 mg/kg	83.0	----	70	130	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2492781)										
EB1223841-006	TP8 0-0.15m	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	106	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2492782)										
EB1223841-006	TP8 0-0.15m	EK067G: Total Phosphorus as P	----	100 mg/kg	122	----	70	130	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EB1223841**	Page	: 1 of 13
Amendment	: **1**		
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Brisbane
Contact	: MR NEIL UNDERHILL	Contact	: Carsten Emrich
Address	: P O BOX 1734 MILTON QLD, AUSTRALIA 4064	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: nunderhill@golder.com.au	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 07 3721 5400	Telephone	: +61 7 3243 7123
Facsimile	: +61 07 3721 5401	Facsimile	: +61 7 3243 7218
Project	: 127683017 4000	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: SCA Expansion Soil Assessment		
C-O-C number	: ----	Date Samples Received	: 07-SEP-2012
Sampler	: Lyndon Gordon	Issue Date	: 24-SEP-2012
Order number	: ----		
		No. of samples received	: 40
Quote number	: EN/002/11	No. of samples analysed	: 39

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

This Interpretive Quality Control Report contains the following information:

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

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Work Order	: EB1223841 Amendment 1
Client	: GOLDER ASSOCIATES
Project	: 127683017 4000

Analysis Holding Time Compliance

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA002 : pH (Soils)								
Snap Lock Bag (EA002)								
TP11 0.20-0.30m,	TP11 0.55-0.65m	**27-AUG-2012**	**11-SEP-2012**	03-SEP-2012	×	**12-SEP-2012**	11-SEP-2012	×
Snap Lock Bag (EA002)								
TP5 0-0.15m,	TP5 0.25-0.35m,	**28-AUG-2012**	**11-SEP-2012**	04-SEP-2012	×	**12-SEP-2012**	11-SEP-2012	×
TP5 0.55-0.65m,	TP5 0.9-1.0m,							
TP5 1.1-1.2m,	TP16 0.25-0.35m,							
TP16 0.5-0.6m,	TP23 0.2-0.3m,							
TP23 0.55-0.65m								
Snap Lock Bag (EA002)								
TP8 0-0.15m,	TP8 0.25-0.35m,	**29-AUG-2012**	**11-SEP-2012**	05-SEP-2012	×	**12-SEP-2012**	11-SEP-2012	×
TP8 0.55-0.65m,	TP8 0.9-1.0m,							
TP8 1.1-1.2m,	TP14 0-0.15m,							
TP14 0.25-0.35m,	TP14 0.55-0.65m,							
TP14 0.9-1.0m,	TP14 1.1-1.2m,							
TP17 0-0.15m,	TP17 0.25-0.35m,							
TP17 0.55-0.65m,	TP17 0.9-1.0m,							
TP17 1.1-1.2m,	TP22 0-0.15m,							
TP22 0.3-0.4m,	TP22 0.55-0.65m,							
TP22 0.9-1.0m,	TP22 1.1-1.2m,							
TP21 0.35-0.45m,	TP21 0.55-0.65m,							
TP2 0.25-0.35m,	TP2 0.55-0.65m,							
TP18 0.25-0.35m,	TP18 0.55-0.65m,							
TP19 0.25-0.35m,	TP19 0.50-060m							

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Project : 127683017 4000

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
EA010: Conductivity								
Snap Lock Bag (EA010)								
TP11 0.20-0.30m,	TP11 0.55-0.65m	**27-AUG-2012**	**11-SEP-2012**	03-SEP-2012	×	**12-SEP-2012**	09-OCT-2012	✓
Snap Lock Bag (EA010)								
TP5 0-0.15m,	TP5 0.25-0.35m,	**28-AUG-2012**	**11-SEP-2012**	04-SEP-2012	×	**12-SEP-2012**	09-OCT-2012	✓
TP5 0.55-0.65m,	TP5 0.9-1.0m,							
TP5 1.1-1.2m,	TP16 0.25-0.35m,							
TP16 0.5-0.6m,	TP23 0.2-0.3m,							
TP23 0.55-0.65m								
Snap Lock Bag (EA010)								
TP8 0-0.15m,	TP8 0.25-0.35m,	**29-AUG-2012**	**11-SEP-2012**	05-SEP-2012	×	**12-SEP-2012**	09-OCT-2012	✓
TP8 0.55-0.65m,	TP8 0.9-1.0m,							
TP8 1.1-1.2m,	TP14 0-0.15m,							
TP14 0.25-0.35m,	TP14 0.55-0.65m,							
TP14 0.9-1.0m,	TP14 1.1-1.2m,							
TP17 0-0.15m,	TP17 0.25-0.35m,							
TP17 0.55-0.65m,	TP17 0.9-1.0m,							
TP17 1.1-1.2m,	TP22 0-0.15m,							
TP22 0.3-0.4m,	TP22 0.55-0.65m,							
TP22 0.9-1.0m,	TP22 1.1-1.2m,							
TP21 0.35-0.45m,	TP21 0.55-0.65m,							
TP2 0.25-0.35m,	TP2 0.55-0.65m,							
TP18 0.25-0.35m,	TP18 0.55-0.65m,							
TP19 0.25-0.35m,	TP19 0.50-060m							
EA055: Moisture Content								
Snap Lock Bag (EA055-103)								
TP5 0-0.15m,	TP5 0.25-0.35m,	**28-AUG-2012**	**----**	----	----	**10-SEP-2012**	11-SEP-2012	✓
TP5 0.55-0.65m,	TP5 0.9-1.0m,							
TP5 1.1-1.2m								
Snap Lock Bag (EA055-103)								
TP8 0-0.15m,	TP8 0.25-0.35m,	**29-AUG-2012**	**----**	----	----	**10-SEP-2012**	12-SEP-2012	✓
TP8 0.55-0.65m,	TP8 0.9-1.0m,							
TP8 1.1-1.2m,	TP14 0-0.15m,							
TP14 0.25-0.35m,	TP14 0.55-0.65m,							
TP14 0.9-1.0m,	TP14 1.1-1.2m,							
TP17 0-0.15m,	TP17 0.25-0.35m,							
TP17 0.55-0.65m,	TP17 0.9-1.0m,							
TP17 1.1-1.2m,	TP22 0-0.15m,							
TP22 0.3-0.4m,	TP22 0.55-0.65m,							
TP22 0.9-1.0m,	TP22 1.1-1.2m							

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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
ED008: Exchangeable Cations								
Snap Lock Bag (ED008)								
TP5 0-0.15m,	TP5 0.25-0.35m,	**28-AUG-2012**	**12-SEP-2012**	25-SEP-2012	✓	**13-SEP-2012**	25-SEP-2012	✓
TP5 0.55-0.65m,	TP5 0.9-1.0m,							
TP5 1.1-1.2m								
Snap Lock Bag (ED008)								
TP8 0-0.15m,	TP8 0.25-0.35m,	**29-AUG-2012**	**12-SEP-2012**	26-SEP-2012	✓	**13-SEP-2012**	26-SEP-2012	✓
TP8 0.55-0.65m,	TP8 0.9-1.0m,							
TP8 1.1-1.2m,	TP14 0-0.15m,							
TP14 0.25-0.35m,	TP14 0.55-0.65m,							
TP14 0.9-1.0m,	TP14 1.1-1.2m,							
TP17 0-0.15m,	TP17 0.25-0.35m,							
TP17 0.55-0.65m,	TP17 0.9-1.0m,							
TP17 1.1-1.2m,	TP22 0-0.15m,							
TP22 0.3-0.4m,	TP22 0.55-0.65m,							
TP22 0.9-1.0m,	TP22 1.1-1.2m							
ED022: Acid Extractable Pottasium (Skene)								
Snap Lock Bag (ED022)								
TP5 0-0.15m		**28-AUG-2012**	**----**	----	----	**12-SEP-2012**	24-FEB-2013	✓
Snap Lock Bag (ED022)								
TP8 0-0.15m,	TP14 0-0.15m,	**29-AUG-2012**	**----**	----	----	**12-SEP-2012**	25-FEB-2013	✓
TP17 0-0.15m,	TP22 0-0.15m							
ED040S : Soluble Sulfate by ICPAES								
Snap Lock Bag (ED040S)								
TP5 0-0.15m		**28-AUG-2012**	**11-SEP-2012**	04-SEP-2012	×	**12-SEP-2012**	09-OCT-2012	✓
Snap Lock Bag (ED040S)								
TP8 0-0.15m,	TP14 0-0.15m,	**29-AUG-2012**	**11-SEP-2012**	05-SEP-2012	×	**12-SEP-2012**	09-OCT-2012	✓
TP17 0-0.15m,	TP22 0-0.15m							
ED042T: Total Sulfur by LECO								
Pulp Bag (ED042T)								
TP5 0-0.15m		**28-AUG-2012**	**11-SEP-2012**	24-FEB-2013	✓	**11-SEP-2012**	24-FEB-2013	✓
Pulp Bag (ED042T)								
TP8 0-0.15m,	TP14 0-0.15m,	**29-AUG-2012**	**11-SEP-2012**	25-FEB-2013	✓	**11-SEP-2012**	25-FEB-2013	✓
TP17 0-0.15m,	TP22 0-0.15m							

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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
ED045G: Chloride Discrete analyser								
Snap Lock Bag (ED045G)								
TP5 0-0.15m,	TP5 0.25-0.35m,	**28-AUG-2012**	**11-SEP-2012**	04-SEP-2012	×	**12-SEP-2012**	09-OCT-2012	✓
TP5 0.55-0.65m,	TP5 0.9-1.0m,							
TP5 1.1-1.2m								
Snap Lock Bag (ED045G)								
TP8 0-0.15m,	TP8 0.25-0.35m,	**29-AUG-2012**	**11-SEP-2012**	05-SEP-2012	×	**12-SEP-2012**	09-OCT-2012	✓
TP8 0.55-0.65m,	TP8 0.9-1.0m,							
TP8 1.1-1.2m,	TP14 0-0.15m,							
TP14 0.25-0.35m,	TP14 0.55-0.65m,							
TP14 0.9-1.0m,	TP14 1.1-1.2m,							
TP17 0-0.15m,	TP17 0.25-0.35m,							
TP17 0.55-0.65m,	TP17 0.9-1.0m,							
TP17 1.1-1.2m,	TP22 0-0.15m,							
TP22 0.3-0.4m,	TP22 0.55-0.65m,							
TP22 0.9-1.0m,	TP22 1.1-1.2m							
ED092: DTPA Extractable Metals								
Snap Lock Bag (ED092)								
TP5 0-0.15m		**28-AUG-2012**	**12-SEP-2012**	24-FEB-2013	✓	**13-SEP-2012**	24-FEB-2013	✓
Snap Lock Bag (ED092)								
TP8 0-0.15m,	TP14 0-0.15m,	**29-AUG-2012**	**12-SEP-2012**	25-FEB-2013	✓	**13-SEP-2012**	25-FEB-2013	✓
TP17 0-0.15m,	TP22 0-0.15m							
ED093S: Soluble Major Cations								
Snap Lock Bag (ED093S)								
TP5 0-0.15m		**28-AUG-2012**	**11-SEP-2012**	24-FEB-2013	✓	**12-SEP-2012**	24-FEB-2013	✓
Snap Lock Bag (ED093S)								
TP8 0-0.15m,	TP14 0-0.15m,	**29-AUG-2012**	**11-SEP-2012**	25-FEB-2013	✓	**12-SEP-2012**	25-FEB-2013	✓
TP17 0-0.15m,	TP22 0-0.15m							
EG005T: Total Metals by ICP-AES								
Snap Lock Bag (EG005T)								
TP5 0-0.15m		**28-AUG-2012**	**10-SEP-2012**	24-FEB-2013	✓	**11-SEP-2012**	24-FEB-2013	✓
Snap Lock Bag (EG005T)								
TP8 0-0.15m,	TP14 0-0.15m,	**29-AUG-2012**	**10-SEP-2012**	25-FEB-2013	✓	**11-SEP-2012**	25-FEB-2013	✓
TP17 0-0.15m,	TP22 0-0.15m							
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Snap Lock Bag (EK059G)								
TP5 0-0.15m		**28-AUG-2012**	**11-SEP-2012**	24-FEB-2013	✓	**12-SEP-2012**	24-FEB-2013	✓
Snap Lock Bag (EK059G)								
TP8 0-0.15m,	TP14 0-0.15m,	**29-AUG-2012**	**11-SEP-2012**	25-FEB-2013	✓	**12-SEP-2012**	25-FEB-2013	✓
TP17 0-0.15m,	TP22 0-0.15m							
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Snap Lock Bag (EK061G)								
TP5 0-0.15m		**28-AUG-2012**	**11-SEP-2012**	24-FEB-2013	✓	**14-SEP-2012**	24-FEB-2013	✓
Snap Lock Bag (EK061G)								
TP8 0-0.15m,	TP14 0-0.15m,	**29-AUG-2012**	**11-SEP-2012**	25-FEB-2013	✓	**14-SEP-2012**	25-FEB-2013	✓
TP17 0-0.15m,	TP22 0-0.15m							

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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
EK067G: Total Phosphorus as P by Discrete Analyser							
Snap Lock Bag (EK067G) TP5 0-0.15m	**28-AUG-2012**	**11-SEP-2012**	24-FEB-2013	✓	**14-SEP-2012**	24-FEB-2013	✓
Snap Lock Bag (EK067G) TP8 0-0.15m, TP14 0-0.15m, TP17 0-0.15m, TP22 0-0.15m	**29-AUG-2012**	**11-SEP-2012**	25-FEB-2013	✓	**14-SEP-2012**	25-FEB-2013	✓
EK080: Bicarbonate Extractable Phosphorus (Colwell)							
Snap Lock Bag (EK080) TP5 0-0.15m	**28-AUG-2012**	**----**	----	----	**11-SEP-2012**	24-FEB-2013	✓
Snap Lock Bag (EK080) TP8 0-0.15m, TP14 0-0.15m, TP17 0-0.15m, TP22 0-0.15m	**29-AUG-2012**	**----**	----	----	**11-SEP-2012**	25-FEB-2013	✓
EP004: Organic Matter							
Snap Lock Bag (EP004) TP5 0-0.15m	**28-AUG-2012**	**11-SEP-2012**	04-SEP-2012	×	**12-SEP-2012**	09-OCT-2012	✓
Snap Lock Bag (EP004) TP8 0-0.15m, TP14 0-0.15m, TP17 0-0.15m, TP22 0-0.15m	**29-AUG-2012**	**11-SEP-2012**	05-SEP-2012	×	**12-SEP-2012**	09-OCT-2012	✓

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Quality Control Parameter Frequency Compliance

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

Matrix: **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)							
Acid extractable K (Skene)	ED022	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Bicarbonate Extractable P (Colwell)	EK080	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Cations - soluble by ICP-AES	ED093S	2	5	**40.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride Soluble By Discrete Analyser	ED045G	3	25	**12.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
DTPA Extractable Metals	ED092	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Electrical Conductivity (1:5)	EA010	4	39	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	4	25	**16.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Anions - Soluble	ED040S	2	5	**40.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	2	5	**40.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	4	39	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	1	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	4	25	**16.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
DTPA Extractable Metals	ED092	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Electrical Conductivity (1:5)	EA010	2	39	**5.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	3	25	**12.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Anions - Soluble	ED040S	2	5	**40.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	2	5	**40.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	2	39	**5.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Acid extractable K (Skene)	ED022	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Bicarbonate Extractable P (Colwell)	EK080	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Cations - soluble by ICP-AES	ED093S	2	5	**40.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride Soluble By Discrete Analyser	ED045G	2	25	**8.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
DTPA Extractable Metals	ED092	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Electrical Conductivity (1:5)	EA010	2	39	**5.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	3	25	**12.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Anions - Soluble	ED040S	2	5	**40.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

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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) - Continued							
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	2	5	**40.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	4	**25.0**	**5.0**	✓	ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	(APHA 21st ed., 4500H+) pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (1999) Schedule B(3) (Method 103)
Electrical Conductivity (1:5)	EA010	SOIL	(APHA 21st ed., 2510) Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (1999) Schedule B(3) (Method 104)
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Exchangeable Cations with pre-treatment	ED008	SOIL	Rayment & Higginson (1992) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 301)
Acid extractable K (Skene)	ED022	SOIL	Rayment & Higginson (1992) Method 18B1 Potassium is extracted from the soil using 0.05M HCl at a 1:40 soil:solution ratio and determined by ICP.
Major Anions - Soluble	ED040S	SOIL	In-house. Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Chloride Soluble By Discrete Analyser	ED045G	SOIL	The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition 4500-Cl- E.
DTPA Extractable Metals	ED092	SOIL	Rayment and Higginson 12A1
Cations - soluble by ICP-AES	ED093S	SOIL	APHA 21st ed., 3120; USEPA SW 846 - 6010 (ICPAES) Water extracts of the soil are analyzed for major cations by ICPAES. 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 (1999) Schedule B(3)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) 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 (1999) Schedule B(3)
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	SOIL	APHA 21st ed., 4500 NO3- F. Combined oxidised Nitrogen (NO2+NO3) in a water extract is determined by Chemical Reduction, and direct colourimetry by Discrete Analyser.
TKN as N By Discrete Analyser	EK061G	SOIL	APHA 21st ed., 4500-Norg-D Soil samples are digested using Kjeldahl digestion followed by determination by Discrete Analyser.
Total Nitrogen as N (TKN + NOx) By Discrete Analyser	EK062G	SOIL	APHA 21st ed., 4500 Norg/NO3- Total Nitrogen is determined as the sum of TKN and Oxidised Nitrrogen, each determined seperately as N.
Total Phosporus By Discrete Analyser	EK067G	SOIL	APHA 21st ed., 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.
Bicarbonate Extractable P (Colwell)	EK080	SOIL	Rayment & Higginson (1992) Method 9B1 Phosphorus is extracted from the soil using 0.5M NaHCO3 at a 1:100 soil:solution ratio and determined by FIA.
Organic Matter	EP004	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (1999) Schedule B(3) (Method 105)

Preparation Methods	Method	Matrix	Method Descriptions

Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	Rayment & Higginson (1992) method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
DTPA Extraction for Cu, Zn, Mn, Fe (2 hour leach)	ED092PR	SOIL	Rayment & Higginson (1992) Method 12A1 2 hour end over end tumbler extraction with 0.005M DTPA at a ratio of 1:2. Extracts can be run by ICP for metals.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (1999) Schedule B(3) (Method 105)

Summary of Outliers

Outliers : Quality Control Samples

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

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

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

Regular Sample Surrogates

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

Outliers : Analysis Holding Time Compliance

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

Matrix: **SOIL**

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA002 : pH (Soils)							
Snap Lock Bag							
TP11 0.20-0.30m,	TP11 0.55-0.65m	11-SEP-2012	03-SEP-2012	8	12-SEP-2012	11-SEP-2012	1
Snap Lock Bag							
TP5 0-0.15m,	TP5 0.25-0.35m,	11-SEP-2012	04-SEP-2012	7	12-SEP-2012	11-SEP-2012	1
TP5 0.55-0.65m,	TP5 0.9-1.0m,						
TP5 1.1-1.2m,	TP16 0.25-0.35m,						
TP16 0.5-0.6m,	TP23 0.2-0.3m,						
TP23 0.55-0.65m							
Snap Lock Bag							
TP8 0-0.15m,	TP8 0.25-0.35m,	11-SEP-2012	05-SEP-2012	6	12-SEP-2012	11-SEP-2012	1
TP8 0.55-0.65m,	TP8 0.9-1.0m,						
TP8 1.1-1.2m,	TP14 0-0.15m,						
TP14 0.25-0.35m,	TP14 0.55-0.65m,						
TP14 0.9-1.0m,	TP14 1.1-1.2m,						
TP17 0-0.15m,	TP17 0.25-0.35m,						
TP17 0.55-0.65m,	TP17 0.9-1.0m,						
TP17 1.1-1.2m,	TP22 0-0.15m,						
TP22 0.3-0.4m,	TP22 0.55-0.65m,						
TP22 0.9-1.0m,	TP22 1.1-1.2m,						
TP21 0.35-0.45m,	TP21 0.55-0.65m,						
TP2 0.25-0.35m,	TP2 0.55-0.65m,						
TP18 0.25-0.35m,	TP18 0.55-0.65m,						
TP19 0.25-0.35m,	TP19 0.50-060m						
EA010: Conductivity							

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Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA010: Conductivity - Analysis Holding Time Compliance							
Snap Lock Bag							
TP11 0.20-0.30m,	TP11 0.55-0.65m	11-SEP-2012	03-SEP-2012	8	----	----	----
Snap Lock Bag							
TP5 0-0.15m,	TP5 0.25-0.35m,	11-SEP-2012	04-SEP-2012	7	----	----	----
TP5 0.55-0.65m,	TP5 0.9-1.0m,						
TP5 1.1-1.2m,	TP16 0.25-0.35m,						
TP16 0.5-0.6m,	TP23 0.2-0.3m,						
TP23 0.55-0.65m							
Snap Lock Bag							
TP8 0-0.15m,	TP8 0.25-0.35m,	11-SEP-2012	05-SEP-2012	6	----	----	----
TP8 0.55-0.65m,	TP8 0.9-1.0m,						
TP8 1.1-1.2m,	TP14 0-0.15m,						
TP14 0.25-0.35m,	TP14 0.55-0.65m,						
TP14 0.9-1.0m,	TP14 1.1-1.2m,						
TP17 0-0.15m,	TP17 0.25-0.35m,						
TP17 0.55-0.65m,	TP17 0.9-1.0m,						
TP17 1.1-1.2m,	TP22 0-0.15m,						
TP22 0.3-0.4m,	TP22 0.55-0.65m,						
TP22 0.9-1.0m,	TP22 1.1-1.2m,						
TP21 0.35-0.45m,	TP21 0.55-0.65m,						
TP2 0.25-0.35m,	TP2 0.55-0.65m,						
TP18 0.25-0.35m,	TP18 0.55-0.65m,						
TP19 0.25-0.35m,	TP19 0.50-060m						
ED040S : Soluble Sulfate by ICPAES							
Snap Lock Bag							
TP5 0-0.15m		11-SEP-2012	04-SEP-2012	7	----	----	----
Snap Lock Bag							
TP8 0-0.15m,	TP14 0-0.15m,	11-SEP-2012	05-SEP-2012	6	----	----	----
TP17 0-0.15m,	TP22 0-0.15m						
ED045G: Chloride Discrete analyser							
Snap Lock Bag							
TP5 0-0.15m,	TP5 0.25-0.35m,	11-SEP-2012	04-SEP-2012	7	----	----	----
TP5 0.55-0.65m,	TP5 0.9-1.0m,						
TP5 1.1-1.2m							
Snap Lock Bag							
TP8 0-0.15m,	TP8 0.25-0.35m,	11-SEP-2012	05-SEP-2012	6	----	----	----
TP8 0.55-0.65m,	TP8 0.9-1.0m,						
TP8 1.1-1.2m,	TP14 0-0.15m,						
TP14 0.25-0.35m,	TP14 0.55-0.65m,						
TP14 0.9-1.0m,	TP14 1.1-1.2m,						
TP17 0-0.15m,	TP17 0.25-0.35m,						
TP17 0.55-0.65m,	TP17 0.9-1.0m,						
TP17 1.1-1.2m,	TP22 0-0.15m,						
TP22 0.3-0.4m,	TP22 0.55-0.65m,						
TP22 0.9-1.0m,	TP22 1.1-1.2m						

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Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP004: Organic Matter						
Snap Lock Bag TP5 0-0.15m	11-SEP-2012	04-SEP-2012	**7**	----	----	----
Snap Lock Bag TP8 0-0.15m, TP14 0-0.15m, TP17 0-0.15m, TP22 0-0.15m	11-SEP-2012	05-SEP-2012	**6**	----	----	----

Outliers : Frequency of Quality Control Samples

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

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

ALS Group

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **EB1223841**		
Client	: **GOLDER ASSOCIATES**	Laboratory	: Environmental Division Brisbane
Contact	: MR NEIL UNDERHILL	Contact	: Carsten Emrich
Address	: P O BOX 1734 MILTON QLD, AUSTRALIA 4064	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: nunderhill@golder.com.au	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 07 3721 5400	Telephone	: +61 7 3243 7123
Facsimile	: +61 07 3721 5401	Facsimile	: +61 7 3243 7218
Project	: 127683017 4000	Page	: 1 of 6
Order number	: ----		
C-O-C number	: ----	Quote number	: EM2011GOLASS0405 (EN/002/11)
Site	: SCA Expansion Soil Assessment		
Sampler	: Lyndon Gordon	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 07-SEP-2012	Issue Date	: 10-SEP-2012 13:42
Client Requested Due Date	: 18-SEP-2012	Scheduled Reporting Date	: **14-SEP-2012**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 12.2, 15.3, 13.7,8°C
No. of coolers/boxes	: 3 MEDIUM	No. of samples received	: 40
Security Seal	: Intact.	No. of samples analysed	: 39

General Comments

APPENDIX B3:E

Issue Date	: 10-SEP-2012 13:42
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Work Order	: EB1223841
Client	: GOLDER ASSOCIATES

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA010 (solids): Electrical Conductivity (1:5) Electrical Conductivity (1:5)	SOIL - EA055-103 Moisture Content	SOIL - ED008 Exchangeable Cations with pre-treatment -All Parameters	SOIL - ED022 Acid Extractable K (Skene)	SOIL - ED042T Sulfur - Total as S (LECO)	SOIL - ED045G (solids) Chloride Soluble by Discrete Analyser
EB1223841-001	28-AUG-2012 15:00	TP5 0-0.15m		✓	✓	✓	✓	✓	✓	
EB1223841-002	28-AUG-2012 15:00	TP5 0.25-0.35m		✓	✓	✓	✓			✓
EB1223841-003	28-AUG-2012 15:00	TP5 0.55-0.65m		✓	✓	✓	✓			✓
EB1223841-004	28-AUG-2012 15:00	TP5 0.9-1.0m		✓	✓	✓	✓			✓
EB1223841-005	28-AUG-2012 15:00	TP5 1.1-1.2m		✓	✓	✓	✓			✓
EB1223841-006	29-AUG-2012 15:00	TP8 0-0.15m		✓	✓	✓	✓	✓	✓	
EB1223841-007	29-AUG-2012 15:00	TP8 0.25-0.35m		✓	✓	✓	✓			✓
EB1223841-008	29-AUG-2012 15:00	TP8 0.55-0.65m		✓	✓	✓	✓			✓
EB1223841-009	29-AUG-2012 15:00	TP8 0.9-1.0m		✓	✓	✓	✓			✓
EB1223841-010	29-AUG-2012 15:00	TP8 1.1-1.2m		✓	✓	✓	✓			✓
EB1223841-011	29-AUG-2012 15:00	TP14 0-0.15m		✓	✓	✓	✓	✓	✓	
EB1223841-012	29-AUG-2012 15:00	TP14 0.25-0.35m		✓	✓	✓	✓			✓
EB1223841-013	29-AUG-2012 15:00	TP14 0.55-0.65m		✓	✓	✓	✓			✓
EB1223841-014	29-AUG-2012 15:00	TP14 0.9-1.0m		✓	✓	✓	✓			✓
EB1223841-015	29-AUG-2012 15:00	TP14 1.1-1.2m		✓	✓	✓	✓			✓
EB1223841-016	29-AUG-2012 15:00	TP17 0-0.15m		✓	✓	✓	✓	✓	✓	
EB1223841-017	29-AUG-2012 15:00	TP17 0.25-0.35m		✓	✓	✓	✓			✓
EB1223841-018	29-AUG-2012 15:00	TP17 0.55-0.65m		✓	✓	✓	✓			✓
EB1223841-019	29-AUG-2012 15:00	TP17 0.9-1.0m		✓	✓	✓	✓			✓
EB1223841-020	29-AUG-2012 15:00	TP17 1.1-1.2m		✓	✓	✓	✓			✓
EB1223841-021	29-AUG-2012 15:00	TP22 0-0.15m		✓	✓	✓	✓	✓	✓	
EB1223841-022	29-AUG-2012 15:00	TP22 0.3-0.4m		✓	✓	✓	✓			✓
EB1223841-023	29-AUG-2012 15:00	TP22 0.55-0.65m		✓	✓	✓	✓			✓
EB1223841-024	29-AUG-2012 15:00	TP22 0.9-1.0m		✓	✓	✓	✓			✓
EB1223841-025	29-AUG-2012 15:00	TP22 1.1-1.2m		✓	✓	✓	✓			✓
EB1223841-026	28-AUG-2012 15:00	TP16 0.25-0.35m		✓	✓					
EB1223841-027	28-AUG-2012 15:00	TP16 0.5-0.6m		✓	✓					
EB1223841-028	29-AUG-2012 15:00	TP21 0.35-0.45m		✓	✓					
EB1223841-029	29-AUG-2012 15:00	TP21 0.55-0.65m		✓	✓					
EB1223841-030	28-AUG-2012 15:00	TP23 0.2-0.3m		✓	✓					
EB1223841-031	28-AUG-2012 15:00	TP23 0.55-0.65m		✓	✓					
EB1223841-032	29-AUG-2012 15:00	TP2 0.25-0.35m		✓	✓					
EB1223841-033	29-AUG-2012 15:00	TP2 0.55-0.65m		✓	✓					
EB1223841-034	27-AUG-2012 15:00	TP11 0.20-0.30m		✓	✓					
EB1223841-035	27-AUG-2012 15:00	TP11 0.55-0.65m		✓	✓					

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			(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA010 (solids): Electrical Conductivity (1:5) Electrical Conductivity (1:5)	SOIL - EA055-103 Moisture Content	SOIL - ED008 Exchangeable Cations with pre-treatment -All Parameters	SOIL - ED022 Acid Extractable K (Skene)	SOIL - ED042T Sulfur - Total as S (LECO)	SOIL - ED045G (solids) Chloride Soluble by Discrete Analyser
EB1223841-036	29-AUG-2012 15:00	TP18 0.25-0.35m		✓	✓					
EB1223841-037	29-AUG-2012 15:00	TP18 0.55-0.65m		✓	✓					
EB1223841-038	29-AUG-2012 15:00	TP19 0.25-0.35m		✓	✓					
EB1223841-039	29-AUG-2012 15:00	TP19 0.50-060m		✓	✓					
EB1223841-040	28-AUG-2012 15:00	TP23 0.0-0.1	✓							

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - ED092 DTPA Extractable Metals	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EK080 Bicarbonate Extractable P (Colwell)	SOIL - EP004 Organic Matter in Soil (Walkley Black)	SOIL - NT-11S Total N + Total P	SOIL - NT-1S Major Cations (Ca, Mg, Na, K)	SOIL - NT-2S Major Anions (Cl, SO4)
EB1223841-001	28-AUG-2012 15:00	TP5 0-0.15m	✓	✓	✓	✓	✓	✓	✓
EB1223841-006	29-AUG-2012 15:00	TP8 0-0.15m	✓	✓	✓	✓	✓	✓	✓
EB1223841-011	29-AUG-2012 15:00	TP14 0-0.15m	✓	✓	✓	✓	✓	✓	✓
EB1223841-016	29-AUG-2012 15:00	TP17 0-0.15m	✓	✓	✓	✓	✓	✓	✓
EB1223841-021	29-AUG-2012 15:00	TP22 0-0.15m	✓	✓	✓	✓	✓	✓	✓

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TP2 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP2 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP21 0.35-0.45m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP21 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.3-0.4m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP23 0.2-0.3m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP23 0.55-0.65m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.25-0.35m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.55-0.65m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.9-1.0m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0-0.15m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 1.1-1.2m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
ED040S: Major Anions - Soluble							
TP14 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0-0.15m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
ED045G: Chloride Soluble By Discrete Analyser							
TP14 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP14 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP14 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP14 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP14 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.3-0.4m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.25-0.35m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.55-0.65m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.9-1.0m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0-0.15m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 1.1-1.2m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
EP004: Organic Matter							
TP14 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0-0.15m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----

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Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL**

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

Method		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
EA002: pH (1:5)							
TP11 0.20-0.30m	Snap Lock Bag	03-SEP-2012	----	07-SEP-2012	×	----	----
TP11 0.55-0.65m	Snap Lock Bag	03-SEP-2012	----	07-SEP-2012	×	----	----
TP14 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP14 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP14 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP14 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP14 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP16 0.25-0.35m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP16 0.5-0.6m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP17 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP17 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP17 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP17 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP17 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP18 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP18 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP19 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP19 0.50-060m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP2 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP2 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP21 0.35-0.45m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP21 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP22 0.3-0.4m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP22 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP22 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP22 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP22 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP23 0.2-0.3m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP23 0.55-0.65m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP5 0.25-0.35m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP5 0.55-0.65m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP5 0.9-1.0m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP5 0-0.15m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP5 1.1-1.2m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP8 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP8 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP8 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP8 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP8 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
EA010: Electrical Conductivity (1:5)							
TP11 0.20-0.30m	Snap Lock Bag	03-SEP-2012	----	07-SEP-2012	×	----	----
TP11 0.55-0.65m	Snap Lock Bag	03-SEP-2012	----	07-SEP-2012	×	----	----
TP14 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP14 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP14 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP14 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP14 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP16 0.25-0.35m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP16 0.5-0.6m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	×	----	----
TP17 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP17 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP17 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP17 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP17 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP18 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP18 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP19 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----
TP19 0.50-060m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	×	----	----

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TP2 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP2 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP21 0.35-0.45m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP21 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.3-0.4m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP23 0.2-0.3m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP23 0.55-0.65m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.25-0.35m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.55-0.65m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.9-1.0m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0-0.15m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 1.1-1.2m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
ED040S: Major Anions - Soluble							
TP14 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0-0.15m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
ED045G: Chloride Soluble By Discrete Analyser							
TP14 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP14 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP14 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP14 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP14 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.3-0.4m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.25-0.35m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.55-0.65m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0.9-1.0m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0-0.15m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 1.1-1.2m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.25-0.35m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.55-0.65m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0.9-1.0m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 1.1-1.2m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
EP004: Organic Matter							
TP14 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP17 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP22 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----
TP5 0-0.15m	Snap Lock Bag	04-SEP-2012	----	07-SEP-2012	✘	----	----
TP8 0-0.15m	Snap Lock Bag	05-SEP-2012	----	07-SEP-2012	✘	----	----

Issue Date	:	10-SEP-2012 13:42
Page	:	6 of 6
Work Order	:	EB1223841
Client	:	GOLDER ASSOCIATES

Requested Deliverables

J MITCHELL		
- *AU Certificate of Analysis - NATA (COA)	Email	jmitchell@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	jmitchell@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	jmitchell@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN	Email	jmitchell@golder.com.au
- Chain of Custody (CoC) (COC)	Email	jmitchell@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	jmitchell@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	jmitchell@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	jmitchell@golder.com.au
- EDI Format - GOLDER_EXCEL (GOLDER_EXCEL)	Email	jmitchell@golder.com.au
MR LYNDON GORDON		
- *AU Certificate of Analysis - NATA (COA)	Email	lgordon@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lgordon@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lgordon@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lgordon@golder.com.au
- Chain of Custody (CoC) (COC)	Email	lgordon@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	lgordon@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	lgordon@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	lgordon@golder.com.au
- EDI Format - GOLDER_EXCEL (GOLDER_EXCEL)	Email	lgordon@golder.com.au
MR NEIL UNDERHILL		
- *AU Certificate of Analysis - NATA (COA)	Email	nunderhill@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	nunderhill@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	nunderhill@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	nunderhill@golder.com.au
- A4 - AU Tax Invoice (INV)	Email	nunderhill@golder.com.au
- Chain of Custody (CoC) (COC)	Email	nunderhill@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	nunderhill@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	nunderhill@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	nunderhill@golder.com.au
- EDI Format - GOLDER_EXCEL (GOLDER_EXCEL)	Email	nunderhill@golder.com.au
THE ACCOUNTS PAYABLE (BRISANE)		
- A4 - AU Tax Invoice (INV)	Email	apbrisbane@golder.com.au

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet ..... of .....

Project ID:	127683017/4000
Site Location:	SCA Expansion Soil Assessment
Sampled By:	Lyndon Gordon
Turnaround (Days):	7 to 10
Report Format:	HARD ☐ FAX ☐ DISK ☐ EMAIL ☑ BULLETIN BOARD ☐
Email Format:	PDF ☑ Excel ☑ Other ☐ Email Address: lgordon@golder.com.au
Quote/Order No.:	
Lab Name:	ALS

GOLDER ASSOCIATES PTY LTD
611 Coronation Drive, Toowong, Qld 4066
Phone: (07) 3721 5400
Fax: (07) 3721 5401
Invoice to be sent to PO Box 1734 Milton BC, Qld 4064
Project Manager: Neil Underhill
Contact Phone: 3721 4897
Email: jmitchell@golder.com.au

Comments/Special Instructions:

Please email to Lyndon Gordon at lgordon@golder.com.au and Josh Mitchell at jmitchell@golder.com.au

Samples from a declared Fire Ant Area: NA
Samples taken from a known Weed and or Pest Area: NA

ANALYSIS REQUIRED

	SAMPLE ID	Location & Depth	SAMPLE MATRIX	SAMPLE DATE	SAMPLE TIME	CONTAINER/ PRESERVATIVE	No CONTAINERS	POSSIBLE HIGH CONCENTRATION	EA010 - Electrical Conductivity (EC)	EA002 pH (1:5)	ED008 - CEC with pretreatment including Al - Rayment & Higginson 15A2	ED004 - ESP calculation	ED045 Water soluble Chloride	ED040 water soluble sulfate (SO_4^{2-})	ED090 - Soluble Cations (Ca, Mg, K, Na)	EK062 - Total Nitrogen	EK067 - Total Phosphorus	EK080 - Colwell Extractable P	EP004 - Organic Matter (Walkley Black)	EG005T - Total Potassium	ED022 - Potassium (acid extractable) - Skene	ED042T - Sulfur - Total as S	ED/092 / EG005F - DTPA extractable metals			
1	TP5	0-0.15m	soil	28/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
2	TP5	0.25-0.35m	soil	28/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
3	TP5	0.55-0.65m	soil	28/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
4	TP5	0.9-1.0m	soil	28/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
5	TP5	1.1-1.2m	soil	28/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
6	TP8	0-0.15m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
7	TP8	0.25-0.35m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
8	TP8	0.55-0.65m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
9	TP8	0.9-1.0m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
10	TP8	1.1-1.2m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
11	TP14	0-0.15m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
12	TP14	0.25-0.35m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
13	TP14	0.55-0.65m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
14	TP14	0.9-1.0m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
15	TP14	1.1-1.2m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
16	TP17	0-0.15m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
17	TP17	0.25-0.35m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
18	TP17	0.55-0.65m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
19	TP17	0.9-1.0m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
20	TP17	1.1-1.2m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
21	TP22	0-0.15m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
22	TP22	0.3-0.4m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
23	TP22	0.55-0.65m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
24	TP22	0.9-1.0m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
25	TP22	1.1-1.2m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x	x	x	x													
26	TP16	0.25-0.35m	soil	28/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
27	TP16	0.5-0.6m	soil	28/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
28	TP21	0.35-0.45m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
29	TP21	0.55-0.65m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
30	TP23	0.2-0.3m	soil	28/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
31	TP23	0.55-0.65m	soil	28/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
32	TP2	0.25-0.35m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
33	TP2	0.55-0.65m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
34	TP11	0.20-0.30m	soil	27/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
35	TP11	0.55-0.65m	soil	27/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
36	TP18	0.25-0.35m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
37	TP18	0.55-0.65m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
38	TP19	0.25-0.35m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																
39	TP19	0.50-0.60m	soil	29/08/2012	NA	Plastic Resealable Bag	1	NA	x	x																

SAMPLE MATRIX = Soil/Sediment/Fill/Other
SAMPLE TYPE = Composite(C)/Discrete(DC)/Disturbed(DS)/Core(CR)
HIGH CONCENTRATION: Tick box and circle expected parameters in analysis list

Container Type and Preservative Codes: P = Natural Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Acid Rinsed Jar; S = Solvent Washed Acid Rinsed Glass Bottle; VC = Hydrochloric Preserved Vial; VS = Sulphuric Acid P

	SIGNATURE	COMPANY	DATE	TIME
RELEASED BY		GOLDER		
RECEIVED BY	A Robertson	ALS	7/9/12	14:50
RELEASED BY				
RECEIVED BY				
RELEASED BY				
RECEIVED BY				

	SIGNATURE	COMPANY	DATE	TIME	Shipment Method
RELEASED BY					Shipping Ref:
RECEIVED BY					

To Be Filled Out By Analysing Laboratory — LAB BATCH NUMBER

Security Seal		Chilled		Bill to:	
Suitable Containers		Frozen		Address	
Cool Box		Ambient			

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

Golder Form No. GA_BQ-035 - Revision 8 - Date: 25/11/03

SCA land resources soil assessment COC.xlsx

Environmental Division
Brisbane
Work Order
EB1223841

Telephone : +61-7-3243 7222

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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

CLIENT:	**TURNAROUND REQUIREMENTS :** ☐ Standard TAT **(List due date):**		**FOR LABORATORY USE ONLY (Circle)**
OFFICE:	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT **(List due date):**		Custody Seal Intact? Yes / No / N/A
PROJECT:	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)**	Freeze (frozen ice bricks present upon receipt)? Yes / No / N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER:	**CONTACT PH:**	OF: 1 2 3 4 5 6 7	Other comments:

SAMPLER:	**SAMPLER MOBILE:**	**RELINQUISHED BY:**	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**				
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): N/A					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	**SAMPLE ID**	**DATE / TIME**	**MATRIX**	**TYPE & PRESERVATIVE** *(refer to codes below)*	**TOTAL BOTTLES**	EXTRA SAMPLE ON HOLD								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
EXTRA	SAMPLE													
40	TP23 0.0-0.1	28/8/12	S		1	X								
				TOTAL										

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