



**PORTS CORPORATION
QUEENSLAND**

Port of Hay Point - Capital Dredging Departure Path and Apron Areas

Sediment Sampling and Analysis Report

March 2005



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1. Introduction

1.1 Proposed Capital Dredging

Ports Corporation of Queensland (PCQ) commissioned GHD to conduct sediment sampling and analysis at the Port of Hay Point, prior to proposed capital dredging being carried out in 2006 and/or 2007. Sediment sampling and analysis was undertaken according to an approved Sampling and Analysis Plan (SAP) and provides supporting information for the assessment of an application for a Permit to Dispose of Dredge or Excavated Material at Sea under the *Environmental Protection (Sea Dumping) Act 1981* (Commonwealth). The results of sediment sampling and analysis also form part of a comprehensive Environmental Impact Study (EIS) being undertaken for the proposed capital dredging project.

PCQ is responsible for the management and development of various port facilities throughout Queensland. In this role, PCQ is responsible for the establishment and maintenance of navigable waters at the Port of Hay Point. To increase the allowable sailing draft for vessels departing the Port of Hay Point and to allow improved exit of shipping traffic, PCQ proposes to conduct capital dredging of a new departure path and apron area at the Port.

All the proposed works lie within the declared port limits of the Port of Hay Point and also within the Great Barrier Reef World Heritage Area (GBRWHA). Because the Great Barrier Reef Marine Park (GBRMP) overlaps the port limits, part of the works fall within the Marine Park, in an area which has a general use zoning. The location of the proposed dredging is shown in Figure 1 and will involve the following:

- » Provision of a ship manoeuvring apron immediately adjacent and parallel to the Dalrymple Bay Coal Terminal and Hay Point Coal Terminal berths. The apron is a minimum of 500 metres wide and will be dredged to achieve a minimum declared depth of RL -14.9 metres Lowest Astronomical Tide (LAT). The actual dredged depth will be slightly deeper and the extra maintenance depth required to maintain this minimum declared depth is being finalised. This area lies within the GBRWHA but outside the GBRMP.
- » Provision of a departure path from the apron to open waters. Prior to sampling, the exact alignment of the Departure Path could not be determined as the results of detailed seismic surveys were not available. Therefore a Departure Path Investigation Area, containing two possible alignments, was sampled. Regardless of the alignment of the Departure Path, the general configuration will be as follows. The total path length is expected to be approximately 9.5 kilometres. The path will be 500 metres wide for the first 500 metres then taper to a width of 300 metres over the next 3 kilometres. The remaining 6.6 kilometres of the departure path will be 300 metres wide and continue until a minimum natural depth of RL -14.9 metres is achieved. The majority of the path is in the GBRWHA and GBRMP, but remains within the port limits.



For descriptive purposes, the area to be dredged consists of two sites; these being the Apron Area and the Departure Path Investigation Area (Figure 1).

Final detailed calculations of the volume to be dredged were not available prior to the conduct of the sampling program, therefore, a conservative estimate of 9,000,000 m³ of seabed material was assumed. Final volumes and dimensions will be provided in the Draft EIS.

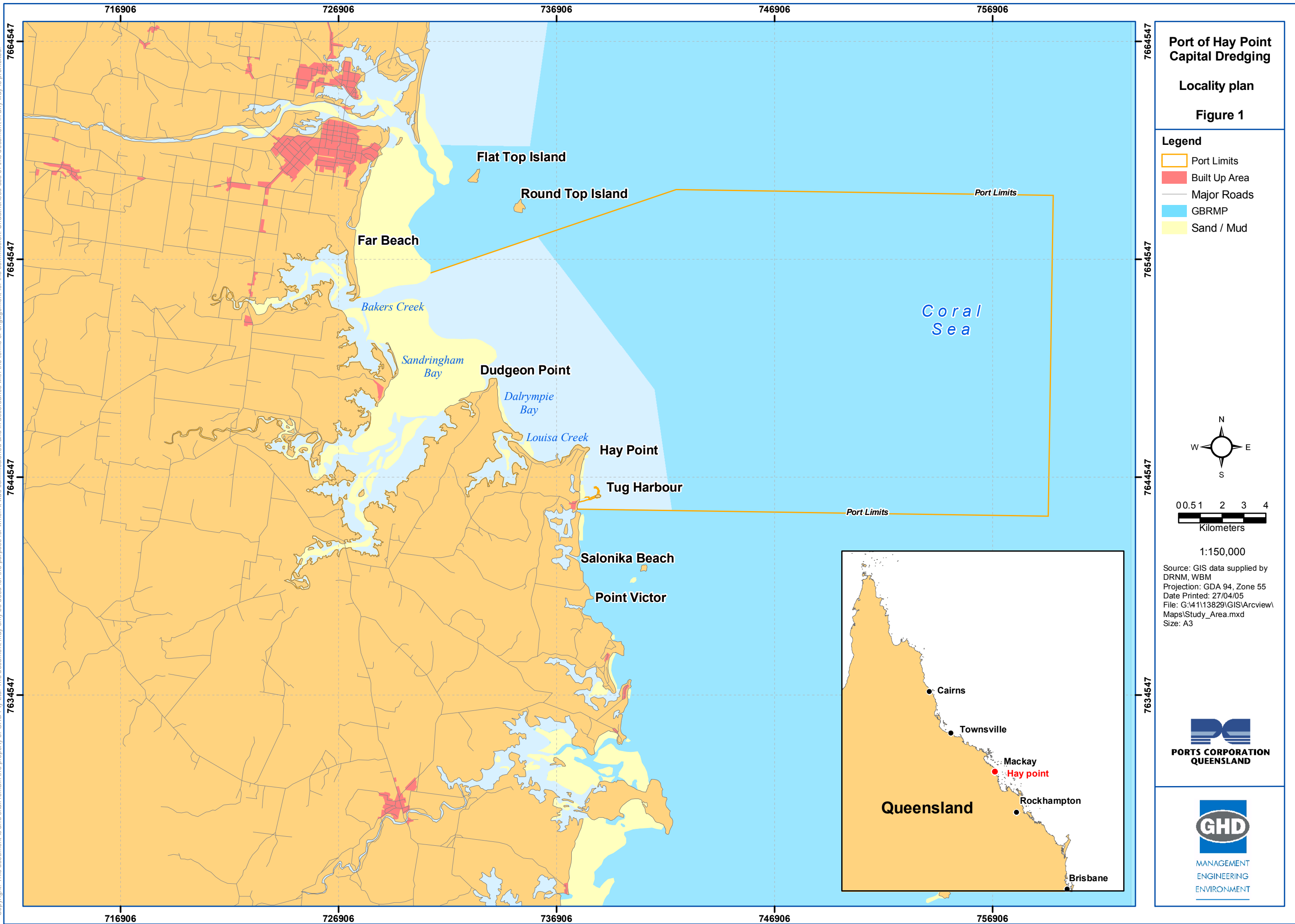
The Apron Area runs parallel to the berth facilities. The approximate dimensions of this area are:

- » Width: 571 m.
- » Length: 3,614 m.
- » Depth: presently RL -13.1m with intended depth of RL -15.2m. Depth to be dredged is ~2 m.
- » Volume: ~4,150,000 m³.

The Departure Path Investigation Area runs perpendicular to the southern end of the HPCT berths. The approximate dimensions of this area are:

- » Width: 800 m.
- » Length: 9,200 m.
- » Depth: RL -14.9 m at completion of dredging. Depth to be dredged varies between 0 m and ~2 m.
- » Volume: ~4,500,000 m³ (volume of the departure path to be dredged, not the entire investigation area).

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1.2 Requirement for Sediment Testing

Sea dumping regulations aim to protect the marine environment from pollution by contaminated dredged spoil. Physical and chemical analyses of sediment to be dredged are used to identify whether the material to be dredged is suitable for ocean disposal or requires special management. Ocean disposal of dredged material outside State and Territory waters is regulated by the Commonwealth Department of the Environment and Heritage (DEH) under the *Environment Protection (Sea Dumping) Act 1981*. To gain a permit for ocean disposal of dredged material under the *Environment Protection (Sea Dumping) Act 1981*, the National Ocean Disposal Guidelines for Dredged Material (NODGDM) (EA 2002) require that sediment be analysed for potential contaminants. The results of sediment analysis are assessed against the Interim Sediment Quality Guidelines (ISQG) (Table 5, NODGDM). The ISQG are set at two levels, low (screening) and high (maximum).

1.3 Sampling and Analysis Plan

The NODGDM (EA 2002) require the development of a Sampling and Analysis Plan (SAP) detailing the methods and protocols to be adopted when assessing the contamination status of the material to be dredged. The Port of Hay Point – Capital Dredging Departure Path and Apron Areas Sampling and Analysis Plan was prepared by GHD in accordance with the requirements of the NODGDM and was approved by DEH on 28 October 2004 (Appendix A). The SAP provides guidance for the assessment of the contamination status of the material to be dredged, including the appropriate sample collection, handling, storage and analysis methods and quality control requirements.

2. Methods

2.1 Introduction

Sampling of the Apron Area was conducted between 29 October and 5 November 2004 and sampling of the Departure Path occurred between 12 and 22 November 2004. Sampling was undertaken in accordance with the approved SAP (GHD 2004). The following sections summarise the field conditions and methodology employed to undertake this sampling.

2.2 Weather and Sea States

Weather conditions varied markedly over the sampling period. Sampling could only be conducted in seas with average wave heights up to 0.7 m. In conditions above 0.7 m and winds of greater than 15 knots, deployment and retrieval of the sampling equipment was both unsafe and ineffective. Sampling was not undertaken on 30 October, 1, 12, 13, 17 and 18 November 2004 as conditions exceeded these limits. During sampling, the calmest seas (<0.5 m) were generally experienced early in the morning with winds typically less than 15 knots and predominantly from the northeast.

2.3 Tides

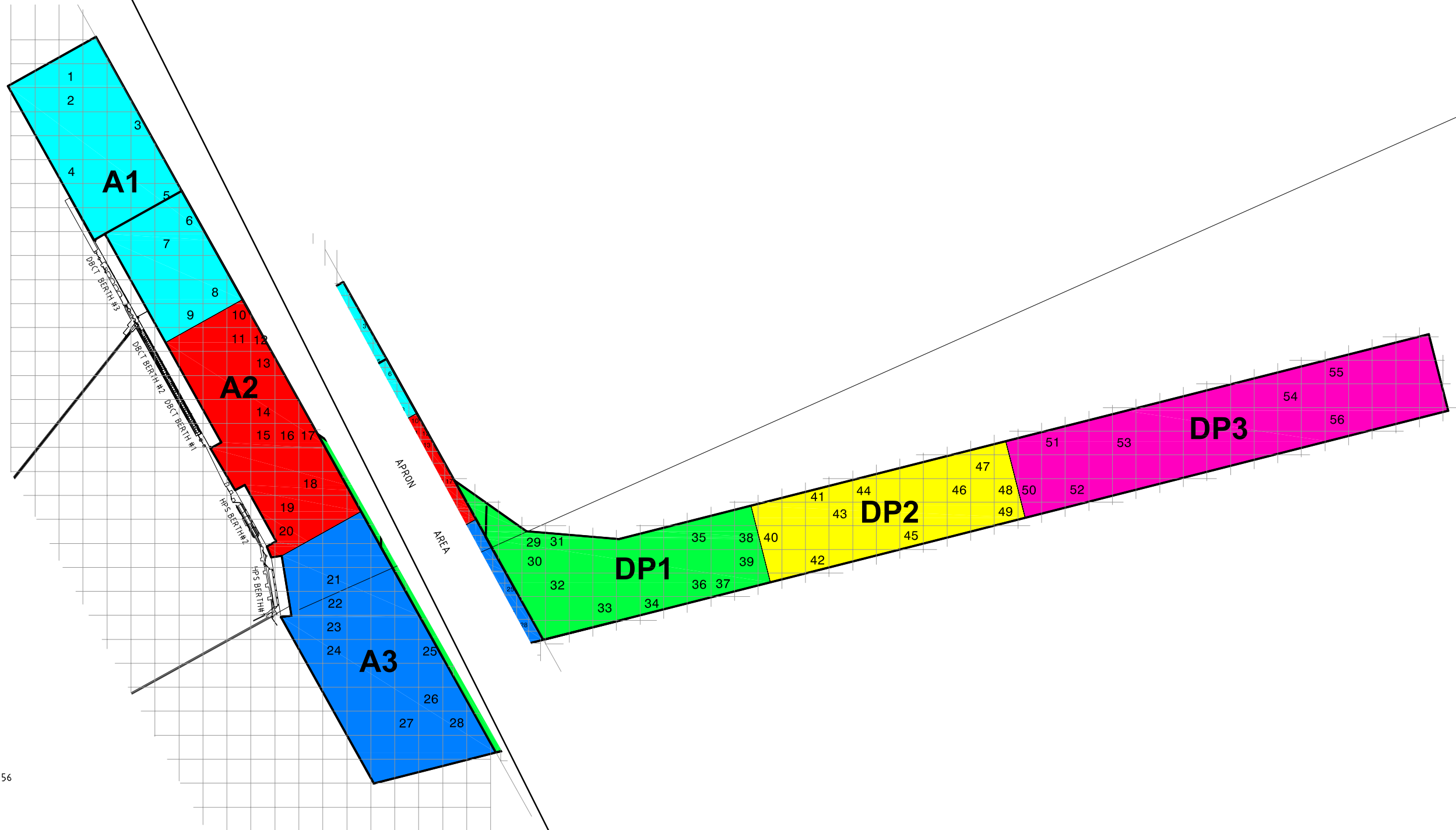
Neap tides dominated during sampling of the Apron Area with a tidal range of approximately 2 m (Appendix B). During sampling of the Departure Path Investigation Area, the tidal range varied from 4 m during a neap tide to 6 m during a spring tide.

2.4 Sampling Locations

Samples were collected from 56 locations within the area to be dredged (Figure 2). Sites 1 to 28 were located in the proposed Apron Area in front of the berths, and sites 29 to 56 were located in the proposed Departure Path Investigation Area. It should be noted that the areas indicated on Figure 2 (A1 – A3 and DP1 – DP3) were used for the purposes of assessing sediment particle size characteristics (Section 3.1).



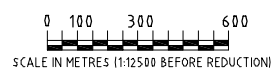
SAMPLE	EASTING	NORTHING
1	738721	7649683
2	738721	7649548
3	739102	7649407
4	738724	7649142
5	739264	7649007
6	739393	7648866
7	739264	7648735
8	739540	7648459
9	739400	7648330
10	739676	7648330
11	739673	7648195
12	739799	7648190
13	739812	7648057
14	739812	7647781
15	739812	7647648
16	739949	7647647
17	740078	7647648
18	740080	7647374
19	739949	7647238
20	739944	7647106
21	740215	7646830
22	740220	7646695
23	740216	7646562
24	740216	7646428
25	740759	7646423
26	740765	7646152
27	740625	7646017
28	740910	7646017
29	741024	7646956
30	741034	7646740
31	741293	7646964
32	741292	7646469
33	741832	7646212
34	742363	7646263
35	742900	7647011
36	742901	7646476
37	743172	7646486
38	743437	7647004
39	743439	7646736
40	743714	7647012
41	744250	7647472
42	744244	7646753
43	744500	7647277
44	744770	7647540
45	745307	7647029
46	745853	7647546
47	746120	7647813
48	746377	7647548
49	746377	7647302
50	746645	7647548
51	746917	7648087
52	747192	7647552
53	747724	7648084
54	749612	7648609
55	750133	7648885
56	750142	7648349
57	740407	7647782
58	741175	7648049
59	741946	7648318
60	742716	7648586
61	743487	7648854
62	744257	7649123
63	745028	7649391
64	745799	7649659
65	746569	7649928
66	747340	7650196
67	748110	7650464
68	748881	7650733
69	749651	7651001
70	750422	7651269



NOTES
HORIZONTAL DATUM = AMG AGD84 ZONE 56
VERTICAL DATUM = CHART DATUM

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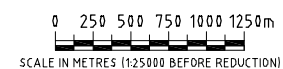
DETAIL OF APRON AREA



SCALE IN METRES (1:12500 BEFORE REDUCTION)



DEPARTURE PATH INVESTIGATION AREA



SCALE IN METRES (1:125000 BEFORE REDUCTION)

FIGURE 2, SAMPLE LOCATIONS

2.5 Sample Collection

2.5.1 Core retrieval and extraction

Sediment cores were collected using a vacuum vibrocorer, operated by GeoCoastal (Australia) Pty Ltd (Figure 3). Equipment included an air compressor, hydraulic pump, vacuum canister, vibrating head, A-frame and drill rods (60 mm internal diameter). The drill rod was deployed to the seabed via the ship's A-frame. Upon reaching the sea floor; the vibrator head pushed the core into the seabed. The vacuum system was used to retain the core within the drill rods during retrieval.

Upon retrieval, the corer was lifted above the deck and a plastic 'sock' was slipped over the exterior of the rod. The vacuum was released and the sediment was progressively 'fed' into the sock. After the entire core was extracted from the rod, the sample 'sock' it was hung vertically to settle, and the freestanding water at the top of the core drained. The drained cores were then placed into a PVC core catcher for improved control while the samples were logged, photographed and sampled (Figure 4).



Figure 3 Vacuum Vibrocorer



Figure 4 Extraction of sediment sample from corer in a plastic ‘sock’

2.5.2 Sub-sampling

Appendix C presents a summary of the sampling program, including sampling locations, water depth, core depth, sub-samples analysed, and quality control samples. At each location, cores were taken to 2.0 m, with sub-samples taken from three depths:

- » 0 – 0.5 m;
- » 0.5 – 1.0 m; and
- » 1.0 – 2.0 m.

Each core was split in half vertically and a replicate taken at each depth. Individual core lengths were mixed to ensure the sample was representative of the entire sub-sampling interval. The analytical laboratory held replicate samples for future analysis if exceedances of the ISQG screening levels or unusual results were identified.

2.5.3 Field measurements

The following measurements were recorded on a field data sheet at each sampling location:

- » date and time of sampling of each core;
- » person conducting sampling, client, project, sample location identifier, GPS coordinates of sampling location;
- » core logs – Each core was logged in accordance with AS 1726 – Geotechnical Site Investigations, before samples were processed. Details recorded included depth, physical appearance (eg. sand clay), colour, odour, plasticity, sand grain size and presence of organic matter, marine organisms, mineral ore, shell layers and other relevant features;
- » photographs – digital photographs of sediment cores and sampling equipment/methodology were taken;
- » tidal state; and
- » weather conditions including wind speed, sea state, currents and rainfall.

2.6 Sample Analysis

Sample jars were stored in eskies filled with cold packs/ice before being dispatched to Advanced Analytical (AA) for analysis within the required holding times. Advanced Analytical is a NATA accredited laboratory. Samples were selected and analysed for either a basic or detailed suite of contaminants of concern, in accordance with the methods detailed in the SAP.

All samples from the top 1.0 metre of each core were analysed for a basic suite of contaminants of concern. In accordance with the SAP, a total of 20% of the samples from the top 1.0 metre were randomly selected and analysed for a detailed suite of contaminants of concern. A total of 20% of samples taken at 1.0 – 2.0 metres were tested for a basic suite of contaminants of concern, minus organotins to allow the composition of naturally occurring trace elements and physical parameters to be determined. The following summarises the number of samples analysed for each suite of contaminants:

Apron Area:

- » 168 samples were collected (28 sample locations x 3 depths x replicate at each location and depth);
- » 56 samples (28 sample locations x 2 depths) were tested for the basic suite of contaminants;
- » 11 of these samples (20% of analysed samples) were tested for the detailed suite of contaminants; and
- » 6 samples from the 1.0 – 2.0m depth layer (20% of 28 samples) were tested for the basic suite of contaminants minus organotins.

Departure Path Investigation Area:

- » 168 samples were collected (28 sample locations x 3 depths x replicate at each location and depth);
- » 56 samples (28 sample locations x 2 depths) were tested for the basic suite of contaminants;
- » 11 of these samples (20% of analysed samples) were tested for the detailed suite of contaminants;
- » 6 samples from the 1.0 – 2.0 m depth layer (20% of 28 samples) were tested for the basic suite of contaminants minus organotins.

This gives a total of 112 samples tested for the Basic Suite, 22 of these samples also tested for the detailed suite and 12 samples tested for the Basic Suite minus organotins.

Basic Suite

- » Particle size analysis (by sieve and hydrometer, AS 1289.3.6.1 and 2);
- » Moisture content (0.1%);
- » Total organic carbon (Leco high temp carbon analyser to 0.02%);
- » Heavy metals (ICP/MS to 0.1 mg/kg):
 - Arsenic;
 - Chromium;
 - Cadmium;
 - Copper;
 - Iron;
 - Lead;
 - Manganese;
 - Nickel; and
 - Zinc.
- » Organotins (TBT, DBT and MBT) (GC/MS to 0.2, 0.5 and 0.5 mg/kg).

Detailed Suite

- » Trace metals (ICP/MS to 0.1 mg/kg; Hg, hydride to 0.01 mg/kg):
 - Antimony;
 - Mercury; and
 - Silver.
- » Polyaromatic Hydrocarbons (standard suite) (GC/MS ultratrace to 0.01 – 0.1 mg/kg);
- » Total Petroleum Hydrocarbons and BTEX (P & T, GC/MS; GC/FID to 2 – 100 mg/kg and 0.5 mg/kg respectively);

- » Organochlorine and organophosphorus pesticides (standard suite) (GC/ECD to 0.0005 mg/kg and GC/FPD to 0.01 mg/kg); and
- » Nutrients:
 - Total nitrogen, total Kjeldahl nitrogen, nitrate + nitrite, ammonia (APHA 4500-various); and
 - Total phosphorus, phosphate (APHA 4500-P).

All quality control samples were tested for the basic suite of contaminants of concern.

2.7 Sampling and Analytical Quality Control

The following quality control/quality assurance (QA/QC) procedures were implemented during the sampling program:

- » Each sample was labelled with a sample number unique to that sample, which was recorded with indelible ink on both the waterproof label and the cap of the sample bottle in case the sample label was lost or destroyed.
- » Stainless steel equipment was used to minimise the risk of sample contamination during handling.
- » Field data sheets and chain of custody forms were used to ensure that relevant information for each sample was properly recorded. Chain of custody forms are provided in Appendix D and field sheets are provided in Appendix E.
- » All equipment coming into contact with the sample (i.e., core catcher, stainless sampling bowls, spatulas etc.) was thoroughly cleaned to prevent cross sample contamination. This cleaning involved decontamination by scrubbing and rinsing with Decon90, saltwater and distilled water respectively.
- » Samples were placed into labelled laboratory supplied plastic bags and jars, prior to storage on ice in an insulated container. Samples were maintained below 4°C and airfreighted to the laboratory for analysis within the specified holding times under standard chain of custody documentation.

In addition to the internal laboratory QA/QC procedures, field replicates and duplicates were collected and tested for all contaminants of concern. Sampling locations at which these were collected are indicated in Table 1. Field blanks were also transported to and from the field with the samples and tested for relevant contaminants of concern. The results of QA/QC testing are present in Section 3.4.

3. Results

3.1 Physical Characteristics

Detailed logs of each sediment core are provided in Appendix F, photos of each core interval are provided in Appendix G and laboratory reports for particle size analysis are provided in Appendix H.

The particle size characteristics of the material to be dredged varied spatially. Table 1 summarises the minimum, mean, maximum and 20th and 80th percentiles of the data for the various areas within the Apron Area and Departure Path Investigation Area. Data for the 0 – 0.5 m and 0.5 – 1.0 m depth layers was not treated separately as these layers will not be treated separately during dredging. Table 6 (Appendix I) summarises the material descriptions for each core interval according to AS 1289 3.6.1.

The majority of sediment in the Departure Path Investigation Area (DPIA) is sand, with the mean percent sand increasing slightly from the landward to seaward end of the DPIA. On average, less than 10% gravel was present in any of the DPIA samples. In the Apron Area clayey/silty-sand dominates, with gravel also present in some samples to a maximum of between 30 – 42%.

Table 1 Physical Characteristics of Sediment within the Areas to be Dredged

Area	Percent Passing																			
	Gravel					Sand					Silt					Clay				
	Min	20 th %	Mean	80 th %	Max	Min	20 th %	Mean	80 th %	Max	Min	20 th %	Mean	80 th %	Max	Min	20 th %	Mean	80 th %	Max
Apron Area																				
A1	0.33	2.40	9.32	18.45	38.25	8.33	32.10	41.82	55.86	70.16	6.30	11.57	19.77	24.34	37.13	1.07	1.956	9.56	16.59	34.95
A2	0.27	4.40	14.72	21.77	42.13	16.98	32.33	46.09	61.62	79.27	5.23	10.26	18.94	25.31	44.89	6.03	15.62	20.26	25.21	33.65
A3	2.13	4.04	15.97	27.11	30.90	15.22	31.58	46.34	66.97	74.19	5.29	8.55	18.01	29.69	31.63	7.15	10.96	19.68	19.79	49.21
Departure Path Investigation Area																				
DP1	0.15	0.65	6.59	9.65	38.66	30.89	59.44	64.99	72.68	76.44	3.00	5.38	9.59	11.94	29.98	6.90	15.05	19.50	22.88	31.34
DP2	0.16	0.67	9.08	9.88	52.09	32.30	54.27	66.87	78.64	89.32	1.79	4.24	6.19	8.41	11.35	4.61	8.30	17.87	25.84	48.41
DP3	0.39	0.48	4.49	7.09	15.65	42.05	65.54	75.91	88.64	92.41	1.92	3.29	5.64	7.87	13.95	3.75	5.79	13.96	20.93	43.57

3.2 Chemical Analyses

A full table of the results of the laboratory analyses for organotin compounds, polyaromatic hydrocarbons (PAHs), metals, nutrients, total petroleum hydrocarbons (TPHs) and, organochlorine and organophosphorus pesticides (OC/OP) is presented in Appendix J. Compliance to the Interim Sediment Quality Guidelines (ISQG) is summarised in the following sections. The ISQG-low screening levels and laboratory limits of reporting for each contaminant of concern are presented in the results table in Appendix J.

Organotin Compounds

- » Only one sample, PCQ 19 (0 – 0.5 m), exceeded the ISQG-low screening level for tributyl tin (TBT) (5 µg Sn/kg) recording a concentration of 36.32 µg Sn/kg (normalised to 1% total organic carbon).
- » Nine samples (PCQ 1 (0 – 0.5), PCQ 13 (0 – 0.5), PCQ 14 (0.5 – 1.0), PCQ 21 (0.5 – 1.0), PCQ 22 (0.5 – 1.0), PCQ 22 (0 – 0.5), PCQ 24 (0 – 0.5), PCQ 28 (0 – 0.5), and PCQ 3 (0.5 – 1.0)) recorded concentrations of TBT above the laboratory limit of reporting (0.5 µg Sn/kg) but below the ISQG-low screening level (5 µg Sn/kg).
- » The remaining samples recorded TBT concentrations below the laboratory limit of reporting (0.5 µg Sn/kg).
- » As only one surface sample recorded a TBT concentration above the ISQG-low screening level, it was not necessary to analyse the samples from the 1.0 – 2.0 m depth layer for this contaminant.
- » Concentrations of monobutyltin (MBT) and dibutyltin (DBT) were below the laboratory limits of reporting (0.5 µg Sn/kg) in all samples.

Metals

- » The concentrations of all metals in all samples were below the relevant ISQG-low screening levels except for:
 - PCQ 20 (0.5 – 1.0): nickel = 28 mg/kg (ISQG-low = 21 mg/kg)
 - PCQ 22 (0 – 0.5), arsenic = 31 mg/kg (ISQG-low = 20 mg/kg)
- » Replicate samples for these sites were analysed with concentrations being below the ISQG-low screening levels:
 - PCQ 20 (0.5 – 1.0): nickel = 19 mg/kg
 - PCQ 22 (0 – 0.5): arsenic = 5.8 mg/kg.

Polyaromatic Hydrocarbons (PAHs)

- » The concentrations of all 15 PAHs were below the ISQG-low screening levels in all samples. All samples except PCQ 1 (0 – 0.5) and PCQ 45 (0 – 0.5) recorded concentrations of PAHs below the laboratory limits of reporting. Screening levels and laboratory limits of reporting for each individual PAH are presented in the table of results in Appendix J.

- PCQ 1 (0 – 0.5):
 - Fluoranthene – 6.8 µg/kg (ISQG-low = 600 µg/kg)
 - Pyrene – 5.5 µg/kg (ISQG-low = 665 µg/kg)
- PCQ 45 (0 – 0.5):
 - Phenanthrene – 7.3 µg/kg (ISQG-low = 240 µg/kg)
 - Fluoranthene – 5 µg/kg (ISQG-low = 600 µg/kg)
 - Pyrene - 8.7µg/kg (ISQG-low = 665 µg/kg)
 - Benz(a)anthracene – 6.3 µg/kg (ISQG-low = 261 µg/kg)
 - Chrysene – 10 µg/kg (ISQG-low = 384 µg/kg)

Total Petroleum Hydrocarbons and BTEX

- » The concentrations of TPHs and BTEX in all samples were below the laboratory limits of reporting.

Nutrients

- » Concentrations of inorganic nitrogen (nitrate, nitrite and ammonia) and inorganic phosphorus (filterable reactive phosphate) were very low in comparison to the concentrations of total nitrogen and total phosphorus. Concentrations of total Kjeldahl nitrogen were similar or equal to concentrations of total nitrogen. These findings indicate that the majority of nitrogen and phosphorus in the sediment to be dredged is of an organic form, and considered of lower risk in becoming readily available within the environment. However, it is important to note that these characteristics can change via both chemical and biological processes.

Organochlorine and Organophosphorus Pesticides

- » The concentrations of organochlorine and organophosphorus pesticides in all samples were below the laboratory limits of reporting and are therefore below the ISQG-low screening levels.

3.3 Confidence Limits

As required in Section 3.10.2 of the NODGDM (EA 2002), the upper 95% confidence limit (95% UCL) of the mean was calculated for the contaminants of concern to determine overall compliance of the sediment to be dredged with the ISQG (Table 2).

The 95% UCLs were calculated for the Apron Area and DPIA separately. As per Section 3.10.5 of the NODGDM, values below the limit of reporting were entered as half the limit of reporting. Note that a 95% UCL cannot be calculated for parameters where all data below the limit of reporting, and displayed no variance.

- » The 95% UCL of the mean was compliant to the relevant ISQG-low screening level for all contaminants of concern in both the Apron Area and DPIA.

Table 2 Apron Area – Upper 95% Confidence Limits for metals, polyaromatic hydrocarbons and tributyl tin.

Parameter	ISQG-low screening level	Mean	Standard Deviation	Count	Confidence Limit	95% UCL
Metals						
	mg/kg					
Arsenic	20	4.11	4.68	81	1.02	5.13
Cadmium	1.5	0.05	0.01	80	0.00	0.05
Chromium	80	15.01	5.67	80	1.24	16.25
Copper	65	5.94	4.27	80	0.94	6.87
Iron*		14743.75	7512.47	80	1646.21	16389.96
Mercury	0.15	0.01	0.01	14	0.01	0.01
Manganese*		278.80	247.99	80	54.34	333.14
Nickel	21	8.63	4.46	81	0.97	9.60
Lead	50	5.06	3.41	80	0.75	5.81
Antimony	2	0.37	0.51	15	0.26	0.63
Zinc	200	19.24	9.53	80	2.09	21.32
Polyaromatic Hydrocarbons						
Fluoranthene (normalised to 1% TOC)	600	3.26	2.83	14	1.48	4.74
Pyrene (normalised to 1% TOC)	665	3.08	2.16	14	1.13	4.21
Organotin compounds						
	ug/kg					
TBT (normalised to 1% TOC)	5	0.81	4.21	74	0.96	1.77

* No guideline is available for these parameters as they are naturally occurring elements in marine sediments.

Table 3 Departure Path – Upper 95% Confidence Limits for metals and polyaromatic hydrocarbons.

Parameter	ISQG-low screening level	Mean	Standard Deviation	Count	Confidence Limit	95% UCL
Metals						
	mg/kg					
Arsenic	20	4.82	2.75	76	0.62	5.44
Cadmium	1.5	0.05	0.00	76	0.00	0.05
Chromium	80	12.48	2.79	76	0.63	13.10
Copper	65	3.83	3.69	76	0.83	4.66
Iron*		10759.21	4962.64	76	1115.72	11874.93
Mercury	0.15	0.01	0.01	10	0.00	0.01
Manganese*		142.97	167.24	76	37.60	180.57
Nickel	21	6.09	2.47	76	0.56	6.64
Lead	50	4.17	2.05	76	0.46	4.63
Antimony	2	0.29	0.30	10	0.18	0.47
Zinc	200	9.68	4.78	76	1.07	10.76
Polyaromatic Hydrocarbons						
Phenanthrene (normalised to 1% TOC)	240	5.90	10.75	10	6.66	12.56
Fluoranthene (normalised to 1% TOC)	600	4.75	7.12	10	4.41	9.16
Pyrene (normalised to 1% TOC)	665	6.60	12.97	10	8.04	14.64
Benz(a)anthracene (normalised to 1% TOC)	261	5.40	9.17	10	5.68	11.08
Chrysene (normalised to 1% TOC)	384	7.25	15.02	10	9.31	16.56

* No guideline is available for these parameters as they are naturally occurring elements in marine sediments.

3.4 Data Validation

The analytical data was validated according to the requirements of Section 3.6.2 of the NODGDM. The following sections present the findings of laboratory QA/QC and field based validation procedures.

3.4.1 Laboratory

Overview

Laboratory QA/QC procedures included accuracy via spike recovery, and analytical precision via duplicate analysis. Detailed laboratory QA/QC results are presented in Appendix K.

Analytical Accuracy

For the majority of parameters, recovery of spiked samples were within the laboratory control limits¹ (70 – 130% for organics) and the limits recommended in the NODGDM (75 – 125%). Exceptions included TPH (C10 – 14 fraction), dieldrin and p,p'-DDE spikes (in one batch only) and organotin compounds (in several batches). Matrix interference and low recovery of spikes and surrogates is commonly encountered in the determination of organotin compounds due to the interference of the soil matrix with the extraction process.

The recovery of the TBT surrogate compound² was within the limits recommended in the NODGDM (75 – 125%) in all bar one batch. In addition to the laboratory reported results from surrogate recoveries, duplicates and spikes, Certified Reference Materials and Laboratory Reference Control materials were also analysed for butyl tin compounds as part of internal laboratory quality assurance procedures. The results for the Certified Reference Material, PACS-2 were:

Compound	% Recovery
» Monobutyltin	94%
» Dibutyltin	86%
» Tributyltin	98%

These results were within the recommended recovery limits for the reference material.

Analytical Precision

The precision of analytical results is determined through calculation of relative percent difference (RPD) and relative standard deviation (RSD) for duplicate and triplicate samples respectively.

- » RPDs for all laboratory replicates for organics were within the laboratory control limits ($\pm 25\%$) and the acceptable limits presented in the NODGDM ($\pm 35\%$).

¹ The specified laboratory control limits are standard USEPA control limits.

² Surrogate compounds are compounds that are similar to the contaminant of concern and can be expected to behave in the same way during extraction and analysis. Known concentrations of surrogates are added to all samples prior to extraction. If a good recovery of the surrogate is achieved, this indicates that the extraction process is working well.

- » The relative percent difference between laboratory duplicate samples that were spiked with known concentrations of the surrogate compound was within the limits outlined in the NODGDM ($\pm 35\%$) in the majority of batches.
- » A few RPDs for laboratory duplicates for metals were outside the control limits recommended in the NODGDM ($\pm 35\%$). These were mercury and arsenic in batch A04/0816; arsenic, manganese and lead in batch A04/0853A; and antimony in batch A04/0952.

Variable distribution of contaminant within the sediment matrix can be attributed to the heterogeneous nature of sediments. This factor alone often leads to variations in analytical precision outside the expected range.

3.4.2 Field

Field replicates (one sample split into two containers) were analysed for 15% of samples (8 samples) and triplicate cores (three separate cores taken at the same location) were collected at 10% of sampling locations (6 locations).

- » RPDs for field replicates were within the acceptable limits outlined in the NODGDM (i.e. $\pm 50\%$), with the exception of arsenic at site PCQ 10 (0 – 0.5 m) and arsenic and copper at site PCQ 23 (0.5 – 1.0m).
- » RSDs for field triplicates (3 separate samples taken at the same location) were within the acceptable limits outlined in the NODGDM (i.e. $\pm 50\%$), with the exception of manganese at PCQ 4 (0 – 0.5); arsenic, nickel and zinc at PCQ 11 (0 – 0.5); arsenic at PCQ 11 (0 – 0.5); arsenic and manganese at PCQ 17 (0 – 0.5); copper and manganese at PCQ 32 (0 – 0.5); arsenic, copper and manganese at PCQ 32 (0.5 – 1.0); and arsenic and copper at PCQ 40 (0 – 0.5); arsenic, copper and iron at PCQ 40 (0.5 – 1.0).

The variability in sediment type and grain size throughout the study area may have contributed to the variation in metal concentration between triplicates.

Five field blanks (chromatographic sand) were transported to and from the field with the samples. Contaminants of concern were not detected in the field blanks, indicating that sample jars and samples were not contaminated in transit.

3.4.3 Inter-laboratory Quality Assurance

To provide additional quality assurance, five samples were randomly chosen and their replicates sent to ALS Environmental for analysis of tributyl tin and total organic carbon. The comparative results are shown in Table 4 and the ALS laboratory reports are presented in Appendix L.

The results were similar with both laboratories detecting TBT samples from the same site (PCQ 24), while all other results were less than the laboratory limit of reporting. Differences in the concentration of TOC and TBT are within the variability that is expected in heterogeneous sediments such as those found at Hay Point.

Table 4 Results of Inter-laboratory Quality Assurance for Tributyl Tin and Total Organic Carbon

Sample and Laboratory	Tributyl tin µg Sn/kg (non-normalised)	Tributyl tin µg Sn/kg (normalised)	Total Organic Carbon %
PCQ 2 0 – 0.5A (Advanced Analytical)	<0.5	-	0.20
PCQ 2 0 – 0.5R (Australian Laboratory Services)	<0.2	-	0.07
PCQ 23 0 – 0.5A (AA)	<0.5	-	<0.1
PCQ 23 0 – 0.5R (ALS)	<0.2	-	0.07
PCQ 24 0 – 0.5A (AA)	0.81	3.7	0.22
PCQ 24 0 – 0.5R (ALS)	1.3	6.5	0.09
PCQ 25 0 – 0.5A (AA)	<0.5	-	0.1
PCQ 25 0 – 0.5R (ALS)	<0.2	-	0.03
PCQ 27 0 – 0.5A (AA)	<0.5	-	0.14
PCQ 27 0 – 0.5R (ALS)	<0.2	-	0.05

3.4.4 Completeness

All samples were received by the laboratory and analysed for the relevant contaminants of concern. The completeness of the data set for this sampling program is 100%.

4. Discussion and Recommendations

4.1 Compliance

A sediment survey was implemented at the Port of Hay Point in accordance with an approved Sampling and Analysis Plan and the requirements of the NODGDM (EA 2002). The 95% UCL concentrations of potential contaminants in the sediment to be dredged were below the ISQG-low screening levels. Therefore, according to the requirements of the NODGDM (EA 2002), the sediment to be dredged is considered non-toxic and is suitable for unconfined ocean disposal.

4.2 Likely Sources of Contaminants of Concern

Although the 95% UCL concentrations of contaminants of concern in the material to be dredged remained well below the ISQG-low screening levels, the presence of organotins in some samples indicates some level of historical and potentially ongoing exposure to these contaminants. Organotins are contained in anti-fouling paints, which protect ships utilising the port area from build up of encrusting marine organisms on their hulls.

Nickel and arsenic were present at concentrations slightly above the ISQG-low screening levels in one sample each. However, the replicate samples were compliant to the ISQG-low screening levels. Both samples in which exceedances were recorded had high iron contents compared with other samples analysed in this program. This indicates that the higher concentrations of arsenic and nickel are likely to be naturally associated with the higher mineral iron content. According to the NODGDM, elevated concentrations of arsenic are common in eastern Australian sediments. The concentrations of nickel and arsenic recorded in this sampling program were similar to those that were recorded in the sediment sampling program conducted as part of the Environmental Impact Study for the Expansion of Dalrymple Bay Coal Terminal (URS 2000).

4.3 Recommendations

There is no requirement for special management/treatment of sediments prior to their disposal in the offshore dumping ground. Routine management and monitoring should be carried out during dredging and dumping operations to ensure any impacts are identified and minimised.



5. References

Commonwealth of Australia. (2004). Australian National Tide Tables - Electronic Version.

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Appendix A

Sampling and Analysis Plan

Port of Hay Point – Capital Dredging – Sediment Sampling
and Analysis Plan (SAP) (GHD 2004)



Ports Corporation of Queensland

**Port of Hay Point - Capital
Dredging Departure Path and
Apron Areas**

Sampling and Analysis Plan (SAP)

October 2004



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- A Previous Sediment Sampling Locations
- B Grid used to Select Sampling Locations



1. Introduction

This Sampling and Analysis Plan (SAP) outlines the requirements for the assessment of the suitability of sediments for ocean disposal at the Port of Hay Point. The SAP has been prepared by GHD on behalf of Ports Corporation of Queensland (PCQ) in accordance with the requirements of the National Ocean Disposal Guidelines for Dredged Material (NODGDM, DEH 2002). The material that is the subject of this assessment is that which will be removed during the proposed capital dredging of the Port of Hay Point Departure Path and Apron Areas.

The results of sediment sampling and analysis will be provided to the Commonwealth Department of Environment and Heritage (DEH) in support of an application for a Permit to Dispose of Dredge or Excavated Material at Sea under the *Environmental Protection (Sea Dumping) Act* 1981. The results of sediment sampling and analysis will also form part of a comprehensive Environmental Impact Study (EIS) being undertaken for the proposed capital dredging project.



2. Background

2.1 Proposed Dredging Works

PCQ is responsible for the management and development of various port facilities throughout Queensland. In this role, PCQ is responsible for the establishment and maintenance of navigable waters at the Port of Hay Point.

2.1.1 Project Scope

To increase the allowable sailing draft for vessels departing the Port of Hay Point and to allow improved exit of shipping traffic, PCQ proposes to conduct capital dredging of a new departure path and apron area at the Port.

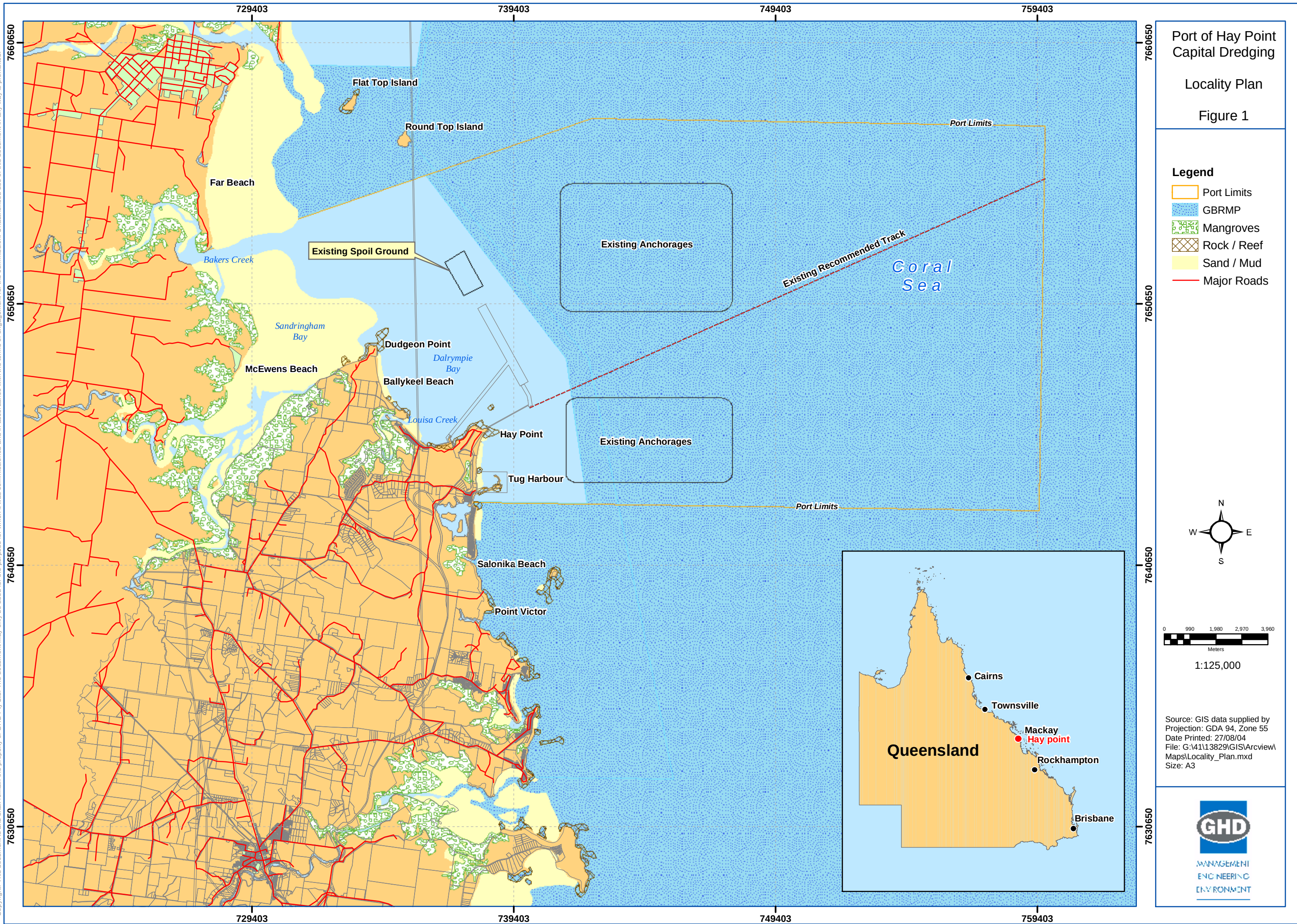
It is anticipated that a trailer suction hopper dredge (TSHD) or cutter suction dredge will be employed to conduct the proposed capital works. PCQ are intending to conduct the proposed capital dredging on receipt of required approvals. PCQ are currently intending to dredge between May and October to minimise potential impacts on turtles and the benefits of this dredging window will be assessed in the EIS. The works are expected to occur in 2005 or 2006.

The project will involve disposal of clean dredged material, with the majority of the material expected to be relocated to an approved ocean disposal site. The EIS will evaluate any other options to minimise the volumes placed in the ocean disposal site, such as land disposal.

2.1.2 Location

The Port of Hay Point is in the Shire of Sarina. It is located on the central Queensland coast approximately 40 kilometres south of Mackay and includes two coal terminals; Hay Point Coal Terminal (HPCT) and Dalrymple Bay Coal Terminal (DBCT) (see Figure 1). The berth facilities of the Port are located within Dalrymple Bay.

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2.1.3 Proposed Works Specification

All the proposed works lie within the declared port limits of the Port of Hay Point and also within the Great Barrier Reef World Heritage Area (GBRWhA). Because the Great Barrier Reef Marine Park (GBRMP) overlaps the port limits, part of the works fall within the Marine Park, in an area which has a general use zoning. The location of the proposed dredging is shown in Figure 2 and will involve the following:

- ▶ Provision of a ship manoeuvring apron immediately adjacent to and parallel to the DBCT and HPCT dredged berths. The apron is a minimum of 500 metres wide. The apron will be dredged to achieve a minimum declared depth of RL -14.9 metres LAT. The actual dredged depth will be slightly deeper and the extra maintenance depth required to maintain this minimum declared depth is being finalised. This area lies within the GBRWhA but outside the GBRMP.
- ▶ Provision of a departure path from the apron to open waters. The precise location of the Departure Path will be confirmed, pending the outcomes of seismic surveys. Two investigation areas have been identified. The southern area includes two alignment options with a third alignment option to the north. For the purposes of this report the southern investigation area is referred to as the Departure Path Investigation Area, with the northern area referred to as Departure Path Option 3. Regardless of the location of the Departure Path, the general configuration will be as follows. The path will be 500 metres wide for the first 500 metres then taper to a width of 300 metres over the next 3 kilometres. The remaining 6.6 kilometres of the departure path will be 300 metres wide and continue until a minimum natural depth of RL -14.9 metres is achieved. The total path length is expected to be approximately 9.5 kilometres. The majority of the path is in the GBRWhA and GBRMP, but remains within the port limits.

It should be noted that the intent is to sample the Apron Area and Departure Path Investigation Area. The Departure Path Option 3 will be sampled only if the results of seismic investigation indicate that departure path options within the Investigation Area are not viable.

The area to be dredged will be considered as three separate sites for the purposes of this assessment, these being the Apron Area, the Departure Path Investigation Area and the Departure Path Option 3 (refer Figure 2).

Final detailed calculations of the volume to be dredged will not be available prior to the implementation of this SAP, therefore, a conservative estimate of 9,000,000 m³ of seabed material has been assumed. Final volumes and dimensions will be provided in the Draft EIS.

The Apron Area runs parallel to the berth facilities. The approximate dimensions of this area are:

- ▶ Width: 571 m.
- ▶ Length: 3,614 m.
- ▶ Depth: -13.1m RL to -15.2m RL = ~2 m.



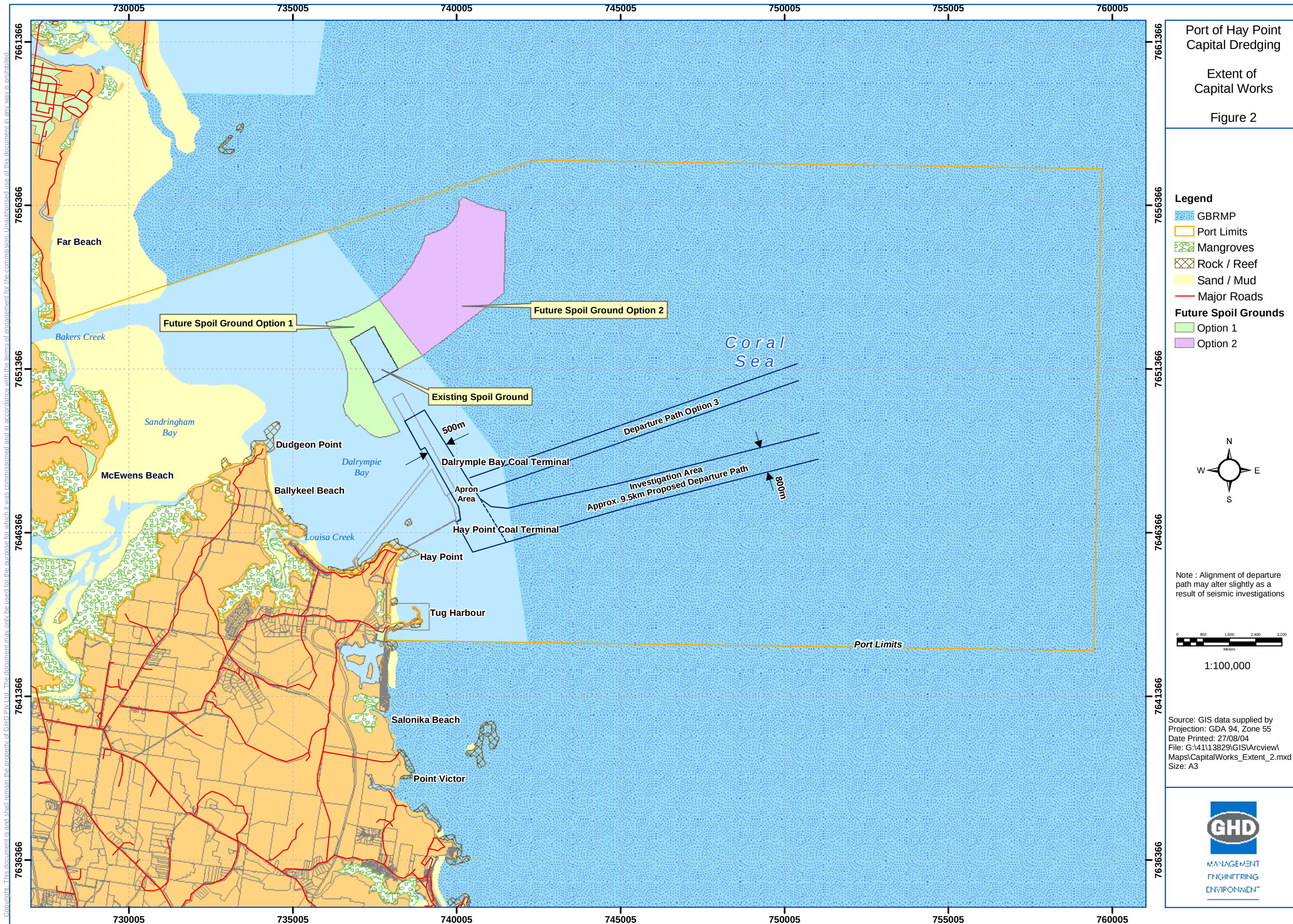
- ▶ Volume: ~4,150,000 m³.

The Departure Path Investigation Area runs perpendicular to the southern end of the HPCT berths. The approximate dimensions of this area are:

- ▶ Width: 800 m.
- ▶ Length: 9,200 m.
- ▶ Depth: -14.9 m RL at completion of dredging. Depth to be dredged varies between 0 m and ~2 m.
- ▶ Volume: ~4,500,000 m³ (volume of the departure path to be dredged, not the entire investigation area).

The Departure Path Option 3 runs perpendicular to the mid point of the Apron Area. The approximate dimensions of this area are:

- ▶ Width: 300 – 500 m.
- ▶ Length: 9,200 m.
- ▶ Depth: -14.9m RL at completion of dredging. Depth to be dredged varies between 0 m and ~2 m.
- ▶ Volume: ~4,500,000 m³.

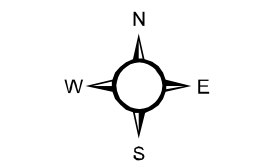


Port of Hay Point
Capital Dredging

Extent of
Capital Works

Figure 2

- Legend**
- GBRMP
 - Port Limits
 - Mangroves
 - Rock / Reef
 - Sand / Mud
 - Major Roads
- Future Spoil Grounds**
- Option 1
 - Option 2



Note : Alignment of departure path may alter slightly as a result of seismic investigations

0 800 1,600 2,400 3,200
Meters
1:100,000

Source: GIS data supplied by
Projection: GDA 94, Zone 55
Date Printed: 27/08/04
File: G:\41\13829\GIS\Arcview\Maps\CapitalWorks_Extent_2.mxd
Size: A3





2.2 Previous Investigations and Potential Pollution Sources

2.2.1 Previous Studies

Numerous studies undertaken at the Port of Hay Point have included sediment quality investigations of relevance to the proposed capital dredging. These include:

- ▶ Sediment Sampling and Analysis to Support a Sea Dumping Permit Application – Port of Hay Point (Terra Search 1995).
- ▶ Dalrymple Bay Coal Terminal Expansion Stages 6 & 7 Draft Environmental Impact Statement (URS 2000).
- ▶ Port of Hay Point Seafloor Survey for Stage 6 and 7 Expansions of Dalrymple Bay Coal Terminal. (Le Provost Dames & Moore 2000).
- ▶ Port of Hay Point (Departure Apron Area) – Maintenance Dredging SAP 2004 (Hydrobiology 2004).
- ▶ Maintenance Dredging SAP Implementation (May 2004) for the Departure Apron Area, Port of Hay Point (Hydrobiology 2004).

2.2.2 Catchment Land Uses and Potential Pollution Sources

The main land uses in the Hay Point region are:

- ▶ Conservation Areas and Environmental Buffers.
- ▶ Coastal Communities (Louisa Creek, Half Tide, Salonika).
- ▶ Port activities at the Port of Hay Point (coal stockpiles, buildings, conveyors, offshore berths and ship loading facilities).
- ▶ Rural residential areas and rural land.
- ▶ Commercial services and community facilities.
- ▶ Tourist activities.
- ▶ Indigenous practices.

The main land use activities with the greatest potential to introduce contaminants into the marine environment are agricultural and port activities, including coal stockpiles and ship loading. There are no major urban or industrial pollutant sources in the area that are likely to result in the introduction of significant quantities of contaminants into the environment. The location of the coal terminals more than 3 kilometres offshore in an open water environment means that this area does not accumulate silty, organic rich sediments in which contaminants generally accumulate. Table 1 provides a summary of the potential contaminants of concern and their known or likely sources.

Table 1 Potential Contaminants of Concern and Sources

Potential Contaminants	Known or Likely Sources	Notes
Organotins - Monobutyltin (MBT) - Dibutyltin (DBT) - Tributyltin (TBT)	Antifouling paints.	- Can occur as paint flakes in sediments. - May dissolve into the water column and attach to sediment particles, which later settle out. - Likely to be present in shipping berths and potentially present in the southern anchorage area.
Metals - Arsenic - Mercury - Cadmium - Chromium - Copper - Lead - Nickel - Manganese - Zinc - Silver - Antimony	- Antifouling paints. - Stormwater and catchment runoff. - Trace levels present in coal particles. - Pesticides and fertilisers. - Marine fabrication metals.	- Some levels of Cu, Cr and Zn likely from antifouling paints and corrosion of marine metals. - Coal particles are considered biologically inert and coal generally contains concentrations of metals below ISQG (Hydrobiology 2004). - Hg low risk, only from historic usage. - Low levels of some metals likely to be present within and adjacent to the berths. - Catchment, urban and industry sources are not significant.
Hydrocarbons - TPH - PAHs - BTEX - Total Hydrocarbons	- Fuel oils. - Lubricants. - Ballast water.	Unlikely to be present in elevated concentrations due to an absence of fuelling facilities at the berths and minimal discharge of ballast water.
Pesticides - Organochlorine - Organophosphorus	Runoff from agricultural areas	Some catchment inputs, but unlikely to be found in offshore areas.

Potential Contaminants	Known or Likely Sources	Notes
Nutrients ▶ Phosphorus ▶ Nitrogen	▶ Fertiliser runoff from agricultural areas. ▶ Nutrients attached to sediment eroded from catchment. ▶ Natural presence in marine sediments.	▶ Some catchment inputs, but of low natural concentrations in offshore areas.
Coal Particles	▶ Coal spillage during ship loading and inputs from dust and stormwater runoff.	▶ Previous studies have shown coal to be biologically inert and contains only trace concentrations of metals (URS 2000, Hydrobiology 2004).

2.3 Sediment Quality in the Apron Area and Departure Path

The following sections provide a summary of available information regarding the likely physical and chemical sediment quality in the proposed Apron Area and Departure Path.

2.3.1 Contaminants of Concern

Testing of sediment contamination to assess suitability of sediments for ocean disposal under the National Ocean Disposal Guidelines for Dredge Material (NODGDM, DEH 2002) has been undertaken at the Port of Hay Point on a number of occasions. Of relevance to the proposed capital dredging are the 2000 and 2004 sampling programs conducted prior to previous dredging of the berths and departure apron areas. Figures showing the location of previous sampling sites for these programs are provided in Appendix A.

A total of 51 samples were collected as part of the sampling undertaken prior to the Stage 6 & 7 expansion of the Port (URS 2000). All contaminants of concern were below the Interim Sediment Quality Guidelines (ISQG) low screening values.

Surface grab samples were taken at 26 sites undertaken prior to the 2004 maintenance dredging of the existing Departure Apron Area (Hydrobiology 2004). The existing Departure Apron Area forms part of the Apron Area for the proposed capital dredging program. Results were as follows:

- ▶ Five samples exceeded the ISQG low screening level for TBT after normalisation to 1% total organic carbon.
- ▶ Two samples slightly exceeded the ISQG-low screening level for arsenic.
- ▶ The 95% upper confidence limits (UCL) for arsenic and TBT were below the ISQG-low screening levels.



- ▶ No other contaminants of concern exceeded the ISQG-low screening levels in the 2004 sampling program.

2.3.2 Sediment Grain Size Analysis

Testing undertaken as part of the Stage 6 & 7 Expansion EIS (URS 2000) indicated that the sediments in the area to be dredged consist of silts and fine sands of variable thickness (1 – 30 cm) underlain by stiff clays. Sampling was conducted in the current Departure Apron Area which also overlaps part of the proposed departure path areas to be sampled.

A review of grain size analysis undertaken for the 2004 Departure Apron Area maintenance dredging campaign indicates that surface sediments within the current Departure Apron Area were predominantly sandy – gravels. The particle size distribution for each size class in all samples was as follows:

- ▶ Clay (<0.002 mm): 3 – 21%.
- ▶ Silt (0.06 – 0.002 mm): 2 – 17%.
- ▶ Sand (2 – 0.06 mm): 57 – 86%.
- ▶ Gravel (>2 mm): 3 – 55%.

2.4 Sufficiency of Information and Exemption from Further Testing

This project does not fall into any of the three exemption categories outlined in Section 3.11 of the NODGDM (DEH 2002). Therefore, the material to be dredged will be assessed as outlined in Phase II of the NODGDM (DEH 2002).

Review of previous testing indicates that there is good quality data available to support the classification of the sediment to be dredged as 'probably clean'. The 95% UCL of all contaminants has been below the ISQG low screening levels in previous sampling programs and has been assessed as suitable for unconfined ocean disposal. The contamination status of the material to be dredged in the Apron Area is unlikely to change prior to the proposed capital dredging in 2005/06. The proposed Departure Path is located in a previously undisturbed open ocean area with few, if any, potential sources of contaminants, although there is the potential for organotins to be present in the area where the southern anchorage intersects with the proposed Departure Path. The design of the sampling program has been based on this classification.



3. Sampling and Analysis Plan (SAP)

3.1 Introduction

This SAP has been prepared according to the requirements outlined in the NODGDM (DEH 2002) to provide supporting information for the assessment of an application for a Permit to Dispose of Dredge or Excavated Material at Sea under the *Environmental Protection (Sea Dumping) Act 1981*. The SAP provides guidance for the assessment of the contamination status of the material to be dredged, including the appropriate sample collection, handling, storage and analysis methods and quality control requirements.

3.1.1 Objectives of the Assessment

The objectives of this assessment are to:

- ▶ Characterise the sediments to be dredged during the proposed capital dredging of the Hay Point Departure Path and Apron Areas.
- ▶ To determine the suitability of sediments for unconfined ocean disposal under the NODGDM (DEH 2002).

3.1.2 Responsible Parties

PCQ is the proponent for the proposed Capital Dredging of the Departure Path and Apron Areas at the Port of Hay Point. PCQ have contracted GHD as the EIS Consultant for this project, therefore GHD are responsible for the preparation, approval and implementation of this SAP and its provision as supporting information for an application to undertake capital dredging and ocean disposal at the Port of Hay Point.

Under the *Environmental Protection (Sea Dumping) Act 1981*, the Commonwealth Department of Environment and Heritage are the Determining Authority for the assessment of the application for a Permit to Dispose of Dredge or Excavated Material at Sea.

A NATA certified laboratory will be contracted to undertake chemical testing for this project.

3.1.3 Occupational Health and Safety Plan

The party/s contracted to undertake sediment sampling will be responsible for the provision of a suitable occupational health and safety plan for undertaking the works as outlined in this SAP including sample collection, processing and handling. This plan will be submitted to PCQ for review and approval prior to commencement of works.

3.1.4 Personnel and Vessel Requirements

The vessel from which sampling is undertaken will have an appropriate sample processing area, which is free of debris and residue and removed from motors and exhaust to minimise the potential for sample contamination. The sample processing



area will be washed down prior to use. An appropriately qualified and experienced environmental engineer/scientist will be on board the vessel to direct, log and provide records of sampling, take photographs, process and package samples in accordance with the NODGDM (DEH 2002) and ensure they are delivered to the laboratory within the required holding times.

3.1.5 Contingency Planning

The contractor employed to undertake sampling will be required to have contingency plans in place for adverse weather conditions and equipment malfunction to prevent any impacts on the timing of the field program.

3.1.6 Review of the SAP

This SAP has been prepared by GHD, as independent consultants, to comply with the NODGDM (DEH 2002). The results of this SAP will provide supporting information for an application to undertake capital dredging under the *Environmental Protection (Sea Dumping) Act 1981*. The Draft SAP will be submitted for approval to DEH as the Determining Authority.

As a comprehensive Environmental Impact Study (EIS) is being prepared for this project, the results of sediment sampling and analysis will be presented within the EIS and a copy of the approved SAP will be appended to the document.

3.2 Sampling of Sediments to be Dredged

3.2.1 Number of Sampling Locations

For dredging programs or individual sites within an area to be dredged involving volumes greater than 509,000 m³, the NODGDM require the number of sampling locations to be determined by statistical means such as power analysis and in consultation with DEH. Sediment quality data for the Hay Point Apron Areas from the 2000 capital dredging and 2004 maintenance dredging campaigns was assessed using power analysis (alpha = 0.05, Statistica 5.5, Statsoft Inc., 1999). As the concentration of a number of metals, all PAHs, TPHs and OC/OP pesticides were below laboratory limits of reporting, they were not subject to power analysis.

Assumptions

In undertaking power analysis, it was assumed that the mean and standard deviation of the previous sampling represents the true mean and standard deviation of the material to be dredged. The previous sampling has been concentrated in surface sediments located within the existing apron and berthing areas. As such, previous sampling has focussed on the areas of the port that are likely to display the highest concentrations of any contaminants. A large proportion of the capital dredging material will be natural material located at depth and in areas that are distant from the existing berths and Departure Apron Area. Use of this data for power analysis provides a conservative approach to the calculation of sample numbers.

Power Analysis

Based on the known sediment characteristics, power analysis was conducted to determine the number of samples required to achieve an arbitrarily selected power of 0.95 when testing the hypothesis that the mean concentration of a particular parameter will be greater than or equal to the ISQG-low screening level for that parameter. A power of 0.8 is commonly applied in sampling programs, therefore the arbitrarily chosen power of 0.95 for this sampling program gives a very high level of confidence that an exceedance of the guidelines will be detected. This affords substantial enhanced protection in recognition of the values of the Great Barrier Reef.

Results of the power analysis are summarised in Table 2. For the majority of parameters, the power of the test approaches 1 with between 2 and 4 samples. This means that very few samples are required to give almost 100% confidence (i.e. power of 1) that an exceedance of the guideline values will be detected. The exception is TBT, which requires approximately 147 samples to be tested to give an arbitrarily selected power of 0.95 for the sampling program. The number of samples to be tested for TBT is 140 (Section 3.2.3). This reduces the power of the sampling program very slightly to 0.94. Given the material to be dredged is virgin material with low potential exposure to TBT, the power of the sampling program will provide a very high level of confidence that the environment is not at risk from TBT.

It should be noted that the validity of this result relies on the previous sediment quality being indicative of the material to be dredged. As the material to be dredged is at a lower risk of exposure to TBT than the material that was the subject of the previous testing, it is likely that the design of the sampling program is highly conservative.

Number of Sampling Locations

Although a high level of statistical confidence would be achieved with a small number of samples for the majority of parameters, the maximum number of locations in Table 1 of the NODGDM will be adopted as a conservative approach (i.e. 28 locations). The classification of the sediments to be dredged as 'probably clean' allows the number of sampling locations to be halved (DEH 2002). This is considered appropriate for the Departure Path (Option 3), however, halving the number of sampling locations will not provide adequate spatial coverage of the proposed Apron Area or the Departure Path Investigation Area. Therefore, 28 locations will be sampled in both the Apron Area and the Departure Path Investigation Area and 14 locations will be sampled in the Departure Path (Option 3), giving a total of 42 sampling locations.



Table 2 Results of Power Analysis

Parameter	Valid N	Mean (mg/kg)	Standard deviation	ISQG (mg/kg)	Type I error (probability)	Type II error (power)	Required N
Arsenic	48	9.0	4.9	20	0.05	0.95	4
Chromium	48	8.7	3.0	80	0.05	0.95	2
Copper	48	2.9	1.7	65	0.05	0.95	2
Lead	48	4.3	2.2	50	0.05	0.95	2
Nickel	48	3.3	1.3	21	0.05	0.95	2
Zinc	48	14.0	7.8	200	0.05	0.95	2
Normalised TBT	38	3.8 µgSn/kg	4.4 µgSn/kg	5 µgSn/kg	0.05	0.95	147



3.2.2 Depth of Sampling

The depth of dredging required for this project is approximately 2 metres in the Apron Area and between 0 metres and 2 metres in both the Departure Path Investigation Area and Departure Path Option 3. It is considered unlikely that contaminants will be present at depths below 0.50 metres, due to:

- ▶ the previously undisturbed nature of the majority of the sediments;
- ▶ the stiff clay layer that underlies surface sediments; and
- ▶ the location of the area to be dredged in an offshore, open water environment where silty, organic rich sediments do not accumulate.

Based on the estimated maximum depth of dredging in both the Departure Path Investigation Area, Departure Path Option 3 and Apron Areas, cores will be taken to 2 metres, with samples taken from 3 depths:

- ▶ 0 – 0.50 metres;
- ▶ 0.50 – 1.00 metres; and
- ▶ 1.00 – 2.00 metres.

Individual core lengths will be homogenised to ensure the sample is representative of the entire interval. The exception is samples for volatile and semi-volatile compounds, which should be taken before the core length is homogenised to prevent volatilisation. Each core will be split in half vertically and a replicate taken at each depth. Replicates will be held by the laboratory and will be tested if the first sample exceeds the ISQG-low screening level (DEH 2002).

3.2.3 Number of Samples

All samples from the top 1.00 metre of each core will be tested for a basic suite of contaminants of concern. As contamination is not suspected below 1.00 metres, initially only 20% of samples from the 1.00 – 2.00 metre core interval will be tested for a basic suite of contaminants of concern, minus organotins. This will allow the composition of naturally occurring trace elements and physical parameters of this depth layer to be determined.

Based on this design, the following sections summarise the number of samples to be collected and tested. Section 3.3.1 summarises the contaminants of concern and Section 3.4.5 summarises the QA/QC samples that will be collected and analysed.

Apron Area:

- ▶ 168 samples will be collected (28 sample locations x 3 depths x replicate at each location and depth);
- ▶ 56 samples (28 sample locations x 2 depths) will be tested for the basic suite of contaminants;
- ▶ 11 of these samples (20% of analysed samples) will also be tested for the additional suite of contaminants; and



- ▶ 6 samples from the 1.0 – 2.0 m depth layer (20% of 28 samples) will be tested for the basic suite of contaminants minus organotins.

Departure Path Investigation Area:

- ▶ 168 samples will be collected (28 sample locations x 3 depths x replicate at each location and depth);
- ▶ 56 samples (28 sample locations x 2 depths) will be tested for the basic suite of contaminants;
- ▶ 11 of these samples (20% of analysed samples) will also be tested for the additional suite of contaminants; and
- ▶ 6 samples from the 1.0 – 2.0 m depth layer (20% of 28 samples) will be tested for the basic suite of contaminants minus organotins.

Departure Path Option 3:

- ▶ 84 samples will be collected (14 sample locations x 3 depths x replicate at each location and depth);
- ▶ 28 samples (14 sample locations x 2 depths) will be tested for the basic suite of contaminants;
- ▶ 6 of these samples (20% of analysed samples) will also be tested for the additional suite of contaminants; and
- ▶ 3 samples from the 1.0 – 2.0 m depth layer (20% of 14 samples) will be tested for the basic suite of contaminants minus organotins.

This gives a total of 420 samples to be collected, with 140 samples tested for the basic suite, 28 of these samples also tested for the additional suite, and 12 samples tested for the basic suite minus organotins.

3.2.4 Sampling Locations

As discussed earlier, the area to be dredged will be considered as three sites. Sampling locations in the Apron Area and Departure Path Investigation Area were chosen using the procedure in Section 3.3.1 of the NODGDM (DEH 2002). Sampling locations are shown in Figure 3 and the grids used to choose sampling locations in both areas is provided in Appendix B. As the Departure Path Option 3 is a linear feature, the sample locations will be distributed evenly along the alignment, as sampling effort does not need to be concentrated in any specific area.

GPS coordinates of each sampling site will be recorded and sites plotted on a map of appropriate scale. A GPS unit will be used, giving an accuracy of not less than ± 10 m.

3.2.5 Sample Collection

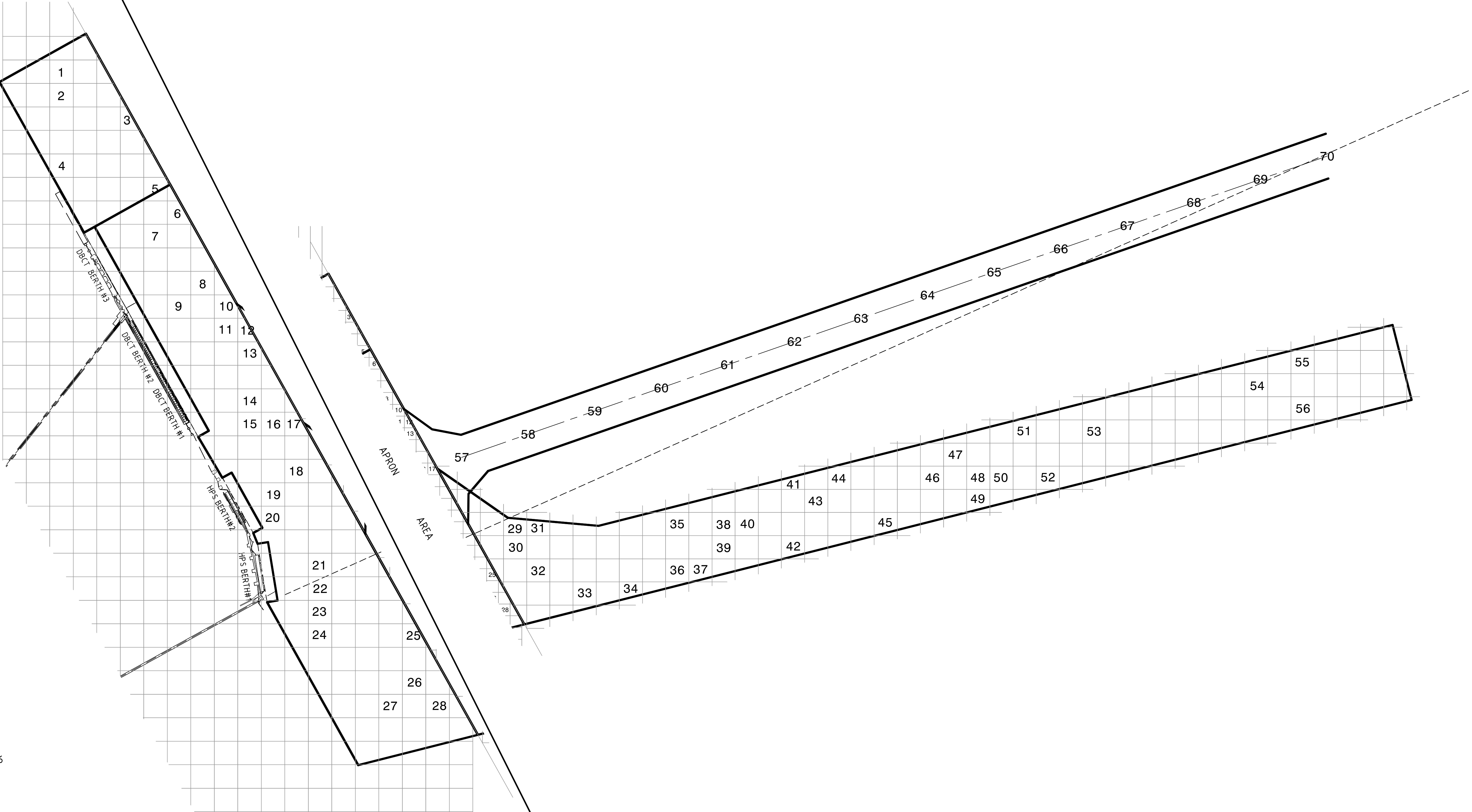
Samples will be collected using a vacuum vibrocorer operated by GeoCoastal (Australia) Pty Ltd. The core tubing will be at least 50 mm in diameter to ensure adequate sample volumes are collected to conduct the required analyses. Cores are



retrieved using drill rods which are progressively attached and deployed to the seabed over the stern of the vessel. A vibrating head is locked on top of the final rod and 'vibrated' under gravity into the seabed. A vacuum system is used to retain the core within the drill rods during retrieval. Once the core has been retrieved, the vacuum is released and core is progressively 'fed' into a plastic sock. The entire core is hung vertically to settle and allow the freestanding water at the top to drain.



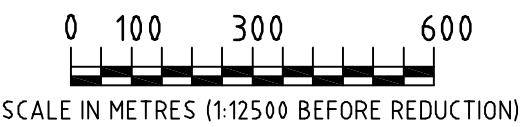
SAMPLE	EASTING	NORTHING
1	738721	7649683
2	738721	7649548
3	739102	7649407
4	738724	7649142
5	739264	7649007
6	739393	7648866
7	739264	7648735
8	739540	7648459
9	739400	7648330
10	739676	7648330
11	739673	7648195
12	739799	7648190
13	739812	7648057
14	739812	7647781
15	739812	7647648
16	739949	7647647
17	740078	7647648
18	740080	7647374
19	739949	7647238
20	739944	7647106
21	740215	7646830
22	740220	7646695
23	740216	7646562
24	740216	7646428
25	740759	7646423
26	740765	7646152
27	740625	7646017
28	740910	7646017
29	741024	7646956
30	741034	7646740
31	741293	7646964
32	741292	7646469
33	741832	7646212
34	742363	7646263
35	742900	7647011
36	742901	7646476
37	743172	7646486
38	743437	7647004
39	743439	7646736
40	743714	7647012
41	744250	7647472
42	744244	7646753
43	744500	7647277
44	744770	7647540
45	745307	7647029
46	745853	7647546
47	746120	7647813
48	746377	7647548
49	746377	7647302
50	746645	7647548
51	746917	7648087
52	747192	7647552
53	747724	7648084
54	749612	7648609
55	750133	7648885
56	750142	7648349
57	740407	7647782
58	741175	7648049
59	741946	7648318
60	742716	7648586
61	743487	7648854
62	744257	7649123
63	745028	7649391
64	745799	7649659
65	746569	7649928
66	747340	7650196
67	748110	7650464
68	748881	7650733
69	749651	7651001
70	750422	7651269



NOTES
HORIZONTAL DATUM = AMG AGD84 ZONE 56
VERTICAL DATUM = CHART DATUM

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DETAIL OF APRON AREA



DEPARTURE PATH INVESTIGATION AREA

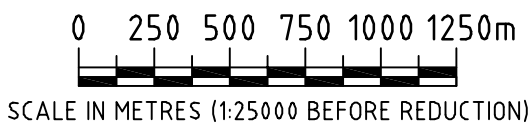


FIGURE 3, SAMPLE LOCATIONS

3.2.6 Sample Volume and Containers

The volume of sediment collected for each sample must be adequate to conduct all required chemical and physical analyses. Based on previous experience and Table 2 of the NODGDM (DEH 2002), it is anticipated that 500 g of sediment per sample/replicate will be adequate. It is not proposed to collect enough sediment to allow elutriation, dilute acid extraction or toxicity testing to be undertaken, as it is not anticipated that the sediments will be contaminated.

Samples will be placed in laboratory supplied glass jars with Teflon-lined lids. It is noted that the footnote in the table of Recommended Procedures for Sample Collection, Preservation and Storage (NODGDM, Appendix 7) states that samples for metals analysis should be stored in polyethylene containers “or other suitable material”. The USEPA guidelines SW-846, “*Test Methods for Evaluating Solid Wastes Physical/Chemical Methods*” (<http://www.epa.gov/epaoswer/hazwaste/test/pdfs/chap3.pdf>) is the standard method is used by analytical laboratories for storage and preservation of samples for chemical analysis. Chapter 3, page 4 of this document states that either glass or plastic containers can be used when testing for inorganic parameters in either aqueous or solid samples. Thus, as both organic and inorganic analytes will be tested for in this sampling program and samples to be tested for organics must be placed in glass jars, all the required sample volume will be placed in glass jars.

Containers will be completely filled with sample. Sample volume and container requirements will be confirmed with the laboratory prior to sample collection.

3.2.7 Field Measurements

The following field measurements will be recorded on an appropriate field data sheet:

- ▶ Date and time of sampling of each core.
- ▶ Person conducting sampling, client, project, sample location identifier, GPS coordinates of sampling location.
- ▶ Core logs – Each core will be logged in accordance with *AS 1726 – Geotechnical Site Investigations*, before samples are processed. Details recorded will include depth, physical appearance (e.g. sand clay), colour, odour, plasticity, sand grain size and presence of organic matter, marine organisms, coal particles, shell layers and other relevant features.
- ▶ Photographs – digital photographs will be taken of sediment cores and sampling equipment/methodology.
- ▶ Tides – the tide chart for each day of sampling will be included.
- ▶ Weather – weather conditions including wind speed, sea state, currents and rainfall for each day of sampling will be recorded.



3.3 Analysis of Sediment Samples

A NATA registered laboratory that can achieve the Practical Quantitation Limits specified in Table 3 of the NODGDM (EA 2003) will conduct analysis of sediment samples.

3.3.1 Contaminants of Concern and Number of Samples

Based on the review of previous testing and potential sources of contaminants at the Port of Hay Point, and given the contamination status of the site is unlikely to have changed since the 2000 and 2004 sampling programs, all samples will be tested for a basic suite of contaminants of concern, with 20% of samples randomly chosen and tested for an additional suite of contaminants.

Basic Suite

All sediment samples will be analysed for the following parameters:

- ▶ particle size analysis (by sieve and hydrometer, AS 1289.3.6.1 and 2);
- ▶ moisture content (0.1%);
- ▶ total organic carbon (Leco high temp carbon analyser to 0.02%);
- ▶ heavy metals (ICP/MS to 0.1 mg/kg):
 - arsenic;
 - chromium;
 - cadmium;
 - copper;
 - iron;
 - lead;
 - manganese;
 - nickel; and
 - zinc.
- ▶ organotins (TBT, DBT and MBT) (GC/MS to 0.2, 0.5 and 0.5 mg/kg).

Additional Suite

A random selection of 20% of the samples in both the Apron Area and Departure Path will be tested for the following additional contaminants:

- ▶ trace metals (ICP/MS to 0.1 mg/kg; Hg, hydride to 0.01 mg/kg):
 - antimony;
 - mercury; and
 - silver.
- ▶ PAHs (standard suite) (GC/MS ultratrace to 0.01 – 0.1 mg/kg);
- ▶ TPHs and BTEX (P & T, GC/MS; GC/FID to 2 – 100 mg/kg and 0.5 mg/kg respectively);



- ▶ organochlorine and organophosphorus pesticides (standard suite) (GC/ECD to 0.0005 mg/kg and GC/FPD to 0.01 mg/kg); and
- ▶ nutrients:
 - total nitrogen, total kjeldahl nitrogen, nitrate + nitrite, ammonia (APHA 4500-various); and
 - total phosphorus, phosphate (APHA 4500-P).

If contaminants from the additional suite are identified at concentrations exceeding the ISQG-low screening level in the randomly selected 20% of samples, the remainder of the samples will be tested for those contaminant/s.

3.3.2 Data Assessment

Results of chemical testing should be assessed for compliance to the ISQG specified in Table 5 of the NODGDM (DEH 2002). Concentrations of organic contaminants, including organotins and PAHs, should be adjusted to 1% total organic carbon before being compared to ISQG values. Statistical analyses of the data should include the calculation of 95% upper confidence limits as specified in the NODGDM (DEH 2002).

3.3.3 Further Analyses

If any contaminant/s are identified at concentrations exceeding the ISQG-low screening level, the replicate sample for those sites will be tested immediately. Upon receipt of results of replicate testing, and in discussion with the Determining Authority, additional testing will be undertaken as outlined in Phase II of the NODGDM (DEH 2002). Also, if any contaminants of concern exceed the ISQG-low screening level in one or more of the 20% of samples tested from the 1.00 – 2.00 metre depth interval, additional testing will be undertaken to determine the concentration of these parameter/s in all samples from this depth. Further analyses will be initiated within the recommended holding times for sediment samples.

3.4 Quality Control and Quality Assurance Procedures

3.4.1 Sample Preservation

Once samples are collected and labelled, they are to be promptly stored in the dark at less than 4°C (on ice) and transported to the testing laboratory within the specified holding times, but ideally within 24 hours. Samples will be collected, preserved, stored and transported according to the requirements of the NODGDM and instructions given by the analytical laboratory.

3.4.2 Sample Labels

Each sample will be labelled with a sample number. The sample number will be unique to a particular sample and will be recorded with indelible ink on both the waterproof label and the cap of the sample bottle in case the sample label is lost or destroyed.



3.4.3 Sampling Equipment

Stainless steel, uPVC or Teflon equipment will be used, where practicable, to minimise the risk of cross-contamination of samples. The following four-step procedure will be used for cleaning the sampling equipment prior to obtaining each sample to be submitted for chemical analysis:

- ▶ an initial rinse with seawater;
- ▶ a detergent solution scrub;
- ▶ a methanol (20%) – distilled water rinse; and
- ▶ a final distilled water rinse.

3.4.4 Documentation

Sample possession during testing will be traceable from the time of collection until the results are verified and reported. Sample custody procedures provide a system for documentation of all information related to sample collection and handling to achieve the objectives.

Field data sheets and chain of custody forms will be used as the primary documentation to ensure that relevant information for each sample is properly recorded. Copies of the chain of custody forms and the field sheets will be retained in the project file.

3.4.5 Analysis of QA/QC Samples

In addition to the internal laboratory quality assurance procedures, field replicates and quality assurance replicates will be collected and tested for the basic suite of contaminants of concern. The following will be analysed per batch of 20 or fewer samples:

- ▶ One container (trip) blank filled with inert material (e.g. chromatographic sand) for analysis of volatile compounds.
- ▶ On 10% of locations (7 locations: 3 in Apron Area, 1 in Departure Path (Option 3) and 3 in Departure Path Investigation Area), one field triplicate (that is, three separate samples taken at the same location).
- ▶ 5% of samples (7 samples) should be split into 2 containers to assess variation associated with sub-sample handling.
- ▶ One sample that has been analysed in a previous batch (if more than one batch is sent).

3.4.6 Validation and Checking of Laboratory Results

Upon receipt of laboratory results, QA/QC results will be checked and the results reviewed for inconsistencies or illogical results. Validation of the laboratory data and field quality control samples will be undertaken according to the requirements of Section 3.6.2 of the NODGDM and presented in the report.



3.5 Reporting

A concise report of the results of SAP will be presented outlining the following:

- ▶ Introduction/Purpose of the SAP.
- ▶ Methods including sample collection, processing, storage and analysis.
- ▶ Results including compliance to ISQG, statistical analyses and data validation.
- ▶ Discussion including an assessment of the suitability of the sediments for ocean disposal as determined by the NODGDM (DEH 2002).



4. References

Department of Environment and Heritage (2002). *National Ocean Disposal Guidelines for Dredged Material*. Commonwealth of Australia, Canberra.

Hydrobiology (2004). Maintenance Dredging SAP Implementation (May 2004) for the Departure Apron Area, Port of Hay Point. Hydrobiology, Brisbane.

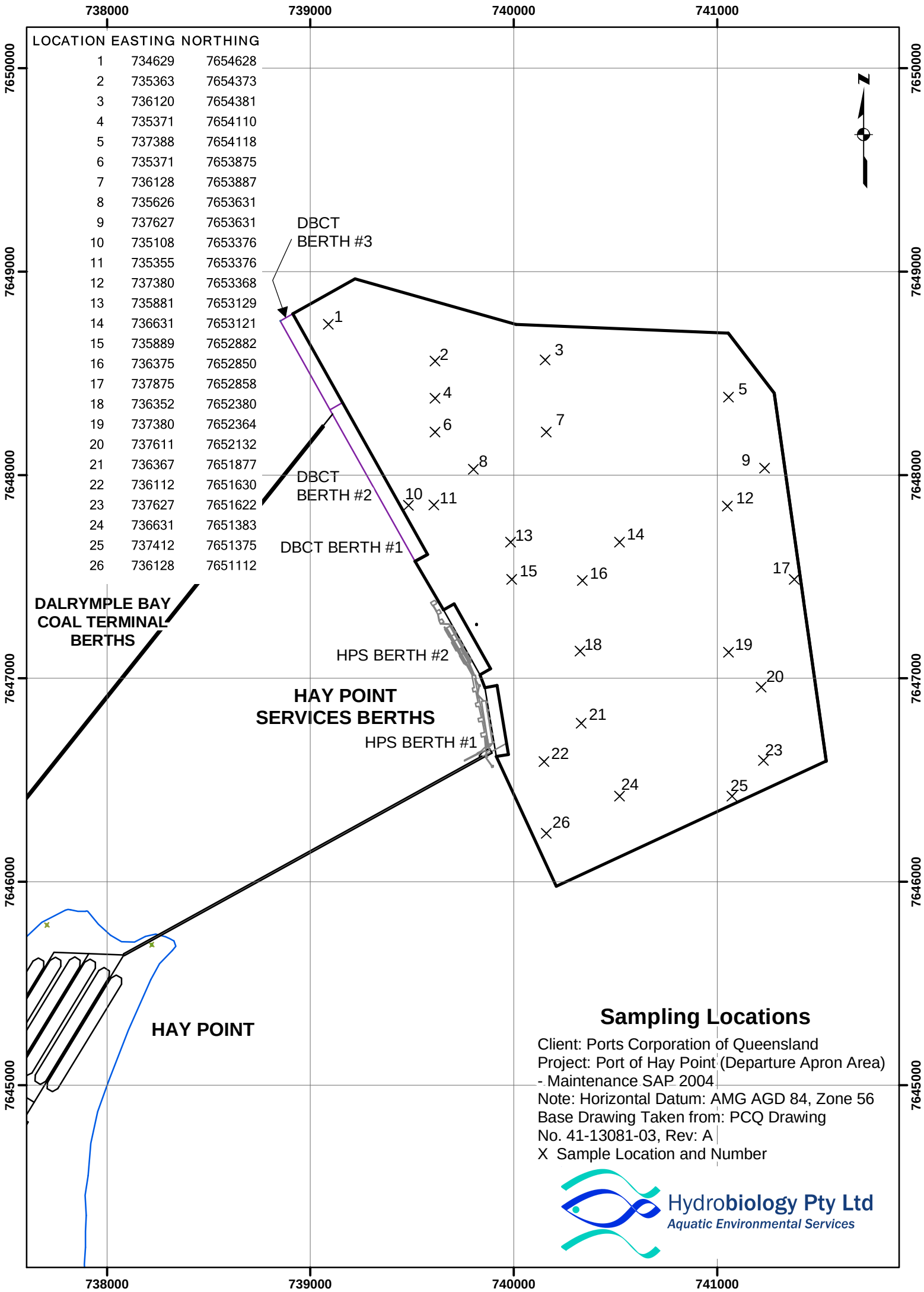
URS (2000). *Dalrymple Bay Coal Terminal Expansion Stages 6 & 7. Environmental Impact Statement*. URS, Dames and Moore, Woodward Clyde, Brisbane.

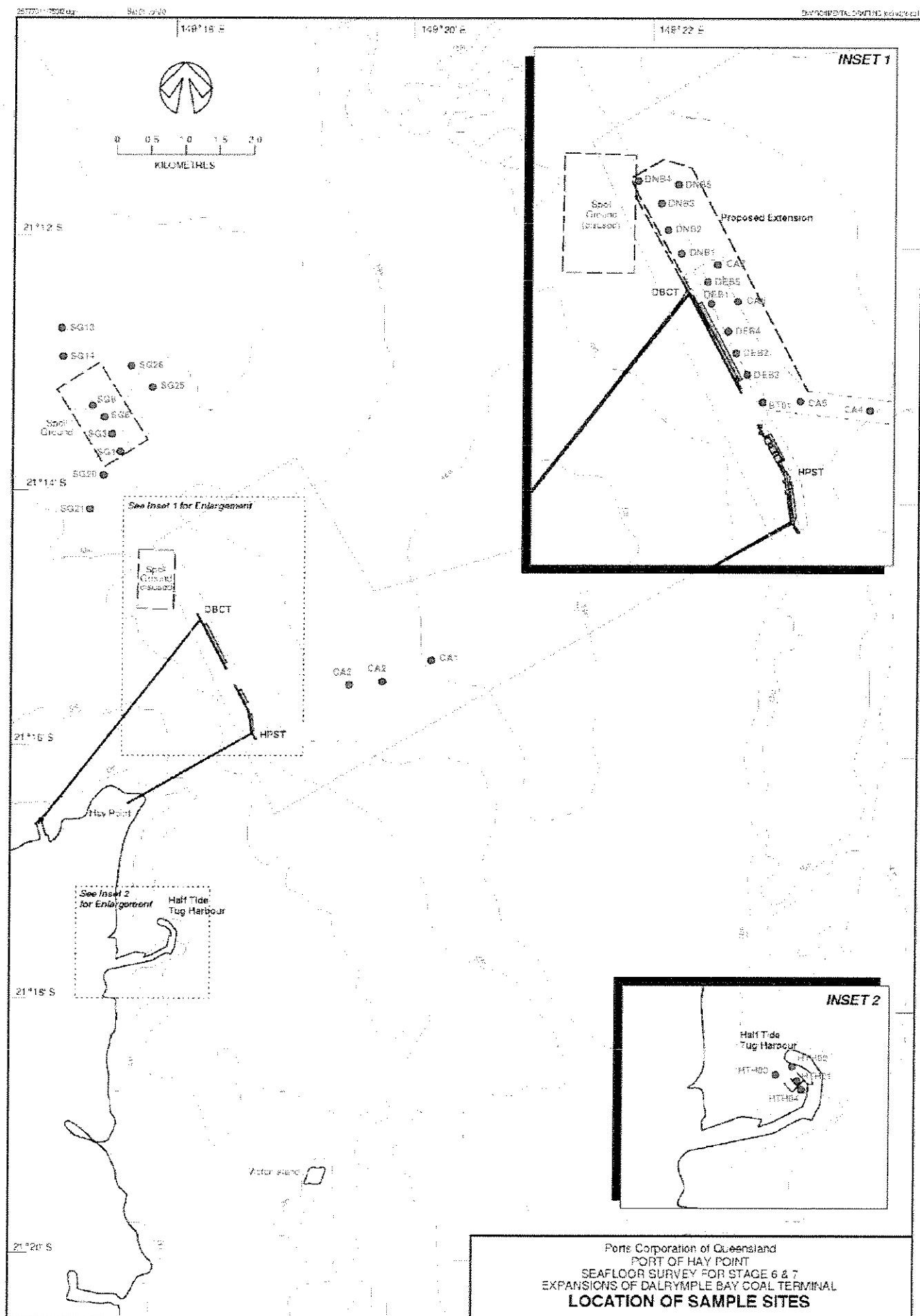
US Environmental Protection Agency (USEPA) (1996). SW-846, "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods". USEPA, (<http://www.epa.gov/epaoswer/hazwaste/test/pdfs/chap3.pdf>).



Appendix A

Previous Sediment Sampling Locations

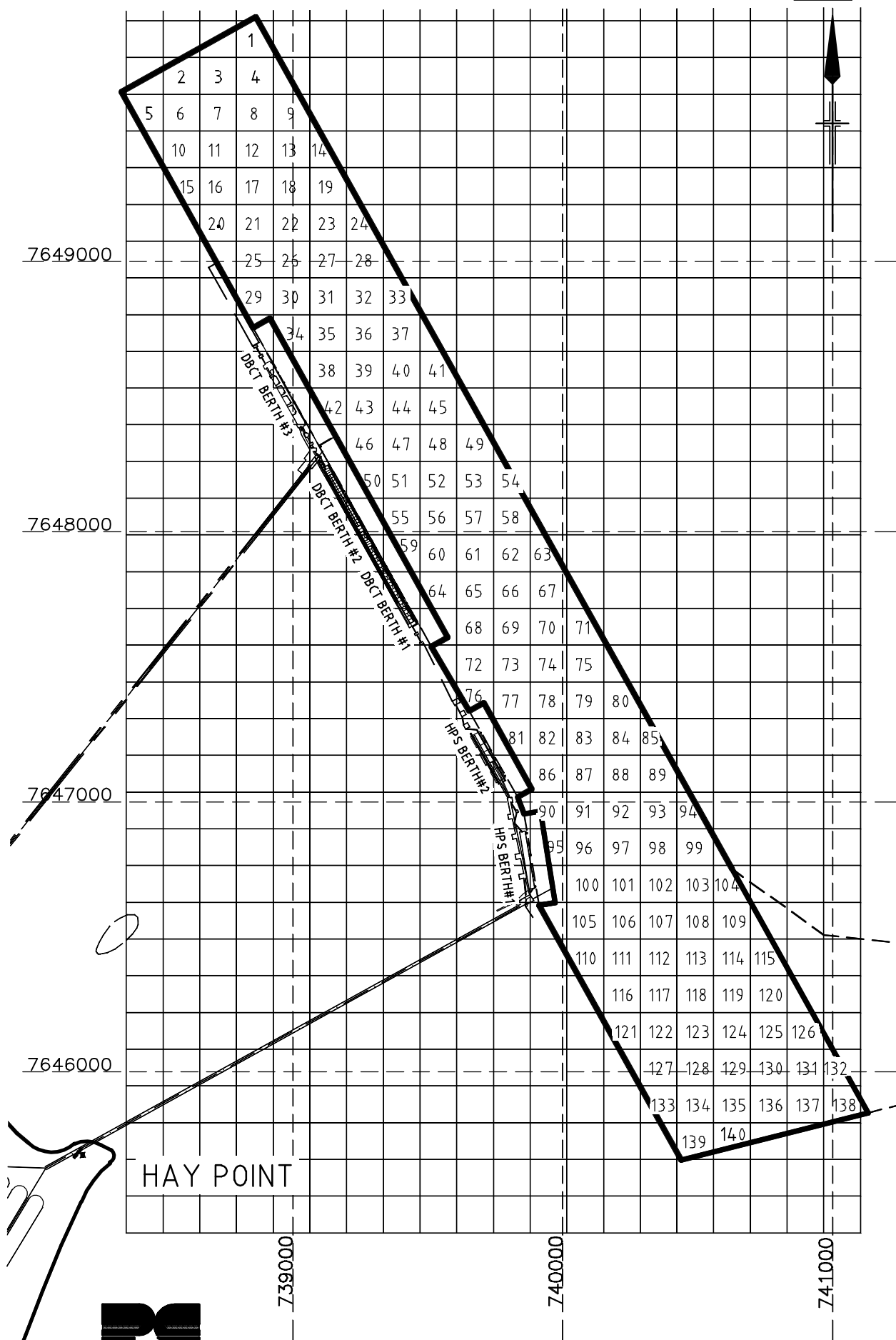






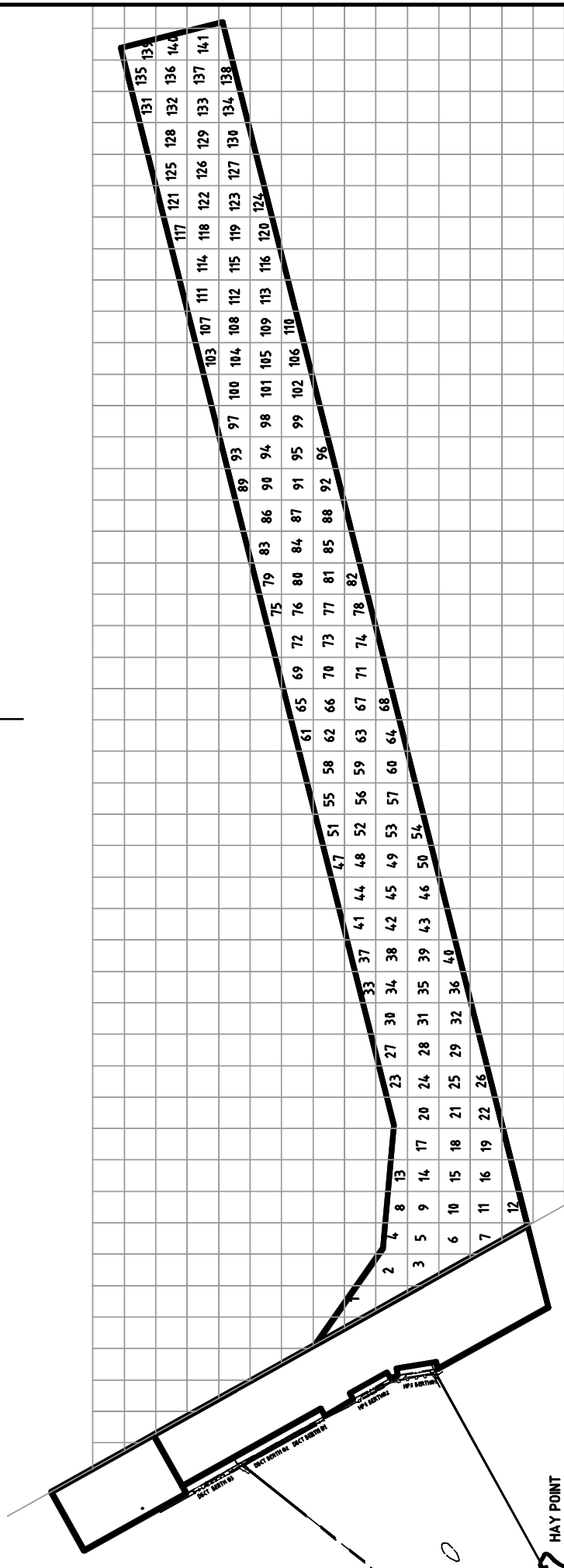
Appendix B

Grid used to Select Sampling Locations





DEPARTURE PATH INVESTIGATION AREA GRID





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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	MGW/JDL	R Koskela	RWK	J Keane	JAK	10/09/04
1	JDL	R Koskela		J Keane		21/10/04



Appendix B

Tide Times

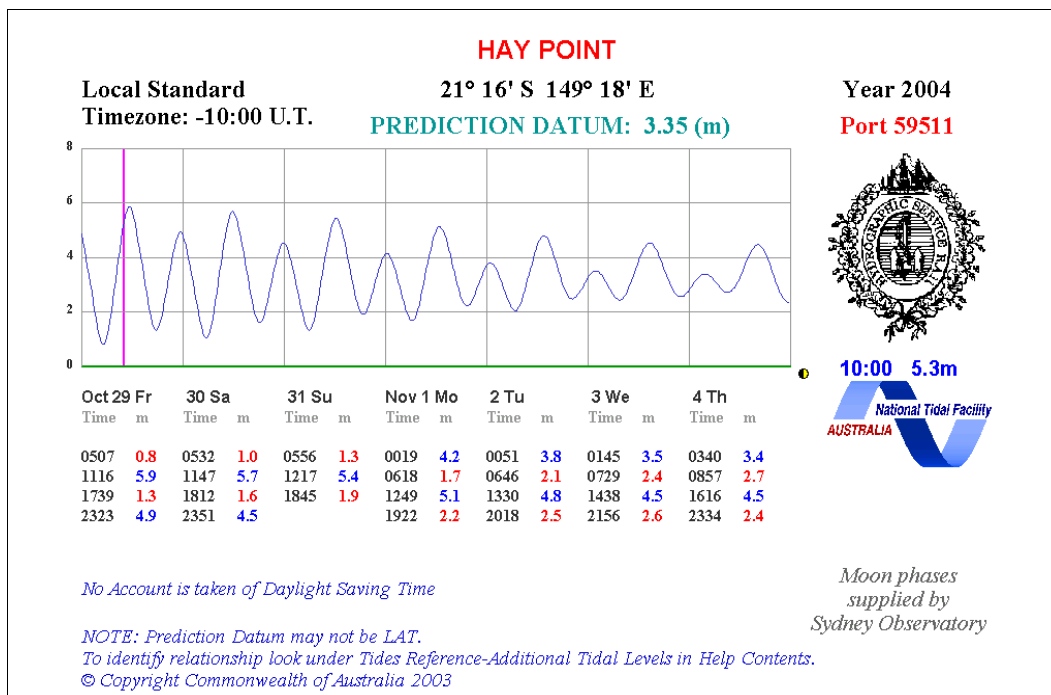


Figure 5 Tidal predictions for Hay Point, 29 October - 4 November 2004. Australian National Tide Tables - Electronic Version (Commonwealth of Australia, 2004).

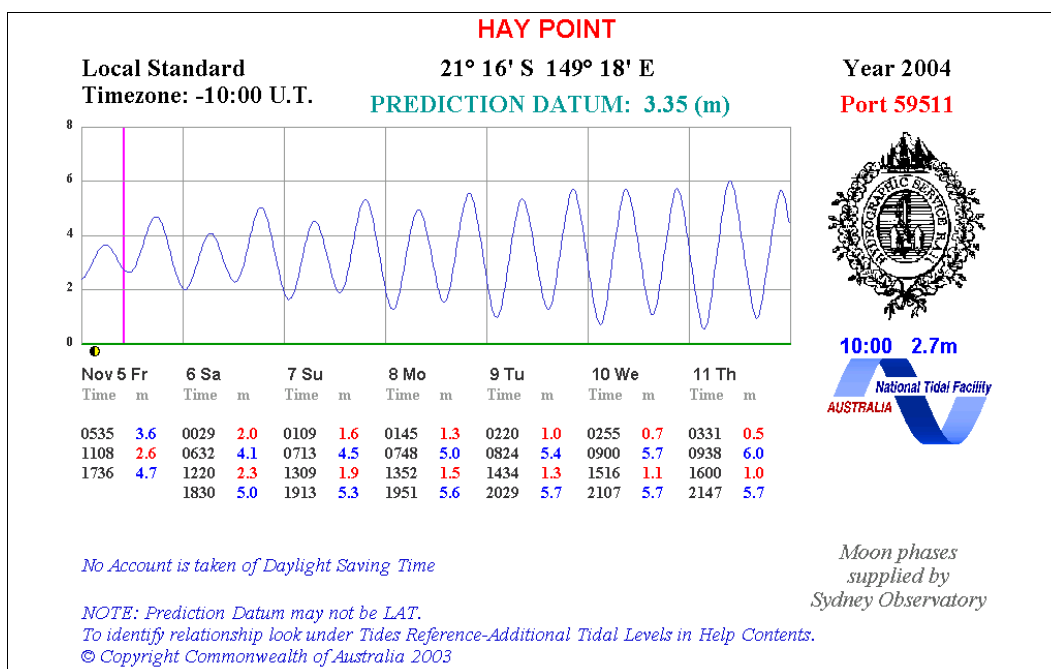


Figure 6 Tidal predictions for Hay Point, 5 – 11 November 2004. Australian National Tide Tables - Electronic Version (Commonwealth of Australia, 2004).

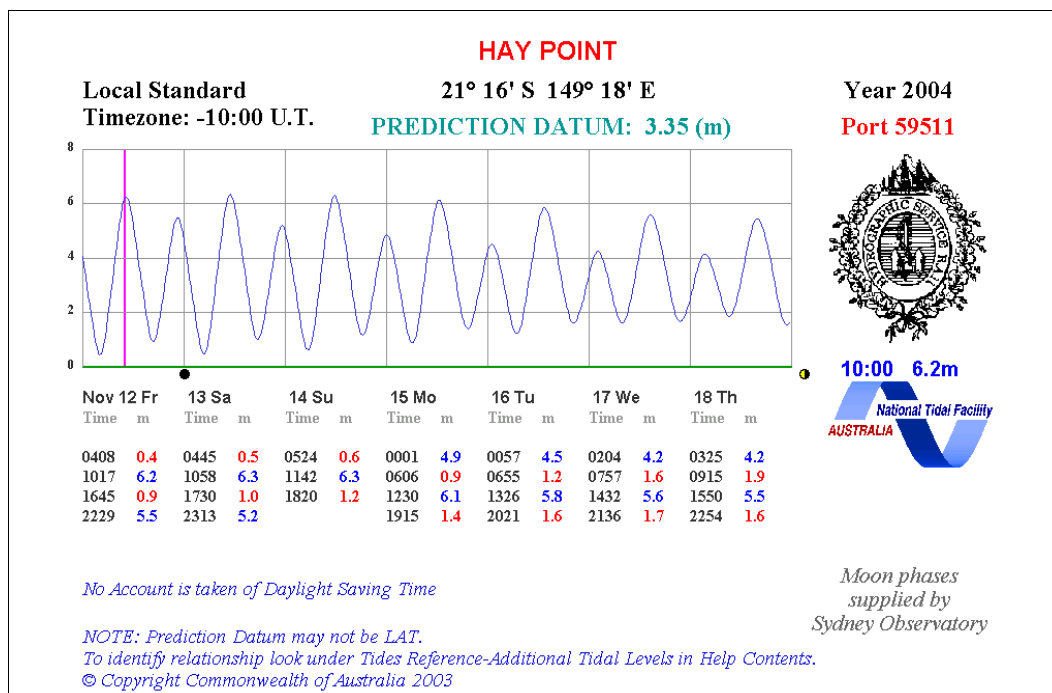


Figure 7 Tidal predictions for Hay Point, 12 – 18 November 2004. Australian National Tide Tables - Electronic Version (Commonwealth of Australia, 2004).

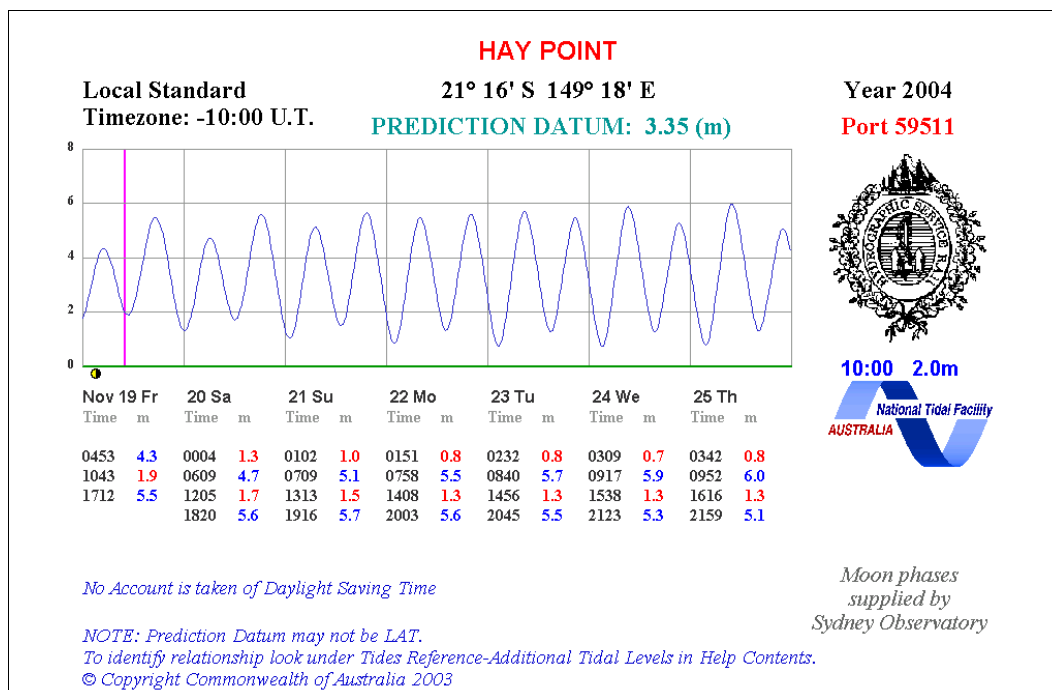


Figure 8 Tidal predictions for Hay Point, 19 – 25 November 2004. Australian National Tide Tables - Electronic Version (Commonwealth of Australia, 2004).



Appendix C

Summary of Sampling Program

Table 5 Summary of Sampling Program

Sampling Location	GPS Coordinates (WGS 84)	Sampling Date and Time	Water Depth (m)	Core Length (m)	Sub-samples Analysed	Quality Control Samples
Apron Area						
PCQ 1	Long: 149° 18.07407'	14:00	17.7	2.0	0-0.5m D	Triplicate cores (T5 and T6)
	Lat: -21° 14.23239703'	2/11/2004			0.5-1.0 B	
PCQ 2	Long: 149° 18.0752'	13:00	17.5	2.0	0-0.5m B	
	Lat: -21° 14.30552384'	2/11/2004			0.5-1.0m B	
PCQ 3	Long: 149° 18.29652'	15:15	17.8	2.0	0-0.5m B	
	Lat: -21° 14.37889354'	2/11/04			0.5-1.0m D	
PCQ 4	Long: 149° 18.08035'	14:00	15.9	1.6	0-0.5m B	
	Lat: -21° 14.52542221'	5/11/2004			0.5-1.0m B	
PCQ 5	Long: 149° 18.39349'	08:15	16.5	2.0	0-0.5m B	
	Lat: -21° 14.59428457'	5/11/2004			0.5-1.0m B	
					1.0-2.0m B-TBT	
PCQ 6	Long: 149° 18.46922'	09:30	16.9	2.0	0-0.5m B	Triplicate cores (T5 and T6)
	Lat: -21° 14.66964092'	5/11/2004			0.5-1.0m B	
PCQ 7	Long: 149° 18.39579'	10:10	16.7	2.4	0-0.5m D	
	Lat: -21° 14.74162088'	5/11/2004			0.5-1.0m B	
PCQ 8	Long: 149° 18.55759'	12:00	16.8	2.0	0-0.5m B	
	Lat: -21° 14.88894001'	5/11/2004			0.5-1.0 B	
					1.0-2.0 B-TBT	
PCQ 9	Long: 149° 18.47778'	12:45	16.4	1.8	0-0.5m B	
	Lat: -21° 14.95992437'	5/11/2004			0.5-1.0m D	

Sampling Location	GPS Coordinates (WGS 84)	Sampling Date and Time	Water Depth (m)	Core Length (m)	Sub-samples Analysed	Quality Control Samples
PCQ 10	Long: 149° 18.63726' Lat: -21° 14.95773916'	15:00 4/11/2004	18.2	2.2	0-0.5m B 0.5-1.0 B	Replicate tested at 0-0.5m
PCQ 11	Long: 149° 18.63667' Lat: -21° 15.03088915'	12:00 4/11/2004	17	2.0	0-0.5m B 0.5-1.0m B	Triplicate cores (T3 and T4)
PCQ 12	Long: 149° 18.70951' Lat: -21° 15.03259904'	14:00 4/11/2004	1400	2.0	0-0.5m B 0.5-1.0m B	
PCQ 13	Long: 149° 18.71815' Lat: -21° 15.10453878'	10:30 4/11/2004	16.9	2.0	0-0.5m D 0.5-1.0m B	
PCQ 14	Long: 149° 18.72048' Lat: -21° 15.25404107'	09:15 4/11/04	16.6	2.0	0-0.5m B 0.5-1.0m D	
PCQ 15	Long: 149° 18.72161' Lat: -21° 15.32608383'	08:30 4/11/04	16.9	2.2	0-0.5m B 0.5-1.0m B 1.0-2.0m B-TBT	
PCQ 16	Long: 149° 18.80078' Lat: -21° 15.32553892'	3/11/2004	17.6	2.1	0-0.5m B 0.5-1.0m B	
PCQ 17	Long: 149° 18.87531' Lat: -21° 15.32397355'	09:00 3/11/2004	16.5	2.2	0-0.5m B 0.5-1.0m B	Triplicate cores (T1 and T2)
PCQ 18	Long: 149° 18.87879' Lat: -21° 15.47237628'	11:40 3/11/2004	18	2.2	0-0.5m B 0.5-1.0m B 1.0-2.0m B-TBT	
PCQ 19	Long: 149° 18.80424' Lat: -21° 15.54708366'	16:30 3/11/2004	18.3	2.1	0-0.5m D 0.5-1.0m B	

Sampling Location	GPS Coordinates (WGS 84)	Sampling Date and Time	Water Depth (m)	Core Length (m)	Sub-samples Analysed	Quality Control Samples
PCQ 20	Long: 149° 18.80247' Lat: -21° 15.61862431'	15:15 3/11/2004	18.5	2.2	0-0.5m B 0.5-1.0m B 1.0-2.0m B-TBT	
PCQ 21	Long: 149° 18.96141' Lat: -21° 15.76597434'	13:30 3/11/2004	18.1	2	0-0.5m B 0.5-1.0m D	
PCQ 22	Long: 149° 18.96544' Lat: -21° 15.83906043'	13:45 3/11/2004	18.4	2	0-0.5m B 0.5-1.0m B 1.0-2.0m B-TBT	
PCQ 23	Long: 149° 18.96425' Lat: -21° 15.91113468'	11:30 2/11/2004	18.6	1.7	0-0.5m B 0.5-1.0m B	Replicate tested at 0.5-1.0m
PCQ 24	Long: 149° 18.96539' Lat: -21° 15.98371881'	10:00 2/11/2004	17	2.0	0-0.5m D 0.5-1.0m B	
PCQ 25	Long: 149° 19.27922' Lat: -21° 15.98210718'	09:15 2/11/2004	16.8	2.0	0-0.5m B 0.5-1.0m D	Replicate tested at 0-0.5m
PCQ 26	Long: 149° 19.28499' Lat: -21° 16.12885208'	10:00 29/10/2004	19.0	1.2	0-0.5m B 0.5-1.0m B	
PCQ 27	Long: 149° 19.20526' Lat: -21° 16.20471756'	13:30 28/10/2004	17.8	1.0	0-0.5m B 0.5-1.0m B	
PCQ 28	Long: 149° 19.36995' Lat: -21° 16.2024471'	08:00 2/11/2004	16	1.8	0-0.5m D 0.5-1.0m B	Replicate tested at 0.5-1.0m
PCQ 29	Long: 149° 19.42782' Lat: -21° 15.6912854'	08:30 12/11/2004	18.5	2.0	0-0.5m D 0.5-1.0m B	

Sampling Location	GPS Coordinates (WGS 84)	Sampling Date and Time	Water Depth (m)	Core Length (m)	Sub-samples Analysed	Quality Control Samples
Departure Path						
PCQ 30	Long: 149° 19.43543' Lat: -21° 15.80820636'	09:45 19/11/2004	16.2	2.0	0-0.5m B 0.5-1.0m B	Replicate tested at 0-0.5m
PCQ 31	Long: 149° 19.58319' Lat: -21° 15.68480652'	11:42 19/11/2004	15.8	2.0	0-0.5m B 0.5-1.0m B	
PCQ 32	Long: 149° 19.58683' Lat: -21° 15.95294053'	07:00 22/11/2004	18.4	2.0	0-0.5m B 0.5-1.0m B	Triplicate cores (T9 and T10)
PCQ 33	Long: 149° 19.90107' Lat: -21° 16.08783366'	08:30 15/11/2004	18.0	2.0	0-0.5m D 0.5-1.0m B	
PCQ 34	Long: 149° 20.20748' Lat: -21° 16.05595564'	09:30 15/11/2004	18.3	2.0	0-0.5m B 0.5-1.0m B 1.0-2.0m B-TBT	
PCQ 35	Long: 149° 20.51138' Lat: -21° 15.64648138'	09:00 22/11/2004	16.7	2.0	0-0.5m D 0.5-1.0m B	
PCQ 36	Long: 149° 20.51655' Lat: -21° 15.93626293'	10:30 20/11/2004	17.4	2.0	0-0.5m B 0.5-1.0m B 1.0-2.0m B-TBT	
PCQ 37	Long: 149° 20.67306' Lat: -21° 15.92866757'	11:30 15/11/2004	19.4	2.0	0-0.5m D 0.5-1.0m B	
PCQ 38	Long: 149° 20.82174' Lat: -21° 15.64595444'	16:15 17/11/2004	19.3	2.0	0-0.5m B 0.5-1.0m B 1.0-2.0m B-TBT	

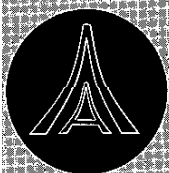
Sampling Location	GPS Coordinates (WGS 84)	Sampling Date and Time	Water Depth (m)	Core Length (m)	Sub-samples Analysed	Quality Control Samples
PCQ 39	Long: 149° 20.8252'	06:30	19	2.0	0-0.5m B	
	Lat: -21° 15.79110345'	22/11/2004			0.5-1.0m B	
PCQ 40	Long: 149° 20.98174'	07:30	20.1	1.9	0-0.5m B	Triplicate cores (T11 and T12)
	Lat: -21° 15.6393898'	22/11/2004			0.5-1.0m B	
PCQ 41	Long: 149° 21.28749'	12:15	16.8	2.0	0-0.5m B	
	Lat: -21° 15.38590222'	20/11/2004			0.5-1.0m B	
PCQ 42	Long: 149° 21.29022'	15:45	20.2	2.0	0-0.5m D	
	Lat: -21° 15.77540276'	16/11/2004			0.5-1.0m B	
PCQ 43	Long: 149° 21.43363'	11:00	17.4	2.0	0-0.5m B	
	Lat: -21° 15.48950536'	20/11/2004			0.5-1.0m B	
					1.0-2.0m B-TBT	
PCQ 44	Long: 149° 21.58737'	15:08	21.2	2.0	0-0.5m B	Replicate tested at 0-0.5m
	Lat: -21° 15.34486565'	17/11/2004			0.5-1.0m B	
PCQ 45	Long: 149° 21.90207'	14:30	20.2	1.8	0-0.5m D	
	Lat: -21° 15.6173003'	16/11/2004			0.5-1.0m B	
PCQ 46	Long: 149° 22.21308'	13:20	20.4	2.0	0-0.5m D	
	Lat: -21° 15.33283189'	16/11/2004			0.5-1.0m B	
PCQ 47	Long: 149° 22.36504'	12:00	20.1	2.0	0-0.5m B	Replicate tested at 0.5-1.0m
	Lat: -21° 15.18603952'	16/11/2004			0.5-1.0m B	
PCQ 48	Long: 149° 22.51584'	14:45	20.5	2.0	0-0.5m B	
	Lat: -21° 15.32748473'	17/11/2004			0.5-1.0m B	
					1.0-2.0m B-TBT	

Sampling Location	GPS Coordinates (WGS 84)	Sampling Date and Time	Water Depth (m)	Core Length (m)	Sub-samples Analysed	Quality Control Samples
PCQ 49	Long: 149° 22.51797'	10:30	17.1	2.0	0-0.5m D	
	Lat: -21° 15.46073067'	20/11/2004			0.5-1.0m B	
PCQ 50	Long: 149° 22.67069'	14:00	20	2.0	0-0.5m B	
	Lat: -21° 15.32530049'	15/11/2004			0.5-1.0m B	
PCQ 51	Long: 149° 22.82142'	13:00	20.5	2.0	0-0.5m B	
	Lat: -21° 15.03115726'	15/11/2004			0.5-1.0m B	
					1.0-2.0m B-TBT	
PCQ 52	Long: 149° 22.98671'	12:30	20.6	2.0	0-0.5m D	
	Lat: -21° 15.31866842'	15/11/2004			0.5-1.0m B	
PCQ 53	Long: 149° 23.28945'	15:40	20.0	2.0	0-0.5m D	
	Lat: -21° 15.02616065'	15/11/2004			0.5-1.0m B	
PCQ 54	Long: 149° 24.37567'	09:45	17.6	2.0	0-0.5m D	
	Lat: -21° 14.72628263'	16/11/2004			0.5-1.0m B	
PCQ 55	Long: 149° 24.67425'	08:15	16.2	2.0	0-0.5m B	Triplicate cores (T7 and T8)
	Lat: -21° 14.57248909'	16/11/2004			0.5-1.0m B	
PCQ 56	Long: 149° 24.68417'	11:00	18.8	1.5	0-0.5m B	Replicate tested at 0-0.5m
	Lat: -21° 14.86273189'	16/11/2004			0.5-1.0m B	



Appendix D

Chain of Custody Forms



SAMPLE RECEIPT NOTIFICATION

Attention: Joanna Lee

Client Name: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Ph/Fax Numbers: 07 4972 6377 07 4972 6236

Client Project: Port of Hay Point

LABORATORY BATCH NUMBER: A04/0798

Completed Chain of Custody accompanied samples.	YES
Samples were received in good condition and correctly preserved for all tests.	YES
Samples were received in sufficient time to allow laboratory to meet holding times.	YES
Samples were received chilled/chilling.	YES

Sample results to be available: 15/11/04

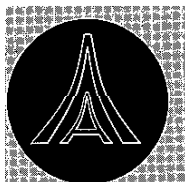
Please contact your Client Services Manager for all queries and issues regarding this sample batch on (07) 3862 2510.

Your Client Services Manager is Andrew Bradbury

Note: Turnaround time begins at time of receipt at laboratory, surcharges may apply for 24 and 48 hour turnaround.

Water samples will be discarded after 3 weeks from receipt at laboratory unless notified.
Soil samples will be stored in chilled condition for one month from receipt at laboratory and discarded after 3 months unless notified.

COMMENTS:



SAMPLE RECEIPT NOTIFICATION

Attention: Joanna Lee
Client Name: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680
Ph/Fax Numbers: 07 4972 6377 07 4972 6236
Client Project: Port of Hay Point

LABORATORY BATCH NUMBER: A04/0816

Completed Chain of Custody accompanied samples.	YES
Samples were received in good condition and correctly preserved for all tests.	YES
Samples were received in sufficient time to allow laboratory to meet holding times.	YES
Samples were received chilled/chilling.	YES

Sample results to be available: 16/11/04

Please contact your Client Services Manager for all queries and issues regarding this sample batch on (07) 3862 2510.

Your Client Services Manager is Andrew Bradbury

Note: Turnaround time begins at time of receipt at laboratory, surcharges may apply for 24 and 48 hour turnaround.

Water samples will be discarded after 3 weeks from receipt at laboratory unless notified.
Soil samples will be stored in chilled condition for one month from receipt at laboratory and discarded after 3 months unless notified.

COMMENTS:

CHAIN OF CUSTODY

FROM Client: **GHD Pty Ltd** JAN: 411 3829

Address: 2/100 Goodson Street

Tel.: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date.

Report results by: ☒ excel ☐ pdf ☐ hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA

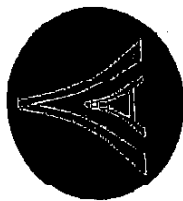
Unit 1/139 Sandgate Road, ALBION QLD 4010

TEL: 07 3862 2510
Fax: 07 3862 2520

Contact: *Miranda Parker*

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au



ANALYSES

Report results by: fax ☒ pdf ☒ hardcopy			
Laboratory ID	Client ID	Sample Date	Preservation
A0410	798	due 15/11/04	
PEA270-0.5A*		28/10/04	4°C
PA270-0.5K		✓	✓
PA270.5-1.0A*		✓	✓
PA270.5-1.0K		✓	✓
PIA260-0.5A*		29/10/04	4°C
PIA260-0.5K		✓	✓
PIA260.5-1.0A*		✓	✓
PIA260.5-1.0K		✓	✓
Note: * INDICATES THAT THIS SAMPLE IS HAS TWO CONTAINERS - ONE FOR 1 ONE FOR REPRESENTATIVE OF SAMPLE LOCATION TO BE TESTED.			
AS PER QUOTE EN04.06.5A			
Metals to Analyse (please circle): ☒ Cd ☒ Cu ☒ Hg ☒ Ni ☒ Pb ☒ Zn			
RELINQUISHED BY: <i>Brown</i>		Date: 1/11/04	
RECEIVED BY: <i>ABed</i>		Date: 2/11/04	

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

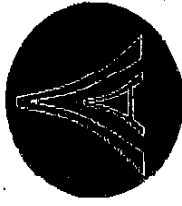
Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au

ANALYSES



Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	Hold.								
				Soil	Water	Other											
PLQ130-0.5A*	(11) (41)	4/11/04	ICE/FRAGE	X				X									2 jars
PLQ130-0.5R		"	"	X					X								
PLQ130.5-1A*	(42) (49)	"	"	X			X										
PLQ130.5-1R		"	"	X					X								
PLQ131-2A*		"	"	X					X								
PLQ131-2R		"	"	X					X								
PLQ110-0.5A	(43) (44) (45) (46)	4/11/04	ICE/FRAGE	X			X										
PLQ110-0.5R		"	"	X					X								
PLQ110.5-1A*	(47) (48) (49) (50)	"	"	X			X										
PLQ110.5-1R	(51) (52)	"	"	X					X								
PLQ111-2A*		"	"	X					X								
PLQ111-2R		"	"	X					X								

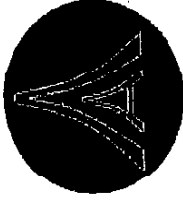
RELINGUISHED BY: *[Signature]*

DATE: 4/11/04

RECEIVED BY: *[Signature]*

DATE: 5/10/04

FROM Client: GHD Pty Ltd Address: 2/100 Goodoon Street Tel: 07 4972 6377 Fax: 07 4972 6236 Project Manager: Joanna Lee Project Ref: Port of Hay Point Results expected due date: 31/01/04 Report results by: fax email pdf hardcopy		TO ADVANCED ANALYTICAL AUSTRALIA Unit 1/139 Sandgate Road, ALBION QLD 4010 Tel: 07 3862 2510 Fax: 07 3862 2520 Contact: Maranda Parker Email: maranda.parker@advancedanalytical.com.au www.advancedanalytical.com.au	
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Report results by: fax <u>6041</u> pdf <u>hardcopy</u>										ANALYSES									
Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Soils	Detailed Soils	HCL										
				Soil	Water	Other													
PLQ 0-0.5T3*	41052	4/11/04	USE FRIDGE	X			X												
PLQ 0-0.5T3R		"	"	X					X										
PLQ 0.5-1T3*	41053	"	"	X			X												
PLQ 0.5-1T3R		"	"	X					X										
PLQ 0.1-2T3*		"	"	X					X										
PLQ 1-2T3R		"	"	X					X										
PLQ 0-0.5T4*	41054	4/11/04	"	X			X												
PLQ 0-0.5T4R		"	"	X					X										
PLQ 0.5-1T4*	41055	"	"	X			X												
PLQ 0.5-1T4R		"	"	X					X										
PLQ 1-2T4*		"	"	X															
PLQ 1-2T4R		"	"	X															
Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn										As	Pb	Cr	Cu	Hg	Ni	Pb	Zn		
RELINQUISHED BY: <u>W. Brown</u>										RECEIVED BY: <u>CA</u>			Date: <u>5/11/04</u>						

CHAIN OF CUSTODY

QUOTE NO: 2004-0054

Page 4 of 7

FROM Client: GHD Pty Ltd

Address: 2/100 Goodoon Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: *Stanoano*Report results by: fax *Excel* pdf hardcopy*4/11/04**due 16/11/04*

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.auwww.advancedanalytical.com.au

ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Sulphs	Detailed Sulphs	FeLo										
				Soil	Water	Other													
PLQ120-0-5A*	<i>Adopt</i> (50) (51) (52)	4/11/04	1 CEF/Refrigerate	X				X		X									
PLQ120-0-5K		"	"	X															
PLQ120-5-1A*	(50) (51)	"	"	X				X		X									
PLQ120-5-1R		"	"	X						X									
PLQ121-2A*		"	"	X						X									
PLQ121-2R		"	"	X						X									
PLQ100-0-5A*	(50) (51) (52)	"	"	X				X											
PLQ100-0-5K	(50) (51) (52)	"	"	X				X											
PLQ100-5-1A*	(50) (51) (52)	"	"	X				X											
PLQ100-5-1R	<i>Adopt</i> (50) (51) (52)	"	"	X						X									
PLQ101-2A*		"	"	X						X									
PLQ101-2R		"	"	X						X									

Notes: Samples with * are represented by a jar in a bag

Sample Requiring DETAIL SUITE ARE REPRESENTED BY TWO

Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn Ag PER QUOTE

RECEIVED BY:

Date: 4/11/04

Date: 5/11/04

QUOTE NO: EN04-065A

Page 1 of 2

CHAIN OF CUSTODY

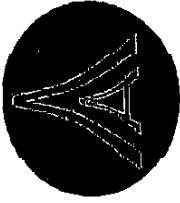
FROM Client: GHD Pty Ltd
Address: 2/100 Goodoon Street
Tel: 07 4972 6377 Fax: 07 4972 6236
Project Manager: Joanna Lee
Project Ref: Port of Hay Point

Results expected due date: Standard turn around

Report results by: fax Excel pdf hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010
Tel: 07 3862 2510 Fax: 07 3862 2520
Contact: Maranda Parker
Email: maranda.parker@advancedanalytical.com.au
www.advancedanalytical.com.au



NORTH RYDE

ANALYSES

Report results by: jax pax naracopy									
Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	HOLD
				Soil	Water	Other			
5288									
⑤	① PCQ20-0-5A	2/11/2004		X			X		X
5288	PCQ20-0-5R	"		X			X		X
⑥	② PCQ20-5-10A	"		X			X		X
	PCQ20-5-10R	"		X			X		X
	PCQ21-0-20A	"		X			X		X
	PCQ21-0-20R	"		X			X		X
5288	③ PCQ230-0-5A	"		X			X		X
5288	PCQ230-0-5R	"		X			X		X
⑧	④ PCQ230-5-10A	"		X			X		X
⑨	⑤ PCQ230-5-10R	"		X			X		X
	⑥ PCQ231-0-20A	"		X			X		X
	PCQ231-0-20R	"		X			X		X

EN04-065A

RECEIVED BY: (1)

Date: 2/11/04

REFEX

As Cd Cr Cu Hg Ni Pb Zn

Meats to Analyse (please circle):

RELINGUISHED BY: Maranda

Date: 2/11/04

Date: 2/11/04

QUOTE NO:

FROM Client: **GHD Pty Ltd**

Client: *GHD Pty Ltd*
Address: *2/100 Goodoon Street*

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: JAN 2012

Report results by: fax pdf excel

6236
A 10/11/91
2

TO ADVANCED ANALYTICAL AUSTRALIA

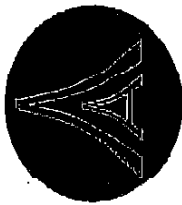
Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510
Fax: 07 3862 2520

Contact: *Maranda Parker*

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au



ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	WAD								
				Soil	Water	Other											
PCQ25 0-0.5A*	As-10556 ⑩	2/11/04	ICE	X			X										
PCQ25 0-0.5R	As-10556 ⑪	"	"	X			X										
PCQ25 0.5-1A*	As-10556 ⑫	"	"	X			X										2/10/04
PCQ25 0.5-1R	As-10556 ⑬	"	"	X					X								
PCQ25 1-2A*		"	"	X					X								
PCQ25 1-2R		"	"	X					X								
PCQ24 0-0.5A*	As-10556 ⑭	2/11/04	ICE	X				X									2/10/04
PCQ24 0-0.5R	As-10556 ⑮	"	"	X					X								
PCQ24 0.5-1A*	As-10556 ⑯	"	"	X				X									
PCQ24 0.5-1R	As-10556 ⑰	"	"	X					X								
PCQ24 1-2A*		"	"	X					X								
PCQ24 1-2R		"	"	X					X								

RELINGUISHED BY: Yam

Date: 6/11/04

RECEIVED BY: EN04

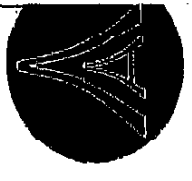
Date: 5/11/04

Metals to Analyze (please circle): As Cd Cr Cu Hg Ni Pb Zn

CHAIN OF CUSTODY QUOTE NO:

FROM Client: GHD Pty Ltd
 Address: 2/100 Goodoon Street
 Tel: 07 4972 6377 Fax: 07 4972 6236
 Project Manager: Joanna Lee
 Project Ref: Part of Hay Point
 Results expected due date: STANBONE
 Report results by: fax excel pdf hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA
 Unit 1/139 Sandgate Road, ALBION QLD 4010
 Tel: 07 3862 2510 Fax: 07 3862 2520
 Contact: Maranda Parker
 Email: maranda.parker@advancedanalytical.com.au
www.advancedanalytical.com.au



Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	HOLD	As Per Quoted	As Discussed	As Stated		
				Soil	Water	Other								
PCQ 28 0-0.5A ³	(11)	2/11/04	ICE	X				X	X				2 jars	
PCQ 28 0-0.5R		"	"	X										
PCQ 28 0.5-1A ¹	(13)	"	"	X			X							
PCQ 28 0.5-1R	(14)	"	"	X			X							
PCQ 28 1-2A ¹	(14)	"	"	X					X					
PCQ 28 1-2R		"	"	X					X					
PCQ 3 0-0.5A ¹	(15)	2/11/04	ICE	X			X							
PCQ 3 0-0.5R		"	"	X					X					
PCQ 3 0.5-1A ¹	(17)	"	"	X				X					2 jars	
PCQ 3 0.5-1R		"	"	X					X					
PCQ 3 1-2A ¹		"	"	X					X					
PCQ 3 1-2R		"	"	X					X					
TRIP BLANK 1	(16)											X		
TRIP BLANK 2	(16)											X		
Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn														
RELINQUISHED BY: <u>Joanna Lee</u>										RECEIVED BY: <u>EM04-0651A</u>				
Date: <u>4/11/04</u>										Date: <u>5/11/04</u>				

CHAIN OF CUSTODY

QUOTE NO:

Page 4 of 8

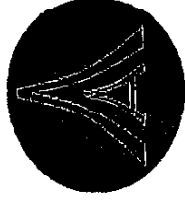
FROM Client: GHD Pty Ltd

Address: 2/100 Goodson Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: **STANDARD**Report results by: fax ☒ pdf ☒ hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au

ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	HOLD											
				Soil	Water	Other														
PCQ10-05A*	(5)	2/11/04	ICE	X				X												2/11/04
PCQ10-05R		"	"	X					X											
PCQ10-5-1A*	(13)	"	"	X			X													
PCQ10-5-1R	(14)	"	"	X					X											
PCQ11-2A*		"	"	X					X											
PCQ11-2R		"	"	X					X											
PCQ190-05A*	(16)	3/11/04	ICE	X				X												2/11/04
PCQ190-05R	(17)	"	"	X					X											
PCQ190-5-1A*	(18)	"	"	X			X													
PCQ190-5-1R	(19)	"	"	X					X											
PCQ191-2A*		"	"	X					X											
PCQ191-2R		"	"	X					X											

Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn

RECEIVED BY: REFER EN04-045A

RELINGUISHED BY:

Date: 4/11/04

RECEIVED BY:

Date: 5/11/04

CHAIN OF CUSTODY

QUOTE NO:

Page 8 of 8

FROM Client: GHD Pty Ltd

Address: 2/100 Goodoon Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: 3/11/04

Report results by: fax (Excel pdf hardcopy)

A0410748
due 16/11

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au



ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	HOLD										
				Soil	Water	Other													
PLQ 0-0.5 T1*	(30) (31)	3/11/04	ICE	X			X												
PLQ 0-0.5 T1 R		"	"	X					X										
PLQ 0.5-1 T1*	(30) (31)	"	"	X			X												
PLQ 0.5-1 T1 R		"	"	X					X										
PLQ 1-2 T1*		"	"	X					X										
PLQ 1-2 T1 R		"	"	X					X										(92) HOLD
PLQ 0-0.5 T2*	(30) (31)	3/11/04	ICE	X			X												
PLQ 0-0.5 T2 R		"	"	X					X										
PLQ 0.5-1 T2*	(30) (31)	"	"	X			X												
PLQ 0.5-1 T2 R		"	"	X					X										
PLQ 1-2 T2*		"	"	X					X										
PLQ 1-2 T2 R		"	"	X					X										

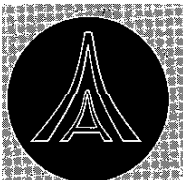
Means to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn - RESEA EN044 06/04

RELINQUISHED BY: Maranda

Date: 4/11/04

RECEIVED BY: AD

Date: 5/1/04



SAMPLE RECEIPT NOTIFICATION

Attention: Joanna Lee
Client Name: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680
Ph/Fax Numbers: 07 4972 6377 07 4972 6236
Client Project: Port of Hay Point

LABORATORY BATCH NUMBER: A04/0951

Completed Chain of Custody accompanied samples. YES
Samples were received in good condition and correctly preserved for all tests. YES
Samples were received in sufficient time to allow laboratory to meet holding times. YES
Samples were received chilled/chilling. YES
Sample results to be available: 1/12/04

Please contact your Client Services Manager for all queries and issues regarding this sample batch on (07) 3862 2510.

Your Client Services Manager is Maranda Parker

Note: Turnaround time begins at time of receipt at laboratory, surcharges may apply for 24 and 48 hour turnaround.

Water samples will be discarded after 3 weeks from receipt at laboratory unless notified.
Soil samples will be stored in chilled condition for one month from receipt at laboratory and discarded after 3 months unless notified.

COMMENTS:

ent by

Page 3 of 7

AXA1095

QUOTENO:

CHAIN OF CUSTODY

FROM Client: GHD Pty Ltd

Address: 27100 Goodson Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: *Standard*

Report results by: fax *Excel pdf hardcopy*

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Miranda Parker

Email: miranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au

ANALYSES

Matrix: Soil Water Other

Preservation

Sample Date

Client ID

Laboratory ID

16/11/04

16/11/04

16/11/04

16/11/04

16/11/04

16/11/04

16/11/04

16/11/04

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16/11/04

16/11/04

16/11/04

16/11/04

Soil

Water

Other

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Soil

Water

Other

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33

34

35

36

Soil

Water

Other

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36

Soil

Water

Other

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36

Soil

Water

Other

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33

34

35

36

Soil

Water

Other

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26

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34

35

36

Soil

Water

Other

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31

32

33

34

35

36

Soil

Water

Other

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9

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12

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14

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23

Page 16 of 17

QUOTE NO:

Page 16 of 17

CHAIN OF CUSTODY

FROM Client: GHD Pty Ltd

TO ADVANCED ANALYTICAL AUSTRALIA

Address: 2/100 Goodoon Street

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 4972 6377 Fax: 07 4972 6236

Tel: 07 1862 2510
Fax: 07 1862 2520

Project Manager: Joanna Lee

Contact: Maranda Parker

Project Ref: Port of Hay Point

Email: naranda.purtes@advancedanalytical.com.au

Results expected due date:

Standard.

Report results by: fax excel pdf hardcopy

AN

ANALYSES

Laboratory ID		Client ID	Sample Date	Preservation	Matrix			Basic	Detailed	PH
					Soil	Water	Other			
PCQ T8	0-0.5A*	16/11/04	Ice/fridge		X		(12)	X		
PCQ T8	0-0.5R								X	
PCQ T8	0.5-1A*						(13)	X		
PCQ T8	0.5-1R								X	
PCQ T8	1-2A*								X	
PCQ T8	1-2R								X	
PCQ 55	0-0.5A*	16/11/04	Ice/fridge		X		(14)	X		
PCQ 55	0-0.5R								X	
PCQ 55	0.5-1A*						(15)	X		
PCQ 55	0.5-1R								X	
PCQ 55	0-2-A*								X	
PCQ 55	1-2R								X	
				• bag only						(16)
				22/11/04						
Metals to Analyse (please circle):										Refer to end - 65A
Date: 17/11/04										RECEIVED BY:

Date: _____

Page 6 of 7

CHAIN OF CUSTODY

Unit 1/139 Sandgate Road, ALBION QLD 4010
Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: *Maranda Parker*

Email: maranda.vanier@advancedanalytical.com.au

www.advancedanalytical.com.au

ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Biotic	Protists	Hold
				Soil	Water	Other			
PCQ 54	0-0.5A*	16/11/04	Ice/fridge	X				X	
PCQ 54	0-0.5R								
PCQ 54	0.5-1A*								
PCQ 54	0.5-1R								
PCQ 54	1-2A*								
PCQ 54	1-2R								

• big only - 22/11/04

④

15/11/04

Date:

~~Metals to Analyze (please circle): As, Cd, Cr, Cu, Hg, Ni, Pb, Zn,~~

Notes:

CHAIN OF CUSTODY

QUOTE NO:

FROM Client: GHD Pty Ltd

Client: **GHD Pty Ltd**

Address: 2/100 Gordon Street

Tel: 07 4972 6377 **Fax:** 07 4972 6236

Project Manager: Joanna Lee

Project Ref: *Port of Hay Point*

Results expected due date: Standard

Report results by: fax pdf hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510
Fax: 07 3862 2520

Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au

Report results by: fax (800) pdf hardcopy				ANALYSES															
Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Bottle Suite	Recovery	Field	Lab									
				Soil	Water	Other													
PCQ38	O-O-S-A*	16/11	ICE/Fridge	X		(17)	X												
	O-O-S-R					(18)	X												
	O-S-1-A*					(19)													
	O-S-1-R																		
	1-Z-A*																		
	1-Z-R																		
PCQ48	O-O-S-A*	16/11	ICE/Fridge	X		(20)	X												
	O-O-S-R					(21)	X												
	O-S-1-A*					(22)													
	O-S-1-R																		
	1-Z-A*					(23)													
	1-Z-R																		

Materials to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn

RELINQUISHED BY: *Don*

Date: 17/11/04

RECEIVED BY:

Date:

FROM **Client:**

Client: **GED Pty Ltd**

Address: 2100 Goodson Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Part of Hay Point

Results expected due date: ~~cd-level~~

Report results by: sat excel pdf hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 · **Fax: 07 3862 2520**

Contact: Maranda Porter

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au

ANALYSES

[illegible]

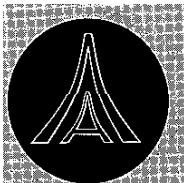
~~Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn~~

RELINQUISHED BY: H. Arab

Date:

RECEIVED BY:

Date:



SAMPLE RECEIPT NOTIFICATION

Attention: Joanna Lee

Client Name: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Ph/Fax Numbers: 07 4972 6377 07 4972 6236

Client Project: Port of Hay Point

LABORATORY BATCH NUMBER: A04/0952

Completed Chain of Custody accompanied samples.	YES
Samples were received in good condition and correctly preserved for all tests.	YES
Samples were received in sufficient time to allow laboratory to meet holding times.	YES
Samples were received chilled/chilling.	YES
Sample results to be available: 1/12/04	

Please contact your Client Services Manager for all queries and issues regarding this sample batch on (07) 3862 2510.

Your Client Services Manager is Maranda Parker

Note: Turnaround time begins at time of receipt at laboratory, surcharges may apply for 24 and 48 hour turnaround.

Water samples will be discarded after 3 weeks from receipt at laboratory unless notified.
Soil samples will be stored in chilled condition for one month from receipt at laboratory and discarded after 3 months unless notified.

COMMENTS:

ADVANCED ANALYTICAL AUSTRALIA

1110 S. Jackson Road ALBION, O.D. 4010

07 1053 2610
Fm 07 3862 2520

Tot. 07.3862 2510

Contact: Marando Parker

E-mail: marco@advancedanalytical.com.au

www.enfermedades.com.au

ANALYSES

Report results by: fax (excel) pdf hardcopy									
Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic	Detailed	Hold
				Soil	Water	Other			
PCQ 45 0-0.5A*		16/11/04	Ice/fridge	X	①		X		X
PCQ 45	0-0.5R								
PCQ 45	0.5-1A*						X		
PCQ 45	0.5-1R								X
PCQ 45	1-2A*								X
PCQ 45	1-2R								X
PCQ 45									
PCQ 47	0-0.5A*	16/11/04	Ice/fridge	X	②		X		
PCQ 47	0-0.5R								X
PCQ 47	0.5-1A*						X		X
PCQ 47	0.5-1R								X
PCQ 47	1-2A*								X
PCQ 47	1-2R								X

Note:

① where has * next to it sample is represented by a jar and a bag

② Detailed suite is represented by 2 jars

Any queries to Samma immediately

PCQ 45 0-0.5A* 16/11/04

AXA10952 Page 2 of 7

CHAIN OF CUSTODY

QUOTE NO:

FROM Client: GHD Pty Ltd
Address: 2/100 Goodson Street
Tel: 07 4972 6377 Fax: 07 4972 6236
Project Manager: Joanna Lee

Project Ref: Port of Hay Point
Results expected due date: Standard

Report results by: fax excel pdf hardcopy

Laboratory ID	Client ID	Sample Date	Preservation	Matrix	Soil	Water	Other	Bulk	Grain	PPH
PCQ46	0-0.5A*	16/11/04	Ice/fridge		X		(13)		X	X
PCQ46	0-0.5R							X		X
PCQ46	0.5-1A*									X
PCQ46	0.5-1R									X
PCQ46	0-2A*									X
PCQ46	1-2R									
PCQ56	0-0.5A*	16/11/04	Ice/fridge		X			X		
PCQ56	0-0.5R							X		
PCQ56	0.5-1A*							X		
PCQ56	0.5-1R									X
PCQ56	0-2A*									X
PCQ56	1-2R									

Date:

Delivered to ENO4-GSA

A0410952 Page 16 of 7

CHAIN OF CUSTODY

QUOTE NO:

FROM Client: GHD Pty Ltd
 Address: 2/100 Goodoon Street
 Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: Standard

Report results by: fax excel pdf hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.au

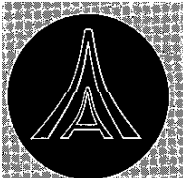
www.advancedanalytical.com.au

ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Bulk	Detailed	(Hd)										
				Soil	Water	Other													
PCQ 18	0-0.5A	16/11/04	ice fridge	x				x	x										
PCQ 18	0-0.5R																		
PCQ 18	0.5-1A*							x	x										
PCQ 18	0.5-1R								x										
PCQ 18	1-2A*								x										
PCQ 18	1-2R																		
PCQ 55	0-0.5A*	16/11/04	ice fridge	x				x	x										
PCQ 55	0-0.5R																		
PCQ 55	0.5-1A*							x	x										
PCQ 55	0.5-1R																		
PCQ 55	0.5-2A*																		
PCQ 55	1-2R																		

Date:

Refer to envelope - 65A



SAMPLE RECEIPT NOTIFICATION

Attention: Joanna Lee
Client Name: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680
Ph/Fax Numbers: 07 4972 6377 07 4972 6236
Client Project: Port of Hay Point

LABORATORY BATCH NUMBER: A04/0962

Completed Chain of Custody accompanied samples.	YES
Samples were received in good condition and correctly preserved for all tests.	YES
Samples were received in sufficient time to allow laboratory to meet holding times.	YES
Samples were received chilled/chilling.	YES

Sample results to be available: 2/12/04

Please contact your Client Services Manager for all queries and issues regarding this sample batch on (07) 3862 2510.

Your Client Services Manager is Andrew Bradbury

Note: Turnaround time begins at time of receipt at laboratory, surcharges may apply for 24 and 48 hour turnaround.

Water samples will be discarded after 3 weeks from receipt at laboratory unless notified.
Soil samples will be stored in chilled condition for one month from receipt at laboratory and discarded after 3 months unless notified.

COMMENTS:

ANALYSES

23/01/84

CHAIN OF CUSTODY

FROM Client: GHD Pty Ltd

Address: 2/100 Goodoon Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Part of Hay Point

Results expected due date: **STANDARD**

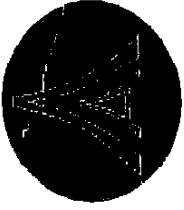
Report results by: fax email pdf hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Miranda Parker

Email: miranda.parker@advancedanalytical.com.auwww.advancedanalytical.com.au

ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Toxicology	HOLD	BASE	TEST
				Soil	Water	Other					
PLQ 35 0-05A*		1	100% Pass	X							
PLQ 35 0-05R									X		
PLQ 35 05-1A*						(6)	X				
PLQ 35 05-1R									X		
PLQ 35 1-2A*									X		
PLQ 35 1-2R									X		
PLQ 41 0-05A*			100% Pass	X		(7)	X				
PLQ 41 0-05R									X		
PLQ 41 05-1A*						(8)	X				
PLQ 41 05-1R									X		
PLQ 41 1-2A*									X		
PLQ 41 1-2R									X		
										(8)	

Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn

RELINQUISHED BY: *[Signature]*

Date: 22/11/04

RECEIVED BY: *[Signature]*

Date: 23/4/04

FROM Client:

GHD Pty Ltd

Address: 2/100 Goodson Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date:

Report results by: ☒ fax ☐ pdf ☐ hardcopy

409/0562

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

TEL: 07 3862 2510 **Fax:** 07 3862 2520

Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au



ANALYSES

[illegible]

Page 4 of 8

QUOTE NO:

CHAIN OF CUSTODY

FROM Client: GHD Pty Ltd

Address: 2/100 Goodoon Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: *Stannard*Report results by: fax *Excel* pdf hardcopy

A0410962

TO ADVANCED ANALYTICAL AUSTRALIA

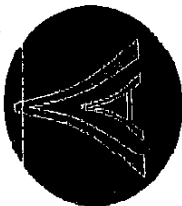
Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au



ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	HOLD										
				Soil	Water	Other													
PLQ T10 0-0.5A			NE/PAHs	✓		(14)	X		X										
PLQ T10 0-0.5K			↑	↑		(15)	X		X										
PLQ T10 0.5-1A			↑	↑					X										
PLQ T10 0.5-1R			↑	↑					X										
PLQ T10 1-2A			↑	↑					X										
PLQ T10 1-2K			↑	↑					X										
PLQ 49 0-0.5A			NE/PAHs	✓		(16)		X											
PLQ 49 0-0.5K			↑	↑		(17)			X										
PLQ 49 0.5-1A			↑	↑		(18)			X										
PLQ 49 0.5-1R			↑	↑		(16)			X										
PLQ 49 1-2A			↑	↑					X										
PLQ 49 1-2K			↑	↑					X										
									(18)										

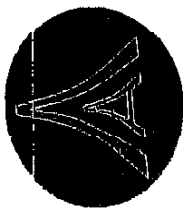
Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn

Date: 22/11/04

RECEIVED BY:

20/11/04

Date: 20/11/04



HAIR OF CUSTODY

ROM Client:

Address: 2100 Goodoon Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: **Spring 2010**

Report results by: fax and pdf hardcopy

Report results by: fax ~~encl~~ pdf ~~haracopy~~

QUOTE NO: END4-063A

ADVANCED ANALYTICAL ADJUSTMENTS

ADVANCED ANALYTICAL
1120 S. Dingle Road, ALBION QLD 4010

Unit 1/139 Sandgale Road, ARLINGTON
 Eng: 07 3862 2520

Tel: 07 3862 2510

Content: Meranda Parker

Contact: Murunda@advancedanalytical.com.au

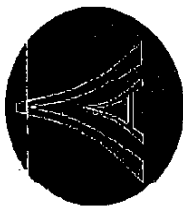
Email: maranda.parker@advantec.com

www.advancedanalytical.com.au

ANALYSES

ANALYSES										Date: 22/11/04
Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	HOLD	Zn/Al (mg/g)
				Soil	Water	Other				
PLQ43 0-0.5A*		22/11/04	ICE/PAGE	X	(F)	(F)	X		X	
PLQ43 0-0.5R					(R)	(R)	X		X	
PLQ43 0.5-1A*					(R)	(R)			X	
PLQ43 0.5-1R					(R)	(R)			X	
PLQ43 1-2A*										
PLQ43 1-2R										
PLQT11 0-0.5A*		22/11/04	ICE/PAGE	X	(20)	(20)	X		X	
PLQT11 0-0.5R							X		X	
PLQT11 0.5-1A*									X	
PLQT11 0.5-1R									X	
PLQT11 1-2A*										
PLQT11 1-2R									(27)	
RECEIVED BY: (27)										Date: 22/11/04

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ANALYSES

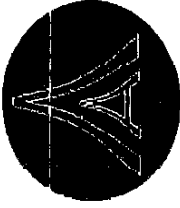
Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Sulfide	Detailed Sulfide	Hole
				Soil	Water	Other			
PLQ112 0-0.5A*		22/11/04	1CE/PAQUE	X		(23)	X		
PLQ112 0-0.5R									X
PLQ112 0.5-1A*						(23) (24)	X		
PLQ112 0.5-1R									X
PLQ112 1-2A*									X
PLQ112 1-2R									X
PLQ39 0-0.5A*		22/11/04	1CE/PAQUE	X		(24) (25)	X		
PLQ39 0-0.5R									X
PLQ39 0.5-1A*						(25) (26)	X		
PLQ39 0.5-1R									X
PLQ39 1-2A*									X
PLQ39 1-2R									X
									(E)

Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn

RELINGUISHED BY: W. Brown Date: 22/11/04

RECEIVED BY: [Signature] Date: 23/11/04

CHAIN OF CUSTODY

QUOTE NO: **ENVU4-065A**Page **1** of **2****FROM** Client: **GHD Pty Ltd**Address: **2/100 Goodoon Street**Tel: **07 4972 6377** Fax: **07 4972 6236**Project Manager: **Joanna Lee**Project Ref: **Port of Hay Point**Results expected due date: **Sign-off**Report results by: **fax** **pdf** **hardcopy****10410962****TO** **ADVANCED ANALYTICAL AUSTRALIA**Unit **1/139 Sandgate Road, ALBION QLD 4010**Tel: **07 3862 2510** Fax: **07 3862 2520**Contact: **Maranda Parker**Email: **maranda.parker@advancedanalytical.com.au****www.advancedanalytical.com.au****ANALYSES**

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	Hold
				Soil	Water	Other			
PLQ 32 0-0.5A*			KE/FAD/Na	X	(36) (2A)	(2A)	X		
PLQ 32 0-0.5R								X	
PLQ 32 0.5-1A*					(2A) (2B)	(2A)	X		
PLQ 32 0.5-1R								X	
PLQ 32 1-2A*								X	
PLQ 32 1-2R								X	
PLQ 39 0-0.5A*		22/11/04	KE/FAD/Na	X			X		
PLQ 39 0-0.5R								X	
PLQ 39 0.5-1A*							X		
PLQ 39 0.5-1R								X	
PLQ 39 1-2A*								X	
PLQ 39 1-2R								X	
								(A)	

Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn

RELINQUISHED BY: **ME**Date: **22/11/04**RECEIVED BY: **DP**Date: **12/12/04**

Client: GHD Pty Ltd

Address: 2/100 Goodoon Street

Tel: 07 4972 6377 **Fax:** 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Part of Hay Point

Results expected due date: **5/19/2010**

Report results by: fax ~~pdf~~ pdf hardcopy

424/0962

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510

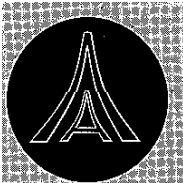
Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au



Laboratory ID				Client ID	Sample Date	Preservation	Matrix			Analyses		
							Soil	Water	Other	Basic Suite	Detailed Suite	H N O P
PLQ40 0-0.5A					22/11/04	Wet/Freeze	X		(28)	X		
PLQ40 0-0.5R												
PLQ40 0.5-1A									(25)	X		
PLQ40 0.5-1R									(30)			
PLQ40 1-2A										X		
PLQ40 1-2R										X		
NOTE: (1) WHERE A SAMPLE HAS A '4' NEXT TO IT SAMPLE IS REPRESENTED BY JAC & DOL. (2) SAMPLES REQUIRING DETAILED SUITE ARE REPRESENTED BY TWO JACS & DOL.												
SAMPLES 'PLQ54 1-2A' & 'PLQ 55 1-2A' (A54/0351) WERE IDENTIFIED ON GHO C.O.C. SENT 17/11/04 & WERE SUPPOSED TO BE IN THAT BATCH. PLEASE HOLD THESE SAMPLES.												
ANY QUERIES IMMEDIATELY TO JOANNA DEE ON WHATMAN GREENSPAN. ON 27/11/04												
Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn												
RELINQUISHED BY: <i>[Signature]</i> Date: 22/11/04 RECEIVED BY: <i>[Signature]</i> Date: 22/11/04												



SAMPLE RECEIPT NOTIFICATION

Attention: Joanna Lee
Client Name: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680
Ph/Fax Numbers: 07 4972 6377 07 4972 6236
Client Project: Port of Hay Point

LABORATORY BATCH NUMBER: A04/0963

Completed Chain of Custody accompanied samples.	YES
Samples were received in good condition and correctly preserved for all tests.	YES
Samples were received in sufficient time to allow laboratory to meet holding times.	YES
Samples were received chilled/chilling.	YES

Sample results to be available: 2/12/04

Please contact your Client Services Manager for all queries and issues regarding this sample batch on (07) 3862 2510.

Your Client Services Manager is Andrew Bradbury

Note: Turnaround time begins at time of receipt at laboratory, surcharges may apply for 24 and 48 hour turnaround.

Water samples will be discarded after 3 weeks from receipt at laboratory unless notified.
Soil samples will be stored in chilled condition for one month from receipt at laboratory and discarded after 3 months unless notified.

COMMENTS:

CHAIN OF CUSTODY

QUOTE NO:

LVO4-0654

Page 2 of 8

FROM

Client: GHD Pty Ltd

Address: 2/100 Goodson Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: STANDARD

Report results by: fax and pdf hardcopy

A04 0963

TO ADVANCED ANALYTICAL AUSTRALIA

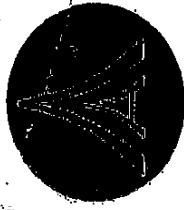
Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Maranda Parker

Email: marandaparker@advancedanalytical.com.au

www.advancedanalytical.com.au



ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Soil	Basic Suite	Demineral	HPLC	Trace Metals
				Water	Other	Soil					
PLQ 35 0-0.5A*		1	ICE/PAH		①		X	X			
PLQ 35 0-0.5R										X	
PLQ 35 0.5-1A*								X		X	
PLQ 35 0.5-1R										X	
PLQ 35 1-2A*										X	
PLQ 35 1-2R										X	
											Detailed (2)
PLQ 41 0-0.5A*			ICE/PAH				X				
PLQ 41 0-0.5R								X		X	
PLQ 41 0.5-1A*								X			
PLQ 41 0.5-1R										X	
PLQ 41 1-2A*										X	
PLQ 41 1-2R										X	

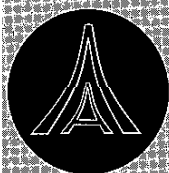
Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn

RELINQUISHED BY: *[Signature]*

Date: 22/11/04

RECEIVED BY: *[Signature]*

Date: 23/11/04



SAMPLE RECEIPT NOTIFICATION

Attention: Joanna Lee

Client Name: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Ph/Fax Numbers: 07 4972 6377 07 4972 6236

Client Project: Port of Hay Point

LABORATORY BATCH NUMBER: A04/0853-A

Completed Chain of Custody accompanied samples.	YES
Samples were received in good condition and correctly preserved for all tests.	YES
Samples were received in sufficient time to allow laboratory to meet holding times.	YES
Samples were received chilled/chilling.	YES

Sample results to be available: 19/11/04

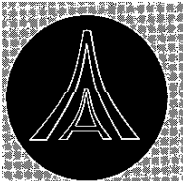
Please contact your Client Services Manager for all queries and issues regarding this sample batch on (07) 3862 2510.

Your Client Services Manager is Andrew Bradbury

Note: Turnaround time begins at time of receipt at laboratory, surcharges may apply for 24 and 48 hour turnaround.

Water samples will be discarded after 3 weeks from receipt at laboratory unless notified.
Soil samples will be stored in chilled condition for one month from receipt at laboratory and discarded after 3 months unless notified.

COMMENTS:



SAMPLE RECEIPT NOTIFICATION

Attention: Joanna Lee

Client Name: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Ph/Fax Numbers: 07 4972 6377 07 4972 6236

Client Project: Port of Hay Point

LABORATORY BATCH NUMBER: A04/0853-B

Completed Chain of Custody accompanied samples.	YES
Samples were received in good condition and correctly preserved for all tests.	YES
Samples were received in sufficient time to allow laboratory to meet holding times.	YES
Samples were received chilled/chilling.	YES

Sample results to be available: 19/11/04

Please contact your Client Services Manager for all queries and issues regarding this sample batch on (07) 3862 2510.

Your Client Services Manager is Andrew Bradbury

Note: Turnaround time begins at time of receipt at laboratory, surcharges may apply for 24 and 48 hour turnaround.

Water samples will be discarded after 3 weeks from receipt at laboratory unless notified.
Soil samples will be stored in chilled condition for one month from receipt at laboratory and discarded after 3 months unless notified.

COMMENTS:

CHAIN OF CUSTODY

QUOTE NO:

C/004 - 005/1

Page 1 of 4

FROM Client: GHD Pty Ltd

Address: 2/100 Goodson Street

Tel: 07 4972 6377

Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: 27 November.

Report results by fax excel pdf hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510

Fax: 07 3862 2520

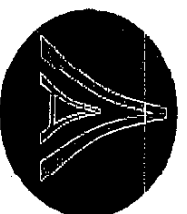
Contact: Maranda Parker

NOETI RXDE

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au

BASIC MINERAL TBT



ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	HOLD	Basic TBT										
				Soil	Water	Other														
PCAS0-0.5A*	40410B53A dme	19/11/04	ICE/fract	X			X													
PCAS0-0.5R		5/11	'	X					X											
PCAS0-5-10A*		5/11	'	X			X													
PCAS0-5-10R		5/11	'	X					X											
PCAS1-0-2-0A*		5/11	'	X						X										
PCAS1-0-2-0R		5/11	'	X					X											
PCAS0-0.5A*		5/11/04	ICE/fract	X			X													
PCAS0-0.5R				X					X											
PCAS0-5-10A*				X			X													
PCAS0-5-10R				X					X											
PCAS1-0-2-0A*				X					X											
PCAS1-0-2-0R				X					X											
PCAS0-0.5A*				X																
PCAS0-0.5R				X					X											
PCAS0-5-10A*				X			X													
PCAS0-5-10R				X					X											
PCAS1-0-2-0A*				X					X											
PCAS1-0-2-0R				X					X											
due	19/11/04																			

Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn

RELINQUISHED BY: M. Muller

Date: 8/11/04

RECEIVED BY: [Signature]

Date: 10/11/04

NOTE: ① where sample has 'x' next to it, sample is represented by Jar & Bag

② Samples requiring analysis for detailed suite are represented by TWO jars.

Any queries to Joanna Lee immediately.

Thanks

CHAIN OF CUSTODY

QUOTE NO:

Page 4 of 4

FROM Client: GHD Pty Ltd

Address: 2/100 Goodoun Street

Tel: 07 4972 6371 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Sydney Point

Results expected due date: Standard

Report results by: fax excel pdf hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510

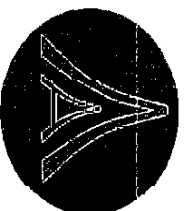
Fax: 07 3862 2520

Contact: Maryneta Parker

NORTH RYDE

Email: maryneta.parker@advancedanalytical.com.au

www.advancedanalytical.com.au



ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	H2O											
				Soil	Water	Other														
PC00-0.5TS	Ad10853A	5/11/04	Ice/Freezer	X			X													
PC00-0.5TSR				X					X											
PC00-0.5-1.0TS*	(11)			X			X													
PC00-0.5-1.0TSR				X					X											
PC01-0-2.0TS*	?			X					X											
PC01-0-2.0TS				X					X											
PC00-0.5TS6	(12)	5/11/04	Ice/Freezer	X			X													
PC00-0.5TS6R				X					X											
PC00-0.5-1.0TS6	(13)			X			X													
PC00-0.5-1.0TS6R				X					X											
PC01-0-2.0TS6				X					X											
PC01-0-2.0TS6R				X					X											
due	19/11/04																			

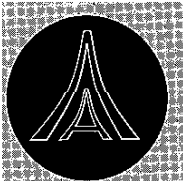
Metals to Analyse (Please circle): As Cd Cr Cu Hg Ni Pb Zn

RELINGUISHED BY: M. M. M. M.

Date: 8/11/04

RECEIVED BY:

Date: 10/11/04



SAMPLE RECEIPT NOTIFICATION

Attention: Joanna Lee
Client Name: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680
Ph/Fax Numbers: 07 4972 6377 07 4972 6236
Client Project: Port of Hay Point

LABORATORY BATCH NUMBER: A04/0911-A

Completed Chain of Custody accompanied samples.	YES
Samples were received in good condition and correctly preserved for all tests.	YES
Samples were received in sufficient time to allow laboratory to meet holding times.	YES
Samples were received chilled/chilling.	YES

Sample results to be available: 26/11/04

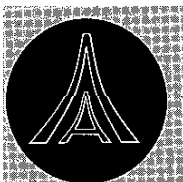
Please contact your Client Services Manager for all queries and issues regarding this sample batch on (07) 3862 2510.

Your Client Services Manager is Andrew Bradbury

Note: Turnaround time begins at time of receipt at laboratory, surcharges may apply for 24 and 48 hour turnaround.

Water samples will be discarded after 3 weeks from receipt at laboratory unless notified.
Soil samples will be stored in chilled condition for one month from receipt at laboratory and discarded after 3 months unless notified.

COMMENTS:



SAMPLE RECEIPT NOTIFICATION

Attention: Joanna Lee

Client Name: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Ph/Fax Numbers: 07 4972 6377 07 4972 6236

Client Project: Port of Hay Point

LABORATORY BATCH NUMBER: A04/0911-B

Completed Chain of Custody accompanied samples.	YES
Samples were received in good condition and correctly preserved for all tests.	YES
Samples were received in sufficient time to allow laboratory to meet holding times.	YES
Samples were received chilled/chilling.	YES

Sample results to be available: 30/11/04

Please contact your Client Services Manager for all queries and issues regarding this sample batch on (07) 3862 2510.

Your Client Services Manager is Andrew Bradbury

Note: Turnaround time begins at time of receipt at laboratory, surcharges may apply for 24 and 48 hour turnaround.

Water samples will be discarded after 3 weeks from receipt at laboratory unless notified.
Soil samples will be stored in chilled condition for one month from receipt at laboratory and discarded after 3 months unless notified.

COMMENTS:

FROM Client: GHD Pty Ltd

Address: 2/100 Goodoon Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: Standard

Report results by: fax excel pdf hardcopy

TO

ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgaie Road, ALBION QLD 4010

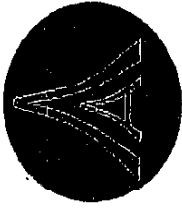
Tel: 07 3862 2510

Fax: 07 3862 2520

Contact: Miranda Parker

Email: miranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au



Acc 09/11/04 Acidology ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic Suite	Detailed Suite	1 to 10	2 to 10	3 to 10	4 to 10	5 to 10	6 to 10	7 to 10	8 to 10	9 to 10	10 to 10
				Soil	Water	Other												
PCQ 330-0-SA*		15/11/04	Ice/Fridge	X				X										
PCQ 330-0-SR									X									
PCQ 330-S-1A*																		
PCQ 330-S-1R																		
PCQ 331-2A*																		
PCQ 331-2R																		
PCQ 340	0-0-SA*	15/11/04	Ice/Fridge	X				X										
PCQ 34	0-0-SR																	
PCQ 34	0-S-1A*																	
PCQ 34	0-S-1R																	
PCQ 34	1-ZA*																	
PCQ 34	1-ZR																	

NOTE: ① where has next to it, sample is represented by a jar + a bag.

② Detailed suite is represented by 2 jars.

Any queries to Joanna Lee immediately

Thanks

Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn

RELINQUISHED BY: P. Moller

Date: 16/11/04

RECEIVED BY: (signature)

Date: 17/11/04

A 055 / 01 CL

Client: GHD Pty Ltd

Address: 2/100 Goodoon Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: Standard

Report results by: fax ~~excel~~ pdf hardcopy

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.au

www.advancedanalytical.com.au



ALBION ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Soil	Basic	Depleted	Soil	To (D)
				Soil	Water	Other					
PCQ37 P	0-0.5A*	15/11/04	Ice/Fridge	X					X	X	
	0-0.5R										
	0.5-1A*										
	0.5-1R										
	1-2A*										
PCQ52 P	0-0.5A*	15/11/04	Ice/Fridge	X					X	X	
	0-0.5R										
	0.5-1A*										
	0.5-1R										
	1-2A*										
	1-2R										

Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn

RELINQUISHED BY: P. Mellor

Date: 16/11/04

RECEIVED BY:

Date: 17/11/04

CHAIN OF CUSTODY

QUOTE NO:

Page 3 of 4

FROM Client: GHD Pty Ltd

Address: 2/100 Goodoon Street

Tel: 07 4972 6377 Fax: 07 4972 6236

Project Manager: Joanna Lee

Project Ref: Port of Hay Point

Results expected due date: *Standard*Report results by: fax *excel* pdf *hardcopy*

TO ADVANCED ANALYTICAL AUSTRALIA

Unit 1/139 Sandgate Road, ALBION QLD 4010

Tel: 07 3862 2510 Fax: 07 3862 2520

Contact: Maranda Parker

Email: maranda.parker@advancedanalytical.com.auwww.advancedanalytical.com.au

ANALYSES

Laboratory ID	Client ID	Sample Date	Preservation	Matrix			Basic	Sulfide	Held	Basic	Held
				Soil	Water	Other					
PCQ S1	0-0-SA*	15/11/04	Ice-Fridge	X		(5)	X				
	0-0-SR					(B)	X		X		
	0-S-1A*					(2)			X		
	0-S-1R										
	1-2A*										
1-2R											
PCQ S0	0-0-SA*	15/11/04	Ice-Fridge	X		(2)	X				
	0-0-SR					(4)	X		X		
	0-S-1A*								X		
	0-S-1R								X		
	1-2A*								X		
1-2R											
Metals to Analyse (please circle): As Cd Cr Cu Hg Ni Pb Zn <i>Refer</i>											
RELINQUISHED BY: <i>J. McPherson</i> Date: <i>18/11/04</i> RECEIVED BY: <i>ENDY-69</i>											



Appendix E

Site Sheets



Site number (including client): PCQ1	Weather conditions: Fine, lt-mad wind	Sea state: NE Sea Breeze 10knts 0.5m E swell	Staff member:
Time of sampling: 1400 2/11/04	Depth of water: 17.7m	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Intervals sampled:	

Sample details and notes:

Replicate tested?

Additional sample at 0-0.5m.

0-50cm: Sandy mud, some shells, grey,
no odour, medium plasticity. **Triplicate taken?**

50cm-60cm: Sandy clay, some shells (to 53cm)
no mottling, dark grey.

60-100cm: High plasticity, clay, some shells,
with depth turns to a more pure
clay.

100-200cm: As above, light grey layered
mottling.

SOIL BOREHOLE LOG

Borehole No.:

Page: 1 of 1

CLIENT:

COMMENCED:

PROJECT:

JOB No.:

COMPLETED:

SITE #: **27 SITE 2**

LOGGED BY:

CONTRACTOR:

EQUIPMENT:

CHECKED BY:

WATER DEPTH (m):

TIDE (m):

SEA BED (AHD):

DIAMETER (mm):

X-COORDINATE:

Y-COORDINATE:

DEPTH OF CORE (m):

Depth (m)	Method Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0				0.00 0.00	Ground Surface					0
1			1300 2/11/04. Depth = 17.5m 5-10km c/s 0.5m E well							1
2			0-15 - Loose silty sand, some clay, grey. Some shells less than no pebbles. 15-60 Dark grey silty clay some shell fragments low plastic soft, some fine sands, some mottling, harder with depth							2
3			0.5-1.0 - Some very fine sands within Very very hard clay Predominantly orange clay With some grey & grey mottling Some black petrified wood @ 0.75m Carbon based low to med plastic bit brittle.							3
4			Stiff clay 1-2m - 10 upper hole sandy clay clay is softer below							4
5			@ 1.5 - dense sand with some clay 140-150 Seams with orange clay							5
6			Some black petrified wood							6

Rest - very hard uniform clay.

1.0-2.0 white clay with brown/black mottling.

brittle



Site number (including client): PCQ 2	Weather conditions: Fine 5-10knts E	Sea state: 0.5m E swell	Staff member: MB MW
Time of sampling: 1300 2/11/04	Depth of water: 17.5m	Tide:	Photo numbers:
GPS coordinates: 149 18 07S 21 14 30E	Depth of core: 2m	Intervals sampled: 0-0.5m, 0.5-1.0m, 1.0m-2.0m	

Sample details and notes:

0-15cm: Loose silty sand, some clay, grey, some shells (1cm diameter) no pebbles

15-60cm - Dark grey silty clay, some shell fragments, low plasticity, soft, some fine sands, some mottling, gets harder with depth.

50-100cm - Some very fine sands within very very hard clay. Predominantly orange clay with some green and grey mottling, some black carboniferous material @ 75cm. Low-to-medium plasticity.

100-200cm - Very hard uniform clay. except @ 150cm, dense sand with some clay (spans 10cm).

190-200cm - white clay, white/brown/black mottling.

Replicate tested?

Triplicate taken?



Site number (including client): <i>PLQ3</i>	Weather conditions: <i>10-15 knots SE/NE</i>	Sea state: <i>0.5m SE swell</i>	Staff member:
Time of sampling: <i>1515</i>	Depth of water: <i>17.8m</i>	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Intervals sampled:	

Sample details and notes:

Replicate tested?

Addition Jute @ 0.5 + 1.0m

TriPLICATE taken?

*0-50 - Grey-brown clay, some mottling,
hard, ~~low~~ medium plastic, some
small shells, ~~sections of high~~*

*50-100 Hard clay, grey orange-reddy mottling,
calcareous deposits, low-medium
plastic. some shells, 2cm*

*100-140 - Grey-brown clay, low plastic, orange
red mottling, some small shells pebbles*

140-170 - Calcareous matter, as above

*170-200 - Uniform brown clay, ~~medium~~ ^{high}
plastic, firm.*



P of HP Ap. Areas & DT
Capital Dredging

Site number (including client): PCQ3	Weather conditions: 10-15 knts SE/NE	Sea state: 0.5m SE Swell	Staff member:
Time of sampling: 1515 2/11/04	Depth of water: 17.8m	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 2m	Intervals sampled: 0-0.5, 0.5-1.0, 1.0-2.0	

Sample details and notes: Additional sample @ 0.5-1.0m.

Replicate tested?

Triplicate taken?

0-50cm - Grey-brown clay, some mottling, hard, medium plasticity, some small shells.

50-100cm - Hard clay, grey orange-red mottle, calcareous deposits, low-medium plasticity, some shells (to 52cm)

100-140cm - Grey-brown clay, low plasticity, orange-red mottling, some small shells/pebbles.

140-170cm - Calcareous matter, as above.

170-200 - Uniform brown clay, high plasticity, firm



Site number (including client): PCQ4	Weather conditions:	Sea state:	Staff member:
Time of sampling: 1100 5/11/04	Depth of water: 15.9m	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 1.6	Intermediate depth:	

Sample details and notes:

+ 2x Triplicate cores

Replicate tested?

N

0-5cm - dark grey silt
5-10cm - " silty sand. Some
carbon based material.

Triplicate taken?

Y TS
96

10-20cm - Grey clay. Very hard. Low plasticity.
Muddy odour

20-50cm - Brown & Orange clay. Hard. No pebbles.

50-100; AS 20cm-50cm, low plastic, V.
Hard.

1-1.5 - AS above
3cm seam grey clayey sand

Rest as above
Softer at bottom.



Site number (including client): PCQ4-T5	Weather conditions:	Sea state:	Staff member:
Time of sampling: 1430 5/11/04	Depth of water: 16.3	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Internals accepted:	
Sample details and notes: As per PCQ4			Replicate tested? N
			Triplicate taken? TS Rep Trip of PCQ5



Site number (including client): PLQ4-T6	Weather conditions:	Sea state:	Staff member:
Time of sampling: 1505	Depth of water: 16.4	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Interval (m):	
Sample details and notes: AS per PCAG Coal fines in top layer		Replicate tested? Triplicate taken?	



Site number (including client): PCQS	Weather conditions: Fine. Light NE breeze.	Sea state: <0.5m swell ENE	Staff member: MW MB
Time of sampling: 0815 5/11/04	Depth of water: 16.5m	Tide: Slack	Photo numbers:
GPS coordinates:	Depth of core: 2m	Intervals sampled: 0-0.5, 0.5-1.0, 1.0-2.0	
Sample details and notes:			Replicate tested: N
Testing 1-2m for Basic mines TBT 0-0.1 - Very hard reddish/brown clay w grey green mottling throughout. Low plasticity. Some small pebbles. No odour 0.1-0.15 - Seam of grey green clay of similar consistency. 0.15-0.5 - Same as first layer with 0.5cm black pebbles. 0.5-1 - Uniform Reddish/brown clay w some grey-green mottling. Same clay structure as above. Harder w depth. 1-1.5 - As above 1.5-1.55 - Seam of dark grey clay. Rel. soft w hard clasts of rocky material. Medium Plasticity. 1.55-2m - similar colour but some white mat. Loh harder. Geopon had some trouble achieving 2m penetration at this location.			Triplicate taken? N



20 ships - 5/11/04 CARE FACTOR?

Site number (including client): PCQ6	Weather conditions:	Sea state:	Staff member:
Time of sampling: 0930 5/11/04	Depth of water: 16.9	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Intervals sampled:	
Sample details and notes: 0-50: Grey/brown silty clay, gravel throughout (~1.5cm) green mottling, grey mottling. medium plasticity, no odor firm but malleable. 0.5-1.0: As above. 1.0-1.5: As above 1.5-1.7: Silty sand, no gravels, Brown 1.7-2.0: Rocks, pebbles, silty sand, large clasts, green mottling, hard clay.			Replicate tested? N Triplicate taken? N



Site number (including client): PCQ 7	Weather conditions: 5-10 NE Some Cloud	Sea state: 0.5 m SE Swell 0.5 m NE Chop	Staff member: MB MW
Time of sampling: 1010 5/11/04	Depth of water: 16.7	Tide:	Photo numbers:
GPS coordinates: Sheet	Depth of core: 2.4 m	Interval (m): 0-0.5, 0.5-1, 1-2	

Sample details and notes:	Replicate tested?
Take additional sample from 0-50 0-0.5 - Coarse sand. Brown sand with white fragments. No odour. 0.5-0.6 - Hard clay, light brown to red/orange mottling. Medium plasticity 0.6-1.0: Sand as per 0-0.5. } 'Sand channel' 1.0-1.5: Sand ↑ 1.5-2.0: Hard clay, As per 0.5-0.6 High Plast. & Some black carbon based material throughout.	☒ Triplicate taken?



Site number (including client): PCQ8	Weather conditions: 5-10 NE	Sea state: 0.5m	Staff member: MB, MW
Time of sampling: 1200 5/11/04	Depth of water: 168	Tide: South	Photo numbers:
GPS coordinates: 8m	Depth of core: 2m	Intervals sampled: 0-0.5, 0.5-1, 1-2	

Sample details and notes:	Replicate tested? N
Testing 1-2m Basic minus TBT 0-5cm - fine grey silt. 5-10cm - Dark grey clay. Small pebbles throughout. No odour. Med plast. Relatively soft. 10-30cm - light grey-white clay to large amounts pebbles Low plast. No odour. 30-50cm - dark grey clay. No pebbles. Med plast. No odour. Soft 50-75 - Dark grey ^{sandy} clay V. soft. Low plastic. pebbles to 5mm throughout. 75-100 - lt Brown silty clay pebbles throughout. Soft low plast. 1-1.5 - Very fine sand to some clay throughout. some pebbles up to 2cm. No plast. lt Brown. 1.5-2 - Grey to coarser sand. as above in pebbles etc.	Triplicate taken? N



Site number (including client): <i>PLQ 9</i>	Weather conditions:	Sea state:	Staff member:
Time of sampling: <i>1245 5/11/04</i>	Depth of water: <i>16.4m</i>	Tide:	Photo numbers:
GPS coordinates:	Depth of core: <i>1.8</i>		

Sample details and notes:

Take Additional Sample 0.5-1.0 m. ^{plankton}

0-0.1 - Fine to coarse ~~gravelly~~ sand, well graded, brown.

0.1-0.5 - Straight to hard silty clay, dark brown, low plasticity, no odour, isolated pebbles.

0.5-1.0 - Brown silty clay, some green mottling at depth, black organics throughout, firm, medium plasticity, sand was carried throughout core from top layer, unavoidable.

1-1.8 - Brown Silty Clay
on above black organics.
some green mottling at depth

Replicate tested? *N*

Triplicate taken? *✓*



Site number (including client): PCQ10	Weather conditions:	Sea state:	Staff member: MB MW
Time of sampling: 1500 4/11/04	Depth of water: 18.2	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 2.2	Intervals ^{xR} : 0-0.5, 0.5-1.0, 1.0-2.0	

Sample details and notes:

0-0.5: Brown clayey-silt, some green mottling, increasing in clay content with depth, low plastic, some fine sands + shells on top, no gravels, no odor.

0.5-0.6: As above.

0.6-1.0: Same consistency, creamy/light grey mottling, silty sand, some clays, fine sand, low plastic; no odor.

1.0-1.7: As above

1.7-1.9: Brown clay, heavy white mottling, light grey pebbles, firm, low plasticity.

1.9-2.0: Grey brown silty sand, some gravels.

Replicate tested?
Y 0-0.5

Triplicate taken?



Site number (including client): <i>PLQ 11</i>	Weather conditions:	Sea state:	Staff member:
Time of sampling: <i>1200 4/11/04</i>	Depth of water: <i>17m</i>	Tide:	Photo numbers:
GPS coordinates:	Depth of core: <i>2m</i>	Intervals sampled: <i>0-0.5m, 0.5-1.0, 1.0-2.0</i>	
Sample details and notes: <i>Replicate Cores T3 & T4 taken from this site.</i>			Replicate tested? <i>N</i>
<i>0-50: Mottled ^{silty} clay, brown/grey mud, to T3 & T4. black organics, some white clay towards 50, soft to firm, low plasticity, no odour, so gravel 1cm.</i>			Triplicate taken?
<i>50-100: As above.</i>			
<i>100-200: As above + Hard clay fragments with depth</i>			
<i>[T3]:</i>			



Triplicate 3 & 4

Site number (including client): PCQ 11 - T3 & T4	Weather conditions: 10 knots	Sea state:	Staff member:
Time of sampling: 4/11/04 1300-1240-13	Depth of water: 17.8	Tide:	Photo numbers:
GPS coordinates: 1330-14	Depth of core: Both 2m	Intervals sampled: 0-0.5, 0.5-1.0, 1.0-2.0	
Sample details and notes: 0-50: Brown silty clay, some green & white mottling, gravel (1cm @) decreases with depth medium plasticity, harder & darker with depth As per PCQ 11		Replicate tested? ☒ Triplicate taken? ☒	



Site number (including client): <i>PCQ 12</i>	Weather conditions: <i>10 knot NE Fine</i>	Sea state: <i>0.5 m NE slip</i>	Staff member: <i>MB, MW</i>
Time of sampling: <i>1400 4/11/04</i>	Depth of water: <i>18m</i>	Tide:	Photo numbers:
GPS coordinates: <i>SL-1</i>	Depth of core: <i>2m</i>	Intervals sampled: <i>0-0.5, 0.5-1, 1-2</i>	

Sample details and notes:

*0-0.1 - Brown silty clay w dark grey streaks. Coal fragments to 1cm Ø
Low plasticity. Soft*

*0.1-0.5 - Brown, hard clay. Small pebbles throughout mottled with white, hard, dry clay.
Medium plasticity.*

0.5-0.7 - As above.

0.7-1.0 - Brown silty-clay, white clay mottled low plastic, Soft, no pebbles on fore-edge weather

*1-2m Same clay but more 'ferrous' mottling white grain.
Pebbles throughout. Hard*

Bottom 10cm has more sandstone/bedstone type material. Sandy-clay?

Replicate tested? *~*

Triplicate taken? *~*



Site number (including client): PCQ 13	Weather conditions: 10knot- NE	Sea state: 0.5-0.7 Slight Easterly swell coming off ship	Staff member: MB, MW
Time of sampling: 1030 4/11/04	Depth of water: 16.9m	Tide: South	Photo numbers:
GPS coordinates: Shute	Depth of core: 2m	Intervals sampled: 0-0.5, 0.5-1, 1-2	

Sample details and notes:

Replicate tested?

- Take additional sample from 0-0.5
- 0-0.3 - light brown clay w dark grey & white mottling. Small pebbles throughout. Medium plasticity. Muddy odour. Soft.
- 0.3-0.5 - Dark Grey clay with light grey clay mottled through. Hard. Low plasticity.
- 0.5-0.6 - clay as above
- 0.6-0.8 - lighter grey clay. w lots light colored pebbles. Clay consistency as above.
- 0.8-1m - Lt Brown clay w some red & dark grey mottling. Small to large pebbles. Low plasticity.
- 1-1.3 - Mottled Brown/orange clay. @ 1.2-1.25 - 2cm of light grey clay with large clasts. Small pebbles throughout. Med plasticity. Hard clay.
- 1.3-2 - clayey sand. Low plasticity. Pebbles throughout. Mottled with isolated grey. ~~Some~~ Majority Red/Brown. Soft.

Triplicate taken?



Site number (including client): PLQ14	Weather conditions: As per 15	Sea state: As per 15	Staff member: MB MW
Time of sampling: 0915 4/11/04	Depth of water: 16.6m	Tide:	Photo numbers:
GPS coordinates:	Depth of cores: 2.0m	Intervals sampled: 0-0.5, 0.5-1.0^{x2}, 1.0-2.0	

Sample details and notes:

Additional sample @ 0.5-1.0m.

0-5cm → Fine Brown silt w/ pebbles to 1cm

5-20cm → Green clay w/ pebbles throughout. Medium plasticity. Some hard white clay deposits. Marine odour

20-50cm - light Brown clay w/ orange/red mottling throughout. med plasticity. At 50cm going to hard white clay deposit

50-~~60~~100cm - Med harden clay. Dark grey/green. Medium plasticity. White clay mottling throughout. At 50cm there is hard white clay clump. No odour

1-1.2 - light brown sandy clay with grey green mottling. Hard clump. Pebble conglomerate throughout. Medium hard. No odour. Low-medium plasticity

1.2-1.8 - light brown sandy clay. Low plasticity. Some small to large pebbles. Soft.

1.8-2.0 - Same sandy clay with lots of rock fragments.

Replicate tested? **N**

Triplicate taken? **N**



Site number (including client): PCQ 15	Weather conditions: Fine Light NE Breeze 10-15 kph	Sea state: Sloppy, 0.5m swell, NE.	Staff member: MB MW
Time of sampling: 0830 4/11/04	Depth of water: 16.9m	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 2.2m	Intervals sampled: 0-0.5, 0.5-1.0, 1.0-2.0	
Sample details and notes: Testing 1.0-2.0m 0-5 : A gravelly, shelly sand, brown 5-50: Grades to silty ^{fine sand} clay, brown, low plasticity, Some small pebbles, no odour, 50-100- Fine silty sand, grey/brown, low plastic, some green mottling, small pebbles, uniform. 100-130- As above. 130-200- Very stiff clay, grey-brown colour, white mottling, to high plasticity, hard, & hardness with depth, no odour.			Replicate tested? N Triplicate taken? N



Site number (including client): PCQ16	Weather conditions: 5 knot NE Breeze	Sea state: < 0.5m Slop. NE ESE	Staff member: MB & MW
Time of sampling: 1230 3/11/04	Depth of water: 17.6m	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 2.1m	Intervals sampled:	

Sample details and notes:

Heplicate tested?

N

Triplicate taken?

N

**0-0.1 - Fine dark grey Silt
No shells, odor or plasticity
some shells down @ 5cm**

**0.1-0.5 - Brown silty sediments
grading to Brown Silty Clay. Some orange & red
mottles. No shells.**

**0.5-1m - light grey, medium plasticity clay with
heavy white & orange mottling throughout.**

1.0-1.9 Soft clay.

**~~0.4-0.9~~ Light grey silty clay, clay nodules (golf ball
size) very hard & brittle.**

1.9-2.0 - Smaller fragments of clay, grey.



18 Ships 3/11/04

Site number (including client): PC Q17	Weather conditions: Fine, light SAE breeze.	Sea state: 0.5 NE swell w some SE swell	Staff member: MB MW
Time of sampling: 0900 3/11/04.	Depth of water: 16.5m 16.5m	Tide: R in South.	Photo numbers:
GPS coordinates: As per sheet	Depth of core: 2.2m	Intervals sampled: 0-0.5, 0.5-1, 1-2	

Sample details and notes:

Replicate tested?

Not

Triplicate taken?

Y

T1 & T2

0-0.1 - Gray Silty Clay. Loose
Coral & shells throughout
(3cm) (<1cm)

0.1-0.5 - Hard Gray Clay w white & orange mottles
Some small pebbles
Medium Plasticity

0.5-0.75 - White clay w gray/green mottling
No odour. Soft Dry Clay. Low Plasticity
No sands, but pebbles (<0.5cm) throughout

0.75-1 - Orangy clay w white & gray mottling
throughout. Low Plasticity. Some pebbles.
Bit harder clay than above.

1-1.4 - As above

1.4-1.5 - Seam of soft sandy mud. Light Gray

1.5-2.0 - Light gray conglomerate of pebbles to 1cm.
Set in clayey sand. Brown color. No plasticity
because of pebble dominance. No odour



Site number (including client): <i>PCQ17 T1</i>	Weather conditions: <i>As for PCQ17</i>	Sea state: <i>As for PCQ17</i>	Staff member: <i>MB & MW</i>
Time of sampling: <i>1015 3/11/04</i>	Depth of water: <i>17.2m</i>	Tide: <i>South</i>	Photo numbers:
GPS coordinates:	Depth of core: <i>2m</i>	Intervals sampled: <i>0-0.5, 0.5-1, 1-2</i>	

Sample details and notes:	Replicate tested?
<i>0-0.05 - ^{Dark} Gray silty sand. w some clay nodules.</i> <i>Hard gray green clay. Malleable - med plasticity</i> <i>0.05-0.2 - Large amount of calcareous matter coral & shells to 3cm & within that, held in clay as above.</i> <i>0.2-0.5 - White - cream coloured clay w some orange muds throughout. Clay hard & brittle. Lots of small pebbles to 0.5cm w some shells</i> <i>0.5-1.0 - 0.5-0.7 - clay as above</i> <i>0.7-0.8 - conglomerate seam as for 0.05-0.2</i> <i>1.0 - Increase in clay content w depth Gray/orange clay. Dense clay low-med plasticity.</i> <i>1m-2m - Uniform light gray clay w orange mat. Pebbles to 2cm throughout. Increase in fine sand content w depth low plast. all through. No odor.</i>	<i>N</i> Triplicate taken? <i>This is Replicate of PCQ17</i>



Site number (including client): PLQ17 T2	Weather conditions: Refer PLQ17 Slight increase NE breeze 10km	Sea state: 0.5m & slippy - Reflected waves from ships.	Staff member: MB, MW
Time of sampling: 1045 3/11/04	Depth of water: 17.5m	Tide: South	Photo numbers:
GPS coordinates: As per PLQ17	Depth of core: 2m	Intervals sampled:	

Sample details and notes:	Replicate tested?
0-0.15 Brittle Grey/green clay. In few smt pebbles. Low plasticity. No odour.	☒
0.15-0.5 - similar clay. Med plastic. Brown to grey/green & white mottling. Lot more pebbles to 1/2cm.	Yes. Is Triplicate of PLQ17.
0.5-0.8 - Light grey clay, pebbles throughout, red/brown grey mottling, dense, soft, silty clay, low to med. plastic.	
0.8-1.00 - Silty sand, brown, uniform, no plastic.	
1-1.8 - Silty clay to some fine sands light grey. Some orange mottling. low plasticity	
1.8-2m - Increase in pebbles & shells/coral conglomerate	



Coral Spawer on Top

Site number (including client): PKQ18	Weather conditions: 10 knot NE	Sea state: 0.5 m Sloppy	Staff member: MB, MW
Time of sampling: 1140 3/11/04	Depth of water: 18m	Tide: South	Photo numbers:
GPS coordinates:	Depth of core: 2.2m	Intervals sampled: 0-0.5, 0.5-1, 1-2.	

Sample details and notes:

Replicate tested?

Test 1-2m Basic mines TBT

Triplicate taken?

~~0-0.5~~

0-0.25 - Fine Gray/green silt

0.25-0.5 - Gray/green ~~clay~~ sandy clay. Soft.

Some Red/orange not low plastic. No odor.

0.5 - 0.6 - Orange red/mottled Sandy clay low plasticity
medium hard. Small or gravelly pebbles.

0.6-1.0 - Coarse Brown/gray sand. No clays.
Uniform.

1-2m - Uniform Brown Gray Coarse Sand.

Some dark gray clay nodules to
golf ball size. Medium plasticity clay.

grading to fine sandy-clay at 2m.



Site number (including client): PCQ 19	Weather conditions: 5-10k NE	Sea state: 0.5 m Sbp	Staff member: MB, MW
Time of sampling: 1630 3/11/04	Depth of water: 18.3m	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 2.1m	Intervals sampled: 0-0.5, 0.5-1, 1-2	

Sample details and notes:

Replicate tested?

Take Additional Sample for
0-0.50

N

Triplicate taken?

N

0-20cm - Conglomerate Coral, Shells in Dark
gray sand. Layer of fine dark
gray silt. Coral < 4cm. Shells crushed
to < 1cm.

0.2-0.5 - Mainly orangey clay w white mottling.
Low plasticity. Brittle. No Mark
Mud colour. Hard clay.

0.5-0.75 - As above
Except large white clay mottles.

0.75-0.85 - White Clay. Brittle - Hard.

0.85-1m - Back to Brown/Orange Clay No White. Hard.
Brittle.

1m - Uniform Grey brown clay w orange mottling throughout
1.05 - White Clay nodules & some pebbles throughout
low plasticity. Hard. No odour.



Site number (including client): <i>PCA20</i>	Weather conditions: <i>5 knot NE</i>	Sea state: <i>< 0.5 m slip.</i>	Staff member: <i>MB, MU</i>
Time of sampling: <i>1515 3/11/04</i>	Depth of water: <i>18.5m</i>	Tide: <i>North</i>	Photo numbers:
GPS coordinates: <i>As sheet</i>	Depth of core: <i>2.2m</i>	Intervals sampled: <i>0-0.5, 0.5-1, 1-2</i>	

Sample details and notes:

Replicate tested?

Test 1-2m Sample for Basic - TBT
0-5cm - Brown Silt + shells
Biovalve. Tube etc. But not dead.

N

Triplicate taken?

N

0.5cm - 0.5m - Uniform, medium plasticity orange/black mottling
Brown Clay.
Carbon based (Coal?) deposit 10cm down.
No odour
Fairly hard Clay.
No Sands. Isolated pebbles to 5mm.
Some corals to 2cm

0.5-1m - Brown Clay. Med plasticity, no odour
Some shells. Soft Clay. No ^{major} mottling (except isolated
Uniform Clay. No pebbles or Sand. orange mottling)

1-1.1
~~*0.5-0.6*~~ - *AS ABOVE*

0.1-2m - Grading to very very hard Brown
clay w heavy Red/orange & predominant
white mottling. Low plasticity, brittle clay
Very dry within core.



Site number (including client): <i>PLQ 21</i>	Weather conditions: <i>As Lapse 6</i>	Sea state: <i>0.5m slop SE & NE chop</i>	Staff member: <i>MB MW</i>
Time of sampling: <i>1330 3/11/04</i>	Depth of water: <i>18.1m</i>	Tide:	Photo numbers:
GPS coordinates:	Depth of core: <i>2m</i>	Intervals sampled:	

Sample details and notes:

Replicate tested?

Take additional sample @ 0.5-1.0

Triplicate taken?

0-0.4: Dark grey, gravelly sand, increasing in clay content with depth, shells,

0.4-0.5: Quick transition into mottled grey/white /orange clay, pebbles, medium plasticity, no odour.

0.5-1.0: Uniform, hard orangy/red clay to grey & white mot. throughout. pebbles throughout. low plasticity (dry). No odour. Large calcareous deposits

1.0-1.7: As above.

1.7-2.0: As above, clay contains fine sand, softer, No mottling, all light brown



Site number (including client): PCQ 22	Weather conditions: 10-15 5-10 NE	Sea state: 0.5m swell NE	Staff member: MW MB
Time of sampling: 1345 3/11/04	Depth of water: 18.4m	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 2m	Intervals sampled: 0-0.5, 0.5-1, 1-2.	
Sample details and notes: 1.0-2.0m to be tested - TBT. 0-20cm - Gravelly, shelly silty conglomerate 0.2-0.5 - Grey, green clay, w white & orange mottling. Pebbles throughout to 1cm ø Low-medium plasticity. Mild marine clay above 0.5-1.0 - Uniform & as above. White sections of clay dryer than above other colours of clay. 1-2 - Uniform light grey clay Some orange mottling Medium plasticity Pebbles Throughout + hard clay clasts to 4cm ø No odour. Medium hardness.			Replicate tested? N Triplicate taken? N

SOIL BOREHOLE LOG

Borehole No.:

Page: 1 of 1

WATER DEPTH

SITE No.

CLIENT: PROJECT: LOCATION: CONTRACTOR: TIDE (m) EQUIPMENT: SEA BED (H.D.) COMMENCED: COMPLETED: LOGGED BY: CHECKED BY: R.L. SURFACE (m): VERTICAL DATUM: TOTAL DEPTH (m): DIAMETER (mm): X-COORDINATE: Y-COORDINATE: HORIZONTAL DATUM: DEPTH OF CORE (m)

Depth (m)	Method Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphical Log	Depth (m)
0				0.00 0.00	Ground Surface					0
			Sik 23 1130 18.6m water 1.7m Core		GPS as per Sheet ~ 20m North.					
			0-0.5m →		0-5 Coarse-small pebbles 0.05cm width					
					5-50 Clay-light grey clay, small pebbles throughout, ^{lgw} medium plasticity. Hard					
					50-75- Clay, small pebbles throughout.					
					25-50 Grey/white/brown mottle, low plasticity					
					75-100 - As above, less pebbles, medium plasticity					
			1-1.7		Uniform light grey - cream silty clay Some minor pebbles & nodules Shells throughout Med-High plasticity					



Site number (including client): PCQ 23	Weather conditions:	Sea state:	Staff member: MB MW
Time of sampling: 1130 2/11/04	Depth of water: 18.6m	Tide:	Photo numbers:
GPS coordinates: 149 18 964 21 15 911 ~ 20m north	Depth of core: 1.7m	Intervale sampled: 0-0.5, 0.5-10, 1.0-20	
Sample details and notes:			Replicate tested?
0-5cm - Small pebbles 0.05cm width 5-50cm - Light clay, grey, some small pebbles, low plasticity, Hard. 50-75cm - Clay, small pebbles throughout, grey/white/brown mottle, low plasticity 75-100cm - As above, less pebbles medium plasticity. 100-170cm - Uniform light grey to cream, silty clay, some minor pebbles and crushed shells throughout, medium-high plasticity.			Triplicate taken?

SITE 24.

1000 2/11/04

17 m Water Depth.

Weather as for 25

Take Additional Sample at ~~0-0.5~~ 0-0.5

0-0.5 - Loose silty sand, fine to coarse particles, some shell fragments.
Every possibly some coal fragments
throughout - black colour.

0.5-60 - as above

60-100 - light grey creamy clay
Some orange mottling throughout
Some pebbles up to 3cm ϕ
Soft pliable clay
Low to medium plasticity
Uniform clay.
No odour, coal.
P

1-2 - as above
Some orange-red mottling throughout



Site number (including client): PCQ 24	Weather conditions: 5-10knts SE	Sea state: 0.5m NE Swell	Staff member: MB MW
Time of sampling: 1000 2/11/04	Depth of water: 17m	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 2m	Intervals sampled: 0-0.5, 0.5-1.0, 1.0-2.0.	

Sample details and notes:

Additional sample at 0-0.5m

Heplicate tested?

Ys 0-0.5

Triplicate taken?

0-50cm: Loose silty sand, fine to coarse particles, some shell fragments, grey, possibly some coal fragments throughout (black colour).

50-60cm: As above.

60-100cm: Light grey/creamy clay, some orange mottling throughout. Some pebbles up to 3cm, soft pliable clay, low to medium plasticity, no odour, coal pieces.

100-200cm: As above.



Site number (including client): <i>PCQ 25</i>	Weather conditions: <i>5-10km/h SE</i>	Sea state: <i>0.5m NE swell</i>	Staff member: <i>MB, MW</i>
Time of sampling: <i>0915 2/11/04</i>	Depth of water: <i>16.8</i>	Tide:	Photo numbers:
GPS coordinates: <i>As per sketch</i>	Depth of core:	Intervals sampled: <i>0-0.5, 0.5-1.0, 1-2.</i>	
Sample details and notes: <i>Taking Additional Jar for 0.5' - Additional Jars</i>			Replicate tested?
			Triplicate taken?
<i>0-50 - Clay, Very plastic, no odour, ^{some to 2cm} coal, small pebbles throughout, Shells, mottled grey-red Very hard grey clay w some orange/red mottles throughout</i>			
<i>0.5-1.0 - very hard grey clay w some orange mottles. Very minor small pebbles within v. high plasticity almost dry in middle</i>			
<i>1.0- <u>As above to 1.8m</u></i>			
<i>1.8m-2m. As above</i>			



Site number (including client): PCQ23	Weather conditions: 5-10 knts SE	Sea state: 0.5m NE swell	Staff member: MB, MW
Time of sampling: 0915 2/11/04	Depth of water: 16.8	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Intervals sampled: 0-0.5, 0.5-1.0, 1.0-2.0	

Sample details and notes:

- Additional Sample for 0.5-1.0m

Replicate tested?
Ys 0-0.5

Triplicate taken?

0-50cm - Clay, very plastic, no odour, some coal (~~to~~ 2cms), small pebbles throughout, shells, mottled grey-red. Very hard grey clay with some orange/red mottling throughout.

50-100cm - Very hard grey clay with some orange mottling. Small pebbles, and V-high plasticity.

100-200cm - As 50-100cm

[illegible]



Site number (including client): <i>PLQ 26</i>	Weather conditions: <i>5 knot NE</i>	Sea state: <i>Calm (< 0.3m)</i>	Staff member: <i>MB & PM</i>
Time of sampling: <i>1000 29/10/04</i>	Depth of water: <i>19.0m</i>	Tide: <i>~ 5.5m</i>	Photo numbers:
GPS coordinates: <i>21 16 180 S</i> <i>149 19 267 E</i>	Depth of core:	Intervals sampled:	

Sample details and notes:

2cm Brown grey Silt on top

Graded to shell sand w shells less than 1cm. Some pebbles orange/red to 5mm

low plasticity

Brown - Green Clay

Appears dry inside molded blocks.

Silty Clay

No odor

Uniform

Not brittle

→ some small pebbles ~~not~~ throughout.

0.5m

Very hard dark gray-brown clay.

Some light green.

Some pebbles 2-5mm

Extensive Calcareous nodules

looks like no moisture inside.

Very dense clay.

low plasticity.

Just cuttable with knife.

Silty Clay.

Replicate tested? *✓*

Triplicate taken? *✓*



Site number (including client): 27	Weather conditions: Fine Lt-mud NEWIA	Sea state: 0.5 m	Staff member: MB PM
Time of sampling: 13:30 28/10	Depth of water: 15.8m + 2m ked	Tide: max ~ 5m	Photo numbers:
GPS coordinates: 149 19 205 21 16 204	Depth of core: 1.0m	Intervals sampled: 0-0.5, 0.5-1.0	

Sample details and notes:

Actual **149 19 133
21 16 210**

**Air TRAPPED in core
Prevent further penetration**

PCQ 427, 0-50A

Some fine silt on surface

Orange/brown gray Sandy clay. Pliostocene

Some small pebbles to 1cm

No odour

Small shell fragments throughout

Medium plasticity

**Greyish brown shelly sand with increase in cl sands compared
surface layer**

Low plasticity

0-0.5m

Replicate tested? **N**

Triplicate taken? **N**



Site number (including client): PCQ 28	Weather conditions: 5-10 knots SE	Sea state: 0-5m NE Swell Max SE Chop	Staff member: MB MW
Time of sampling: 0800 2/11/04	Depth of water: 16m	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 1.8m	Intervals sampled: 0-0.5, 0.5-1, 1-2	

Sample details and notes:

Heplicate tested?

Yes 0.5-1.0

Triplicate taken?

Additional sample at 0-0.5m.

0-5cm: Fine brown uniform sand, no shells/clay/clays.

5cm-30cm: Shelly, gravelly sand, 1cm shell clasts, some clay, minor plasticity, some pebbles.

30cm-50cm: Sandy-clay, medium plasticity, reddish-brown, calcareous matter.

50-65cm: Clayey-sand, medium plasticity, grey brown.

65-100cm: Sandier substrate, large rock clast (3cm), some clay, little plasticity.

100-180cm: Uniform Brown Coarse sand, no clay, pebbles or shells.



Site number (including client): 28	Weather conditions: 5-10 knot SE	Sea state: 0.5 m NE SWELL. Minor SE Chop	Staff member: MB, MV
Time of sampling: 0800 2/11/04	Depth of water: 16m	Tide:	Photo numbers:
GPS coordinates: As per SLat.	Depth of core: 2 1.8m	Intervals sampled: 0-0.5, 0.5-1, 1-2.	

Sample details and notes:

Replicate tested?

Additional Site tested @ 0-0.5 i/y and 1m.

Triplicate taken?

1st 5cm ^{Uniform} fine brown sand, no shells / adour / clays

5cm-30cm Shelly gravelly sand, 1cm shell clasts, some glays, minor plasticity, some pebbles,

40cm-50 Sandy-clay, medium plasticity, brown reddish calcareous matter

50-65 Clayey-sand medium plasticity, grey/brown
65-100 Sandier substrate, large rock clast (3cm)
Some clay, little plasticity.

100-170 - Uniform Brown Coarse Sand
No clays, pebbles or shells.

212
277



28

Site number (including client): PCQ29	Weather conditions: Cloudy, light W breeze,	Sea state: 0.5m swell NE.	Staff member:
Time of sampling: 0830 12/11/04	Depth of water: 18.5	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Sampled:	

~ 30 m E of post.

Sample details and notes:

Triplicate tested:

Take extra sample at 0-0.5m and test
for detailed suite.

N

Triplicate taken?

N

0-0.1 - fine sandy silt dark grey
with light coloured sands @ 0.1-0.5
Some gravel - sand gets coarser with depth
Some shell fragments

0.5-0.7 as above

0.7-1 sandy clay (brown/red with
grey patches throughout) no gravel or
shell fragments. Firm

1-1.05 as above

1.05-2 grades into firm light brown clay
with brown red spots @ 1.5-1.6
white kaolin deposits



Site number (including client): PCC 30.	Weather conditions: Cloudy.	Sea state: Swell 0.5 Choppy.	Staff member: DC PM
Time of sampling: 9.45 18/11	Depth of water: 16.7.	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:

Replicate tested?

Triplicate taken?

- Test replicate for basic.
- 0-0.1 Fine clayey sand, high plasticity, some organic matter, brown, with orange mottling
- 0.1-0.2 orange clay, some sand, small pebbles to 3mm
- 0.2-0.5 irregular fine sand, brown, w small shell + rock fragments to 5mm
- 0.5-0.8 as above, however ~~the~~ finer + clay
- 0.8-1.4 irregular fine sand w shell + rock fragments to 2mm, moist,
- 1.4-1.6 white calcareous nodules in clay binding sand
2.0 increasing clay content @ depth, orange sand mottling intermittent, some rock to 5mm



Site number (including client): PCQ 31	Weather conditions: Cloudy.	Sea state:	Staff member: DC + PM
Time of sampling: 11.42 / 19/11	Depth of water: 18m	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:	Replicate tested?
0 - 0.05 - brown silty sand some organisms and shell fragments to 2mm	No
0.05 - 0.5 - Grey clay with brown mottling. Silt based clay, low plasticity, Low moisture	Triplicate taken? No
0.5 - 0.55 - Regular grey sand uniform texture,	
0.55 - 1.2 - As per 0.05 - 0.5	
1.2 - 1.25 - Black / brown / grey regular sand loose	
1.25 - 2m - white calcareous nodular band brown and grey clay. Dry very firm and brittle. Some rock fragments to 2cm.	



Site number (including client): PCQ 32	Weather conditions: Avg - few clouds	Sea state: 0.5M swell	Staff numbers: PM + BDC
Time of sampling: 7:00 20/11	E		Photo numbers:
	Depth of water: 18.4	Tide:	
	Depth of core:	Intervals sampled:	
Sample details and notes: Triplicate Site PCQ T9, T, 10, 0 - 0.2 - Coarse brown sand some organics and shell fragments to 5mm. 0.2 - 0.5 - Moist grey clay with orange mottling, medium plasticity and medium density. 0.5 - 2 - Firm silt based clay, grey with orange mottling, white clay mottling at depth, low plasticity and dry.			Replicate tested? Triplicate taken?



Site number (including client): PCQ T9	Weather conditions: partly cloudy	Sea state: choppy 0-5m swell	Staff member: A + PM
Time of sampling: 07.28 20/11	Depth of water: 18m	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Intervals sampled:	

Sample details and notes: Triplicate 1 for PCQ 32 0 - 0.3 - Coarse sand/gravel mainly shell fragments, loose, shell/rock fragments to 1cm increase in particle size with depth. 0.3 - 0.75 - High plasticity grey clay with orange mottling - soft with uniform plasticity throughout. 0.75 - 0.7 - Grey clay with orange mottling and calcareous nodules throughout. Plasticity decrease with depth, as does the clay becomes harder with depth.	Replicate tested? Triplicate taken?
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Site number (including client): PCQ T10	Weather conditions:	Sea state: As per PCQ 32	Staff member: DC + PM
Time of sampling: 8.04 20/11	Depth of water: 17.6	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Interval core sampled:	

Sample details and notes: Triplicate 2 for PCQ 32. 0.0.3 - As for T10 0.3.0.0 - Sand based clay with orange and white mottling. Some calcareous nodules and sandy nodules. 1-2 - As for PCQ 1.	Replicate tested? No Triplicate taken? Yes
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Site number (including client): PCQ 303	Weather conditions: unsettled - Fine to coar. NNE 5-10 kts	Sea state: 0.25 choppy	Staff member: PM DC
Time of sampling: 8:30 15/11/04	Depth of water:	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:

replicate tested:

Take extra sample for 0-1 m (Additional jar) Y
0-0.15 - Grey silty clay, some shells, intermittent pebbles less than 1cm. ~~OTF~~ ^{Triplicate taken?}
0.15-0.5 - Sand bound clay, brown and green mottling, grey, uniform sand, moist.
0.5-1.5 - Firm brown clay, grey mottling, dry, calcareous nodules, low plasticity.
0.5-1.6 - Large pebbles with coarse irregular sand grey
1.6-2 - Grey firm clay/white clay, silt composition low plasticity.



15/11

Site number (including client): PCQ 34	Weather conditions:	Sea state:	Staff member: PM DC
Time of sampling: 9.30 / 15/11	Depth of water: 18.3	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:	Replicate tested?
Test replicate for bulk minus TBT 0-0.05 Brown silty sand (Fine) speckled black organics fine shell fragments 0.05-1 moist clay with patches of sand mottled grey/Brown uniform particle size 1-1.8 Sandy clay (brown) higher moisture content uniform particle size grey patches / occasional pebbles coarser sand than <1m more plasticity with depth 1.8-2 grey clay, patches of brown sand even in moisture, dry, uniform particle size + consistency.	Triplicate taken?



Site number (including client): PCQ 35	Weather conditions: Rough	Sea state:	Staff member:
Time of sampling: 11:45 20/11	Depth of water: 16.7	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Intervals sampled:	
Sample details and notes: Take extra sample and test for detailed suite (two jars) to 1m.			Replicate tested?
			Triplicate taken?
0-0.1	regular coarse sand with fragments of shell rock to 2mm, soft + moist		
0.1-0.9	irregular sandy clay w red+grey mottling, hard in low plasticity, some fragments of shell + sand (coarse)		
0.9-1.9	Soft sandy clay w decreasing plasticity in depth regular texture, red sand mottling		
1.9-2	calcareous nodules for. bound by fine clay sand		



Site number (including client): PCQ 36	Weather conditions:	Sea state:	Staff member:
Time of sampling: 10:30 20/11	Depth of water: 17.4	Tide:	Photo numbers:
GPS coordinates: 21, 15.853 149 20 625	Depth of core:	Intervals sampled:	
Sample details and notes: Test replicate for basic 0-0.2 - Coarse, regular brown sand irregular shell fragments. Some rocks to 3cm 0.2 - 2 - Brown sand based clay becoming sandier with depth. Brown with grey mottling. Becoming drier with depth firm at surface pliable at depth			Replicate tested? Triplicate taken?



Site number (including client): PCO 37	Weather conditions:	Sea state:	Staff member:
Time of sampling: 11:30 15/11	Depth of water: 19.4	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:

Replicate tested?

Take extra sample + test for detailed suite
0-0.5

Triplicate taken?

0-0.5 - Uniform silt, clay binding particles, shells to 4cm, shell particles, medium plasticity, wet

0.15 - 2 - low plasticity clay, moist becoming dry with depth, brown/grey dry/organic clay with depth.



Site number (including client): 38 PCQ	Weather conditions:	Sea state:	Staff member: PM+DC
Time of sampling: 16:15 17/11	Depth of water: 19.3	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:	Replicate tested?
Test 1-2 m for basic minus T13+	
Triplicate taken?	
0 - 0.15 - fine brown sand with fine shell and organic fragments. Individual rock < 3 cm	
0.15 - 0.25 - Coarse shell and sand bound in a clay a matrix	
0.25 - 1 - firm brown clay with grey mottling, low plasticity and dry	
1 - 1.9 - Brown pliable clay, grey mottling some shell fragments to 3mm moist	
1.9 - 2 - Silty brown sand with some binding clay.	



Site number (including client): 39 PCQ	Weather conditions: OVERCAST SCATTERED SHOWERS	Sea state: 0.5 m E SWELL	Staff member: MB, DL
Time of sampling: 0630 22/11/04	Depth of water: 19m	Tide: SOOTH	Photo numbers:
GPS coordinates:	Depth of core: 2m	Intervale sampled: 0-0.5, 0.5-1, 1-2.	
Sample details and notes: 0-0.2 - Coarse irregular sand. Shell & rock fragments to 1cm. Some organic. Loose. Wet. Grey/Brown. Increasing rock fragments (size/no.) to depth. 0.2-0.5 - Grey brown, fine sandy clay w orange mottling. 1m low plasticity. Soft. No gravels. 0.5-1m - A 1-2m - As above. Increases in stiffness to depth. Increase in orange mottling. Black organics @ 1.5m Calcareous nodules @ 1.8 Increasing plasticity to depth.			Replicate tested? N Triplicate taken? N



Site number (including client): PCQ40	Weather conditions: SCATTER SHOWERS	Sea state: 0.5m E SWELL	Staff member: MB, DL
Time of sampling: 0730 22/11/04	Depth of water: 20.1	Tide:	Photo numbers:
Depth of core: From 1.9m		Interval time (seconds): 0-0.5-0.5-1, 1-2.	
Sample details and notes:			Replicate tested? N
0-0.2 - Shelly, greenish grey silt with shells less 1cm. 0.2-0.5 - Coarser than firm grey clay increasing with depth orange mottling and shell fragments at 0.5. Medium plasticity. 0.5-1 - Grey/brown fine sandy clay increasing in stiffness with depth. Some orange mottling. Brittle. 1-1.4 Orange/brown silty clay. firm, brittle. Some fine calcareous matter throughout. 1.4-1.7 - Grey/brown ^{sandy} silty clayey fine sand. 1.7-1.9 - Gradings to uniform fine grey sand.			Triplicate taken? Y T11 T12



Site number (including client): T11 PCQ 40	Weather conditions: Fin Showers to E	Sea state: 0.5 E swell	Staff member: MB, DL
Time of sampling: 0800 22/11/04	Depth of water: 19.9m	Tide: North / calm	Photo numbers:
GPS coordinates:	Depth of core: 1.7	Intervals sampled: 0-0.5, 0.5-1, 1-2	

Sample details and notes:	Replicate tested?
0-5cm - Fine brown silty sand. No shells.	N
5cm-10cm - Hard grey silty clay. W orange mottling	Triplicate taken? Yes T11
-12cm High plasticity. Uniform throughout. No shells.	
1.2-1.3 - Sand ^{Clayey sand} grey clay. Some orange mottling.	
1.3 - Coarse sands. Soft.	
1.3-1.6 - Grading	
1.3-1.6 - Medium sand w some silty clay.	
Grey / orange mottling	
1.6-1.7 - As above, but denser	



Site number (including client): <i>T12 PCA 40</i>	Weather conditions: <i>Fn. 5-10 km/h NE</i>	Sea state: <i>05 E.</i>	Staff member: <i>MB. DC.</i>
Time of sampling: <i>0845 22/11/04</i>	Depth of water: <i>19.7m</i>	Tide: <i>North</i>	Photo numbers:
GPS coordinates:	Depth of core:	Intervals sampled:	

Sample details and notes:	Replicate tested? ☒
<i>0 - 0.1 - fine light brown sand with some pebbles upto 1cm black organics.</i>	Triplicate taken? <i>1/3</i>
<i>0.1 - 0.15 - Brown clay with shell fragments clay has is soft with medium plasticity.</i>	
<i>0.15 - 0.2 - Dark grey clay some orange mottling, firm, medium plasticity. Some isolated bits of gravel. Increasing hardness with depth.</i>	
<i>1.2 - 2m - fine sandy clay, brown/grey soft with low plasticity. Some orange mottling.</i>	



Site number (including client): PC Q 41	Weather conditions:	Sea state: Choppy	Staff member:
Time of sampling: 12.15 20/11	Depth of water: 16.8	Tide:	Photo numbers:
GHD client notes:	Depth of core: 16.2m	Intervals sampled:	
Sample details and notes: 0 - 1.2m - fine silty sand some organic some small rock particles (0.3 - 0.6m - clay horizon loosely bound brown, wet) 1.2 - 2m - pebbles bound by silty sand become larger and more dominant with depth.			Replicate tested? No Triplicate taken? No



Site number (including client): PCQ 42	Weather conditions:	Sea state:	Staff member:
Time of sampling: 16/11 15.45	Depth of water: 20.2	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 2m	Intervals sampled:	

Sample details and notes:	Replicate tested?
Take extra sample and test for detailed suite. 0-0.2 wet coarse irregular sand shell fragments to 2mm, + organic matter, rock fragments to 2cm, grey/Brown 0.2-0.8 - soft clay with fine brown coloured sand, shell fragments, rock fragments to 5mm, moist 0.8-1 soft fine sand, with binding clay medium plasticity, regular, 1-1.2 as above, higher clay composition 1.2-1.3 white clay + calcareous nodules contained within fine clay 1.3-2 coarse sandy clay, moist, regular, brown	Triplicate taken?



Site number (including client): PCQ 43	Weather conditions:	Sea state: Choppy	Staff member: DC + PM
Time of sampling: 11.00 20/11	Depth of water: 17.4 m	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:	Replicate tested?
Test 1-2m for basic minus TBT. Triplicate taken?	
0-0.1 - Brown silty - organics not structured Shell fines.	
0.1-0.2 - Clay bound sand - brown with grey mottling.	
0.2-0.3 - Horizon of Brown clay, medium plasticity, shells and roots to 2mm	
0.3-0.5 - Bro 0-0.1 Same as 0-0.1	
0.5-0.6 - Horizon brown clay medium density	
0.6-1.5 - Brown regular sand with rock and shell fragments to 7mm. Larger fragments at depth	
1.5-2 - Gravel pebbles to 3cm faced with brown sand, brittle irregular pebbles	



Site number (including client): PCCQ 46	Weather conditions:	Sea state: Messy 0.5m swell	Staff member:
Time of sampling: 15:08 16/11	Depth of water: 21.2	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 2	Intervals sampled:	

Sample details and notes:	Replicate tested?
Test replicate for basic	
0 - 0.2 Fine silty sand ⁱⁿ organic matter + shell Brown wet	
0.2 - 0.5 Fine silty sand with rock frag- ments to 2cm wet	
0.5 - 1.2 Fine sand with rock fragments organic coral fragments to 2cm V wet	
1.2 - 2 coarse sand (Dry) with rock fragments - regular - Brown, M ^{medium} Density	



Site number (including client): PCQ 4.5	Weather conditions:	Sea state:	Staff member:
Time of sampling: 14.30 16/11 11:35pm	Depth of water: 20.2	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Intervals sampled:	
Sample details and notes: Take extra sample + test for detailed suite 0-0.5 0 - 0.3 - regular brown silty/sand shell fragments to 2mm some organics, 0.3 - 0.8 - sandy/grey clay intermittent with shells, irregular sand. 0.8 - 1.8 - Brown clay grey mottled low plasticity dry. Gaining plasticity with depth.			Replicate tested? Triplicate taken?



Site number (including client): PEQ 46	Weather conditions:	Sea state:	Staff member:
Time of sampling: 13.21 16/11	Depth of water: 20.4	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Intervals sampled:	

Sample details and notes:	Replicate tested?
Take extra sample and test for details, soil (2 jars) to 1m. 0-0.1 Coarse sand + rock, (Finer @ surface), wet large shell fragments, brown/grey, some organic 0.1-0.2 coarse sand, large shell fragments @ 1cm net, some binding clay 0.2-1.80 Brown clay, mottled grey + red, dry, high plasticity, uniform texture 1.8-2 coarse sand, large shell fragments, grey, dry, some calcareous nodules	Triplicate taken?



Site number (including client): PCQ 47	Weather conditions:	Sea state:	Staff member:
Time of sampling: 12:00 16/11	Depth of water: 20.1	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:

Replicate tested?

Test replicate for basic mineralogy

Triplicate taken?

0-0.3 - Fine silty sand, predominantly brown
some grey sands, small shell particles less
than 2mm, wet, regular size sand

0.3-1.9 - Low plasticity silty clay, brown with
grey mottling, firm uniform texture
dry

1.9-2 - Rock particles bound by clay, grey
pebbles up to 2cm



Site number (including client): PCQ48	Weather conditions: Fine S-10kts SE	Sea state: 0.425 swell	Staff member: DC PH
Time of sampling: 17/11 14:45	Depth of water: 20.5	Tide:	Photo numbers:
GPS coordinates:	Depth of core:	Intervals sampled:	

Sample details and notes:

Test 1-2 m for basic minus +BT

Replicate tested?

Triplicate taken?

0 - 0.15 - Brown silty sand with shell fragments ^(<1cm) some binding clay. Black organics

0.15 - 1 m - Brown silty clay orange/green moist, low plasticity

1 - 2 m - Grey clay heavy ~~etc~~ calcareous w white nodule associations some brown clay streaks. Firm and dry.



Site number (including client): PCQ 49	Weather conditions:	Sea state: Choppy	Staff member: DC + PM
Time of sampling: 10:30/20/11	Depth of water: 17.1	Tide:	Photo numbers:
GPS coordinates:	Depth of core: 2	Interval samples:	

Sample details and notes:

0-0.5 Fine sand silt, irregular particle size wet + loose, ~~Take extra sample~~ 0-0.5

0.5-2 Sandy based clay, decreasing plasticity @ depth increasing hardness + dryness @ depth, orangey colour, in grey + red mottling, regular particle size

Replicate tested?

Triplicate taken?



Site number (including client): PCQSO	Weather conditions:	Sea state:	Staff member: PM DC
Time of sampling: 15/11 14:00	Depth of water: 20 m	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:

Replicate tested?

nothing Extra

Triplicate taken?

0-0.3 - Coarse sand irregular, brown, shell fragments, pebbles

0.3-1 - Brown silt based clay - ~~orange~~ orange mottling, grey mottlings, some sand

1-2 - Wet loosely bound silty clay - grey with brown mottling becoming firmer with depth, medium plasticity -



Site number (including client): PCQ 51	Weather conditions:	Sea state:	Staff member:
Time of sampling: 1:30:00 15/11	Depth of water: 20.5	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:

Replicate tested?

Test 1-2 m For Basic Suite minus FBT

0-0.1 - silty grey sand with shell fragments. ~~to 20.8 cm~~ ^{Triplicate taken?} N

0.1-0.3 - Grey coarse sand with multiple shell fragments. & Some rock fragments to 2cm.

0.3-1 - Silt bound clay, grey, green brown. moist, loose.

1-2 - low plasticity clay grey brown, calcareous nodules, firm, dry.



Site number (including client): <i>822 PCQ 52</i>	Weather conditions:	Sea state:	Staff member: <i>DC PM</i>
Time of sampling: <i>12:30</i> <i>15/11</i>	Depth of water: <i>20.6</i>	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:	Replicate tested?
<i>Take extra sample + test for detailed suite (0.5-1)</i>	Triplicate taken?
<i>0-0.2 Fine sand / silt, stone + shell fragments wet, some organic matter</i>	
<i>0.2-0.4 as above with larger shells</i>	
<i>< 2cm -</i>	
<i>0.4-1 Silty clay wet (drier with depth) uniform particle size, grey,</i>	
<i>1-2 Dry & firm clay, brown, with patches of grey, high composition of fine sands with clay, low plasticity</i>	



Site number (including client): PCQ S3	Weather conditions:	Sea state:	Staff member:
Time of sampling: 15:40 15/11	Depth of water: 20.0	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:	Replicate tested?
Take extra sample 0-0.5 + test for additional	Triplicate taken?
0-0.1 very wet sandy silt-grey, few organics 0.1-0.2 Silty clay, moist, with shell fragments (0.2-0.5 cm) 0.2-2 Clay, low plasticity, very compact, grey, mottling of brown, white calcareous nodules increasing brown dominance with depth moist, few pebbles	



Site number (including client): PCQ S4	Weather conditions:	Sea state:	Staff member: PM, DC
Time of sampling: 9:45 16/11	Depth of water: 17.6	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:	replicate tested:
Take extra sample + test for detailed suite (0-0.5).	Triplicate taken?
0-1 - fine silty sand, wet, brown + grey organic, shell frag to 2mm, loose	
1-2 - grey silty sand with binding clay shell fragments, wet → moist at depth.	



Site number (including client): PCQSS	Weather conditions: Overcast 22°C NW SW Sknts	Sea state: Flat < 0.25	Staff member: DC PM
Time of sampling: 16/11/04 08:15	Depth of water: 16.2	Tide: H	Photo numbers:
GPS coordinates:			

Sample details and notes: Triplicate taken T7 + T7R , T8 + T8R	Triplicate tested? Triplicate taken? Y
0-0.1 ^{some black organics} soft sandy silt, w shell fragments, grey in colour 0.1-0.5 coarse sand (irregular) w shell fragments (5mm) 0.5-1 soft uniform sand, moist, large shell fragments (zone) grey, 1-2 wet, regular sand, minimal shell fragments, grey some binding along with depth.	



Site number (including client): PCQ T7	Weather conditions:	Sea state:	Staff member: PM, DC
Time of sampling: 08:30 16/11	Depth of water:	Tide:	Photo numbers:
GPS coordinates:			

Sample details and notes:	replicate tested?
PCQ SS Trip ①	
More clay with depth otherwise same	Triplicate taken? Y
T8 - Same as PCQ 55 - except no shell fragments 0-0.1 silt/sand.	



Site number (including client): PCQ S6	Weather conditions:	Sea state:	Staff member:
Time of sampling: 11:00 16/11	Depth of water: 18.8	Tide:	Photo numbers:
	Depth of core: 1.5	Intervals sampled:	
Sample details and notes: Test replicate for basic 0-0.2 Fine sand silt, bits of organic matter, r shell fragments to 1mm. consistent regular, grey 0.2-0.8 as above but longer + plentiful shell fragments individual shell @ 5cm, grey 0.8-1.5 coarse sand / fine sand small amount of shell fragments, moist, grey			Replicate tested? Triplicate taken?



Appendix F

Sediment Core Logs

SOIL BOREHOLE LOG

Borehole No.: PCQ1

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **2/11/2004**

PROJECT: **Port of Hay Point Apron Area and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **2/11/2004 1300**

SITE #: **1**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **17.5**

TIDE (m): **Ebb 3.25**

SEA BED (AHD): **17.5**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.075**

Y-COORDINATE: **2114.306**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	MD		0
				PCQ1-0-0.5A(R)	0.15	Loose silty sand, some clay, grey, some shells (10mm diameter), no pebbles. Dark grey silty clay, some shell fragments, low plasticity, soft, some fine sands, some mottling, hardness increases with depth.	Test detailed suite at 0-0.5m				
				PCQ1-0.5-1A(R)	0.50	Very fine sands withing very hard clay, predominantly orange clay with some green and grey mottling, some black carboniferous material @ 75cm, low-to-medium plasticity.		M	F		
1				PCQ1-1.0-2.0A(R)	1.00	Very hard uniform clay, except @ 150cm, dense sand with some clay (spans 10cm), 190-200cm: white clay, with brown and black mottling.			F		1
2					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ2

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **2/11/2004**

PROJECT: **Port of Hay Point Apron Area and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **2/11/2004 13:00**

SITE #: **2**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **17.5**

TIDE (m): **Flooding 4.6**

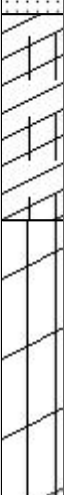
SEA BED (AHD): **17.5**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.07524**

Y-COORDINATE: **21.1430604**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ2-0-0.5A(R)	0.00	Loose silty sand, some clay, grey, some shells to 1cm in diameter. No pebbles	No odour	W	MD		0
					0.15	Dark grey silty clay, some shell fragments, low plasticity and soft some fine sands. Some mottling, getting harder with depth.					
				PCQ2-0.5-1.0A(R)	0.50	Some very fine sands within very firm clay. Predominantly orange caly with green and grey mottling. Some black carboniferous material at 0.75 cm. Low to medium plasticity.					
					1.00	Very hard uniform clay. Similar coulourings to above. At 1.5 m dense sand with som clay for 10 cm. At depth there is white clay with white, grey, black mottling.		M	D		1
				PCQ2-1.0-2.0A(R)					F		2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ3

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **2/11/2004**

PROJECT: **Port of Hay Point Apron Area and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **2/11/2004 15:15**

SITE #: **3**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **17.8**

TIDE (m): **Ebb 3.25**

SEA BED (AHD): **17.8**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.29652**

Y-COORDINATE: **2114.37942**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ3-0-0.5A(R)	0.00	Grey brown clay, some mottling, hard, medium plasticity, some small shells.	No odour	W	MD		
				PCQ3-0.5-1A(R)	0.50	Hard clay (grey), orange red mottling, calcareous deposits, low to medium plasticity, some shells.	Tested for detailed suite (0.5-1m)	M	F		
1				PCQ3-1.0-2.0A(R)	1.00	Grey brown clay, low plasticity, orange red mottling, some small shells and pebbles.			F		1
					1.70	Uniform brown clay high plasticity and firm.					
2					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ4

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **5/11/2004**

PROJECT: **Port of Hay Point Apron Area and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **5/11/2004 14:00**

SITE #: **4**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **15.9**

TIDE (m): **Flooding 3.15**

SEA BED (AHD): **15.9**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.0804**

Y-COORDINATE: **2114.52594**

DEPTH OF CORE (m): **1.6**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	Triplicate taken at this site	W	MD		0
				PCQ4-0-0.5A(R)	0.00	Dark grey silt					
					0.05	Dark grey silty sand, some carbon based material					
					0.10	Dark grey silty sand, some carbon based material					
					0.20	Grey clay, very hard, low plasticity, muddy odour Brown and orange clay hard with no pebbles					
				PCQ4-0.5-1A(R)	0.50	As per 0.2-0.5 m, low plasticity, very hard		M	F		
1				PCQ4-1.0-2.0A(R)	1.00	As above, has 3 cm horizon of grey clay sand					1
					1.50	As above however softer with depth					
2					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ5

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **5/11/2004**

PROJECT: **Port of Hay Point Apron Area and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **5/11/2004 08:15**

SITE #: **5**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **16.5**

TIDE (m): **Ebb 3.0**

SEA BED (AHD): **16.5**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.39354**

Y-COORDINATE: **2114.59476**

DEPTH OF CORE (m): **2.0**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ5-0-0.5A(R)	0.00	Very hard reddy brown clay, with grey/green mottling throughout. Low plasticity, some small pebbles. Seam of grey green clay of similar consistency to the above As above with black pebbles throughout	No odour	W	D		
					0.10						
					0.15						
				PCQ5-0.5-1A(R)	0.50	Very hard reddy brown clay, with grey/green mottling throughout. Low plasticity, some small pebbles.		D	F		
1				PCQ5-1.0-2.0A(R)		Seam of dark grey clay, relatively soft with hard clasts of rocky material. Medium plasticity Dark grey clay with some white mottling. Harder than previous layer. Vibrocorer hit refusal at 2 m	1.5-2 tested for basic minus TBT				
					1.50						
					1.55						
2											
					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ6

Page: 1 of 1

CLIENT: PCQ						COMMENCED: 5/11/2004					
PROJECT: Port of Hay Point Apron Area and Departure Path Capital Dredging						JOB No.: 41/13829 COMPLETED: 5/11/2004 09:30					
SITE #: 6						LOGGED BY: Martin Brennan					
CONTRACTOR: GeoCoastal						EQUIPMENT: Vibrocorer					
CHECKED BY: Matthew Weller											
WATER DEPTH (m): 16.9			TIDE (m): Ebb 2.6			SEA BED (AHD): 16.9			DIAMETER (mm): 50mm		
X-COORDINATE: 14918.46926			Y-COORDINATE: 2114.67012			DEPTH OF CORE (m): 2					

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	D		0
				PCQ6-0-0.5A(R)		Grey brown silty clay, gravel throughout to approximately 1.5 cm in size. Green and grey mottling, medium plasticity, no odour, firm but malleable.		D			
				PCQ6-0.5-1A(R)							
1											1
				PCQ6-1.0-2.0A(R)	1.50	Silty sand, no gravels and brown.		L			
					1.70	Rocks pebbles and silty sand, large clasts of green mottling no clay					
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ7

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **5/11/2004**

PROJECT: **Port of Hay Point Apron Area and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **5/11/2004 10:10**

SITE #: **7**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **16.7**

TIDE (m): **Low tide 2.5**

SEA BED (AHD): **16.7**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.39582**

Y-COORDINATE: **2114.74212**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ7-0-0.5A(R)	0.05	Coarse sand, brown with white fragments Hard clay, light brown with red/orange mottling, medium plasticity	0-0.5 Detailed suite analysed	D	F		
				PCQ7-0.5-1A(R)	0.60	Coarse sand, brown with white fragments			MD		
1				PCQ7-1.0-2.0A(R)	1.50	Hard clay, light brown with red/orange mottling, high plasticity, black carbon based material throughout			VF		
2					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ8

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **5/11/2004**

PROJECT: **Port of Hay Point Apron Area and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **5/11/2004 12:00**

SITE #: **8**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **16.8**

TIDE (m): **Flooding 2.7**

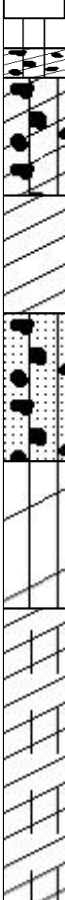
SEA BED (AHD): **16.8**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.55764**

Y-COORDINATE: **2114.88942**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/ Relative Density	Graphic Log	Depth (m)	
0						Ground Surface	No odour	M	L		0	
				PCQ8-0-0.5A(R)	0.00	Fine grey silt						
					0.05	Dark grey clay small pebbles throughout. Medium plasticity relatively soft						
					0.10	Light grey white clay, with large amounts of pebble, low plasticity						
					0.30	Dark grey clay no pebbles, medium plasticity, soft						
				PCQ8-0.5-1A(R)	0.50	Dark grey sandy clay, very soft, low plasticity, pebbles to 5 mm throughout	1-2 m tested for basic minus TBT	M	L			
					0.75	Brown silty clay, pebbles throughout, soft low plasticity						
				PCQ8-1.0-2.0A(R)	1.00	Very fine sand with some clay throughout, light brown, some pebbles u to 2 cm. No plasticity					1	
					1.50	Grey coarse sand, pebbles upto 2 cm						
					2.50							
2												

[illegible]

SOIL BOREHOLE LOG

Borehole No.: PCQ10

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **4/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **4/11/2004 15:00**

SITE #: **10**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **18.2**

TIDE (m): **Flooding 4.36**

SEA BED (AHD): **18.2**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.63726**

Y-COORDINATE: **2114.95824**

DEPTH OF CORE (m): **2.2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	None	W	MD		0
				PCQ10-0-0.5A(R)		Brown clayey silt, some green mottling, increasing in clay content with depth, low plasticity, some fine sands and shells at surface. No gravels, no odour.	0-0.5 replicate tested for basic minus TBT				
				PCQ10-0.5-1.0A(R)	0.60	Similar consistency to surface level, creamy/light grey mottling, silty (fine) sand-some clays, low plasticity, no odour.					
1				PCQ10-1.0-2.0A(R)	1.70	Brown clay, heavy white mottling, light grey pebbles. Firm with low plasticity.			D		1
					1.90	Grey, brown silty sand some gravels			L		2
2					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ11

Page: 1 of 1

CLIENT: PCQ						COMMENCED: 4/11/2004					
PROJECT: Port of Hay Point Apron Area and Departure Path Capital Dredging						JOB No.: 41/13829 COMPLETED: 4/11/2004 12:00					
SITE #: 11						LOGGED BY: Martin Brennan					
CONTRACTOR: GeoCoastal						EQUIPMENT: Vibrocorer					
CHECKED BY: Matthew Weller											
WATER DEPTH (m): 17.0		TIDE (m): Flooding 3.16		SEA BED (AHD): 17.0		DIAMETER (mm): 50mm					
X-COORDINATE: 14918.63672		Y-COORDINATE: 2115.03138		DEPTH OF CORE (m): 2.0							

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	M	L		0
				PCQ11-0-0.5A(R)		Silty clay, mottled brown/grey/red, black organics, some white clay at depth. Low plasticity, firm, gravel to 1cm	Triplicate site				
				PCQ11-0.5-1A(R)							
1				PCQ11-1.0-2.0A(R)							1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ12

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **4/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **4/11/2004 16:00**

SITE #: **12**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **18**

TIDE (m): **High tide 4.49**

SEA BED (AHD): **18**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.70956**

Y-COORDINATE: **21.1503312**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface					0
				PCQ12-0-0.5A(R)	0.10	Brown clayey silt, with dark grey streaks. Low plasticity soft.	Coal fragments present to 1 cm	W	MD		
						Brown hard clay, small pebbles throughout, mottled with white hard clay. Medium plasticity					
				PCQ12-0.5-1.0A(R)	0.70	Brown silty clay, mottled with white clay. Low plasticity and soft. No pebbles.					
1				PCQ12-1.0-2.0A(R)	1.00	Similar clay however more ferrous, with pebbles. Compressed sand present at depth		D			1
2								F			2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ13

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **4/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **4/11/2004 10:30**

SITE #: **13**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **16.9**

TIDE (m): **Flooding 3.07**

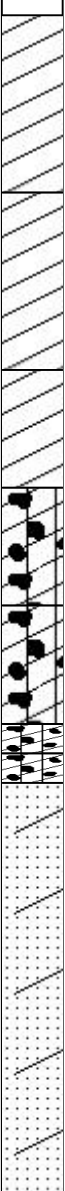
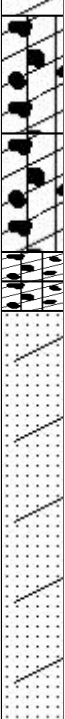
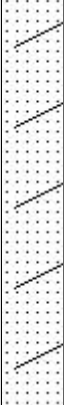
SEA BED (AHD): **16.9**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.7182**

Y-COORDINATE: **21.1510508**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	MD		0
				PCQ13-0-0.5A(R)	0.30	Light brown clay with dark gray mottling, small pebbles throughout, medium plasticity, muddy odour, soft	Tested for detailed suite	M	F		
					0.60	Dark grey clay with light clay mottling throughout. Hard, low plasticity, clay					
				PCQ13-0.5-1.0A(R)	0.80	Lighter grey clay with multiple light green pebbles. Clay consistency same as 0.3-0.6					
					1.00	Brown clay with red and dark grey mottling. Small to large pebbles low plasticity					
1				PCQ13-1.0-2.0A(R)	1.20	Mottled brown/orange clay, small pebbles throughout, medium plasticity, hard clay.		D			1
					1.25	Mottled brown/orange clay, small pebbles throughout, medium plasticity, hard clay.					
					1.30	With a seam of white clay and large clasts					
						Mottled brown/orange clay, small pebbles throughout, medium plasticity, hard clay.					
						Clay sand, low plasticity, pebbles throughout, mottled with isolated grey clay, majority red/brown clay, soft no structure.					
2					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ14

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **4/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **4/11/2004 09:15**

SITE #: **14**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **16.6**

TIDE (m): **Flooding 2.56**

SEA BED (AHD): **16.6**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.72054**

Y-COORDINATE: **2115.25542**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface					0
					0.05	Fine brown silt, with pebbles to 1cm	Marine odour	W	MD		
				PCQ14-0-0.5A(R)	0.20	Green clay with pebbles throughout, medium plasticity, some hard white clay deposits		M	D		
					0.50	Light brown clay with orange red mottling throughout. Medium plasticity, white clay at depth		D	F		
				PCQ14-0.5-1.0A(R)	1.00	Medium plasticity clay, dark/grey/green mottling throughout	Tested for detailed suite				
					1.20	Light brown sandy clay with grey/green mottling, hard clasts, pebbles conglomerated throughout, medium density and plasticity			MD		1
				PCQ14-1.0-2.0A(R)	2.00	Light brown sandy clay, low plasticity, some small to large pebbles, soft			S		
					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ15

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **4/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **4/11/2004 08:30**

SITE #: **15**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **16.9**

TIDE (m): **Low Tide 2.36**

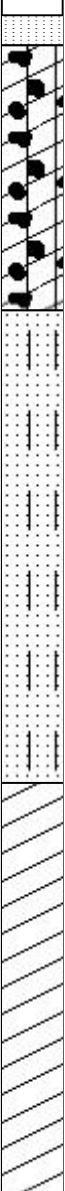
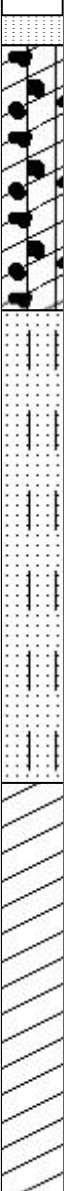
SEA BED (AHD): **16.9**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.72162**

Y-COORDINATE: **2115.32658**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ15-0-0.5A(R)	0.00 0.05	Gravelly shelly brown sand Grades of silty fine sand and clay, brown, low plasticity, some small pebbles					
				PCQ15-0.5-1.0A(R)	0.50	Fine silty sand, grey/brown, low plasticity, some green mottling, with small uniform pebbles	Analysed for basic suite	D	F		
				PCQ15-1.0-2.0A(R)	1.30	Very stiff clay, grey/brown in colour with white mottling, medium plasticity, increased hardness with depth					
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ16

Page: 1 of 1

CLIENT: PCQ						COMMENCED:						
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging						JOB No.: 41/13829 COMPLETED:						
SITE #: 16						LOGGED BY: Martin Brennan						
CONTRACTOR: GeoCoastal				EQUIPMENT: Vibrocorer				CHECKED BY: Matthew Weller				
WATER DEPTH (m): 17.6		TIDE (m):		SEA BED (AHD): 17.6		DIAMETER (mm): 50mm						
X-COORDINATE: 14918.80082		Y-COORDINATE: 2115.3604		DEPTH OF CORE (m): 2.1								
Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)	
0						Ground Surface	No odour	W	L		0	
				PCQ16-0-0.5A(R)	0.00	Fine dark grey silt, no shells, loose						
					0.10	Brown silty sediment, changing to brown silty clay, some red mottles, no shells						
				PCQ16-0.5-1.0A(R)	0.50	Light grey medium plasticity clay, with heavy white and orange mottling throughout	Analysed for basic suite	D	F			
1				PCQ16-1.0-2.0A(R)	1.00	Light grey silty clay, clay nodules, hard and brittle					1	
					1.90	Smaller fragments of silty clay, grey						
2					2.50						2	

SOIL BOREHOLE LOG

Borehole No.: PCQ17

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **3/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **3/11/2004 09:00**

SITE #: **17**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **16.5**

TIDE (m): **Flooding 2.48 m**

SEA BED (AHD): **16.5**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.87534**

Y-COORDINATE: **2115.32448**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ17-0-0.5A(R)	0.00	Fine dark grey silt clay, loose shells and coral throughout	Triplicate site	D	H		
					0.10	Hard grey clay with white and orange mottles, some small pebbles, medium plasticity					
				PCQ17-0.5-1.0A(R)	0.50	White grey with grey green mottling, soft dry clay, low plasticity with pebbles less than 5 mm throughout					
					0.75	Orange clay with white grey mottling throughout, low plasticity, some pebbles, denser horizon than above.					
1				PCQ17-1.0-2.0A(R)				W	S F		
					1.40	Horizon of soft light grey sandy mud					
					1.50	Light grey conglomerate of pebbles to 10 mm, some binding brown sandy clay					
2											
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ18

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **3/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **3/11/2004 11:40**

SITE #: **18**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **18.0**

TIDE (m): **Flooding 3.55 m**

SEA BED (AHD): **18.0**

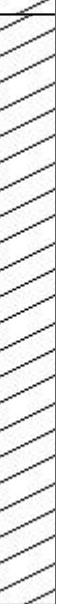
DIAMETER (mm): **50mm**

X-COORDINATE: **14918.87882**

Y-COORDINATE: **2115.47285**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
					0.00	Fine grey green silt	No odour	W	L		
				PCQ18-0-0.5A(R)	0.25	Grey green sandy clay, soft with some red and orange mottling low plasticity					
					0.50	Orange red mottled sandy clay, at low plasticity, medium/hard clay, small gravelly pebbles			S		
				PCQ18-0.5-1.0A(R)	0.60	Coarse brown grey sand, uniform texture					
1					1.00	Uniform brown grey coarse sand, with dark grey clay nodules, medium plasticity, grading to fine sandy clay at 2m					1
				PCQ18-1.0-2.0A(R)			Basic suite minus TBT analysed		F		
2											2
					2.50						

Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/ Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ19-0-0.5A(R)	0.00	Coral shells and dark grey sand - corals <40 mm, shells <10 mm. Layer of fine dark grey silt	No odour	W	L		
					0.20	Orange brittle hard clay with white mottling, low plasticity, increasing white clay mottling with depth	Additional sample taken	D	F		
				PCQ19-0.5-1.0A(R)							
					0.75	White brittle hard clay					
					0.85	Orange brittle hard clay, low plasticity					
1				PCQ19-1.0-2.0A(R)	1.00	Uniform brown grey clay with orange mottling throughout, low plasticity					1
2											2
			</								

SOIL BOREHOLE LOG

Borehole No.: PCQ20

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **3/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **3/11/2004 15:15**

SITE #: **20**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **18.5**

TIDE (m): **High tide 4.54 m**

SEA BED (AHD): **18.5**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.8025**

Y-COORDINATE: **2115.61914**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
					0.00	Brown silt and shells					
				PCQ20-0-0.5A(R)	0.05	Uniform medium plasticity brown clay, orange and black mottling. Firm with isolated pebbles <5 mm some coral fragments to 20 mm	Tested for basic minus TBT	D	MD		
				PCQ20-0.5-1.0A(R)	0.50	Medium plasticity brown soft clay, with some shells					
1				PCQ20-1.0-2.0A(R)	1.10	Brown clay with red/orange and white mottling. Low plasticity, brittle, dry and increasing hardness with depth.					1
					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ21

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **3/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **3/11/2004 15:30**

SITE #: **21**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **18.1**

TIDE (m): **Ebb 4.51 m**

SEA BED (AHD): **18.1**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.96144**

Y-COORDINATE: **2115.7665**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ21-0-0.5A(R)	0.00	Dark grey gravelly sand, with increasing clay content with depth with some shell fragments	No odour	W	L		
					0.40	Mottled grey/orange/white clay, with medium plasticity and pebbles		D	MD		
				PCQ21-0.5-1.0A(R)	0.50	Uniform hard orange/red clay with grey/white mottling, pebbles throughout and calcareous deposits, low plasticity	Additional sample taken		VH		
1				PCQ21-1.0-2.0A(R)							1
					1.70	Uniform hard orange/red clay, clay contains some fine light brown sand pebbles throughout and calcareous deposits, low plasticity		M			
2					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ22

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **3/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **3/11/2004 13:45**

SITE #: **22**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **18.4**

TIDE (m): **Flooding 4.44 m**

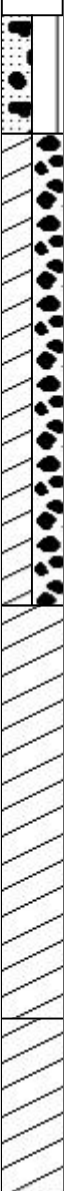
SEA BED (AHD): **18.4**

DIAMETER (mm): **50mm**

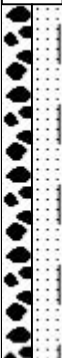
X-COORDINATE: **14918.96546**

Y-COORDINATE: **2115.83958**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ22-0-0.5A(R)	0.20	Gravelly shelly silt					
				PCQ22-0.5-1.0A(R)		Grey/green clay, with white and orange mottling, low medium plasticity, with pebbles to 10 mm	Tested for basic minus TBT	D	D		
				PCQ22-1.0-2.0A(R)	1.00	Uniform light grey clay, with some orange mottling, medium plasticity, pebbles and hard clay clusts to 40 mm					1
					1.70	Uniform hard orange/red clay, clay contains some fine light brown sand pebbles throughout and calcareous deposits, low plasticity					2
					2.50						

Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ23-0-0.5A(R)	0.00 0.05	Small pebbles less than 5 mm Light clay, grey, some small pebbles, low plasticity, hard	No odour	W D	L H		0
				PCQ23-0.5-1.0A(R)	0.50	Clay small pebbles throughout, grey/white/brown mottling, low plasticity, decreasing number of pebbles compensated by increasing clay at depth					
1				PCQ23-1.0-2.0A(R)	1.00	Uniform light grey to silty clay, some minor pebbles and crushed shells throughout, medium high plasticity					1
2											2
					2.50						

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ24-0-0.5A(R)	0.00	Loose silty sand, fine to coarse particles, some shell fragments, grey, organics (black),	No odour Additional sample taken	W	L		
				PCQ24-0.5-1.0A(R)	0.60	Light grey green clay, some orange mottling throughout, some pebbles up to 30 mm, soft and pliable, low to medium plasticity		M	MD		
1				PCQ24-1.0-2.0A(R)							
2											2
					2.50						

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ25-0-0.5A(R)	0.00	Mottled grey/red clay of high plasticity, and coal fragments to 20 mm. Small pebbles and shells throughout	No odour Additional sample taken	W	L		
				PCQ25-0.5-1.0A(R)	0.50	Very hard grey clay, some orange mottling, small pebbles throughout		M	MD		
1				PCQ25-1.0-2.0A(R)							1
2											2
					2.50						

Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/ Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ26-0-0.5A(R)	0.00	Brown grey silt, shell based sand, shells less than 10 mm with isolated pebbles to 5 mm Low plasticity brown green, silty, uniform clay, dry, non brittle, small pebbles throughout	No odour	W D	L		
				PCQ26-0.5-1.0A(R)	0.50	Very hard dark grey/brown clay, pebbles 2-5 mm, kaolin, dry dense clay with low plasticity			D		
1				PCQ26-1.0-2.0A(R)							1
2											2
					2.50						

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/ Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ27-0-0.5A(R)	0.00	Fine silt followed by orange/brown/grey sandy clay. Some small pebbles to 10 mm, small shell fragments throughout with medium plasticity					
				PCQ27-0.5-1.0A(R)	0.50	Grey brown shelly sand, with increased sands compared to surface. Low plasticity			D		
1							Originally thought we had hit refusal, however later identified air was trapped in core				1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ28

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **2/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **2/11/2004 08:00**

SITE #: **28**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **16**

TIDE (m): **Flooding 2.15 m**

SEA BED (AHD): **16**

DIAMETER (mm): **50mm**

X-COORDINATE: **14919.36998**

Y-COORDINATE: **2116.201132**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
					0.00		No odour	W	L		
					0.05	Fine brown uniform sand					
				PCQ28-0-0.5A(R)		Shelly gravelly sand, 10 mm shell clusters, some binding clay, intermittent pebbles	Additional sample analysed				
					0.30	Red brown sandy clay, medium plasticity, kaolin.					
					0.50	Grey brown clayey sand, medium plasticity			D		
				PCQ28-0.5-1.0A(R)	0.65	Sandier substrate some binding clay and rock clusters to 30 mm					
1					1.00	Uniform brown, coarse sand, no clay, pebbles or shells					1
				PCQ28-1-2A(R)							
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ29

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **12/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **12/11/2004 08:30**

SITE #: **29**

LOGGED BY: **Matt Weller**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **18.5**

TIDE (m): **Flooding 5.24 m**

SEA BED (AHD): **18.5**

DIAMETER (mm): **50mm**

X-COORDINATE: **14919.42782**

Y-COORDINATE: **2115.6918**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ29-0-0.5A(R)		Fine sandy silt, dark grey with light colored sand, clayey fine sands some gravel at depth, as well as larger sand and shell fragments <2 mm	Additional sample analysed				
				PCQ29-0.5-1.0A(R)	0.70	Sandy clay, brown/red with grey mottling throughout					
1				PCQ29-1-2A(R)	1.05	Grades into firm light brown clay, with brown red mottling. At 1.5-1.6 white kaolin deposits		D			1
2					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ30

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **19/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **19/11/2004 09:45**

SITE #: **30**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **16.2**

TIDE (m): **Ebb 2.06 m**

SEA BED (AHD): **16.2**

DIAMETER (mm): **50mm**

X-COORDINATE: **14919.43544**

Y-COORDINATE: **2115.80868**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ30-0-0.5A(R)	0.00	Fine clayey sand, high plasticity, some organic matter, brown with orange mottling. Orange clay, some sand, small pebbles to 3 mm Irregular fine sand, brown with small rock and shell fragments to 5 mm.	Replicate tested for basic				
					0.10						
					0.20						
				PCQ30-0.5-1.0A(R)	0.50	Irregular fine sand, brown with small rock and shell fragments to 5 m, firm and dry.					
					0.80	Irregular fine sand, with shell and rock fragments to 2 mm.					
1				PCQ30-1-2A(R)	1.40	Kaolin, in clay binding sand, clay content increases with depth, orange sand mottling intermittent, some rock to 5 mm		M			1
2								D	VF		2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ31

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **19/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **19/11/2004 11:42**

SITE #: **31**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **15.8**

TIDE (m): **Flooding 2.18 m**

SEA BED (AHD): **15.8**

DIAMETER (mm): **50mm**

X-COORDINATE: **14919.58322**

Y-COORDINATE: **2115.68532**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ31-0-0.5A(R)	0.05	Brown silty sand, some organics and shell fragments to 2 mm					
						Grey silty clay with brown mottling, low plasticity and low moisture.					
				PCQ31-0.5-1.0A(R)	0.50	Regular grey sand uniform texture					
					0.55	Grey silty clay with brown mottling, low plasticity and low moisture					
1											1
				PCQ31-1-2A(R)	1.20	black, brown, grey regular loose sand		D			
					1.25	Kaolin, bound in brown and grey clay. dry very firm and brittle, some rock fragments to 20 mm					
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ32

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **20/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **20/11/2004 07:00**

SITE #: **32**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **18.4**

TIDE (m): **Ebb 4.44 m**

SEA BED (AHD): **18.4**

DIAMETER (mm): **50mm**

X-COORDINATE: **14919.58688**

Y-COORDINATE: **2115.95346**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ32-0-0.5A(R)	0.20	Coarse brown sand some organics and shell fragments to 5 mm Grey clay with orange mottling, medium plasticity and medium density.	Triplicate site		MD		
				PCQ32-0.5-1.0A(R)	0.50	Firm silt based clay, grey with orange mottling white clay mottling at depth, low plasticity and dry		M			
1				PCQ32-1-2A(R)				D			1
2											2
					2.50						

Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/ Relative Density	Graphic Log	Depth (m)
-0						Ground Surface	No odour	W	L		0
				PCQ33-0-0.5A(R)	0.00	Grey silty clay, some shells, intermittent pebbles less than 10 mm	Detailed suite analysed	M			
					0.15	Sand bound clay, brown and green mottling, grey, uniform sand					
				PCQ33-0.5-1.0A(R)	0.50	Firm brown clay, grey mottling, dry kaolin and low plasticity		D	MD		
-1				PCQ33-1-2A(R)	1.50	Large pebbles with coarse poorly sorted grey sand					
					1.60	Grey white firm clay, silt composition, low plasticity					
-2					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ34

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **15/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **15/11/2004 09:30**

SITE #: **34**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **18.3**

TIDE (m): **Flooding 4.05 m**

SEA BED (AHD): **18.3**

DIAMETER (mm): **50mm**

X-COORDINATE: **14920.20752**

Y-COORDINATE: **2116.05648**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ34-0-0.5A(R)	0.05	Brown silty sand - fine, speckled black organics, fine shell fragments Moist clay with patches of sand, mottled grey/brown, uniform particle size		M	MD		
				PCQ34-0.5-1.0A(R)							
1				PCQ34-1-2A(R)	1.00	Sandy brown clay, higher moisture content, uniform particle size, grey patches and occasional pebbles, coarser sand, higher plasticity with depth					1
					1.60	Grey white firm clay, silt composition, low plasticity		W			
					1.80	Grey clay patches of brown sand, low moisture, uniform particle size and consistency	Basic tested minus TBT				
2								D			2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ35

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **20/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **20/11/2004 09:00**

SITE #: **35**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **16.7**

TIDE (m): **Ebb 3.15 m**

SEA BED (AHD): **16.7**

DIAMETER (mm): **50mm**

X-COORDINATE: **14920.51142**

Y-COORDINATE: **2115.64698**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ35-0-0.5A(R)	0.10	Well-sorted coarse sand, with fragments of shell and rock to 2 mm, soft and moist		D			
				PCQ35-0.5-1.0A(R)		Poorly sorted sandy clay with red and grey mottling, hard with low plasticity, some coarse fragments of shell and sand	Detailed suite analysed				
1				PCQ35-1-2A(R)	0.90	Soft sandy clay with decreasing plasticity with depth regular texture and red sand mottling			S		1
2					1.90	Kaolin bound by fine dry sand			L		2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ36

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **20/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **20/11/2004 10:30**

SITE #: **36**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **17.4**

TIDE (m): **Ebb 1.86 m**

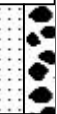
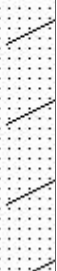
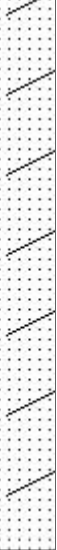
SEA BED (AHD): **17.4**

DIAMETER (mm): **50mm**

X-COORDINATE: **14920.625**

Y-COORDINATE: **2115.853**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ36-0-0.5A(R)	0.20	Coarse brown sand, poorly sorted shell fragments, some rocks to 30 mm		M	VH		
				PCQ36-0.5-1.0A(R)		Brown sand based clay, becoming sandier with depth, grey mottling throughout, Plasticity and dryness increasing with depth					
1				PCQ36-1-2A(R)			Basic suite analysed minus TBT				
2					2.50			D	F		2

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
					0.00	Uniform silt, clay binding particles shells to 40 mm medium plasticity, wet	No odour	W	L		
				PCQ37-0-0.5A(R)	0.15	Low plasticity clay moist becoming dry with depth. Brown grey dry organic clay at depth	Detailed suite analysed	M	F		
				PCQ37-0.5-1.0A(R)							
1				PCQ37-1-2A(R)				D	VF		
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ38

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **17/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **17/11/2004 16:15**

SITE #: **38**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **19.4**

TIDE (m): **Ebb 4.94 m**

SEA BED (AHD): **19.3**

DIAMETER (mm): **50mm**

X-COORDINATE: **14920.8214**

Y-COORDINATE: **2115.64644**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ38-0-0.5A(R)	0.00	Fine brown sand with fine shell and organic fragments. Individual rock (<30 mm)	No odour	W	L		
					0.15			M	F		
					0.25	Coarse shell and sand bound in a clay matrix		D			
				PCQ38-0.5-1.0A(R)		Firm brown clay with grey mottling, low plasticity and dry					
1				PCQ38-1-2A(R)	1.00	Brown pliable clay, grey mottling some shell fragments to 3 mm, moist	Basic suite minus TBT analysed	M			1
					1.90	Silty brown sand with some binding clay					
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ39

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **22/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **22/11/2004 06:30**

SITE #: **39**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Martin Brennan**

WATER DEPTH (m): **19.0**

TIDE (m): **Flooding 4.94 m**

SEA BED (AHD): **19.0**

DIAMETER (mm): **50mm**

X-COORDINATE: **14920.82522**

Y-COORDINATE: **2115.79158**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ39-0-0.5A(R)	0.20	Coarse poorly sorted sand, shell and rock fragments to 10 mm, some organics, loose and wet, grey/brown colour, increasing rock fragments in size and number with depth		M	MD		
				PCQ39-0.5-1.0A(R)		Grey brown, fine sandy clay with orange mottling, low plasticity, soft with no gravels					
1				PCQ39-1-2A(R)	1.00	As per 0.25-1 m however increases with stiffness and orange mottling with depth. Black organics at 1.5 m kaolin at 1.8 m - increasing plasticity with depth			D		1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ40

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **22/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **22/11/2004 07:30**

SITE #: **40**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Martin Brennan**

WATER DEPTH (m): **20.1**

TIDE (m): **Flooding 5.42m**

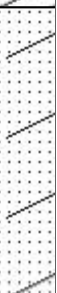
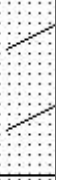
SEA BED (AHD): **20.1**

DIAMETER (mm): **50mm**

X-COORDINATE: **14920.98176**

Y-COORDINATE: **2115.6990**

DEPTH OF CORE (m): **1.9**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ40-0-0.5A(R)	0.00	Shelly, gravelly, green silt, with shells less than 10mm.	Triplicate Site				
					0.20	Grades to a firm grey clay, increasing with depth, orange mottling and shell fragments at 0.5m, medium plasticity.		M	F		
				PCQ40-0.5-1.0A(R)	0.50	Grey/brown firm sandy clay, increasing in stiffness with depth, some orange mottling, brittle.					
					1.00	Orange-brown silty clay, firm, brittle, some fine kaolin throughout.					1
				PCQ40-1-2A(R)	1.40	Grey/brown clayey fine sand.			MD		
					1.70	Grading to uniform fine grey sand.			L		
					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQ41

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **20/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **20/11/2004 12:15**

SITE #: **41**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Martin Brennan**

WATER DEPTH (m): **16.8**

TIDE (m): **Flood Tide 1.82m**

SEA BED (AHD): **16.8**

DIAMETER (mm): **50mm**

X-COORDINATE: **14921.28762**

Y-COORDINATE: **2115.3864**

DEPTH OF CORE (m): **2.0**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ41-0-0.5A(R)		Fine silty sand, some organics, some small rock particles. (0.3-0.6m - moist brown clay horizon, loosely bound).	Triplicate Site				
				PCQ41-0.5-1.0A(R)							
1					1.20	Pebbles bound by silty sand, become larger and more dominant with depth.		M	L		1
				PCQ41-1-2A(R)							
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ42

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **16/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **16/11/2004 15:45**

SITE #: **42**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **16.8**

TIDE (m): **Ebb Tide 4.54m**

SEA BED (AHD): **20.2**

DIAMETER (mm): **50mm**

X-COORDINATE: **14921.29022**

Y-COORDINATE: **2115.77592**

DEPTH OF CORE (m): **2.0**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ42-0-0.5A(R)	0.20	Wet coarse poorly sorted sand, shell fragments to 2mm, organic matter, rock fragments to 20mm, grey/brown.	Detailed suite analysed	M	MD		
				PCQ42-0.5-1.0A(R)	0.80	Soft fine sand, with binding clay, medium plasticity, consistent.					
1				PCQ42-1-2A(R)	1.00	Soft fine sand, with higher clay content than previous layer, medium plasticity, consistent.					1
					1.20	White clay and kaolin, contained within fine clay.					
					1.30	Coarse sandy clay, consistent and brown.					
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ43

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **20/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **20/11/2004 11:00**

SITE #: **43**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Martin Brennan**

WATER DEPTH (m): **17.4**

TIDE (m): **Ebb Tide 2.02m**

SEA BED (AHD): **17.4**

DIAMETER (mm): **50mm**

X-COORDINATE: **14921.43368**

Y-COORDINATE: **2115.49002**

DEPTH OF CORE (m): **2.0**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ43-0-0.5A(R)		Brown silt, organics, no structure, shell fines.		M	MD		
					0.10	Clay bound sand, brown with grey mottling..			D		
					0.20	Horizon of brown clay, medium plasticity, shells and rocks to 2mm.			MD		
					0.30	Clay bound sand, brown with grey mottling.					
				PCQ43-0.5-1.0A(R)	0.50	Horizon of brown clay, medium plasticity.	Basic minus TBT analysed		D		
					0.60	Brown consistent sand, with rock and shell fragments to 7mm, larger fragments at depth.			L		
1				PCQ43-1-2A(R)	1.50	Gravel pebbles to 30mm, mixed with brown sand, brittle, irregular pebbles.					
2											
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ44

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **16/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **16/11/2004 15:00**

SITE #: **44**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **21.2**

TIDE (m): **Ebb Tide 3.38m**

SEA BED (AHD): **21.2**

DIAMETER (mm): **50mm**

X-COORDINATE: **14921.5874**

Y-COORDINATE: **2115.34536**

DEPTH OF CORE (m): **2.0**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ44-0-0.5A(R)	0.00	Wet, fine, brown, silty sand, with organic matter and shell fragments less than 0.5mm.	Replicate tested for Basic Suite	W			
					0.20	Fine silty sand with rock fragments to 20mm.					
				PCQ44-0.5-1.0A(R)	0.50	Fine sand with rock fragments, coral fragments to 20mm.		VW			
					1.20	Coarse sand, rock fragments, medium density, consistent.		D			
				PCQ44-1-2A(R)	1.50	Gravel pebbles to 30mm, mixed with brown sand, brittle, irregular pebbles.					
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ45

Page: 1 of 1

CLIENT: PCQ			COMMENCED: 16/11/2004
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging		JOB No.: 41/13829	COMPLETED: 16/11/2004 14:30
SITE #: 45		LOGGED BY: Dan Collins	
CONTRACTOR: GeoCoastal		EQUIPMENT: Vibrocorer	CHECKED BY: Peter Mellor
WATER DEPTH (m): 20.2	TIDE (m): Ebb Tide 5.43m	SEA BED (AHD): 20.2	DIAMETER (mm): 50mm
X-COORDINATE: 14921.9021	Y-COORDINATE: 2115.61782	DEPTH OF CORE (m): 1.8	

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ45-0-0.5A(R)	0.00	Well sorted brown silty sand, shell fragments to 2mm, some organics.	Detailed suite analysed				
					0.30	Sandy grey clay, intermittent with shells, poorly graded sand.		M	MD		
				PCQ45-0.5-1.0A(R)	0.80	Brown clay, grey mottling, low plasticity and dry, gaining plasticity with depth.		D	D		
1				PCQ45-1-2A(R)							1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ46

Page: 1 of 1

CLIENT: PCQ					COMMENCED: 16/11/2004							
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging					JOB No.: 41/13829 COMPLETED: 16/11/2004 13:21							
SITE #: 46					LOGGED BY: Dan Collins							
CONTRACTOR: GeoCoastal					EQUIPMENT: Vibrocorer			CHECKED BY: Peter Mellor				
WATER DEPTH (m): 20.4		TIDE (m): High Tide 5.8m		SEA BED (AHD): 20.4		DIAMETER (mm): 50mm						
X-COORDINATE: 14922.21308		Y-COORDINATE: 2115.33335		DEPTH OF CORE (m): 2.0								
Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)	
0						Ground Surface	No odour	W	L		0	
				PCQ46-0-0.5A(R)	0.00	Fine silty sand, large shell fragments, brown/grey, some organics.	Detailed suite analysed	D	MD			
					0.10							
					0.20					Coarse sand, large shell fragments less than 10mm, some binding clay.		
					Brown clay, mottled grey and red, high plasticity, uniform texture.							
				PCQ46-0.5-1.0A(R)								
1				PCQ46-1-2A(R)							1	
					1.80	Coarse sand, large shell fragments, grey, dry, some kaolin.		L				
2											2	
					2.50							

SOIL BOREHOLE LOG

Borehole No.: PCQ47

Page: 1 of 1

CLIENT: PCQ						COMMENCED: 16/11/2004					
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging						JOB No.: 41/13829 COMPLETED: 16/11/2004 12:00					
SITE #: 47						LOGGED BY: Dan Collins					
CONTRACTOR: GeoCoastal						EQUIPMENT: Vibrocorer					
CHECKED BY: Peter Mellor											
WATER DEPTH (m): 20.1		TIDE (m): Flooding Tide 5.36m		SEA BED (AHD): 20.1		DIAMETER (mm): 50mm					
X-COORDINATE: 14922.36506		Y-COORDINATE: 2115.18654		DEPTH OF CORE (m): 2.0							

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ47-0-0.5A(R)		Fine silty sand, predominantly brown, some grey sands, small shell particles less than 2mm, consistent sand particles.	Detailed suite analysed		MD		
					0.30	Low plasticity, silty clay, brown with grey mottling, firm uniform texture.		D			
				PCQ47-0.5-1.0A(R)							
1				PCQ47-1-2A(R)							
					1.90	Rock particles bound by clay, grey pebbles up to 20mm.			L		
2					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ48

Page: 1 of 1

CLIENT: PCQ			COMMENCED: 17/11/2004
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging		JOB No.: 41/13829	COMPLETED: 17/11/2004 14:45
SITE #: 48		LOGGED BY: Dan Collins	
CONTRACTOR: GeoCoastal		EQUIPMENT: Vibrocorer	CHECKED BY: Peter Mellor
WATER DEPTH (m): 20.5	TIDE (m): Ebb Tide 5.51m	SEA BED (AHD): 20.5	DIAMETER (mm): 50mm
X-COORDINATE: 14922.51584	Y-COORDINATE: 2115.32796	DEPTH OF CORE (m): 2.0	

Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/ Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ48-0-0.5A(R)	0.00 0.15	Brown silty sand, shell fragments less than 10mm, some binding clay, black organics.		M	MD		
				PCQ48-0.5-1.0A(R)		Brown silty clay, orange/green mottling, low plasticity.					
							Basic minus TBT analysed				
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											

SOIL BOREHOLE LOG

Borehole No.: PCQ49

Page: 1 of 1

CLIENT: PCQ						COMMENCED: 20/11/2004					
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging						JOB No.: 41/13829 COMPLETED: 20/11/2004 10:30					
SITE #: 49						LOGGED BY: Dan Collins					
CONTRACTOR: GeoCoastal						EQUIPMENT: Vibrocorer					
WATER DEPTH (m): 17.1						TIDE (m): Ebb Tide 2.22m		SEA BED (AHD): 17.1		DIAMETER (mm): 50mm	
X-COORDINATE: 14922.518						Y-COORDINATE: 2115.46122		DEPTH OF CORE (m): 2.0			

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ49-0-0.5A(R)	0.00	Fine sandy-silt, poorly sorted particle size, loose.	Detailed Suite analysed		MD		
				PCQ49-0.5-1.0A(R)	0.50	Sandy-clay, decreasing plasticity at depth, increasing hardness and dryness at depth, orange, grey and red mottling, well sorted.		M			
1				PCQ49-1-2A(R)				D	L		1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ50

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CLIENT: **PCQ**

COMMENCED: **15/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **15/11/2004 14:00**

SITE #: **50**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **20**

TIDE (m): **Ebb Tide 5.93m**

SEA BED (AHD): **20**

DIAMETER (mm): **50mm**

X-COORDINATE: **14922.82316**

Y-COORDINATE: **2115.03162**

DEPTH OF CORE (m): **2.0**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ50-0-0.5A(R)	0.30	Brown silty-clay, orange and grey mottling, some sand throughout.					
				PCQ50-0.5-1.0A(R)							
1				PCQ50-1-2A(R)	1.00	Wet, loosely bound silty-clay, grey and brown mottling, becomes firmer with depth, medium plasticity.					1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ51

Page: 1 of 1

CLIENT: PCQ					COMMENCED: 15/11/2004						
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging					JOB No.: 41/13829 COMPLETED: 15/11/2004 13:00						
SITE #: 51					LOGGED BY: Dan Collins						
CONTRACTOR: GeoCoastal					EQUIPMENT: Vibrocorer				CHECKED BY: Peter Mellor		
WATER DEPTH (m): 20.0			TIDE (m): Ebb Tide 5.93m			SEA BED (AHD): 20.5			DIAMETER (mm): 50mm		
X-COORDINATE: 14922.82316			Y-COORDINATE: 2115.03162			DEPTH OF CORE (m): 2.0					
Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ51-0-0.5A(R)	0.00	Silty grey sand, with shell fragments.					
					0.10	Grey coarse sand, with shell fragments, some rock fragments to 20mm.					
					0.30	Silt bound clay, grey/green/brown, loose.		M	MD		
				PCQ51-0.5-1.0A(R)							
1				PCQ51-1-2A(R)	1.00	Low plasticity clay, grey/brown, kaolin, firm and dry.	Basic minus TBT analysed	D			1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ52

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **15/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **15/11/2004 12:30**

SITE #: **52**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **20.6**

TIDE (m): **Ebb Tide 6.05m**

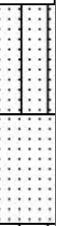
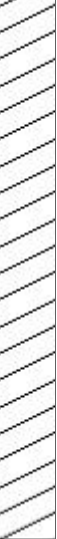
SEA BED (AHD): **20.6**

DIAMETER (mm): **50mm**

X-COORDINATE: **14922.98672**

Y-COORDINATE: **2115.31914**

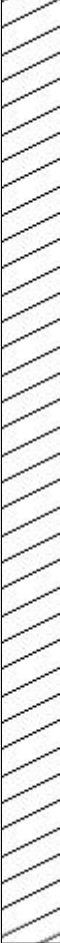
DEPTH OF CORE (m): **2.0**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface					0
				PCQ52-0-0.5A(R)	0.00	Fine sandy silt, stone and shell fragments, some organic matter.	No odour	W	L		
					0.20	Fine sandy silt, stone and shell fragments (20mm), some organic matter.					
					0.40	Silty clay, uniform particle size, grey.					
				PCQ52-0.5-1.0A(R)			Detailed suite analysed	M	MD		
1				PCQ52-1-2A(R)	1.00	Dry firm clay, brown with patches of grey, high composition of fine sands with clay, low plasticity.		D			1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ53

Page: 1 of 1

CLIENT: PCQ					COMMENCED: 15/11/2004						
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging					JOB No.: 41/13829 COMPLETED: 15/11/2004 15:40						
SITE #: 53					LOGGED BY: Dan Collins						
CONTRACTOR: GeoCoastal					EQUIPMENT: Vibrocorer				CHECKED BY: Peter Mellor		
WATER DEPTH (m): 20.0			TIDE (m): Ebb Tide 3.67m			SEA BED (AHD): 20.0			DIAMETER (mm): 50mm		
X-COORDINATE: 14923.28948			Y-COORDINATE: 2115.02664			DEPTH OF CORE (m): 2.0					
Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	VW	L		0
				PCQ53-0-0.5A(R)	0.00	Very wet sandy silt, grey, few organics.	Detailed suite analysed	M	MD		
			0.10		Silty clay, moist with shell fragments 2-5mm.						
			0.20		Clay, low plasticity, very compacted, grey with brown mottling, kaolin, increasing brown dominance with depth, few pebbles.						
				PCQ53-0.5-1.0A(R)							
				PCQ53-1-2A(R)							
1											1
							</				

SOIL BOREHOLE LOG

Borehole No.: PCQ54

Page: 1 of 1

CLIENT: PCQ						COMMENCED: 16/11/2004					
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging						JOB No.: 41/13829 COMPLETED: 16/11/2004 09:45					
SITE #: 54						LOGGED BY: Dan Collins					
CONTRACTOR: GeoCoastal						EQUIPMENT: Vibrocorer					
WATER DEPTH (m): 17.6						TIDE (m): Flood Tide 3.27m		SEA BED (AHD): 17.6		DIAMETER (mm): 50mm	
X-COORDINATE: 14924.37572						Y-COORDINATE: 2114.72676		DEPTH OF CORE (m): 2.0			

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQ54-0-0.5A(R)		Fine silty sand, brown and grey, organics, shell fragments to 2mm, loose.	Detailed suite analysed				
				PCQ54-0.5-1.0A(R)							
1				PCQ54-1-2A(R)	1.00	Grey silty sand, binding clay, shell fragments, wet, moist at depth.		M	MD		1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ55

Page: 1 of 1

CLIENT: PCQ						COMMENCED: 16/11/2004					
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging						JOB No.: 41/13829 COMPLETED: 16/11/2004 08:15					
SITE #: 55						LOGGED BY: Dan Collins					
CONTRACTOR: GeoCoastal						EQUIPMENT: Vibrocorer					
CHECKED BY: Peter Mellor											
WATER DEPTH (m): 16.2		TIDE (m): Flood Tide 1.85m		SEA BED (AHD): 16.2		DIAMETER (mm): 50mm					
X-COORDINATE: 14924.67428		Y-COORDINATE: 2114.57298		DEPTH OF CORE (m): 2.0							

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQ55-0-0.5A(R)	0.00 0.10	Soft sandy silt, with shell fragments, grey, some black organics. Poorly sorted sand, shell fragments to 5mm.	Triplicate site				
				PCQ55-0.5-1.0A(R)	0.50	Soft uniform sand, moist, large shell fragments to 20mm, grey.					
1				PCQ55-1-2A(R)	1.00	Wet, well sorted sand, minimal shell fragments, grey, some binding clay with depth.					1
2									MD		2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQ56

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CLIENT: **PCQ**

COMMENCED: **16/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **16/11/2004 11:00**

SITE #: **56**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **18.8**

TIDE (m): **Flood Tide 4.57m**

SEA BED (AHD): **18.8**

DIAMETER (mm): **50mm**

X-COORDINATE: **14924.68418**

Y-COORDINATE: **2114.86326**

DEPTH OF CORE (m): **1.5**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	M	L		0
				PCQ56-0-0.5A(R)	0.20	Fine sandy silt, organic matter and shell fragments to 1mm throughout, consistent, well sorted and grey.	Replicate tested for Basic Suite				
				PCQ56-0.5-1.0A(R)	0.80	Fine sandy silt, organic matter and large shell fragments to 1mm throughout, consistent, well sorted and grey.					
1				PCQ56-1-2A(R)		Coarse/fine sand, some shell fragments, moist grey.					1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQT1

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **3/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **3/11/2004 10:15**

SITE #: **17**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Mathew Weller**

WATER DEPTH (m): **16.5**

TIDE (m): **Flooding 2.96 m**

SEA BED (AHD): **16.5**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.87534**

Y-COORDINATE: **2115.32448**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
					0.05	Fine dark grey silt sand, loose shells and coral throughout, intermittent clay nodules	Triplicate site	D	H		
				PCQT1-0-0.5(R)	0.20	Large amount of kaolin bound by clay nodules					
						White cream coloured clay with some orange mottling throughout. Clay hard and brittle and small pebbles to 0.05 and shells					
				PCQT1-0.5-1.0(R)	0.70	Large amount of kaolin matter bound by clay nodules, increasing clay content with dept, brown/orange clay, low to medium plasticity					
1					1.00	Uniform light grey clay with orange mottling, increased fine sand content with depth, pebbles throughout to 20 mm, low plasticity					1
				PCQT1-1.0-2.0(R)				W	S		
									F		
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQT2

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **3/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **3/11/2004 10:45**

SITE #: **17**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **17.5**

TIDE (m): **Flooding 3.17 m**

SEA BED (AHD): **17.5**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.87534**

Y-COORDINATE: **2115.32448**

DEPTH OF CORE (m): **2**

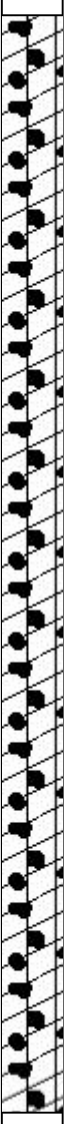
Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQT2-0-0.5(R)	0.00	Brittle grey/green clay, with few small pebbles, low plasticity.	Triplicate site	D			
					0.15	Brown clay, with grey green and white mottling, pebbles to 5 mm					
				PCQT2-0.5-1.0(R)	0.50	Light grey clay, with pebbles throughout, red grey and brown mottling, dense soft silty clay with medium plasticity		W	S		
					0.80	Silty brown uniform sand, no plasticity.					
1				PCQT2-1.0-2.0(R)	1.00	Silty clay with some fine sands, light grey with some orange mottling, low plasticity					1
					1.80	Silty clay with some fine sands, light grey with some orange mottling, low plasticity. Intermittent pebbles, shells and coral					
2									F		2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQT3

Page: 1 of 1

CLIENT: PCQ						COMMENCED: 4/11/2004					
PROJECT: Port of Hay Point Apron Area and Departure Path Capital Dredging						JOB No.: 41/13829 COMPLETED: 4/11/2004 12:00					
SITE #: 11						LOGGED BY: Martin Brennan					
CONTRACTOR: GeoCoastal						EQUIPMENT: Vibrocorer					
CHECKED BY: Matthew Weller											
WATER DEPTH (m): 17.0		TIDE (m): Flooding 3.16		SEA BED (AHD): 17.0		DIAMETER (mm): 50mm					
X-COORDINATE: 14918.63672		Y-COORDINATE: 2115.03138		DEPTH OF CORE (m): 2.0							

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	M	L		0
				PCQ-0-0.5T3		Silty clay, mottled brown/grey/red, black organics, some white clay at depth. Low plasticity, firm, gravel to 1cm	Triplicate site				
				PCQ-0.5-1T3							
1				PCQ-1.0-2.0T3							
2											
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQT4

Page: 1 of 1

CLIENT: PCQ						COMMENCED: 4/11/2004					
PROJECT: Port of Hay Point Apron Area and Departure Path Capital Dredging						JOB No.: 41/13829 COMPLETED: 4/11/2004 12:00					
SITE #: 11						LOGGED BY: Martin Brennan					
CONTRACTOR: GeoCoastal						EQUIPMENT: Vibrocorer					
CHECKED BY: Matthew Weller											
WATER DEPTH (m): 17.0		TIDE (m): Flooding 3.16		SEA BED (AHD): 17.0		DIAMETER (mm): 50mm					
X-COORDINATE: 14918.63672		Y-COORDINATE: 2115.03138		DEPTH OF CORE (m): 2.0							

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	M	L		0
				PCQ-0-0.5T4		Silty clay, mottled brown/grey/red, black organics, some white clay at depth. Low plasticity, firm, gravel to 1cm	Triplicate site				
				PCQ-0.5-1T4							
1				PCQ-1.0-2.0T4							1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQT5

Page: 1 of 1

CLIENT: PCQ				COMMENCED: 5/11/2004							
PROJECT: Port of Hay Point Apron Area and Departure Path Capital Dredging				JOB No.: 41/13829 COMPLETED: 5/11/2004 14:00							
SITE #: 4				LOGGED BY: Martin Brennan							
CONTRACTOR: GeoCoastal				EQUIPMENT: Vibrocorer				CHECKED BY: Matthew Weller			
WATER DEPTH (m): 15.9		TIDE (m): Flooding 3.15		SEA BED (AHD): 15.9		DIAMETER (mm): 50mm					
X-COORDINATE: 14918.0804		Y-COORDINATE: 2114.52594		DEPTH OF CORE (m): 1.6							
Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	Triplicate taken at this site	W	MD		0
					0.00	Dark grey silt					
				PCQ0-0.5T5	0.05	Dark grey silty sand, some carbon based material					
					0.10	Grey clay, very hard, low plasticity, muddy odour					
					0.20	Brown and orange clay hard with no pebbles					
					0.50	As per 0.2-0.5 m, low plasticity, very hard		M	F		
				PCQ0.5-1T5							
1					1.00	As above, has 3 cm horizon of grey clay sand					
				PCQ1.0-2.0T5	1.50	As above however softer with depth			M		
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQT6

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **5/11/2004**

PROJECT: **Port of Hay Point Apron Area and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **5/11/2004 14:00**

SITE #: **4**

LOGGED BY: **Martin Brennan**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Matthew Weller**

WATER DEPTH (m): **15.9**

TIDE (m): **Flooding 3.15**

SEA BED (AHD): **15.9**

DIAMETER (mm): **50mm**

X-COORDINATE: **14918.0804**

Y-COORDINATE: **2114.52594**

DEPTH OF CORE (m): **1.6**

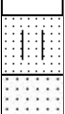
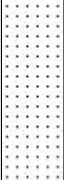
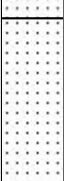
Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	Triplicate taken at this site	W	MD		0
				PCQ0-0.5T6	0.00	Dark grey silt					
					0.05						
					0.10	Dark grey silty sand, some carbon based material					
					0.20	Grey clay, very hard, low plasticity, muddy odour					
						Brown and orange clay hard with no pebbles					
				PCQ0.5-1T6	0.50	As per 0.2-0.5 m, low plasticity, very hard		M	F		
1				PCQ1.0-2.0T6	1.00	As above, has 3 cm horizon of grey clay sand			F		1
					1.50	As above however softer with depth			M		
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQT7

Page: 1 of 1

CLIENT: PCQ			COMMENCED: 16/11/2004
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging		JOB No.: 41/13829	COMPLETED: 16/11/2004 08:30
SITE #: T7		LOGGED BY: Dan Collins	
CONTRACTOR: GeoCoastal		EQUIPMENT: Vibrocorer	CHECKED BY: Peter Mellor
WATER DEPTH (m): 16.2	TIDE (m): Flood Tide 2.06m	SEA BED (AHD): 16.2	DIAMETER (mm): 50mm
X-COORDINATE: 14924.67428	Y-COORDINATE: 2114.57298	DEPTH OF CORE (m): 2.0	

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQT7-0-0.5A(R)	0.00	Soft sandy silt, with shell fragments, grey, some black organics.	Triplicate site				
					0.10	Poorly sorted sand, shell fragments to 5mm.					
				PCQT7-0.5-1.0A(R)	0.50	Soft uniform sand, moist, large shell fragments to 20mm, grey.					
					1.00	Wet, well sorted sand, minimal shell fragments, grey, binding clay with depth (final 20cm).					
				PCQT7-1-2A(R)	2.00						
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQT8

Page: 1 of 1

CLIENT: PCQ			COMMENCED: 16/11/2004
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging		JOB No.: 41/13829	COMPLETED: 16/11/2004 08:45
SITE #: T8		LOGGED BY: Dan Collins	
CONTRACTOR: GeoCoastal		EQUIPMENT: Vibrocorer	CHECKED BY: Peter Mellor
WATER DEPTH (m): 16.2	TIDE (m): Flood Tide 2.28m	SEA BED (AHD): 16.2	DIAMETER (mm): 50mm
X-COORDINATE: 14924.67428	Y-COORDINATE: 2114.57298	DEPTH OF CORE (m): 2.0	

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0						Ground Surface	No odour	W	L		0
				PCQT8-0-0.5A(R)	0.00	Soft sandy silt, grey, some black organics.	Triplicate site				
					0.10	Poorly sorted sand, shell fragments to 5mm.					
				PCQT8-0.5-1.0A(R)	0.50	Soft uniform sand, moist, large shell fragments to 20mm, grey.					
1				PCQT8-1-2A(R)	1.00	Wet, well sorted sand, minimal shell fragments, grey, binding clay with depth (final 20cm).					1
									MD		
2											2
					2.50						

Depth (m)	Method	Support	Water	Sample Number	Depth Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/ Relative Density	Graphic Log	Depth (m)
-0					0.00	Ground Surface	No odour	W	L		0
				PCQT9-0-0.5A(R)	0.30	Coarse brown sand some organics and shell fragments to 10 mm, some gravel, increasing particle size with depth	Triplicate site	M			
				PCQT9-0.5-1.0A(R)	0.75	High plasticity grey clay with orange mottling, soft and uniform throughout.		D	MD		
-1				PCQT9-1-2A(R)		Grey clay with orange mottling and kaolin throughout, plasticity decreases with depth and clay becomes harder					1
-2					2.50						2

SOIL BOREHOLE LOG

Borehole No.: PCQT10

Page: 1 of 1

CLIENT: **PCQ**

COMMENCED: **20/11/2004**

PROJECT: **Port of Hay Point Apron Areas and Departure Path Capital Dredging**

JOB No.: **41/13829** COMPLETED: **20/11/2004 08:04**

SITE #: **T10**

LOGGED BY: **Dan Collins**

CONTRACTOR: **GeoCoastal**

EQUIPMENT: **Vibrocorer**

CHECKED BY: **Peter Mellor**

WATER DEPTH (m): **17.6**

TIDE (m): **Ebb 3.86 m**

SEA BED (AHD): **17.6**

DIAMETER (mm): **50mm**

X-COORDINATE: **14919.58688**

Y-COORDINATE: **2115.95346**

DEPTH OF CORE (m): **2**

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQT10-0-0.5A(R)	0.30	Coarse brown sand some organics and shell fragments to 10 mm, some gravel, increasing particle size with depth	Triplicate site				
				PCQT10-0.5-1.0A(R)		Sand based clay with orange and white mottling, some kaolin and sandy nodules		M			
								D	MD		
1				PCQT10-1-2A(R)	1.00	Grey clay with orange mottling and kaolin throughout, plasticity decreases with depth and clay becomes harder					1
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQT11

Page: 1 of 1

CLIENT: PCQ

COMMENCED: 22/11/2004

PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging

JOB No.: 41/13829 COMPLETED: 22/11/2004 08:00

SITE #: T11

LOGGED BY: Dan Collins

CONTRACTOR: GeoCoastal

EQUIPMENT: Vibrocorer

CHECKED BY: Martin Brennan

WATER DEPTH (m): 19.9

TIDE (m): High Tide 5.48m

SEA BED (AHD): 19.9

DIAMETER (mm): 50mm

X-COORDINATE: 14920.98176

Y-COORDINATE: 2115.6990

DEPTH OF CORE (m): 1.7

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
					0.05	Fine brown silty sand, no shells.	Triplicate Site	M	MD		
				PCQT11-0-0.5A(R)		Hard grey silty clay, with orange mottling, high plasticity, uniform throughout, no shells.					
				PCQT11-0.5-1.0A(R)							
1					1.20	Clayey grey sand, some orange mottling, fine coarse sands, soft.		M	L		1
					1.30	Medium grained sand, with silty clay, orange grey mottling, becoming denser with depth.		M	L		
				PCQT11-1-2A(R)							
2											2
					2.50						

SOIL BOREHOLE LOG

Borehole No.: PCQT12

Page: 1 of 1

CLIENT: PCQ			COMMENCED: 22/11/2004
PROJECT: Port of Hay Point Apron Areas and Departure Path Capital Dredging		JOB No.: 41/13829	COMPLETED: 22/11/2004 08:45
SITE #: T12		LOGGED BY: Dan Collins	
CONTRACTOR: GeoCoastal		EQUIPMENT: Vibrocorer	CHECKED BY: Martin Brennan
WATER DEPTH (m): 19.7	TIDE (m): Ebb Tide 5.26m	SEA BED (AHD): 19.7	DIAMETER (mm): 50mm
X-COORDINATE: 14920.98176	Y-COORDINATE: 2115.6990	DEPTH OF CORE (m): 2.0	

Depth (m)	Method	Support	Water	Sample Number	Depth/Elevation (m)	DESCRIPTION AS1726 Soil Group Symbol, colour, soil types, particle characteristics or fines plasticity, secondary and minor components.	CONTAMINANT INDICATORS Odours, staining, waste materials, separate phase liquids, imported fill, ash.	Moisture Condition	Consistency/Relative Density	Graphic Log	Depth (m)
0					0.00	Ground Surface	No odour	W	L		0
				PCQT12-0-0.5A(R)	0.10	Fine light brown sand, some pebbles up to 10mm, black organics.	Triplicate Site	M	MD		
					0.15	Brown clay, with shell fragments, clay is soft with medium plasticity.					
						Dark grey clay, some orange mottling, firm, medium plasticity, some isolated gravel, increasing hardness with depth.					
				PCQT12-0.5-1.0A(R)							
1					1.20	Firm sandy clay, brown grey, soft, with low plasticity, some orange mottling..			D		1
				PCQT12-1-2A(R)							
2											2
					2.50						



Appendix G

Photos of Core Intervals

PCQ 1



0.5 –1.0m



1.0 –2.0m

PCQ 2



0 –0.5m



0.5 –1.0m



1.0 –2.0m

PCQ 3



0 –0.5m



0.5 –1.0m



1.0 –2.0m



PCQ 4

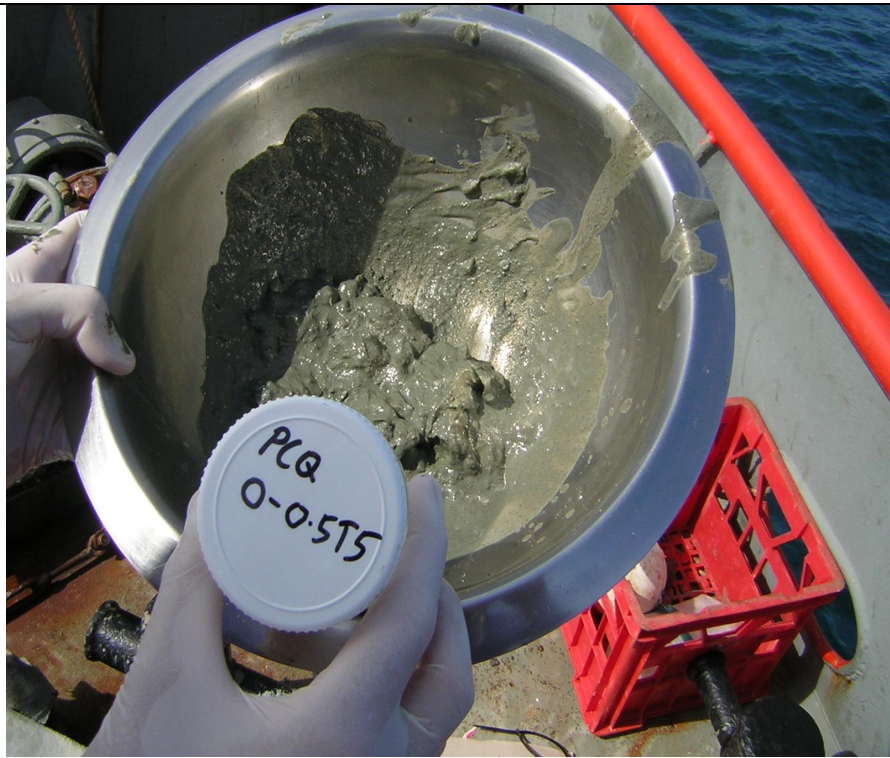


0 –0.5m



1.0 –2.0m

PCQ T5



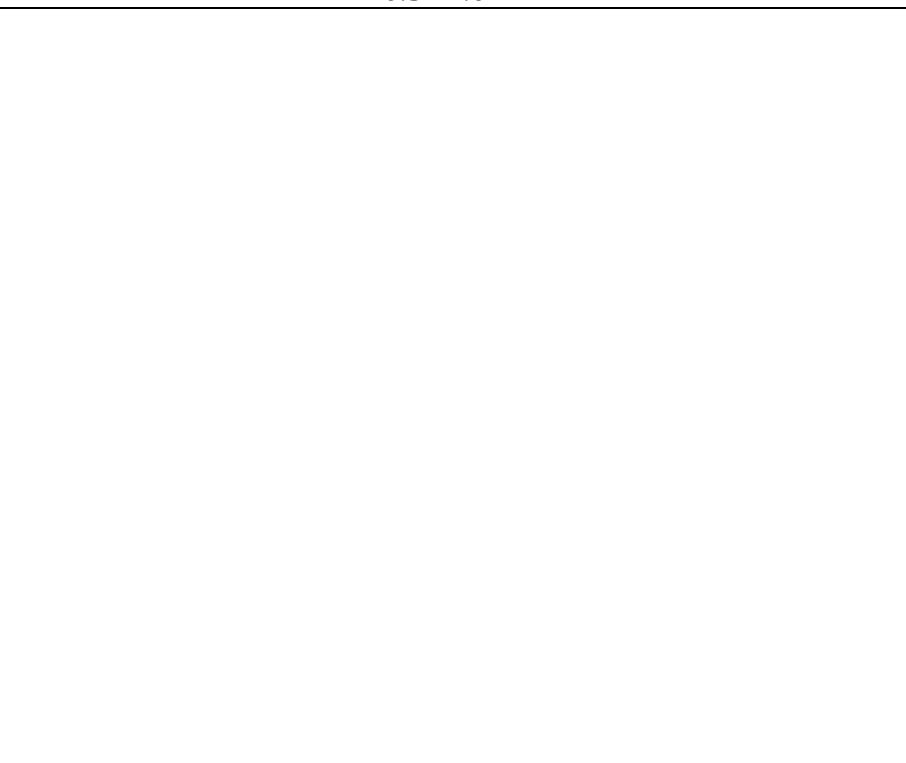
0 -0.5m



0.5 -1.0m



1.0 -2.0m



PCQ T6



0 -0.5m



0.5 -1.0m



1.0 –2.0m

PCQ 5



0 –0.5m

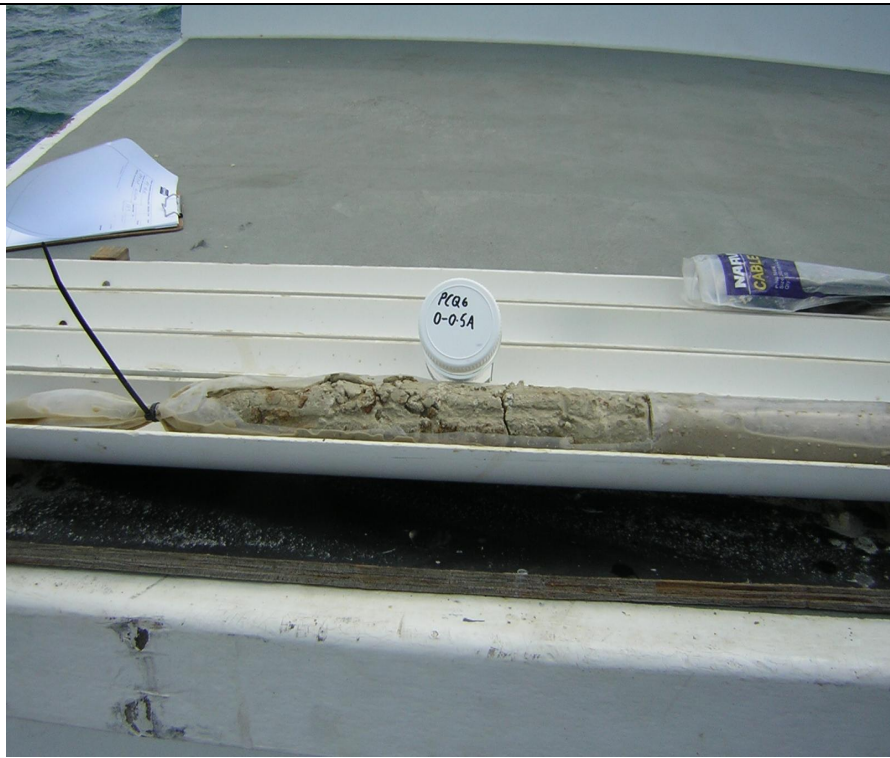


0.5 –1.0m



1.0 –2.0m

PCQ 6



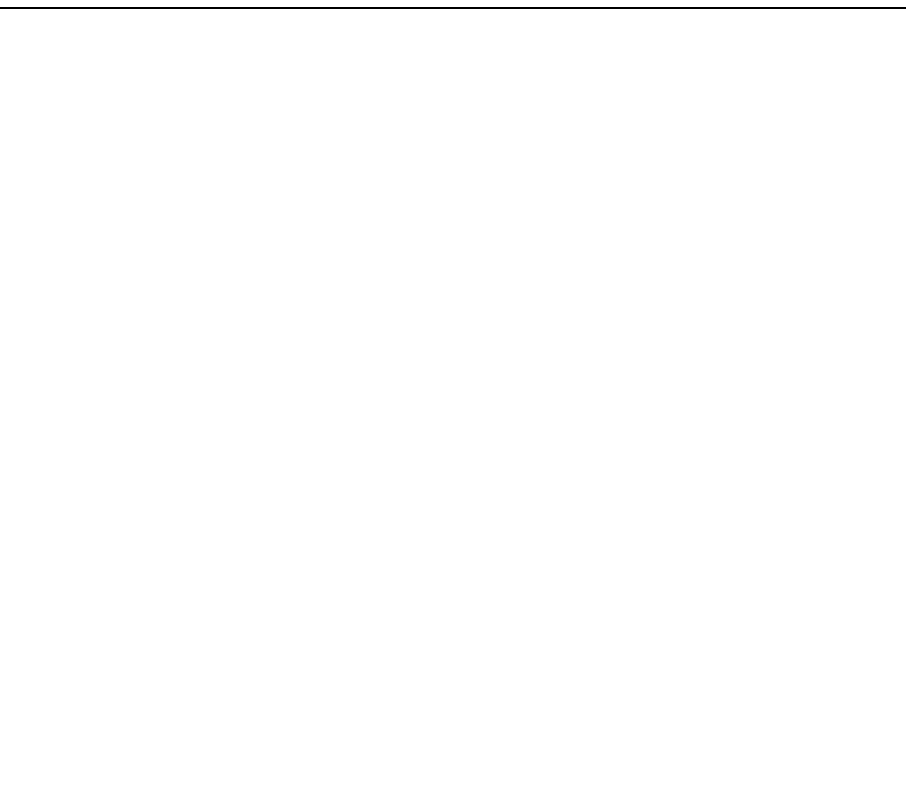
0 -0.5m



0.5 -1.0m



1.0 -2.0m



PCQ 7



0 -0.5m

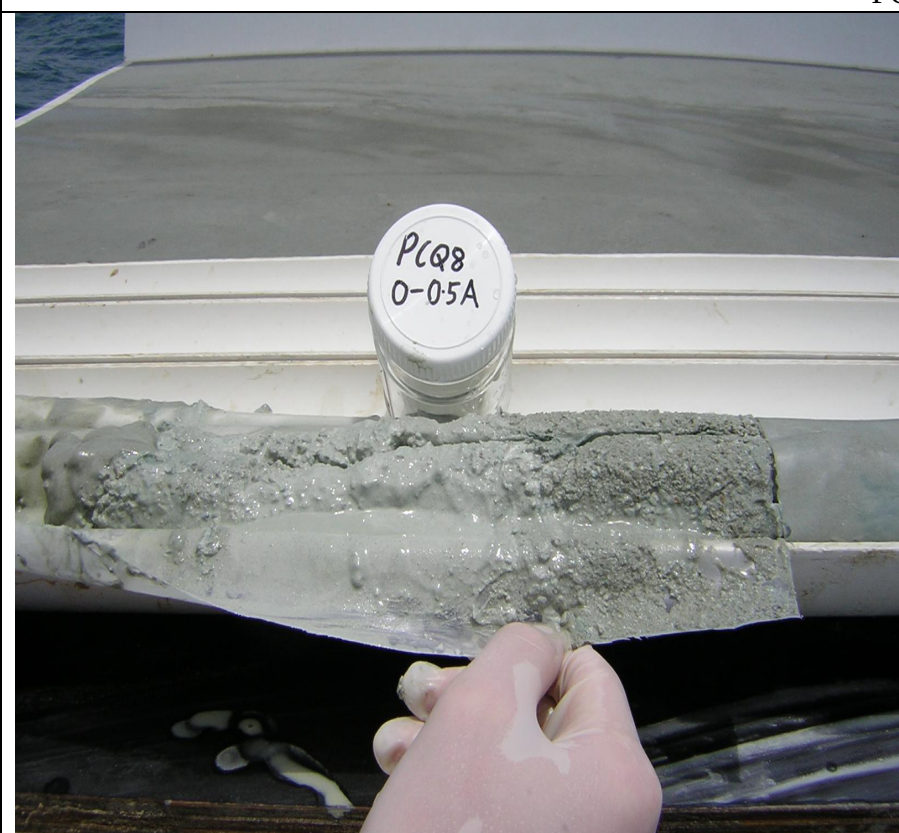


0.5 -1.0m

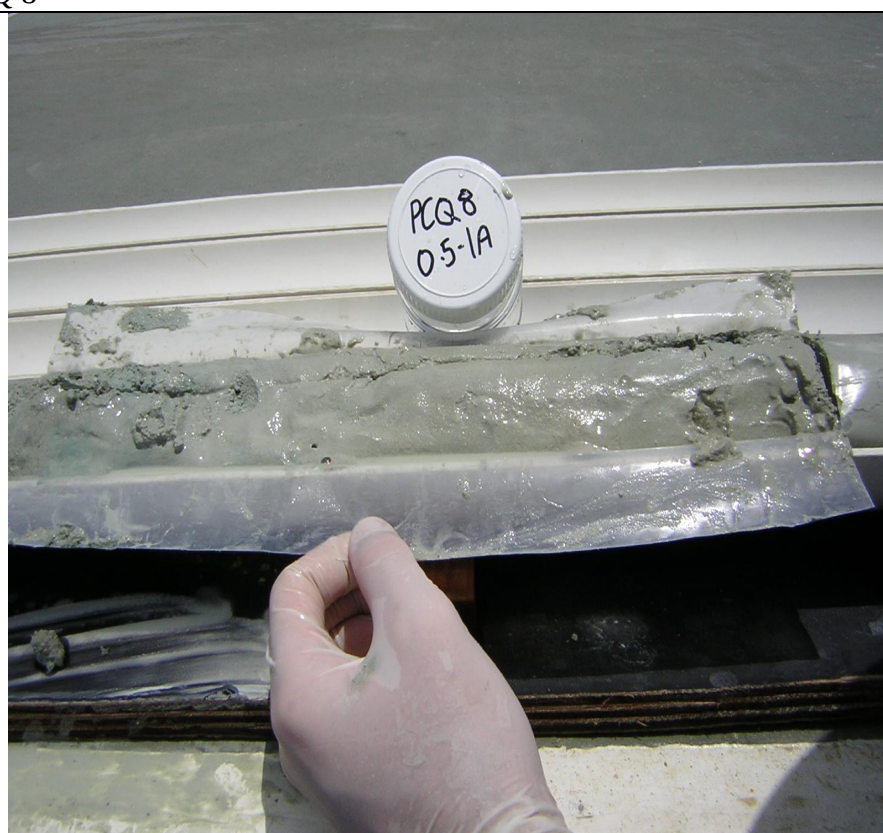


1.0 –2.0m

PCQ 8



0 –0.5m



0.5 –1.0m



1.0 –2.0m

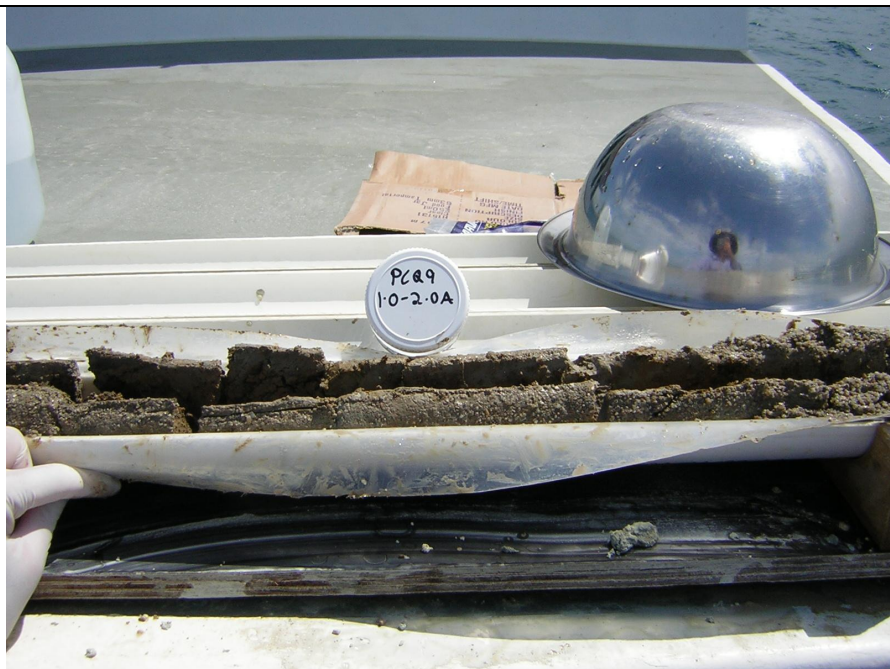
PCQ 9



0 -0.5m



0.5 -1.0m



1.0 -2.0m

PCQ 10



0 -0.5m



0.5 -1.0m

PCQ 11



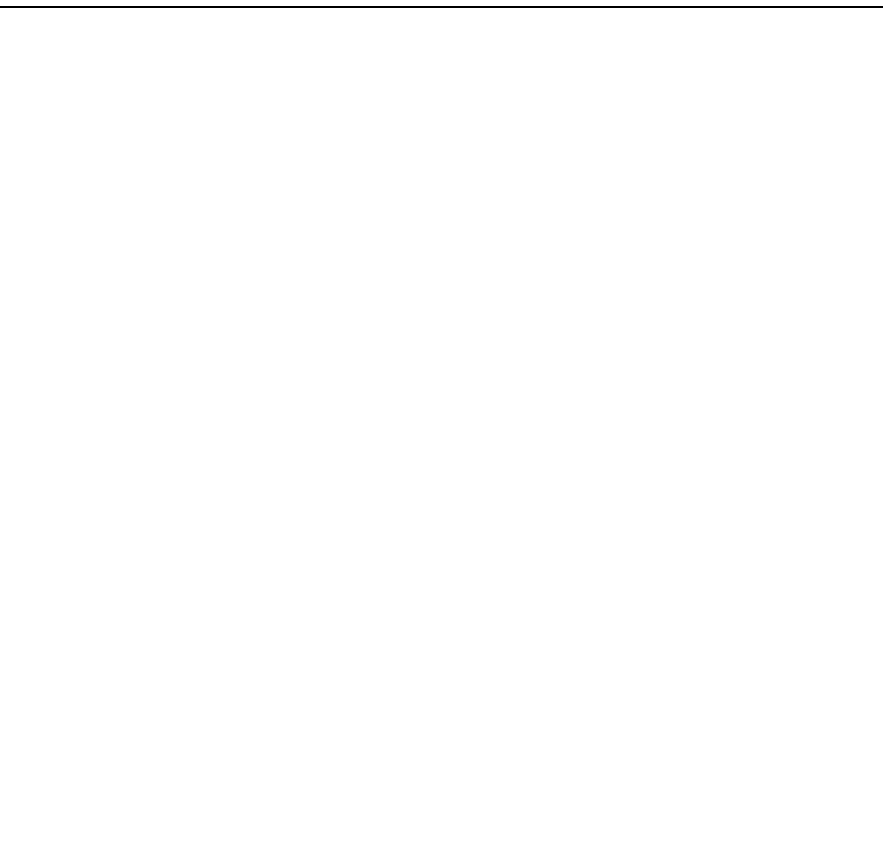
0 -0.5m



0.5 -1.0m



1.0 -2.0m



PCQ T3



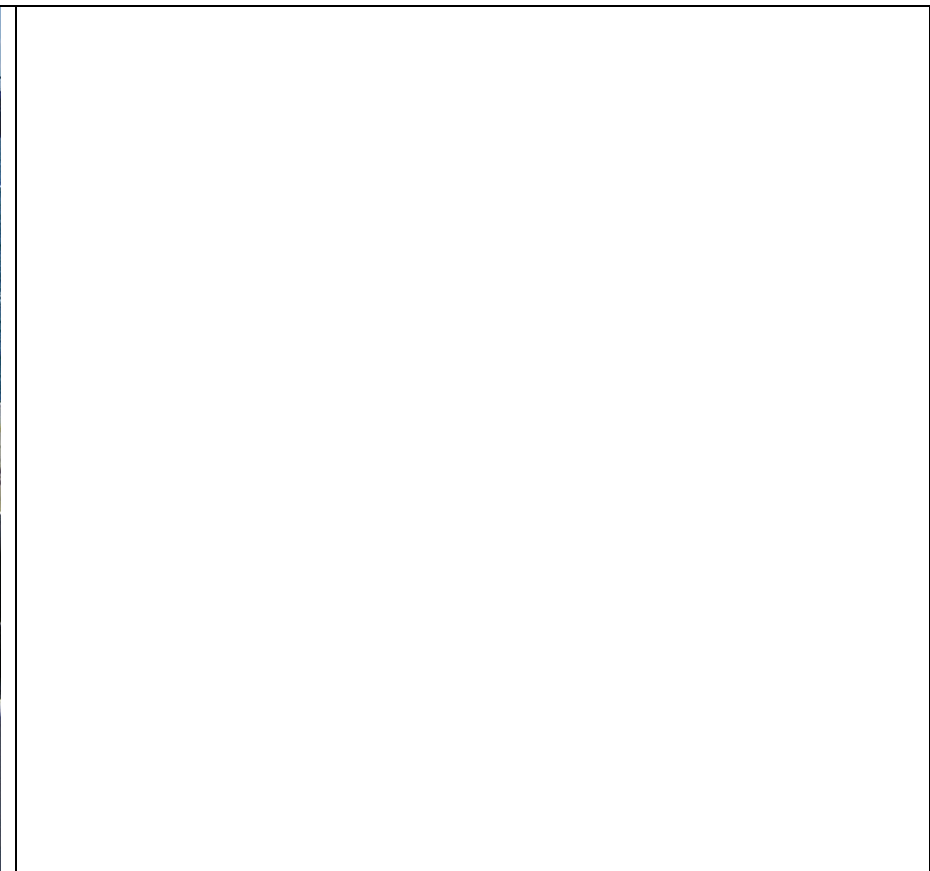
0 -0.5m



0.5 -1.0m



1.0 –2.0m



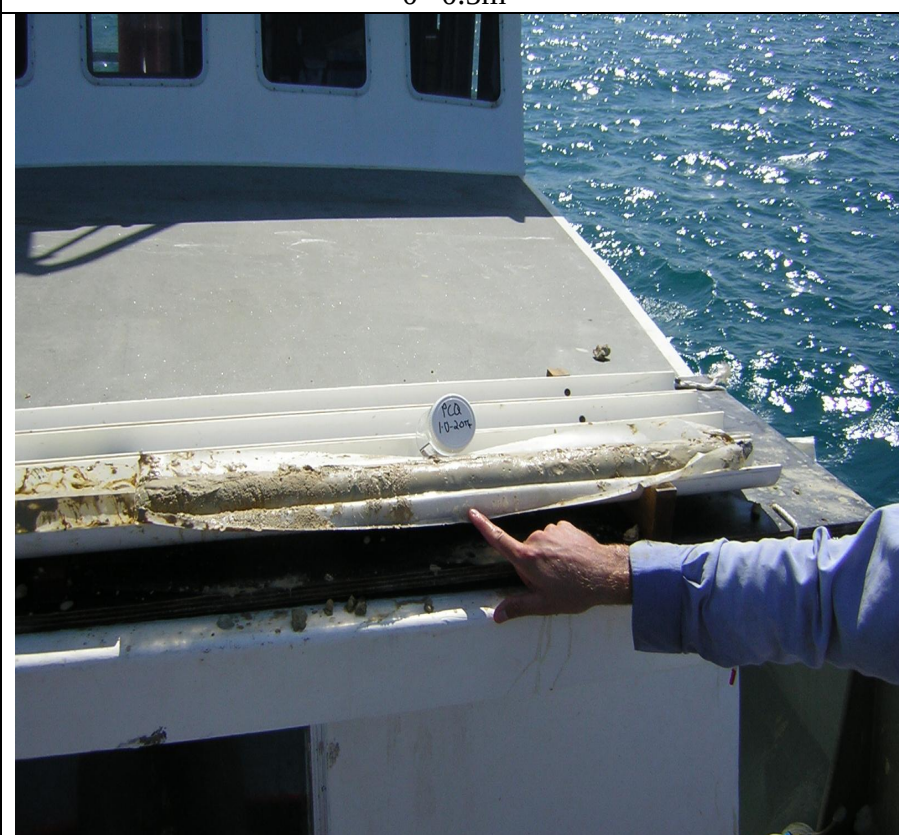
PCQ T4



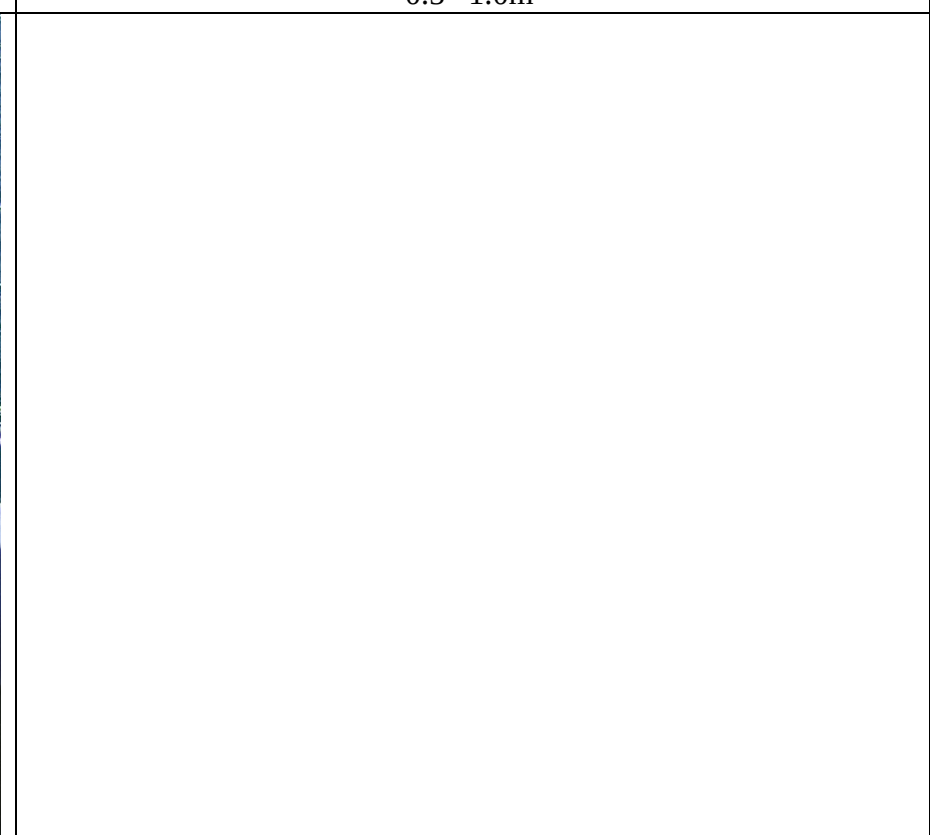
0 –0.5m



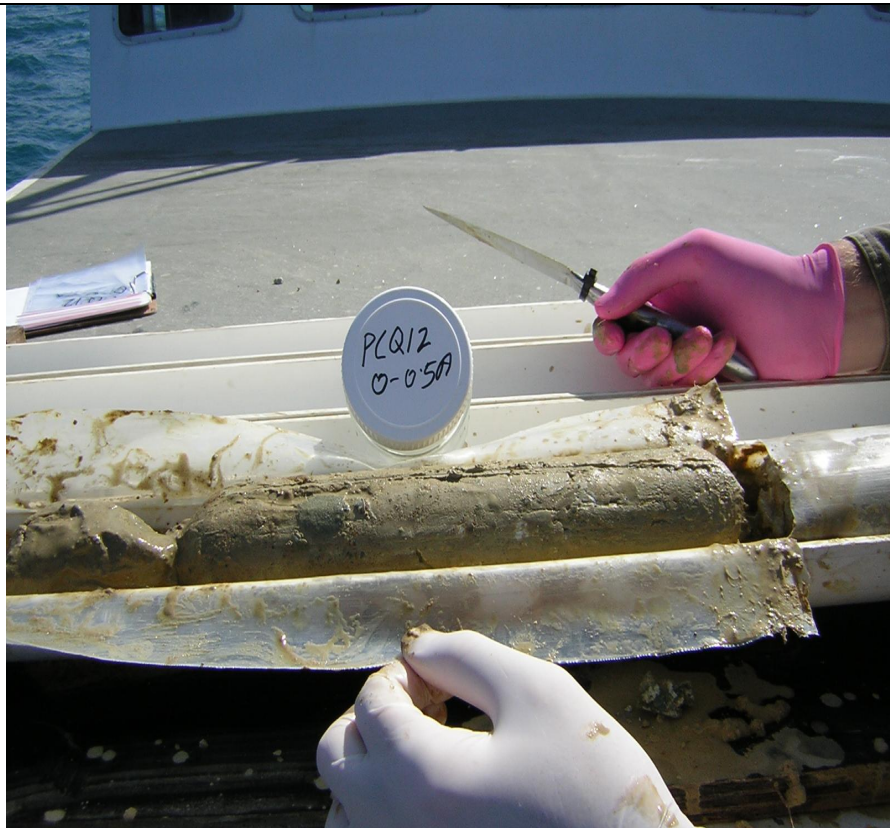
0.5 –1.0m



1.0 –2.0m



PCQ 12



0 -0.5m

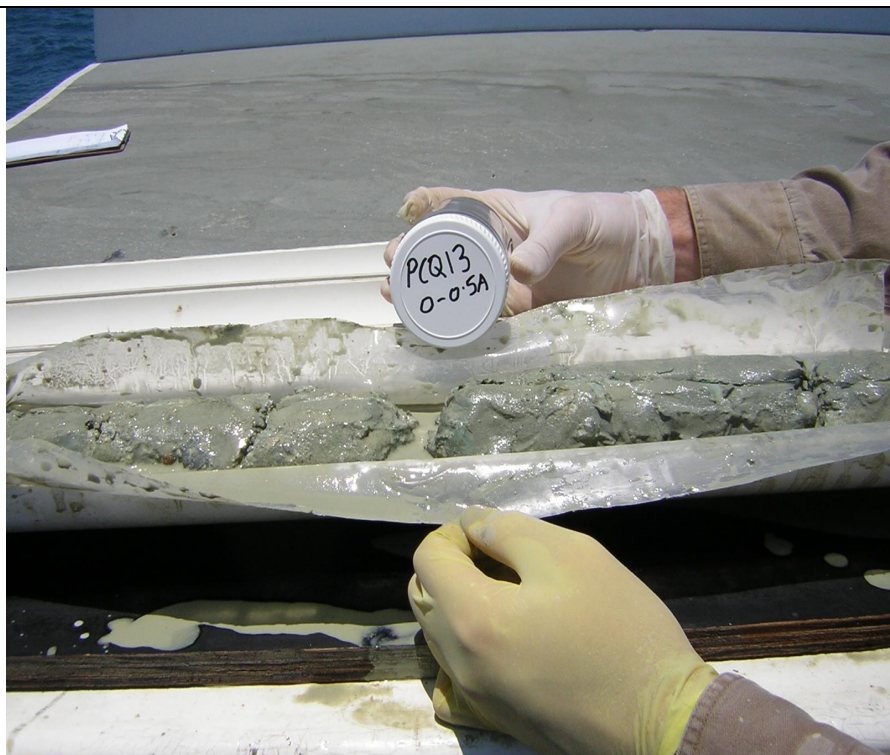


0.5 -1.0m



1.0 -2.0m

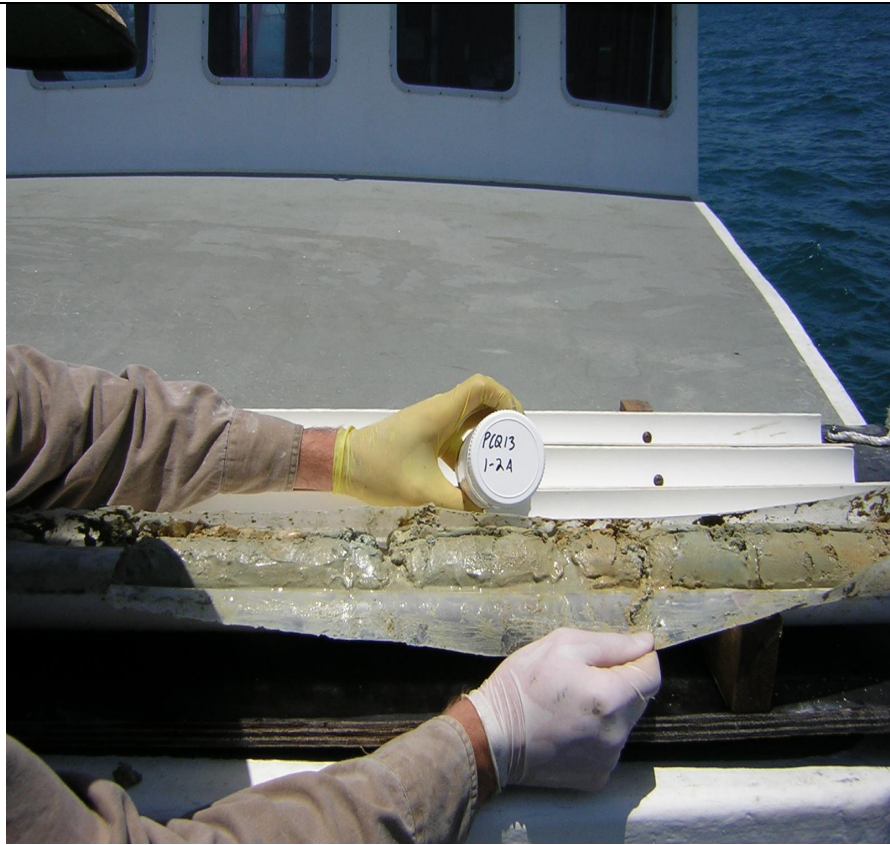
PCQ 13



0 -0.5m



0.5 -1.0m

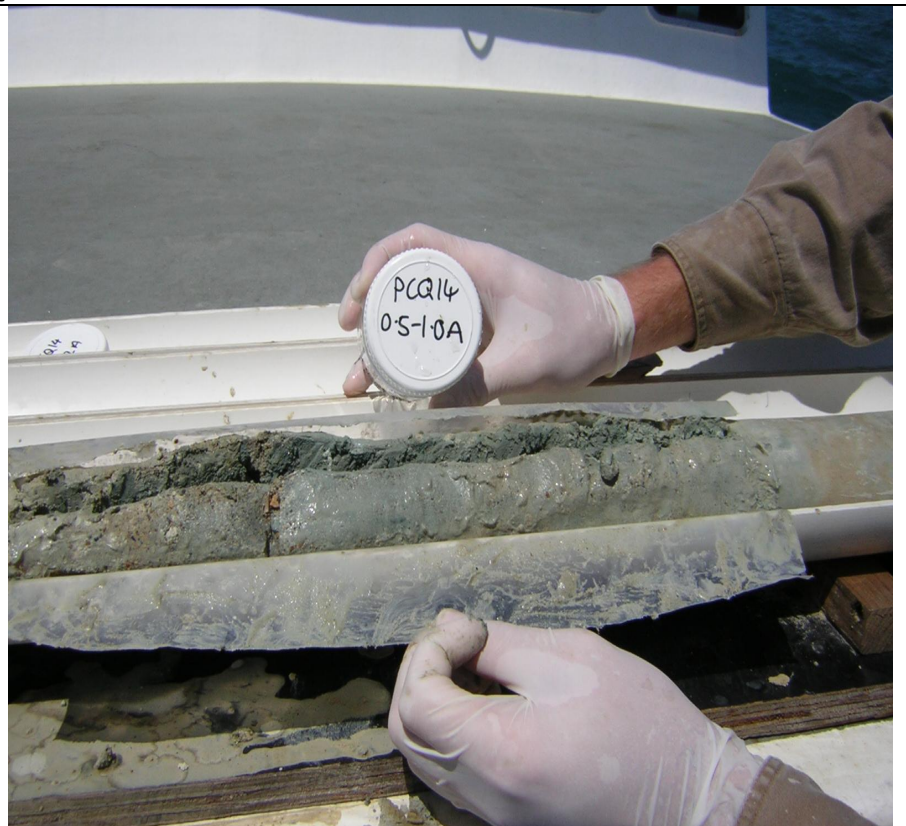


1.0 –2.0m

PCQ 14



0 –0.5m

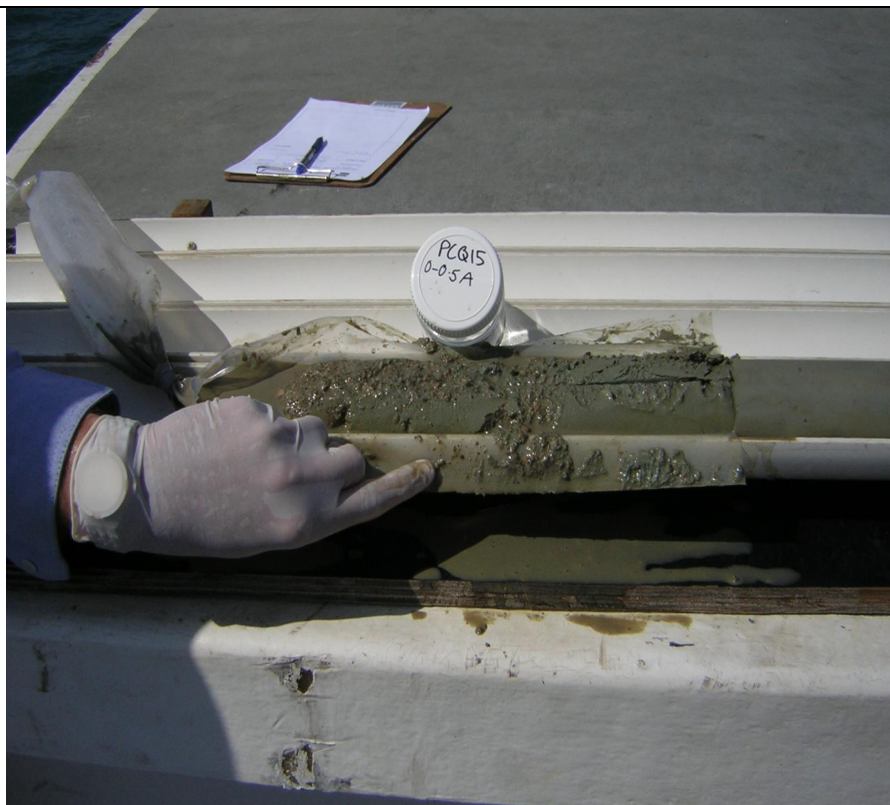


0.5 –1.0m



1.0 –2.0m

PCQ 15



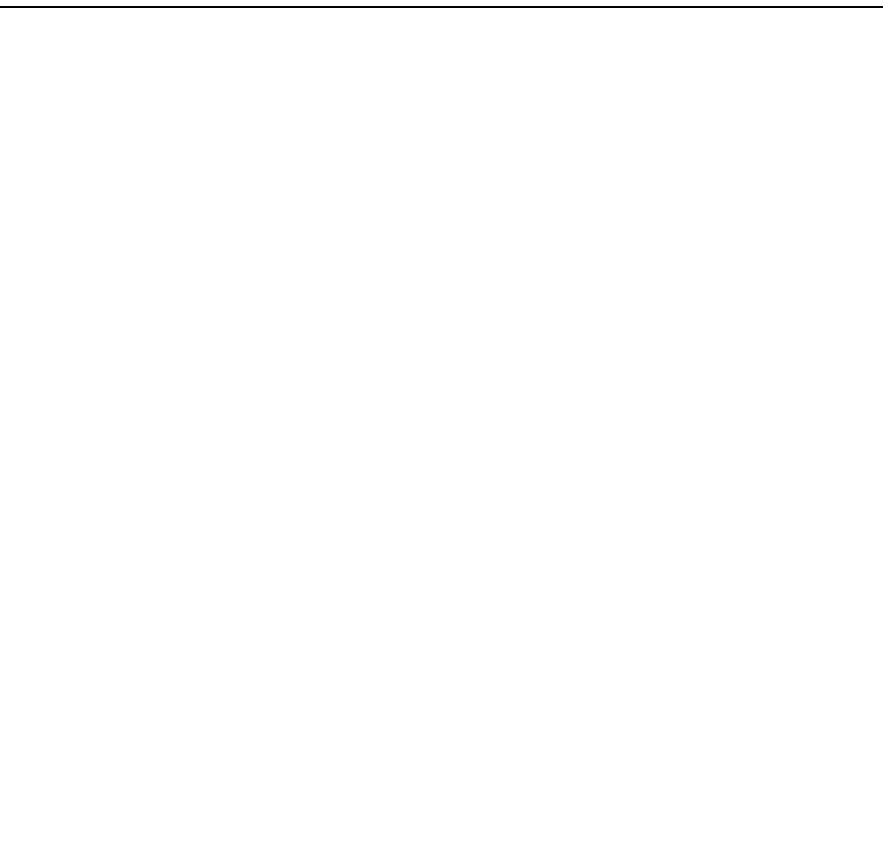
0 -0.5m



0.5 -1.0m



1.0 -2.0m



PCQ 16



0 -0.5m

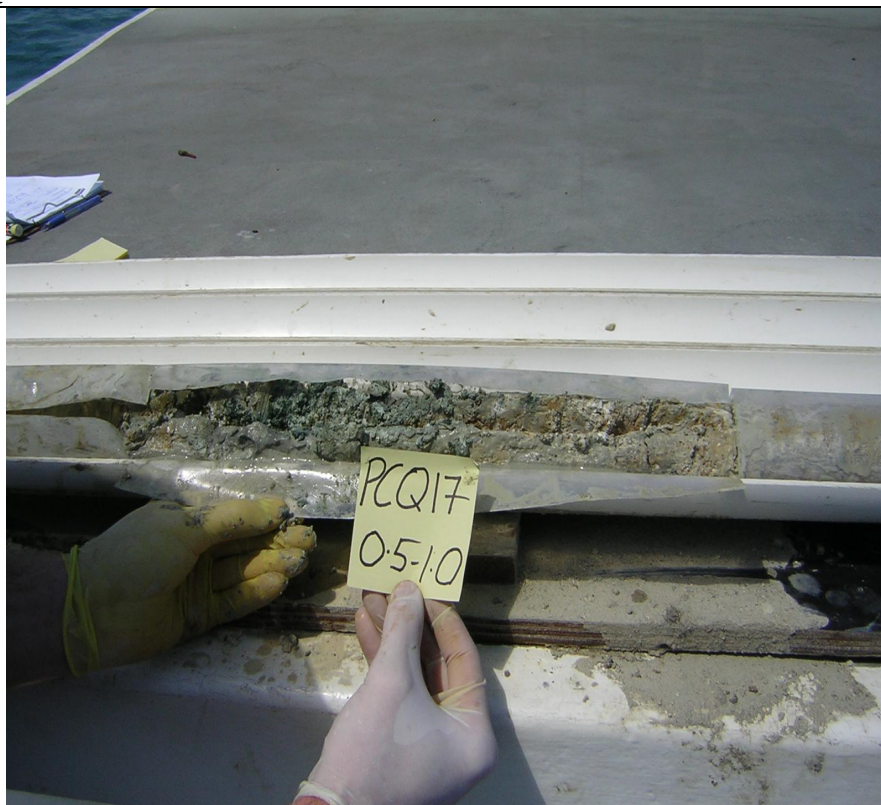


0.5 -1.0m

PCQ 17



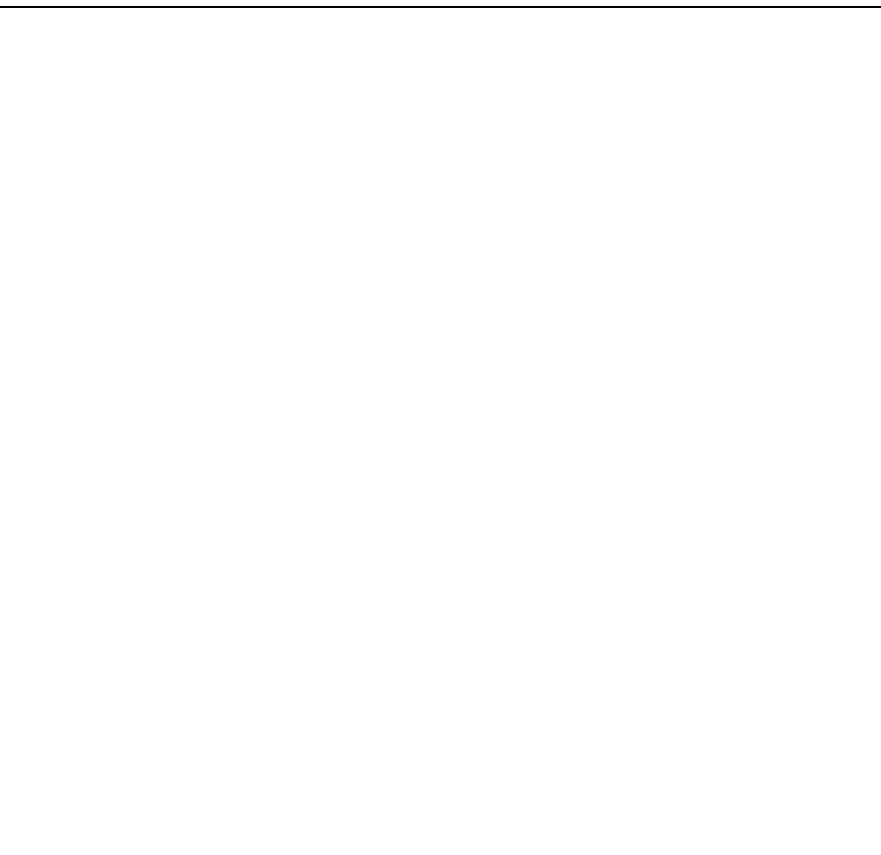
0 -0.5m



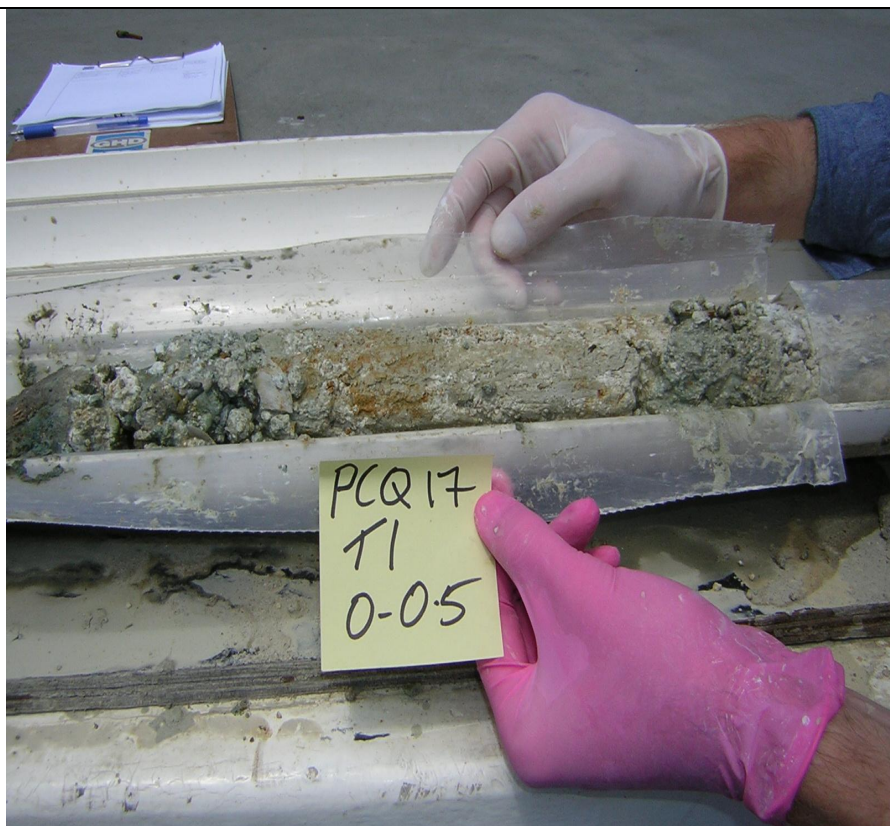
0.5 -1.0m



1.0 -2.0m



PCQ T1



0 -0.5m

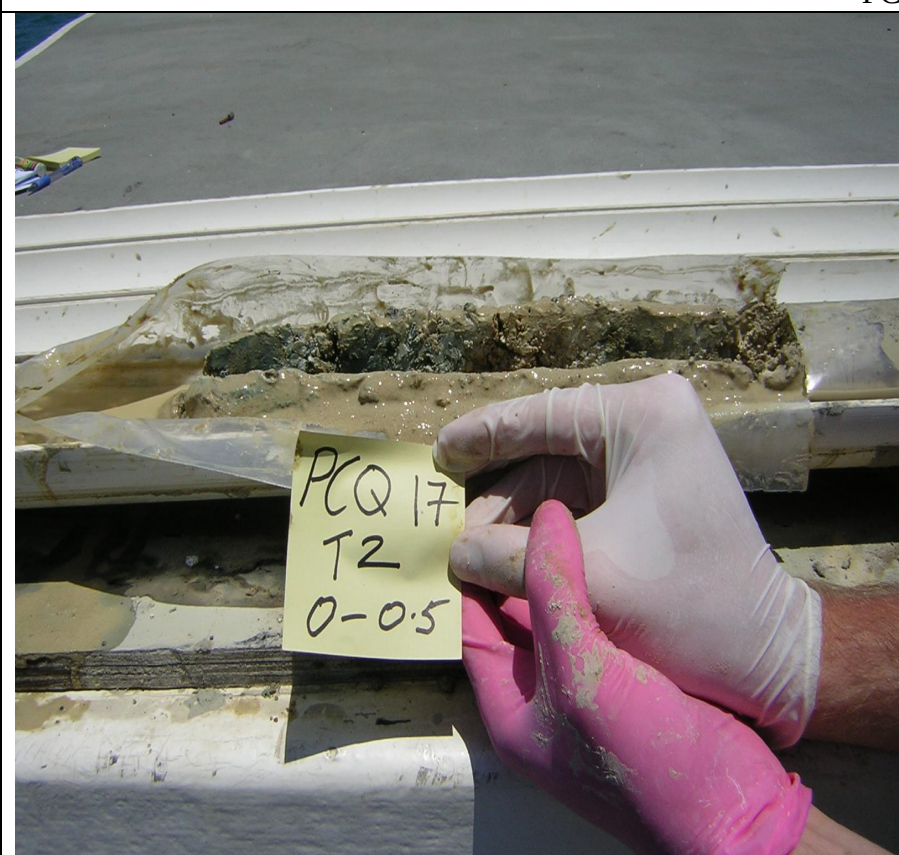


0.5 -1.0m



1.0 –2.0m

PCQ T2



0 –0.5m



0.5 –1.0m



1.0 –2.0m

PCQ 18



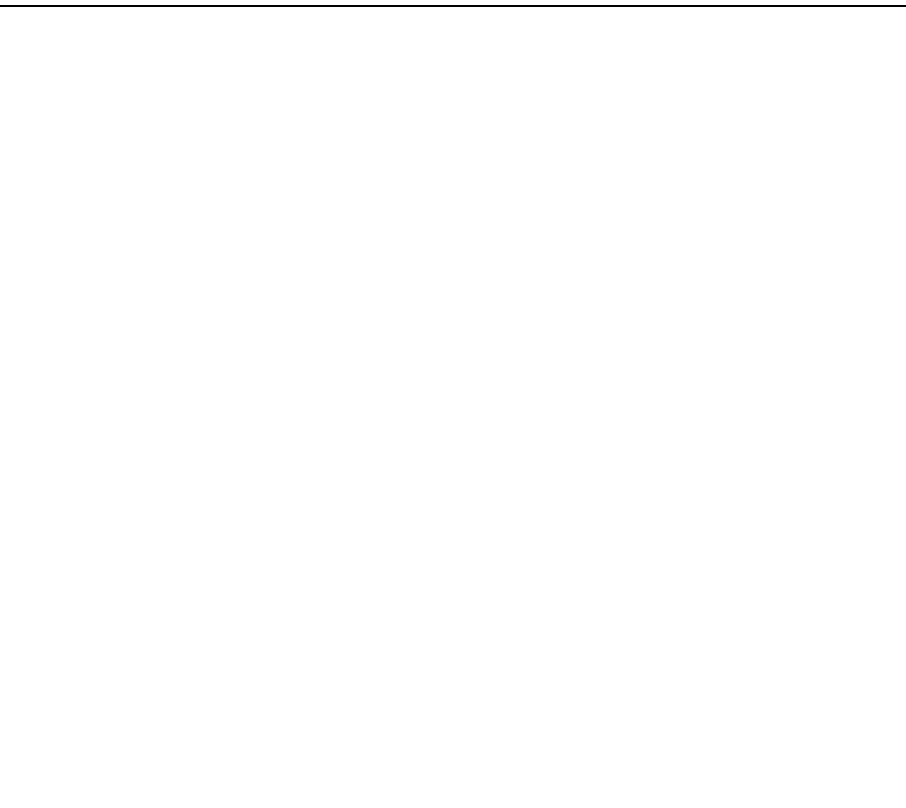
0 -0.5m



0.5 -1.0m



1.0 -2.0m



PCQ 19



0 -0.5m



0.5 -1.0m



1.0 –2.0m

PCQ 20



0 –0.5m



0.5 –1.0m



1.0 –2.0m

PCQ 21



0 -0.5m



0.5 -1.0m



1.0 -2.0m

PCQ 22



0 -0.5m

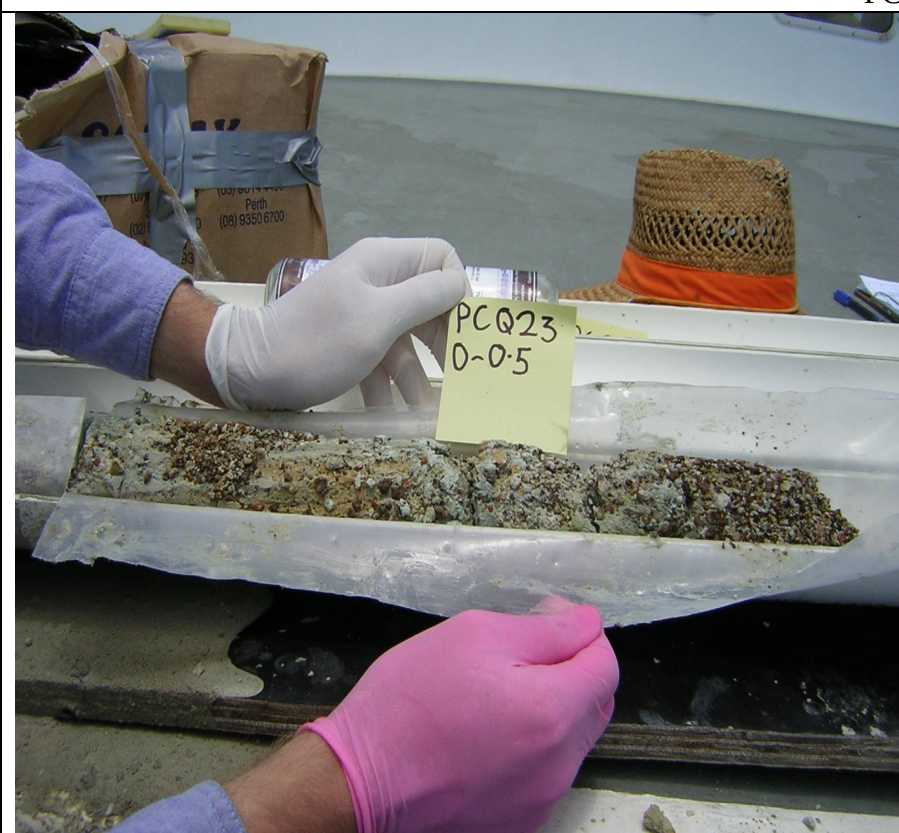


0.5 -1.0m



1.0 –2.0m

PCQ 23



0 –0.5m



0.5 –1.0m



1.0 –1.5m

PCQ 24



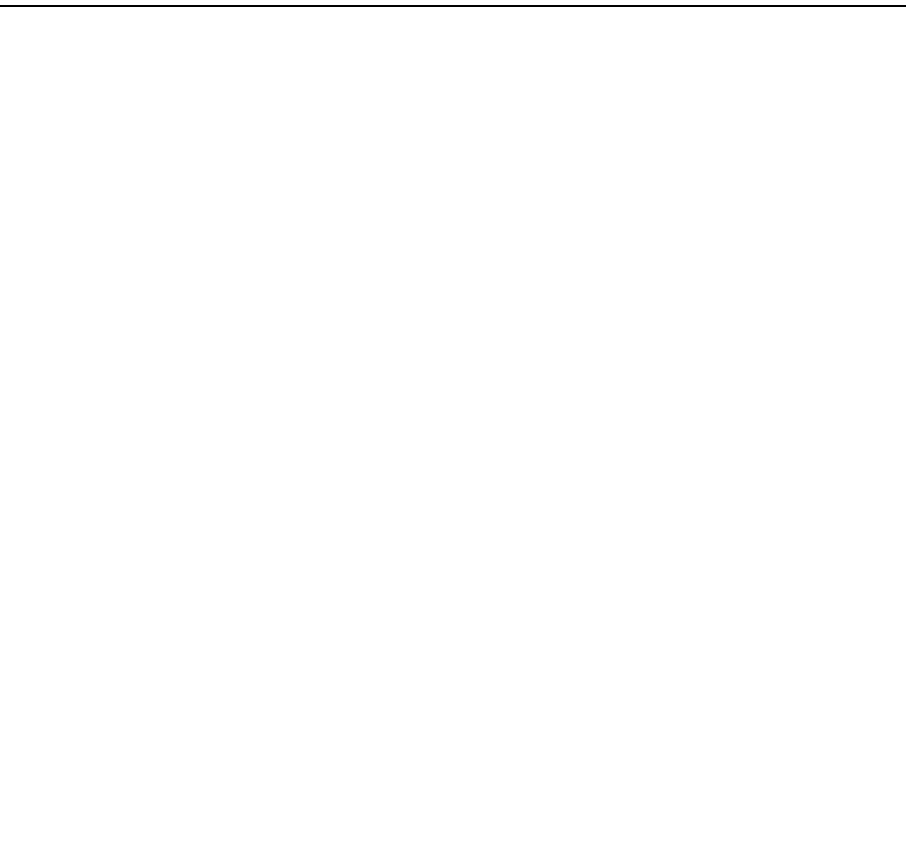
0 -0.5m



0.5 -1.0m



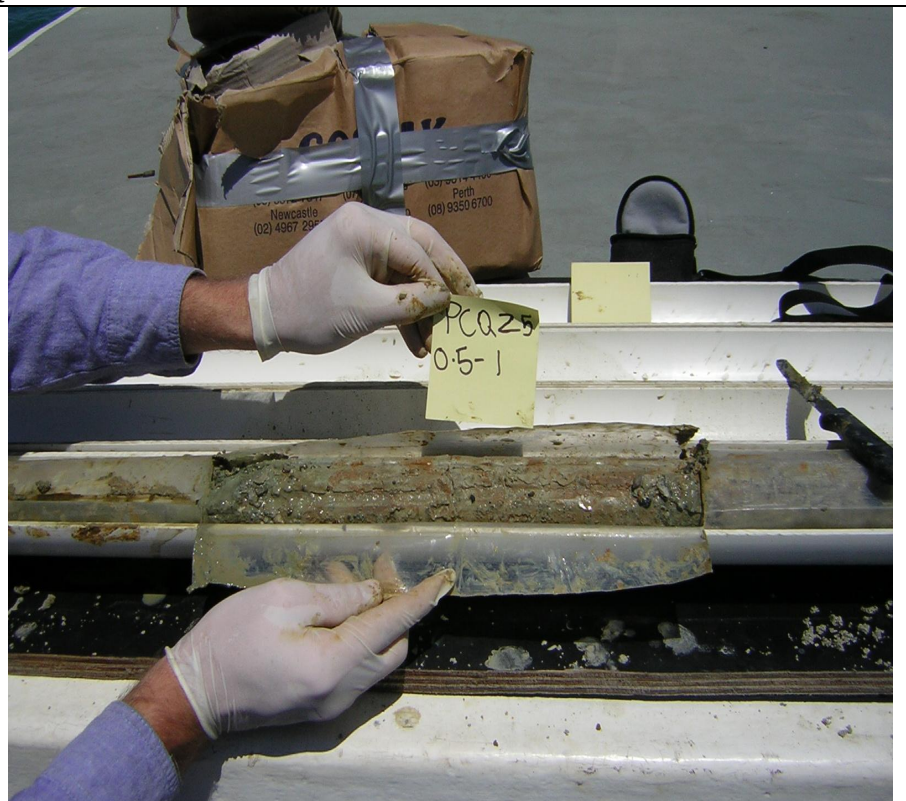
1.0 -2.0m



PCQ 25



0 -0.5m



0.5 -1.0m

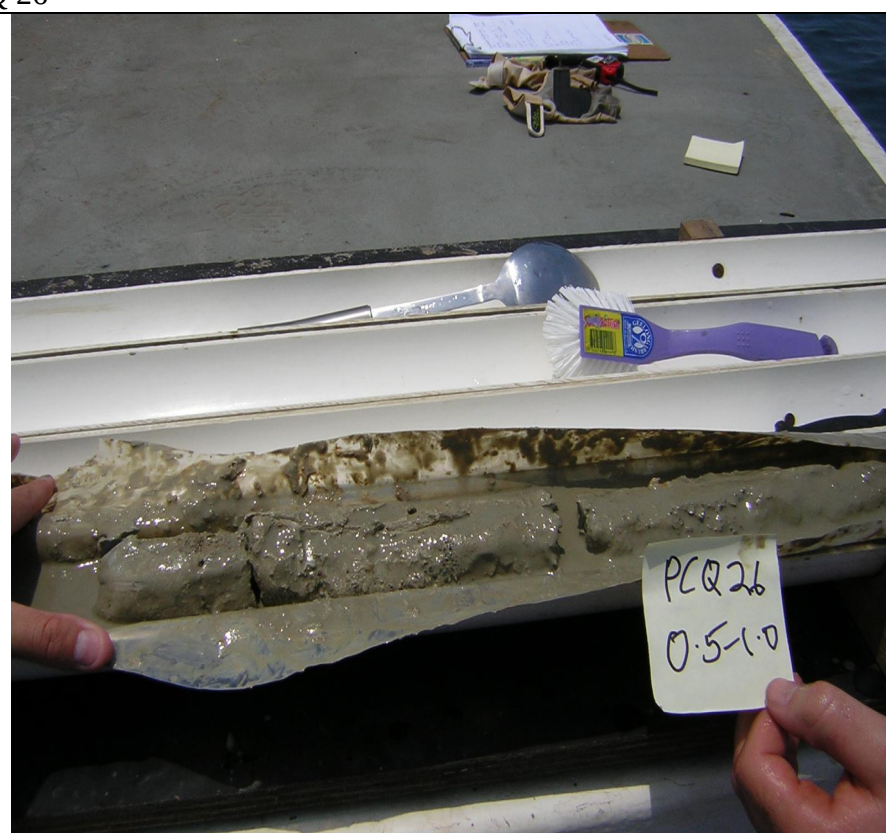


1.0 – 2.0m

PCQ 26

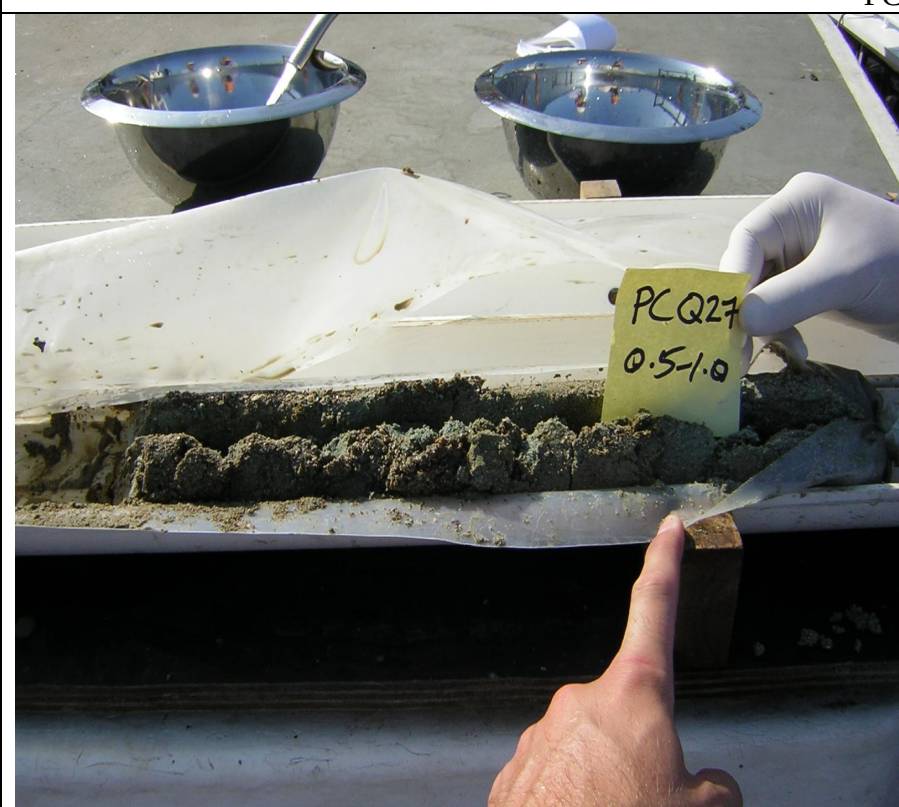


0 – 0.5m



0.5 – 1.0m

PCQ 27



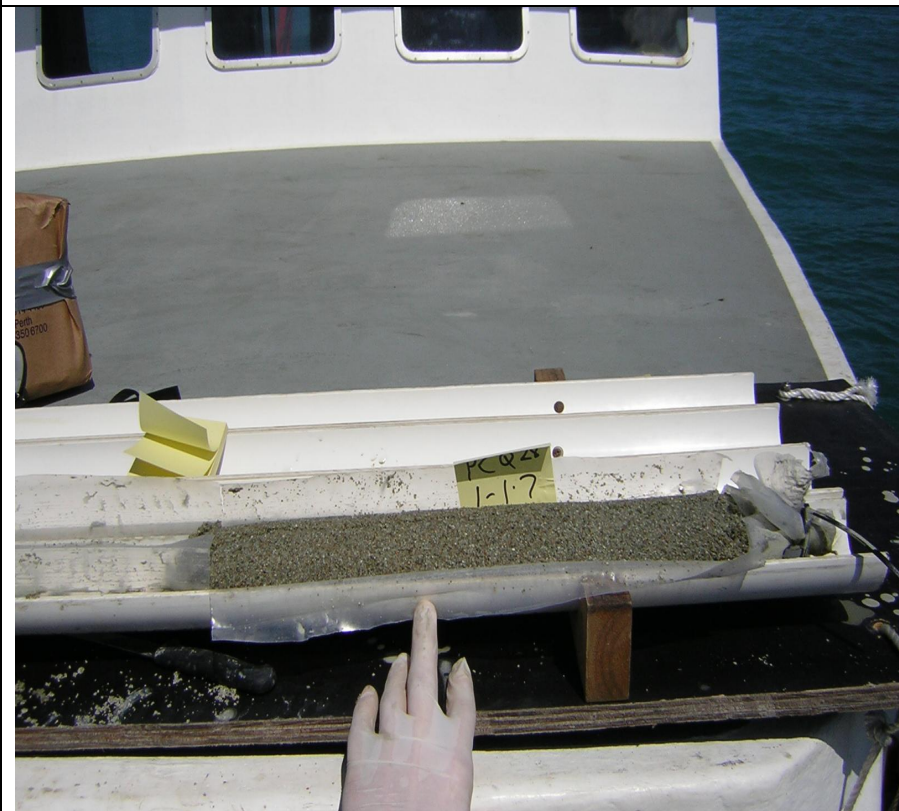
0.5 – 1.0m



0 -0.5m



0.5 -1.0m



1.0 -1.7m



Appendix H

Laboratory Reports – Particle Size Analysis

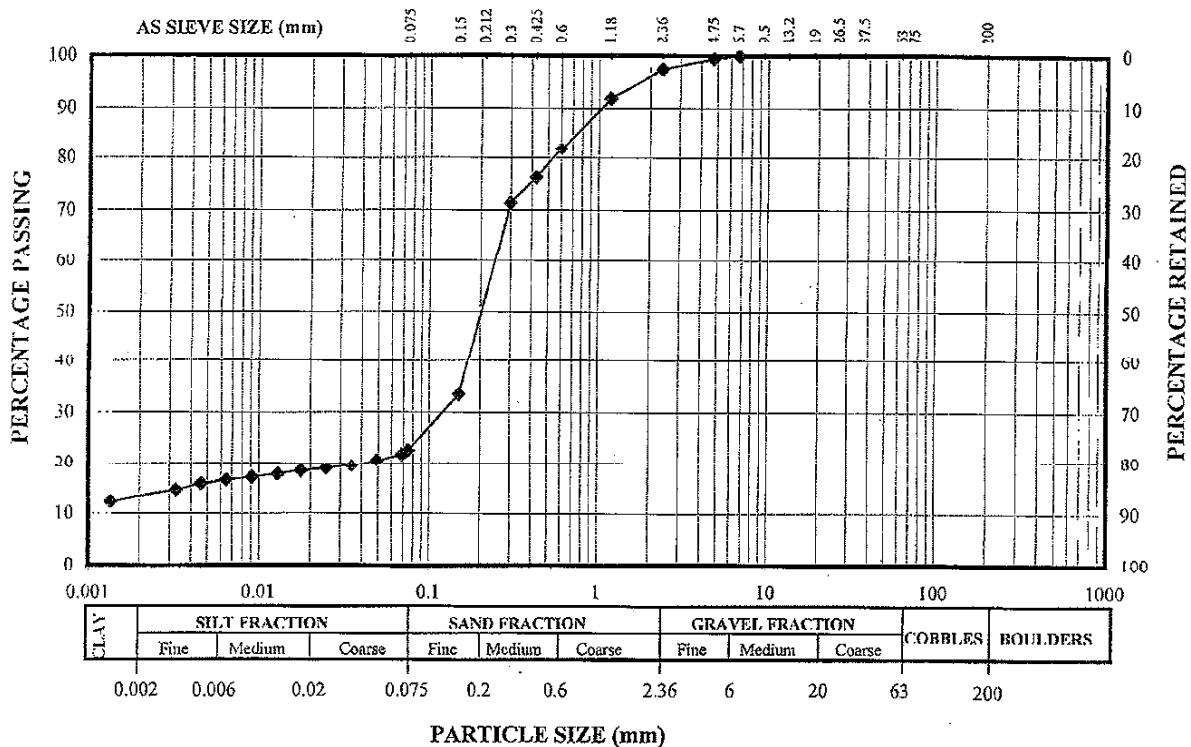
GHD Longmac

SOIL CLASSIFICATION REPORT

Trial Hole: PCQ1
Depth: 0.0-0.5A
Sample No: 3666/05

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/5
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

AS1289.3.5.1.1

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (measured)

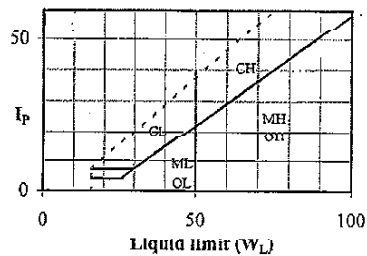
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Afterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 08.11.04
Checked by: [Signature]
Date checked: 18.11.2004



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57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710



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Authorised Signatory: [Signature]
18.11.2004



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JOB No. 2113283

REPORT No. 12774

Ref: F&S/UTEL/AD/START/NEWS

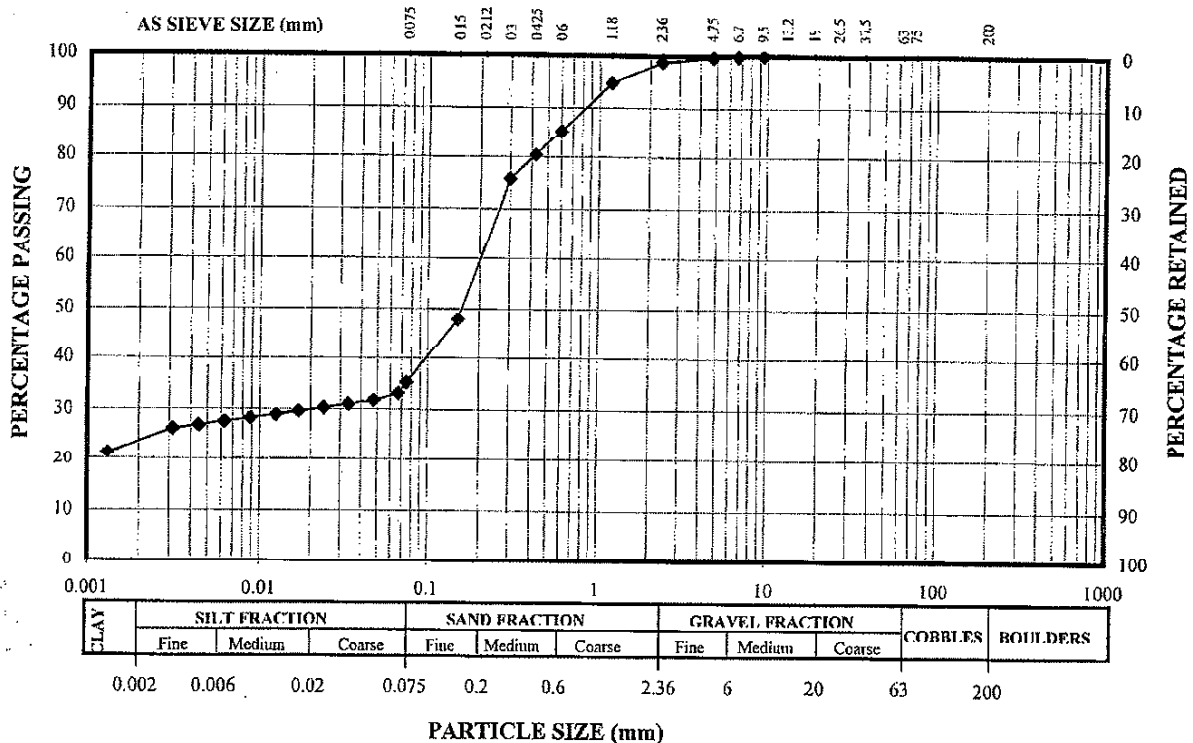
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ2
Depth: 0.0 to 0.5A
Sample No: 3666/16

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/5
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

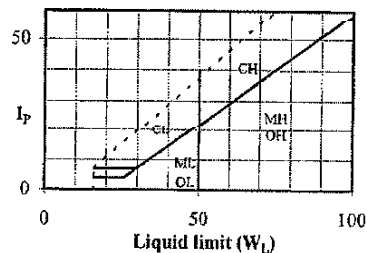
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND with clay (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.11.2004
Checked by: *[Signature]*
Date checked: 12.11.04



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[Signature]
S. LUNATI
12.11.04



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JOB No. 2113283

REPORT No. 12786

Ref: F:\NUTUG\LAB\NATA\SI\VE

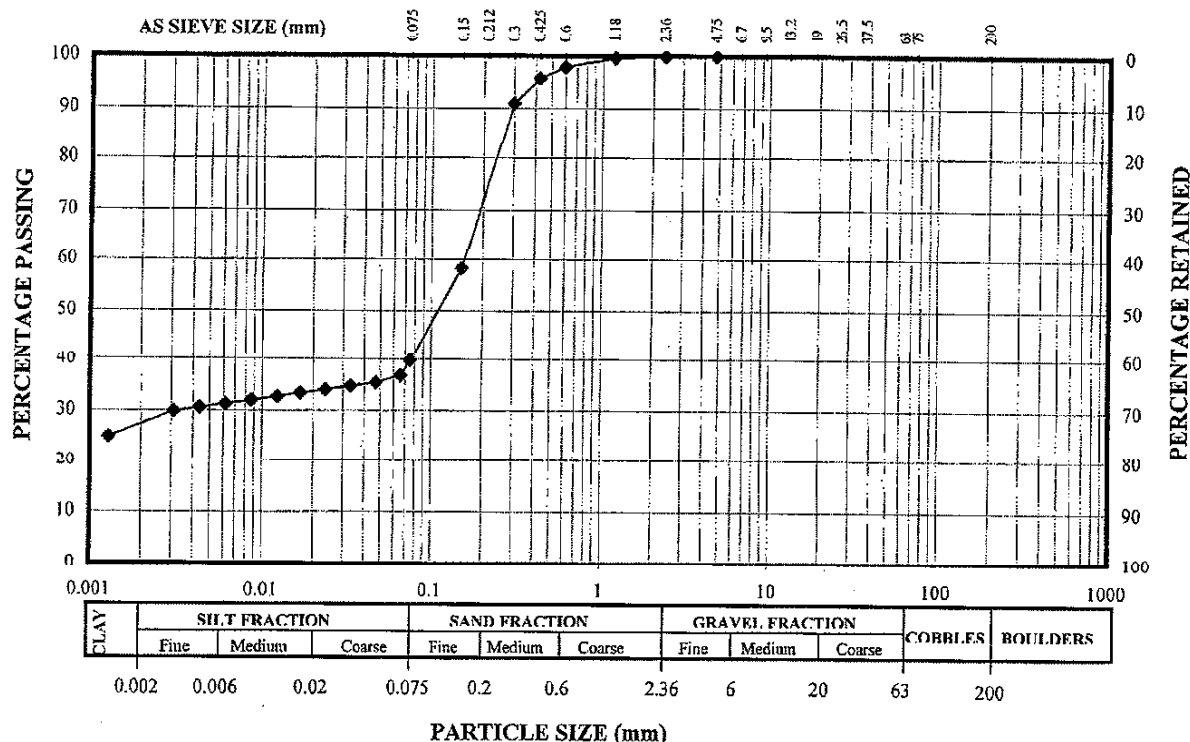
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ2
Depth: 0.5 to 1.0A
Sample No: 3666/17

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/6
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.73 (measured)

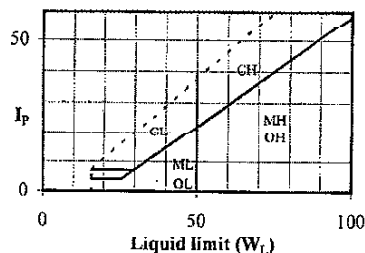
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND with clay (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.11.2004
Checked by: *[Signature]*
Date checked: 19.11.04



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JOB No. 2113283

REPORT No. 12787

Ref: FSW/TEL: LAD/STAKTSIEVE

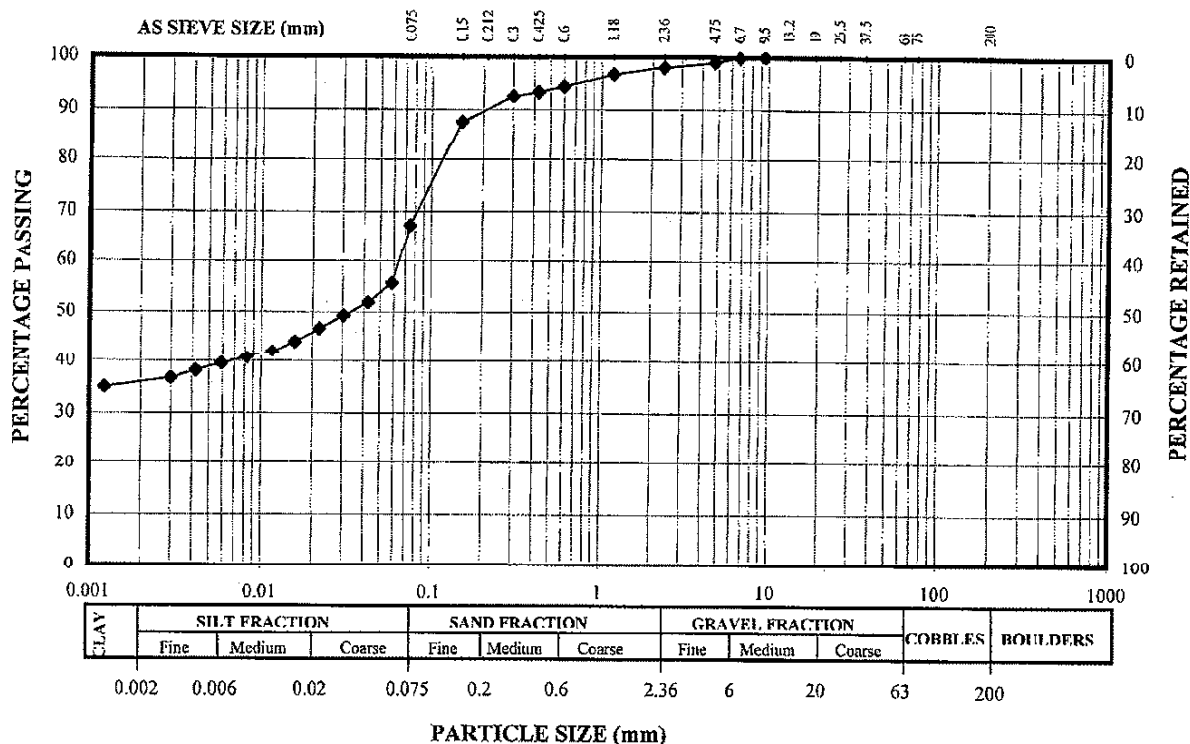
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ3
Depth: 0.0 to 0.5A
Sample No: 3666/23

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/15
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (measured)

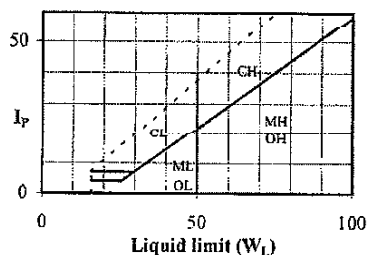
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: CLAY with sand (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plasticity Index = N/A

Plastic Limit = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.11.2004
Checked by: *[Signature]*
Date checked: 10.11.04



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[Signature]
J. HANAN
19.11.04



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JOB No. 2113283

REPORT No. 12793

Ref: F:\01\77\LAB\START\NIEVE

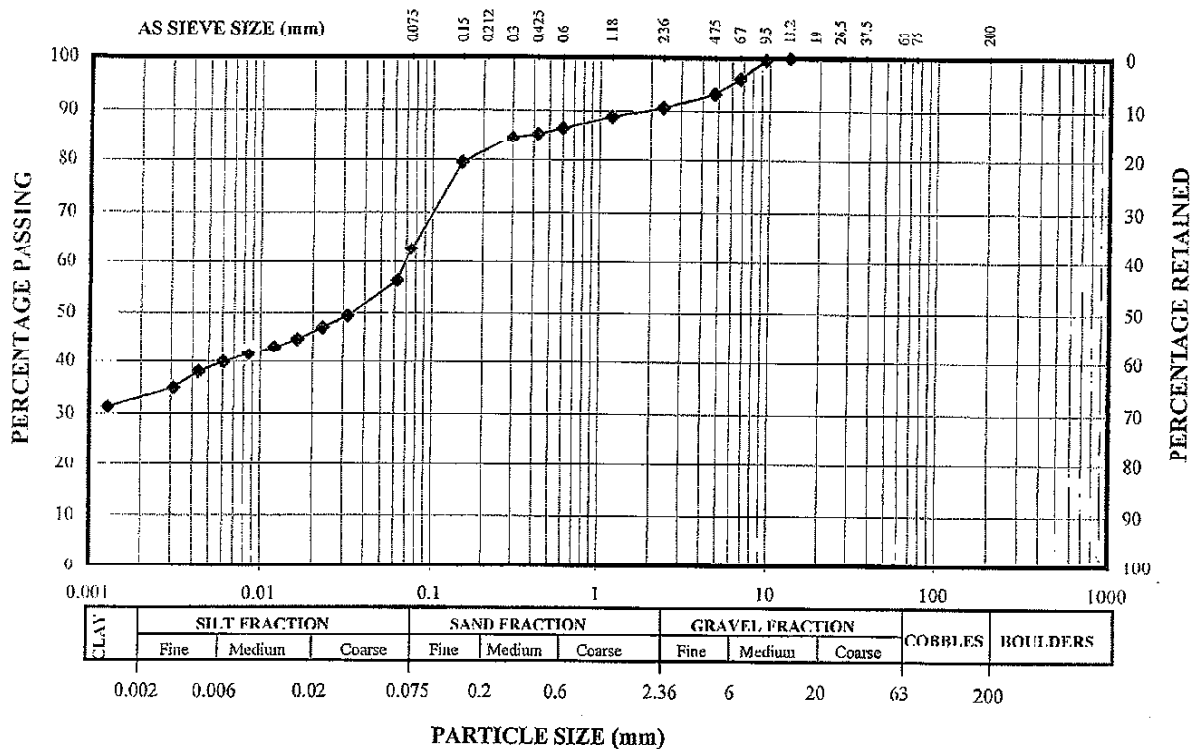
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ3
Depth: 0.5-1.0A
Sample No: 3666/04

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/4
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

AS1289.3.5.1.1

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.7 (measured)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Sandy CLAY (visual)

INDEX PROPERTIES (%)

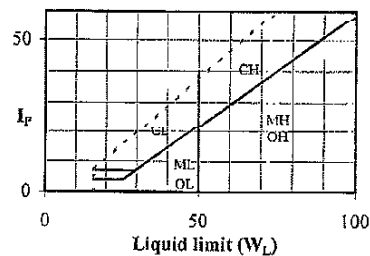
Liquid Limit = N/A Plastic Limit = N/A

Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS:

Tested by: GV
Date tested: 08.11.04
Checked by: *DS*
Date checked: 13/11/04



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JOB No. 2113283

REPORT No. 12773

101 PARATURALAB/STARS/SIEVE

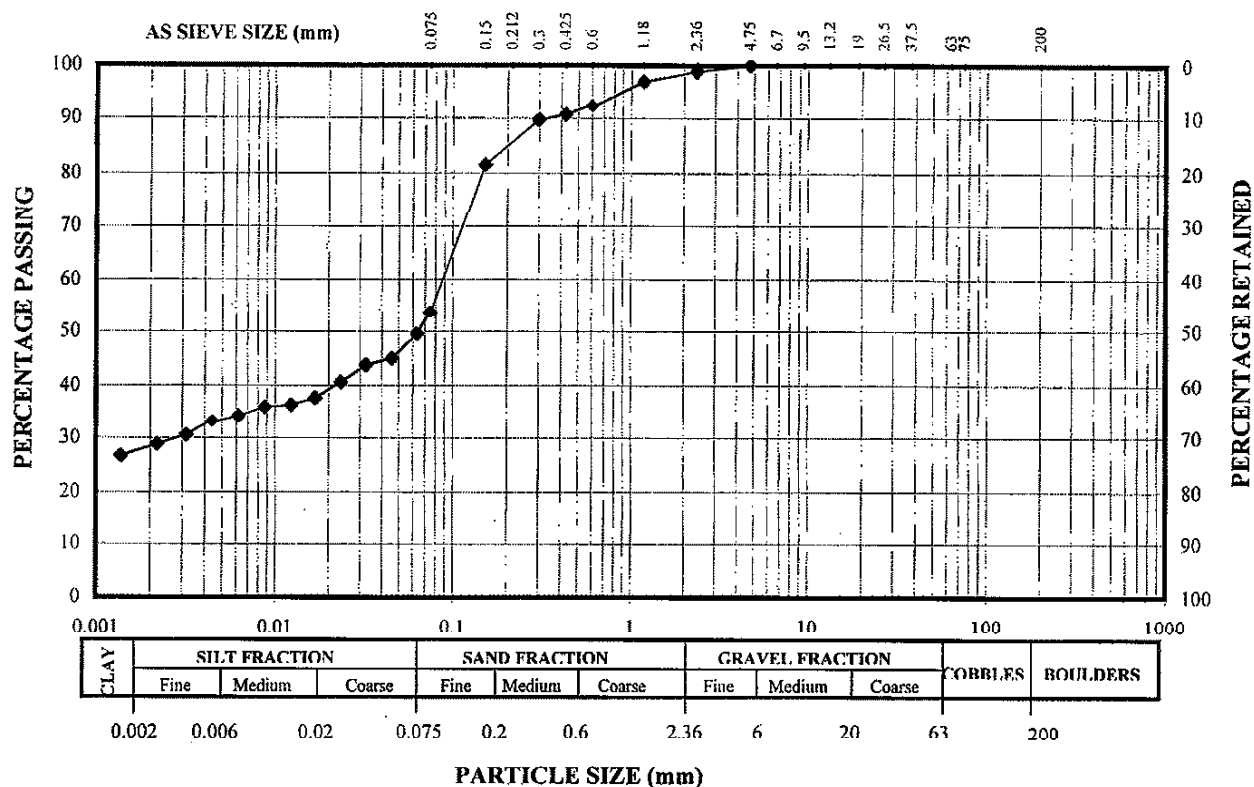
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 4
Depth: 0.0 - 0.5A
Sample No: 3666/71

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/15
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

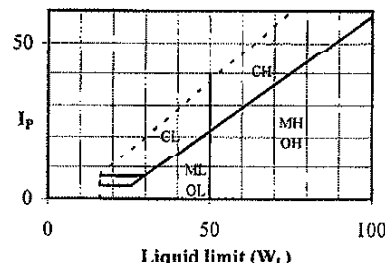
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey silty SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 06.12.04
Checked by: S. LUNDIN
Date checked: 13/12/04



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14.12.2004



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JOB No. 2113283

REPORT No. 12904

Ref: F-SWUTL-LAB-STARTSIEVE

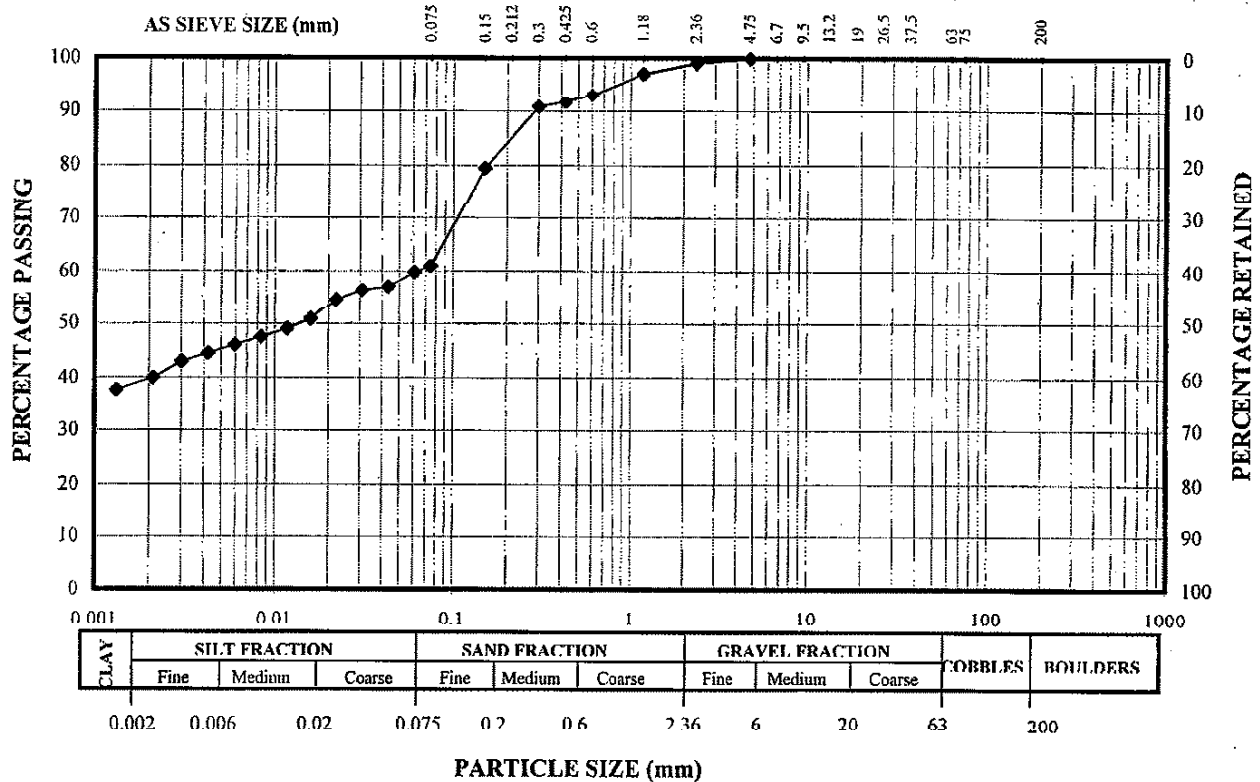
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 4
Depth: 0.5 - 1.0A
Sample No: 3666/72

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/16
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

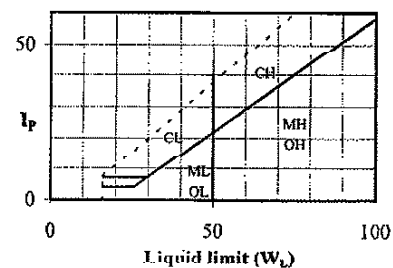
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: silty sandy CLAY



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 06.12.04
Checked by: *[Signature]*
Date checked: 13/12/04



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JOB No. 2113283

REPORT No. 12905

Ref: P-NWUTLABSTARTSIEVE

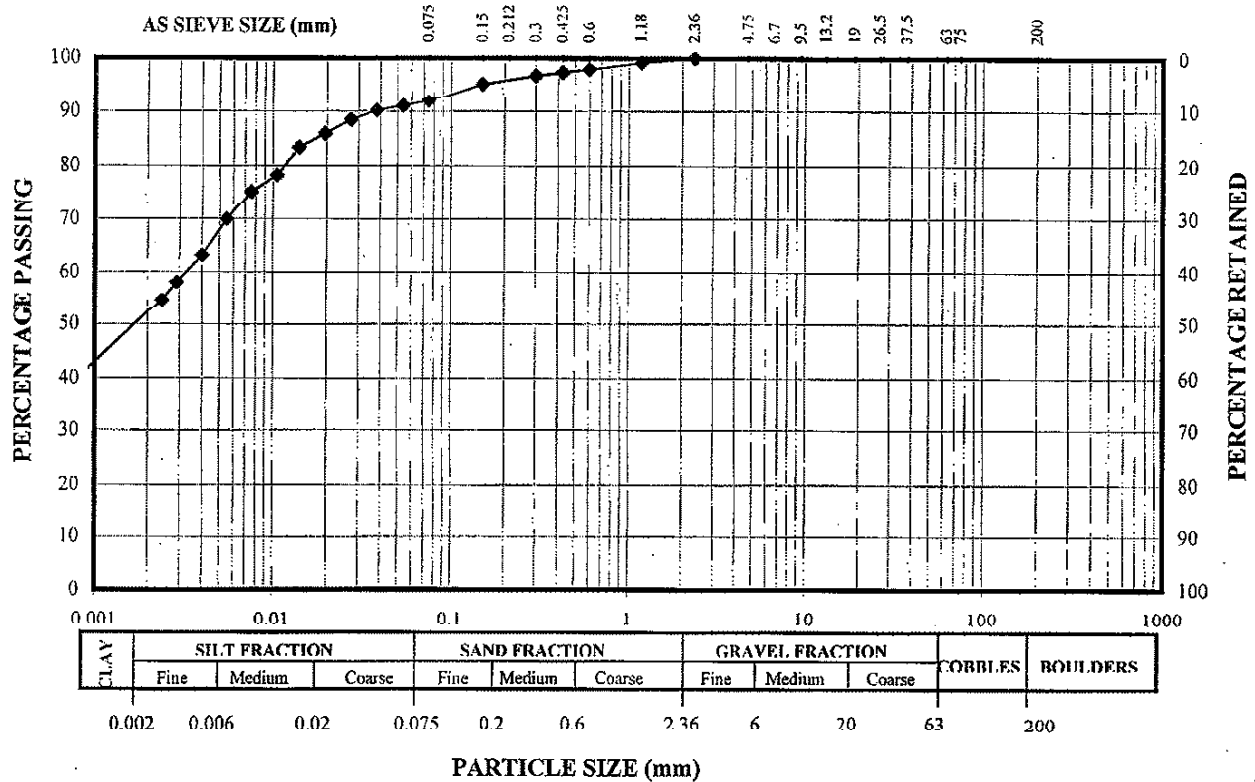
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 5
Depth: 0.0 to 0.5A
Sample No: 3666/57

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

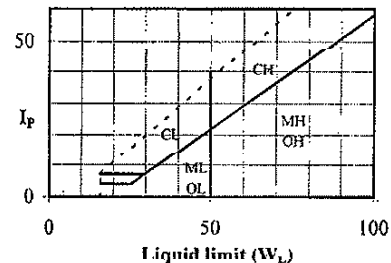
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: CLAY with silt



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 04.12.04
Checked by: *[Signature]*
Date checked: 13/12/04



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JOB No. 2113283

REPORT No. 12890

Ref: P:\SW\TILLAGE\STARTS\TIEVE

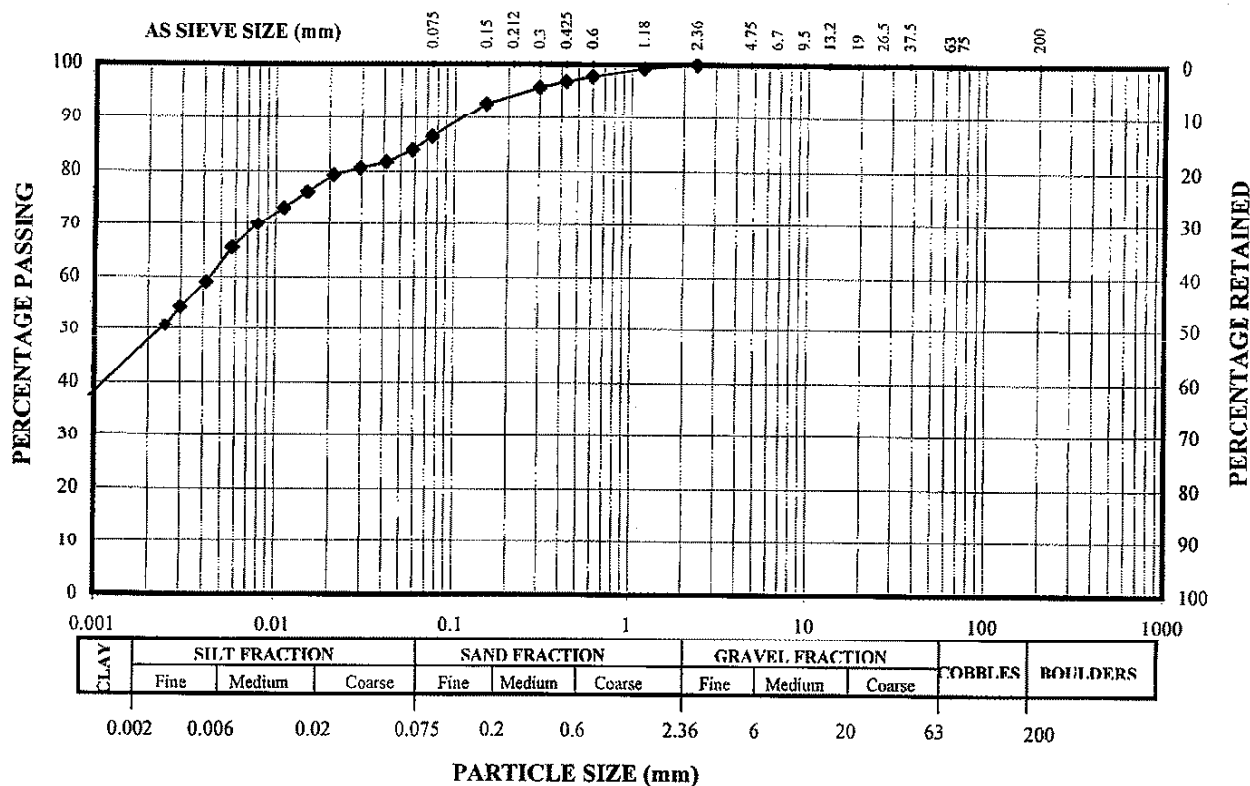
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 3
Depth: 0.5 - 1.0A
Sample No: 3666/58

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/2
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (measured)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: CLAY with silt

INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

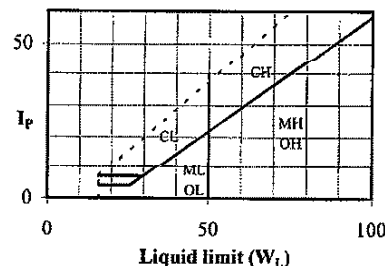
Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 04.12.05
Checked by: *OR*
Date checked:



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Authorised Signatory:

[Signature]
21/11/09



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JOB No. 2113284

REPORT No. 12891

Ref: FSWUTLLABSTCARTSIEVE

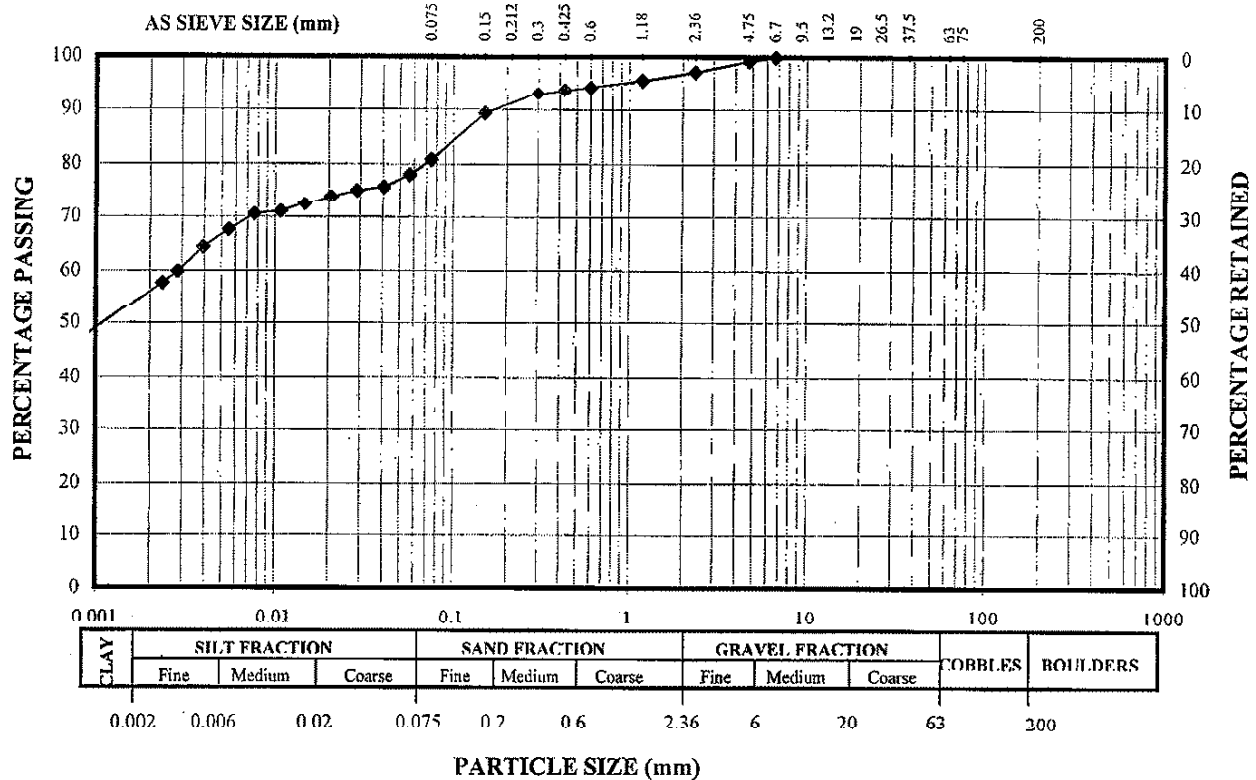
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 5
Depth: 1 - 2A
Sample No: 3666/59

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/3
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: CLAY with silt & sand

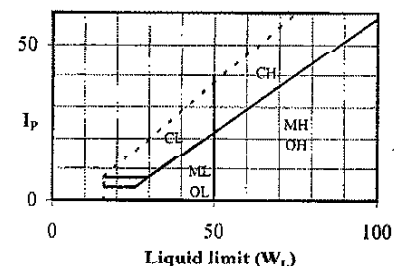
INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 04.12.04
Checked by: *[Signature]*
Date checked: 13/12/04



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GEOTECHNICAL TESTING SERVICES



Authorised Signatory:

[Signature]
S. LAMARCA
14.12.2004



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JOB No. 2113283

REPORT No. 12892

Ref: FSWUTL-LABSTART-SIEVE

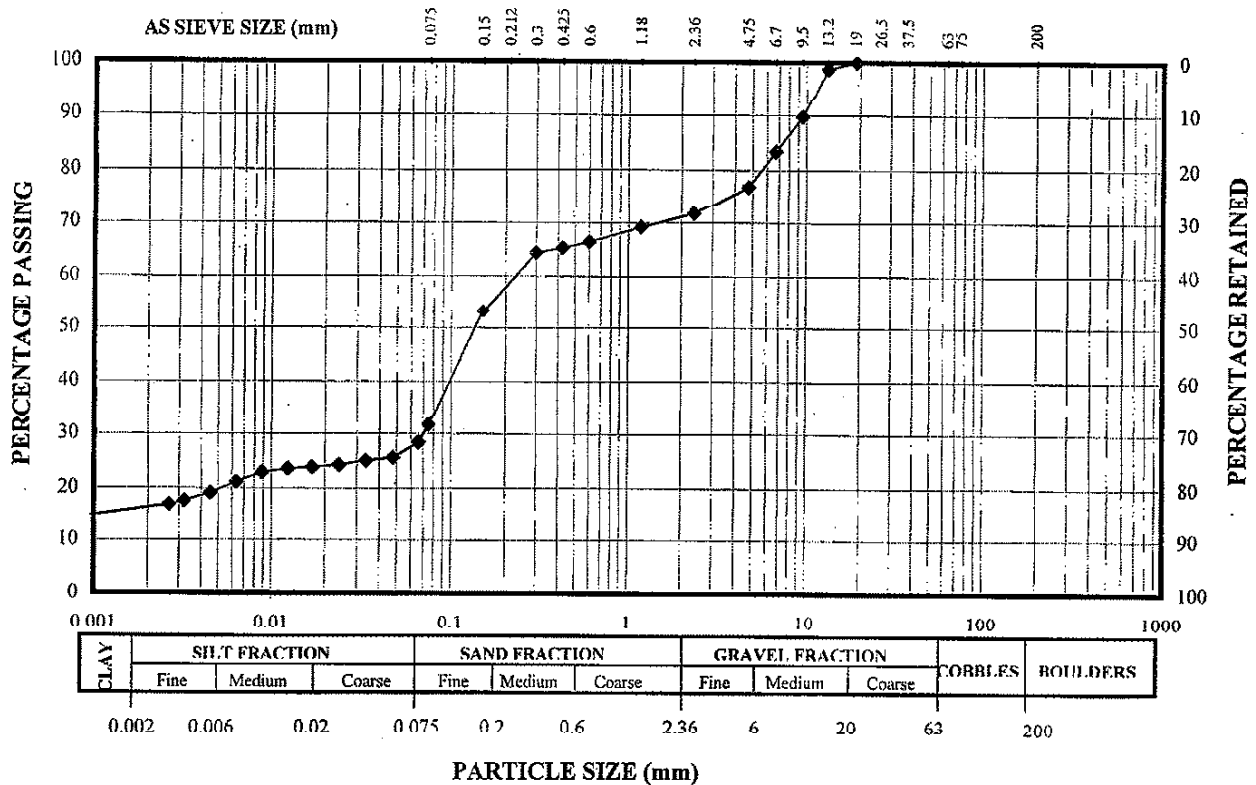
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 6
Depth: 0.0 to 0.5A
Sample No: 3666/61

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/5
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

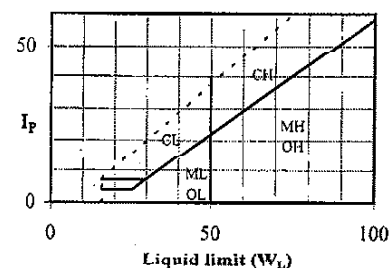
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Gravelly SAND with Clay



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 04.12.04
Checked by: [Signature]
Date checked: 13/12/04



GHD LONGMAC

57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710

GEOTECHNICAL TESTING SERVICES



Authorised Signatory:

[Signature]
S. Longman
24.12.2004



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JOB No. 2113283

REPORT No. 12894

Ref: F:\SWITZER\LAB\START\SIEVE

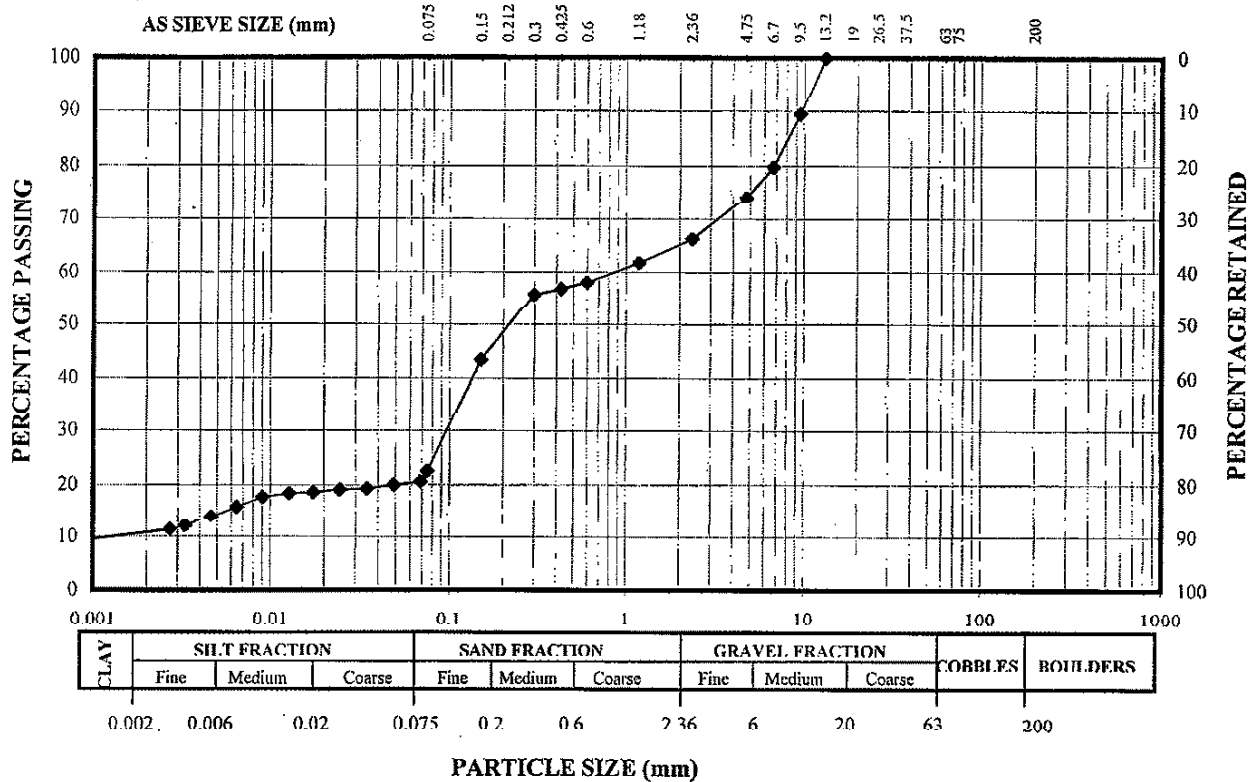
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 6
Depth: 0.5 - 1.0A
Sample No: 3666/60

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/4
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 629.3$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 8.0$$

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Gravelly SAND with silt & clay

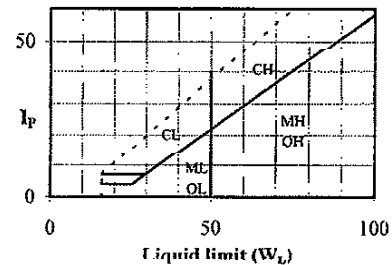
INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 04.12.04
Checked by: *ES*
Date checked: 13/12/04



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Authorised Signatory:

S. Longman
24.12.2004



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JOB No. 2113283

REPORT No. 12893

REF: FSW/UTL/AD/SWAT/SIEVE

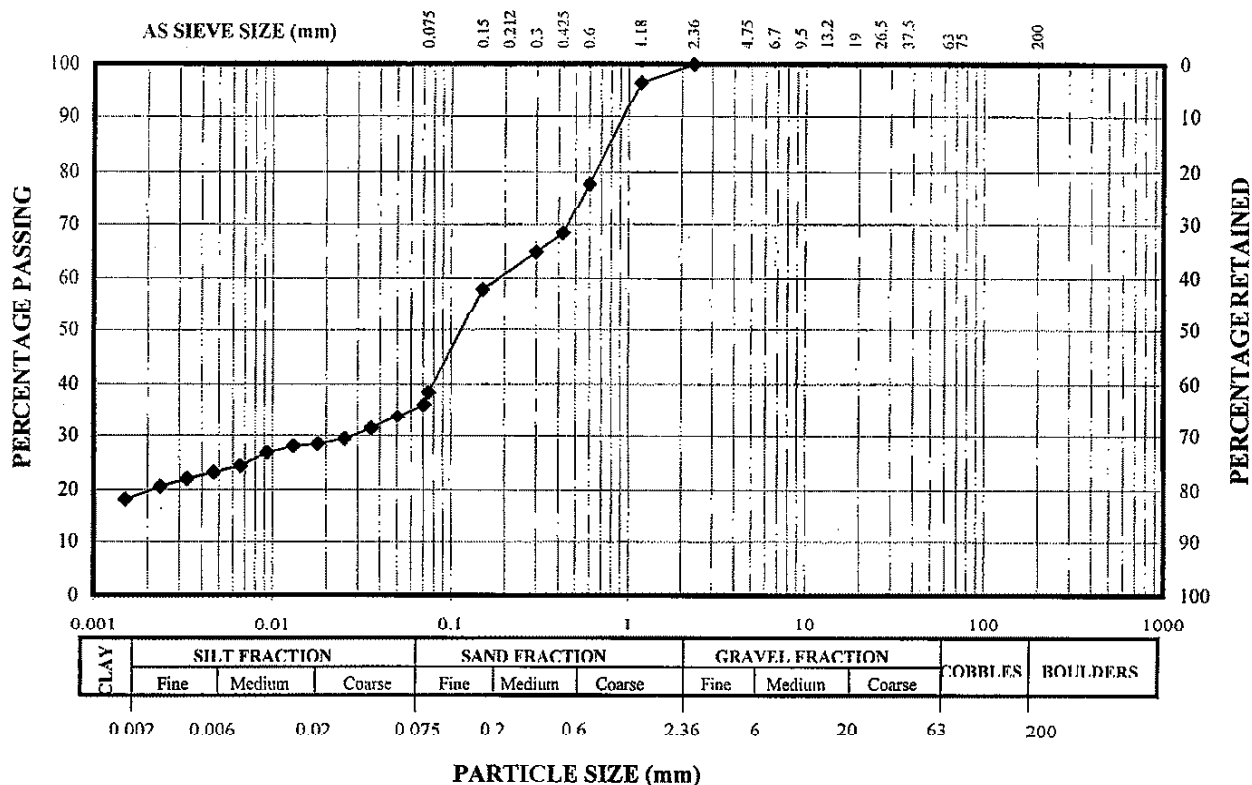
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 7
Depth: 0.0 - 0.5A
Sample No: 3666/88

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853B/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

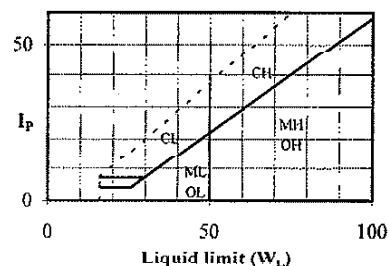
PARTICLE DENSITY 2.72 (assumed)

PRE TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1318

Tested by: SMEC
Date tested: 03.12.04
Checked by: *S. Inan*
Date checked: 13/12/04



GHD LONGMAC
57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710



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Authorised Signatory:

S. Inan
S. INAN
14.12.2004



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JOB No. 2113283

REPORT No. 12921

Ref: F:\SWUTL LABS\START\SIEVE

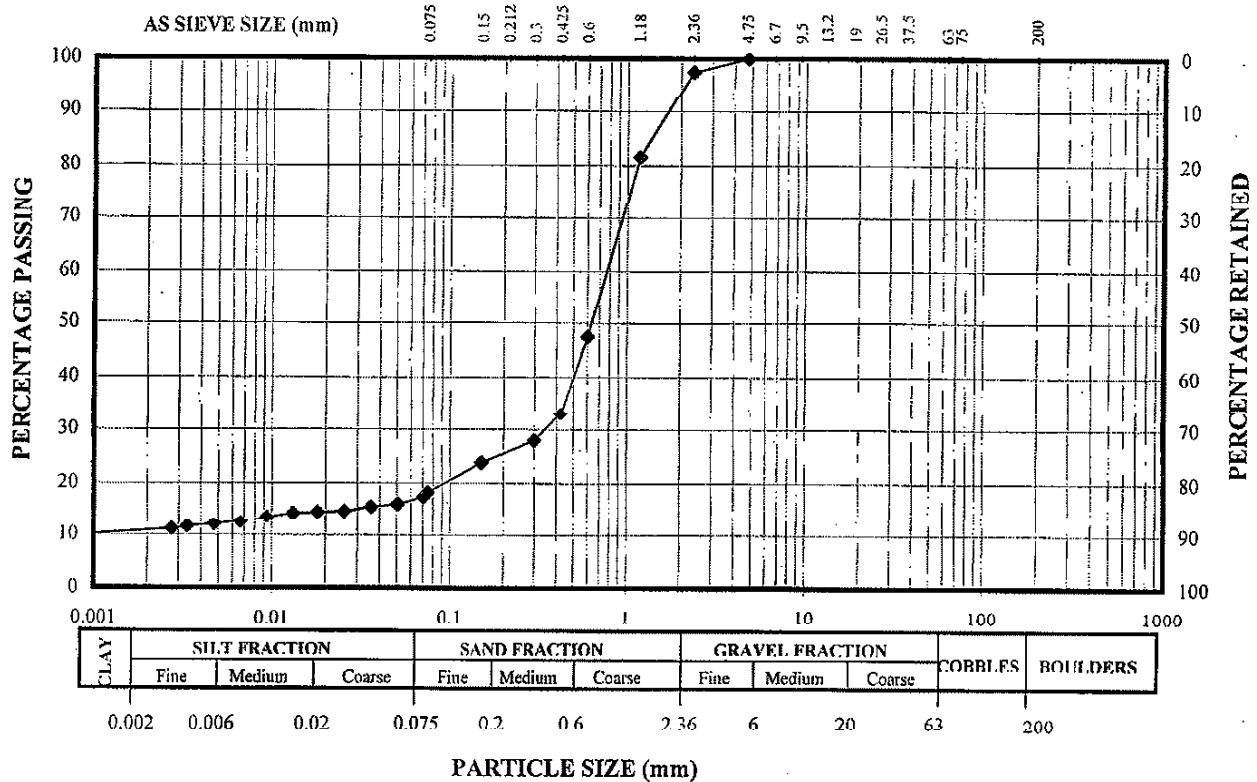
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 7
Depth: 0.5 - 1.0A
Sample No: 3666/62

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/6
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND with gravel same clay & silt

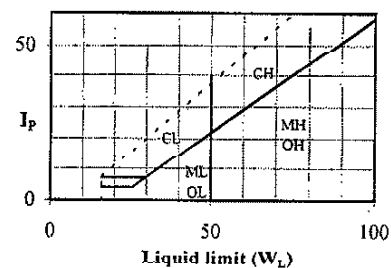
INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 04.12.04
Checked by: [Signature]
Date checked: 13/12/04



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57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710
GEOTECHNICAL TESTING SERVICES



Authorised Signatory:

[Signature]
S. LUNATH
24.11.2004



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JOB No. 2113283

REPORT No. 12895

Ref: FSWUTL-AB-START-01/02/04

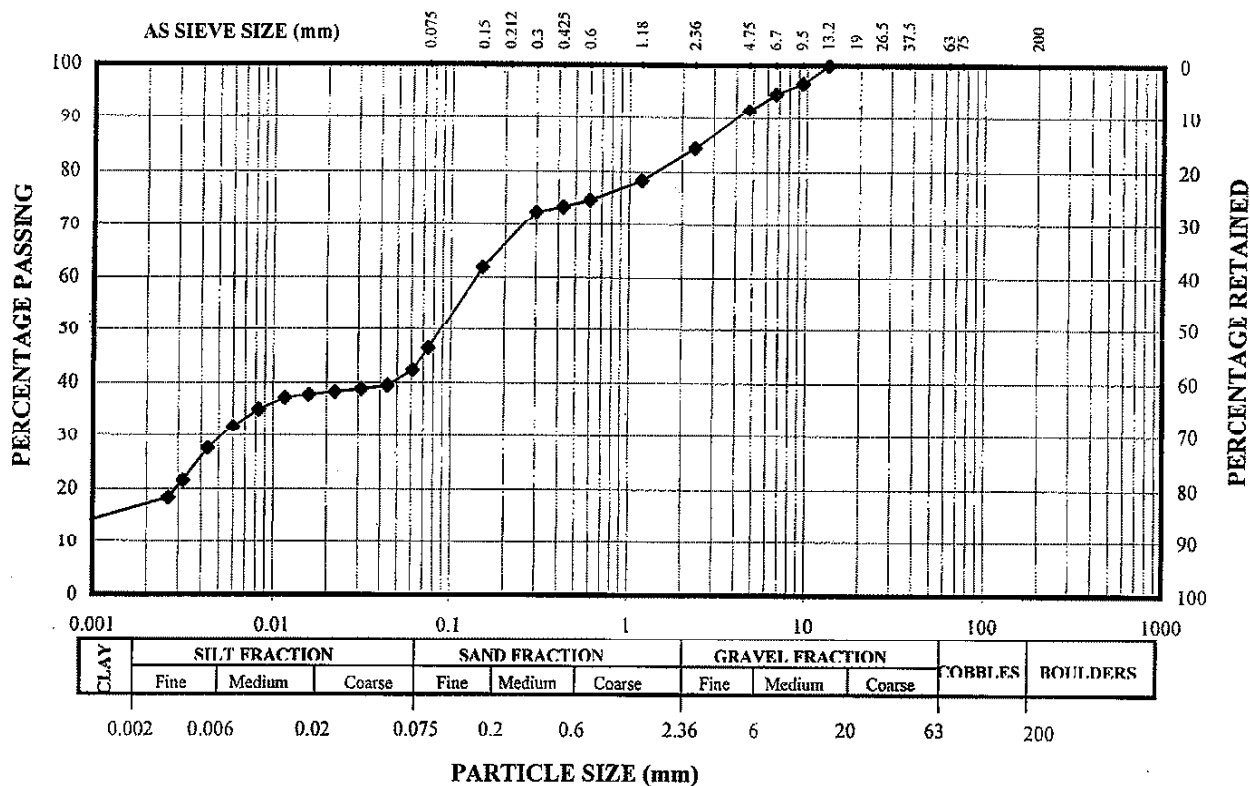
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 8
Depth: 0.0 to 0.5A
Sample No: 3666/63

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0833A/7
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: silty clayey SAND with Gravel

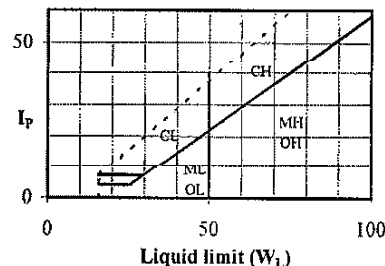
INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services Pty Ltd NATA Accredited Laboratory Number 2570 Report No 04/1317

Tested by: SMEC
Date tested: 04.12.04
Checked by: *car*
Date checked:



GHD LONGMAC
57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710



GEOTECHNICAL TESTING SERVICES

Authorised Signatory:

[Signature]
21/12/04



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JOB No. 2113283

REPORT No. 12896

Ref: PASWITHLABSTARTSIEVE

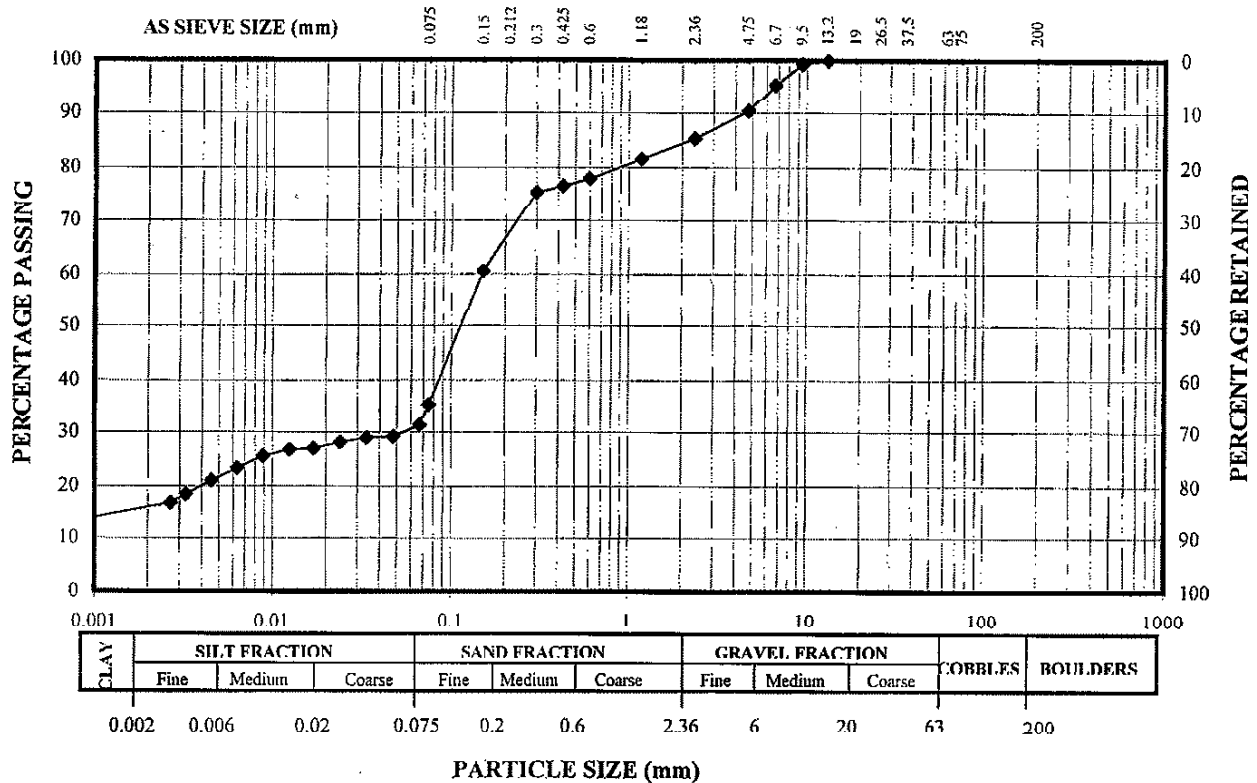
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 8
Depth: 0.5 - 1.0A
Sample No: 3666/64

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/8
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey gravelly Sand some silt

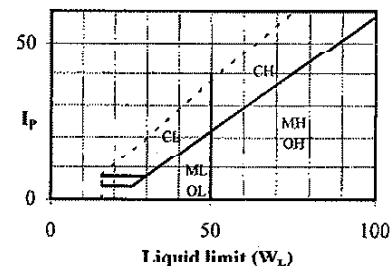
INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 04.12.04
Checked by: [Signature]
Date checked: 13/12/04



GHD LONGMAC
57 Herbert St, Artarmon NSW, 2064
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Authorised Signatory:

[Signature]
24.12.2004



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JOB No. 2113283

REPORT No. 12897

Ref: F-SW/01/LAB/START/SH/VE

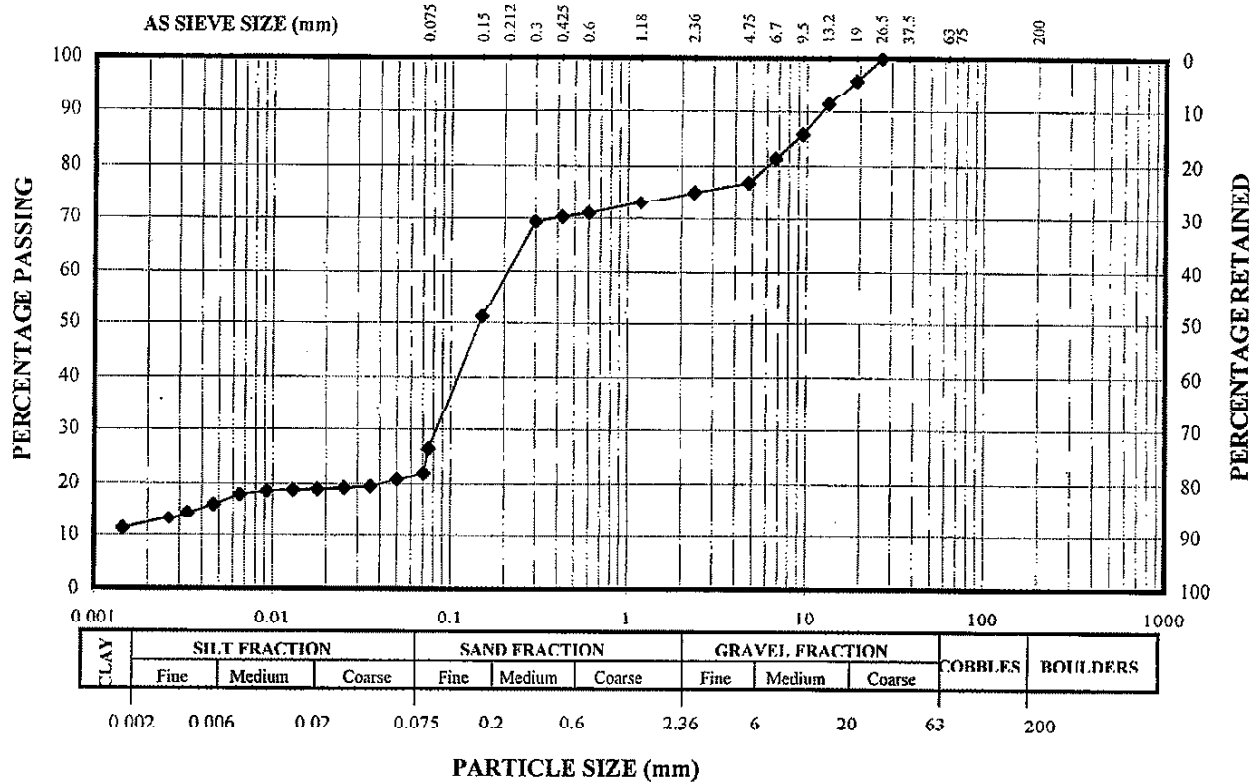
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 8
Depth: 1 - 2A
Sample No: 3666/65

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/9
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Gravelly SAND, some silt & clay

INDEX PROPERTIES (%)

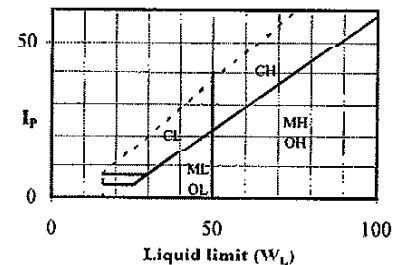
Liquid Limit = N/A
Plasticity Index = N/A

Plastic Limit = N/A
Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 06.12.04
Checked by: [Signature]
Date checked: 13/12/04



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57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710



GEOTECHNICAL TESTING SERVICES

Authorised Signatory:

[Signature]
S. MANAII
24.12.2004



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JOB No. 2113283

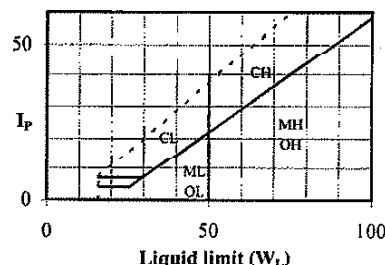
REPORT No. 12898

Ref: P-SWUTULABSTAR-01876

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Trial Hole:	PCQ 9
Depth:	0.0 - 0.5A
Sample No:	3666/70

Client Sample No.: A04/0853A/14
Sample History: Supplied by Client



Particle size AS1289.3.6.3

$$C_u = D_{60} / D_{10} = \text{not determinable}$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = \text{not determinable}$$

Linear Shrinkage % = Not determined

SOIL NAME: Silty clayey SAND

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317



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REPORT No.	12903
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REF:SWUTL-LAB-START-SIEVE

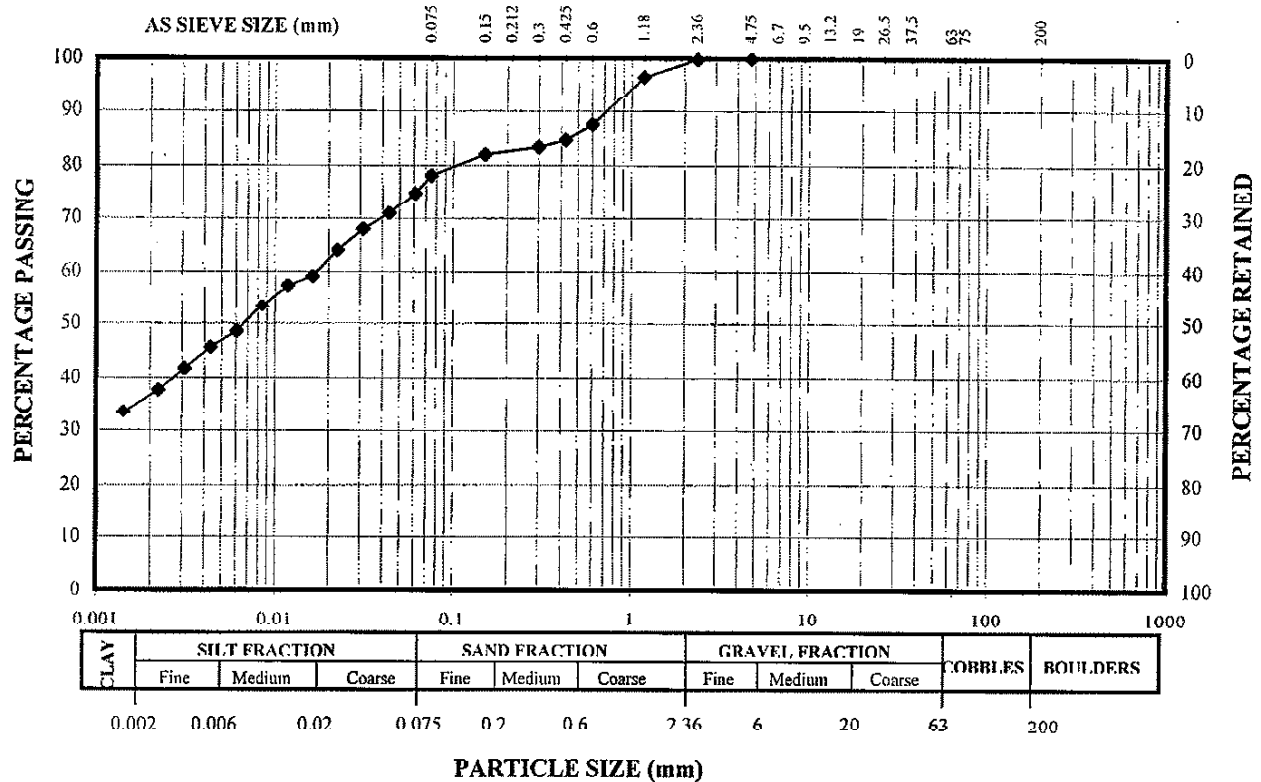
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 9
Depth: 0.5 - 1.0A
Sample No: 3666/89

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853B/2
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

PRE TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Sandy silty CLAY

INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

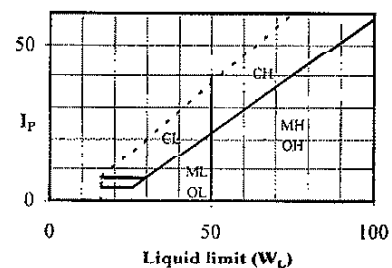
Plasticity Index = N/A

Linear Shrinkage % - Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1318

Tested by: SMEC
Date tested: 03.12.04
Checked by: [Signature]
Date checked: 13/12/04



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57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710



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Authorised Signatory:

[Signature]
14.12.2004



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JOB No. 2113283

REPORT No. 12922

R.O. PERSWILL/ALAN START/SHEVE

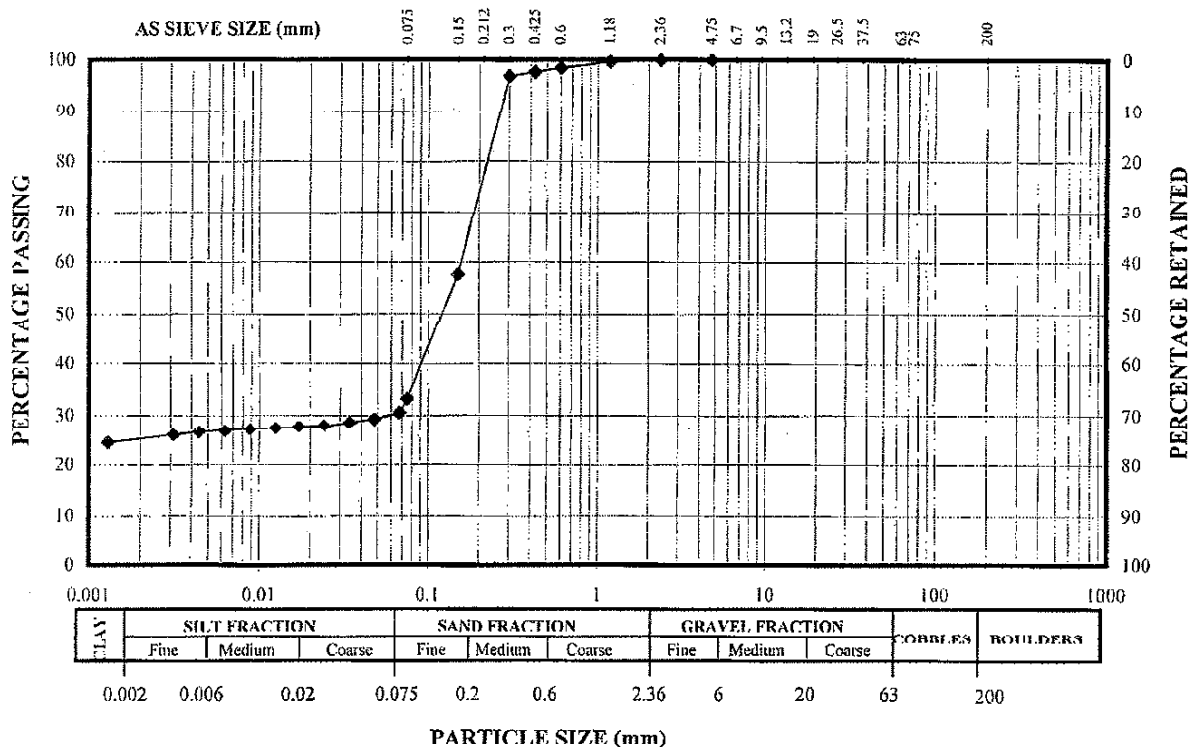
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ10
Depth: 0.0 to 0.5A
Sample No: 3666/35

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0/98/21
Sample History: Supplied by Client



TEST METHODS

Classification AS1776 A2

Particle size AS1289 3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{30} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

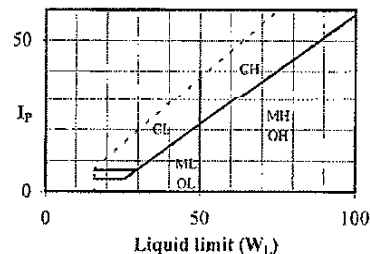
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: sandy CLAY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 22.11.2004
Checked by: *DS*
Date checked: 25.11.04



GHD LONGMAC

57 Herbert St, Artarmon NSW, 2064

Tel: 9462 4700 Fax: 9462 4710

GEOTECHNICAL TESTING SERVICES



Authorised Signatory:

S. LUNATIN
25.11.2004



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JOB No. 2113283

REPORT No. 12837

REF: SWITZ/LAB/ST/04/01/01

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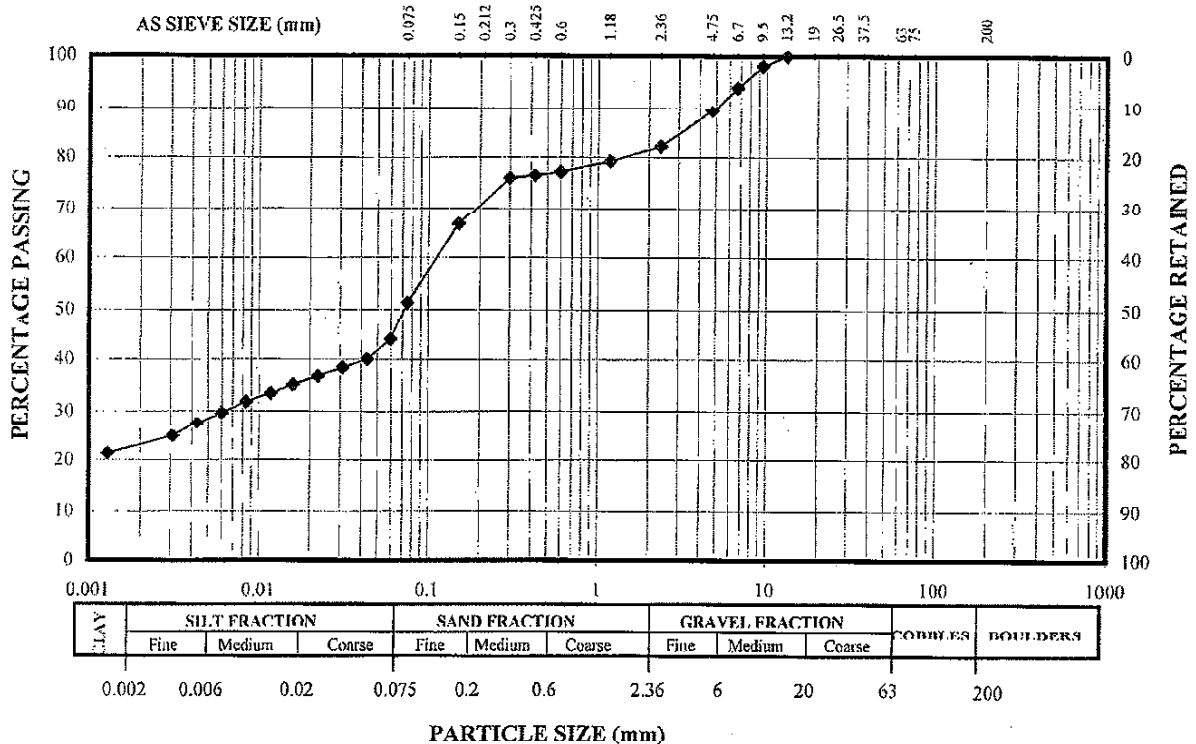
SOIL CLASSIFICATION REPORT			Trial Hole: PCQ10																																				
			Depth: 0.5 to 1.0A																																				
			Sample No: 3666/56																																				
Client: Advanced Analytical Australia Project: Hay Point Dredging PCQ Location: Hay Point, QLD	Client Sample No.: A04/0798/33 Sample History: Supplied by Client																																						
<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <tr> <th style="width: 10%;">CLAY</th> <th colspan="3">SILT FRACTION</th> <th colspan="3">SAND FRACTION</th> <th colspan="3">GRAVEL FRACTION</th> <th>COBBLES</th> <th>BOULDERS</th> </tr> <tr> <td></td> <td>Fine</td> <td>Medium</td> <td>Coarse</td> <td>Fine</td> <td>Medium</td> <td>Coarse</td> <td>Fine</td> <td>Medium</td> <td>Coarse</td> <td></td> <td></td> </tr> <tr> <td></td> <td>0.002</td> <td>0.006</td> <td>0.02</td> <td>0.075</td> <td>0.2</td> <td>0.6</td> <td>2.36</td> <td>6</td> <td>20</td> <td>63</td> <td>200</td> </tr> </table>				CLAY	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES	BOULDERS		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse				0.002	0.006	0.02	0.075	0.2	0.6	2.36	6	20	63	200
CLAY	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES	BOULDERS																												
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse																														
	0.002	0.006	0.02	0.075	0.2	0.6	2.36	6	20	63	200																												
TEST METHODS Classification AS1726 A2 Particle size AS1289.3.6.2 OTHER TESTS GRADING $C_u = D_{60} / D_{10} =$ not determinable $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable PARTICLE DENSITY 2.72 (assumed) PRE-TREATMENT HYDROMETER N/A TEST CONDITION Washed sieve with dispersing agent GROUP SYMBOL: SOIL NAME: sandy CLAY (visual) REMARKS: INDEX PROPERTIES (%) Liquid Limit = N/A Plastic Limit = N/A Plasticity Index = N/A Linear Shrinkage % = Not determined Atterberg Limits (History/preparation) Liquid Limit (type of test) Linear Shrinkage (mould size)																																							
Tested by: GV Date tested: 22.11.2004 Checked by: [Signature] Date checked: 25.11.04		GHD LONGMAC 57 Herbert St, Artarmon NSW, 2064 Tel: 9462 4700 Fax: 9462 4710 GEOTECHNICAL TESTING SERVICES																																					
Authorised Signatory: S. Longmac 25.11.2004		This laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its scope of accreditation. NATA Accredited Laboratory Number: 679																																					
		JOB No. 2113283 REPORT No. 12838	REF: FSW/TE/LAB/STAR/SIEVE																																				
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ11
Depth: 0.0 to 0.5A
Sample No: 3666/47

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/43
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

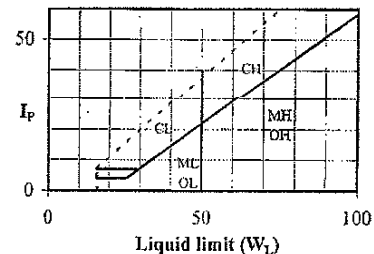
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: gravelly sandy CALY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 22.11.2004
Checked by: *SB*
Date checked: 25/11/04



GHD LONGMAC

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Authorised Signatory:

N. J. J. J.
25.11.2004



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JOB No. 2113283

REPORT No. 12829

SEE FORWARDING LABEL FOR DETAILS

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SOIL CLASSIFICATION REPORT		Trial Hole: PCQ11
		Depth: 0.5 to 1.0A
		Sample No: 3666/48
Client: Advanced Analytical Australia	Client Sample No.: A04/0798/44	
Project: Hay Point Dredging PCQ	Sample History: Supplied by Client	
Location: Hay Point, QLD		

AS SIEVE SIZE (mm)

SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES	BOULDERS
Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
0.002	0.006	0.02	0.075	0.2	0.6	2.36	6	20	63	200

PARTICLE SIZE (mm)

PERCENTAGE PASSING

PERCENTAGE RETAINED

TEST METHODS
Classification AS1726 A2 Particle size AS1289 3 6 2

OTHER TESTS

GRADING
 $C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: sandy CLAY (visual)

REMARKS:

INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
 Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)
 Liquid Limit (type of test)
 Linear Shrinkage (mould size)

Tested by: GV Date tested: 22.11.2004 Checked by: <i>BB</i> Date checked: 25/11/04		GHD LONGMAC 57 Herbert St, Artarmon NSW, 2064 Tel: 9462 4700 Fax: 9462 4710 GEOTECHNICAL TESTING SERVICES					
Authorised Signatory: <i>[Signature]</i> 25.11.2004		This laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its scope of accreditation. NATA Accredited Laboratory Number: 679	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">JOB No.</td> <td>2113283</td> </tr> <tr> <td>REPORT No.</td> <td>12830</td> </tr> </table>	JOB No.	2113283	REPORT No.	12830
JOB No.	2113283						
REPORT No.	12830						

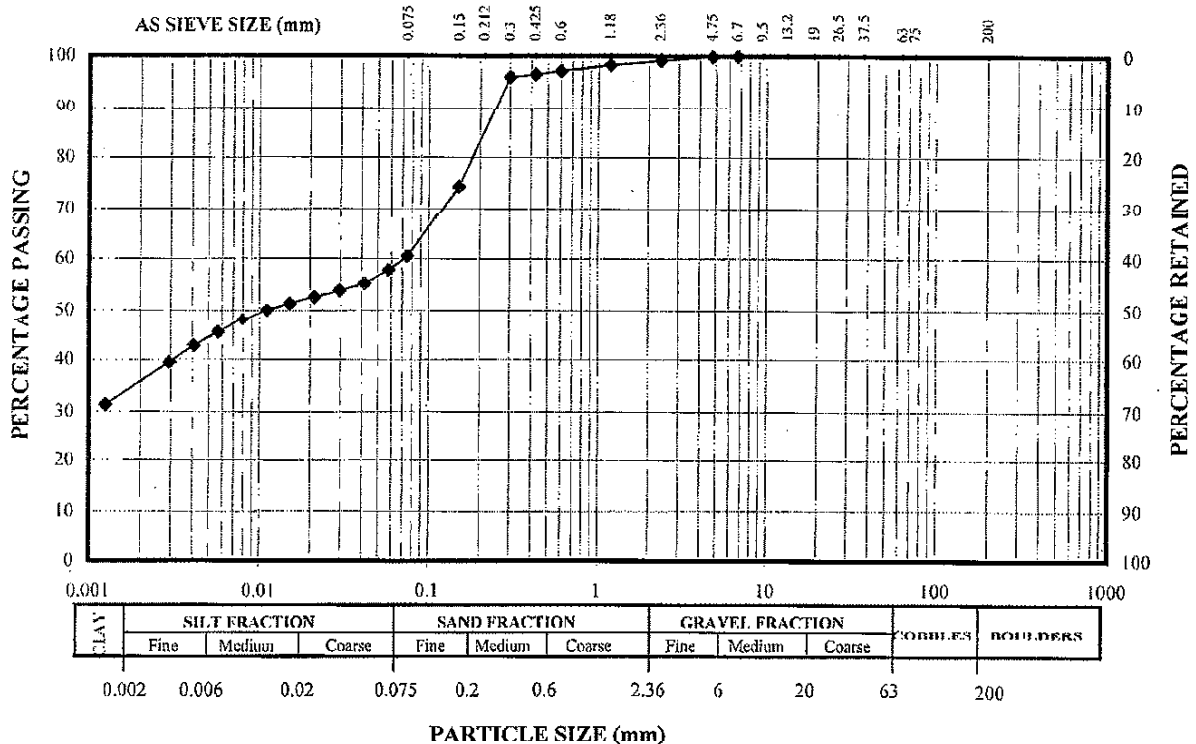
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ12
Depth: 0.0 to 0.5A
Sample No: 3666/53

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/49
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

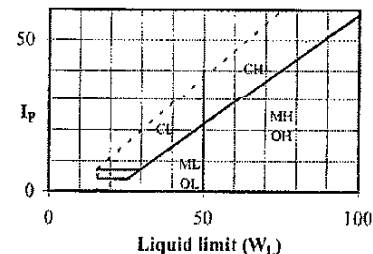
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: sandy CLAY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 22.11.2004
Checked by: *[Signature]*
Date checked: 25.11.04



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JOB No. 2113283

REPORT No. 12835

Ref: EN50118-1:2000

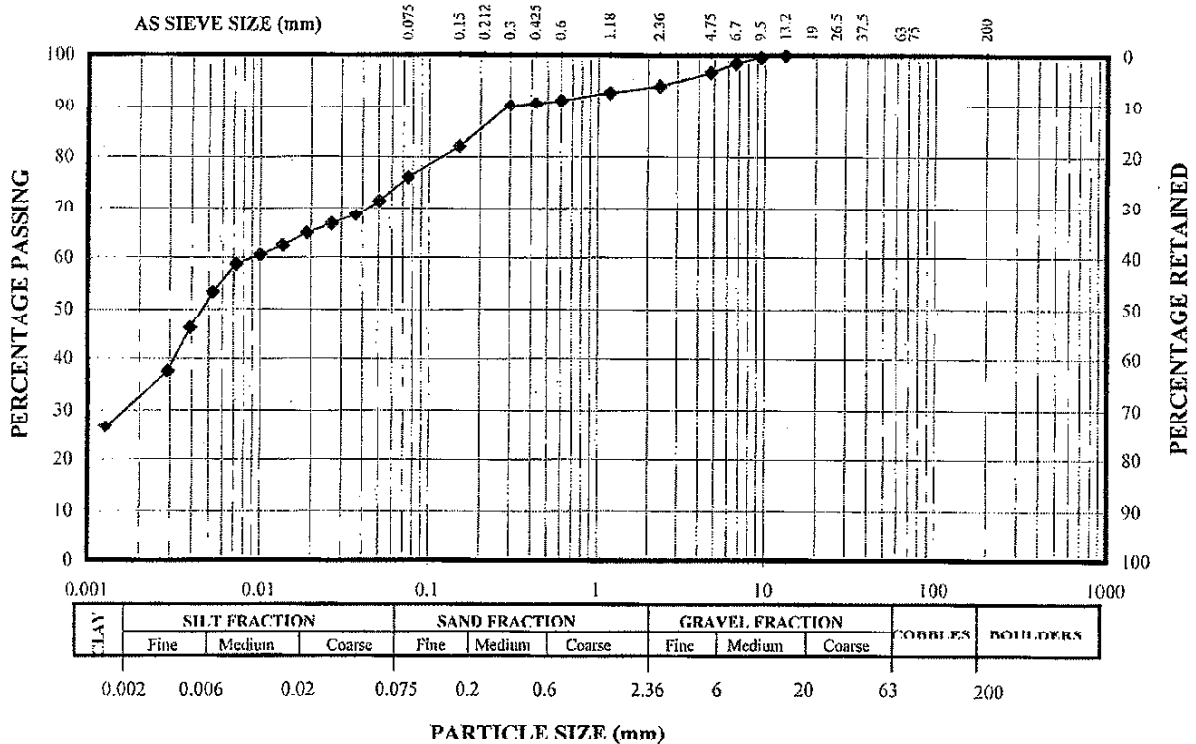
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ12
Depth: 0.5 to 1.0A
Sample No: 3666/54

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/U/98/50
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289 3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

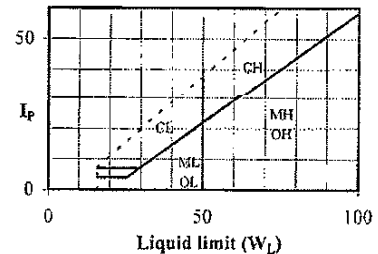
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: sandy CLAY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 22.11.2004
Checked by: *[Signature]*
Date checked: 25/11/04



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JOB No. 2113283

REPORT No. 12836

REF: 2004/11/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100

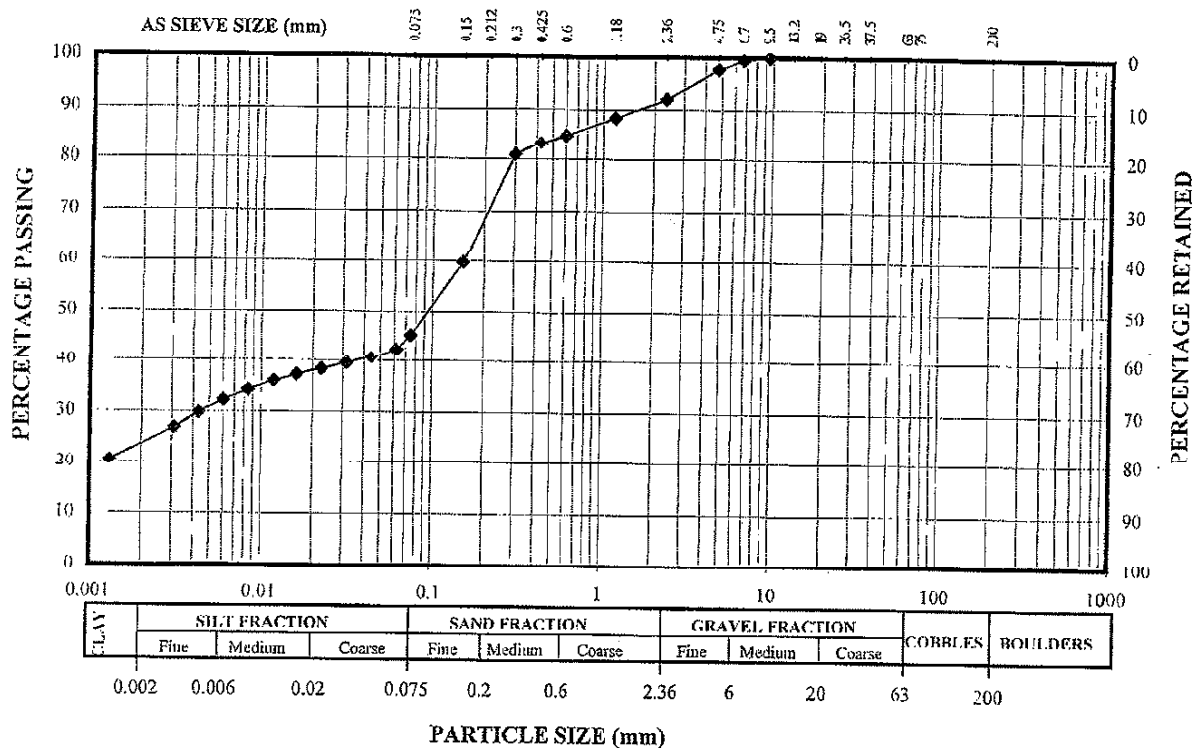
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ13
Depth: 0.0-0.5A
Sample No: 3666/11

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/11
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

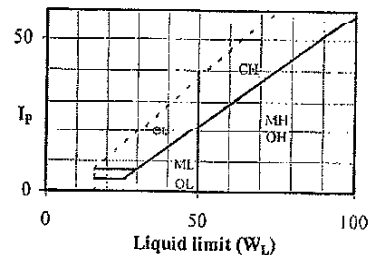
OTHER TESTS

AS1289.3.5.1.1

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable



PARTICLE DENSITY 2.7 (measured)

INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

Atterberg Limits (History/preparation)

GROUP SYMBOL:

Liquid Limit (type of test)

SOIL NAME: Clayey SAND (visual)

Linear Shrinkage (mould size)

REMARKS:

Tested by: GV
Date tested: 08.11.04
Checked by: *JB*
Date checked: *10.11.2004*



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JOB No. 2113283

REPORT No. 12780

SCALE: 1:1000 (1:1000)

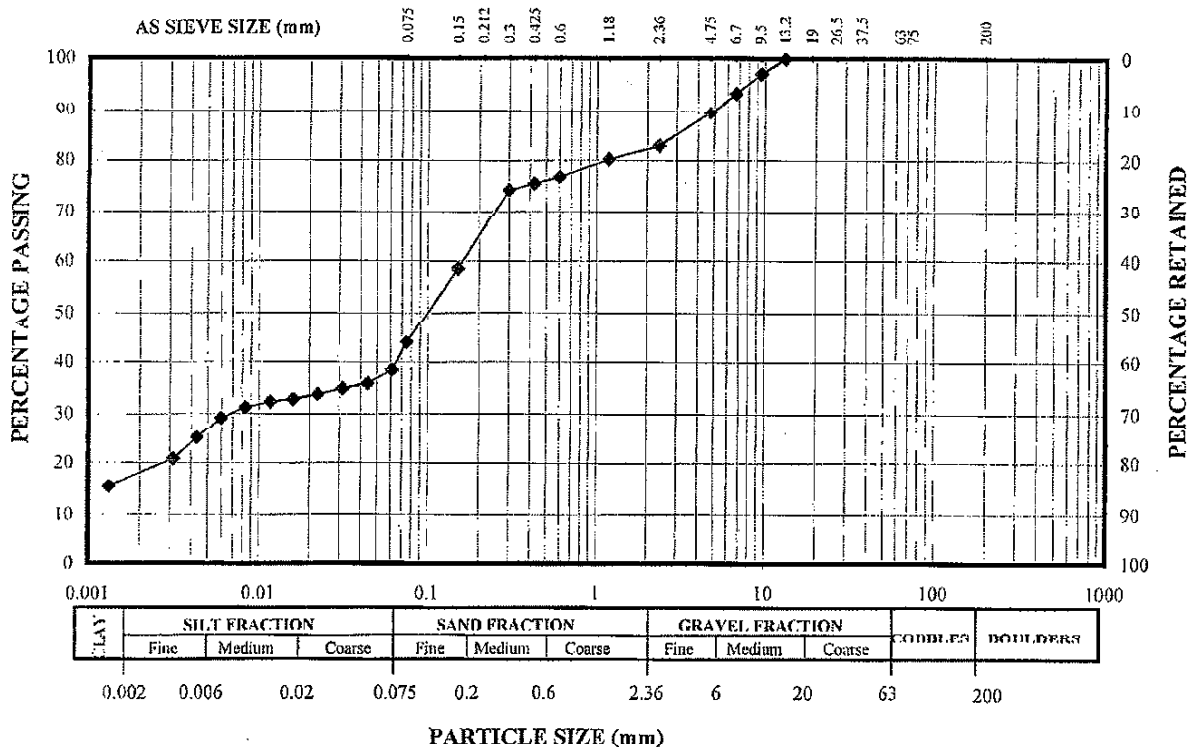
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ13
Depth: 0.5 to 1.0A
Sample No: 3666/46

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/42
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

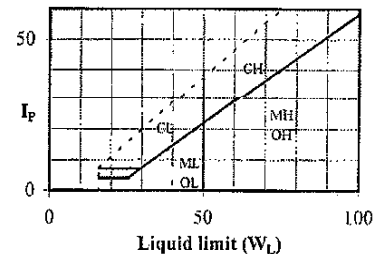
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: gravelly sandy CLAY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 22.11.2004
Checked by: *[Signature]*
Date checked: 25.11.04



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JOB No. 2113283

REPORT No. 12828

FOR SUPPLIER SIGNATURE

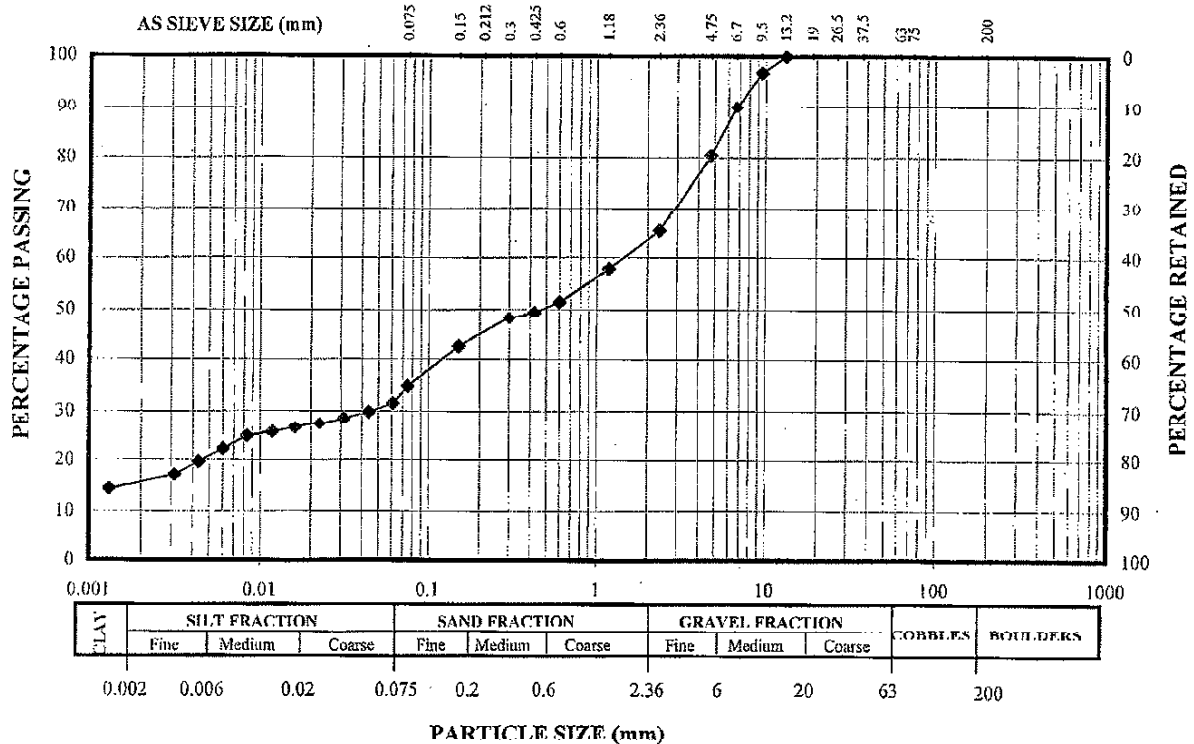
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ14
Depth: 0.0 to 0.5A
Sample No: 3666/45

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/41
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289 3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

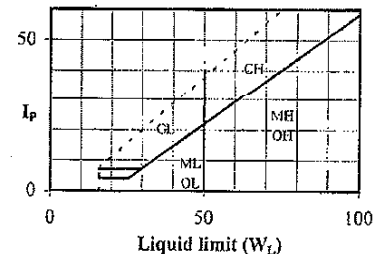
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: gravelly CLAY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 22.11.2004
Checked by: *[Signature]*
Date checked: 25.11.2004



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JOB No. 2113283

REPORT No. 12827

REF: P/SW/UTL LAB/STARS/04X

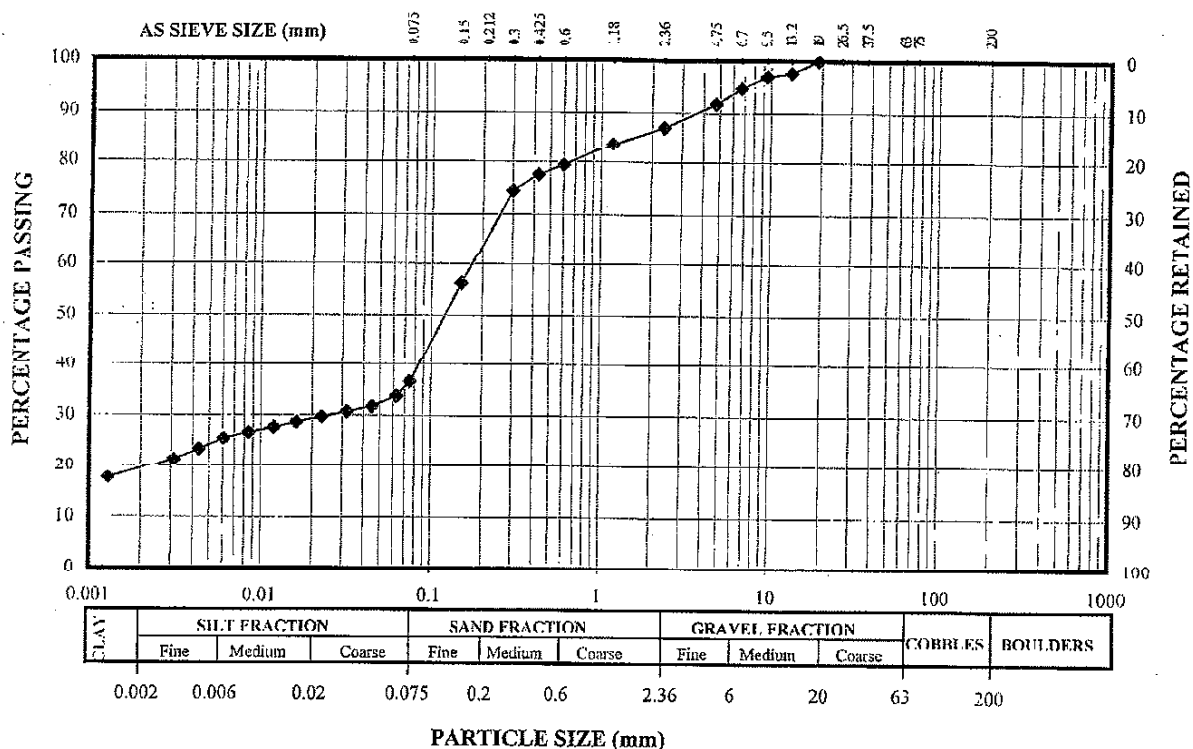
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ14
Depth: 0.5-1.0A
Sample No: 3666/10

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/10
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

AS1289.3.5.1.1

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

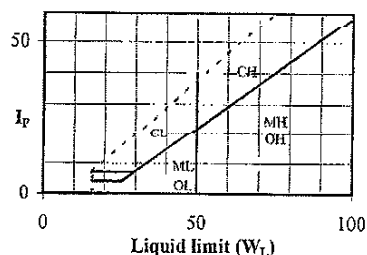
PARTICLE DENSITY 2.72 (measured)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND (visual)



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS:

Tested by: GV
Date tested: 08.11.04
Checked by: *[Signature]*
Date checked: 18/11/04



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Authorised Signatory:

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JOB No. 2113283

REPORT No. 12779

Ed: P. S. V. TEL: 9462 4710

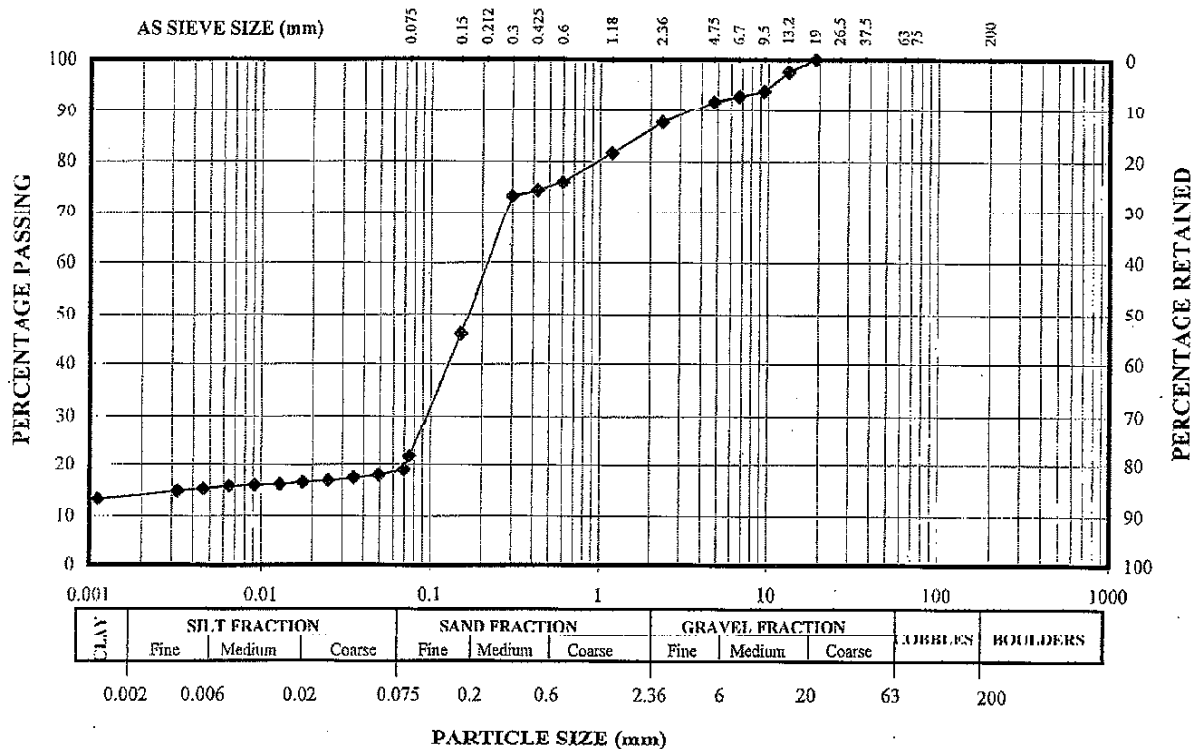
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ15
Depth: 0.0-0.5A
Sample No: 3666/42

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/37
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

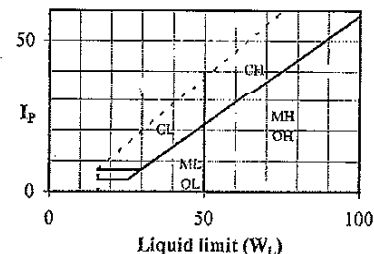
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 12.11.2004
Checked by: *SS*
Date checked: 24/11/04



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JOB No. 2113283
REPORT No. 12819

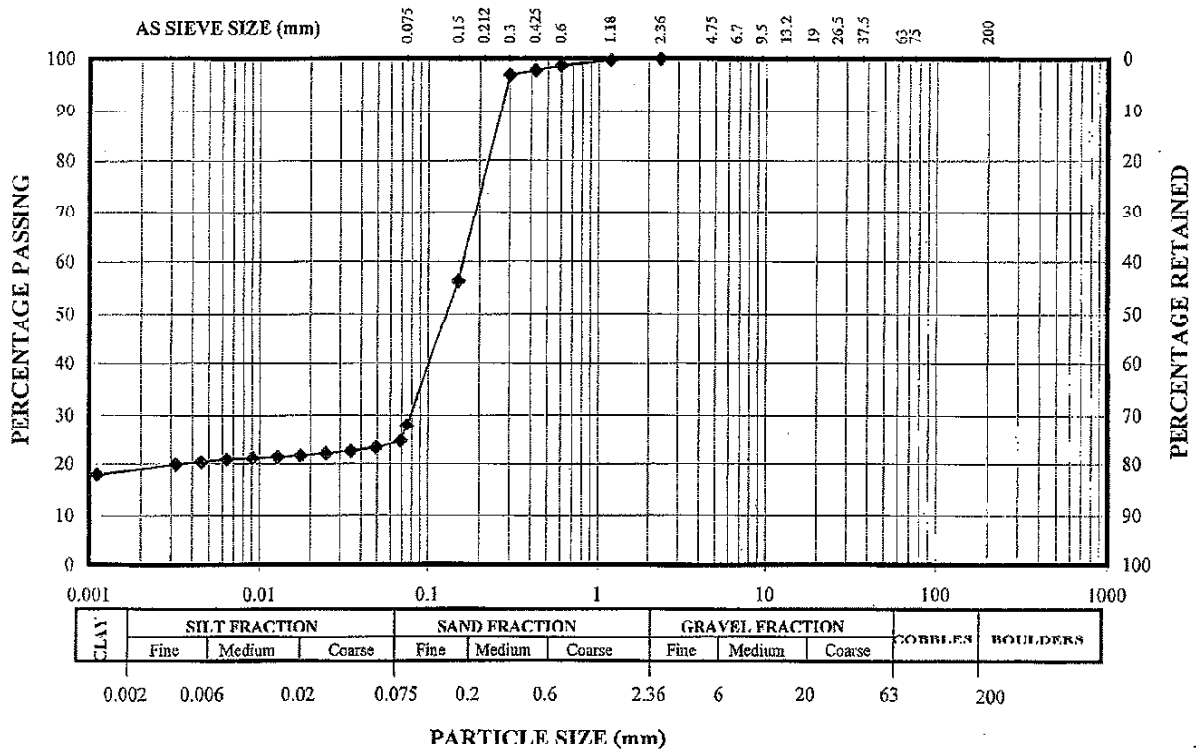
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ15
Depth: 0.5-1.0A
Sample No: 3666/43

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/38
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289 3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.73 (assumed)

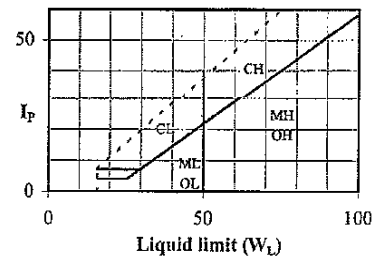
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 12.11.2004
Checked by: *SS*
Date checked: 24/11/04



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JOB No. 2113283

REPORT No. 12820

Ref: 01-SW/UT/LAB/TEST/01

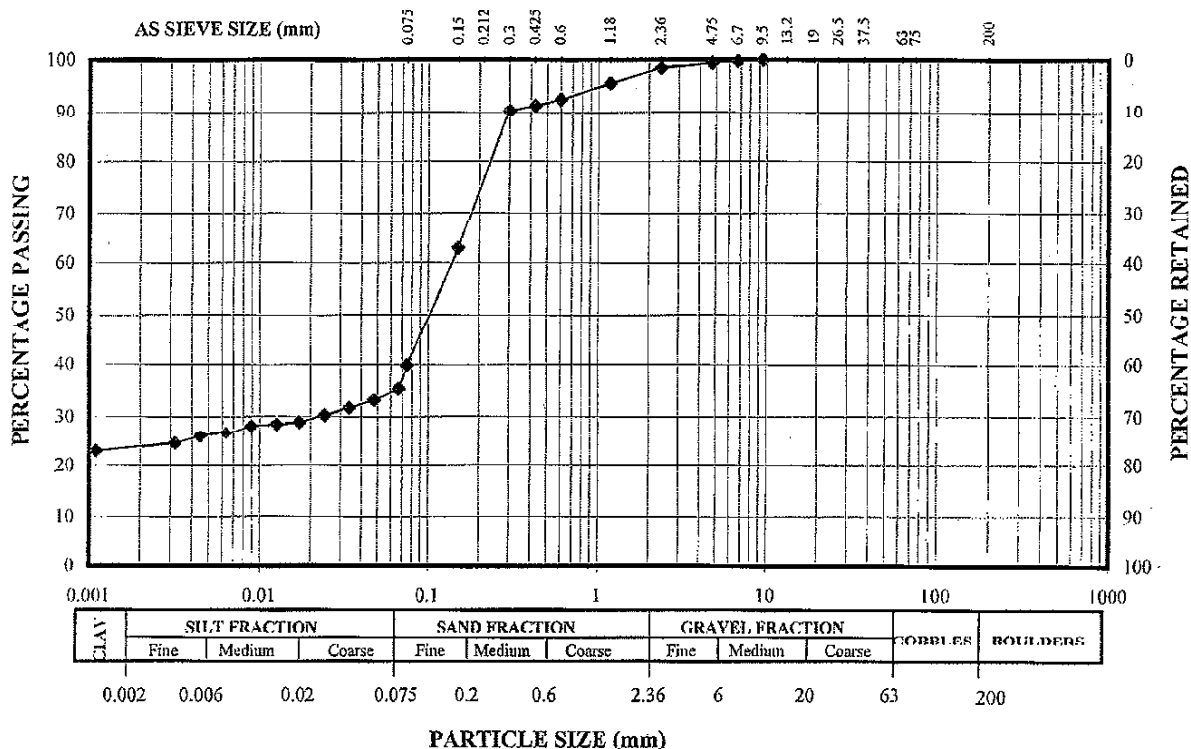
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ15
Depth: 1.0-2.0A
Sample No: 3666/44

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/39
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.73 (assumed)

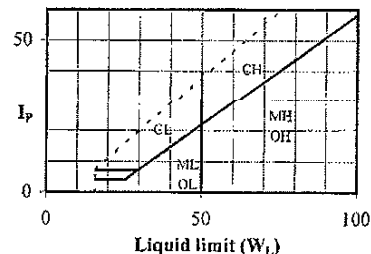
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 12.11.2004
Checked by: *[Signature]*
Date checked: 24/11/04



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JOB No. 2113283

REPORT No. 12821

Ref: P. SWIFT/LAH/NSV/ARTARMON

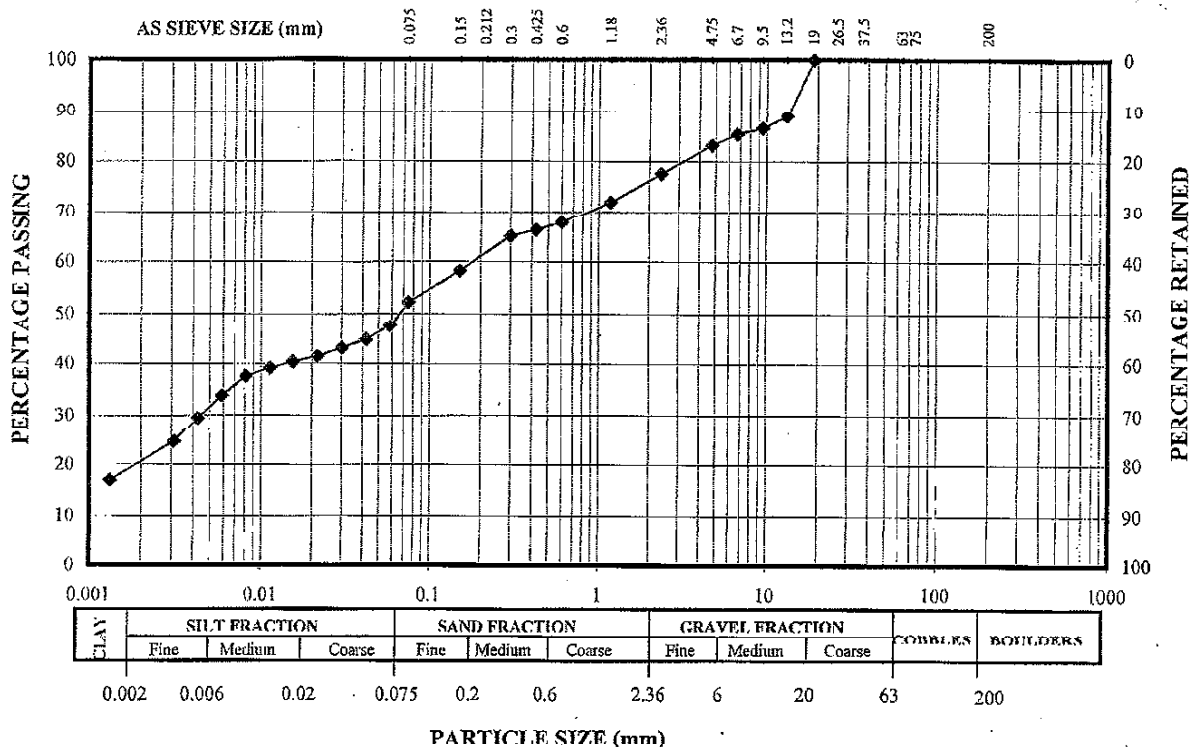
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ17
Depth: 0.0-0.5A
Sample No: 3666/36

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/31
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY

2.7 (assumed)

PRE-TREATMENT HYDROMETER

N/A

TEST CONDITION

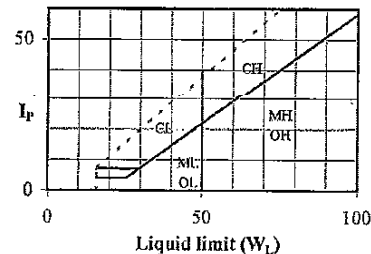
Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME:

Sandy CLAY with gravel

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 12.11.2004
Checked by: *[Signature]*
Date checked: 24/11/04



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Authorised Signatory:

[Signature]
S. LAMARCA
25.11.2004



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JOB No. 2113283

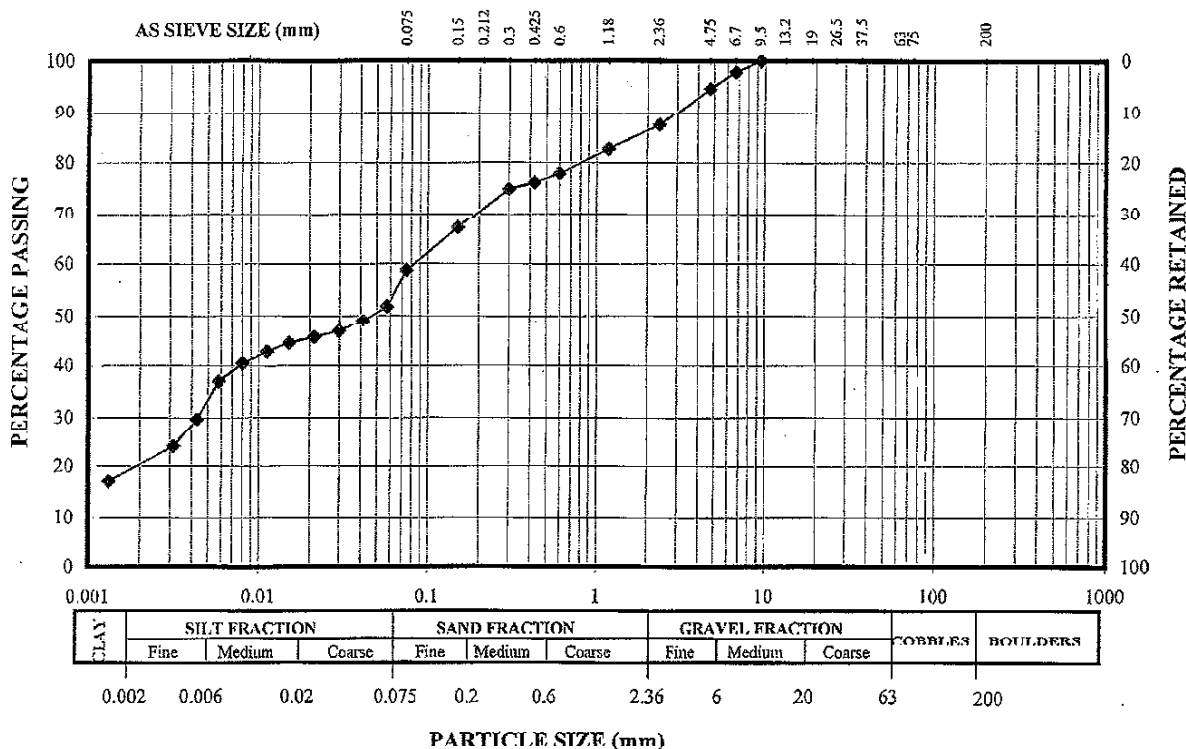
REPORT No. 12813

Ref: PHSWUT/LAB/ARTARMON

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Trial Hole:	PCQ17
Depth:	0.5-1.0A
Sample No:	3666/37

Client Sample No.: A04/0798/32
Sample History: Supplied by Client



Classification AS1726 A2

Particle size AS1289 3 6 2

$$C_u = D_{60} / D_{10} = \text{not determinable}$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = \text{not determinable}$$

27 (assumed)

INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Washed sieve with dispersing agent

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Sandy CLAY (visual)

REMARKS:



57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710

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JOB No.	2113283
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REPORT No. 12814

Ref: VASWUTUM, AASSI, ARTS, IVE

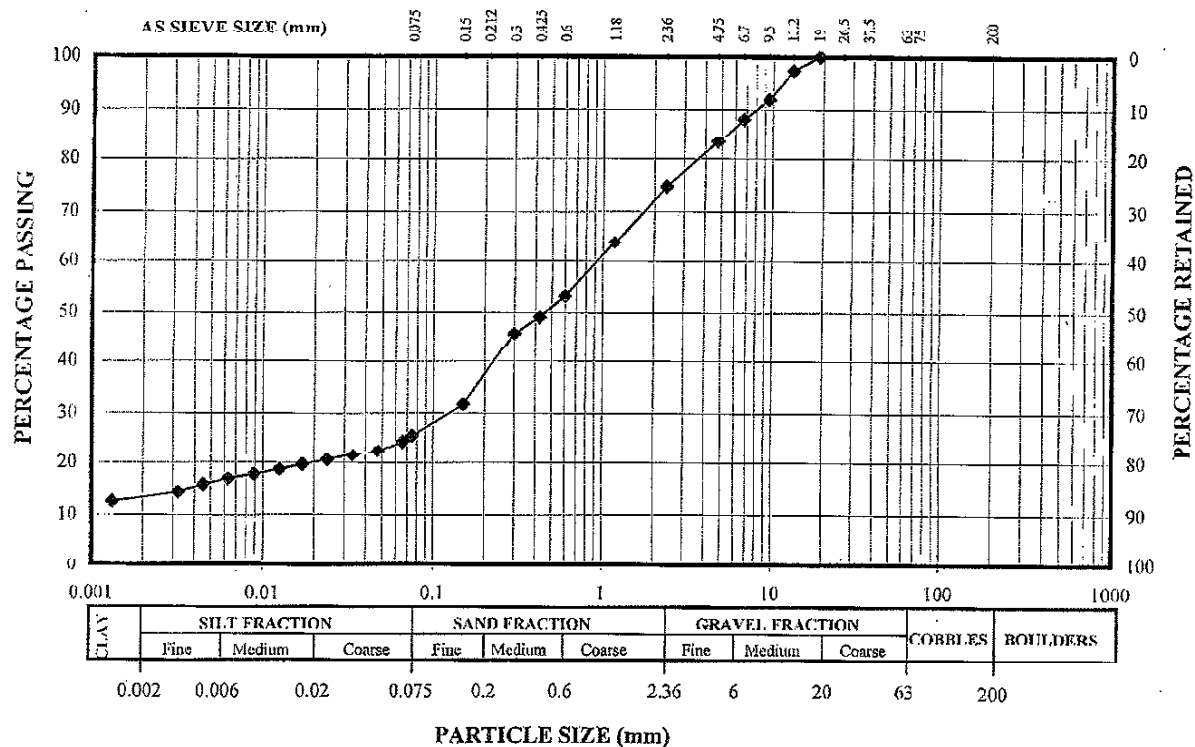
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ19
Depth: 0.0-0.5A
Sample No: 3666/06

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/6
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

AS1289.3.5.1.1

GRADING

$C_u = D_{60} / D_{10}$ = not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60})$ = not determinable

PARTICLE DENSITY 2.72 (measured)

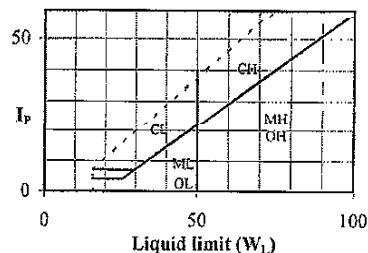
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND with gravel (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 08.11.04
Checked by: *[Signature]*
Date checked: 18.11.04



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57 Herbert St, Artarmon NSW, 2064
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GEOTECHNICAL TESTING SERVICES

Authorised Signatory

[Signature]
S. LONGMAC
18.11.2004



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JOB No. 2113283

REPORT No. 12775

REF: SNT/TESTLAB/STANDARD

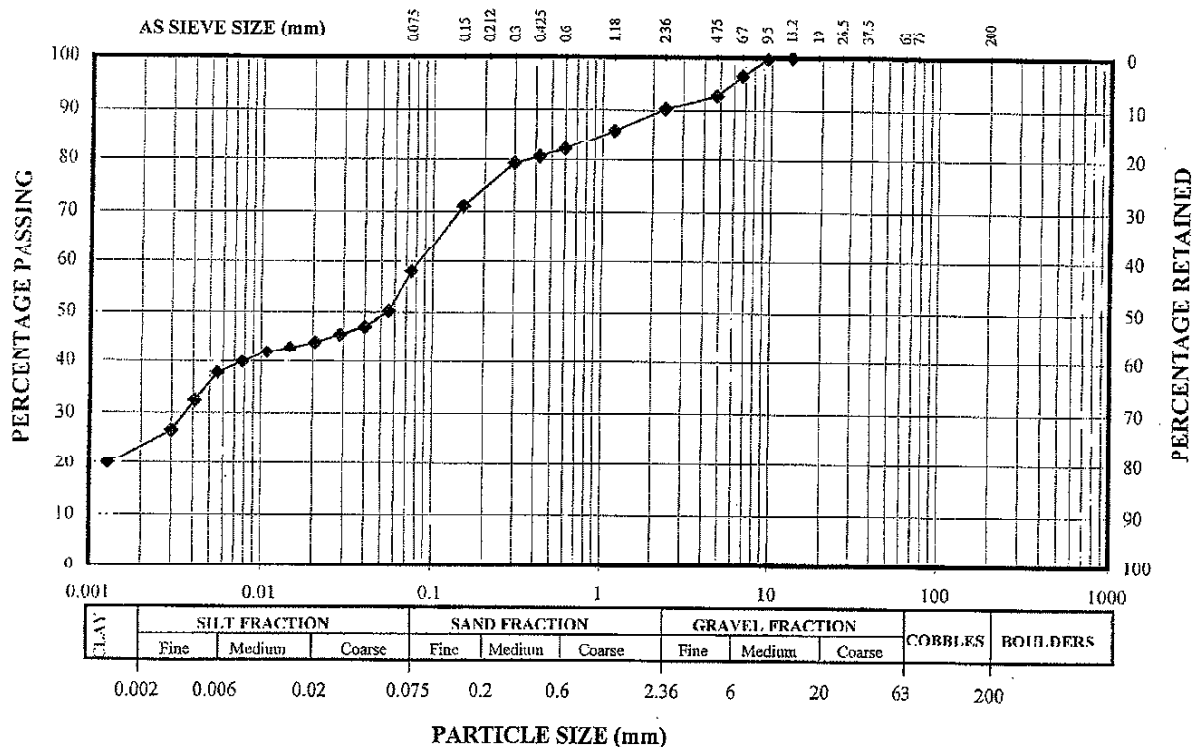
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ21
Depth: 0.5-1.0A
Sample No: 3666/09

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/9
Sample History: Supplied by Client

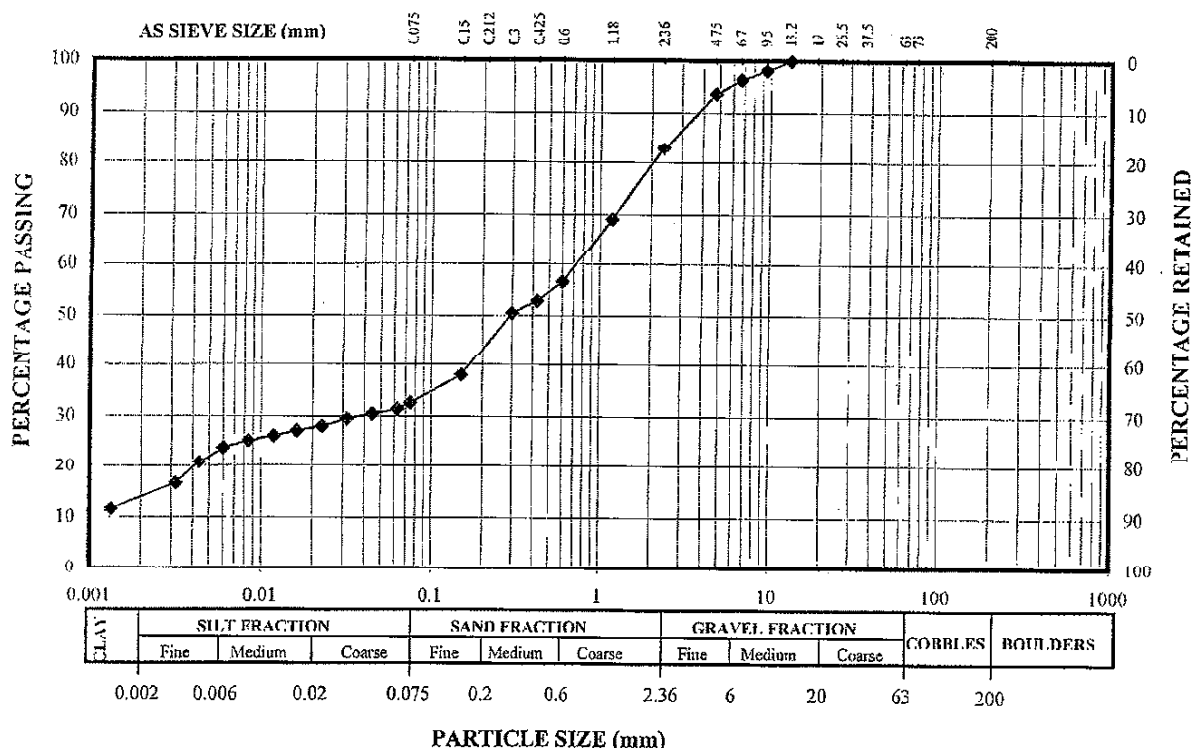


SOIL CLASSIFICATION REPORT

Trial Hole: PCQ22
Depth: 0.0-0.5A
Sample No: 3666/07

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/7
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

AS1289.3.5.1.1

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (measured)

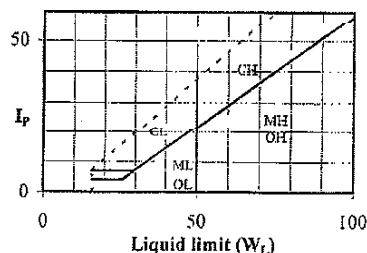
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND with gravel

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 08.11.04
Checked by: *[Signature]*
Date checked: 08.11.04



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JOB No. 2113283

REPORT No. 12776

NOT FOR UTILITY LABORATORY USE

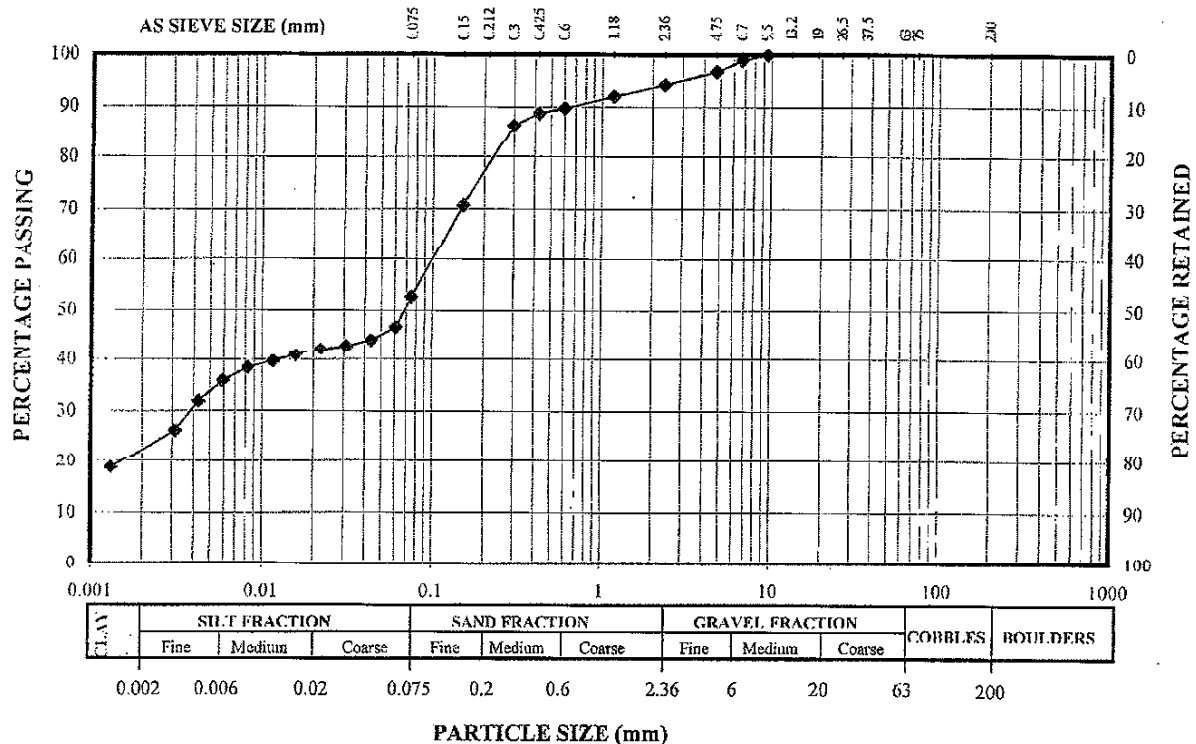
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ22
Depth: 0.5-1.0A
Sample No: 3666/08

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/8
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

AS1289.3.5.1.1

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.73 (measured)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Sandy CLAY (visual)

REMARKS:

Tested by: GV
Date tested: 08.11.04
Checked by:
Date checked: 18/11/04



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JOB No. 2113283

REPORT No. 12777

Ref: R53WUTLLAD5STARTSIEVE

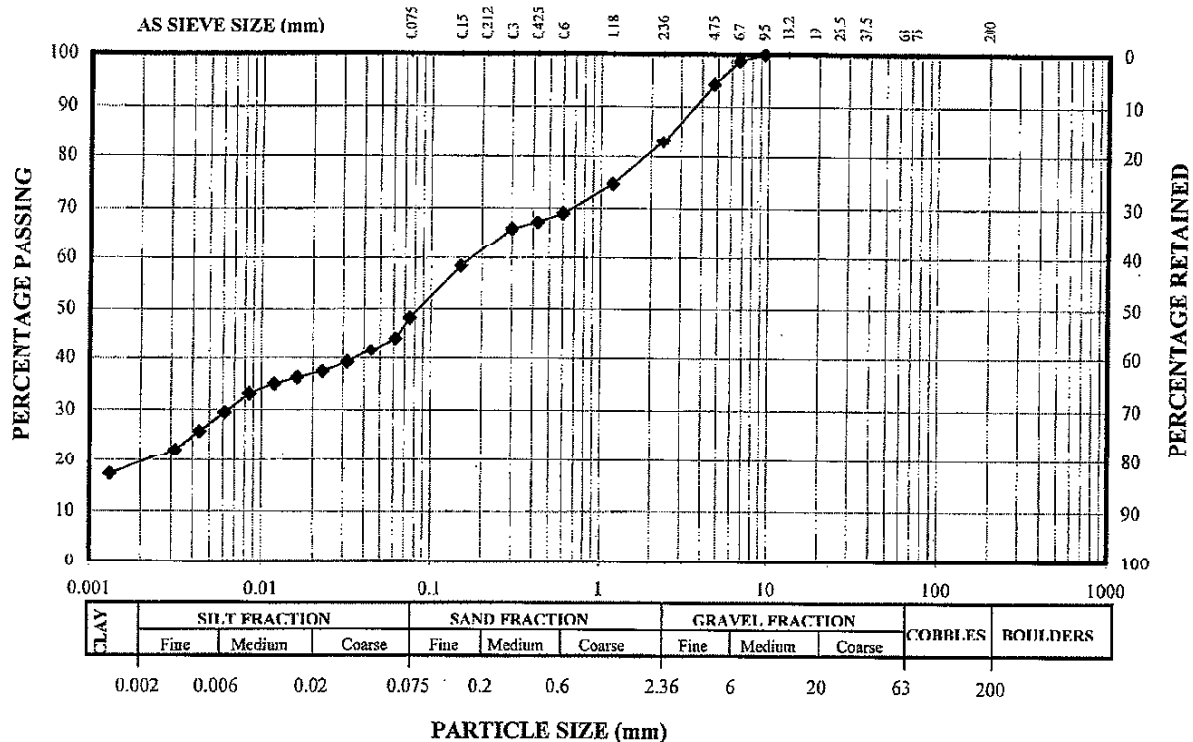
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ23
Depth: 0.0 to 0.5A
Sample No: 3666/18

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/7
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (measured)

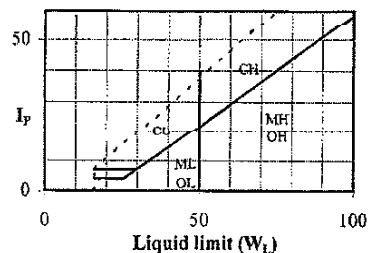
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND with silt & clay (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.11.2004
Checked by: *[Signature]*
Date checked: 12/11/04



GHD LONGMAC
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Tel: 9462 4700 Fax: 9462 4710



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Authorised Signatory:



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JOB No. 2113283

REPORT No. 12788

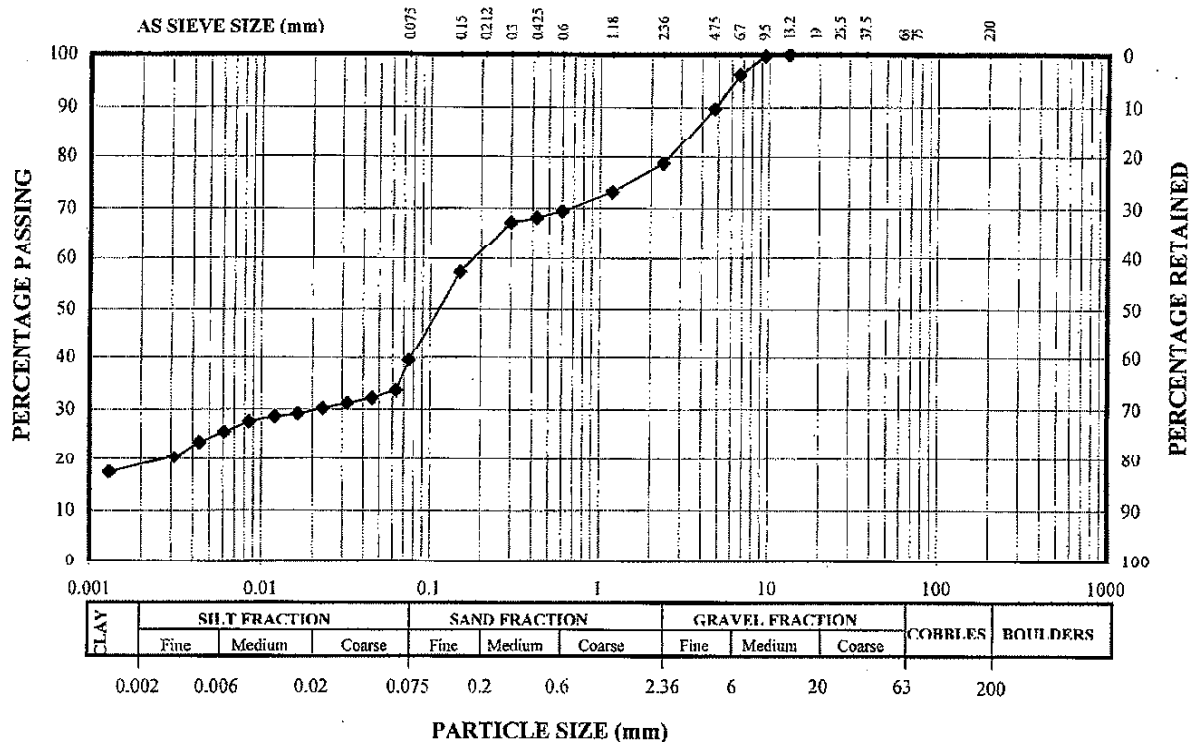
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ23
Depth: 0.5 to 1.0A
Sample No: 3666/19

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/8
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.7 (measured)

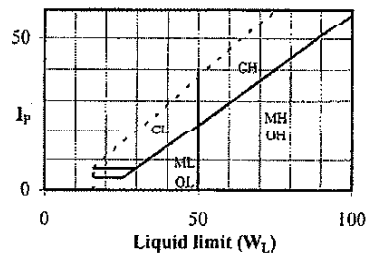
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND with silt & clay

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.11.2004
Checked by: *[Signature]*
Date checked: 10.11.04



GHD LONGMAC
57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710



GEOTECHNICAL TESTING SERVICES

Authorised Signatory

[Signature]
S. LAMATIN
19.11.04



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JOB No. 2113283

REPORT No. 12789

Ref: EASWUTIL LAINSTARTSIEVE

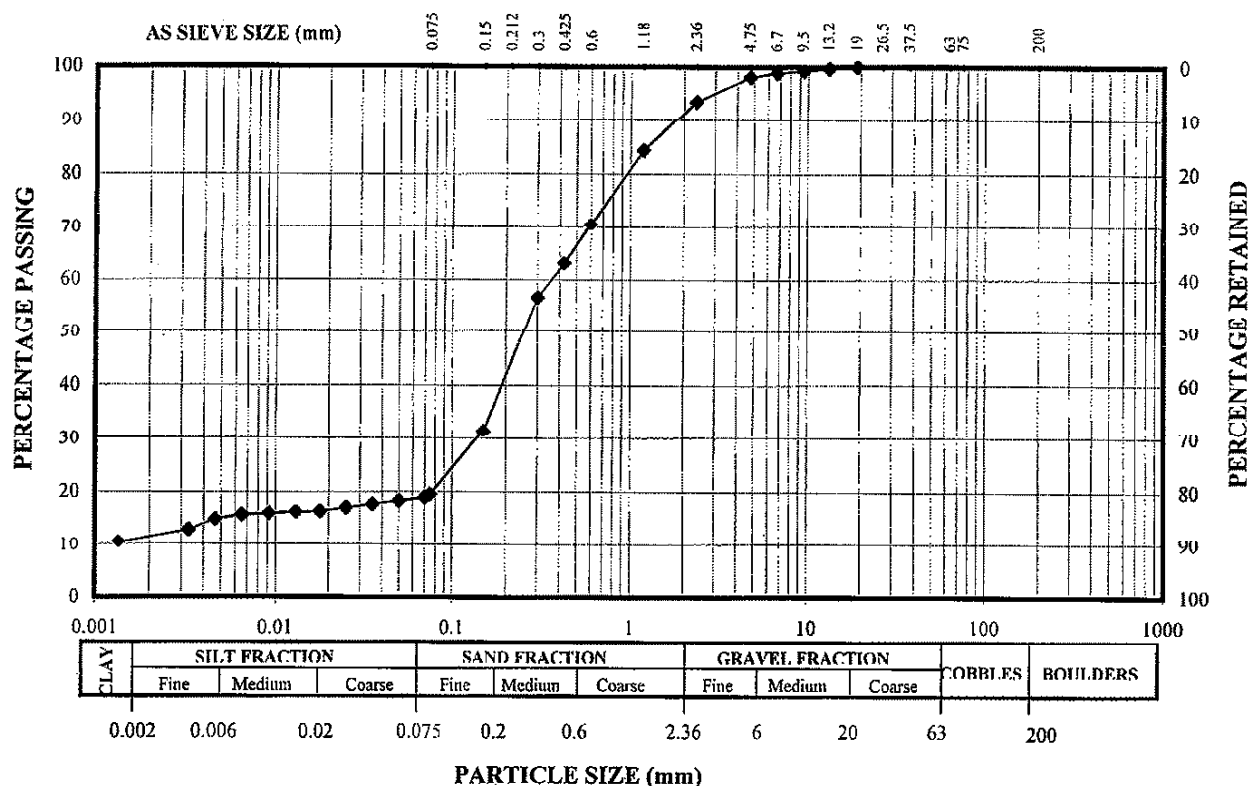
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 24
Depth: 0.0-0.5A
Sample No: 3666/02

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/2
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

AS1289.3.5.1.1

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{40}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (measured)

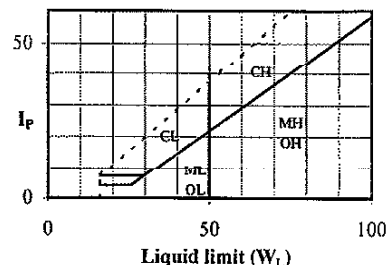
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 08.11.04
Checked by: *g*
Date checked:



GHD LONGMAC

57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710

GEOTECHNICAL TESTING SERVICES



Authorised Signatory:

[Signature]
DREDDGE
21/12/04



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JOB No. 2113283

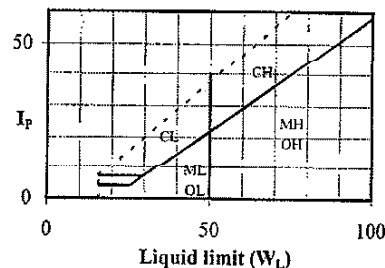
REPORT No. 12771

Ref: P-SW/UT/LAB/STAR/SH/VE

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Trial Hole:	PCQ 24
Depth:	0.5 to 1.0A
Sample No:	3666/21

Client Sample No.: A04/0798/12
Sample History: Supplied by Client



Particle size AS1289.3.6.2

Linear Shrinkage (mould size)

JOB No.	2113283
REPORT No.	12791

Ref: F-SNUTTALAUSSE:RTSNUVE

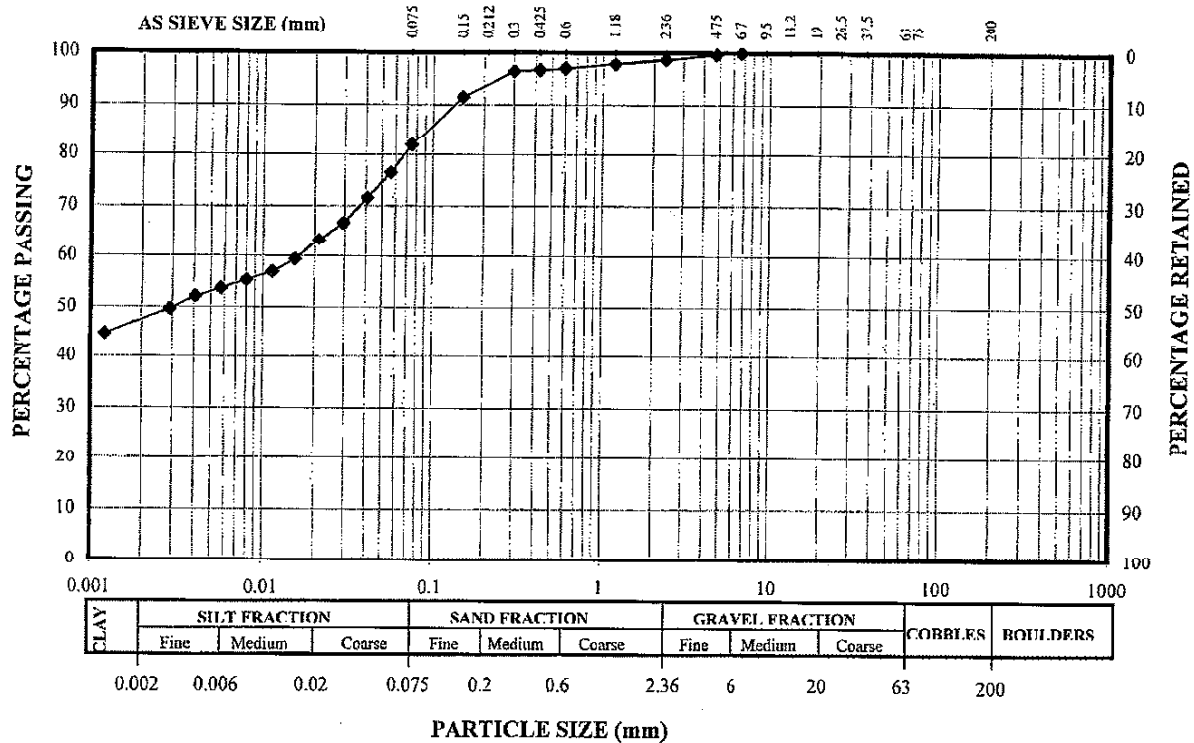
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ25
Depth: 0.0 to 0.5A
Sample No: 3666/20

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/10
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.73 (measured)

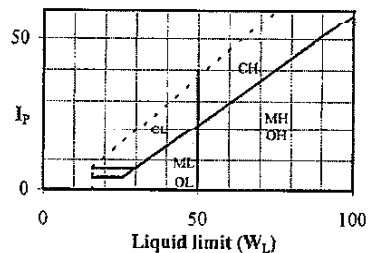
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: CLAY with sand (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.11.2004
Checked by: *B. Lubu*
Date checked: 12.11.04



GHD LONGMAC
57 Herbert St, Artarmon NSW, 2064
Tel: 9462 4700 Fax: 9462 4710



GEOTECHNICAL TESTING SERVICES

Authorised Signatory:



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JOB No. 2113283

REPORT No. 12790

Ref: F:\SWUTH\LAB\NATA\START\SEVE

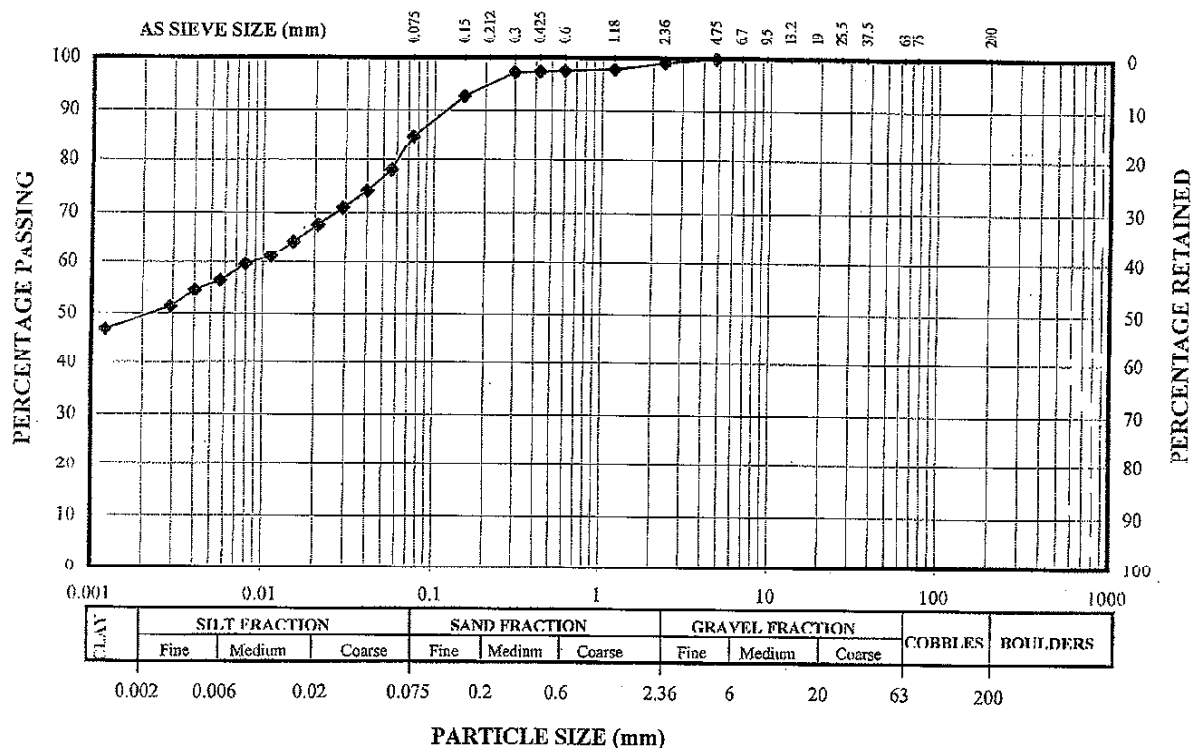
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ25
Depth: 0.5-1.0A
Sample No: 3666/01

Client: Advanced Analytical Australia
Project: Hay point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

AS1289.3.5.1.1

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.7 (measured)

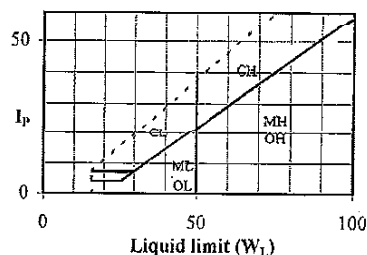
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Sandy CLAY(visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 08.11.04
Checked by: *EB*
Date checked: 18/11/04



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JOB No. 2113283

REPORT No. 12769

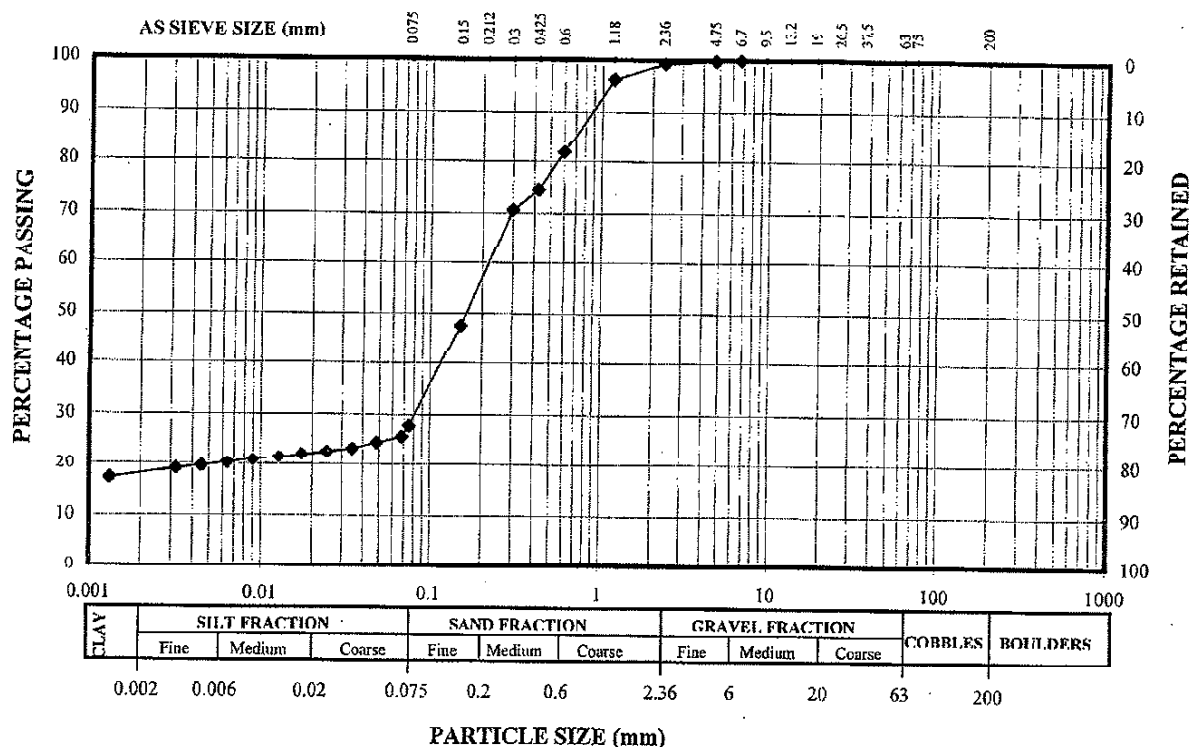
SEE REVERSE SIDE FOR STARTING PAGE

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Trial Hole:	PCQ26
Depth:	0.0 to 0.5A
Sample No:	3666/14

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/3
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = \text{not determinable}$$
$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = \text{not determinable}$$

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND (visual)

REMARKS:

Tested by: GV
Date tested: 10.11.2004
Checked by: B
Date checked: 12.11.04



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JOB No.	2113283
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2113283

REPORT No. 12784

12784

Ref ESWITH & ASSISTANTS

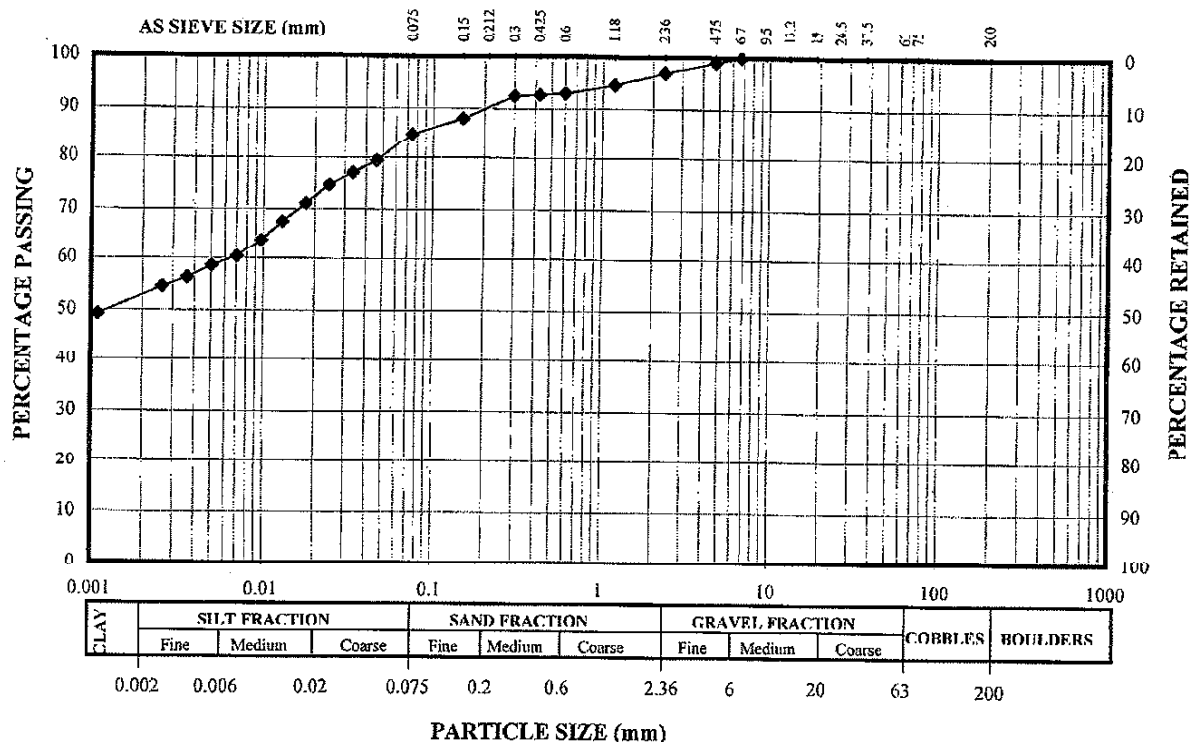
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ26
Depth: 0.5 to 1.0A
Sample No: 3666/15

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/4
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

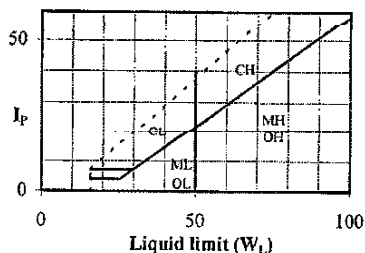
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: CLAY with sand (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.11.2004
Checked by: *[Signature]*
Date checked: 10.11.04



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S. L. HANNAH
19.11.04



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JOB No. 2113283

REPORT No. 12785

Ref: FFW/TRL/AN/STARS/SIEVE

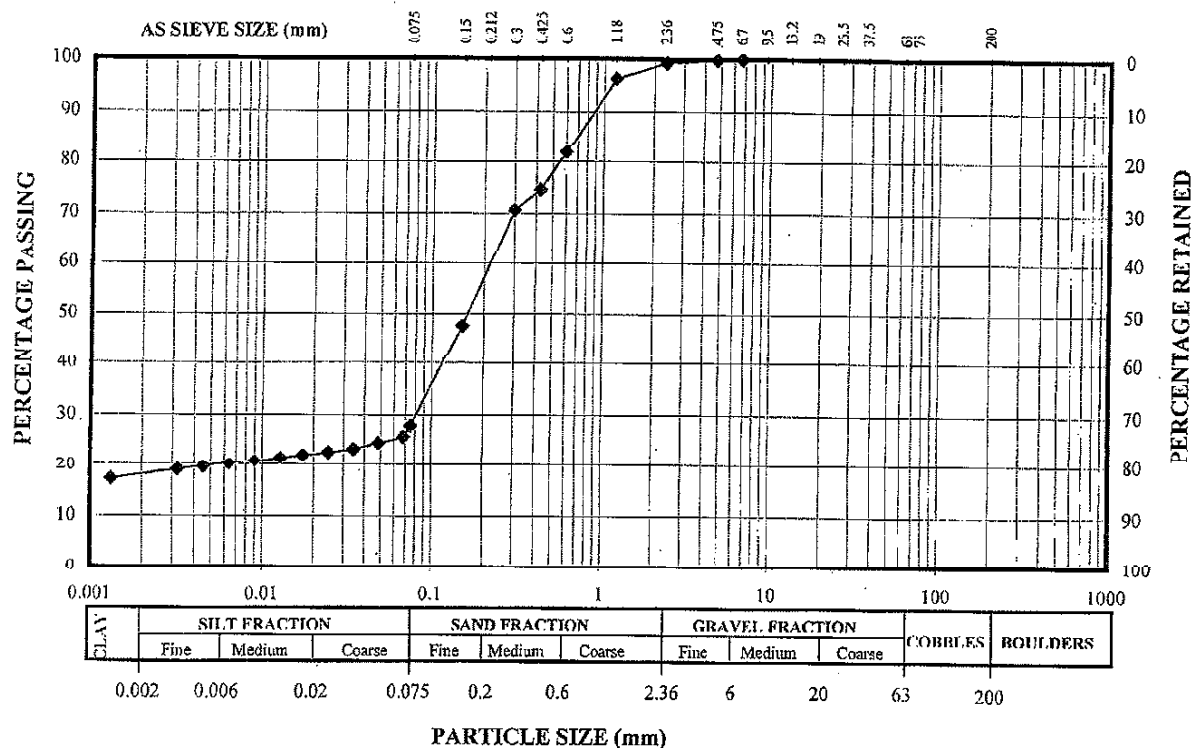
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ27
Depth: 0.0 to 0.5A
Sample No: 3666/12

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

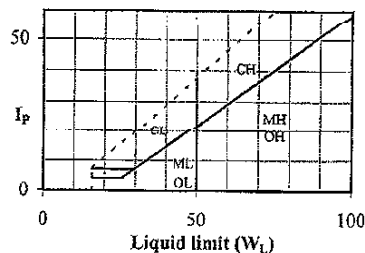
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: clayey SAND (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.11.2004
Checked by: *[Signature]*
Date checked: *[Signature]*



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JOB No. 2113283

REPORT No. 12782

Ref: F:\SWUTLAB\STARTSIEVE

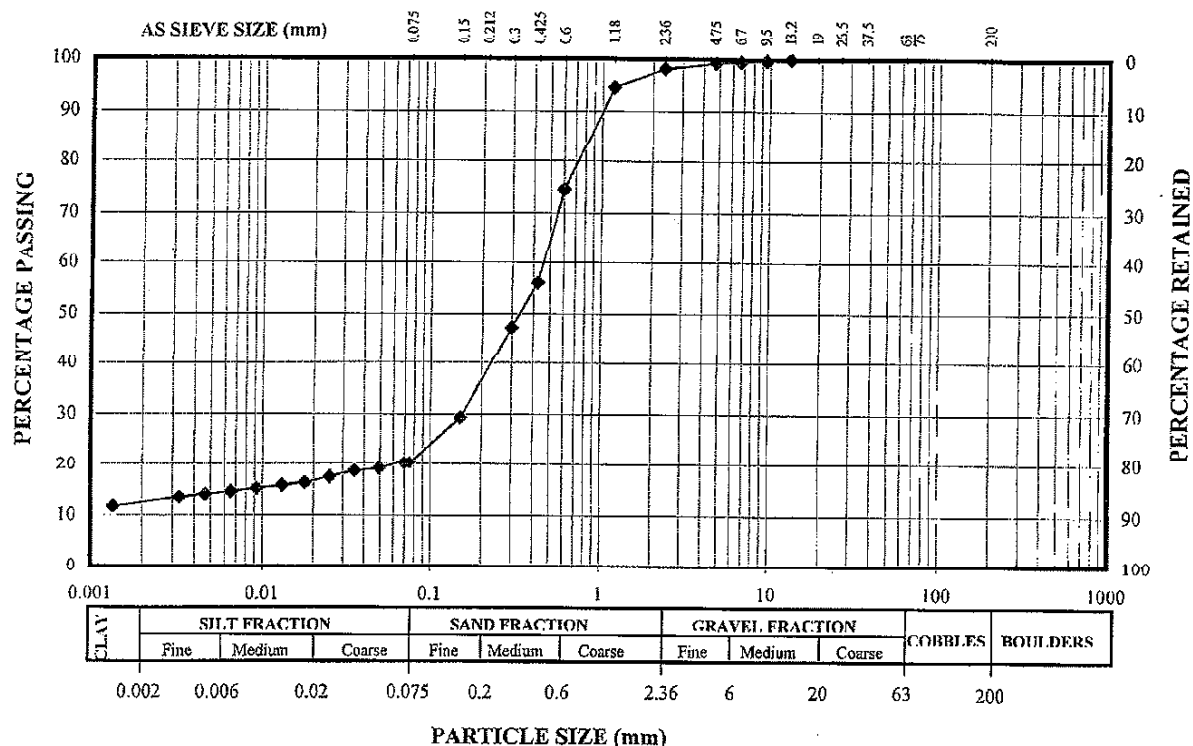
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ27
Depth: 0.5 to 1.0A
Sample No: 3666/13

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/2
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

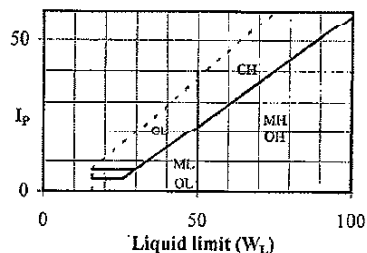
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: clayey SAND (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.11.2004
Checked by: *SB*
Date checked: 19/11/04



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JOB No. 2113283

REPORT No. 12783

See F:\SWOT\LAB\STAR\PRIV

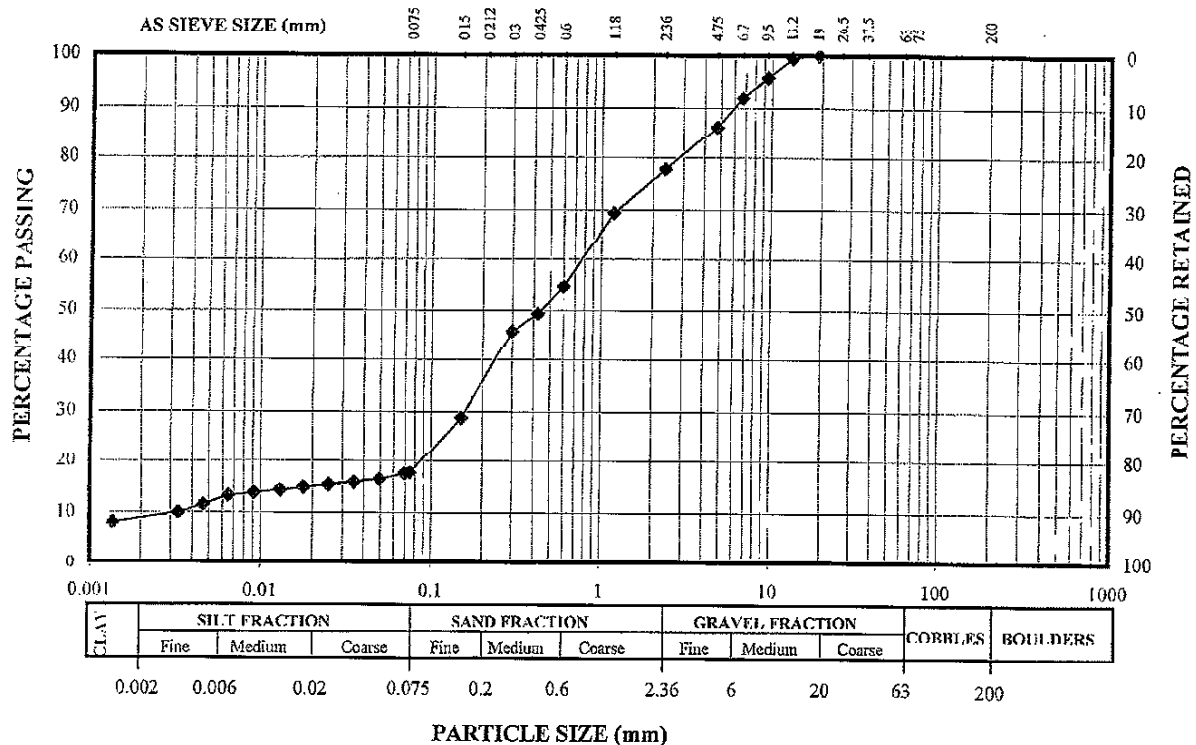
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ28
Depth: 0.0-0.5A
Sample No: 3666/03

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, Qld

Client Sample No.: A04/0816/3
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

AS1289.3.5.1.1

GRADING

$$C_u = D_{60} / D_{10} = 244.6$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 9.6$$

PARTICLE DENSITY 2.72 (measured)

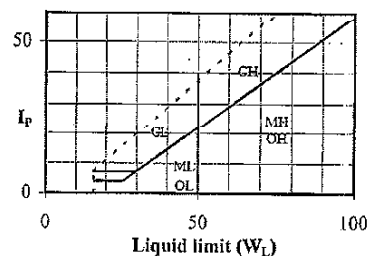
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty SAND with gravel (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 08.11.04
Checked by:
Date checked: 18/11/04



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S. GANATHAN
18.11.2004



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JOB No. 2113283

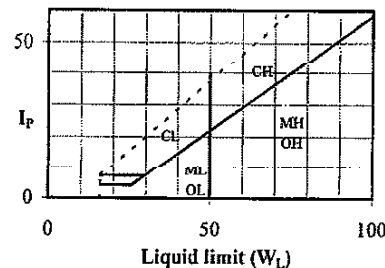
REPORT No. 12772

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Trial Hole:	PCQ28
Depth:	0.5 - 1.0A
Sample No:	3666/22

Client Sample No.: A04/0798/13
Sample History: Supplied by Client



R&C FSWTH LAID START SIEVE

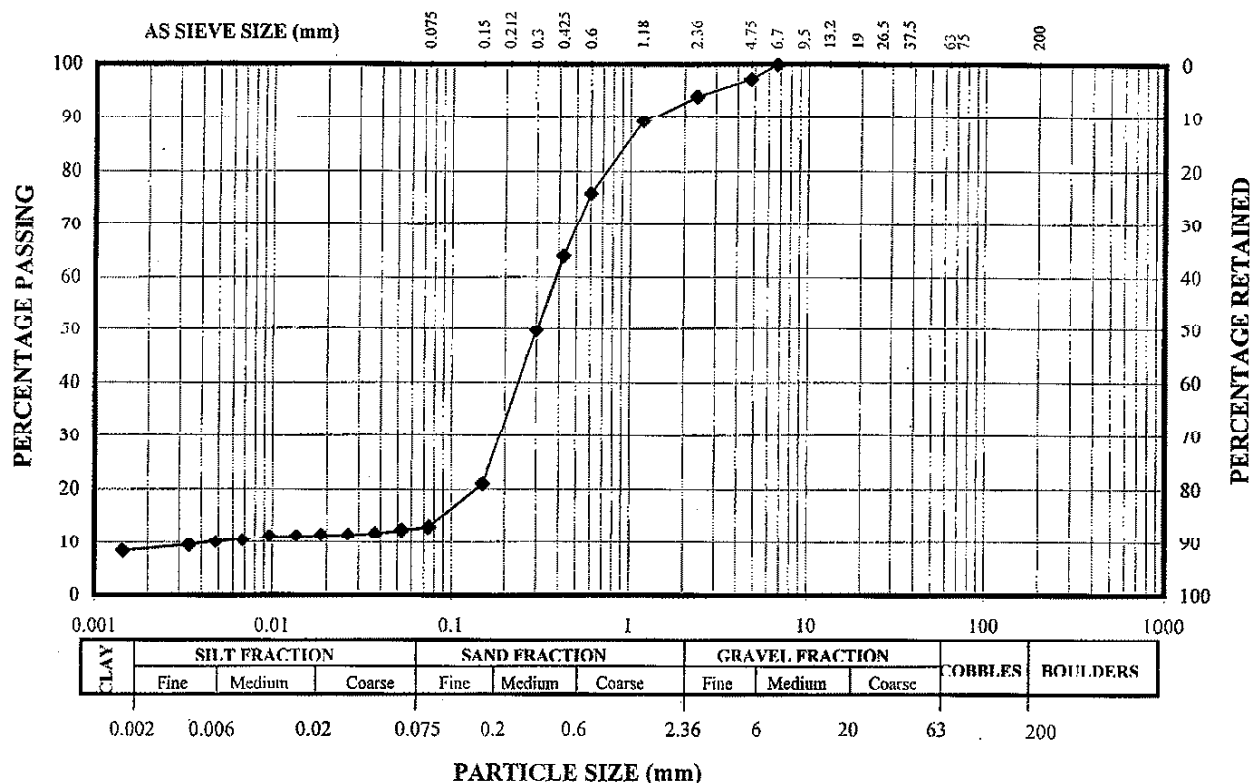
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ29
Depth: 0.0 - 0.5A
Sample No: 3666/122

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911D/5
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 86.0$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 21.9$$

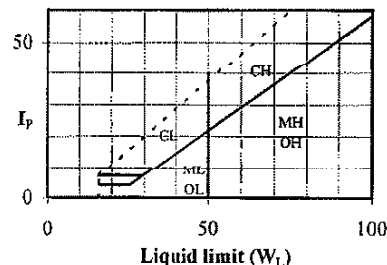
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1367

Tested by: SMEC
Date tested: 15.12.04
Checked by:
Date checked:



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30/12/04



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JOB No. 2113283

REPORT No. 13032

REF: SWUTH/LAB/START/SHEVE

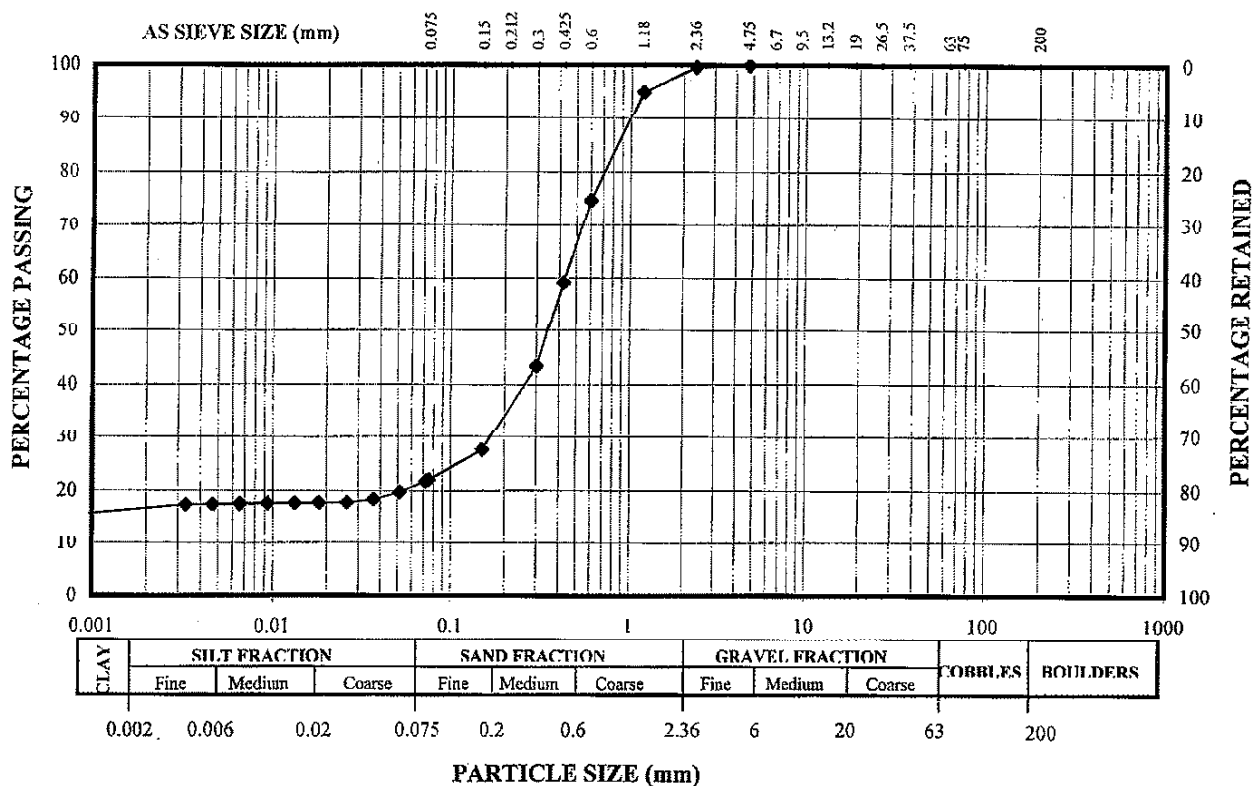
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ29
Depth: 0.5 - 1.0A
Sample No: 3666/117

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/13
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = (D_{30})^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

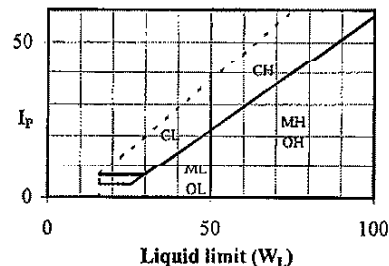
INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1367

Tested by: SMEC
Date tested: 18.12.04
Checked by:
Date checked:



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Authorised Signatory:

D. B. S. K. E.
30/12/04



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JOB No. 2113283

REPORT No. 13027

Ref: F:\NATA\LAB\ARTAR\BUE

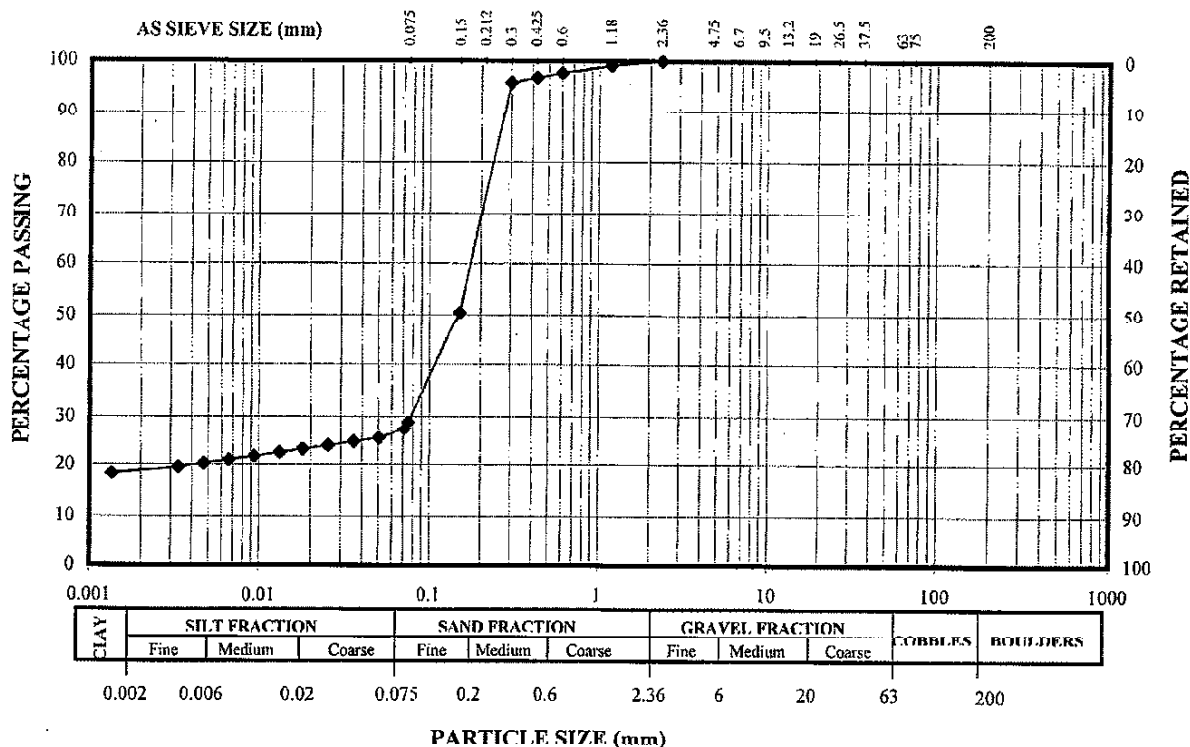
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 30
Depth: 0.0 - 0.5A
Sample No: 3666/151

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/3
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289 3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

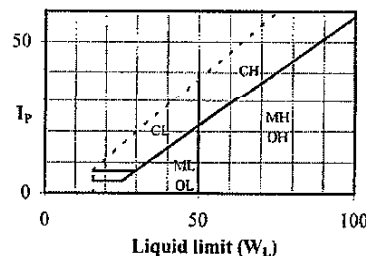
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.12.04
Checked by: *[Signature]*
Date checked:



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JOB No. 2113283

REPORT No. 12953

Ref: P:\SW\TIL-LAB\STARTS\IEVE

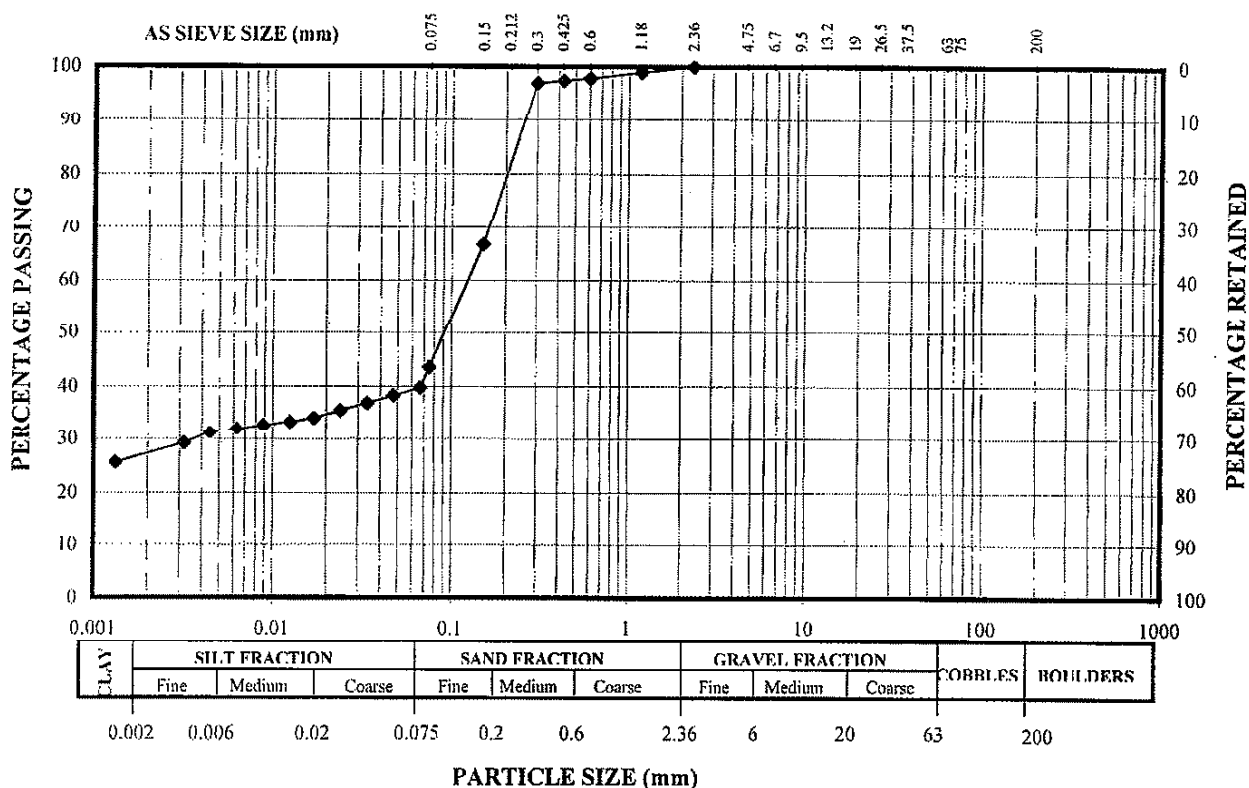
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ30
Depth: 0.5 - 1.0A
Sample No: 3666/152

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/5
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

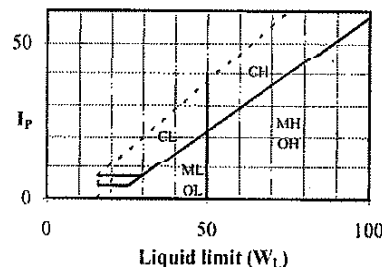
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 13.12.04
Checked by: *GV*
Date checked: 17.12.04



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Authorised Signatory:

[Signature]
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JOB No.

2113283

REPORT No.

129/0

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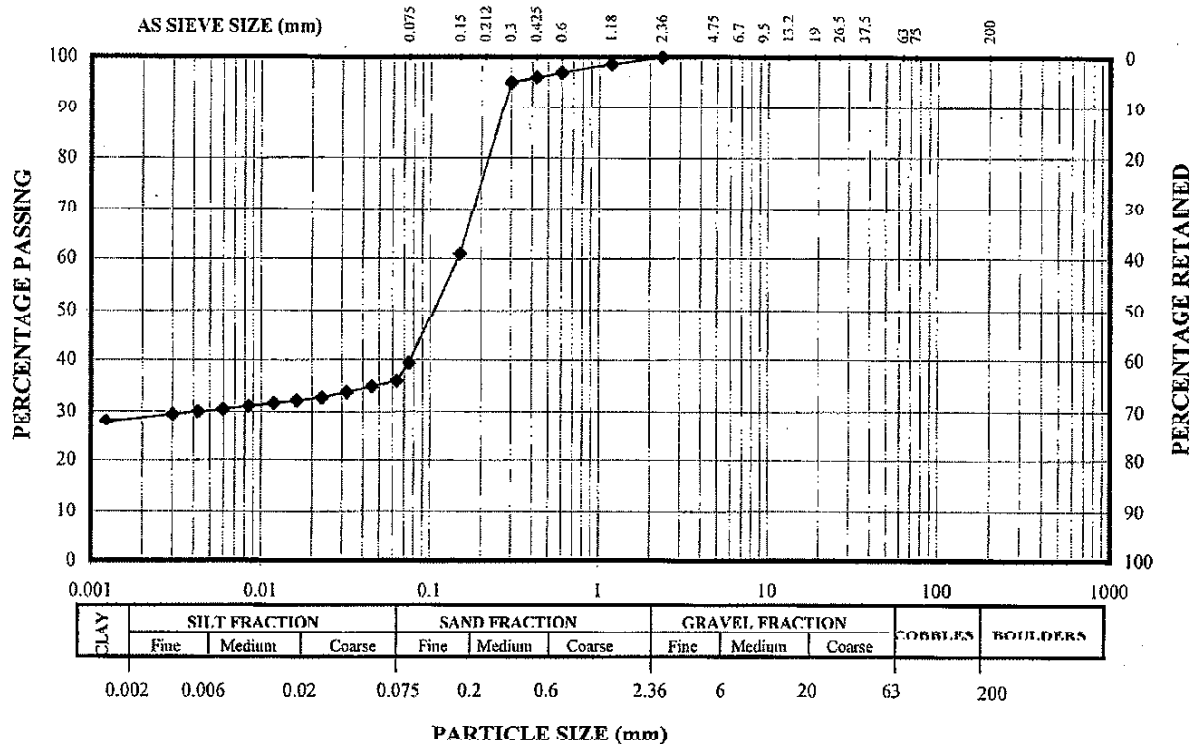
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 31
Depth: 0.0 - 0.5A
Sample No: 3666/149

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289 3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

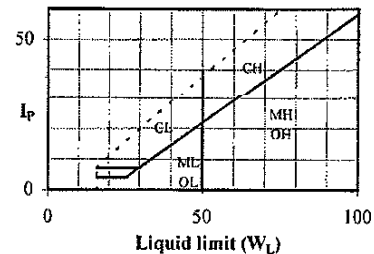
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A

Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.12.04
Checked by: A
Date checked:



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Authorised Signatory:

[Signature]
OBLOONE
15/12/04



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JOB No. 2113283

REPORT No. 12954

SEE P. SWITELL LAB START SHEET

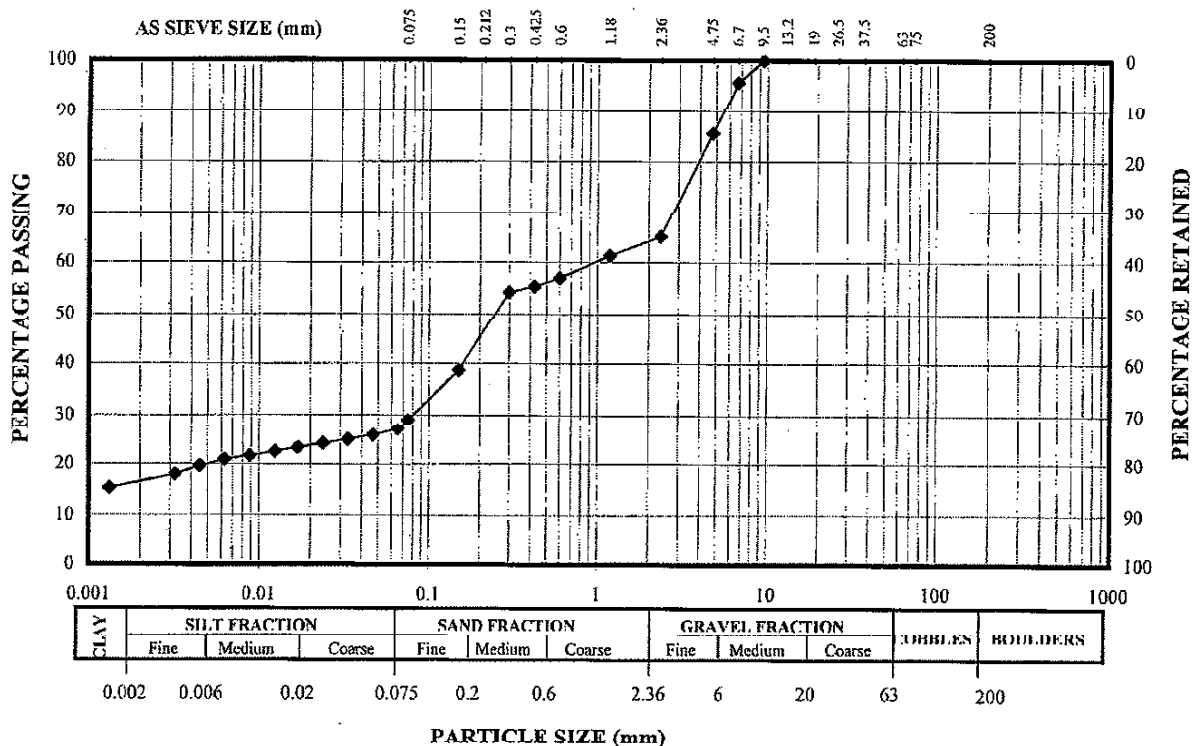
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 31
Depth: 0.5 - 1.0A
Sample No: 3666/150

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/2
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.62 (measured)

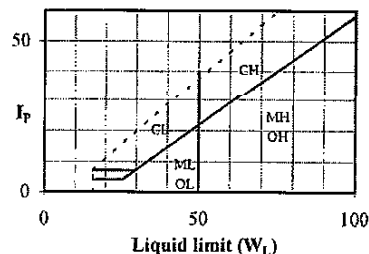
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Gravelly SAND with clay & silt

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.12.04
Checked by:
Date checked: 15/12/04



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Authorised Signatory:

15/12/04



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JOB No. 2113283

REPORT No. 12955

Ref: P25W17/LAB-START/SIEVE

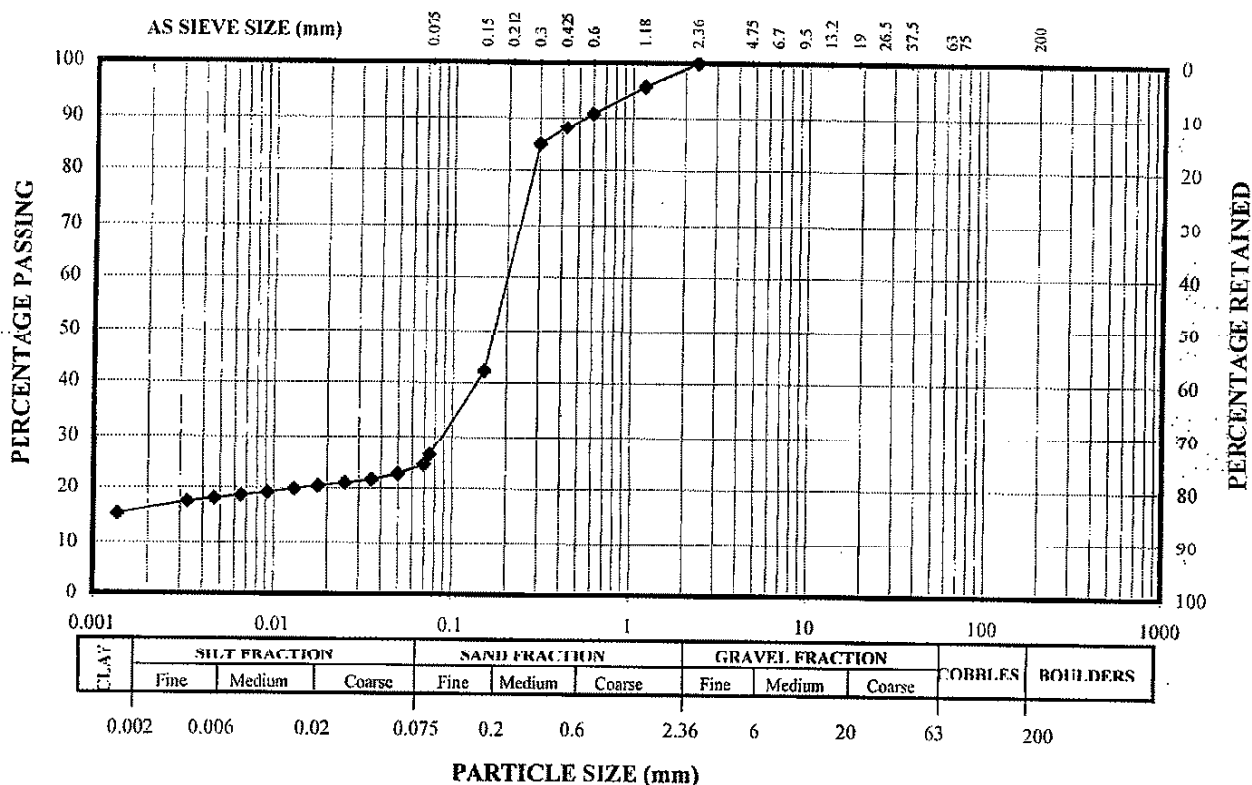
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ32
Depth: 0.0 - 0.5A
Sample No: 3666/173

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/26
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

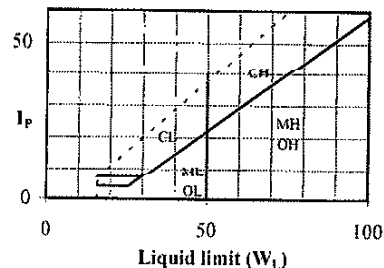
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by: *gk*
Date checked: 17.12.04



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Tel: 9462 4700 Fax: 9462 4710

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JOB No. 2113283

REPORT No. 17991

Ref: F010711-LAB/STANDARD/SHEE

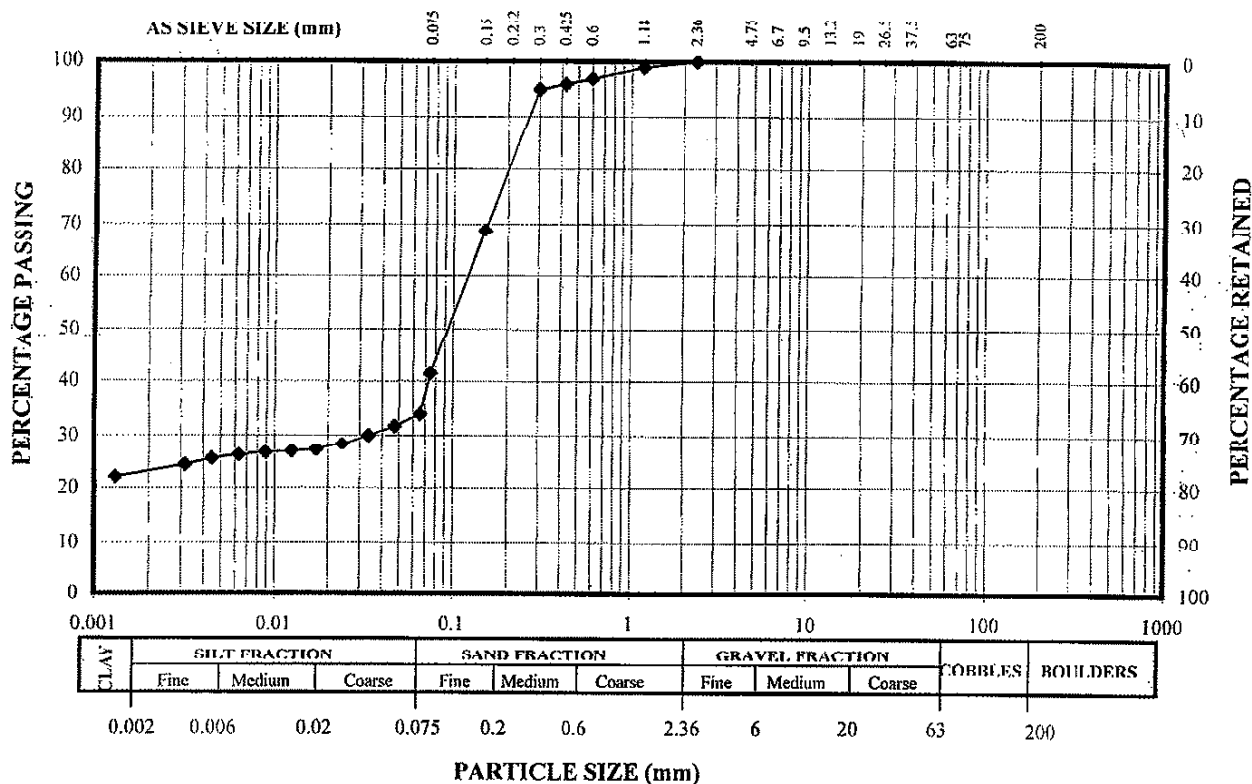
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ32
Depth: 0.5 - 1.0A
Sample No: 3666/174

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/27
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

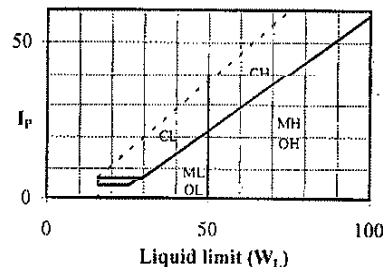
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by: *GV*
Date checked: 17.12.04



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JOB No. 2113283

REPORT No. 12992

Ref: F:\SW\TIL\LAB\START SEVE

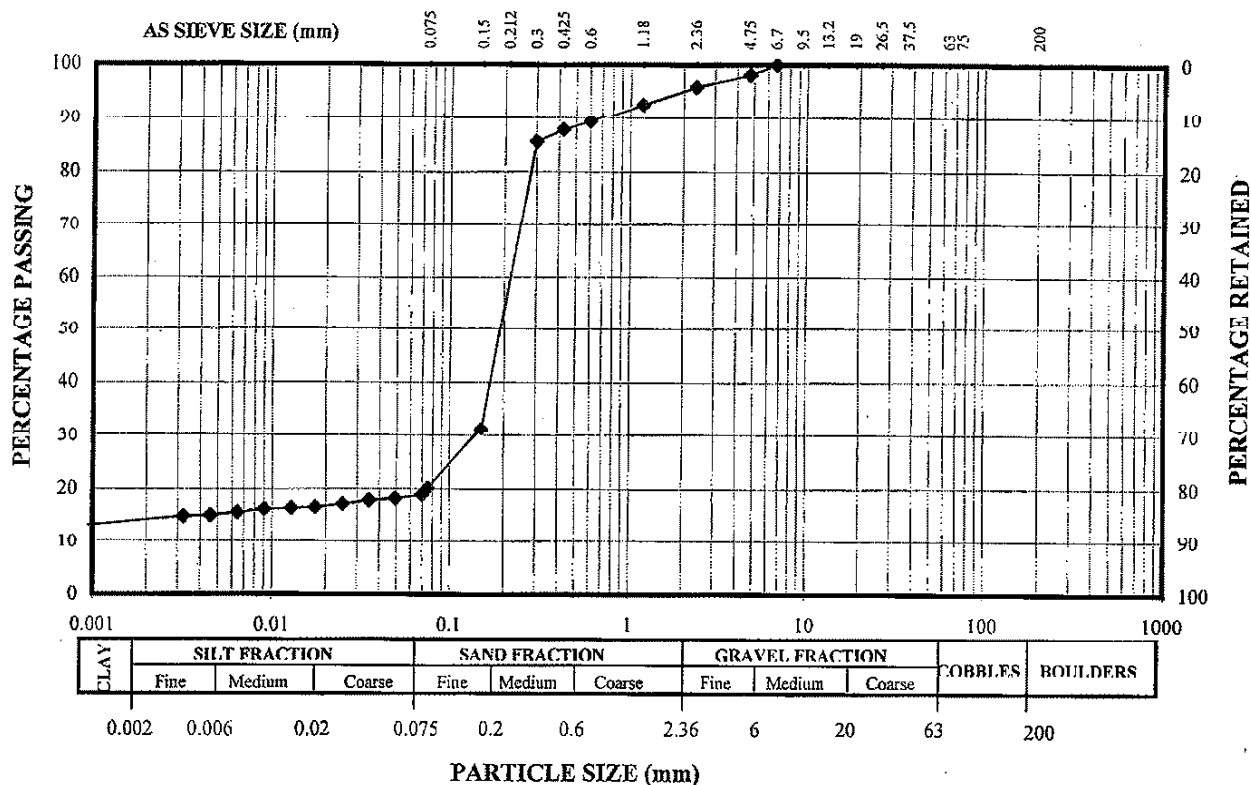
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ33
Depth: 0.0 - 0.5A
Sample No: 3666/118

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911B/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

INDEX PROPERTIES (%)

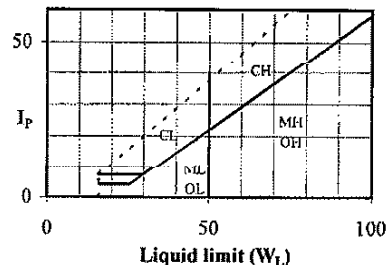
Liquid Limit = N/A Plastic Limit = N/A

Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1380

Tested by: SMEC
Date tested: 18.12.04
Checked by: *BS*
Date checked:



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JOB No. 2113283

REPORT No. 13028

Ref: FSWUTLABSTART-SIEVE

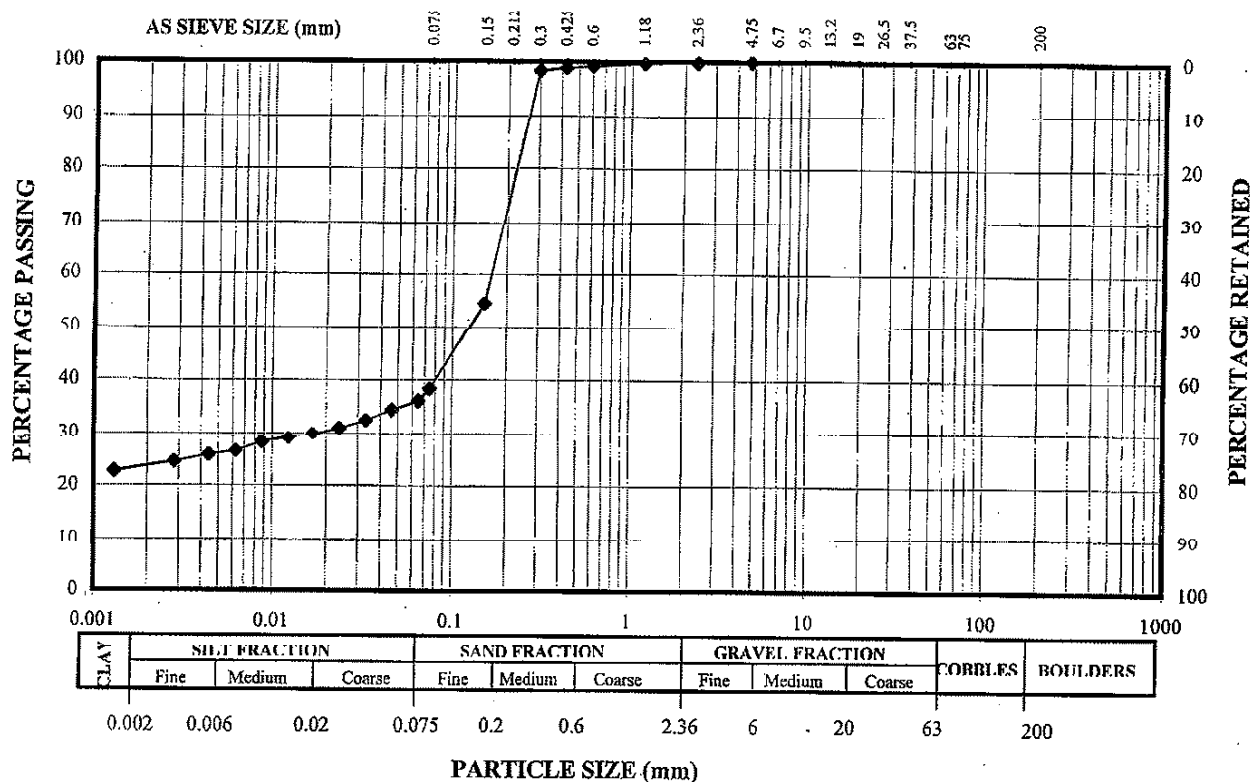
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ33
Depth: 0.5 - 1.0A
Sample No: 3666/105

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/911A/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

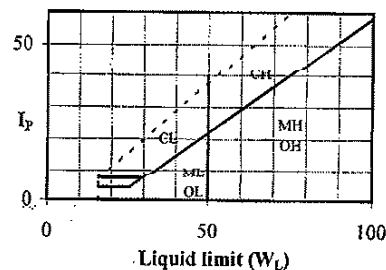
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1367

Tested by: SMEC
Date tested: 13.12.04
Checked by:
Date checked:



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JOB No. 2113283

REPORT No. 13015

REGISTRATION LABS STARTS 2004

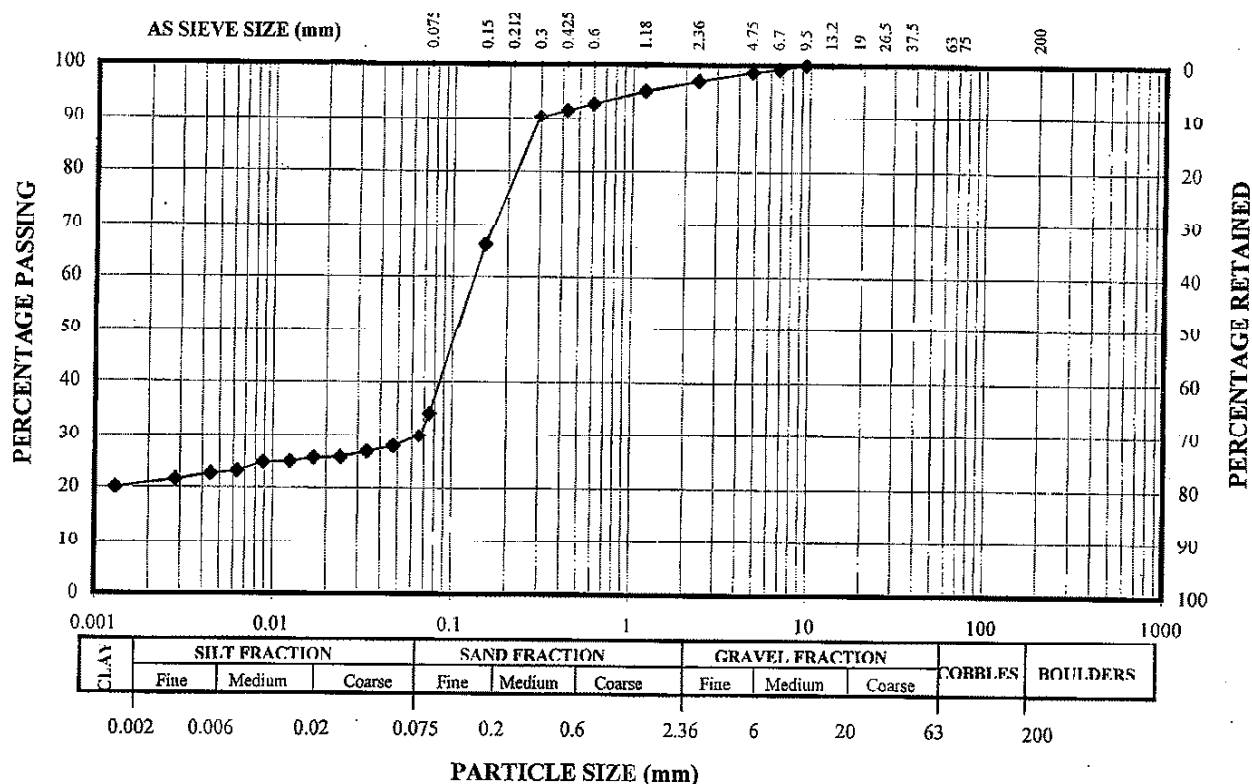
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ34
Depth: 0.0 - 0.5A
Sample No: 3666/106

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/2
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

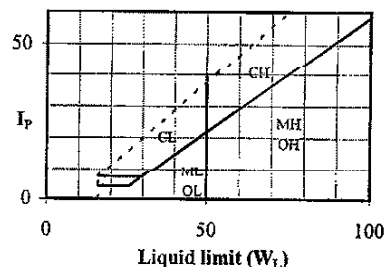
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1368

Tested by: SMEC
Date tested: 13.12.04
Checked by: *AS*
Date checked:



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AS
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JOB No. 2113283

REPORT No. 13016

Ref: F:\NUTEL\LABS\STARTSIEVE

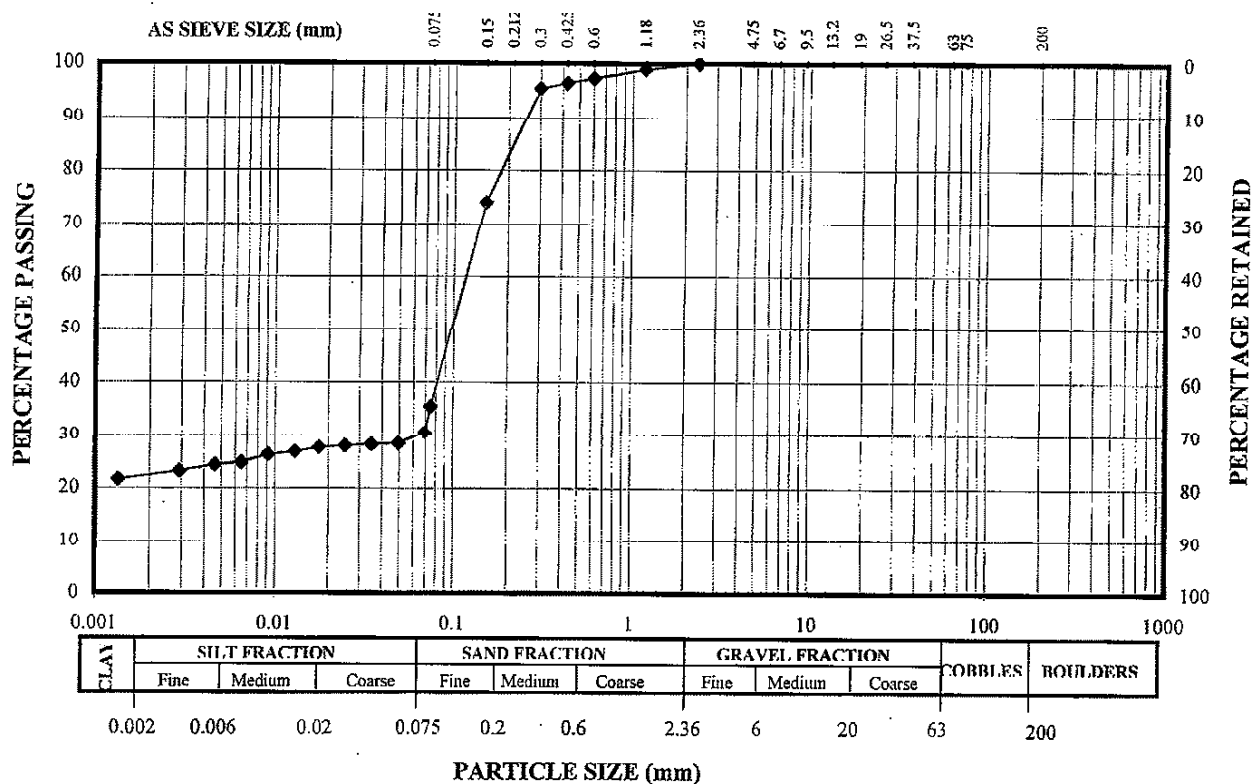
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ34
Depth: 0.5 - 1.0A
Sample No: 3666/107

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/3
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

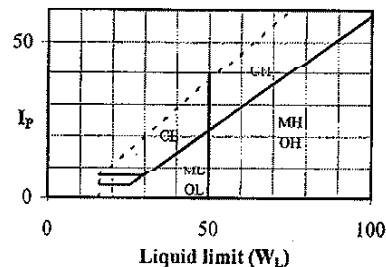
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1369

Tested by: SMEC
Date tested: 13.12.04
Checked by: *JB*
Date checked:



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JOB No. 2113283

REPORT No. 13017

Ref: PSWUTLAD STARTSHEE

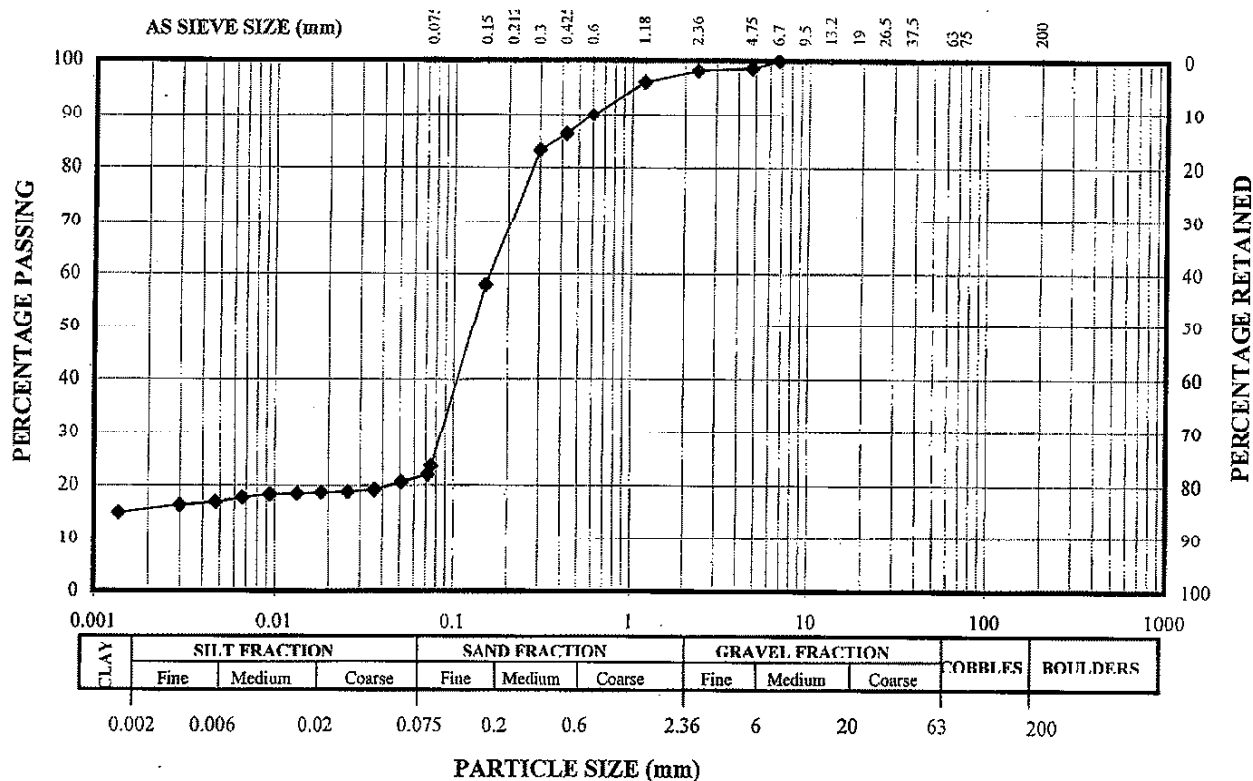
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ34
Depth: 1.0 - 2.0A
Sample No: 3666/108

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/A
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

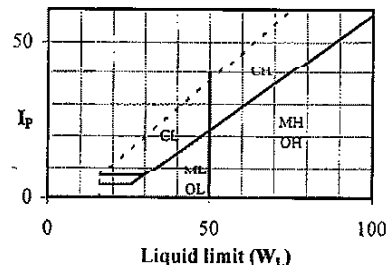
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1370

Tested by: SMEC
Date tested: 13.12.04
Checked by: *DS*
Date checked:



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DR DOONE
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JOB No. 2113283

REPORT No. 13018

Ref: FNSWUTILLABSTARTSIEVE

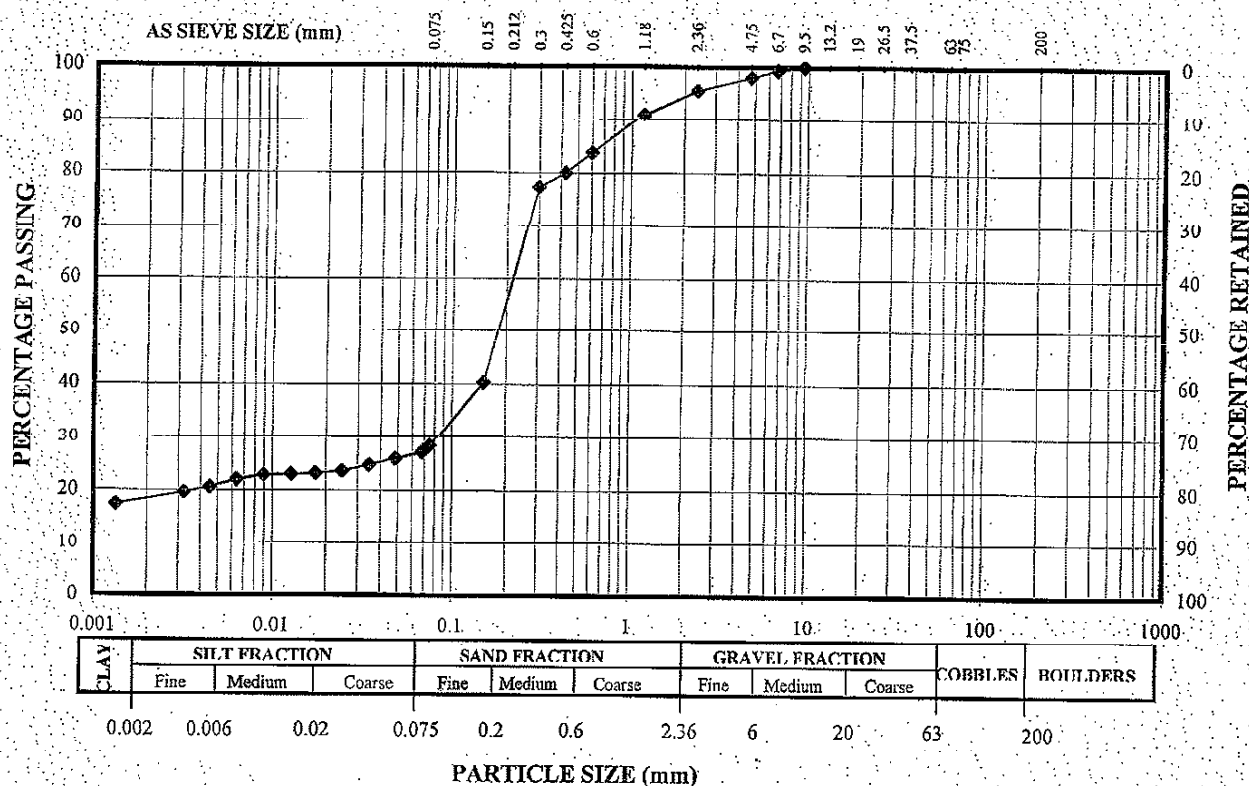
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ3J
Depth: 0.0 - 0.5A
Sample No: 3666/352

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0963/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.7 (assumed)

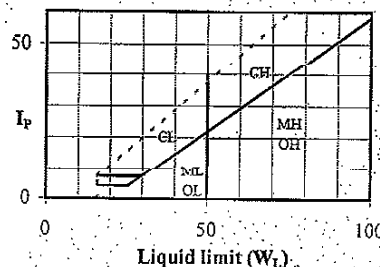
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: DB
Date tested: 18.01.05
Checked by:
Date checked:



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JOB No. 2113283

REPORT No. 13163

Ref: PSWUTELABS/STARS/REV1

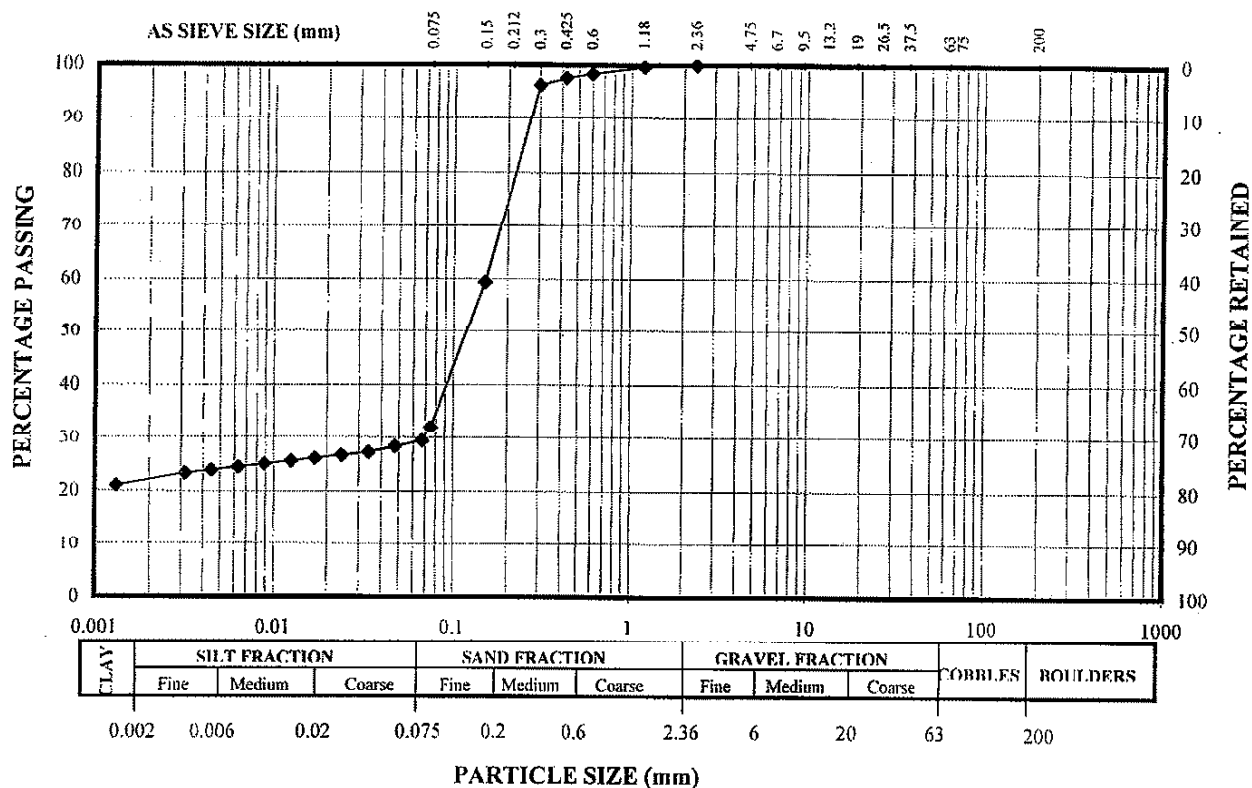
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ35
Depth: 0.5 - 1.0A
Sample No: 3666/153

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/6
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = (D_{30}^2 / (D_{10} \times D_{60})) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

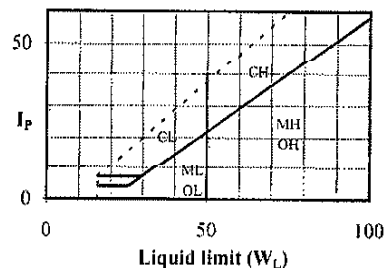
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 13.12.04
Checked by: *BB*
Date checked: 17.12.04



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Authorised Signatory:

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JOB No. 2113283

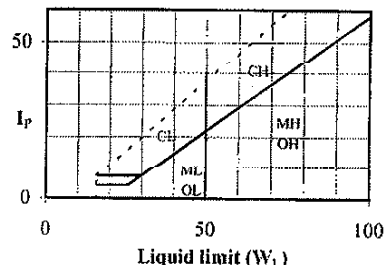
REPORT No. 12971

REF: SW/011/LAB/STANDARD/SIEVE

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Trial Hole:	PCQ36
Depth:	0.0 - 0.5A
Sample No:	3666/156

Client Sample No.: A04/0962/9
Sample History: Supplied by Client



REMARKS:



REPORT No.	12974
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Ref. F: SW 711-CAI-START SIEVE

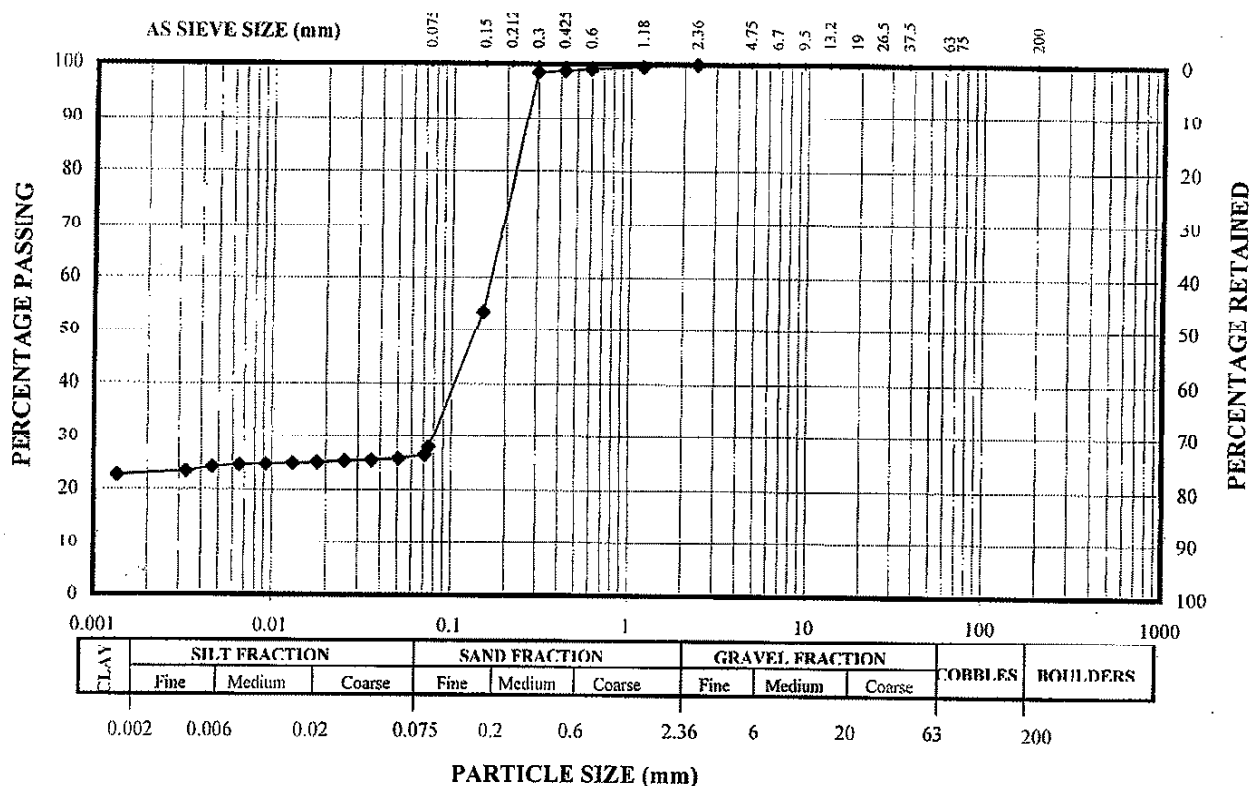
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ36
Depth: 0.5 - 1.0A
Sample No: 3666/157

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/10
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

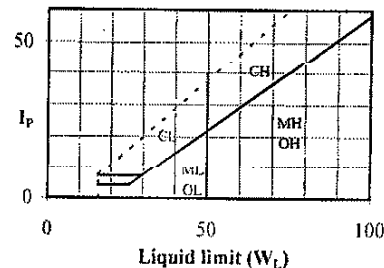
Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable



PARTICLE DENSITY 2.65 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS:

Tested by: GV
Date tested: 13.12.04
Checked by: *GV*
Date checked: 17.12.04



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Tel: 9462 4700 Fax: 9462 4710



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Authorised Signatory:

DBE
2012/04



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JOB No. 2113283

REPORT No. 12975

Ref: P:\AW\T\LAB\STARTS\NIEVE

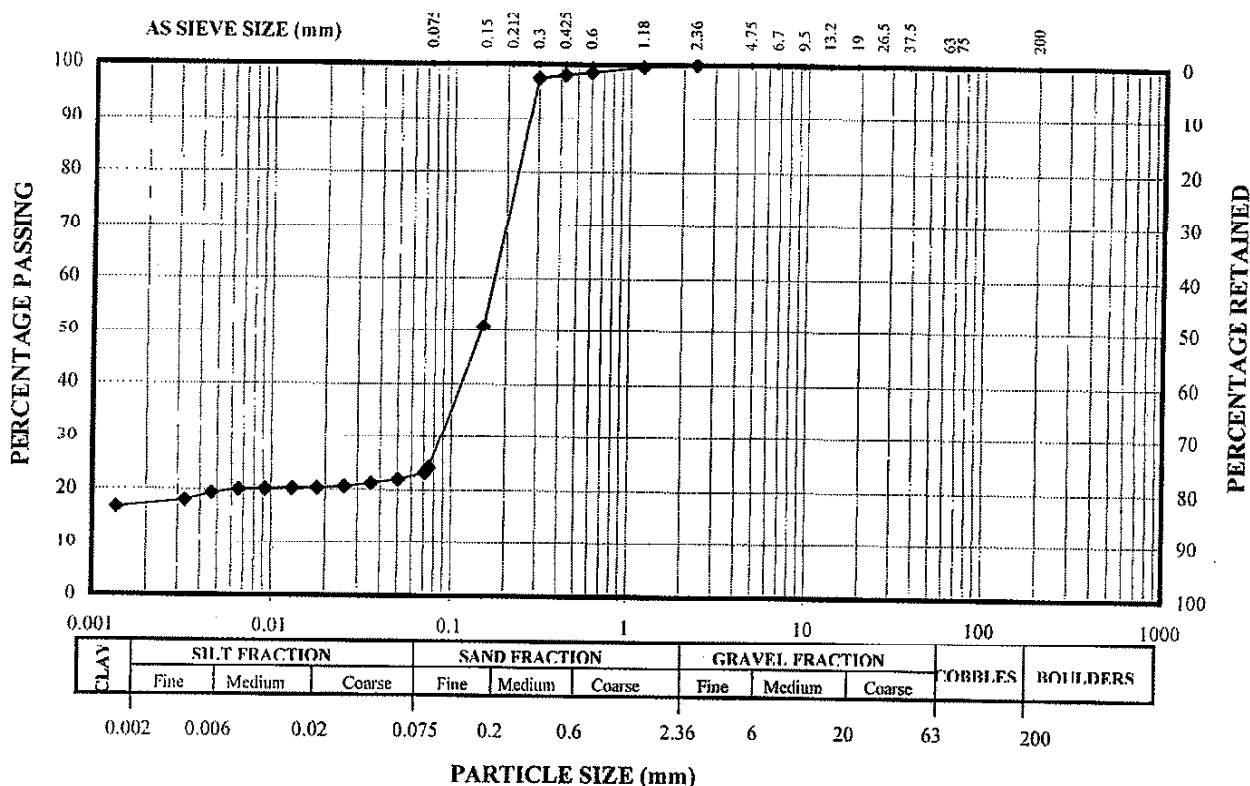
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ36
Depth: 1.0 - 2.0A
Sample No: 3666/158

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/11
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

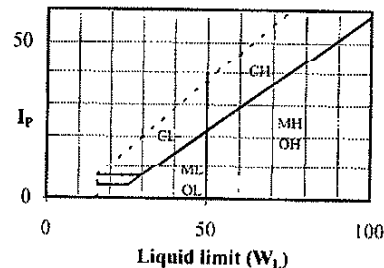
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 13.12.04
Checked by: *GV*
Date checked: 17.12.04



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Tel: 9462 4700 Fax: 9462 4710

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Authorised Signatory:

[Signature]
20/12/04



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JOB No. 2113283

REPORT No. 12976

Ref: FSW/01/CLAS/STAMP/01/01

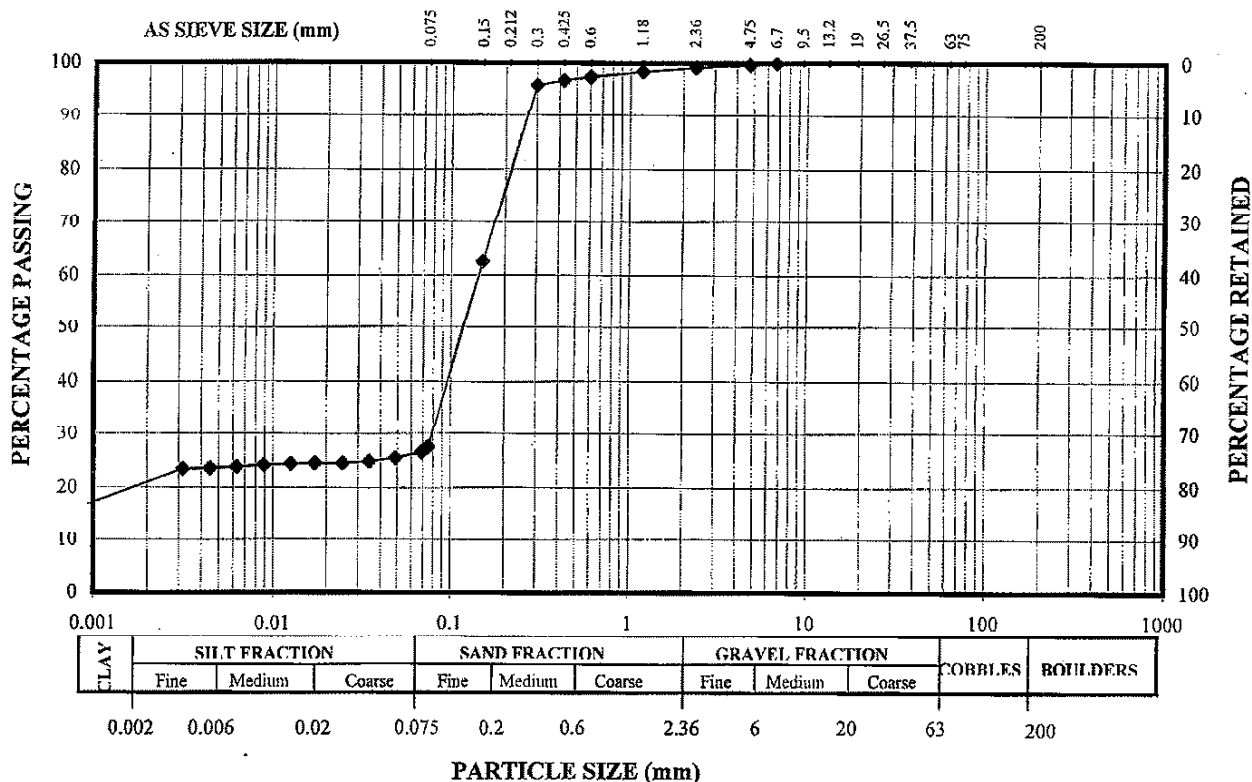
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ37
Depth: 0.0 - 0.5A
Sample No: 3666/119

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911B/2
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{90}) =$ not determinable

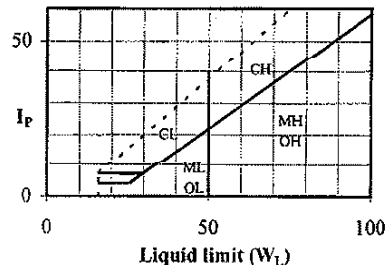
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1367

Tested by: SMEC
Date tested: 18.12.04
Checked by: *DS*
Date checked:



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DS
DS LONGMAC
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JOB No. 2113283

REPORT No. 13029

Ref: FSWUTLAB-START-SIEVE

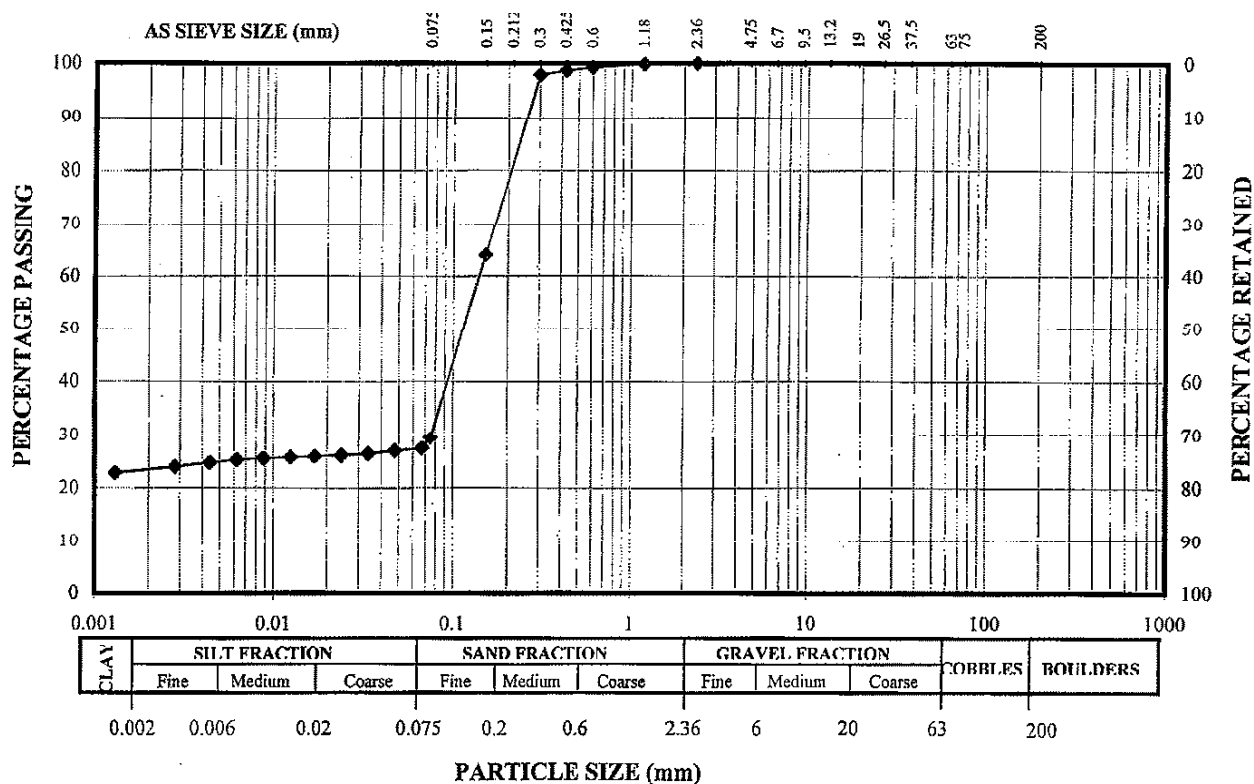
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ37
Depth: 0.5 - 1.0A
Sample No: 3666/109

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/5
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

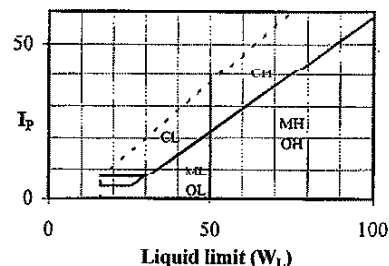
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1371

Tested by: SMEC
Date tested: 13.12.04
Checked by:
Date checked:



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JOB No. 2113283

REPORT No. 13019

Ref: P30WUTL LAB STARTS/REV

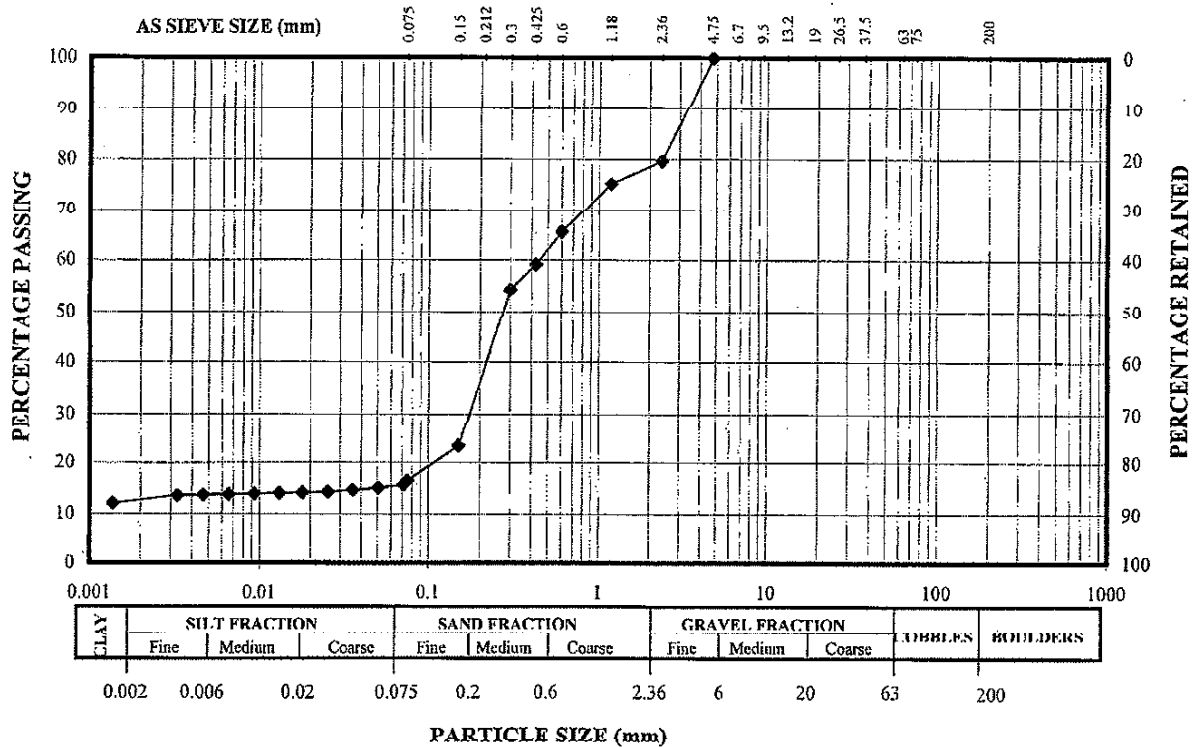
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 38
Depth: 0.0 - 0.5A
Sample No: 3666/137

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/17
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

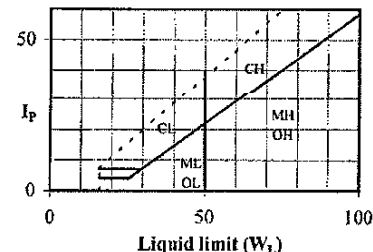
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty SAND with gravel

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:
Date checked: 13/12/04



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JOB No. 2113283

REPORT No. 12936

Ref: F05WUTL LAB-85TAKTSIEVE

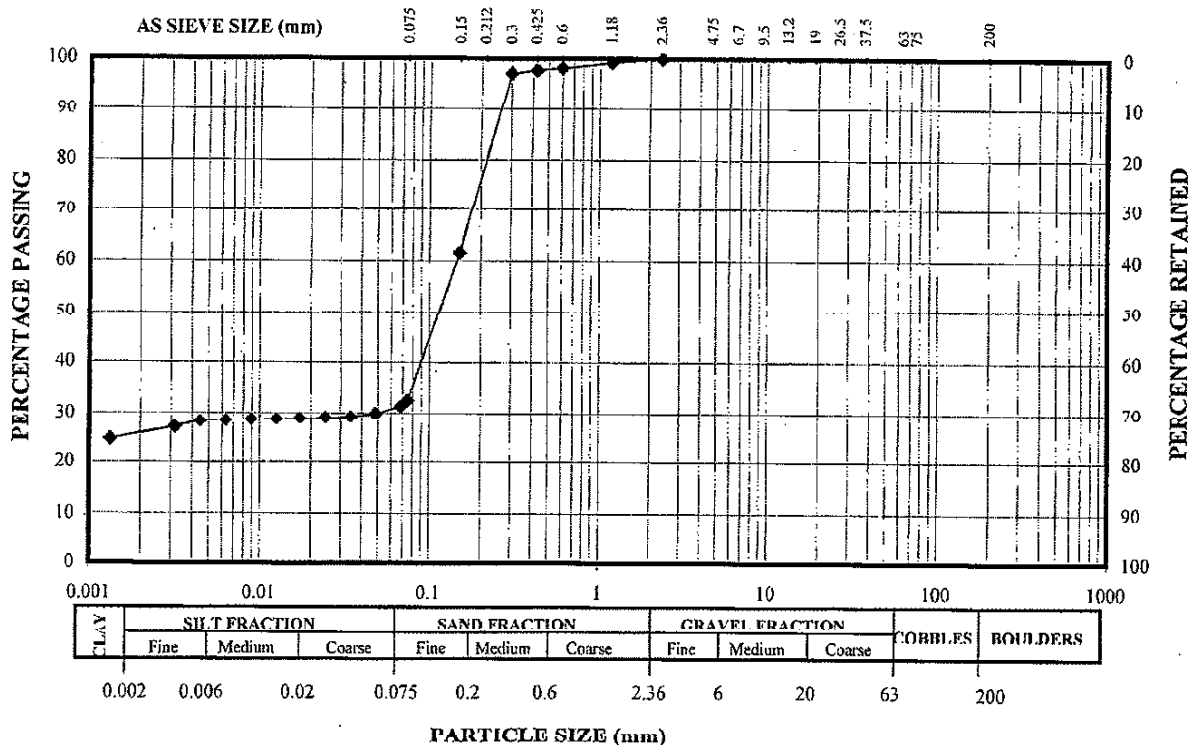
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 38
Depth: 0.5 - 1.0A
Sample No: 3666/138

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/18
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

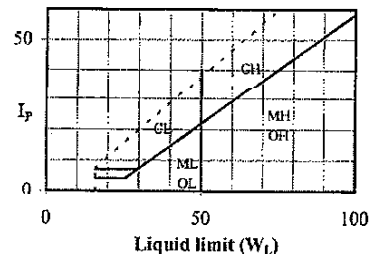
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND with silt

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:
Date checked: 15/12/04



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JOB No. 2113283

REPORT No. 12937

Ref: PHSWUTLABSTARTSIEVE

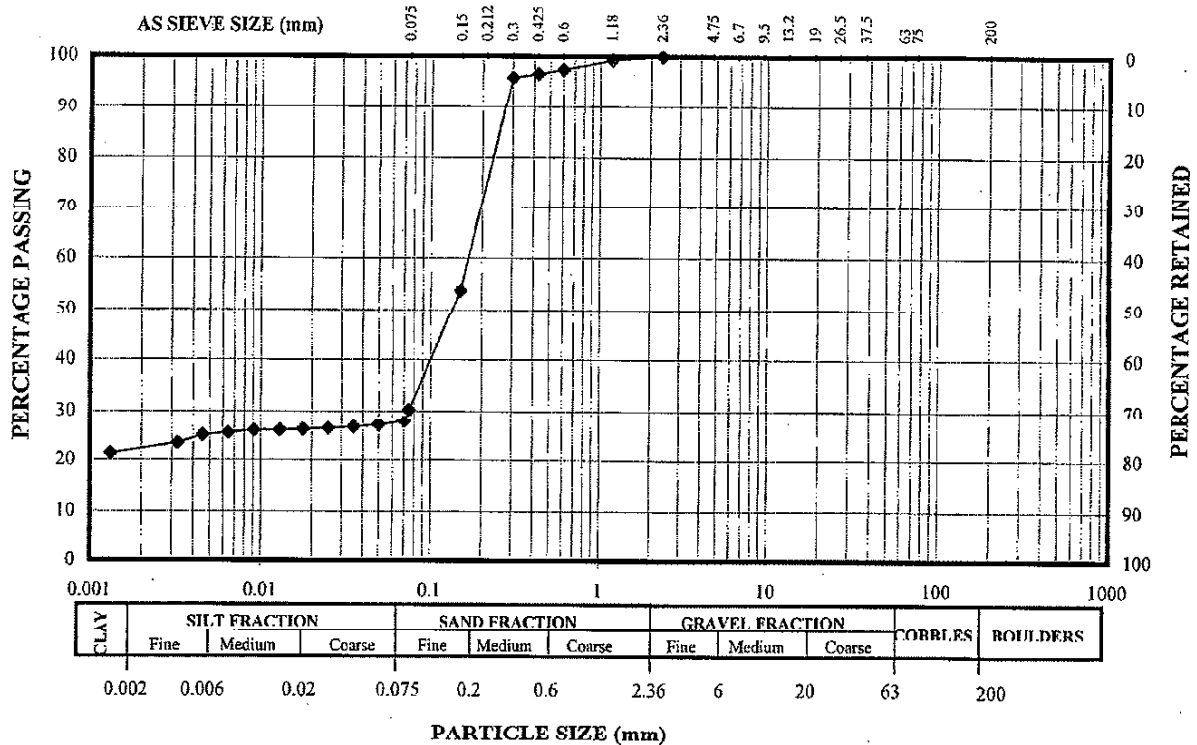
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 38
Depth: 1.0 - 2.0A
Sample No: 3666/139

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/19
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

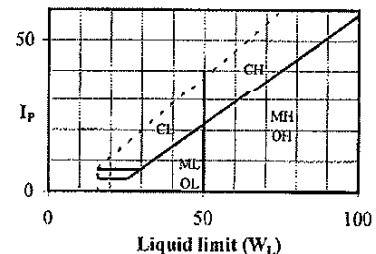
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by: J
Date checked:



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JOB No. 2113283

REPORT No. 12938

Ref: F:\SWUTLAD\START\SIEVE

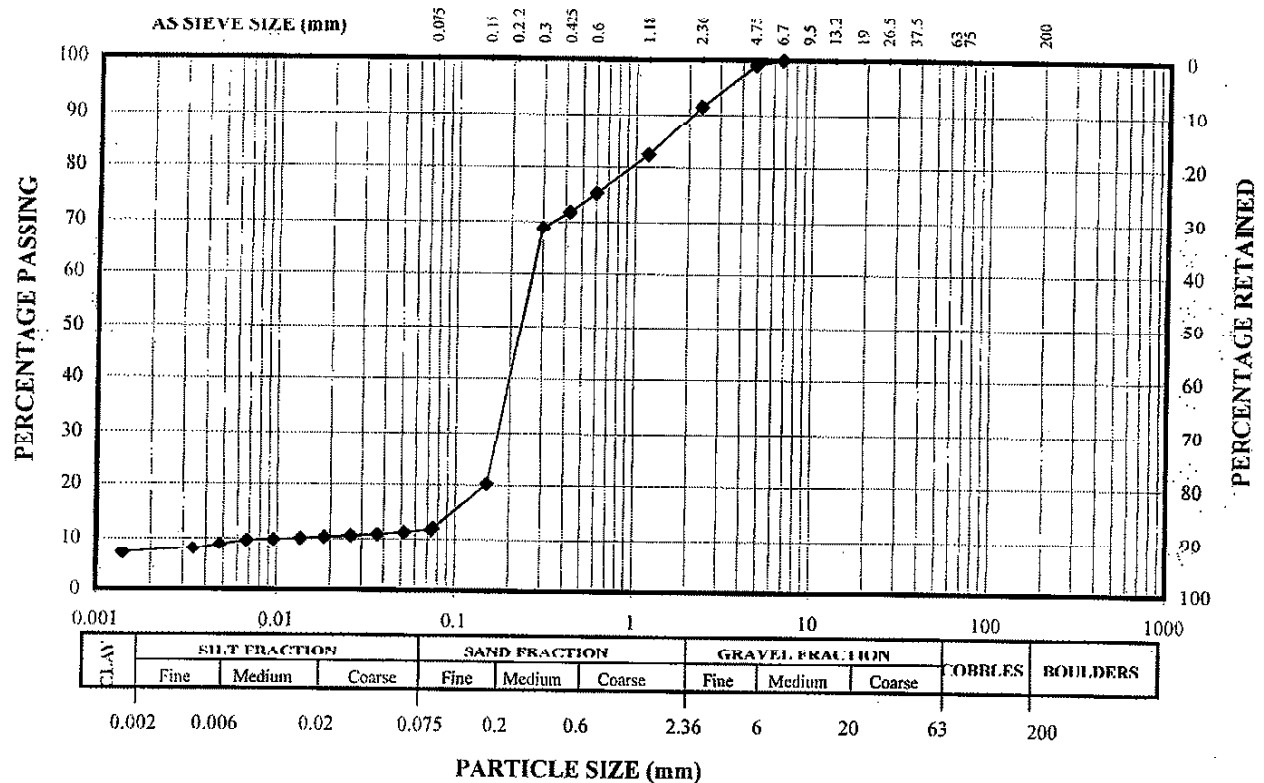
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ39
Depth: 0.0 - 0.5A
Sample No: 3666/171

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/24
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 20.5$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 8.9$$

PARTICLE DENSITY 2.65 (assumed)

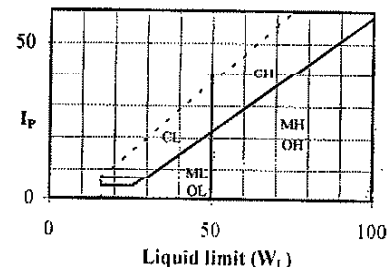
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND with clay

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by: ew
Date checked: 17.12.04



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JOB No. 2113283

REPORT No. 12989

Ref: F:\SW\TTL\LAB\START\SHIVE

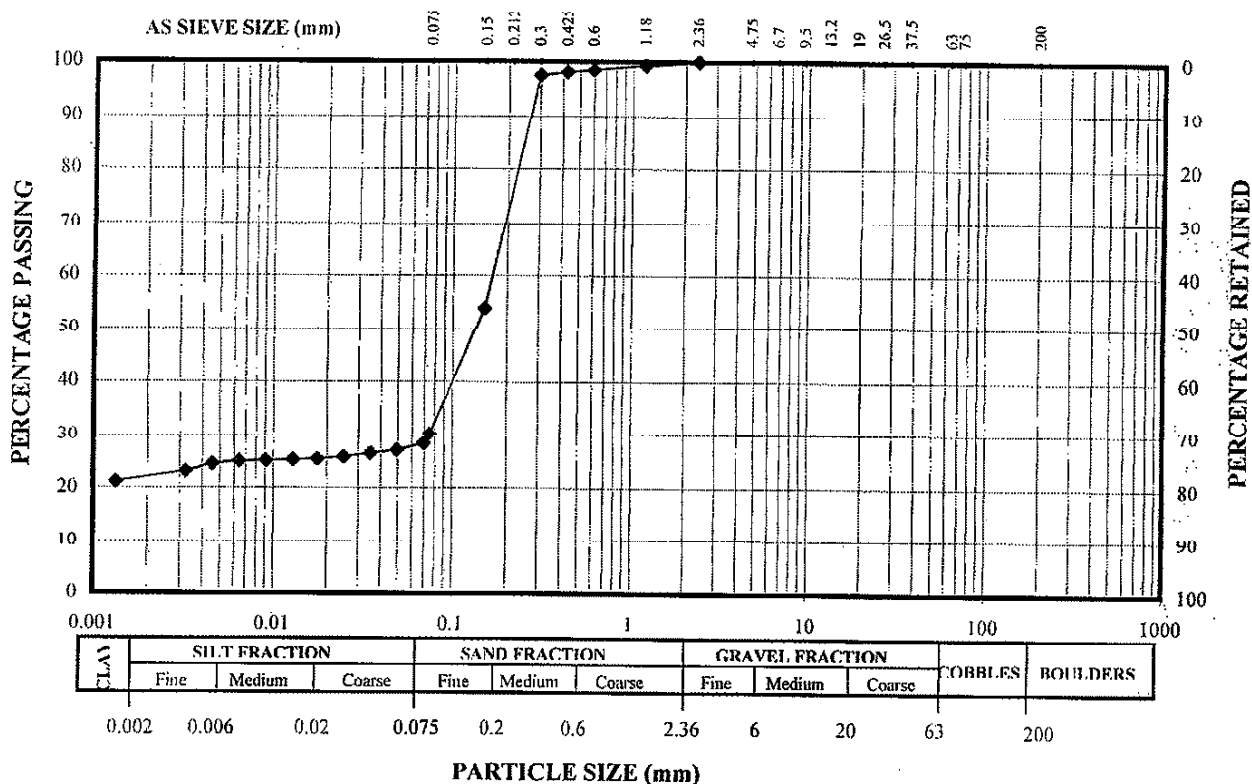
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ39
Depth: 0.5 - 1.0A
Sample No: 3666/172

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/25
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

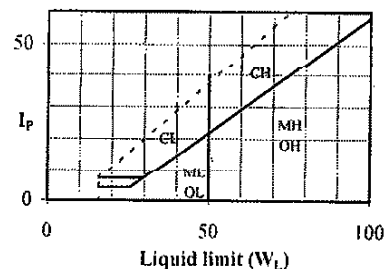
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by: EU
Date checked: 17.12.04



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20/12/04



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JOB No. 2113283

REPORT No. 12990

Ref: F080014/LAB/STANDARD

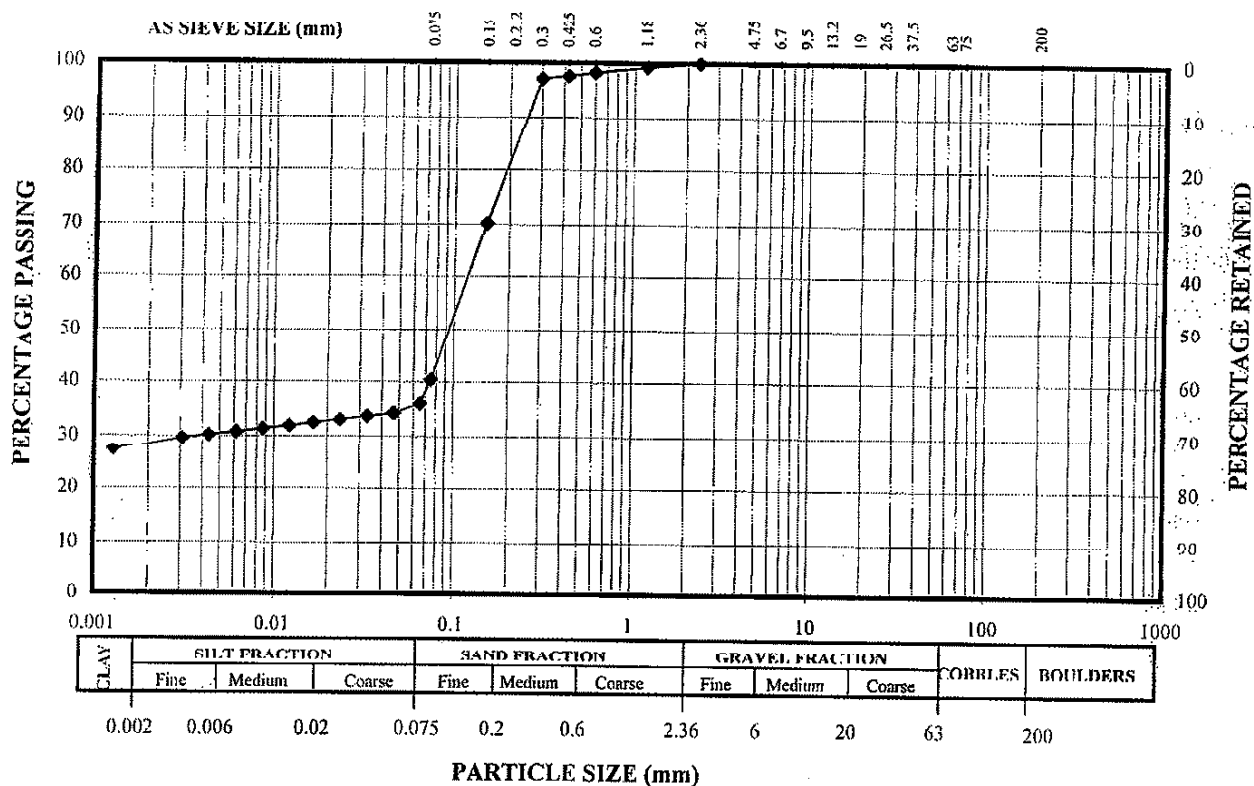
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SOIL CLASSIFICATION REPORT

Trial Hole: PCO40
Depth: 0.0 - 0.5A
Sample No: 3666/175

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/28
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

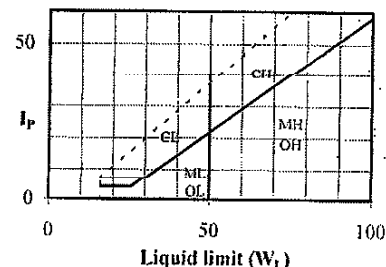
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by: *GV*
Date checked: 17.12.04



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JOB No. 2113283

REPORT No. 12993

Ref: P:\NORTH\LAIS\START\SEVE

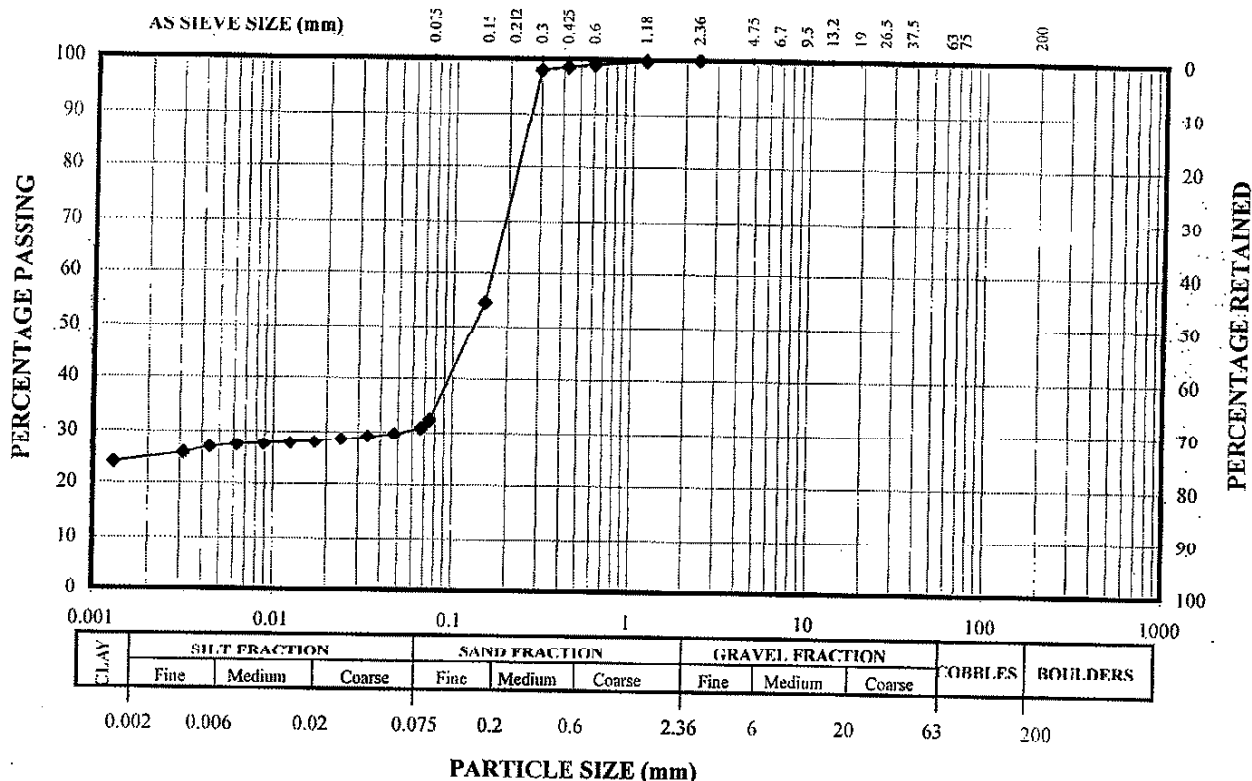
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ40
Depth: 0.5 - 1.0A
Sample No: 3666/176

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0967/79
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

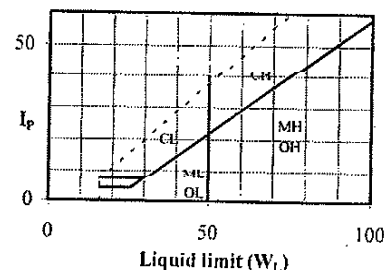
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by: *gh*
Date checked: 17.12.04



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JOB No. 2113283

REPORT No. 12994

Ref: F-SW001/LABSTARY SHEET

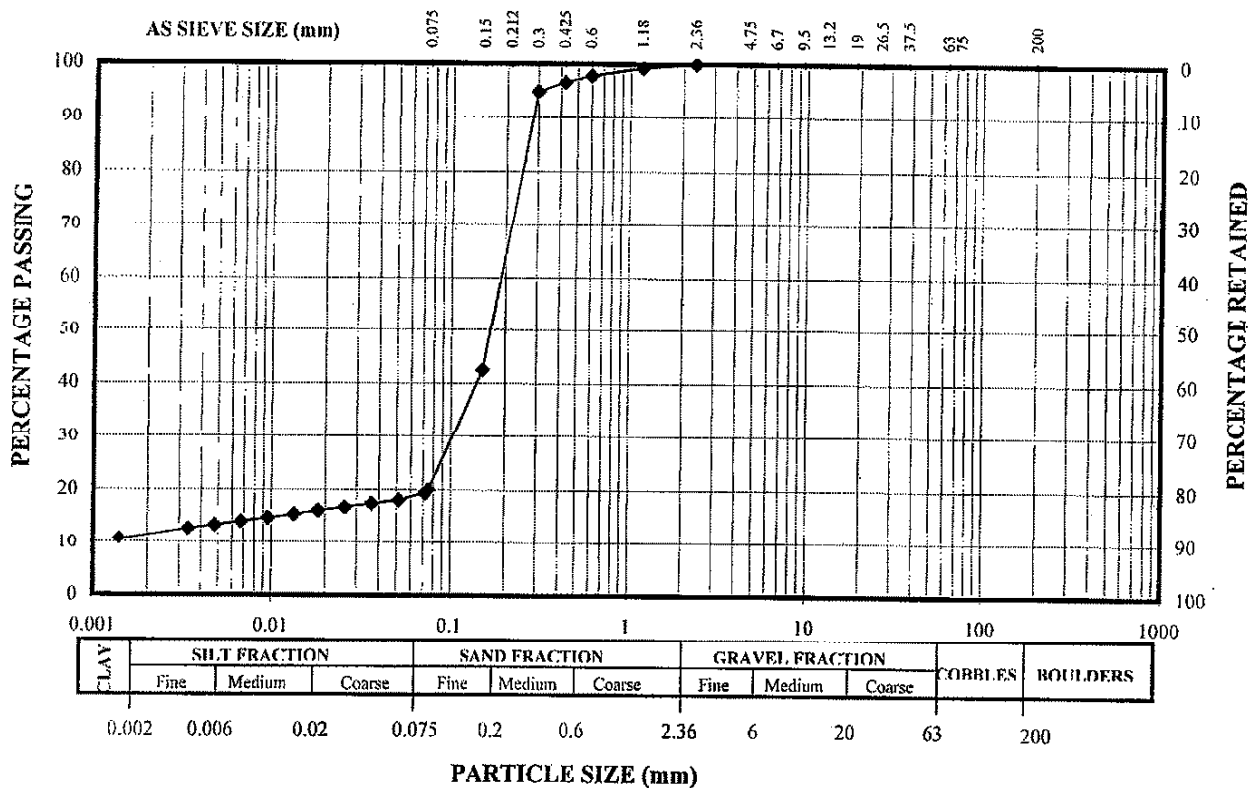
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ41
Depth: 0.0 - 0.5A
Sample No: 3666/154

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/7
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_e = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

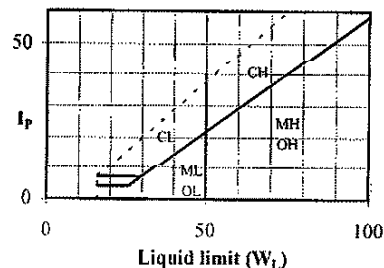
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 13.12.04
Checked by: *gav*
Date checked: 17.12.04



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Debbie
20/12/04



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JOB No. 2113283

REPORT No. 12972

Ref: F:\SWH\ELAB\START\SI\VE

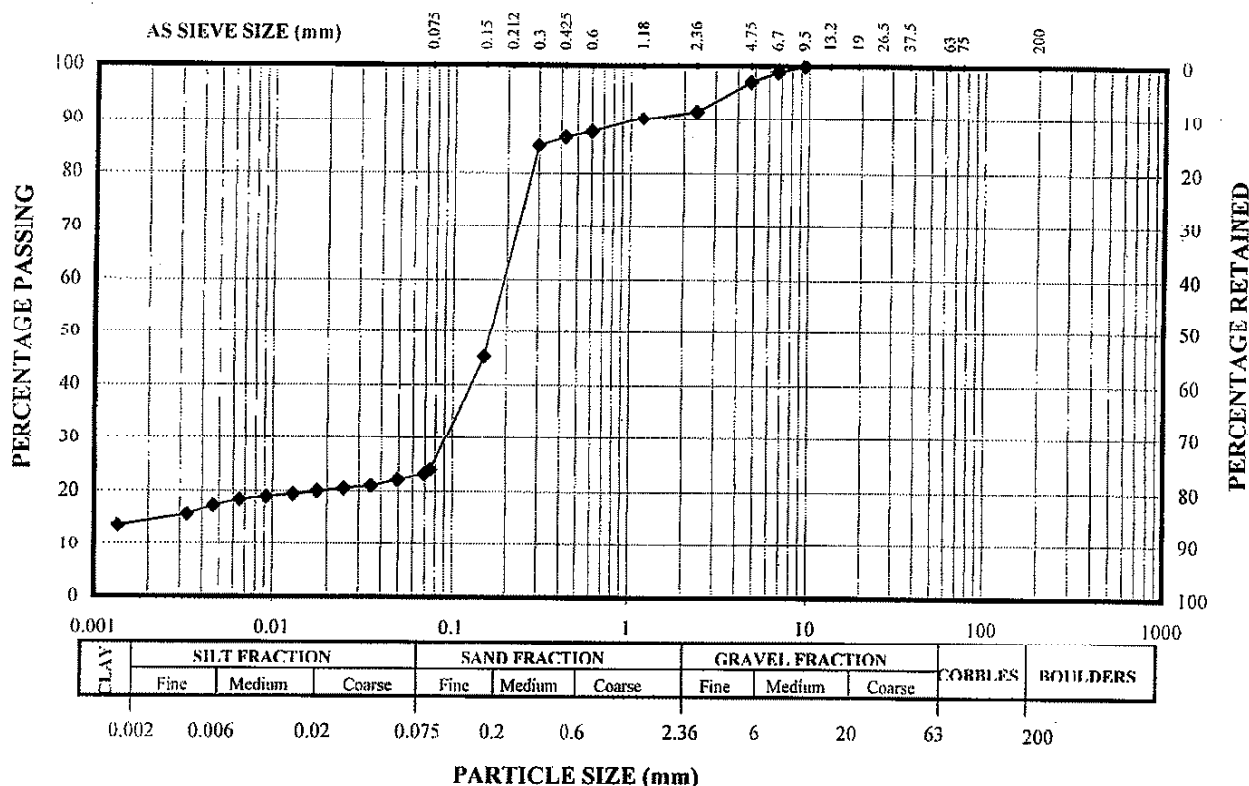
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ41
Depth: 0.5 - 1.0A
Sample No: 3666/155

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/8
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{40}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

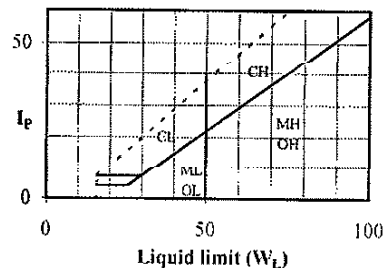
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 13.12.04
Checked by: *GV*
Date checked: 17.12.04



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JOB No. 2113283

REPORT No. 12973

REP: FSWITH LABS/TART NIEVE

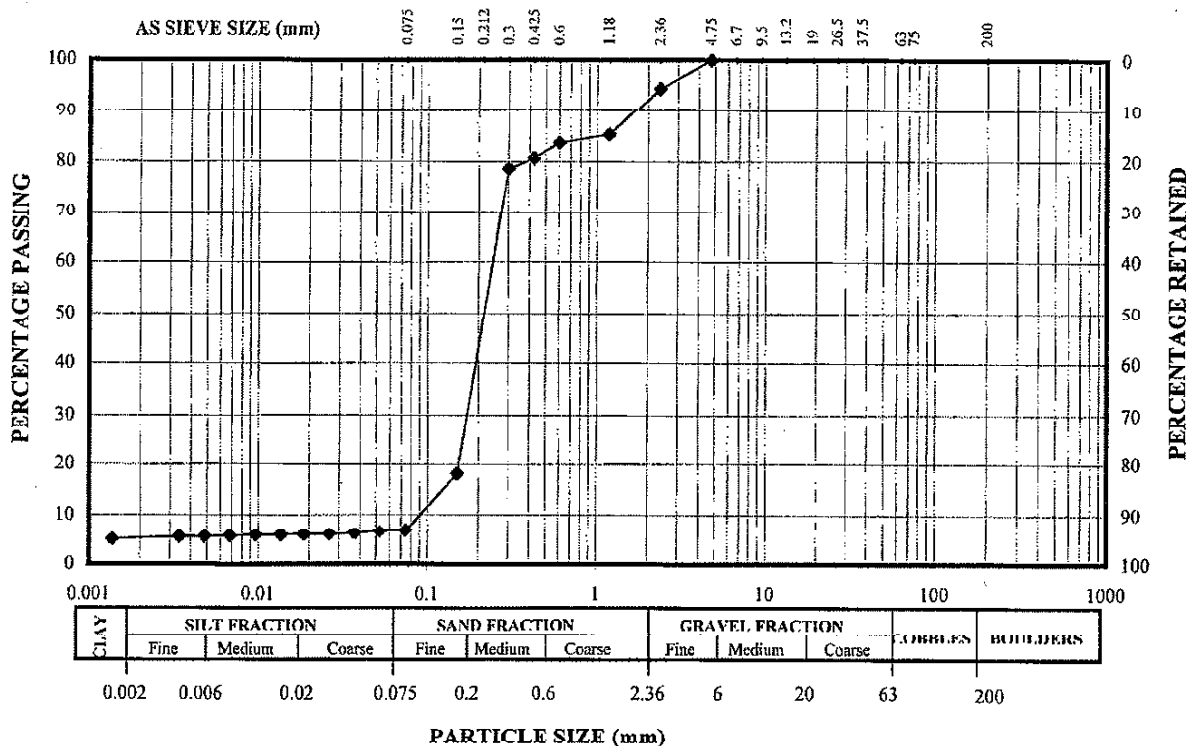
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 42
Depth: 0.0 - 0.5a
Sample No: 3666/146

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0952/2
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 2.7$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 1.3$$

PARTICLE DENSITY 2.72 (assumed)

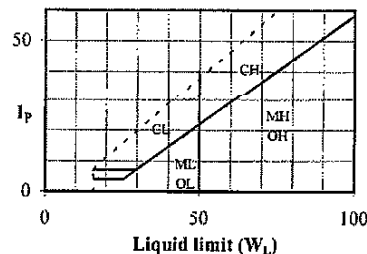
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Gravelly SAND with some silt

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A

Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.12.04
Checked by:
Date checked:



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JOB No. 2113283

REPORT No. 12951

Ref: F-SWATH-LAB-START-SHIEVE

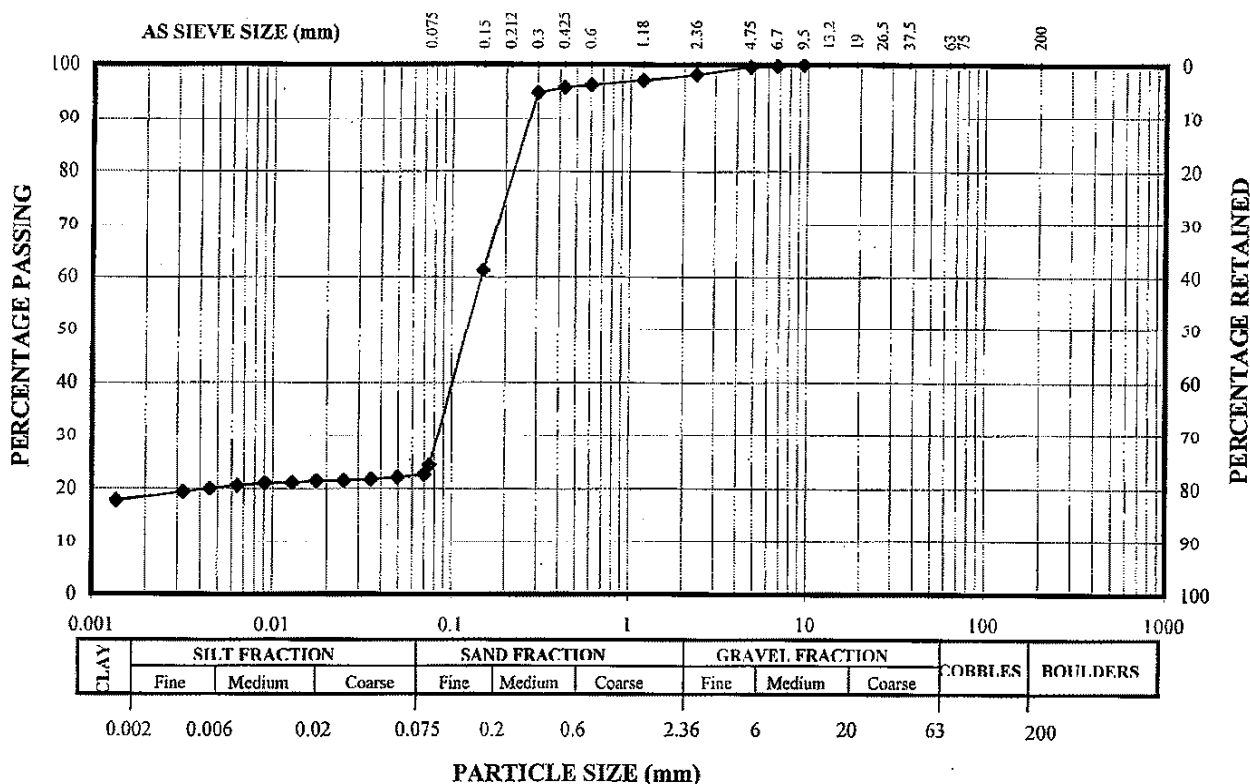
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ42
Depth: 0.5 - 1.0A
Sample No: 3666/124

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/2
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

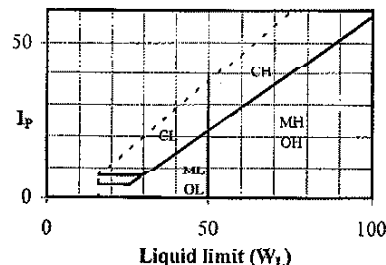
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1368

Tested by: SMEC
Date tested: 22.12.04
Checked by: *DS*
Date checked:



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Tel: 9462 4700 Fax: 9462 4710



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Authorised Signatory:

DS
22/12/04
30/12/04



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JOB No. 2113283

REPORT No. 13035

Ref: F:\SWUT\LAB\START\SI\VE

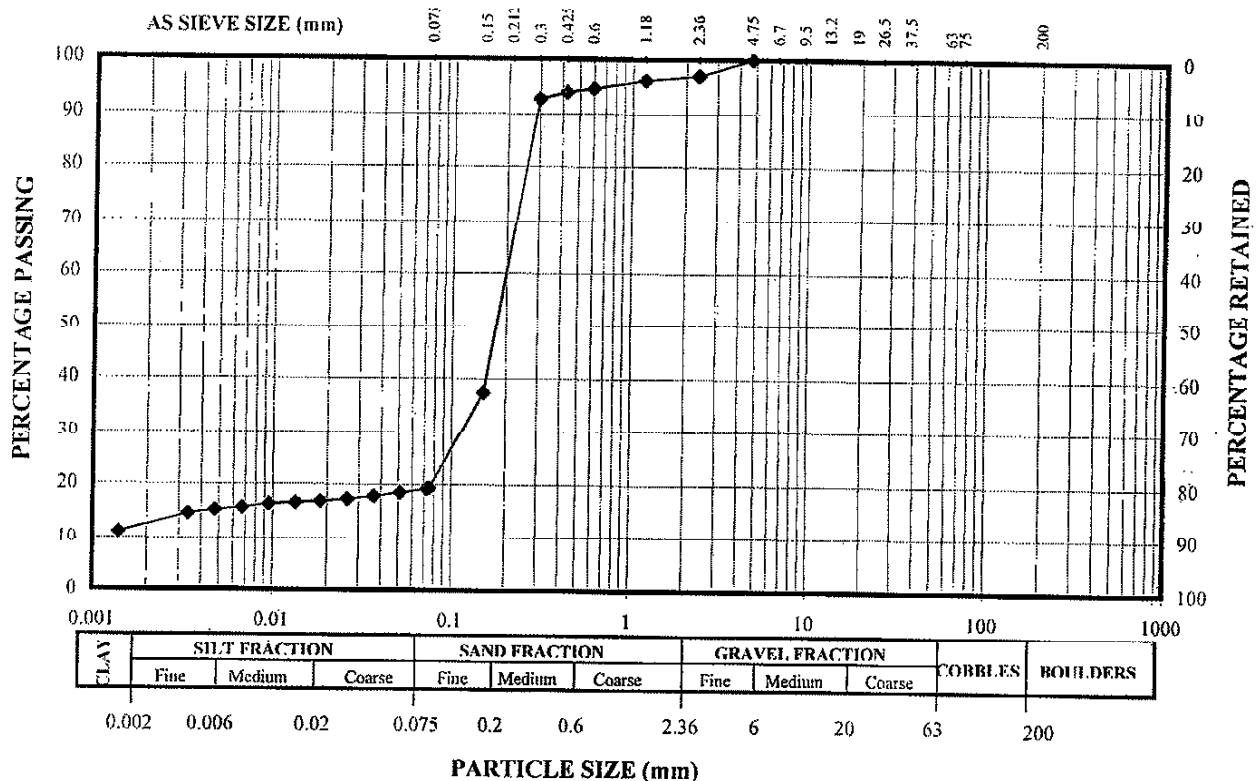
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ43
Depth: 0.0 - 0.5A
Sample No: 3666/164

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/17
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

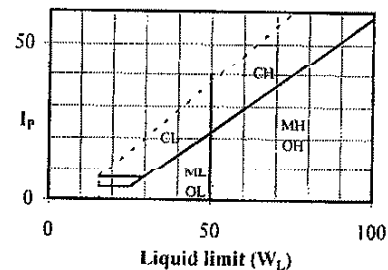
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by: *W*
Date checked: 17.12.04



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[Signature]
D. R. ROSE
20/12/04



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JOB No. 2113283

REPORT No. 12962

Ref: P:SWUTL:LAB:START:STIEVE

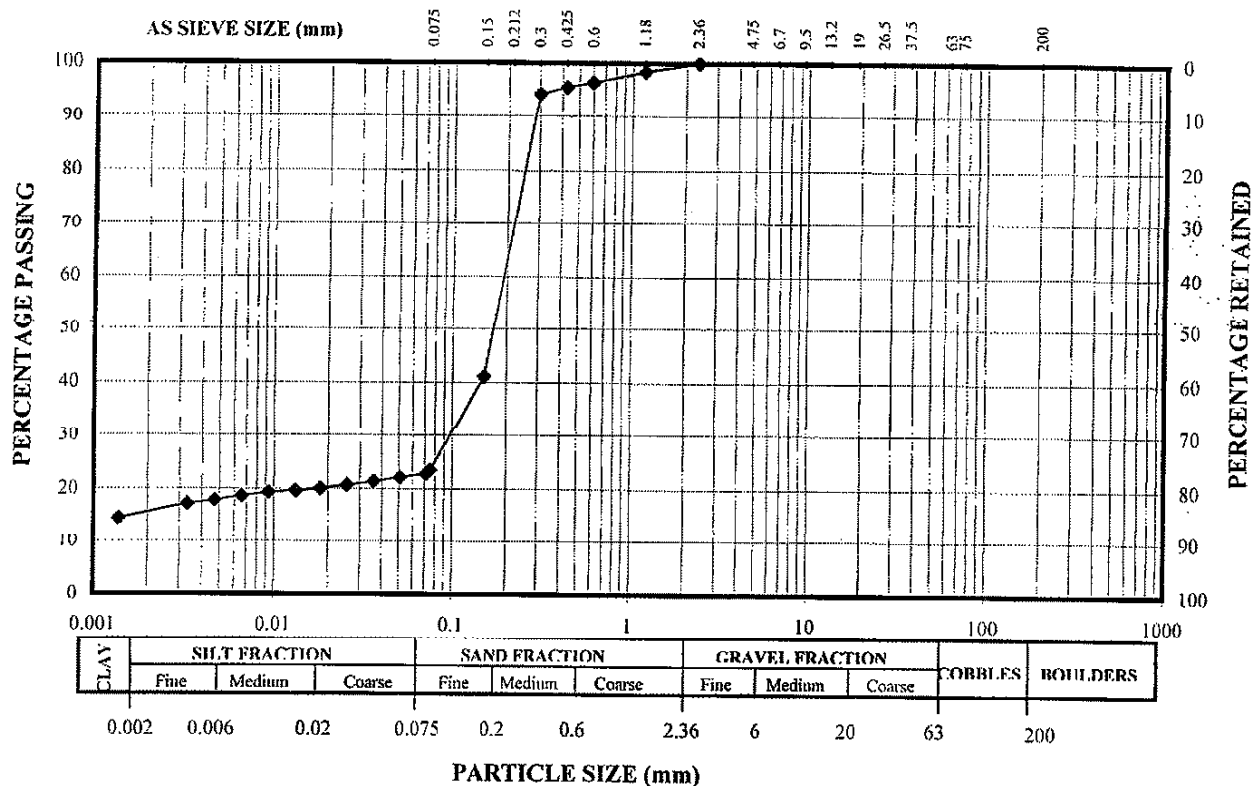
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ43
Depth: 0.5 - 1.0A
Sample No: 3666/165

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/18
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = (D_{30})^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

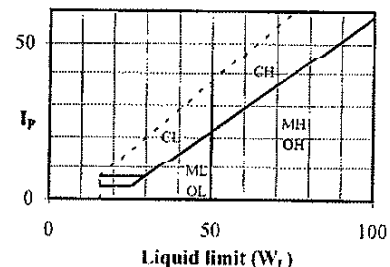
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by: *GV*
Date checked: 17.12.04



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JOB No. 2113283

REPORT No. 12983

Ref: P-2007/12.2-ASISTARTSIEVE

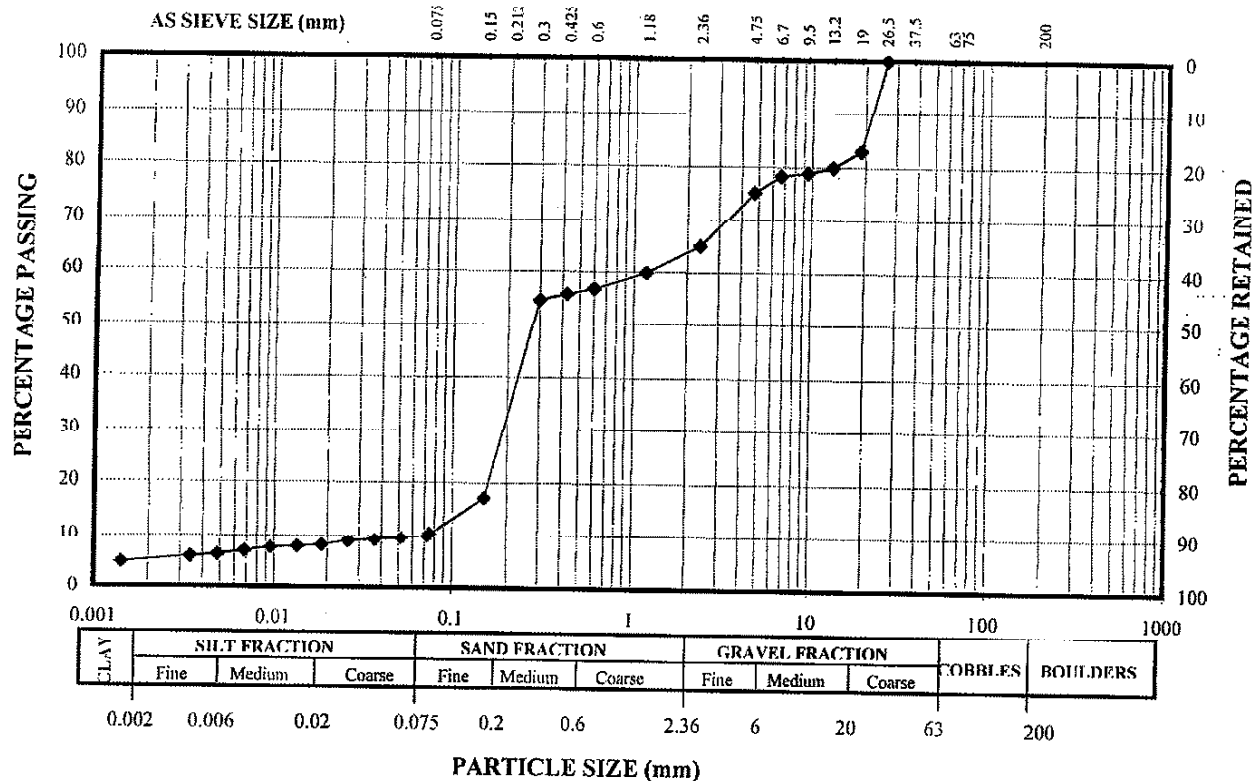
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ43
Depth: 1.0 - 2.0A
Sample No: 3666/166

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/19
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 16.4$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 0.5$$

PARTICLE DENSITY 2.65 (assumed)

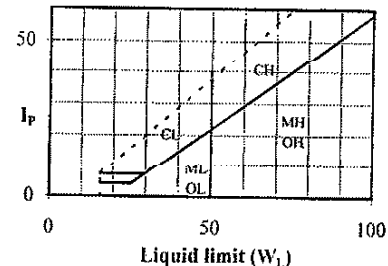
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Gravelly SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by: *GV*
Date checked: 17.12.04

Authorised Signatory:

[Signature]
20/12/04



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JOB No. 2113283

REPORT No. 12984

Ref: P-SW-TL LAB-START-000001

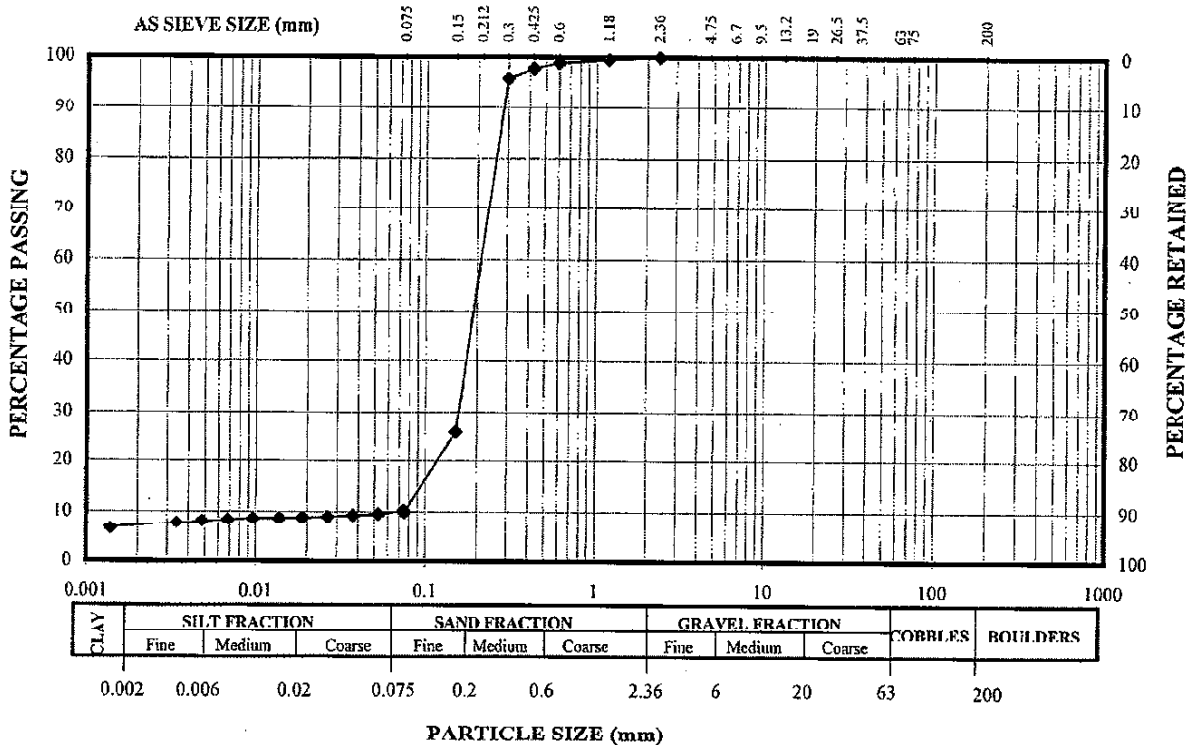
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 44
Depth: 0.0 - 0.5A
Sample No: 3666/143

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/23
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 3.0$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 1.5$$

PARTICLE DENSITY 2.72 (assumed)

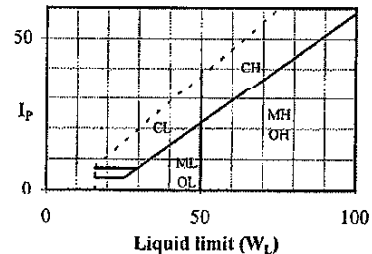
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND with silt

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:
Date checked:



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JOB No. 2113283

REPORT No. 12942

Ref: EN5872/LAB/STANDARD/SIEVE

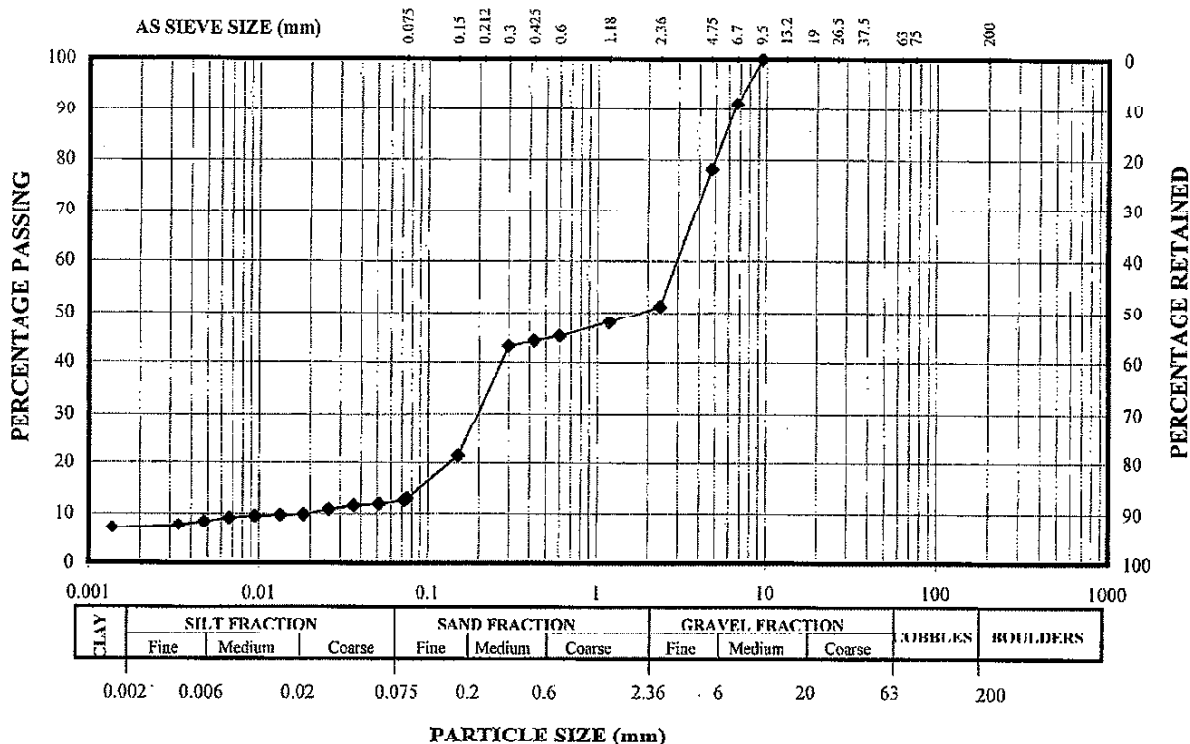
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 44
Depth: 0.5 - 1.0A
Sample No: 3666/144

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/25
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 160.2$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 0.7$$

PARTICLE DENSITY 2.66 (measured)

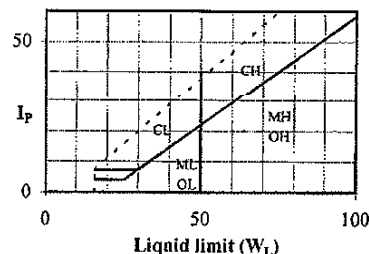
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Gravelly SAND with some silt & clay

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.12.04
Checked by: *[Signature]*
Date checked:



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D. B. B. B. B.
15/12/04



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JOB No. 2113283

REPORT No. 12943

Ref: J:\SW\FILE\AMSTAR\SI\E

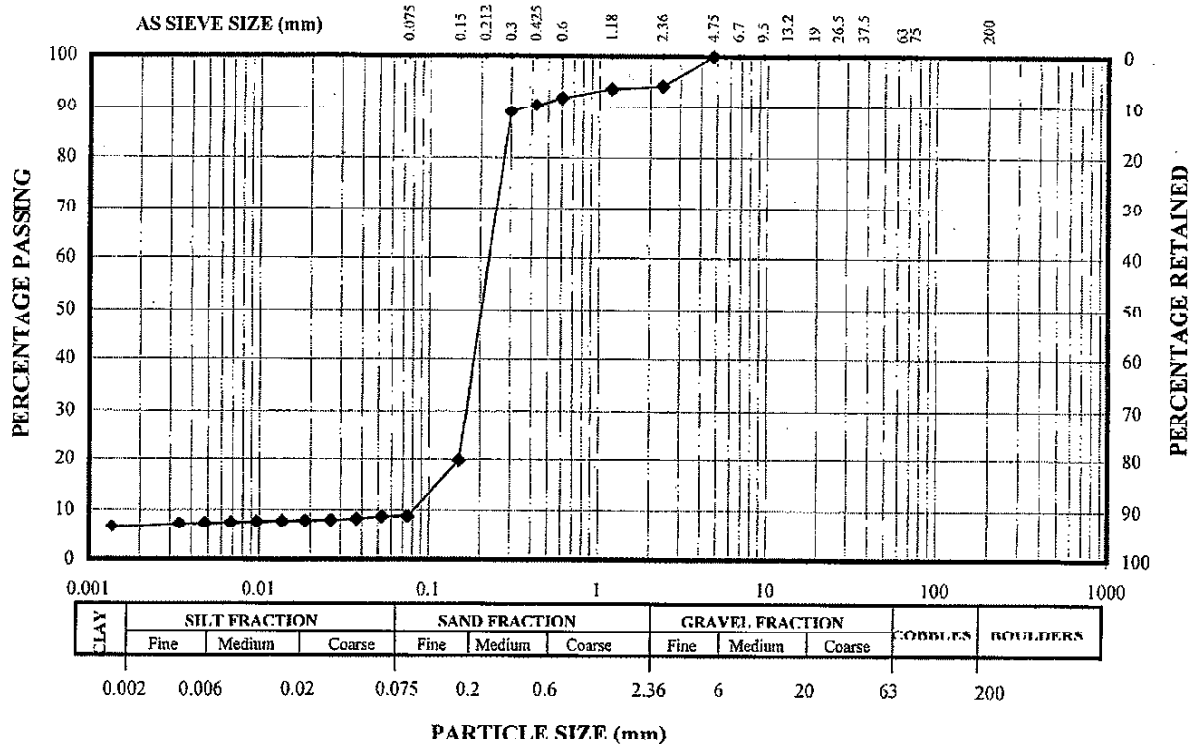
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 45
Depth: 0.0 - 0.5A
Sample No: 3666/145

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0952/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size: AS1289 3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 2.8$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 1.5$$

PARTICLE DENSITY 2.72 (assumed)

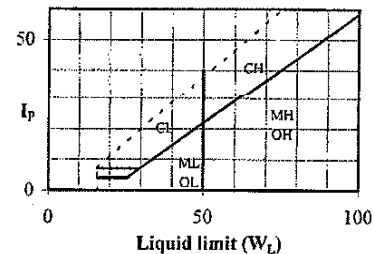
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME:

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.12.04
Checked by: *[Signature]*
Date checked:



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JOB No. 2113283

REPORT No. 12950

Ref: F25WUTL-LABNSTARTSIEVE

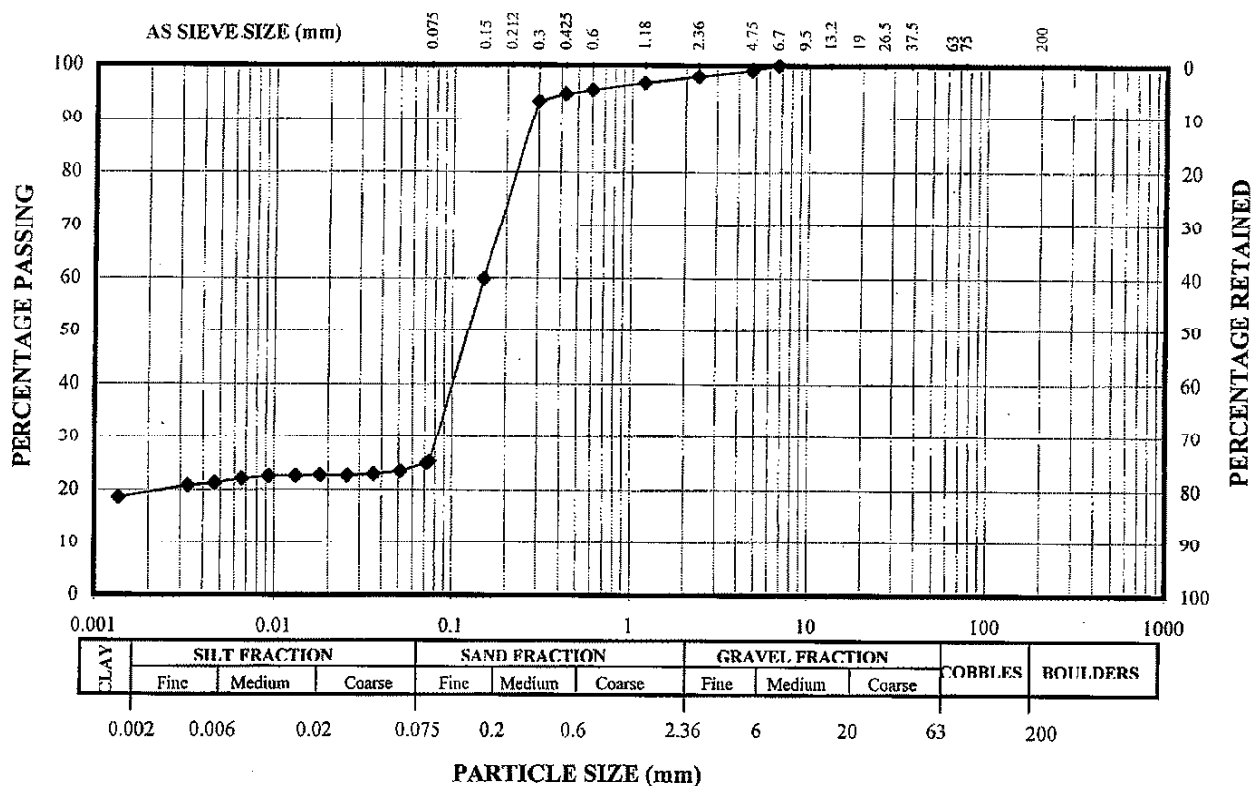
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ45
Depth: 0.5 - 1.0A
Sample No: 3666/123

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

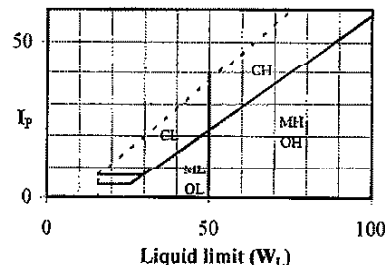
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1367

Tested by: SMEC
Date tested: 22.12.04
Checked by: *SB*
Date checked:



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GEOTECHNICAL TESTING SERVICES

Authorised Signatory:

Deborah
30/12/04



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JOB No. 2113283

REPORT No. 13034

Ref: F:\SWUTEL\LAB\START\SIEVE

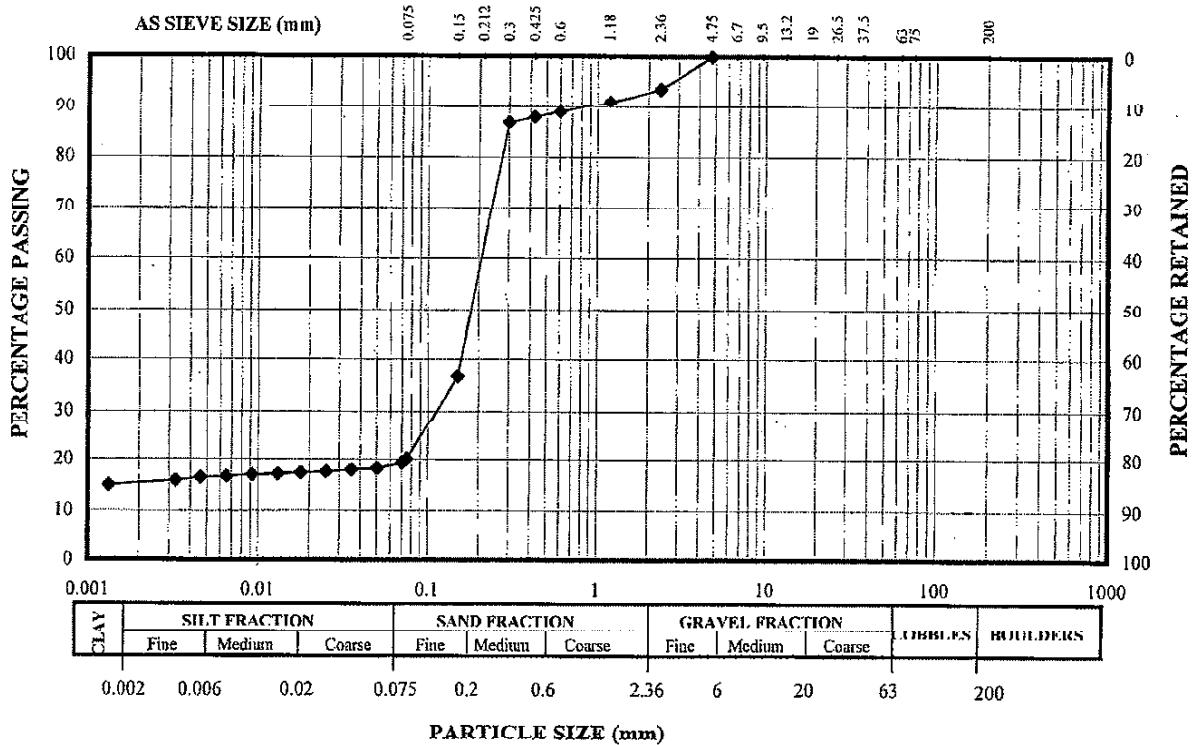
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 46
Depth: 0.0 - 0.5A
Sample No: 3666/147

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0952/3
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

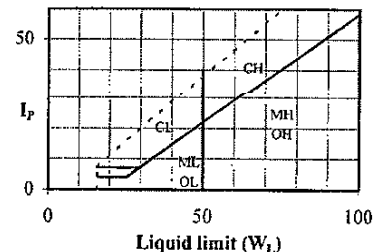
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND with gravel

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.12.04
Checked by:
Date checked:



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JOB No. 2113283

REPORT No. 12952

Ref: FSW/70/LAB/START/SIEVE

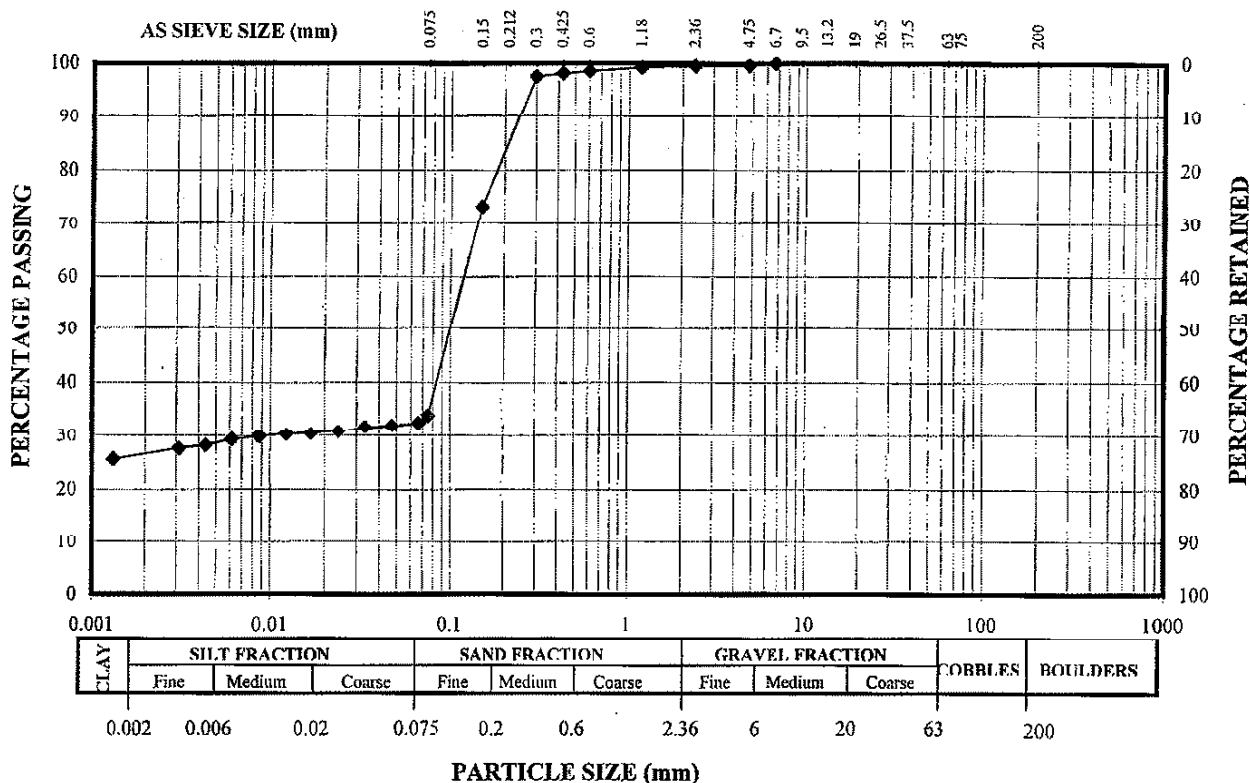
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SOIL CLASSIFICATION REPORT

Trial Hole: FCQ46
Depth: 0.5 - 1.0A
Sample No: 3666/125

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/3
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

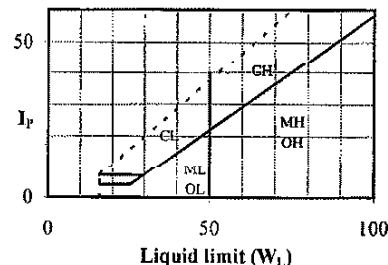
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1369

Tested by: SMEC
Date tested: 22.12.04
Checked by: *[Signature]*
Date checked:



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[Signature]
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JOB No. 2113283

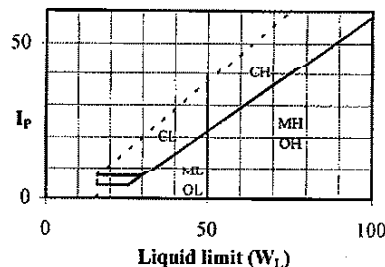
REPORT No. 13036

Ref: FSWUT/LAB-START/SIEVE

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Trial Hole:	PCQ47
Depth:	0.0 - 0.5A
Sample No:	3666/128

Client Sample No.: A04/0951/6
Sample History: Supplied by Client



Particle size AS1289.3.6.2

Linear Shrinkage (mould size)

REF=SWITCH:LABS:START:STEVE

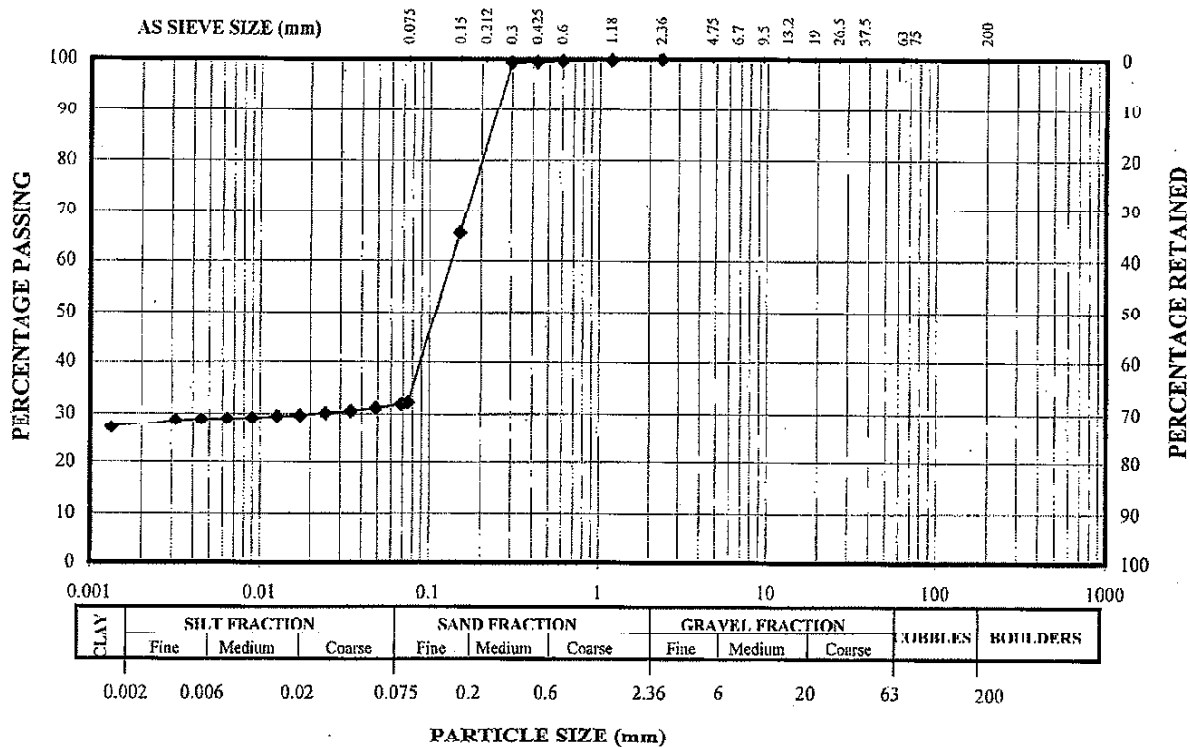
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 47
Depth: 0.5 - 1.0A
Sample No: 3666/129

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/8
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

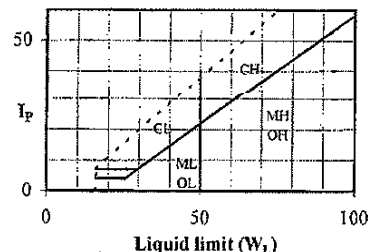
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:
Date checked:



GHD LONGMAC

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Tel: 9462 4700 Fax: 9462 4710

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Authorised Signatory:

15/12/04



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JOB No. 2113283

REPORT No. 12928

Ref: F-SW/UTL-LAB/STAR/SIEVE

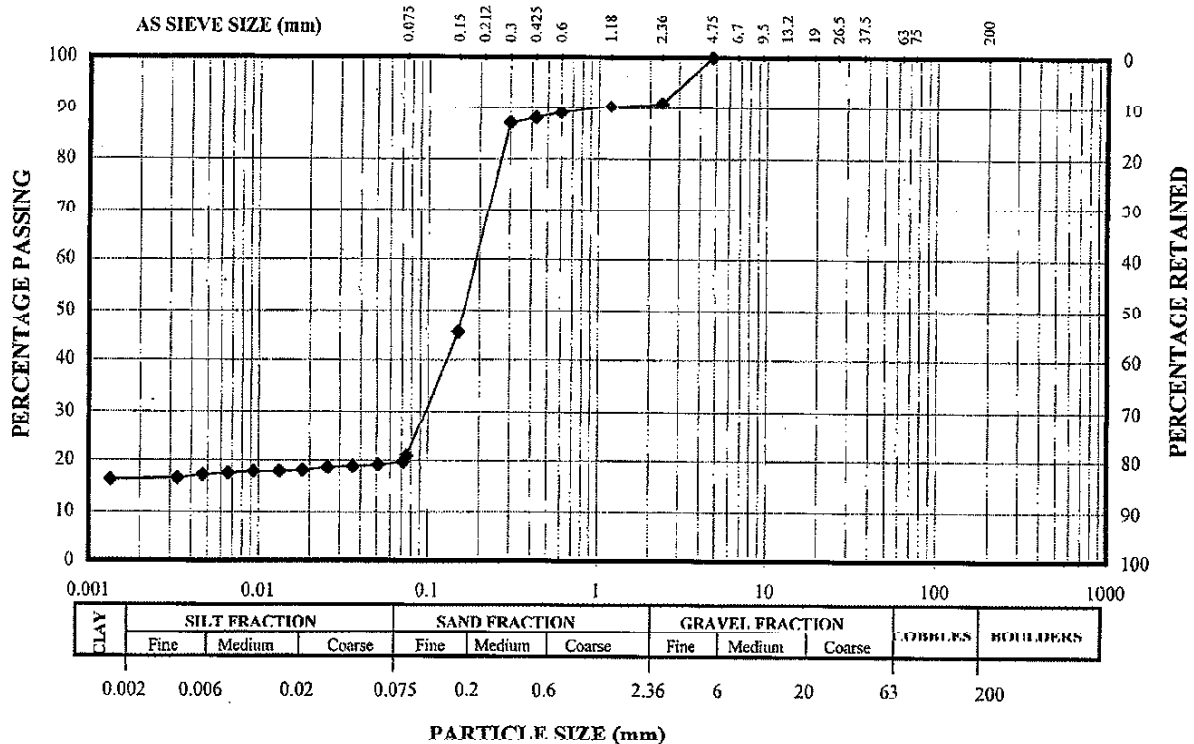
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 48
Depth: 0.0 - 0.5A
Sample No: 3666/140

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/20
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289 3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (measured)

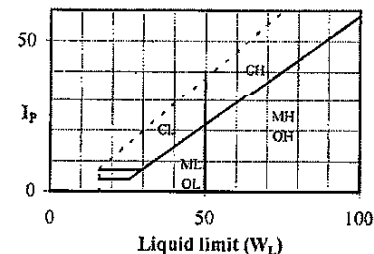
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND with some gravel

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:
Date checked:



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Tel: 9462 4700 Fax: 9462 4710

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15/12/04



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JOB No. 2113283

REPORT No. 12939

Ref: F500/UT/LAB/START/SIEVE

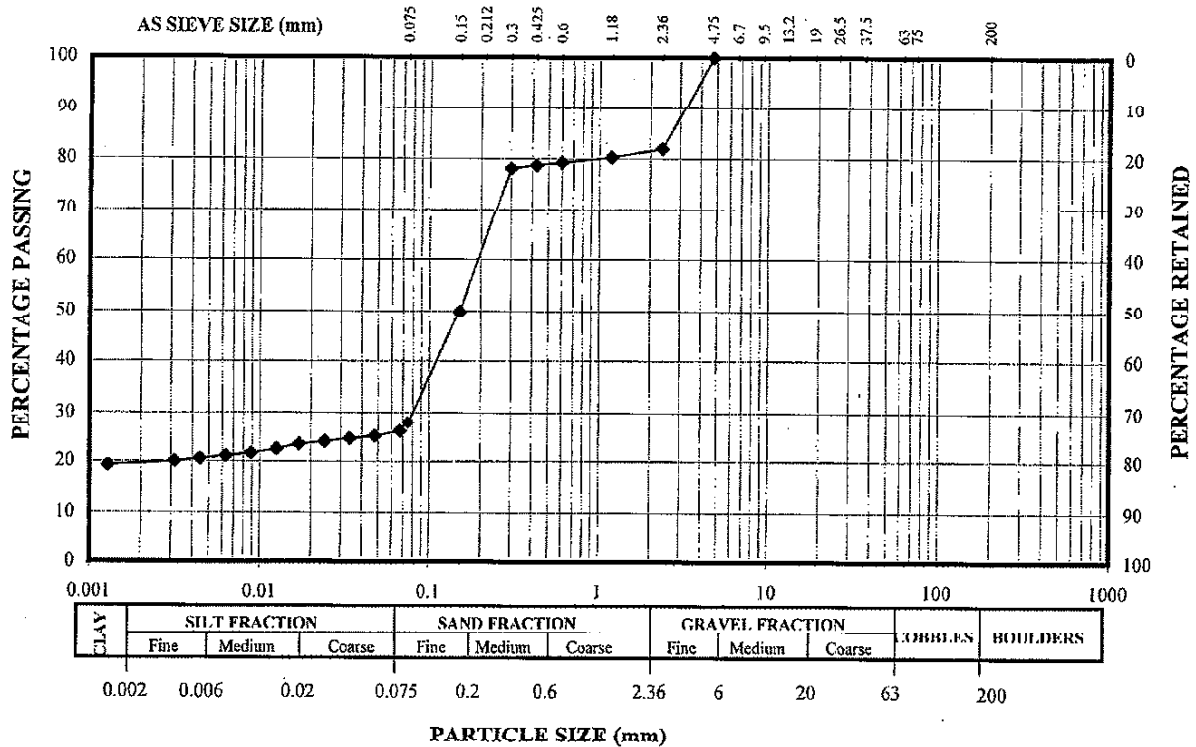
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 48
Depth: 0.5 - 1.0A
Sample No: 3666/141

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/21
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

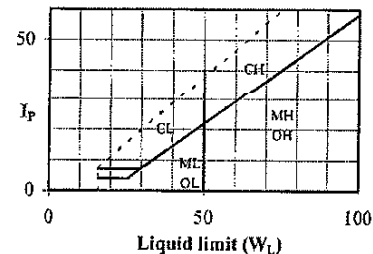
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey gravelly sand

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.12.04
Checked by: *[Signature]*
Date checked: *[Signature]*



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JOB No. 2113283

REPORT No. 12940

Ref: NSW011/LAB-START-SIEVE

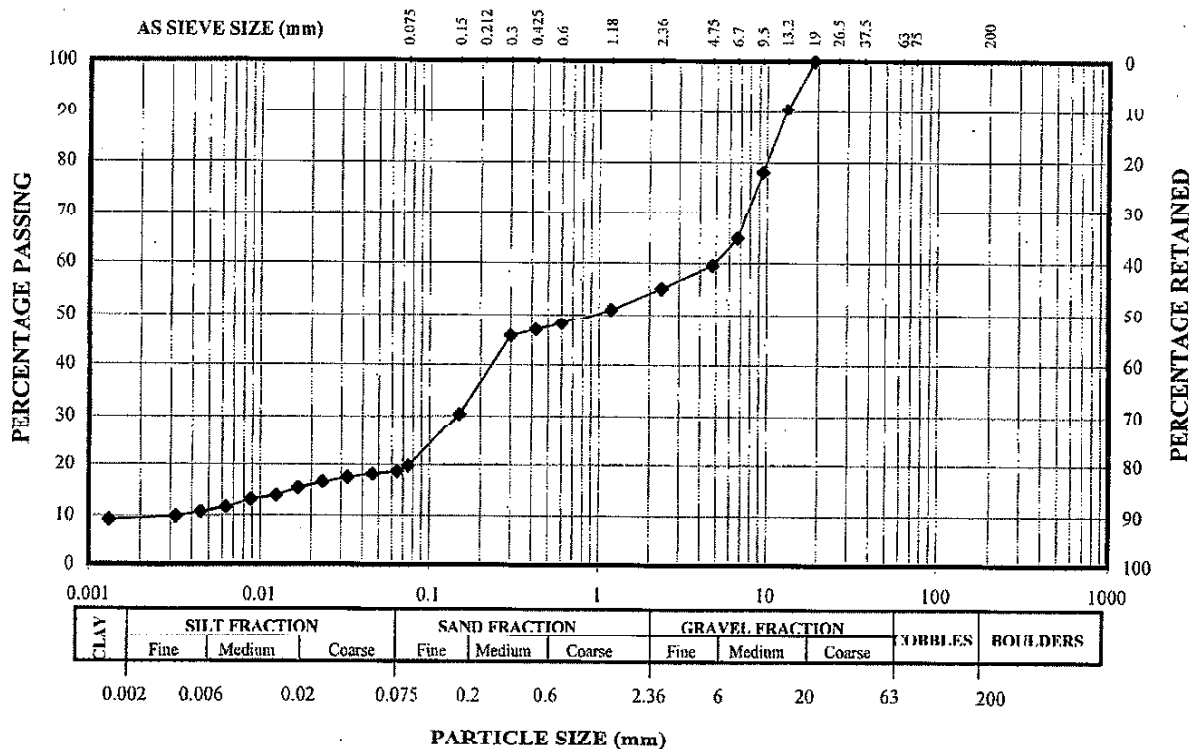
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 48
Depth: 1.0 - 2.0A
Sample No: 3666/142

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/22
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 1407.2$$

$$C_c = D_{50}^2 / (D_{10} \times D_{60}) = 1.3$$

PARTICLE DENSITY 2.72 (assumed)

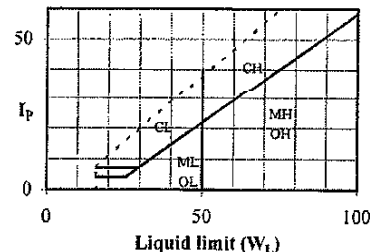
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Gravelly SAND with silt & clay

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.12.04
Checked by:
Date checked:



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JOB No. 2113283

REPORT No. 12941

Ref: P:\SW\T\LA\NATA\NOME

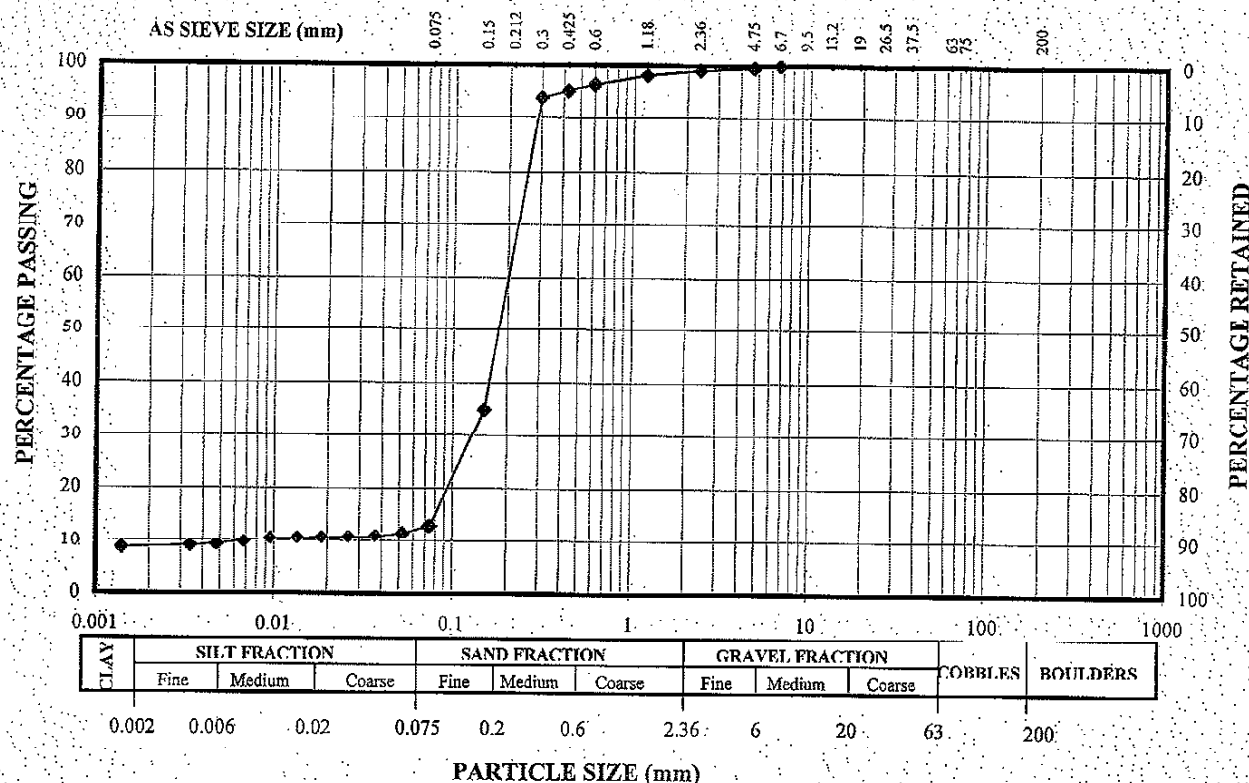
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ49
Depth: 0.0 - 0.5A
Sample No: 3666/353

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0963/2
Sample History: Supplied by Client



TEST METHODS
Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 30.3$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 11.7$$

PARTICLE DENSITY 2.7 (assumed)

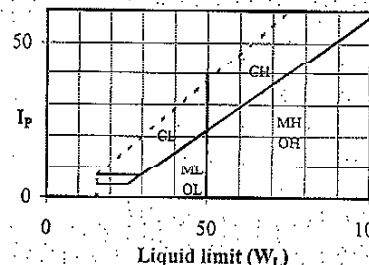
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND with silt & clay

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: DB
Date tested: 18.01.05
Checked by:
Date checked:



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JOB No. 2113283

REPORT No. 13164

Ref: F05WUTILLABESTARTSHEET

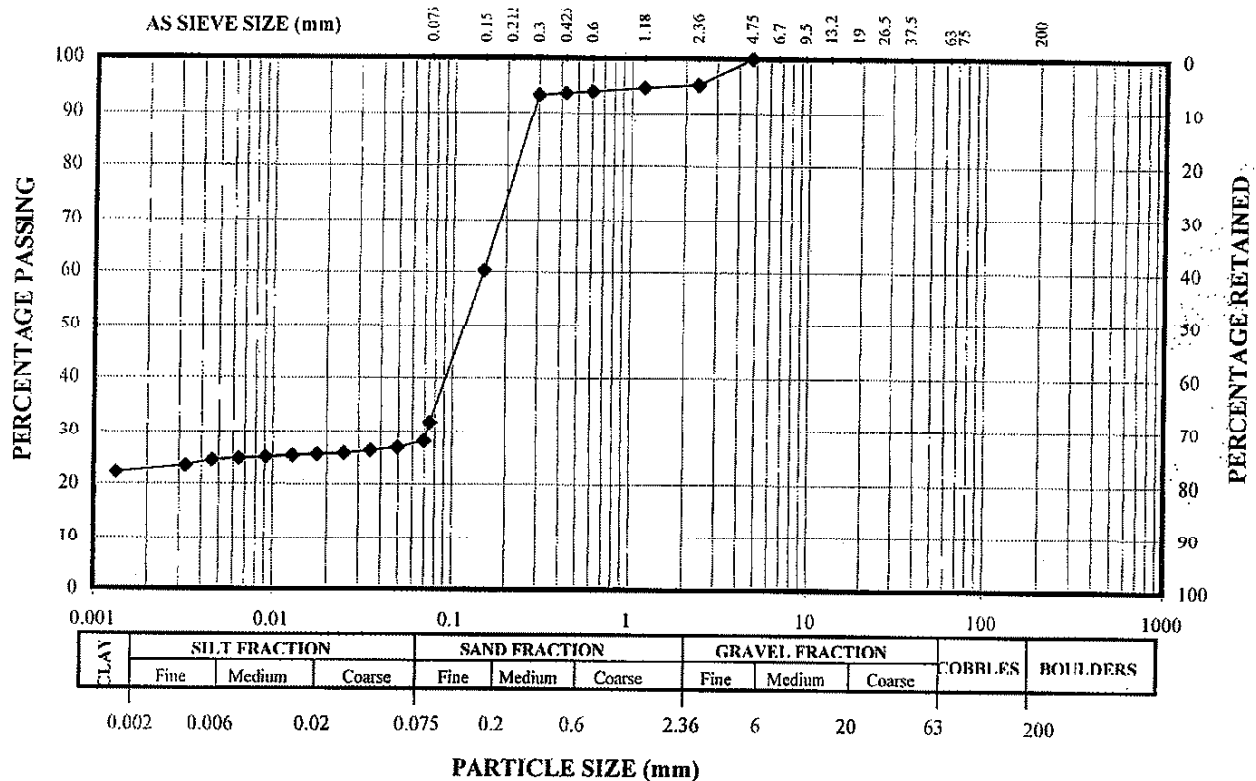
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ49
Depth: 0.5 - 1.0A
Sample No: 3666/163

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/16
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

AS1289.3.5.1.1

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.59 (measured)

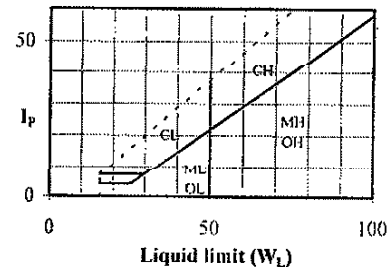
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 13.12.04
Checked by: *[Signature]*
Date checked: 17.12.04



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Authorised Signatory:

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20/12/04



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JOB No. 2113283

REPORT No. 12981

Ref: F:\SW\TECH\LAB\STANDARD\DRIVE

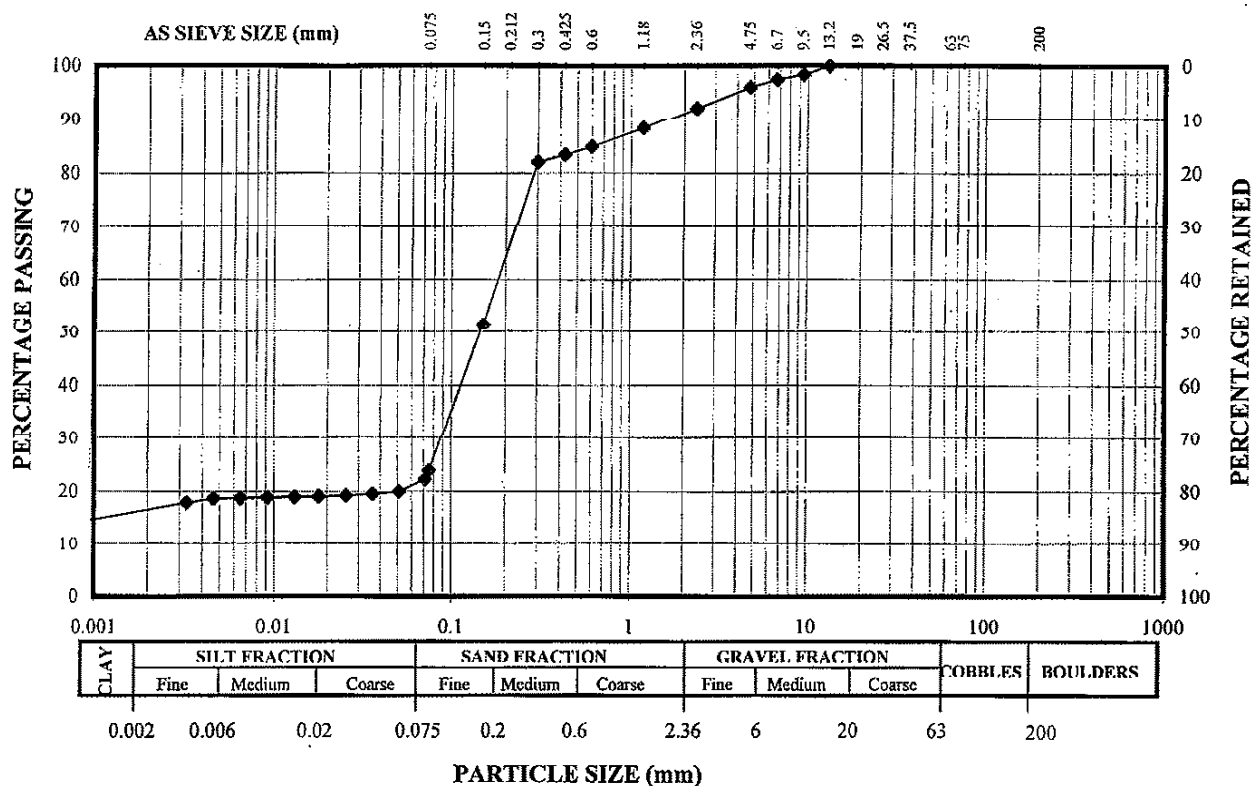
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ50
Depth: 0.0 - 0.5A
Sample No: 3666/114

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/10
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{50}^2 / (D_{10} \times D_{60}) =$ not determinable

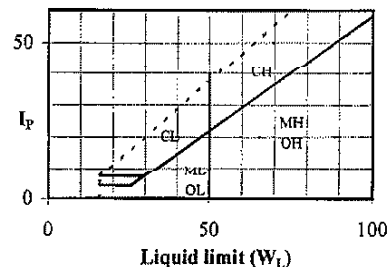
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1376

Tested by: SMEC
Date tested: 18.12.04
Checked by: *SS*
Date checked:



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SS
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JOB No. 2113283

REPORT No. 13024

Ref: P&W/TH/LAB/ARTAR/SH/VE

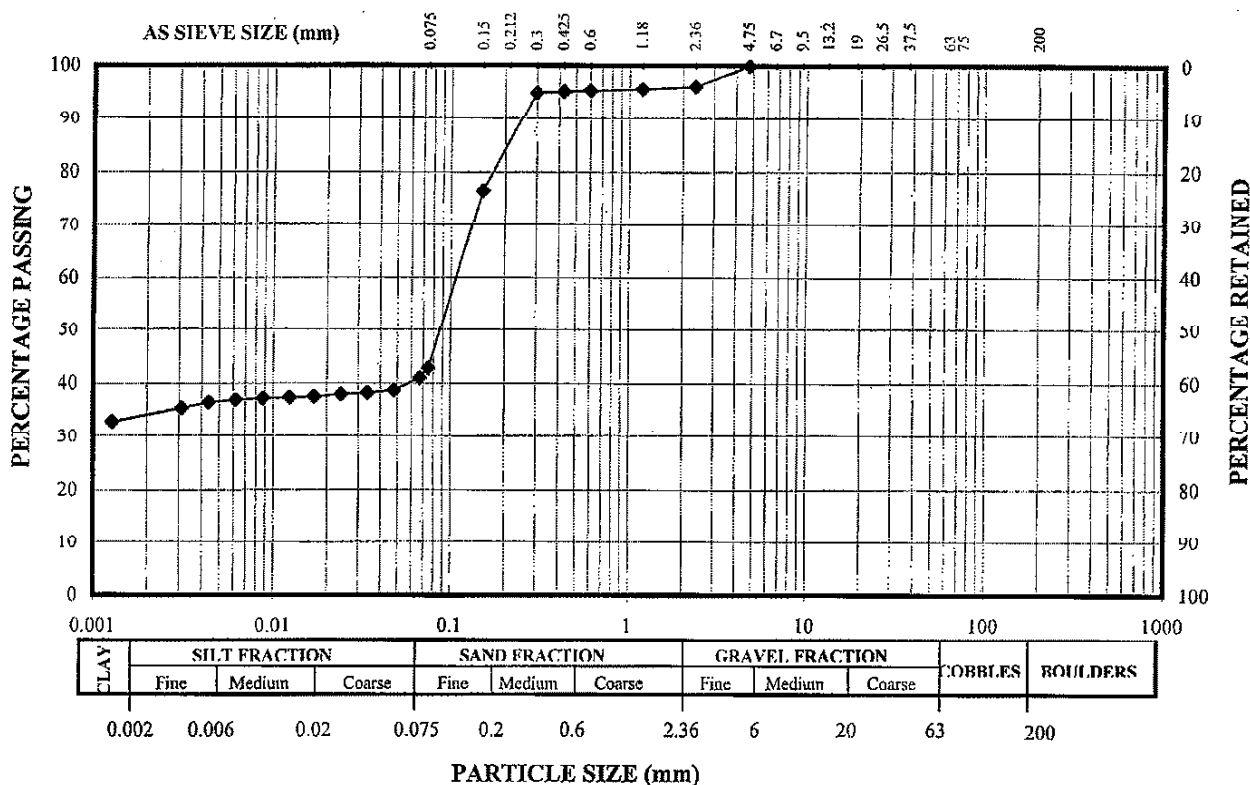
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ50
Depth: 0.5 - 1.0A
Sample No: 3666/115

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/11
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

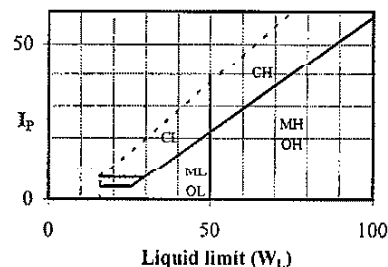
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1367

Tested by: SMEC
Date tested: 18.12.04
Checked by:
Date checked:



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Authorised Signatory:

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JOB No. 2113283

REPORT No. 13025

Ref: F-SWUT/LAUS/START/SIEVE

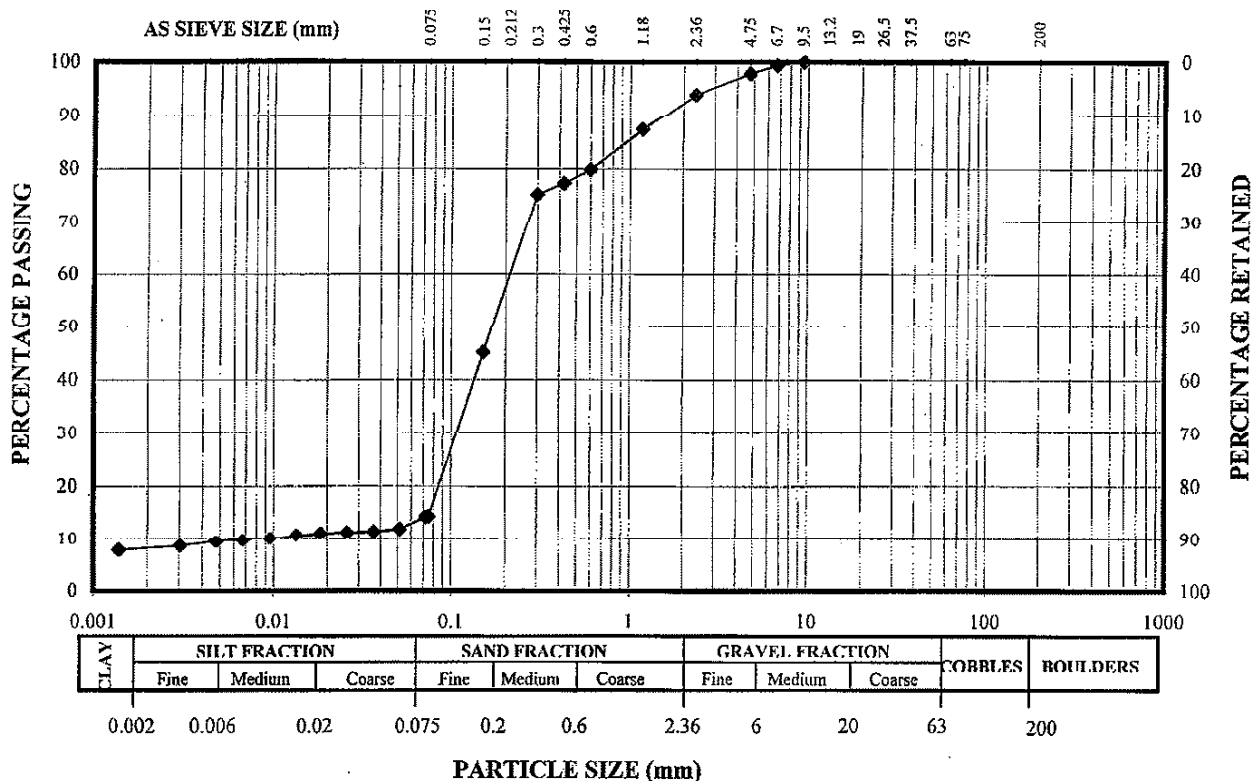
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ51
Depth: 0.0 - 0.5A
Sample No: 3666/111

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/7
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 26.6$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 6.8$$

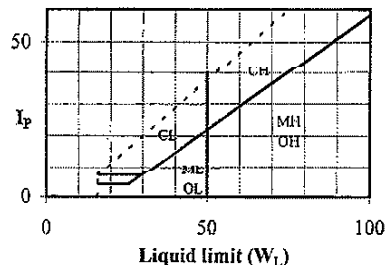
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND some clay



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1373

Tested by: SMEC
Date tested: 13.12.04
Checked by:
Date checked:



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Authorised Signatory:

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JOB No. 2113283

REPORT No. 13021

Re: F357011A05 STARTS SIEVE

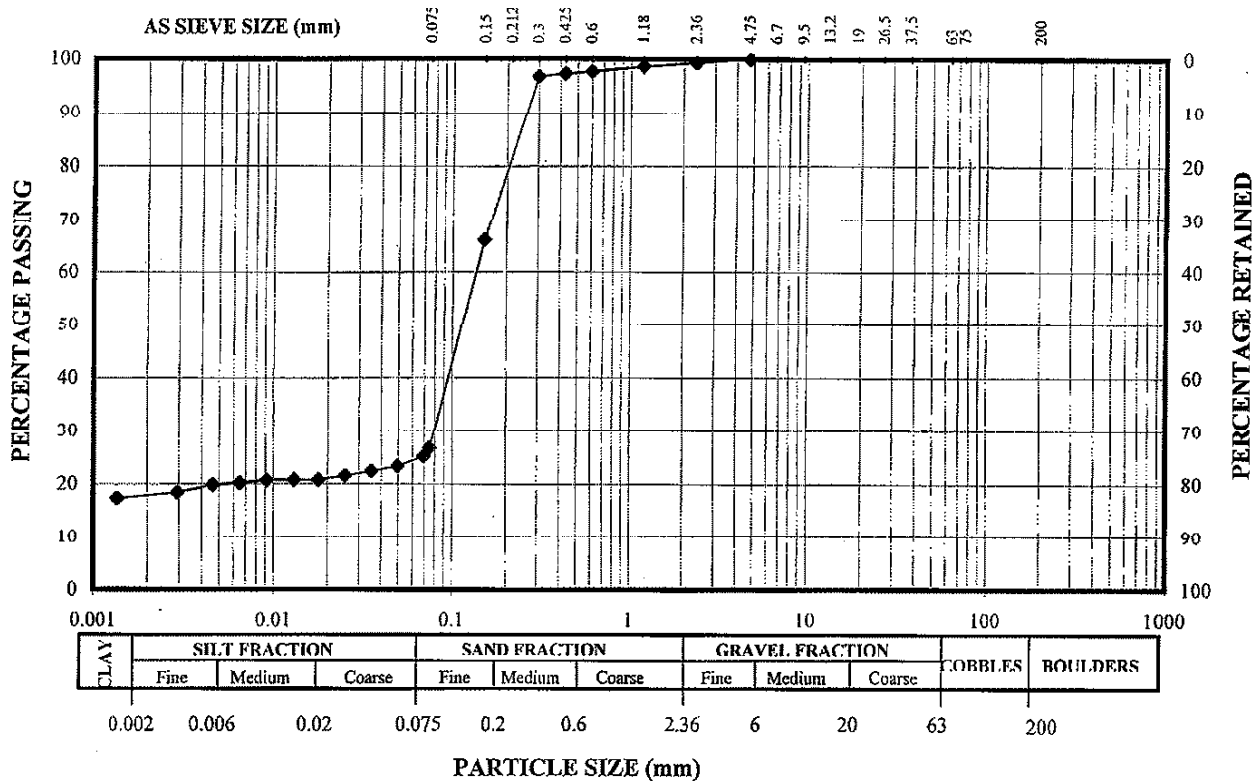
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ51
Depth: 0.5 - 1.0A
Sample No: 3666/112

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/8
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

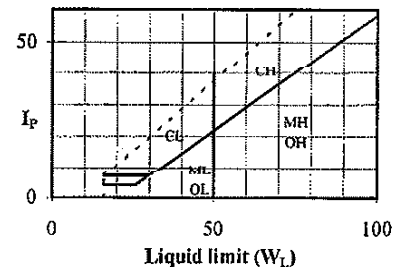
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1374

Tested by: SMEC
Date tested: 13.12.04
Checked by: *DS*
Date checked:



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JOB No. 2113283

REPORT No. 13022

Ref: P/SW/TEL/LAB/START/SIEVE

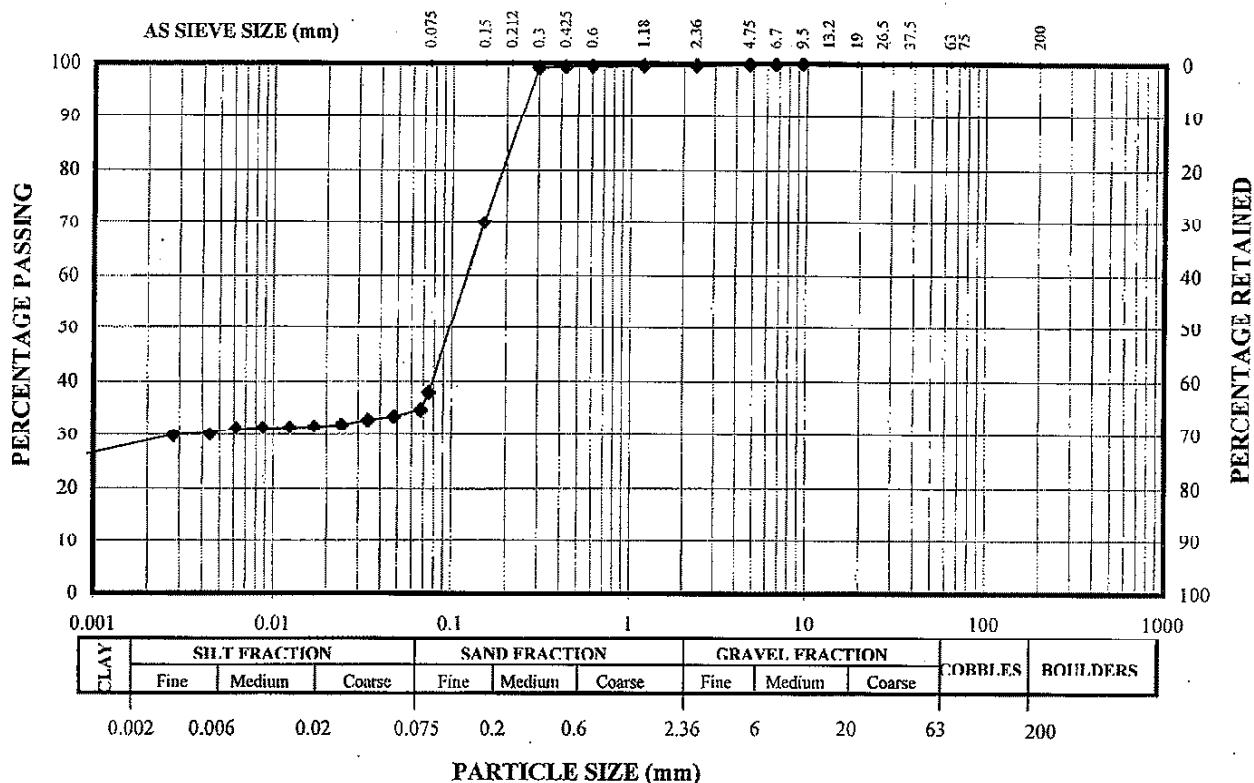
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ51
Depth: 1.0 - 2.0A
Sample No: 3666/113

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/9
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{20}^2 / (D_{10} \times D_{60}) =$ not determinable

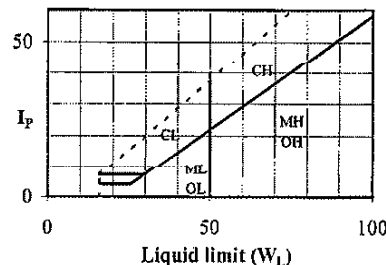
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1375

Tested by: SMEC
Date tested: 18.12.04
Checked by:
Date checked:



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JOB No. 2113283

REPORT No. 13023

Ref: FSW/TH-LAB/START/SIEVE

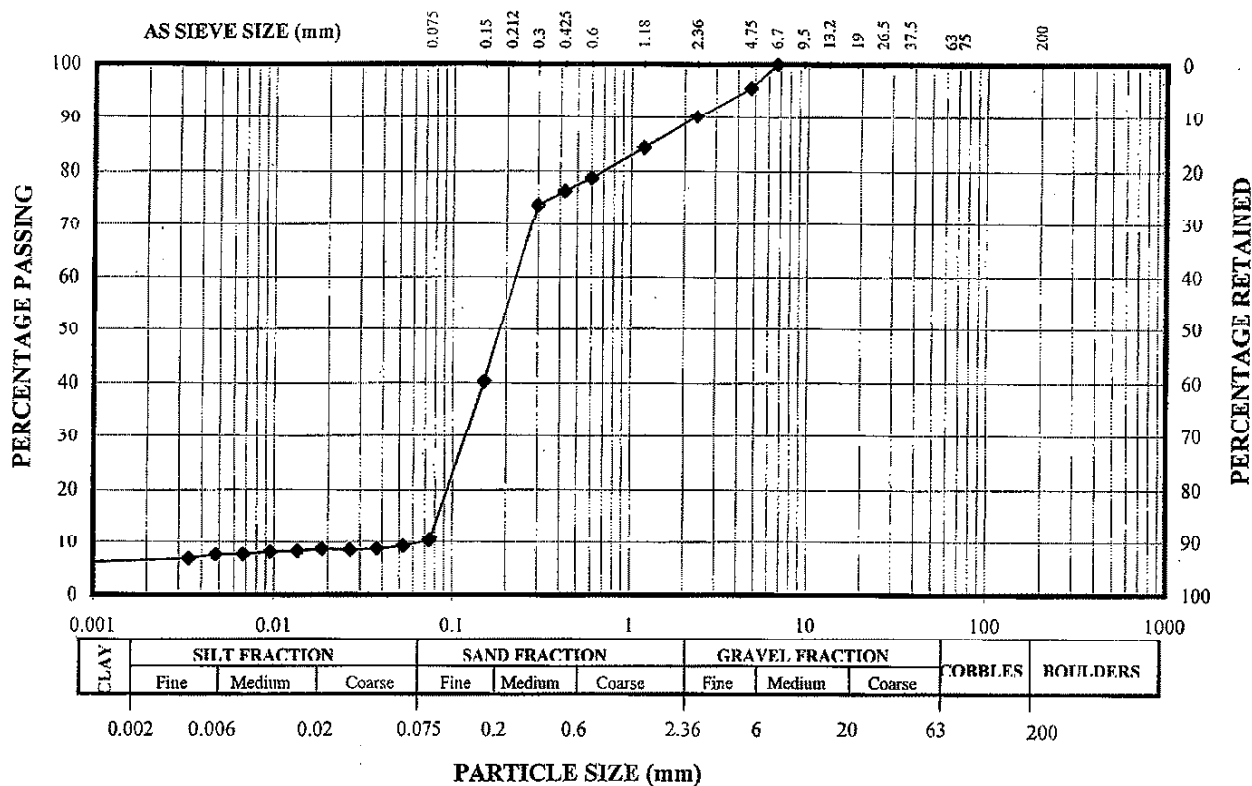
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SOIL CLASSIFICATION REPORT

Trial Hole: FCQ52
Depth: 0.0 - 0.5A
Sample No: 3666/120

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911B/3
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

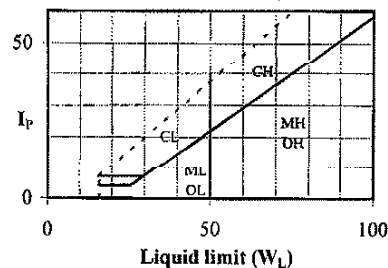
Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 3.5$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 0.9$$



PARTICLE DENSITY 2.75 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND

INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1367

Tested by: SMEC
Date tested: 18.12.04
Checked by:



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JOB No. 2113283

REPORT No. 13030

Ref: P03WUT/LAB/START/ST/VE

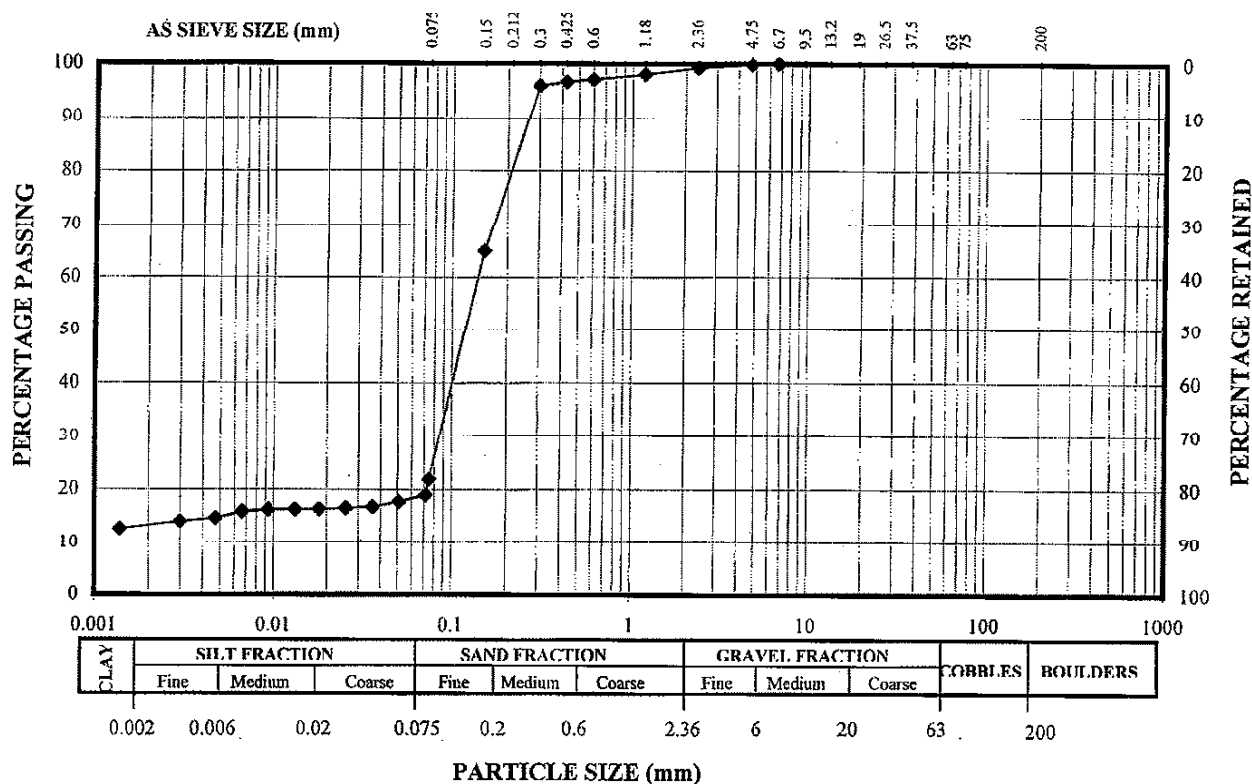
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ52
Depth: 0.5 - 1.0A
Sample No: 3666/110

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/6
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

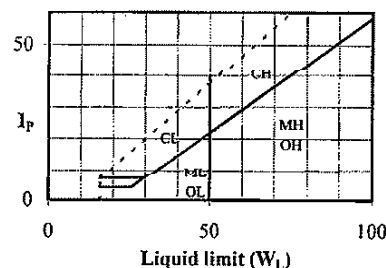
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1372

Tested by: SMEC
Date tested: 13.12.04
Checked by:
Date checked:



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Tel: 9462 4700 Fax: 9462 4710



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Authorised Signatory:

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JOB No. 2113283

REPORT No. 13020

Ref: F5WUT/LAB/START/SIEVE

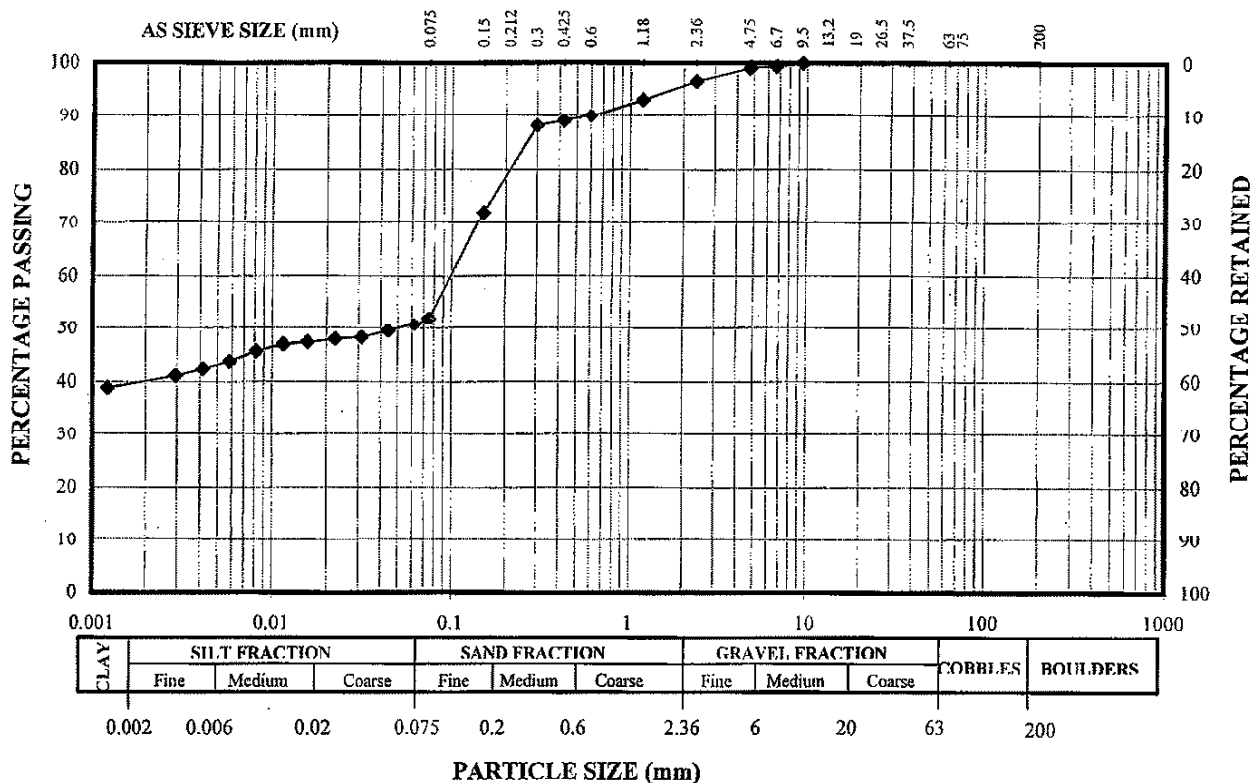
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ53
Depth: 0.0 - 0.5A
Sample No: 3666/121

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911D/4
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

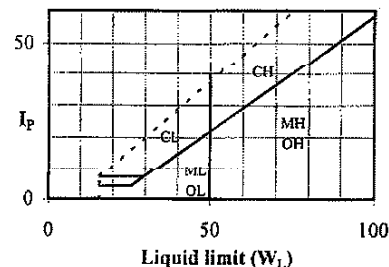
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Dry

GROUP SYMBOL:

SOIL NAME: Silty clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1367

Tested by: SMEC
Date tested: 22.12.04
Checked by: BS
Date checked:



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Authorised Signatory:

BS
30/12/04



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JOB No. 2113283

REPORT No. 13031

Ref: F04WUTLAD-STARTSIEVE

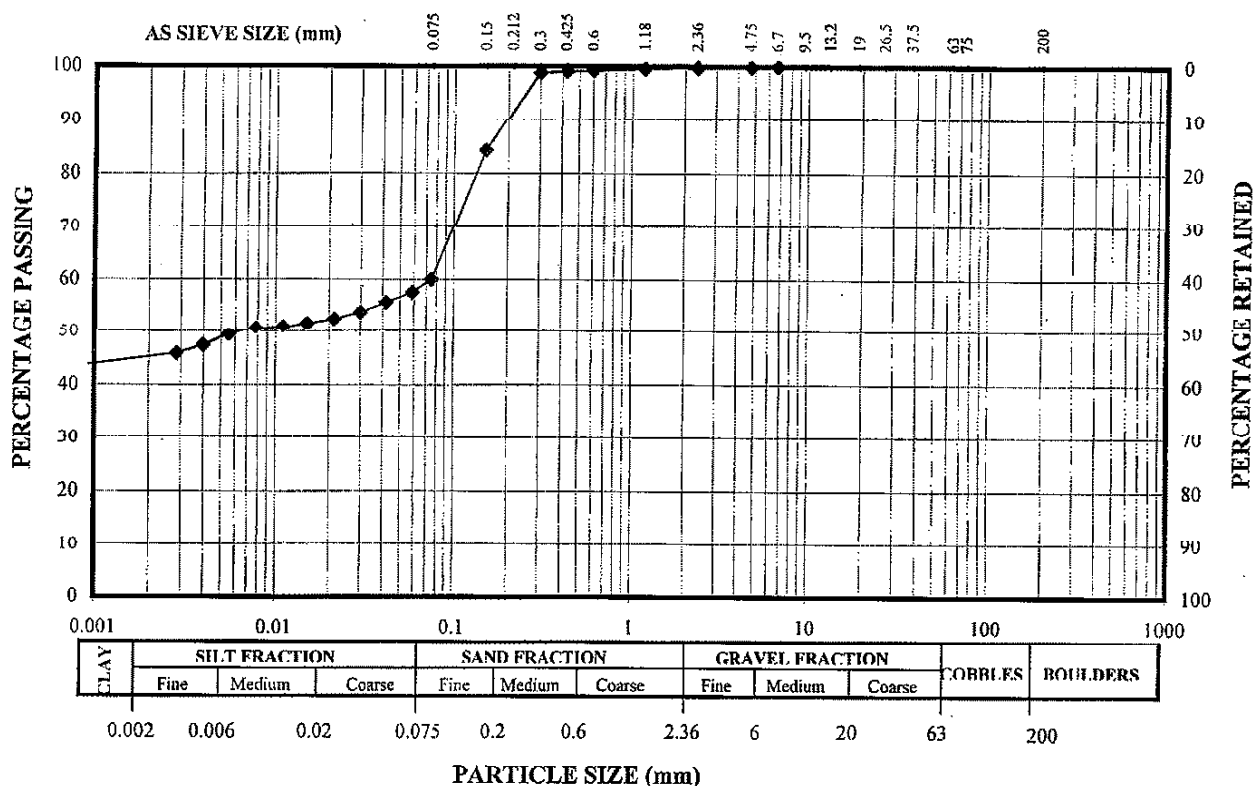
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ53
Depth: 0.5 - 1.0A
Sample No: 3666/116

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0911A/12
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{40}^2 / (D_{10} \times D_{60}) =$ not determinable

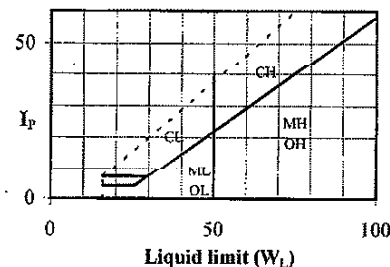
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND / sandy CLAY



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1367

Tested by: SMEC
Date tested: 18.12.04
Checked by:
Date checked: 30/12/04



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BROOKE
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JOB No. 2113283

REPORT No. 13026

Ref: P-SWUTELAINSTARTSIEVE

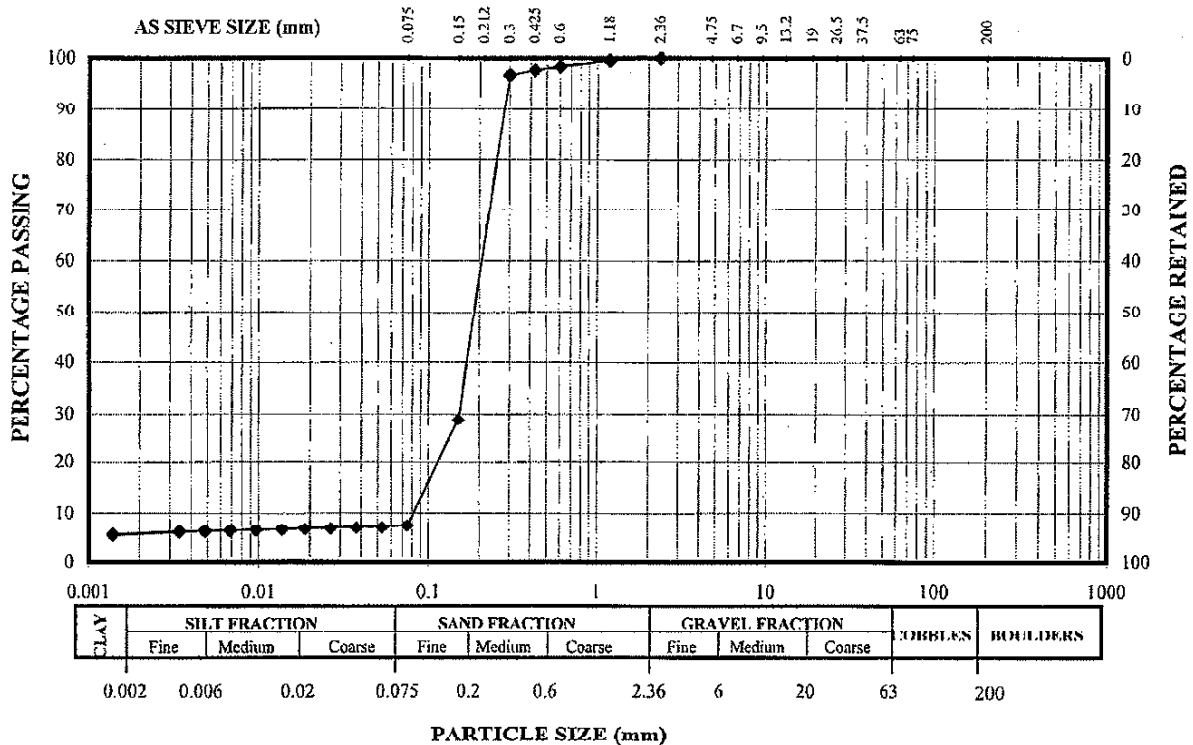
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 54
Depth: 0.0 - 0.5A
Sample No: 3666/148

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0952/4
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 2.6$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 1.3$$

PARTICLE DENSITY 2.72 (assumed)

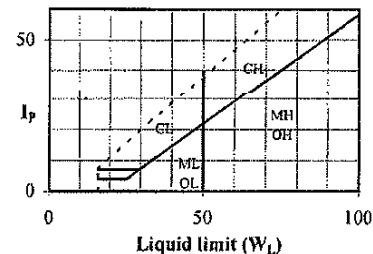
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND with some silt

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 10.12.04
Checked by:
Date checked:



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JOB No. 2113283

REPORT No. 12953

Ref: F:\SW\TIL\LA\START\BIVE

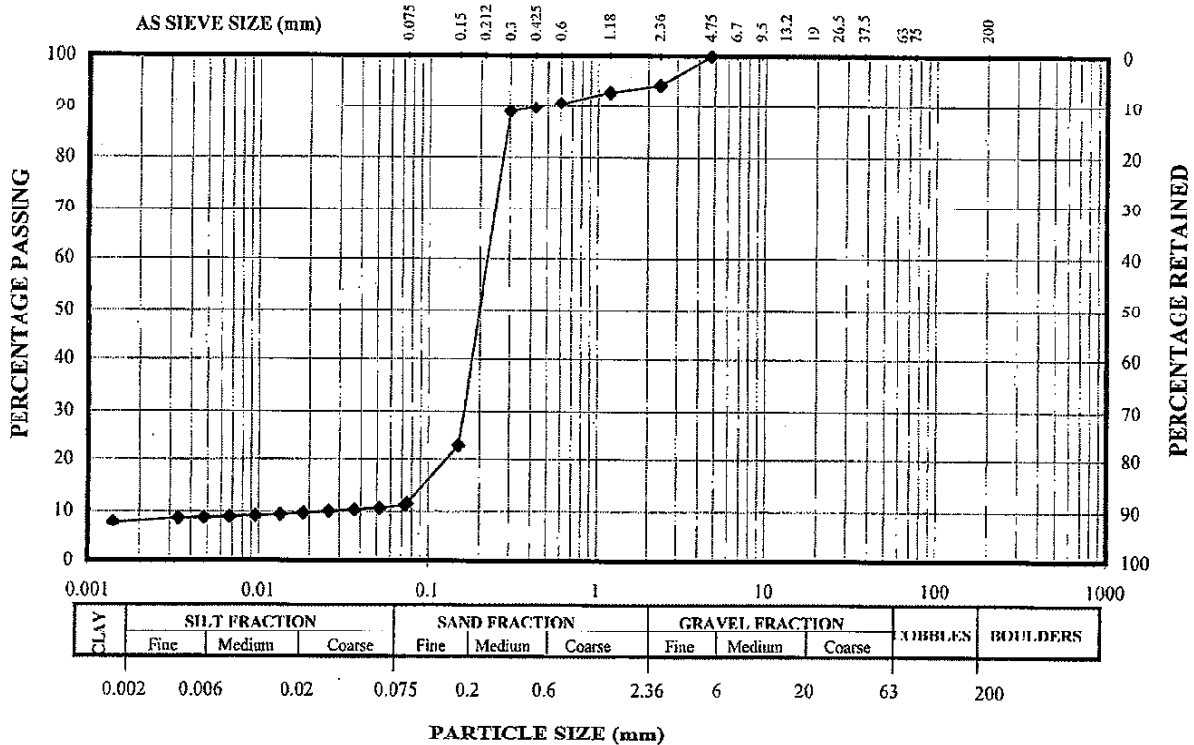
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 54
Depth: 0.5 - 1.0A
Sample No: 3666/136

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/16
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 8.8$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 4.4$$

PARTICLE DENSITY 2.72 (assumed)

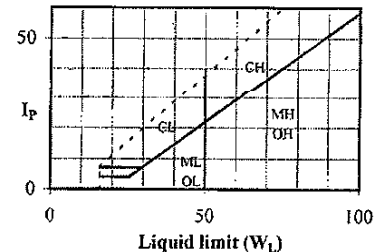
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: silty sand

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:
Date checked:



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DBL
15/12/04



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JOB No. 2113283

REPORT No. 12935

Ref: ENSW/TEL/LAB/START/SIEVE

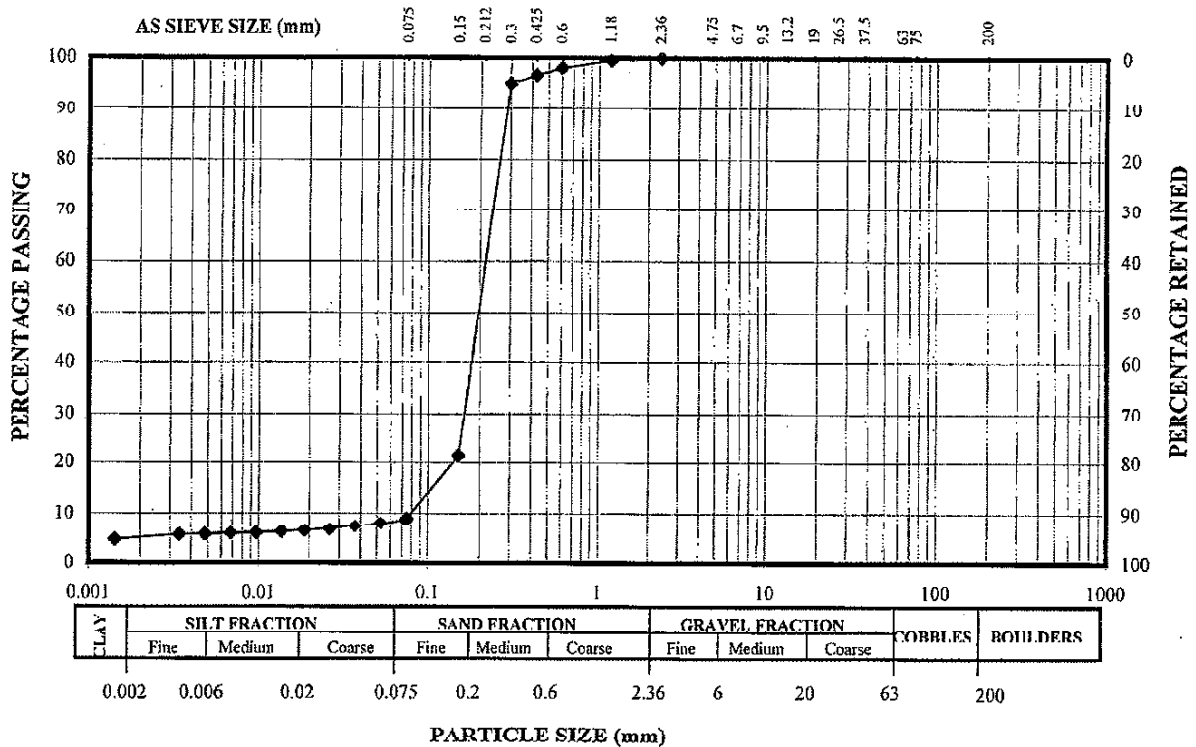
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 55
Depth: 0.0 - 0.5A
Sample No: 3666/134

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/14
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 2.8$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 1.5$$

PARTICLE DENSITY 2.72 (assumed)

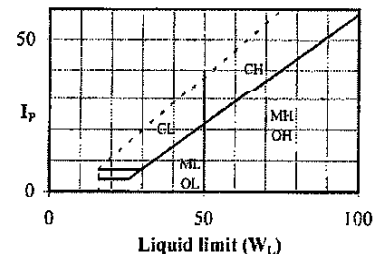
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:
Date checked:



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09/12/04



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JOB No. 2113283

REPORT No. 12933

Ref: F:\NW\TCL\ARTAR\START\SIYE

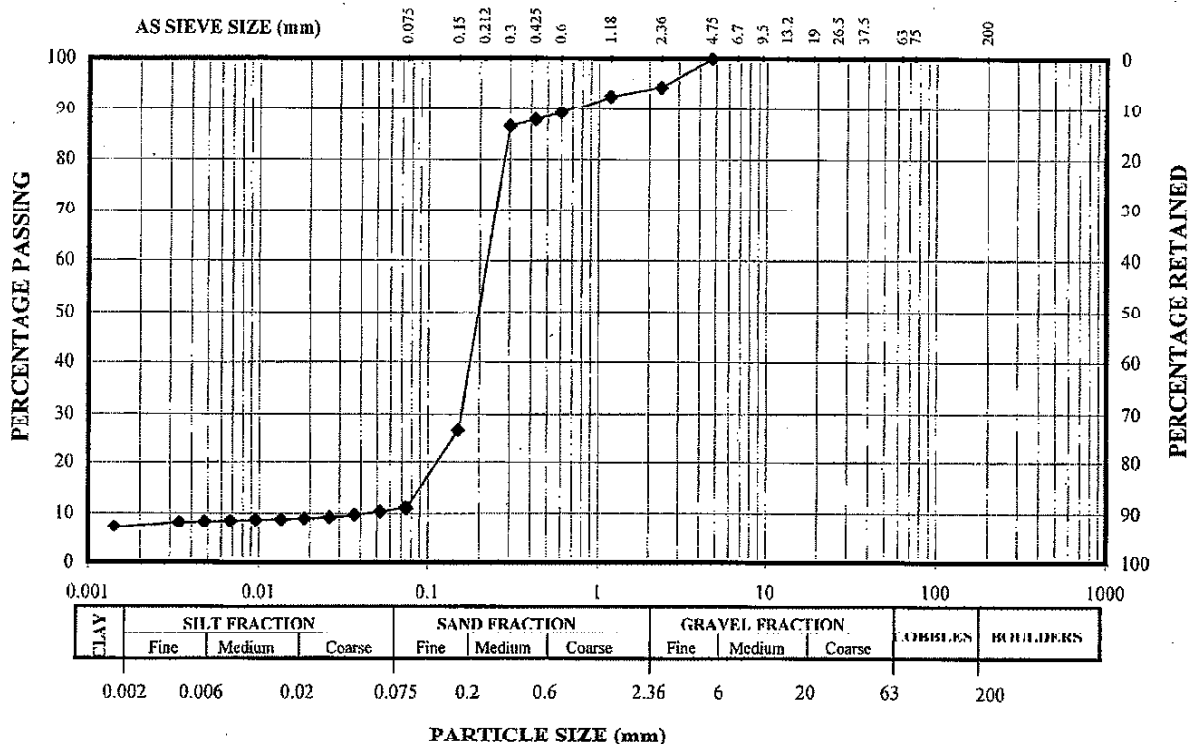
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ 55
Depth: 0.5 - 1.0
Sample No: 3666/135

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/15
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 5.3$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 2.5$$

PARTICLE DENSITY 2.72 (assumed)

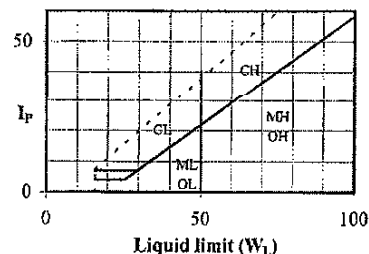
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: silty SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:
Date checked:



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15/12/04



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JOB No. 2113283

REPORT No. 12934

Ref: F550/01/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100

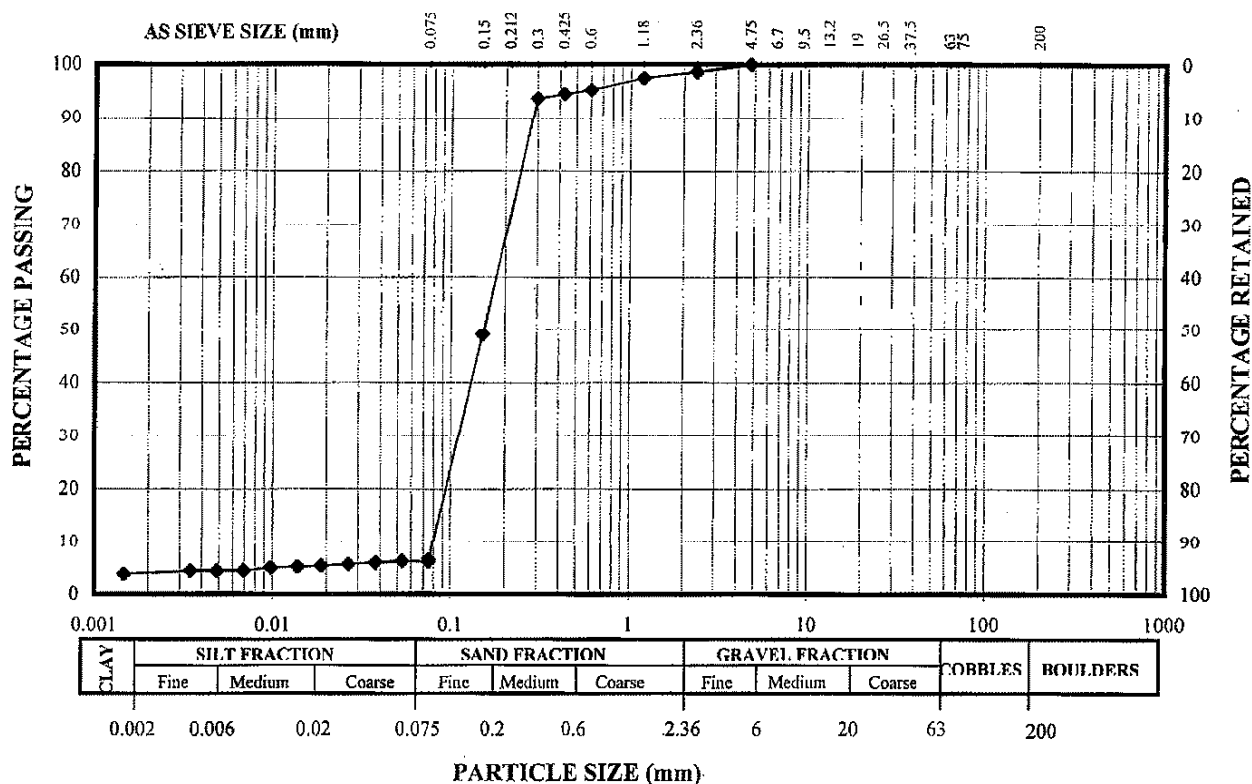
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ56
Depth: 0.0 - 0.5A
Sample No: 3666/126

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/1
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 2.3$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 0.9$$

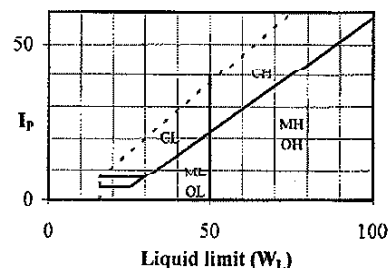
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1387

Tested by: SMEC
Date tested: 15.12.04
Checked by: *SB*
Date checked:



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Authorised Signatory:

SB
D. B. Smith
30/12/04



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JOB No. 2113283

REPORT No. 13037

REF: SWUTH/LAB/START/SIEVE

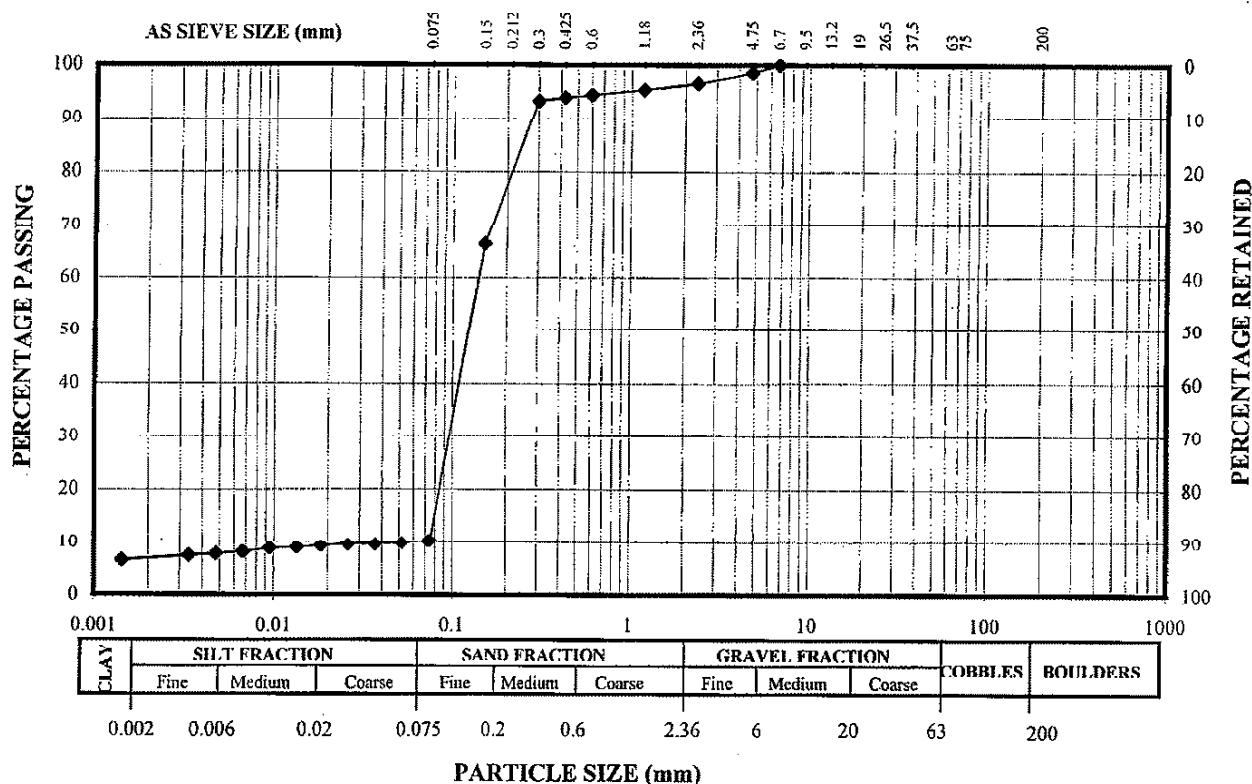
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ56
Depth: 0.5 - 1.0A
Sample No: 3666/127

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/5
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 2.6$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 1.3$$

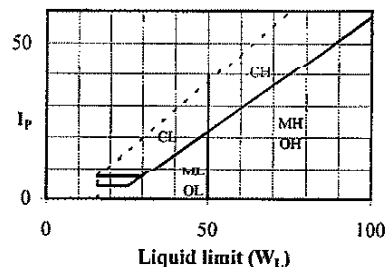
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 Report No 04-1387

Tested by: SMEC
Date tested: 15.12.04
Checked by: *JB*
Date checked:



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JB
30/12/04



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JOB No. 2113283

REPORT No. 13038

Ref: F:SWUTH/LAB/START/SIEVE

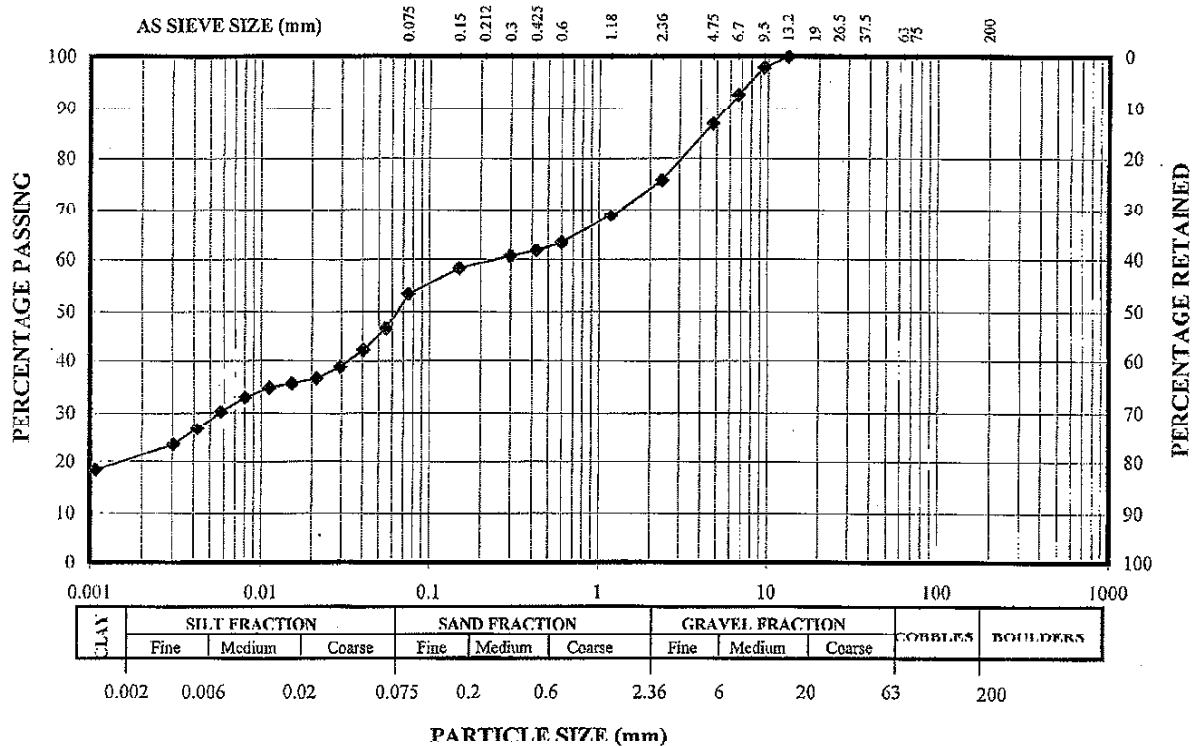
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.0-0.5T1
Sample No: 3666/38

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/33
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.7 (assumed)

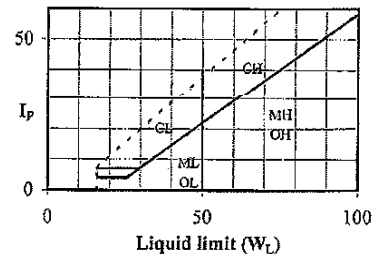
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Gravely CLAY with sand (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 12.11.2004
Checked by: *[Signature]*
Date checked: 24/11/04



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57 Herbert St, Artarmon NSW, 2064

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Authorised Signatory:

[Signature]
P. HANAWAY
25.11.2004



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JOB No. 2113283

REPORT No. 12815

Ref: P000016/LAB/ART/ART/ART

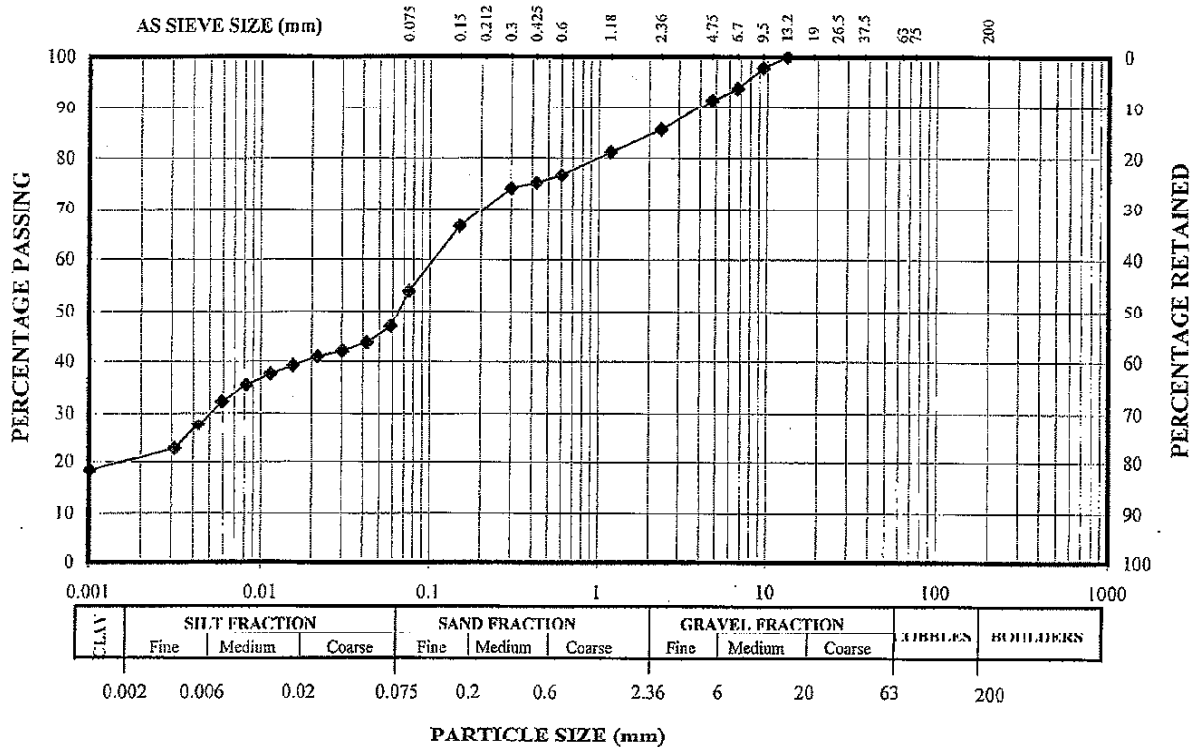
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.5-1.0T1
Sample No: 3666/39

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/34
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.7 (assumed)

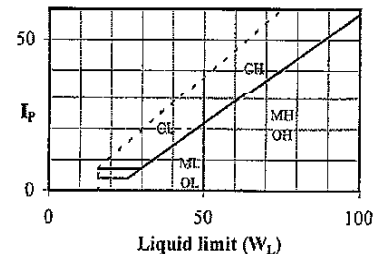
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Sandy CLAY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 12.11.2004
Checked by: *SS*
Date checked: 24/11/04



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Tel: 9462 4700 Fax: 9462 4710
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Authorised Signatory:

N. J. J. J.
N. J. J. J.
25.11.2004



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JOB No. 2113283

REPORT No. 12816

Ref. F05WUTPL/14/01/01/01/01/01

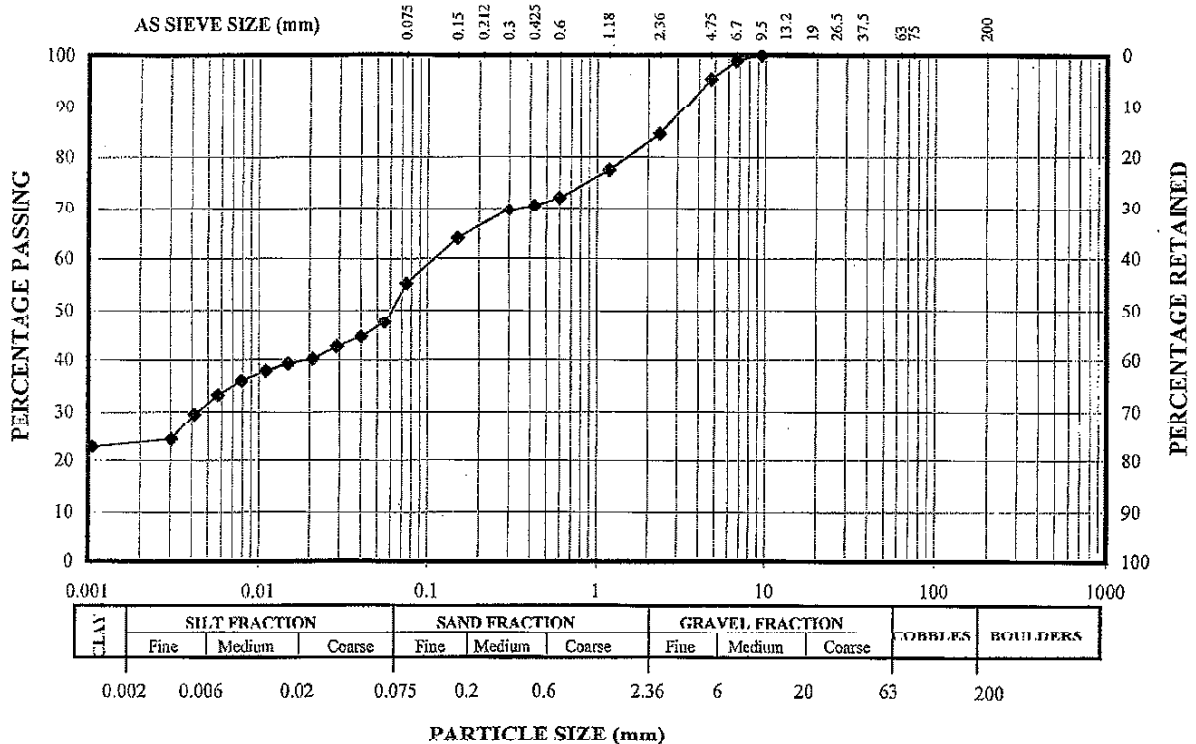
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.0-0.5T2
Sample No: 3666/40

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0/98/33
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.7 (assumed)

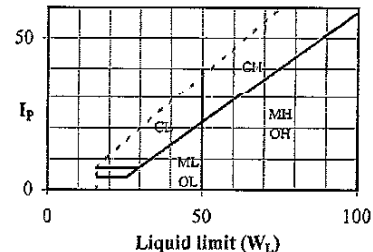
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Sandy CLAY with gravel

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 12.11.2004
Checked by: ES
Date checked: 24/1/04



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57 Herbert St, Artarmon NSW, 2064
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Authorised Signatory:

[Signature]
25.11.2004



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JOB No. 2113283

REPORT No. 12817

REF: PSWUT/LAB/START/0042

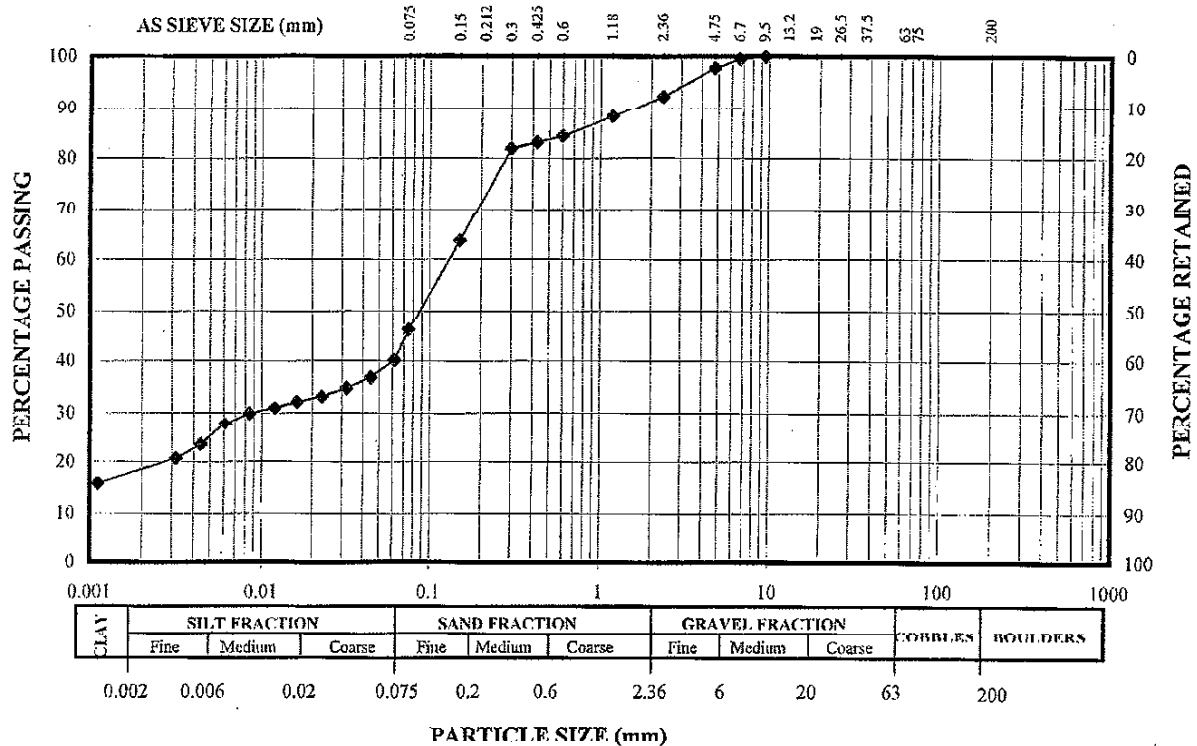
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.5-1.0T2
Sample No: 3666/41

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/36
Sample History: Supplied by Client



TEST METHODS

Classification AS1776 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.7 (assumed)

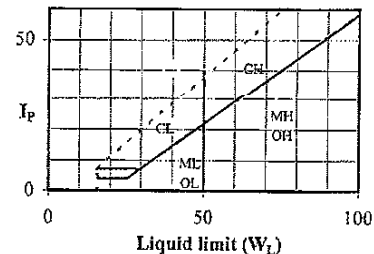
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 12.11.2004
Checked by: *SS*
Date checked: 24/11/04



GHD LONGMAC

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GEOTECHNICAL TESTING SERVICES



Authorised Signatory:

S. HANATW
25.11.2004



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JOB No. 2113283

REPORT No. 12818

USE FOR INTERNAL LAB/STAFF USE

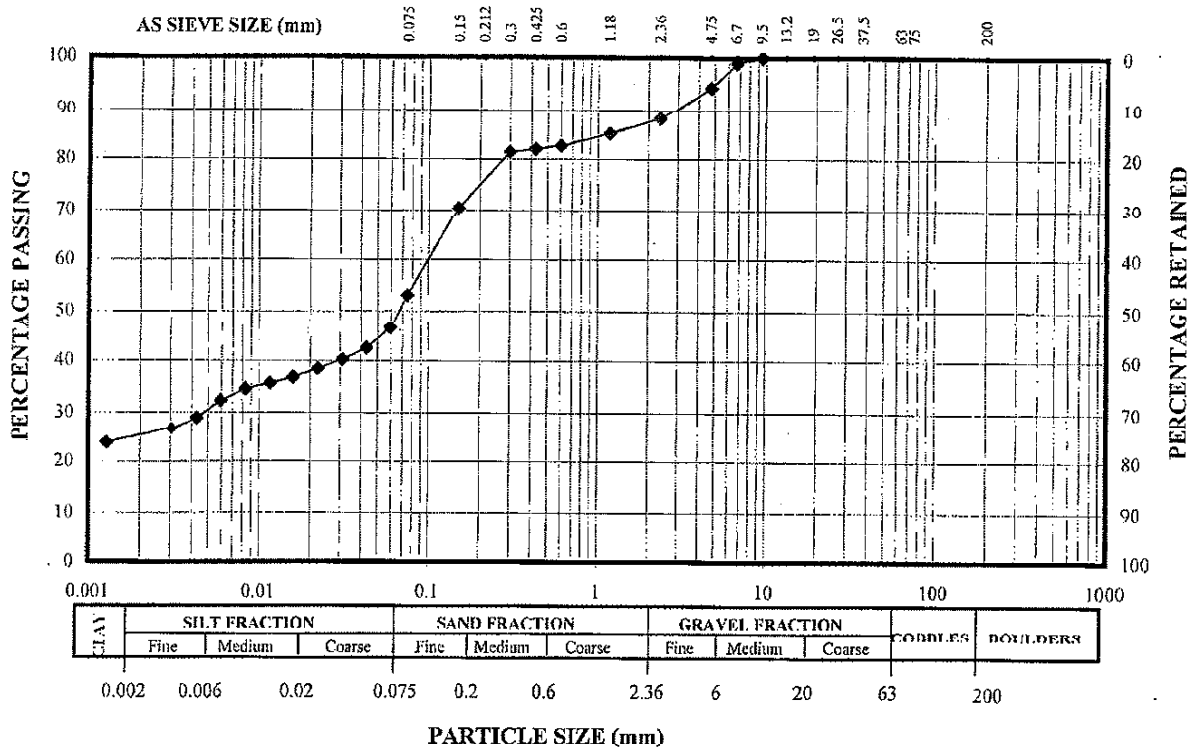
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.0 to 0.5T3
Sample No: 3666/49

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/45
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

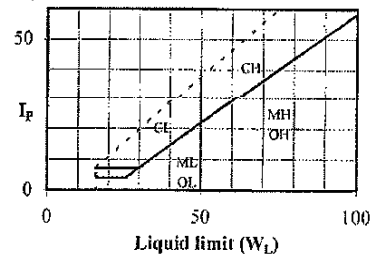
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: sandy CLAY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 22.11.2004
Checked by: *[Signature]*
Date checked: 25/11/04



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JOB No. 2113283

REPORT No. 12831

Rev: 01/01/01, 01/01/02, 01/01/03

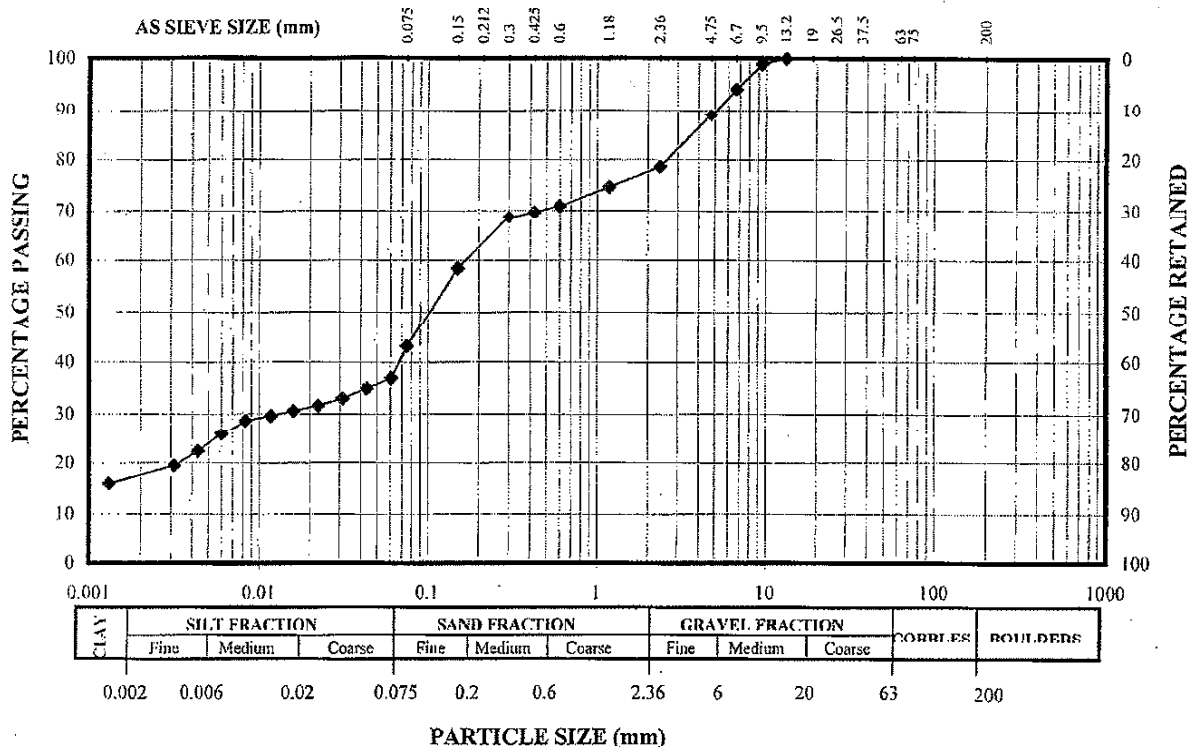
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.5 to 1.0T3
Sample No: 3666/50

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/46
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = (D_{30}^2 / (D_{10} \times D_{60})) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

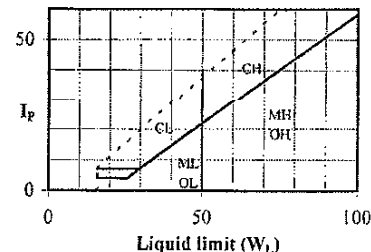
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: gravelly sandy CLAY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 22.11.2004
Checked by: DB
Date checked: 25.11.04



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JOB No. 2113283

REPORT No. 12832

REF: FSW/TH/AD/ST/ART/SEV

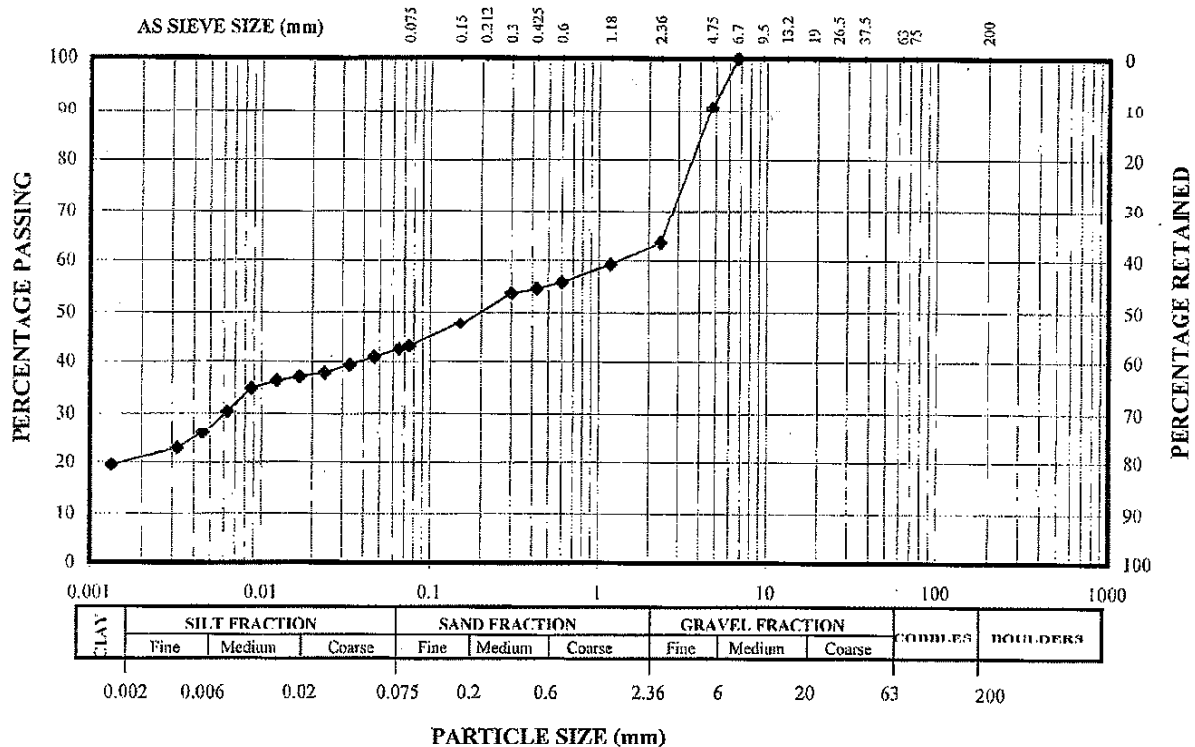
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.0 to 0.5T4
Sample No: 3666/51

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/41
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

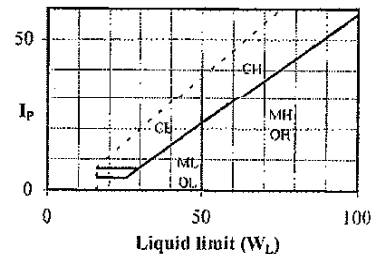
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: sandy CLAY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 22.11.2004
Checked by: *[Signature]*
Date checked: 25/11/04



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JOB No. 2113283

REPORT No. 12833

DO NOT SCALE FROM THIS REPORT

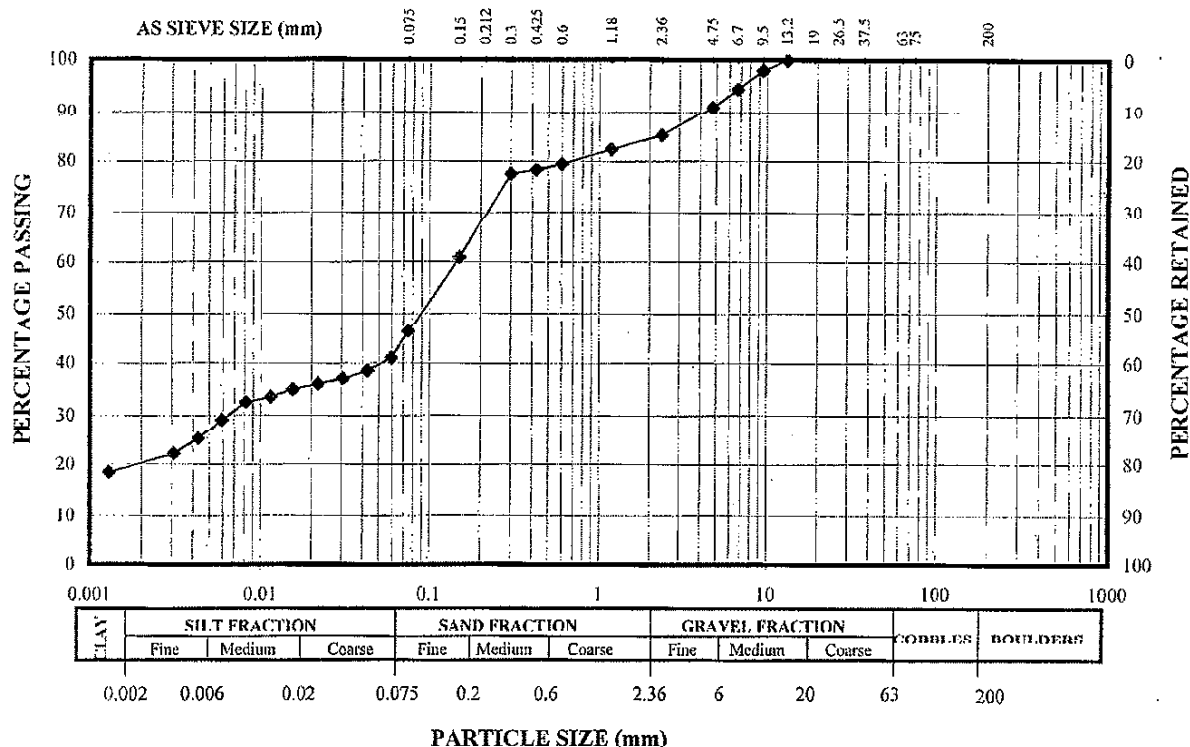
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.5 to 1.0T4-
Sample No: 3666/52

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0798/48
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

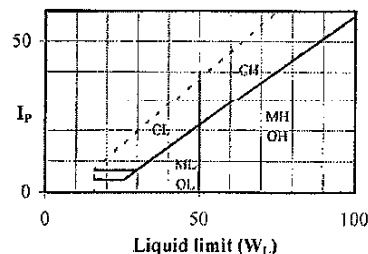
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: gravelly sandy CLAY (visual)

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 22.11.2004
Checked by: *SS*
Date checked: 25.11.04

Authorised Signatory:

[Signature]
J. HANAW
25.11.2004



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JOB No. 2113283

REPORT No. 12834

SEE PARTIAL QUANTITATIVE

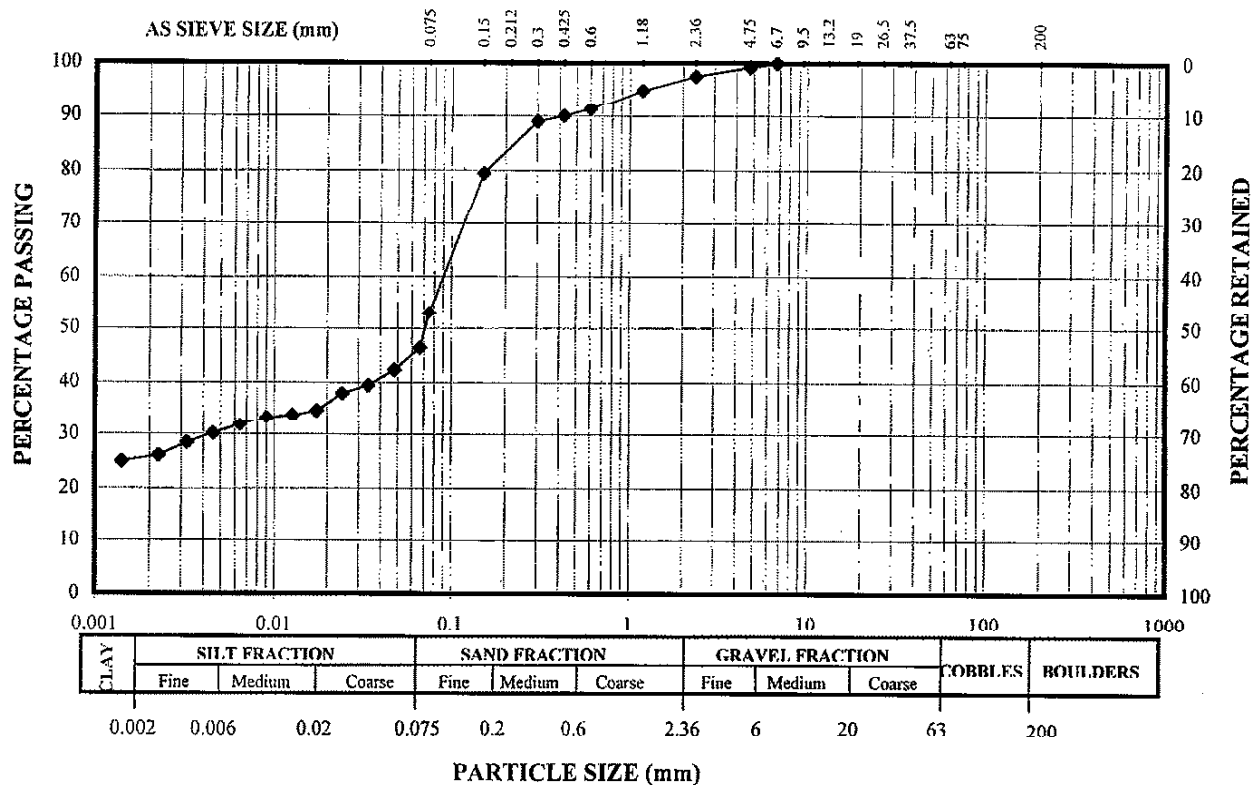
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.0 to 0.5T5
Sample No: 3666/68

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/12
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

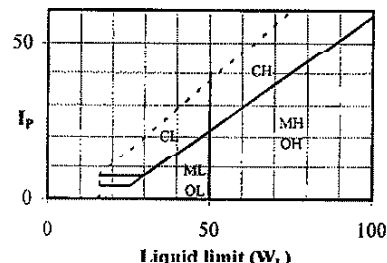
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % - Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 06.12.04
Checked by: *[Signature]*
Date checked: 13/12/04



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Authorised Signatory:

[Signature]
S. Longmac

24.11.2014



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JOB No. 2113283

REPORT No. 12901

Ref: F:\SW\TH\LAB\START\SIEVE

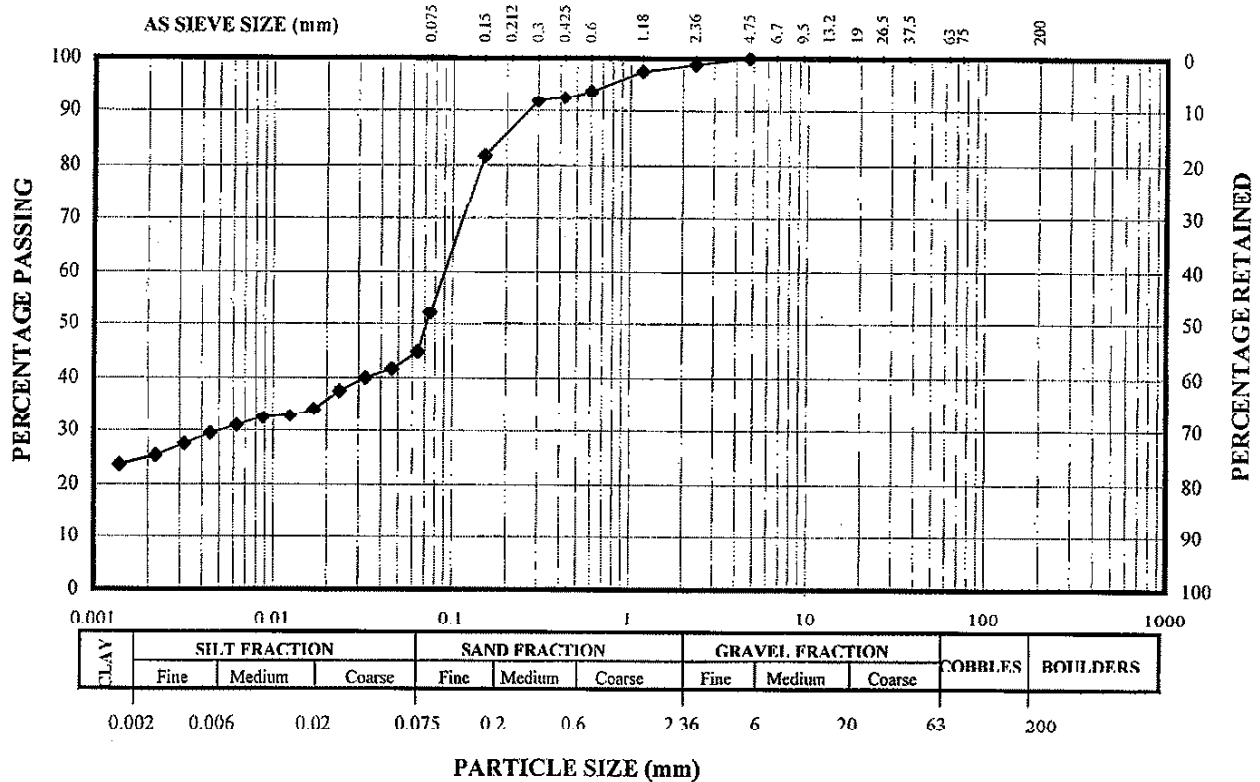
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.0 - 0.5T5
Sample No: 3666/66

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/10
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

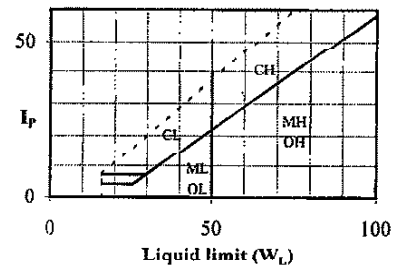
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Dry

GROUP SYMBOL:

SOIL NAME: Silty clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 6.12.04
Checked by: [Signature]
Date checked: 13/12/04



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14.12.2004



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JOB No. 2113283

REPORT No. 12899

Ref: PAVUT10-LANSTART-SIEVE

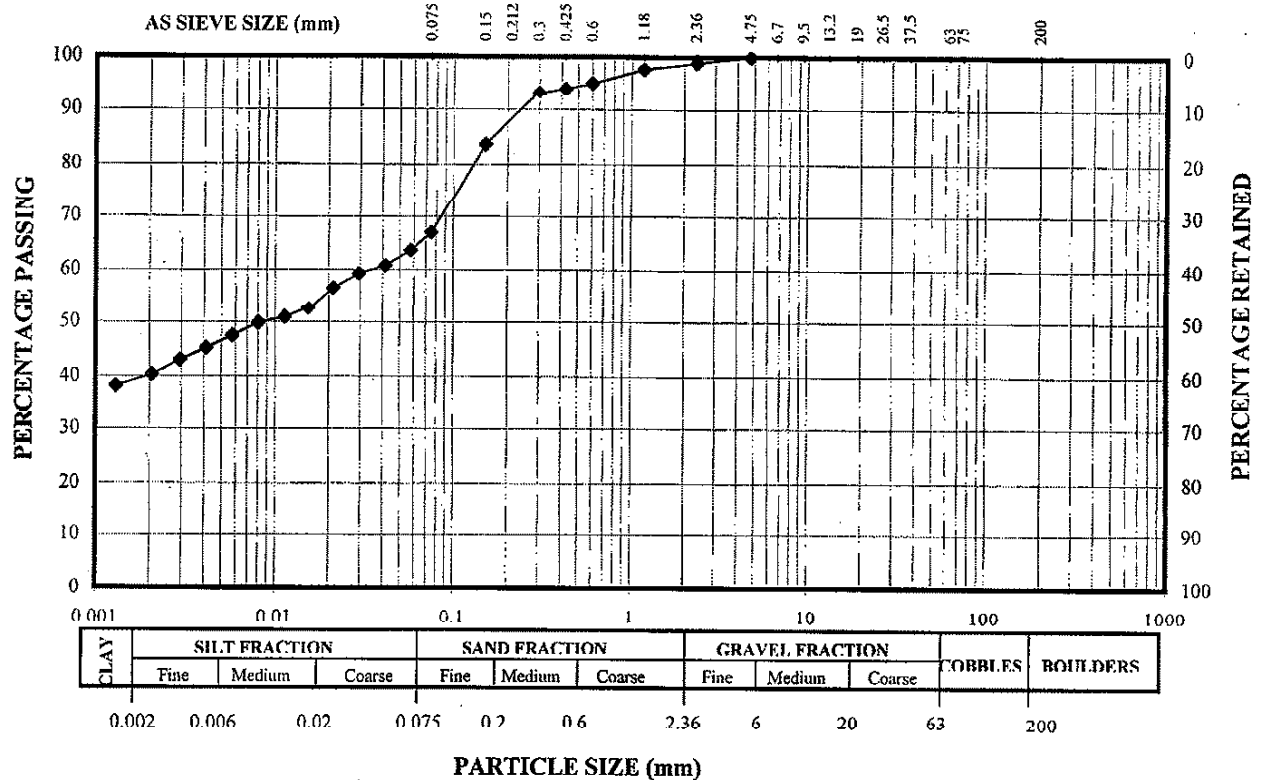
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.5 - 1.0T5
Sample No: 3666/67

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/11
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty sandy CLAY

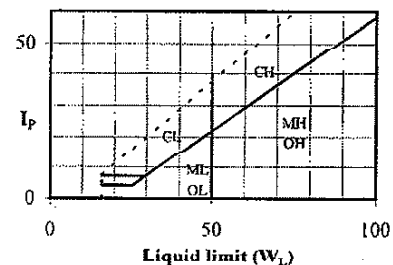
INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)



REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 06.12.04
Checked by: *[Signature]*
Date checked: 13/12/04



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Authorised Signatory:

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S. ANATY
24.12.2004



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JOB No. 2113283

REPORT No. 12900

REF: NSWUTLAP/START/SHVE

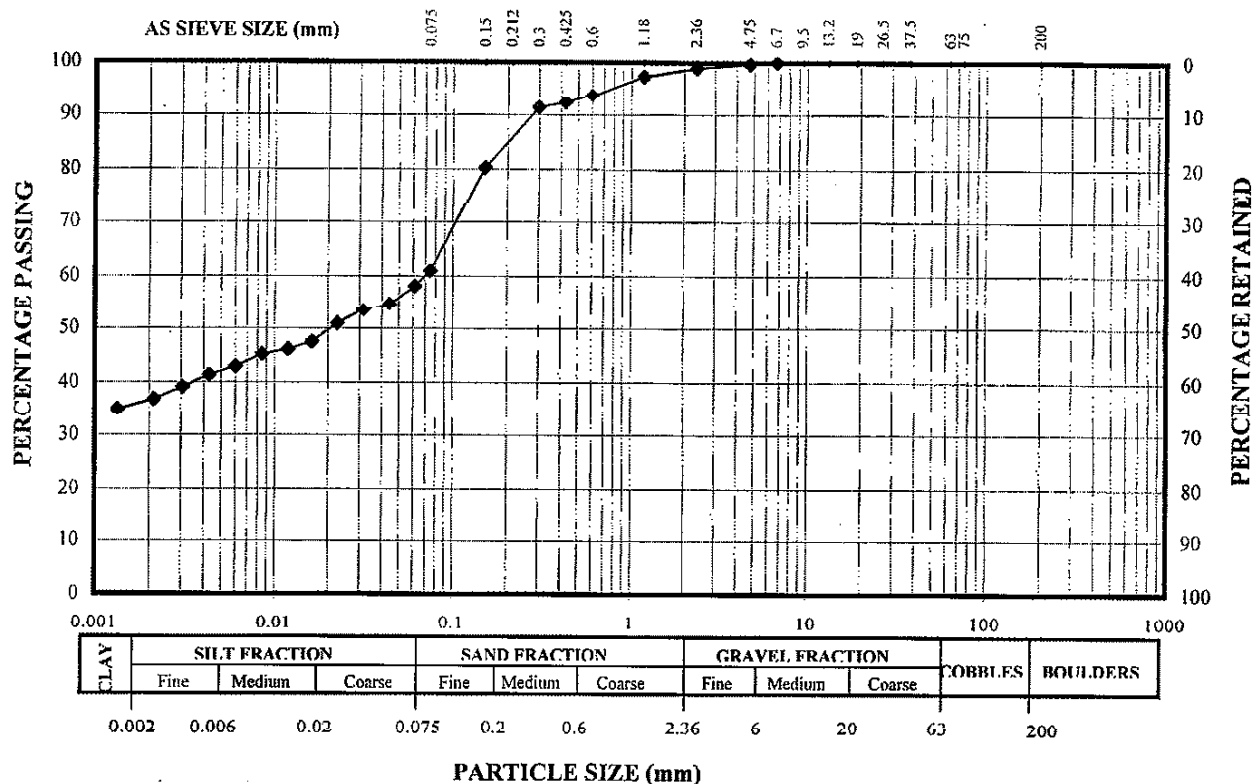
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ
Depth: 0.0 to 0.5T6
Sample No: 3666/69

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0853A/13
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

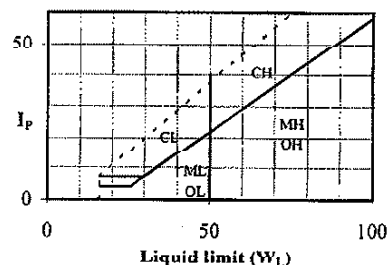
PARTICLE DENSITY 2.72 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty clayey SAND



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS: Tested by SMEC Testing Services NATA Accredited Laboratory No 2750 report No 04/1317

Tested by: SMEC
Date tested: 06.12.04
Checked by: *[Signature]*
Date checked: 13/12/04



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JOB No. 2113283

REPORT No. 12902

Ref: F:\SWUTLAB\START\SIEVE

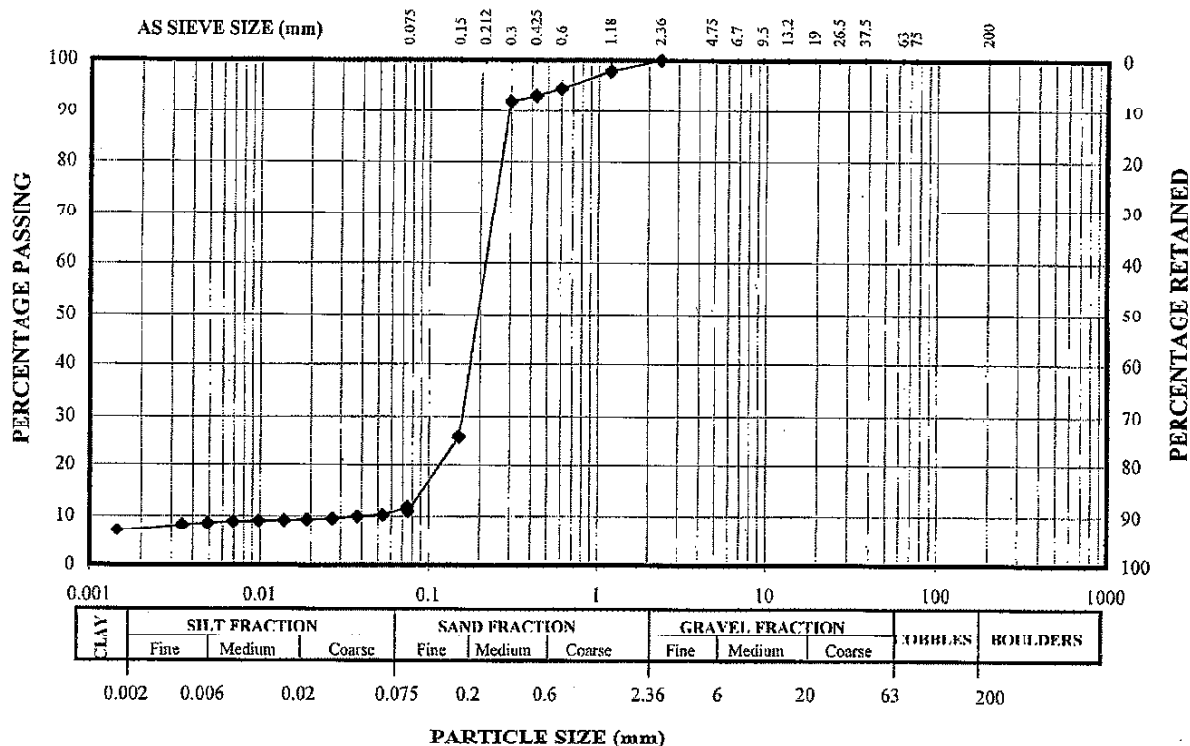
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ T7
Depth: 0.0 - 0.5
Sample No: 3666/130

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/10
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 5.1$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 2.5$$

PARTICLE DENSITY 2.65 (assumed)

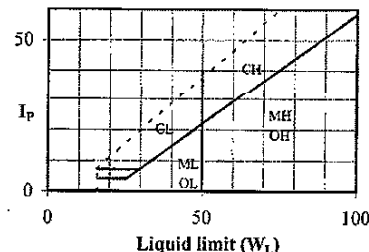
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME:

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:
Date checked: 15/12/04



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JOB No. 2113283

REPORT No. 12929

END OF WORK/TEST/REPORT/STATEMENT

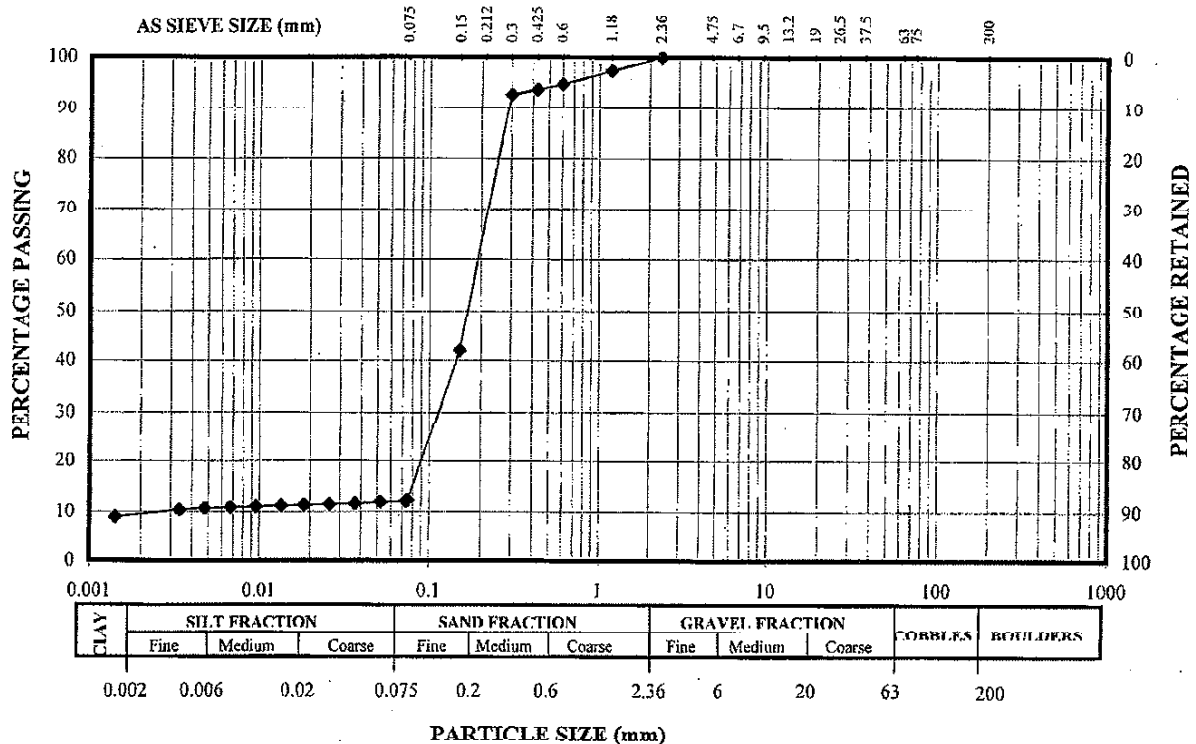
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ T7
Depth: 0.5 - 1.0A
Sample No: 3666/131

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/11
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289 3.6.3

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 69.6$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 24.2$$

PARTICLE DENSITY 2.72 (assumed)

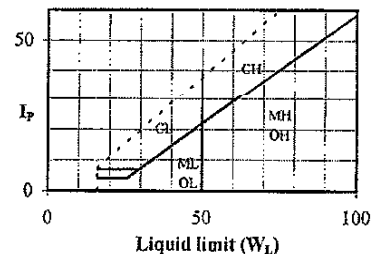
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME:

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by: R
Date checked:



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Tel: 9462 4700 Fax: 9462 4710

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Authorised Signatory:

DR J. DOWIE
15/12/04



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JOB No. 2113283

REPORT No. 12930

Ref: F-SW2014LABSTAKE/SIEVE

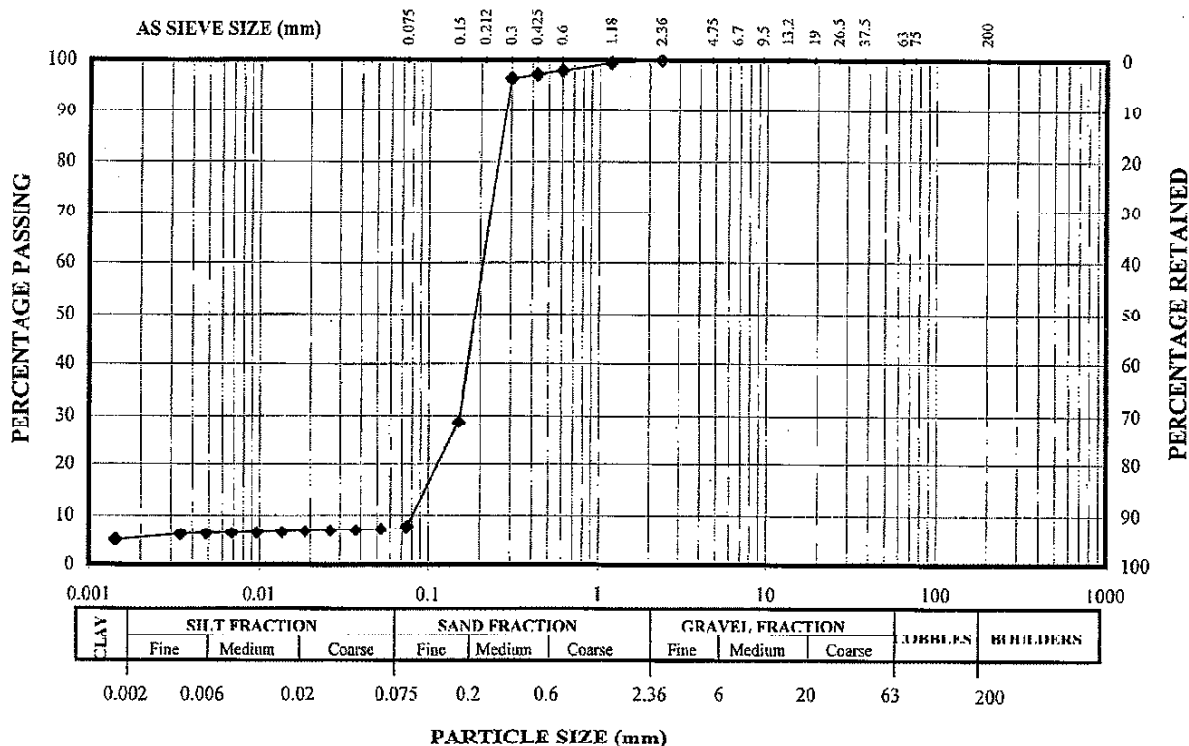
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ T8
Depth: 0.0 - 0.5
Sample No: 3666/132

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/12
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 2.6$$

$$C_c = D_{50}^2 / (D_{10} \times D_{60}) = 1.3$$

PARTICLE DENSITY 2.72 (assumed)

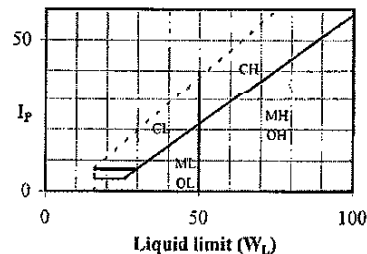
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:
Date checked: 15/12/04



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Authorised Signatory:

DSLOANE
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JOB No. 2113283

REPORT No. 12931

Ref: F:\SWT\12\LAB\START\SI\VE

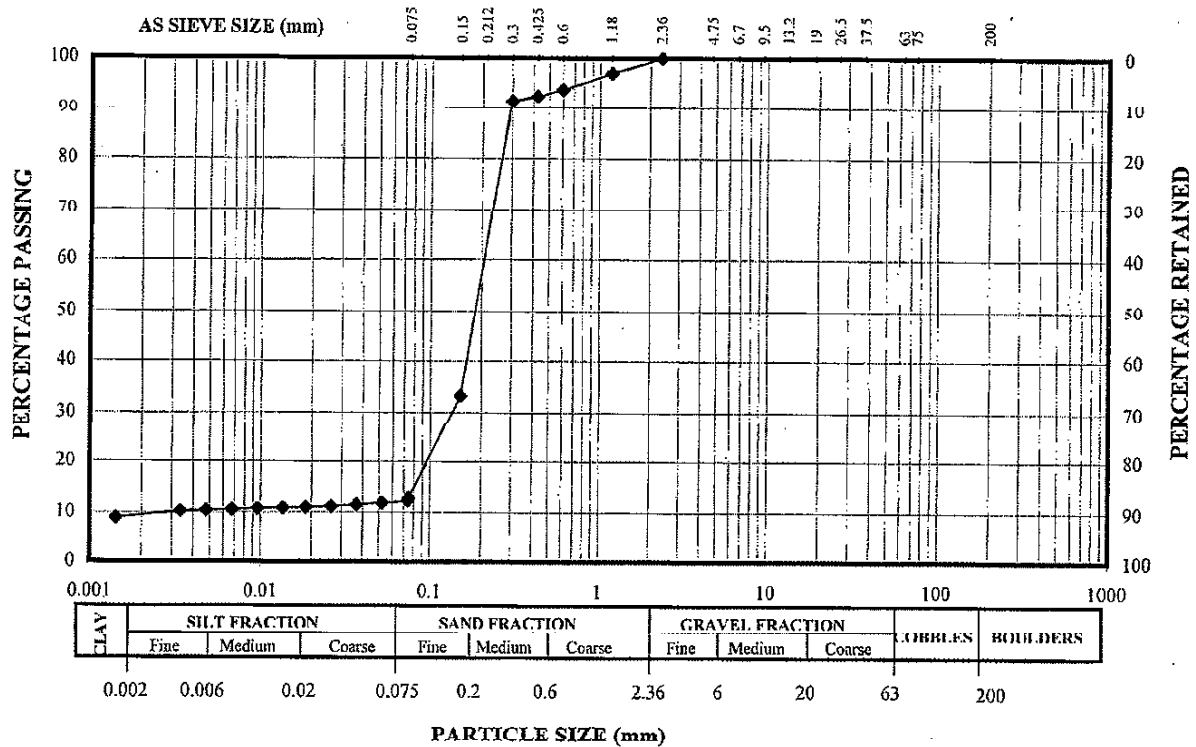
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQ T8
Depth: 0.5 - 1.0
Sample No: 3666/133

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0951/13
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$$C_u = D_{60} / D_{10} = 70.7$$

$$C_c = D_{30}^2 / (D_{10} \times D_{60}) = 28.2$$

PARTICLE DENSITY 2.72 (assumed)

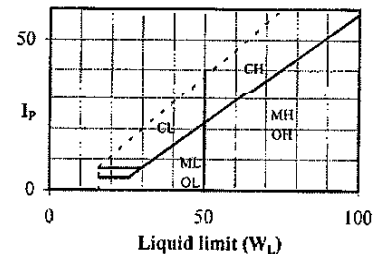
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Silty SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 09.12.04
Checked by:



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JOB No. 2113283

REPORT No. 12932

Ref: EN ISO 17025:2005

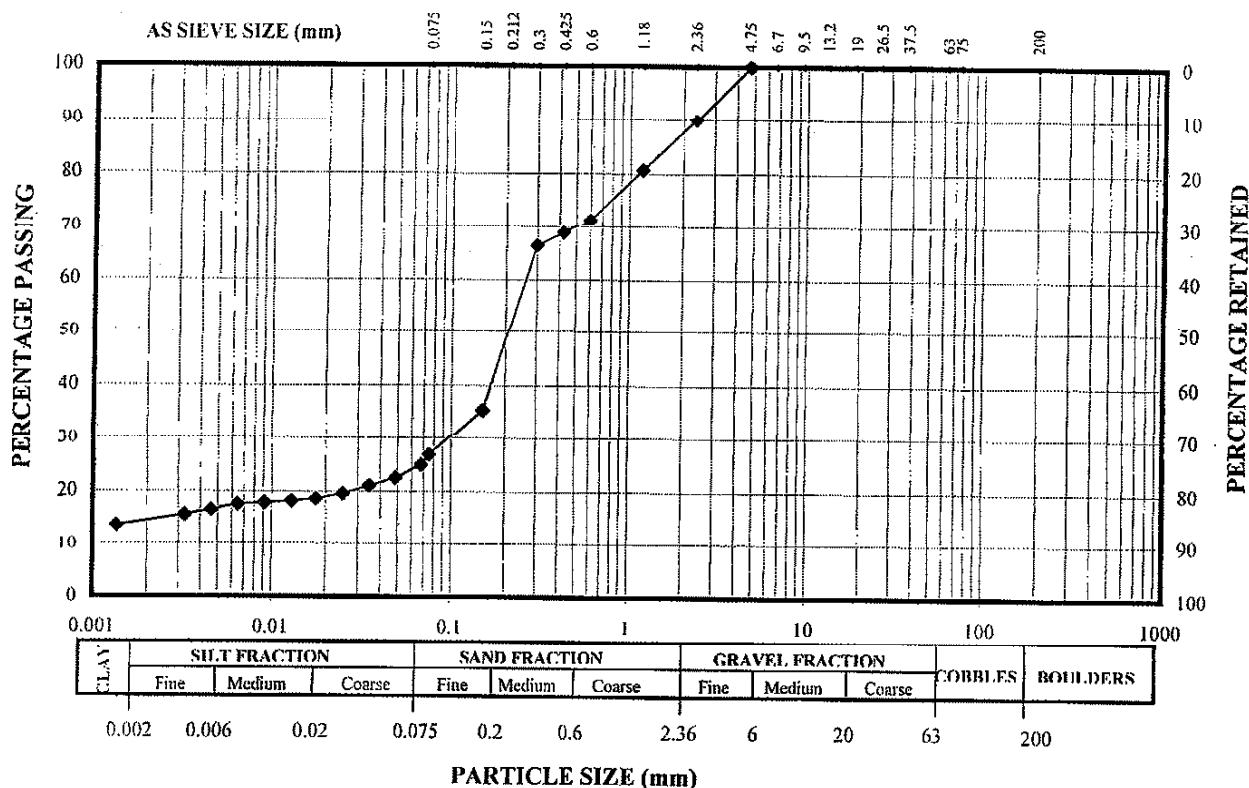
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQT9
Depth: 0.0 - 0.5A
Sample No: 3666/159

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/12
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

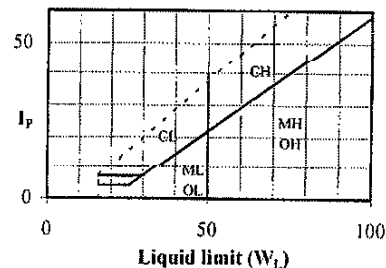
Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{60}^2 / (D_{10} \times D_{30}) =$ not determinable



PARTICLE DENSITY 2.65 (assumed)

INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

Atterberg Limits (History/preparation)

GROUP SYMBOL:

Liquid Limit (type of test)

SOIL NAME: Clayey SAND

Linear Shrinkage (mould size)

REMARKS:

Tested by: GV
Date tested: 13.12.04
Checked by: *GV*
Date checked: 17.12.04



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JOB No.

2113283

REPORT No.

12977

Ref: P-SW/TECH/ANSTARS/SEVE

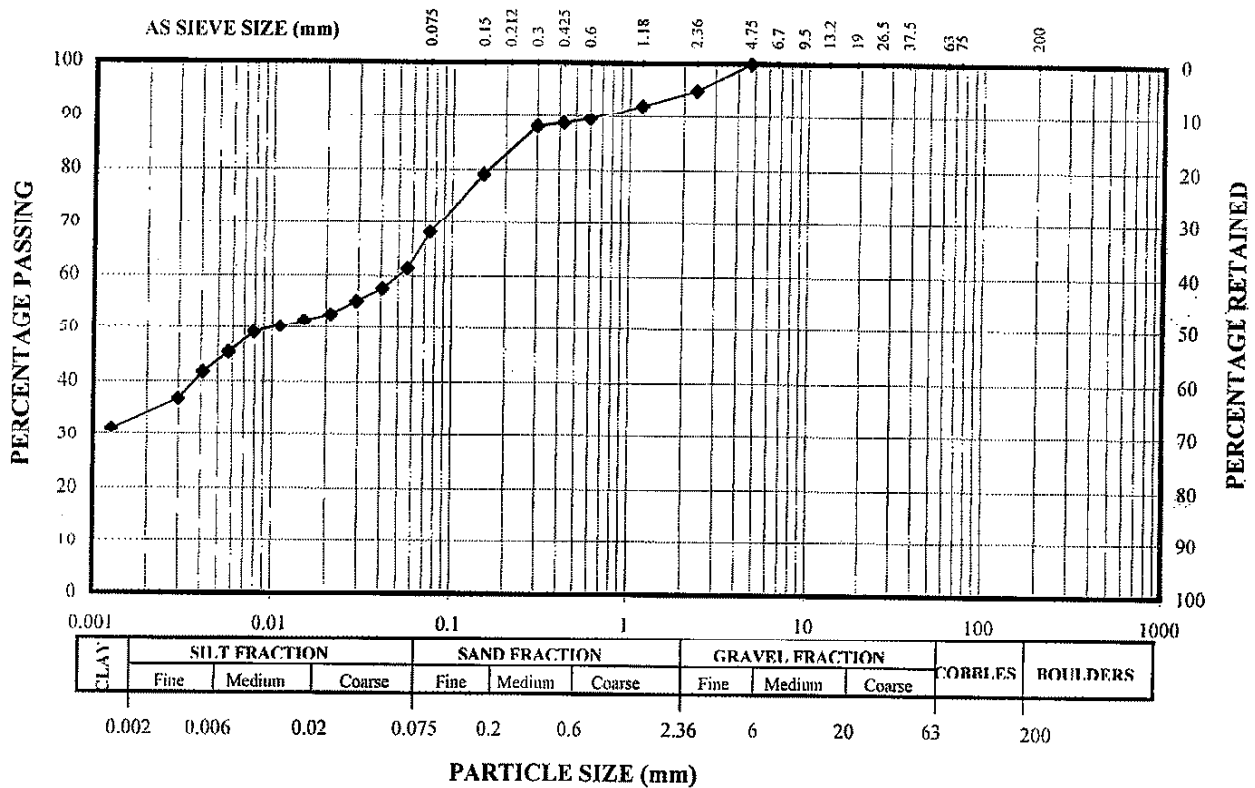
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQT9
Depth: 0.5 - 1.0A
Sample No: 3666/160

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/13
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

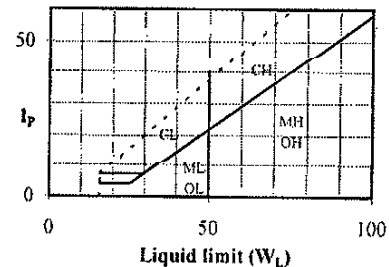
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Sandy CLAY

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 13.12.04
Checked by:
Date checked: 17.12.04



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JOB No. 2113283

REPORT No. 12978

Ref: YSW016 LAB START SHEET

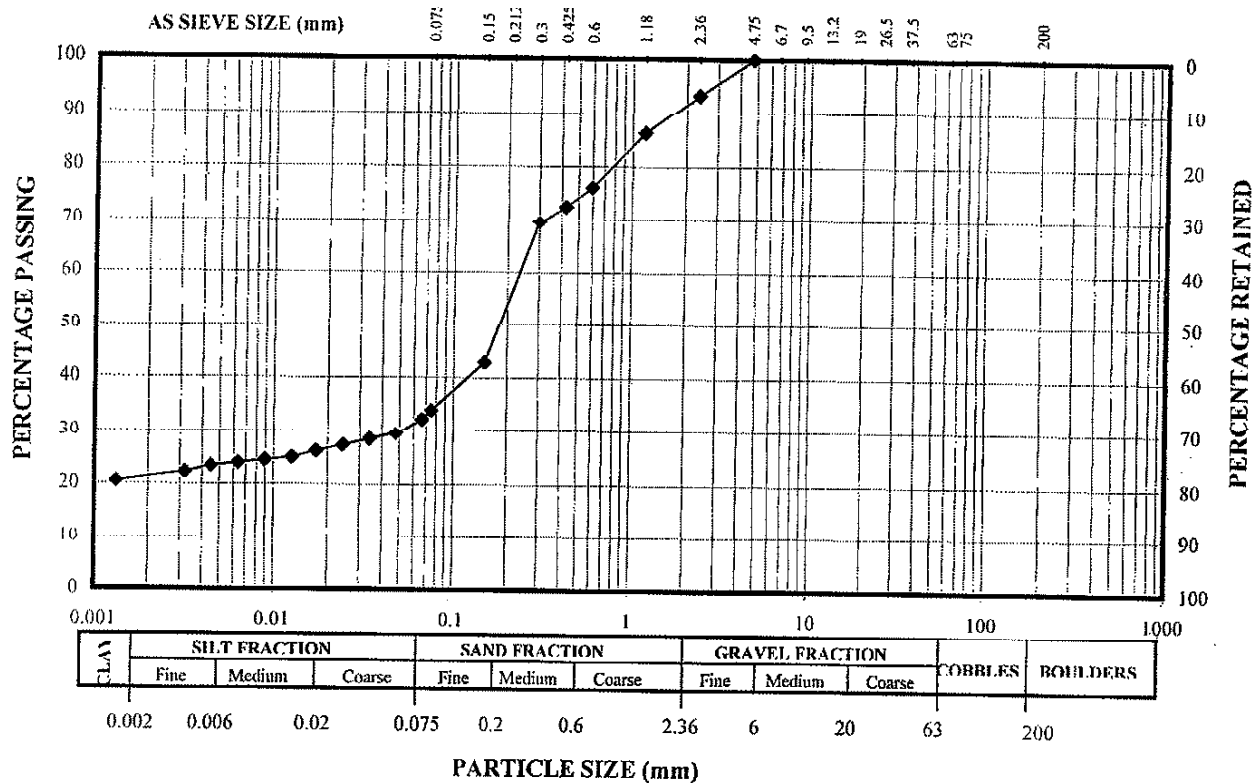
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQT10
Depth: 0.0 - 0.5A
Sample No: 3666/161

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/14
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.2

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

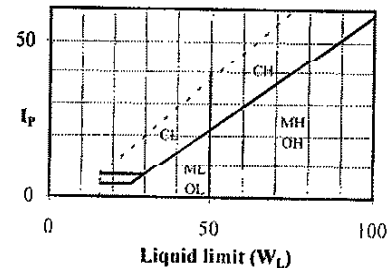
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 13.12.04
Checked by: BW
Date checked: 17.12.04



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REPORT No. 12979

Ref: P-SWATH-LAB-START-SHEET

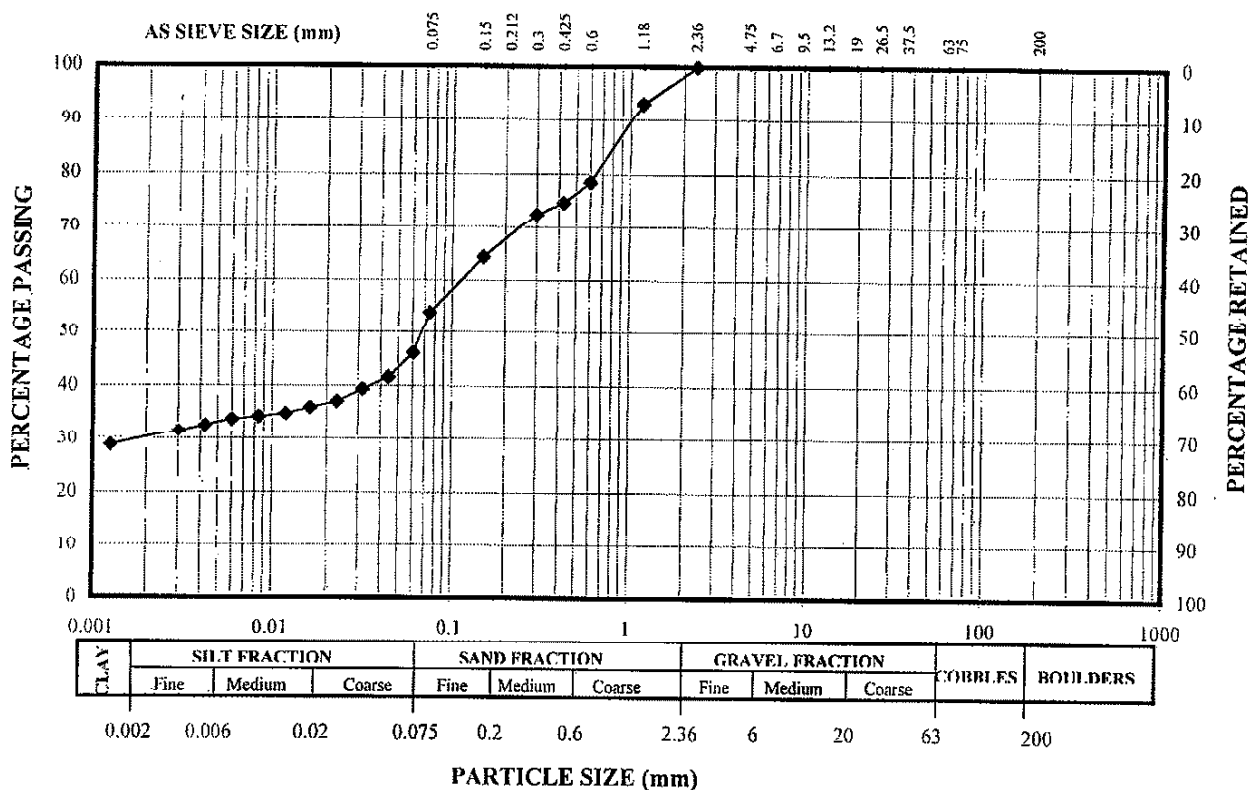
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQT10
Depth: 0.5 - 1.0A
Sample No: 3666/162

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/15
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

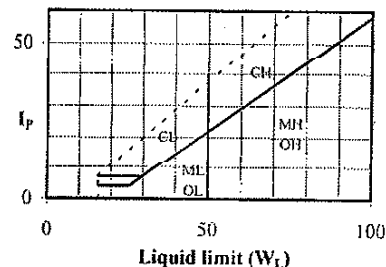
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Sandy CLAY

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 13.12.04
Checked by: *MD*
Date checked: 17.12.04



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JOB No. 2113283

REPORT No. 12980

Ref: P-010 TULAS STARTSIVE

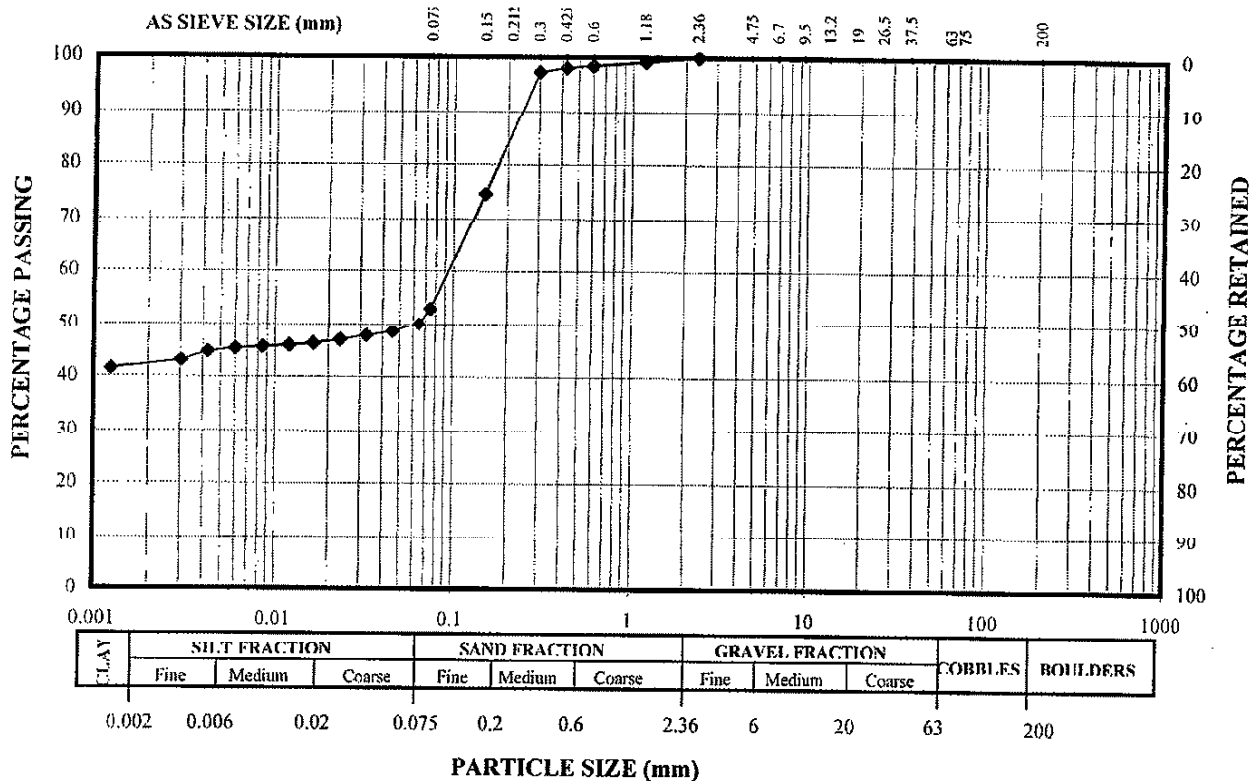
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQT11
Depth: 0.0 - 0.5A
Sample No: 3666/167

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/20
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

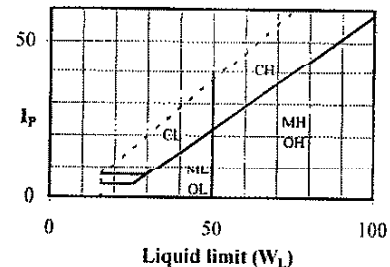
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Sandy CLAY

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by:
Date checked: 17.12.04



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JOB No. 2113283

REPORT No. 12985

Ref: P-SW-TES-LAB-START SIEVE

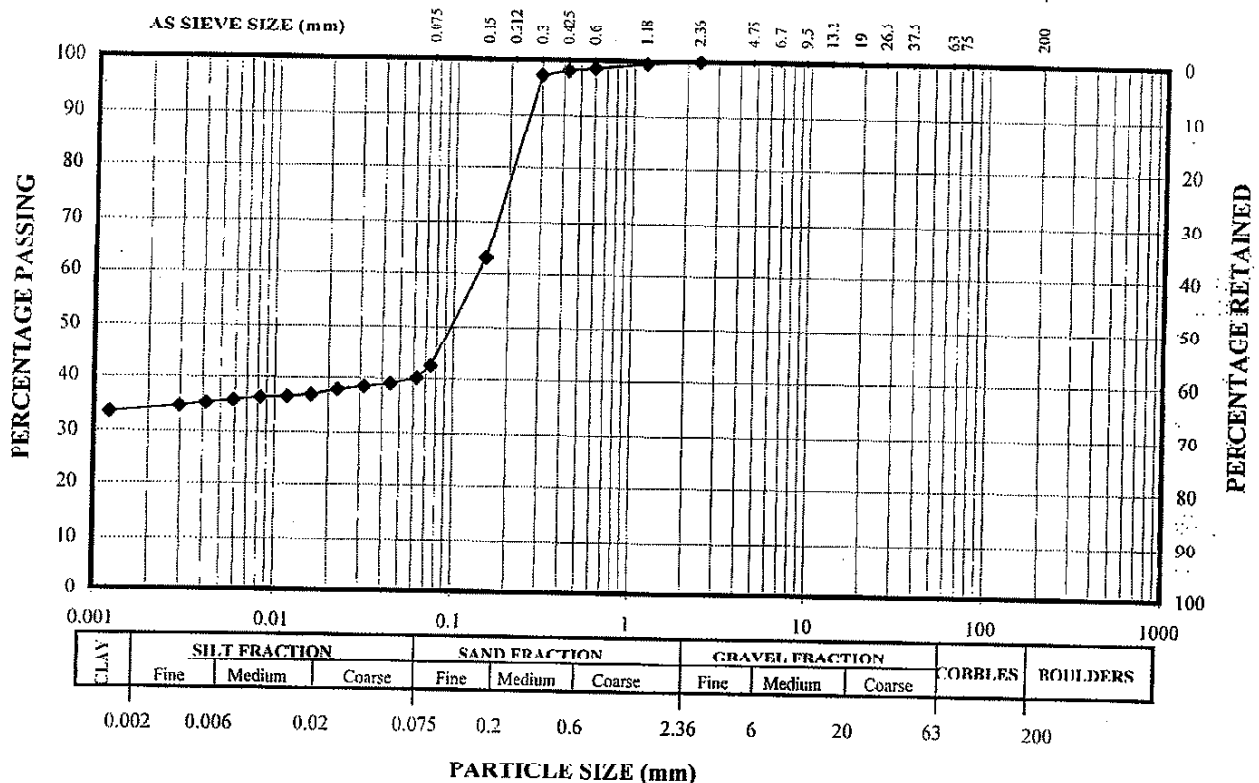
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQT11
Depth: 0.5 - 1.0A
Sample No: 3666/168

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/21
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable

$C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

PARTICLE DENSITY 2.65 (assumed)

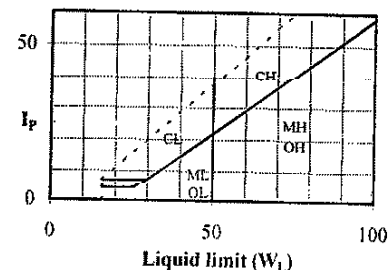
PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Clayey SAND

REMARKS:



INDEX PROPERTIES (%)

Liquid Limit = N/A

Plastic Limit = N/A

Plasticity Index = N/A

Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

Tested by: GV
Date tested: 15.12.04
Checked by: *GW*
Date checked: 17.12.04



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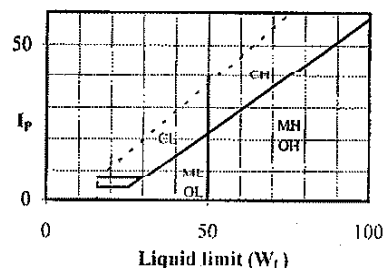
REPORT No. 12986

ISO 15189:2013 LABORATORY

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Trial Hole:	PCQT12
Depth:	0.0 - 0.5A
Sample No:	3666/169

Client Sample No.: A04/0962/22
Sample History: Supplied by Client



Particle size AS1289.3.6.3

Linear Shrinkage (mould size)

REFERENCES

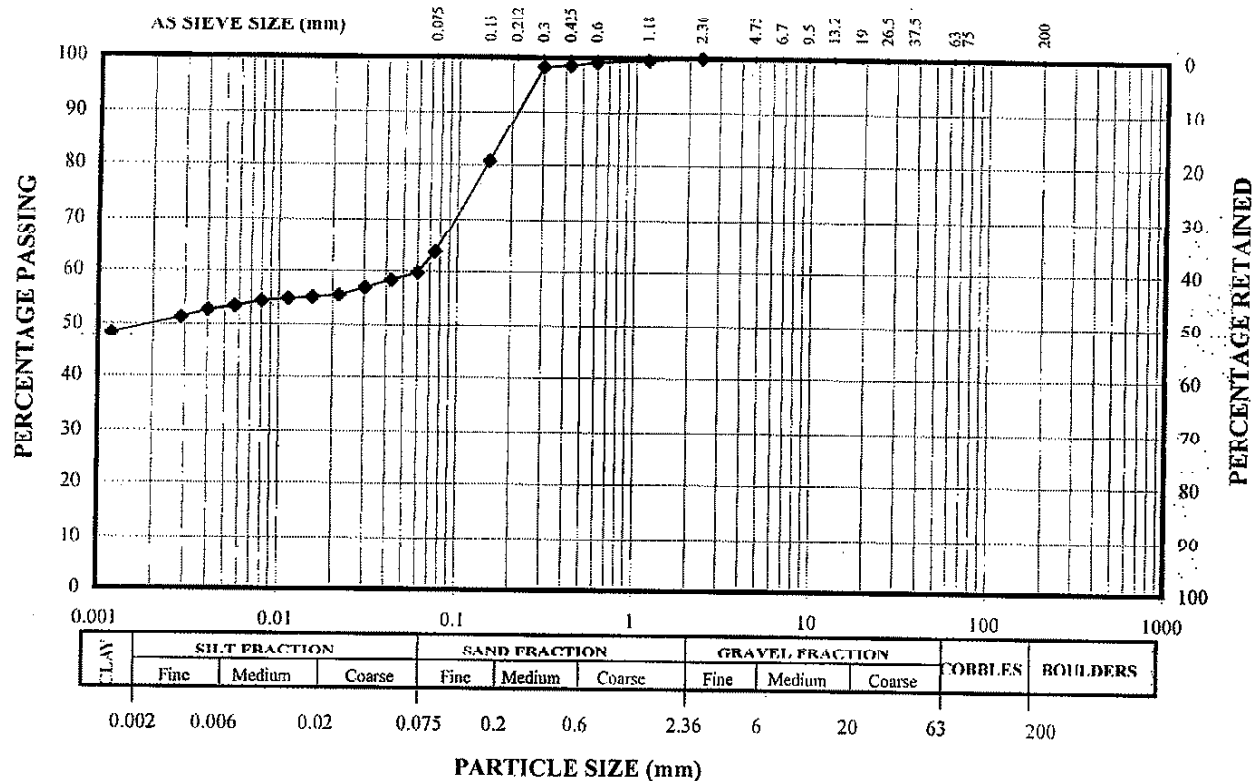
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SOIL CLASSIFICATION REPORT

Trial Hole: PCQT12
Depth: 0.5 - 1.0A
Sample No: 3666/170

Client: Advanced Analytical Australia
Project: Hay Point Dredging PCQ
Location: Hay Point, QLD

Client Sample No.: A04/0962/23
Sample History: Supplied by Client



TEST METHODS

Classification AS1726 A2

Particle size AS1289.3.6.3

OTHER TESTS

GRADING

$C_u = D_{60} / D_{10} =$ not determinable
 $C_c = D_{30}^2 / (D_{10} \times D_{60}) =$ not determinable

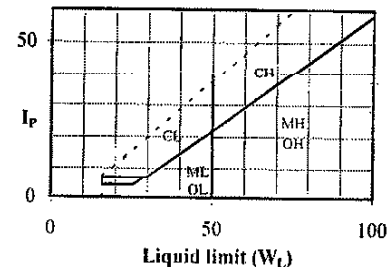
PARTICLE DENSITY 2.65 (assumed)

PRE-TREATMENT HYDROMETER N/A

TEST CONDITION Washed sieve with dispersing agent

GROUP SYMBOL:

SOIL NAME: Sandy CLAY



INDEX PROPERTIES (%)

Liquid Limit = N/A Plastic Limit = N/A
Plasticity Index = N/A Linear Shrinkage % = Not determined

Atterberg Limits (History/preparation)

Liquid Limit (type of test)

Linear Shrinkage (mould size)

REMARKS:

Tested by: GV
Date tested: 15.12.04
Checked by: *GV*
Date checked: 17-12-04



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JOB No. 2113283

REPORT No. 12988

Ref: FSW/TH-LABS/START/ST/VE

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Appendix I

Soil Descriptions

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Table 6 Summary of Soil Types

Sample Location	Depth	Soil Type (Visual)
PCQ1	0-0.5 m	Clayey SAND
PCQ2	0-0.5 m	SAND with clay
	0.5-1.0 m	SAND with clay
PCQ3	0-0.5 m	CLAY with sand
	0.5-1.0 m	Sandy CLAY
PCQ4	0-0.5 m	Clayey SAND
	0.5-1.0 m	Silty sandy CLAY
PCQ5	0-0.5 m	CLAY with silt
	0.5-1.0 m	CLAY with silt
	1.0-2.0 m	CLAY with silt and sand
PCQ6	0-0.5m	CLAY with silt
	0.5-1.0m	Gravelly SAND with silt and clay
PCQ7	0-0.5m	Silty clayey SAND
	0.5-1.0m	SAND with some gravel, clay and silt
PCQ8	0-0.5m	Silty clayey SAND with gravel
	0.5-1.0m	Clayey gravelly SAND with some silt
	1.0-2.0m	Gravelly SAND, some silt and clay
PCQ9	0-0.5m	Silty clayey SAND
	0.5-1.0m	Sandy silty CLAY
PCQ10	0-0.5m	Sandy CLAY
	0.5-1.0m	Sandy CLAY
PCQ11	0-0.5m	Gravelly sandy CLAY
	0.5-1.0m	Sandy CLAY
PCQ12	0-0.5m	Sandy CLAY
	0.5-1.0m	Sandy CLAY
PCQ13	0-0.5m	Clayey SAND
	0.5-1.0m	Gravelly sandy CLAY
PCQ14	0-0.5m	Gravelly CLAY



Sample Location	Depth	Soil Type (Visual)
PCQ15	0.5-1.0m	Clayey SAND
	0-0.5m	Clayey SAND
	0.5-1.0m	Clayey SAND
PCQ16	1.0-2.0m	Clayey SAND
	0-0.5m	Clayey SAND
	0.5-1.0m	Clayey SAND
PCQ17	0-0.5m	Sandy CLAY with gravel
	0.5-1.0m	Sandy CLAY
PCQ18	0-0.5m	Clayey SAND
	0.5-1.0m	Silty SAND
PCQ19	0-0.5m	Clayey SAND with gravel
	0.5-1.0m	Clayey SAND
PCQ20	0-0.5m	Sandy CLAY
	0.5-1.0m	Clayey SAND
PCQ21	0-0.5m	Clayey sand with gravel
	0.5-1.0m	Sandy CLAY
PCQ22	0-0.5m	Clayey SAND with gravel
	0.5-1.0m	Sandy CLAY
PCQ23	0-0.5m	SAND with silt and clay
	0.5-1.0m	SAND with silt and clay
PCQ24	0-0.5m	Clayey SAND
	0.5-1.0m	SAND with clay and silt
PCQ25	0-0.5m	CLAY with sand
	0.5-1.0m	Sandy CLAY
PCQ26	0-0.5m	Clayey SAND
	0.5-1.0m	CLAY with sand
PCQ27	0-0.5m	Clayey SAND
	0.5-1.0m	Clayey SAND
PCQ28	0-0.5m	Silty SAND with gravel
	0.5-1.0m	SAND with gravel
PCQ29	0-0.5m	SAND



Sample Location	Depth	Soil Type (Visual)
PCQ30	0.5-1.0m	Clayey SAND
	0-0.5m	Clayey SAND
PCQ31	0.5-1.0m	Clayey SAND
	0-0.5m	Clayey SAND
PCQ32	0.5-1.0m	Gravelly SAND with clay and silt
	0-0.5m	Clayey SAND
PCQ33	0.5-1.0m	Clayey SAND
	0-0.5m	Clayey SAND
PCQ34	0.5-1.0m	Silty clayey SAND
	0-0.5m	Clayey SAND
PCQ35	0.5-1.0m	Clayey SAND
	1.0-2.0m	Clayey SAND
PCQ36	0-0.5m	Clayey SAND
	0.5-1.0m	Clayey SAND
PCQ37	0-0.5m	Clayey SAND
	1.0-2.0m	Clayey SAND
PCQ38	0-0.5m	Silty SAND with gravel
	0.5-1.0m	Clayey SAND with silt
PCQ39	0-0.5m	SAND with clay
	1.0-2.0m	Clayey SAND
PCQ40	0-0.5m	Clayey SAND
	0.5-1.0m	Clayey SAND
PCQ41	0-0.5m	Clayey SAND
	0.5-1.0m	Clayey SAND
PCQ42	0-0.5m	Gravelly SAND with some silt
	0.5-1.0m	Clayey SAND



Sample Location	Depth	Soil Type (Visual)
PCQ43	0-0.5m	Clayey SAND
	0.5-1.0m	Clayey SAND
	1.0-2.0m	Gravelly SAND
PCQ44	0-0.5m	SAND with silt
	0.5-1.0m	Gravelly SAND with some silt and clay
PCQ45	0-0.5m	SAND with some silt & clay
	0.5-1.0m	Clayey SAND
PCQ46	0-0.5m	Clayey SAND with gravel
	0.5-1.0m	Clayey SAND
PCQ47	0-0.5m	Silty clayey SAND
	0.5-1.0m	Silty clayey SAND
PCQ48	0-0.5m	Clayey SAND with some gravel
	0.5-1.0m	Clayey gravelly sand
	1.0-2.0m	Gravelly SAND with silt and clay
PCQ49	0-0.5m	Clayey SAND
	0.5-1.0m	Clayey SAND
PCQ50	0-0.5m	Clayey SAND
	0.5-1.0m	Clayey SAND
PCQ51	0-0.5m	SAND some clay
	0.5-1.0m	Clayey SAND
	1.0-2.0m	Clayey SAND
PCQ52	0-0.5m	SAND
	0.5-1.0m	Clayey SAND
PCQ53	0-0.5m	Silty clayey SAND
	0.5-1.0m	Clayey SAND/sandy CLAY
PCQ54	0-0.5m	SAND with some silt
	0.5-1.0m	Silty sand
PCQ55	0-0.5m	Silty SAND
	0.5-1.0m	Silty SAND
PCQ56	0-0.5m	SAND



Sample Location	Depth	Soil Type (Visual)
	0.5-1.0m	SAND

* Soil description not provided by laboratory.



Appendix J

Results of Chemical Analysis

Table 7 Concentrations of contaminants of concern in the material to be dredged. Grey shading = exceeds ISQG-low screening level; Black shaded = exceeds ISQG maximum screening level

				Site Date	PCQ23 0-0.5A 4/11/2004	PCQ23 0.5-1.0A 4/11/2004	PCQ23 0.5-1.0R 4/11/2004	PCQ24 0-0.5A 8/11/2004	PCQ24 0.5-1.0A 4/11/2004	PCQ25 0-0.5A 4/11/2004	PCQ25 0-0.5R 4/11/2004	PCQ25 0.5-1.0A 8/11/2004	PCQ26 0-0.5A 4/11/2004	PCQ26 0.5-1.0A 4/11/2004	PCQ27 0-0.5A 4/11/2004	PCQ27 0.5-1.0A 4/11/2004	PCQ28 0-0.5A 8/11/2004	PCQ28 0.5-1.0A 4/11/2004	PCQ28 0.5-1.0R 4/11/2004	PCQ29 0-0.5A 17/11/2004	PCQ29 0.5-1.0A 17/11/2004	PCQ30 0-0.5A 23/11/2004	PCQ30 0-0.5R 23/11/2004	PCQ30 0.5-1.0A 23/11/2004
			NODGDM Screening Level	NODGDM Maximum Level																				
Parameter	Units	Limit of Reporting																						
Moisture Content	%				16	18	18	20	19	24	24	27	24	27	16	7.8	21	13	12	21.2	14.6	20.9	19.5	17.1
Metals																								
Silver	mg/kg	0.1mg/kg	1	3.7				<0.1				<0.1					<0.1		<0.1					
Arsenic	mg/kg	0.1mg/kg	20	70	4.9	5.4	11	12	4.4	7	7.1	17	12	0.4	3.6	1.7	4.6	1	1.1	3.1	0.86	10	6	6.6
Cadmium	mg/kg	0.1mg/kg	1.5	10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	mg/kg	0.1mg/kg	80	370	10	11	10	10	11	23	24	27	20	26	8.4	8.3	9.4	6.5	5.1	8.2	11	14	14	14
Copper	mg/kg	0.1mg/kg	65	270	3.3	4.6	8.4	2.1	2.9	5.2	5.5	8	7.3	6.5	3.1	2.6	2.5	2.4	1.9	4.2	7	5.7	4.1	5.7
Iron	mg/kg	0.1mg/kg			9900	13000	13000	12000	12000	20000	20000	27000	25000	18000	11000	7100	8200	5800	4300	8800	9500	15000	13000	15000
Mercury	mg/kg	0.01mg/kg	0.15	1				<0.01				<0.01					<0.01		<0.01					
Manganese	mg/kg	0.1mg/kg			290	290	390	320	330	150	110	310	190	100	63	40	160	29	23	180	53	55	47	39
Nickel	mg/kg	0.1mg/kg	21	52	5	6.6	7.4	4.8	5.2	10	10	13	11	12	6.4	4.6	4.7	3.4	2.9	3.7	4.8	6.4	5.7	6.3
Lead	mg/kg	0.1mg/kg	50	220	3.5	3.6	4.2	3.6	3.1	7.5	6.9	11	7	6.5	3.9	2.1	2.9	2	1.7	3.1	3.6	5.5	4.3	6.3
Antimony	mg/kg	0.1mg/kg	2	25				<0.1				0.6					<0.1			<0.1				
Zinc	mg/kg	0.1mg/kg	200	410	9.8	12	13	12	11	26	26	33	26	35	12	9.4	9.7	8.6	6.4	12	18	15	13	15
Organotin Compounds																								
Monoethyl tin	µgSn/kg	0.5µgSn/kg			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibutyl tin	µgSn/kg	0.5µgSn/kg			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tributyl tin	µgSn/kg	0.5µgSn/kg	5	70	<0.5	<0.5	<0.5	0.81	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(normalised to 1% TOC)	µgSn/kg	0.5µgSn/kg	5	70	<0.5	<0.5	<0.5	3.68	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.27	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon	%	0.10%			0.05	0.05	0.05	0.22	0.21	0.10	0.05	0.05	0.18	0.05	0.14	0.05	0.11	0.11	0.11	0.18	0.05	0.05	0.05	0.05
Total Petroleum Hydrocarbons and BTEX																								
Benzene	mg/kg	0.2mg/kg						<0.2				<0.2					<0.2			<0.2				
Toluene	mg/kg	0.2mg/kg						<0.2				<0.2					<0.2			<0.2				
Ethyl Benzene	mg/kg	0.2mg/kg						<0.2				<0.2					<0.2			<0.2				
m+p xylenes	mg/kg	0.2mg/kg						<0.4				<0.4					<0.4			<0.4				
o-xylene	mg/kg	0.2mg/kg						<0.2				<0.2					<0.2			<0.2				
Total BTEX	mg/kg	0.2mg/kg						<1.2				<1.2					<1.2			<1.2				
TPH C6-C9	mg/kg	10mg/kg						<10				<10					<10			<10				
TPH C10-14	mg/kg	10mg/kg						<10				<10					<10			<10				
TPH C15-28	mg/kg	50mg/kg						<50				<50					<50			<50				
TPH C29-36	mg/kg	50mg/kg						<50				<50					<50			<50				
Polyaromatic Hydrocarbons																								
Naphthalene	µg/kg	5µg/kg	160	2100				<5				<5					<5			<5				
Acenaphthalene	µg/kg	5µg/kg	16	500				<5				<5					<5			<5				
Acenaphthene	µg/kg	5µg/kg	44	640				<5				<5					<5			<5				
Fluorene	µg/kg	5µg/kg	19	540				<5				<5					<5			<5				
Phenanthrene	µg/kg	5µg/kg	240	1500				<5				<5					<5			<5				
(normalised to 1% TOC)	µg/kg	5µg/kg						<5				<5					<5			<5				
Anthracene	µg/kg	5µg/kg	85	1100				<5				<5					<5			<5				
Fluoranthene	µg/kg	5µg/kg	600	5100				<5				<5					<5			<5				
(normalised to 1% TOC)	µg/kg	5µg/kg						<5				<5					<5			<5				
Pyrene	µg/kg	5µg/kg	665	2600				<5				<5					<5			<5				
(normalised to 1% TOC)	µg/kg	5µg/kg						<5				<5					<5			<5				
Benz(a)anthracene	µg/kg	5µg/kg	261	1600				<5				<5					<5			<5				
(normalised to 1% TOC)	µg/kg	5µg/kg						<5				<5					<5			<5				
Chrysene	µg/kg	5µg/kg	384	2800				<5				<5					<5			<5				
(normalised to 1% TOC)	µg/kg	5µg/kg						<5				<5					<5			<5				
Benzo(b)&(k)fluoranthene	µg/kg	5µg/kg						<10				<10					<10			<10				
Benzo(a)pyrene	µg/kg	5µg/kg	430	1600				<5				<5					<5			<5				
Indeno(1,2,3-cd)pyrene	µg/kg	5µg/kg						<5				<5					<5			<5				
Dibenz(a,h)anthracene	µg/kg	5µg/kg	63	260				<5				<5					<5			<5				
Benzo(g,h,i)perylene	µg/kg	5µg/kg						<5				<5					<5			<5				
Total PAHs (as above)	µg/kg	5µg/kg	4000	45000				<100				<100					<100			<100				
Organochlorine and Organophosphorus Pesticides																								
Aldrin	ug/kg	1ug/kg						<1				<1					<1			<1				
alpha-BHC	ug/kg	1ug/kg						<1				<1					<1			<1				
beta-BHC	ug/kg	1ug/kg						<1				<1					<1			<1				
gamma-BHC (Lindane)	ug/kg	1ug/kg						<1				<1					<1			<1				
delta-BHC	ug/kg	1ug/kg						<1				<1					<1			<1				
cis-Chlordane	ug/kg	1ug/kg	0.5	6				<1				<1					<1			<1				
trans-Chlordane	ug/kg	1ug/kg	0.5	6				<1				<1					<1			<1				
p,p'-DDD	ug/kg	1ug/kg	2	20				<1				<1					<1			<1				
p,p'-DDE	ug/kg	1ug/kg	202	27				<1				<1					<1			<1				
p,p'-DDT	ug/kg	1ug/kg	1.6	46				<1				<1					<1			<1				
Dieldrin	ug/kg	1ug/kg	0.02	8				<1				<1					<1			<1				
alpha-Endosulfan	ug/kg	1ug/kg						<1				<1					<1			<1				
beta-Endosulfan	ug/kg	1ug/kg						<1				<1					<1			<1				
Endosulfan Sulphate	ug/kg	1ug/kg						<1				<1					<1			<1				
Endrin	ug/kg	1ug/kg	0.02	8				<1				<1					<1			<1				
Endrin ketone	ug/kg	1ug/kg						<1				<1					<1			<1				
Endrin aldehyde	ug/kg	1ug/kg						<1				<1					<1			<1				
Heptachlor	ug/kg	1ug/kg						<1				<1					<1			<1				
Heptachlor epoxide	ug/kg	1ug/kg						<1				<1					<1			<1				
Hexachlorobenzene	ug/kg	1ug/kg						<1				<1					<1			<1				
Methoxychlor	ug/kg	1ug/kg						<1				<1					<1			<1				
Azinphos-methyl	ug/kg	50ug/kg						<50				<50												

Table 7 Concentrations of contaminants of concern in the material to be dredged. Grey shading = exceeds ISQG-low screening level; Black shaded = exceeds ISQG maximum screening level

				Site	PCQ53 0-0.5A	PCQ53 0.5-1.0A	PCQ54 0-0.5A	PCQ54 0.5-1.0A	PCQ55 0-0.5A	PCQ T7 0-0.5A	PCQ T8 0-0.5A	PCQ55 0.5-1.0A	PCQ T7 0.5-1.0A	PCQ T8 0.5-1.0A	PCQ56 0-0.5A	PCQ56 0-0.5R	PCQ56 0.5-1.0A
				Date	17/11/2004	17/11/2004	22/11/2004	22/11/2004	22/11/2004	22/11/2004	22/11/2004	22/11/2004	22/11/2004	22/11/2004	22/11/2004	22/11/2004	22/11/2004
			NODGDM	NODGDM													
Parameter	Units	Limit of Reporting	Screening Level	Maximum Level				16	14	10	12	15	11	13	4	5	6
Moisture Content	%				27.1	20.0	22.3	22.6	21.3	19.1	20.8	23.6	23	21.8	18.9	18.9	20.2
Metals																	
Silver	mg/kg	0.1mg/kg	1	3.7	<0.1		<0.1										
Arsenic	mg/kg	0.1mg/kg	20	70	2	0.15	3.6	3.5	4	4	3.8	3.8	4.3	3.9	3.7	3.9	4.1
Cadmium	mg/kg	0.1mg/kg	1.5	10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	mg/kg	0.1mg/kg	80	370	14	13	8.8	9.7	7.9	10	8.6	9.9	11	9.9	8.4	8.8	9.5
Copper	mg/kg	0.1mg/kg	65	270	15	12	0.63	0.87	0.58	0.9	0.67	0.91	1.3	1	0.65	0.69	1
Iron	mg/kg	0.1mg/kg			14000	11000	3900	4500	3900	4600	4100	4800	5700	5200	3900	4400	5400
Mercury	mg/kg	0.01mg/kg	0.15	1	0.02		<0.01										
Manganese	mg/kg	0.1mg/kg			170	53	150	150	180	190	160	200	190	190	170	190	170
Nickel	mg/kg	0.1mg/kg	21	52	10	6.5	3	3.4	2.3	3.5	3	3.5	4.4	3.7	2.8	2.9	3.8
Lead	mg/kg	0.1mg/kg	50	220	8.9	7.9	1.5	1.7	1.5	1.8	1.5	1.9	2.2	2	1.5	1.6	2
Antimony	mg/kg	0.1mg/kg	2	25	<0.1		<0.1										
Zinc	mg/kg	0.1mg/kg	200	410	23	18	4	5	3.6	5.1	5	5.3	6.5	6	4	4.3	5.6
Organotin Compounds																	
Monobutyl tin	µgSn/kg	0.5µgSn/kg			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibutyl tin	µgSn/kg	0.5µgSn/kg			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tributyl tin	µgSn/kg	0.5µgSn/kg	5	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(normalised to 1% TOC)	µgSn/kg	0.5µgSn/kg	5	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon	%	0.10%			0.13	0.12	0.17	0.15	0.11	0.17	0.17	0.15	0.21	0.20	0.13	0.12	0.17
Total Petroleum Hydrocarbons and BTEX																	
Benzene	mg/kg	0.2mg/kg			<0.2		<0.2										
Toluene	mg/kg	0.2mg/kg			<0.2		<0.2										
Ethyl Benzene	mg/kg	0.2mg/kg			<0.2		<0.2										
m+p xylenes	mg/kg	0.2mg/kg			<0.4		<0.4										
o-xylene	mg/kg	0.2mg/kg			<0.2		<0.2										
Total BTEX	mg/kg	0.2mg/kg			<1.2		<1.2										
TPH C6-C9	mg/kg	10mg/kg			<10		<10										
TPH C10-14	mg/kg	10mg/kg			<10		<10										
TPH C15-28	mg/kg	50mg/kg			<50		<50										
TPH C29-36	mg/kg	50mg/kg			<50		<50										
Polyaromatic Hydrocarbons																	
Naphthalene	µg/kg	5µg/kg	160	2100	<5		<5										
Acenaphthalene	µg/kg	5µg/kg	16	500	<5		<5										
Acenaphthene	µg/kg	5µg/kg	44	640	<5		<5										
Fluorene	µg/kg	5µg/kg	19	540	<5		<5										
Phenanthrene	µg/kg	5µg/kg	240	1500	<5		<5										
(normalised to 1% TOC)	µg/kg	5µg/kg			<5		<5										
Anthracene	µg/kg	5µg/kg	85	1100	<5		<5										
Fluoranthene	µg/kg	5µg/kg	600	5100	<5		<5										
(normalised to 1% TOC)	µg/kg	5µg/kg			<5		<5										
Pyrene	µg/kg	5µg/kg	665	2600	<5		<5										
(normalised to 1% TOC)	µg/kg	5µg/kg			<5		<5										
Benzo(a)anthracene	µg/kg	5µg/kg	261	1600	<5		<5										
(normalised to 1% TOC)	µg/kg	5µg/kg			<5		<5										
Chrysene	µg/kg	5µg/kg	384	2800	<5		<5										
(normalised to 1% TOC)	µg/kg	5µg/kg			<5		<5										
Benzo(b)&(k)fluoranthene	µg/kg	5µg/kg			<10		<10										
Benzo(a)pyrene	µg/kg	5µg/kg	430	1600	<5		<5										
Indeno(1,2,3-cd)pyrene	µg/kg	5µg/kg			<5		<5										
Dibenz(a,h)anthracene	µg/kg	5µg/kg	63	260	<5		<5										
Benzo(g,h,i)perylene	µg/kg	5µg/kg			<5		<5										
Total PAHs (as above)	µg/kg	5µg/kg	4000	45000	<100		<100										
Organochlorine and Organophosphorus Pesticides																	
Aldrin	ug/kg	1ug/kg			<1		<1										
alpha-BHC	ug/kg	1ug/kg			<1		<1										
beta-BHC	ug/kg	1ug/kg			<1		<1										
gamma-BHC (Lindane)	ug/kg	1ug/kg			<1		<1										
delta-BHC	ug/kg	1ug/kg			<1		<1										
cis-Chlordane	ug/kg	1ug/kg	0.5	6	<1		<1										
trans-Chlordane	ug/kg	1ug/kg	0.5	6	<1		<1										
p,p'-DDD	ug/kg	1ug/kg	2	20	<1		<1										
p,p'-DDE	ug/kg	1ug/kg	202	27	<1		<1										
p,p'-DDT	ug/kg	1ug/kg	1.6	46	<1		<1										
Dieldrin	ug/kg	1ug/kg	0.02	8	<1		<1										
alpha-Endosulfan	ug/kg	1ug/kg			<1		<1										
beta-Endosulfan	ug/kg	1ug/kg			<1		<1										
Endosulfan Sulphate	ug/kg	1ug/kg			<1		<1										
Endrin	ug/kg	1ug/kg	0.02	8	<1		<1										
Endrin ketone	ug/kg	1ug/kg			<1		<1										
Endrin aldehyde	ug/kg	1ug/kg			<1		<1										
Heptachlor	ug/kg	1ug/kg			<1		<1										
Heptachlor epoxide	ug/kg	1ug/kg			<1		<1										
Hexachlorobenzene	ug/kg	1ug/kg			<1		<1										
Methoxychlor	ug/kg	1ug/kg			<1		<1										
Azinphos-methyl	ug/kg	50ug/kg			<50		<50										
Bromophos-ethyl	ug/kg	50ug/kg			<50		<50										
Carbophenothion	ug/kg	50ug/kg			<50		<50										
Chlorfenvinphos	ug/kg	50ug/kg			<50		<50										
Chlorpyrifos	ug/kg	50ug/kg			<50		<50										
Chlorpyrifos-methyl	ug/kg	50ug/kg			<50		<50	113									
Diazinon	ug/kg	50ug/kg			<50		<50	23									
Demeton-S-methyl	ug/kg	50ug/kg			<50		<50	30									
Dimethoate	ug/kg	50ug/kg			<50		<50										
Dichlorvos	ug/kg	50ug/kg			<50		<50										
Ethion	ug/kg	50ug/kg			<50		<50										
Fenitrothion	ug/kg																



Appendix K

Laboratory Reports – Chemical Analyses

Advanced Analytical



REPORT OF ANALYSIS

Laboratory Reference: A04/0798

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Soil
No. of Samples: 53
Date Received: 4/11/2004
Date Completed: 26/11/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
NATA endorsed test report. This document shall not be reproduced, except in full.



Nata Accredited Laboratory
Number: 15109



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ27	PCQ27	PCQ26	PCQ26
Date Sampled:	-	-	0-0.5A	0.5-1.0A	0-0.5A	0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	16	7.8	24	27
Trace Elements						
Arsenic	04-001	mg/kg	3.6	1.7	12	0.40
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	8.4	8.3	20	26
Copper	04-001	mg/kg	3.1	2.6	7.3	6.5
Iron	04-001	mg/kg	11,000	7,100	25,000	18,000
Manganese	04-001	mg/kg	63	40	190	100
Nickel	04-001	mg/kg	6.4	4.6	11	12
Lead	04-001	mg/kg	3.9	2.1	7.0	6.5
Zinc	04-001	mg/kg	12	9.4	26	35
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	69	87	57	55
Date Extracted	04-026	-	22/11/2004	22/11/2004	22/11/2004	22/11/2004
Date Analysed	04-026	-	22/11/2004	22/11/2004	22/11/2004	22/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/5	/6	/7	/8
Client Reference:	-	-	PCQ2 0-0.5A	PCQ2 0.5-1.0A	PCQ23 0-0.5A	PCQ23 0.5-1.0A
Date Sampled:	-	-				
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	20	13	16	18
Trace Elements						
Arsenic	04-001	mg/kg	2.4	1.8	4.9	5.4
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	14	8.0	10	11
Copper	04-001	mg/kg	6.6	6.7	3.3	4.6
Iron	04-001	mg/kg	12,000	12,000	9,900	13,000
Manganese	04-001	mg/kg	110	43	290	290
Nickel	04-001	mg/kg	6.3	5.8	5.0	6.6
Lead	04-001	mg/kg	4.1	4.5	3.5	3.6
Zinc	04-001	mg/kg	18	18	9.8	12
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	44	73	63	80
Date Extracted	04-026	-	22/11/2004	22/11/2004	22/11/2004	22/11/2004
Date Analysed	04-026	-	22/11/2004	22/11/2004	22/11/2004	22/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/9	/10	/11	/12
Client Reference:	-	-	PCQ23	PCQ25	PCQ25	PCQ24
Date Sampled:	-	-	0.5-1.0R	0-0.5A	0-0.5R	0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	18	24	24	19
Trace Elements						
Arsenic	04-001	mg/kg	11	7.0	7.1	4.4
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	10	23	24	11
Copper	04-001	mg/kg	8.4	5.2	5.5	2.9
Iron	04-001	mg/kg	13,000	20,000	20,000	12,000
Manganese	04-001	mg/kg	390	150	110	330
Nickel	04-001	mg/kg	7.4	10	10	5.2
Lead	04-001	mg/kg	4.2	7.5	6.9	3.1
Zinc	04-001	mg/kg	13	26	26	11
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	100	45	38	97
Date Extracted	04-026	-	22/11/2004	22/11/2004	22/11/2004	22/11/2004
Date Analysed	04-026	-	22/11/2004	22/11/2004	22/11/2004	22/11/2004
Subcontract Analysis						
Particle Size Distribution			[NA]	See comment	[NA]	See comment
Total Organic Carbon			[NA]	See comment	[NA]	See comment



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/13	/14	/15	/16
Client Reference:	-	-	PCQ28	PCQ28	PCQ3 0-0.5A	Trip Blank 1
Date Sampled:	-	-	0.5-1.0A	0.5-1.0R		
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	13	12	24	2.9
Trace Elements						
Arsenic	04-001	mg/kg	1.0	1.1	3.2	<0.10
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	6.5	5.1	17	<0.10
Copper	04-001	mg/kg	2.4	1.9	4.8	<0.10
Iron	04-001	mg/kg	5,800	4,300	12,000	19
Manganese	04-001	mg/kg	29	23	400	0.2
Nickel	04-001	mg/kg	3.4	2.9	9.0	<0.10
Lead	04-001	mg/kg	2.0	1.7	4.5	<0.10
Zinc	04-001	mg/kg	8.6	6.4	20	<0.10
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	[NA]
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	[NA]
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	[NA]
Surrogate 1 Recovery	04-026	%	64	92	69	[NA]
Date Extracted	04-026	-	23/11/2004	23/11/2004	23/11/2004	[NA]
Date Analysed	04-026	-	23/11/2004	23/11/2004	23/11/2004	[NA]
Subcontract Analysis						
Particle Size Distribution			See comment	[NA]	See comment	[NA]
Total Organic Carbon			See comment	[NA]	See comment	[NA]



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/17	/18	/19	/20
Client Reference:	-	-	Trip Blank 2	Trip Blank 3	PCQ1	PCQ19
Date Sampled:	-	-			0.5-1.0A	0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	2.2	4.7	34	19
Trace Elements						
Arsenic	04-001	mg/kg	<0.10	<0.10	8.8	4.2
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	<0.10	<0.10	26	19
Copper	04-001	mg/kg	<0.10	<0.10	10	6.9
Iron	04-001	mg/kg	15	16	20,000	25,000
Manganese	04-001	mg/kg	0.1	0.2	380	140
Nickel	04-001	mg/kg	<0.10	<0.10	9.6	11
Lead	04-001	mg/kg	<0.10	<0.10	8.0	5.9
Zinc	04-001	mg/kg	<0.10	<0.10	21	23
Organotins						
Monobutyl tin	04-026	µgSn/kg	[NA]	[NA]	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	[NA]	[NA]	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	[NA]	[NA]	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	[NA]	[NA]	71	83
Date Extracted	04-026	-	[NA]	[NA]	23/11/2004	23/11/2004
Date Analysed	04-026	-	[NA]	[NA]	23/11/2004	23/11/2004
Subcontract Analysis						
Particle Size Distribution			[NA]	[NA]	See comment	See comment
Total Organic Carbon			[NA]	[NA]	See comment	See comment



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/21	/22	/23	/24
Client Reference:	-	-	PCQ20	PCQ20	PCQ20 1-2A	PCQ22 1-2A
Date Sampled:	-	-	0-0.5A	0.5-1.0A		
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	24	22	13	15
Trace Elements						
Arsenic	04-001	mg/kg	3.7	7.2	6.0	0.90
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	20	23	12	12
Copper	04-001	mg/kg	12	22	4.0	2.3
Iron	04-001	mg/kg	33,000	35,000	11,000	6,400
Manganese	04-001	mg/kg	340	520	980	260
Nickel	04-001	mg/kg	13	28	8.2	5.0
Lead	04-001	mg/kg	6.2	8.3	4.3	2.8
Zinc	04-001	mg/kg	32	39	13	10
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	[NA]
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	[NA]
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	[NA]
Surrogate 1 Recovery	04-026	%	98	78	[NA]	[NA]
Date Extracted	04-026	-	23/11/2004	23/11/2004	[NA]	[NA]
Date Analysed	04-026	-	23/11/2004	23/11/2004	[NA]	[NA]
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/25	/26	/27	/28
Client Reference:	-	-	PCQ21	PCQ16	PCQ16	PCQ18
Date Sampled:	-	-	0-0.5A	0-0.5A	0.5-1.0A	0-0.5A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	19	26	20	24
Trace Elements						
Arsenic	04-001	mg/kg	15	7.5	6.6	2.2
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	13	23	16	13
Copper	04-001	mg/kg	3.4	8.4	7.0	3.3
Iron	04-001	mg/kg	17,000	24,000	17,000	15,000
Manganese	04-001	mg/kg	360	950	460	92
Nickel	04-001	mg/kg	7.5	20	11	7.0
Lead	04-001	mg/kg	4.3	10	8.3	7.0
Zinc	04-001	mg/kg	15	26	17	15
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	89	83	100	93
Date Extracted	04-026	-	23/11/04	23/11/2004	23/11/2004	23/11/2004
Date Analysed	04-026	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/29	/30	/31	/32
Client Reference:	-	-	PCQ18	PCQ18 1-2A	PCQ17	PCQ17
Date Sampled:	-	-	0.5-1.0A		0-0.5A	0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	19	11	25	18
Trace Elements						
Arsenic	04-001	mg/kg	3.7	3.7	4.9	3.6
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	12	26	13	17
Copper	04-001	mg/kg	2.7	2.4	3.6	5.7
Iron	04-001	mg/kg	9,500	7,500	11,000	16,000
Manganese	04-001	mg/kg	100	43	280	360
Nickel	04-001	mg/kg	7.1	16	6.3	9.5
Lead	04-001	mg/kg	4.1	3.0	3.6	4.2
Zinc	04-001	mg/kg	9.2	6.7	13	17
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	[NA]	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	[NA]	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	[NA]	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	100	[NA]	100	110
Date Extracted	04-026	-	23/11/2004	[NA]	23/11/2004	23/11/2004
Date Analysed	04-026	-	23/11/2004	[NA]	23/11/2004	23/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/33	/34	/35	/36
Client Reference:	-	-	PCQ0-0.5T1	PCQ0.5-1T1	PCQ 0-0.5T2	PCQ 0.5-1T2
Date Sampled:	-	-				
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	20	17	26	21
Trace Elements						
Arsenic	04-001	mg/kg	3.0	2.5	1.1	2.7
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	19	14	25	15
Copper	04-001	mg/kg	6.1	5.4	4.6	5.3
Iron	04-001	mg/kg	17,000	11,000	21,000	13,000
Manganese	04-001	mg/kg	170	230	57	220
Nickel	04-001	mg/kg	8.9	6.4	12	7.4
Lead	04-001	mg/kg	4.3	3.7	2.7	2.8
Zinc	04-001	mg/kg	20	16	26	15
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	100	94	130	120
Date Extracted	04-026	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Date Analysed	04-026	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/37	/38	/39	/40
Client Reference:	-	-	PCQ15	PCQ15	PCQ15 1-2A	Trip Blank 4
Date Sampled:	-	-	0-0.5A	0.5-1.0A		
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	21	22	17	3.1
Trace Elements						
Arsenic	04-001	mg/kg	1.6	2.1	1.2	<0.10
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	12	14	15	0.12
Copper	04-001	mg/kg	3.3	6.1	4.2	<0.10
Iron	04-001	mg/kg	7,900	9,300	10,000	22
Manganese	04-001	mg/kg	72	28	33	0.2
Nickel	04-001	mg/kg	6.0	8.3	8.2	<0.10
Lead	04-001	mg/kg	4.3	4.6	3.5	<0.10
Zinc	04-001	mg/kg	15	17	17	<0.10
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	[NA]
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	[NA]
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	[NA]
Surrogate 1 Recovery	04-026	%	110	120	[NA]	[NA]
Date Extracted	04-026	-	23/11/2004	23/11/2004	[NA]	[NA]
Date Analysed	04-026	-	23/11/2004	23/11/2004	[NA]	[NA]
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	[NA]
Total Organic Carbon			See comment	See comment	See comment	[NA]



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/41	/42	/43	/44
Client Reference:	-	-	PCQ14	PCQ13	PCQ11	PCQ11
Date Sampled:	-	-	0-0.5A	0.5-1.0A	0-0.5A	0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	19	16	23	16
Trace Elements						
Arsenic	04-001	mg/kg	2.6	1.3	5.6	2.9
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	17	12	15	14
Copper	04-001	mg/kg	4.8	3.1	5.1	6.4
Iron	04-001	mg/kg	12,000	7,500	24,000	17,000
Manganese	04-001	mg/kg	170	280	520	250
Nickel	04-001	mg/kg	8.5	5.2	18	11
Lead	04-001	mg/kg	3.6	3.2	4.5	4.1
Zinc	04-001	mg/kg	16	11	49	20
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	130	100	130	130
Date Extracted	04-026	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Date Analysed	04-026	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/45	/46	/47	/48
Client Reference:	-	-	PCQ 0-0.5T3	PCQ 0.5-1T3	PCQ 0-0.5T4	PCQ 0.5-1T4
Date Sampled:	-	-				
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	16	18	21	16
Trace Elements						
Arsenic	04-001	mg/kg	3.2	0.90	0.30	1.1
Cadmium	04-001	mg/kg	<0.10	<0.10	0.12	<0.10
Chromium	04-001	mg/kg	11	13	12	15
Copper	04-001	mg/kg	5.2	4.2	4.3	5.6
Iron	04-001	mg/kg	13,000	12,000	10,000	15,000
Manganese	04-001	mg/kg	540	260	240	200
Nickel	04-001	mg/kg	7.6	7.1	6.9	8.0
Lead	04-001	mg/kg	3.6	3.1	4.5	3.2
Zinc	04-001	mg/kg	12	14	25	19
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	120	120	97	120
Date Extracted	04-026	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Date Analysed	04-026	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/49	/50	/51	/52
Client Reference:	-	-	PCQ12	PCQ12	PCQ10	PCQ10
Date Sampled:	-	-	0-0.5A	0.5-1.0A	0-0.5A	0-0.5R
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	20	15	22	21
Trace Elements						
Arsenic	04-001	mg/kg	3.6	3.6	3.7	1.7
Cadmium	04-001	mg/kg	0.12	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	16	20	12	11
Copper	04-001	mg/kg	3.8	4.7	6.3	3.6
Iron	04-001	mg/kg	16,000	21,000	11,000	9,500
Manganese	04-001	mg/kg	430	260	44	37
Nickel	04-001	mg/kg	9.0	12	7.1	6.3
Lead	04-001	mg/kg	4.8	3.4	4.3	2.9
Zinc	04-001	mg/kg	17	22	18	16
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	110	66	64	48
Date Extracted	04-026	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Date Analysed	04-026	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	[NA]
Total Organic Carbon			See comment	See comment	See comment	[NA]



Batch Number: A04/0798

Project: Port of Hay Point

Laboratory Reference:	-	-	/53
Client Reference:	-	-	PCQ10
Date Sampled:	-	-	0.5-1.0A
Analysis Description	Method	Units	
Moisture Content			
Moisture Content	04-004	%	19
Trace Elements			
Arsenic	04-001	mg/kg	0.90
Cadmium	04-001	mg/kg	<0.10
Chromium	04-001	mg/kg	12
Copper	04-001	mg/kg	3.8
Iron	04-001	mg/kg	9,700
Manganese	04-001	mg/kg	38
Nickel	04-001	mg/kg	6.4
Lead	04-001	mg/kg	3.1
Zinc	04-001	mg/kg	15
Organotins			
Monobutyl tin	04-026	µgSn/kg	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50
Surrogate 1 Recovery	04-026	%	54
Date Extracted	04-026	-	23/11/2004
Date Analysed	04-026	-	23/11/2004
Subcontract Analysis			
Particle Size Distribution			See comment
Total Organic Carbon			See comment

Method	Method Description
04-004	Moisture Content by Gravimetric, %
04-001	Metals in Solids by ICP, mg/kg
04-026	*Organotins in Solids, µgSn/kg

Result Comments

[<] Less than
[INS] Insufficient sample for this test
[NA] Test not required

Solid sample results are reported on a dry weight basis.

TOC analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884); see attached SAL report for job number SAL15288B.

PSD analysis was subcontracted to GHD LongMac (NATA Number 679); see attached GHD LongMac report for job number 2113283.

Issue Date: 1 December 2004

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Batch Number: A04/0798

Project: Port of Hay Point

QUALITY ASSURANCE REPORT

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	N/A	A04/0798-1	16 13 RPD: 21

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Arsenic	mg/kg	<0.10	A04/0798-1	3.6 3.8 RPD: 5	A04/0798-1	96%
Cadmium	mg/kg	<0.10	A04/0798-1	<0.10 <0.10	A04/0798-1	88%
Chromium	mg/kg	<0.10	A04/0798-1	8.4 9.0 RPD: 7	A04/0798-1	105%
Copper	mg/kg	<0.10	A04/0798-1	3.1 3.2 RPD: 3	A04/0798-1	108%
Iron	mg/kg	<0.10	A04/0798-1	11000 11000 RPD: 0	A04/0798-1	#
Manganese	mg/kg	<0.1	A04/0798-1	63 56 RPD: 12	A04/0798-1	97%
Nickel	mg/kg	<0.10	A04/0798-1	6.4 6.2 RPD: 3	A04/0798-1	94%
Lead	mg/kg	<0.10	A04/0798-1	3.9 3.7 RPD: 5	A04/0798-1	92%
Zinc	mg/kg	<0.10	A04/0798-1	12 11 RPD: 9	A04/0798-1	97%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Monobutyl tin	µgSn/kg	n/a	A04/0798-1	<0.50 <0.50	A04/0798-1	71%
Dibutyl tin	µgSn/kg	n/a	A04/0798-1	<0.50 <0.50	A04/0798-1	110%
Tributyl tin	µgSn/kg	n/a	A04/0798-1	<0.50 <0.50	A04/0798-1	104%
Surrogate 1 Recovery	%	n/a	A04/0798-1	69 83 RPD: 18	A04/0798-1	112%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	N/A	A04/0798-11	24 25 RPD: 4

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Arsenic	mg/kg	<0.10	A04/0798-11	7.1 7.2 RPD: 1
Cadmium	mg/kg	<0.10	A04/0798-11	<0.10 <0.10
Chromium	mg/kg	<0.10	A04/0798-11	24 25 RPD: 4
Copper	mg/kg	<0.10	A04/0798-11	5.5 5.7 RPD: 4
Iron	mg/kg	<0.10	A04/0798-11	20000 26000 RPD: 26
Manganese	mg/kg	<0.1	A04/0798-11	110 120 RPD: 9
Nickel	mg/kg	<0.10	A04/0798-11	10 10 RPD: 0
Lead	mg/kg	<0.10	A04/0798-11	6.9 7.1 RPD: 3
Zinc	mg/kg	<0.10	A04/0798-11	26 26 RPD: 0



Batch Number: A04/0798

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Monobutyl tin	µgSn/kg	<0.50	A04/0798-11	<0.50 <0.50
Dibutyl tin	µgSn/kg	<0.50	A04/0798-11	<0.50 <0.50
Tributyl tin	µgSn/kg	<0.50	A04/0798-11	<0.50 <0.50
Surrogate 1 Recovery	%	54	A04/0798-11	38 48 RPD: 23

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0798-21	24 23 RPD: 4

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Arsenic	mg/kg	[NT]	A04/0798-21	3.7 3.3 RPD: 11	A04/0798-21	82%
Cadmium	mg/kg	[NT]	A04/0798-21	<0.10 <0.10	A04/0798-21	83%
Chromium	mg/kg	[NT]	A04/0798-21	20 17 RPD: 16	A04/0798-21	94%
Copper	mg/kg	[NT]	A04/0798-21	12 11 RPD: 9	A04/0798-21	97%
Iron	mg/kg	[NT]	A04/0798-21	33000 29000 RPD: 13	A04/0798-21	#
Manganese	mg/kg	[NT]	A04/0798-21	340 290 RPD: 16	A04/0798-21	#
Nickel	mg/kg	[NT]	A04/0798-21	13 11 RPD: 17	A04/0798-21	84%
Lead	mg/kg	[NT]	A04/0798-21	6.2 5.4 RPD: 14	A04/0798-21	87%
Zinc	mg/kg	[NT]	A04/0798-21	32 27 RPD: 17	A04/0798-21	88%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Monobutyl tin	µgSn/kg	[NT]	A04/0798-21	<0.50 <0.50	A04/0798-21	61%
Dibutyl tin	µgSn/kg	[NT]	A04/0798-21	<0.50 <0.50	A04/0798-21	95%
Tributyl tin	µgSn/kg	[NT]	A04/0798-21	<0.50 <0.50	A04/0798-21	89%
Surrogate 1 Recovery	%	[NT]	A04/0798-21	98 55 RPD: 56	A04/0798-21	77%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0798-31	25 23 RPD: 8

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Arsenic	mg/kg	[NT]	A04/0798-31	4.9 4.3 RPD: 13
Cadmium	mg/kg	[NT]	A04/0798-31	<0.10 <0.10
Chromium	mg/kg	[NT]	A04/0798-31	13 14 RPD: 7
Copper	mg/kg	[NT]	A04/0798-31	3.6 3.3 RPD: 9
Iron	mg/kg	[NT]	A04/0798-31	11000 11000 RPD: 0
Manganese	mg/kg	[NT]	A04/0798-31	280 280 RPD: 0
Nickel	mg/kg	[NT]	A04/0798-31	6.3 5.9 RPD: 7
Lead	mg/kg	[NT]	A04/0798-31	3.6 3.2 RPD: 12
Zinc	mg/kg	[NT]	A04/0798-31	13 12 RPD: 8



Batch Number: A04/0798

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Monobutyl tin	µgSn/kg	[NT]	A04/0798-31	<0.50 <0.50
Dibutyl tin	µgSn/kg	[NT]	A04/0798-31	<0.50 <0.50
Tributyl tin	µgSn/kg	[NT]	A04/0798-31	<0.50 <0.50
Surrogate 1 Recovery	%	[NT]	A04/0798-31	100 70 RPD: 35

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0798-41	19 19 RPD: 0

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Arsenic	mg/kg	[NT]	A04/0798-41	2.6 2.5 RPD: 4	A04/0798-41	102%
Cadmium	mg/kg	[NT]	A04/0798-41	<0.10 <0.10	A04/0798-41	80%
Chromium	mg/kg	[NT]	A04/0798-41	17 17 RPD: 0	A04/0798-41	92%
Copper	mg/kg	[NT]	A04/0798-41	4.8 4.9 RPD: 2	A04/0798-41	108%
Iron	mg/kg	[NT]	A04/0798-41	12000 17000 RPD: 34	A04/0798-41	#
Manganese	mg/kg	[NT]	A04/0798-41	170 170 RPD: 0	A04/0798-41	#
Nickel	mg/kg	[NT]	A04/0798-41	8.5 8.8 RPD: 3	A04/0798-41	86%
Lead	mg/kg	[NT]	A04/0798-41	3.6 3.8 RPD: 5	A04/0798-41	88%
Zinc	mg/kg	[NT]	A04/0798-41	16 17 RPD: 6	A04/0798-41	85%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Monobutyl tin	µgSn/kg	[NT]	A04/0798-41	<0.50 <0.50	A04/0798-41	[NT]
Dibutyl tin	µgSn/kg	[NT]	A04/0798-41	<0.50 <0.50	A04/0798-41	[NT]
Tributyl tin	µgSn/kg	[NT]	A04/0798-41	<0.50 <0.50	A04/0798-41	[NT]
Surrogate 1 Recovery	%	[NT]	A04/0798-41	130 74 RPD: 55	A04/0798-41	[NT]

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0798-51	22 21 RPD: 5

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Arsenic	mg/kg	[NT]	A04/0798-51	3.7 3.7 RPD: 0
Cadmium	mg/kg	[NT]	A04/0798-51	<0.10 <0.10
Chromium	mg/kg	[NT]	A04/0798-51	12 12 RPD: 0
Copper	mg/kg	[NT]	A04/0798-51	6.3 4.8 RPD: 27
Iron	mg/kg	[NT]	A04/0798-51	11000 11000 RPD: 0
Manganese	mg/kg	[NT]	A04/0798-51	44 43 RPD: 2
Nickel	mg/kg	[NT]	A04/0798-51	7.1 7.3 RPD: 3
Lead	mg/kg	[NT]	A04/0798-51	4.3 3.4 RPD: 23
Zinc	mg/kg	[NT]	A04/0798-51	18 17 RPD: 6



Batch Number: A04/0798

Project: Port of Hay Point

Comments:

RPD = Relative Percent Deviation

[NT] = Not Tested

[N/A] = Not Applicable

'#' = Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Trace elements +/- 10%

Organic analyses +/- 25%

Recommended matrix spike recovery limits: Trace elements 80-120%

Organic analyses 70-130%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.



REPORT OF ANALYSIS

Laboratory Reference: A04/0798

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Soil
No. of Samples: 53
Date Received: 4/11/2004
Date Completed: 26/11/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
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FILE		
27 JAN 2005		
Name	Initial	Date
number		



Nata Accredited Laboratory
Number: 15109

Issue Date: 30 November 2004 {Interim Report Date}

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SYDNEY
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Page 1 of 5

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A.C.N. 003 614 695
A.B.N. 81 829 182 852

ANALYTICAL REPORT for:

ADVANCED ANALYTICAL AUSTRALIA

1/139 SANDGATE ROAD
ALBION QLD 4010

ATTN: ANDREW BRADBURY

JOB NO: SAL15288B
CLIENT ORDER: A04/0798
DATE RECEIVED: 09/11/04
DATE COMPLETED: 19/11/04
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 49

NATA Accredited Laboratory

Number: 1884



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.....
Issued on 26/11/04
Lance Smith
(Chief Chemist)

SYDNEY ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

JOB NO: SAL15288B
CLIENT ORDER: A04/0798

	SAMPLES	TOC %
1	A04/0798/1	0.14
2	A04/0798/2	<0.1
3	A04/0798/3	0.18
4	A04/0798/4	<0.1
5	A04/0798/5	0.20
6	A04/0798/6	<0.1
7	A04/0798/7	<0.1
8	A04/0798/8	<0.1
9	A04/0798/9	<0.1
10	A04/0798/10	0.10
11	A04/0798/11	<0.1
12	A04/0798/12	0.21
13	A04/0798/13	0.11
14	A04/0798/14	0.11
15	A04/0798/15	<0.1
16	A04/0798/19	0.96
17	A04/0798/20	<0.1
18	A04/0798/21	0.10
19	A04/0798/22	<0.1
20	A04/0798/23	<0.1
21	A04/0798/24	0.10
22	A04/0798/25	0.41
23	A04/0798/26	0.12
24	A04/0798/27	<0.1
25	A04/0798/28	0.16
26	A04/0798/29	0.18
27	A04/0798/30	<0.1
28	A04/0798/31	0.19
29	A04/0798/32	<0.1
30	A04/0798/33	0.11
31	A04/0798/34	<0.1
32	A04/0798/35	0.11
33	A04/0798/36	<0.1
34	A04/0798/37	0.13
35	A04/0798/38	<0.1
36	A04/0798/39	<0.1
37	A04/0798/41	0.11
38	A04/0798/42	0.11
39	A04/0798/43	0.11
40	A04/0798/44	<0.1

MDL	0.1
Method Code	C48
Preparation	P5

SYDNEY ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

JOB NO: SAL15288B
CLIENT ORDER: A04/0798

SAMPLES	TOC %
41 A04/0798/45	0.10
42 A04/0798/46	<0.1
43 A04/0798/47	0.67
44 A04/0798/48	<0.1
45 A04/0798/49	<0.1
46 A04/0798/50	<0.1
47 A04/0798/51	0.10
48 A04/0798/52	<0.1
49 A04/0798/53	<0.1
DUPLICATES:	
17 A04/0798/20	<0.1
37 A04/0798/41	0.11
BLANK	<0.1

MDL	0.1
Method Code	C48
Preparation	P5

RESULTS ON DRY BASIS

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 4 of 5

LABORATORY DUPLICATE REPORT

JOB NO: SAL15288B
CLIENT ORDER: A04/0798

Sample Number	Analyte	Units	MDL	Sample Result	Duplicate Result	%RPD
A04/0798/20	TOC	%	0.1	<0.1	<0.1	0
A04/0798/41	TOC	%	0.1	0.11	0.11	0

Acceptance criteria:

RPD <50% for low level (<20xMDL)
RPD <30% for medium level (20-100xMDL)
RPD <15% for high level (>100xMDL)
No limit applies at <2xMDL

MDL = Method Detection Limit

All results are within the acceptance criteria

ANALYTICAL REPORT

**JOB NO: SAL15288B
CLIENT ORDER: A04/0798**

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5 Sample dried, split and crushed to -150um
C48 Total Organic Carbon - AS1289.4.1.1

A preliminary report was faxed on 19/11/04



REPORT OF ANALYSIS

Laboratory Reference: A04/0816

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediment
No. of Samples: 15
Date Received: 8/11/2004
Date Completed: 29/11/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Phalak Inthakesone
Senior Organics Chemist

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
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Nata Accredited Laboratory
Number: 15109

Issue Date: 1 December 2004

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Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ25	PCQ24	PCQ28	PCQ3
Date Sampled:	-	-	0.5-1.0A	0-0.5A	0-0.5A	0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	27	20	21	20
Trace Elements						
Silver	04-001	mg/kg	<0.1	<0.1	<0.1	<0.1
Arsenic	04-001	mg/kg	17	12	4.6	2.9
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	27	10	9.4	18
Copper	04-001	mg/kg	8.0	2.1	2.5	5.0
Iron	04-001	mg/kg	27,000	12,000	8,200	12,000
Mercury	04-002	mg/kg	0.01	<0.01	<0.01	<0.01
Manganese	04-001	mg/kg	310	320	160	1,300
Nickel	04-001	mg/kg	13	4.8	4.7	14
Phosphorus	04-001	mg/kg	230	320	210	180
Lead	04-001	mg/kg	11	3.6	2.9	5.9
Antimony	04-001	mg/kg	0.6	<0.1	<0.1	0.1
Zinc	04-001	mg/kg	33	12	9.7	21
BTEX						
Benzene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Toluene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Ethyl Benzene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
m+p xylenes	04-021	mg/kg	<0.40	<0.40	<0.40	<0.40
o-xylene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Total BTEX	04-021	mg/kg	<1.2	<1.2	<1.2	<1.2
Surrogate 1 Recovery	04-021	%	83	86	84	84
Surrogate 2 Recovery	04-021	%	82	82	82	84
Surrogate 3 Recovery	04-021	%	86	88	85	89
Date Extracted	04-021	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-021	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Total Petroleum Hydrocarbons						
TPH C6-C9	04-021	mg/kg	<10	<10	<10	<10
TPH C10-14	04-020	mg/kg	<10	<10	<10	<10
TPH C15-28	04-020	mg/kg	<50	<50	<50	<50



Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference: Client Reference: Date Sampled: Analysis Description	- - - Method	- - - Units	/1 PCQ25 0.5-1.0A	/2 PCQ24 0-0.5A	/3 PCQ28 0-0.5A	/4 PCQ3 0.5-1.0A
TPH C29-36	04-020	mg/kg	<50	<50	<50	<50
Surrogate Recovery	04-020	%	85	106	87	93
Date Extracted	04-020	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-020	-	16/11/2004	16/11/2004	16/11/2004	16/11/2004
Poly Aromatic Hydrocarbons						
Naphthalene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Acenaphthalene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Acenaphthene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Fluorene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Phenanthrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Fluoranthene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Benz(a)anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Chrysene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Benzo(b)&(k)fluoranthene	04-025	µg/kg	<10	<10	<10	<10
Benzo(a)pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Indeno(1,2,3-cd)pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Dibenz(a,h)anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Benzo(g,h,i)perylene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Total PAHs (as above)	04-025	µg/kg	<100	<100	<100	<100
Surrogate 1 Recovery	04-025	%	75	92	75	82
Surrogate 2 Recovery	04-025	%	80	96	75	83
Surrogate 3 Recovery	04-025	%	90	106	85	91
Date Extracted	04-025	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-025	-	16/11/2004	16/11/2004	16/11/2004	16/11/2004
Organochlorine Pesticides						
Aldrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
alpha-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
beta-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
gamma-BHC (Lindane)	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
delta-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
cis-Chlordane	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
trans-Chlordane	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0

Issue Date: 1 December 2004

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Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ25	PCQ24	PCQ28	PCQ3
Date Sampled:	-	-	0.5-1.0A	0-0.5A	0-0.5A	0.5-1.0A
Analysis Description	Method	Units				
<i>p,p'</i> -DDD	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>p,p'</i> -DDE	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>p,p'</i> -DDT	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Dieldrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>alpha</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>beta</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endosulfan Sulphate	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin ketone	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin aldehyde	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Heptachlor	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Heptachlor epoxide	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Methoxychlor	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Surrogate Recovery	04-023	%	114	99	73	81
Date Extracted	04-023	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-023	-	15/11/2004	15/11/2004	15/11/2004	15/11/2004
Organophosphate Pesticides						
Azinphos-methyl	04-024	ug/kg	<50	<50	<50	<50
Bromophos-ethyl	04-024	ug/kg	<50	<50	<50	<50
Carbophenothion	04-024	ug/kg	<50	<50	<50	<50
Chlorfenvinphos	04-024	ug/kg	<50	<50	<50	<50
Chlorpyrifos	04-024	ug/kg	<50	<50	<50	<50
Chlorpyrifos-methyl	04-024	ug/kg	<50	<50	<50	<50
Diazinon	04-024	ug/kg	<50	<50	<50	<50
Demeton-S-methyl	04-024	ug/kg	<50	<50	<50	<50
Dimethoate	04-024	ug/kg	<50	<50	<50	<50
Dichlorvos	04-024	ug/kg	<50	<50	<50	<50
Ethion	04-024	ug/kg	<50	<50	<50	<50
Fenitrothion	04-024	ug/kg	<50	<50	<50	<50
Fenthion	04-024	ug/kg	<50	<50	<50	<50
Fenamiphos	04-024	ug/kg	<50	<50	<50	<50
Malathion	04-024	ug/kg	<50	<50	<50	<50
Methidathion	04-024	ug/kg	<50	<50	<50	<50

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Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference: Client Reference: Date Sampled: Analysis Description	- - - Method	- - - Units	/1 PCQ25 0.5-1.0A	/2 PCQ24 0-0.5A	/3 PCQ28 0-0.5A	/4 PCQ3 0.5-1.0A
Monocrotophos	04-024	ug/kg	<50	<50	<50	<50
Omethoate	04-024	ug/kg	<50	<50	<50	<50
Parathion	04-024	ug/kg	<50	<50	<50	<50
Parathion-methyl	04-024	ug/kg	<50	<50	<50	<50
Phosalone	04-024	ug/kg	<50	<50	<50	<50
Pirimiphos-methyl	04-024	ug/kg	<50	<50	<50	<50
Prothiofos	04-024	ug/kg	<50	<50	<50	<50
Surrogate Recovery	04-024	%	114	99	73	81
Date Extracted	04-024	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-024	-	15/11/2004	15/11/2004	15/11/2004	15/11/2004
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	0.81	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	86	74	88	84
Date Extracted	04-026	-	24/11/2004	24/11/2004	24/11/2004	24/11/2004
Date Analysed	04-026	-	24/11/2004	24/11/2004	24/11/2004	24/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment
Nutrients			See comment	See comment	See comment	See comment



Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference:	-	-	/5	/6	/7	/8
Client Reference:	-	-	PCQ1 0-0.5A	PCQ19 0-0.5A	PCQ22 0-0.5A	PCQ22 05-1.0A
Date Sampled:	-	-				
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	26	18	18	17
Trace Elements						
Silver	04-001	mg/kg	<0.1	<0.1	<0.1	<0.1
Arsenic	04-001	mg/kg	4.2	13	31	0.70
Cadmium	04-001	mg/kg	<0.10	<0.10	0.10	<0.10
Chromium	04-001	mg/kg	10	22	12	12
Copper	04-001	mg/kg	2.8	5.9	3.8	3.5
Iron	04-001	mg/kg	9,400	24,000	30,000	7,600
Mercury	04-002	mg/kg	<0.01	<0.01	<0.01	<0.01
Manganese	04-001	mg/kg	140	310	430	250
Nickel	04-001	mg/kg	4.6	13	7.9	5.1
Phosphorus	04-001	mg/kg	170	250	640	200
Lead	04-001	mg/kg	3.1	6.3	5.7	3.8
Antimony	04-001	mg/kg	0.2	<0.1	2	0.4
Zinc	04-001	mg/kg	13	23	14	13
BTEX						
Benzene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Toluene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Ethyl Benzene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
m+p xylenes	04-021	mg/kg	<0.40	<0.40	<0.40	<0.40
o-xylene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Total BTEX	04-021	mg/kg	<1.2	<1.2	<1.2	<1.2
Surrogate 1 Recovery	04-021	%	81	87	82	83
Surrogate 2 Recovery	04-021	%	79	83	81	84
Surrogate 3 Recovery	04-021	%	83	92	89	95
Date Extracted	04-021	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-021	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Total Petroleum Hydrocarbons						
TPH C6-C9	04-021	mg/kg	<10	<10	<10	<10
TPH C10-14	04-020	mg/kg	<10	<10	<10	<10
TPH C15-28	04-020	mg/kg	<50	<50	<50	<50



Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference: Client Reference: Date Sampled: Analysis Description	- - - Method	- - - Units	/5 PCQ1 0-0.5A	/6 PCQ19 0-0.5A	/7 PCQ22 0-0.5A	/8 PCQ22 05-1.0A
TPH C29-36	04-020	mg/kg	<50	<50	<50	<50
Surrogate Recovery	04-020	%	84	91	85	94
Date Extracted	04-020	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-020	-	16/11/2004	16/11/2004	16/11/2004	16/11/2004
Poly Aromatic Hydrocarbons						
Naphthalene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Acenaphthalene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Acenaphthene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Fluorene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Phenanthrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Fluoranthene	04-025	µg/kg	6.8	<5.0	<5.0	<5.0
Pyrene	04-025	µg/kg	5.5	<5.0	<5.0	<5.0
Benz(a)anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Chrysene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Benzo(b)&(k)fluoranthene	04-025	µg/kg	<10	<10	<10	<10
Benzo(a)pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Indeno(1,2,3-cd)pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Dibenz(a,h)anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Benzo(g,h,i)perylene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Total PAHs (as above)	04-025	µg/kg	<100	<100	<100	<100
Surrogate 1 Recovery	04-025	%	74	80	75	83
Surrogate 2 Recovery	04-025	%	78	84	76	81
Surrogate 3 Recovery	04-025	%	81	88	83	90
Date Extracted	04-025	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-025	-	16/11/2004	16/11/2004	16/11/2004	16/11/2004
Organochlorine Pesticides						
Aldrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
alpha-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
beta-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
gamma-BHC (Lindane)	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
delta-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
cis-Chlordane	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
trans-Chlordane	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0



Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference:	-	-	/5	/6	/7	/8
Client Reference:	-	-	PCQ1 0-0.5A	PCQ19 0-0.5A	PCQ22 0-0.5A	PCQ22 05-1.0A
Date Sampled:	-	-				
Analysis Description	Method	Units				
<i>p,p'</i> -DDD	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>p,p'</i> -DDE	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>p,p'</i> -DDT	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Dieldrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>alpha</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>beta</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endosulfan Sulphate	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin ketone	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin aldehyde	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Heptachlor	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Heptachlor epoxide	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Methoxychlor	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Surrogate Recovery	04-023	%	87	80	84	89
Date Extracted	04-023	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-023	-	15/11/2004	15/11/2004	15/11/2004	15/11/2004
Organophosphate Pesticides						
Azinphos-methyl	04-024	ug/kg	<50	<50	<50	<50
Bromophos-ethyl	04-024	ug/kg	<50	<50	<50	<50
Carbophenothion	04-024	ug/kg	<50	<50	<50	<50
Chlorfenvinphos	04-024	ug/kg	<50	<50	<50	<50
Chlorpyrifos	04-024	ug/kg	<50	<50	<50	<50
Chlorpyrifos-methyl	04-024	ug/kg	<50	<50	<50	<50
Diazinon	04-024	ug/kg	<50	<50	<50	<50
Demeton-S-methyl	04-024	ug/kg	<50	<50	<50	<50
Dimethoate	04-024	ug/kg	<50	<50	<50	<50
Dichlorvos	04-024	ug/kg	<50	<50	<50	<50
Ethion	04-024	ug/kg	<50	<50	<50	<50
Fenitrothion	04-024	ug/kg	<50	<50	<50	<50
Fenthion	04-024	ug/kg	<50	<50	<50	<50
Fenamiphos	04-024	ug/kg	<50	<50	<50	<50
Malathion	04-024	ug/kg	<50	<50	<50	<50
Methidathion	04-024	ug/kg	<50	<50	<50	<50

Issue Date: 1 December 2004

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Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference: Client Reference: Date Sampled: Analysis Description	- - - Method	- - - Units	/5 PCQ1 0-0.5A	/6 PCQ19 0-0.5A	/7 PCQ22 0-0.5A	/8 PCQ22 05-1.0A
Monocrotophos	04-024	ug/kg	<50	<50	<50	<50
Omethoate	04-024	ug/kg	<50	<50	<50	<50
Parathion	04-024	ug/kg	<50	<50	<50	<50
Parathion-methyl	04-024	ug/kg	<50	<50	<50	<50
Phosalone	04-024	ug/kg	<50	<50	<50	<50
Pirimiphos-methyl	04-024	ug/kg	<50	<50	<50	<50
Prothiofos	04-024	ug/kg	<50	<50	<50	<50
Surrogate Recovery	04-024	%	87	80	84	89
Date Extracted	04-024	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-024	-	15/11/2004	15/11/2004	15/11/2004	15/11/2004
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	6.9	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	54	85	100	87
Date Extracted	04-026	-	24/11/2004	24/11/2004	24/11/2004	24/11/2004
Date Analysed	04-026	-	24/11/2004	24/11/2004	24/11/2004	24/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment
Nutrients			See comment	See comment	See comment	See comment



Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference:	-	-	/9	/10	/11	/12
Client Reference:	-	-	PCQ21	PCQ14	PCQ13	Trip Blank 1
Date Sampled:	-	-	0.5-1.0A	0.5-1.0A	0-0.5A	
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	14	17	20	[NA]
Trace Elements						
Silver	04-001	mg/kg	<0.1	<0.1	<0.1	[NA]
Arsenic	04-001	mg/kg	2.6	0.70	1.5	[NA]
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	[NA]
Chromium	04-001	mg/kg	15	11	14	[NA]
Copper	04-001	mg/kg	3.6	4.6	2.8	[NA]
Iron	04-001	mg/kg	12,000	7,900	10,000	[NA]
Mercury	04-002	mg/kg	<0.01	<0.01	0.02	[NA]
Manganese	04-001	mg/kg	400	230	310	[NA]
Nickel	04-001	mg/kg	7.8	5.0	7.1	[NA]
Phosphorus	04-001	mg/kg	510	220	210	[NA]
Lead	04-001	mg/kg	4.1	3.9	3.1	[NA]
Antimony	04-001	mg/kg	0.2	0.2	<0.1	[NA]
Zinc	04-001	mg/kg	13	13	13	[NA]
BTEX						
Benzene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Toluene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Ethyl Benzene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
m+p xylenes	04-021	mg/kg	<0.40	<0.40	<0.40	<0.40
o-xylene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Total BTEX	04-021	mg/kg	<1.2	<1.2	<1.2	<1.2
Surrogate 1 Recovery	04-021	%	85	83	88	97
Surrogate 2 Recovery	04-021	%	82	80	83	93
Surrogate 3 Recovery	04-021	%	88	89	89	99
Date Extracted	04-021	-	12/11/2004	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-021	-	12/11/2004	12/11/2004	13/11/2004	13/11/2004
Total Petroleum Hydrocarbons						
TPH C6-C9	04-021	mg/kg	<10	<10	<10	[NA]
TPH C10-14	04-020	mg/kg	<10	<10	<10	[NA]
TPH C15-28	04-020	mg/kg	<50	<50	<50	[NA]



Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference:	-	-	/9	/10	/11	/12
Client Reference:	-	-	PCQ21	PCQ14	PCQ13	Trip Blank 1
Date Sampled:	-	-	0.5-1.0A	0.5-1.0A	0-0.5A	
Analysis Description	Method	Units				
TPH C29-36	04-020	mg/kg	<50	<50	<50	[NA]
Surrogate Recovery	04-020	%	86	91	107	[NA]
Date Extracted	04-020	-	12/11/2004	12/11/2004	12/11/2004	[NA]
Date Analysed	04-020	-	16/11/2004	16/11/2004	16/11/2004	[NA]
Poly Aromatic Hydrocarbons						
Naphthalene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Acenaphthalene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Acenaphthene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Fluorene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Phenanthrene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Fluoranthene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Benz(a)anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Chrysene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Benzo(b)&(k)fluoranthene	04-025	µg/kg	<10	<10	<10	[NA]
Benzo(a)pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Indeno(1,2,3-cd)pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Dibenz(a,h)anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Benzo(g,h,i)perylene	04-025	µg/kg	<5.0	<5.0	<5.0	[NA]
Total PAHs (as above)	04-025	µg/kg	<100	<100	<100	[NA]
Surrogate 1 Recovery	04-025	%	78	82	76	[NA]
Surrogate 2 Recovery	04-025	%	74	80	72	[NA]
Surrogate 3 Recovery	04-025	%	83	91	85	[NA]
Date Extracted	04-025	-	12/11/2004	12/11/2004	12/11/2004	[NA]
Date Analysed	04-025	-	16/11/2004	16/11/2004	16/11/2004	[NA]
Organochlorine Pesticides						
Aldrin	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
alpha-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
beta-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
gamma-BHC (Lindane)	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
delta-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
cis-Chlordane	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
trans-Chlordane	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]

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**Batch Number:** A04/0816**Project:** Port of Hay Point

Laboratory Reference: Client Reference: Date Sampled: Analysis Description	- - - Method	- - - Units	/9 PCQ21 0.5-1.0A	/10 PCQ14 0.5-1.0A	/11 PCQ13 0-0.5A	/12 Trip Blank 1
<i>p,p'</i> -DDD	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
<i>p,p'</i> -DDE	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
<i>p,p'</i> -DDT	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
Dieldrin	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
<i>alpha</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
<i>beta</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
Endosulfan Sulphate	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
Endrin	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
Endrin ketone	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
Endrin aldehyde	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
Heptachlor	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
Heptachlor epoxide	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
Hexachlorobenzene	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
Methoxychlor	04-023	ug/kg	<1.0	<1.0	<1.0	[NA]
Surrogate Recovery	04-023	%	89	65	92	[NA]
Date Extracted	04-023	-	12/11/2004	12/11/2004	12/11/2004	[NA]
Date Analysed	04-023	-	15/11/2004	15/11/2004	15/11/2004	[NA]
Organophosphate Pesticides						
Azinphos-methyl	04-024	ug/kg	<50	<50	<50	[NA]
Bromophos-ethyl	04-024	ug/kg	<50	<50	<50	[NA]
Carbophenothion	04-024	ug/kg	<50	<50	<50	[NA]
Chlorfenvinphos	04-024	ug/kg	<50	<50	<50	[NA]
Chlorpyrifos	04-024	ug/kg	<50	<50	<50	[NA]
Chlorpyrifos-methyl	04-024	ug/kg	<50	<50	<50	[NA]
Diazinon	04-024	ug/kg	<50	<50	<50	[NA]
Demeton-S-methyl	04-024	ug/kg	<50	<50	<50	[NA]
Dimethoate	04-024	ug/kg	<50	<50	<50	[NA]
Dichlorvos	04-024	ug/kg	<50	<50	<50	[NA]
Ethion	04-024	ug/kg	<50	<50	<50	[NA]
Fenitrothion	04-024	ug/kg	<50	<50	<50	[NA]
Fenthion	04-024	ug/kg	<50	<50	<50	[NA]
Fenamiphos	04-024	ug/kg	<50	<50	<50	[NA]
Malathion	04-024	ug/kg	<50	<50	<50	[NA]
Methidathion	04-024	ug/kg	<50	<50	<50	[NA]

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Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference:	-	-	/9	/10	/11	/12
Client Reference:	-	-	PCQ21	PCQ14	PCQ13	Trip Blank 1
Date Sampled:	-	-	0.5-1.0A	0.5-1.0A	0-0.5A	
Analysis Description	Method	Units				
Monocrotophos	04-024	ug/kg	<50	<50	<50	[NA]
Omethoate	04-024	ug/kg	<50	<50	<50	[NA]
Parathion	04-024	ug/kg	<50	<50	<50	[NA]
Parathion-methyl	04-024	ug/kg	<50	<50	<50	[NA]
Phosalone	04-024	ug/kg	<50	<50	<50	[NA]
Pirimiphos-methyl	04-024	ug/kg	<50	<50	<50	[NA]
Prothiofos	04-024	ug/kg	<50	<50	<50	[NA]
Surrogate Recovery	04-024	%	89	65	92	[NA]
Date Extracted	04-024	-	12/11/2004	12/11/2004	12/11/2004	[NA]
Date Analysed	04-024	-	15/11/2004	15/11/2004	15/11/2004	[NA]
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	[NA]
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	[NA]
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	[NA]
Surrogate 1 Recovery	04-026	%	90	100	91	[NA]
Date Extracted	04-026	-	24/11/2004	24/11/2004	24/11/2004	[NA]
Date Analysed	04-026	-	24/11/2004	24/11/2004	24/11/2004	[NA]
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	[NA]
Total Organic Carbon			See comment	See comment	See comment	[NA]
Nutrients			See comment	See comment	See comment	[NA]



Batch Number: A04/0816

Project: Port of Hay Point

Laboratory Reference:	-	-	/13	/14	/15
Client Reference:	-	-	Trip Blank 2	Trip Blank 3	Trip Blank 4
Date Sampled:	-	-			
Analysis Description	Method	Units			
Moisture Content					
Trace Elements					
BTEX					
Benzene	04-021	mg/kg	<0.20	<0.20	<0.20
Toluene	04-021	mg/kg	<0.20	<0.20	<0.20
Ethyl Benzene	04-021	mg/kg	<0.20	<0.20	<0.20
m+p xylenes	04-021	mg/kg	<0.40	<0.40	<0.40
o-xylene	04-021	mg/kg	<0.20	<0.20	<0.20
Total BTEX	04-021	mg/kg	<1.2	<1.2	<1.2
Surrogate 1 Recovery	04-021	%	96	99	98
Surrogate 2 Recovery	04-021	%	96	96	93
Surrogate 3 Recovery	04-021	%	104	104	102
Date Extracted	04-021	-	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-021	-	13/11/2004	13/11/2004	13/11/2004
Total Petroleum Hydrocarbons					
Poly Aromatic Hydrocarbons					
Organochlorine Pesticides					
Organophosphate Pesticides					
Organotins					
Subcontract Analysis					

Method	Method Description
04-004	Moisture Content by Gravimetric, %
04-001	Metals in Solids by ICP, mg/kg
04-002	Mercury in Solids by CVAAS, mg/kg
04-021	TPH C6-9 & BTEX in Solids, mg/kg
04-020	Total Petroleum Hydrocarbons in Solids, mg/kg
04-025	Low Level Poly Aromatic Hydrocarbons in Solids, mg/kg
04-023	*Low Level Organochlorine Pesticides in Solids, mg/kg
04-024	*Organophosphate Pesticides in Solids, mg/kg
04-026	*Organotins in Solids, µgSn/kg



Batch Number: A04/0816

Project: Port of Hay Point

Result Comments

[<] Less than

[INS] Insufficient sample for this test

[NA] Test not required

* Method not covered by NATA terms of accreditation.

Solid sample results are reported on a dry weight basis.

TOC and nutrient analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884); see attached SAL report for job number SAL15288A.

PSD analysis was subcontracted to GHD LongMac (NATA Number 679); see attached GHD LongMac report for job number 2113283.



Batch Number: A04/0816

Project: Port of Hay Point

QUALITY ASSURANCE REPORT

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Moisture Content	%	N/A	A04/0816-1	27 26 RPD: 4	A04/0816-1	N/A

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Silver	mg/kg	<0.1	A04/0816-1	<0.1 <0.1	A04/0816-1	91%
Arsenic	mg/kg	<0.10	A04/0816-1	17 14 RPD: 19	A04/0816-1	82%
Cadmium	mg/kg	<0.10	A04/0816-1	<0.10 <0.10	A04/0816-1	88%
Chromium	mg/kg	<0.10	A04/0816-1	27 28 RPD: 4	A04/0816-1	103%
Copper	mg/kg	<0.10	A04/0816-1	8.0 7.2 RPD: 11	A04/0816-1	102%
Iron	mg/kg	<0.10	A04/0816-1	27000 26000 RPD: 4	A04/0816-1	#
Mercury	mg/kg	<0.01	A04/0816-1	0.01 <0.01	A04/0816-1	98%
Manganese	mg/kg	<0.1	A04/0816-1	310 250 RPD: 21	A04/0816-1	#
Nickel	mg/kg	<0.10	A04/0816-1	13 13 RPD: 0	A04/0816-1	94%
Phosphorus	mg/kg	<0.1	A04/0816-1	230 210 RPD: 9	A04/0816-1	#
Lead	mg/kg	<0.10	A04/0816-1	11 11 RPD: 0	A04/0816-1	91%
Antimony	mg/kg	<0.1	A04/0816-1	0.6 0.8 RPD: 29	A04/0816-1	92%
Zinc	mg/kg	<0.10	A04/0816-1	33 33 RPD: 0	A04/0816-1	96%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Benzene	mg/kg	<0.20	A04/0816-1	<0.20 <0.20	A04/0816-1	86%
Toluene	mg/kg	<0.20	A04/0816-1	<0.20 <0.20	A04/0816-1	88%
Ethyl Benzene	mg/kg	<0.20	A04/0816-1	<0.20 <0.20	A04/0816-1	86%
m+p xylenes	mg/kg	<0.40	A04/0816-1	<0.40 <0.40	A04/0816-1	86%
o-xylene	mg/kg	<0.20	A04/0816-1	<0.20 <0.20	A04/0816-1	84%
Total BTEX	mg/kg	<1.2	A04/0816-1	<1.2 <1.2	A04/0816-1	N/A
Surrogate 1 Recovery	%	96	A04/0816-1	83 98 RPD: 17	A04/0816-1	80%
Surrogate 2 Recovery	%	94	A04/0816-1	82 95 RPD: 15	A04/0816-1	82%
Surrogate 3 Recovery	%	97	A04/0816-1	86 102 RPD: 17	A04/0816-1	85%



Batch Number: A04/0816

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
TPH C6-C9	mg/kg	<10	A04/0816-1	<10 <10	A04/0816-1	82%
TPH C10-14	mg/kg	<10	A04/0816-1	<10 <10	A04/0816-1	72%
TPH C15-28	mg/kg	<50	A04/0816-1	<50 <50	A04/0816-1	79%
TPH C29-36	mg/kg	<50	A04/0816-1	<50 <50	A04/0816-1	85%
Surrogate Recovery	%	103	A04/0816-1	85 86 RPD: 1	A04/0816-1	124%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Naphthalene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	79%
Acenaphthalene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	86%
Acenaphthene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	85%
Fluorene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	92%
Phenanthrene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	85%
Anthracene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	82%
Fluoranthene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	90%
Pyrene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	90%
Benz(a)anthracene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	92%
Chrysene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	84%
Benzo(b)&(k)fluoranthene	µg/kg	<10	A04/0816-1	<10 <10	A04/0816-1	85%
Benzo(a)pyrene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	84%
Indeno(1,2,3-cd)pyrene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	84%
Dibenz(a,h)anthracene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	86%
Benzo(g,h,i)perylene	µg/kg	<5.0	A04/0816-1	<5.0 <5.0	A04/0816-1	84%
Total PAHs (as above)	µg/kg	<100	A04/0816-1	<100 <100	A04/0816-1	N/A
Surrogate 1 Recovery	%	82	A04/0816-1	75 73 RPD: 3	A04/0816-1	80%
Surrogate 2 Recovery	%	94	A04/0816-1	80 79 RPD: 1	A04/0816-1	77%
Surrogate 3 Recovery	%	105	A04/0816-1	90 92 RPD: 2	A04/0816-1	89%



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TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Aldrin	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
<i>alpha</i> -BHC	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
<i>beta</i> -BHC	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
<i>gamma</i> -BHC (Lindane)	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	123%
<i>delta</i> -BHC	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
<i>cis</i> -Chlordane	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
<i>trans</i> -Chlordane	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	90%
<i>p,p'</i> -DDD	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
<i>p,p'</i> -DDE	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	88%
<i>p,p'</i> -DDT	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
Dieldrin	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	58%
<i>alpha</i> -Endosulfan	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
<i>beta</i> -Endosulfan	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	95%
Endosulfan Sulphate	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
Endrin	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
Endrin ketone	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
Endrin aldehyde	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
Heptachlor	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	113%
Heptachlor epoxide	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
Hexachlorobenzene	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
Methoxychlor	ug/kg	<1.0	A04/0816-1	<1.0 <1.0	A04/0816-1	N/A
Surrogate Recovery	%	85	A04/0816-1	114 123 RPD: 8	A04/0816-1	109%



Batch Number: A04/0816

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Azinphos-methyl	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Bromophos-ethyl	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Carbophenothion	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Chlorfenvinphos	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Chlorpyrifos	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	78%
Chlorpyrifos-methyl	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Diazinon	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	90%
Demeton-S-methyl	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Dimethoate	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Dichlorvos	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Ethion	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	112%
Fenitrothion	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Fenthion	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Fenamiphos	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Malathion	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Methidathion	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Monocrotophos	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Omethoate	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Parathion	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Parathion-methyl	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Phosalone	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Pirimiphos-methyl	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Prothiofos	ug/kg	<50	A04/0816-1	<50 <50	A04/0816-1	N/A
Surrogate Recovery	%	85	A04/0816-1	114 123 RPD: 8	A04/0816-1	109%



Batch Number: A04/0816

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Monobutyl tin	µgSn/kg		A04/0816-2	<0.50 <0.50	A04/0816-2	95%
Dibutyl tin	µgSn/kg		A04/0816-2	<0.50 <0.50	A04/0816-2	111%
Tributyl tin	µgSn/kg		A04/0816-2	0.81 0.83 RPD: 2	A04/0816-2	101%
Surrogate 1 Recovery	%		A04/0816-2	74 130 RPD: 55	A04/0816-2	85%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0816-11	20 20 RPD: 0

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Silver	mg/kg	[NT]	A04/0816-11	<0.1 <0.1
Arsenic	mg/kg	[NT]	A04/0816-11	1.5 1.0 RPD: 40
Cadmium	mg/kg	[NT]	A04/0816-11	<0.10 <0.10
Chromium	mg/kg	[NT]	A04/0816-11	14 12 RPD: 15
Copper	mg/kg	[NT]	A04/0816-11	2.8 2.1 RPD: 29
Iron	mg/kg	[NT]	A04/0816-11	10000 9000 RPD: 11
Mercury	mg/kg	[NT]	A04/0816-11	0.02 0.01 RPD: 67
Manganese	mg/kg	[NT]	A04/0816-11	310 230 RPD: 30
Nickel	mg/kg	[NT]	A04/0816-11	7.1 6.4 RPD: 10
Phosphorus	mg/kg	[NT]	A04/0816-11	210 210 RPD: 0
Lead	mg/kg	[NT]	A04/0816-11	3.1 3.7 RPD: 18
Antimony	mg/kg	[NT]	A04/0816-11	<0.1 <0.1
Zinc	mg/kg	[NT]	A04/0816-11	13 11 RPD: 17

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Benzene	mg/kg	[NT]	A04/0816-11	<0.20 <0.20
Toluene	mg/kg	[NT]	A04/0816-11	<0.20 <0.20
Ethyl Benzene	mg/kg	[NT]	A04/0816-11	<0.20 <0.20
m+p xylenes	mg/kg	[NT]	A04/0816-11	<0.40 <0.40
o-xylene	mg/kg	[NT]	A04/0816-11	<0.20 <0.20
Total BTEX	mg/kg	[NT]	A04/0816-11	<1.2 <1.2
Surrogate 1 Recovery	%	[NT]	A04/0816-11	88 82 RPD: 7
Surrogate 2 Recovery	%	[NT]	A04/0816-11	83 81 RPD: 2
Surrogate 3 Recovery	%	[NT]	A04/0816-11	89 87 RPD: 2



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Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
TPH C6-C9	mg/kg	[NT]	A04/0816-11	<10 <10
TPH C10-14	mg/kg	[NT]	A04/0816-11	<10 <10
TPH C15-28	mg/kg	[NT]	A04/0816-11	<50 <50
TPH C29-36	mg/kg	[NT]	A04/0816-11	<50 <50
Surrogate Recovery	%	[NT]	A04/0816-11	107 90 RPD: 17

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Naphthalene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Acenaphthalene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Acenaphthene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Fluorene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Phenanthrene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Anthracene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Fluoranthene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Pyrene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Benz(a)anthracene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Chrysene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Benzo(b)&(k)fluoranthene	µg/kg	[NT]	A04/0816-11	<10 <10
Benzo(a)pyrene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Indeno(1,2,3-cd)pyrene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Dibenz(a,h)anthracene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Benzo(g,h,i)perylene	µg/kg	[NT]	A04/0816-11	<5.0 <5.0
Total PAHs (as above)	µg/kg	[NT]	A04/0816-11	<100 <100
Surrogate 1 Recovery	%	[NT]	A04/0816-11	76 78 RPD: 3
Surrogate 2 Recovery	%	[NT]	A04/0816-11	72 75 RPD: 4
Surrogate 3 Recovery	%	[NT]	A04/0816-11	85 87 RPD: 2



Batch Number: A04/0816

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Monobutyl tin	µgSn/kg	[NT]	A04/0816-5	<0.50 <0.50
Dibutyl tin	µgSn/kg	[NT]	A04/0816-5	<0.50 <0.50
Tributyl tin	µgSn/kg	[NT]	A04/0816-5	<0.50 <0.50
Surrogate 1 Recovery	%	[NT]	A04/0816-5	54 120 RPD: 76

Comments:

RPD = Relative Percent Deviation

[NT] = Not Tested

[N/A] = Not Applicable

'#' = Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Trace elements +/- 10%

Organic analyses +/- 25%

Recommended matrix spike recovery limits: Trace elements 80-120%

Organic analyses 70-130%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.



REPORT OF ANALYSIS

Laboratory Reference: A04/0816

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediment
No. of Samples: 15
Date Received: 8/11/2004
Date Completed: 29/11/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Phalak Inthakesone
Senior Organics Chemist

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
NATA endorsed test report. This document shall not be reproduced, except in full.

FILE		
27 JAN 2005		
Name	Initials	Date



Nata Accredited Laboratory
Number: 15109

Issue Date: 1 December 2004

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**SYDNEY
ANALYTICAL
LABORATORIES**

Page 1 of 4

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SEVEN HILLS NSW 2147
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Fax: (02) 9838 8919
A.C.N. 003 614 695
A.B.N. 81 829 182 852

ANALYTICAL REPORT for:

ADVANCED ANALYTICAL AUSTRALIA

1/139 SANDGATE ROAD
ALBION QLD 4010

ATTN: ANDREW BRADBURY

JOB NO: SAL15288A
CLIENT ORDER: A04/0816
DATE RECEIVED: 09/11/04
DATE COMPLETED: 19/11/04
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 11

NATA Accredited Laboratory

Number: 1884



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.....
Issued on 26/11/04
Lance Smith
(Chief Chemist)

SYDNEY ANALYTICAL LABORATORIES

Page 2 of 4

ANALYTICAL REPORT

JOB NO: SAL15288A
CLIENT ORDER: A04/0816

SAMPLES	TOC %	TKN mg/kg	Total N mg/kg	NO3 mg/kg	NO2 mg/kg	NH4-N mg/kg
1 A04/0816/1	<0.1	180	180	<0.5	<0.5	<0.5
2 A04/0816/2	0.22	190	190	<0.5	<0.5	<0.5
3 A04/0816/3	0.11	96	96	<0.5	<0.5	<0.5
4 A04/0816/4	<0.1	120	120	<0.5	<0.5	<0.5
5 A04/0816/5	0.52	350	350	<0.5	<0.5	<0.5
6 A04/0816/6	0.19	140	140	<0.5	<0.5	<0.5
7 A04/0816/7	0.27	160	160	<0.5	<0.5	<0.5
8 A04/0816/8	<0.1	84	84	<0.5	<0.5	<0.5
9 A04/0816/9	<0.1	72	72	<0.5	<0.5	<0.5
10 A04/0816/10	<0.1	72	72	<0.5	<0.5	<0.5
11 A04/0816/11	<0.1	48	48	<0.5	<0.5	<0.5
BLANK	<0.1	<20	<20	<0.5	<0.5	<0.5
MDL	0.1	20	20	0.5	0.5	0.5
Method Code	C48	WA14	CAL.	WA5	WA12	WA3
Preparation	P5	P5	P1	P1	P1	P1

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 3 of 4

ANALYTICAL REPORT

JOB NO: SAL15288A
CLIENT ORDER: A04/0816

	SAMPLES	PO4 mg/kg
1	A04/0816/1	1.5
2	A04/0816/2	<0.5
3	A04/0816/3	0.5
4	A04/0816/4	0.5
5	A04/0816/5	1.0
6	A04/0816/6	1.0
7	A04/0816/7	0.5
8	A04/0816/8	<0.5
9	A04/0816/9	<0.5
10	A04/0816/10	<0.5
11	A04/0816/11	<0.5
	BLANK	<0.5

MDL	0.5
Method Code	WA7
Preparation	P1

RESULTS ON DRY BASIS

ANALYTICAL REPORT

JOB NO: SAL15288A
CLIENT ORDER: A04/0816

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5 Sample dried, split and crushed to -150um
P1 Analysis performed on sample as received
C48 Total Organic Carbon - AS1289.4.1.1
WA14 Total Kjeldahl Nitrogen
 Determined by APHA 4500B
CAL. Determined by Calculation
WA5 Nitrate - 1:5 soil/water extract
 Determined by APHA 4500F
WA12 Nitrite - 1:5 soil/water extract
 Determined by APHA 4500F
WA3 Total Ammonia - 1:5 soil/water extract
 Determined by APHA 4500C
WA7 Phosphate - 1:5 soil/water extract
 Determined by APHA 4500F

A preliminary report was faxed on 19/11/04



REPORT OF ANALYSIS

Laboratory Reference: A04/0853-A

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Soil
No. of Samples: 16
Date Received: 10/11/2004
Date Completed: 2/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
NATA endorsed test report. This document shall not be reproduced, except in full.



Nata Accredited Laboratory
Number: 15109

Issue Date: 3 December 2004

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Page 1 of 7

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Batch Number: A04/0853-A

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ5 0-0.5A	PCQ5 0.5-1.0A	PCQ5 1.0-2.0A	PCQ6 0-0.5A
Date Sampled:	-	-				
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	20	19	19	21
Trace Elements						
Arsenic	04-001	mg/kg	0.51	0.68	1.4	<0.10
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	22	21	16	12
Copper	04-001	mg/kg	27	20	16	6.1
Iron	04-001	mg/kg	33,000	29,000	25,000	11,000
Manganese	04-001	mg/kg	210	1,100	990	350
Nickel	04-001	mg/kg	12	9.3	9.5	6.7
Lead	04-001	mg/kg	14	24	19	3.3
Zinc	04-001	mg/kg	54	42	36	16
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	<0.50
Surrogate 1 Recovery	04-026	%	96	79	[NA]	93
Date Extracted	04-026	-	27/11/2004	27/11/2004	[NA]	27/11/2004
Date Analysed	04-026	-	27/11/2004	27/11/2004	[NA]	27/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0853-A

Project: Port of Hay Point

Laboratory Reference:	-	-	/5	/6	/7	/8
Client Reference:	-	-	PCQ6	PCQ7	PCQ8 0-0.5A	PCQ8
Date Sampled:	-	-	0.5-1.0A	0.5-1.0A		0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	16	16	19	18
Trace Elements						
Arsenic	04-001	mg/kg	0.10	<0.10	0.75	<0.10
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	9.5	12	9.0	9.7
Copper	04-001	mg/kg	4.4	4.7	2.6	2.2
Iron	04-001	mg/kg	6,100	5,400	6,700	5,400
Manganese	04-001	mg/kg	310	24	380	170
Nickel	04-001	mg/kg	4.4	6.4	5.4	4.1
Lead	04-001	mg/kg	2.8	3.0	2.3	3.1
Zinc	04-001	mg/kg	13	14	14	18
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	82	82	96	100
Date Extracted	04-026	-	27/11/2004	27/11/2004	27/11/2004	27/11/2004
Date Analysed	04-026	-	27/11/2004	27/11/2004	27/11/2004	27/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0853-A

Project: Port of Hay Point

Laboratory Reference:	-	-	/9	/10	/11	/12
Client Reference:	-	-	PCQ8	PCQ 0-0.5T5	PCQ	PCQ 0-0.5T6
Date Sampled:	-	-	1.0-2.0A		0.5-1.0T5	
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	18	28	19	23
Trace Elements						
Arsenic	04-001	mg/kg	0.45	4.4	2.9	7.0
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	11	14	27	15
Copper	04-001	mg/kg	3.8	5.1	7.0	5.6
Iron	04-001	mg/kg	7,500	14,000	20,000	17,000
Manganese	04-001	mg/kg	300	430	290	140
Nickel	04-001	mg/kg	5.0	6.5	16	6.7
Lead	04-001	mg/kg	3.2	4.8	5.9	5.2
Zinc	04-001	mg/kg	12	20	30	17
Organotins						
Monobutyl tin	04-026	µgSn/kg	[NA]	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	[NA]	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	[NA]	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	[NA]	66	78	81
Date Extracted	04-026	-	[NA]	27/11/2004	27/11/2004	27/11/2004
Date Analysed	04-026	-	[NA]	27/11/2004	27/11/2004	27/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0853-A

Project: Port of Hay Point

Laboratory Reference:	-	-	/13	/14	/15	/16
Client Reference:	-	-	PCQ	PCQ9 0-0.5A	PCQ4 0-0.5A	PCQ
Date Sampled:	-	-	0.5-1.0T6			0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	21	20	19	24
Trace Elements						
Arsenic	04-001	mg/kg	6.7	0.54	8.1	7.9
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	26	14	13	30
Copper	04-001	mg/kg	9.4	11	6.5	12
Iron	04-001	mg/kg	28,000	17,000	18,000	31,000
Manganese	04-001	mg/kg	330	260	65	440
Nickel	04-001	mg/kg	16	6.0	7.0	20
Lead	04-001	mg/kg	8.3	6.0	7.0	5.6
Zinc	04-001	mg/kg	36	25	20	42
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	100	90	150	76
Date Extracted	04-026	-	27/11/2004	27/11/2004	27/11/2004	27/11/2004
Date Analysed	04-026	-	27/11/2004	27/11/2004	27/11/2004	27/11/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment

Method	Method Description
04-004	Moisture Content by Gravimetric, %
04-001	Metals in Solids by ICP
04-026	*Organotins in Solids, µgSn/kg

Result Comments

[<] Less than

[INS] Insufficient sample for this test

[NA] Test not required

* Method not covered by NATA terms of accreditation.

Solid sample results are reported on a dry weight basis.

TOC analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884);

see attached SAL report for job number SAL15313C.

PSD analysis was subcontracted to GHD LongMac (NATA Number 679); see

attached GHD LongMac report for job number 2113283.

Issue Date: 3 December 2004

Page 5 of 7

Advanced Analytical Australia Pty Ltd

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Batch Number: A04/0853-A

Project: Port of Hay Point

QUALITY ASSURANCE REPORT

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	N/A	A04/0853-A-1	20 20 RPD: 0

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Arsenic	mg/kg	<0.10	A04/0853-A-1	0.51 0.19 RPD: 91	A04/0853-A-1	77%
Cadmium	mg/kg	<0.10	A04/0853-A-1	<0.10 <0.10	A04/0853-A-1	87%
Chromium	mg/kg	<0.10	A04/0853-A-1	22 23 RPD: 4	A04/0853-A-1	100%
Copper	mg/kg	<0.10	A04/0853-A-1	27 23 RPD: 16	A04/0853-A-1	101%
Iron	mg/kg	<0.10	A04/0853-A-1	33000 28000 RPD: 16	A04/0853-A-1	#
Manganese	mg/kg	<0.1	A04/0853-A-1	210 340 RPD: 47	A04/0853-A-1	#
Nickel	mg/kg	<0.10	A04/0853-A-1	12 10 RPD: 18	A04/0853-A-1	91%
Lead	mg/kg	<0.10	A04/0853-A-1	14 9.0 RPD: 43	A04/0853-A-1	87%
Zinc	mg/kg	<0.10	A04/0853-A-1	54 53 RPD: 2	A04/0853-A-1	97%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Monobutyl tin	µgSn/kg	<0.50	A04/0853-A-2	<0.50 <0.50	A04/0853-A-2	45%
Dibutyl tin	µgSn/kg	<0.50	A04/0853-A-2	<0.50 <0.50	A04/0853-A-2	77%
Tributyl tin	µgSn/kg	<0.50	A04/0853-A-2	<0.50 <0.50	A04/0853-A-2	34%
Surrogate 1 Recovery	%	59	A04/0853-A-2	79 71 RPD: 11	A04/0853-A-2	79%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0853-A-11	19 22 RPD: 15

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Arsenic	mg/kg	[NT]	A04/0853-A-11	2.9 2.2 RPD: 27
Cadmium	mg/kg	[NT]	A04/0853-A-11	<0.10 <0.10
Chromium	mg/kg	[NT]	A04/0853-A-11	27 27 RPD: 0
Copper	mg/kg	[NT]	A04/0853-A-11	7.0 6.5 RPD: 7
Iron	mg/kg	[NT]	A04/0853-A-11	20000 20000 RPD: 0
Manganese	mg/kg	[NT]	A04/0853-A-11	290 260 RPD: 11
Nickel	mg/kg	[NT]	A04/0853-A-11	16 16 RPD: 0
Lead	mg/kg	[NT]	A04/0853-A-11	5.9 4.8 RPD: 21
Zinc	mg/kg	[NT]	A04/0853-A-11	30 32 RPD: 6



Batch Number: A04/0853-A

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Monobutyl tin	µgSn/kg	[NT]	A04/0853-A-5	<0.50 <0.50
Dibutyl tin	µgSn/kg	[NT]	A04/0853-A-5	<0.50 <0.50
Tributyl tin	µgSn/kg	[NT]	A04/0853-A-5	<0.50 <0.50
Surrogate 1 Recovery	%	[NT]	A04/0853-A-5	82 89 RPD: 8

Comments:

RPD = Relative Percent Deviation

[NT] = Not Tested

[N/A] = Not Applicable

'#' = Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Trace elements +/- 10%

Organic analyses +/- 25%

Recommended matrix spike recovery limits: Trace elements 80-120%

Organic analyses 70-130%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 1 of 4

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SEVEN HILLS NSW 2147
Telephone: (02) 9838 8903
Fax: (02) 9838 8919
A.C.N. 003 614 695
A.B.N. 81 829 182 852

ANALYTICAL REPORT for:

ADVANCED ANALYTICAL AUSTRALIA

1/139 SANDGATE ROAD
ALBION QLD 4010

ATTN: ANDREW BRADBURY

JOB NO: SAL15313C
CLIENT ORDER: A04/0853A
DATE RECEIVED: 12/11/04
DATE COMPLETED: 23/11/04
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 16

NATA Accredited Laboratory

Number: 1884



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.....
Issued on 30/11/04
Lance Smith
(Chief Chemist)

**SYDNEY
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Page 2 of 4

ANALYTICAL REPORT

**JOB NO: SAL15313C
CLIENT ORDER: A04/0853A**

SAMPLES	TOC %
1 A04/0853A/1	0.11
2 A04/0853A/2	0.10
3 A04/0853A/3	<0.1
4 A04/0853A/4	0.11
5 A04/0853A/5	0.10
6 A04/0853A/6	0.12
7 A04/0853A/7	0.12
8 A04/0853A/8	0.10
9 A04/0853A/9	0.10
10 A04/0853A/10	0.28
11 A04/0853A/11	0.11
12 A04/0853A/12	0.24
13 A04/0853A/13	<0.1
14 A04/0853A/14	0.16
15 A04/0853A/15	0.11
16 A04/0853A/16	<0.1
DUPLICATES:	
10 A04/0853A/10	0.26
BLANK	<0.1

MDL	0.1
Method Code	C48
Preparation	P5

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 3 of 4

LABORATORY DUPLICATE REPORT

JOB NO: SAL15313C
CLIENT ORDER: A04/0853A

Sample Number	Analyte	Units	MDL	Sample Result	Duplicate Result	%RPD
A04/0853A/10	TOC	%	0.1	0.28	0.26	7

Acceptance criteria:

RPD <50% for low level (<20xMDL)
RPD <30% for medium level (20-100xMDL)
RPD <15% for high level (>100xMDL)
No limit applies at <2xMDL

MDL = Method Detection Limit

All results are within the acceptance criteria

ANALYTICAL REPORT

JOB NO: SAL15313C
CLIENT ORDER: A04/0853A

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5 Sample dried, split and crushed to -150um
C48 Total Organic Carbon - AS1289.4.1.1

A preliminary report was faxed on 23/11/04



REPORT OF ANALYSIS

Laboratory Reference: A04/0853-B

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Soil
No. of Samples: 3
Date Received: 10/11/2004
Date Completed: 30/11/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Phalak Inthakesone
Senior Organics Chemist

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
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Nata Accredited Laboratory
Number: 15109

Issue Date: 3 December 2004

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Page 1 of 7

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Batch Number: A04/0853-B

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3
Client Reference:	-	-	PCQ7 0-0.5A	PCQ9 0.5-1.0A	Trip Blank 5
Date Sampled:	-	-			
Analysis Description	Method	Units			
Moisture Content					
Moisture Content	04-004	%	13	18	[NA]
Trace Elements					
Silver	04-001	mg/kg	<0.1	<0.1	[NA]
Arsenic	04-001	mg/kg	0.26	0.62	[NA]
Cadmium	04-001	mg/kg	<0.10	<0.10	[NA]
Chromium	04-001	mg/kg	6.9	12	[NA]
Copper	04-001	mg/kg	5.1	9.2	[NA]
Iron	04-001	mg/kg	4,600	13,000	[NA]
Mercury	04-002	mg/kg	<0.01	0.04	[NA]
Manganese	04-001	mg/kg	20	200	[NA]
Nickel	04-001	mg/kg	3.0	5.3	[NA]
Phosphorus	04-001	mg/kg	30	75	[NA]
Lead	04-001	mg/kg	3.3	4.5	[NA]
Antimony	04-001	mg/kg	0.9	0.5	[NA]
Zinc	04-001	mg/kg	12	22	[NA]
BTEX					
Benzene	04-021	mg/kg	<0.20	<0.20	<0.20
Toluene	04-021	mg/kg	<0.20	<0.20	<0.20
Ethyl Benzene	04-021	mg/kg	<0.20	<0.20	<0.20
m+p xylenes	04-021	mg/kg	<0.40	<0.40	<0.40
o-xylene	04-021	mg/kg	<0.20	<0.20	<0.20
Total BTEX	04-021	mg/kg	<1.2	<1.2	<1.2
Surrogate 1 Recovery	04-021	%	79	89	87
Surrogate 2 Recovery	04-021	%	75	87	84
Surrogate 3 Recovery	04-021	%	82	94	93
Date Extracted	04-021	-	12/11/2004	12/11/2004	12/11/2004
Date Analysed	04-021	-	13/11/2004	13/11/2004	13/11/2004
Total Petroleum Hydrocarbons					
TPH C6-C9	04-021	mg/kg	<10	<10	[NA]
TPH C10-14	04-020	mg/kg	<10	<10	[NA]
TPH C15-28	04-020	mg/kg	<50	<50	[NA]

**Batch Number:** A04/0853-B**Project:** Port of Hay Point

Laboratory Reference: Client Reference: Date Sampled: Analysis Description	- - - Method	- - - Units	/1 PCQ7 0-0.5A	/2 PCQ9 0.5-1.0A	/3 Trip Blank 5
TPH C29-36	04-020	mg/kg	<50	<50	[NA]
Surrogate Recovery	04-020	%	95	94	[NA]
Date Extracted	04-020	-	12/11/2004	12/11/2004	[NA]
Date Analysed	04-020	-	16/11/2004	16/11/2004	[NA]
Poly Aromatic Hydrocarbons					
Naphthalene	04-025	µg/kg	<5.0	<5.0	[NA]
Acenaphthalene	04-025	µg/kg	<5.0	<5.0	[NA]
Acenaphthene	04-025	µg/kg	<5.0	<5.0	[NA]
Fluorene	04-025	µg/kg	<5.0	<5.0	[NA]
Phenanthrene	04-025	µg/kg	<5.0	<5.0	[NA]
Anthracene	04-025	µg/kg	<5.0	<5.0	[NA]
Fluoranthene	04-025	µg/kg	<5.0	<5.0	[NA]
Pyrene	04-025	µg/kg	<5.0	<5.0	[NA]
Benz(a)anthracene	04-025	µg/kg	<5.0	<5.0	[NA]
Chrysene	04-025	µg/kg	<5.0	<5.0	[NA]
Benzo(b)&(k)fluoranthene	04-025	µg/kg	<10	<10	[NA]
Benzo(a)pyrene	04-025	µg/kg	<5.0	<5.0	[NA]
Indeno(1,2,3-cd)pyrene	04-025	µg/kg	<5.0	<5.0	[NA]
Dibenz(a,h)anthracene	04-025	µg/kg	<5.0	<5.0	[NA]
Benzo(g,h,i)perylene	04-025	µg/kg	<5.0	<5.0	[NA]
Total PAHs (as above)	04-025	µg/kg	<100	<100	[NA]
Surrogate 1 Recovery	04-025	%	81	78	[NA]
Surrogate 2 Recovery	04-025	%	84	74	[NA]
Surrogate 3 Recovery	04-025	%	87	85	[NA]
Date Extracted	04-025	-	12/11/2004	12/11/2004	[NA]
Date Analysed	04-025	-	16/11/2004	16/11/2004	[NA]
Organochlorine Pesticides					
Aldrin	04-023	ug/kg	<1.0	<1.0	[NA]
alpha-BHC	04-023	ug/kg	<1.0	<1.0	[NA]
beta-BHC	04-023	ug/kg	<1.0	<1.0	[NA]
gamma-BHC (Lindane)	04-023	ug/kg	<1.0	<1.0	[NA]
delta-BHC	04-023	ug/kg	<1.0	<1.0	[NA]
cis-Chlordane	04-023	ug/kg	<1.0	<1.0	[NA]
trans-Chlordane	04-023	ug/kg	<1.0	<1.0	[NA]

Issue Date: 3 December 2004

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**Batch Number:** A04/0853-B**Project:** Port of Hay Point

Laboratory Reference: Client Reference: Date Sampled: Analysis Description	- - - Method	- - - Units	/1 PCQ7 0-0.5A	/2 PCQ9 0.5-1.0A	/3 Trip Blank 5
<i>p,p'</i> -DDD	04-023	ug/kg	<1.0	<1.0	[NA]
<i>p,p'</i> -DDE	04-023	ug/kg	<1.0	<1.0	[NA]
<i>p,p'</i> -DDT	04-023	ug/kg	<1.0	<1.0	[NA]
Dieldrin	04-023	ug/kg	<1.0	<1.0	[NA]
<i>alpha</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	[NA]
<i>beta</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	[NA]
Endosulfan Sulphate	04-023	ug/kg	<1.0	<1.0	[NA]
Endrin	04-023	ug/kg	<1.0	<1.0	[NA]
Endrin ketone	04-023	ug/kg	<1.0	<1.0	[NA]
Endrin aldehyde	04-023	ug/kg	<1.0	<1.0	[NA]
Heptachlor	04-023	ug/kg	<1.0	<1.0	[NA]
Heptachlor epoxide	04-023	ug/kg	<1.0	<1.0	[NA]
Hexachlorobenzene	04-023	ug/kg	<1.0	<1.0	[NA]
Methoxychlor	04-023	ug/kg	<1.0	<1.0	[NA]
Surrogate Recovery	04-023	%	75	61	[NA]
Date Extracted	04-023	-	12/11/2004	12/11/2004	[NA]
Date Analysed	04-023	-	15/11/2004	15/11/2004	[NA]
Organophosphate Pesticides					
Azinphos-methyl	04-024	ug/kg	<50	<50	[NA]
Bromophos-ethyl	04-024	ug/kg	<50	<50	[NA]
Carbophenothion	04-024	ug/kg	<50	<50	[NA]
Chlorfenvinphos	04-024	ug/kg	<50	<50	[NA]
Chlorpyrifos	04-024	ug/kg	<50	<50	[NA]
Chlorpyrifos-methyl	04-024	ug/kg	<50	<50	[NA]
Diazinon	04-024	ug/kg	<50	<50	[NA]
Demeton-S-methyl	04-024	ug/kg	<50	<50	[NA]
Dimethoate	04-024	ug/kg	<50	<50	[NA]
Dichlorvos	04-024	ug/kg	<50	<50	[NA]
Ethion	04-024	ug/kg	<50	<50	[NA]
Fenitrothion	04-024	ug/kg	<50	<50	[NA]
Fenthion	04-024	ug/kg	<50	<50	[NA]
Fenamiphos	04-024	ug/kg	<50	<50	[NA]
Malathion	04-024	ug/kg	<50	<50	[NA]
Methidathion	04-024	ug/kg	<50	<50	[NA]

Issue Date: 3 December 2004

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Batch Number: A04/0853-B

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3
Client Reference:	-	-	PCQ7 0-0.5A	PCQ9 0.5-1.0A	Trip Blank 5
Date Sampled:	-	-			
Analysis Description	Method	Units			
Monocrotophos	04-024	ug/kg	<50	<50	[NA]
Omethoate	04-024	ug/kg	<50	<50	[NA]
Parathion	04-024	ug/kg	<50	<50	[NA]
Parathion-methyl	04-024	ug/kg	<50	<50	[NA]
Phosalone	04-024	ug/kg	<50	<50	[NA]
Pirimiphos-methyl	04-024	ug/kg	<50	<50	[NA]
Prothiofos	04-024	ug/kg	<50	<50	[NA]
Surrogate Recovery	04-024	%	75	61	[NA]
Date Extracted	04-024	-	12/11/2004	12/11/2004	[NA]
Date Analysed	04-024	-	15/11/2004	15/11/2004	[NA]
Organotins					
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]
Surrogate 1 Recovery	04-026	%	69	80	[NA]
Date Extracted	04-026	-	27/11/2004	27/11/2004	[NA]
Date Analysed	04-026	-	27/11/2004	27/11/2004	[NA]
Subcontract Analysis					
Particle Size Distribution			See comment	See comment	[NA]
Total Organic Carbon			See comment	See comment	[NA]
Nutrients			See comment	See comment	[NA]

Method	Method Description
04-004	Moisture Content by Gravimetric, %
04-001	Metals in Solids by ICP
04-002	Mercury in Solids by CVAAS, mg/kg
04-021	TPH C6-9 & BTEX in Solids, mg/kg
04-020	Total Petroleum Hydrocarbons in Solids, mg/kg
04-025	Low Level Poly Aromatic Hydrocarbons in Solids, mg/kg
04-023	*Low Level Organochlorine Pesticides in Solids, mg/kg
04-024	*Organophosphate Pesticides in Solids, mg/kg
04-026	*Organotins in Solids, µgSn/kg

Issue Date: 3 December 2004

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Batch Number: A04/0853-B

Project: Port of Hay Point

Result Comments

[<] Less than

[INS] Insufficient sample for this test

[NA] Test not required

* Method not covered by NATA terms of accreditation.

Solid sample results are reported on a dry weight basis.

TOC and nutrient analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884); see attached SAL report for job number SAL15313D.

PSD analysis was subcontracted to GHD LongMac (NATA Number 679); see attached GHD LongMac report for job number 2113283.



Batch Number: A04/0853-B

Project: Port of Hay Point

QUALITY ASSURANCE REPORT

Comments:

RPD = Relative Percent Deviation

[NT] = Not Tested

[N/A] = Not Applicable

'#' = Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Trace elements +/- 10%

Organic analyses +/- 25%

Recommended matrix spike recovery limits: Trace elements 80-120%

Organic analyses 70-130%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 1 of 4

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A.C.N. 003 614 695
A.B.N. 81 829 182 852

ANALYTICAL REPORT for:

ADVANCED ANALYTICAL AUSTRALIA

1/139 SANDGATE ROAD
ALBION QLD 4010

ATTN: ANDREW BRADBURY

JOB NO: SAL15313D
CLIENT ORDER: A04/0853B
DATE RECEIVED: 12/11/04
DATE COMPLETED: 19/11/04
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 2

NATA Accredited Laboratory

Number: 1884



NATA ENDORSED TEST REPORT
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.....
Issued on 26/11/04
Lance Smith
(Chief Chemist)

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 2 of 4

ANALYTICAL REPORT

JOB NO: SAL15313D
CLIENT ORDER: A04/0853B

SAMPLES		TOC %	TKN mg/kg	Total N mg/kg	NO3 mg/kg	NO2 mg/kg	NH4-N mg/kg
1	A04/0853B/1	0.11	24	24	<0.5	<0.5	<0.5
2	A04/0853B/2	0.14	200	200	<0.5	0.5	<0.5
	BLANK	<0.1	<20	<20	<0.5	<0.5	<0.5
MDL		0.1	20	20	0.5	0.5	0.5
Method Code		C48	WA14	CAL.	WA5	WA12	WA3
Preparation		P5	P5	P5	P5	P5	P1

**SYDNEY
ANALYTICAL
LABORATORIES**

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ANALYTICAL REPORT

JOB NO: SAL15313D
CLIENT ORDER: A04/0853B

	SAMPLES	PO4 mg/kg
1	A04/0853B/1	<0.5
2	A04/0853B/2	1.5
	BLANK	<0.5

MDL	0.5
Method Code	WA7
Preparation	P5

RESULTS ON DRY BASIS

ANALYTICAL REPORT

JOB NO: SAL15313D
CLIENT ORDER: A04/0853B

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5 Sample dried, split and crushed to -150um
P1 Analysis performed on sample as received
C48 Total Organic Carbon - AS1289.4.1.1
WA14 Total Kjeldahl Nitrogen
 Determined by APHA 4500B
CAL. Determined by Calculation
WA5 Nitrate - 1:5 soil/water extract
 Determined by APHA 4500F
WA12 Nitrite - 1:5 soil/water extract
 Determined by APHA 4500F
WA3 Total Ammonia - 1:5 soil/water extract
 Determined by APHA 4500G
WA7 Phosphate - 1:5 soil/water extract
 Determined by APHA 4500F

A preliminary report was faxed on 19/11/04



REPORT OF ANALYSIS

Laboratory Reference: A04/0911-A

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediment
No. of Samples: 14
Date Received: 17/11/2004
Date Completed: 13/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
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Nata Accredited Laboratory
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Batch Number: A04/0911-A

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ33	PCQ34	PCQ34	PCQ34 1-2A
Date Sampled:	-	-	0.5-1.0A	0-0.5A	0.5-1.0A	
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	14.9	16.7	16.1	17.6
Trace Elements						
Arsenic	04-001	mg/kg	7.9	11	4.1	4.2
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	13	12	14	12
Copper	04-001	mg/kg	3.0	4.3	2.8	3.2
Iron	04-001	mg/kg	13,000	13,000	10,000	11,000
Manganese	04-001	mg/kg	50	100	40	42
Nickel	04-001	mg/kg	7.7	7.3	7.7	9.1
Lead	04-001	mg/kg	5.0	9.3	4.9	3.1
Zinc	04-001	mg/kg	12	12	13	12
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	[NA]
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	[NA]
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	[NA]
Surrogate 1 Recovery	04-026	%	100	100	85	[NA]
Date Extracted	04-026	-	1/12/2004	1/12/2004	1/12/2004	[NA]
Date Analysed	04-026	-	1/12/2004	1/12/2004	1/12/2004	[NA]
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0911-A

Project: Port of Hay Point

Laboratory Reference:	-	-	/5	/6	/7	/8
Client Reference:	-	-	PCQ37	PCQ52	PCQ51	PCQ51
Date Sampled:	-	-	0.5-1.0A	0.5-1.0A	0-0.5A	0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	16.7	18.7	24.9	18.4
Trace Elements						
Arsenic	04-001	mg/kg	4.2	6.8	4.5	4.0
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	15	12	11	11
Copper	04-001	mg/kg	2.7	3.8	2.5	3.6
Iron	04-001	mg/kg	10,000	8,000	8,000	9,500
Manganese	04-001	mg/kg	26	170	210	170
Nickel	04-001	mg/kg	5.2	4.4	4.0	4.9
Lead	04-001	mg/kg	3.0	3.4	3.1	2.8
Zinc	04-001	mg/kg	8.7	7.9	7.3	8.3
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	100	93	130	92
Date Extracted	04-026	-	1/12/2004	1/12/2004	1/12/2004	1/12/2004
Date Analysed	04-026	-	1/12/2004	1/12/2004	1/12/2004	1/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0911-A

Project: Port of Hay Point

Laboratory Reference:	-	-	/9	/10	/11	/12
Client Reference:	-	-	PCQ51 1-2A	PCQ50 0-0.5A	PCQ50 0.5-1.0A	PCQ53 0.5-1.0A
Date Sampled:	-	-				
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	11.1	18.2	14.7	20.0
Trace Elements						
Arsenic	04-001	mg/kg	2.4	5.9	2.8	0.15
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	14	11	15	13
Copper	04-001	mg/kg	8.7	3.5	7.4	12
Iron	04-001	mg/kg	12,000	9,000	15,000	11,000
Manganese	04-001	mg/kg	45	190	26	53
Nickel	04-001	mg/kg	6.7	4.5	7.7	6.5
Lead	04-001	mg/kg	5.4	3.2	4.7	7.9
Zinc	04-001	mg/kg	11	6.6	8.0	18
Organotins						
Monobutyl tin	04-026	µgSn/kg	[NA]	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	[NA]	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	[NA]	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	[NA]	150	74	85
Date Extracted	04-026	-	[NA]	1/12/2004	1/12/2004	1/12/2004
Date Analysed	04-026	-	[NA]	1/12/2004	1/12/2004	1/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0911-A

Project: Port of Hay Point

Laboratory Reference:	-	-	/13	/14
Client Reference:	-	-	PCQ29	PCQ20
Date Sampled:	-	-	0.5-1.0A	0.5-1R
Analysis Description	Method	Units		
Moisture Content				
Moisture Content	04-004	%	14.6	21.9
Trace Elements				
Arsenic	04-001	mg/kg	0.86	N/A
Cadmium	04-001	mg/kg	<0.10	N/A
Chromium	04-001	mg/kg	11	N/A
Copper	04-001	mg/kg	7.0	N/A
Iron	04-001	mg/kg	9,500	N/A
Manganese	04-001	mg/kg	53	N/A
Nickel	04-001	mg/kg	4.8	19
Lead	04-001	mg/kg	3.6	N/A
Zinc	04-001	mg/kg	18	N/A
Organotins				
Monobutyl tin	04-026	µgSn/kg	<0.50	[NA]
Dibutyl tin	04-026	µgSn/kg	<0.50	[NA]
Tributyl tin	04-026	µgSn/kg	<0.50	[NA]
Surrogate 1 Recovery	04-026	%	170	[NA]
Date Extracted	04-026	-	10/12/2004	[NA]
Date Analysed	04-026	-	10/12/2004	[NA]
Subcontract Analysis				
Particle Size Distribution			See comment	[NA]
Total Organic Carbon			See comment	[NA]

Method	Method Description
04-004	Moisture Content by Gravimetric, %
04-001	Metals in Solids by ICP
04-026	*Organotins in Solids, µgSn/kg

Result Comments

[<] Less than

[INS] Insufficient sample for this test

[NA] Test not required

* Method not covered by NATA terms of accreditation.

Solid sample results are reported on a dry weight basis.

TOC analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884);

see attached SAL report for job number SAL15326B.

PSD analysis was subcontracted to GHD LongMac (NATA Number 679); see attached GHD LongMac report for job number 2113283.

Issue Date: 13 December 2004

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Batch Number: A04/0911-A

Project: Port of Hay Point

QUALITY ASSURANCE REPORT

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	N/A	A04/0911-A-1	14.9 17.2 RPD: 14

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Arsenic	mg/kg	<0.10	A04/0911-A-1	7.9 9.2 RPD: 15	A04/0911-A-1	102%
Cadmium	mg/kg	<0.10	A04/0911-A-1	<0.10 <0.10	A04/0911-A-1	92%
Chromium	mg/kg	<0.10	A04/0911-A-1	13 13 RPD: 0	A04/0911-A-1	100%
Copper	mg/kg	<0.10	A04/0911-A-1	3.0 3.3 RPD: 10	A04/0911-A-1	104%
Iron	mg/kg	<0.10	A04/0911-A-1	13000 15000 RPD: 14	A04/0911-A-1	#
Manganese	mg/kg	<0.1	A04/0911-A-1	50 63 RPD: 23	A04/0911-A-1	107%
Nickel	mg/kg	<0.10	A04/0911-A-1	7.7 7.8 RPD: 1	A04/0911-A-1	97%
Lead	mg/kg	<0.10	A04/0911-A-1	5.0 5.3 RPD: 6	A04/0911-A-1	98%
Zinc	mg/kg	<0.10	A04/0911-A-1	12 13 RPD: 8	A04/0911-A-1	100%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Monobutyl tin	µgSn/kg	<0.50	A04/0911-A-1	<0.50 <0.50	A04/0911-A-13	67%
Dibutyl tin	µgSn/kg	<0.50	A04/0911-A-1	<0.50 <0.50	A04/0911-A-13	103%
Tributyl tin	µgSn/kg	<0.50	A04/0911-A-1	<0.50 <0.50	A04/0911-A-13	100%
Surrogate 1 Recovery	%	120	A04/0911-A-1	100 78 RPD: 25	A04/0911-A-13	103%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0911-A-11	14.7 16.3 RPD: 10

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Arsenic	mg/kg	[NT]	A04/0911-A-11	2.8 2.7 RPD: 4
Cadmium	mg/kg	[NT]	A04/0911-A-11	<0.10 <0.10
Chromium	mg/kg	[NT]	A04/0911-A-11	15 14 RPD: 7
Copper	mg/kg	[NT]	A04/0911-A-11	7.4 6.8 RPD: 8
Iron	mg/kg	[NT]	A04/0911-A-11	15000 12000 RPD: 22
Manganese	mg/kg	[NT]	A04/0911-A-11	26 36 RPD: 32
Nickel	mg/kg	[NT]	A04/0911-A-11	7.7 7.0 RPD: 10
Lead	mg/kg	[NT]	A04/0911-A-11	4.7 5.0 RPD: 6
Zinc	mg/kg	[NT]	A04/0911-A-11	8.0 8.2 RPD: 2



Batch Number: A04/0911-A

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Monobutyl tin	µgSn/kg	[NT]	A04/0911-A-13	<0.50 <0.50
Dibutyl tin	µgSn/kg	[NT]	A04/0911-A-13	<0.50 <0.50
Tributyl tin	µgSn/kg	[NT]	A04/0911-A-13	<0.50 <0.50
Surrogate 1 Recovery	%	[NT]	A04/0911-A-13	170 78 RPD: 74

Comments:

RPD = Relative Percent Deviation

[NT] = Not Tested

[N/A] = Not Applicable

'#' = Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Trace elements +/- 10%

Organic analyses +/- 25%

Recommended matrix spike recovery limits: Trace elements 80-120%

Organic analyses 70-130%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 1 of 4

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ANALYTICAL REPORT for:

ADVANCED ANALYTICAL AUSTRALIA

1/139 SANDGATE ROAD
ALBION QLD 4010

ATTN: ANDREW BRADBURY

JOB NO: SAL15326B
CLIENT ORDER: A04/0911A
DATE RECEIVED: 17/11/04
DATE COMPLETED: 30/11/04
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 13

NATA Accredited Laboratory

Number: 1884



NATA ENDORSED TEST REPORT
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except in full.

.....
Issued on 07/12/04
Lance Smith
(Chief Chemist)

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 2 of 4

ANALYTICAL REPORT

JOB NO: SAL15326B
CLIENT ORDER: A04/0911A

SAMPLES	TOC %
1 A04/0911A/1	<0.1
2 A04/0911A/2	<0.1
3 A04/0911A/3	<0.1
4 A04/0911A/4	<0.1
5 A04/0911A/5	<0.1
6 A04/0911A/6	0.28
7 A04/0911A/7	0.16
8 A04/0911A/8	0.13
9 A04/0911A/9	<0.1
10 A04/0911A/10	<0.1
11 A04/0911A/11	<0.1
12 A04/0911A/12	0.12
13 A04/0911A/13	<0.1
DUPLICATES:	
10 A04/0911A/10	<0.1
BLANK	<0.1

MDL	0.1
Method Code	C48
Preparation	P5

RESULTS ON DRY BASIS

LABORATORY DUPLICATE REPORT

JOB NO: SAL15326B
CLIENT ORDER: A04/0911A

Sample Number	Analyte	Units	MDL	Sample Result	Duplicate Result	%RPD
A04/0911A/10	TOC	%	0.1	<0.1	<0.1	0

Acceptance criteria:

RPD <50% for low level (<20xMDL)
RPD <30% for medium level (20-100xMDL)
RPD <15% for high level (>100xMDL)
No limit applies at <2xMDL

MDL = Method Detection Limit

All results are within the acceptance criteria

ANALYTICAL REPORT

JOB NO: SAL15326B
CLIENT ORDER: A04/0911A

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5 Sample dried, split and crushed to -150um
C48 Total Organic Carbon - AS1289.4.1.1

A preliminary report was faxed on 30/11/04



REPORT OF ANALYSIS

Laboratory Reference: A04/0911-B

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediment
No. of Samples: 5
Date Received: 17/11/2004
Date Completed: 7/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Phalak Inthakesone
Senior Organics Chemist

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
NATA endorsed test report. This document shall not be reproduced, except in full.



Nata Accredited Laboratory
Number: 15109



Batch Number: A04/0911-B

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ33	PCQ37	PCQ52	PCQ53
Date Sampled:	-	-	0-0.5A	0-0.5A	0-0.5A	0-0.5A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	20.6	17.1	20.6	27.1
Trace Elements						
Silver	04-001	mg/kg	<0.1	<0.1	<0.1	<0.1
Arsenic	04-001	mg/kg	2.9	9.6	4.8	2.0
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	9.6	11	11	14
Copper	04-001	mg/kg	2.5	3.4	1.0	15
Iron	04-001	mg/kg	7,500	18,000	6,600	14,000
Mercury	04-002	mg/kg	0.02	0.02	<0.01	0.02
Manganese	04-001	mg/kg	82	29	220	170
Nickel	04-001	mg/kg	3.7	5.9	3.5	10
Phosphorus	04-001	mg/kg	85	230	160	100
Lead	04-001	mg/kg	2.6	4.3	2.1	8.9
Antimony	04-001	mg/kg	<0.1	0.2	<0.1	<0.1
Zinc	04-001	mg/kg	8.1	9.6	5.1	23
BTEX						
Benzene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Toluene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Ethyl Benzene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
m+p xylenes	04-021	mg/kg	<0.40	<0.40	<0.40	<0.40
o-xylene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Total BTEX	04-021	mg/kg	<1.2	<1.2	<1.2	<1.2
Surrogate 1 Recovery	04-021	%	82	85	83	79
Surrogate 2 Recovery	04-021	%	80	82	79	76
Surrogate 3 Recovery	04-021	%	82	84	78	76
Date Extracted	04-021	-	18/11/2004	18/11/2004	18/11/2004	18/11/2004
Date Analysed	04-021	-	19/11/2004	19/11/2004	19/11/2004	19/11/2004
Total Petroleum Hydrocarbons						
TPH C6-C9	04-021	mg/kg	<10	<10	<10	<10
TPH C10-14	04-020	mg/kg	<10	<10	<10	<10
TPH C15-28	04-020	mg/kg	<50	<50	<50	<50



Batch Number: A04/0911-B

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ33	PCQ37	PCQ52	PCQ53
Date Sampled:	-	-	0-0.5A	0-0.5A	0-0.5A	0-0.5A
Analysis Description	Method	Units				
TPH C29-36	04-020	mg/kg	<50	<50	<50	<50
Surrogate Recovery	04-020	%	111	113	113	113
Date Extracted	04-020	-	18/11/2004	18/11/2004	18/11/2004	18/11/2004
Date Analysed	04-020	-	26/11/2004	26/11/2004	26/11/2004	26/11/2004
Poly Aromatic Hydrocarbons						
Naphthalene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Acenaphthalene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Acenaphthene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Fluorene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Phenanthrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Fluoranthene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Benz(a)anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Chrysene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Benzo(b)&(k)fluoranthene	04-025	µg/kg	<10	<10	<10	<10
Benzo(a)pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Indeno(1,2,3-cd)pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Dibenz(a,h)anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Benzo(g,h,i)perylene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Total PAHs (as above)	04-025	µg/kg	<100	<100	<100	<100
Surrogate 1 Recovery	04-025	%	92	90	89	96
Surrogate 2 Recovery	04-025	%	93	88	87	88
Surrogate 3 Recovery	04-025	%	86	85	79	81
Date Extracted	04-025	-	18/11/2004	18/11/2004	18/11/2004	18/11/2004
Date Analysed	04-025	-	26/11/2004	26/11/2004	26/11/2004	26/11/2004
Organochlorine Pesticides						
Aldrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
alpha-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
beta-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
gamma-BHC (Lindane)	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
delta-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
cis-Chlordane	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
trans-Chlordane	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0

Issue Date: 17 February 2005

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Batch Number: A04/0911-B

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ33	PCQ37	PCQ52	PCQ53
Date Sampled:	-	-	0-0.5A	0-0.5A	0-0.5A	0-0.5A
Analysis Description	Method	Units				
<i>p,p'</i> -DDD	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>p,p'</i> -DDE	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>p,p'</i> -DDT	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Dieldrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>alpha</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>beta</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endosulfan Sulphate	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin ketone	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin aldehyde	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Heptachlor	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Heptachlor epoxide	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Methoxychlor	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Surrogate Recovery	04-023	%	102	150	69	112
Date Extracted	04-023	-	22/11/2004	22/11/2004	22/11/2004	22/11/2004
Date Analysed	04-023	-	30/11/2004	30/11/2004	30/11/2004	30/11/2004
Organophosphate Pesticides						
Azinphos-methyl	04-024	ug/kg	<50	<50	<50	<50
Bromophos-ethyl	04-024	ug/kg	<50	<50	<50	<50
Carbophenothion	04-024	ug/kg	<50	<50	<50	<50
Chlorfenvinphos	04-024	ug/kg	<50	<50	<50	<50
Chlorpyrifos	04-024	ug/kg	<50	<50	<50	<50
Chlorpyrifos-methyl	04-024	ug/kg	<50	<50	<50	<50
Diazinon	04-024	ug/kg	<50	<50	<50	<50
Demeton-S-methyl	04-024	ug/kg	<50	<50	<50	<50
Dimethoate	04-024	ug/kg	<50	<50	<50	<50
Dichlorvos	04-024	ug/kg	<50	<50	<50	<50
Ethion	04-024	ug/kg	<50	<50	<50	<50
Fenitrothion	04-024	ug/kg	<50	<50	<50	<50
Fenthion	04-024	ug/kg	<50	<50	<50	<50
Fenamiphos	04-024	ug/kg	<50	<50	<50	<50
Malathion	04-024	ug/kg	<50	<50	<50	<50
Methidathion	04-024	ug/kg	<50	<50	<50	<50

Issue Date: 17 February 2005

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Batch Number: A04/0911-B

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ33	PCQ37	PCQ52	PCQ53
Date Sampled:	-	-	0-0.5A	0-0.5A	0-0.5A	0-0.5A
Analysis Description	Method	Units				
Monocrotophos	04-024	ug/kg	<50	<50	<50	<50
Omethoate	04-024	ug/kg	<50	<50	<50	<50
Parathion	04-024	ug/kg	<50	<50	<50	<50
Parathion-methyl	04-024	ug/kg	<50	<50	<50	<50
Phosalone	04-024	ug/kg	<50	<50	<50	<50
Pirimiphos-methyl	04-024	ug/kg	<50	<50	<50	<50
Prothiofos	04-024	ug/kg	<50	<50	<50	<50
Surrogate Recovery	04-024	%	102	150	69	112
Date Extracted	04-024	-	22/11/2004	22/11/2004	22/11/2004	22/11/2004
Date Analysed	04-024	-	30/11/2004	30/11/2004	30/11/2004	30/11/2004
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	95	87	110	100
Date Extracted	04-026	-	1/12/2004	1/12/2004	1/12/2004	1/12/2004
Date Analysed	04-026	-	1/12/2004	1/12/2004	1/12/2004	1/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment
Nutrients			See comment	See comment	See comment	See comment



Batch Number: A04/0911-B

Project: Port of Hay Point

Laboratory Reference:	-	-	/5
Client Reference:	-	-	PCQ29
Date Sampled:	-	-	0-0.5A
Analysis Description	Method	Units	
Moisture Content			
Moisture Content	04-004	%	21.2
Trace Elements			
Silver	04-001	mg/kg	<0.1
Arsenic	04-001	mg/kg	3.1
Cadmium	04-001	mg/kg	<0.10
Chromium	04-001	mg/kg	8.2
Copper	04-001	mg/kg	4.2
Iron	04-001	mg/kg	8,800
Mercury	04-002	mg/kg	<0.01
Manganese	04-001	mg/kg	180
Nickel	04-001	mg/kg	3.7
Phosphorus	04-001	mg/kg	110
Lead	04-001	mg/kg	3.1
Antimony	04-001	mg/kg	<0.1
Zinc	04-001	mg/kg	12
BTEX			
Benzene	04-021	mg/kg	<0.20
Toluene	04-021	mg/kg	<0.20
Ethyl Benzene	04-021	mg/kg	<0.20
m+p xylenes	04-021	mg/kg	<0.40
o-xylene	04-021	mg/kg	<0.20
Total BTEX	04-021	mg/kg	<1.2
Surrogate 1 Recovery	04-021	%	84
Surrogate 2 Recovery	04-021	%	83
Surrogate 3 Recovery	04-021	%	85
Date Extracted	04-021	-	18/11/2004
Date Analysed	04-021	-	19/11/2004
Total Petroleum Hydrocarbons			
TPH C6-C9	04-021	mg/kg	<10
TPH C10-14	04-020	mg/kg	<10
TPH C15-28	04-020	mg/kg	<50

Issue Date: 17 February 2005

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Batch Number: A04/0911-B

Project: Port of Hay Point

Laboratory Reference:	-	-	/5
Client Reference:	-	-	PCQ29
Date Sampled:	-	-	0-0.5A
Analysis Description	Method	Units	
TPH C29-36	04-020	mg/kg	<50
Surrogate Recovery	04-020	%	119
Date Extracted	04-020	-	18/11/2004
Date Analysed	04-020	-	26/11/2004
Poly Aromatic Hydrocarbons			
Naphthalene	04-025	µg/kg	<5.0
Acenaphthalene	04-025	µg/kg	<5.0
Acenaphthene	04-025	µg/kg	<5.0
Fluorene	04-025	µg/kg	<5.0
Phenanthrene	04-025	µg/kg	<5.0
Anthracene	04-025	µg/kg	<5.0
Fluoranthene	04-025	µg/kg	<5.0
Pyrene	04-025	µg/kg	<5.0
Benz(a)anthracene	04-025	µg/kg	<5.0
Chrysene	04-025	µg/kg	<5.0
Benzo(b)&(k)fluoranthene	04-025	µg/kg	<10
Benzo(a)pyrene	04-025	µg/kg	<5.0
Indeno(1,2,3-cd)pyrene	04-025	µg/kg	<5.0
Dibenz(a,h)anthracene	04-025	µg/kg	<5.0
Benzo(g,h,i)perylene	04-025	µg/kg	<5.0
Total PAHs (as above)	04-025	µg/kg	<100
Surrogate 1 Recovery	04-025	%	98
Surrogate 2 Recovery	04-025	%	88
Surrogate 3 Recovery	04-025	%	86
Date Extracted	04-025	-	18/11/2004
Date Analysed	04-025	-	26/11/2004
Organochlorine Pesticides			
Aldrin	04-023	ug/kg	<1.0
<i>alpha</i> -BHC	04-023	ug/kg	<1.0
<i>beta</i> -BHC	04-023	ug/kg	<1.0
<i>gamma</i> -BHC (Lindane)	04-023	ug/kg	<1.0
<i>delta</i> -BHC	04-023	ug/kg	<1.0
<i>cis</i> -Chlordane	04-023	ug/kg	<1.0
<i>trans</i> -Chlordane	04-023	ug/kg	<1.0

Issue Date: 17 February 2005

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Batch Number: A04/0911-B

Project: Port of Hay Point

Laboratory Reference:	-	-	/5
Client Reference:	-	-	PCQ29
Date Sampled:	-	-	0-0.5A
Analysis Description	Method	Units	
<i>p,p'</i> -DDD	04-023	ug/kg	<1.0
<i>p,p'</i> -DDE	04-023	ug/kg	<1.0
<i>p,p'</i> -DDT	04-023	ug/kg	<1.0
Dieldrin	04-023	ug/kg	<1.0
<i>alpha</i> -Endosulfan	04-023	ug/kg	<1.0
<i>beta</i> -Endosulfan	04-023	ug/kg	<1.0
Endosulfan Sulphate	04-023	ug/kg	<1.0
Endrin	04-023	ug/kg	<1.0
Endrin ketone	04-023	ug/kg	<1.0
Endrin aldehyde	04-023	ug/kg	<1.0
Heptachlor	04-023	ug/kg	<1.0
Heptachlor epoxide	04-023	ug/kg	<1.0
Hexachlorobenzene	04-023	ug/kg	<1.0
Methoxychlor	04-023	ug/kg	<1.0
Surrogate Recovery	04-023	%	102
Date Extracted	04-023	-	22/11/2004
Date Analysed	04-023	-	30/11/2004
Organophosphate Pesticides			
Azinphos-methyl	04-024	ug/kg	<50
Bromophos-ethyl	04-024	ug/kg	<50
Carbophenothion	04-024	ug/kg	<50
Chlorfenvinphos	04-024	ug/kg	<50
Chlorpyrifos	04-024	ug/kg	<50
Chlorpyrifos-methyl	04-024	ug/kg	<50
Diazinon	04-024	ug/kg	<50
Demeton-S-methyl	04-024	ug/kg	<50
Dimethoate	04-024	ug/kg	<50
Dichlorvos	04-024	ug/kg	<50
Ethion	04-024	ug/kg	<50
Fenitrothion	04-024	ug/kg	<50
Fenthion	04-024	ug/kg	<50
Fenamiphos	04-024	ug/kg	<50
Malathion	04-024	ug/kg	<50
Methidathion	04-024	ug/kg	<50

Issue Date: 17 February 2005

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Batch Number: A04/0911-B

Project: Port of Hay Point

Laboratory Reference:	-	-	/5
Client Reference:	-	-	PCQ29
Date Sampled:	-	-	0-0.5A
Analysis Description	Method	Units	
Monocrotophos	04-024	ug/kg	<50
Omethoate	04-024	ug/kg	<50
Parathion	04-024	ug/kg	<50
Parathion-methyl	04-024	ug/kg	<50
Phosalone	04-024	ug/kg	<50
Pirimiphos-methyl	04-024	ug/kg	<50
Prothiofos	04-024	ug/kg	<50
Surrogate Recovery	04-024	%	102
Date Extracted	04-024	-	22/11/2004
Date Analysed	04-024	-	30/11/2004
Organotins			
Monobutyl tin	04-026	µgSn/kg	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50
Surrogate 1 Recovery	04-026	%	85
Date Extracted	04-026	-	1/12/2004
Date Analysed	04-026	-	1/12/2004
Subcontract Analysis			
Particle Size Distribution			See comment
Total Organic Carbon			See comment
Nutrients			See comment

Method	Method Description
04-004	Moisture Content by Gravimetric, %
04-001	Metals in Solids by ICP
04-002	Mercury in Solids by CVAAS, mg/kg
04-021	TPH C6-9 & BTEX in Solids, mg/kg
04-020	Total Petroleum Hydrocarbons in Solids, mg/kg
04-025	Low Level Poly Aromatic Hydrocarbons in Solids, mg/kg
04-023	*Low Level Organochlorine Pesticides in Solids, mg/kg
04-024	*Organophosphate Pesticides in Solids, mg/kg
04-026	*Organotins in Solids, µgSn/kg

Issue Date: 17 February 2005

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Batch Number: A04/0911-B

Project: Port of Hay Point

Result Comments

[<] Less than

[INS] Insufficient sample for this test

[NA] Test not required

* Method not covered by NATA terms of accreditation.

Solid sample results are reported on a dry weight basis.

TOC and nutrient analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884); see attached SAL report for job number SAL15326C.

PSD analysis was subcontracted to GHD LongMac (NATA Number 679); see attached GHD LongMac report for job number 2113283.



Batch Number: A04/0911-B

Project: Port of Hay Point

QUALITY ASSURANCE REPORT

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	N/A	A04/0911-B-1	20.6 20.3 RPD: 1

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Silver	mg/kg	<0.1	A04/0911-B-1	<0.1 <0.1	A04/0911-B-1	95%
Arsenic	mg/kg	<0.10	A04/0911-B-1	2.9 2.7 RPD: 7	A04/0911-B-1	119%
Cadmium	mg/kg	<0.10	A04/0911-B-1	<0.10 <0.10	A04/0911-B-1	85%
Chromium	mg/kg	<0.10	A04/0911-B-1	9.6 9.2 RPD: 4	A04/0911-B-1	101%
Copper	mg/kg	<0.10	A04/0911-B-1	2.5 2.4 RPD: 4	A04/0911-B-1	112%
Iron	mg/kg	<0.10	A04/0911-B-1	7500 11000 RPD: 38	A04/0911-B-1	#
Mercury	mg/kg	<0.01	A04/0911-B-1	0.02 0.01 RPD: 67	A04/0911-B-1	105%
Manganese	mg/kg	<0.1	A04/0911-B-1	82 78 RPD: 5	A04/0911-B-1	#
Nickel	mg/kg	<0.10	A04/0911-B-1	3.7 3.6 RPD: 3	A04/0911-B-1	94%
Phosphorus	mg/kg	<0.1	A04/0911-B-1	85 82 RPD: 4	A04/0911-B-1	101%
Lead	mg/kg	<0.10	A04/0911-B-1	2.6 2.4 RPD: 8	A04/0911-B-1	94%
Antimony	mg/kg	<0.1	A04/0911-B-1	<0.1 0.2	A04/0911-B-1	104%
Zinc	mg/kg	<0.10	A04/0911-B-1	8.1 7.6 RPD: 6	A04/0911-B-1	92%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Benzene	mg/kg	<0.20	A04/0911-B-1	<0.20 <0.20	A04/0911-B-1	82%
Toluene	mg/kg	<0.20	A04/0911-B-1	<0.20 <0.20	A04/0911-B-1	77%
Ethyl Benzene	mg/kg	<0.20	A04/0911-B-1	<0.20 <0.20	A04/0911-B-1	77%
m+p xylenes	mg/kg	<0.40	A04/0911-B-1	<0.40 <0.40	A04/0911-B-1	77%
o-xylene	mg/kg	<0.20	A04/0911-B-1	<0.20 <0.20	A04/0911-B-1	76%
Total BTEX	mg/kg	<1.2	A04/0911-B-1	<1.2 <1.2	A04/0911-B-1	N/A
Surrogate 1 Recovery	%	108	A04/0911-B-1	82 83 RPD: 1	A04/0911-B-1	79%
Surrogate 2 Recovery	%	102	A04/0911-B-1	80 81 RPD: 1	A04/0911-B-1	78%
Surrogate 3 Recovery	%	108	A04/0911-B-1	82 84 RPD: 2	A04/0911-B-1	78%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
TPH C6-C9	mg/kg	<10	A04/0911-B-1	<10 <10	A04/0911-B-1	78%
TPH C10-14	mg/kg	<10	A04/0911-B-1	<10 <10	A04/0911-B-1	89%
TPH C15-28	mg/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	83%
TPH C29-36	mg/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	88%
Surrogate Recovery	%	100	A04/0911-B-1	111 102 RPD: 8	A04/0911-B-1	104%



Batch Number: A04/0911-B

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Naphthalene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	105%
Acenaphthalene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	97%
Acenaphthene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	103%
Fluorene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	108%
Phenanthrene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	110%
Anthracene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	103%
Fluoranthene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	97%
Pyrene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	96%
Benz(a)anthracene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	110%
Chrysene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	104%
Benzo(b)&(k)fluoranthene	µg/kg	<10	A04/0911-B-1	<10 <10	A04/0911-B-1	104%
Benzo(a)pyrene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	98%
Indeno(1,2,3-cd)pyrene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	104%
Dibenz(a,h)anthracene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	107%
Benzo(g,h,i)perylene	µg/kg	<5.0	A04/0911-B-1	<5.0 <5.0	A04/0911-B-1	101%
Total PAHs (as above)	µg/kg	<100	A04/0911-B-1	<100 <100	A04/0911-B-1	N/A
Surrogate 1 Recovery	%	78	A04/0911-B-1	92 86 RPD: 7	A04/0911-B-1	90%
Surrogate 2 Recovery	%	92	A04/0911-B-1	93 86 RPD: 8	A04/0911-B-1	87%
Surrogate 3 Recovery	%	94	A04/0911-B-1	86 79 RPD: 8	A04/0911-B-1	79%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Aldrin	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
<i>alpha</i> -BHC	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
<i>beta</i> -BHC	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
<i>gamma</i> -BHC (Lindane)	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	100%
<i>delta</i> -BHC	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
<i>cis</i> -Chlordane	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
<i>trans</i> -Chlordane	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	80%
<i>p,p'</i> -DDD	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
<i>p,p'</i> -DDE	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	70%
<i>p,p'</i> -DDT	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
Dieldrin	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	68%
<i>alpha</i> -Endosulfan	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
<i>beta</i> -Endosulfan	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	100%
Endosulfan Sulphate	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
Endrin	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
Endrin ketone	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
Endrin aldehyde	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
Heptachlor	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	70%
Heptachlor epoxide	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
Hexachlorobenzene	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
Methoxychlor	ug/kg	<1.0	A04/0911-B-1	<1.0 <1.0	A04/0911-B-1	N/A
Surrogate Recovery	%	103	A04/0911-B-1	102 84 RPD: 19	A04/0911-B-1	100%

Issue Date: 17 February 2005

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Batch Number: A04/0911-B

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Azinphos-methyl	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Bromophos-ethyl	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Carbophenothion	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Chlorfenvinphos	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Chlorpyrifos	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Chlorpyrifos-methyl	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Diazinon	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Demeton-S-methyl	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Dimethoate	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Dichlorvos	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Ethion	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Fenitrothion	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Fenthion	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Fenamiphos	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Malathion	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Methidathion	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Monocrotophos	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Omethoate	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Parathion	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Parathion-methyl	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Phosalone	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Pirimiphos-methyl	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Prothiofos	ug/kg	<50	A04/0911-B-1	<50 <50	A04/0911-B-1	N/A
Surrogate Recovery	%	103	A04/0911-B-1	102 84 RPD: 19	A04/0911-B-1	N/A



Batch Number: A04/0911-B

Project: Port of Hay Point

TEST	Units	Blank
Monobutyl tin	µgSn/kg	<0.50
Dibutyl tin	µgSn/kg	<0.50
Tributyl tin	µgSn/kg	<0.50
Surrogate 1 Recovery	%	N/A

Comments:

RPD = Relative Percent Deviation

[NT] = Not Tested

[N/A] = Not Applicable

'#' = Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Trace elements +/- 10%

Organic analyses +/- 25%

Recommended matrix spike recovery limits: Trace elements 80-120%

Organic analyses 70-130%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 1 of 4

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A.B.N. 81 829 182 852

ANALYTICAL REPORT for:

ADVANCED ANALYTICAL AUSTRALIA

1/139 SANDGATE ROAD
ALBION QLD 4010

ATTN: ANDREW BRADBURY

JOB NO: SAL15326C
CLIENT ORDER: A04/0911B
DATE RECEIVED: 17/11/04
DATE COMPLETED: 30/11/04
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 5

NATA Accredited Laboratory

Number:

1884



NATA ENDORSED TEST REPORT
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.....
Issued on 07/12/04
Lance Smith
(Chief Chemist)

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 2 of 4

ANALYTICAL REPORT

JOB NO: SAL15326C
CLIENT ORDER: A04/0911B

SAMPLES	TOC %	TKN mg/kg	Total N mg/kg	NO3 mg/kg	NO2 mg/kg	NH4-N mg/kg
1 A04/0911B/1	0.16	220	220	<0.5	<0.5	<0.5
2 A04/0911B/2	<0.1	180	180	<0.5	<0.5	<0.5
3 A04/0911B/3	0.17	220	220	<0.5	<0.5	<0.5
4 A04/0911B/4	0.13	220	220	<0.5	<0.5	<0.5
5 A04/0911B/5	0.18	190	190	<0.5	<0.5	<0.5
BLANK	<0.1	<20	<20	<0.5	<0.5	<0.5
MDL	0.1	20	20	0.5	0.5	0.5
Method Code	C48	WA14	CAL.	WA5	WA12	WA13
Preparation	P5	P5	P5	P5	P5	P1

**SYDNEY
ANALYTICAL
LABORATORIES**

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ANALYTICAL REPORT

JOB NO: SAL15326C
CLIENT ORDER: A04/0911B

	SAMPLES	PO4 mg/kg
1	A04/0911B/1	<0.5
2	A04/0911B/2	<0.5
3	A04/0911B/3	<0.5
4	A04/0911B/4	<0.5
5	A04/0911B/5	<0.5
	BLANK	<0.5

MDL	0.5
Method Code	WA7
Preparation	P5

RESULTS ON DRY BASIS

ANALYTICAL REPORT

JOB NO: SAL15326C
CLIENT ORDER: A04/0911B

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5	Sample dried, split and crushed to -150um
P1	Analysis performed on sample as received
C48	Total Organic Carbon - AS1289.4.1.1
WA14	Total Kjeldahl Nitrogen Determined by APHA 4500B
CAL.	Determined by Calculation
WA5	Nitrate - 1:5 soil/water extract Determined by APHA 4500F
WA12	Nitrite - 1:5 soil/water extract Determined by APHA 4500F
WA13	Formaldehyde - 1:5 water extract Determined by Walker J.F.1964
WA7	Phosphate - 1:5 soil/water extract Determined by APHA 4500F

A preliminary report was faxed on 30/11/04



REPORT OF ANALYSIS

Laboratory Reference: A04/0951

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediments
No. of Samples: 25
Date Received: 22/11/2004
Date Completed: 7/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
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Nata Accredited Laboratory
Number: 15109

Issue Date: 10 December 2004

Advanced Analytical Australia Pty Ltd
ABN 20 105 644 979
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Batch Number: A04/0951

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ45	PCQ42	PCQ46	PCQ56
Date Sampled:	-	-	0.5-1.0A	0.5-1.0A	0.5-1.0A	0-0.5A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	19.8	18.1	16.7	18.9
Trace Elements						
Arsenic	04-001	mg/kg	11	4.6	5.4	3.7
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	14	12	18	8.4
Copper	04-001	mg/kg	2.0	3.3	4.2	0.65
Iron	04-001	mg/kg	12,000	9,700	14,000	3,900
Manganese	04-001	mg/kg	90	60	53	170
Nickel	04-001	mg/kg	6.7	6.1	8.4	2.8
Lead	04-001	mg/kg	3.9	3.9	4.4	1.5
Zinc	04-001	mg/kg	11	9.0	14	4.0
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	92	92	78	120
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0951

Project: Port of Hay Point

Laboratory Reference:	-	-	/5	/6	/7	/8
Client Reference:	-	-	PCQ56	PCQ56	PCQ 0-0.5A	PCQ47
Date Sampled:	-	-	0-0.5R	0.5-1.0A		0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	18.9	20.2	17.9	18.2
Trace Elements						
Arsenic	04-001	mg/kg	3.9	4.1	5.5	3.8
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	8.8	9.5	9.7	12
Copper	04-001	mg/kg	0.69	1.0	1.9	2.5
Iron	04-001	mg/kg	4,400	5,400	8,900	11,000
Manganese	04-001	mg/kg	190	170	100	24
Nickel	04-001	mg/kg	2.9	3.8	4.1	5.2
Lead	04-001	mg/kg	1.6	2.0	3.0	4.3
Zinc	04-001	mg/kg	4.3	5.6	4.8	8.1
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	100	99	60	80
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0951

Project: Port of Hay Point

Laboratory Reference:	-	-	/9	/10	/11	/12
Client Reference:	-	-	PCQ47	PCQ T7	PCQ T7	PCQ T8
Date Sampled:	-	-	0.5-1.0R	0-0.5A	0.5-1.0A	0-0.5A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	17.2	19.1	23.0	20.8
Trace Elements						
Arsenic	04-001	mg/kg	6.0	4.0	4.3	3.8
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	15	10	11	8.6
Copper	04-001	mg/kg	2.4	0.90	1.3	0.67
Iron	04-001	mg/kg	13,000	4,600	5,700	4,100
Manganese	04-001	mg/kg	31	190	190	160
Nickel	04-001	mg/kg	6.3	3.5	4.4	3.0
Lead	04-001	mg/kg	5.0	1.8	2.2	1.5
Zinc	04-001	mg/kg	8.4	5.1	6.5	5.0
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	63	82	91	93
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0951

Project: Port of Hay Point

Laboratory Reference:	-	-	/13	/14	/15	/16
Client Reference:	-	-	PCQ T8	PCQ55	PCQ55	PCQ54
Date Sampled:	-	-	0.5-1.0A	0-0.5A	0.5-1.0A	0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	21.8	21.3	23.6	22.6
Trace Elements						
Arsenic	04-001	mg/kg	3.9	4.0	3.8	3.5
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	9.9	7.9	9.9	9.7
Copper	04-001	mg/kg	1.0	0.58	0.91	0.87
Iron	04-001	mg/kg	5,200	3,900	4,800	4,500
Manganese	04-001	mg/kg	190	180	200	150
Nickel	04-001	mg/kg	3.7	2.3	3.5	3.4
Lead	04-001	mg/kg	2.0	1.5	1.9	1.7
Zinc	04-001	mg/kg	6.0	3.6	5.3	5.0
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	79	97	87	130
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0951

Project: Port of Hay Point

Laboratory Reference:	-	-	/17	/18	/19	/20
Client Reference:	-	-	PCQ38	PCQ38	PCQ38 1-2A	PCQ48
Date Sampled:	-	-	0-0.5A	0.5-1.0A		0-0.5A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	14.7	17.8	20.6	21.2
Trace Elements						
Arsenic	04-001	mg/kg	8.9	2.1	1.3	8.8
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	11	14	14	13
Copper	04-001	mg/kg	5.2	5.7	4.8	2.1
Iron	04-001	mg/kg	17,000	13,000	8,700	12,000
Manganese	04-001	mg/kg	96	53	61	230
Nickel	04-001	mg/kg	5.3	5.6	7.0	5.9
Lead	04-001	mg/kg	7.8	5.5	3.6	4.5
Zinc	04-001	mg/kg	13	11	14	6.8
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	[NA]	<0.50
Surrogate 1 Recovery	04-026	%	94	60	[NA]	70
Date Extracted	04-026	-	2/12/2004	2/12/2004	[NA]	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	[NA]	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0951

Project: Port of Hay Point

Laboratory Reference:	-	-	/21	/22	/23	/24
Client Reference:	-	-	PCQ48	PCQ48 1-2A	PCQ44	PCQ44
Date Sampled:	-	-	0.5-1.0A		0-0.5A	0-0.5R
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	15.7	13.9	21.6	18.6
Trace Elements						
Arsenic	04-001	mg/kg	7.8	4.6	2.7	2.2
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	15	14	7.7	8.4
Copper	04-001	mg/kg	2.5	2.8	1.1	1.4
Iron	04-001	mg/kg	10,000	9,100	4,900	5,700
Manganese	04-001	mg/kg	580	280	130	160
Nickel	04-001	mg/kg	8.1	6.6	2.8	3.5
Lead	04-001	mg/kg	3.9	3.6	1.9	2.4
Zinc	04-001	mg/kg	3.9	3.6	1.9	2.4
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	[NA]	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	[NA]	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	[NA]	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	75	[NA]	87	50
Date Extracted	04-026	-	2/12/2004	[NA]	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	[NA]	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0951

Project: Port of Hay Point

Laboratory Reference:	-	-	/25
Client Reference:	-	-	PCQ44
Date Sampled:	-	-	0.5-1.0A
Analysis Description	Method	Units	
Moisture Content			
Moisture Content	04-004	%	16.6
Trace Elements			
Arsenic	04-001	mg/kg	3.2
Cadmium	04-001	mg/kg	<0.10
Chromium	04-001	mg/kg	9.1
Copper	04-001	mg/kg	2.2
Iron	04-001	mg/kg	7,700
Manganese	04-001	mg/kg	400
Nickel	04-001	mg/kg	4.7
Lead	04-001	mg/kg	3.9
Zinc	04-001	mg/kg	3.9
Organotins			
Monobutyl tin	04-026	µgSn/kg	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50
Surrogate 1 Recovery	04-026	%	63
Date Extracted	04-026	-	2/12/2004
Date Analysed	04-026	-	2/12/2004
Subcontract Analysis			
Particle Size Distribution			See comment
Total Organic Carbon			See comment

Method	Method Description
04-004	Moisture Content by Gravimetric, %
04-001	Metals in Solids by ICP
04-026	*Organotins in Solids, µgSn/kg

Result Comments

[<] Less than

[INS] Insufficient sample for this test

[NA] Test not required

* Method not covered by NATA terms of accreditation.

Solid sample results are reported on a dry weight basis.

TOC analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884); see attached SAL report for job number SAL15375.

PSD analysis was subcontracted to GHD LongMac (NATA Number 679); see attached GHD LongMac report for job number 2113283.

Issue Date: 10 December 2004

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Batch Number: A04/0951

Project: Port of Hay Point

QUALITY ASSURANCE REPORT

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	N/A	A04/0951-1	19.8 19.7 RPD: 1

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Arsenic	mg/kg	<0.10	A04/0951-1	11 15 RPD: 31	A04/0951-1	103%
Cadmium	mg/kg	<0.10	A04/0951-1	<0.10 <0.10	A04/0951-1	92%
Chromium	mg/kg	<0.10	A04/0951-1	14 15 RPD: 7	A04/0951-1	101%
Copper	mg/kg	<0.10	A04/0951-1	2.0 2.4 RPD: 18	A04/0951-1	108%
Iron	mg/kg	<0.10	A04/0951-1	12000 15000 RPD: 22	A04/0951-1	#
Manganese	mg/kg	<0.1	A04/0951-1	90 110 RPD: 20	A04/0951-1	82%
Nickel	mg/kg	<0.10	A04/0951-1	6.7 8.2 RPD: 20	A04/0951-1	96%
Lead	mg/kg	<0.10	A04/0951-1	3.9 4.6 RPD: 16	A04/0951-1	95%
Zinc	mg/kg	<0.10	A04/0951-1	11 13 RPD: 17	A04/0951-1	97%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Monobutyl tin	µgSn/kg	<0.50	A04/0951-1	<0.50 <0.50	A04/0951-1	19%
Dibutyl tin	µgSn/kg	<0.50	A04/0951-1	<0.50 <0.50	A04/0951-1	121%
Tributyl tin	µgSn/kg	<0.50	A04/0951-1	<0.50 <0.50	A04/0951-1	45%
Surrogate 1 Recovery	%	86	A04/0951-1	92 68 RPD: 30	A04/0951-1	64%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0951-11	23.0 23.6 RPD: 3

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Arsenic	mg/kg	[NT]	A04/0951-11	4.3 3.8 RPD: 12	A04/0951-21	107%
Cadmium	mg/kg	[NT]	A04/0951-11	<0.10 <0.10	A04/0951-21	89%
Chromium	mg/kg	[NT]	A04/0951-11	11 10 RPD: 10	A04/0951-21	103%
Copper	mg/kg	[NT]	A04/0951-11	1.3 1.1 RPD: 17	A04/0951-21	109%
Iron	mg/kg	[NT]	A04/0951-11	5700 5600 RPD: 2	A04/0951-21	#
Manganese	mg/kg	[NT]	A04/0951-11	190 180 RPD: 5	A04/0951-21	#
Nickel	mg/kg	[NT]	A04/0951-11	4.4 4.0 RPD: 10	A04/0951-21	96%
Lead	mg/kg	[NT]	A04/0951-11	2.2 2.0 RPD: 10	A04/0951-21	93%
Zinc	mg/kg	[NT]	A04/0951-11	6.5 5.8 RPD: 11	A04/0951-21	94%

**Batch Number:** A04/0951**Project:** Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Monobutyl tin	µgSn/kg	[NT]	A04/0951-10	<0.50 <0.50	A04/0951-21	41%
Dibutyl tin	µgSn/kg	[NT]	A04/0951-10	<0.50 <0.50	A04/0951-21	152%
Tributyl tin	µgSn/kg	[NT]	A04/0951-10	<0.50 <0.50	A04/0951-21	61%
Surrogate 1 Recovery	%	[NT]	A04/0951-10	82 110 RPD: 29	A04/0951-21	73%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0951-21	15.7 17.9 RPD: 13

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Arsenic	mg/kg	[NT]	A04/0951-21	7.8 8.7 RPD: 11
Cadmium	mg/kg	[NT]	A04/0951-21	<0.10 <0.10
Chromium	mg/kg	[NT]	A04/0951-21	15 18 RPD: 18
Copper	mg/kg	[NT]	A04/0951-21	2.5 2.9 RPD: 15
Iron	mg/kg	[NT]	A04/0951-21	10000 11000 RPD: 10
Manganese	mg/kg	[NT]	A04/0951-21	580 550 RPD: 5
Nickel	mg/kg	[NT]	A04/0951-21	8.1 10 RPD: 21
Lead	mg/kg	[NT]	A04/0951-21	3.9 4.6 RPD: 16
Zinc	mg/kg	[NT]	A04/0951-21	3.9 4.6 RPD: 16

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Monobutyl tin	µgSn/kg	[NT]	A04/0951-23	<0.50 <0.50
Dibutyl tin	µgSn/kg	[NT]	A04/0951-23	<0.50 <0.50
Tributyl tin	µgSn/kg	[NT]	A04/0951-23	<0.50 <0.50
Surrogate 1 Recovery	%	[NT]	A04/0951-23	87 57 RPD: 42

Comments:

RPD = Relative Percent Deviation

[NT] = Not Tested

[N/A] = Not Applicable

= Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Trace elements +/- 10%

Organic analyses +/- 25%

Recommended matrix spike recovery limits: Trace elements 80-120%

Organic analyses 70-130%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.



REPORT OF ANALYSIS

Laboratory Reference: A04/0951

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediments
No. of Samples: 25
Date Received: 22/11/2004
Date Completed: 7/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
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FILE		
27 JAN 2005		
Name	Initial	Date



Nata Accredited Laboratory
Number: 15109

Issue Date: 10 December 2004

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**SYDNEY
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A.B.N. 81 829 182 852

ANALYTICAL REPORT for:

ADVANCED ANALYTICAL AUSTRALIA

1/139 SANDGATE ROAD
ALBION QLD 4010

ATTN: ANDREW BRADBURY

JOB NO: SAL15375
CLIENT ORDER: A04/0951
DATE RECEIVED: 23/11/04
DATE COMPLETED: 10/12/04
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 25

NATA Accredited Laboratory

Number: 1884



NATA ENDORSED TEST REPORT
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.....
Issued on 17/12/04
Lance Smith
(Chief Chemist)

SYDNEY ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

JOB NO: SAL15375
CLIENT ORDER: A04/0951

	SAMPLES	TOC %
1	A04/0951/1	0.11
2	A04/0951/2	<0.1
3	A04/0951/3	<0.1
4	A04/0951/4	0.13
5	A04/0951/5	0.12
6	A04/0951/6	0.17
7	A04/0951/7	<0.1
8	A04/0951/8	<0.1
9	A04/0951/9	<0.1
10	A04/0951/10	0.17
11	A04/0951/11	0.21
12	A04/0951/12	0.17
13	A04/0951/13	0.20
14	A04/0951/14	0.11
15	A04/0951/15	0.15
16	A04/0951/16	0.15
17	A04/0951/17	<0.1
18	A04/0951/18	<0.1
19	A04/0951/19	<0.1
20	A04/0951/20	<0.1
21	A04/0951/21	<0.1
22	A04/0951/22	<0.1
23	A04/0951/23	<0.1
24	A04/0951/24	<0.1
25	A04/0951/25	<0.1
DUPLICATES:		
20	A04/0951/20	<0.1
	BLANK	<0.1

MDL	0.1
Method Code	C48
Preparation	P5

**SYDNEY
ANALYTICAL
LABORATORIES**

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LABORATORY DUPLICATE REPORT

JOB NO: SAL15375
CLIENT ORDER: A04/0951

Sample Number	Analyte	Units	MDL	Sample Result	Duplicate Result	%RPD
A04/0951/20	TOC	%	0.1	<0.1	<0.1	0

Acceptance criteria:

RPD <50% for low level (<20xMDL)
RPD <30% for medium level (20-100xMDL)
RPD <15% for high level (>100xMDL)
No limit applies at <2xMDL

MDL = Method Detection Limit

All results are within the acceptance criteria

ANALYTICAL REPORT

JOB NO: SAL15375
CLIENT ORDER: A04/0951

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5 Sample dried, split and crushed to -150um
C48 Total Organic Carbon - AS1289.4.1.1

A preliminary report was faxed on 10/12/04



REPORT OF ANALYSIS

Laboratory Reference: A04/0952

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediment
No. of Samples: 5
Date Received: 22/11/2004
Date Completed: 8/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
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Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Phalak Inthakesone
Senior Organics Chemist

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
NATA endorsed test report. This document shall not be reproduced, except in full.



Nata Accredited Laboratory
Number: 15109

Issue Date: 10 December 2004

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Page 1 of 11

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Batch Number: A04/0952

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ45	PCQ42	PCQ46	PCQ54
Date Sampled:	-	-	0-0.5A	0-0.5A	0-0.5A	0-0.5A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	20.2	20.0	20.2	22.3
Trace Elements						
Silver	04-001	mg/kg	<0.1	<0.1	<0.1	<0.1
Arsenic	04-001	mg/kg	3.5	4.2	5.0	3.6
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	8.7	8.6	13	8.8
Copper	04-001	mg/kg	1.1	0.84	2.0	0.63
Iron	04-001	mg/kg	5,300	5,400	8,300	3,900
Mercury	04-002	mg/kg	<0.01	<0.01	<0.01	<0.01
Manganese	04-001	mg/kg	140	130	250	150
Nickel	04-001	mg/kg	3.4	3.2	4.4	3.0
Phosphorus	04-001	mg/kg	110	110	110	84
Lead	04-001	mg/kg	1.8	2.0	3.4	1.5
Antimony	04-001	mg/kg	0.3	0.3	0.4	<0.1
Zinc	04-001	mg/kg	5.0	4.7	6.9	4.0
BTEX						
Benzene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Toluene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Ethyl Benzene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
m+p xylenes	04-021	mg/kg	<0.40	<0.40	<0.40	<0.40
o-xylene	04-021	mg/kg	<0.20	<0.20	<0.20	<0.20
Total BTEX	04-021	mg/kg	<1.2	<1.2	<1.2	<1.2
Surrogate 1 Recovery	04-021	%	98	80	96	84
Surrogate 2 Recovery	04-021	%	93	78	89	79
Surrogate 3 Recovery	04-021	%	93	80	89	80
Date Extracted	04-021	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Date Analysed	04-021	-	24/11/2004	24/11/2004	24/11/2004	24/11/2004
Total Petroleum Hydrocarbons						
TPH C6-C9	04-021	mg/kg	<10	<10	<10	<10
TPH C10-14	04-020	mg/kg	<10	<10	<10	<10
TPH C15-28	04-020	mg/kg	<50	<50	<50	<50



Batch Number: A04/0952

Project: Port of Hay Point

Laboratory Reference: Client Reference: Date Sampled: Analysis Description	- - - Method	- - - Units	/1 PCQ45 0-0.5A	/2 PCQ42 0-0.5A	/3 PCQ46 0-0.5A	/4 PCQ54 0-0.5A
TPH C29-36	04-020	mg/kg	<50	<50	<50	<50
Surrogate Recovery	04-020	%	103	115	92	114
Date Extracted	04-020	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Date Analysed	04-020	-	26/11/2004	26/11/2004	26/11/2004	26/11/2004
Poly Aromatic Hydrocarbons						
Naphthalene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Acenaphthalene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Acenaphthene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Fluorene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Phenanthrene	04-025	µg/kg	7.3	<5.0	<5.0	<5.0
Anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Fluoranthene	04-025	µg/kg	5.0	<5.0	<5.0	<5.0
Pyrene	04-025	µg/kg	8.7	<5.0	<5.0	<5.0
Benz(a)anthracene	04-025	µg/kg	6.3	<5.0	<5.0	<5.0
Chrysene	04-025	µg/kg	10	<5.0	<5.0	<5.0
Benzo(b)&(k)fluoranthene	04-025	µg/kg	<10	<10	<10	<10
Benzo(a)pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Indeno(1,2,3-cd)pyrene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Dibenz(a,h)anthracene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Benzo(g,h,i)perylene	04-025	µg/kg	<5.0	<5.0	<5.0	<5.0
Total PAHs (as above)	04-025	µg/kg	<100	<100	<100	<100
Surrogate 1 Recovery	04-025	%	85	91	89	84
Surrogate 2 Recovery	04-025	%	83	88	86	85
Surrogate 3 Recovery	04-025	%	75	82	80	79
Date Extracted	04-025	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Date Analysed	04-025	-	26/11/2004	26/11/2004	26/11/2004	26/11/2004
Organochlorine Pesticides						
Aldrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
alpha-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
beta-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
gamma-BHC (Lindane)	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
delta-BHC	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
cis-Chlordane	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
trans-Chlordane	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0

Issue Date: 10 December 2004

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Batch Number: A04/0952

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ45	PCQ42	PCQ46	PCQ54
Date Sampled:	-	-	0-0.5A	0-0.5A	0-0.5A	0-0.5A
Analysis Description	Method	Units				
<i>p,p'</i> -DDD	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>p,p'</i> -DDE	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>p,p'</i> -DDT	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Dieldrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>alpha</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
<i>beta</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endosulfan Sulphate	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin ketone	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Endrin aldehyde	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Heptachlor	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Heptachlor epoxide	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Methoxychlor	04-023	ug/kg	<1.0	<1.0	<1.0	<1.0
Surrogate Recovery	04-023	%	81	82	100	113
Date Extracted	04-023	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Date Analysed	04-023	-	30/11/2004	30/11/2004	30/11/2004	30/11/2004
Organophosphate Pesticides						
Azinphos-methyl	04-024	ug/kg	<50	<50	<50	<50
Bromophos-ethyl	04-024	ug/kg	<50	<50	<50	<50
Carbophenothion	04-024	ug/kg	<50	<50	<50	<50
Chlorfenvinphos	04-024	ug/kg	<50	<50	<50	<50
Chlorpyrifos	04-024	ug/kg	<50	<50	<50	<50
Chlorpyrifos-methyl	04-024	ug/kg	<50	<50	<50	<50
Diazinon	04-024	ug/kg	<50	<50	<50	<50
Demeton-S-methyl	04-024	ug/kg	<50	<50	<50	<50
Dimethoate	04-024	ug/kg	<50	<50	<50	<50
Dichlorvos	04-024	ug/kg	<50	<50	<50	<50
Ethion	04-024	ug/kg	<50	<50	<50	<50
Fenitrothion	04-024	ug/kg	<50	<50	<50	<50
Fenthion	04-024	ug/kg	<50	<50	<50	<50
Fenamiphos	04-024	ug/kg	<50	<50	<50	<50
Malathion	04-024	ug/kg	<50	<50	<50	<50
Methidathion	04-024	ug/kg	<50	<50	<50	<50

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Batch Number: A04/0952

Project: Port of Hay Point

Laboratory Reference: Client Reference: Date Sampled: Analysis Description	- - - Method	- - - Units	/1 PCQ45 0-0.5A	/2 PCQ42 0-0.5A	/3 PCQ46 0-0.5A	/4 PCQ54 0-0.5A
Monocrotophos	04-024	ug/kg	<50	<50	<50	<50
Omethoate	04-024	ug/kg	<50	<50	<50	<50
Parathion	04-024	ug/kg	<50	<50	<50	<50
Parathion-methyl	04-024	ug/kg	<50	<50	<50	<50
Phosalone	04-024	ug/kg	<50	<50	<50	<50
Pirimiphos-methyl	04-024	ug/kg	<50	<50	<50	<50
Prothiofos	04-024	ug/kg	<50	<50	<50	<50
Surrogate Recovery	04-024	%	81	82	100	113
Date Extracted	04-024	-	23/11/2004	23/11/2004	23/11/2004	23/11/2004
Date Analysed	04-024	-	30/11/2004	30/11/2004	30/11/2004	30/11/2004
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	100	190	62	97
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment
Nutrients			See comment	See comment	See comment	See comment



Batch Number: A04/0952

Project: Port of Hay Point

Laboratory Reference:	-	-	/5
Client Reference:	-	-	PCQ22
Date Sampled:	-	-	0-0.5R
Analysis Description	Method	Units	
Moisture Content			
Moisture Content	04-004	%	19.3
Trace Elements			
Silver	04-001	mg/kg	N/A
Arsenic	04-001	mg/kg	5.8
Cadmium	04-001	mg/kg	N/A
Chromium	04-001	mg/kg	N/A
Copper	04-001	mg/kg	N/A
Iron	04-001	mg/kg	N/A
Mercury	04-002	mg/kg	N/A
Manganese	04-001	mg/kg	N/A
Nickel	04-001	mg/kg	N/A
Phosphorus	04-001	mg/kg	N/A
Lead	04-001	mg/kg	N/A
Antimony	04-001	mg/kg	0.2
Zinc	04-001	mg/kg	N/A
BTEX			
Total Petroleum Hydrocarbons			
Poly Aromatic Hydrocarbons			
Organochlorine Pesticides			
Organophosphate Pesticides			
Organotins			
Subcontract Analysis			

Method	Method Description
04-004	Moisture Content by Gravimetric, %
04-001	Metals in Solids by ICP
04-002	Mercury in Solids by CVAAS, mg/kg
04-021	TPH C6-9 & BTEX in Solids, mg/kg
04-020	Total Petroleum Hydrocarbons in Solids, mg/kg
04-025	Low Level Poly Aromatic Hydrocarbons in Solids, mg/kg

Issue Date: 10 December 2004

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Batch Number: A04/0952

Project: Port of Hay Point

Method	Method Description
04-023	*Low Level Organochlorine Pesticides in Solids, mg/kg
04-024	*Organophosphate Pesticides in Solids, mg/kg
04-026	*Organotins in Solids, µgSn/kg

Result Comments

[<] Less than

[INS] Insufficient sample for this test

[NA] Test not required

* Method not covered by NATA terms of accreditation.

Solid sample results are reported on a dry weight basis.

TOC and nutrient analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884); see attached SAL report for job number SAL15375B.

PSD analysis was subcontracted to GHD LongMac (NATA Number 679); see attached GHD LongMac report for job number 2113283.



Batch Number: A04/0952

Project: Port of Hay Point

QUALITY ASSURANCE REPORT

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	N/A	A04/0952-1	20.2 20.4 RPD: 1

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Silver	mg/kg	<0.1	A04/0952-1	<0.1 <0.1	A04/0952-1	97%
Arsenic	mg/kg	<0.10	A04/0952-1	3.5 3.2 RPD: 9	A04/0952-1	104%
Cadmium	mg/kg	<0.10	A04/0952-1	<0.10 <0.10	A04/0952-1	90%
Chromium	mg/kg	<0.10	A04/0952-1	8.7 8.2 RPD: 6	A04/0952-1	96%
Copper	mg/kg	<0.10	A04/0952-1	1.1 1.1 RPD: 0	A04/0952-1	105%
Iron	mg/kg	<0.10	A04/0952-1	5300 5000 RPD: 6	A04/0952-1	#
Mercury	mg/kg	<0.01	A04/0952-1	<0.01 <0.01	A04/0952-1	104%
Manganese	mg/kg	<0.1	A04/0952-1	140 120 RPD: 15	A04/0952-1	85%
Nickel	mg/kg	<0.10	A04/0952-1	3.4 2.9 RPD: 16	A04/0952-1	91%
Phosphorus	mg/kg	<0.1	A04/0952-1	110 100 RPD: 10	A04/0952-1	95%
Lead	mg/kg	<0.10	A04/0952-1	1.8 1.7 RPD: 6	A04/0952-1	93%
Antimony	mg/kg	<0.1	A04/0952-1	0.3 0.5 RPD: 50	A04/0952-1	98%
Zinc	mg/kg	<0.10	A04/0952-1	5.0 5.3 RPD: 6	A04/0952-1	90%

TEST	Units	Blank
Benzene	mg/kg	<0.20
Toluene	mg/kg	<0.20
Ethyl Benzene	mg/kg	<0.20
m+p xylenes	mg/kg	<0.40
o-xylene	mg/kg	<0.20
Total BTEX	mg/kg	<1.2
Surrogate 1 Recovery	%	N/A
Surrogate 2 Recovery	%	N/A
Surrogate 3 Recovery	%	N/A

TEST	Units	Blank
TPH C6-C9	mg/kg	<10
TPH C10-14	mg/kg	<10
TPH C15-28	mg/kg	<50
TPH C29-36	mg/kg	<50
Surrogate Recovery	%	N/A

TEST	Units	Blank
Naphthalene	µg/kg	<5.0
Acenaphthalene	µg/kg	<5.0
Acenaphthene	µg/kg	<5.0
Fluorene	µg/kg	<5.0

Issue Date: 10 December 2004

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Batch Number: A04/0952

Project: Port of Hay Point

TEST	Units	Blank
Phenanthrene	µg/kg	<5.0
Anthracene	µg/kg	<5.0
Fluoranthene	µg/kg	<5.0
Pyrene	µg/kg	<5.0
Benz(a)anthracene	µg/kg	<5.0
Chrysene	µg/kg	<5.0
Benzo(b)&(k)fluoranthene	µg/kg	<10
Benzo(a)pyrene	µg/kg	<5.0
Indeno(1,2,3-cd)pyrene	µg/kg	<5.0
Dibenz(a,h)anthracene	µg/kg	<5.0
Benzo(g,h,i)perylene	µg/kg	<5.0
Total PAHs (as above)	µg/kg	<100
Surrogate 1 Recovery	%	N/A
Surrogate 2 Recovery	%	N/A
Surrogate 3 Recovery	%	N/A

TEST	Units	Blank
Aldrin	ug/kg	<1.0
<i>alpha</i> -BHC	ug/kg	<1.0
<i>beta</i> -BHC	ug/kg	<1.0
<i>gamma</i> -BHC (Lindane)	ug/kg	<1.0
<i>delta</i> -BHC	ug/kg	<1.0
<i>cis</i> -Chlordane	ug/kg	<1.0
<i>trans</i> -Chlordane	ug/kg	<1.0
<i>p,p'</i> -DDD	ug/kg	<1.0
<i>p,p'</i> -DDE	ug/kg	<1.0
<i>p,p'</i> -DDT	ug/kg	<1.0
Dieldrin	ug/kg	<1.0
<i>alpha</i> -Endosulfan	ug/kg	<1.0
<i>beta</i> -Endosulfan	ug/kg	<1.0
Endosulfan Sulphate	ug/kg	<1.0
Endrin	ug/kg	<1.0
Endrin ketone	ug/kg	<1.0
Endrin aldehyde	ug/kg	<1.0
Heptachlor	ug/kg	<1.0
Heptachlor epoxide	ug/kg	<1.0
Hexachlorobenzene	ug/kg	<1.0
Methoxychlor	ug/kg	<1.0
Surrogate Recovery	%	103



Batch Number: A04/0952

Project: Port of Hay Point

TEST	Units	Blank
Azinphos-methyl	ug/kg	<50
Bromophos-ethyl	ug/kg	<50
Carbophenothion	ug/kg	<50
Chlorfenvinphos	ug/kg	<50
Chlorpyrifos	ug/kg	<50
Chlorpyrifos-methyl	ug/kg	<50
Diazinon	ug/kg	<50
Demeton-S-methyl	ug/kg	<50
Dimethoate	ug/kg	<50
Dichlorvos	ug/kg	<50
Ethion	ug/kg	<50
Fenitrothion	ug/kg	<50
Fenthion	ug/kg	<50
Fenamiphos	ug/kg	<50
Malathion	ug/kg	<50
Methidathion	ug/kg	<50
Monocrotophos	ug/kg	<50
Omethoate	ug/kg	<50
Parathion	ug/kg	<50
Parathion-methyl	ug/kg	<50
Phosalone	ug/kg	<50
Pirimiphos-methyl	ug/kg	<50
Prothiofos	ug/kg	<50
Surrogate Recovery	%	103



Batch Number: A04/0952

Project: Port of Hay Point

TEST	Units	Blank
Monobutyl tin	µgSn/kg	<0.50
Dibutyl tin	µgSn/kg	<0.50
Tributyl tin	µgSn/kg	<0.50
Surrogate 1 Recovery	%	N/A

Comments:

RPD = Relative Percent Deviation

[NT] = Not Tested

[N/A] = Not Applicable

'#' = Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Trace elements +/- 10%

Organic analyses +/- 25%

Recommended matrix spike recovery limits: Trace elements 80-120%

Organic analyses 70-130%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.



REPORT OF ANALYSIS

Laboratory Reference: A04/0952

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediment
No. of Samples: 5
Date Received: 22/11/2004
Date Completed: 8/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
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Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Phalak Inthakesone
Senior Organics Chemist

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
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FILE		
27 JAN 2005		
Name	Initial	Date



Nata Accredited Laboratory
Number: 15102

Issue Date: 10 December 2004

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A.B.N. 81 829 182 852

ANALYTICAL REPORT for:

ADVANCED ANALYTICAL AUSTRALIA

1/139 SANDGATE ROAD
ALBION QLD 4010

ATTN: ANDREW BRADBURY

JOB NO: SAL15375B
CLIENT ORDER: A04/0952
DATE RECEIVED: 23/11/04
DATE COMPLETED: 10/12/04
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 4

NATA Accredited Laboratory
Number: 1884



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.....*Ulls*.....
Issued on 17/12/04
Lance Smith
(Chief Chemist)

SYDNEY ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

JOB NO: SAL15375B
CLIENT ORDER: A04/0952

SAMPLES	TOC %	TKN mg/kg	Total N mg/kg	NO3 mg/kg	NO2 mg/kg	NH4-N mg/kg
1 A04/0952/1	0.12	180	180	<0.5	<0.5	<0.5
2 A04/0952/2	0.10	180	180	<0.5	<0.5	<0.5
3 A04/0952/3	0.18	180	180	<0.5	<0.5	<0.5
4 A04/0952/4	0.17	190	190	<0.5	<0.5	<0.5
BLANK	<0.1	<20	<20	<0.5	<0.5	<0.5
MDL	0.1	20	20	0.5	0.5	0.5
Method Code	C48	WA14	CAL.	WA5	WA12	WA3
Preparation	P5	P5	P1	P1	P1	P1

**SYDNEY
ANALYTICAL
LABORATORIES**

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ANALYTICAL REPORT

JOB NO: SAL15375B
CLIENT ORDER: A04/0952

	SAMPLES	PO4 mg/kg
1	A04/0952/1	<0.5
2	A04/0952/2	<0.5
3	A04/0952/3	<0.5
4	A04/0952/4	<0.5
	BLANK	<0.5

MDL	0.5
Method Code	WA7
Preparation	P1

RESULTS ON DRY BASIS

ANALYTICAL REPORT

JOB NO: SAL15375B
CLIENT ORDER: A04/0952

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5 Sample dried, split and crushed to -150um
P1 Analysis performed on sample as received
C48 Total Organic Carbon - AS1289.4.1.1
WA14 Total Kjeldahl Nitrogen
 Determined by APHA 4500B
CAT. Determined by Calculation
WA5 Nitrate - 1:5 soil/water extract
 Determined by APHA 4500F
WA12 Nitrite - 1:5 soil/water extract
 Determined by APHA 4500F
WA3 Total Ammonia - 1:5 soil/water extract
 Determined by APHA 4500G
WA7 Phosphate - 1:5 soil/water extract
 Determined by APHA 4500F

A preliminary report was faxed on 10/12/04



REPORT OF ANALYSIS

Laboratory Reference: A04/0962

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediment
No. of Samples: 29
Date Received: 23/11/2004
Date Completed: 13/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
NATA endorsed test report. This document shall not be reproduced, except in full.



Nata Accredited Laboratory
Number: 15109

Issue Date: 13 December 2004

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Batch Number: A04/0962

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2	/3	/4
Client Reference:	-	-	PCQ31	PCQ31	PCQ30	PCQ30
Date Sampled:	-	-	0-0.5A	0.5-1.0A	0-0.5A	0-0.5R
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	18.3	16.7	20.9	19.5
Trace Elements						
Arsenic	04-001	mg/kg	4.4	0.41	10	6.0
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	16	15	14	14
Copper	04-001	mg/kg	2.7	3.1	5.7	4.1
Iron	04-001	mg/kg	18,000	12,000	15,000	13,000
Manganese	04-001	mg/kg	20	27	55	47
Nickel	04-001	mg/kg	4.7	7.4	6.4	5.7
Lead	04-001	mg/kg	4.5	3.4	5.5	4.3
Zinc	04-001	mg/kg	12	11	15	13
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	84	100	91	88
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0962

Project: Port of Hay Point

Laboratory Reference:	-	-	/5	/6	/7	/8
Client Reference:	-	-	PCQ30	PCQ35	PCQ41	PCQ41
Date Sampled:	-	-	0.5-1.0A	0.5-1.0A	0-0.5A	0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	17.1	17.6	24.2	24.7
Trace Elements						
Arsenic	04-001	mg/kg	6.6	3.8	3.3	5.0
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	14	14	12	13
Copper	04-001	mg/kg	5.7	2.6	2.8	3.2
Iron	04-001	mg/kg	15,000	11,000	7,900	10,000
Manganese	04-001	mg/kg	39	49	150	140
Nickel	04-001	mg/kg	6.3	7.3	5.4	7.3
Lead	04-001	mg/kg	6.3	7.1	2.9	4.1
Zinc	04-001	mg/kg	15	12	10	12
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	63	71	100	110
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0962

Project: Port of Hay Point

Laboratory Reference:	-	-	/9	/10	/11	/12
Client Reference:	-	-	PCQ36	PCQ36	PCQ36 1-2A	PCQ T9
Date Sampled:	-	-	0-0.5A	0.5-1.0A		0-0.5A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	17.5	18.6	19.3	19.5
Trace Elements						
Arsenic	04-001	mg/kg	7.1	15	2.1	6.3
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	16	11	11	11
Copper	04-001	mg/kg	2.2	2.6	2.0	1.9
Iron	04-001	mg/kg	15,000	15,000	7,800	10,000
Manganese	04-001	mg/kg	38	76	31	260
Nickel	04-001	mg/kg	5.0	6.2	5.3	6.1
Lead	04-001	mg/kg	5.3	10	3.0	3.2
Zinc	04-001	mg/kg	8.4	10	8.7	9.0
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	72	130	120	110
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0962

Project: Port of Hay Point

Laboratory Reference:	-	-	/13	/14	/15	/16
Client Reference:	-	-	PCQ T9	PCQ T10	PCQ T10	PCQ49
Date Sampled:	-	-	0.5-1.0A	0-0.5A	0.5-1.0A	0.5-1.0A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	20.2	19.1	14.9	18.8
Trace Elements						
Arsenic	04-001	mg/kg	1.9	6.4	3.8	8.7
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	15	16	18	13
Copper	04-001	mg/kg	3.8	5.5	9.1	3.2
Iron	04-001	mg/kg	16,000	20,000	22,000	14,000
Manganese	04-001	mg/kg	410	110	180	94
Nickel	04-001	mg/kg	9.5	13	14	7.5
Lead	04-001	mg/kg	4.2	5.8	6.7	6.7
Zinc	04-001	mg/kg	15	19	20	7.3
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	94	100	85	100
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0962

Project: Port of Hay Point

Laboratory Reference:	-	-	/17	/18	/19	/20
Client Reference:	-	-	PCQ43	PCQ43	PCQ43 1-2A	PCQ T11
Date Sampled:	-	-	0-0.5A	0.5-1.0A		0-0.5A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	20.7	19.5	14.2	22.9
Trace Elements						
Arsenic	04-001	mg/kg	4.6	4.3	3.3	3.3
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	12	11	10	18
Copper	04-001	mg/kg	2.6	2.8	2.9	12
Iron	04-001	mg/kg	12,000	15,000	9,000	21,000
Manganese	04-001	mg/kg	97	82	180	59
Nickel	04-001	mg/kg	6.8	7.3	5.7	8.7
Lead	04-001	mg/kg	3.0	4.4	2.6	7.5
Zinc	04-001	mg/kg	10	11	6.4	17
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	140	100	110	65
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0962

Project: Port of Hay Point

Laboratory Reference:	-	-	/21	/22	/23	/24
Client Reference:	-	-	PCQ T11	PCQ T12	PCQ T12	PCQ39
Date Sampled:	-	-	0.5-1.0A	0-0.5A	0.5-1.0A	0-0.5A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	20.7	17.7	22.9	18.9
Trace Elements						
Arsenic	04-001	mg/kg	6.2	1.1	0.82	7.4
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	16	11	15	9.0
Copper	04-001	mg/kg	15	17	17	1.2
Iron	04-001	mg/kg	33,000	7,800	11,000	7,900
Manganese	04-001	mg/kg	87	64	76	180
Nickel	04-001	mg/kg	11	5.7	8.5	3.8
Lead	04-001	mg/kg	9.5	5.2	7.5	2.4
Zinc	04-001	mg/kg	20	14	22	5.3
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	110	100	75	120
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0962

Project: Port of Hay Point

Laboratory Reference:	-	-	/25	/26	/27	/28
Client Reference:	-	-	PCQ39	PCQ32	PCQ32	PCQ40
Date Sampled:	-	-	0.5-1.0A	0-0.5A	0.5-1.0A	0-0.5A
Analysis Description	Method	Units				
Moisture Content						
Moisture Content	04-004	%	16.5	21.5	19.6	18.2
Trace Elements						
Arsenic	04-001	mg/kg	2.4	5.3	0.94	7.7
Cadmium	04-001	mg/kg	<0.10	<0.10	<0.10	<0.10
Chromium	04-001	mg/kg	15	14	21	14
Copper	04-001	mg/kg	4.9	2.6	2.9	4.8
Iron	04-001	mg/kg	12,000	13,000	11,000	13,000
Manganese	04-001	mg/kg	1,300	94	35	60
Nickel	04-001	mg/kg	8.3	9.2	13	9.3
Lead	04-001	mg/kg	4.7	4.5	4.3	5.9
Zinc	04-001	mg/kg	12	15	16	10
Organotins						
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	59	63	71	67
Date Extracted	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004	2/12/2004	2/12/2004
Subcontract Analysis						
Particle Size Distribution			See comment	See comment	See comment	See comment
Total Organic Carbon			See comment	See comment	See comment	See comment



Batch Number: A04/0962

Project: Port of Hay Point

Laboratory Reference:	-	-	/29
Client Reference:	-	-	PCQ40
Date Sampled:	-	-	0.5-1.0A
Analysis Description	Method	Units	
Moisture Content			
Moisture Content	04-004	%	15.5
Trace Elements			
Arsenic	04-001	mg/kg	0.48
Cadmium	04-001	mg/kg	<0.10
Chromium	04-001	mg/kg	17
Copper	04-001	mg/kg	4.9
Iron	04-001	mg/kg	7,100
Manganese	04-001	mg/kg	31
Nickel	04-001	mg/kg	6.9
Lead	04-001	mg/kg	3.6
Zinc	04-001	mg/kg	9.3
Organotins			
Monobutyl tin	04-026	µgSn/kg	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50
Surrogate 1 Recovery	04-026	%	83
Date Extracted	04-026	-	2/12/2004
Date Analysed	04-026	-	2/12/2004
Subcontract Analysis			
Particle Size Distribution			See comment
Total Organic Carbon			See comment

Method	Method Description
04-004	Moisture Content by Gravimetric, %
04-001	Metals in Solids by ICP
04-026	*Organotins in Solids, µgSn/kg

Result Comments

[<] Less than

[INS] Insufficient sample for this test

[NA] Test not required

* Method not covered by NATA terms of accreditation.

Solid sample results are reported on a dry weight basis.

TOC analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884);

see attached SAL report for job number SAL15374.

PSD analysis was subcontracted to GHD LongMac (NATA Number 679); see attached GHD LongMac report for job number 2113283.

Issue Date: 13 December 2004

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Batch Number: A04/0962

Project: Port of Hay Point

QUALITY ASSURANCE REPORT

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	N/A	A04/0962-1	18.3 16.8 RPD: 9

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Arsenic	mg/kg	<0.10	A04/0962-1	4.4 4.9 RPD: 11	A04/0962-1	96%
Cadmium	mg/kg	<0.10	A04/0962-1	<0.10 <0.10	A04/0962-1	91%
Chromium	mg/kg	<0.10	A04/0962-1	16 18 RPD: 12	A04/0962-1	91%
Copper	mg/kg	<0.10	A04/0962-1	2.7 3.0 RPD: 11	A04/0962-1	96%
Iron	mg/kg	<0.10	A04/0962-1	18000 14000 RPD: 25	A04/0962-1	#
Manganese	mg/kg	<0.1	A04/0962-1	20 26 RPD: 26	A04/0962-1	91%
Nickel	mg/kg	<0.10	A04/0962-1	4.7 5.3 RPD: 12	A04/0962-1	90%
Lead	mg/kg	<0.10	A04/0962-1	4.5 5.2 RPD: 14	A04/0962-1	90%
Zinc	mg/kg	<0.10	A04/0962-1	12 13 RPD: 8	A04/0962-1	89%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Monobutyl tin	µgSn/kg	<0.50	A04/0962-1	<0.50 <0.50	A04/0962-1	48%
Dibutyl tin	µgSn/kg	<0.50	A04/0962-1	<0.50 <0.50	A04/0962-1	92%
Tributyl tin	µgSn/kg	<0.50	A04/0962-1	<0.50 <0.50	A04/0962-1	70%
Surrogate 1 Recovery	%	110	A04/0962-1	84 51 RPD: 49	A04/0962-1	80%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0962-11	19.3 17.2 RPD: 12

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Arsenic	mg/kg	[NT]	A04/0962-11	2.1 1.8 RPD: 15	A04/0962-21	97%
Cadmium	mg/kg	[NT]	A04/0962-11	<0.10 <0.10	A04/0962-21	92%
Chromium	mg/kg	[NT]	A04/0962-11	11 10 RPD: 10	A04/0962-21	99%
Copper	mg/kg	[NT]	A04/0962-11	2.0 2.4 RPD: 18	A04/0962-21	104%
Iron	mg/kg	[NT]	A04/0962-11	7800 7700 RPD: 1	A04/0962-21	#
Manganese	mg/kg	[NT]	A04/0962-11	31 32 RPD: 3	A04/0962-21	88%
Nickel	mg/kg	[NT]	A04/0962-11	5.3 4.9 RPD: 8	A04/0962-21	94%
Lead	mg/kg	[NT]	A04/0962-11	3.0 3.1 RPD: 3	A04/0962-21	93%
Zinc	mg/kg	[NT]	A04/0962-11	8.7 8.6 RPD: 1	A04/0962-21	95%



Batch Number: A04/0962

Project: Port of Hay Point

TEST	Units	Blank	Duplicate Sm#	Duplicate Results	Spike Sm#	Spike Results
Monobutyl tin	µgSn/kg	[NT]	A04/0962-11	<0.50 <0.50	A04/0962-21	43%
Dibutyl tin	µgSn/kg	[NT]	A04/0962-11	<0.50 <0.50	A04/0962-21	99%
Tributyl tin	µgSn/kg	[NT]	A04/0962-11	<0.50 <0.50	A04/0962-21	50%
Surrogate 1 Recovery	%	[NT]	A04/0962-11	120 140 RPD: 15	A04/0962-21	73%

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Moisture Content	%	[NT]	A04/0962-21	20.7 20.5 RPD: 1

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Arsenic	mg/kg	[NT]	A04/0962-21	6.2 6.9 RPD: 11
Cadmium	mg/kg	[NT]	A04/0962-21	<0.10 <0.10
Chromium	mg/kg	[NT]	A04/0962-21	16 16 RPD: 0
Copper	mg/kg	[NT]	A04/0962-21	15 15 RPD: 0
Iron	mg/kg	[NT]	A04/0962-21	33000 36000 RPD: 9
Manganese	mg/kg	[NT]	A04/0962-21	87 89 RPD: 2
Nickel	mg/kg	[NT]	A04/0962-21	11 11 RPD: 0
Lead	mg/kg	[NT]	A04/0962-21	9.5 9.4 RPD: 1
Zinc	mg/kg	[NT]	A04/0962-21	20 20 RPD: 0

TEST	Units	Blank	Duplicate Sm#	Duplicate Results
Monobutyl tin	µgSn/kg	[NT]	A04/0962-21	<0.50 <0.50
Dibutyl tin	µgSn/kg	[NT]	A04/0962-21	<0.50 <0.50
Tributyl tin	µgSn/kg	[NT]	A04/0962-21	<0.50 <0.50
Surrogate 1 Recovery	%	[NT]	A04/0962-21	110 57 RPD: 63

Comments:

RPD = Relative Percent Deviation

[NT] = Not Tested

[N/A] = Not Applicable

= Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Trace elements +/- 10%

Organic analyses +/- 25%

Recommended matrix spike recovery limits: Trace elements 80-120%

Organic analyses 70-130%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.



REPORT OF ANALYSIS

Laboratory Reference: A04/0962

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediment
No. of Samples: 29
Date Received: 23/11/2004
Date Completed: 13/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
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FILE		
27 JAN 2005		
Name	Initials	Date



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Number: 15109

Issue Date: 13 December 2004

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**SYDNEY
ANALYTICAL
LABORATORIES**

Page 1 of 4

Office:
PO BOX 48
ERMINGTON NSW 2115

Laboratory:
1/4 ABBOTT ROAD
SEVEN HILLS NSW 2147
Telephone: (02) 9838 8903
Fax: (02) 9838 8919
A.C.N. 003 614 695
A.B.N. 81 829 182 852

ANALYTICAL REPORT for:

ADVANCED ANALYTICAL AUSTRALIA

1/139 SANDGATE ROAD
ALBION QLD 4010

ATTN: ANDREW BRADBURY

JOB NO: SAL15374
CLIENT ORDER: A04/0962
DATE RECEIVED: 24/11/04
DATE COMPLETED: 07/12/04
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 29

NATA Accredited Laboratory

Number: 1884



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.....
Issued on 14/12/04
Lance Smith
(Chief Chemist)

**SYDNEY
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Page 2 of 4

ANALYTICAL REPORT

**JOB NO: SAL15374
CLIENT ORDER: A04/0962**

	SAMPLES	TOC %
1	A04/0962/1	0.19
2	A04/0962/2	<0.1
3	A04/0962/3	<0.1
4	A04/0962/4	<0.1
5	A04/0962/5	<0.1
6	A04/0962/6	0.14
7	A04/0962/7	0.12
8	A04/0965/8	<0.1
9	A04/0962/9	0.15
10	A04/0962/10	0.16
11	A04/0962/11	<0.1
12	A04/0962/12	<0.1
13	A04/0962/13	<0.1
14	A04/0962/14	0.10
15	A04/0962/15	<0.1
16	A04/0962/16	<0.1
17	A04/0962/17	<0.1
18	A04/0962/18	<0.1
19	A04/0962/19	<0.1
20	A04/0962/20	0.11
21	A04/0962/21	<0.1
22	A04/0962/22	<0.1
23	A04/0962/23	0.12
24	A04/0962/24	0.11
25	A04/0962/25	<0.1
26	A04/0962/26	0.12
27	A04/0962/27	<0.1
28	A04/0962/28	<0.1
29	A04/0962/29	<0.1
DUPLICATES:		
20	A04/0962/20	0.10
	BLANK	<0.1

MDL	0.1
Method Code	C48
Preparation	P5

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 3 of 4

LABORATORY DUPLICATE REPORT

JOB NO: SAL15374

CLIENT ORDER: A04/0962

Sample Number	Analyte	Units	MDL	Sample Result	Duplicate Result	%RPD
A04/0962/20	TOC	%	0.1	0.11	0.10	9

Acceptance criteria:

RPD <50% for low level (<20xMDL)
RPD <30% for medium level (20-100xMDL)
RPD <15% for high level (>100xMDL)
No limit applies at <2xMDL

MDL = Method Detection Limit

All results are within the acceptance criteria

ANALYTICAL REPORT

JOB NO: SAL15374

CLIENT ORDER: A04/0962

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5 Sample dried, split and crushed to -150um
C48 Total Organic Carbon - AS1289.4.1.1

A preliminary report was faxed on 07/12/04



REPORT OF ANALYSIS

Laboratory Reference: A04/0963

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediment
No. of Samples: 2
Date Received: 23/11/2004
Date Completed: 8/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Phalak Inthakesone
Senior Organics Chemist

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
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Nata Accredited Laboratory
Number: 15109

Issue Date: 13 December 2004

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Batch Number: A04/0963

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2
Client Reference:	-	-	PCQ35	PCQ49
Date Sampled:	-	-	0-0.5A	0-0.5A
Analysis Description	Method	Units		
Moisture Content				
Moisture Content	04-004	%	18.5	24.8
Trace Elements				
Silver	04-001	mg/kg	<0.1	<0.1
Arsenic	04-001	mg/kg	7.8	9.1
Cadmium	04-001	mg/kg	<0.10	<0.10
Chromium	04-001	mg/kg	14	10
Copper	04-001	mg/kg	2.1	1.5
Iron	04-001	mg/kg	13,000	8,500
Mercury	04-002	mg/kg	0.01	<0.01
Manganese	04-001	mg/kg	64	300
Nickel	04-001	mg/kg	4.4	4.5
Phosphorus	04-001	mg/kg	68	180
Lead	04-001	mg/kg	4.1	2.8
Antimony	04-001	mg/kg	1	0.5
Zinc	04-001	mg/kg	7.7	5.2
BTEX				
Benzene	04-021	mg/kg	<0.20	<0.20
Toluene	04-021	mg/kg	<0.20	<0.20
Ethyl Benzene	04-021	mg/kg	<0.20	<0.20
m+p xylenes	04-021	mg/kg	<0.40	<0.40
o-xylene	04-021	mg/kg	<0.20	<0.20
Total BTEX	04-021	mg/kg	<1.2	<1.2
Surrogate 1 Recovery	04-021	%	90	89
Surrogate 2 Recovery	04-021	%	88	87
Surrogate 3 Recovery	04-021	%	91	91
Date Extracted	04-021	-	25/11/2004	25/11/2004
Date Analysed	04-021	-	26/11/2004	26/11/2004
Total Petroleum Hydrocarbons				
TPH C6-C9	04-021	mg/kg	<10	<10
TPH C10-14	04-020	mg/kg	<10	<10
TPH C15-28	04-020	mg/kg	<50	<50

Issue Date: 13 December 2004

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Batch Number: A04/0963

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2
Client Reference:	-	-	PCQ35	PCQ49
Date Sampled:	-	-	0-0.5A	0-0.5A
Analysis Description	Method	Units		
TPH C29-36	04-020	mg/kg	<50	<50
Surrogate Recovery	04-020	%	122	118
Date Extracted	04-020	-	25/11/2004	25/11/2004
Date Analysed	04-020	-	26/11/2004	26/11/2004
Poly Aromatic Hydrocarbons				
Naphthalene	04-025	µg/kg	<5.0	<5.0
Acenaphthalene	04-025	µg/kg	<5.0	<5.0
Acenaphthene	04-025	µg/kg	<5.0	<5.0
Fluorene	04-025	µg/kg	<5.0	<5.0
Phenanthrene	04-025	µg/kg	<5.0	<5.0
Anthracene	04-025	µg/kg	<5.0	<5.0
Fluoranthene	04-025	µg/kg	<5.0	<5.0
Pyrene	04-025	µg/kg	<5.0	<5.0
Benz(a)anthracene	04-025	µg/kg	<5.0	<5.0
Chrysene	04-025	µg/kg	<5.0	<5.0
Benzo(b)&(k)fluoranthene	04-025	µg/kg	<10	<10
Benzo(a)pyrene	04-025	µg/kg	<5.0	<5.0
Indeno(1,2,3-cd)pyrene	04-025	µg/kg	<5.0	<5.0
Dibenz(a,h)anthracene	04-025	µg/kg	<5.0	<5.0
Benzo(g,h,i)perylene	04-025	µg/kg	<5.0	<5.0
Total PAHs (as above)	04-025	µg/kg	<100	<100
Surrogate 1 Recovery	04-025	%	101	93
Surrogate 2 Recovery	04-025	%	93	90
Surrogate 3 Recovery	04-025	%	88	84
Date Extracted	04-025	-	25/11/2004	25/11/2004
Date Analysed	04-025	-	26/11/2004	26/11/2004
Organochlorine Pesticides				
Aldrin	04-023	ug/kg	<1.0	<1.0
alpha-BHC	04-023	ug/kg	<1.0	<1.0
beta-BHC	04-023	ug/kg	<1.0	<1.0
gamma-BHC (Lindane)	04-023	ug/kg	<1.0	<1.0
delta-BHC	04-023	ug/kg	<1.0	<1.0
cis-Chlordane	04-023	ug/kg	<1.0	<1.0
trans-Chlordane	04-023	ug/kg	<1.0	<1.0

Issue Date: 13 December 2004

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Batch Number: A04/0963

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2
Client Reference:	-	-	PCQ35	PCQ49
Date Sampled:	-	-	0-0.5A	0-0.5A
Analysis Description	Method	Units		
<i>p,p'</i> -DDD	04-023	ug/kg	<1.0	<1.0
<i>p,p'</i> -DDE	04-023	ug/kg	<1.0	<1.0
<i>p,p'</i> -DDT	04-023	ug/kg	<1.0	<1.0
Dieldrin	04-023	ug/kg	<1.0	<1.0
<i>alpha</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0
<i>beta</i> -Endosulfan	04-023	ug/kg	<1.0	<1.0
Endosulfan Sulphate	04-023	ug/kg	<1.0	<1.0
Endrin	04-023	ug/kg	<1.0	<1.0
Endrin ketone	04-023	ug/kg	<1.0	<1.0
Endrin aldehyde	04-023	ug/kg	<1.0	<1.0
Heptachlor	04-023	ug/kg	<1.0	<1.0
Heptachlor epoxide	04-023	ug/kg	<1.0	<1.0
Hexachlorobenzene	04-023	ug/kg	<1.0	<1.0
Methoxychlor	04-023	ug/kg	<1.0	<1.0
Surrogate Recovery	04-023	%	85	80
Date Extracted	04-023	-	29/11/2004	29/11/2004
Date Analysed	04-023	-	30/11/2004	30/11/2004
Organophosphate Pesticides				
Azinphos-methyl	04-024	ug/kg	<50	<50
Bromophos-ethyl	04-024	ug/kg	<50	<50
Carbophenothion	04-024	ug/kg	<50	<50
Chlorfenvinphos	04-024	ug/kg	<50	<50
Chlorpyrifos	04-024	ug/kg	<50	<50
Chlorpyrifos-methyl	04-024	ug/kg	<50	<50
Diazinon	04-024	ug/kg	<50	<50
Demeton-S-methyl	04-024	ug/kg	<50	<50
Dimethoate	04-024	ug/kg	<50	<50
Dichlorvos	04-024	ug/kg	<50	<50
Ethion	04-024	ug/kg	<50	<50
Fenitrothion	04-024	ug/kg	<50	<50
Fenthion	04-024	ug/kg	<50	<50
Fenamiphos	04-024	ug/kg	<50	<50
Malathion	04-024	ug/kg	<50	<50
Methidathion	04-024	ug/kg	<50	<50

Issue Date: 13 December 2004

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Batch Number: A04/0963

Project: Port of Hay Point

Laboratory Reference:	-	-	/1	/2
Client Reference:	-	-	PCQ35	PCQ49
Date Sampled:	-	-	0-0.5A	0-0.5A
Analysis Description	Method	Units		
Monocrotophos	04-024	ug/kg	<50	<50
Omethoate	04-024	ug/kg	<50	<50
Parathion	04-024	ug/kg	<50	<50
Parathion-methyl	04-024	ug/kg	<50	<50
Phosalone	04-024	ug/kg	<50	<50
Pirimiphos-methyl	04-024	ug/kg	<50	<50
Prothiofos	04-024	ug/kg	<50	<50
Surrogate Recovery	04-024	%	85	80
Date Extracted	04-024	-	29/11/2004	29/11/2004
Date Analysed	04-024	-	30/11/2004	30/11/2004
Organotins				
Monobutyl tin	04-026	µgSn/kg	<0.50	<0.50
Dibutyl tin	04-026	µgSn/kg	<0.50	<0.50
Tributyl tin	04-026	µgSn/kg	<0.50	<0.50
Surrogate 1 Recovery	04-026	%	75	110
Date Extracted	04-026	-	2/12/2004	2/12/2004
Date Analysed	04-026	-	2/12/2004	2/12/2004
Subcontract Analysis				
Particle Size Distribution			See comment	See comment
Total Organic Carbon			See comment	See comment
Nutrients			See comment	See comment

Method	Method Description
04-004	Moisture Content by Gravimetric, %
04-001	Metals in Solids by ICP
04-002	Mercury in Solids by CVAAS, mg/kg
04-021	TPH C6-9 & BTEX in Solids, mg/kg
04-020	Total Petroleum Hydrocarbons in Solids, mg/kg
04-025	Low Level Poly Aromatic Hydrocarbons in Solids, mg/kg
04-023	*Low Level Organochlorine Pesticides in Solids, mg/kg
04-024	*Organophosphate Pesticides in Solids, mg/kg
04-026	*Organotins in Solids, µgSn/kg

Issue Date: 13 December 2004

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Batch Number: A04/0963

Project: Port of Hay Point

Result Comments

[<] Less than

[INS] Insufficient sample for this test

[NA] Test not required

* Method not covered by NATA terms of accreditation.

Solid sample results are reported on a dry weight basis.

TOC and nutrient analysis was subcontracted to Sydney Analytical Laboratories (NATA Number 1884); see attached SAL report for job number SAL15374B.

PSD analysis was subcontracted to GHD LongMac (NATA Number 679); see attached GHD LongMac report for job number 2113283.



Batch Number: A04/0963

Project: Port of Hay Point

QUALITY ASSURANCE REPORT

Comments:

RPD = Relative Percent Deviation

[NT] = Not Tested

[N/A] = Not Applicable

'#' = Spike recovery data could not be calculated due to high levels of contaminants

Acceptable replicate reproducibility limit or RPD: Trace elements +/- 10%

Organic analyses +/- 25%

Recommended matrix spike recovery limits: Trace elements 80-120%

Organic analyses 70-130%

When levels outside these limits are obtained, an investigation into the cause of the deviation is performed before the batch is accepted or rejected, and results are released.



REPORT OF ANALYSIS

Laboratory Reference: A04/0963

Client: GHD Pty Ltd
Level 2, 100 Goondoon St
Gladstone QLD 4680

Contact: Joanna Lee

Order No: 4113829
Project: Port of Hay Point
Sample Type: Sediment
No. of Samples: 2
Date Received: 23/11/2004
Date Completed: 8/12/2004

Laboratory Contact Details:

Client Services Manager: Maranda Parker
Technical Enquiries: Andrew Bradbury
Telephone: +61 7 3862 2510
Fax: +61 7 3862 2520
Email: maranda.parker@advancedanalytical.com.au

Attached Results Approved By:

Giovanni Agosti
Senior Inorganics Chemist

Ian Eckhard
Technical Director

Phalak Inthakesone
Senior Organics Chemist

Comments:

All samples tested as submitted by client.
All attached results have been checked and approved for release.
This is the Final Report and supersedes any reports previously issued with this batch number.
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FILE		
27 JAN 2005		
Name	Initial	Date



Nata Accredited Laboratory
Number: 15109

Issue Date: 13 December 2004

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**SYDNEY
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A.C.N. 003 614 695
A.B.N. 81 829 182 852

ANALYTICAL REPORT for:

ADVANCED ANALYTICAL AUSTRALIA

1/139 SANDGATE ROAD
ALBION QLD 4010

ATTN: ANDREW BRADBURY

JOB NO: SAL15374B
CLIENT ORDER: A04/0963
DATE RECEIVED: 24/11/04
DATE COMPLETED: 07/12/04
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 2

NATA Accredited Laboratory

Number: 1884



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Issued on 14/12/04
Lance Smith
(Chief Chemist)

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 2 of 4

ANALYTICAL REPORT

JOB NO: SAL15374B
CLIENT ORDER: A04/0963

SAMPLES	TOC %	TKN mg/kg	Total N mg/kg	NO3 mg/kg	NO2 mg/kg	NH4-N mg/kg
1 A04/0963/1	0.10	190	190	<0.5	<0.5	<0.5
2 A04/0963/2	0.18	240	240	<0.5	<0.5	<0.5
RTANK	<0.1	<20	<20	<0.5	<0.5	<0.5
MDL	0.1	20	20	0.5	0.5	0.5
Method Code	C48	WA14	CAL.	WA5	WA12	WA3
Preparation	P5	P5	P1	P1	P1	P1

**SYDNEY
ANALYTICAL
LABORATORIES**

Page 3 of 4

ANALYTICAL REPORT

**JOB NO: SAL15374B
CLIENT ORDER: A04/0963**

	SAMPLES	PO4 mg/kg
1	A04/0963/1	<0.5
2	A04/0963/2	<0.5
	BLANK	<0.5

MDL	0.5
Method Code	WA7
Preparation	P1

RESULTS ON DRY BASIS

ANALYTICAL REPORT

JOB NO: SAL15374B
CLIENT ORDER: A04/0963

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5 Sample dried, split and crushed to -150um
P1 Analysis performed on sample as received
C48 Total Organic Carbon - AS1289.4.1.1
WA14 Total Kjeldahl Nitrogen
 Determined by APHA 4500B
CAL. Determined by Calculation
WA5 Nitrate - 1:5 soil/water extract
 Determined by APHA 4500F
WA12 Nitrite - 1:5 soil/water extract
 Determined by APHA 4500F
WA3 Total Ammonia - 1:5 soil/water extract
 Determined by APHA 4500G
WA7 Phosphate - 1:5 soil/water extract
 Determined by APHA 4500F

A preliminary report was faxed on 07/12/04



Appendix L

Laboratory Reports – Inter-laboratory QA

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: GHD SERVICES PTY LTD	Laboratory	: ALS Environmental Brisbane	Page	: 1 of 4
Contact	: MS JOANNA LEE	Contact	: Michael Heery		
Address	: P O BOX 373 GLADSTONE QLD AUSTRALIA 4680	Address	: 32 Shand Street Stafford QLD Australia 4053	Work order	: EB0407920
Project	: 41/13829	Quote number	: EB20030015	Date received	: 6 Dec 2004
Order number	: - Not provided -			Date issued	: 21 Dec 2004
C-O-C number	: - Not provided -				
Site	: - Not provided -				
E-mail	: jlee@ghd.com.au	E-mail	: Michael.Heery@alsenviro.com	No. of samples	
Telephone	: (07)4972-6377	Telephone	: 61-7-32437222	Received	: 5
Facsimile	: (07)4972-6236	Facsimile	: 61-7-32437259	Analysed	: 5

This final report was issued on Tuesday, December 21, 2004 for the ALSE work order reference EB0407920 and supersedes any previous reports with this reference.

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- 1 Analytical results for samples submitted
- 1 Surrogate control limits

ALSE - QUALITY, SERVICE and TECHNOLOGY provided GLOBALLY**NATA Accredited Laboratory - 825**

The Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its scope of accreditation. This document shall not be reproduced except in full.

This document has been digitally signed by those names that appear on this report and are the authorised signatories. Digital signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory

Kim McCabe
Kim McCabe
Mat Taylor
Mat Taylor

Department

Inorganics - NATA 818 (Brisbane)
Industrial Minerals - NATA 818 (Brisbane)
Inorganics - NATA 818 (Brisbane)
Organics - NATA 818 (Brisbane)

Client : GHD SERVICES PTY LTD
Project : 41/13829

Work Order : EB0407920
ALS Quote Reference : EB20030015

Page Number : 2 of 4
Issue Date : 21 Dec 2004

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insufficient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI/EN38 (in the absence of specified USEPA limits).

Abbreviations: **CAS number** = Chemical Abstract Services number, **LOR** = Limit of Reporting. # Indicates a raised LOR, * Indicates failed Surrogate Recoveries.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes.

Analytical Results

Analytical Results	Client Sample ID :			PCQ 2 0-0.5R	PCQ 23 0-0.5R	PCQ 24 0-0.5R	PCQ 25 0-0.5R	PCQ 27 0-0.5R
	Sample Matrix Type / Description :			SOIL / PULP	SOIL / PULP	SOIL / PULP	SOIL / PULP	SOIL / PULP
	Sample Date / Time :			29 Nov 2004 15:00	29 Nov 2004 15:00	29 Nov 2004 15:00	29 Nov 2004 15:00	29 Nov 2004 15:00
	Laboratory Sample ID :			EB0407920-001	EB0407920-002	EB0407920-003	EB0407920-004	EB0407920-005
	Analyte	CAS number	LOR					
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon		0.02	%	0.07	0.07	0.09	0.03	0.05

Client : GHD SERVICES PTY LTD
Project : 41/13829

Work Order : EB0407920
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Analytical Results				Client Sample ID :	PCQ 2 0-0.5R	PCQ 23 0-0.5R	PCQ 24 0-0.5R	PCQ 25 0-0.5R	PCQ 27 0-0.5R
				Sample Matrix Type / Description :	SOIL / SOIL	SOIL / SOIL	SOIL / SOIL	SOIL / SOIL	SOIL / SOIL
				Sample Date / Time :	29 Nov 2004 15:00	29 Nov 2004 15:00	29 Nov 2004 15:00	29 Nov 2004 15:00	29 Nov 2004 15:00
				Laboratory Sample ID :	EB0407920-001	EB0407920-002	EB0407920-003	EB0407920-004	EB0407920-005
Analyte	CAS number	LOR	Units						
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		0.1	%	19.5	15.0	21.0	23.1	18.9	
EP090: Organotin Compounds									
Tributyltin	56573-85-4	0.2	µgSn/kg	<0.2	<0.2	1.3	<0.2	<0.2	
EP090S: Organotin Surrogate									
Tripropyltin		0.1	%	70.3	70.6	72.4	80.4	63.0	

Client : GHD SERVICES PTY LTD
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Surrogate Control Limits

The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedure 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 herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Matrix Type: SOIL		Surrogate Control Limits	
Method name	Analyte name	Lower Limit	Upper Limit
EP090: Organotin Analysis			
EP090S: Organotin Surrogate	Tripropyltin		

**QUALITY CONTROL REPORT**

Client	: GHD SERVICES PTY LTD	Laboratory	: ALS Environmental Brisbane	Page	: 1 of 4
Contact	: MS JOANNA LEE	Contact	: Michael Heery		
Address	: P O BOX 373 GLADSTONE QLD AUSTRALIA 4680	Address	: 32 Shand Street Stafford QLD Australia 4053	Work order	: EB0407920
Project	: 41/13829	Quote number	: EB20030015	Date received	: 6 Dec 2004
Order number	: - Not provided -			Date issued	: 21 Dec 2004
C-O-C number	: - Not provided -				
Site	: - Not provided -				
E-mail	: jlee@ghd.com.au	E-mail	: Michael.Heery@alsenviro.com	No. of samples	
Telephone	: (07)4972-6377	Telephone	: 61-7-32437222	Received	: 5
Facsimile	: (07)4972-6236	Facsimile	: 61-7-32437259	Analysed	: 5

This final report was issued on Tuesday, December 21, 2004 for the ALSE work order reference EB0407920 and supersedes any previous reports with this reference.

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- 1 Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- 1 Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- 1 Matrix Spikes (MS); Recovery and Acceptance Limits

ALSE - QUALITY, SERVICE and TECHNOLOGY provided GLOBALLY**NATA Accredited Laboratory - 825**

The Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its scope of accreditation. This document shall not be reproduced except in full.

This document has been digitally signed by those names that appear on this report and are the authorised signatories. Digital signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory

Kim McCabe
Kim McCabe
Mat Taylor
Mat Taylor

Department

Inorganics - NATA 818 (Brisbane)
Industrial Minerals - NATA 818 (Brisbane)
Inorganics - NATA 818 (Brisbane)
Organics - NATA 818 (Brisbane)

Client : GHD SERVICES PTY LTD
 Project : 41/13829

Work Order : EB0407920
 ALS Quote Reference : EB20030015

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Quality Control Report - Laboratory Duplicates (DUP)

The quality control term **Laboratory Duplicate** refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.

- Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations: LOR = Limit of Reporting, RPD = Relative Percent Difference.*

* Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) 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%

Matrix Type: SOIL **Laboratory Duplicates (DUP) Report**

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EA055-103: Moisture Content						
EA055: Moisture Content - (QC Lot: 26247)				%	%	%
EB0407912-009	- Anonymous -	Moisture Content (dried @ 103°C)	0.1 %	22.0	20.1	9.0
EB0407912-016	- Anonymous -	Moisture Content (dried @ 103°C)	0.1 %	21.7	23.1	6.3
EP005: Total Organic Carbon						
EP005: Total Organic Carbon (TOC) - (QC Lot: 28764)				%	%	%
EB0407920-005	PCQ 27 0-0.5R	Total Organic Carbon	0.02 %	0.05	0.05	0.0
EP090: Organotin Analysis						
EP090: Organotin Compounds - (QC Lot: 26411)				µgSn/kg	µgSn/kg	%
EB0407920-001	PCQ 2 0-0.5R	Tributyltin	0.2 µgSn/kg	<0.2	<0.2	0.0

Client : GHD SERVICES PTY LTD
 Project : 41/13829

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Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

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 type is to monitor potential laboratory contamination. The quality control term **Laboratory Control Sample (LCS)** refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Abbreviations: LOR = Limit of reporting.

* Indicates failed QC. Refer to the Summary of all QC Outliers within the Interpretive Quality Control Report.

Matrix Type: SOIL

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

		Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery	Dynamic Recovery Limits	
					LCS	Low
Analyte name	LOR					
EP005: Total Organic Carbon						
EP005: Total Organic Carbon (TOC) - (QC Lot: 28764)		%	%	%	%	%
Total Organic Carbon	0.02 %	<0.02	----	----	----	----
		----	100	98.0	70	130
EP090: Organotin Analysis						
EP090: Organotin Compounds - (QC Lot: 26411)		µgSn/kg	µgSn/kg	%	%	%
Tributyltin	0.2 µgSn/kg	<0.2	----	----	----	----
		----	25	75.3	19	127

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 Project : 41/13829

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 ALS Quote Reference : EB20030015

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Quality Control Report - Matrix Spikes (MS)

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 type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQO's). 'Ideal' recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations: LOR = Limit of Reporting, RPD = Relative Percent Difference.*

* Indicates failed QC. Refer to the Summary of all QC Outliers within the Interpretive Quality Control Report.

					Matrix Spike (MS) Report			
					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
						MS	Low	High
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration				
EP090: Organotin Analysis								
EP090: Organotin Compounds - (QC Lot: 26411)				µgSn/kg	µgSn/kg	%	%	%
Tributyltin	EB0407920-002	PCQ 23 0-0.5R	.2 µgSn/kg	25	<0.2	61.7	20	130

INTERPRETIVE QUALITY CONTROL REPORT

Client	: GHD SERVICES PTY LTD	Laboratory	: ALS Environmental Brisbane	Page	: 1 of 5
Contact	: MS JOANNA LEE	Contact	: Michael Heery		
Address	: P O BOX 373 GLADSTONE QLD AUSTRALIA 4680	Address	: 32 Shand Street Stafford QLD Australia 4053	Work order	: EB0407920
				Amendment No.	:
Project	: 41/13829	Quote number	: EB20030015	Date received	: 6 Dec 2004
Order number	: - Not provided -			Date issued	: 21 Dec 2004
C-O-C number	: - Not provided -				
Site	: - Not provided -				
E-mail	: jlee@ghd.com.au	E-mail	: Michael.Heery@alsenviro.com	No. of samples	
Telephone	: (07)4972-6377	Telephone	: 61-7-32437222	Received	: 5
Facsimile	: (07)4972-6236	Facsimile	: 61-7-32437259	Analysed	: 5

This Interpretive Quality Control Report was issued on Tuesday, December 21, 2004 for the ALS work order reference EB0407920 and supersedes any previous reports with this reference.

This report contains the following information:

- 1 Analysis Holding Time and Preservation Compliance
- 1 Quality Control Type Frequency Compliance
- 1 Summary of all Quality Control Outliers
- 1 Brief Method Summaries

Client : GHD SERVICES PTY LTD
 Project : 41/13829

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 ALS Quote Reference : EB20030015

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Interpretive Quality Control Report - Analysis Holding Time and Preservation

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time and preservative are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL **Analysis Holding Time and Preservation**

Method		Date Sampled	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?	
EP005: Total Organic Carbon									
Pulp Bag PCQ 2 0-0.5R, PCQ 24 0-0.5R, PCQ 27 0-0.5R		PCQ 23 0-0.5R, PCQ 25 0-0.5R,	29 Nov 2004	21 Dec 2004	Not Extracted		21 Dec 2004	28 May 2005	Pass
EP090: Organotin Analysis									
Soil miscellaneous glass jar PCQ 2 0-0.5R, PCQ 24 0-0.5R, PCQ 27 0-0.5R		PCQ 23 0-0.5R, PCQ 25 0-0.5R,	29 Nov 2004	9 Dec 2004	13 Dec 2004	Pass	9 Dec 2004	18 Jan 2005	Pass

Client : GHD SERVICES PTY LTD
 Project : 41/13829

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Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL **Frequency of Quality Control Samples**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	2	20	10.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP005: Total Organic Carbon	1	5	20.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP090: Organotin Analysis	1	5	20.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP005: Total Organic Carbon	1	5	20.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP090: Organotin Analysis	1	5	20.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP005: Total Organic Carbon	1	5	20.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP090: Organotin Analysis	1	5	20.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP090: Organotin Analysis	1	5	20.0	5.0	ALS QCS3 requirement

Client : GHD SERVICES PTY LTD
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Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

- 1 For all matrices, no RPD recovery outliers occur for the duplicate analysis.
- 1 For all matrices, no method blank result outliers occur.
- 1 For all matrices, no laboratory spike recoveries breaches occur.
- 1 For all matrices, no matrix spike recoveries breaches occur.

- 1 For all matrices, no surrogate recovery outliers occur.

Outliers : Analysis Holding Time and Preservation

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time and Preservation'.

EP005: Total Organic Carbon								
Pulp Bag PCQ 2 0-0.5R, PCQ 24 0-0.5R, PCQ 27 0-0.5R	PCQ 23 0-0.5R,	29 Nov 2004	21 Dec 2004	Not Extracted		21 Dec 2004	28 May 2005	Pass
	PCQ 25 0-0.5R,							

- 1 No holding time and preservation outliers occur.

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- 1 No frequency outliers occur.

Client : GHD SERVICES PTY LTD
Project : 41/13829

Work Order : EB0407920
ALS Quote Reference : EB20030015

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Method Reference Summary

The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedure 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 herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Matrix Type: PULP

Method Reference Summary

Analytical Methods

EP005 : Total Organic Carbon - In-house. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO₂) is automatically measured by infra-red detector.

Matrix Type: SOIL

Method Reference Summary

Preparation Methods

GEO30 : Dry and Pulverise (up to 100g) -

ORG35 : Organotin Sample Preparation - In house. 20g sample is spiked with surrogate and leached in a methanol:acetic acid:UHP water mix and vacuum filtered. Reagents and solvents are added to the sample and the mixture tumbled. The butyltin compounds are simultaneously derivatised and extracted. The extract is further extracted with petroleum ether. The resultant extracts are combined and concentrated for analysis.

Analytical Methods

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EP090 : Organotin Analysis - (USEPA SW 846 - 8270D) Prepared sample extracts are analysed by GC/MS coupled with high volume injection, and quantified against an established calibration curve.

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32 Shand Street, Stafford, QLD 4053
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Analysis Request / Chain of Custody Form

Company:	GHD Pty Ltd	Purchase Order Number:	
Contact:	Joanna Lee	Project Identification:	41/13829
Postal Address:	PO Box 373 Gladstone Q 4680	Quotation Reference:	N/A.
Phone:	4972 6377	Results Required By:	10/12/04
Fax:	4972 6236	Special Requirements:	
E-mail:	jlee@ghd.com.au		
Result Format (Please Circle):	☒ FAX ☐ MAIL	ALS Batch Number:	
Electronic:	☒ EXCEL ☐ PDF	(Lab Use Only)	

ALS Environmental
Brisbane
Work Order

METALS -Water Samples	TOTAL (USEPA 3005) /FILTERED
(Please Circle)	ICPAES / ICPMS

[illegible][illegible]

Relinquished By		Received By	
Name: Joanna Lee	Date: 29/11	Name: K. CURTAIN <i>K.C.</i>	Date: 6/12/04
Company: GHO Pty Ltd	Time: 9am	Company: Australian Laboratory Services	Time:



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Document Status

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		Name	Signature	Name	Signature	Date
A	MGW	J Lee T Koskela	TVK	J Keane	JAK	28/01/05
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