Section 7 Sampling and Analytical Plan

7.2.2 Quality Control Sample Collection Methodology

Sediment concentrations often have high spatial variation across small areas. To minimise the high spatial variation (both vertically and horizontally), composite samples were collected at each sediment sampling location. Composite samples are generally used to estimate the average concentration of the individual samples that make up the composite.

Multiple grabs for a composite sample were mixed thoroughly using a stainless steel trowel in a stainless steel bowl to homogenise the sample. Sample jars were filled with the sediment mixture ensuring zero head space, to reduce the loss of volatile compounds.

7.3 Analytical Plan - Groundwater and Sediment

7.3.1 Schedule of Analysis

The analytical schedule for the groundwater and sediment investigation is presented below. The chemicals of concern assessed as part of the current groundwater and sediment program, were chemicals selected based on previous analytical results to allow an assessment of potential risk of harm and form a subset of the chemicals of concern for the nominated areas in Section 5.

Refer to Table 2a, 2b and 2c for adopted investigation levels.

Groundwater and QA/QC Analytical Schedule

	Metals*	TPH/BTEX	PAH	VCH**
Primary samples	18	18	18	9
QC Samples:				
Duplicates	2	2	2	1
Triplicates	1	1	1	-
Trip spikes	-	1	-	-
Trip blanks	1	1	1	1
Rinsate blank	1	1	1	1
TOTAL SAMPLES	**23**	**24**	**23**	**12**

* Metals/metalloids – arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc

**VCH – Volatile Chlorinated Hydrocarbons

Sediment and QA/QC Analytical Schedule

	Metals	Arsenic
Composite samples	5	5
TOTAL SAMPLES	**5**	**5**

*** Metals – cadmium, chromium, copper, lead, mercury, nickel, and zinc**

Section 7 Sampling and Analytical Plan

7.3.2 Sediment Sampling Schedule

Location	Contaminants of Concern	Rationale
Area C – LMC		
Stormwater Culvert	TPH, BTEX, metals, PAHs, VOCs	Targeted up-gradient background concentrations in culvert south of LMC building. .
Area F - North West Corner and Ballast Recycling Facility		
Retention Pond	TPH, BTEX, metals	Targeted sediment in retention pond, southern boundary of Area F.
Area G – North East Portion Including Former Rail Reclamation and Recycling Area		
Swamp Sediment near well 317	TPH, BTEX, PAHs, metals	Targeted swampy area near previously broken water main to investigate impact, if any potential migration to surface water. Sediment sample to be collected from swamp.
Freshwater Creek outfall	TPH, BTEX, metals, PAHs, VOCs	Targeted off site migration of on site contaminants. The outfall is interconnected with off site water, so may not give an accurate indication of Chullora Railway Workshops impact.
Sydney Water Land Corridor		
Canal sediment	TPH, BTEX, metals, PAHs, VOCs	Targeted sediment from mouth of stormwater canal adjacent to Pollution Control Plant potentially impacted from all site activities. It is noted that this area has recently been disturbed by Sydney Water as part of their current program of works in this area. The results may not, therefore, be representative of sediment accumulation in this area.

Section 7 Sampling and Analytical Plan

7.3.3 Groundwater Sampling Schedule

Well ID	Contaminants of Concern	Rationale
Area A – BMC		
112 (1.5 – 4m)	TPH, BTEX, metals, PAHs	Down-gradient of the BMC, also targeted boiler bottom ash used to level site. Alternate location 202 (12-15m)
306 (1.25-4.25 m)	TPH, BTEX, metals, PAHs, VOCs	Down-gradient of the BMC, targeted evidence of contaminant off site migration from contaminated fill, waste oil and solvents from workshop, component caustic washing. Alternate locations 305 (2.5-5.5m) and 304 (1.5-4.5 m).
Area B – DEMC		
107b (1.5 – 6 m)	TPH, BTEX, PAHs, metals, pesticides	Targeted contaminated fill, garden maintenance, diesel UST.
121 (1.5-4.5 m)	TPH, BTEX, PAHs, metals, VOCs	Targeted diesel engine maintenance activities, chemical store, component caustic washing. Previously identified contamination. Alternate location 313 (1-4 m) or 311 (1-4.25m). (MW121 most impacted previously).
317 (1-4 m)	TPH, BTEX, PAHs, metals	Targeted swampy area near previously broken water main to investigate impact, if any potential migration to surface water.
Area C – LMC		
MW01 (1.5-3m)	TPH, BTEX, PAHs, metals, VOCs	Targeted the Pollution Control Plant and wash bay. Alternate location 205 (7.5-10.5m), MW05 (0.8-3.8m) located close to surface water.
148 (2-5m)	TPH, BTEX, PAHs, metals	Up gradient of the site, close to the LMC for background concentrations. Alternate location 206 (9-15m) (deeper well – limited options).
Area D – EMC		
MW2 (2-5m)	TPH, BTEX, metals, PAHs, VOCs	Chemical Storage (including hazardous) located in south west corner
MW02 (0.5-2m), MW03 (2.2-5.2m)	TPH, BTEX, metals, PAHs, VOCs	Targeted wash bay and former waste route to Pollution Control Plant, located close to surface water.
MW12 (2-5 m)	TPH, BTEX, metals, PAHs, VOCs	Targeted electrical maintenance activities inside building. Alternate location MW13 (2.3-5.3m), previous identified contamination
MW207 (8-9.5m)	TPH, BTEX, metals, PAHs, VOCs	Up-gradient boundary of the site. Targeted background concentrations in car park. Note this is a deep well.
Area E – Load Box and Refuelling Facility		
MW1CS, MW1CD	TPH, BTEX, metals, PAHs, VOCs	Targeted refuelling activities, to confirm presence of PSH and measure apparent thickness. Sample MWCS1 only, if no PSH present. Current data is sufficient, no further sampling required.
Area F - North West Portion Including Ballast Recycling Facility		
301 (1.5-4.5m) and 303 (1-4m)	TPH, BTEX, metals, PAHs	Targeted down-gradient boundary for off site migration. Alternate locations 302 (1.7-4.7m), 401 (7-10m) and 104 (3-6m)
Area G - North East Portion Including Former Rail Reclamation and Recycling Area		
132 (1-3m)	TPH, BTEX, metals	Targeted ballast stockpile. Alternate location 135 (3-6m).
125 (0.5-5.5 m)	TPH, BTEX, metals	Targeted down-gradient boundary for off site migration. Alternate locations 309 (0.5-4m), 203 (6-9m).
Area H - South East Portion		
MW403 (4.5-7.5m)	TPH, BTEX, metals	Targeted contaminated fill and general railway line impacts. Also potentially representative of background groundwater quality.

Note: Depth of screened section for each well is listed in brackets following well

Section 8 Fieldwork

8.1 Investigation Program

The fieldwork was undertaken by Norm Ronis, a Senior Technician (URS) following a briefing by Erin Corby and Andrew Holloway (URS) who attended the site walkover visit in April 2007.

The field sampling program was undertaken during the period 17 to 20 July 2007 with a Railway Protection Officer (MKB) present during the period 17– to 19 July 2007. A summary of the groundwater wells located and sampled is provided below. For further information the field data sheets should be referenced (Appendix A).

Sampling Plan Well ID	Wells Sampled	Works Completed
Area A – BMC		
112 (1.5 – 4m)	0/2	Alternate location 202 (12-15m). No wells located in this area. Possibly covered with ballast or destroyed.
306 (1.25-4.25 m)	1/1	Located and sampled.
Area B – DEMC		
107b (1.5 – 6 m)	1/1	107b not located. As discussed with RailCorp 107a sampled instead.
121 (1.5-4.5 m)	1/1	Located and sampled.
317 (1-4 m)	1/1	Located and sampled. Well monument and pipe is in bad condition (possibly knocked by car/truck).
Area C – LMC		
MW01 (1.5-3m)	1/1	Located and sampled.
148 (2-5m)	0/2	Alternate location 206 (9-15m) (deeper well – limited options). No wells located in this area. Possibly covered or destroyed.
Area D – EMC		
MW2 (2-5m)	1/1	Located and sampled.
MW02 (0.5-2m), MW03 (2.2-5.2m)	1/1 1/1	MW02 was dry. Well ID 205 (Area C) sampled as additional location. MW03 located and sampled.
MW12 (2-5 m)	1/1	Located and sampled.
MW207 (8-9.5m)	1/1	Located and sampled.
Area E - Load Box and Refuelling Facility		
MW1CS, MW1CD	1/1	MW1CS 4cm of product. Not Sampled. MW1CD located and sampled.
Area F - North West Portion Including Ballast Recycling Facility		
301 (1.5-4.5m) and 303 (1-4m)	0/5	Alternate locations 302 (1.7-4.7m), 401 (7-10m) and 104 (3-6m) No wells located in this area. Possibly covered with ballast or destroyed.
Area G - North East Portion Including Former Rail Reclamation and Recycling Area		
132 (1-3m)	0/2	Alternate location 135 (3-6m). No wells located in this area. Possibly covered with ballast/railway tracks or destroyed.
125 (0.5-5.5 m)	0/3	Alternate locations 309 (0.5-4m), 203 (6-9m). No wells located in this area. Possibly covered with ballast/ railway tracks or destroyed.
Area H - South East Portion		
MW403 (4.5-7.5m)	0/1	No wells located in this area. Possibly covered with ballast or destroyed.

Section 8 Fieldwork

Summary of the sediment sample locations below

Location	Sampled	Comments
Area C – LMC		
Stormwater Culvert	0/1	Not sampled due to access issues.
Area F - North West Corner and Ballast Recycling Facility		
Retention Pond	1/1	Sediment sample collected. Retention pond had a low water level.
Area G – North East Corner		
Swamp Sediment near 317	1/1	Sediment sample collected.
Freshwater Creek outfall	0/1	Sediment sample collected but not representative and not analysed. Sample from creek bank not channel bed.
Sydney Water Land Corridor		
Canal sediment	1/1	Sediment sample collected. Large scale earthworks in area of Sydney Water Land corridor.

8.1.1 Water Level Measurements

Measurement of water levels was undertaken prior to purging of the wells and recorded on the field data sheets (Appendix A). The depth at which groundwater was intercepted during the July 2007 investigation ranged from 1.25m to 6.02m below surface ground level.

The results of the ESA highlighted that the general groundwater flow direction is to the north heading towards the Cooks River Canal.

8.1.2 Groundwater Purging and Sampling

Purging of monitoring wells was undertaken using dedicated disposable bailers. Purging was continued until stable water parameters (pH, electrical conductivity, redox, temperature and dissolved oxygen) were achieved or the well was purged dry. Purging details were recorded on the field data sheets (Appendix A). The field parameters and a physical description of the samples were also recorded on the field data sheets:

- The groundwater measured as part of this investigation had a pH range from 6.12 to 8.30, which is neutral to slightly alkaline;
- The redox potential for the groundwater ranged between -41 and 186 mV. The groundwater would be described as slightly reducing; and
- The electrical conductivity (EC) ranged between 483uS/cm and 16.08 mS/cm indicating the groundwater across majority of the site to be saline.

Section 9 Results of Investigations

9.1 Previous Investigations

9.1.1 Sub-Surface Conditions

The general stratigraphy encountered during previous investigations is summarised below:

General Stratigraphy

Depth (metres)	Soil Description
0 – 0.3	Concrete
0 – 1.2	Fill: Gravel, ash, silty clay, gravelly clay and clayey sands. Isolated locations of deeper fill have either been identified during investigations or are historically known to be present across the site, including, crushed sandstone extended to 6.0 m in one location, MW15 on the eastern end of the EMC (Area D) and reported pits in the BMC (Area A) have been backfilled with fill to 15 m.
0.8 – 4.0	Alluvial Clay: Interbedded with alluvial gravelly clays and residual clays, grey / brown medium clays with some ironstone inclusions
4.0 – 6.0	Shale: Moderate to extremely weathered to 6.0 m, with some laminate lenses. Shale extended from 1.0 metre below ground surface in Area C

With the exception of ballast stockpiles, areas of deep fill include: the western (possible backfilling of boiler test pits) and north eastern sides of BMC building (Area A); an area north of the XPT shed (Area A); and the south east side of the LMC workshop (Area C). Site fill appears to thicken north of the site, possibly due to embankment works to the canalised section of the Cooks River. Ash deposits reflect this apparent thickening to the north of the Site.

Ash deposits appear thickest to the east of the BMC building (Area A), north of the historic compressor plant (Area G) and beneath the DEMC workshop (Area B), extending west to the materials store (Area F). The only ash deposits identified south of the Sydney Water land are in the central portion of the LMC workshop. There are only thin accumulations of fill in the former rail reclamation and recycling area (Area G).

The ash material across the site is made up of loose, black, coarse sandy to fine gravel sized carbonaceous material with some fine gravel sized fragments of brick, unburnt coal and occasional glass. The remainder of fill is predominantly clayey, light brown to red brown in colour, similar to the natural soils. It also, however, contains variable amounts of ash, ballast, sandstone or shale material. In addition the clay fill appears reworked and does not show laminations as in the underlying natural material.

9.1.2 Soil Results

Available historical soil results from the site have been assessed against the current screening level guidelines as presented in Section 6 of this report. The results of chemical analysis for soil samples are presented in Tables 8 to 13 (inclusive). Generally, soil contamination is limited to the upper fill materials and comprises heavy metals and TPH.

Elevated concentrations of various heavy metals (in particular lead, cadmium and zinc) are widespread in fill materials across the site.

Section 9 Results of Investigations

Localised TPH contamination has been identified in surface soils to the north west of the BMC building (Area A), around the EMC (Area D) and LMC (Area C) workshops in the vicinity of a former gas–fired boiler and pollution control plant.

Elevated VCH concentrations (tetrachloroethene and trichloroethene) are limited to the wash bay annex in the EMC (Area D) and the boiler house at the LMC (Area C). Dieldrin was detected in fill within the garden area of the DEMC (Area B). This was not, however, detected at concentrations above guideline levels. No other OC or OP pesticides have been detected.

9.1.3 Groundwater Results

Available historical groundwater and surface water data for the site have been assessed against the current guideline levels as presented in Section 6 of this report. The results of chemical analysis for groundwater samples are presented in Tables 3 to 6 (inclusive). The main areas of Site groundwater contamination have been identified as the Load Box and refuelling facility (Area E), the pollution control plant nearby the EMC and LMC buildings (Areas D and C).

PSH has previously been detected at the Load Box and refuelling facility (well ID MWCS1)

Localised TPH (both volatile and heavy end fractions) contamination is present at various locations across the site, including the west of the BMC building and to the east of the former flammable goods store (Area A), LMC (Area C), and the Load Box and refuelling facility (Area E);

Metals including copper, lead and zinc were reported at concentrations in excess of adopted groundwater guidelines in shallow groundwater across the site. Around the EMC (Area D) copper, nickel, cadmium, chromium and zinc groundwater concentrations exceeded adopted guidelines. Copper and zinc concentrations were also recorded above adopted guidelines in surface water collected from the Cooks River Canal to the north of the site.

Various VCH concentrations above site adopted guideline (1.1-dichloroethene, cis-1.2-dichloroethene, tetrachloroethene) were detected in groundwater near the pollution control plant (Area C), the wash bay area (Area D) and the load box and refuelling facility (Area E).

Chlorinated solvents (and likely break-down products of chlorinated solvents such as trichloroethene) were present in shallow groundwater to the west of the BMC building (Area A) and to the south of the DEMC workshop (Area B). The main source area is considered to be the degreasing pit to the west of the BMC building, while in-ground waste pits to the south of the DEMC building are also considered a potential source. Chlorinated solvents (tetrachlorethene, trichloroethene and break-down products) were also detected in shallow groundwater to the north east corner of the Area D EMC, building down-gradient of the effluent collection pits.

PAH compounds (including naphthalene and total PAHs) have been detected in groundwater above the site adopted guidelines at: the BMC building (Area A) and former flammable goods store (east of former Maintenance Building) in the north-eastern portion of Area A; to the north and south of the LMC workshop (Area C); and also at the Load Box and refuelling facility (Area E).

9.1.4 Sediment Results

Limited investigations (nine sediment samples) of sediment quality in the stormwater drainage system at the EMC (Area D) have been undertaken. The results of chemical analysis for sediment samples are presented in Table 7a. Elevated concentrations of heavy metals above the adopted ISQG-high screening levels guidelines were detected in the majority of sediment samples. Although no guidelines are available, concentrations of TPH varied from 260 mg/kg to 9280 mg/kg (predominantly in the C_{10}-C_{36} fraction). Low concentrations of BTEX, PAHs and VCHs have been detected at a number of locations. The presence of contaminants in the sediment of the stormwater system indicates the potential for off-site migration of these contaminants through the stormwater system.

Section 9 Results of Investigations

9.2 July 2007 Groundwater Investigation

A summary of the groundwater analytical results for the July 2007 ESA are presented in Tables 3 to 6 (inclusive) and laboratory reports are included in Appendix B

9.2.1 Metals and Metalloids

Area A - BMC

Groundwater sampled from monitoring well 306 (Area A – BMC) contained zinc at a concentration (10 µg/L) in excess of the site adopted screening guideline of 8 µg/L.

Area B - DEMC

Groundwater sampled from monitoring wells 107a, 121 and 317 (Area B – DEMC) contained copper and zinc concentrations in excess of the site adopted screening guidelines.

Area C - LMC

Groundwater sampled from monitoring well 205 (Area C – LMC) contained zinc at a concentration in excess of the site adopted screening guideline.

Area D - EMC

Groundwater sampled from monitoring wells MW01 (Area D – EMC) contained copper at a concentration in excess of the site adopted screening guideline.

Groundwater sampled from monitoring wells 207, MW2, MW12, and MW03 (Area D – EMC) all contained copper and zinc concentrations in excess of the site adopted screening guidelines.

Groundwater sampled from monitoring well MW12 (Area D – EMC) contained nickel at a concentration in excess of the site adopted screening guideline.

Groundwater sampled from monitoring wells MW12 and MW03 (Area D – EMC) contained cadmium at concentrations in excess of the site adopted screening guideline.

Area E – Refuelling Facility

Groundwater sampled from monitoring well MWCD1 (Area E – Refuelling Facility) contained chromium, copper, nickel and zinc at concentrations in excess of the respective site adopted screening guidelines.

9.2.2 TPH

The highest concentration of TPH was detected in the sample collected from monitoring well 205 (Area C – LMC) 195,440 µg/L (predominantly in the C_6-C_9 fraction). The detected TPH in the volatile fraction (C_6-C_9 fraction) is considered represent the volatile chlorinated compounds (VCHs) detected in this sample.

TPH (predominantly the C_{10}-C_{14} and C_{15}-C_{28} fractions) was detected in the following wells: 121 (Area B – DEMC) 1150 µg/L: 317 (Area B – DEMC) 170 µg/L; 205 (Area C – LMC) 440 µg/L, MW12 (Area D – EMC) 100 µg/L; MW01 (Area D – EMC) 2770 µg/L; and MW03 (Area D – EMC) 70 µg/L.

9.2.3 BTEX

Groundwater collected from all the wells sampled contained BTEX at concentrations below the respective laboratory detection limits.

Section 9 Results of Investigations

9.2.4 PAHs

The individual PAH, naphthalene was detected in groundwater sampled from monitoring well 205 (Area C – LMC) at a concentration of 1.4 µg/L. This concentration was below the adopted screening guideline level. All other groundwater samples collected from the wells sampled contained PAHs at concentrations below the respective laboratory detection limits (LORs).

9.2.5 VOCs

VOC analytes were detected (only VCHs detected) in the following wells:

Monitoring well 306 (Area A – BMC): 1,1-dichloroethane (35 µg/L) and 1,1,1-trichloroethane (37 µg/L). Concentrations were below the adopted screening level guidelines, where available.

Monitoring well 121 (Area B – DEMC): 1,1-dichloroethene (8 µg/L) and 1,1-dichloroethane (27 µg/L)). Concentrations were below the adopted screening level guidelines, where available.

Monitoring well 205 (Area C – LMC): vinyl chloride (12,700 µg/L), 1,1-dichloroethene (384 µg/L), trans-1,2-dichloroethene (207 µg/L), 1,1-dichloroethane (2,720 µg/L), cis -1,2-dichloroethene (93,800 µg/L), trichloroethene 1,920 µg/L and tetrachloroethene 22,400 µg/L. The concentrations of vinyl chloride (100µg/L), 1,1-dichloroethane (90 µg/L) and trichloroethene (330 µg/L) exceeded the Site adopted screening level guidelines.

Monitoring well MW03 (Area D – EMC): cis -1,2-dichloroethene (120 µg/L) and trichloroethene (12 µg/L). Concentrations were below the adopted screening level guidelines, where available.

Other groundwater samples collected contained VOCs at concentrations below the respective laboratory detection limits (LOR).

9.2.6 OC/OP Pesticides

OC/OP pesticide analytes were not detected at the only location analysed for pesticides (107a in Area B – DEMC) with all results below the laboratory detection limits.

9.3 July 2007 Sediment Investigation

A summary of the sediment analytical results are presented in Tables 7a and 7b and laboratory reports are included in Appendix B

Area F - North West Corner and Ballast Recycling Facility Retention Pond

Inorganics analytes were detected in the sediment sample collected including exceedences of the Site adopted guidelines for copper, lead and zinc.

TPH/BTEX, PAHs and VOCs were not detected in the sediment sample at concentrations above the respective laboratory detection limits (LORs).

Area G – North East Corner Swamp Sediment near Monitoring Well 317

Inorganics analytes were detected in the sediment sample collected including some exceedences of the Site adopted guidelines for copper, lead and zinc.

The individual PAH, pyrene was also detected in the sample at a concentration of 0.8 mg/kg, which was below the Site adopted ISQG-low screening level guideline.

TPH/BTEX, and VOCs were not detected in the sample collected at concentrations above the respective laboratory detection limits (LORs).

Section 9 Results of Investigations

Sydney Water Land Corridor - Canal Sediment

Inorganics analytes were detected in the sediment sample collected, including exceedences of the Site adopted guidelines for copper, lead and zinc.

The following individual PAHs were also detected in the sediment sample: benzo(b)fluoranthracene (0.6 mg/kg), fluoranthene (0.7 mg/kg) and pyrene (0.8 mg/kg). All PAH concentrations detected were below the respective ISQG-low screening level guidelines.

TPH (C_{15}-C_{36}) was detected (1,580 mg/kg) in the sediment sample. There are no available screening guideline levels for TPH in sediment.

BTEX, and VOCs were not detected in the sediment sample at concentrations exceeding the respective laboratory detection limits (LORs).

9.4 Analytical Data Validation

9.4.1 Previous Investigations

URS has not undertaken a detailed validation of the analytical data presented in the previous investigations. The approaches adopted by the consultants are, however, considered to be in general accordance with industry protocols and the individual consultants considered that the results were acceptable for use in the respective investigations. Some minor data non-conformance issues were noted by the respective consultants in their reports.

9.4.2 July 2007 Investigation

Groundwater samples from the Site were submitted to Australian Laboratory Services Pty Ltd (ALS) for analysis. ALS is NATA certified for the relevant analyses.

The analytical data, including both the field and laboratory quality control and assurance samples, has been evaluated by URS and the data validation is presented in Appendix C. Copies of the NATA certified laboratory reports are presented in Appendix B. Based on the QA/QC evaluation performed the following observations are noted:

- The number of field duplicate samples collected is 15%, which complies with the minimum number of duplicate samples recommended;
- A new disposable bailer was used for each monitoring well sampled;
- A field rinsate blank (QC02) was collected and all concentrations of contaminants analysed were below the respective laboratory detection limits;
- Field duplicate and triplicate (QC01 and QC100) sample results are considered to be within acceptable control limits;
- Laboratory duplicate results are considered to be within acceptable control limits; and
- ALS laboratory QA/QC systems including results for method blanks, matrix spikes and spike recoveries and surrogates were considered acceptable.

Based on the QA/QC evaluation completed by URS, the laboratory data is considered of a sufficient level of accuracy and precision for use in this assessment.

Section 10 Site Characterisation

This Site Characterisation of contamination is based on the available data collected by numerous environmental consultants from the Chullora Railway Workshops. The Site Characterisation is therefore, limited to the data available and may not provided complete coverage of the land defined by the Site boundaries. The details of the assessment data used for the Site Characterisation is listed below for each Area of the Site. In addition, some whole of Site chemical characterisation is provided. This whole of site characterisation is not discussed further in the individual Areas.

The Site Characterisation has been completed on the assumption that the site will continue to be used for on-going industrial/commercial land use (Section 6).

The Figures showing the locations of soil bores, groundwater wells and sediment samples are presented in Appendix D. The sample locations have not been transposed onto a composite Figure as survey details are not available for most of the locations, and therefore, any transposition of sample locations was considered likely to results in a loss of accuracy. The original consultants Figures have therefore been presented in Appendix D. For each sample result the consultant responsible for sample collection and the date of the investigation are listed in each table of results. Figure 2 presents the locations of groundwater monitoring wells and sediment locations where samples were collected during this (July 2007) assessment.

The previous and current results of chemical analysis are presented in Tables 3 to 13 (inclusive). The data have been compared against current guidelines as detailed in Section 6. The results are divided into the sub-areas of the site according to sample media as follows:

- Soil: Tables 8 to 13 (inclusive);
- Groundwater: Tables 3 to 6 (inclusive); and
- Sediment: Tables 7a and 7b.

It is noted that no Site Characterisation has been undertaken for the Sydney Water Land (Area I) as this is not part of the investigation area. Sampling locations that are located on Area I have been included on the adjacent potential contamination source Area which the sample location was selected to target.

10.1 Whole of Site Contamination Issues

Characterisation has been undertaken for each of the Site Areas as described in the following sections. There are, however, some contamination issues that are common to the whole Chullora Workshop Site. These are discussed together in this Section to minimise repetition in Site Area summaries.

Metal and metalloid concentrations in groundwater, predominantly chromium, copper, and zinc, but to a lesser extent arsenic, cadmium, lead and nickel exceed the adopted screening level guidelines across the Site. Concentrations of the metals and metalloids in groundwater are relatively consistent across the Site including up-gradient locations 206 and 207. It is considered that the concentrations of metals are representative of background (regional) concentrations in groundwater. This consideration is supported by the observation that there no significantly higher concentrations of metals/metalloids have been detected in groundwater sampled immediately adjacent to potential point sources. There is, however, the potential for the metals/metalloids identified within the soil/fill to leach and contribute to the metals detected in the Site groundwater. URS considers that the contribution from this source would, however, be low based on the concentrations of metals detected in the soil/fill and the expectation that the clay soil would adsorb metals and minimise the potential migration to groundwater.

Section 10 Site Characterisation

10.2 Area A: Bogie Maintenance Centre

Area	~ 33 000 m^2
Number of soil locations	17 soil bores
Soil sampling strategy achieved	Judgmental
Number of groundwater wells	9 wells
Groundwater sampling strategy achieved	Judgmental
Number of sediment samples	Nil
Key soil contamination identified	• TPH (C_{10}-C_{28}) exceeded the Site adopted screening level guidelines at three locations 111 (1.6-2.0 m), 112 (2.3-2.5 m) and 307A (1.4-1.5 m). Locations 111 and 307 were in the vicinity of a degreasing pit. The TPH at 112, was considered likely to be diesel fuel. CES reported that Rail Infrastructure Corporation personnel had indicated that an underground concrete waste water holding tank associated with the BMC workshop was the likely source of TPH detected at 112. It is noted that the adopted guideline level is conservative because it is applicable to sensitive land use.
Key groundwater contamination identified	• Metals/metalloids – considered to be representative of background conditions discussed in relation to the whole of site (Section 10.1) • TPH predominantly in the C_{10}-C_{28} fraction was detected in monitoring wells 111, 112 and 307. This corresponds to TPH detected in soil at these locations and is likely to representative of either a diesel or a waste oil source. The source of the TPH at locations 111 and 307 is likely to be the degreasing pit, and a waste water holding tank the source at 112. TPH and BTEX compounds were also detected in groundwater adjacent the flammable goods store located in the north eastern portion of the Area A. • PAHs were also detected in groundwater at locations 111p, 125 and 307 at concentrations that exceeded the Site adopted screening level guidelines. This corresponds to the same degreasing pit source as the TPH impact in the soil and groundwater at these locations. • VCHs, 1,1-dichloroethane and 1,1-dichloroethene were both detected in groundwater above the Site adopted screening level guidelines at location 307. The source of the VCHs is considered to be either components of, or break-down products of, chlorinated solvents disposed in the degreasing pit. It is noted that solvent odours and VCHs were detected in other Area A wells including locations 111, and 306although concentrations were less than the Site adopted screening guidelines, where available.
Data Gaps	Soil investigations to date have targeted potential sources, therefore area wide coverage has not been achieved (not a systematic grid). Identified soil and groundwater contamination at locations 111, 112 and 307 has not been delineated down-gradient or at depth.
Characterisation	TPH and VCH have been detected associated with identified point sources including a degreasing pit located within the western end of the BMC building, and an underground concrete waste water holding tank located in the BMC workshop.

Section 10 Site Characterisation

10.3 Area B: Diesel Engine Maintenance Centre

Area	~ 30 000 m^2
Number of soil locations	15 soil bores
Soil sampling strategy achieved	Judgmental
Number of groundwater wells	7 wells
Groundwater sampling strategy achieved	Judgmental
Number of sediment samples	Nil
Key soil contamination identified	No contaminants detected above the Site adopted screening level guidelines.
Key groundwater contamination identified	• Metals/metalloids – considered to be representative of background conditions discussed in relation to the whole of site (Section 10.1) • TPH (17 mg/L) predominantly in the C_{10}-C_{28} fraction was detected in monitoring well 121 in 2001. Concentrations detected prior (1999) and post this event (2007) have however been significantly lower at this location. The source of the TPH was considered to be from workshop located in the southern corner of the DEMC building. • VCHs, predominantly 1,1-dichloroethane (monitoring well 121) and cis-1,2-dichlororethene (monitoring well 317) were present in groundwater in the DEMC, although concentrations did not exceed the Site adopted screening level guidelines (where available). The source of the VCHs in location 121 is considered to be either associated with chlorinated solvents used for degreasing in the workshop.
Data Gaps	Investigations to date have targeted potential sources, therefore systematic investigation of the Area has not been achieved (not a systematic sampling grid). There has been no investigation of potential contamination within the vicinity of the 2 identified USTs.
Characterisation	The monitoring undertaken at monitoring well 121 indicated that the elevated concentrations of TPH in February 2001, appears to be an isolated event as subsequent analysis in May 2001 and in 2007 detected significantly lower concentrations. Also TPH has not been detected at elevated concentrations has not been detected in subsequent monitoring events at location 313, north of 121. Concentrations of VCHs present in the groundwater, although not above the Site adopted guideline levels (where available) indicates that chlorinated solvents used at the DEMC (assumed for degreasing purposes) have impacted Site groundwater either through historical disposal practices, or leaks/spills from storage areas.

Section 10 Site Characterisation

10.4 Area C: Locomotive Maintenance Centre

Area	~ 85 000 m^2
Number of soil locations	24 soil bores
Soil sampling strategy achieved	Judgmental
Number of groundwater wells	12 wells
Groundwater sampling strategy achieved	Judgmental
Number of sediment samples	1 sediment sample (located immediately down-gradient of Area in the Sydney Water land corridor (Area I))
Key soil contamination identified	• Metals/metalloids were detected at concentrations exceeding the Site adopted screening level guidelines at isolated locations. These included lead (sample location 205) and arsenic (sample location 315) adjacent the waste water treatment plant (formerly know as the Pollution Control Plant). The elevated concentration of arsenic was reported to be within gravel ash fill material. Copper (sample location 319) within clay fill was detected in the grassed area in the north-eastern portion of Area C. • TPH concentrations exceeded the conservative Site adopted screening level guidelines at three sample locations: 205, BH06, and SB18. Locations 205 and SB18 are in the vicinity of the waste water treatment plant and location 205 also contains elevated lead. Elevated concentrations were detected in both the volatile C_6-C_9 fractions and the semi-volatile C_{10}-C_{36} fraction. The source of the TPH was reported to be from leaks from the treatment plant. The identified TPH in BH06 was located in the vicinity of a former gas fired boiler facility and may be related to fuel oil used with this facility, prior to gas operation. • VCH, tetrachloroethene was detected at 730 mg/kg at one location SB18 (a well was installed at this location MW05, however this was dry). VCHs may also be the reason for the TPH C_6-C_9 present in 205 (soil not analysed for VCHs). There are no adopted guidelines for tetrachloroethene.
Key groundwater contamination identified	• Metals/metalloids – considered to be representative of background conditions discussed in relation to the whole of site (Section 10.1) • TPH was reported in monitoring well 205 in the C_6-C_9 fraction, this detection was from VCHs present in this sample. • TPH (C_{15}-C_{36} fraction) was detected in 2002 and 2007 at a concentration of 2 mg/L at monitoring well MW01 (BH06-soil). The source of TPH at this location was considered to be weathered diesel (based on review of chromatograms) and likely to be from the former gas-fired boiler (possible earlier fuel source) (as per soil contamination- BH06). • Significant VCHs were detected in the recent (2007) monitoring at monitoring well 205, with concentrations of tetrachloroethene and trichloroethene, and their break-down products exceeding the Site adopted screening level guidelines. Previous monitoring undertaken in 2001 did not detect VCHs at this location. It is considered that the VCHs present at 205 may be from a recent spill of VCHs in the vicinity of the waste water treatment plant, or migration of VCH for near-by sources.

Section 10 Site Characterisation

Data Gaps	Investigations to date have targeted potential sources, therefore systematic investigation of the Area has not been achieved (not a systematic sampling grid). Delineation of contaminants down-gradient of 205 and MW01 or at depth has not been undertaken. It is noted that groundwater from these locations may discharge into the adjacent stormwater channels located within 20 to 30 m of either of these wells. Confirmation of the VCH concentrations in 205, by resampling and analysis is considered appropriate, as this well was slow to recharge and contained some sediment.
Characterisation	Contamination predominantly (TPH and VCHs) has been detected in isolated locations adjacent to identified point sources, including the former degreasing operations on Area C and potentially Area D, waste water treatment plant and the former gas-fired boiler.

Section 10 Site Characterisation

10.5 Area D: Electrical Maintenance Centre

Area	~ 30 000 m^2
Number of soil locations	59 soil bores (15 locations [SB series] assessed only for VCHs)
Soil sampling strategy achieved	Judgmental and approximate systematic grid achieved
Number of groundwater wells	20 wells
Groundwater sampling strategy achieved	Judgmental
Number of sediment samples	9 sediment samples
Sediment sampling strategy achieved	Systematic sampling from accessible stormwater drain sumps
Key soil contamination identified	• Arsenic was detected at concentrations exceeding the Site adopted screening level guidelines at BH01, located at the western end of the EMC building. The source of the arsenic was not identified. • TPH (C_{10}-C_{36}) soil concentrations exceeded the conservative Site adopted screening level guideline at three locations: 138, BH12 and SB15. These locations are all down-gradient of the wash bay located in the north-east annex of the EMC building. Leaks or spills of waste effluent containing petroleum hydrocarbons from the washing facilities located in the washing bay are considered to be the likely source. • VCHs (predominantly tetrachloroethene) were detected at low concentrations at a number of soil samples across the EMC area. Although there are no Site adopted guidelines for VCHs in soils, the concentrations of tetrachloroethene detected exceeds some international screening level guidelines.
Key groundwater contamination identified	• Metals/metalloids – considered to be representative of background conditions discussed in relation to the whole of site (Section 10.1) • TPH predominantly in the C_{10}-C_{36} fraction was detected in monitoring wells 315, MW02, MW03, MW04, MW12 and MW14, located in the north-eastern corner of the site down-gradient of the wash bay and effluents pits. This area was consistent with the area where TPH detected in soil samples. The TPH detected in MW01 (C_6-C_9), is associated with the VCHs detected in this groundwater. • Detect concentrations of VCHs were detected in groundwater in the north-eastern of the Area, down-gradient of the washing bay and effluent pits. The concentration of 1,1-dichloroethene, detected in MW9, exceeded the Site adopted screening level guideline. The source of the VCHs is considered to be leaks and spills associated with the washing bay and effluent pits.

Section 10 Site Characterisation

Key Sediment contamination identified	• Metals (cadmium, copper, lead, nickel, silver and zinc) concentrations in the sediments collected from the stormwater pits around Area D exceeded the ISQG-high screening level guidelines for the majority of locations. • TPH concentrations (predominantly C_{10}-C_{36}) varied from 260 mg/kg to 9500 mg/kg in sediment samples. • Toluene, ethyl benzene and xylenes were also detected in four of the sediment samples. • VCHs (tetrachloroethene, triochloroethene and associated break-down products) were also detected in some sediment samples. The presence metals, TPH.TEX and VCHs in the sediment indicated the potential for these contaminants to migrate off-site through the stormwater system and potentially enter Cooks River.
Data Gaps	Based on the sampling strategy and densities achieved by the various investigations undertaken on the site, it is considered that Area D (EMC) has been adequately characterised within the Area D boundary with respect to the identified areas and chemical of concern. However, the extent of migration from Area D has not been fully delineated.
Characterisation	Elevated concentrations of TPH and VCHs have been identified in the soil and groundwater in the north-eastern corner of Area D, down-gradient of the wash bay and effluent collection pits. Based on the presence of the stormwater drainage channel located along the eastern boundary of Area D, contaminated groundwater may discharge to the stormwater channel or the channel may form a preferential pathway for the migration of contaminants off-site.

Section 10 Site Characterisation

10.6 Area E: Locomotive Load Box, Weighbridge & Fuel/Oil Facility

Area	~ 5000 m^2
Number of soil locations	15 soil bores
Soil sampling strategy achieved	Judgmental
Number of groundwater wells	12 well locations, however, there are shallow and deep wells located at 5 of these locations.
Groundwater sampling strategy achieved	Judgmental
Number of sediment samples	Nil
Key soil contamination identified	• TPH predominantly in the fraction C_{10}-C_{36} (although C_6-C_9 was detected in MWCD1 – possibly VCHs based on previous results at the Site) exceeding the conservative adopted screening level guidelines at five locations (151, MWCS1 and MWCD1, BH1, BH2 and MWCS5). Sources of petroleum hydrocarbons, considered to be diesel, are considered to be leaks and/or spills from the above ground diesel storage tanks, and the fuel dispensing area. The results of chemical analysis indicated that contamination is primarily limited to the fill material (top 1 m) and that vertical migration of the TPH appears to be limited by the residual clay soils. However, odours, staining and low PID readings were noted at depths (>2 m) where analytical results were less than laboratory detection limits. • Total PAHs exceeding the adopted screening level guidelines were detected in MWCD1. It is considered that the PAHs are associated with diesel fuels and is from the same source as discussed above.
Key groundwater contamination identified	• Metals/metalloids – considered to be representative of background conditions discussed in relation to the whole of site (Section 10.1) • TPH predominantly in the C_{10}-C_{36} fraction was detected in shallow wells MW1 and MW3 (now decommissioned), MWCS1, MWCs4, MWCS5, and deeper wells, MWCD1, MWCD4, MWCD5 and MWCD6. Phase separated hydrocarbons (PSH) were identified in MWCD1 and MW1. Although TPH was detected in the deeper wells, the concentrations in the deeper groundwater were lower than shallow groundwater. The TPH, as per the soil, was considered to be diesel from spills and/or leaks associated with the storage or dispensing of fuels. Fingerprinting work on the PSH indicated that the fuel was diesel and was likely to have been in the environment for 20 to 30 years. • PAHs were also detected in groundwater collected from monitoring wells MW1, MW3, and MWCD6. It is considered, as per the soil contamination, that the PAHs are associated with the diesel fuel. • VCHs predominantly tetrachlorethene and trichloroethene (and break-down products) were detected in MWCD5 and MWCD6. Tetrachloroethene was detected in MWCD5 and concentrations exceeding the adopted screening level guidelines. A source of the VCHs was not determined.

Section 10 Site Characterisation

Data Gaps	The sampling undertaken has focused on the identified sources, with sampling undertaken to the north, south and west. Limited sampling has been undertaken in the vicinity of the load box and weighbridge. The full extent of the identified contamination has not been delineated, although concentrations at wells located away from the sources are at significantly lower concentrations. VCHs (tetrachloroethene, trichloroethene and break-down products) in groundwater was detected in the recently installed wells (MWCD5 and MWCD6), the source and extent of VCHs has not been characterised in Area E.
Characterisation	The main source of diesel fuels detected in the soil and groundwater in Area E appears to be the above ground diesel storage tanks and the fuel dispensing area, with PSH noted in the well adjacent to the fuel dispensing area and elevated concentrations in wells surrounding this area. It appears that spills and/or leaks of diesel fuels have been primarily limited to the surface 1 to 2 m of fill/soil because of the residual clay soils, however, petroleum hydrocarbon odours, staining and PID responses in the soil as well as TPH in deeper groundwater have been detected.

Section 10 Site Characterisation

10.7 Area F: North Western Portion including Ballast Recycling Depot

Area	~ 44 000 m^2
Number of soil locations	10 soil bores
Soil sampling strategy achieved	Judgmental
Number of groundwater wells	5 wells
Groundwater sampling strategy achieved	Located along the northern (down-gradient) boundary
Number of sediment samples	1 sample in the retention pond of the ballast recycling area
Key soil contamination identified	No contaminants detected above the relevant screening level guidelines.
Key groundwater contamination identified	• Metals/metalloids – considered to be representative of background conditions discussed in relation to the whole of site (Section 10.1)
Key sediment contamination identified	Arsenic, copper and lead exceeded the ISQG-low screening level guidelines, indicating that there has been some accumulation of these metals in the sediment of the retention pond. However, it is unlikely that sediment from the pond will migrate into off-site waterways. Although the accumulation of sediments with elevated metal concentrations does indicate that sediment generated from stormwater run-off may potentially transport contaminants off-site into waterways.
Data Gaps	Very limited coverage by either soil or groundwater investigations. The sources of contamination are whole of area issues involving the importation of used ballast for recycling cover the majority of this area. No investigation has been undertaken in the south-eastern corner of this area which contains the two buildings used for storage of equipment and documents. Although this area has a low potential to host significant contamination, because of the limited sampling completed in this area, there remains the potential for unidentified contamination to be present.
Characterisation	Based on the available data no contamination has been identified that would preclude the use of this area for industrial land use.

Section 10 Site Characterisation

10.8 Area G: North Eastern Portion including Former Rail Reclamation Area

Area	~ 80 000 m^2
Number of soil locations	14 soil bores
Soil sampling strategy achieved	Systematic, on large grid (> 50 m grid spacing).
Number of groundwater wells	8 wells
Groundwater sampling strategy achieved	Located along the northern (down-gradient), eastern and southern boundary of the Area. The northern and eastern boundaries are also the boundaries of the Site.
Number of sediment samples	1 sediment sample (swamp near well 307)
Key soil contamination identified	No contaminants detected above the relevant screening level guidelines.
Key groundwater contamination identified	• Metals/metalloids – considered to be representative of background conditions discussed in relation to the whole of site (Section 10.1)
Key sediment contamination identified	Arsenic, mercury, nickel and zinc exceeded the ISQG-low and copper and lead marginally exceeded the ISQG-high screening level guidelines. Although sediment from this swamp location is unlikely to migrate to off-site waterway, it indicates that sediment generated from stormwater run-off may potentially transport contaminants off-site into waterways.
Data Gaps	Very limited coverage by either soil and groundwater investigations, however, no point sources of contamination have been identified within this area. The sources of contamination area whole of area issues involving fill material covering the area and rail recycling activities undertaken over large portions of this area. Although this area has a low potential to host significant contamination, because of the limited sampling completed in this area, there remains the potential for unidentified contamination to be present.
Characterisation	Based on the available data no contamination has been identified that would preclude the use of this area for industrial land use.

Section 10 Site Characterisation

10.9 Area H: South Eastern Portion

Area	~ 41 000 m^2
Number of soil locations	2 soil bores
Soil sampling strategy achieved	Judgmental
Number of groundwater wells	1 well
Groundwater sampling strategy achieved	Judgmental
Number of sediment samples	Nil
Key soil contamination identified	No contaminants detected above the relevant screening level guidelines.
Key groundwater contamination identified	• Metals/metalloids – considered to be representative of background conditions discussed in relation to the whole of site (Section 10.1)
Data Gaps	Very limited coverage by either soil or groundwater investigations, however, no point sources of contamination have been identified within this area. The sources of contamination area whole of area issues involving fill material covering the area and rail recycling activities undertaken over large portions of this area. Although this area has a low potential to host significant contamination, because of the limited sampling completed in this area, there remains the potential for unidentified contamination to be present.
Characterisation	Based on the available data no contamination has been identified that would preclude the use of this area for industrial land use.

Section 11 Conclusions and Recommendations

11.1 Conclusions

A whole of site Environmental Site Assessment (ESA) has been completed for the Chullora Railway Workshops by URS. The ESA primarily involved the review of 16 environmental reports previously prepared for the Site, a Site inspection and limited sampling of sediment and groundwater.

Based on the data presented in the previous environmental reports, combined with the observations made during the Site inspection and the additional chemical data collected during the recent sampling investigation, this ESA report provides a comprehensive summary of the activities undertaken during the history of use of the Site that have had the potential to result in contamination of the Site soils, groundwater and/or sediment.

Available analytical data has been tabulated and assessed against current screening level guidelines to provide a complete characterisation of the Site's contamination profile. This includes consideration of the overall sampling strategy achieved by the investigations and the associated data gaps.

The Site characterisation identified a number of contamination issues that are present on the site. These are discussed in Section 10. In general, the sampling strategy achieved, with the exception of Area D (EMC) was judgmental and targeted identified potential sources. Although judgemental sampling strategies are more likely to identify the areas with the highest potential to host contamination there remain large areas of the Site that have not been assessed to date.

The identified contamination was found to be associated with known areas of concern. This was to be expected given the largely judgmental sampling strategies.

A common source of contamination (predominantly TPH and VCHs) across the Site related to the cleaning/degreasing of components prior to and/or during maintenance activities being undertaken and the subsequent management/disposal of the waste water. This has resulted in TPH impact, from the removal of oils and greases, from the component washing and solvent impact from the degreasers used. Historically chlorinated solvents such as trichloroethene or tetrachloroethene have been used for degreasing/cleaning metal components. Therefore, petroleum hydrocarbons and VCHs (predominantly trichloroethene, tetrachloroethene and their associated break-down products) have been found in the soil and groundwater in the vicinity of these degreasing operations.

The other major source of contamination present on the site is the fuel storage and refuelling area (Area E) where leaks and/or spills associated with facility have resulted in contamination of the soil and groundwater with petroleum hydrocarbons. Other smaller sources of contamination are discussed in Section 10. To a large degree although contamination has been identified at a number of sources the extent of the contamination has not been fully delineated.

In addition to the contamination identified from on-site sources, metal/metalloid concentrations in groundwater across the Site exceed the adopted screening level guidelines. As the metal/metalloid concentrations are relatively consistent across the Site including up-gradient locations, it is considered that the metal/metalloid concentrations are representative of background (regional) conditions. This is supported by the fact that no significantly higher concentrations of metals/metalloids have been detected adjacent to potential on-site point sources. There is, however, the potential for the metals/metalloids identified within the soil/fill to leach and contribute to the metals/metalloids detected in the Site groundwater.

Although the Site characterisation can only be considered as preliminary, based on the predominantly judgmental sampling strategy, and the large areas of the site that have not been assessed, the results of the combined investigations have not identified contamination that would preclude the on-going heavy industrial use of the Site. However, as VCHs are present in both soil and groundwater there is the potential for the emission of VCH vapours. If vapours were to accumulate within work areas such as buildings or sub-surface excavations, these may pose a risk to site workers. Although vapour diffusion modelling was undertaken by Dames and Moore (2000), the results of this modelling are not considered to be currently valid. This is based on the higher concentrations of VCHs identified in the groundwater

post the modelling, particularly vinyl chloride. In addition the model and approach used for the modelling are outdated and do not reflect currently accepted practice.

In assessing potential risk to the off-site environment, evidence of off-site migration of sediment or groundwater has not been identified, however, as stated above the extent of identified contamination has not been delineated in all areas of contamination. It is noted that the migration of contamination is considered to be minimised because of the clay soils present on the site (likely retardation of contaminants), and the distance between sources and the down-gradient site boundary. However, it is noted that there are a number of stormwater channels that intersect the Site that may form preferential pathways for the migration of contaminants to off-site waterways. The potential for identified contaminated groundwater in north-eastern corner of Area D and the north-western portion of Area C to migrate into the stormwater channel that runs between Area C and D exists. In addition, there is the potential for organic contaminants, particularly TPH and VCHs to migrate along fractures within the clay and shale.

Although sediments have not been extensively assessed across the Site, the investigation undertaken in Area D indicates that there is the potential for contaminated sediments within stormwater drains to accumulate at concentrations that exceed the screening level guidelines across the Site. Although these guideline levels are not applicable within constructed stormwater systems, as there are no ecosystems present, the presence of contaminated sediments within the stormwater system indicates that there is the potential for these sediments to migrate off-site during periods of high rainfall. Removal of contaminated sediments would minimise the potential for these sediments to migrate off-site.

11.2 Recommendations

It is recommended that groundwater be re-sampled in well 205 to confirm the high concentrations of TPH and VCHs detected during the current investigation, as concentrations were significantly lower during previous monitoring at this location.

With respect to assessment of potential environmental risk, as a number of wells formerly located along the northern (down-gradient) boundary were not found (either destroyed or covered), it is recommended that additional groundwater wells be installed and groundwater samples analysed along the northern (down-gradient) boundary of the Site. The wells, to the extent possible should try to be located down-gradient of identified contamination. It is also recommended that the wells be installed in locations where they will not be destroyed/damaged by Site activities and allow easy access for future monitoring events.

Although the identified contamination does not preclude the on-going industrial use of the Site, URS recommends a management strategy be adopted by RailCorp to ensure that the identified contamination is appropriately managed. This adopted strategy would depend on the current and proposed future use of the site, but may involve, one or more of the following:

- Delineation of identified contamination, to ensure that the contamination has not migrated off-site. A monitoring program may also be required to confirm the understanding of the groundwater contamination;
- Assessment for the potential for VCH vapours to accumulate within work environments;
- Remediation of identified source and contaminated soil/groundwater. If the contamination has not been delineated, this may involve a staged remediation program. Remediation works should be undertaken using an appropriate Remedial Action Plan including a validation program; and/or
- Implement an Environmental Management Plan (EMP) to ensure that future workers on the Site are aware of the presence of identified and potentially unidentified contamination and the associated precautions that should be undertaken when undertaking sub-surface works. The EMP should also address mitigation of soil/sediments entering the stormwater system and potentially off-site.

Section 11 Conclusions and Recommendations

Based on the persistence of phase separated hydrocarbon in the vicinity of the refuelling facility (Area E), it is recommended that the existing EMP for Area E be continued to be implemented, as well as active remediation methods to remove the identified contamination.

As the two underground storage tanks (USTs) located in Area B are currently not in use (one already decommissioned), it is recommended that the USTs and associated infrastructure be removed and contaminated soil be chased out and validated.

If redevelopment and/or divestment of the Site, or part of, is proposed, it is likely that further systematic sampling of soil, sediment and groundwater will be required to fully characterise the Site to a sufficient degree of confidence. The density of sampling required will predominantly be depended on the future land use.

Section 12 References

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Section 13 Limitations

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Rail Corporation NSW (RailCorp) and only those third parties who have been authorised in writing by URS to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 1 December 2006 (proposal number 03038426).

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between January 2007 and April 2008 and is based on the conditions encountered and information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

This environmental assessment addresses the likelihood of environmental liability resulting from past and current known uses of the property and the immediately adjacent properties. This investigation is limited to visual observation of surface conditions at the property, interview(s) with personnel and a review of reports and literature, and limited groundwater and sediment sampling and laboratory analysis. Opinions and recommendations contained in this report are based upon data provided by representatives of Rail Corporation, NSW, information gained during site inspections, employee interviews, information obtained from government authorities' records and other third parties. This approach reflects current professional practice for Phase 1 and 2 environmental site assessments. No warranty or guarantee of property conditions is given or intended.

This investigation addresses the likelihood of hazardous substance contamination resulting from past and current known uses of the subject facility. But given the limited and mutually agreed scope of work, URS does not guarantee that hazardous materials do not exist at the subject property. Similarly, a property which appears to be unaffected by hazardous materials at the time of our assessment may later, due to natural phenomena or human intervention, become contaminated.

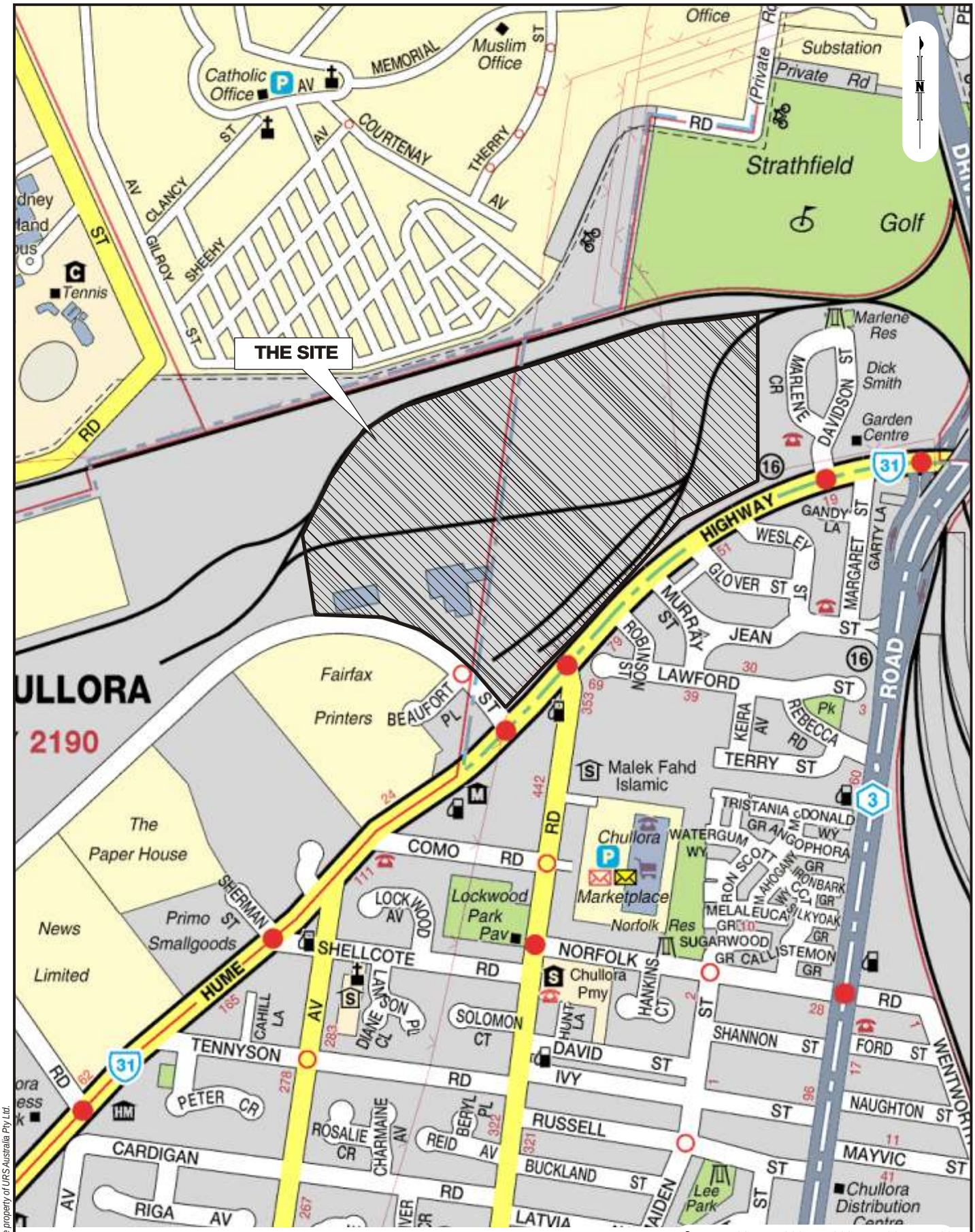
As a result, certain conditions such as those listed hereafter may not have been revealed:

- naturally occurring toxins in the sub-surface soils, rocks, water or the toxicity of the on-site flora;
- toxicity of substances common in current habitable environments such as stored household products, building materials and consumables;
- sub-surface contaminant concentrations that do not exceed present regulatory standards but may exceed future standards; and/or
- unknown site contamination such as dumping or accidental spillage which may occur following the site visit by URS.

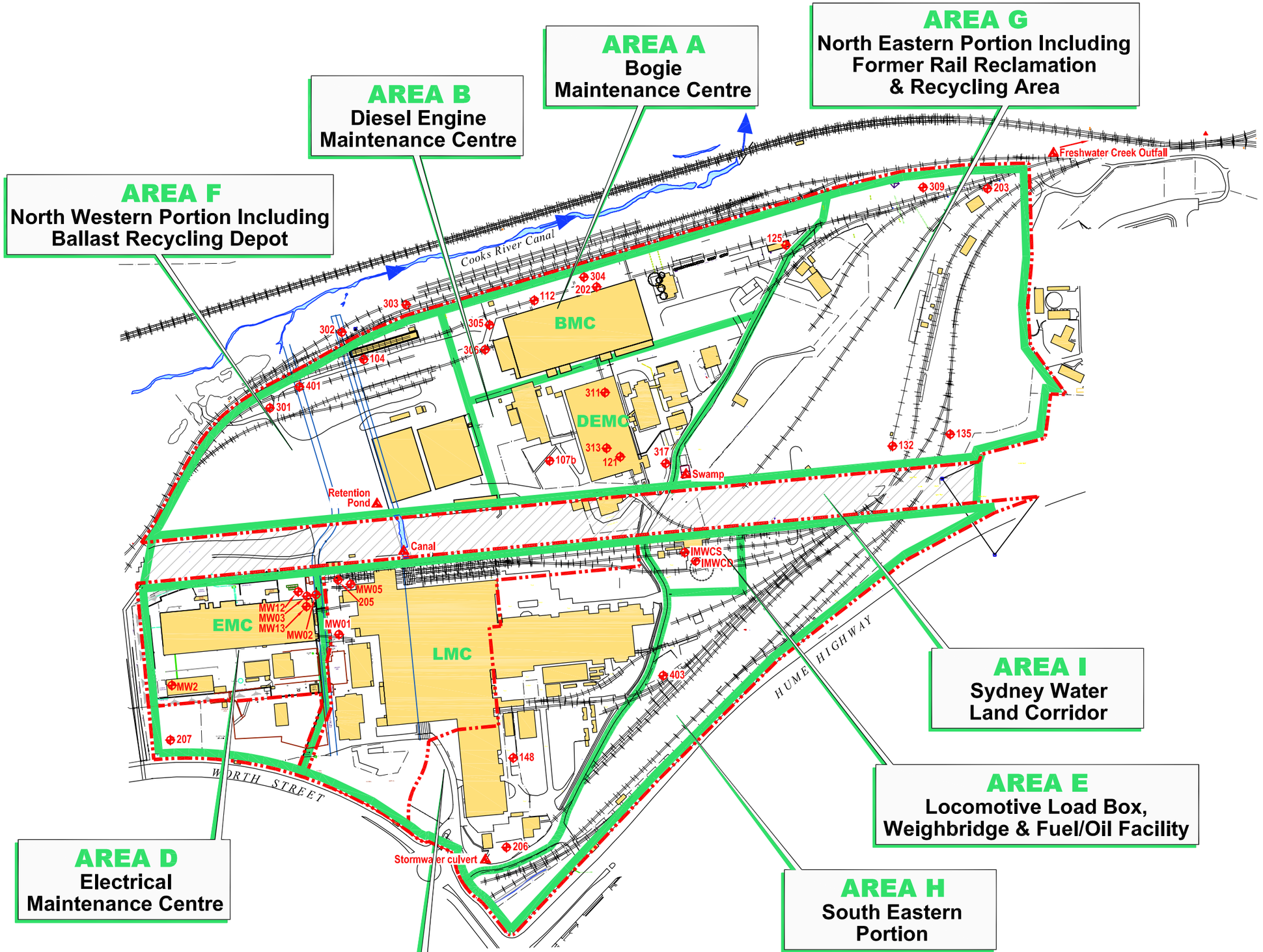
URS cannot be responsible for changes in conditions that occur after the date of this report, whether they are hazardous or otherwise.

Opinions and recommendations presented herein apply to the site existing at the time of our investigation and cannot necessarily apply to site changes of which URS is not aware and has not had the opportunity to evaluate. URS makes no determination or recommendation regarding a decision to provide or not to provide financing with respect to the site.

Figures



Client: RAIL CORPORATION OF NSW	Project: ENVIRONMENTAL ASSESSMENT OF CHULLORA RAILWAY WORKSHOPS	Title: **SITE LOCATION PLAN**
URS	Drawn: SP; Approved: NR; Date: 10/10/2007; Job No.: 43217612; File No. 43217612.001.cdr	Figure: **1**; Rev. A; A4



LEGEND

- SITE BOUNDARY
- FENCE
- BUILDING FOOTPRINT
- INVESTIGATION AREAS
- SYDNEY WATER EASEMENT
- DIRECTION OF WATER FLOW
- 317 — PROPOSED GROUNDWATER SAMPLE LOCATION
- Swamp — PROPOSED SEDIMENT SAMPLE LOCATION

Note: This Microstation Drawing originally surveyed in ISG Coordinates, has been translated to to MGA 56 coordinates

0 100 200

1:4000 (metres)

Source: Rail Infrastructure Corporation,Dwg Ref. CV0068092, Rev A, Date of Survey, April 2002, Dwg dated 21/06/2002

Drawn: HC	Approved: EC	Date: 24/05/2007
Job No.: 43217612	File No.: 43217612-007.dwg	

Client
RAIL CORPORATION
OF NSW

Project
ENVIRONMENTAL ASSESSMENT OF
CHULLORA RAILWAY WORKSHOPS

Title
SITE OPERATIONAL AREAS
AND SAMPLING LOCATIONS

Figure: 2 | Rev. A | A3

URS

Tables

Table 1 - Chullora Railway Workshops
Monitoring Well Register

Well ID	Company	Year	Well Condition (URS 2007)	Well Condition (EPU 2006)	Well Condition (CES 2002)
Area A: Bogie Maintenance Centre (BMC)					
110	DM	1999	Did Not Inspect	OK	OK
111	DM	1999	Did Not Inspect	OK	-
112	DM	1999	Could Not Identify	Could Not Identify	OK
125	DM	1999	Could Not Identify	Could Not Identify	-
202	DM	1999	Could Not Identify	Could Not Identify	-
304	DM	2000	Could Not Identify	Could Not Identify	-
305	DM	2000	Could Not Identify	Destroyed / Lost	Destroyed / Lost
306	DM	2000	OK	OK	OK
307	DM	2000	Did Not Inspect	OK	Destroyed / Lost
308	DM	2000	Did Not Inspect	Could Not Identify	OK
Area B: Diesel Engine Maintenance Centre (DEMC)					
107	DM	1999	107a OK (107b Could not identify)	OK	-
121	DM	1999	OK	No Access To Building	OK
311	DM	2000	Did Not Inspect	No Access To Building	OK
312	DM	2000	Did Not Inspect	OK	OK
313	DM	2000	Did Not Inspect	No Access To Building	OK
316	DM	2000	Did Not Inspect	OK	Could Not Identify
317	DM	2000	OK	OK	OK
Area C: Locomotive Maintenance Centre (LMC)					
143	DM	1999	Could Not Identify	Could Not Identify	-
148	DM	1999	Could Not Identify	Could Not Identify	-
149	DM	1999	Could Not Identify	Could Not Identify	OK, but damaged. New Gatic Required
205	DM	1999	OK	Did Not Inspect	OK
206	DM	1999	Could Not Identify	Could Not Identify	OK, but damaged. New Gatic Required
315	DM	1999	Could Not Identify	Did Not Inspect	OK
318	DM	2000	Could Not Identify	Could Not Identify	-
319	DM	2000	Could Not Identify	Could Not Identify	-
320	DM	2000	Could Not Identify	Could Not Identify	-
MW01	URS	2001	OK	OK	-
MW05	URS	2002	OK	Did Not Inspect	NA
MW06	URS	2002	Did Not Inspect	Did Not Inspect	NA
Area D: Electrical Maintenance Centre (EMC)					
207	DM	1999	OK	OK	OK
314	DM	1999	Did Not Inspect	Did Not Inspect	Damaged / Destroyed
MW1	ERM	2005	Did Not Inspect	Did Not Inspect	NA
MW2	ERM	2005	OK	OK	NA
MW3	ERM	2005	Did Not Inspect	No Access To Building	NA
MW4	ERM	2005	Did Not Inspect	Did Not Inspect	NA
MW5	ERM	2005	Did Not Inspect	Did Not Inspect	NA
MW6	ERM	2005	Did Not Inspect	No Access To Building	NA
MW7	ERM	2005	Did Not Inspect	OK	NA
MW8	ERM	2005	Did Not Inspect	OK	NA
MW9	ERM	2005	Did Not Inspect	Did Not Inspect	NA
MW10	ERM	2005	Did Not Inspect	OK	NA
MW11	ERM	2005	Did Not Inspect	OK	NA
MW12	ERM	2005	OK	No Access To Building	NA
MW13	ERM	2005	OK	OK	NA
MW14	ERM	2005	Did Not Inspect	Did Not Inspect	NA
MW15	ERM	2005	Did Not Inspect	OK	NA
MW02	URS	2002	OK - DRY	Could Not Identify	NA
MW03	URS	2002	OK	Could Not Identify	NA
MW04	URS	2002	Did Not Inspect	Could Not Identify	NA
Area E: Load Box and Refuelling Facility					
150	DM	1999	Did Not Inspect	OK	OK
MW1	RIC	2004	Destroyed	Destroyed	NA
MW3	RIC	2004	Decommissioned	Decommissioned	NA
MW4	RIC	2004	Decommissioned	Decommissioned	NA
MWCD1	Coffey	2005	OK	OK	NA
MWCS1	Coffey	2005	OK	OK	NA
MWCD2	Coffey	2005	OK	OK	NA
MWCD3	Coffey	2005	OK	OK	NA
MWCD4	Coffey	2005	OK	OK	NA
MWCS4	Coffey	2005	OK	OK	NA
MWCD5	Coffey	2006	OK	OK	NA
MWCS5	Coffey	2006	OK	OK	NA
MWCD6	Coffey	2006	OK	OK	NA
MWCS6	Coffey	2006	OK	OK	NA
MWCS7	Coffey	2006	OK	OK	NA
MWCS8	Coffey	2006	OK	OK	NA
Area F: North Western Portion, Including Ballast Recycling Centre					
104	DM	1999	Could Not Identify	Could Not Identify	-
301	DM	2000	Could Not Identify	Could Not Identify	-
302	DM	2000	Could Not Identify	Could Not Identify	-
303	DM	2000	Could Not Identify	Could Not Identify	-
401	DM	2000	Could Not Identify	Could Not Identify	-
Area G: North Eastern Portion Including Former Rail Reclamation Area					
132	DM	1999	Could Not Identify	Could Not Identify	-
135	DM	1999	Could Not Identify	Could Not Identify	-
154	DM	1999	Could Not Identify	Could Not Identify	-
203	DM	1999	Could Not Identify	Could Not Identify	-
204	DM	1999	Could Not Identify	Could Not Identify	-
309	DM	2000	Could Not Identify	Could Not Identify	-
310	DM	2000	Could Not Identify	Could Not Identify	-
402	DM	2000	Could Not Identify	Could Not Identify	-
Area H: South Eastern Portion					
403	DM	2000	Could Not Identify	Could Not Identify	-

Notes:

	Existence of monitoring well has been confirmed by Environmental Projects Unit (August 2006)
NA	Monitoring well not yet installed.
-	Monitoring well not included in investigation program.

Table 2a
Adopted Investigation Levels - Soil
Chullora Railway Workshops ESA

Analyte	Units	ANZECC 2000 [1]	NSW EPA [2]	Adopted IL
TPH				
TPH (C6-C9 Fraction)	mg/kg	-	65	65
TPH (C10-C14 Fraction)	mg/kg	-	-	-
TPH (C15-C28 Fraction)	mg/kg	-	-	-
TPH (C29-C36 Fraction)	mg/kg	-	-	-
Total TPH (C10-C40 Fraction)	mg/kg	-	1000	1000
BTEX				
Benzene	mg/kg	-	1	1
Toluene	mg/kg	-	130	130
Ethylbenzene	mg/kg	-	50	50
m- & p-Xylene	mg/kg	-		-
o-Xylene	mg/kg	-		-
Total Xylenes	mg/kg	-	25	25
PAH				
Pyrene	mg/kg	-	-	-
Benzo(a)pyrene	mg/kg	5	1	5
Total PAH	mg/kg	100	20	100
PHENOL				
Phenol	mg/kg	42,500	-	42,500
Total Phenolics	mg/kg	-	-	-
Heavy Metals				
Arsenic	mg/kg	500	-	500
Cadmium	mg/kg	100	-	100
Chromium	mg/kg	500	-	500
Copper	mg/kg	5000	-	5000
Lead	mg/kg	1500	300	1500
Mercury	mg/kg	75	-	75
Nickel	mg/kg	3000	-	3000
Zinc	mg/kg	35000	-	35000
Organochlorine Pesticides (OC)				
DDD+DDT+DDE	mg/kg	1000	-	1000
Aldrin + Dieldrin	mg/kg	50	-	50
Chlordane	mg/kg	250	-	250
Heptachlor	mg/kg	50	-	50
Polychlorinated biphenyls				
Polychlorinated biphenyls	mg/kg	50	-	50
VCHs				
1,1,2-Trichloroethane	ug/L	-	-	-
1,2,3-Trichlorobenzene	ug/L	-	-	-
1,2,4-Trichlorobenzene	ug/L	-	-	-
Trichlorobenzene (total)	ug/L	-	-	-
1,2-Dichlorobenzene	ug/L	-	-	-
1,3-Dichlorobenzene	ug/L	-	-	-
1,4-Dichlorobenzene	ug/L	-	-	-

Notes:

1) National Environment Protection (Assessment of Site Contamination) Measure (1999) - HIL "F" (Commercial / Industrial)

2) NSW EPA Guidelines for the Assessment of Service Station Sites - 1994

- No investigation levels established

Table 2b
Adopted Investigation Levels - Groundwater
Chullora Railway Workshops ESA

Analyte	Units	ANZECC 2000 [1]	NSW EPA [2]	IIWL [3]	Adopted IL
TPH					
TPH (C_6-C_9 Fraction)	ug/L	-	-		-
TPH (C_{10}-C_{14} Fraction)	ug/L	-	-		-
TPH (C_{15}-C_{28} Fraction)	ug/L	-	-		-
TPH (C_{29}-C_{36} Fraction)	ug/L	-	-		-
Total TPH (C_{10}-C_{36} Fraction)	ug/L	-	-		-
BTEX					
Benzene	ug/L	950	300		950
Toluene	ug/L	-	300		300
Ethylbenzene	ug/L	-	140		140
meta-Xylene	ug/L	-	-		-
para-Xylene	ug/L	200	-		200
ortho-Xylene	ug/L	350	-		350
Total Xylenes	ug/L	-	380		380
PAHs					
Naphthalene	ug/L	16			16
Phenanthrene	ug/L			2	
Anthracene	ug/L			0.4	
Fluoranthene	ug/L			1.4	
Benzo(a)anthracene	ug/L			0.2	
Total PAHs	ug/L		3		3
Phenols					
Phenol	ug/L	320	-		320
2,4,6-Trichlorophenol	ug/L	20	-		20
2,4-Dichlorophenol	ug/L	160	-		160
2-Chlorophenol	ug/L	490	-		490
Pentachlorophenol	ug/L	10	-		10
Metals					
Arsenic (As V)	ug/L	0.013	-		0.013
Barium	ug/L	-	-		--
Cadmium	ug/L	0.0002	-		0.0002
Chromium (VI)	ug/L	0.001	-		0.001
Copper	ug/L	0.0014	-		0.0014
Lead	ug/L	0.0034	-		0.0034
Mercury	ug/L	0.0006	-		0.0006
Nickel	ug/L	0.011	-		0.011
Zinc	ug/L	0.008	-		0.008
VCHs					
1,1,2-Trichloroethane	ug/L	6500	-		6500
1,2,3-Trichlorobenzene	ug/L	10	-		10
1,2,4-Trichlorobenzene	ug/L	170	-		170
1,2-Dichlorobenzene	ug/L	160	-		160
1,3-Dichlorobenzene	ug/L	260	-		260
1,4-Dichlorobenzene	ug/L	60	-		60
Vinyl chloride	ug/L			100	
1,1-Dichloroethene	ug/L			90	
1,1-Dichloroethane	ug/L			700	
cis-1,2- Dichloroethene	ug/L			1900	
Trichloroethene	ug/L			330	
Tetrachloroethene	ug/L			70	

Notes:

1. Australia New Zealand Environment Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) 2000, Protection of Aquatic Ecosystems Fresh Water 95% Protection

2. New South Wales (NSW) Environment Protection Authority (EPA) 1994, Guidelines for Assessing Service Station Sites, Protection of Aquatic Ecosystems (Fresh)

3. Indicative Interim Working Levels

- No investigation levels established

Table 2c
Adopted Investigation Levels - Sediment
Chullora Railway Workshops ESA

Analyte	Units	ISQG-Low	ISQG-High	Adopted Investigation Level
Heavy Metals				
Arsenic	(mg/kg)	20	70	70
Antimony	(mg/kg)	2	25	25
Cadmium	(mg/kg)	1.5	10	10
Chromium	(mg/kg)	80	370	370
Copper	(mg/kg)	65	270	270
Lead	(mg/kg)	50	220	220
Mercury	(mg/kg)	0.15	1	1
Nickel	(mg/kg)	21	52	52
Silver	(mg/kg)	1	3.7	3.7
Zinc	(mg/kg)	200	410	410
PAH				
Acenaphthene	(mg/kg)	16	500	500
Acenaphthalene	(mg/kg)	44	640	640
Anthracene	(mg/kg)	85	1,100	1,100
Fluorene	(mg/kg)	19	540	540
Naphthalene	(mg/kg)	160	2,100	2,100
Phenanthrene	(mg/kg)	240	1,500	1,500
Benzo(a)anthracene	(mg/kg)	261	1,600	1,600
Benzo(a)pyrene	(mg/kg)	430	1,600	1,600
Dibenzo(a,h)anthracene	(mg/kg)	63	260	260
Chrysene	(mg/kg)	384	2,800	2,800
Fluoranthene	(mg/kg)	600	5,100	5,100
Pyrene	(mg/kg)	665	2,600	2,600
Total PAHs	(mg/kg)	4,000	45,000	45,000
Organochlorine Pesticides (OC)				
Total DDT	(mg/kg)	2	46	46
p,p'-DDE	(mg/kg)	2	27	27
o,p'-+p,p'-DDD	(mg/kg)	2	20	20
Chlordane	(mg/kg)	1	6	6
Dieldrin	(mg/kg)	0	8	8
Endrin	(mg/kg)	0	8	8
Lindane	(mg/kg)	0	1	1
Polychlorinated biphenyls				
Total PCBs	(mg/kg)	23	-	23

a Primarily adapted from Long et al. (1995).

b Normalised to 1% organic carbon.

(1) ANZECC/ARMCANZ 2000 Sediment Quality Guidelines (Trigger Values)

Table 3 - Chullora Railway Workshops
Groundwater Analytical Results - Metals and Metalloids

Sample ID	Sampled By	Date	Metals and Metalloids								
			Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Nickel (Ni)	Zinc (Zn)	Mercury (Hg)	Cyanide (CN)
LOR	-		1.0	0.1	1.0	1.0	1.0	1.0	2.0	0.5	0.5
ADOPTED IL	-	-	0.013	0.0002	0.001	0.0014	0.0034	0.011	0.0034	0.0006	0.007
Area A: Bogie Maintenance Centre (BMC)											
110	D&M	Sep-99	<0.005	nd	0.007	0.005	0.007	nd	0.365	na	na
110	CES	Feb-01	nd	nd	0.002	nd	0.002	0.006	0.033	nd	na
110	CES	May-01	0.005	nd	nd	0.001	nd	0.006	0.046	nd	na
110	CES	Nov-01	0.004	nd	nd	nd	nd	0.004	0.029	0.00005	na
111p	D&M	Sep-99	<0.005	0.0001	0.014	0.002	0.005	nd	0.108	na	na
111d	D&M	Sep-99	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	0.11	<0.0001	na
112	D&M	Sep-99	0.004	nd	0.003	0.004	0.003	0.002	0.195	na	na
112	CES	Feb-01	nd	nd	0.004	nd	nd	0.02	0.05	nd	na
112	CES	Feb-01	nd	0.001	0.004	0.001	0.01	0.02	0.055	nd	na
112	CES	May-01	0.01	nd	0.003	nd	0.002	0.023	0.008	nd	na
112	CES	Aug-01	0.016	nd	nd	nd	nd	0.021	0.018	0	na
112	CES	Nov-01	0.012	nd	nd	nd	nd	0.011	0.012	nd	na
125	D&M	Sep-99	<0.005	0.0006	0.003	0.003	0.003	nd	0.126	0.00005	nd
202	D&M	Sep-99	<0.02	0.0001	0.022	0.003	0.004	nd	0.016	0.00005	na
304	D&M	Jun-00	0.003	0.0001	0.005	0.001	0.002	0.003	0.013	na	na
305	D&M	Jun-00	0.003	0.0002	0.004	0.010	0.045	0.005	0.269	na	na
305	CES	Feb-01	nd	0.0001	0.005	0.002	0.01	0.004	0.009	na	na
305	CES	May-01	0.005	nd	0.003	0.001	nd	0.64	0.262	nd	na
305	CES	Aug-01	nd	0.0001	0.001	0.006	0.002	0.005	0.067	0.00006	na
305	CES	Nov-01	nd	nd	nd	0.005	0.002	0.003	0.016	0.00005	na
306	URS	Jul-07	nd	nd	nd	nd	nd	nd	0.010	nd	na
307	D&M	Jun-00	0.007	nd	0.006	0.004	0.004	0.001	0.006	na	na
307	CES	Feb-01	nd	0.0001	0.005	nd	0.002	0.006	0.01	na	na
307	CES	May-01	0.011	nd	0.001	nd	nd	0.008	0.042	nd	na
308	D&M	Jun-00	0.003	0.0001	0.006	0.001	nd	nd	0.007	na	na
308	CES	Feb-01	nd	nd	0.002	0.001	nd	nd	0.029	na	na
308	CES	May-01	0.042	0.001	0.001	0.013	nd	0.001	0.022	nd	na
308	CES	Aug-01	0.002	nd	0.001	0.003	0.002	0.002	0.05	0.00006	na
308	CES	Nov-01	0.003	nd	nd	nd	nd	nd	0.19	nd	na
Area B: Diesel Engine Maintenance Centre (DEMC)											
107	D&M	Sep-99	0.002	nd	0.01	0.002	0.002	nd	0.079	0.00013	nd
107	CES	Feb-01	nd	nd	0.003	0.002	nd	0.002	0.01	nd	na
107	CES	May-01	0.003	nd	0.002	0.002	0.003	0.006	0.011	nd	na
107	CES	Aug-01	0.002	nd	nd	0.003	nd	0.002	0.012	nd	na
107	CES	Aug-01	0.002	nd	0.001	0.002	nd	0.002	0.012	nd	na
107	CES	Nov-01	0.003	nd	nd	nd	0.002	0.017	0.022	nd	na
107a	URS	Jul-07	nd	nd	nd	0.004	nd	nd	0.015	nd	na
121	D&M	Sep-99	<0.005	nd	0.009	0.002	0.002	nd	0.142	na	na
121	CES	Feb-01	nd	nd	0.013	0.001	nd	0.003	0.056	nd	na
121	CES	May-01	0.051	nd	0.002	0.014	nd	0.002	0.018	nd	na
121	URS	Jul-07	0.003	nd	nd	0.003	nd	0.002	0.018	nd	na
311	D&M	Jun-00	0.003	nd	0.004	0.006	nd	0.002	0.014	na	na
311	CES	Feb-01	nd	0.0001	0.002	0.008	0.002	0.001	0.18	na	na
311	CES	May-01	0.007	nd	nd	0.016	0.005	0.002	0.030	nd	na
312	D&M	Jun-00	nd	0.0001	0.003	0.004	0.002	0.003	0.090	na	na
312	CES	Feb-01	nd	0.0001	0.002	0.007	0.001	0.003	0.031	nd	na
312	CES	May-01	na	na	na	na	na	na	na	na	na
312	CES	Aug-01	nd	0.0001	nd	0.006	nd	0.006	0.115	nd	na
312	CES	Nov-01	0.001	0.0001	nd	0.005	nd	0.004	0.034	nd	na
313	D&M	Jun-00	0.005	0.0001	0.009	0.002	nd	0.003	0.017	na	na
313	CES	Feb-01	nd	nd	0.005	0.001	nd	0.001	0.011	na	na
313	CES	May-01	0.046	0.0001	0.001	0.013	nd	0.001	0.022	nd	na
316	D&M	Jun-00	0.005	nd	0.008	0.002	0.002	0.003	0.047	na	na
317	D&M	Jun-00	0.002	nd	0.004	0.002	0.001	0.002	0.028	na	na
317	CES	Feb-01	nd	0.0001	0.003	nd	nd	0.004	0.033	nd	na
317	CES	May-01	na	na	na	na	na	na	na	nd	na
317	CES	May-01	0.005	nd	0.001	0.001	nd	0.003	0.054	nd	na
317	CES	Aug-01	0.003	nd	nd	0.002	nd	0.003	0.079	nd	na
317	CES	Nov-01	0.003	0.0002	nd	0.001	nd	0.004	0.108	nd	na
317	URS	Jul-07	nd	nd	nd	0.003	nd	0.002	0.145	nd	na
Area C: Locomotive Maintenance Centre (LMC)											
143	D&M	Sep-99	<0.005	0.0001	0.002	0.005	0.002	nd	0.061	0.00005	nd
148	D&M	Sep-99	0.004	0.0001	0.019	0.004	0.003	0.005	0.06	0.00005	nd
149	D&M	Sep-99	<0.005	nd	0.005	0.002	0.006	nd	0.038	0.00017	nd
149	CES	Feb-01	nd	0.0002	0.002	0.002	nd	0.004	0.369	na	na
149	CES	May-01	0.001	nd	nd	nd	nd	0.003	0.165	nd	na
149	CES	Aug-01	0.001	nd	0.001	0.002	nd	0.005	0.134	0.00008	na
149	CES	Nov-01	0.003	0.0001	nd	0.001	nd	0.005	0.191	0.00008	na
205	D&M	Sep-99	<0.025	nd	0.008	0.006	0.007	nd	0.054	nd	nd
205	CES	Feb-01	nd	nd	0.004	0.003	nd	0.012	0.024	na	na
205	CES	May-01	nd	nd	0.008	0.003	nd	0.016	0.014	nd	na
205	CES	Aug-01	*<0.03	0.0001	0.002	0.005	nd	0.007	0.008	nd	na
205	CES	Nov-01	0.04	0.0001	0.001	0.004	nd	0.005	0.039	0.00005	na
205	CES	Nov-01	0.039	0.0002	0.001	0.004	nd	0.005	0.061	nd	na
205	URS	Jul-07	0.001	nd	nd	0.001	nd	0.002	0.035	nd	na
206	D&M	Sep-99	<0.025	0.0001	0.013	0.006	0.011	nd	0.03	0.00015	nd
206	CES	Feb-01	nd	nd	0.007	0.007	nd	0.009	0.011	na	na
206	CES	May-01	nd	nd	0.005	0.005	nd	0.015	0.011	nd	na
206	CES	May-01	nd	nd	0.005	0.006	nd	0.016	0;011	nd	na
206	CES	Aug-01	*<0.02	0.0001	0.003	0.008	nd	0.014	0.018	nd	na
206	CES	Nov-01	0.03	0.0002	nd	0.005	nd	0.005	0.047	0.00005	na

Table 3 - Chullora Railway Workshops
Groundwater Analytical Results - Metals and Metalloids

Sample ID	Sampled By	Date	Metals and Metalloids								
			Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Nickel (Ni)	Zinc (Zn)	Mercury (Hg)	Cyanide (CN)
LOR	-		1.0	0.1	1.0	1.0	1.0	1.0	2.0	0.5	0.5
ADOPTED IL	-	-	**0.013**	**0.0002**	**0.001**	**0.0014**	**0.0034**	**0.011**	**0.0034**	**0.0006**	**0.007**
315	CES	Feb-01	nd	**0.0002**	**0.006**	**0.008**	**0.016**	0.007	**0.102**	na	na
315	CES	May-01	nd	0.0001	**0.006**	**0.012**	**0.026**	0.007	**0.093**	nd	na
315	CES	Aug-01	nd	0.0001	**0.006**	0,006	**0.011**	**0.014**	**0.108**	nd	na
315	CES	Aug-01	nd	0.0001	**0.005**	0.0006	**0.011**	**0.014**	**0.104**	nd	na
315	CES	Nov-01	**0.02**	0.0001	nd	**0.011**	**0.013**	0.006	**0.074**	nd	na
315	D&M	Jun-00	<0.02	**0.0002**	**0.008**	**0.026**	**0.007**	**0.031**	**0.049**	na	na
318	D&M	Jun-00	0.001	0.0001	**0.002**	**0.004**	**0.005**	nd	**0.033**	na	na
319	D&M	Jun-00	0.005	0.0001	**0.006**	**0.003**	**0.008**	nd	**0.057**	na	na
320	D&M	Jun-00	0.005	0.0001	**0.004**	**0.005**	0.002	0.003	**0.034**	na	na
MW01	URS	Jul-01	10*	**0.0005**	**0.004**	**0.010**	**0.008**	0.004	**0.089**	nd	na
MW01	URS	Jan-02	na	na	na	na	na	na	na	0.00043	na
MW01	**URS**	**Jul-07**	nd	nd	nd	**0.013**	nd	nd	nd	nd	na
MW06	URS	Jan-02	nd	nd	nd	**0.006**	0.002	nd	**0.029**	0.00005	na
Area D: Electrical Maintenance Centre (EMC)											
207p	D&M	Sep-99	<0.015	**0.0002**	**0.061**	**0.005**	**0.011**	0.006	**0.059**	0.00011	nd
207d	D&M	Sep-99	<0.015	**0.0002**	**0.025**	**0.003**	**0.011**	nd	**0.019**	0.00011	nd
207	CES	Feb-01	nd	0.0001	**0.035**	**0.004**	nd	0.009	**0.014**	na	na
207	CES	May-01	nd	nd	**0.008**	**0.003**	nd	0.01	**0.013**	nd	na
207	CES	Aug-01	*<0.02	nd	**0.002**	**0.004**	nd	0.009	**0.03**	nd	na
207	CES	Nov-01	**0.17**	**0.0007**	**0.003**	**0.003**	nd	**0.07**	**0.068**	nd	na
207	**URS**	**Jul-07**	0.003	nd	nd	**0.002**	nd	0.004	**0.022**	nd	na
315	CES	Nov-01	**0.020**	0.0001	nd	**0.011**	**0.013**	0.006	**0.074**	nd	na
MW1	ERM	Jan-05	<5*	nd	<10*	**0.004**	na	**0.015**	**0.013**	0.0001	na
MW2	ERM	Jan-05	<5*	nd	<10*	**0.003**	na	**0.016**	**0.021**	0.0001	na
MW2	**URS**	**Jul-07**	nd	nd	nd	**0.002**	na	0.002	**0.010**	na	na
MW4	ERM	Jan-05	<10*	**0.0025**	<20*	**0.011**	na	**0.098**	**0.098**	0.0001	na
MW5	ERM	Jan-05	<5*	nd	<10*	**0.002**	na	**0.015**	**0.015**	0.0001	na
MW6	ERM	Jan-05	<5*	nd	<10*	**0.002**	na	0.009	**0.012**	0.0001	na
MW7	ERM	Jan-05	<10*	nd	**0.003**	**0.002**	na	0.004	**0.005**	na	na
MW8	ERM	Jan-05	<5*	nd	<5*	**0.007**	na	**0.041**	**0.060**	0.0001	na
MW9	ERM	Jan-05	<15*	**0.0008**	**0.003**	**0.031**	0.001	**0.070**	**0.240**	0.0001	na
MW10	ERM	Jan-05	<15*	**0.0007**	**0.004**	**0.011**	na	**0.093**	**0.130**	0.0001	na
MW11	ERM	Jan-05	<10*	**0.0007**	**0.002**	**0.009**	0.001	**0.024**	**0.055**	na	na
MW12	ERM	Jan-05	<25*	**0.0002**	**0.002**	**0.012**	0.001	**0.041**	**0.160**	na	na
MW12	**URS**	**Jul-07**	**0.016**	**0.0003**	nd	**0.007**	0.002	**0.032**	**0.139**	na	na
MW13	ERM	Jan-05	<25*	**0.0002**	<20*	**0.004**	na	**0.012**	**0.048**	0.0001	na
MW14	ERM	Jan-05	<10*	**0.0004**	<20*	**0.012**	na	**0.012**	**0.044**	0.0002	na
MW15	ERM	Jan-05	<10*	nd	**0.001**	**0.002**	na	0.010	**0.009**	<0.1	na
MW02	URS	Jan-02	nd	nd	nd	**0.008**	0.001	0.008	**0.012**	0.00005	na
MW03	URS	Jan-02	**0.017**	nd	nd	**0.013**	**1**	**0.011**	**0.077**	0.00006	na
MW03	**URS**	**Jul-07**	**0.017**	**0.0002**	nd	**0.010**	nd	0.010	**0.037**	nd	na
MW04	URS	Jan-02	nd	nd	nd	**0.008**	**1**	nd	**0.024**	0.00005	na
Area E: Load Box and Refuelling Facility											
150	D&M	Sep-99	<0.005	**0.0002**	**0.002**	**0.019**	**0.012**	0.003	**0.515**	0	nd
150	CES	Feb-01	nd	**0.0002**	**0.003**	**0.013**	**0.004**	0.003	**0.076**	na	na
150	CES	May-01	0.004	nd	nd	**0.02**	0.001	0.003	**0.016**	nd	na
150	CES	Aug-01	0.002	0.0001	nd	**0.017**	0.001	0.003	**0.027**	nd	na
150	CES	Nov-01	0.003	nd	nd	**0.008**	nd	0.001	**0.014**	0.00009	na
150	Coffey	Feb-06	na	na	na	**0.021**	na	0.002	**0.018**	na	na
MW1	RIC	Mar-04	0.003	**0.001**	**0.002**	**0.030**	na	0.005	**0.056**	0.0001	na
MW3	RIC	Mar-04	0.004	**0.001**	**0.001**	**0.110**	**0.004**	**0.047**	**0.170**	0.0001	na
MW4	RIC	Mar-04	0.001	0.000	na	na	na	0.005	**0.046**	na	na
MWCD1	Coffey	Feb-06	0.002	na	na	**0.003**	na	**0.034**	**0.094**	na	na
MWCD1	**URS**	**Jul-07**	0.002	0.000	**0.001**	**0.017**	0.002	**0.027**	**0.086**	na	na
MWCS1	**URS**	**Jul-07**	na	na	na	na	na	na	na	na	na
MWCD2	Coffey	Feb-06	na	na	na	**0.006**	0.001	**0.018**	**0.192**	na	na
MWCD3	Coffey	Feb-06	na	na	na	**0.003**	na	**0.048**	**0.137**	na	na
MWCD4	Coffey	Feb-06	na	na	na	**0.003**	na	0.002	**0.021**	na	na
MWCS4	Coffey	Feb-06	na	na	na	0.001	0.001	0.002	**0.040**	na	na
Area F: North Wetern Portion Including Ballast Recycling Centre											
104	D&M	Sep-99	0.002	nd	**0.006**	**0.003**	0.003	0.001	**0.074**	0.0001	nd
201	D&M	Sep-99	<0.02	0.0001	**0.007**	**0.004**	**0.004**	nd	**0.098**	0.00005	nd
302	D&M	Jun-00	0.002	nd	**0.008**	**0.003**	**0.004**	0.005	**0.020**	na	na
303	D&M	Jun-00	nd	nd	**0.003**	**0.002**	nd	nd	**0.004**	na	na
401	D&M	Jun-00	<0.03	**0.0008**	**0.004**	**0.013**	**0.034**	0.005	**0.087**	na	na
Area G: North Eastern Portion Including Former Rail Reclamation Area											
132	D&M	Sep-99	0.002	**0.0008**	**0.002**	**0.011**	**0.049**	nd	**0.227**	nd	na
154	D&M	Sep-99	<0.005	0.0001	**0.003**	**0.008**	**0.008**	nd	**0.151**	na	nd
203	D&M	Sep-99	<0.01	**0.0002**	**0.004**	**0.005**	**0.017**	nd	**0.111**	na	nd
204	D&M	Sep-99	<0.01	nd	**0.003**	**0.007**	**0.008**	0.005	**0.149**	na	nd
309	D&M	Jun-00	nd	0.0001	**0.001**	**0.002**	0.003	0.002	**0.022**	na	na
310	D&M	Jun-00	<0.02	0.0001	**0.012**	**0.007**	0.003	nd	**0.015**	na	na
402	D&M	Jun-00	<0.02	nd	**0.015**	**0.007**	**0.008**	nd	**0.015**	na	na
Area H: South Eastern Portion											
403	CES	Feb-01	nd	0.0001	0.015	0.003	nd	0.007	0.014	na	na
403	CES	May-01	nd	nd	0.016	0.002	nd	0.012	0.006	nd	na
403	CES	Aug-01	nd	0.0003	0,001	0.004	0.003	0.015	0.067	nd	na
403	CES	Nov-01	**0.019**	nd	**0.005**	**0.002**	0.001	0.009	**0.028**	nd	na
403	D&M	Jun-00	<0.02	0.0001	**0.026**	**0.006**	**0.011**	nd	**0.006**	na	na
Max. Concentration			0.1700	0.0025	0.0610	0.1100	1.0000	0.0980	0.5150	0.0004	0.0000
Min. Concentration			0.0010	0.00007	0.0010	0.0006	0.0010	0.0010	0.0040	0.0000	0.0000

Notes:

* LOR increased due to matrix interference

All units in ug/L

"--" = not analysed

nd = not detected

p = primary sample d = duplicate sample

Results Exceed Adopted Investigation Levels

Prepared by:EC and NR
Checked by: TO and MJ

Table 4 - Chullora Railway Workshops
Groundwater Analytical Results - TPH

Sample ID	Sampled By	Date	Total Petroleum Hydrocarbon					Monocyclic Hydrocarbons			
			C6-C9	C10-C14	C15-C28	C29-C36	C10-C36	Benzene	Toluene	Ethylbenzene	Xylenes
LOR	-	-	5	10	50	50	110	0.5	1	1	3
ADOPTED IL			--	--	--	--	--	950	300	140	380
Area A: Bogie Maintenance Centre (BMC)											
110	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	0
110	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
110	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
110	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
111p	D&M	Sep-99	nd	4960	5950	nd	10910	nd	nd	nd	nd
111d	D&M	Sep-99	83	2100	4400	nd	6500	nd	nd	nd	nd
112	D&M	Sep-99	nd	426	1000	nd	1426	nd	nd	nd	nd
112	CES	Feb-01	nd	1500	4850	nd	6350	nd	nd	nd	nd
112	CES	Feb-01	nd	700	2510	nd	3210	nd	nd	nd	nd
112	CES	May-01	nd	3000	6360	nd	9360	nd	nd	nd	nd
112	CES	Aug-01	nd	460	803	nd	1263	nd	nd	nd	nd
112	CES	Nov-01	nd	300	970	nd	1270	nd	nd	nd	nd
125	D&M	Sep-99	782	6990	1090	225	8305	240	253	58	225
202	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
304	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
305	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
305	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
305	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd
307	D&M	Jun-00	30	2700	2820	nd	5520	5.6	nd	2	10
307	CES	Feb-01	120	3200	4780	nd	7980	4	nd	nd	nd
307	CES	May-01	120	7400	2480	nd	9880	3.2	20	5	52
308	D&M	Jun-00	nd	30	nd	nd	30	nd	nd	nd	nd
308	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
308	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
308	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
308	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
Area B: Diesel Engine Maintenance Centre (DEMC)											
107	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
107	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
107	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
107	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
107	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
107a	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd
121	D&M	Sep-99	80	nd	nd	nd	nd	nd	nd	nd	nd
121	CES	Feb-01	30	5000	12300	nd	17300	nd	nd	nd	nd
121	CES	May-01	nd	100	nd	nd	100	nd	nd	nd	nd
121	**URS**	**Jul-07**	nd	80	900	170	1150	nd	nd	nd	nd
311	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
311	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
311	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
312	D&M	Jun-00	nd	nd	133	nd	133	nd	nd	nd	nd
312	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
312	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
312	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
312	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
313	D&M	Jun-00	nd	nd	243	nd	243	nd	nd	nd	nd
313	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
313	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
316	D&M	Jun-00	nd	nd	120	nd	120	nd	nd	nd	nd
317	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	**URS**	**Jul-07**	170	nd	nd	nd	0	nd	nd	nd	nd
Area C: Locomotive Maintenance Centre (LMC)											
143	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
148	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	D&M	Sep-99	nd	2	nd	nd	nd	nd	nd	nd	nd
205	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	**URS**	**Jul-07**	195000	240	200	nd	440	nd	nd	nd	nd
206	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
206	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
206	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
206	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
206	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	Nov-01	nd	nd	253	nd	253	nd	nd	nd	nd
318	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
319	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
320	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW01	URS	Jan-02	nd	140	1030	669	1839	nd	nd	nd	nd
MW01	**URS**	**Jul-07**	nd	nd	2000	770	2770	nd	nd	nd	nd
MW06	URS	Jan-02	nd	nd	nd	nd	0	nd	nd	nd	nd

Table 4 - Chullora Railway Workshops
Groundwater Analytical Results - TPH

Sample ID	Sampled By	Date	Total Petroleum Hydrocarbon					Monocyclic Hydrocarbons			
			C6-C9	C10-C14	C15-C28	C29-C36	C10-C36	Benzene	Toluene	Ethylbenzene	Xylenes
LOR	-	-	5	10	50	50	110	0.5	1	1	3
Area D: Electrical Maintenance Centre (EMC)											
207p	D&M	Sep-99	nd	nd	nd	nd	0	nd	nd	nd	nd
207d	D&M	Sep-99	nd	nd	nd	nd	0	nd	nd	nd	nd
207	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
207	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
207	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
207	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
207	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	Nov-01	nd	nd	253	nd	253	nd	nd	nd	nd
MW1	ERM	Jan-05	90**	<50	<200	<50	0	<5	<5	<5	<15
MW2	ERM	Jan-05	nd	<50	<200	<50	0	<5	6	<5	<5
MW2	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW4	ERM	Jan-05	<50	<50	<200	<50	0	<5	<5	<5	<5
MW5	ERM	Jan-05	<50	<50	<200	<50	0	<5	<5	<5	<5
MW6	ERM	Jan-05	<50	<50	<200	<50	0	<5	<5	<5	<5
MW7	ERM	Jan-05	<50	<50	<200	<50	0	<5	<5	<5	<5
MW8	ERM	Jan-05	<50	<50	<200	<50	0	<5	5	<5	<5
MW9	ERM	Jan-05	70**	<50	<200	<50	0	<5	<5	<5	<5
MW10	ERM	Jan-05	<50	<50	<200	<50	0	<5	<5	<5	<5
MW11	ERM	Jan-05	<50	<50	<200	<50	0	<5	7	<5	<5
MW12	ERM	Jan-05	<50	<50	<200	<50	0	<5	<5	<5	<5
MW12	**URS**	**Jul-07**	nd	nd	100	nd	100	nd	nd	nd	nd
MW13	ERM	Jan-05	<50	<50	<200	<50	0	<5	<5	<5	<5
MW14	ERM	Jan-05	<50	<50	240	150	390	<5	<5	<5	<5
MW15	ERM	Jan-05	<50	<50	<200	<50	0	<5	<5	<5	<5
MW02	URS	Jan-02	nd	12000	5120	3460	20580	nd	nd	nd	nd
MW03	URS	Jan-02	nd	180	1010	224	1414	nd	nd	nd	nd
MW03	**URS**	**Jul-07**	70	nd	nd	nd	0	nd	nd	nd	nd
MW04	URS	Jan-02	nd	1200	3680	586	5466	nd	nd	nd	nd
Area E: Load Box and Refuelling Facility											
150	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	0
150	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
150	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
150	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
150	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
150	Coffey	Feb-06	<20	<50	100	<50	100	<1	<2	<2	<4
MW1	RIC	Mar-04	<50	536000	1540000	330000	2406000	<1	<1	<1	<2
MW3	RIC	Mar-04	<50	2130	8560	<100	10690	<1	<1	<1	<2
MW4	RIC	Mar-04	<50	<50	<400	<100	0	<1	<1	<1	<2
MWCD1	Coffey	Feb-06	<20	<50	100	170	270	<1	<2	<2	<4
MWCD1	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd
MWCS1	Coffey	Feb-06	PSH Present					-	-	-	-
MWCS1	**URS**	**Jul-07**	PSH Present								
MWCD2	Coffey	Feb-06	<20	<50	<100	<50	0	<1	<2	<2	<4
MWCD3	Coffey	Feb-06	<20	<50	<100	<50	0	<1	<2	<2	<4
MWCD4	Coffey	Feb-06	<20	80	300	70	450	<1	<2	<2	<4
MWCS4	Coffey	Feb-06	<20	<50	<100	140	140	<1	<2	<2	<4
MWCD5	Coffey	Feb-06	870	830	1100	<50	1930	<1	<2	<2	<4
MWCS5	Coffey	Feb-06	<20	720	1700	<50	2420	<1	<2	<2	<4
MWCD6	Coffey	Feb-06	440	860	4300	250	5410	1	<2	<2	<4
Area F: North Western Portion, including Ballast Recycling Centre											
104	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
201	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
302	D&M	Jun-00	nd	30	nd	nd	30	nd	nd	nd	nd
303	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
401	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
Area G: North Eastern Portion Including Former Rail Reclamation Area											
132	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
154	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
203	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
204	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd
309	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
310	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
402	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
Area H: South Eastern Portion											
403	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
403	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
403	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
403	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd
403	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd
Max. Concentration			195000	536000	1540000	330000	2406000	240	253	58	225
Min. Concentration			30	2	100	70	0	1	5	2	0

Notes:
"--" = not analysed
nd = not detected
PSH = Phase Separated Hydrocarbon
* LOR increased due to matrix interference
** Results represent compounds not consistent with a typical vTPH profile.
All units in ug/L
p = primary sample d = duplicate sample
Results Exceed Adopted Investigation Levels

Table 5 - Chullora Railway Workshops
Groundwater Analytical Results - PAHs

Sample ID	Sampled by	Date	Polycyclic Aromatic Hydrocarbons																
			Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)&(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(ah)anthracene	Benzo(ghi)perylene	Total PAH
LOR	-	-	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**	**1**	**1**	-
ADOPTED IL	-	-	**16**				**2**	**0.4**	**1.4**		**0.2**							**3**
Area A: Bogie Maintenance Centre (BMC)																		
110	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
110	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
111p	D&M	Sep-99	6	nd	4.1	6.1	**6.1**	nd	0.3	0.4	nd	nd	nd	nd	nd	nd	nd	**23**
111d	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
112	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
125	D&M	Sep-99	**285**	51	85	45	**31**	**4.1**	**2.6**	1.7	0.1	0.1	nd	nd	nd	nd	nd	**506**
202	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
304	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
305	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
305	CES	May-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
306	D&M	Jun-00	nd	nd	nd	nd	0.2	nd	0.1	0.2	0.1	0.1	0.2	0.1	0.2	nd	0.2	1.4
306	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
306	**URS**	**Jul-07**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
307	D&M	Jun-00	**40**	1	3.8	7.6	**2**	0.3	0.1	0.1	nd	nd	nd	nd	nd	nd	nd	**55**
307	CES	May-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
308	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
308	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Area B: Diesel Engine Maintenance Centre (DEMC)																		
107	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
107	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
107a	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
121	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
121	CES	Feb-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
121	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
311	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
311	CES	May-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
312	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
312	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
313	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
313	CES	May-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
316	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
317	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Area C: Locomotive Maintenance Centre (LMC)																		
143	D&M	Sep-99	1.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.4
148	D&M	Sep-99	nd	nd	nd	nd	0.6	nd	1.3	1.3	**0.5**	0.5	1.1	0.7	0.5	0.1	0.6	**7.2**
148	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
205	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
205	**URS**	**Jul-07**	1.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
206	D&M	Sep-99	0.2	nd	nd	0.2	0.6	nd	nd	nd	nd	0.2	nd	0.1	nd	nd	nd	1.3
206	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
206	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
318	D&M	Jun-00	nd	nd	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.1
319	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
320	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW01	URS	Jul-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW01	**URS**	**Jul-07**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**
Area D: Electrical Maintenance Centre (EMC)																		
207p	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
207d	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.2	nd	nd	nd	nd	nd	0.2
207	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
207	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW1	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW2	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW2	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW3	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW4	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW5	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW6	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW7	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW8	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW9	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW10	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW11	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW12	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW12	**URS**	**Jul-07**	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW13	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW14	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW15	ERM	Jan-05	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	nd	<2	<2	<2	<2	nd
MW03	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

Table 5 - Chullora Railway Workshops
Groundwater Analytical Results - PAHs

Sample ID	Sampled by	Date	Polycyclic Aromatic Hydrocarbons																
			Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)&(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(ah)anthracene	Benzo(ghi)perylene	Total PAH
LOR	-	-	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**	**1**	**1**	-
ADOPTED IL	-	-	**16**				**2**	**0.4**	**1.4**		**0.2**							**3**
Area E: Load Box and Refuelling Facility																		
150	D&M	Sep-99	0.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.4
150	Coffey	Feb-06	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW1	RIC	Mar-04	**<1000***	<1000*	nd	nd	nd	nd	nd	nd	nd	nd	<4	**<20***	<20*	<20*	<20*	nd*
MW3	RIC	Mar-04	**<20***	<20*	nd	nd	nd	nd	nd	nd	nd	nd	<4	**<2**	<2	<2	<2	nd
MW4	RIC	Mar-04	<2	<2	nd	nd	nd	nd	nd	nd	nd	nd	<4	<2	<2	<2	<2	nd
MWCD1	Coffey	Feb-06	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MWCD1	**URS**	**Jul-07**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MWCS1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MWCS1	**URS**	**Jul-07**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MWCD2	Coffey	Feb-06	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MWCD3	Coffey	Feb-06	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MWCD4	Coffey	Feb-06	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MWCS4	Coffey	Feb-06	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MWCD5	Coffey	Feb-06	nd	nd	nd	**1.2**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	**1.2**
MWCS5	Coffey	Feb-06	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MWCD6	Coffey	Feb-06	nd	nd	nd	**2.8**	**2.0**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	**4.8**
Area F: North Western Portion, Including Ballast Recycling Centre																		
104	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
201	D&M	Sep-99	0.3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.3
302	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
303	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
401	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Area G: North Eastern Portion Including Former Rail Reclamation Area																		
132	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
154	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
203	D&M	Sep-99	1.3	nd	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.4
204	D&M	Sep-99	nd	nd	nd	nd	0.3	nd	0.1	0.1	nd	0.2	nd	0.1	nd	nd	nd	0.8
309	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
310	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
402	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Area H: South Eastern Portion																		
403	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
403	CES	Nov-01	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Max. Concentration			1	0	0	2.8	2.0	0	1	1	1	1	1	1	1	0	1	7.2
Min. Concentration			0	0	0	0.2	0.3	0	0	0	1	0	1	0	1	0	1	0.1

Notes:

* LOR increased due to matrix interference

All units in ug/L

"--" and "na" = not analysed

nd = not detected

p = primary sample d = duplicate sample

Results Exceed Adopted Investigation Levels

Table 6 - Chullora Railway Workshops
Groundwater Analytical Results - Volatile Chlorinated Hydrocarbons

All units in ug/L

Sample ID	Sampled by	Date	Volatile Halogenated Hydrocarbons																										
			Vinyl chloride	Chloroethane	Trichlorodifluoromethane	1,1-Dichloroethene	Methylene chloride	trans-1,2-Dichloroethene	1,1-Dichloroethane	cis-1,2-Dichloroethene	Chloroform	1,1,1-Trichloroethane	Carbon tetrachloride	1,2-Dichloroethane	Trichloroethene	1,2-Dichloropropane	Bromodichloromethane	trans-1,3-Dichloropropylene	cis-1,3-Dichloropropylene	1,1,2-Trichloroethane	Tetrachloroethene	Dibromochloromethane	Chlorobenzene	Bromoform	1,1,2,2-Tetrachloroethane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2-Dichlorobenzene
LOR	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADOPTED IL	-	-	100			90			700	1900					330					6500	70					260	60	160
Area A: Bogie Maintenance Centre (BMC)																													
110	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
110	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
110	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
110	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
111p	D&M	Sep-99	4	241	nd	29	1	nd	216	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
111d	D&M	Sep-99	nd	138	nd	26	1.6	nd	180	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
112	D&M	Sep-99	4	28	nd	17	nd	nd	93	nd	nd	2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
112	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
112	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
112	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
112	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
125	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
202	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
304	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
305	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
305	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
305	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	D&M	Jun-00	29	210	nd	**200**	6	nd	**2500**	nd	nd	110	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	CES	Feb-01	nd	62	nd	39	nd	nd	370	nd	nd	310	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	CES	May-01	nd	23	nd	25	nd	nd	25	nd	nd	210	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	CES	Aug-01	nd	nd	nd	19	nd	nd	190	nd	nd	120	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	CES	Nov-01	nd	nd	nd	19	nd	nd	200	nd	nd	140	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
306	URS	Jul-07	nd	nd	nd	nd	nd	nd	**35**	nd	nd	**37**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
307	D&M	Jun-00	nd	17	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
307	CES	Feb-01	nd	8	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
307	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
308	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
308	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
308	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
308	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
308	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Area B: Diesel Engine Maintenance Centre (DEMC)																													
107	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
107	CES	Feb-01	5	nd	nd	nd	nd	nd	1	3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
107	CES	May-01	2	nd	nd	nd	nd	nd	nd	2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
107	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
107	CES	Nov-01	10	nd	nd	nd	nd	nd	nd	3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
107a	URS	Jul-07	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
121	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
121	CES	Feb-01	17	27	nd	13	nd	nd	120	nd	nd	2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
121	CES	May-01	24	43	nd	11	nd	nd	140	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
121	URS	Jul-07	nd	nd	nd	**8**	nd	nd	**27**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
311	D&M	Jun-00	nd	nd	nd	nd	nd	nd	15	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
311	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
311	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
312	D&M	Jun-00	nd	nd	nd	2	nd	nd	nd	nd	nd	4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
312	CES	Feb-01	nd	nd	nd	3	nd	nd	nd	nd	nd	4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
312	CES	May-01	nd	nd	nd	2	nd	nd	nd	nd	nd	3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
312	CES	Aug-01	nd	nd	nd	3	nd	nd	nd	nd	nd	5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
312	CES	Nov-01	nd	nd	nd	4	nd	nd	nd	nd	nd	3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
313	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
313	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
313	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
316	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	D&M	Jun-00	37	nd	nd	7	nd	2	17	430	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	CES	Feb-01	33	33	33	15	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	CES	May-01	26	2	nd	15	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	CES	Aug-01	46	nd	nd	16	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	CES	Nov-01	**45**	**2**	nd	**16**	nd	**4**	**17**	**220**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
317	URS	Jul-07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Area C: Locomotive Maintenance Centre (LMC)																													
143	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
148	D&M	Sep-99	1	nd	nd	nd	nd	nd	3	8	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
149	CES	Nov-01	nd	nd	nd	nd	nd	nd	1	6	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
205	URS	Jul-07	**12700**	nd	nd	**384**	nd	**207**	**2720**	**93800**	nd	nd	nd	nd	**1920**	nd	nd	nd	nd	nd	**22400**	nd	nd	nd	nd	nd	nd	nd	nd
206	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
206	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
206	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
206	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
206	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	Feb-01	nd	nd	nd	nd	nd	3	16	170	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	May-01	nd	nd	nd	nd	nd	4	14	150	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	Aug-01	nd	nd	nd	nd	nd	3	13	150	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	Aug-01	nd	nd	nd	nd	nd	4	16	210	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
315	CES	Nov-01	nd	nd	nd	nd	nd	4	17	220	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
318	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
319	D&M	Jun-00	1	nd	nd	nd	nd	nd	11	36	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
320	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW01	URS	Jan-02	nd	nd	nd	nd	nd	nd	**3**	**4**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW01	URS	Jul-07	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW06	URS	Jan-02	**1**	nd	nd	nd	nd	nd	nd	**6**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	**34**	nd	nd	nd	nd	nd	nd	nd	nd

Table 6 - Chullora Railway Workshops
Groundwater Analytical Results - Volatile Chlorinated Hydrocarbons

All units in ug/L

Sample ID	Sampled by	Date	Volatile Halogenated Hydrocarbons																										
			Vinyl chloride	Chloroethane	Trichlorodifluoromethane	1,1-Dichloroethene	Methylene chloride	trans-1,2-Dichloroethene	1,1-Dichloroethane	cis-1,2-Dichloroethene	Chloroform	1,1,1-Trichloroethane	Carbon tetrachloride	1,2-Dichloroethane	Trichloroethene	1,2-Dichloropropane	Bromodichloromethane	trans-1,3-Dichloropropylene	cis-1,3-Dichloropropylene	1,1,2-Trichloroethane	Tetrachloroethene	Dibromochloromethane	Chlorobenzene	Bromoform	1,1,2,2-Tetrachloroethane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2-Dichlorobenzene
LOR	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADOPTED IL		-	100			90			700	1900					330					6500	70					260	60	160
Area D: Electrical Maintenance Centre (EMC)																													
207p	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
207d	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
207	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
207	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
207	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
207	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
207	URS	Jul-07	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW1	ERM	Jan-05	<50	<50	<50	**76**	na	<5	**6**	<5	<5	**98**	<5	<5	**15**	<5	<5	na	na	<5	**60**	<5	<5	<5	<5	<5	<5	<5	<5
MW2	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW2	URS	Jul-07	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW4	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW5	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW6	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW7	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW8	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW9	ERM	Jan-05	<50	<50	<50	**100**	na	<5	<5	**22**	<5	<5	<5	<5	**15**	<5	<5	na	na	<5	**81**	<5	<5	<5	<5	<5	<5	<5	<5
MW10	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW11	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW12	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW12	URS	Jul-07	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW13	ERM	Jan-05	<50	<50	<50	**8**	na	<5	<5	**40**	<5	<5	<5	<5	**19**	<5	<5	na	na	<5	15	<5	<5	<5	<5	<5	<5	<5	<5
MW14	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	na	na	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW15	ERM	Jan-05	<50	<50	<50	<5	na	<5	<5	**5**	<5	<5	<5	<5	**16**	<5	<5	na	na	<5	**45**	<5	<5	<5	<5	<5	<5	<5	<5
MW02	URS	Jan-02	**29**	nd	nd	nd	nd	**2**	**11**	**60**	nd	nd	nd	nd	**6**	nd	nd	nd	nd	nd	**2**	nd	nd	nd	nd	nd	nd	nd	nd
MW03	URS	Jan-02	**2**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW03	URS	Jul-07	nd	nd	nd	nd	nd	nd	nd	**120**	nd	nd	nd	nd	**12**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW04	URS	Jan-02	nd	nd	nd	nd	nd	nd	nd	**4**	nd	nd	nd	nd	**1**	nd	nd	nd	nd	nd	**34**	nd	nd	nd	nd	nd	nd	nd	nd
Area E: Load Box and Refuelling Facility																													
150	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
150	CES	Feb-01	nd	nd	nd	nd	nd	nd	2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
150	CES	May-01	nd	nd	nd	nd	nd	nd	2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
150	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
150	CES	Nov-01	nd	nd	nd	nd	nd	nd	2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
154	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
201	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MWCD1	URS	Jul-07	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MWCS1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MWCS1	URS	Jul-07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MWCD5	Coffey	Feb-06	<50	na	na	**16**	na	<5	**44**	**1010**	na	na	na	na	**306**	na	na	na	na	na	**207**	na	na	na	na	na	na	na	na
MWCD6	Coffey	Feb-06	**60**	na	na	**12**	na	**5**	**38**	**949**	na	na	na	na	<5	na	na	na	na	na	<5	na	na	na	na	na	na	na	na
Area F: North Western Portion, Including Ballast Recycling Centre																													
104	D&M	Sep-99	nd	nd	nd	16	1	nd	12	nd	nd	66	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
302	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
303	D&M	Jun-00	nd	nd	nd	46	nd	nd	35	nd	nd	200	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
401	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Area G: North Eastern Portion Including Former Rail Reclamation Area																													
132	D&M	Sep-99	5	nd	64	3	nd	nd	2	7	nd	nd	nd	nd	16	nd	nd	nd	nd	nd	36	nd	nd	nd	nd	nd	nd	nd	nd
203	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
204	D&M	Sep-99	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
309	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
310	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
402	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Area H: South Eastern Portion																													
403	D&M	Jun-00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
403	CES	Feb-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
403	CES	May-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
403	CES	Aug-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
403	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
403	CES	Nov-01	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Max. Concentration			12700	43	64	384	1	207	2720	93800	0	200	0	0	1920	0	0	0	0	0	22400	0	0	0	0	0	0	0
Min. Concentration			1	2	33	2	1	2	1	1	0	2	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0

Notes:

* LOR increased due to matrix interference

All units in ug/L

"--" and "na" = not analysed

nd = not detected

p = primary sample d = duplicate sample

Table 7a- Chullora Railway Workshops
Sediment Analytical Results, January 2005 - ERM

Sample ID				SWP-1	SWP-2	SWP-3	SWP-4	SWP-6	SWP-7	SWP-8	SWP-9	SWP-10	D1401-2
Date Sampled				14/01/2005	14/01/2005	14/01/2005	14/01/2005	14/01/2005	14/01/2005	14/01/2005	14/01/2005	14/01/2005	14/01/2005
Sample Type				Primary Sample	Primary Sample	Primary Sample	Primary Sample	Primary Sample	Primary Sample	Primary Sample	Primary Sample	Primary Sample	Primary Sample
Batch No.			ADOPTED IL	AREA D - EMC	AREA D - EMC	AREA D - EMC	AREA D - EMC	AREA D - EMC	AREA D - EMC	AREA D - EMC	AREA D - EMC	AREA D - EMC	AREA D - EMC
Analyte	**LOR**	**Units**											
Total Petroleum Hydrocarbons													
C6-C9 fraction	2	mg/kg		nd	nd	10	nd	nd	nd	nd	390	nd	nd
C10-C14 fraction	50	mg/kg		800	160	90	nd	60	70	nd	3810	120	110
C15-C28 fraction	100	mg/kg		4180	890	540	100	**600**	630	200	2370	620	360
C29-C36 fraction	100	mg/kg		2370	1410	840	160	**1240**	1180	350	3100	920	290
BTEX Compounds													
Benzene	0.2	mg/kg		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	0.2	mg/kg		3.1	nd	1.3	nd	nd	nd	nd	1.1	nd	nd
Ethylbenzene	0.2	mg/kg		nd	nd	0.9	nd	nd	nd	nd	11	nd	nd
Total Xylenes	0.4	mg/kg		nd	nd	9.7	nd	0.7	nd	nd	52	nd	nd
Metals (Total)													
Antimony	1	mg/kg		54	11	12	3	28	12	36	20	9	13
Arsenic	5	mg/kg	20	16	14	13	17	16	**28**	16	16	13	17
Beryllium	1	mg/kg		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Cadmium	1	mg/kg	1.5	**20**	**11**	**17**	**1.6**	**28**	**60**	**28**	**139**	**20**	**38**
Chromium	2	mg/kg	80	**190**	**230**	**87**	17	**160**	**140**	**100**	**250**	**120**	**94**
Copper	5	mg/kg	65	**7530**	**5450**	**4010**	**1190**	**2030**	**1430**	**1610**	**11900**	**1980**	**2410**
Lead	5	mg/kg	50	**640**	**510**	**370**	**75**	**1210**	**1110**	**930**	**1350**	**440**	**710**
Nickel	2	mg/kg	21	**120**	**150**	**35**	12	**72**	**85**	**66**	**330**	**93**	**50**
Selenium	5	mg/kg		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver	5	mg/kg		24	30	39	3.2	24	39	31	39	45	28
Thallium	2	mg/kg		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Zinc	5	mg/kg	200	**4920**	**2540**	**1320**	170	**1190**	**4280**	**1910**	**7470**	**2730**	**2210**
Mercury	0.1	mg/kg	0.15	**0.26**	**1.4**	0.14	0.07	**0.22**	**0.39**	**0.34**	**0.74**	**0.2**	**0.23**
VOC													
Total detected VOC		mg/kg	--	10.3	nd	12.5	nd	0.7	nd	17.4	409	1.2	10.5
SVOC (Inl													
Total detected SVOC		mg/kg	--	92.7	20.3	13.4	0.9	16.5	23.1	9.3	157.1	21.7	28.8
PAHs													
Total detected PAHs		mg/kg	--	5.5	2.4	nd	2.4	nd	1.1	nd	9.5	1	nd
OCPs													
Total detected OCPs		mg/kg	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
PCBs													
Total detected PCBS		mg/kg	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

(1) ANZECC/ARMCANZ 2000 Sediment Quality Guidelines (Trigger Values)

Results Exceed Adopted Investigation Levels

Table 7b - Chullora Railway Workshops
Sediment Analytical Results, July 2007 - URS

Sample ID			CANAL	RETENTION POND	SWAMP	QC03_2007/07
Date Sampled			20/07/2007	19/07/2007	19/07/2007	19/07/2007
Sample Type			Primary Sample	Primary Sample	Primary Sample	Duplicate Sample
Area			AREA C -LMC	AREA F - NW Portion including Ballast Recycling Centre	Area G - NE Portion Including Rail Reclamation Area	Area G - NE Portion Including Rail Reclamation Area
Batch No.		**ADOPTED IL**	ES0709901_MRED	ES0709901_MRED	ES0709901_MRED	ES0709901_MRED

Analyte	**LOR**	**Units**					
Total Petroleum Hydrocarbons							
C6-C9 fraction	2	mg/kg		<10	<10	<10	<10
C10-C14 fraction	50	mg/kg		<50	<50	<50	<50
C15-C28 fraction	100	mg/kg		**640**	<100	<100	<100
C29-C36 fraction	100	mg/kg		**940**	<100	<100	<100
BTEX Compounds							
Benzene	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2
Ethylbenzene	0.2	mg/kg		<0.5	<0.5	<0.5	<0.5
m&p-Xylene	0.2	mg/kg		<0.5	<0.5	<0.5	<0.5
o-Xylene	0.2	mg/kg		<0.5	<0.5	<0.5	<0.5
Toluene	0.2	mg/kg		<0.5	<0.5	<0.5	<0.5
Total Xylenes	0.4	mg/kg		-	-	-	-
Metals (Total)							
Arsenic	5	mg/kg	20	**12**	**33**	**41**	**47**
Cadmium	1	mg/kg	1.5	**3**	<1	<1	<1
Chromium	2	mg/kg	80	**54**	**13**	**29**	**31**
Copper	5	mg/kg	65	**138**	**117**	**274**	**305**
Lead	5	mg/kg	50	**166**	**51**	**238**	**252**
Mercury	0.1	mg/kg	0.15	**0.1**	<0.1	**0.2**	**0.2**
Nickel	2	mg/kg	21	**21**	**14**	**31**	**34**
Zinc	5	mg/kg	200	**565**	**100**	**355**	**390**
Chlorinated Aliphatic Compounds							
1,1,1,2-Tetrachloroethane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,1-Dichloropropylene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,2,3-Trichloropropane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,2-Dibromo-3-chloropropane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Bromomethane	5	mg/kg		<5	<5	<5	<5
Carbon Tetrachloride	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Chloroethane	5	mg/kg		<5	<5	<5	<5
Chloromethane	5	mg/kg		<5	<5	<5	<5
cis-1,2-Dichloroethene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
cis-1,4-Dichloro-2-butene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Dibromomethane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	5	mg/kg		<5	<5	<5	<5
Hexachlorobutadiene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Iodomethane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Pentachloroethane	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
trans-1,4-Dichloro-2-butene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	5	mg/kg		<5	<5	<5	<5
Vinyl chloride	5	mg/kg		<5	<5	<5	<5
Chlorinated Aromatic Compounds							
1,2,3-Trichlorobenzene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
2-Chlorotoluene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
4-Chlorotoluene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Bromobenzene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5