Dow Corning Ltd Site SPMP Report – 2014

The following items are included within the report:

1. H2 Infrastructure Monitoring Report
2. Spill Report
3. Landfill groundwater Sampling Programme and update on boreholes

Appendix 1	Borehole Location Map On Landfill and Current Status
Appendix 2	Borehole data - groundwater monitoring programme data (8 pages)
Appendix 3	Borehole data – gauge water depths (2 pages)

1. H2 INFRASTRUCTURE MONITORING REPORT Period: 2014

Infrastructure Element	Monitoring Frequency	Scope of Monitoring	Summary of monitoring performed versus plan and key issues identified	Summary of Remediation Action Taken and/or planned
Bunds and Interceptors	(every 2-4 years depending on condition, volume & contents hazard)	A programmed visual engineering inspection and condition assessment will be undertaken for: • Foundations • Overall structure • External walls • Ground floor • Stairs and access ladders • Protective coatings • Gratings and covers • Joint sealants, and • Other observations The severity and extent of observed defects are assessed using a risk assessment matrix to establish a High, Medium or Low risk for the defect and determine the required response time for remedial attention. • High Risk – Requires attention in the short term i.e. repairs must be done within the year following the inspection. • Medium Risk – Will require attention in medium term, probably after next inspection. • Low Risk – Not urgent; will eventually require attention in the long term.	**Number of inspections carried out:** 10 out of 11 planned. **Outstanding Inspections:** Interceptor **I11** (W952 Chem Sump) not inspected, as in constant use throughout 2014, &/or limited Area 5 Coordinator resource to jet/prep. Further delay caused in QTR 4 2014 due to compliance change with vac pumping flammable, solid materials from pits. Area 5 currently working on procedure to safely vac out solids to allow inspection to take place. Will be inspected QTR 1 2015. **2014 High risk findings = 3No.** Bund **B06** (W712) – Varying degrees of cracking & damage to protective coating, to inside faces of bund wall & floor. Bund **B26** (W801) – Varying degrees of cracking & damage to protective screed to bund floor. (Note: Initial mortar repairs carried out in QTR 3 2014 to address immediate trip hazards/raised HONK, but further discussion will be required in 2015 to determine whether a new protective coating is required.) Interceptor **I06** (W413 Chem	**'High Priority' Defects:** Repair packages were prepared in QTR 1 of 2014 to address the 2013 'High Priority' defects. Approx **£11.4K** has been spent to complete these. Please note: **£20.9K** worth of repairs still outstanding to Sacrificial Slab of I14 (400 Primary Bay) & I15 (1307 Primary Bay). Limited Area 5 Coordinator resource available to jet/prep to allow access for repairs to take place. All 'High Priority' defects recorded in 2014 inspections have been added to the ongoing repair list & will be quoted for & agreed by end QTR 2 2015. **'Medium Priority' Defects:** These assets will be reviewed at the next scheduled inspection unless otherwise highlighted as requiring immediate attention. (E.g. from Plant Operators, HONKS, Structural Inspections etc).

			Sumps) – Defective mortar joint between acid tiling courses. (Note: Repairs were carried out the day after inspection, as sump was already shutdown & Ancorite resource was available on site to address ASAP.) **2014 Low to Medium risk findings = 7No.** **Typical Issues identified:** Minor surface cracks to slabs/screeds/walls <5mm wide. Minor joint sealant deterioration. Loose bricks & poor mortar joints (Note: to 2No non-compliant bunds). Chipped acid tiles. Eroded pointing to acid tile courses.	

Infrastructure Element	Monitoring Frequency	Scope of Monitoring	Summary of monitoring performed versus plan and key issues identified	Summary of Remediation Action Taken and/or planned
Surfaced areas	Inspection frequency determined by risk score for each hardstanding area.	Appearance of cracks and evidence of fluids ingress into the subsurface; • Deterioration of sealed joints in concrete hardstanding; • Vehicular damage to containment kerbs; • Subsidence or movement; • Discolouration/staining • Evidence of surface spalling and/or chemical attack; and • Ponding and/or run off to non hardstanding areas. The severity and extent of observed	**Number of inspections carried out:** 6 out of 6 planned. **2014 High risk findings = 3No.** Hardstanding **H10** (W410) – Warehouse: Cracked/missing acid tiles & poor acid tile pointing; significant condensate wear causing voids to concrete slab; missing joint sealant to concrete slab. Loading Bays: Missing joint sealant to concrete slab; vehicle chocks damaged exposing dowel bars & drill holes.	**'High Priority' Defects:** Repair packages were prepared in QTR 1 of 2014 to address the 2013 'High Priority' defects. Approx **£5K** has been spent to complete these. All 'High Priority' defects recorded in 2014 inspections have been added to the ongoing repair list & will be quoted for & agreed by end QTR 2 2014. **'Medium Priority' Defects:** These assets will be reviewed at

		defects will be assessed using the risk assessment matrix developed for the bund and interceptor inspection programme. This will establish a High, Medium or Low risk for the defect and determine the required response time for remedial attention. • High Risk – Requires attention in the short term i.e. repairs must be done within the year following the inspection. • Medium Risk – Will require attention in medium term, probably after next inspection. • Low Risk – Not urgent; will eventually require attention in the long term.	Hardstanding **H23** (W306) – <u>Building:</u> Damaged concrete slab causing voids; missing joint sealant to concrete slab. <u>Waste Patch:</u> Concrete crumble at chem grating edge; missing joint sealant to slab. Hardstanding **H24** (W115) – Missing joint sealant to concrete slab. **<u>2014 Low to Medium risk findings = 3No.</u>** **<u>Typical Issues identified:</u>** Minor surface cracks to slabs <5mm wide. Minor chem pitting to slabs. Minor deterioration of slab joint sealant. General wear to slab edges. Galvanised finish breakdown to grating covers.	the next scheduled inspection unless otherwise highlighted as requiring immediate attention. (E.g. from Plant Operators, HONKS, Structural Inspections etc).

Infrastructure Element	Monitoring Frequency	Scope of Monitoring	Summary of monitoring performed versus plan and key issues identified	Summary of Remediation Action Taken and/or planned
Chemical Sewer Inspections	BAT requirement for an inspection programme is every 3 years. i). It was agreed that the **site**	i). In line with EA requirements, **Atec Drainage LTD** were invited to site in 2010 to carry out condition surveys of the open chemical channel network as follows: Finishing in 2010, Dragon in 2011 & Genesis in 2012. **<u>Atec Drainage LTD – Scope of works included:</u>** • Lifting grating covers & cleansing	**<u>i). Key issues identified to Open Chem Channel Network:</u>** Civils Group reviewed all open channel reports & photographs by QTR 4 of 2012, compiled a list of defects & a drawing showing each location. Environmental resource helped to populate this defect list based on chemical risk & continuous flow	**<u>2015 Plan of Action:</u>** **<u>i). Open Channel Surveys:</u>** - 12 'High/Medium Priority – 4s' were addressed in 2014. Approx **£5.4K** has been spent to complete these. <u>Please note:</u> **£1.6K** worth of repairs still outstanding to damage on W1206.

	chemical open channel system would be split into 3 zones (Finishing, Dragon & Genesis), & inspected under a 3 year rolling programme. ii). Similarly, it was agreed under IP12 that **underground chemical sewers** would be split into 3 zones (new basics, old basics and finishing) and that each zone would be inspected every 6 years under a rolling programme.	open channel runs, prior to surveying. • Provision of survey reports with photographs in standard format ii). In line with EA requirements, **Atec Drainage LTD** were awarded the tender at start of QTR 3 in 2012, to carry out condition surveys of the underground chemical site sewer network (approx 12Kms) as follows: Genesis in 2012, Dragon in 2013, & Finishing in 2014. **<u>Scope of works includes:</u>** • Cleansing sewer runs and interconnecting chambers prior to surveying. • Upto 100% surveys of underground chemical sewer network. • CCTV surveys carried out of each sewer run. • Surveys & water testing of interconnecting chambers & manholes. • Provision of survey reports in standard format. The severity and extent of observed defects will be assessed using the risk assessment matrix developed for the bund and interceptor inspection programme. This will establish a High, Medium or Low risk for the defect and determine the required response time for remedial attention.	data, to prioritise repairs as follows: '5s' High – repair in 2013 '4s' High/Medium – repair in 2014 '3s' Medium – repair in 2015 '2s' Medium/Low – repair in 2016 '1s' Low – repair in 2017 **<u>ii). Key issues identified to Underground Chem Sewer Network:</u>** Civils Group reviewed all CCTV reports & MH surveys by QTR 2 2014, compiled a list of defects & a drawing showing each location. Environmental resource helped to populate this defect list based on chemical risk & continuous flow data, to prioritise repairs as follows: '1s' – High to '9s' – Low.	Limited Area 5 Coordinator resource available to jet/prep to allow access for repairs to take place. 21 'Medium Priority – 3s' will be quoted for & agreed by end QTR 2 2015. **<u>ii). Underground Chem Sewer Surveys:</u>** - 49 CCTV footage surveys showed dubious pipe or joint defects, which from past experience could simply be formed excess adhesive material, when the pipes were 'push-fitted' together. In order to discount any potential containment issues, air tests will be carried out in QTR 1 & 2 2015 to check the integrity of these pipes in question. These air tests will be addressed via a Revenue work order for quote amount **£14.7K.** Any pipes found with containment issues, will be input back into the defect register & scored accordingly based on chemical risk & continuous flow data. A **Capital budget of £250K** has been secured for the chem sewer repairs in 2015. Civils Group presented a programme to address the higher risk items, aswell as some of the easy fix items, with the aim of spending as much of the £250K as

		• High Risk – Requires attention in the year after the inspection (at the latest). • Medium Risk – Will require attention in medium term, probably after next inspection. • Low Risk – Not urgent; will eventually require attention in the long term.		possible. <u>2015 Repairs will aim to include:</u> • 12 MH Invert caps (Easy fixes – Priorities 1 to 9). • 9 Patch repairs to pipes (Priorities 1 to 4). • 4 Liner repairs to pipes (Priorities 1 to 4). 4 Flange repairs (Priorities 1 to 3) • 6 Manhole repairs or replacements • (Priorities 1 to 4)
Spillways	(every 2-4 years depending on condition & contents hazard)	A programmed visual engineering inspection and condition assessment will be undertaken for the spillways: • Foundations • Overall structure • Spillway walls • Ground floor • Gratings and covers • Joint sealants • Evidence of surface spalling and/or chemical attack • Ponding • Other observations The severity and extent of observed defects are assessed using a risk assessment matrix to establish a High, Medium or Low risk for the defect and determine the required response time for remedial attention. • High Risk – Requires attention in the short term i.e. repairs must be done within the year following the inspection. • Medium Risk – Will require	100% visual Inspection completed by QTR 4 2014 **<u>Key issues identified:</u>** • **<u>High Priorities:</u>** Exposed re-bar. Surface damage/pitting. Spalling concrete/holes. Condensate wear.	**<u>'High Priority' Defects:</u>** All 'High Priority' defects recorded in 2014 Spillway inspections will be quoted for & agreed by end QTR 2 2014. <u>Please note:</u> <u>Low Spots/Pockets of Water:</u> Flagged up as part of the Jan 2014 COMAH Audit. Response by Neil Roberts (Email dated: 07/05/14, Titled: COMAH Process Safety Inspection – follow up response 2), stated the following: 'In view of Process Safety, low spots/pockets of water do not pose a significant additional hazard as: a) We have demonstrated adequate spillway capacity for credible worst case scenarios. b) Inevitably there will be a low level of water present in W809 spillpond, into which the spillways will

		attention in medium term, probably after next inspection. • Low Risk – Not urgent; will eventually require attention in the long term.		drain. c) We intend to install spillway foam pourers to help maximize Emergency Response Mitigation Management Capability (primarily for fire but also to minimize HCl fumes). d) We will set-up a cleaning schedule via Workplace Inspections/Housekeeping Programme, to ensure the spillways are clean & clear from debris & rubbish.'

2. SPILLS REPORT YEAR END, 2014

A total of 103 reported spill incidents in total from January 2014 to December 2014 were accessed for potential to contaminate the ground. Most of the reported incidents had little or no potential to contaminate the ground. There were immediate Engineering mitigation measures in place for most of the spills thereby reducing the possibility of contamination. The incidents with potential to cause any contamination or inconclusive consequences are reported above, along with comments regarding potential impact.

Incident Ref	Incident Summary	Material spilt	Actions taken including any remediation
18226	Due to a blockage on the primary sewer, low pH material overflowed to the floor. It was noted that were cracks in the concrete into which the material was running	Hydrochloric acid	Short term, the hole in the concrete will be repaired. Longer ter, there is an active project to upgrade the scrubber system which should prevent blockages and overloading the system leading to overflow.
18686	On connecting a sulphuric acid tanker it was noted that it was leaking and drips of material could be seen where it had driven across the site.	Sulphuric acid	Roads were washed down. Tanker repaired Reported to Haulier. Tanker was weighed and loss thought to be very low
18031	There was a pump failure on W719 chemical collection pit. This resulted in the pump overflowing, although this would be primarily rain water, staining could be seen on surrounding chippings		Pump repaired Chippings replaced
19299	People working on W705 noticed there were some sunkem chippings. On investigation it was found the chemical sewer beneath the chippings had failed	Hydrochloric acid	The chemical sewer was surveyed by atec and areas of damage identified. These were cut out and replaced with a new section.

3. Dow Corning Groundwater Sampling Programme (2010 onwards)

Sampling Plan

A quarterly sampling plan was implemented in 2009 to satisfy both SPMP (Site Protection and Monitoring Programme) and Landfill licence requirements (ref URS design of a site monitoring programme, 44382681, July 2006 and Dow Corning landfill CMS review, 49310733, October 2008).

Table 1 Quarterly Borehole and Surface Water Sampling programme

Table 1 lists the sampling programme designed to satisfy the requirements for 6 monthly sampling of boreholes associated with the landfill area and annual sampling for other site boreholes for SPMP purposes.

Q1 (LANDFILL)	Q2 (SITE)	Q3 (LANDFILL)	Q4 (SITE)
LF1 I **(if not waterlogged**)	155	LF1 **(if not waterlogged**)	157
LF4	156	LF4	160
LF6 **(if not waterlogged**)	165	LF6 **(if not waterlogged**)	161
LF7	174	LF7	168
210	175	210	203
312	201	312	206
412	202	412	311
A2d	215	A2d	311a
E1s	B1	E1s	411
E1m	C2d	E1m	A1s
E1d	C3s	E1d	A1d
E2s **(if not waterlogged**)	C3d	E2s **(if not waterlogged**)	B2s
E2d **(if not waterlogged**)	D1	E2d **(if not waterlogged**)	B2d
E4s	D2s	E4s	
E4d	D2d	E4d	
Timber Pond **(Access not possible due to advancing Reed bed)**	D3d	Timber Pond **(Access not possible due to advancing Reed bed)**	
Cadoxton Pond		Cadoxton Pond	
Freshwater Pond		Freshwater Pond	
Cadoxton River SW2		Cadoxton River SW2	
Cadoxton River SW3		Cadoxton River SW3	
LF1,4,6.7 Gas		LF1,4,6.7 Gas	
Visual Stability		Visual Stability	
LF2 (**if not waterlogged**)		LF2 (**if not waterlogged**)	
LF3(**if not waterlogged**)		LF3(**if not waterlogged**)	

The location of boreholes is shown in the borehole location plan (Appendix 2), which is now on the main site MUDS drawing for control purposes.

Table 2 Borehole status Jan 2015

Q1 (LANDFILL)	Jan'15 status
LF1 (if not waterlogged)	Unable to sample – borehole lost, collar destroyed.
LF4	ok
LF6 (if not waterlogged)	ok
LF7	ok
210	ok
312	ok
412	ok
A2d	ok
E1s	ok
E1m	ok
E1d	ok
E2s (if not waterlogged)	Unable to sample – borehole lost to reeds/timber pond
E2d (if not waterlogged)	Unable to sample – bore hole lost to reeds/timber pond
E4s	ok
E4d	ok
Timber Pond	ok
Cadoxton Pond	ok
Freshwater Pond	ok
Cadoxton River SW2	ok
Cadoxton River SW3	ok
LF1,4,6.7 Gas	Removed as a requirement in 2010
Visual Stability	
LF2 (**if not waterlogged**)	Unable to sample – bore hole collar full of solid waste, needs to be dug out, access to bore hole is restricted due to unstable ground surrounding bore hole.
LF3(**if not waterlogged**)	Unable to sample – bore hole lost.
170 - obsolete	Removed in 2010

Q2 (SITE)	Jan'15 status	Q4 (SITE)	Jan'15 status
155	No Bung in bore hole, top of shaft is shattered. Shaft is full of mud/silt. Unable to sample	157	
156	ok	160	ok
165	ok	161	ok
174	ok	168	ok
175	ok	203	ok
201	ok	206	ok
202	ok	311	ok
215	ok	311a	ok

B1	ok	411	ok
C2d	ok	A1s	ok
C3s	ok	A1d	ok
C3d	ok	B2s	ok
D1	ok	B2d	ok
D2s	ok		
D2d	ok		
D3d	lost		

The above table highlights the condition of the existing boreholes. A number of the boreholes are difficult to sample or have been lost. A project was initiated in 2014 to review the data and determine if there were any gaps in the data gathering. A report from an external company is expected back on 31st January 2015 and provision has been made within the site infrastructure and planning teams for installation of additional boreholes during 2015.

Monitoring Plan

Each sample in Table 1 will be monitored for the following determinants:

Table 3 Groundwater Monitoring Programme

Determinants	Comments
Hardness	**Only for Landfill samples** (for use in Cu/Zn EQS setting by EA)
COD	All
BOD	**Only for Site samples** (not required for landfill samples)
pH	All
Chloride	All
Alkalinity	All
Sulphates	All
Metals	All (Al,As,Cd,Cr,Cu,Fe,Hg,Mn,Ni,Pb,Se,Si,Sn,Zn) plus Ca,Mg
Ethyl benzene	All
Xylene	All (Ortha, Meta & Para)
Toluene	All
Cyclic siloxanes	All (D3,D4,D5,D6 and HMDS siloxanes)
Trimethylsilanol	All
Methanol	All

Other Monitoring Parameters

The following parameters will be monitored in addition to the requirements laid out in Tables 3.

- **Gauge water levels**: these will be measured for all boreholes every sample.

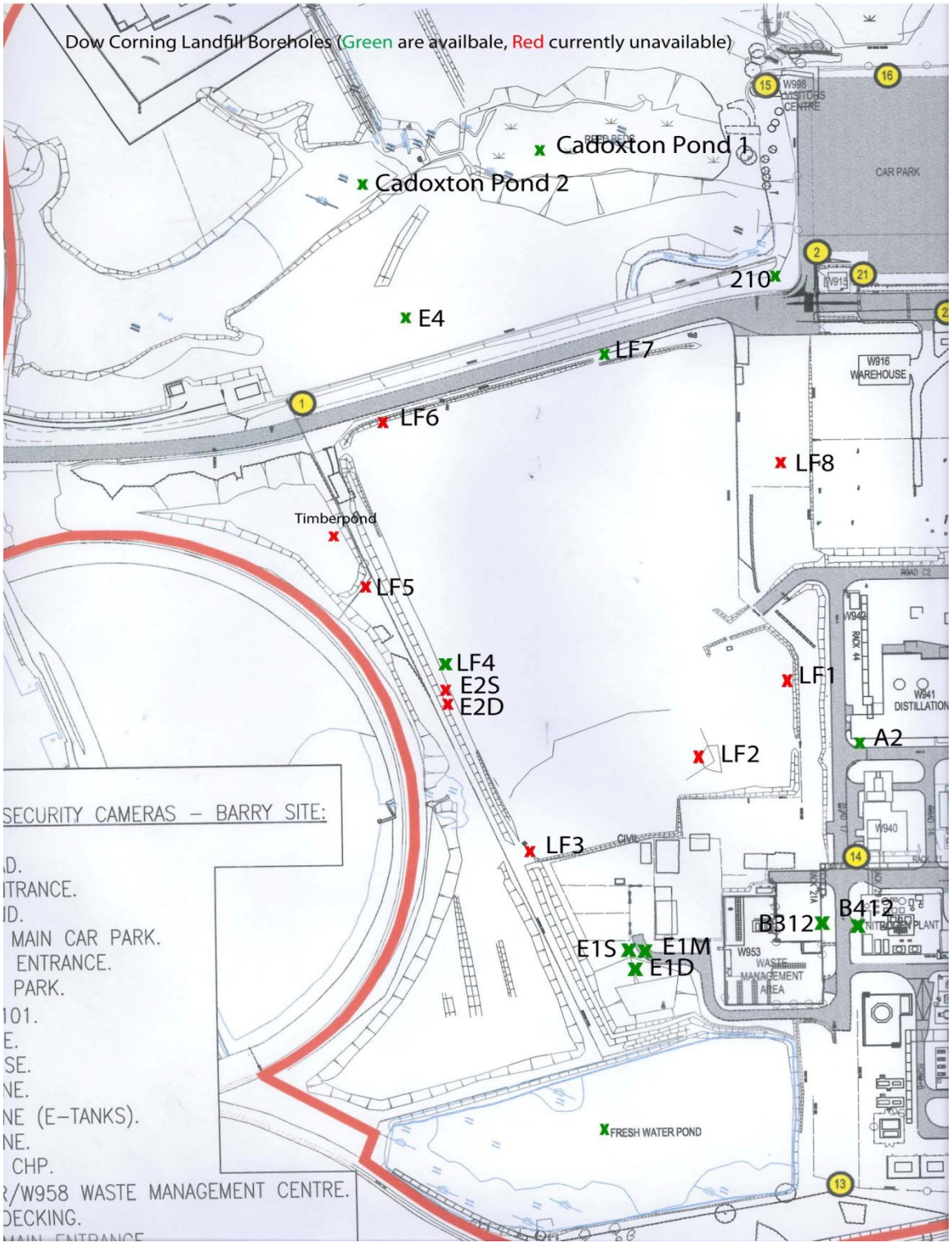
Trend Analysis for Copper and TMS (Trimethyl Silanol)

All landfill related boreholes and surface water samples (i.e. Q1 and Q3) sample results for copper and TMS* will be graphically reported to clearly illustrate trends. Graphs are to be submitted to the Agency along with landfill reporting forms every 6 months. This commenced in 2010. The latest Q3 report was submitted October 2014

*Note that the current test method for TMS provides inaccurate results so caution should be taken when looking at graphical trends.

APPENDIX 1

Borehole Location Map On Landfill and Current Status


Dow Corning Landfill Boreholes (Green are availbale, Red currently unavailable)
Cadoxton Pond 1
Cadoxton Pond 2
210
E4
LF7
LF6
LF8
Timberpond
LF5
LF4
E2S
E2D
LF1
LF2
A2
LF3
B412
B312
E1S
E1M
E1D
FRESH WATER POND
CAR PARK
W916 WAREHOUSE
W941 DISTILLATION
W940
W953 WASTE MANAGEMENT AREA
SECURITY CAMERAS – BARRY SITE:
MAIN CAR PARK.
ENTRANCE.
PARK.
(E–TANKS).
CHP.
/W958 WASTE MANAGEMENT CENTRE.
DECKING.

APPENDIX 2

Max of Result value	Column Labels						
Row Labels	Aluminium	Arsenic	Biological Oxygen Demand (BOD)	Cadmium	Calcium	Chemical Oxygen Demand	Chloride
Q1							
A2D	0.0	0.0		0.0	2127.1	579.0	5087.6
BH_210	0.0	0.0		0.0	106.2	27.3	1080.4
BH_312	0.0	0.0		0.0	880.7	149.0	3943.9
BH_412	0.0	0.0		0.0	673.5	119.0	3823.5
CAD_PND1	0.0	0.0		0.0	63.6	18.4	170.5
CAD_PND2	0.0	0.0		0.0	76.5	0.0	144.9
E1D	0.0	0.0		0.0	195.7	16.4	2144.2
E1M	0.0	0.0		0.0	152.7	197.2	4724.1
E1S	0.0	0.0		0.0	102.9	65.3	568.0
E4D	0.0	0.0		0.0	86.9	48.1	4462.6
E4S	0.0	0.0		0.0	175.5	101.0	8471.6
FRESHW_PND	0.0	0.0		0.0	311.1	48.2	808.2
LF_4	0.0	0.0		0.0		498.0	3933.2
LF_7	0.0	0.0		0.0	465.1	54.4	4809.3
SW2	0.0	0.0		0.0	76.5	0.0	22.6
SW3	0.0	0.0		0.0	163.5	29.6	213.8
Q2							
B1	0.0	0.0	5.0	0.0		193.0	1271.7
BH_165	0.0	0.0		0.0		112.0	699.2
BH_174	0.0	0.0	1.0	0.0		107.0	45.1
BH_175	0.0	0.0	4.0	0.0		26.6	52.3
BH_201	0.0	0.0	6.0	0.0		287.0	1609.5
BH_202	0.0	0.0	2.0	0.0		196.0	3985.6
BH_215	0.0	0.0	3.0	0.0		65.3	40.1
C2D	0.0	0.0	3.0	0.0		0.0	5026.0
C3D	0.0	0.0	0.0	0.0		0.0	1337.4
C3S	0.0	0.0	1.0	0.0		36.7	508.4
D1	0.0	0.0	2.0	0.0		0.0	7326.0
D2D	0.0	0.0	4.0	0.0		98.5	2970.3
D2S	0.0	0.0	3.0	0.0		0.0	11388.4
Q3							
A2D	0.0	0.0		1.1	2650.7	525.0	592.6
BH_210	0.0	0.0		0.0	190.4	72.2	91.2
BH_312	0.0	0.0		0.0	723.4	213.0	154.3
BH_412	0.0	0.0		0.0		259.0	450.9
CAD_PND1	77.4	0.0		0.0	75.8	34.5	265.5
CAD_PND2	106.7	0.0		0.0	86.0	32.9	219.2
E1D	0.0	0.0		0.0	208.7	95.0	207.2
E1M	0.0	23.2		0.0	216.1	185.0	489.6
E1S	0.0	36.5		0.0	132.7	89.4	89.0
E4D	0.0	0.0		0.0	113.7	0.0	513.4
E4S	0.0	0.0		0.0	159.2	0.0	607.3

Row Labels	Aluminium	Arsenic	Biological Oxygen Demand (BOD)	Cadmium	Calcium	Chemical Oxygen Demand	Chloride
FRESHW_PND	114.3	0.0		0.0	362.9	140.2	859.9
LF_4	98.3	0.0		0.0	1417.6	570.0	284.7
LF_7	0.0	64.3		0.0	759.0	0.0	269.4
SW2	1260.9	0.0		1.1	897.8	237.5	185.6
SW3	178.0	0.0		0.0	96.7	26.1	28.1
TIMBER_PND	141.1	0.0		0.0	619.9	158.0	144.1
Q4							
A1D	0.0	10.6	0.0	0.0		178.0	884.4
A1S	0.0	8.6	4.0	0.0		158.0	851.7
B2D	0.0	17.2	0.0	0.0		85.0	36.0
B2S	0.0	55.2	0.0	0.0		138.0	24.4
BH_157	0.0	11.7	2.0	0.0		21.3	335.2
BH_160	0.0	23.9	2.0	0.0		27.1	932.3
BH_161	0.0	12.2	1.0	0.0		21.9	83.1
BH_203	0.0	0.0	1.0	0.0		16.6	43.4
BH_206	19.2	0.0	1.0	0.0		23.4	51.9
BH_311	0.0	97.7	3.0	0.0		58.0	736.8
BH_311A	0.0	0.0	2.0	0.0		13.7	45.8
BH_411	0.0	182.6	1.0	1.5		66.1	76.4

Max of Result value											
Row Labels	Chromium	Copper	D4	D5	D6	Ethylbenzene	Hardness (mg equ. CaCO3/L)	HMDS	Iron	Lead	M Alkalinity (Total Alkalinity)
Q1											
A2D	0.0	4.2	0.0	0.0	0.0	8.0	5491.2	0.0	0.6	0.0	116.1
BH_210	0.0	0.0	0.0	0.0	0.0	0.0	407.4	0.0	0.0	0.0	42.7
BH_312	0.0	0.0	0.0	0.0	0.0	11.5	2264.0	0.0	5.5	0.0	139.8
BH_412	0.0	0.0	0.0	0.0	0.0	0.0	2198.4	0.0	2.2	0.0	419.5
CAD_PND1	0.0	0.0	0.0	0.0	0.0	0.0	218.6	0.0	0.5	0.0	258.3
CAD_PND2	0.0	0.0	0.0	0.0	0.0	0.0	271.1	0.0	0.3	0.0	225.2
E1D	0.0	0.0	0.0	0.0	0.0	0.0	1002.9	0.0	0.0	0.0	395.8
E1M	0.0	0.0	0.0	0.0	0.0	0.0	1134.3	0.0	18.1	0.0	1187.4
E1S	0.0	0.0	0.0	0.0	0.0	0.0	535.4	0.0	11.7	0.0	853.2
E4D	0.0	0.0	0.0	0.0	0.0	0.0	943.4	0.0	3.2	0.0	876.9
E4S	0.0	0.0	0.0	0.0	0.0	0.0	1587.6	0.0	0.0	0.0	687.3
FRESHW_PND	0.0	0.0	0.0	0.0	0.0	0.0	851.0	0.0	0.0	0.0	109.0
LF_4	0.0	0.0	0.0	0.0	0.0	0.0		0.0	2.8	0.0	27.6
LF_7	0.0	0.0	0.0	0.0	0.0	0.0	2075.0	0.0	69.2	0.0	730.0
SW2	0.0	0.0	0.0	0.0	0.0	0.0	251.3	0.0	0.3	0.0	284.4
SW3	0.0	0.0	0.0	0.0	0.0	0.0	466.1	0.0	0.3	0.0	260.7
Q2											
B1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	5.3	0.0	475.2
BH_165	0.0	0.0	0.0	0.0	0.0	0.0		0.0	15.9	0.0	254.4
BH_174	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	180.0
BH_175	0.0	0.0				0.0			3.8	0.0	126.0
BH_201	0.0	1.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	70.8
BH_202	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	62.4
BH_215	0.0	0.0				0.0			0.0	0.0	43.2
C2D	0.0	0.0	0.0	0.0	0.0	0.0		0.0	4.7	0.0	396.0
C3D	0.0	0.0	0.0	0.0	0.0	2.0		0.0	1.4	0.0	222.0
C3S	0.0	0.0	0.0	0.0	0.0	0.0		0.0	8.9	0.0	192.0
D1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	1.2	0.0	253.2
D2D	0.0	0.0	0.0	0.0	0.0	0.0		0.0	8.7	0.0	159.6
D2S	0.0	0.0	0.0	0.0	0.0	0.0		0.0	12.1	0.0	580.8
Q3											
A2D	0.0	6428.0	0.0	0.0	0.0	3.2	6768.8	0.0	547.5	0.0	82.0
BH_210	0.0	0.0	0.0	0.0	0.0	0.0	569.6	0.0	3.2	0.0	32.8
BH_312	1.5	0.0	0.0	0.0	0.0	1.9	1841.5	0.0	5702.6	0.0	114.8
BH_412	0.0	0.0	0.0	0.0	0.0	0.0		0.0	3652.2	0.0	319.8
CAD_PND1	0.0	0.0	0.0	0.0	0.0	0.0	289.9	0.0	436.7	0.0	225.5
CAD_PND2	0.0	0.0	0.0	0.0	0.0	0.0	316.9	0.0	463.9	0.0	282.9
E1D	0.0	0.0	0.0	0.0	0.0	0.0	1010.3	0.0	79.5	0.0	336.2
E1M	8.5	0.0	0.0	0.0	0.0	0.0	1315.7	0.0	24487.1	0.0	943.0
E1S	8.5	0.0	0.0	0.0	0.0	0.0	703.0	0.0	21378.3	0.0	820.0
E4D	0.0	0.0	0.0	0.0	0.0	0.0	1016.7	0.0	4059.2	0.0	865.1
E4S	0.0	0.0	0.0	0.0	0.0	0.0	1227.1	0.0	0.0	0.0	619.1

Row Labels	Chromium	Copper	D4	D5	D6	Ethylbenzene	Hardness (mg equ. CaCO3/L)	HMDS	Iron	Lead	M Alkalinity (Total Alkalinity)
FRESHW_PND	0.0	9.6	0.0	0.0	0.0	0.0	992.8	0.0	1522.0	0.0	53.3
LF_4	0.0	11.9	0.0	0.0	0.0	0.0	3571.5	0.0	2271.4	0.0	131.2
LF_7	18.3	20.4	0.0	0.0	0.0	0.0	2437.5	0.0	51736.5	0.0	623.2
SW2	8.1	87.8	0.0	0.0	0.0	0.0	2355.8	0.0	3496.9	24.5	205.0
SW3	0.0	10.5	0.0	0.0	0.0	0.0	329.4	0.0	638.4	0.0	311.6
TIMBER_PND	0.0	339.4				0.0	1638.1		3212.9	0.0	82.0
Q4											
A1D	18.2	0.0	0.0	0.0	0.0	0.0		0.0	29380.7	5.2	188.3
A1S	19.8	0.0	0.0	0.0	0.0	0.0		0.0	31852.5	5.6	107.3
B2D	0.0	0.0	0.0	0.0	0.0	0.0		0.0	306.5	1.7	284.7
B2S	4.1	0.0	0.0	0.0	0.0	0.0		0.0	6380.9	1.5	280.3
BH_157	0.0	5.8	0.0	0.0	0.0	0.0		0.0	6.5	0.0	438.0
BH_160	0.0	2.5	0.0	0.0	0.0	0.0		0.0	557.3	1.3	792.8
BH_161	0.0	6.6	0.0	0.0	0.0	0.0		0.0	25.1	0.0	221.2
BH_203	0.0	32.5	0.0	0.0	0.0	0.0		0.0	60.3	0.0	135.8
BH_206	0.0	5.2	0.0	0.0	0.0	0.0		0.0	45.5	0.0	221.2
BH_311	1.9	6.7	0.0	0.0	0.0	0.0		0.0	3231.6	1.7	663.6
BH_311A	0.0	15.6	0.0	0.0	0.0	0.0		0.0	824.2	0.0	192.7
BH_411	5.9	0.0	0.0	0.0	0.0	0.0		0.0	8596.2	2.3	694.2

Max of Result value									
Row Labels	Magnesium	Manganese	Mercury	Methanol	m-Xylene	Nickel	o-Xylene	P Alkalinity (As Carbonates)	pH
Q1									
A2D	43.7	0.5	0.0	0.0	8.0	0.0	15.5	0.0	7.2
BH_210	34.5	0.0	0.0	0.0	0.0	0.0	0.0	16.6	8.7
BH_312	15.8	0.4	0.0	0.0	23.5	0.0	29.3	0.0	6.9
BH_412	125.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	7.3
CAD_PND1	14.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	7.8
CAD_PND2	19.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	7.7
E1D	124.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5
E1M	182.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	7.3
E1S	67.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	7.4
E4D	176.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	7.7
E4S	279.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	7.5
FRESHW_PND	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5
LF_4		4.9	0.0	0.0	0.0	0.0	0.0	0.0	7.5
LF_7	221.9	2.1	0.0	0.0	0.0	0.0	0.0	0.0	7.3
SW2	14.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8
SW3	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5
Q2									
B1		0.3	0.0	0.0	0.0	0.0	0.0	0.0	7.6
BH_165		1.3	0.0	0.0	0.0	0.0	0.0	0.0	7.2
BH_174		0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1
BH_175		1.1	0.0		0.0	0.0	0.0	0.0	7.2
BH_201		0.2	0.0	0.0	0.0	0.0	0.0	0.0	7.4
BH_202		0.0	0.0	0.0	0.0	0.0	2.4	56.4	11.3
BH_215		0.0	0.0		0.0	0.0	0.0	0.0	7.8
C2D		0.7	0.0	0.0	0.0	0.0	0.0	0.0	7.3
C3D		0.1	0.0	0.0	0.0	0.0	1.6	0.0	7.5
C3S		0.2	0.0	0.0	0.0	0.0	0.0	0.0	7.2
D1		0.4	0.0	0.0	0.0	0.0	0.0	0.0	7.6
D2D		1.1	0.0	0.0	0.0	0.0	0.0	0.0	6.9
D2S		5.4	0.0	0.0	0.0	0.0	0.0	0.0	6.9
Q3									
A2D	36.5	810.9	0.0	0.0	4.2	89.2	6.3	0.0	7.5
BH_210	22.9	0.0	0.0	0.0	0.0	0.0	0.0	20.5	8.9
BH_312	8.5	248.2	0.0	0.0	0.0	7.0	9.4	0.0	7.9
BH_412		896.1	0.0	0.0	0.0	0.0	8.0	0.0	7.6
CAD_PND1	24.4	272.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4
CAD_PND2	24.8	238.5	0.0	0.0	0.0	0.0	0.0	0.0	8.3
E1D	118.8	18.6	0.0	0.0	0.0	0.0	0.0	0.0	8.0
E1M	188.5	1929.1	4.5	0.0	0.0	0.0	0.0	0.0	7.9
E1S	90.3	1136.3	0.0	0.0	0.0	0.0	0.0	0.0	8.0
E4D	177.9	494.1	0.0	0.0	0.0	0.0	0.0	0.0	8.3
E4S	201.4	1010.4	8.2	0.0	0.0	0.0	0.0	0.0	8.3

Row Labels	Magnesium	Manganese	Mercury	Methanol	m-Xylene	Nickel	o-Xylene	P Alkalinity (As Carbonates)	pH
FRESHW_PND	21.0	1733.2	0.0	0.0	0.0	0.0	0.0	0.0	7.6
LF_4	7.7	8594.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6
LF_7	131.7	2043.6	0.0	0.0	0.0	0.0	0.0	0.0	7.1
SW2	27.6	294.4	5.6	0.0	0.0	0.0	0.0	0.0	7.9
SW3	21.3	323.4	0.0	0.0	0.0	0.0	0.0	0.0	7.8
TIMBER_PND	21.9	886.6	0.0		0.0	0.0	0.0	0.0	7.8
Q4									
A1D		9824.5	0.0	0.0	0.0	4.1	2.8	0.0	6.6
A1S		10282.3	0.0	0.0	0.0	0.0	3.0	0.0	7.5
B2D		290.4	0.0	0.0	0.0	0.0	0.0	0.0	8.1
B2S		2160.7	0.0	0.0	0.0	0.0	0.0	0.0	7.9
BH_157		321.3	4.3	0.0	0.0	0.0	0.0	0.0	8.0
BH_160		541.6	1.2	17.8	0.0	7.4	0.0	0.0	7.8
BH_161		305.0	1.2	0.0	0.0	0.0	0.0	0.0	7.9
BH_203		41.3	0.0	0.0	0.0	0.0	0.0	0.0	8.5
BH_206		13.7	0.0	0.0	0.0	0.0	0.0	0.0	8.6
BH_311		1159.6	0.0	0.0	0.0	0.0	0.0	0.0	7.6
BH_311A		264.2	0.0	0.0	0.0	0.0	0.0	0.0	8.2
BH_411		1721.5	0.0	0.0	0.0	0.0	0.0	0.0	7.5

Max of Result value							
Row Labels	p-Xylene	Selenium	Sulphates	Tin	TMS	Toluene	Zinc
Q1							
A2D	42.2	0.0	0.0	0.0	155.0	50.9	0.0
BH_210	0.0	0.0	0.0	0.0	3.6	0.0	0.0
BH_312	73.5	0.0	0.0	0.0	226.9	70.7	0.0
BH_412	20.4	0.0	114.0	0.0	71.4	0.0	0.0
CAD_PND1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAD_PND2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E1D	0.0	0.0	245.0	0.0	0.0	0.0	0.0
E1M	0.0	0.0	0.0	0.0	18.2	0.0	0.0
E1S	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E4D	0.0	0.0	362.0	0.0	0.0	0.0	0.0
E4S	0.0	0.0	1320.0	0.0	0.0	0.0	0.0
FRESHW_PND	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LF_4	4.1	0.0	0.0	0.0	19.4	0.0	0.0
LF_7	0.0	0.0	0.0	0.0	4.0	0.0	0.0
SW2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SW3	0.0	0.0	0.0	0.0	3.1	0.0	0.0
Q2							
B1	0.0	0.0	0.0	0.0	3.9	29.7	0.0
BH_165	0.0	0.0	0.0	0.0	31.2	0.0	0.0
BH_174	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BH_175	0.0	0.0	0.0	0.0		17.1	0.0
BH_201	0.0	0.0	140.0	0.0	3.1	0.0	0.0
BH_202	4.5	0.0	0.0	0.0	69.6	0.0	0.0
BH_215	0.0	0.0	0.0	0.0			0.0
C2D	0.0	0.0	0.0	0.0	13.1	6.1	0.0
C3D	0.0	0.0	249.0	0.0	0.0	2.4	0.0
C3S	0.0	0.0	0.0	0.0	4.0	2.3	0.0
D1	0.0	0.0	0.0	0.0	10.6	0.0	0.0
D2D	0.0	0.0	0.0	0.0	21.9	0.0	0.0
D2S	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Q3							
A2D	27.0	0.0	0.0	0.0	154.2	16.9	101.5
BH_210	0.0	0.0	0.0	0.0	0.0	0.0	2.1
BH_312	37.9	0.0	59.1	0.0	194.9	0.0	6.9
BH_412	13.3	0.0	142.0	0.0	66.6	0.0	3.6
CAD_PND1	0.0	0.0	0.0	0.0	0.0	0.0	2.5
CAD_PND2	0.0	0.0	0.0	0.0	0.0	0.0	4.6
E1D	0.0	0.0	262.0	0.0	0.0	0.0	1.9
E1M	0.0	0.0	55.4	0.0	7.9	0.0	4.5
E1S	0.0	0.0	94.3	0.0	0.0	0.0	6.5
E4D	0.0	0.0	396.0	0.0	0.0	0.0	0.5
E4S	0.0	0.0	900.0	0.0	0.0	0.0	2.2

Row Labels	p-Xylene	Selenium	Sulphates	Tin	TMS	Toluene	Zinc
FRESHW_PND	0.0	0.0	0.0	0.0	0.0	0.0	19.7
LF_4	4.0	0.0	63.8	0.0	24.5	0.0	3.2
LF_7	0.0	0.0	63.8	0.0	0.0	0.0	10.8
SW2	3.0	0.0	71.7	0.0	26.4	0.0	367.9
SW3	0.0	0.0	0.0	0.0	0.0	0.0	68.8
TIMBER_PND	0.0	0.0	61.8	0.0		0.0	32.6
Q4							
A1D	0.0	0.0	110.0	0.0	2.6	0.0	15.2
A1S	13.3	0.0	0.0	0.0	2.5	0.0	10.6
B2D	0.0	0.0	0.0	0.0	0.0	0.0	6.7
B2S	0.0	0.0	0.0	0.0	0.0	0.0	6.1
BH_157	0.0	0.0	49.5	0.0	0.1	0.0	8.7
BH_160	0.0	0.0	208.0	0.0	0.0	0.0	7.1
BH_161	0.0	0.0	0.0	0.0	0.1	0.0	6.0
BH_203	0.0	0.0	0.0	0.0	0.0	0.0	89.0
BH_206	0.0	0.0	101.0	0.0	0.0	0.0	5.9
BH_311	1.5	0.0	0.0	0.0	0.8	0.0	6.4
BH_311A	0.0	0.0	0.0	0.0	0.1	0.0	64.2
BH_411	0.0	0.0	0.0	0.0	0.8	0.0	5.8

APPENDIX 3

Max of Result value	Column Labels	
Row Labels	Depth to Bottom	Depth to Water
Q1		
A2D	5.52	1.45
BH_210	17.95	2.5
BH_312	3.71	1.97
BH_412	22.7	3.15
CAD_PND1	0	0
CAD_PND2	0	0
E1D	18.9	2.95
E1M	7.85	1.33
E1S	5.1	0.73
E4D	8.6	3.06
E4S	5.22	2.62
FRESHW_PND	0	0
LF_6	3.52	3.06
LF_7	4.67	1.85
SW2	0	0
SW3	0	0
Q2		
B1	6.12	3.06
BH_156	1.7	0.7
BH_165	3.3	1.75
BH_174	6.11	3.35
BH_175	4.75	1.96
BH_201	15.21	2.9
BH_202	18.6	3.16
BH_215	3.7	1.6
C2D	7.8	1.85
C3D	13.95	2.83
C3S	7.97	0
D1	6.3	3.9
D2D	6.8	1.89
D2S	6.85	3.26
Q3		
A2D	5.49	1.7
BH_210	18.1	3.77
BH_312	3.75	1.15
BH_412	22.07	4.15
E1D	18.93	4.06
E1M	7.85	1.73
E1S	5.05	0.85
E4D	8.6	3.45
E4S	5.24	3.85
LF_4	3.95	0.3
LF_6	3.53	3.05
LF_7	4.7	2.05
Q4		
A1D	13.03	3.41
A1S	6.47	1.3

B2D	4.67	0.85
B2S	1.68	0.7
BH_157	3.82	1.08
BH_160	14	2.26
BH_161	2.43	0.5
BH_168	0.85	0.32
BH_203	16.3	2.63
BH_206	2.3	0.71
BH_311	7.47	1.01
BH_311A	1.99	0.9
BH_411	17.91	3.95