

SHANKS WASTE MANAGEMENT LTD, PONTYPOL HTI FACILITY

Appendix 5a: Comparison of measured concentrations with soil screening guidance values (SSGV) - Metals and traditional parameters

Sample Identity	Background level (2)	BH3	BH26	BH26 RETEST	BH34	BH34	BH44	BH44	BH63	BH81	BH81	BH88	BH88 RETEST	BH94	BH96	BH96 DUPLICATE	BH96	GS6	GS7	GS9	GS10	BH samples			GS samples			LDD/Units	Soil Screening Value	Source		
																						Z	min	max	Z	min	max					
Depth (m)		0.5	0.5	1.6	1.3	4.0	0.5	1.7	0.5	0.5	1.5	0.4	1.5	0.5	0.5	0.5	1.3															
Sampled Date		20.09.05	09.09.05	09.09.05	18.08.05	18.08.05	20.09.05	20.09.05	19.09.05	05.09.05	05.09.05		31.08.05	20.09.05	20.09.05	20.09.05	20.09.05	29.09.05	29.09.05	29.09.05	29.09.05											
METALS and TRADITIONAL																																
Total Sulphate BRE (Corrected to mg/l)		870	540	390	360	400	1140	-	960	670	270	1060	550	106	122	118	-	1810	2000	1090	910	15	270	1140	4	910	2000	mg/l	na	-		
Aluminium*		13000	12900	-	76000	30600	10900	-	11000	91000	7455	12100	-	12400	17200	15600	-	15400	18300	22500	9900	12	7455	91000	4	9900	22500	mg/kg	na (1)	-		
Arsenic*		10	16	-	11	<3	16	-	11	14	6	16	-	17	23	25	-	17	21	10	12	12	<3	25	4	10	21	mg/kg	10	ORNL (plants)		
Barium*		205	177	-	81	195	404	-	493	283	165	305	-	401	263	546	-	730	486	235	399	12	81	546	4	235	730	mg/kg	500	ORNL (plants)		
Cadmium*	0.5-3.6	3	2	-	1	1	3	-	4	1	<1	1	-	3	2	2	-	4	4	2	3	12	<1	4	4	2	4	mg/kg	4	ORNL (plants)		
Chromium*		75	30	-	14	43	25	-	36	71	16	17	-	29	44	43	-	1177	146	64	49	12	14	75	4	49	1177	mg/kg	64	CCME, Cr Total (Agr., Res/Park), based on ecological receptors		
Copper*	22	34	28	-	14	13	73	-	69	52	15	55	-	79	85	79	-	371	132	49	141	12	13	85	4	49	371	mg/kg	50	ORNL (earthworms)		
Lead*	55	81	57	-	21	11	167	-	107	60	39	77	-	153	243	238	-	515	203	87	101	12	11	243	4	87	515	mg/kg	50	ORNL (plants)		
Mercury*		0.29	0.14	-	<0.10	<0.10	0.91	-	0.58	0.23	<1	0.31	-	1.03	2.42	2.31	-	0.83	0.74	0.23	0.19	12	<1	2	4	<1	1	mg/kg	0.1	ORNL (plants)		
Nickel*		247	83	-	26	57	43	-	50	301	30	47	-	44	38	37	-	4926	418	128	57	12	26	301	4	57	4926	mg/kg	30	ORNL (plants)		
Vanadium*		25	24	-	14	44	36	-	25	22	21	32	-	36	36	35	-	39	115	40	30	12	14	44	4	30	115	mg/kg	2	ORNL (plants)		
Zinc*	111	211	163	-	90	78	246	-	228	130	109	154	-	248	306	291	-	1548	457	230	640	12	78	306	4	230	1548	mg/kg	50	ORNL (plants)		
Sodium		-	469	-	-	-	385	-	694	613	-	969	-	394	394	484	-	1065	1059	635	891	12	385	969	4	635	1065	<4 mg/kg	na	-		
Nitrate (soluble) as NO3		-	1	-	<1	2	6	-	4	17	-	5	-	9	4	2	-	36	34	15	27	12	1	17	4	15	36	<1 mg/kg	na	-		
Acid Soluble Sulphide		7	<50	-	<50	<50	<50	-	<50	<50	-	<50	-	<50	<50	<50	-	<50	<50	<50	121	12	7	<50	4	<50	121	<50 mg/kg	na	-		
Chloride (soluble)		<50	20	-	-	-	22	-	85	33	-	12	-	21	24	22	-	40	174	33	53	12	12	85	4	33	174	<5 mg/kg	na	-		
Fluoride (soluble)		-	<3	-	-	-	<3	-	10	<3	-	3	-	<1	<1	<1	-	<1	3	<1	<1	12	<1	10	4	<1	3	<3 mg/kg	500	VROM (target value)		
Free Cyanide		<1	<1	-	<1	<1	<1	-	<1	<1	-	<1	-	<1	<1	<1	-	2	<1	<1	<1	12	<1	<1	4	<1	2	<1 mg/kg	0.9	CCME, (Agr., Res/Park), based on ecological receptors		
Bromide		-	0.2	-	-	-	0.1	-	0.6	0.2	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1		<0.1		12	<0.1	0.6	4	<0.1	<0.1	<0.1 mg/kg	na	-		
FOC		-	0.012	-	-	-	-	-	-	0.102	-	-	-	-	-	-	-	-	-	-	-	2	0.012	0.012	0	-	0		na	-		
pH Value		6.95	7.60	-	-	-	6.81	-	7.87	6.60	-	7.48	-	6.20	6.04	6.01	-	7.70	7.63	7.76	7.71	12	6	8	4	8	8	<1.00 pH Units	na	-		

- Notes:
- note measured
 - na SSGV not available
 - measured concentration higher than SSGV general
 - (1) Al is identified as COPC only at sites where the soil pH is less than 5.5 (OSWER 2003)
 - (2) mean levels measured at sampling point 18 (off site, upwind), Shanks monitoring data 1998-2003

SHANKS WASTE MANAGEMENT LTD, PONTYPOL HTI FACILITY

Appendix 5b: Comparison of measured concentrations with soil screening guidance values (SSGV)

Sample Identity	Background level (1)	BH samples																		GS samples			LoD/Units	SSGV	Source														
		BH3	BH26	BH26 RETEST	BH34	BH34	BH44	BH44	BH63	BH81	BH81	BH88	BH88 RETEST	BH94	BH96	BH96 DUPLICATE	BH96	GS6	GS7	GS9	GS10	N				min	max	N	min	max									
Depth (m)		0.5	0.5	1.6	1.3	4.0	0.5	1.7	0.5	0.5	1.5	0.4	1.5	0.5	0.5	0.5	1.3																						
Sampled Date		20.09.05	09.09.05	09.09.05	18.08.05	18.08.05	20.09.05	20.09.05	19.09.05	05.09.05	05.09.05		31.08.05	20.09.05	20.09.05	20.09.05	20.09.05	29.09.05	29.09.05	29.09.05	29.09.05																		
HYDROCARBONS																																							
Toluene		<10	<10	-	-	-	<10	-	<10	18	-	<10	-	<10	<10	<10	-	<10	<10	<10	<10	9	<10	18	4	<10	<10	<10 ug/kg	200		ORNL (plants)								
TPH (Aliphatics and Aromatics C5-C15)		9033	11316	-	-	-	9553	-	5408	27963	-	273717	-	52885	28262	10700	-	3535405	303239	328281	1256772	9	5408	273717	4	303239	3535405	<100 ug/kg	50000		VROM (target value)								
PCBs																																							
Total of 7 Congener PCBs		<1	22	-	-	-	<1	-	19	<1	-	6	-	<1	<1	<1	-	444	1343	327		12	<1	22	3	327	1343	<1 ug/kg	40000		ORNL (value for PCBs based on plants)								
Total of 12 Congener PCBs		<12	≤13	-	-	-	<12	-	<12	<12	-	<12	-	<12	<12	<12	-	≤77	≤281	≤30		12	<12	≤13	3	≤30	≤281	<1 ug/kg	40000		ORNL (value for PCBs based on plants)								
Total PCBs	0.66-280	<13	≤35	-	-	-	<13	-	<31	<13	-	<19	-	<13	<13	<13	-	≤521	≤1624	≤357	<114	9	<13	<31	4	<114	≤1624	<1 ug/kg	40000		ORNL (value for PCBs based on plants)								
																													4000		ODEQ (value PCBs based on mammals)								
PAHs																																							
2-Methylnaphthalene		<100	<100	-	-	-	261	-	<100	1034	-	193	-	250	<100	<100	-	371	800	<100	<100	9	<100	1034	4	<100	800	<100 ug/kg	3240		EPA R5 (based on masked shrew)								
Acenaphthene		<100	<100	-	-	-	<100	31	<100	<100	-	<100	<100	<100	<100	<100	<14	237	<100	<100	<100	9	<14	31	4	<100	237	<100 ug/kg	682000		EPA R5 (based on masked shrew)								
Acenaphthylene		<100	<100	-	-	-	<100	55	<100	<100	-	<100	<100	<100	<100	<100	<5	<100	<100	<100	<100	9	<5	55	4	<100	<100	<100 ug/kg	682000		EPA R5 (based on masked shrew)								
Anthracene		<100	<100	-	-	-	155	18	<100	132	-	<100	<100	159	<100	<100	<9	361	288	<100	151	9	<9	159	4	<100	361	<100 ug/kg	1480000		EPA R5 (based on masked shrew)								
Benzo(a)anthracene		<100	<100	-	-	-	598	160	151	269	-	332	<100	536	283	317	<12	1983	793	337	661	9	<12	598	4	337	1983	<100 ug/kg	5210		EPA R5 (based on masked shrew)								
Benzo(a)pyrene		<100	<100	-	-	-	518	74	139	223	-	315	<100	519	281	353	<12	2313	735	440	964	9	<12	519	4	440	2313	<100 ug/kg	1520		EPA R5 (based on masked shrew)								
Benzo(b)fluoranthene		<100	<100	-	-	-	760	104	152	272	-	265	<100	690	319	350	<16	1788	693	407	969	9	<16	760	4	407	1788	<100 ug/kg	59800		EPA R5 (based on masked shrew)								
Benzo(ghi)perylene		<100	<100	-	-	-	435	137	<100	<100	-	<100	<100	464	240	263	<10	2700	504	320	882	9	<10	464	4	320	2700	<100 ug/kg	na		-								
Benzo(k)fluoranthene		<100	<100	-	-	-	486	<25	118	221	-	274	<100	584	278	275	<25	3000	810	509	1088	9	<25	584	4	509	3000	<100 ug/kg	148000		EPA R5 (based on masked shrew)								
Chrysene		<100	<100	-	-	-	947	422	159	765	-	447	161	988	408	525	<10	3145	998	560	1299	9	<10	988	4	560	3145	<100 ug/kg	4730		EPA R5 (based on masked shrew)								
Dibenzo(a,h)anthracene		<100	<100	-	-	-	156	43	<100	<100	-	<100	<100	130	<100	<100	<8	716	<100	<100	233	9	<8	156	4	233	716	<100 ug/kg	18400		EPA R5 (based on masked shrew)								
Fluoranthene		<100	<100	-	-	-	1007	136	162	359	-	331	<100	1008	452	554	<25	3831	1481	652	1340	9	<25	1008	4	652	3831	<100 ug/kg	122000		EPA R5 (based on masked shrew)								
Fluorene		<100	<100	-	-	-	<100	33	<100	<100	-	<100	<100	<100	<100	<100	<12	211	<100	<100	<100	9	<12	33	4	<100	211	<100 ug/kg	12200		EPA R5 (based on masked shrew)								
Indeno(1,2,3-cd)pyrene		<100	<100	-	-	-	371	22	<100	<100	-	<100	<100	369	170	204	<11	1863	365	234	573	9	<11	371	4	234	1863	<100 ug/kg	109000		EPA R5 (based on masked shrew)								
Naphthalene		<100	<100	-	-	-	206	1125	<100	601	-	154	271	191	<100	<100	<10	<100	<100	<100	<100	9	<10	1125	4	<100	<100	<100 ug/kg	99.4		EPA R5 (based on masked shrew)								
Phenanthrene		<100	<100	-	-	-	636	1311	188	1547	-	404	256	622	303	349	<21	1795	1686	416	922	9	<21	1547	4	416	1795	<100 ug/kg	45710		EPA R5 (based on masked shrew)								
Pyrene		<100	<100	-	-	-	817	185	139	383	-	289	<100	841	382	469	<22	3547	1200	510	1094	9	<22	841	4	510	3547	<100 ug/kg	75800		EPA R5 (based on masked shrew)								
Phthalates																																							
Bis(2-ethylhexyl) phthalate		<100	<100	-	-	-	<100	-	<100	<100	-	<100	-	<100	<100	<100	-	6223	2635	890	2272	9	<100	<100	4	890	6223	<100 ug/kg	925		EPA R5 (based on masked shrew)								
Di-n-butyl phthalate		<100	<100	-	-	-	<100	-	<100	<100	-	<100	-	<100	<100	<100	-	<100	6147	<100	<100	9	<100	<100	4	<100	6147	<100 ug/kg	320		derived(1)								
Other Semi-volatiles																																							
Carbazole		<100	<100	-	-	-	<100	-	<100	<100	-	<100	-	<100	<100	<100	-	187	<100	<100	<100	9	<100	<100	4	<100	187	<100 ug/kg	na		-								
Dibenzofuran		<100	<100	-	-	-	125	-	<100	473	-	<100	-	132	<100	<100	-	175	352	<100	<100	9	<100	473	4	<100	352	<100 ug/kg	na		-								
Volatile Organic Compounds																																							
cis-1,2-Dichloroethene		<1	<1	-	-	-	<1	-	10	<1	-	<1	-	<1	<1	<1	-	<1	<1	<1	<1	9	<1	10	4	<1	<1	<1 ug/kg	21200		EPA R5 (based on masked shrew)								
Chloroform		<1	<1	-	-	-	<1	-	3	<1	-	<1	-	<1	<1	<1	-	<1	<1	<1	<1	9	<1	3	4	<1	<1	<1 ug/kg	1190		EPA R5 (based on masked shrew)								
Trichloroethene		<1	<1	-	-	-	3	-	9	4	-	<1	-	6	<1	<1	-	<1	<1	<1	<1	9	<1	9	4	<1	<1	<1 ug/kg	12400		EPA R5 (based on masked shrew)								
Toluene		13	<1	-	-	-	10	-	10	34	-	<1	-	13	14	17	-	42	13	8	<1	9	10	34	4	8	42	<1 ug/kg	5450		EPA R5 (based on masked shrew)								
Tetrachloroethene		<1	<1	-	-	-	5	-	8	85	-	<1	-	6	27	26	-	<1	<1	<1	<1	9	<1	85	4	<1	<1	<1 ug/kg	9920		EPA R5 (based on masked shrew)								
Ethylbenzene		2	<1	-	-	-	<1	-	<1	60	-	<1	-	<1	3	<1	-	<1	<1	<1	<1	9	<1	60	4	<1	<1	<1 ug/kg	5160		EPA R5 (based on masked shrew)								
Bromoform		3	<1	-	-	-	<1	-	<1	89	-	<1	-	<1	7	8	-	51	23	7	<1	9	3	89	4	7	51	<1 ug/kg	15000		EPA R5 (based on masked shrew)								
Total Xylene		≤3	<2	-	-	-	<2	-	<2	≤35	-	<2	-	<2	<2	<2	-	<2	<2	<2	<2	9	<2	0	4	<2	<2	<1 ug/kg	10000		EPA R5 (based on plant)								
1,2,4-Trimethylbenzene		<1	<1	-	-	-	<1	-	<1	12	-	<1	-	<1	<1	<1	-	<1	<1	<1	<1	9	<1	12	4	<1	<1	<1 ug/kg	na		-								
1,3,5-Trimethylbenzene		<1	<1	-	-	-	<1	-	<1	5	-	<1	-	<1	<1	<1	-	<1	<1	<1	<1	9	<1	5	4	<1	<1	<1 ug/kg	na		-								

Notes: - note measured
na SSGV not available
measured concentration higher than SSGV general
(1) Minimum-Maximum levels measured at sampling point 18 (off site, upwind), Shanks monitoring data 2000, 2001, 2002, 2003

SHANKS WASTE MANAGEMENT LTD, PONTYPOOL HTI FACILITY

Appendix 5c: Comparison of measured concentrations with soil screening guidance values (SSGV) - dioxins and furans

Company	Borehole No	Background level (e.g. TQ 2718 TCS24)	Dioxins																								C6H				C8H				D	E			
			B201 & 202						B204 & 205						B208 & 209						B210 & 211						C6H		C8H										
			TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF							
12176 NCF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12176 PCF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12176 RCF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TQ 2718	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Average (TQ21-TQ22)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:
(1) Mean concentration measured at sampling point 18 (cell site, upwind). Borehole monitoring data: B201, B202, B203
(2) Mean (2018)
(3) Concentration higher than SSGV