Draft for discussion CONFIDENTIAL Research for IVS

Table 29

Research for Wannam Risk Assessment + DAM WATER + SAMPLE NO. 7S [INORGANIC - MICRO'S & MACRO'S]
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

							RISK TO HUMA	M			
			RISI	OF DAM WATER	AS IS	RISK OF DII	LUTED DAM WATE	R IN RIVER	RISK OF DAM	WATER FOR GRO	UNDWATER
COMPOUNDS		7EPA RfD/				11 Conc. in			13 Conc. in	14 <sub>PDI</sub>	
INORGANICS	6 Hill	EPA DWEL/	8Conc. in	<sup>9</sup> PDI Dam	10 Margin	River water	<sup>12</sup> PDI river	10 Margin	groundwater	groundwater	10 Margin
Micro's and Macro's	ADI/GV	RSA RfD/	Dam water	water expesure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	0/6	pph	mg/kg/day	%	ppb	mg/kg/day	%
Aluminium as Al	0.005	RSA RfD	< 0.100	0.00	0.00	0.00	The second secon	0.00	0.00	0.00	0.0
Arsenic as As	0.0003	EPA RfD	< 0.005	0.00	0.00	0.00		0.00	0.00	0.00	i) i
Barium as Ba	0.07	EPA RfD	< 0.10	0.00	9.90	0.00		0.00	0.00	0.00	
Cadmium as Cd	0.0005	EPA RfD	< 0.010	0.00	0.98	0.00	0.00	0.00	0.00	0.00	6.0
Chromium <sup>3+</sup> as Cr <sup>3+</sup>	1.50	EPA RfD	0.053	0.0018	0.118	1.8		0.004	23	0.0008	0.96
Chromium + as Cr +	0.003	EPA RfD	< 0.025	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.3
Cobalt as Co	800.0	RSA RfD	0.026	0.0009	10.9	0.87	0.00003	0.363	12	0.0004	5.0
Copper as Cu	0.04	EPA RfD	< 0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Cyanide as CN	0.04	EPA RfD	< 0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.43
Iron as Fe	0.003	RSA RfD	0.734	0.024	816	24	0.0008	26.7	325	0.011	36
Lead as Pb	0.002	RSA RfD	< 0.050	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,0
Manganese as Mn	0.046	EPA RfD	3.36	0.112	243	112	0.0037	8.12	1488	0.050	10
Mercury as Hg	0.0003	EPA RfD	< 0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Nickel as Ni	0.02	EPA RfD	0.038	0.0013	6.33	1.3	0.00004	0.217	17	0.0006	11.8
Selenium as Se	0.005	EPA RfD	< 0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	L.O
Titanium as Ti	0.003	RSA RfD	0.23	0.0077	256	7.7	0.0003	0.56	102	0.0034	11
Vanadium as V	0.009	EPA RfD	< 0.03	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0,0
Zinc as Zn	0.3	EPA RfD	0.280	0.0093	3.11	9.3	0.00031	0.163	124	0.0041	1.3
Calcium as Ca	5.0	RSA RfD	581	19.4	387	19367	0.646	12.9	257228	8.57	17
Chloride as Cl	8.3	RSA RfD	1211	40.4	486	40367	1.35	16.2	536149	17.9	21
Fluoride as F	0.06	EPA RfD	7.4	0.247	411	247	0.0082	18.7	3276	0.109	18
Magnesium as Mg	2.3	RSA RfD	81	2.70	117	2700	0.09	3.91	35861	1.20	5
Potassium as K	6.7	RSA RfD	91	3.03	45.3	3033	0.101	1.51	40289	1.34	ZŪ.
Sodium as Na	3,3	RSA RfD	369	12.3	373	12300	0.410	12.4	163368	5.45	16
Sulphate as SO <sub>4</sub>	6.7	RSA RfD	1039	34.6	517	34633	1.15	17.2	459999	15.3	22
Boron as B	0.09	EPA RfD	0.71	0.024	28.3	24	0.0008	0.874	314	0.010	11.
Nitrate as N	1.8	EPA RfD	4.4	0.147	9.17	147		0.306	1948	0.065	4.0
	RISK LAGUS	PTABLE HSK	TO: HUMAN	Dam water	R		Rivar water	AR .		Groundwater	R

# Draft for discussion CONFIDENTIAL Research for NS

#### Table 30

DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 70 [INORGANIC - MICRO'S & MACRO'S]
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

AMPLE NUMBER:							RISK TO HUMA	·N			
			RISH	OF DAM WATER	ASIS		UTED DAM WATE		RISK OF DAN	WATER FOR GRO	UNDWATER
COMPDUNDS		7EPA RfD/				11 Conc. in			13 Conc. in	14 <sub>P91</sub>	
INDRGANICS	6 HD/	EPA DWEL/	8 Conc. in	<sup>9</sup> PDI Dam	10 <sub>Margin</sub>	River water	12 PDI river	10 Margin	groundwater	groundwater	10 <sub>Margin</sub>
Micro's and Macro's	10100	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	€/8	pph	mg/kg/day	0/8	ppb	mg/kg/day	%
Aluminium as Al	0.005	RSA RfD	< 0.106	0.00	0,00	0.00	THE RESERVE OF THE PERSON NAMED IN	0.00	0.00	0.00	0.0
Arsenic as As	0.0003	EPA RfD	< 0.005	0.00	9.00	0.00		0.00	0.00	0.00	9.0
Barium as Ba	0.07	EPA RfD	< 0.10	0.00		0.00		0.00	0.00	0.00	3.0
Cadmium as Cd	0.0005	EPA RfD	< 0.010	0.00	9.50	0.00		0.00	0.00	0.00	0.0
Chromium <sup>3+</sup> as Cr <sup>3+</sup>	1.50	EPA RfD	0.832	0.028	1.35	28		0.062	368	0.012	131
Chromium as Cr +	0.003	EPA RfD	< 0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	لزران
Cobalt as Co	0.008	RSA RfD	0.054	0.0018	22.5	1.8	0.00006	-0.750	24	0.0008	(1),
Copper as Cu	0.04	EPA RfD	< 0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Vo
Cyanide as CN	0.04	EPA RfD	< 0.05	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.3
Iron as Fe	0.003	RSA RfD	34	1.13	37778	1133	0.038	1259	15053	0.502	1872
Lead as Pb	0.002	RSA RfD	< 0.050	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Manganese as Mn	0.046	EPA RfD	4.35	0.145	315	145	0.0048	16.5	1926	0.064	14.
Mercury as Hg	0,0003	EPA RfD	< 0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Nickel as Ni	0.02	EPA RfD	0.085	0.0028	14.2	2.8	0.00009	0.467	38	0.0013	0.0
Selenium as Se	0.005	EPA RfD	0.006	0.0002	4.0	0.20	0.000007	0.133	2.70	0.00009	.0
Titanium as Ti	0.003	RSA RfD	0.39	0.013	433	13	0.0004	j.4,4	173	0.0058	1.0
Vanadium as V	0.009	EPA RfD	< 0.03	0.00	0.80	0.00	0.00	0,011	0.00	0.00	6.0
Zinc as Zn	0.3	EPA RfD	3.08	0.103	34.2	103	0.0034	1,14	1364	0.045	15.
Calcium as Ca	5.0	RSA RfD	581	19.4	387	19367	0.646	12.8	257228	8.57	17
Chloride as Cl	8.3	RSA RfD	1223	40.8	491	40767	1.36	15.4	541462	18.0	21
Fluoride as F	0.06	EPA RfD	7.8	0.260	433	260		14,74	3453	0.115	19
Magnesium as Mg	2.3	RSA RfD	83	2.77	120	2767	0.092	4.01	36747	1.22	53.
Potassium as K	6.7	RSA RfD	91	3.03	45.3	3033	0.101	E.0	40289	1.34	20.
Sodium as Na	3.3	RSA RfD	390	13.0	394	13000		13.1	172666	5.76	17
Sulphate as SD <sub>4</sub>	6.7	RSA RfD	1058	35.3	526	35267	1.18	17.5	468411	15.6	23
Boron as B	0.09	EPA RfD	0.38	0.013	14.1	13	0.0004	0.467	168	0.0056	5.2
Nitrate as N	1.6	EPA RfD	3.9	0.130	8.13	130	0.0043	0.271	1727	0.058	3.6
	RISK LACCE	Pimili mek	TO: HUMAN	Dam water	R		River water	R		Groundwater	R

Draft for discussion CONFIDENTIAL Research for IVS

#### Table 31

Research for 1/3

DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 8S [INORGANIC - MICRO'S & MACRO'S]

[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

							RISK TO HUMA	P. C.			
	100		RISH	DF DAM WATER	AS IS		UTED DAM WATE	R IN RIVER	RISK OF DAN	WATER FOR GRO	UNDWATE
COMPOUNDS		7EPARIDI				11 Conc. in			13 Conv. in	<sup>14</sup> PDi	
INORGANICS	6 (10)	EPA DWEL/	<sup>8</sup> Conc. in	<sup>9</sup> PDI Dam	10 Margin	River water	12 PDI river	10 Margin	groundwater	groundwater	10 <sub>Margin</sub>
Micro's and Macro's	ALTER ST	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water expesure	of Safety	(EEC)	exposure	of Safety
	rog kg day	WHO GV	ppm	mg/kg/day	0/6	ppb	mg/kg/day	0/2	ppb	mg/kg/day	%
Aluminium as Al	0.005	RSA RfD	< 0.100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.0
Arsenic as As	0.0003	EPA RfD	< 0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,0
Barium as Ba	0.07	EPA RfD	< 0.10	0.00	0.00	0.00		8,00	0.00	0.00	5.0
Cadmium as Cd	0.0005	EPA RfD	< 0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Chromium as Cr 3+	1.50	EPA RfD	0.055	0.0018	0.12	1.8	0.00006	0.004	24	0.0008	0.05
Chromium as Cr"+	0.003	EPA RfD	< 0.025	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0,0
Cobalt as Co	800.0	RSA RfD	0.041	0.0014	1 7 7	1.4	0.00005	0.580	18	0.0006	7.5
Copper as Cu	0.04	EPA RfD	< 0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,0
Cyanide as CN	0.04	EPA RfD	< 0.05	0.00	9.4/0	0.00	0.00	0,00	0.00	0.00	0.4
Iron as Fe	0.003	RSA RfD	0.660	0.022	733	22	0.0007	24, 4	292	0.0097	32
Lead as Pb	0.002	RSA RfD	< 0.050	0.00	0.00	0.00	0.00	9.66	0.00	0.00	0.0
Manganese as Mn	0.046	EPA RfD	3.35	0.112	243	112	0.0037	9.12	1483	0.049	10
Mercury as Hg	0.0003	EPA RfD	< 0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.0
Nickel as Ni	0.02	EPA RfD	0.048	0.0016	8.0	1.6	0.00005	0.287	21	0.0007	7.5
Selenium as Se	0.005	EPA RfD	< 0.005	0.00	0.90	0.00	0.00	Ulab	0.00	0.00	1.0
Titanium as Ti	0.003	RSA RfD	0.23	0.0077	256	7.7	0.0003	8,706	102	0.0034	11
Vanadium as V	0.009	EPA RfD	< 0.03	0.00	0.60	0.00	0.00	0.00	0.00	0.00	5.0
Zinc as Zn	0.3	EPA RfD	0.289	0.0096	3.2	9.6	0.0003	9.107	128	0.0043	1.4
Calcium as Ca	5,0	RSA RfD	585	19.5	390	19500	0.650	13.0	258999	8.63	17
Chloride as Cl	8.3	RSA RfD	1223	40.8	491	40767	1.36	15.4	541462	18.0	21
Fluoride as F	0.06	EPA RfD	7.6	0.253	422	253		11.1	3365	0.112	18
Magnesium as Mg	2.3	RSA RfD	78	2.60	113	2600	0.087	3.77	34533	1.15	7 (2) - ) (2)
Potassium as K	6.7	RSA RfD	92	3.07	45.8	3067	0.102	1,68	40731	1.36	70.
Sodium as Na	3.3	RS A RfD	389	13.0	393	12967	0.432	13.1	172223	5.74	17
Sulphate as SD <sub>4</sub>	6.7	RSA RfD	1092	36.4	543	36400	1.21	14.1	483464	16.1	24
Boron as B	0.09	EPA RfD	0.73	0.024	27	24	0.0008	J.1900	323	0.011	12.
Nitrate as N	1.6	EPA RfD	3.8	0.127	7.9	127	0.0042	0.264	1682	0.056	3.5
	RIBA I ACCE	PTABLEDNSK	TO: HUMAN	Dam water	R		River water	AR		Groundwater	R

Draft for discussion CONFIDENTIAL Page 20th for 1975

Table 32

Research for 1975 DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 80 [INORGANIC - MICRO'S & MACRO'S]
[ISCOR VANDERBIJL - MASTER PLAN]

							RISK TO HUMA	Section 1			
	1	18	RISH	OF DAM WATER	AS IS	RISK OF DIL	UTED DAM WATE	R IN RIVER	RISK OF DAN	WATER FOR GRO	UNDWATER
COMPDUNDS		7EPA RIDI				11 Conc. in			13 Conc. in	14 <sub>PDi</sub>	
INORGANICS	6 AllO	EPA DWEL/	<sup>8</sup> Conc. in	<sup>9</sup> PDI Dam	10 <sub>Margin</sub>	River water	12 PDI river	10 Margin	groundwater	groundwater	10 Margin
Micro's and Macro's	ADI CV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	ехроѕиге	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	%	ppb	mg/kg/day	9/0	ppb	mg/kg/day	0/0
Aluminium as Al	0.005	RSA RfD	< 0.100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Arsenic as As	0.0003	EPA RfD	< 0.005	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0,0
Barium as Ba	0.07	EPA RfD	< 0.10	0.00	9.80	0.00	0.00	0.00	0.00	0.00	0.0
Cadmium as Cd	0.0005	EPA RfD	< 0.010	0.00	9.00	0.00	0.00	<b>J</b> .00	0.00	0.00	91.6
Chromium³+ as Cr¹+	1.50	EPA RfD	1.96	0.065	436	65	0.0022	(), ( 44)	868	0.029	1,3
Chromium as Cr**	0.003	EPA RfD	< 0.025	0.00	0.60	0.00	0.00	1.00	0.00	0.00	0.0
Cobalt as Co	0.008	RSA RfD	0.056	0.0019	23.3	1.9	0.00006	0.782	25	0.001	1{1.
Copper as Cu	0.04	EPA RfD	< 0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,8
Cyanide as CN	0.04	EPA RfD	< 0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.8
Iron as Fe	0.003	RSA RfD	57	1.9	63333	1900	0.063	2111	25236	0.841	2804
Lead as Pb	0.002	RSA RfD	1.01	0.034	1683	34	0.0011	56.7	2.70	0.0001	4.
Manganese as Mn	0.046	EPA RfD	4.87	0.162	353	162	0.0054	11.7	2156	0.072	15
Mercury as Hg	0.0003	EPA RfD	< 0.002	0.00	0.00	0.00	0.00	8.98	0.00	0.00	9.0
Nickel as Ni	0,02	EPA RfD	0.091	0.003	15.2	3.0	0.0001,	5.5	40	0.001	8.5
Selenium as Se	0.005	EPA RfD	< 0.005	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.0
Titanium as Ti	0.003	RSA RfD	1.7	0.057	1889	57	0.0019	93.5	753	0.025	83
Vanadium as V	0.009	EPA RfD	< 0.03	0.00	0.90	0.00	0.00	0.76	0.00	0.00	i i i i i
Zinc as Zn	0.3	EPA RfD	18	0.600	200	600	0.020	<b>5.6</b> 7	7969	0.266	8
Calcium as Ca	5.0	RSA RfD	583	19.4	389	19433	0.648	13.0	258113	8.60	17
Chloride as Cl	8.3	RSA RfD	1223	40.77	491	40767	1.36	16.4	541462	18.0	21
Fluoride as F	0.06	EPA RfD	7.6	0.253	422	253	0.0084	(4, 1	3365	0.112	18
Magnesium as Mg	2.3	RSA RfD	80	2.67	116	2667	0.089	3.87	35419	1.18	51.
Potassium as K	6.7	RSA RfD	93	3.1	46.3	3100	0.103	1.5	41174	1.37	20.
Sodium as Na	3.3	RSA RfD	357	11.9	361	11900	0.397	12.0	158056	5.3	16
Sulphate as \$0 <sub>4</sub>	5.7	RSA RfD	1043	34.77	519	34767	1.16	17.3	461770	15.4	23
Boron as B	0.04	EPA RfD	0.79	0.026	29.3	26	0.0009	0.974	350	0.012	16.
Nitrate as N	1.6	EPA RfD	0.9	0.030	1.9	30	0.001	0.063	398	0.013	0.82
	MISK I HUGE	PTABLE HISK	TD: HUMAN	Dam vvater	R		River water	R		Groundwater	R

Draft for discussion CONFIDENTIAL Research for IV

#### Table 33

Research for 1/PAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 9S [INORGANIC - MICRO'S & MACRO'S]
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

							RISK TO HUM <i>r</i>	M			
			RISI	OF DAM WATER	AS IS		UTED DAM WATE	R IN RIVER	RISK OF DAN	WATER FOR GRO	UNDWATE
COMPOUNDS		7EPA RfD/				11 Conc. in			13 Conc. in	14 <sub>PDI</sub>	
INORGANICS	S RfD/	EPA DWEL	<sup>8</sup> Conc. in	9PDI Dam	10 Margin	River water	12 PDI river	10 Margin	groundwater	groundwater	10 Margin
Micro's and Macro's	ADI/GV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	8/6	ppb	mg/kg/day	0/a	ppb	mg/kg/day	8/0
Aluminium as Al	0.005	RSA RfD	< 0.100	0.00	0.00	0.00	And in case of the last of the	9.00	0.00	the same of the sa	9.1
Arsenic as As	8:3003	EPA RfD	< 0.005	0.00	0.00	0.00	0.00	9.90	0.00	0.00	i.i.
Barium as Ba	0.07	EPA RfD	< 0.10	0.00	0.00	0.00	0.00	0.56	0.00	0.00	(0.0
Cadmium as Cd	0.0005	EPA RfD	< 0.010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	U,
Chromium <sup>3+</sup> as Cr <sup>3+</sup>	1.50	EPA RfD	0.072	0.0024	<u>U.18</u>	2.4	0.00008	0.(a)63	32	0.0011	1)
Chromium as Cr"+	0.003	EPA RfD	< 0.025	0.00	0.90	0.00	0.00	0.48	0.00	0.00	().(
Cobalt as Co	0.008	RSA RfD	0.028	0.0009	31.7	0.93	0.00003	0,808	12	0.0004	5.
Copper as Cu	0.04	EPA RfD	< 0.025	0.00	0.00	0.00	0.00	7.09	0.00	0.00	i).:
Cyanide as CN	0.04	EPA RfD	< 0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.:
Iron as Fe	0.003	RSA RfD	0.581	0.019	644	19	0.0006	21.4	257	0.0086	2
Lead as Pb	0.002	RSA RfD	< 0.050	0.03	0.00	0.00	0.00	A (9)	0.00	0.00	70.1
Manganese as Mn	0.046	EPA RfD	3.37	0.112	244	112	0.0037	8.1	1492	0.050	į
Mercury as Hg	0.0003	EPA RfD	< 0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	- 0.
Nickel as Ni	0.02	EPA RfD	0.045	0.0015	7.5	1.5	0.00005	0.25	20	0.0007	
Selenium as Se	0.005	EPA RfD	0.002	0.00007	1.1	0.07	0.000002	9,0	3.1	0.0001	***
Titanium as Ti	0.003	RSA RfD	0.21	0.0070	233	7.0	0.00023	7.78	93	0.0031	7
Vanadium as V	0.009	EPA RfD	< 0.03	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.5
Zinc as Zn	0.3	EPA RfD	0.257	0.0086	2.9	8.6	and the same of th	0.10	Control of the Contro	0.0038	j.,
Calcium as Ca	5.0	RSA RfD	585	19.5	390	19500	0.650	13.0	258999	8.63	1
Chloride as Cl	8.3	RSA RfD	1235	41.17	496	41167		16.5	546775	18.2	2
Fluoride as F	0.06	EPA RfD	7.3	0.243	406	243	0.0081	13.5	3232	0.108	1
Magnesium as Mg	2.3	RSA RfD	80	2.667	116	2667	0.0889	3.87	35419	1.18	51
Potassium as K	6.7	RSA RfD	93	3.10	48.3	3100	0.103	1.54	41174		20
Sodium as Na	3.3	RSA RfD	364	12.13	368	12133		12.3	161155	5.37	1
Sulphate as SD <sub>4</sub>	6.7	RSA RfD	1159	38.63	577	38633		19,2	513127	17.1	2
Boron as B	0.09	EPA RfD	0.81	0.027	30	27	0.0009	1.0	359	0.012	10
Nitrate as N	1.6	EPA RfD	1.2	0.040	2.5	40	0.0013	6.083	531	0.018	i.
	RISK Lance	STAGLE HISA	TO: HUMAN	Dam water	R		River water	AR.		Groundwater	R

Draft for discussion CONFIDENTIAL Research for IVS

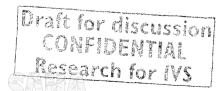
Table 34

Research for IVSDAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 90 [INORGANIC - MICRO'S & MACRO'S]
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

							RISK TO HUMA	N			
			RISH	OF DAM WATER	AS IS		UTED DAM WATE	R IN RIVER	RISK OF DAN	WATER FOR GRO	UNDWATER
COMPOUNDS		7EPA RfD/				<sup>11</sup> Conc. in			13 Conc. in	14 <sub>PD</sub>	
INORGANICS	6 1111	EPA DWEL/	<sup>8</sup> Conc. in	<sup>9</sup> PDI Dam	10 <sub>Margin</sub>	River water	12 PDI river	10 Margin	groundwater	groundwater	10 Margin
Micro's and Macro's	111/6/	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	%	ppb	mg/kg/day	%	ppb	mg/kg/day	0/6
Aluminium as Al	0.005	RSA RfD	< 0.100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Arsenic as As	0.0003	EPA RfD	< 0.005	0.00	0.00	0.00	0.00	0.90	0.00	0.00	9.0
Barium as Ba	0.07	EPA RfD	< 0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Cadmium as Cd	0.0005	EPA RfD	< 0.010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Chromium³+ as Cr³+	1.50	EPA RfD	0.072	0.0024	0.16	2.4	0.00008	0.005	32	0.0011	9.07
Chromium as Cr +	0.003	EPA RfD	< 0.025	0.00	0.00	0.00	0.00	9,90	0.00	0.00	3.0
Cobalt as Co	0.008	RSA RfD	0.033	0.0011	13.8	1.1	0.00004	0.458	15	0.0005	8.2
Copper as Cu	0.04	EPA RfD	< 0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Cyanide as CN	0.04	EPA RfD	0.05	0.0017	4.17	1.7	0.00006	0.142	22	0.0007	1.8
Iron as Fe	0.003	RSA RfD	0.732	0.024	813	24	0.0008	26.7	324	0.011	36
Lead as Pb	0.002	RSA RfD	< 0.050	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.0
Manganese as Mn	0.046	EPA RfD	3.43	0.114	249	114	0.0038	8.3	1519	0.051	11
Mercury as Hg	0.0003	EPA RfD	< 0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Nickel as Ni	0.02	EPA RfD	0.043	0.0014	7.17	1.4	0.00005	0.23	19	0.0006	3.1
Selenium as Se	0.005	EPA RfD	< 0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Titanium as Ti	0.003	RSA RfD	0.23	0.0077	256	7.7	0.0003	8.6	102	0.0034	(§ )
Vanadium as V	0.009	EPA RfD	< 0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.0
Zinc as Zn	0.3	EPA RfD	0.307	0.0102	3.41	10.2	0.0003	0.113	136	0.0045	1.6
Calcium as Ca	5.0	RSA RfD	581	19.4	387	19367	0.646	12.9	257228	8.57	17
Chloride as Cl	8,3	RSA RfD	1211	40.4	486	40367	1.35	16.2	536149	17.9	21
Fluoride as F	0.06	EPA RfD	7.1	0.237	394	237	0.0079	13.2	3143	0.105	17
Magnesium as Mg	2.3	RSA RfD	83	2.77	120	2767	0.092	4.01	36747	1.22	53.
Potassium as K	6.7	RSA RfD	91	3.03	45	3033	0.101	1.5	40289	1.34	20,
Sodium as Na	3.3	RSA RfD	358	11.9	362	11933	0.398	12.1	158498	5.28	16
Sulphate as SO <sub>4</sub>	6.7	RSA RfD	1058	35.3	526	35267	1.18	17.5	468411	15.6	23
Boron as B	0.09	EPA RfD	0.73	0.024	27	24	0.0008	0.869	323	0.011	12.
Nitrate as N	1.6	EPA RfD	1.3	0.043	2.7	43	0.0014	0,000	576	0.019	1.2
	HISK/ ADDE	PEHOLE HISK	TO: HUMAN	Dam water	R		Rivar water	AR		Groundwater	R

#### **TABLES 35 - 51**

## DAM 10: WATERS ORGANIC ENVIRONMENTAL RISK QUANTIFICATION



DAM 18: ENVIRONMENTAL RISK QUANTIFICATION \* DAM WATER \* SAMPLE NO. 15 (OAGAGICS - PAR' & VOC')
[ISCOR VANDERBIJLPARK STEEL – MASTER PLAN]

SAMPLE NUMBER: 19									DAM	10:	Gurrent	/olume	= 670,807 k	g/ha/m	Total Vo	lume =	1,085,683 kg	g/ha/m
ORGANIC	Art. Risk		RISK OF DA	M WATI	ER AS IS		RISK OF D	LUTED D	HISK TO E				RISK OF DAN	WATER	FOR GROU	NDWATE	R	
COMPOUNDS	Value	TOTA	AL ANALYSIS		<sup>4</sup> PROBIT N	MODEL	DILUTED		4 PROBIT I		CURRENT	/OLUME	4 PROBIT N	AODEL	TOTAL V	DLUME	4 PROBIT N	NODEL
PAH <sup>s</sup> & VOC <sup>s</sup>	(MR)	1 Lab Conc.	<sup>2</sup> EEC	Risk RIAN	Risk Quan-	RIAB	<sup>2</sup> EEC	Risk R / AR	Risk Quan- tification %	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan- tification %	3 Risk R / AR	<sup>2</sup> EEC	R/AB	Risk Quan- tification %	3 Risk
Naphthalene	дро 3 460	<b>ppm</b> 0.000	0.00	A / Am	OE ÷ 00	_	<b>ppb</b> 0.00	A) AB	OE + OO		0.00	A 52	OE + OO	<b>n</b>   200	0.00	_	0E + 00	
Acenaphthylene	0.5	0.000	0.00	AR	0E + 00		0.00	2.83	0E + 00	_	0.00	251	0E + 00	AR	0.00	AR	0E + 00	ASI
Acenaphthene	170	0.000	0.00	AR	0E + 00		0.00		0E + 00		0.00	A i i	0E + 00	AR	0.00	AR	0E ÷ 00	Art
Dibenzofuran	190	0.000	0.00	дR	0E + 00	aR	0.00	24 F 3	0E + 00	48	0.00	91 * 1 2 4 4 4	0E + 00	AR	0.00	AR	0E + 00	AR
Fluorene	160	0.000	0.00	яR	0E + 00	AR	0.00	161	0E + 00	AB	0.00	.111	0E + 00	ÀR	0.00	All	0E + 00	AN
Phenanthrene	80	0.000	0.00	AR	0E + 00	AS	0.00	11.7	0E + 00	AR	0.00	£138	0E + 00	AB	0.00	AÑ	0E + 00	AR
Anthracene	0.	0.000	0.00	AÑ	0E + 00	FAR	0.00	_ NT	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR
Di-n-butylphthalate	200	0.000	0.00	AR	0E + 00	AR	0.00	1 5 7	0E+00	MFI	0.00	A.B	0E + 00	nft	0.00	AR	0E + 00	AR
Fluoranthene	14	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AA	0.00	A. F	0E + 00	AB	0.00	AB	0E+00	AR
Pyrene	200	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AS	0E + 00		0.00	ΑÑ	0E + 00	- 5
Benzo[a]anthracene		0.000	0.00	AR	0E+00	相信	0.00	AH	0E+00	AR	0.00	142	0E + 00	AR	0.00	AR	0E + 00	AB
Chrysene		0.000	0.00	AR	0E+00		0.00	AR	0E + 00	AR	0.00	AII	0E + 00	AR	0.00	лR	0E + 00	AA
bis[2-ethylhexyl)phthalate	14400	0.000	0.00	Añ	0E + 00		0.00	112	0E+00		0.00	AR	0E + 00	, 4 E	0.00	AR	0E + 00	
Benzo[b]&[k]fluoranthene	1.0	0.000	0.00	AR	0E+00		0.00	All	0E+00	АĤ	0.00	AN	0E + 00	ÄÄ	0.00	AR	0E + 00	AR
Benzo(a)pyrene	0.5	0.000	0.00	AR	0E + 00		0.00	A)	0E + 00	AR	0.00	AR	0E + 00	16.7	0.00	AR	0E + 00	AR
Indeno[1,2,3-cd]pyrene	1.3	0.000	0.00	AA	0E + 00		0.00	Ali	0E + 00		0.00	An	0E + 00		0.00		0E + 00	AR
Benzo(g,h,i)perylene	0.5	0.000	0.00	AR	0E + 00	aR	0.00	All	0E + 00	AR	0.00	All	0E + 00	AR	0.00	AR	0E + 00	AN
RISK / ACCEP	TABLE RIS	K TO: ENVI	RONMENT			AR.		_ Ad		AM		Ah		411		AP		1.12



BAM 10: ENVIRONMENTAL RISK QUANTIFICATION + DAM WATER + SAMPLE NO. 28 TORGANIGS (PAH" & VGC")
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

	The terms								BISK TO B	ENVIROR	IMENT							
ORGANIC	in this		RISK OF D	AM WAT	ER AS IS		RISK OF DI	LUTED D	AM WATER I	IN RIVER			RISK OF DAN	1 WATER	FOR GROU	NDWATE	R	
COMPOUNDS	Value	TOTA	LANALYS	S	4 PROBIT N	<b>NODEL</b>	DILUTED	NATER	4 PROBIT I	MOOEL	CURRENT	/OLUME	4 PROBIT N	/IODEL	TOTAL VI	DLUME	4 PROBIT	MODEL
PAH <sup>s</sup> & VOC <sup>s</sup>	(MB)	<sup>1</sup> Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	<sup>3</sup> Risk	Risk Quan-	<sup>3</sup> Risk R / AR	<sup>2</sup> EEC	3 Risk	Risk Quan-	<sup>3</sup> Risk	<sup>2</sup> EEC	<sup>3</sup> Risk R / All	Risk Quan-	<sup>3</sup> Risk R / All
	hbp	ppm	ppb	R / AW	tification %	R/AN	ppb		tification %		ppb	R/AR	tification %	R/AR	hbp	_	tification %	_
Naphthalene	460	0.000	0.00	An	0E+00	afi	0.00	AR	0E+00		0.00	1112	0E + 00		0.00	Alt	0E + 00	
Acenaphthylene	0.5	0.000	0.00	_	0E + 00	AR	0.00		0E + 00		0.00	1166	0E+00		0.00		0E + 00	
Acenaphthene	170	0.000	0.00	AH	0E + 0D	AH	0.00	AH	0E + 00		0.00	11.11	0E+00		0.00	All	0E + 00	
Dibenzofuran	190	0,000	0.00	All	0E+00	All	0.00	124.	0E + 00	Ali	0.00	15 1	0E+00		0.00	All	0E+00	
Fluorene	160	0.000	0.00	AR	0E+00	N. I	0.00	AH	0E + 00	丹布	0.00	AR	0E + 00	Añ	0.00	All	0E+00	
Phenanthrene	80	0,000	0.00	1111	0E + 00	2147	0.00	31.5	0E + 00	39 ( )	0.00		0E+00	1411	0.00	AR	0E+00	10 1 7
Anthracene	0.5	0.000	0.00	AF	0E + 00	AR	0.00	1,52	0E + 00	AR	0.00	11	0E+00	AR	0.00	110	0E+00	2.35.3
Di-n-butylphthalate	200	0.000	0.00	AB	0E+00	24 3 1 2 3 1	0.00	217	0E + 00	AR	0.00		0E+00	1.83	0.00	141	0E+00	2108
Fluoranthene	14	0.000	0.00	AR	0E+00	AH	0.00	Aft	0E + 00	Art	0.00	All	0E + 00	AF	0.00	AB	0E+00	113
Pyrene	200	0.000	0.00	Ait	0E + 00	Ail	0.00	añ.	0E + 00		0.00	- 2 1 1	0E + 00	AA	0.00	14 M	0E+00	447
Benzo[a]anthracene	1.0	0.000	0.00	AR	0E+00	AR	0.00	AN	0E + 00	Añ	0.00	Ail	0E+00	AB	0.00	AR	0E+00	Aa
Chrysene	100	0.000	0.00	All	0E + 00	(vi)	0.00	7 Ka	0E + 00	AH	0.00	AF	0E+00	all	0.00	AR	0E+00	AB
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	лП	0E+00	41	0.00	AH	0E + 00	AR	0.00	All	0E+00	11.	0.00	AR	0E+00	AR
Benzo[b]&[k]fluoranthene	0.5	0.000	0.00	All	0E+00	11 A 3 A 1	0.00	M	0E+00	AVi	0.00	14.5	0E+00	117	0.00	AR	0E + 00	An
Benzo(a)pyrene	0.5	0.000	0.00	AB	0E + 00	200	0.00	AF	0E + 00	All	0.00	1-15	0E + 00	88	0.00	AR	0E+00	411
Indeno[1,2,3-cd]pyrene	0.5	0.000	0.00	Ail	0E + 00		0.00	AR	0E+00	AR	0.00	AE	0E+00	AR	0.00	AR	0E+00	1111
	0.5	0.000	0.00	AR	0E + 00	NI.	0.00	All	0E+00	All	0.00	AR	0E+00	All	0.00	AR	0E+00	J. E.
RISK / ACCEPT	ABLE BICK	TO- SNIVER	ONMENT	AR		A ATT	111111111111111111111111111111111111111	Alte		the section		AUG		That is				1845



### [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

									RISK TO E	NVIRO	VIMENT							
ORGANIC	lisk		RISK OF D	AM WAT	ER AS IS		RISK OF DI	LUTED D	AM WATER I	N RIVER			RISK OF DAM	WATER	FOR GROU	NDWATE	R	
COMPOUNDS	vajuje	TOTA	L ANALYS	IS	4 PROBIT N	MODEL	DILUTED	NATER	4 PROBIT!	MODEL	CURRENT	/OLUME	4 PROBIT I	MODEL	TOTAL VI	DLUME	4 PROBIT N	MODEL
PAH <sup>s</sup> & VOC <sup>s</sup>	(MR)	<sup>1</sup> Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
	a fingle	ppm	ppb	RIAR	tification %	RIAR	ppb	RIAR	tification %	RIAB	ppb	RIAR	tification %	RIAN	ppb	用人的	tification %	RIAR
Naphthalene	461	0.000	0.00	AR	0.00E + 00	A 1 1	0.00	AL S	0.00E + 00	AR	0.00	AR	0.00E + 00	AB	0.00	AR	0.00E+00	AB
Acenaphthylene	0.5	0.000	0.00	AR	0.00E + 00	184	0.00	Ati	0.00E + 00	AH	0.00	AR	0.00E + 00		0.00	Α,.	0.00E + 00	All
Acenaphthene	3 7 9 5	0.000	0.00	2 7 2 2 4 3	0.00E+00	417	0.00	() 20 0013	0.00E + 00	All.	0.00	1188	0.00E+00		0.00	AR	0.00E + 00	AH
Dibenzofuran	130	0.000	0.00	11 2 2	0.00E+00	AR	0.00	AA	0.00E + 00	AW	0.00	Nil	0.00E+00	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.00	All	0.00E+00	AR
Fluorene	130	0.000	0.00	AR	0.00E +00	1 7 7 1 2 2 8	0.00	11,83	0.00E + 00	Fill	0.00	AR	0.00E + 00	Ali	0.00	AFT	0.00E+00	
Phenanthrene	0.0	0.000	0.00	AR	0.00E + 00	4.11	0.00	19 2	0.00E + 00	AH	0.00	Alf	0.00E+00	AH	0.00	AR	0.00E+00	MI
Anthracene	9.5	0.002	2.0	R	3.67E+00	R	0.067	All	2.22E-14	AR	0.89	R	3.72E-02	R	1.43	R	7. <b>2</b> 2E-01	R
Di-n-butylphthalate	2.0(0)	0.000	0.00	AN	0.00E+00	48	0.00	AR	0.00E+00	aA	0.00	AA	0.00E+00	All .	0.00	AR	0.00E + 00	AA
Fluoranthene	14	0.020	20.0	R	7.16E-03	B	0.667	AVI	0.00E + 00	AN	8.90	AH	3.97E-06	RA /	14.3	R	4.18E-04	B
Pyrene	200	0.015	15.0	22.0°	0.00E +00	AR	0.50	AR	0.00E+00	A 11	6.64	, 13 , 12 2	0.00E + 00	Aji	10.7	AR	0.00E + 00	AH
Benzo[a]anthracene	4.0	0.006	6.0	R	1.59E+01	R	0.20	n.E	4.22E-12	113	2.66	R	4.83E-01	TV b t	4.30	R	4.95E+00	10
Chrysene	100	0.005	5.0	AR	0.00E + 00	/\fi	0.167	Asi	0.00E + 00	AR	2.21	:111	0.00E + 00	20	3.58	5 - 1 - 1	0.00E + 00	AR
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	AR	0.00E + 00	AB.	0.00	MEL	0.00E + 00	AR	0.00	Añ	0.00E # 00	1112	0.00	All	0.00E + 00	AH
Benzo[b]&[k]fluoranthene	深值这么	0.004	4.0	R	3.31E+01	R	0.133	AR	1.57E-10	Ali	1. <b>7</b> 7	R	2.12E+00	R	2.87	R	1.39E +01	R
Benzo(a)pyrene	1000000	0.004	4.0	R	3.31E+01	R	0.133	AR	1.57E-10	AB	1.77	R	2.12E+00	R	2.87	B	1.39E+01	R
Indeno[1,2,3·cd]pyrene	64.5	0.003	3.0	R	1.59E+01	R	0.10	AA	4.22E-12		1.33	R	4.83E-01	R	2.15	R	4.95E +00	R
Benzo(g,h,i)perylene	10.5	0.000	0.00	All	0.00E + 00	AH	0.00	1 1 1	0.00E+00	Aft	0.00	IN FR	0.00E+00	AR	0.00	2 9 2	0.00E +00	1886
RISK / ACCEPT	ABLE BIST	TO: ENVIR	ONMENT	R		R		1.2				R		R		R		R



DAM 16: ENVIRONMENTAL RISK QUANTIFICATION + DAM WATER + SAMPLE NO. 3S [ORGANIC - PART & VOCT]
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

	Art								RISK TO E	NVIRON	IMENT							
ORGANIC	Mag		RISK OF DA	M WAT	R AS IS		RISK OF DI	LUTED D	AM WATER	N RIVER			RISK OF DAN	WATER	FOR GROU	NDWATE	R	
COMPOUNDS	College	TOTA	L ANALYSIS	S	<sup>4</sup> PROBIT N	NODEL	DILUTED	WATER	4 PROBIT I	MODEL	CURRENT	VOLUME	4 PROBIT	MODEL	TOTAL VI	DLUME	4 PROBIT N	NODEL
PAH <sup>°</sup> & VOC <sup>°</sup>	(MH)	<sup>1</sup> Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	<sup>3</sup> Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
	106	ppm	ppb	RIAB	tification %	RIAR	ppb	R/AR	tification %	B/AB	ppb	RIAR	tification %	R/AS	ppb	R/AR	tification %	RIAS
Naphthalene	410	0.000	0.00	AS	0.00E + 00	AR	0.00	A33	0.00E + 00	AB	0.00	A ST	0.00E + 00	_AB	0.00	AB	0.00E + 00	AR
Аселарhthylene	(1),(3)	0.000	0.00	AB	0.00E + 00	AR	0.00	AR	0.00E + 00	AR	0.00	AT	0.00E+00	lia li	0.00	AR	0.00E+00	AB
Acenaphthene	170	0.000	0.00	水草	0.00E+00	AR	0.00	4.7	0.00E + 00	AR .	0.00	14.T 13.La	0.00E+00	AR	0.00	1 5 7	0.00E+00	AP
Dibenzofuran	190	0.000	0.00	AR	0.00E+00	11	0.00	7.83	0.00E + 00	A.F.	0.00	AN	0.00E+00	AR	0.00	MA	0.00E+00	All
Fluorene	160	0.000	0.00	AR	0.D0E+00	All	0.00	AR	0.00E + 00	Ait	0.00	AR	0.00E+00	Añ	0.00	P.D	0.00E+00	AB
Phenanthrene	3.0	0.002	2.00	NÝ.	0.00E+00	An	0.067	AB	0.00E + 00	AR	0.89	AR	0.00E+00	AR	1.43	2.27	0.00E+00	AR
Anthracene	$i_1, j_2$	0.000	0.00	×A	0.00E+00	AR	0.00	AR	0.00E + 00	*** **** ******	0.00	AR	0.00E+00	AR	0.00	1 24	0.00E+00	AR
Di-n-butylphthalate	20.)	0.000	0.00	AR	0.00E+00	AR	0.00	254	0.00E + 00	AB	0.00	AR	0.00E+00	AH	0.00	Adi	0.00E+00	1,27
Fluoranthene	是主体的	0.011	11.0	48	3.47E-05	7° 2513	0.367	AR	0.00E + 00	AR	4.9	AR	4.55E-09	AH	7.9	AR	1.10E-06	AR
Pyrene	200	0.000	0.0	- AR	0.00E+00	AR	0.00		0.00E+00	AR	0.00	2.77	0.00E+00	All	0.00	, , ; ; , , , , ;	0.00E+00	AA
Benzo(a)anthracene	1.0	0.004	4.0	R	3.67E+00	R	0.133	AR	2.22E-14	All	1.77	R	3.57E-02	a	2.87	R	7.35E-01	R
Chrysene	100	0.004	4.0	яĤ	0.00E+00	AR	0.133	AN	0.00E + 00	Ai.	1.77	88	0.00E + 00	A.L	2.87	A11	0.00E+00	- AS
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	a.R	0.00E+00	AR	0.00	AR	0.00E + 00	AR	0.00	AF	0.00E+00	AR	0.00		0.00E+00	AB
Benzo(b)&(k)fluoranthene	0.5	0.006	6.0	R	6.39E+01	R	0.20	All	2.23E-08	AR	2.66	R	1.09E+01	R	4.30	R	3.84E+01	R
	0.5	0.004	4.0	R	3.31E+01	R	0.133	AR	1.57E-10	AD	1.77	R	2.12E + 00	8	2.87	R	1.39E+01	R
Indeno[1,2,3-cd]pyrene	0.5	0.004	4.0	R	3.31E+01	R	0.133	418.	1.57E-10	200	1.77	R	2.12E+00	8	2.87	R	1.39E+01	R
Benzo[g,h,i]perylene	0.5	0.000	0.00	AR	0.00E+00	AR	0.00	Aft	0.00E+00	24	0.00	1003	0.00E+00	A	0.00	1127	0.00E+00	A, :
AISK / ACI	EPTABLE	MEK TO: ENVI	RONMENT	R				Litt		1.19				R				



ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

SAMPLE NUMBER: 3D																		
	4/4								RISK TO E	NVIROA	IMENT							
ORGANIC			RISK OF DA	M WAT	R AS IS		RISK OF O	LUTEO O	AM WATER	IN RIVER			RISK OF DAN	WATER	FOR GROU	NOWATE	R	
COMPOUNOS	N. Hu	TOT	AL ANALYSIS	3	4 PROBIT I	MODEL	DILUTED	WATER	4 PROBIT I	MODEL	CURRENT	VOLUME	4 PROBIT!	MODEL	TOTAL V	DLUME	<sup>4</sup> PROBIT N	MODEL
PAH <sup>®</sup> & VOC <sup>®</sup>		<sup>1</sup> Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
		ppm	ppb	RISE	tification %	RIAR	ppb	RIAR	tification %	R/AR	ppb	RIAR	tification %	RIAR	ppb	R/AB	tification %	R/AR
Naphthalene	450	0.000	0.00	AR	0E+00	AH	0.00	AR	0E + 00	AR	0.00	AS	0E + 00	AK	0.00	AR	0E + 00	AR
Acenaphthylene	9.0	0.000	0.00	AR	0E + 00	AR	0.00	AB	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR
Acenaphthene	170	0.000	0.00	AR	0E + 00	FA	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR
Dibenzofuran	1,915	0.000	0.00	AR	0E + 00	AR	0.00	AH	0E + 00	AR	0.00	AR	0E + 00	Ari	0.00	AR	0E + 00	AR
Fluorene	100	0.000	0.00	AR	0E + 00	AR	0.00	AT	0E + 00	AR	0.00	Añ	0E + 00	AR	0.00	AR	0E + 00	AR
Phenanthrene	50	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AP	0.00	AR	0E+00	AR
Anthracene	0.5	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR
Oi-n-butylphthalate	200	0.000	0.00	AR	0E + 00	A \$ 3	0.00	AB	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AN	0E + 00	AR
Fluoranthene	14	0.000	0.00	Ari	0E+00	Aff	0.00	AB	0E + 00	Añ	0.00	AR	0E + 00	AA	0.00	AR	0E+00	AR
Pyrene	203	0.000	0.00	AR	0E + 00	AH	0.00	AB	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR
Benzo[a]anthracene	1.0	0.000	0.00	AR	0E + 00	AR	0.00	AB	0E + 00	AH	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AN
Chrysene	100	0.000	0.00	AR	0E+00	AR	0.00	AN	0E + 00	AR	0.00	A 8 3	0E + 00	AH	0.00	AR	0E + 00	AIL
bis(2-ethylhexyl)phthalate	44400	0.000	0.00	AR	0E + 00	AR	0.00	AB	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E + 80	AR
Benzo[b]&[k]fluoranthene	0.5	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E + 00	
Benzo(a)pyrene	0	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	4R	0.00	AR	0E + 00	
Indeno[1,2,3-cd]pyrene	9.5	0.000	0.00	AR	0E + 00	AR	0.00	1.00	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	
Benzo(g,h,i)perylene	0.5	0.000	0.00	AR	0E + 00	FA	0.00	AA	0E + 00	AR	0.00	AB	0E + 00	AR	0.00	AR	0E + 00	AR
RISK / ACCEP	TABLE RIS	SK TO: ENVI	RONMENT	All		AĤ		All		Æ		ÄĦ		AR		AR		AŘ



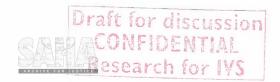
### DAM 10: ENVIRONMENTAL RISK QUANTIFICATION • DAM WATER • SAMPLE NO. 4S [ORGANICS - PAH\* & V8C\*] [ISCOR VANDERBIJLPARK STEEL – MASTER PLAN]

SAMPLE NUMBER: 48																		
	Ace.								RISK TO E	NVIRON	IMENT							
ORGANIC	Risk		RISK OF DA	M WATI	R AS IS		RISK OF D	LUTED D	AM WATER I	N RIVER			RISK OF DAN	/ WATER	FOR GROU	NDWATI	ER	
COMPOUNOS	ALTER A	TOT	AL ANALYSI	S	4 PROBIT I	MODEL	DILUTED	WATER	<sup>4</sup> PROBIT I	AODEL	CURRENT	VOLUME	4 PROBIT I	MODEL	TOTAL VO	DLUME	4 PROBIT N	NODEL
PAHS & VOCS	(Mil)	1 Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	<sup>3</sup> Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
	1-10h	ppm	ppb	RIAR	tification %	R / A8	ppb	RIAR	tification %	R/AH	ppb	R/AR	tification %	RIAR	ppb	RIAA	tification %	RIAS
Naphthalene	450	0.000	0.00	AR	0E + 00	4)-	0.00	AR	0E ÷ 00	ÂR	0.00	AB	0E + 00	AR	0.00	ΑH	0E+00	AR
Acenaphthylene	0.5	0.000	0.00	AR	0E ÷ 00	AR	0.00	AR	0E + 00	9.Ft	0.00	AR	0E + 00	AR	0.00	AR	0E+00	411
Acenaphthene	170	0.000	0.00	AA	0E+00	AR	0.00	AR	0E + 00	AA	0.00	AB	0E + 00	AA	0.00	AR	0E+00	AB
Dibenzofuran	190	0.000	0.00	4.6	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AH	0E+00	AR
Fluorene	160	0.000	0.00	AR	0E+00	AH	0.00	AR	0E+00	AR	0.00	AR	0E+00	AB	0.00	AR	0E+00	AR
Phenanthrene	80	0.000	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR
Anthracene	0.5	0.000	0.00	ΑÊ	0E + 00	AH	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AH	0E+00	AR
Di-n-butylphthalate	200	0.000	0.00	AB	0E + 00	A.	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR
Fluoranthene	14	0.000	0.00	AS	0E + 00	AR	0.00	AB	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E ÷ 00	AB
Pyrene	200	0.000	0.00	AH	0E + 00	AR	0.00	AR	0E+00	An	0.00	AB	0E+00	AR	0.00	AR	0E+00	AF
Benzo[a]anthracene	1.0	0.000	0.00	AR	0E+00	AF	0.00	AR	0E+00	48	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR
Chrysene	100	0.000	0.00	AR	0E+00	48	0.00	AR	0E + 00	AR	0.00	AH	0E + 00	AR	0.00	AF	0E+00	AR
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	AR	<b>0</b> E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR
Benzo[b]&[k]fluoranthene	0.5	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AK	0.00	AR	0E+00	AR
Benzo(a)pyrene	0.5	0.000	0.00	AR	0E+00	W	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR
Indeno[1,2,3-cd]pyrene	0.5	6. <b>20</b> 6	0.00	AR	0E + 00	Añ	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR
Benzo(g,h,i)perylene	0.5	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR
RISK / ACCEP	TABLE RI	SK TO: ENVI	RONMENT	AR		AA		AR		. H		AR		AR		AR		AR



BAM 10: ENVIRONMENTAL RISK QUANTIFICATION + DAM WATER + SAMPLE NO. 4D (GRGANICS - PAR' & VOC')
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

SAMPLE NUMBER: 40																		
	Ace								RISK TO E	NVIRON	IMENT							
ORGANIC	Risk		RISK OF DA	M WATE	R AS IS		RISK DF D	LUTED D	AM WATER	N RIVER			RISK OF DAN	WATER	FOR GRDU	NDWATE	R	
COMPOUNDS	Value	TOT	AL ANALYSIS	3	4 PROBIT I	MODEL	DILUTED	WATER	4 PROBIT I	MODEL	CURRENT	VOLUME	4 PROBIT I	MODEL	TOTAL VI	DLUME	<sup>4</sup> PROBIT N	<b>ADDEL</b>
PAHS & VOCS	(MF)	1 Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
	g <sub>+</sub> b	ppm	ppb	RIAB	tification %	R/AB	pph	R/AD	tification %	R/AR	ppb	R/88	tification %	R/AR	ppb	RIAR	tification %	RIAR
Naphthalene	460	0.000	0.00	AR	0E+00	AR	0.00	AB	0E+00	Añ	0.00	AR	0E + 00	AR	0.00	40	0E+00	AR
Acenaphthylene	0.5	0.000	0.00	AH	0E+00	AR	0.00	AR	0E + 00	AN	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR
Acenaphthene	170	0.000	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	ĀR	0E+00	AR
Dibenzofuran	190	0.000	0.00	AR	0E+00	Ah	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AH	0.00	AR	0E+00	AIT
Fluorene	160	0.000	0.00	AR	0E+00	AR	0.00	AR	0E+00	AB	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AK
Phenanthrene	80	0.000	0.00	AR	0E+00	49	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AN
Anthracene	0.5	0.000	0.00	AR	0E+00	AR	0.00	AR	<b>0</b> E + 00	AH	0.00	AR	0E+00	AR	0.00	AR	0E+00	AH
Di-n-butylphthalate	200	0,000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AP	0E+00	μŘ
Fluoranthene	14	0.000	0.00	AR	0E+00	AR	0.00	AB	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR
Pyrene	200	0.000	0.00	AA	0E ÷ 00	AR	0.00	AB	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR
Benzo(a)anthracene	1.0	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AH	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR
Chrysene	100	0.000	0.00	ÅR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AB	0E+00	AB	0.00	AR	0E+00	
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	ÀR	0E + 00	AR	0.00	AR	0E+00	Aft	0.00	AR	0E+00		0.00	AÄ	0E+00	
Benzo[b]&[k]fluoranthene	0.5	0.000	0.00	AR	0E+00	AA	0.00	AR	0E + 00	AR	0.00	AR	0E+00		0.00	AR	0E + 00	
Benzo(a)pyrene	0.5	0.000	0.00	AG	0E+00	AR	0.00		0E+00	AH	0.00	AR	0E+00		0.00	AR	0E + 00	
Indeno[1,2,3-cd]pyrene	0.5	0.000	0.00	AR	0E + 00	AR	0.00	AB	0E+00	AR	0.00	Asa	0E+00		0.00	AR	0E + 00	
Benzo[g,h,i]perylene	0,5	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	Afi	0E+00	AH	0.00	AR	0E + 00	All
RISK / ADSEP	TABLE RIS	SK TO: ENVI	RONMENT	AR		AR		AR		ÀR		40-		AR		AH		AR



(ISCOR VANDERBIJLPARK STEEL - MASTER PLAN)

SAMPLE NUMBER: 5S	A Acr.								RISK TO E	VVIRON	IMFNT							
ORGANIC	Risk		RISK OF DA	M WAT	ER AS IS		RISK OF DI		AM WATER I				RISK DF DAN	1 WATER	FOR GROU	NDWATE	ER	
COMPOUNDS	Value	TOTA	AL ANALYSI	S	4 PROBIT N	/ODEL	DILUTED	NATER	4 PROBIT N	/ODEL	CURRENT	VOLUME	4 PROBIT N	/IODEL	TOTAL VI	DLUME	4 PROBIT N	WODEL
PAH' & VOC'	(MR)	<sup>1</sup> Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	<sup>3</sup> Risk
	ppb	ppm	ppb	R / AH	tification %	R/AA	ppb	R/AB	tification %	R/AS	ppb	R/AB	tification %	RIAR	ppb	RIAR	tification %	R/AR
Naphthalene	460	0.000	0.00	1 2 3	0E + 00	AX	0.00	23 17° 2 2 9 3	0E + 00		0.00	1124	0E+00	AR	0.00	AH	0E + 00	
Acenaphthylene	0.5	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	A 12	0.00	AN	0E + 00	All	0.00	.4.1	0E+00	AR
Acenaphthene	1/0	0.000	0.00	13.34	0E + 00	AF	0.00	IAT Z	0E+00	1.51	0.00	Afi	0E + 00	AŘ	0.00	Pat .	0E + 00	AR
Dibenzofuran	revolution of	0.000	0.00	AA	0E + 00	AR	0.00	15,63	0E + 00	AP.	0.00	AR	0E + 00	aR	0.00	Mi	0E + 00	AIL
Fluorene	180	0.000	0.00	RH	0E+00	AR	0.00	All	0E + 00	AR	0.00	AB	0E + 00	AR	0.00	An	0E + 00	AR
Phenanthrene	40	0.000	0.00	AR	0E + 00	AN	0.00	AR	0E + 00	Ali	0.00	AR	0E + 00	AR	0.00	All	0E + 00	AH
Anthracene	9.3	0.000	0.00	100	0E+00	Añ	0.00	4.1	0E ÷ 00	Aff	0.00	Alli	0E + 00	All	0.00	ATT	0E + 00	Ait
Di-n-butylphthalate	200	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E ÷ 00	AR	0.00	AR	0E+00	, 4 P	0.00	All	0E + 00	AK
Fluoranthene	14	0.000	0.00	AF	0E+00	Afl	0.00	All	0E ÷ 00	101	0.00	AST	0E +00	s.R	0.00	AB	0E+00	Asi
Pyrene	4(00)	0.000	0.00	Alti	0E+00	AR	0.00	AR	0E + 00	12 10 10	0.00	AR	0E+00	AP	0.00	AR	0E + 00	AR
Benzo(a)anthracene	1.0	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AF	0E + 00	AR	0.00	M.	0E + 00	AR
Chrysene	100	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AN	0.00	AT	0E + 00	ART	0.00	2 = 1° 3	0E + 00	AR
bis(2-ethylhexyl)phthalate	14490	0.000	0.00	MI	0E+00	AR	0.00	AB	0E + 00	AR	0.00	AR	0E + 00	All	0.00	AR	0E + 00	All
Benzo(b)&(k)fluoranthene	0.9	0.000	0.00	AR	0E+00	AR	0.00	AE	0E + 00	AB	0.00	at N	0E+00	4.1	0.00	A.I	0E+00	AB
Benzo(a)pyrene	0.5	0.000	0.00	nF)	0E + 00	AR	0.00	AR	0E + 00	*** B **	0.00	All	0E+00	AR	0.00	Pai .	0E + 00	AR
Indeno[1,2,3-cd]pyrene	0.5	0.000	0.00	All	0E+00	AR	0.00	Aff	0E + 00	Ail	0.00	MA	0E + 00	AR	0.00	AB	0E + 00	AR
Benzo[g,h,i]perylene	0.6	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AD	0E+00	Alv	0.00	AR	0E ± 00	AR
RISK / ACCE	TABLE RE	SK TO: ENVI	RONMENT	Air .		AR		Talia		41		Tay was		AIR				m. 1



Draft for discussion CONFIDENTIAL Research for IVS

UAW 10: ENVIRONMENTAL RISK QUANTIFICATION + UAM WATER + SAMPLE NO. 50 (CREAMICS - PAIN' & VSC\*)
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

	fee.								RISK TO E	VVIRON	IMENT							
ORGANIC	Aisa		RISK OF DA	M WAT	ER AS IS		RISK OF D	LUTED (	AM WATER I	N RIVER			RISK OF DAN	<b>WATER</b>	FOR GROU	IDWATI	R	
COMPOUNDS		TOTA	L ANALYSI	3	<sup>4</sup> PROBIT N	<b>NODEL</b>	DILUTED	WATER	4 PROBIT N	/ODEL	CURRENT	VOLUME	4 PROBIT N	MODEL	TOTAL VO	LUME	4PROBIT	MODEL
PAH® & VOC®	(MR)	<sup>1</sup> Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	<sup>3</sup> Risk	Risk Quan-	<sup>3</sup> Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	<sup>3</sup> Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
	ppb	ppm	ppb	R/AH	tification %	R/AR	ppb	RIAR	tification %	RIAR	ppb	RIAB	tification %	R/AR	ppb	R / AR	tification %	R/M
Naphthalene	460	0.000	0.00	AR	0E + 00	AR	0.00	25 T #	0E + 00	AR	0.00		0E+00	AR	0.00	- AR	0E+00	añ.
Acenaphthylene	0.5	0.000	0.00	AR	0E+00	AR	0.00	AB	0E+00	AR	0.00	n.H	0E + 00	A.B	0.00	48	0E + 00	AH
Acenaphthene	170	0.000	0.00	AR	0E + 00	AR	0.00	- Aft	0E + 00	AR	0.00	AB	0E + 00	RA	0.00	HÑ	0E ÷ 00	4.55
Dibenzofuran	190	0.000	0.00	A音	0E + 00	ÀŘ	0.00	AR	0E + 00	MA	0.00	.49	0E + 00	48	0.00	aR	0E+00	AR
Fluorene	160	0.000	0.00	AR.	0E+00	aR	0.00	AR	0E + 00	AĤ	0.00	aii	0E + 00	AA	0.00	AR	0E+00	AS
Phenanthrene	80	0.000	0.00	AR	0E + 00	AÑ	0.00	Att	0E+00	$p(\frac{1}{2})$	0.00	AR	0E + 00	AR	0.00	48	0E+00	48
Anthracene	0.5	0.000	0.00	AR	0E + 00	яĥ	0.00	1.13	0E + 00	AB.	0.00	W. []	0E + 00	AR	0.00	AS	0E+00	AR
Di-n-butylphthalate	200	0.000	0.00	All	0E+00	лħ	0.00	1 6 2 4	0E + 00	ΑÑ	0.00	AH	0E + 00	AR	0.00	aR	0E + 00	10
Fluoranthene	14	0.000	0.00	Alt	0E+00	AA	0.00	illi	0E+00	A.R	0.00	AR	0E + 00	AR	0.00	AF	0E+00	NA.
Pyrene	200	0.000	0.00	AH	0E+00	AR	0.00	10.75	0E + 00	4.T	0.00	3.1.	0E + 00	25 25/4	0.00	AÑ	0E+00	AR
Benzo(a)anthracene	1.0	0.000	0.00		0E+00	AR	0.00		0E + 00	RA	0.00	.45	0E+00	AP	0.00	off.	0E + 00	AR
Chrysene	100	0.000	0.00	AA	0E+00	AR	0.00	AR	0E + 00	ΑÑ	0.00	AB	0E+00	AR .	0.00	MK	0E + 00	AR
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	48	0E+00	MR	0.00	AN	0E + 00	AB	0.00	. 76.	0E + 00	AÑ	0.00		0E + 00	añ.
Benzo[b]&[k]fluoranthene	0.5	0.000	0.00	AH	0E + 00	AX	0.00	1433	0E + 00	яŘ	0.00	A.I.	0E + 00	AR	0.00	AR	0E+00	AR
Benzo(a)pyrene	0.5	0.000	0.00	AR	0E+00	AA	0.00	AR	0E + 00	AB	0.00	Ali	0E + 00	AR	0.00	Aft	0E+00	AR
manual that a call by and	0.5	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AN	0E + 00	AR	0.00	жÑ	0E+00	AB
Benzo(g,h,i)perylene	0.5	0,000	0.00	AR	0E + 00	AB	0.00	AH	0E + 00	AR	0.00	AH	0E+00	A A	0.00	afi	0E + 00	AR
RISK I AUCEP	TARLERU	M TO: ENVI	RONMENT	10		17.1		An		AP		AR		11		17		18

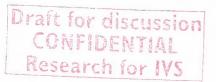


Draft for discussion CONFIDENTIAL Research for IVS

DAM 10: ENVIRONMENTAL RISK QUANTIFICATION + DAM WATER + SAMPLE NO. 6S [ORGANICS - PAH\* & VOC\*]
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

SAMPLE NUMBER: 68									RISK TO E	MIVIDOS	INTENT							
DRGANICS	Aee. Risk		RISK DF DA	M WATI	R AS IS		RISK DF D		AM WATER				RISK OF DAN	WATER	FOR GROU	NDWATI	ER	
COMPOUNDS	Value	TOTA	AL ANALYSIS		4 90811	40081	DILUTED		4 PROBIT I		CURRENT	VOLUME	4 PROBIT I		TOTAL V		<sup>4</sup> PROBIT N	<b>NODEL</b>
PAH° & VDC°	puig.	1 Lab Conc.	2 EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
	ppb	ppm	ppb	RIAN	tification %	R/AR	ppb	RIAN	tification %	R/AS	ppb	A / 40	tification %	RIAR	ppb	R/AR	tification %	RIAR
Naphthalene	460	0.000	0.00	AH	0E + 0 <b>0</b>	AR	0.00	AR	0E + <b>00</b>	AR	0.00	AR	0E + 00	AR	0.00	мh	0E+00	Ari
Acenaphthylene	0.5	0.000	0.00	AH	0E+00	AÑ	0.00	AR	0E + 00	AR	0.00	AS	0E + 00	AR	0.00	A A	0E+00	AR
Acenaphthene	170	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AH	0E+00	AR
Dibenzofuran	190	0.000	0.00	AR	0E + <b>0</b> 0	AR	0.00	AR	0E + <b>0</b> 0	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR
Fluorene	160	0.000	0.00	AR	0E+00	A	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AH	0E + 00	AH
Phenanthrene	80	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + <b>0</b> 0	AR	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR
Anthracene	0.5	0.000	0.00	AR	0E+00	AH	0.00	AR	0E + <b>0</b> 0	AR	0.00	AR	0E+00	AR	0.00	Aħ	0E+00	AR
Di-n-butylphthalate	200	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	48	0.00	AR	0E+00	AR	0.00	AH	0E+00	AR
Fluoranthene	14	0.000	0.00	AR	<b>0</b> E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	
Pyrene	200	0.000	0.00	AR	0E + 00	ÀН	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AH	0E+00	
Benzo[a]anthracene	1.0	0.000	0.00	AR	0E+00	Δ	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	Añ	0E+00	AR
Chrysene	100	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E ÷ 00	AR	0.00	AR	0E+00	AR
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	AR	0E+00	AR	0.00	AB	0E + 00		0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR
Benzo[b]&[k]fluoranthene	0.5	0.009	0.00	AR	0E +00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR
Benzo(a)pyrene	0.5	0.000	0.00	ĀR	0E + 00	AR	0.00	AR	0E + 00	43	0.00	AR	0E + 00	AR	0.00	4.1	0E+00	AR
Indeno[1,2,3-cd]pyrene	0.5	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 0 <b>0</b>	0.73	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR
Benzo(g,h,i)perylene	0.5	0.000	0.00	AR	0E+00	AR	0.00	AB	0E + 00	AH	0.00	AR	0E+00	AR	0.00	An	0E + 00	AR
RISK / ACCEP	TABLE BE	IN TO: ENVI	RONMENT	18		AR		AR		AR		AR		AR		AR		AR





(ISCOR VANDERBIJLPARK STEEL - MASTER PLAN)

	To Asia.								RISK TO E	ENVIRO	VMENT							
ORGANIC			RISK OF D	AM WAT	ER AS IS		RISK OF DI	LUTED D	AM WATER	IN RIVER			RISK OF DAN	WATER	FOR GROUP	VDWATE	R	
COMPOUNDS		TOTA	L ANALYS	S	4 PROBIT N	<b>NODEL</b>	DILUTED	NATER	4 PROBIT	MODEL	CURRENT	VOLUME	4 PROBIT N	NODEL	TOTAL VO	LUME	4 PROBIT N	MODEL
PAH <sup>s</sup> & VDC <sup>s</sup>	In H	<sup>1</sup> Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	<sup>3</sup> Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
		ppm	ppb	RIAN	tification %	R/An	ppb	RIAR	tification %	R/A6	ppb	R/AB	tification %	R / ASI	ppb	R/3/1	tification %	RIAR
Naphthalene	460	0.000	0.00	AR	0.00E+00	AR	0.00	AR	0.00E + 00	AÑ	0.00	ÄÄ	0.00E+00	AR	0.00	AB	0.00E+00	AN
Acenaphthylene	1.5	0.000	0.00	福祉	0.00E + 00	AN	0.00	AR	0.00E + 00	ĀR	0.00	AÑ	0.00E + 00	AR	0.00	мA	0.00E+00	48
Acenaphthene	171	0.000	0.00	AR	0.00E + 00	149	0,00	Aft	0.00E + 00	AB	0.00	aR .	0.00E+00	-AR	0.00	All	0.00E+00	aR
Oibenzofuran	150	0.000	0.00	AR	0.00E + 00	0,14	0.00	AS	0.00E + 00	AR	0.00	11/3	0.00E + 00	All	0.00	äR	0.00E + 00	All
Fluorene	160	0.000	0.00	AN	0.00E + 00	44	0.00	AR	0.00E+00	AR	0.00	A, Fi	0.00E+00	AR	0.00	AR.	0.00E+00	18
Phenanthrene		0.004	4.0	Aff	0.00E + 00	AA	0.133	AR	0.00E+00	nFl	1.77	AR	0.00E+00	AB	2.87	AB	0.00E + 00	10.00
Anthracene	0.5	0.003	3.0	R	1.59E+01	R	0.10	AR	4.22E-12	1918	1.33	R	4.83E-01	R	2.15	R	4.95E+00	R
Di-n-butylphthalate	400	0.007	7.0	a Fi	0.00E+00	AR	0.233	4R	0.00E + 00	AR	3.10	A.P.	0.00E+00	AR	5.02	AF	0.00E+00	AH
Fluoranthene	1.44	0.017	17.0	R	1.90E-03	R	0.567	Aft	0.00E+00	AR	7.53	ĸВ	6.52E-07	AR	12.2	AÑ	9.38E-05	13
Pyrene	200	8.008	8.0	Afi	0.00E + 00	AR	0.267	AH	0.00E+00	AR	3.54	AB.	0.00E + 00	AR	5.73	11	0.00E+00	71.5
Benzo[a]anthracene	4.0	0.005	5.0	R	8.78E+00	R	0.167	AR	4.11E-13	AP	2.21	R	1.59E-01	R	3.58	R	2.24E+00	R
Chrysene	Tu.	0.005	5.0	AR	0.00E+00	AR	0.167	AA	0.00E + 00	All	2.21	4A	0.00E+00	All	3.58	AR	0.00E+00	4/7
bis(2-ethylhexyl)phthalate	14400	0.015	15.0	All	0.00E+00	AR	0.50	AR	0.00E + 00	AR	6.64	All	0.00E+00	AN	10.8	жB	0.00E+00	. AG
Benzo[b]&[k]fluoranthene	0.5	0.007	7.0	R	7.45E+01	R	0.233	AR	1.31E-07	电影	3.10	R	1.75E+01	R	5.02	R	5.03E+01	R
Benzo(a)pyrene	0.5.	0.004	4.0	R	3.31E+01	R	0.133	AR	1.57E-10	Ait	1.77	R	2.12E+00	R	2.87	R	1.39E+01	R
Indeno[1,2,3-cd]pyrene	1000	0.003	3.0	R	1.59E+01	R	0.10	Añ	4.22E-12	AR	1.33	R	4.83E-01	R	2.15	R	4.95E+00	R
Benzo(g,h,i)perylene	0.5	0.000	0.00	Aft	0.00E + 00	AŘ	0.00	AR	0.00E+00	Aĥ	0.00	All	0.00E + 00	aR	0.00	1311	0.00E+00	AÑ
RISK / ACCEPT	ABLE RISI	TO: ENVIR	ONMENT	R		R		A D		1.0		R		R		R		R





QAM 19: ENVIRONMENTAL RISK QUANTIFICATION + DAM WATER + SAMPLE NO. 78 (QRGANICS - PAH" & VOC")
[ISCOR VANDERBIJLPARK STEEL – MASTER PLAN]

SAMPLE NUMBER: 78																		
	Age.								AISK TO E	NVIRON	IMENT							
ORGANIC	disk		RISK OF DA	M WAT	ER AS IS		RISK OF D	LUTED D	AM WATER	IN RIVER			RISK OF DAN	I WATER	FOR GROU	NDWATI	R	
COMPOUNDS	Value	TOTA	AL ANALYSI:	S	4 PROBIT N	<b>NODEL</b>	DILUTED	WATER	4 PROBIT I	MODEL	GURRENT	VOLUME	4 PROBIT I	/IODEL	TOTAL VO	DLUME	4 PROBIT N	MODEL
PAH & VOC	F (MR)	<sup>1</sup> Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
	) piu	ppm	ppb	R/AR	tification %	R/AR	ppb	RIAR	tification %	R / AB	ppb	R / AR	tification %	RIAS	ppb	R / AB	tification %	R/AR
Naphthalene	460	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AH	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AP
Acenaphthylene	9.5	0.000	0.00	AR	0E+00	Añ	0.00	AR	0E+00	AĤ	0.00	AR	0E + 00	AN	0.00	AN	0E + 00	AR
Acenaphthene	170	0.000	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E + 00	ŔŔ	0.00	AR	0E+00	AR
Dibenzofuran	100	0.000	0.00	AR	0E+00	AH	0.00	AR	0E + 00		0.00	AR	0E + 00	AR	0.00	AR	0E+00	AB
Fluorene	160	0.000	0.00	AR	0E+00	ΔN	0.00	AR	0E + 00	AR	0.00	AB	0E+00	AR	0.00	AR	0E + 00	AR
Phenanthrene	40	0,000	0.00	A科	0E+00	AH	0.00	AR	0E+00		0.00	AR	0E + 00	AR	0.00	Añ.	0E+00	AR
Anthracene	0.5	0.000	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	Añ	0E + 00	AR
Di-n-butylphthalate	200	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR
Fluoranthene	14	0.000	0.00	AR	0E+00	AR	0.00	AR	0E+00	AB	0.00	AR	0E+00	AÑ	0.00	AR	0E+00	AR
Pyrene	2/010	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	Arl
Benzo[a]anthracene	1.0	0,000	0.00	AR	0E + 00	AR.	0.00		0E+00	AR	0.00	1.00	0E+00	AR	0.00	AR	0E + 00	Art
Chrysene	100	0.000	0.00	AH	0E+00	AR	0.00	AH	0E+00	AR	0.00	AR	0E+00	AH	0.00	AR	0E+00	AH
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	AR	0E+00	AR	0.00	AR	0E+00	AB	0.00	AR	0E + 00	AR	0.00	AA	0E+00	AR
Benzo(b)&(k)fluoranthene	0.5	0.000	0.00	ДR	0E+00	AR	0.00	AR	0E+00	AH	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	An
Benzo(a)pyrene	0.5	0.000	0.00	AR	0E+00	AH	0.00	AR	0E + 00	AÑ	0.00	AR	0E+00	AR	0.00	Air	0E+00	AH
Indeno[1,2,3-cd]pyrene	0.3	0.000	0.00	AŘ	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AH
Benzo[g,h,i]perylene	0.5	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AB	0E + 00	A.A	0.00	AH	0E + 00	AR
RESK / ACCEP	TABLE RE	SK TO: ENVI	RONMENT	Àñ		44		Añ		18		AB.		T.A.		AR		AR

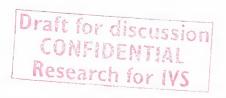




### DAM 10: ENVIRONMENTAL RISK QUANTIFICATION + BAW WATER + SAMPLE NO. 70 MRGARIGS PAR' & VOC'I

	Acc.								RISK TO E	NVIRO	NMENT							
ORGANIC	Risk		RISK OF D	AM WAT	ER AS IS		RISK OF D	LUTED [	AM WATER I	N RIVER			RISK OF DAN	I WATER	FOR GROU	NDWATE	R	
COMPOUNDS	Value	TOTAL	LANALYS	IS	4 PROBIT N	<b>NODEL</b>	DILUTED	WATER	4 PROBIT N	NODEL	CURRENT	DLUME	4 PROBIT I	VIODEL	TOTAL V	OLUME	4 PROBIT N	MODEL
PAH <sup>s</sup> & VOC <sup>s</sup>	(MR)	1 Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan- tification %	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan- tification %	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan- tification %	3 Risk	<sup>2</sup> EEC	Risk R/AA	Risk Quan-	3 Risk
Manhthalana	460	ppm	bbp	11 1 1511	0.00E+00	11 ( 2000	ppb	A.S.	0.00E+00	11 ( FRA)	<b>ppb</b> 1.77	11 / 2003	0.00E+00	ARE	2.87	1.02	0.00E+00	
Naphthalene	62015	0.004	4.00	ni.	1	A.O.	0.133	Att		AR		Alt		Put	2.15	R	4.95E+00	
Acenaphthylene			3.00	R	1.59E+01	R	0.10	Att	4.22E-12	An	1.33	R	4.83E-01	11		- N		
Acenaphthene	in the Carlo	0.003	3.00	AH	0.00E + 00	An	0.10	Ah	0.00E+00	ANT	1.33	is Fi	0.00E + 00	-86	2.15	F4.11	0.00+ 300.0	A D
Dibenzofuran	150	0.004	4.00	ali	0.00E+00	A.M.	0.133	Aft.	0.00E+00	41	1.77	AH	0.00E+00	A.N	2.87	MIT	0.00E+00	AK
Fluorene	Name and Address of the Owner, where	0.008	8.00	Rli	0.00E + 00	AÑ	0.267	Ari	0.00E+00	AR	3.54	85	0.00E+00	AN	5.73	All	0.00E+00	
Phenanthrene	30	0.013	13.0	_AH_	2.89E-13	AN	0.433	AR	0.00E + 00	All	5.76	All	0.00E+00	Ali	9.32		0.00E+00	
Anthracene	0.3	0.008	8.8	R	8.21E+01	R	0.267	AR	6.03E-07	Ax	3.54	R	2.50E + 01	R	5.73	R	6.05E+01	R
Di-n-butylphthalate	200	0.900	0.00	AP	0.00E + 00	AH	0.00	AR	0.00E+00	AR	0.00	13.5	0.00E + 00	AR	0.00	AN	0.00E + 00	MR
Fluoranthene	14	0.037	37.0	R	4.65E-01	R	1.23	AR	0.00E + 00	AR	16.4	R	1.40E-03	R	26.5	R	5.71E-02	R
Pyrene	200	0.018	18.0	AH	0.00E + 00	Ali	0.60	Añ	0.00E + 00	$A_{P}($	7.97	AR	0.00E+00	AR	12.9	AS	0.00E + 00	AR
Benzo[a]anthracene	11.0	0.012	12.0	R	6.39E+01	R	0.40	48	2.23E-08	AR	5.31	R	1.08E+01	<u> </u>	8.60	n	3.84E+01	R
Chrysene	1,000	0.012	12.0	Ail	0.00E+00	AR	0.40	AR	0.00E + 00	AR	5.31	Añ	0.00E+00	AR	8.60	4.5	0.00E+00	aâ
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	AR	0.00E+00	AH	0.00	AR	0.00E+00	AH	0.00	Aři	0.00E+00	Aff	0.00	AR	0.00E+00	1414
Benzo[b]&[k]fluoranthene	0.5	0.019	19.0	R	9.96E+01	R	0.633	R	2.70E-03	R	8.41	R	8.45E+01	R	13.6	R	9.75E+01	R
Benzo(a)pyrene	Q. 5X	0.011	11.0	R	9.38E+01	R	0.367	AR	1.76E-05	A.P	4.87	R	4.80E+01	R	7.88	R	8.13E+01	R
Indeno[1,2,3-cd]pyrene	0.5	0.006	6.0	R	6.39E+01	R	0.20	AR	2.23E-08	All	2.66	R	1.09E+01	R	4.30	R	3.84E+01	R
Benzo[g,h,i]perylene	6, 5	0.005	5.0	R	5.00E+01	R	0.167	AR	2.59E-09	AR	2.21	R	5.53E+00	R	3.58	R	2.57E+01	R
BISK I ACCEPT	ABLE RIS	TO: ENVIRE	NMENT	R		R	1	R	1	R		R		R		R		R





DAM 10: ENVIRONMENTAL RISK QUANTIFICATION \* DAM WATER \* SAMPLE NO. 85 (ORGANICS - PAR & VOCT)
[ISCOR VANDERBIJLPARK STEEL – MASTER PLAN]

	Ast								RISK TO E	NVIRON	IMENT							
ORGANIC	tish		RISK OF DA	M WATE	R AS IS		RISK OF D	LUTED D	AM WATER	IN RIVER			RISK OF DAN	NATER	FOR GROU	NDWATE	R	
COMPOUNDS	<b>Val</b> le	TOTA	L ANALYSIS	S	4 PROBIT I	/ODEL	DILUTED	WATER	4 PROBIT I	MODEL	CURRENT	VOLUME	4 PROBIT N	MODEL	TOTAL V	DLUME	4 PROBIT N	MODEL
PAH <sup>s</sup> & VOC <sup>s</sup>	(MP)	1 Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
	100	ppm	ppb	R/AR	tification %	R/AH	ppb	RIAR	tification %	RIAR	ppb	RIAR	tification %	R/AR	ppb	R/AR	tification %	RIAF
Naphthalene	46.0	0.000	0.00	AR	0E+00	AR	0.00		0E + 00	AR	0.00	A	0E + 00	AB	0.00	49	0E+00	All
Acenaphthylene	0.3	0.000	0.00	AR	0E+00	AB	0.00	AR	0E+00	AH	0.00	ali	0E + 00	AH N	0.00	48	0E+00	All
Acenaphthene	170	0.000	0.00	AF.	0E+00	AR	0.00	45	0E+00	AR	0.00	AN	0E + 00	AR	0.00		0E+00	AR
Dibenzofuran	At je	0.000	0.00	AR	0E+00	An	0.00	AR	0E + 00	AR	0.00	18.7	0E + 00	4	0.00	AR	0E+00	AA.
Fluorene	160	0.000	0.00	AR	0E ÷ 00	ATT	0.00	1. C.	0E+00	API	0.00	2 E 2	0E + 00	AR	0.00	, , , ; ,	0E+00	AR
Phenanthrene	20	0.000	0.00	AR	0E+00	AA	0.00	14.	0E+00	AB	0.00	112	0E+00	AÑ	0.00	45	0E + 00	AR
Anthracene	0, 3	0.000	0.00	AR	0E+00	AR	0.00	AH	0E+00	-AR	0.00	2.85	0E+00	AR	0.00	иŘ	0E+00	AR
Di-n-butylphthalate	209	0.000	0.00	ьŘ	0E + 00	AB.	0.00	All	0E+00	y . V .	0.00	J.F.	0E+00	AR	0.00	AF	0E + 00	WIL
Fluoranthene	K. H.A.	0.000	0.00	AR	0E+00	A 27	0.00	AR	0E+00	AR	0.00	AS	0E + 00	n/i	0.00	AR	0E + 00	AS
Pyrene	200	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	All	0.00	AT	0E + 00	A.A	0.00	4/2	0E + 00	AR
Benzo[a]anthracene	1.0	0.000	0.00	AB	0E+00	41	0.00	AU	0E+00	4,9	0.00	-AR	0E + 00	- AH	0.00	AR	0E + 00	AT
Chrysene	100	0.008	0.00	八名	0E + 00	AN	0.00	*9 * 7 6 3	0E+00	48	0.00	AR	0E + 00	AR	0.00	1481	0E+00	48
bis(2-ethylhexyl)phthalate	14400	0,000	0.00	Aft	0E+00	AR	0.00	ASS	0E + 00	ΔH	0.00	AR	0E+00	All	0.00	AĀ	0E + 00	AÑ
Benzo[b]&[k]fluoranthene	0.5	0.000	0.00	AR	0E ÷ 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	All	0E+00	AR
Benzo(a)pyrene	0.5	0.000	0.00	海洋	0E ÷ 00	AR	0.00	A.	0E + 00	AR	0.00	AR	0E+00	M)A	0.00	AB	0E + 00	Afi
Indeno[1,2,3-cd]pyrene	0.5	0.000	0.00	AR	0E+00	RA	0.00	AR	0E+00	AR	0.00	AH	0E + 00	AR	0.00	14 (T)	0E + 00	_
Benzo(g,h,i)perylene	0.5	0.000	0.00	АŘ	0E+00	MR	0.00	F.	0E+00	AR	0.00	3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0E+00	AA	0.00	AR	0E+00	AR
RISK / ACRES	TABLE NO	TO: ENVIR	RONMENT	AH		A.C.				AR		S Trans		1114		444		411

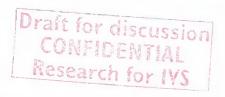


Draft for discussion CONFIDENTIAL Research for IVS

DAM 18: ENVIRONMENTAL RISK QUANTIFICATION + DAM WATER + SAMPLE NO. 8D | ORGANICS | PART & VOLT |
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

ORGANIC COMPOUNDS PAH <sup>5</sup> & VOC <sup>5</sup>	lak								RISK TO E	ar a mui	MINISTEE							
			RISK OF D	AM WAT	ER AS IS		RISK OF DI	LUTED D	AM WATER	N RIVER			RISK OF DAM	1 WATER	FOR GROU	NDWATE	R	
DAUS C. VOCS		TOTAL	L ANALYS	S	4 PROBIT A	AODEL	DILUTED	NATER	4 PROBIT	MODEL	CURRENT	/OLUME	4 PROBIT	MODEL	TOTAL VO	JLUME	4 PROBIT N	MODEL
PARI Q VUL	234	1 Lab Cone.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Rist
	47005	ppm	ppb	RIAN	tification %	RIAR	ppb	RIAS	tification %	R/AR	ppb	RIAN	tification %	R/AR	ppb	RIAM	tification %	RIM
Vaphthalene	4,60	0.000	0.00	AR	0.00E+00	AR	0.00	AR	0.00E+00	- AÑ	0.00	AR	0.00E + 00	AR	0.00	AF	0.00E+00	AK
Acenaphthylene	0.4	0.000	0.00	AR	0.00E + 00	AR	0.00	AR	0.00E + 00	AR	0.00	AR	0.00E + 00	AR	0.00	AR	0.00E+00	AR
Acenaphthene	170	0.000	0.00	AFI	0.00E + 00	AR	0.00	H	0.00E + 00	AT	0.00	AR	0.00E +00	p. li	0.00	AR	0.00E + 00	AR
Dibenzofuran	1/310	0.000	0.00	All	0.00E + 00	AR	0.00	AR	0.00E+00	AR	0.00	жä	0.00E +00	AR	0.00	AF	0.00E +00	AR
luorene	A HOUR	9.000	0.00	AH	0.00E + 00	AR	0.00	AR	0.00E + 00	AR	0.00	AR	0.00E + 00	AR	0.00	AE	0.00E +00	AR
Phenanthrene		0.004	4.00	Aft	0.00E + 00	AR.	0.133	AR	0.00E + 00	AR	1.77	ΑÑ	0.00E+00	nR.	2.87	ÄŘ	0.00E +00	nR
Anthracene		0.003	3.0	R	1.59E+01	R	0.10	Ail	4.22E-12	AA	1.33	R	4.83E-01	R	2.15	R	4.95E+00	R
Di-n-butylphthalate	7.2000	0.000	0.00	Ait	0.00E+00	AR	0.00	Añ	0.00E+00	A.F.	0.00	AA	0.00E+00	AR	0.00	AR	0.00E ÷ 00	AR
luoranthene	14	0.018	18.0	R	3.06E-03	R	0.60	40,	0.00E+00	AB	8.00	AT	1.27E-06	AR	12.9	FÄ	1.62E-04	AR
Pyrene	200	0.000	0.0	1415	0.00E + 00	48	0.00	74T)	0.00E+00	AR	0.00	AR	0.00E+00	nK	0.00	AR	0.00E+00	ĄĤ
Benzo(a)anthracene	1= (1)	0.005	5.0	R	8.78E+00	R	0.167	Añ	4.11E-13	AR	2.21	R	1.59E-01	R	3.58	R	2.24E+00	R
Chrysene	100	0.005	5.0	_AR	0.00E+00	Áří	0.167	AM	0.00E+00	A F	2.21	$m^{\alpha}$	0.00E+00	All	3.58	nti-	0.00E + 00	Alt
nis(2-ethylhexyl)phthalate	14400	0,000	0.00	AR .	0.00E + 00	ΑĒ	0.00	八利	0.00E+00	AR	0.00	ΑĒ	0.00E+00	AW	0.00	AF	0.00E + 00	- Añ
Benzo(b)&(k)fluoranthene	0.5	0.006	6.0	R	6.39E+01	R	0.20	AF	2.23E-08	12 (1	2.66	R	1.09E+01	R	4.30	R	3.84E+01	R
Benzo(a)pyrene	0.5	0.005	5.0	R	5.00E+01	R	0.167	AR	2.59E-09	AS	2.21	R	5.53E+00	R	3.58	R	2.57E+01	R
ndeno[1,2,3-cd]pyrene	0.5	0.003	3.0	R	1.59E+01	R	0.10	All	4.22E-12	AR	1.33	R	4.83E-01	R	2.15	C	4.95E+00	R
Benzo(g,h,i)perylene	6.5	0.000	0.00	MR	0.00E+00	AR	0.00	AA	0.00E+00	24Si	0.00	AR	0.00E+00	AN	0.00	Mil	0.00E+00	AR





18: ENVIRONMENTAL RISK QUANTIFICATION • DAM WATER • SAMPLE NO. 98 (ORGANICS - PAM' & VOC')
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

SAMPLE NUMBER: 95																		
									RISK TO E	AVIBGO	IMENT							
ORGANIC	kir ik		RISK DF DA	M WAT	ER AS IS		RISK OF D	LUTED D	AM WATER I	N RIVER			RISK OF DAM	WATER	FOR GROU	ITAWDV	R	
COMPOUNDS	value -	TOTA	L ANALYSI	S	4 PROBIT N	NODEL	DILUTED	WATER	4 PROBIT N	MODEL	CURRENT	VOLUME	4 PROBIT I	MODEL	TOTAL VO	DLUME	4 PROBIT N	MODEL
PAH <sup>®</sup> & VDC <sup>®</sup>	(AR)	<sup>1</sup> Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	<sup>3</sup> Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
	ij iii.	ppm	ppb	RIAB	tification %	RIAR	ppb	R/AR	tification %	R/48	ppb	RIAR	tification %	R/AR	ppb	B / AB	tification %	R / AR
Naphthalene	460	0.000	0.00	AN	0E + 00	AR	0.00	21. 43 4 44 4	0E + 00	AR	0.00	AR	0E + 00	AR .	0.00	AR	0E ÷ 00	AR
Acenaphthylene	2.04	0.000	0.00	14 1	0E ÷ 00	AB	0.00	All	0E + 00	AR	0.00	AH	0E + 00	A.F	0.00	All	0E + 00	AR
Acenaphthene	179	0.000	0.00	ΑĒ	0E + 00	AA	0.00	7. 12 1. 14 2	0E + 00	AR	0.00	All	0E+00	AR	0.00	AR	0E + 00	AH
Dibenzofuran	790	0.000	0.00	84 E)	0E + 00	25	0.00	1415	0E + 00	яŘ	0.00	200	0E + 00	AR	0.00	AR	0E + 00	3.B
Fluorene	180	0.000	0.00	1418	0E + 00	AP	0.00	AG	0E + 00	AŘ	0.00	2 1 m 1 1 1 2 3	0E + 00	AH	0.00	141	0E + 00	
Phenanthrene	\$10	0.000	0.00	AR	0E+00	AR	0.00	JUL	0E + 00	AR	0.00		0E + 00	AR.	0.00	Añ	0E + 00	
Anthracene	4.5	0.000	0.00	AH	0E + 00	ATT	0.00		0E + 00	AF	0.00	AR	0E+00	44	0.00	AR	0E + 00	-
Di-n-butylphthalate	200	0.000	0.00	AA	0E + 00	A\$	0.00	1121	0E + 00	AR	0.00	AR	0E+00	лĤ	0.00	AR	0E + 00	
Fluoranthene	Market 12	0.000	0.00	Añ	0E + 00	N.Fi	0.00	AR	0E + 00	AN	0.00	AR	0E + 00	AH	0.00	AR	0E + 00	
Pyrene	2010	0.000	0.00	AB	0E + 00	AR	0.00	- 48	0E + 00	八島	0.00	AII	0E+00		0.00	μŘ	0E+00	_
Benzo(a)anthracene	1.0	0.000	0.00	AR	0E+00	A.W	0.00		0E + 00	<b>AB</b>	0.00	AH	0E+00		0.00	Ait	0E + 00	-
Chrysene	100	0.000	0.00	AR	0E+00	AR	0.00		0E +00	AR	0.00	Asi	0E + 00	Ail	0.00	AR	0E+00	AM
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	AR	0E+00		0.00		0E+00	All	0.00	AH	0E + 00	AR	0.00	AR	0E + 00	AH
Benzo[b]&[k]fluoranthene	0.5	0.000	0.00	AH	0E + 00	AH	0.00	Ali	0E + 00	AÑ	0.00	11.	0E + 00	AR	0.00	r/D	0E + 00	AR
Benzo(a)pyrene	0.5	0.000	0.00	AR	0E + 00		0.00	AR	0E+00		0.00	AR	0E + 00		0.00	Aft	0E+00	AR
Indeno[1,2,3-cd]pyrene	0.5	0.000	0.00	AR	0E + 00		0.00	AR	0E + 00		0.00		0E + 00		0.00	AÑ	0E+00	
Benzo(g,h,i)perylene	15	0.000	0.00	ali	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AFI	0E + 00	AA	0.00	Pall.	0E + 00	AH
RISK / ACCEP	TABLE RI	SK TO: ENVIR	RONMENT	All	"	10		Aft		AV.		AA		AR		1 419		AR

Draft for discussion CONFIDENTIAL Research for IVS



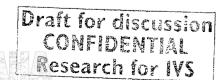
DAM 10: ENVIRONMENTAL RISK QUANTIFICATION • DAM WATER • SAMPLE NO. 9D [ONGANICS | PART & VOCT [ISCOR VANDERBIJLPARK STEEL – MASTER PLAN]

SAMPLE NUMBER: 90																		
	Acces								RISK TO E	NVIRON	IMENT							
ORGANIC	iksk		RISK OF DA	M WATI	ER AS IS		RISK OF D	LUTED D	AM WATER I	N RIVER			RISK OF DAN	WATER	FOR GROU	NDWATI	ER	
COMPOUNDS	<b>Winner</b>	TOTA	L ANALYSIS	3	4 PROBIT N	NODEL	DILUTED	WATER	4 PROBIT I	MODEL	CURRENT	VOLUME	4 PRDBIT I	MODEL	TOTAL V	DLUME	4 PROBIT A	MODEL
PAH <sup>s</sup> & VOC <sup>s</sup>	JMB)	<sup>1</sup> Lab Conc.	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk	<sup>2</sup> EEC	3 Risk	Risk Quan-	3 Risk
	700	ppm	ppb	R/AB	tification %	R / A8	ppb	RIAR	tification %	RIAR	ppb	R/AB	tification %	R/AB	pph	R/AR	tification %	RIAR
Naphthalene	480	0.000	0.00	AH	0E + 00	AR	0.00	ÄĤ	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AH
Acenaphthylene	9.5	0.000	0.00	AR	0E+00	ΔH	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR
Acenaphthene	170	0.000	0.00	AR	0E+00	AR	0.00	AB	0E + 00	AR	0.00	AII	0E + 00	AB	0.00	AR	0E+00	AR
Dibenzofuran	ijen)	0.000	0.00	AB	0E+00	AR	0.00	111	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR
Fluorene	160	0.000	0.00	Alt	0E+00	All	0.00	AR	0E + 00	AR	0.00	AB	0E + 00	AR	0.00	AH	0E+00	AR
Phenanthrene	80	0.000	0.00	AR	0E+00	AR	0.00	AH	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AH	0E+00	AR
Anthracene	0.5	0.000	0.00	AR	0E+00	AH	0.00	AR	0E+00	AR	0.00	AH	0E + 00	AR	0.00	AB	0E + 00	AR
Di-n-butylphthalate	200	0.000	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AH
Fluoranthene	74	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	Añ	0.00	AE	0E+00	AH
Pyrene	200	0,000	0.00	AR	0E ÷ 00	20	0.00	AR	0E+00	AA	0.00	AR	0E + 00	AR	0.00	AA	0E+00	AR
Benzo(a)anthracene	1.0	0.000	0.00	AP	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AR	0E+00	AR	0.00	AR	0E +00	Aff
Chrysene	100	0.000	0.00	AR	0E + 00	AR	0.00	AR	0E + 00	AR	0.00	AR.	0E + 00	AR	0.00	AR	0E+00	AA
bis(2-ethylhexyl)phthalate	14400	0.000	0.00	AR	0E+00		0.00	AB	0E+00	AR	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR
Benzo[b]&[k]fluoranthene	0.5	0.000	0.00	AR	0E+00	AR	0.00	AA	0E + 00	AH	0.00	AR	0E+00	AR	0.00	ĄĤ	0E+00	AR
Benzo(a)pyrene	0.5	0.000	0.00	AR	0E+00	AR	0.00	Ali	0E + 00	AR	0.00	AR	0E + 00	AH	0.00	AR	0E+00	AR
Indeno[1,2,3-cd]pyrene	0.5	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	AR	0.00	AS	0E + 00	Añ	0.00	AH	0E+00	AR
Benzo(g,h,i)perylene	0.5	0.000	0.00	AR	0E+00	AR	0.00	AR	0E + 00	Añ	0.00	AR	0E+00	AR	0.00	AR	0E+00	AR
RISK / ACCEP	TABLE RIS	K TO: ENVIR	RONMENT	AR		Añ		Αħ		A A B		AN.		AR		+∧ <b>R</b>		AF



**TABLES 52 – 66** 

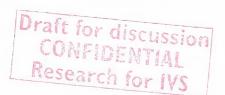
DAM 10: WATERS ORGANIC HUMAN RISK ASSESSMENT



### 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 1S (ORGANICS - PAR' & VOC') [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

							RISK TO HUMA	.N			
			RISE	OF DAM WATER	AS IS	RISK OF DIL	UTED DAM WATE	R IN RIVER	RISK OF DAN	WATER FOR GRO	UNDWATER
ORGANIC		7 EPA RfO/				11 Conc. in			13 Conc. in	14 PDi	
COMPOUNDS	<sup>6</sup> RfD/	EPA DWEL/	8 Conc. in	<sup>9</sup> PDI Dam	<sup>10</sup> Margin	River water	12 PDI river	10 Margin	groundwater	groundwater	10 Margin
PAH <sup>s</sup> & VOC <sup>s</sup>	ADI / GV	RSA RfD/	Oam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	<b>0</b> ∕₀	ppb	mg/kg/day	9/a	bbp	mg/kg/day	9/0
Naphthalene	102	EPA RfD	0.000	0.00	9.00	0.00	0.00	0.00	0.00	0.00	Ú.í
Acenaphthylene	0.0000	WHO GV	0.000	0.00	8.00	0.00	0.00	0.90	0.00	0.00	0.4
Acenaphthene	0,86	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Dibenzofuran	0.004	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Fluorene	0.04	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,6
Phenanthrene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	9.00	0.00	0.00	1.0
Anthracene	0.3	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1
Di-n-butylphthalate	0.1	EPA RfD	0.000	0.00	0.00	0.00	0.00	9.99	0.00	0.00	0.6
Fluoranthene	0.04	EPA RfD	0.000	0.00	U.05	0.00	0.00	0.00	0.00	0.00	0,0
Pyrene	0.03	EPA RfD	0.000	0.00	0.00	0.00		0.00	0.00	0.00	B.C
Benzo[a]anthracene	0.000	WHO GV	0.000	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.0
Chrysene	0.0000%	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
bis(2-ethylhexyl)phthalate	3.02	EPA RfD	9.000	0.00	9,00	0.00	0.00	9.00	0.00	0.00	0.0
Benzo[b]&[k]fluoranthene	0.00003	WHD GV	0.000	0.00	8.90	0.00	0.00	9.00	0.00	0.00	3.0
Benzo(a)pyrene	0.4004	WHO GV	0.000	0.00	0,90	0.00		0.00	0.00	0.00	0.0
Indeno[1,2,3-cd]pyrene	0.00002	WHO GV	0.000	0.00	9.00	0.00	0.00	5.90	0.00	0.00	0.5
Benzo(g,h,i)perylene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	9.00	0.00	0.00	J. J.
	RISK / ACC	EPTABLE RISK	TE: HUMAN	Dam water	All		River vvater	AR		Groundwater	AR





#### DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 25 | DEGAMICS - PART & VIII [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

							RISK TO HUM <i>a</i>	N			
			RISI	OF DAM WATER			UTED DAM WATE	R IN RIVER	RISK OF DAIV	WATER FOR GRO	UNDWATE
ORGANIC		7 EPA RfD/				11 Conc. in			13 Cons. in	14 PDI	
COMPOUNDS	<sup>6</sup> RfD/	EPA DWEL/	<sup>8</sup> Conc. in	<sup>9</sup> PDI Dam	10 Margin	River water	<sup>12</sup> PDI river	10 Margin	groundwater	groundwater	10 Margin
PAH <sup>s</sup> & VOC <sup>s</sup>	ADI/GV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mijik lijay	WHO GV	ppm	mg/kg/day	0/s	ppb	mg/kg/day	0/6	ppb	mg/kg/day	%
Naphthalene	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	6,89	0.00	0.00	0.0
Acenaphthylene	0,00002	WHD GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Acenaphthene	0.06	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Dibenzofuran	0,004	EPA RfD	0.000	0.00	9.90	0.00	0.00	9.00	0.00	0.00	0.0
Fluorene	1.14	EPA RfD	0.000	0.00	9,00	0.00	0.00	0.00	0.00	0.00	0.0
Phenanthrene	0.0世紀	WHO GV	0.000	0.00	9.90	0.00	0.00	9.00	0.00	0.00	0.0
Anthracene	9.3	EPA RfD	0.000	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.0
Di-n-butylphthalate	6:1	EPA RfD	0.000	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.0
Fluoranthene	0.04	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Ù.U
Pyrene	1,13	EPA RfD	0.000	0.00	0,00	0.00	0.00	0.00	0.00	0.00	9.0
Benzo(a)anthracene	0.00002	WHO GV	0.000	0.00	9.90	0.00	0.00	0.00	0.00	0.00	0.0
Chrysene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	9,00	0.00	0.00	0.0
Benzo(b)&[k]fluoranthene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.0
Benzo(a)pyrene	0.0002	WHO GV	0.000	0.00	9.00	0.00	0.00	0,90	0.00	0.00	0.0
Indeno[1,2,3·cd]pyrene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Benzo(g,h,i)perylene	0.0002	WHO GV	0.000	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.0
	RISKIACE	EPTABLE MSK	TO: HUMAN	Dam water	E ARE		River water	AR		Groundwater	





DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 20 (SEGARICS - PART & VOCT) [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

SAMPLE NUMBER: 2							DIOL TO HUMA	81			
			RISI	OF DAM WATER	ASIS		RISK TO HUMA		RISK OF DAM	1 WATER FOR GRO	NINDWATER
ORGANIC		7 EPA RfD/	11101	COT DAIN WATER	NO 10	11 Conc. in	O TED DAM WATE		13 Conc. in	<sup>14</sup> PDI	TO TO TO THE TEN
COMPDUNDS	<sup>6</sup> RfD/	EPA DWEL/	8 Conc. in	<sup>9</sup> PDI Dam	10 Margin	River water	<sup>12</sup> PDI river	10 Margin	groundwater	groundwater	10 Margin
PAH' & VOC'	ADI / GV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	axposure	of Safety
	might globay	WHO GV	ppm	mg/kg/day	0/2	ppb	mg/kg/day	%	ppb	mg/kg/day	%
Naphthalene	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.0
Acenaphthylene	0.40002	WHD GV	0.000	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.0
Acenaphthene	0.04	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Dibenzofuran	0.004	EPA RfD	0.000	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.0
Fluorene	0.04	EPA RfD	0.000	0.00	0.90	0.00	0.00	0.90	0.00	0.00	0,0
Phenanthrene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Anthracene	1.3	EPA RfD	0.002	0.00007	0.022	0.067	0.000002	0.0007	0.890	0.00003	0.01
Di-n-butylphthalate	9.1	EPA RfD	0.000	0.00	0.00	0.00	0.00	6,00	0.00	0.00	0.0
Fluoranthene	0.04	EPA RfD	0.020	0.0007	1.67	0.667	0.00002	0.08	8.90	0.0003	0.74
Pyrene	0.03	EPA RfD	0.015	0.0005	1.37	0.50	0.00002	0.08	6.64	0.0002	0.79
Benzo[a]anthracene	0.00002	WHD GV	0.006	0.0002	1000	0.20	0.00001	33.3	2.66	0.00009	44.
Chrysene	0.000002	WHD GV	0.005	0.0002	833	0.167	0.00001	27.9	2.21	0.00007	36
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.3
Benzo[b]&[k]fluoranthene	0.00002	WHD GV	0.004	0.00013	667	0.133	0.000004	12.2	1.77	0.00006	29
Benzo(a)pyrene	0.00	WHO GV	0.004	0.00013	67	0.133	0.000004	2.2	1.77	0.00006	0.0
Indeno[1,2,3-cd]pyrene	0.00002	WHO GV	0.003	0.0001	500	0.10	0.000003	18.7	1.33	0.00004	22
Benzo[g,h,i]perylene	0.0002	WHD GV	0.008	0.00	5,00	0.00	0.00	9.00	0.00	0.00	0.0
	RISK J ACE	EPTABLE RISK	TO: HUMAN	Dam water	R		River water	Als		Groundwater	R

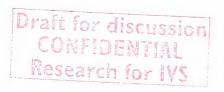




### BAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 3S | URGARIOS | PAM & VOC | [ISCOR VANDERBIJLPAR STEEL - MASTER PLAN]

							RISK TO HUMA	N			
			RISK	OF DAM WATER	AS IS		UTED DAM WATE	R IN RIVER	RISK OF DAN	WATER FOR GRO	UNDWATER
ORGANIC		7 EPA RfD/				11 Conc. in			13 Conc. in	14 PDI	
	RIDI	EPA DWEL/	8 Conc. in	<sup>9</sup> PDI Dam	10 Margin	River water	<sup>12</sup> PDI river	10 Margin	groundwater	proundwater	10 Margin
PAH' & VOC'	RfD) Adi/GV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
TAIL CLEAN	mykyliay	WHO GV	ppm	mg/kg/day	%	ppb	mg/kg/day	%	ppb	mg/kg/day	8/0
Naphthalene	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	9,08	0.00	0.00	0.0
Acenaphthylene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.0
Acenaphthene	0.06	EPA RfD	0.000	0.00	9,08	0.00	0.00	0,00	0.00	0.00	0.0
Dibenzofuran	3, 81214	EPA RfD	0.000	0.00	9.80	0.00	0.00	0.00	0.00	0.00	9.0
Fluorene	0.03	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	101.0
Phenanthrene	J. 00038	WHO GV	0.002	0.00007	53	0.067	0.000002	1.12	0.89	0.00003	Ţ4.
Anthracene	0.3	EPA RfD	0.000	0.00	9,00	0.00	0.00	9.00	0.00	0.00	0.0
Di-n-butylphthalate		EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Fluoranthene	0.1/4	EPA RfD	0.011	0.0004	0.917	0.367	0.00001	0.03	4.90	0.0002	0.46
Pyrene	0.63	EPA RfD	0.000	0.00	9.00	0.00	0.00	0.50	0.00	0.00	0.00
Benzo(a)anthracene	0.00000.2	WHO GV	0.004	0.00013	667	0.133	0.000004	22.2	1.77	0.00006	
Chrysene	0.00002	WHO GV	0.004	0.00013	667	0.133	0.000004	27.2	1.77	0.00006	
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.000	0.00		0.00	0.00	8,00	0.00	0.00	
Benzo[b]&[k]fluoranthene	0.00002	WHO GV	0.006	0.0002	1000	0.20	0.000007	33.3	2.66	0.00009	44
Benzo(a)pyrene	0.0002	WHD GV	0.004	0.00013	67	0.133	0.000004	2.22	1.77	0.00006	25.
Indeno[1,2,3-cd]pyrene	0.000/02	WHD GV	0.004	0.0001	667	0.133	0.000004	27.2	1.77	0.00006	29
Benzo(g,h,i)perylene	0.0902	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.5
	RISK LAGO	EPTADLE MAK	TU: HUMAN	Dam water	R		River water	THE CONTRACTOR		Groundwater	





### DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 3D [DREAMICS - PAH" & VOC"] [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

SAMPLE NUMBER: 3D											
							RISK TO HUM <i>a</i>	N.			
			RISK	OF DAM WATER	AS IS	RISK OF DI	UTED DAM WATE	R IN RIVER		WATER FOR GR	DUNDWATER
ORGANIC		7 EPA RfD/				11 Conc. in			13 Conc. in	<sup>14</sup> PDI	
COMPOUNDS	<sup>6</sup> RfD/	EPA OWEL/	<sup>8</sup> Conc. in	<sup>9</sup> PDI Dam	10 Margin	River water	12 PDI river	10 Margin	groundwater	groundwater	10 Margin
PAHS & VOCS	ADI / GV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	<b>%</b>	ppb	mg/kg/day	%	ppb	mg/kg/day	%
Naphthalene	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acenaphthylene	0.00002	WHD GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acenaphthene	0.06	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzofuran	0.004	EPA RfD	0.000	0.00		0.00		9.68	0.00	0.00	0.80
Fluorene	0.04	EPA RfD	0.000	0.00		0.00		0.00	0.00	0.00	0.00
Phenanthrene	0.0002	WHD GV	0.000	0.00		0.00		0.88	0.00	0.00	0.00
Anthracene	0.3	EPA RfD	0.000	0.00		0.00		0.00	0.00	0.00	9.00
Di-n-butylphthalate	0.1	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.80	0.00	0.00	Ü.90
Fluoranthene	0.04	EPA RfD	0.000	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Pyrene	0.03	EPA RfD	0.000	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Benzo[a]anthracene	0.00002	WHO GV	0.000	0.00	0.69	0.00		8,90	0.00	0.00	
Chrysene	0.00002	WHD GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0,000	0.00		0.00		0.00	0.00		
Benzo(b)&(k)fluoranthene	0.00002	WHD GV	0.000	0.00	9,00	0.00		0.00	0.00	0.00	0.90
Benzo(a)pyrene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Indeno[1,2,3-cd]pyrene	0.00002	WHD GV	0.000	0.00	9.00	0.00	0.00	9.00	0.00		
Benzo(g,h,i)perylene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	6.60	0.00	0.00	0.00
	RISK / ACC	SEPTABLE RISK	TO: HUMAN	Dam water	AH J		River water	AR .		Groundwater	The second

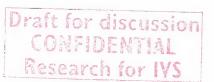




### DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 48 (000GARICS - PAN' & VUC"! [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

	THE BOOK						RISK TO HUMA	IN			
			RISK	OF DAM WATER	AS IS	RISK OF DII	LUTED DAM WATE	R IN RIVER	RISK OF DAM	WATER FOR GRO	UNDWATER
ORGANIC		7 EPA RfD/				<sup>11</sup> Conc. in			13 Conc. in	<sup>14</sup> PDI	
COMPOUNDS	<sup>6</sup> R(D)	EPA DWEL/	<sup>8</sup> Conc. in	<sup>9</sup> PDI Dam	<sup>10</sup> Margin	River water	<sup>12</sup> PDI river	10 Margin	groundwater	groundwater	10 Margin
PAHS & VOCS	ADI/GV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	axposuro	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	0/0	ppb	mg/kg/day	0/6	pph	mg/kg/day	0/e
Naphthalene	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Acenaphthylene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Acenaphthene	0.06	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.0
Dibenzofuran	0.004	EPA RfD	0.000	0.00	G.00	0.00	0.00	9.00	0.00	0.00	0,0
Fluorene	0.04	EPA RfD	0.000	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.0
Phenanthrene	0.0002	WHO GV	0.000	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.03
Anthracene	0.3	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Di-n-butylphthalate	0.1	EPA RfD	0.000	0.00	0.00	0.00		0.90	0.00	0.00	0.0
Fluoranthene	0.04	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00
Pyrene	0.03	EPA RfD	0.000	0.00	9.98	0.00	0.00	0.00	0.00	0.00	9.6
Benzo[a]anthracene	0.00002	WHO GV	0.000	0.00	0.00	0.00		9.90	0.00	0.00	0.0
Chrysene	0.00002	WHO GV	0.000	0.00	9.00	0.00		0.00	0.00	0.00	0.0
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.000	0.00	0.00	0.00		0.00	0.00	0.00	0.0
Benzo[b]&[k]fluoranthene	0.00002	WHO GV	0.000	0.00	0.00	0.00	-	9.00	0.00	0.00	0.9
Benzo(a)pyrene	0.0002	WHO GV	0.000	0.00	0.00	0.00		9.00	0.00	0.00	0.0
Indeno[1,2,3-cd]pyrene	0.00002	WHO GV	0.000	0.00	9,00	0.00		0.00	0.00	0.00	0.0
Benzo(g,h,i)perylene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	U.U
	RISK / AGE	EPTABLE RISK	TO: HUMAN	Dam water	AR		flivor water			Groundwater	5 All - 10





### DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 40 (OHBANUS - PAH® & VOC\*) [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

							RISK TO HUM <i>a</i>	N.			
			RISK	OF DAM WATER			UTED DAM WATE			WATER FOR GRO	UNDWATER
ORGANIC		7 EPA RfD/				11 Conc. in			13 Conc. in	<sup>14</sup> PDI	
COMPOUNDS	e RfD!	EPA DWEL/	8 Conc. in	<sup>9</sup> PDI Dam	10 Margin	River water	<sup>12</sup> PDI river	10 Margin	groundwater	groundwater	10 Margin
PAH <sup>®</sup> & VOC <sup>®</sup>	ADITO	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	%	ppb	mg/kg/day	%	pph	mg/kg/day	%
Naphthalene	0.02	EPA RfD	0.000	0.00	5,00	0.00	0.00	0.00	0.00	0.00	0.0
Acenaphthylene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Acenaphthene	3 ( ) ( )	EPA RfD	0.000	0.00	0.00	0.00	0.00	8.00	0.00	0.00	0,0
Dibenzofuran	0,004	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.90	0.00	0.00	TLÜ
Fluorene	-0.14	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Phenanthrene	0.0002	WHO GV	0.000	0.00	9.00	0.00	0.00	9.00	0.00	0.00	0.0
Anthracene	0.3	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Di-n-butylphthalate	0.1	EPA RfD	0.000	0.00	0.00	0.00	0.00	0,00	0.00	0.00	0.0
Fluoranthene	0.04	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.0
Pyrene	0.03	EPA RfD	0.000	0.00	9.00	0.00	0.00	0,00	0.00	0.00	0.0
Benzo[a]anthracene	0.00002	WHO GV	0.000	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.6
Chrysene	0.00002	WHO GV	0,000	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.0
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Benzo[b]&[k]fluoranthene	0.00002	WHO GV	0.000	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.0
Benzo(a)pyrene	0.0002	WHO GV	0.000	0.00	0.60	0.00	0.00	0.03	0.00	0.00	0.0
Indeno[1,2,3-cd]pyrene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Benzo[g,h,i]perylene	0.0082	WHO GV	0.000	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.0
	RESKINGO	EPTABLE SSEK	TO: HUMAN	Dam water	MAR		River water	48		Groundwater	

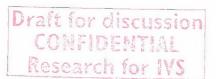


Draft for discussion CONFIDENTIAL Research for IVS

### DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 6S [ORGANICS - FAM & VUC\*] [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

SAMPLE NUMBER: 63											
							RISK TO HUM <i>A</i>	IN			
			RISI	OF DAM WATER	AS IS		UTED DAM WATE	R IN RIVER	RISK OF DAN	WATER FOR GR	OUNDWATER
ORGANIC		7 EPA RfD/				11 Conc. in			13 Conc. in	<sup>14</sup> PDI	
COMPOUNDS	<sup>6</sup> RfD/	EPA DWELJ	8 Conc. in	<sup>9</sup> PDI Dam	10 Margin	River water	12 PDI river	10 Margin	groundwater	groundwater	10 Margin
PAH <sup>®</sup> & VOC <sup>®</sup>	ADI/GV	RSA RfD/	Dam water		of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	%	ppb	mg/kg/day	%	ppb	mg/kg/day	8/0
Naphthalene	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acenaphthylene	0.00002	WHO GV	0.000	0.00	9.00	0.00	0.00	0.00	0.00	0.00	9.00
Acenaphthene	0.06	EPA RfD	0.000	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Dibenzofuran	0.004	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.00
Fluorene	0.04	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phenanthrene	0.0002	WHO GV	0.000	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Anthracene	0.3	EPA RfD	0.000	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Di-n-butylphthalate	0.1	EPA RfD	0.000	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Fluoranthene	0.04	EPA RfD	0.000	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Pyrene	0.03	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)anthracene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	Ü.(0i)	0.00	0.00	0.01
Chrysene	0.00002	WHO GV	0.000	0.00	9.69	0.00	0.00	0.00	0.00	0.00	0.00
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.000	0.00	9.00	0.00		0.06	0.00	0.00	0.00
Benzo[b]&[k]fluoranthene	0.00002	WHO GV	0.000	0.00	9.00	0.00		0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.0002	WHD GV	0.000	0.00	8.00	0.00		0.00	0.00	0.00	9.00
Indeno[1,2,3-cd]pyrene	0.00002	WHO GV	0.000	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(g,h,i)perylene	0.0002	WHO GV	0.000	0.00	€.00	0.00	0.00	0.00	0.00	0.00	9.00
	MISK / ACC	EPTABLE RISK	TO: HUMAN	Dam water	AR 4		River water	E AA		Groundwater	Aft





### DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 6D [ORGARICS | PAM & VOC\*] [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

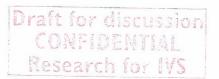
							RISK TO HUMA	N			
			RISK	DF DAM WATER	AS IS	RISK OF DIL	UTED DAM WATE	R IN RIVER	RISK OF DAM	WATER FOR GRO	UNDWATER
ORGANIC		7 EPA RfD/				11 Conc. in			13 Conc. in	14 PDI	
COMPOUNDS	6 RIDI	EPA DWEL/	8 Conc. in	<sup>9</sup> PDI Dam	10 Margin	River water	12 PDI river	10 Margin	groundwater	groundwater	10 Margin
PAH <sup>s</sup> & VOC <sup>s</sup>	ADI / GV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	%	ppb	mg/kg/day	%	ppb	mg/kg/day	0/a
Naphthalene	0.02	EPA RfD	0.000	0.00	U.00	0.00	0.00	9,00	0.00	0.00	0.9
Acenaphthylene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.90	0.00	0.00	9.0
Acenaphthene	0.06	EPA RfD	0.000	0.00	9.00	0.00	0.00	9.90	0.00	0.00	0.0
Dibenzofuran	0.004	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.0
Fluorene	0.04	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.0
Phenanthrene	0.0002	WHO GV	0.004	0.00013	67	0.133	0.000004	2.22	1.77	0.00006	29.
Anthracene	0.3	EPA RfD	0.003	0.0001	0.03	0.10	0.000003	0.00	1.33	0.00004	9.0
Di-n-butylphthalate	0.1	EPA RfD	0.007	0.0002	0.23	0.233	0.000008	0,608	3.10	0.00010	0.10
Fluoranthene	0.04	EPA RfD	0.017	0.0006	1.42	0.567	0.00002	0.05	7.53	0.0003	0.62
Pyrene	0.03	EPA RfD	0.008	0.0003	0.889	0.267	0.000009	0.03	3.54	0.00012	ire.ii
Benzo(a)anthracene	0.00002	WHD GV	0.005	0.0002	833	0.167	0.000006	27.9	2.21	0.00007	06
Chrysene	0.00002	WHO GV	0.005	0.0002	833	0.167	0.000006	27,8	2.21	0.00007	36
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.015	0.0005	2.50	0.50	0.00002	0.08	6.64	0.0002	4 to 1 to
Benzo(b)&(k)fluoranthene	0.00002	WHO GV	0.007	0.0002	1167	0.233	0.000008	38.8	3.10	0.00010	51
Benzo(a)pyrene	0.0002	WHD GV	0.004	0.00013	57	0.133	0.000004	2.22	1.77	0.00006	29.
Indeno[1,2,3-cd]pyrene	0.00002	WHO GV	0.003	0.0001	500	0.10	0.000003	18.67	1.33	0.00004	22
Benzo(g,h,i)perylene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.0
	RISKIAGE	EPTABLE RISO	Tu: HUMAN	Dam water	R		River water	A.P		Greundwater	



### DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 7S [ORGANICS - PAN & VOC\*] [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

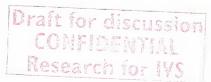
SAMPLE NUMBER: 78											
							RISK TO HUM <i>a</i>	N			
			RISK	OF DAM WATER			UTED DAM WATE	R IN RIVER		WATER FOR GR	OUNDWATER
ORGANIC		7 EPA RfD/				11 Conc. in	Acc o compression		13 Conc. ia	<sup>14</sup> PDI	
COMPOUNDS	<sup>6</sup> RfD/	EPA OWEL!	<sup>8</sup> Conc. in	<sup>9</sup> PDI Oam	10 Margin	River water	12 PDI river	10 Margin	groundwater	groundwater	10 Margin
PAH <sup>s</sup> & VOC <sup>s</sup>	ADI/GV	RSA RfD/	Dam water	svater exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	%	ppb	mg/kg/day	<b>8</b> √u	ppb	mg/kg/day	0/6
Naphthalene	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.90
Acenaphthylene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	9.90	0.00	0.00	0.00
Acenaphthene	0.06	EPA RfD	0.000	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.90
Dibenzofuran	0.004	EPA RfD	0.000	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.00
Fluorene	0.04	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phenanthrene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00
Anthracene	0.3	EPA RfD	0.000	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00
Di-n-butylphthalate	0.1	EPA RfD	0.000	0.00	0.00	0.00	0.00	9.90	0.00	0.00	0.00
Fluoranthene	0.04	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pyrene	0.03	EPA RfD	0.000	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Benzo(a)anthracene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	9,00	0.00	0.00	0.00
Chrysene	0.00002	WHO GV	0.000	0.00	0.00	0.00		0.90	0.00	0.00	0.00
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.000	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Benzo[b]&[k]fluoranthene	0.00002	WHO GV	0.000	0.00	0.00	0.00		9.06	0.00	0.00	0.00
Benzo(a)pyrene	0.0002	WHO GV	0.000	0.00	6,90	0.00		9.09	0.00	0.00	0.00
Indeno[1,2,3-cd]pyrene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo[g,h,i]perylene	0.0002	WHO GV	0.000	0.00	9.00	0.00	0.00	9.00	0.00	0.00	9.00
	RISK / ACC	eptable risk	TO: HUMAN	Dam water	All		River water	λR		Groundwater	All





DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 70 [ORGANICS - PAR" & VOC"]
[ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

							RISK TO HUMA	N			
			RISI	OF DAM WATER			UTED DAM WATE	R IN RIVER		WATER FOR GRO	UNDWATER
ORGANIC		7 EPA RfD/				<sup>11</sup> Conc. in			13 Conc. ia	14 PDI	
COMPOUNDS	6 RID	EPA DWEL/	8 Conc. in	9 PDI Dam	10 Margin	Rivor water	12 PDI river	10 Margin	groundwater	groundwater	10 Margin
PAH' & VOC'	ADI/ GV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	0/0	qqq	mg/kg/day	0/e	ppb	mg/kg/day	0/0
Naphthalene	0.02	EPA RfO	0.004	0.00013	9.587	0.133	0.000004	9.82	1.77	0.00006	0.20
Acenaphthylene	0.00002	WHO GV	0.003	0.0001	500	0.100	0.000003	18.67	1.33	0.00004	22
Acenaphthene	0.06	EPA RfO	0.003	0.0001	0.167	0.100	0.000003	i).096	1.33	0.00004	9.07
Oibenzofuran	0.004	EPA RfO	0.004	0.00013	3.33	0.133	0.000004	0.111	1.77	0.00006	1,3
Fluorene	0.04	EPA RfO	0.008	0.0003	9.667	0.267	0.000009	9.02	3.54	0.00012	9.20
Phenanthrene	0.0002	WHO GV	0.013	0.0004	217	0.433	0.000014	7.2	5.76	0.00019	
Anthracene	0.3	EPA RfO	0.008	0.0003	0,98	0.267	0.000009	0.003	3.54	0.00012	u,i
Oi-n-butylphthalate	0.1	EPA RfO	0.00	0.00	9.00	0.00	0.00	9.00	0.00	0.00	9.0
Fluoranthene	0.04	EPA RfO	0.037	0.0012	3.08	1.23	0.00004	0.103	16.4	0.0005	\$ 1.5
Pyrene	0.03	EPA RfD	0.018	0.0006	2.0	0.600		0.067	7.97	0.0003	9.88
Benze[a]anthracene	0.00002	WHO GV	0.012	0.0004	2000	0.400		97	5.31	0.00018	88
Chrysene	0.00002	WHO GV	0.012	0.0004	2000	0.400		57	5.31	0.00018	88
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.00	0.00	0.00	0.00		0.00	0.00	0.00	3.6
Benzo[b]&[k]fluoranthene	0.00002	WHO GV	0.019	0.0006	3167	0.633	0.000021	106	8.41	0.0003	14(
Benzo(a)pyrene	0.0002	WHO GV	0.011	0.0004	183	0.367	0.000012	6.1	4.87	0.00016	81
Indeno[1,2,3-cd]pyrene	0.00002	WHO GV	0.006	0.0002	1000	0.200	0.000007	33.3	2.66	0.00009	44
Benzo[g,h,i]perylene	0.0002	WHO GV	0.005	0.0002	83	0.167	0.000006	2.78	2.21	0.00007	36
	RISKIACE	EPTABLE RISK	TO: HUMAN	Dam water	R		River water			Groundwater	R





### DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 8S (GRGARICS - PART 9 VEC\*) [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

							RISK TO HUMA	N			
			RISH	OF DAM WATER	AS IS	RISK OF DII	UTED DAM WATE	R IN RIVER	RISK OF DAN	WATER FOR GRO	UNDWATER
ORGANIC		7 EPA RfD/				11 Conc. in			13 Conc. in	<sup>14</sup> PDI	
COMPOUNDS	<sup>6</sup> RfU	EPA DWEL/	8 Conc. in	9 PDI Dam	10 Margin	River water	12 PDI river	10 Margin	groundwater	groundwater	10 Margin
PAH <sup>s</sup> & VOC <sup>s</sup>	ADI/ SV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHD GV	ppm	mg/kg/day	%	ppb	mg/kg/day	9/0	ppb	mg/kg/day	0/0
Naphthalene	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Acenaphthylene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1
Acenaphthene	0.06	EPA RfD	0.000	0.00	9.00	0.00	0.00	0,08	0.00	0.00	0.1
Dibenzofuran	0.004	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9,1
Fluorene	0.04	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Phenanthrene	0.0002	WHO GV	0.000	0.00	0.80	0.00	0.00	0.00	0.00	0.00	8.6
Anthracene	0.3	EPA RfD	0.000	0.00	0,00	0.00	0.00	9.00	0.00	0.00	0.0
Di-n-butylphthalate	0.1	EPA RfD	0.000	0.00	0.00	0.00	0.00	9.90	0.00	0.00	0.0
Fluoranthene	0.04	EPA RfD	0.000	0.00	6.60	0.00	0.00	0.00	0.00	0.00	Ţ,
Pyrene	0.03	EPA RfD	0.000	0.00	9.50	0.00	0.00	0.00	0.00	0.00	0.0
Benzo[a]anthracene	0.00002	WHO GV	0.000	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.9
Chrysene	0.00002	WHO GV	0.000	0.00	0.90	0.00	0.00	0.00	0.00	0.00	U,
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.000	0.00	0,00	0.00	0.00	0.00	0.00	0.00	0.0
Benzo[b]&[k]fluoranthene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Benzo(a)pyrene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1
Indeno[1,2,3-cd]pyrene	0.00002	WHO GV	0.000	0.00	00.6	0.00	0.00	0.00	0.00	0.00	0.0
Benzo[g,h,i]perylene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
	RISK / ACCEPTABLE RIS			Dam water			River water			Groundwater	AR





### DAM 10: HUMAN RISK ASSESSMENT + DAM WATER + SAMPLE NO. 80 | ORGANICS | PAH' & VOC'| [ISCOR VANDERBIJLPARK STEEL - MASTER PLAN]

							RISK TO HUMA	N			
			RISE	OF DAM WATER			UTED DAM WATE	R IN RIVER	RISK OF DAN	WATER FOR GRO	UNDWATER
ORGANIC		7 EPA RIDI				<sup>11</sup> Conc. in			13 Conc. in	<sup>14</sup> PDI	
COMPOUNDS	6 RFD	EPA DWEL/	8 Conc. in	9 PDI Dam	10 Margin	River water	12 PDI river	10 Margin	groundwater		10 Margin
PAH <sup>s</sup> & VOC <sup>s</sup>	ADITGV	RSA RfD/	Dam water	water exposure	of Safety	(EEC)	water exposure	of Safety	(EEC)	exposure	of Safety
	mg/kg/day	WHO GV	ppm	mg/kg/day	0/0	ppb	mg/kg/day	%	ppb	mg/kg/day	%
Naphthalene	0.02	EPA RfD	0.000	0.00	0.00	0.00	0.00	9.60	0.00	0.00	0.0
Acenaphthylene	0.00002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Acenaphthene	0.06	EPA RfD	0.000	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.9
Dibenzofuran	0.004	EPA RfD	0.000	0.00i	0,00	0.00	0.00	0.00	0.00	0.00	0.0
Fluorene	0.04	EPA RfD	9.090	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.0
Phenanthrene	0.0002	WHD GV	0.004	0.00013	67	0.133	0.000004	2.22	1.77	0.00006	29.
Anthracene	0.3	EPA RfD	0.003	0.0001	0.033	0.10	0.000003	0.001	1.33	0.00004	0.0
Di-n-butylphthalate	0.1	EPA RfD	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Fluoranthene	0.04	EPA RfD	0.018	0.0006	1,5	0.60	0.00002	0.05	8.0	0.0003	0.58
Pyrene	0.03	EPA RfD	0.000	0.0000	0.000	0.00	0.00	0.50	0.00	0.00	6.0
Benzo[a]anthracene	0.00002	WHO GV	0.005	0.00017	833	0.167	0.00001	27.63	2.21	0.00007	36
Chrysene	0.00002	WHO GV	0.005	0.00017	833	0.167	0.00001	27,80	2.21	0.00007	36
bis(2-ethylhexyl)phthalate	0.02	EPA RfD	0.000	0.0000	9.60	0.00	0.00	0.00	0.00	0.00	0.0
Benzo[b]&[k]fluoranthene	0.00002	WHO GV	0.006	0.0002	1000	0.20	0.00001	33.3	2.66	0.00009	44
Benzo(a)pyrene	0.0002	WHO GV	0.005	0.00017	83	0.167	0.00001	2.78	2.21	0.00007	3
Indeno[1,2,3-cd]pyrene	0.00002	WHO GV	0.003	0.0001	500	0.10	0.000003	18,67	1.33	0.00004	22
Benzolg,h,ilperylene	0.0002	WHO GV	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.9
	RISKIAGE	EPTAGLE MSK	TD: HUMAN	Dam water	R		River water	7(3)		Groundwater	R



