Attachment C:

Technical Appendices to the Revised Risk Screen for Veolia Incineration Facility; Sauget, Illinois

Waterbody and Watershed Parameters for lakes at Frank Holten State Park:			
Waterbody Parameters	Input Value	Watershed Parameters	Input Value
Depth of Water Column	2.0 m	Impervious Area	31 %
Average Volumetric Flow	384,998 m^3/yr	USLE Cover Management Factor	0.05
Surface Area	715,087 m^2	USLE Erosivity Factor	210 yr^{-1}
		Area Receiving Fallout	7,441,556 m^2

Fed 24400

FORMERLY (Onyx) 7-28-06

RISK SUMMARY

VEOLIA FACILITY

Date : 7/28/2006

RECEPTOR NAME	SCENARIO	TOTAL CANCER RISK	TOTAL HAZARD QUOTIENT
Receptor	fisher_adult	4.5267E-006	2.3420E+000
Receptor	fisher_child	1.2474E-006	1.7342E+000

COPY #1

RISK BY COPC

Date : 7/28/2006

RECEPTOR NAME	SCENARIO	SOURCE	COPC	TOTAL CANCER RISK	TOTAL HAZARD QUOTIENT
Receptor	fisher_adult	STACK2	Arsenic	7.5334E-007	7.4530E-003
Receptor	fisher_adult	STACK2	Beryllium	1.5271E-007	8.0822E-003
Receptor	fisher_adult	STACK2	Cadmium	2.8565E-007	1.8514E-002
Receptor	fisher_adult	STACK2	Chromium, hexavalent	7.6356E-007	1.2948E-003
Receptor	fisher_adult	STACK2	Lead	0.0000E+000	0.0000E+000
Receptor	fisher_adult	STACK2	Mercuric chloride	[illegible]	[illegible]
Receptor	fisher_adult	STACK2	Mercury	0.0000E+000	8.7099E-008
Receptor	fisher_adult	STACK2	Methyl mercury	0.0000E+000	5.0383E-001
Receptor	fisher_adult	STACK2	TetraCDD, 2,3,7,8-	3.4156E-008	6.9815E-004
			Total	1.9894E-006	5.4886E-001
Receptor	fisher_adult	STACK3	Arsenic	7.3519E-007	7.2734E-003
Receptor	fisher_adult	STACK3	Beryllium	1.4903E-007	7.8874E-003
Receptor	fisher_adult	STACK3	Cadmium	2.7944E-007	1.8112E-002
Receptor	fisher_adult	STACK3	Chromium, hexavalent	7.4516E-007	1.2636E-003
Receptor	fisher_adult	STACK3	Lead	0.0000E+000	0.0000E+000
Receptor	fisher_adult	STACK3	Mercuric chloride	0.0000E+000	8.7090E-003
Receptor	fisher_adult	STACK3	Mercury	0.0000E+000	8.4078E-008
Receptor	fisher_adult	STACK3	Methyl mercury	0.0000E+000	4.9728E-001
Receptor	fisher_adult	STACK3	TetraCDD, 2,3,7,8-	3.3397E-008	6.8264E-004
			Total	1.9422E-006	5.4121E-001
Receptor	fisher_adult	STACK4	Arsenic	1.7903E-007	2.0929E-003
Receptor	fisher_adult	STACK4	Beryllium	5.0242E-008	2.5655E-003
Receptor	fisher_adult	STACK4	Cadmium	9.3996E-008	6.0923E-003
Receptor	fisher_adult	STACK4	Chromium, hexavalent	2.5121E-007	3.9204E-004
Receptor	fisher_adult	STACK4	Lead	0.0000E+000	0.0000E+000
Receptor	fisher_adult	STACK4	Mercuric chloride	0.0000E+000	2.6137E-003
Receptor	fisher_adult	STACK4	Mercury	0.0000E+000	2.6075E-008
Receptor	fisher_adult	STACK4	Methyl mercury	0.0000E+000	1.2378E+000
Receptor	fisher_adult	STACK4	TetraCDD, 2,3,7,8-	2.0560E-008	4.0045E-004
			Total	5.9504E-007	1.2519E+000
Receptor	fisher_child	STACK2	Arsenic	2.9865E-007	1.1331E-002
Receptor	fisher_child	STACK2	Beryllium	3.0542E-008	9.8159E-003
Receptor	fisher_child	STACK2	Cadmium	5.7129E-008	1.8514E-002
Receptor	fisher_child	STACK2	Chromium, hexavalent	1.5271E-007	1.6487E-003
Receptor	fisher_child	STACK2	Lead	0.0000E+000	0.0000E+000
Receptor	fisher_child	STACK2	Mercuric chloride	0.0000E+000	2.4236E-002

RISK BY COPC

Date : 7/28/2006

RECEPTOR NAME	SCENARIO	SOURCE	COPC	TOTAL CANCER RISK	TOTAL HAZARD QUOTIENT
Receptor	fisher_child	STACK2	Mercury	0.0000E+000	8.7099E-008
Receptor	fisher_child	STACK2	Methyl mercury	0.0000E+000	3.5693E-001
Receptor	fisher_child	STACK2	TetraCDD, 2,3,7,8-	1.7524E-008	1.9078E-003
			Total	5.5656E-007	4.2438E-001
Receptor	fisher_child	STACK3	Arsenic	2.9146E-007	1.1058E-002
Receptor	fisher_child	STACK3	Beryllium	[illegible]	[illegible]
Receptor	fisher_child	STACK3	Cadmium	5.5887E-008	1.8112E-002
Receptor	fisher_child	STACK3	Chromium, hexavalent	1.4903E-007	1.6090E-003
Receptor	fisher_child	STACK3	Lead	0.0000E+000	0.0000E+000
Receptor	fisher_child	STACK3	Mercuric chloride	0.0000E+000	2.3479E-002
Receptor	fisher_child	STACK3	Mercury	0.0000E+000	8.4078E-008
Receptor	fisher_child	STACK3	Methyl mercury	0.0000E+000	3.5225E-001
Receptor	fisher_child	STACK3	TetraCDD, 2,3,7,8-	1.7135E-008	1.8654E-003
			Total	5.4332E-007	4.1795E-001
Receptor	fisher_child	STACK4	Arsenic	6.3108E-008	2.8086E-003
Receptor	fisher_child	STACK4	Beryllium	1.0048E-008	2.8906E-003
Receptor	fisher_child	STACK4	Cadmium	1.8799E-008	6.0923E-003
Receptor	fisher_child	STACK4	Chromium, hexavalent	5.0242E-008	4.5723E-004
Receptor	fisher_child	STACK4	Lead	0.0000E+000	0.0000E+000
Receptor	fisher_child	STACK4	Mercuric chloride	0.0000E+000	7.0444E-003
Receptor	fisher_child	STACK4	Mercury	0.0000E+000	2.6075E-008
Receptor	fisher_child	STACK4	Methyl mercury	0.0000E+000	8.7202E-001
Receptor	fisher_child	STACK4	TetraCDD, 2,3,7,8-	5.3284E-009	5.5381E-004
			Total	1.4753E-007	8.9187E-001

LEAD EXPOSURE

Date : 7/28/2006

RECEPTOR NAME	SCENARIO	SOURCE	AVERAGE SOIL CONCENTRATION (mg/kg)	MAXIMUM SOIL CONCENTRATION (mg/kg)	AIR CONCENTRATION (ug/m^3)
Receptor	fisher_adult	STACK2	2.4651E-001	4.4541E-001	3.8615E-004
Receptor	fisher_adult	STACK3	2.4115E-001	4.3572E-001	3.7776E-004
Receptor	fisher_adult	STACK4	4.6665E-002	8.4316E-002	1.2707E-004
Receptor	fisher_child	STACK2	2.4651E-001	4.4541E-001	3.8615E-004
Receptor	fisher_child	STACK3	2.4115E-001	4.3572E-001	3.7776E-004
Receptor	fisher_child	STACK4	[illegible]	[illegible]	[illegible]

Source List

SOURCE	UTM X	UTM Y	ACTIVE
STACK2	745314.500	4275912.300	Yes
STACK3	745342.400	4275958.000	Yes
STACK4	744979.800	4275205.000	Yes

EXPOSURE SCENARIOS EVALUATED

Date : 7/28/200(

Resident Adult | Resident Child | Farmer Adult | Farmer Child | Fisher Adultt | Fisher Child

RECEPTOR	UTM X	UTM Y	WB TYPE	WB ID						
Receptor	745,301.00	4,276,197.00		Frank Holder	No	o	No	No	Yes	Yes

SITE PARAMETERS

Date : 7/28/2006

RECEPTOR:	Receptor	UTM X:	745,301.00	UTM Y:	4,276,197.00

SITE PARAMETER	VALUE	SYMBOL	UNITS
Soil dry bulk density	1.5	bd	g/cm^3
Forage fraction grown on contam. soil eaten by CATTLE	1.0	beef_fi_forage	--
Grain fraction grown on contam. soil eaten by CATTLE	1.0	beef_fi_grain	--
Silage fraction grown on contam. soil eaten by CATTLE			
Qty of forage eaten by CATTLE each day	8.8	beef_qp_forage	kg DW/day
Qty of grain eaten by CATTLE each day	0.47	beef_qp_grain	kg DW/day
Qty of silage eaten by CATTLE each day	2.5	beef_qp_silage	kg DW/day
Grain fraction grown on contam. soil eaten by CHICKEN	1.0	chick_fi_grain	--
Qty of grain eaten by CHICKEN each day	0.2	chick_qp_grain	kg DW/day
Average annual evapotranspiration	54.3	e_v	cm/yr
Fish lipid content	0.07	f_lipid	--
Fraction of CHICKEN's diet that is soil	0.1	fd_chicken	--
Universal gas constant	8.205e-5	gas_r	atm-m^3/mol-K
Average annual irrigation	12.5	i	cm/yr
Plant surface loss coefficient	18	kp	yr^-1
Fraction of mercury emissions NOT lost to the global cycle	0.48	merc_q_corr	--
Fraction of mercury speciated into methyl mercury in produce	0.22	mercmethyl_ag	--
Fraction of mercury speciated into methyl mercury in soil	0.02	mercmethyl_sc	--
Forage fraction grown contam. soil, eaten by MILK CATTLE	1.0	milk_fi_forage	--
Grain fraction grown contam. soil, eaten by MILK CATTLE	1.0	milk_fi_grain	--
Silage fraction grown contam. soil, eaten by MILK CATTLE	1.0	milk_fi_silage	--
Qty of forage eaten by MILK CATTLE each day	13.2	milk_qp_forage	kg DW/day
Qty of grain eaten by MILK CATTLE each day	3.0	milk_qp_grain	kg DW/day
Qty of silage eaten by MILK CATTLE each day	4.1	milk_qp_silage	kg DW/day
Averaging time	1	milkfat_at	yr
Body weight of infant	9.4	milfat_bw_infant	kg
Exposure duration of infant to breast milk	1	milkfat_ed	yr
Proportion of ingested dioxin that is stored in fat	0.9	milkfat_f1	--
Proportion of mothers weight that is fat	0.3	milkfat_f2	--
Fraction of fat in breast milk	0.04	milkfat_f3	--
Fraction of ingested contaminant that is absorbed	0.9	milkfat_f4	--
Half-life of dioxin in adults	2555	milkfat_h	days
Ingestion rate of breast milk	0.688	milkfat_ir_milk	kg/day
Viscosity of air corresponding to air temp.	1.81e-04	mu_a	g/cm-s
Average annual precipitation	99.94	p	cm/yr

SITE PARAMETERS

Date : 7/28/2006

RECEPTOR:	Receptor	UTM X:	745,301.00	UTM Y:	4,276,197.00

SITE PARAMETER	VALUE	SYMBOL	UNITS
Fraction of grain grown on contam. soil eaten by PIGS	1.0	pork_fi_grain	--
Fraction of silage grown on contam. soil and eaten by PIGS	1.0	pork_fi_silage	--
Qty of grain eaten by PIGS each day	3.3	pork_qp_grain	kg DW/day
Qty of silage eaten by PIGS each day	1.4	pork_qp_silage	kg DW/day
Qty of soil eaten by CATTLE	0.5	qs_beef	kg/day
Qty of soil eaten by CHICKEN	0.022	qs_chick	kg/day
Qty of soil eaten by DAIRY CATTLE	0.4	qs_milk	kg/day
Qty of soil eaten by PIGS	0.37	qs_pork	kg/day
Average annual runoff	12.5	r	cm/yr
Density of air	1.2e-3	rho_a	g/cm^3
Solids particle density	2.7	rho_s	g/cm^3
Interception fraction - edible portion ABOVEGROUND	0.39	rp	--
Interception fraction - edible portion FORAGE	0.5	rp_forage	--
Interception fraction - edible portion SILAGE	0.46	rp_silage	--
Ambient air temperature	298	t	K
Temperature correction factor	1.026	theta	--
Soil volumetric water content	0.2	theta_s	mL/cm^3
Length of plant expos. to depos. - ABOVEGROUND	0.16	tp	Yr
Length of plant expos. to depos. - FORAGE	0.12	tp_forage	Yr
Length of plant expos. to depos. - SILAGE	0.16	tp_silage	Yr
Average annual wind speed	3.9	u	m/s
Dry deposition velocity	0.5	vdv	cm/s
Dry deposition velocity for mercury	2.9	vdv_hg	cm/s
Wind velocity	4.55	w	m/s
Yield/standing crop biomass - edible portion ABOVEGROUND	2.24	yp	kg DW/m^2
Yield/standing crop biomass - edible portion FORAGE	0.24	yp_forage	kg DW/m^2
Yield/standing crop biomass - edible portion SILAGE	0.8	yp_silage	kg DW/m^2
Soil mixing zone depth	2.0	z	cm

EXPOSURE SCENARIO PARAMETERS

Date : 7/28/2006

RECEPTOR: Receptor UTM X: 745,301.00 UTM Y: 4,276,197.00

Resident Adult	Resident Child	Farmer Adult	Farmer Child	Fisher Adult	Fisher Child
No	No	No	No	Yes	Yes

DESCRIPTION	Resident Adult	Resident Child	Farmer Adult	Farmer Child	Fisher Adult	Fisher Child	UNITS
Averaging time for carcinogens	70	70	70	70	70	70	yr
Averaging time for noncarcinogens	30	6	40	6	30	6	yr
Consumption rate of BEEF	0.0	0.0	0.00122	0.00075	0.0	0.0	kg/kg-day FW
Body weight	70	15	70	15	70	15	kg
Consumption rate of POULTRY	0.0	0.0	0.00066	0.00045	0.0	0.0	kg/kg-day FW
Consumption rate of ABOVEGROUND PRODUCE	0.00032	0.00077	0.00047	0.00113	0.00032	0.00077	kg/kg-day DW
Consumption rate of BELOWGROUND PRODUCE	0.00014	0.00023	0.00017	0.00028	0.00014	0.00023	kg/kg-day DW
Consumption rate of DRINKING WATER	1.4	0.67	1.4	0.67	1.4	0.67	L/day
Consumption rate of PROTECTED ABOVEGROUND P	0.00061	0.0015	0.00064	0.00157	0.00061	0.00150	kg/kg-day DW
Consumption rate of SOIL	0.0001	0.0002	0.0001	0.0002	0.0001	0.0002	kg/d
Exposure duration	30	6	40	6	30	6	yr
Exposure frequency	350	350	350	350	350	350	day/yr
Consumption rate of EGGS	0.0	0.0	0.00075	0.00054	0.0	0.0	kg/kg-day FW
Fraction of contaminated ABOVEGROUND PRODUCE	1.0	1.0	1.0	1.0	1.0	1.0	--
Fraction of contaminated DRINKING WATER	1.0	1.0	1.0	1.0	1.0	1.0	--
Fraction contaminated SOIL	1.0	1.0	1.0	1.0	1.0	1.0	--
Consumption rate of FISH	0.0	0.0	0.0	0.0	0.00125	0.00088	kg/kg-day FW
Fraction of contaminated FISH	1.0	1.0	1.0	1.0	1.0	1.0	--
Inhalation exposure duration	30	6	40	6	30	6	yr
Inhalation exposure frequency	350	350	350	350	350	350	day/yr
Inhalation exposure time	24	24	24	24	24	24	hr/day
Fraction of contaminated BEEF	1	1	1	1	1	1	--
Fraction of contaminated POULTRY	1	1	1	1	1	1	--
Fraction of contaminated EGGS	1	1	1	1	1	1	--
Fraction of contaminated MILK	1	1	1	1	1	1	--
Fraction of contaminated PORK	1	1	1	1	1	1	--
Inhalation rate	0.83	0.30	0.83	0.30	0.83	0.30	m^3/hr
Consumption rate of MILK	0.0	0.0	0.01367	0.02268	0.0	0.0	kg/kg-day FW
Consumption rate of PORK	0.0	0.0	0.00055	0.00042	0.0	0.0	kg/kg-day FW
Time period at the beginning of combustion	0	0	0	0	0	0	yr
Length of exposure duration	30	6	40	6	30	6	yr

Unyx 7-28-06

CAS_NUMBER	COPC_NAME	param_MW	param_T_m	param_V_p	param_S	param_H	param_D_a	
1746-01-6	TetraCDD, 2,3,7,8-	321.98	578.7	1.97E-12	1.93E-5	3.29E-5	0.104	
18540-29-9	Chromium, hexavalent	51.996	2173	0	0	0	0.136387209	50798
22967-92-6	Methyl mercury	216	0	0	0	4.7E-7	0.052777777	777778
7439-92-1	Lead	207.2	600.5	0	0	0	0.054261746	500396
7440-38-2	Arsenic	74.92	0	0	0	0	0.106910843	82165
7440-41-7	Beryllium	9.012	1560.1	0	0	0	0.438738903	65391
7440-43-9	Cadmium	112.41	594.1	0	0	0	0.081573726	903543
7487-94-7	Mercuric chloride	271.52	550.1	0.00012	69000	7.1E-10	0.045312607	588587

Fed 24410

param_Dw	param_K_ow	param_K_oc	param_Kd_s	param_Kd_sw	param_Kd_bs	param_k_sg	param_f_v	param_RCF
5.6E-6	6309573.44480193	3890451.45	38904.51	291783.86	155618.06	0.03	0.664	39999
1.57922032227239E-5	0	0	19	19	19	0	0	0
6.11111111111111E-6	0	0	7000	100000	3000	0	0	0
6.28293905105722E-6	0	0	900	900	900	0	0	0
1.2379150274777E-5	0	0	29	29	29	0	0	0
5.08013467286242E-5	0	0	790	790	790	0	0	0
9.44537885677787E-6	0	0	75	75	75	0	0	0
5.24672293418364E-6	0.609536897240169	0	58000	100000	50000	0	0.85	0

Fed 24411

param_br_root_veg	param_br_leafy_veg	param_br_forage	param_bv_leafy_veg	param_bv_forage	para	_ba_milk
1.03	0.00455	0.00455	65500	65500	0.005	9920603406625
0.0045	0.00488	0.0075	0	0	0.001	
0.099	0.0294	0	0	0	0.00(	38
0.009	0.0136	0.045	0	0	0.00(	5
0.008	0.00633	0.036	0	0	6.0E-	
0.0015	0.00258	0.01	0	0	9E-7	
0.064	0.125	0.364	0	0	6.5E-	
0.036	0.0145	0	1800	1800	0.00:	62

Fed 24412

param_ba_beef	param_ba_pork	param_bcf_egg	param_bcf_chicken	param_BCF_fish	param_ AF_fish	param_BSAF_fish
0.0261212286618147	0.031620434695881	0.05962	3.32	34400	0	0.09
0.0055	0	0	0	3	0	0
0.00078	5.07E-6	0.003575	0	0	680000(	0
0.0003	0	0	0	0	0.09	0
0.002	0	0	0	2.00E1	0	0
0.001	0	0	0	6.20E1	0	0
0.00012	0.000191489361702128	0.0025	0	2.50E2	0	0
0.00522	3.393E-5	0.023925	0	0	0	0

Fed 24413

param_RfD	param_Oral_csf	param_RfC	param_inhalation_urf	param_inhalation_csf	Chemical_type	Che ical_subtype
1E-9	150000	0	0	150000	O	D
3.00E-3	0	1.40E-4	0.012	4.20E1	I	Met
0.0001	0	0	0	0	O	
0	0	0	0	0	I	Met
0.0003	1.5	3E-5	0.0043	15	I	Met
0.002	0	2E-5	0.0024	8.4	I	Met
0	0	2E-5	0.0018	6.3	I	Met
0.0003	0	0.00105	0	0	I	Div nt

Param_br_grain	Param_ba_egg	Param_ba_chicken	Param_inhalation_rfd	Param_tef
0.00455	0.0109984120681325	0.0192472211192319	0	1
0.0075	0	0	0.005	0
0	0.003575	0.003575	0.0001	0
0.045	0	0	0	0
4.00e-03	0	0	0.0003	0
0.01	0	0	0.00571428571428571	0
6.20e-02	0.0025	0.10625	0.001	0
0	0.023925	0.023925	0.0003	0