APPENDIX E

UNIVERSAL TREATMENT STANDARDS FRIT TEST RESULTS

This appendix provides the full screen analysis for the U.S. Environmental Protection Agency Universal Treatment Standards constituents. The relevancy of the leach test results presented here are discussed in more detail in Chapter 3 of this EIS. Note that the sample that provided these results originated from a commercial scale British Gas Lurgi gasifier that is operating on a 100 percent coal feed.

Regulated Constituent Common Name	CAS Number	Non WW Standard mg/kg or as mg/l TCLP	Analytical Results Concn, mg/kg	Analytical Results Concn, mg/l (TCLP)	Analytical Results Detection Limit mg/kg or mg/l
Acenaphthylene	208-96-8	3.4	ND		0.00755
Acenaphthene	83-32-9	3.4	ND		0.00552
Acetone	67-64-1	160	ND		0.00482
Acetonitrile	75-05-8	38	ND		0.00289
Acetophenone	96-86-2	9.7	ND		0.00356
2-Acetylaminofluorene	53-96-3	140	ND		0.00708
Acrolein	107-02-8	NA	ND		0.00491
Acrylamide	79-06-1	23			
Acrylonitrile	107-13-1	84	ND		0.0015
Aldicarb sulfone	1646-88-4	0.28			
Aldrin	309-00-2	0.066			
4-Aminobiphenyl	92-67-1	NA			
Aniline	62-53-3	14	ND		0.0180
Anthracene	120-12-7	3.4	ND		0.00902
Aramite	140-57-8	NA			
alpha-BHC	319-84-6	0.066			
beta-BHC	319-85-7	0.066			
delta-BHC	319-86-8	0.066			
gamma-BHC	58-89-9	0.066			
Barban	101-27-9	1.4			
Bendiocarb	22781-23-3	1.4			
Bendiocarb phenol	22961-82-6	1.4			
Benomyl	17804-35-2	1.4			
Benzene	71-43-2	10	ND		0.000625
Benz(a)anthracene	56-55-3	3.4	ND		0.00572
Benzal chloride	98-87-3	6.0			
Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	6.8	ND		0.00829
Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	6.8	ND		0.00856
Benzo(g,h,i)perylene	191-24-2	1.8			0.00599
Benzo(a)pyrene	50-32-8	3.4	ND		0.00862
Bromodichloromethane	75-27-4	15	ND		.000377
Bromomethane/Methyl bromide	74-83-9	15	ND		0.000623
4-Bromophenyl phenyl ether	101-55-3	15	ND		0.00734
n-Butyl alcohol	71-36-3	2.6			
Butylate	2008-41-5	1.4			
Butyl benzyl phthalate	85-68-7	28	ND		0.0111
2-sec-Butyl-4,6-dinitrophenol/Dinoseb	88-85-7	2.5			
Carbaryl	63-25-2	0.14			

Regulated Constituent Common Name	CAS Number	Non WW Standard mg/kg or as mg/l TCLP	Analytical Results Concn, mg/kg	Concn, mg/l (TCLP)	Detection Limit mg/kg or mg/l
Carbenzadim	10605-21-7	1.4			
Carbofuran	1563-66-2	0.14			
Carbofuran phenol	1563-38-8	1.4			
Carbon disulfide	75-15-0	4.8 mg/l TCLP	ND	< 0.00003 (estimated)	0.00065
Carbon tetrachloride	56-23-5	6.0	ND		0.000426
Carbosulfan	55285-14-8	1.4			
Chlordane (alpha and gamma isomers)	57-74-9	0.26			
p-Chloroaniline	106-47-8	16	ND		0.0110
Chlorobenzene	108-90-7	6.0	ND		0.000455
Chlorobenzilate	510-15-6	NA	ND		0.00571
2-Chloro-1,3-butadiene	126-99-8	0.28			
Chlorodibromomethane	124-48-1	15			
Chloroethane	75-00-3	6.0	ND		0.000695
bis(2-Chloroethoxy)methane	111-91-1	7.2	ND		0.00543
bis(2-Chloroethyl)ether	111-44-4	6.0	ND		0.00500
Chloroform	67-66-3	6.0	ND		0.000487
bis(2-Chloroisopropyl)ether	39638-32-9	7.2			
p-Chloro-m-cresol	59-50-7	14	ND		0.00758
2-Chloroethyl vinyl ether	110-75-8	NA			
Chloromethane/Methyl chloride	74-87-3	30	ND		0.00127
2-Chloronaphthalene	91-58-7	5.6	ND		0.00787
2-Chlorophenol	95-57-8	5.7	ND		0.00515
3-Chloropropylene	107-05-1	30	ND		0.00114
Chrysene	218-01-9	3.4	ND		0.00638
o-Cresol	95-48-7	5.6			
m-Cresol (difficult to distinguish from p-cresol)	108-39-4	5.6			
p-Cresol (difficult to distinguish from m-cresol)	106-44-5	5.6			
m-Cumenyl methylcarbamate	64-00-6	1.4			
Cyclohexanone	108-94-1	0.75 mg/l TCLP			
o,p'-DDD	53-19-0	0.087			
p,p'-DDD	72-54-8	0.087			
o,p'-DDE	3424-82-6	0.087			
p,p'-DDE	72-55-9	0.087			
o,p'-DDT	789-02-6	0.087			
p,p'-DDT	50-29-3	0.087			
Dibenz(a,h)anthracene	53-70-3	8.2	ND		0.00609
Dibenz(a,e)pyrene	192-65-4	NA			
1,2-Dibromo-3-chloropropane	96-12-8	15	ND		0.000987

Regulated Constituent Common Name	CAS Number	Non WW Standard mg/kg or as mg/l TCLP	Analytical Results Concn, mg/kg	Concn, mg/l (TCLP)	Detection Limit mg/kg or mg/l
1,2-Dibromoethane/Ethylene dibromide	106-93-4	15	ND		0.00646
Dibromomethane	74-95-3	15	ND		0.000645
m-Dichlorobenzene	541-73-1	6.0	ND		0.00556
o-Dichlorobenzene	95-50-1	6.0	ND		0.00530
p-Dichlorobenzene	106-46-7	6.0	ND		0.00530
Dichlorodifluoromethane	75-71-8	7.2	ND		0.000605
1,1-Dichloroethane	75-34-3	6.0	ND		0.000588
1,2-Dichloroethane	107-06-2	6.0	ND		0.000537
1,1-Dichloroethylene	75-35-4	6.0	ND		0.000997
trans-1,2-Dichloroethylene	156-60-5	30	ND		0.001
2,4-Dichlorophenol	120-83-2	14	ND		0.00294
2,6-Dichlorophenol	87-65-0	14	ND		0.00761
2,4-Dichlorophenoxyacetic acid/2,4-D	94-75-7	10			
1,2-Dichloropropane	78-87-5	18	ND		0.000645
cis-1,3-Dichloropropylene	10061-01-5	18	ND		0.000407
trans-1,3-Dichloropropylene	10061-02-6	18	ND		0.000659
Dieldrin	60-57-1	0.13			
Diethylene glycol, dicarbamate	5952-26-1	1.4			
Diethyl phthalate	84-66-2	28	0.0123		0.00881
p-Dimethylaminoazobenzene	60-11-7	NA			0.00809
2-4-Dimethyl phenol	105-67-9	14	ND		0.0404
Dimethyl phthalate	131-11-3	28	ND		0.00576
Dimetilan	644-64-4	1.4			
Di-n-butyl phthalate	84-74-2	28			
1,4-Dinitrobenzene	100-25-4	2.3			
4,6-Dinitro-o-cresol	534-52-1	160			
2,4-Dinitrophenol	51-28-5	160	ND		0.231
2,4-Dinitrotoluene	121-14-2	140	ND		0.00530
2,6-Dinitrotoluene	606-20-2	28	ND		0.00827
Di-n-octyl phthalate	117-84-0	28			
Di-n-propylnitrosamine	621-64-7	14			
1,4-Dioxane	123-91-1	170			
Diphenylamine (difficult to distinguish from diphenylnitrosamine)	122-39-4	13			
Diphenylnitrosamine (difficult to distinguish from diphenylamine)	86-30-6	13	ND		0.0235
1,2-Diphenylhydrazine	122-66-7	NA			
Disulfoton	298-04-4	6.2			
Dithiocarbamates (total)	137-30-4	28			
Endosulfan I	959-98-8	0.066			

Regulated Constituent Common Name	CAS Number	Non WW Standard mg/kg or as mg/l TCLP	Analytical Results Concn, mg/kg	Concn, mg/l (TCLP)	Detection Limit mg/kg or mg/l
Endosulfan II	33213-65-9	0.13			
Endosulfan sulfate	1031-07-8	0.13			
Endrin	72-20-8	0.13			
Endrin aldehyde	7421-93-4	0.13			
EPTC	759-94-4	1.4			
Ethyl acetate	141-78-6	33			
Ethyl benzene	100-41-4	10	ND		0.000729
Ethyl cyanide/Propanenitrile	107-12-0	360			
Ethyl ether	60-29-7	160			
bis(2-Ethylhexyl) phthalate	117-81-7	28	ND		0.0640
Ethyl methacrylate	97-63-2	160	ND		0.000391
Ethylene oxide	75-21-8	NA			
Famphur	52-85-7	15			
Fluoranthene	206-44-0	3.4	0.0170		0.00443
Fluorene	86-73-7	3.4	ND		0.00628
Formetanate hydrochloride	23422-53-9	1.4			
Formparanate	17702-57-7	1.4			
Heptachlor	76-44-8	0.066			
Heptachlor epoxide	1024-57-3	0.066			
Hexachlorobenzene	118-74-1	10	ND		0.00554
Hexachlorobutadiene	87-68-3	5.6	ND		0.00662
Hexachlorocyclopentadiene	77-47-4	2.4	ND		0.130
HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.001			
HxCDFs (All Hexachlorodibenzo-furans)	NA	0.001			
Hexachloroethane	67-72-1	30	ND		0.00804
Hexachloropropylene	1888-71-7	30	ND		0.00675
Indeno (1,2,3-c,d) pyrene	193-39-5	3.4	ND		0.00526
Iodomethane	74-88-4	65	ND		0.000814
Isobutyl alcohol	78-83-1	170			
Isodrin	465-73-6	0.066			
Isolan	119-38-0	1.4			
Isosafrole	120-58-1	2.6	ND		0.0176
Kepone	143-50-0	0.13			
Methacrylonitrile	126-98-7	84			
Methanol	67-56-1	0.75 mg/l TCLP			
Methapyrilene	91-80-5	1.5	ND		0.112
Methiocarb	2032-65-7	1.4			
Methomyl	16752-77-5	0.14			
Methoxychlor	72-43-5	0.18			
3-Methylcholanthrene	56-49-5	15	ND		0.0232

Regulated Constituent Common Name	CAS Number	Non WW Standard mg/kg or as mg/l TCLP	Analytical Results Concn, mg/kg	Concn, mg/l (TCLP)	Detection Limit mg/kg or mg/l
4,4-Methylene bis(2-chloroaniline)	101-14-4	30			
Methylene chloride	75-09-2	30	0.00158		0.000545
Methyl ethyl ketone	78-93-3	36			
Methyl isobutyl ketone	108-10-1	33	ND		0.000923
Methyl methacrylate	80-62-6	160	ND		0.000686
Methyl methansulfonate	66-27-3	NA			
Methyl parathion	298-00-0	4.6			
Metolcarb	1129-41-5	1.4			
Mexacarbate	315-18-4	1.4			
Molinate	2212-67-1	1.4			
Naphthalene	91-20-3	0.00072	ND		0.000441
2-Naphthylamine	91-59-8	NA			0.0354
o-Nitroaniline	88-74-4	14	ND		0.00565
p-Nitroaniline	100-01-6	28	ND		0.00750
Nitrobenzene	98-95-3	14	ND		0.00686
5-Nitro-o-toluidine	99-55-8	28			
o-Nitrophenol	88-75-5	13	ND		0.00796
p-Nitrophenol	100-02-7	29	ND		0.0277
N-Nitrosodiethylamine	55-18-5	28	ND		0.0106
N-Nitrosodimethylamine	62-75-9	2.3	ND		0.0199
N-Nitroso-di-n-butylamine	924-16-3	17	ND		0.00765
N-Nitrosomethylethylamine	10595-95-6	2.3	ND		0.0213
N-Nitrosomorpholine	59-89-2	2.3	ND		0.00752
N-Nitrosopiperidine	100-75-4	35	ND		0.0109
N-Nitrosopyrrolidine	930-55-2	35	ND		0.00784
Oxamyl	23135-22-0	0.28			
Parathion	56-38-2	4.6			
Total PCBs (sum of all PCB isomers, or all Aroclors)	1336-36-3	10			
Pebulate	1114-71-2	1.4			
Pentachlorobenzene	608-93-5	10	ND		0.00496
PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	0.001			
PeCDFs (All Pentachlorodibenzo-furans)	NA	0.001			
Pentachloroethane	76-01-7	6.0	ND		0.0109
Pentachloronitrobenzene	82-68-8	4.8	ND		0.0368
Pentachlorophenol	87-86-5	7.4	ND		0.179
Phenacetin	62-44-2	16	ND		0.00919
Phenanthrene	85-01-8	5.6	ND		0.00567
Phenol	108-95-2	6.2	ND		0.00920
o-Phenylenediamine	95-54-5	5.6			
Phorate	298-02-2	4.6			

Regulated Constituent Common Name	CAS Number	Non WW Standard mg/kg or as mg/l TCLP	Analytical Results Concn, mg/kg	Concn, mg/l (TCLP)	Detection Limit mg/kg or mg/l
Phthalic acid	100-21-0	28			
Phthalic anhydride	85-44-9	28			
Physostigmine	57-47-6	1.4			
Physostigmine salicylate	57-64-7	1.4			
Promecarb	2631-37-0	1.4			
Pronamide	23950-58-5	1.5			
Propham	122-42-9	1.4			
Propoxur	114-26-1	1.4			
Prosulfocarb	52888-80-9	1.4			
Pyrene	129-00-0	8.2			
Pyridine	110-86-1	16	ND		0.0230
Safrole	94-59-7	22	ND		0.00842
Silvex/2,4,5-TP	93-72-1	7.9			
1,2,4,5-Tetrachlorobenzene	95-94-3	14	ND		0.00513
TCDDs (All Tetrachlorodi-benzo-p-dioxins)	NA	0.001			
TCDFs (All Tetrachlorodibenzofurans)	NA	0.001			
1,1,1,2-Tetrachloroethane	630-20-6	6.0	ND		0.000696
1,1,2,2-Tetrachloroethane	79-34-5	6.0	ND		0.000868
Tetrachloroethylene	127-18-4	6.0	ND		0.00105
2,3,4,6-Tetrachlorophenol	58-90-2	7.4	ND		0.0179
Thiodicarb	59669-26-0	1.4			
Thiophanate-methyl	23564-05-8	1.4			
Tirpate	26419-73-8	0.28			
Toluene	108-88-3	10	ND		0.000497
Toxaphene	8001-35-2	2.6			
Triallate	2303-17-5	1.4			
Tribromomethane/Bromoform	75-25-2	15			
1,2,4-Trichlorobenzene	120-82-1	19	ND		0.00696
1,1,1-Trichloroethane	71-55-6	6.0	ND		0.000737
1,1,2-Trichloroethane	79-00-5	6.0	ND		0.000727
Trichloroethylene	79-01-6	6.0	ND		0.000935
Trichloromonofluoromethane	75-69-4	30			
2,4,5-Trichlorophenol	95-95-4	7.4	ND		0.00850
2,4,6-Trichlorophenol	88-06-2	7.4	ND		0.00463
2,4,5-Trichlorophenoxyacetic acid/2,4,5-T	93-76-5	7.9			
1,2,3-Trichloropropane	96-18-4	30	ND		0.000847
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	30	ND		0.000761
Triethylamine	101-44-8	1.5			
tris-(2,3-Dibromopropyl) phosphate	126-72-7	0.10			

Regulated Constituent Common Name	CAS Number	Non WW Standard mg/kg or as mg/l TCLP	Analytical Results Concn, mg/kg	Concn, mg/l (TCLP)	Detection Limit mg/kg or mg/l
Vernolate	1929-77-7	1.4			
Vinyl chloride	75-01-4	6.0	ND		0.00115
Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	30	ND		0.00153
Antimony	7440-36-0	2.1 mg/l TCLP		0.0065	0.00309
Arsenic	7440-38-2	5.0 mg/l TCLP		0.0145	0.00156
Barium	7440-39-3	7.6 mg/l TCLP		0.159	0.00052
Beryllium	7440-41-7	0.014 mg/l TCLP		0.0079	0.00007
Cadmium	7440-43-9	0.19 mg/l TCLP		ND	0.0003
Chromium (Total)	7440-47-3	0.86 mg/l TCLP		0.0222	0.00109
Cyanides (Total)[1]	57-12-5	590			
Cyanides (Amenable)[1]	57-12-5	30			
Fluoride[2]	16984-48-8	NA			
Lead	7439-92-1	0.37 mg/l TCLP		0.0043	0.00118
Mercury--Nonwastewater from Retort	7439-97-6	0.20 mg/l TCLP			
Mercury--All Others	7439-97-6	0.025 mg/l TCLP		ND	0.00006
Nickel	7440-02-0	5.0 mg/l TCLP		0.379	0.00168
Selenium	7782-49-2	0.16 mg/l TCLP		ND	0.00388
Silver	7440-22-4	0.30 mg/l TCLP		ND	0.00087
Sulfide	18496-25-8	NA			
Thallium	7440-28-0	0.078 mg/l TCLP		ND	0.0048
Vanadium[2]	7440-62-2	0.23 mg/l TCLP		0.0486	0.00059
Zinc[2]	7440-66-6	5.3 mg/l TCLP		0.0111	0.00233

Notes:
CAS means Chemical Abstract Services. When the waste code and/or regulated constituents are described as a combination of a chemical with it's salts and/or esters, the CAS number is given for the parent compound only.44.
Concentration standards for wastewaters are expressed in mg/l and are based on analysis of composite samples.
Except for Metals (EP or TCLP) and Cyanides (Total and Amenable) the nonwastewater treatment standards expressed as a concentration were established, in part, based upon incineration in units operated in accordance with the technical requirements of 40 CFR part 264, subpart O, or 40 CFR part 265, subpart O, or based upon combustion in fuel substitution units operating in accordance with applicable technical requirements. A facility may comply with these treatment standards according to provisions in Sec. 268.40(d). All concentration standards for nonwastewaters are based on analysis of grab samples.

ND means Non-District, Concn means concentration, and TCLP means Toxicity Characteristic Leaching Procedure.

[1] Both Cyanides (Total) and Cyanides (Amenable) for nonwastewaters are to be analyzed using Method 9010 or 9012, found in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA Publication SW-846, as incorporated by reference in 40 CFR 260.11, with a sample size of 10 grams and a distillation time of one hour and 15 minutes.
[2] These constituents are not "underlying hazardous constituents" in characteristic wastes, according to the definition at Sec. 268.2(i).
Source: Global Energy 2001c.