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APPENDIX A. CHEMICAL SPECIATION MODELS FOR EXAMPLE CASES

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Table A-1. Chemical Speciation Fingerprint for Coal Combustion Fly Ash

Chemical Speciation Fingerprint - Municipal Solid Waste Landfill							**LeachXS**	**2012**
Prediction case	LtoF MSW		**DOC/DHA data**				**Polynomial coeficients**	
Speciation session	Landgraaf mix		**pH**	**[DOC] (kg/l)**	**DHA fraction**	**[DHA] (kg/l)**	**C0**	-3.446E+00
Material	Mixed organic waste DS NL (P,1,1)		1.00	4.539E-04	0.55	2.496E-04	**C1**	-8.161E-02
			2.75	2.810E-04	0.40	1.124E-04	**C2**	-7.705E-02
Solved fraction DOC	0.2		3.69	1.790E-04	0.30	5.370E-05	**C3**	1.349E-02
Sum of pH and pe	13.00		6.37	1.470E-04	0.25	3.675E-05	**C4**	-5.311E-04
L/S	10.0000	**l/kg**	6.81	1.730E-04	0.20	3.460E-05	**C5**	0.000E+00
Clay	1.000E-01	**kg/kg**	7.48	1.740E-04	0.20	3.480E-05		
HFO	1.000E-02	**kg/kg**	8.78	3.330E-04	0.25	8.325E-05		
SHA	4.000E-02	**kg/kg**	10.32	6.195E-04	0.35	2.168E-04		
Percolation material	Mixed organic waste DS NL (C,1,1)		11.66	8.380E-04	0.55	4.609E-04		
Avg L/S first perc. fracti	0.1240	**l/kg**	14.00	9.574E-04	0.90	8.617E-04		
Reactant concentrations								
Reactant	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	
Ag+	not measured	CrO4-2	5.273E+01	Mg+2	1.632E+03	SO4-2	2.769E+03	
Al+3	3.076E+03	Cu+2	2.342E+02	Mn+2	3.392E+02	Sb[OH]6-	1.813E+00	
H3AsO4	6.116E-01	F-	1.680E+02	MoO4-2	7.673E+00	SeO4-2	5.495E-01	
H3BO3	7.289E+01	Fe+3	1.341E+04	Na+	2.079E+03	H4SiO4	1.973E+03	
Ba+2	1.567E+01	H2CO3	3.010E+04	NH4+	not measured	Sr+2	6.760E+01	
Br-	9.010E+00	Hg+2	not measured	Ni+2	8.473E+01	Th+4	not measured	
Ca+2	2.272E+04	I-	not measured	NO3-	not measured	UO2+	not measured	
Cd+2	1.695E+01	K+	1.584E+03	PO4-3	7.881E+01	VO2+	4.727E+00	
Cl-	2.330E+03	Li+	2.670E+00	Pb+2	5.878E+02	Zn+2	2.110E+03	
Selected Minerals								
Al[OH]3[a]	Birnessite	CuCO3[s]	Huntite	Otavite	Wairakite			
alpha-TCP	Brucite	Diopside	hydrozincite	Pb2V2O7	Witherite			
Analbite	Ca2Zn[PO4]2	Dolomite	Magnesite	Pb3[VO4]2	Zn[OH]2[B]			
Anglesite	CaCu2[PO4]2	Fe_Vanadate	Manganite	PbMoO4[c]	ZnCO3:H2O			
Anhydrite	Calcite	Fe2[OH]4SeO3	NiCO3[s]	Rhodochrosite				
Ba[SCr]O4[96%SO4]	CaMoO4[c]	Ferrihydrite	Nsutite	Strontianite				
BaSrSO4[50%Ba]	Cerrusite	Fluorite	OCP	Talc				

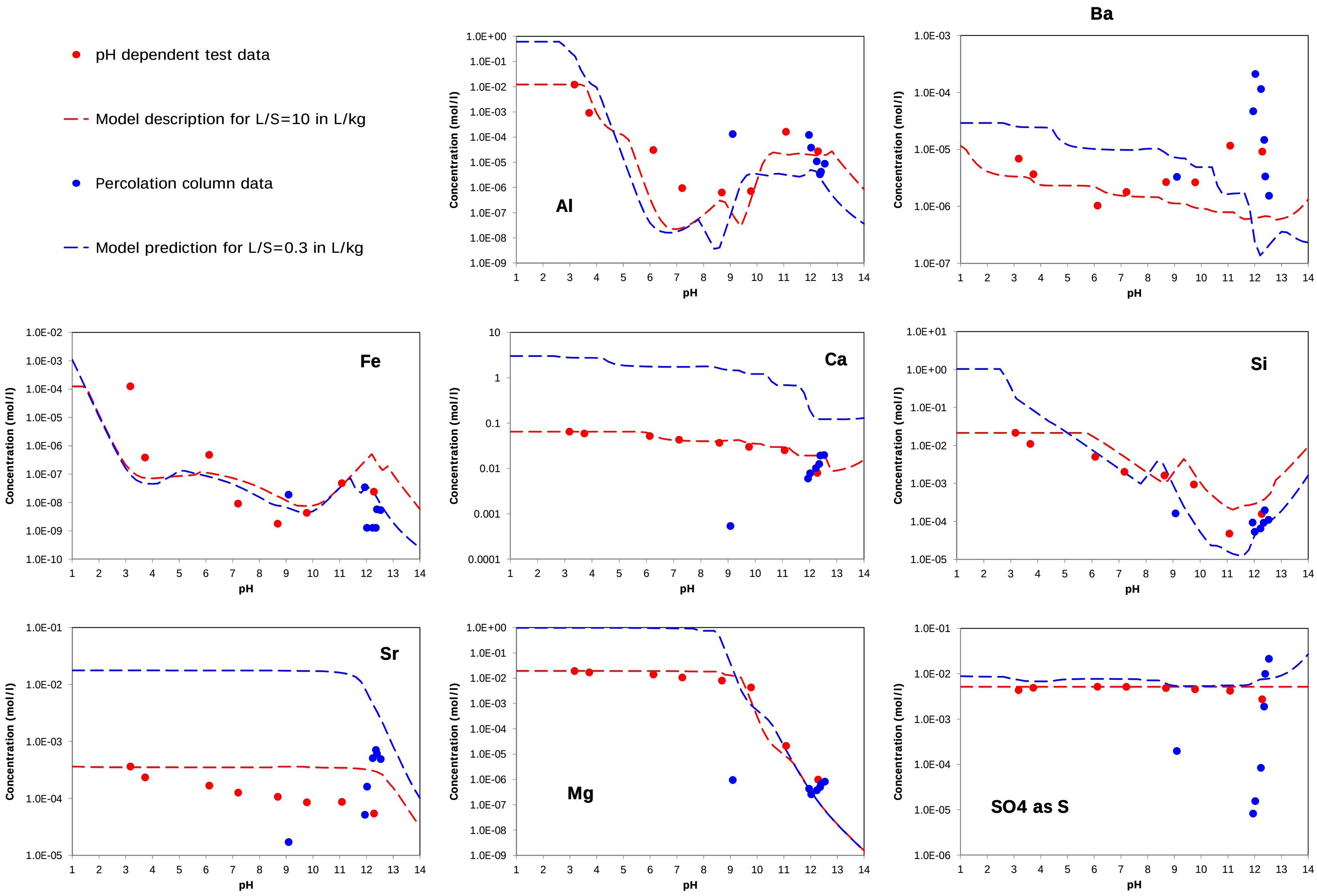

Figure A-1. Chemical speciation model for constituents in coal combustion fly ash.

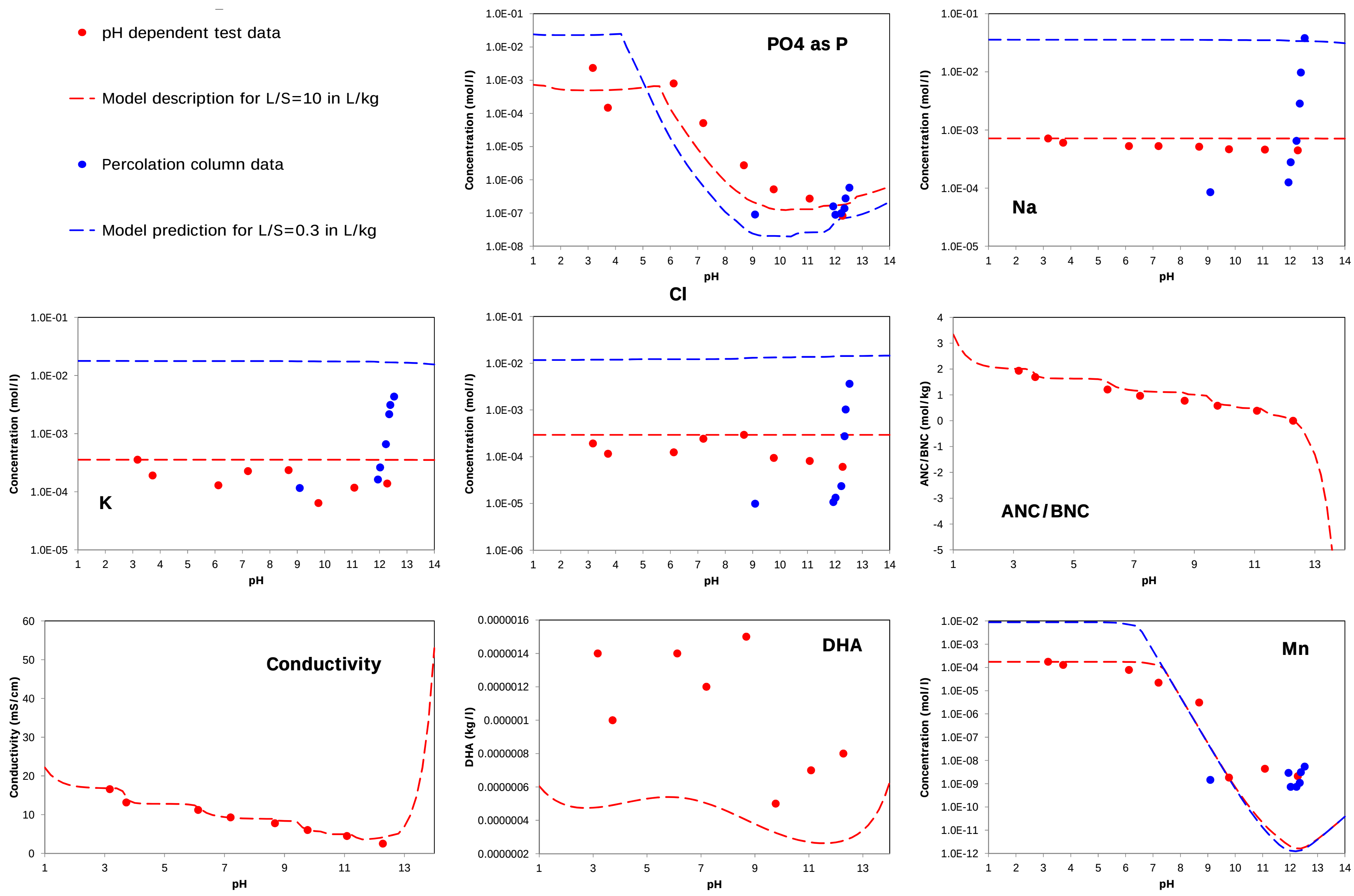

Figure A-2. Chemical speciation model for constituents in coal combustion fly ash.

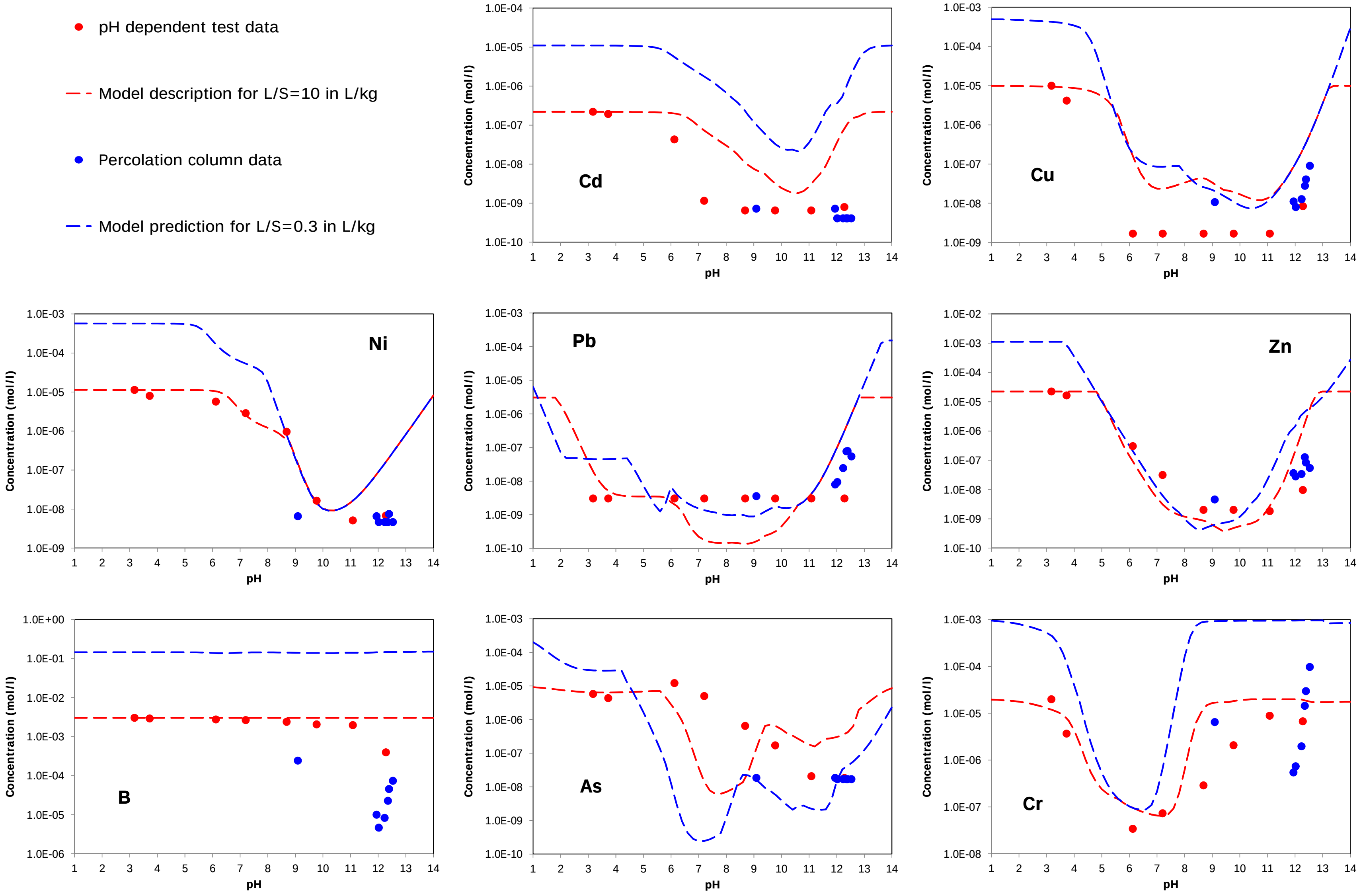

Figure A-3. Chemical speciation model for constituents in coal combustion fly ash.

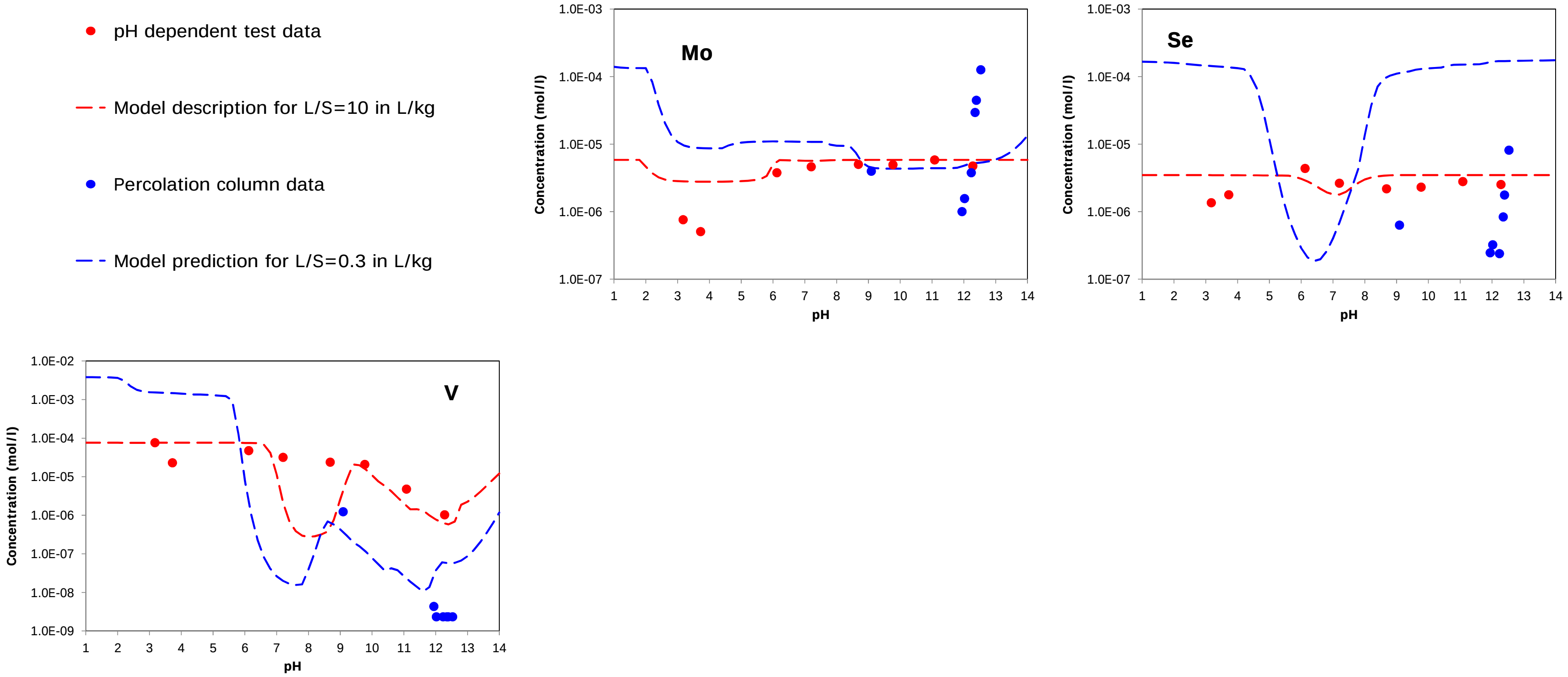

Figure A-4. Chemical speciation model for constituents in coal combustion fly ash.

Table A-2. Chemical Speciation Fingerprint for MSWI Bottom Ash

Chemical Speciation Fingerprint - Municipal Solid Waste Incinerator Bottom Ash							**LeachXS**	**2012**
Prediction case	LtoF MSWI BA Aust + kol							
Speciation session	MSWI BA Austria + kolom AA		**DOC/DHA data**				**Polynomial coeficients**	
Material	MSWI Bottom ash Austria (P,1,1)		**pH**	**[DOC] (kg/l)**	**DHA fraction**	**[DHA] (kg/l)**	**C0**	-4.230E+00
			1.00	6.711E-05	0.35	2.349E-05	**C1**	-4.461E-01
Solved fraction DOC	0.2		3.46	4.320E-05	0.18	7.776E-06	**C2**	5.797E-02
Sum of pH and pe	13.00		4.01	4.070E-05	0.15	6.105E-06	**C3**	-1.872E-03
L/S	10.0000	**l/kg**	5.70	4.700E-05	0.10	4.700E-06	**C4**	0.000E+00
Clay	0.000E+00	**kg/kg**	7.26	4.880E-05	0.18	8.784E-06	**C5**	0.000E+00
HFO	7.000E-04	**kg/kg**	8.79	4.820E-05	0.24	1.157E-05		
SHA	2.000E-03	**kg/kg**	9.62	4.010E-05	0.35	1.404E-05		
Percolation material	MSWI BA-A A (C,1,1)		10.68	4.900E-05	0.45	2.205E-05		
Avg L/S first perc. fractions	0.2195	**l/kg**	11.86	5.880E-05	0.55	3.234E-05		
			14.00	8.026E-05	0.70	5.618E-05		
Reactant concentrations								
Reactant	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	
Ag+	not measured	CrO4-2	9.543E+00	Mg+2	5.026E+03	SO4-2	4.649E+03	
Al+3	3.614E+03	Cu+2	1.674E+02	Mn+2	1.139E+02	Sb[OH]6-	1.472E+00	
H3AsO4	1.837E-01	F-	5.000E+01	MoO4-2	6.727E-01	SeO4-2	9.660E-02	
H3BO3	2.180E+01	Fe+3	2.079E+03	Na+	3.669E+03	H4SiO4	7.279E+03	
Ba+2	1.463E+01	H2CO3	3.800E+04	NH4+	1.000E+01	Sr+2	7.071E+01	
Br-	not measured	Hg+2	not measured	Ni+2	5.628E+00	Th+4	not measured	
Ca+2	5.178E+04	I-	not measured	NO3-	2.000E+02	UO2+	not measured	
Cd+2	4.110E+00	K+	1.373E+03	PO4-3	5.717E+02	VO2+	3.257E+00	
Cl-	2.000E+04	Li+	2.760E+00	Pb+2	1.408E+02	Zn+2	6.088E+02	
Selected Minerals								
AA_3CaO_Al2O3_6H2O[s]		AA_Gypsum	Cd[OH]2[A]	Pb[OH]2[C]	Wairakite			
AA_3CaO_Fe2O3_6H2O[s]		AA_Magnesite	Cr[OH]3[C]	Pb2V2O7	Willemite			
AA_Al[OH]3[am]		AA_Portlandite	Cu[OH]2[s]	Pb3[VO4]2	ZnSiO3			
AA_Brucite		BaSrSO4[50%Ba]	Manganite	PbCrO4				
AA_Calcite		Ca2Cd[PO4]2	Ni[OH]2[s]	PbMoO4[c]				
AA_Fe[OH]3[microcr]		Ca4Cd[PO4]3OH	OCP	P-Wollstanite				

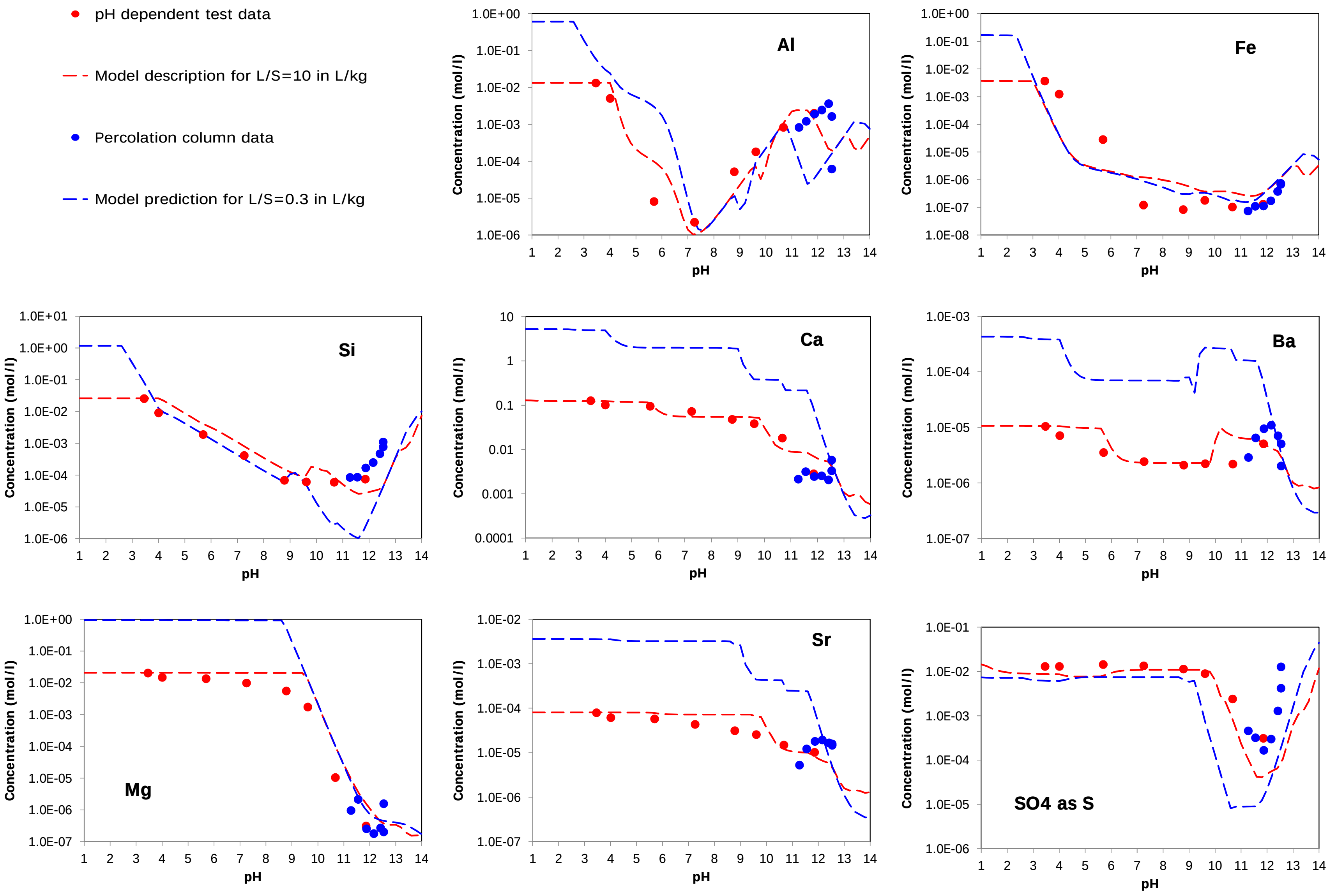

Figure A-5. Chemical speciation model for constituents in municipal solid waste incinerator bottom ash.

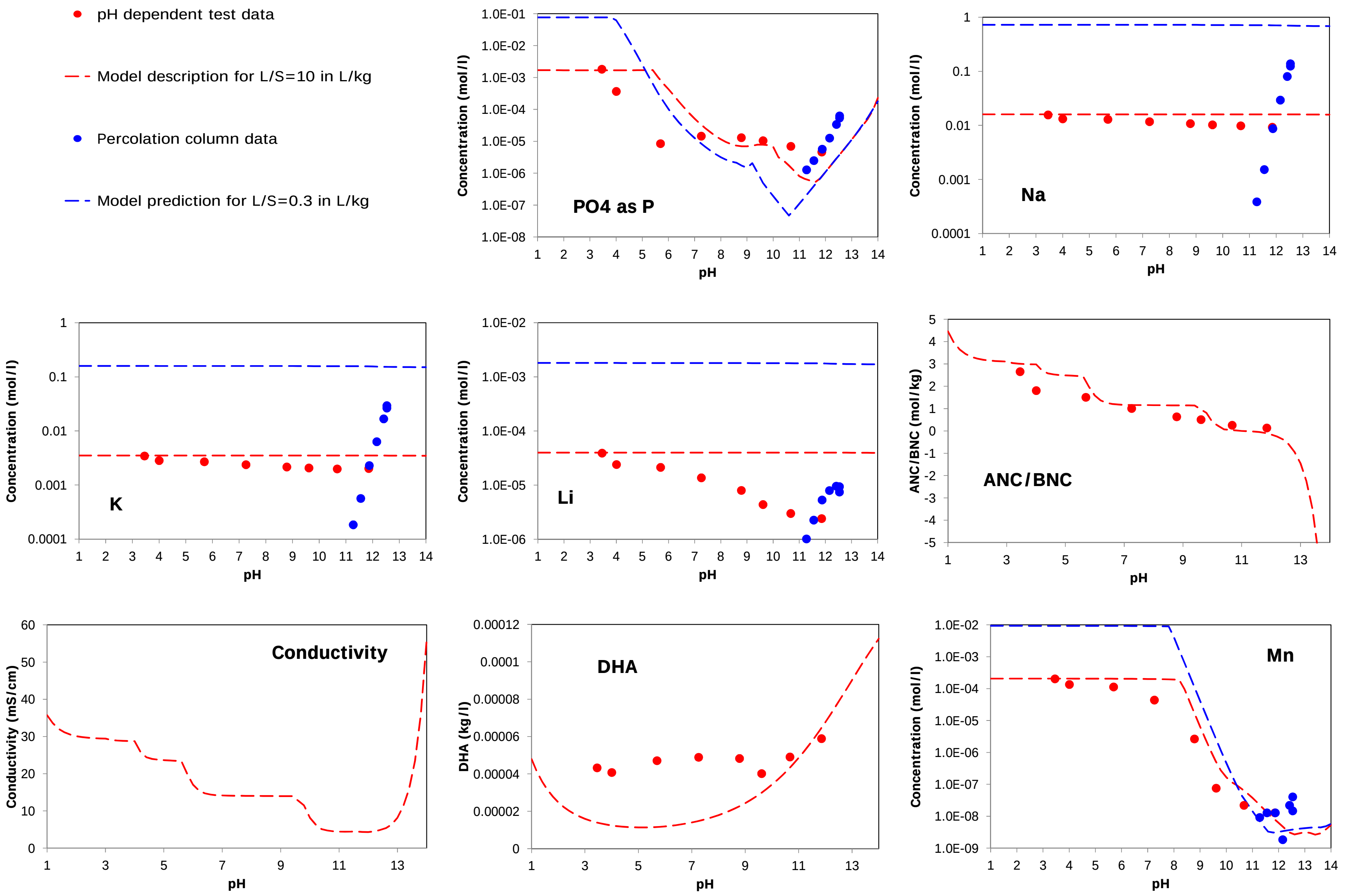

Figure A-6. **Chemical speciation model for constituents in municipal solid waste incinerator bottom ash.**

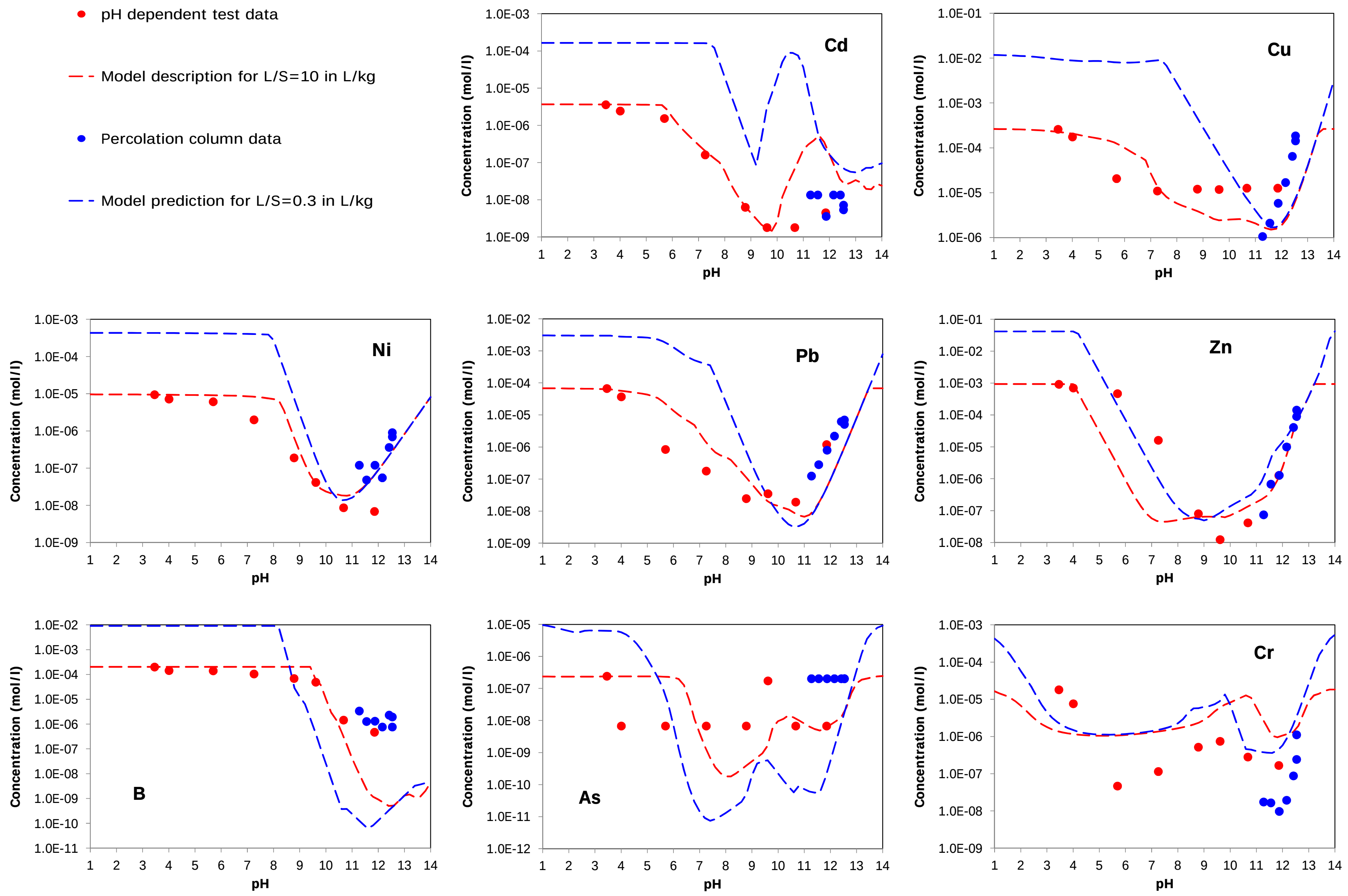

Figure A-7. Chemical speciation model for constituents in municipal solid waste incinerator bottom ash.

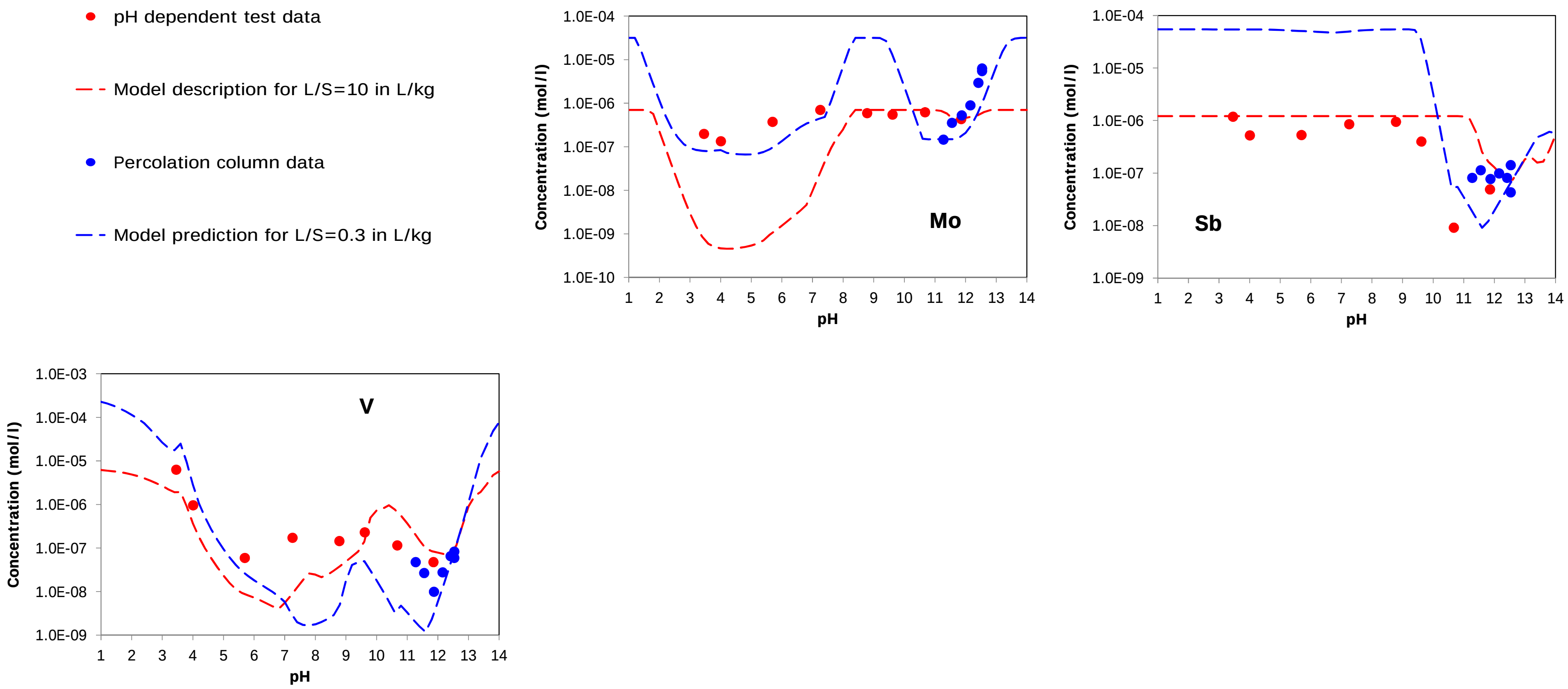

Figure A-8. Chemical speciation model for constituents in municipal solid waste incinerator bottom ash.

Table A-3. Chemical Speciation Fingerprint for Inorganic Waste Landfill at Nauerna (The Netherlands).

Chemical Speciation Fingerprint - Predominantly Inorganic Waste Landfill							**LeachXS**	**2012**
Prediction case	EPA LtoF Predominantly Inorganic Waste Landfill		**DOC/DHA data**				**Polynomial coeficients**	
Speciation session	LtoF Nauerna_pilot		**pH**	**[DOC] (kg/l)**	**DHA fraction**	**[DHA] (kg/l)**	**C0**	-4.684E+00
Material	Pred Inorg Wastemix NL(P,1,1)		1.00	2.914E-05	0.20	5.828E-06	**C1**	-5.010E-01
			3.02	1.500E-05	0.15	2.250E-06	**C2**	5.562E-04
Solved fraction DOC	0.2		4.00	1.840E-06	0.12	2.208E-07	**C3**	7.768E-03
Sum of pH and pe	10.00		5.27	3.800E-06	0.10	3.800E-07	**C4**	-3.543E-04
L/S	10.0000	**l/kg**	6.36	2.580E-06	0.15	3.870E-07	**C5**	0.000E+00
Clay	0.000E+00	**kg/kg**	7.23	2.700E-06	0.18	4.860E-07		
HFO	1.500E-03	**kg/kg**	8.18	3.560E-06	0.25	8.900E-07		
SHA	1.900E-02	**kg/kg**	9.51	7.800E-06	0.35	2.730E-06		
Percolation material	Pred Inorg Wastemix NL(C,2,1)		10.70	1.756E-05	0.50	8.780E-06		
Avg L/S first perc. fracti	0.2791	**l/kg**	12.01	2.960E-05	0.70	2.072E-05		
			13.17	9.860E-05	0.90	8.874E-05		
			14.00	1.408E-04	0.95	1.338E-04		
Reactant concentrations								
Reactant	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	
Ag+	not measured	H2CO3	5.600E+04	Mg+2	3.002E+03	SO4-2	1.272E+04	
Al+3	2.276E+03	CrO4-2	1.919E+01	Mn+2	5.737E+02	Sb[OH]6-	3.863E-01	
H3AsO4	2.570E+00	Cu+2	3.977E+01	MoO4-2	2.872E+00	SeO4-2	3.191E-01	
H3BO3	1.865E+01	F-	5.000E+01	Na+	2.360E+03	H4SiO4	3.015E+03	
Ba+2	1.536E+00	Fe+3	1.636E+04	NH4+	6.096E+02	Sr+2	1.761E+02	
Br-	3.452E+01	Hg+2	not measured	Ni+2	2.323E+01	Th+4	not measured	
Ca+2	5.015E+04	I-	not measured	NO3-	not measured	UO2+	not measured	
Cd+2	2.760E+00	K+	1.059E+03	PO4-3	8.157E+01	VO2+	5.225E+00	
Cl-	5.268E+03	Li+	2.623E+00	Pb+2	2.500E+02	Zn+2	2.401E+03	
Selected Minerals								
Albite[low]	Bunsenite	Ferrihydrite	Ni[OH]2[s]	Portlandite	ZnSiO3			
AlOHSO4	Ca2Cd[PO4]2	Fluorite	NiCO3[s]	Rhodochrosite				
alpha-TCP	Ca4Cd[PO4]3OH	Gypsum	OCP	Sb[OH]3[s]				
Anhydrite	Calcite	Hausmannite	Otavite	Strengite				
Ba[SCr]O4[96%SO4]	CaZincate	Hinsdalite[2]	Pb[OH]2[C]	Strontianite				
BaSrSO4[50%Ba]	Cd[OH]2[C]	Hydromagnesite	Pb2V2O7	Struvite				
Boehmite	Cr[OH]3[A]	Leucite	PbCrO4	Willemite				
Brucite	Cu[OH]2[s]	Manganite	PbMoO4[c]	Zincite				

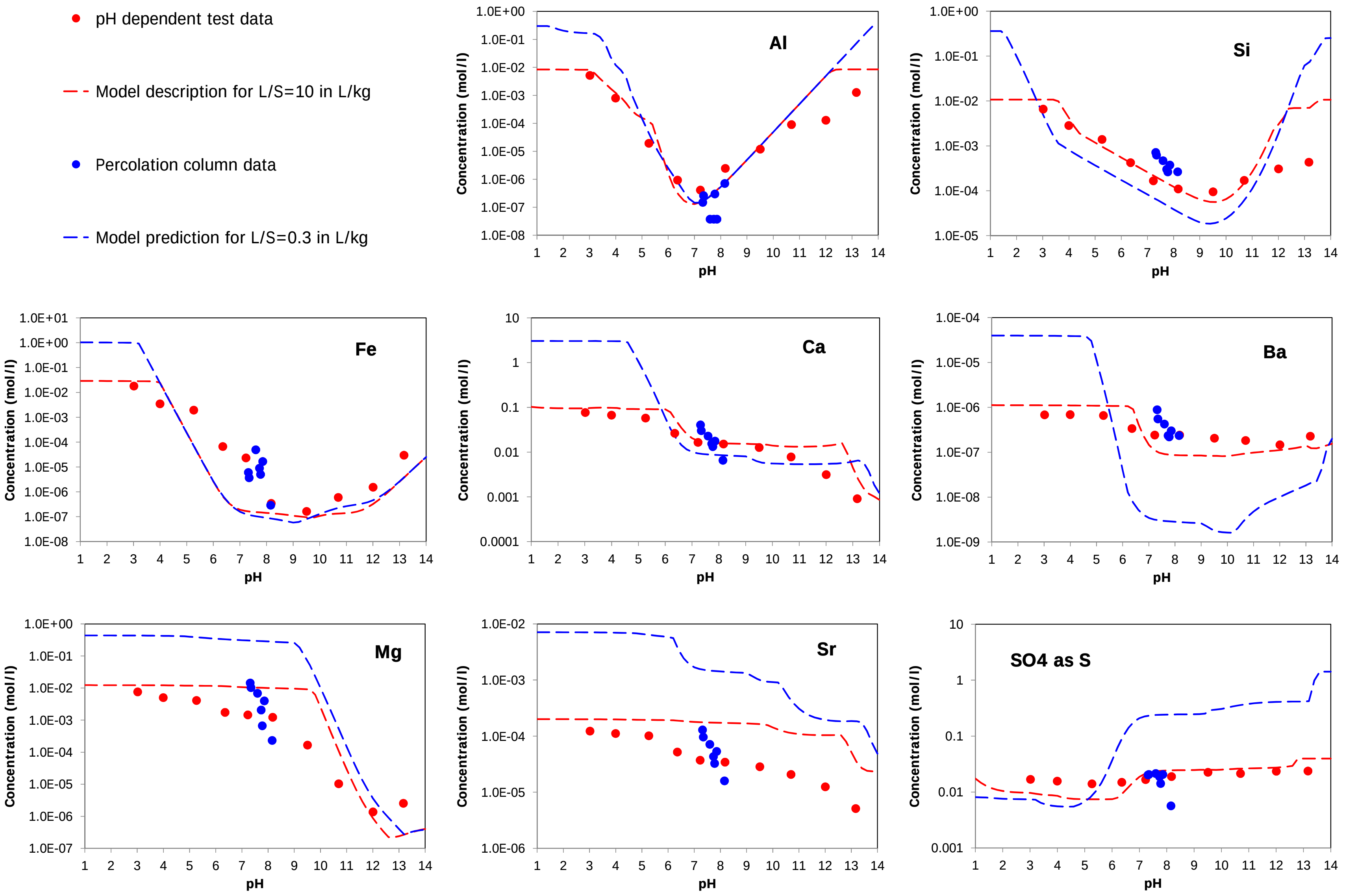

Figure A-9. Chemical speciation model for constituents in inorganic waste landfill material.

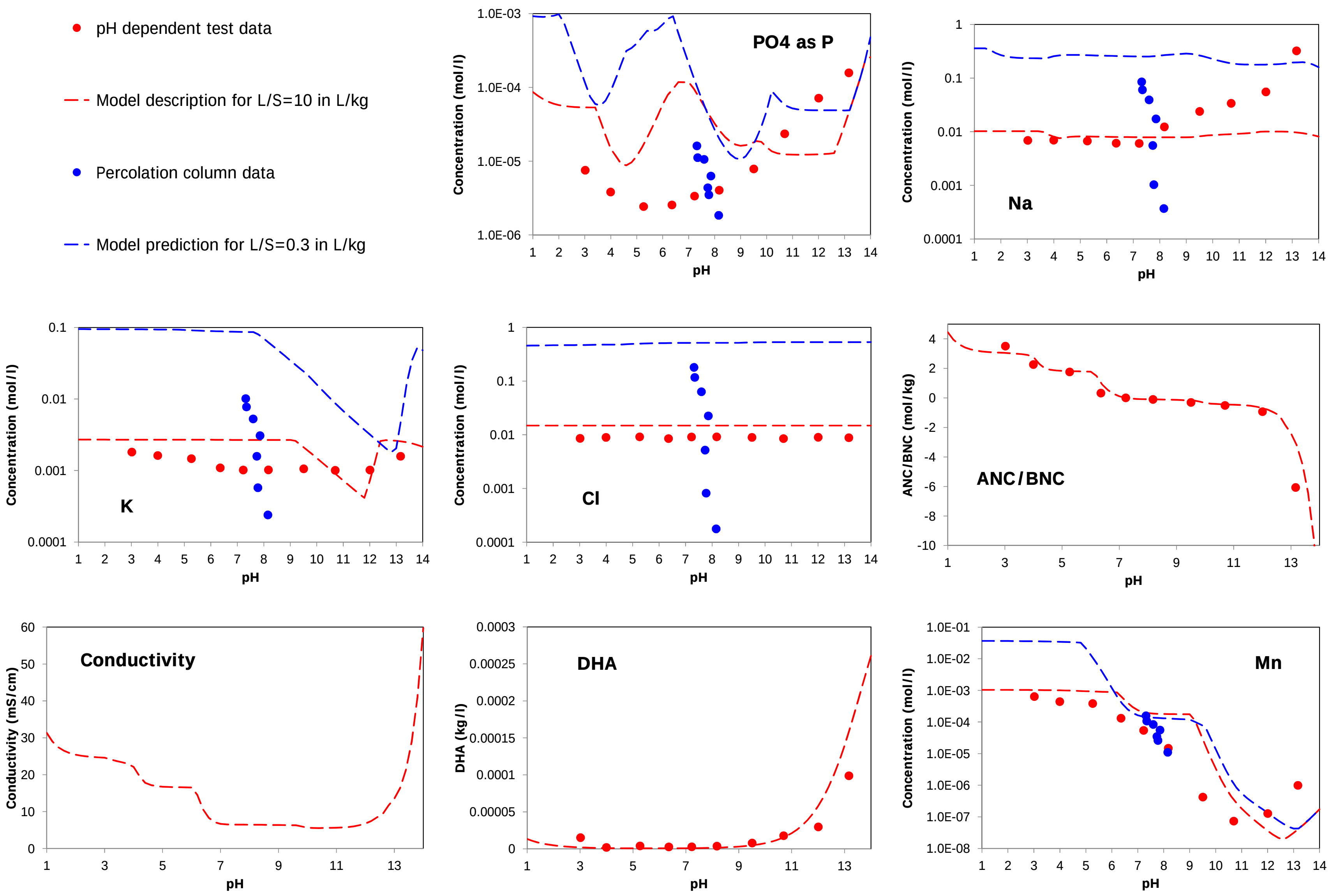

Figure A-10. Chemical speciation model for constituents in inorganic waste landfill material.

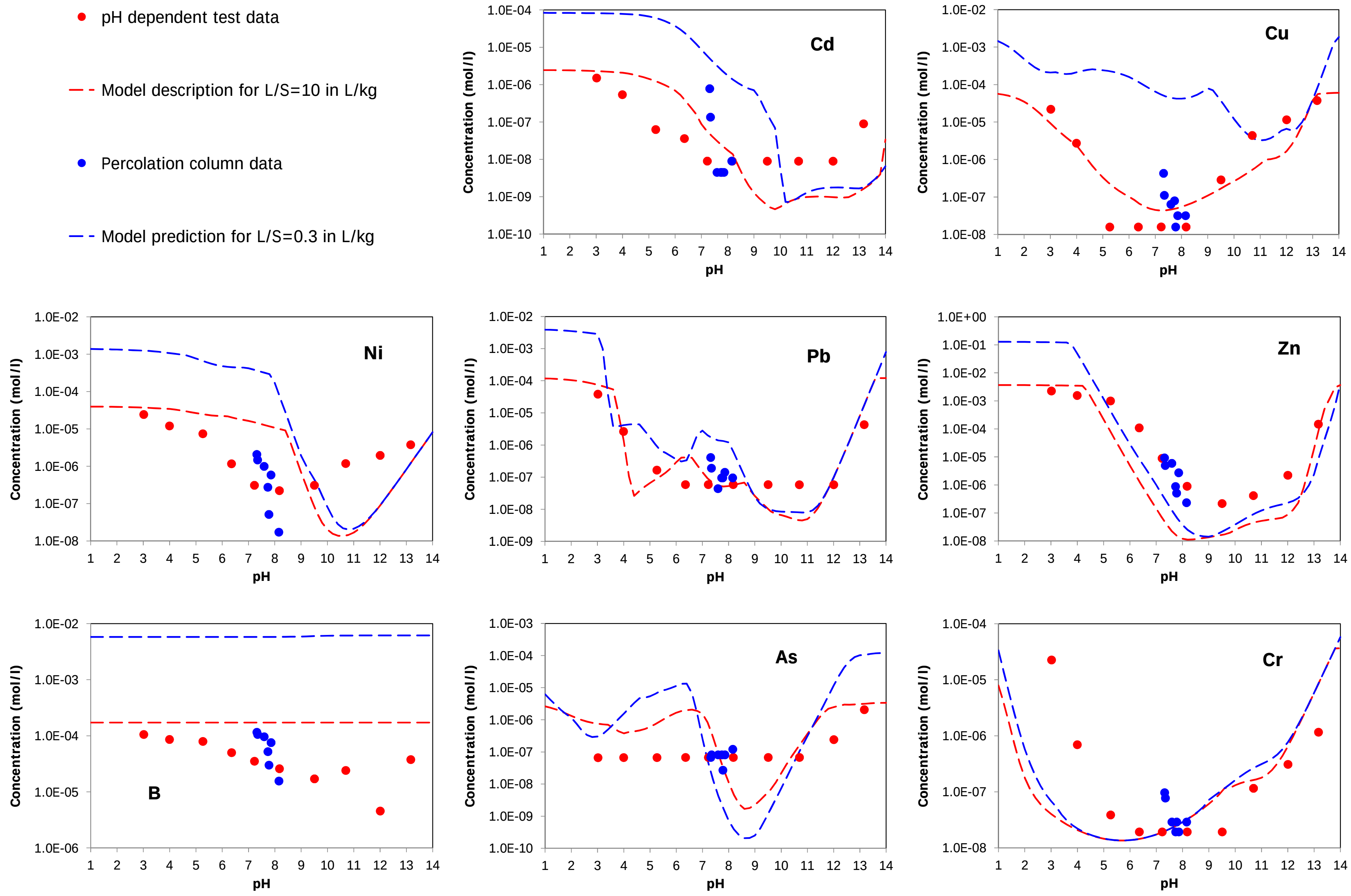

Figure A-11. Chemical speciation model for constituents in inorganic waste landfill material.

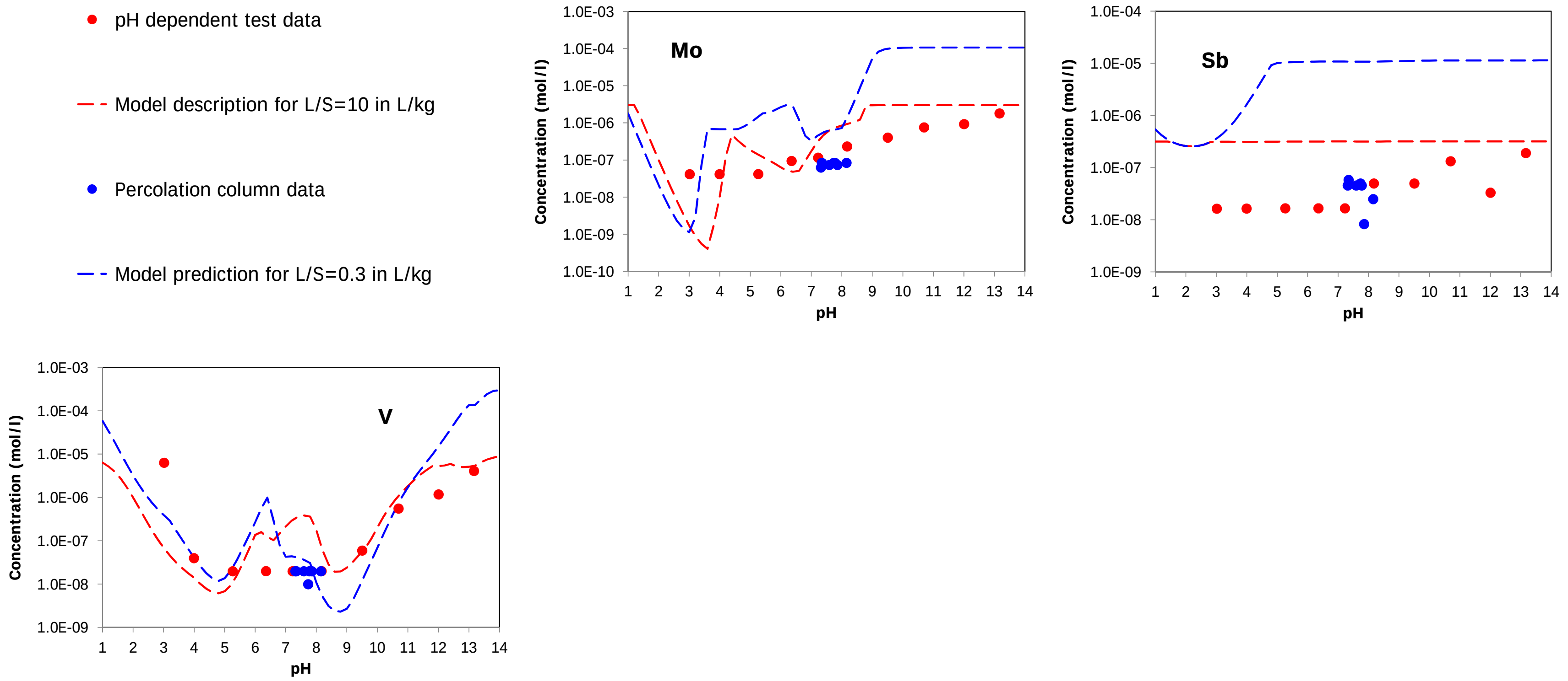

Figure A-12. Chemical speciation model for constituents in inorganic waste landfill material.

Table A-4. Chemical Speciation Fingerprint for Municipal Solid Waste (The Netherlands).

Chemical Speciation Fingerprint - Municipal Solid Waste Landfill							**LeachXS**	**2012**
Prediction case	LtoF MSW		**DOC/DHA data**				**Polynomial coeficients**	
Speciation session	Landgraaf mix		**pH**	**[DOC] (kg/l)**	**DHA fraction**	**[DHA] (kg/l)**	**C0**	-3.446E+00
Material	Mixed organic waste DS NL (P,1,1)		1.00	4.539E-04	0.55	2.496E-04	**C1**	-8.161E-02
			2.75	2.810E-04	0.40	1.124E-04	**C2**	-7.705E-02
Solved fraction DOC	0.2		3.69	1.790E-04	0.30	5.370E-05	**C3**	1.349E-02
Sum of pH and pe	13.00		6.37	1.470E-04	0.25	3.675E-05	**C4**	-5.311E-04
L/S	10.0000	**l/kg**	6.81	1.730E-04	0.20	3.460E-05	**C5**	0.000E+00
Clay	1.000E-01	**kg/kg**	7.48	1.740E-04	0.20	3.480E-05		
HFO	1.000E-02	**kg/kg**	8.78	3.330E-04	0.25	8.325E-05		
SHA	4.000E-02	**kg/kg**	10.32	6.195E-04	0.35	2.168E-04		
Percolation material	Mixed organic waste DS NL (C,1,1)		11.66	8.380E-04	0.55	4.609E-04		
Avg L/S first perc. fracti	0.1240	**l/kg**	14.00	9.574E-04	0.90	8.617E-04		
Reactant concentrations								
Reactant	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	
Ag+	not measured	CrO4-2	5.273E+01	Mg+2	1.632E+03	SO4-2	2.769E+03	
Al+3	3.076E+03	Cu+2	2.342E+02	Mn+2	3.392E+02	Sb[OH]6-	1.813E+00	
H3AsO4	6.116E-01	F-	1.680E+02	MoO4-2	7.673E+00	SeO4-2	5.495E-01	
H3BO3	7.289E+01	Fe+3	1.341E+04	Na+	2.079E+03	H4SiO4	1.973E+03	
Ba+2	1.567E+01	H2CO3	3.010E+04	NH4+	not measured	Sr+2	6.760E+01	
Br-	9.010E+00	Hg+2	not measured	Ni+2	8.473E+01	Th+4	not measured	
Ca+2	2.272E+04	I-	not measured	NO3-	not measured	UO2+	not measured	
Cd+2	1.695E+01	K+	1.584E+03	PO4-3	7.881E+01	VO2+	4.727E+00	
Cl-	2.330E+03	Li+	2.670E+00	Pb+2	5.878E+02	Zn+2	2.110E+03	
Selected Minerals								
Al[OH]3[a]	Birnessite	CuCO3[s]	Huntite	Otavite	Wairakite			
alpha-TCP	Brucite	Diopside	hydrozincite	Pb2V2O7	Witherite			
Analbite	Ca2Zn[PO4]2	Dolomite	Magnesite	Pb3[VO4]2	Zn[OH]2[B]			
Anglesite	CaCu2[PO4]2	Fe_Vanadate	Manganite	PbMoO4[c]	ZnCO3:H2O			
Anhydrite	Calcite	Fe2[OH]4SeO3	NiCO3[s]	Rhodochrosite				
Ba[SCr]O4[96%SO4]	CaMoO4[c]	Ferrihydrite	Nsutite	Strontianite				
BaSrSO4[50%Ba]	Cerrusite	Fluorite	OCP	Talc				

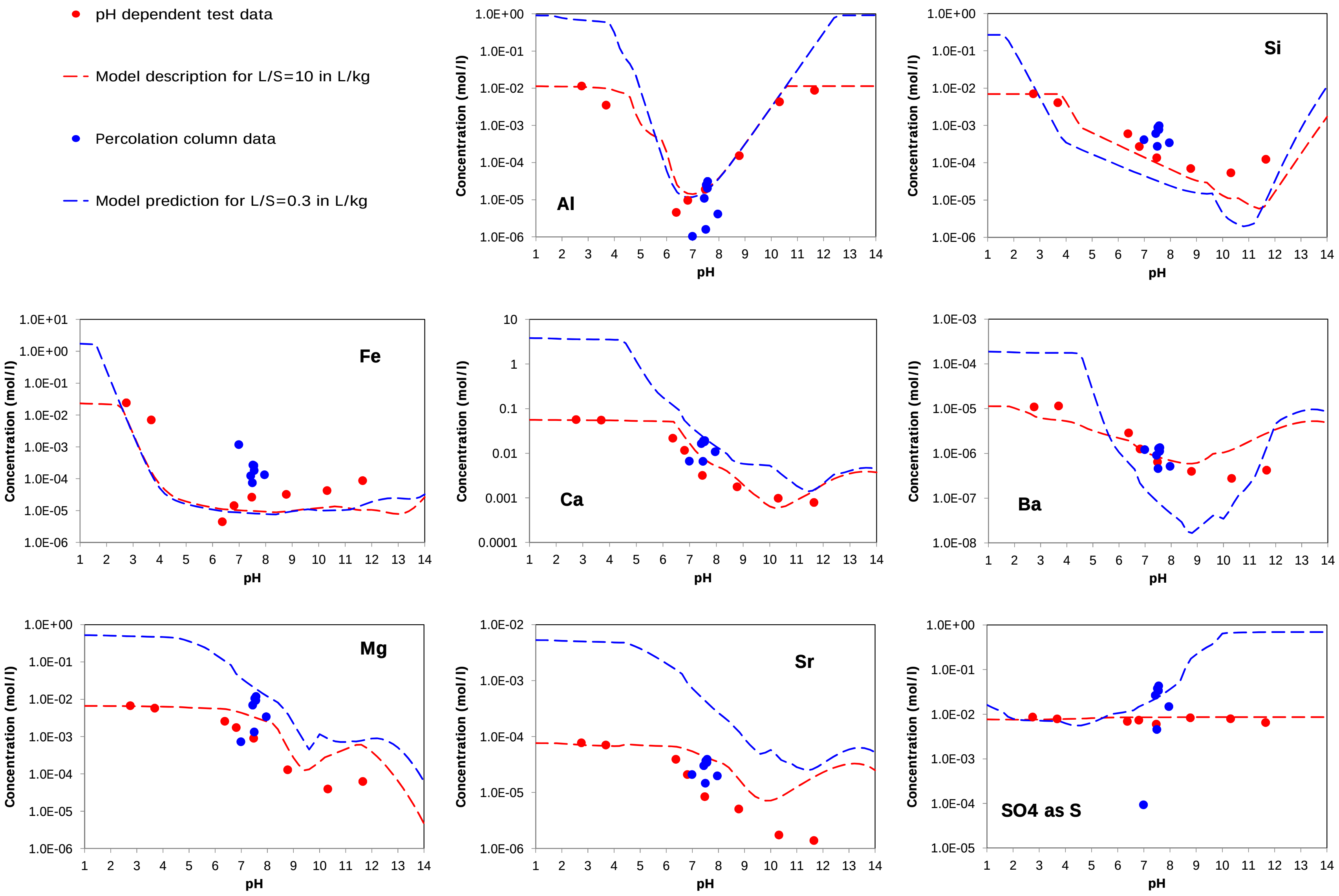

Figure A-13. Chemical speciation model for constituents in inorganic waste landfill material.

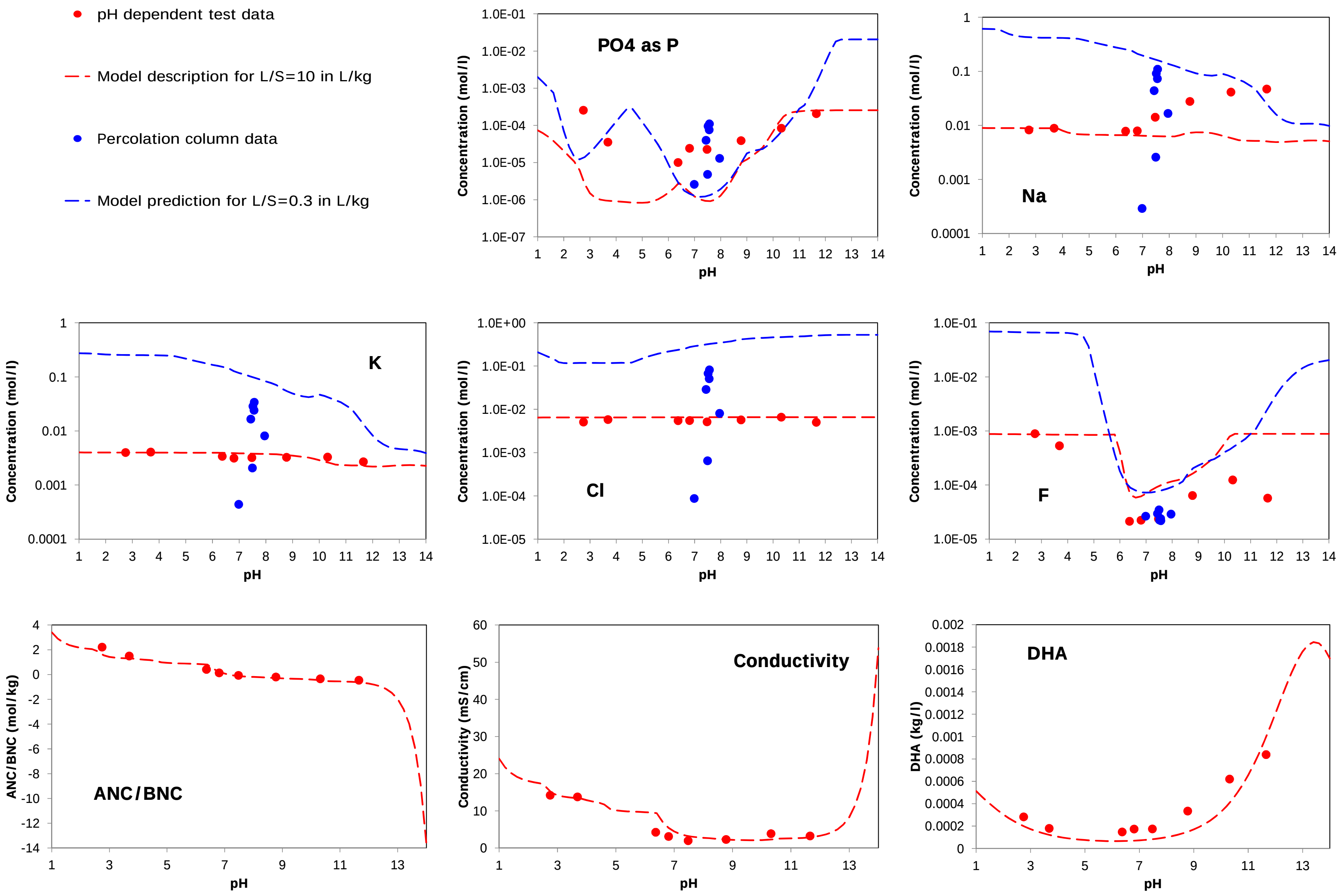

Figure A-14. Chemical speciation model for constituents in inorganic waste landfill material.

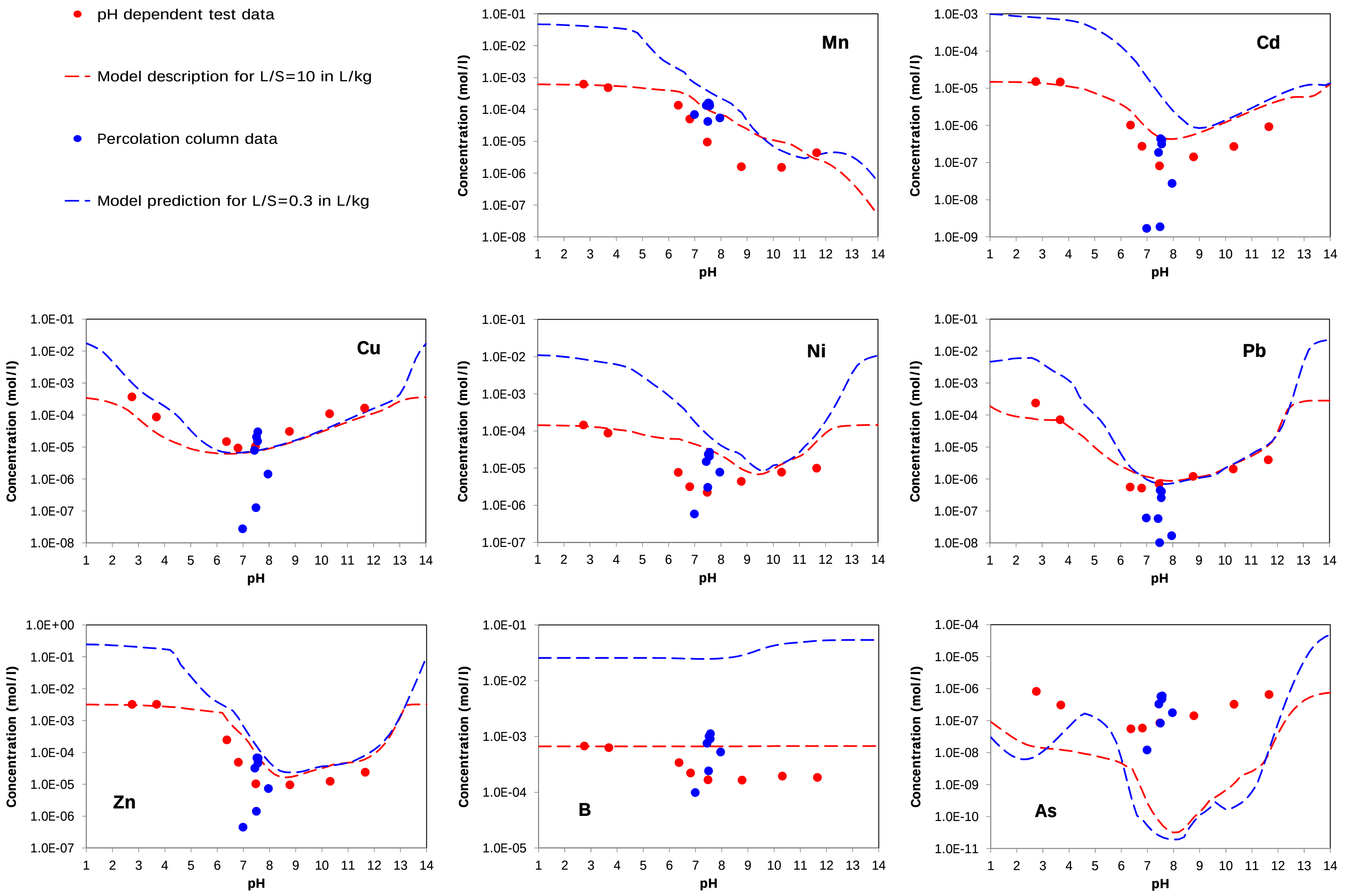

Figure A-15. Chemical speciation model for constituents in inorganic waste landfill material.

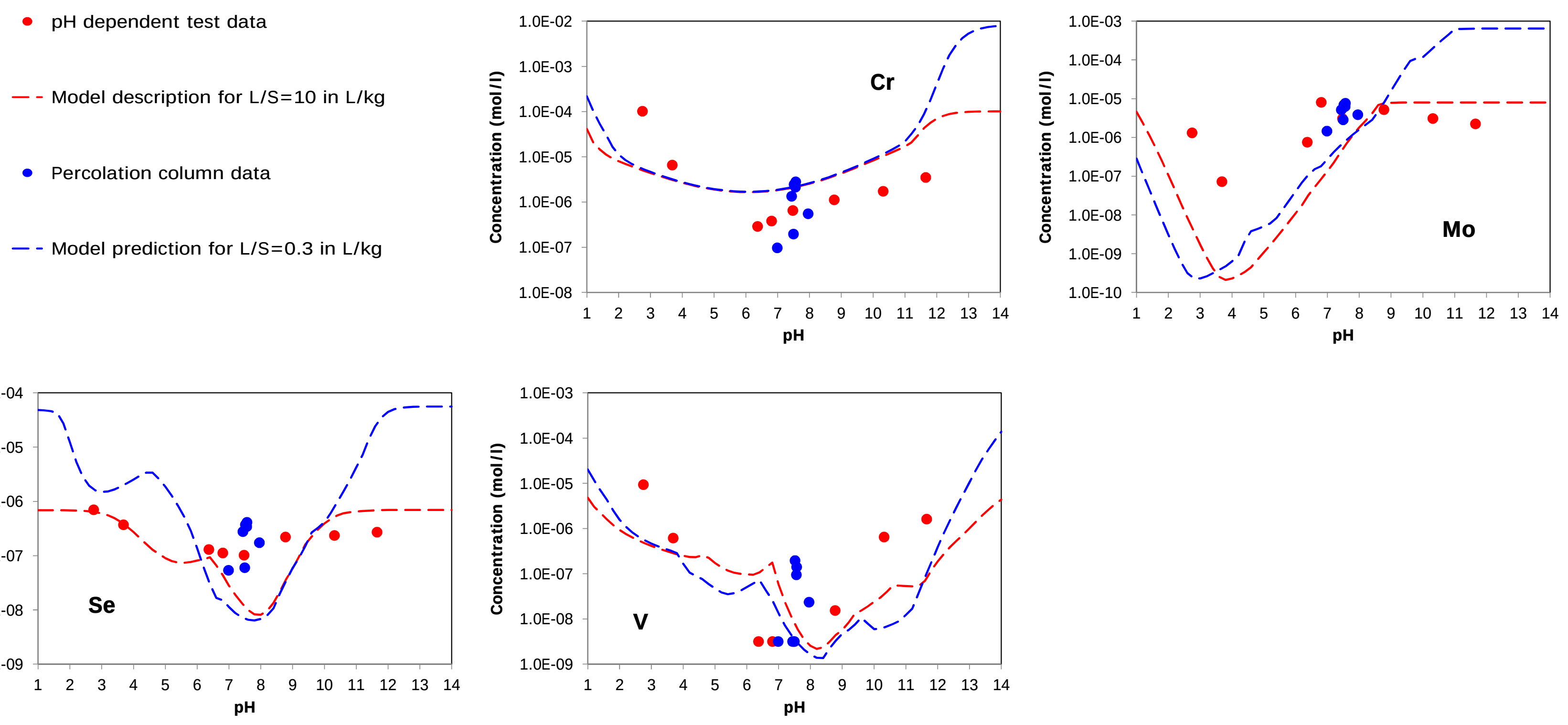

Figure A-16. Chemical speciation model for constituents in inorganic waste landfill material.

Table A-5. Chemical Speciation Fingerprint for Stabilized Waste Landfill Material (The Netherlands).

Chemical Speciation Fingerprint - Stabilised Waste							**LeachXS**	**2012**
Prediction case	LtoF Stabised waste		**DOC/DHA data**					
Speciation session	Stabilised waste		**pH**	**[DOC] (kg/l)**	**DHA fraction**	**[DHA] (kg/l)**	**Polynomial coeficients**	
Material	Stabilised waste NL (P,6,1)		1.00	4.000E-06	0.20	8.000E-07	**C0**	-6.006E+00
			3.60	3.200E-06	0.20	6.400E-07	**C1**	-7.827E-02
Solved fraction DOC	0.2		4.78	3.100E-06	0.20	6.200E-07	**C2**	4.355E-03
Sum of pH and pe	13.00		6.06	1.900E-06	0.20	3.800E-07	**C3**	5.802E-05
L/S	10.0000		7.28	2.400E-06	0.20	4.800E-07	**C4**	0.000E+00
Clay	0.000E+00	**kg/kg**	7.80	2.200E-06	0.20	4.400E-07	**C5**	0.000E+00
HFO	1.000E-05	**kg/kg**	9.50	3.100E-06	0.20	6.200E-07		
SHA	5.000E-04	**kg/kg**	10.30	2.300E-06	0.20	4.600E-07		
Percolation material	Stabilised waste NL (C,15,1)		11.69	3.000E-06	0.20	6.000E-07		
Avg L/S first perc. fractions	0.2222	**l/kg**	14.00	4.000E-06	0.20	8.000E-07		
Reactant concentrations								
Reactant	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	
Ag+	not measured	CrO4-2	9.690E+00	Mg+2	3.903E+03	SO4-2	1.066E+04	
Al+3	6.056E+03	Cu+2	3.650E+02	Mn+2	1.750E+02	Sb[OH]6-	4.920E+00	
H3AsO4	1.450E-01	F-	1.904E+03	MoO4-2	7.700E+00	SeO4-2	4.600E-01	
H3BO3	5.947E+01	Fe+3	7.393E+01	Na+	2.563E+04	H4SiO4	3.556E+03	
Ba+2	1.933E+01	H2CO3	1.500E+04	NH4+	not measured	Sr+2	2.060E+02	
Br-	8.338E+02	Hg+2	not measured	Ni+2	9.290E+00	Th+4	not measured	
Ca+2	8.362E+04	I-	not measured	NO3-	not measured	UO2+	not measured	
Cd+2	1.782E+02	K+	3.381E+04	PO4-3	4.740E+00	VO2+	5.800E-01	
Cl-	5.350E+04	Li+	2.452E+01	Pb+2	9.551E+02	Zn+2	8.015E+03	
Selected Minerals								
AA_2CaO_Al2O3_8H2O[s]			AA_CaO_Al2O3_10H2O[s]		BaSrSO4[50%Ba]		Pb[OH]2[C]	
AA_2CaO_Al2O3_SiO2_8H2O[s]			AA_CO3-hydrotalcite		Cd[OH]2[A]		Pb2V2O7	
AA_2CaO_Fe2O3_SiO2_8H2O[s]			AA_Fe[OH]3[microcr]		Corkite		Pb3[VO4]2	
AA_3CaO_Al2O3[Ca[OH]2]0_5_[CaCO3]0_5_11_5H2O[s]			AA_Gibbsite		Cr[OH]3[C]		PbCrO4	
AA_3CaO_Al2O3_CaCO3_11H2O[s]			AA_Gypsum		CSH_ECN		PbMoO4[c]	
AA_3CaO_Al2O3_CaSO4_12H2O[s]			AA_Jennite		Cu[OH]2[s]		Plgummite[1]	
AA_3CaO_Fe2O3_CaCO3_11H2O[s]			AA_Magnesite		Fe_Vanadate		Rhodochrosite	
AA_4CaO_Al2O3_13H2O[s]			AA_Portlandite		Fluorite		Strontianite	
AA_Al[OH]3[am]			AA_Syngenite		Laumontite		Wairakite	
AA_Brucite			AA_Tricarboaluminate		Manganite		Willemite	
AA_Calcite			Analbite		Ni[OH]2[s]			

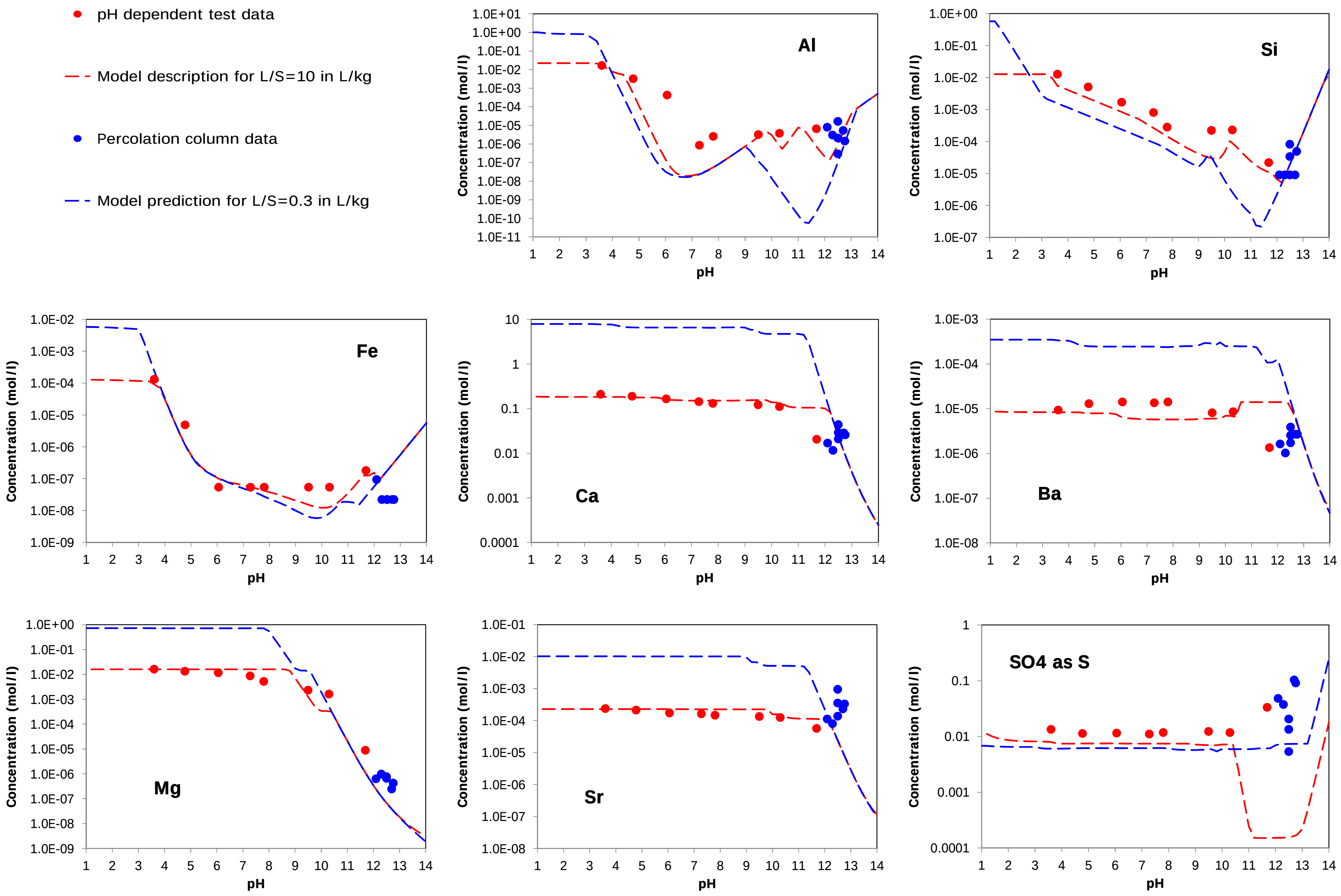

Figure A-17. Chemical speciation model for constituents in stabilized waste landfill material.

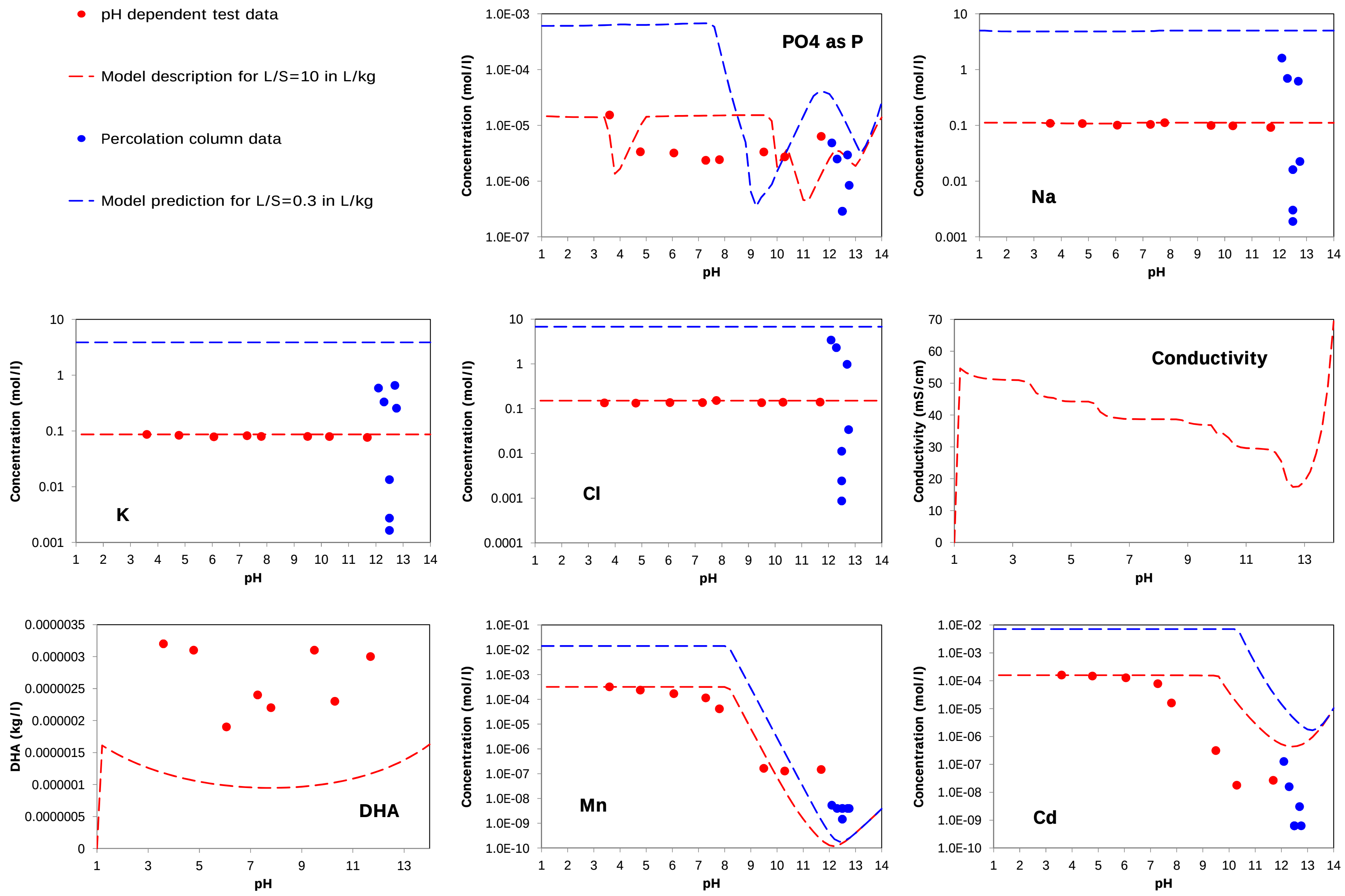

Figure A-18. Chemical speciation model for constituents in stabilized waste landfill material.

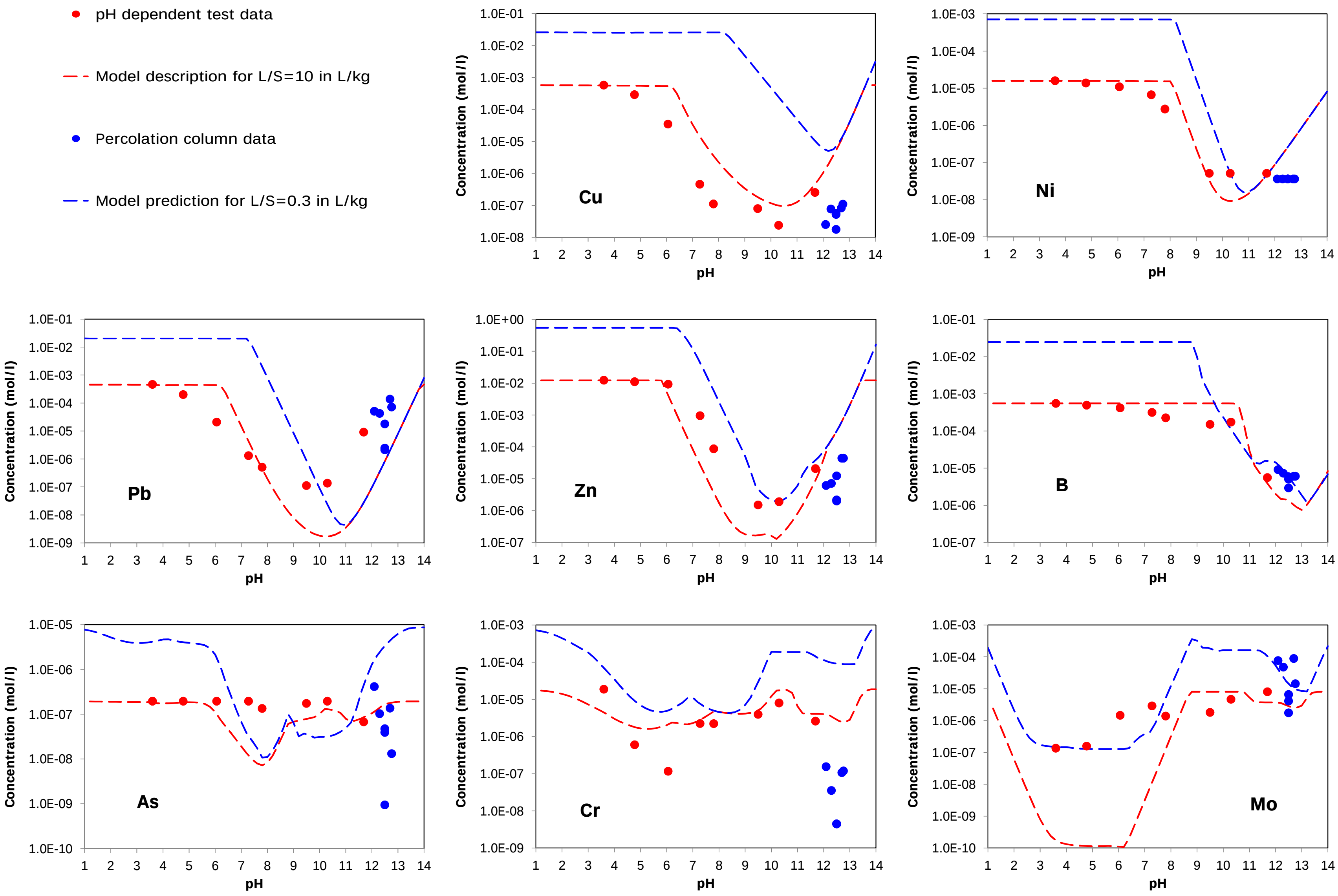

Figure A-19. Chemical speciation model for constituents in stabilized waste landfill material.

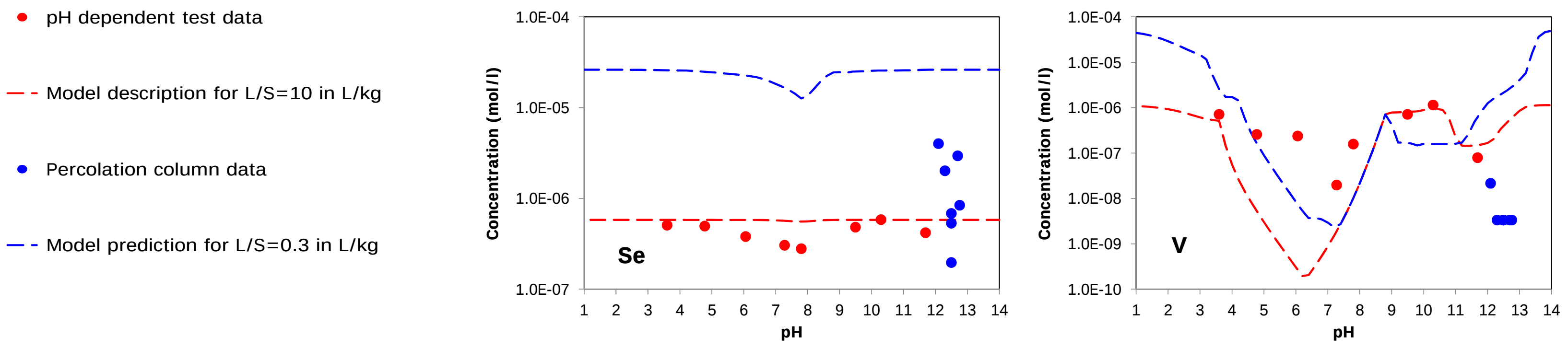

Figure A-20. Chemical speciation model for constituents in stabilized waste landfill material.

Table A-6. Chemical Speciation Fingerprint for Concrete.

Chemical Speciation Fingerprint - Cement Mortar							**LeachXS**	**2012**
Prediction case	LTF Cement Mortar CEM I		**DOC/DHA data**					
Speciation session	Cement Mortar CEM I		**pH**	**[DOC] (kg/l)**	**DHA fraction**	**[DHA] (kg/l)**	**Polynomial coeficients**	
Material	Cement Mortar CEM I_SCCC (P,1,1)		1.00	2.000E-07	0.20	4.000E-08	**C0**	-7.398E+00
			2.10	2.000E-07	0.20	4.000E-08	**C1**	0.000E+00
Solved fraction DOC	0.2		5.10	2.000E-07	0.20	4.000E-08	**C2**	0.000E+00
Sum of pH and pe	17.00		7.10	2.000E-07	0.20	4.000E-08	**C3**	0.000E+00
L/S	10.0000	**l/kg**	9.20	2.000E-07	0.20	4.000E-08	**C4**	0.000E+00
Clay	0.000E+00	**kg/kg**	11.60	2.000E-07	0.20	4.000E-08	**C5**	0.000E+00
HFO	2.000E-04	**kg/kg**	11.95	2.000E-07	0.20	4.000E-08		
SHA	2.000E-05	**kg/kg**	12.10	2.000E-07	0.20	4.000E-08		
Percolation material	Cement Mortar CEM I_SCCC (C,1,1)		12.90	2.000E-07	0.20	4.000E-08		
Avg L/S first perc. fractions	0.1455	**l/kg**	14.00	2.000E-07	0.20	4.000E-08		
Reactant concentrations								
Reactant	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	**Reactant**	**mg/kg**	
Ag+	not measured							
Al+3	5.104E+03	Cu+2	3.035E+01	MoO4-2	4.382E+00	H4SiO4	2.640E+03	
H3AsO4	2.509E+00	H2CO3	5.000E+03	Na+	4.418E+02	SO4-2	6.423E+03	
H3BO3	2.005E+01	Fe+3	3.187E+03	NH4+	not measured	Sr+2	6.665E+01	
Ba+2	1.906E+01	Hg+2	not measured	Ni+2	6.133E+00	Th+4	2.000E+00	
Br-	5.000E+01	I-	not measured	NO3-	not measured	UO2+	2.000E+00	
Ca+2	9.840E+04	K+	1.896E+03	Pb+2	4.936E+00	VO2+	3.805E+00	
Cd+2	2.262E-01	Li+	2.748E+00	PO4-3	1.051E+02	Zn+2	3.314E+01	
Cl-	1.445E+03	Mg+2	1.959E+03	Sb[OH]6-	1.892E-01			
CrO4-2	1.830E+01	Mn+2	6.325E+01	SeO4-2	2.345E-01			
Selected Minerals								
AA_2CaO_Al2O3_SiO2_8H2O[s]		AA_Calcite		AA_Tobermorite-I		Magnesite		PbMoO4[c]
AA_2CaO_Fe2O3_8H2O[s]		AA_CO3-hydrotalcite		Analbite		Manganite		Tenorite
AA_2CaO_Fe2O3_SiO2_8H2O[s]		AA_Fe[OH]3[microcr]		Ca2Cd[PO4]2		Ni[OH]2[s]		Willemite
AA_3CaO_Al2O3_6H2O[s]		AA_Gypsum		Ca4Cd[PO4]3OH		Pb[OH]2[C]		
AA_3CaO_Fe2O3_6H2O[s]		AA_Jennite		Cd[OH]2[C]		Pb2V2O7		
AA_Al[OH]3[am]		AA_Magnesite		Cr[OH]3[A]		Pb3[VO4]2		
AA_Brucite		AA_Portlandite		Fe_Vanadate		PbCrO4		

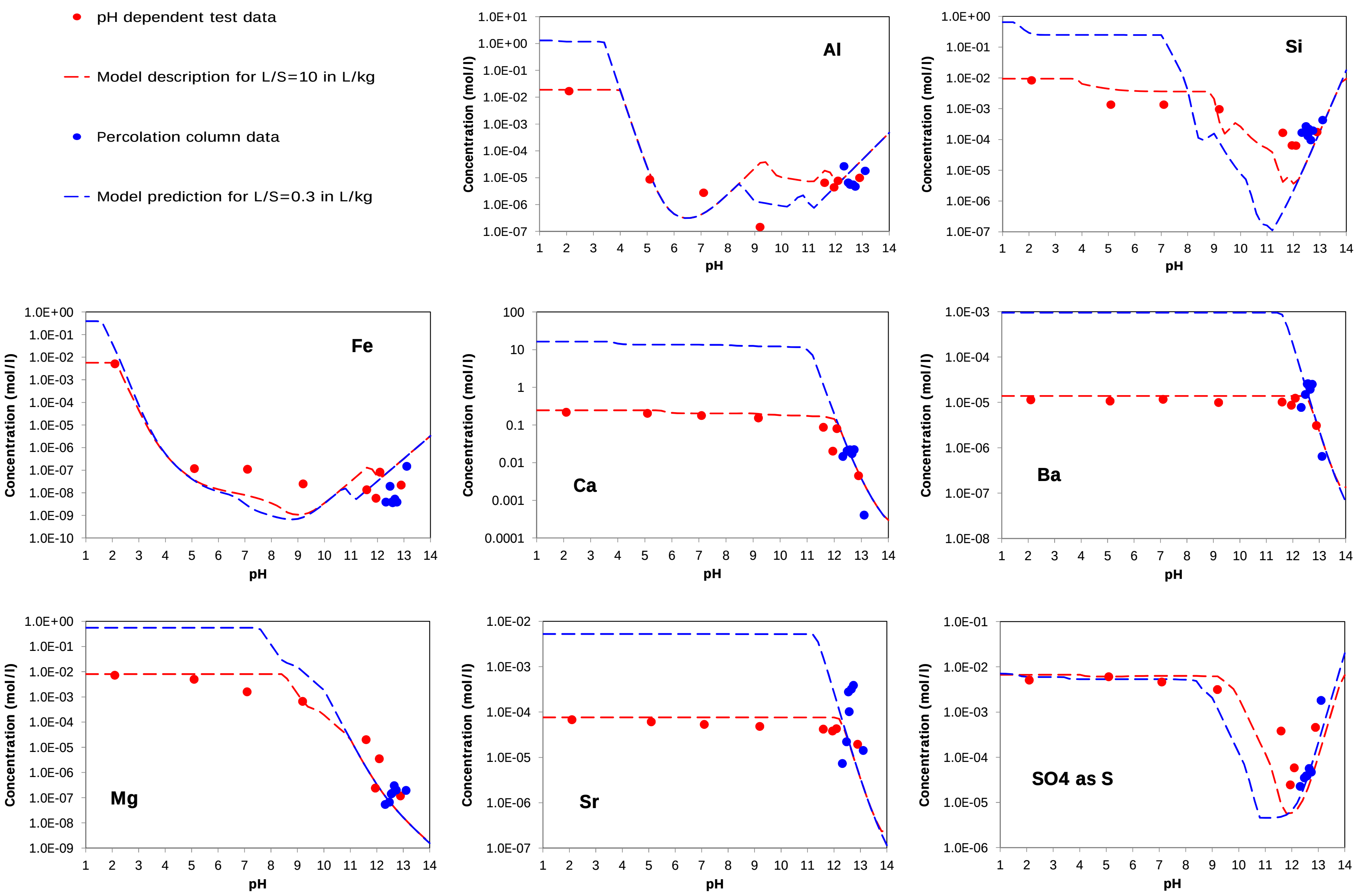

Figure A-21. Chemical speciation model for constituents in concrete.

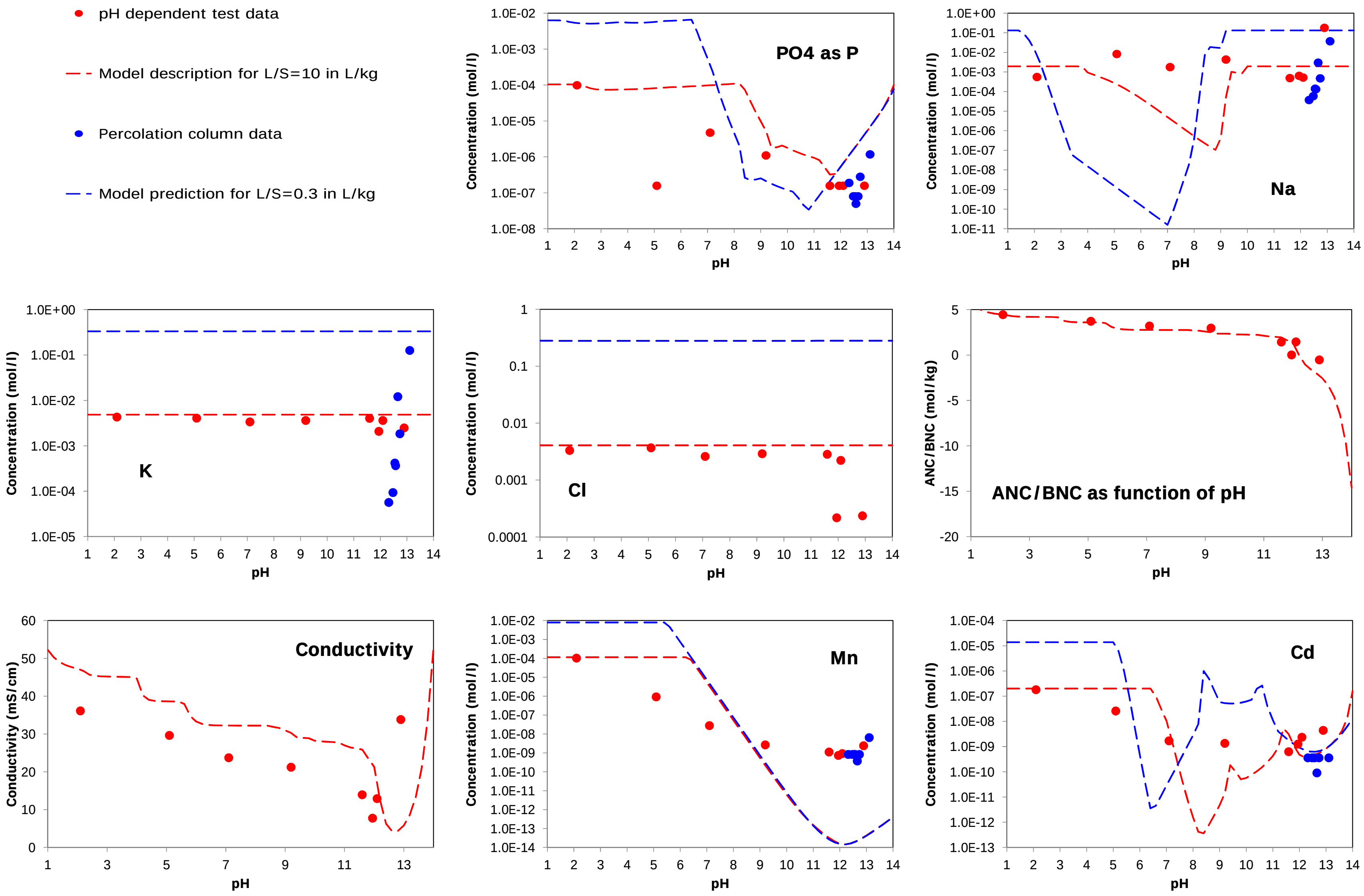

Figure A-22. Chemical speciation model for constituents in concrete.

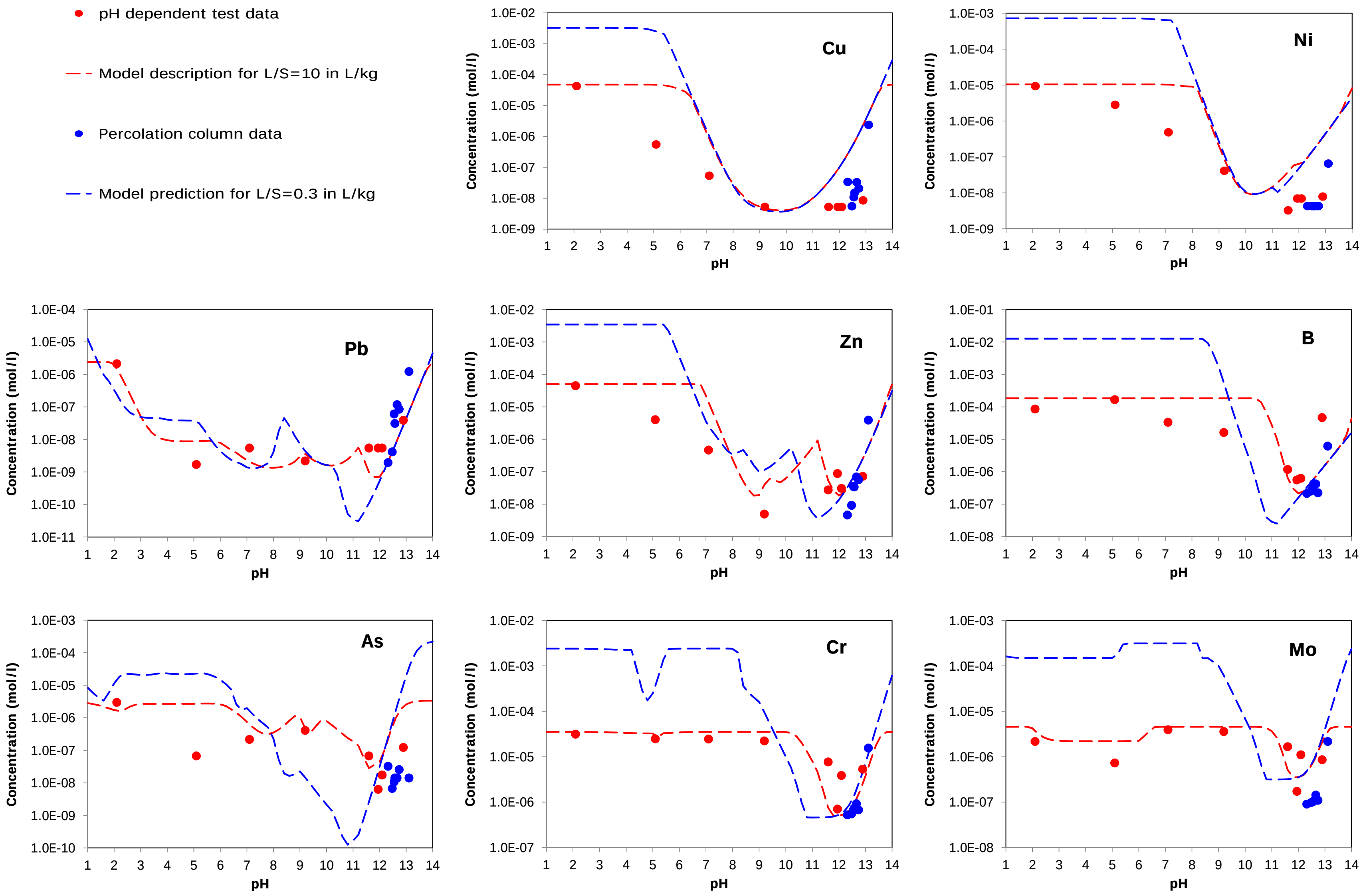

Figure A-23. Chemical speciation model for constituents in concrete.

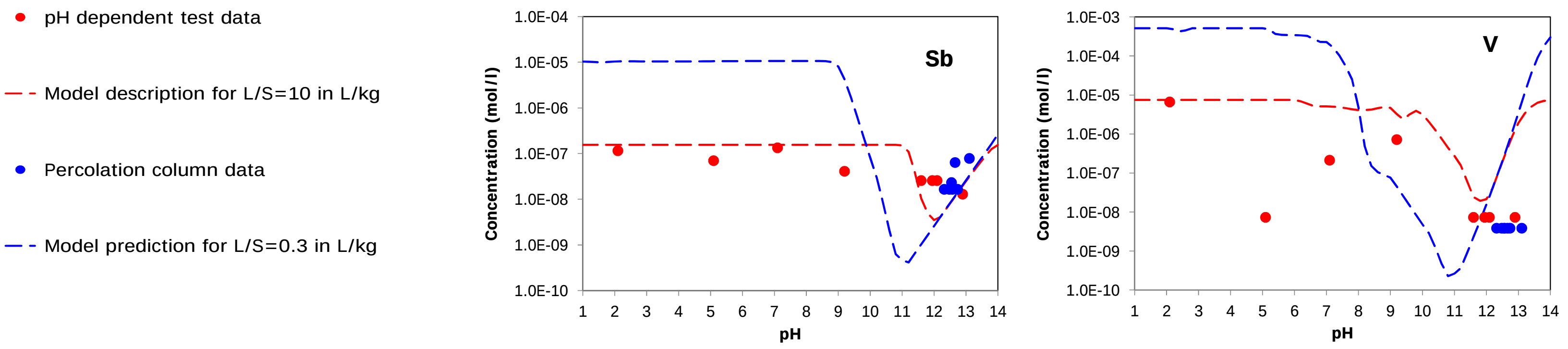

Figure A-24. Chemical speciation model for constituents in concrete.

APPENDIX B. COAL COMBUSTION FLY ASH LANDFILL LEACHATE (U.S.)

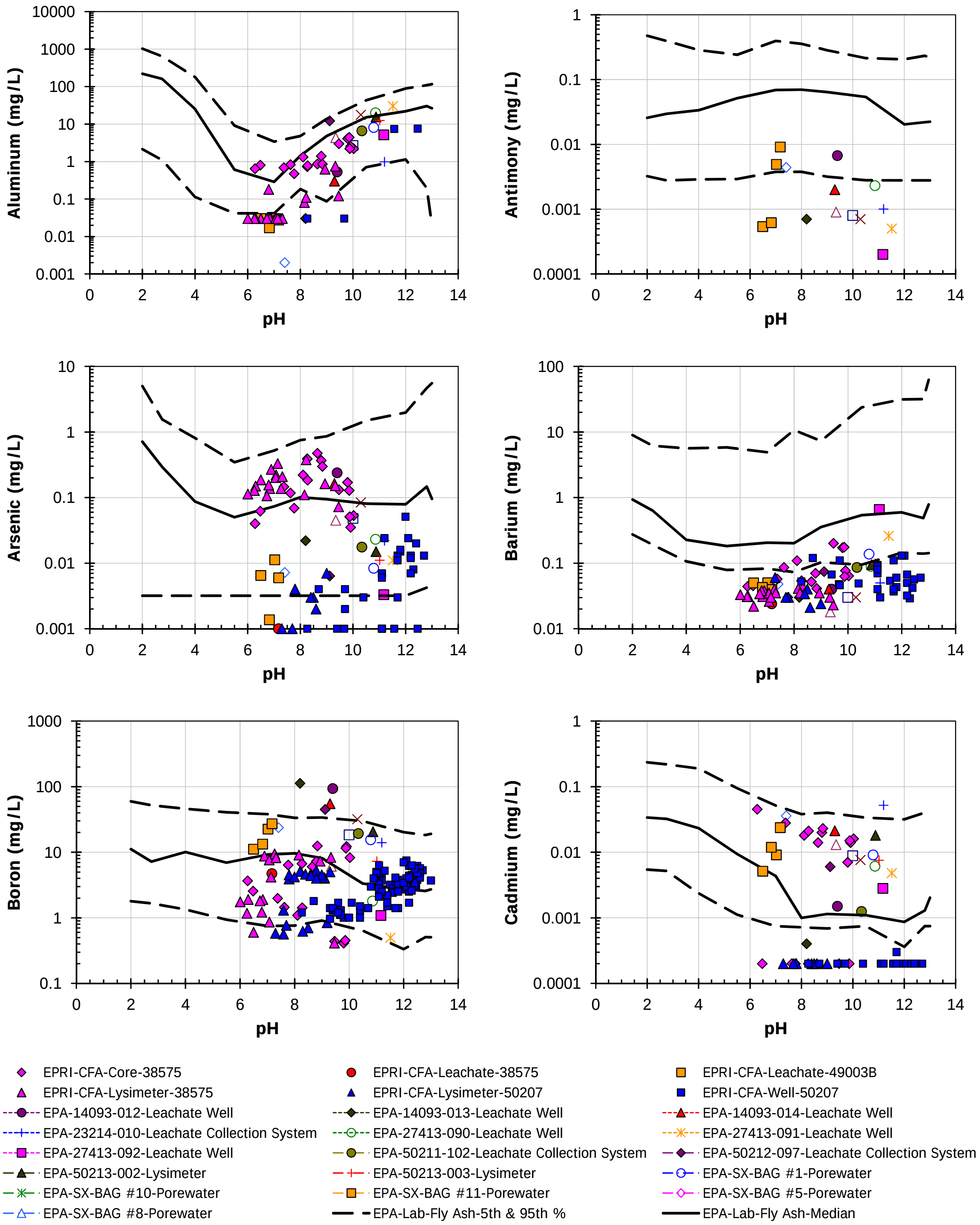

Figure B-1. Comparison of laboratory and field concentration results for coal combustion fly ash landfill (United States).

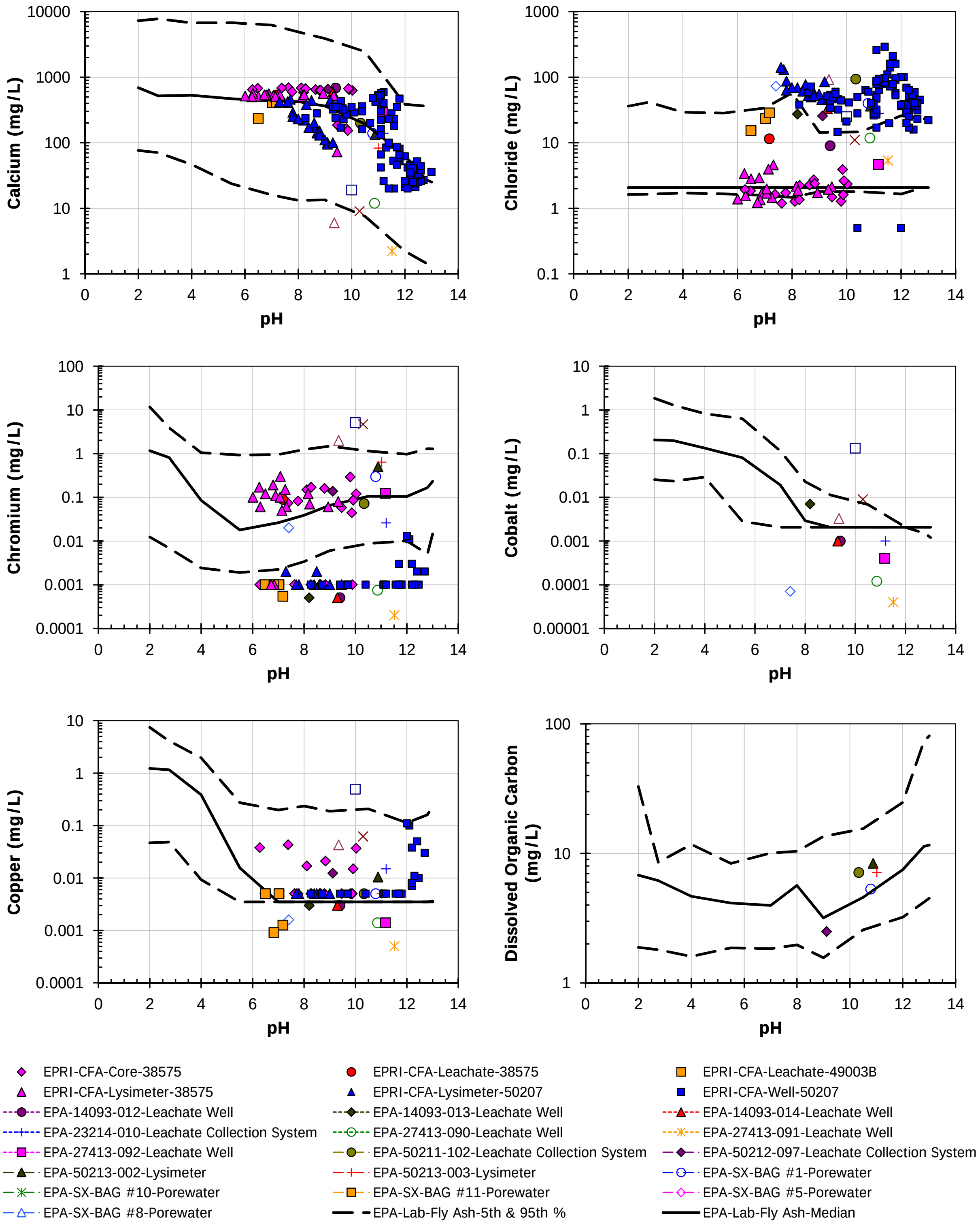

Figure B-2. Comparison of laboratory and field concentration results for coal combustion fly ash landfill (United States).

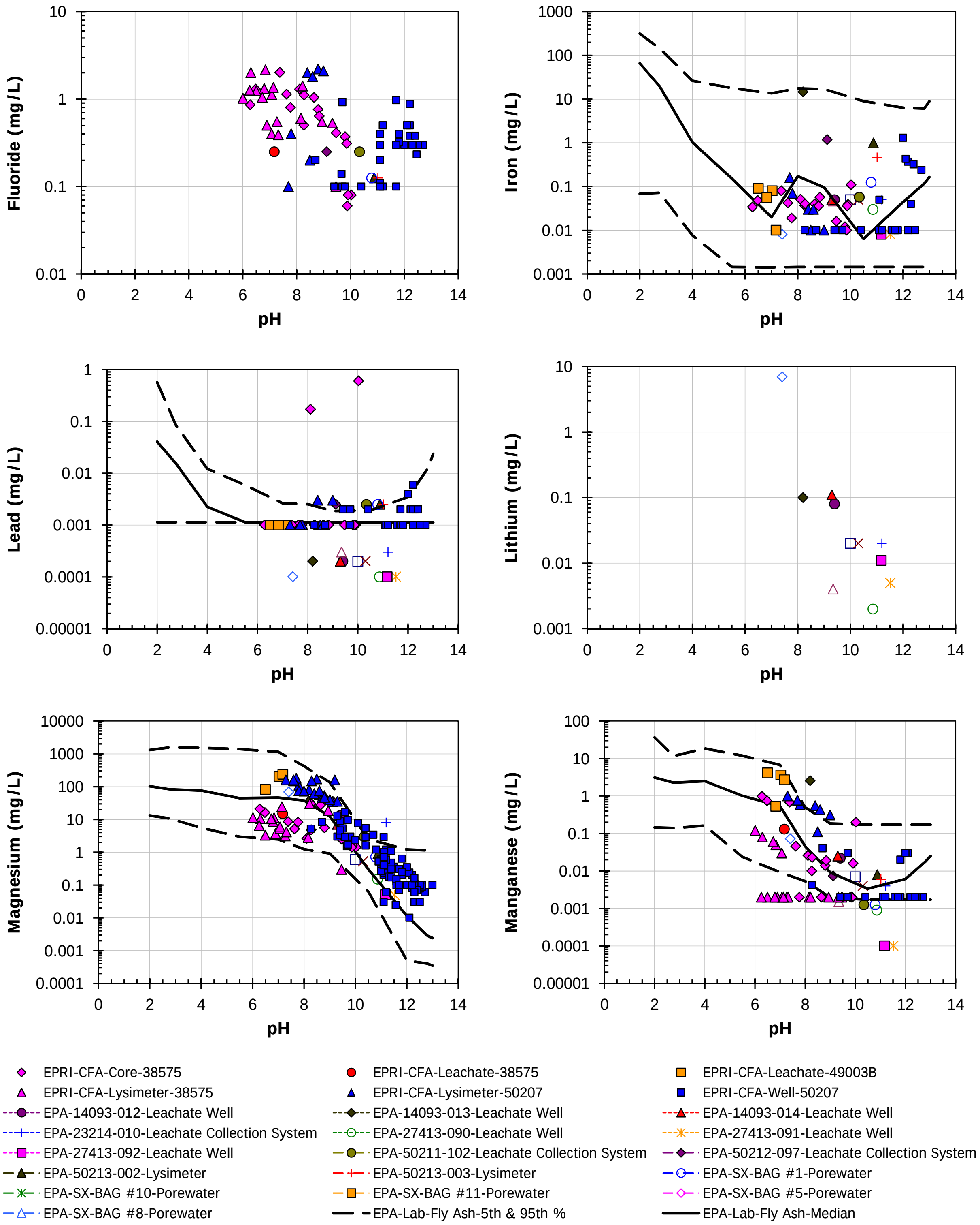

Figure B-3. Comparison of laboratory and field concentration results for coal combustion fly ash landfill (United States).

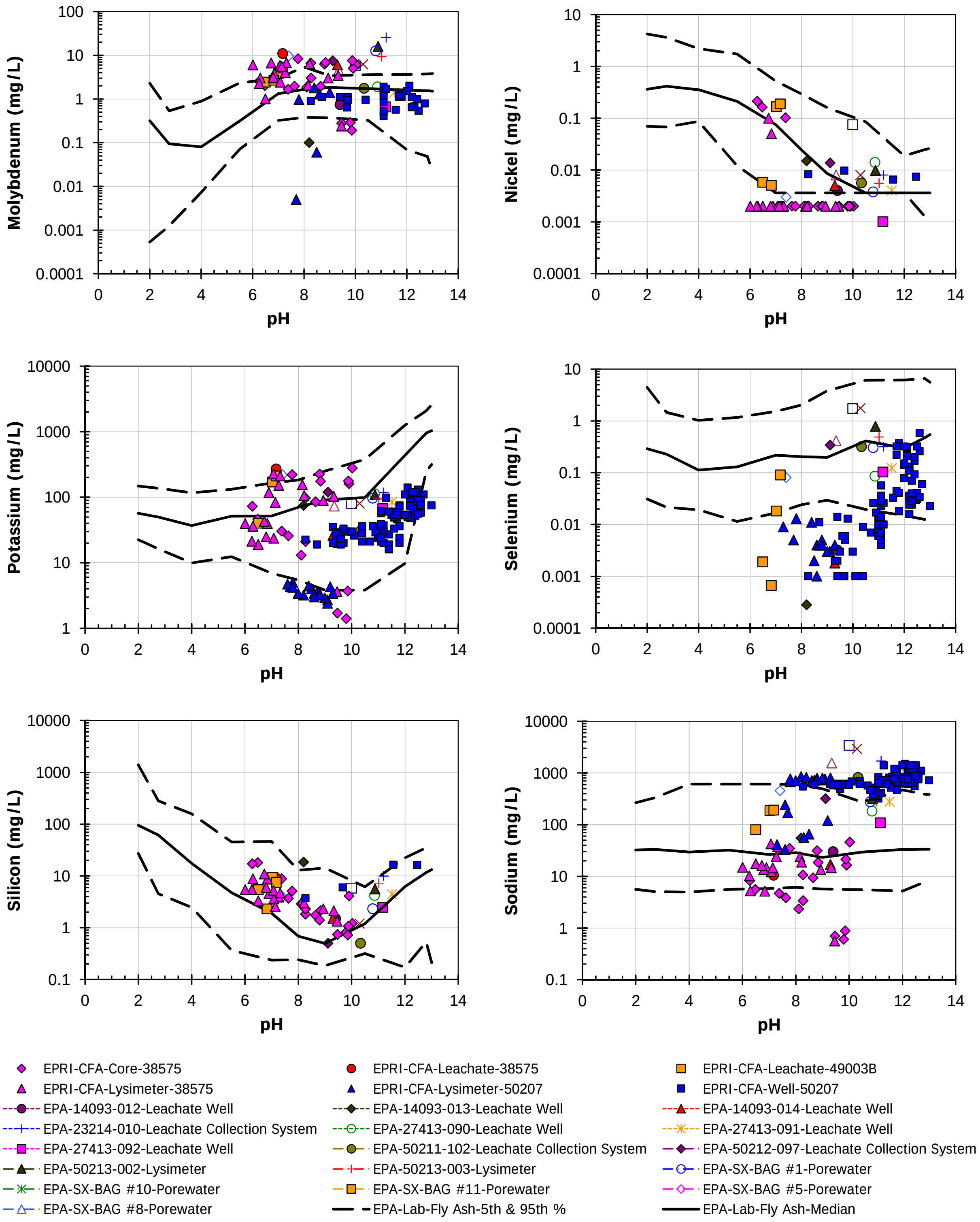

Figure B-4. Comparison of laboratory and field concentration results for coal combustion fly ash landfill (United States).

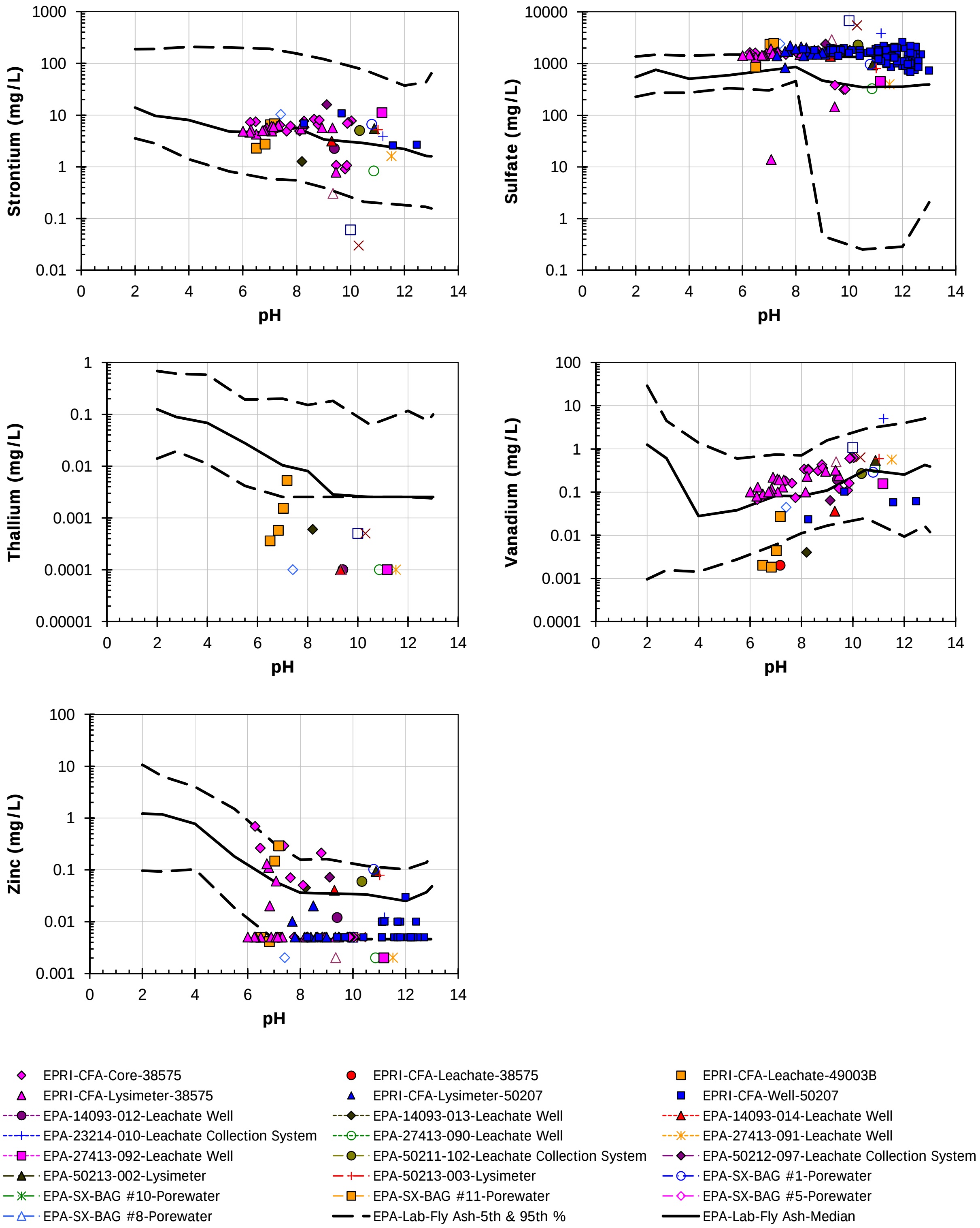

Figure B-5. Comparison of laboratory and field concentration results for coal combustion fly ash landfill (United States).

APPENDIX C. LANDFILL OF COAL COMBUSTION FIXATED SCRUBBER SLUDGE WITH LIME (UNITED STATES)

Table C-1. Data Sources for Laboratory-to-Field Comparisons for Coal Combustion Fixated Scrubber Sludge with Lime.

Legend ID	Source	Material Type	Data Type	Citation
FSSL – "as produced" (MAD)	Pub Mill (fresh 4 hr composite)	Fixated Scrubber Sludge with Lime	pH-dependence (SR002)	Sanchez et al., 2008
FSSL – Field Core (FCM)	FSSL Landfill	Core at depth (3-5 m)	pH-dependence (SR002)	EPRI, 2012 (draft)
Landfill Porewater	FSSL Landfill	Leachate	-	EPRI, 2012 (draft)

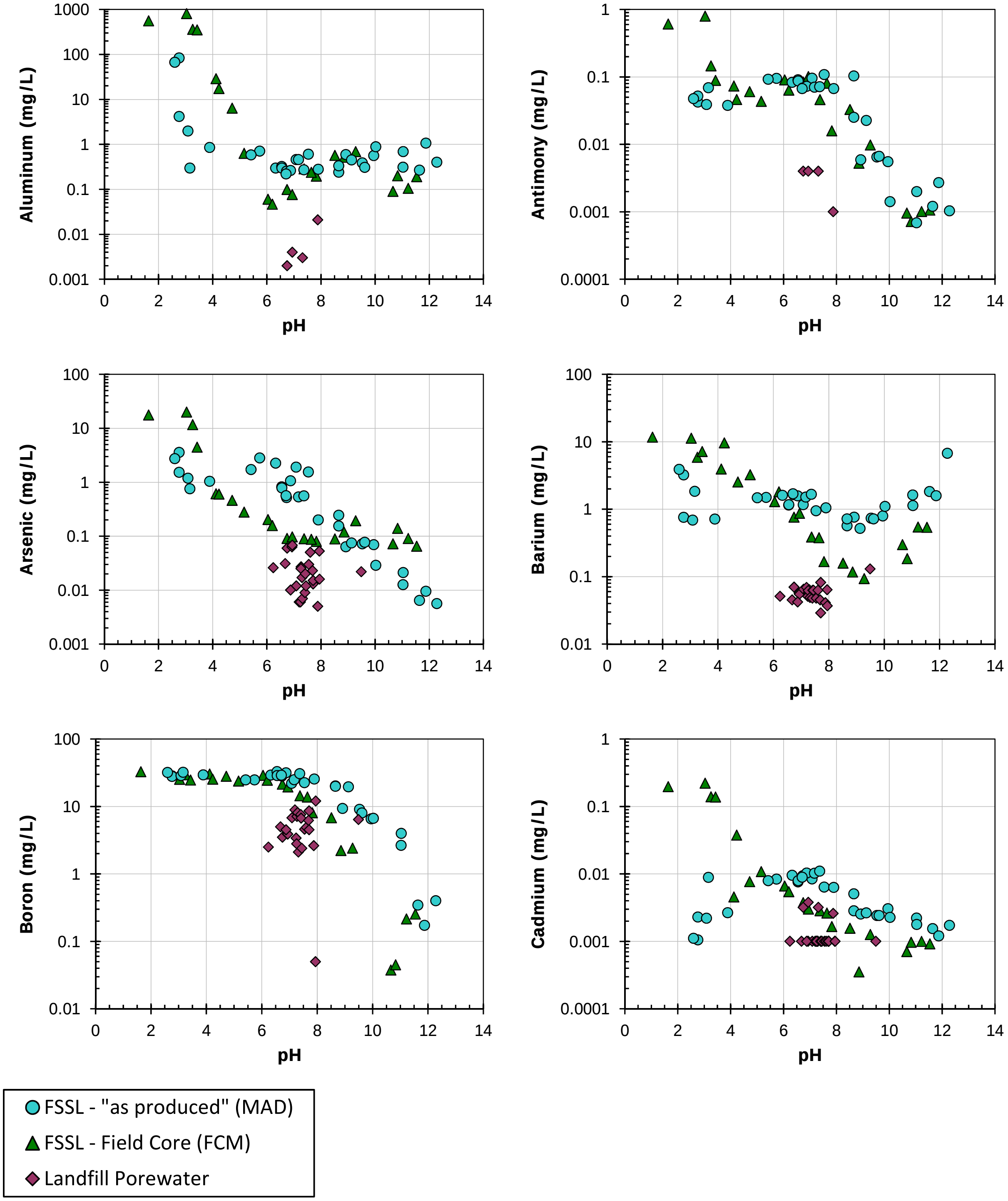

Figure C-1. **Comparison of laboratory and field concentration results for a coal combustion fixated scrubber sludge with lime (FSSL) landfill (United States).**

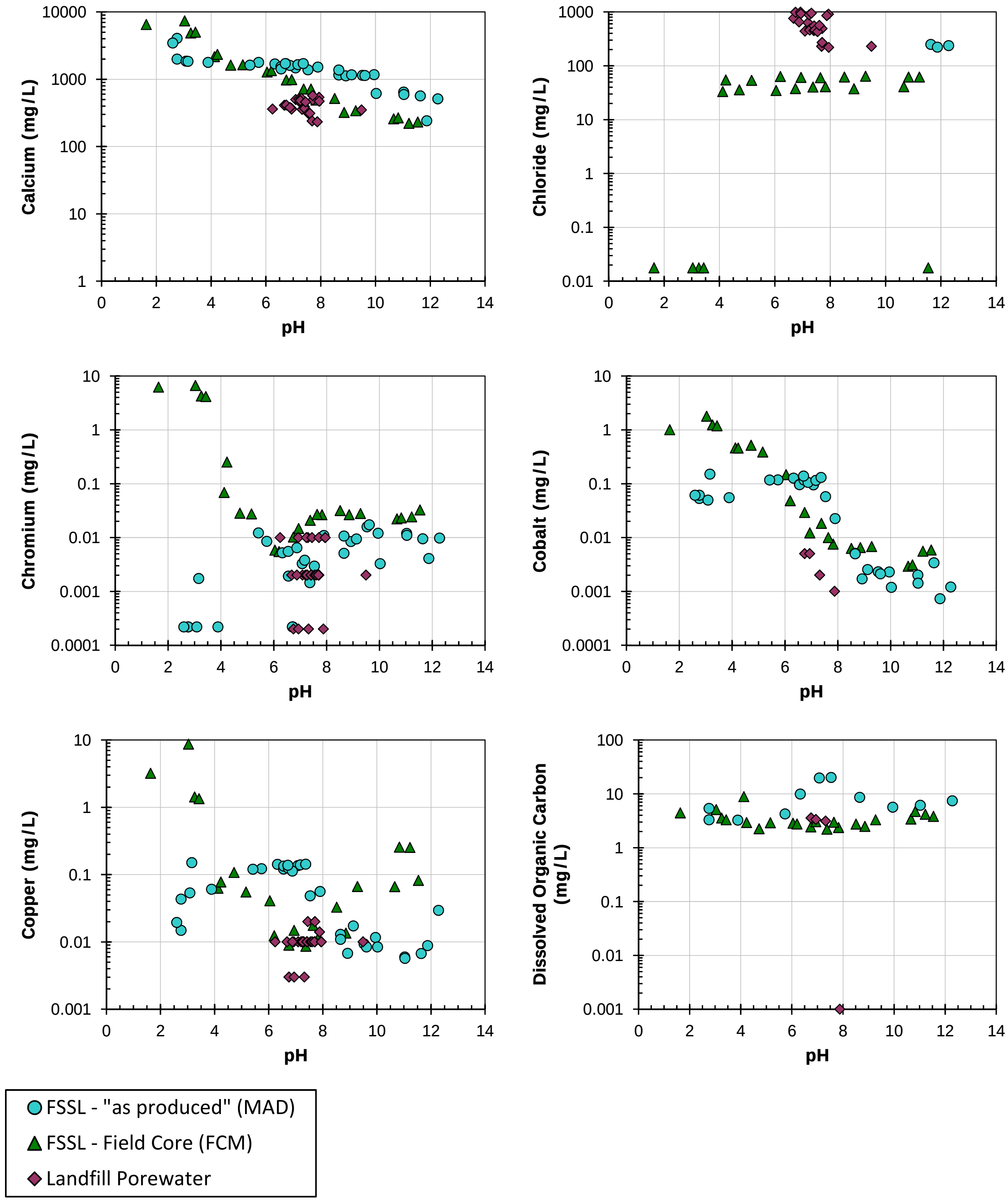

Figure C-2. **Comparison of laboratory and field concentration results for a coal combustion fixated scrubber sludge with lime (FSSL) landfill (United States).**

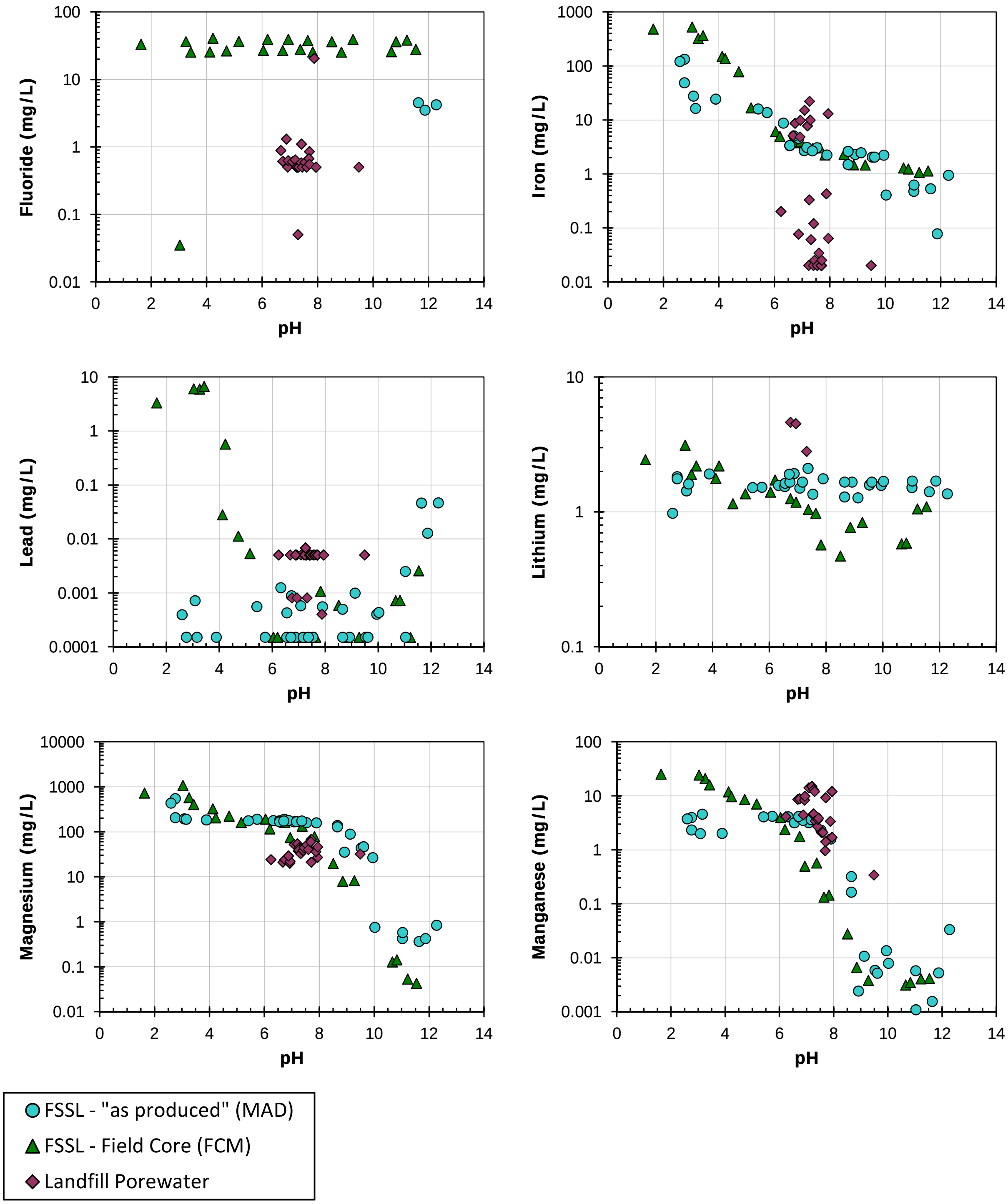

Figure C-3. Comparison of laboratory and field concentration results for a coal combustion fixated scrubber sludge with lime (FSSL) landfill (United States).

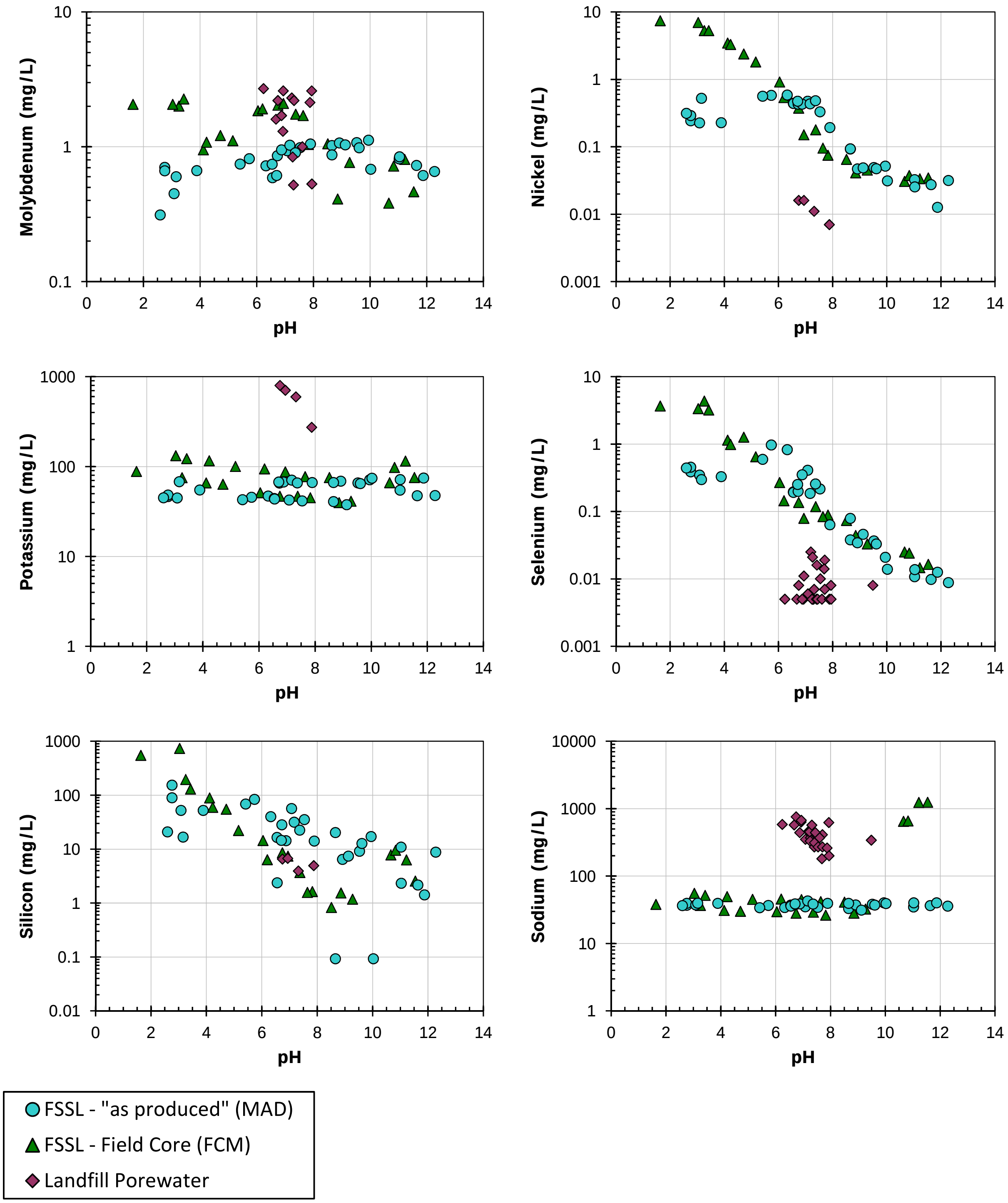

Figure C-4. **Comparison of laboratory and field concentration results for a coal combustion fixated scrubber sludge with lime (FSSL) landfill (United States).**

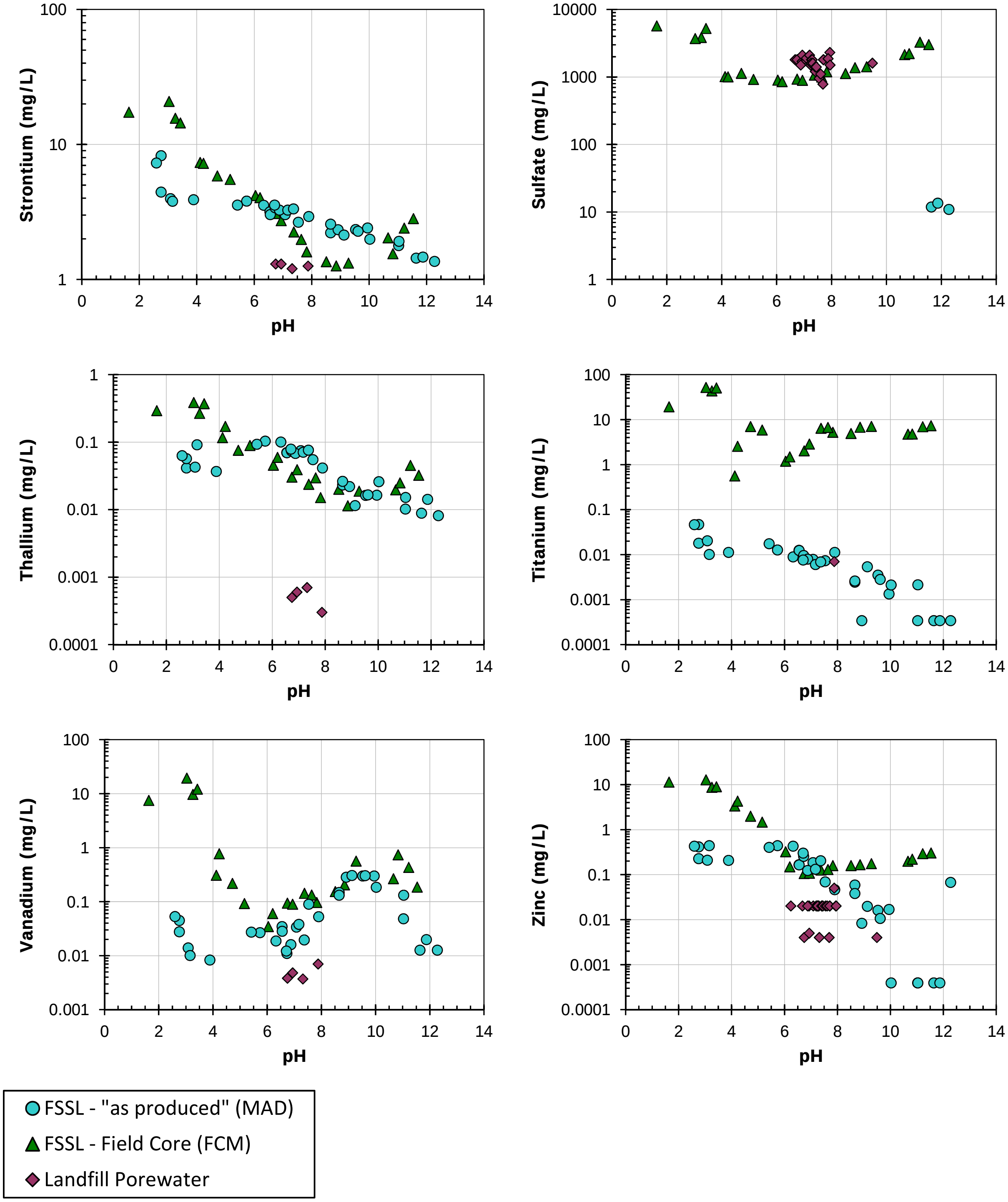

Figure C-5. Comparison of laboratory and field concentration results for a coal combustion fixated scrubber sludge with lime (FSSL) landfill (United States).

APPENDIX D. MUNICPAL SOLID WASTE INCINERATOR BOTTOM ASH LANDFILL (DENMARK)

Table D-1. Data Sources for Laboratory-to-Field Comparisons for MSWI Bottom Ash Landfill

Legend ID	Source	Material Type	Data Type	Citation
MSWI BA (AT)	Austria, MSW Incinerator	MSWI Bottom Ash	pH-dependence Percolation	van der Sloot et al., 2000b
MSWI BA (DE)	Germany, MSW Incinerator 1	MSWI Bottom Ash	pH-dependence Percolation	Berger et al., 2005
Landfill Leachate (DK)	Denmark	Field Leachate	-	Hjelmar et al., 1991
Landfill Core (DK)	Denmark	Landfill Core	Batch L/S	Meima, 1997
MSWI BA (NL)	The Netherlands	MSWI Bottom Ash	pH-dependence Percolation	ECN ongoing studies on MSWI BA
MSWI BA (IT)	Italy	MSWI Bottom Ash	pH-dependence Percolation	ECN ongoing studies on MSWI BA (Italian client)
MSWI BA (UK)	UK, MSW Incinerator	MSWI Bottom Ash	pH-dependence Percolation	ECN studies on UK MSWI BA

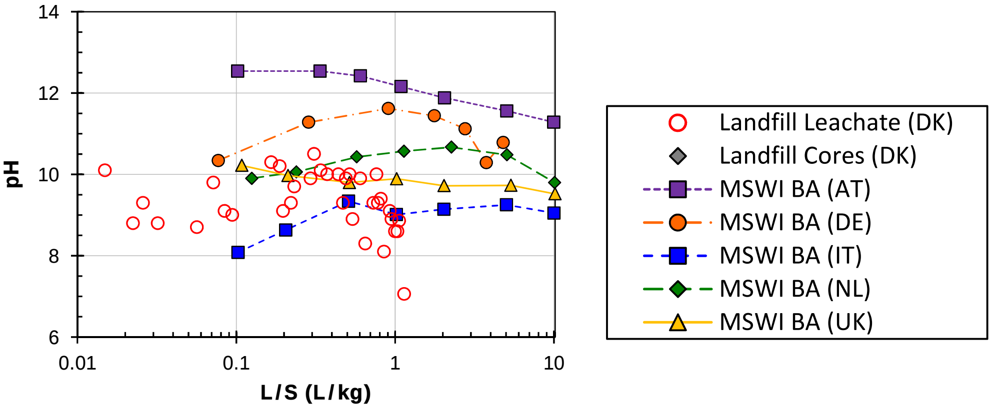

Figure D-1. Eluate pH from leachates from the Vestkoven monofill (red circles) compared to the percolation column pH for comparable bottom ash samples (solid symbols).

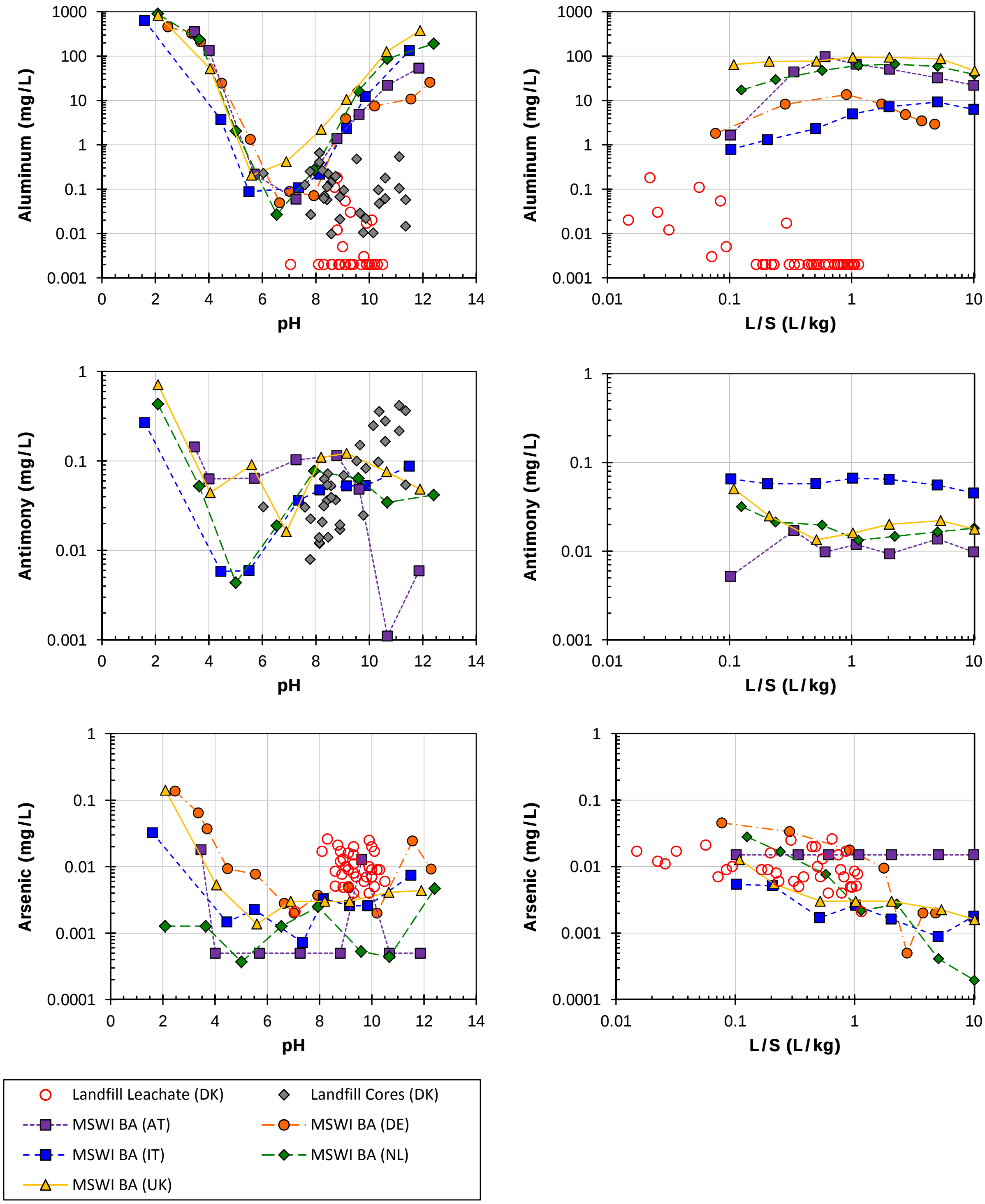

Figure D-2. Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).

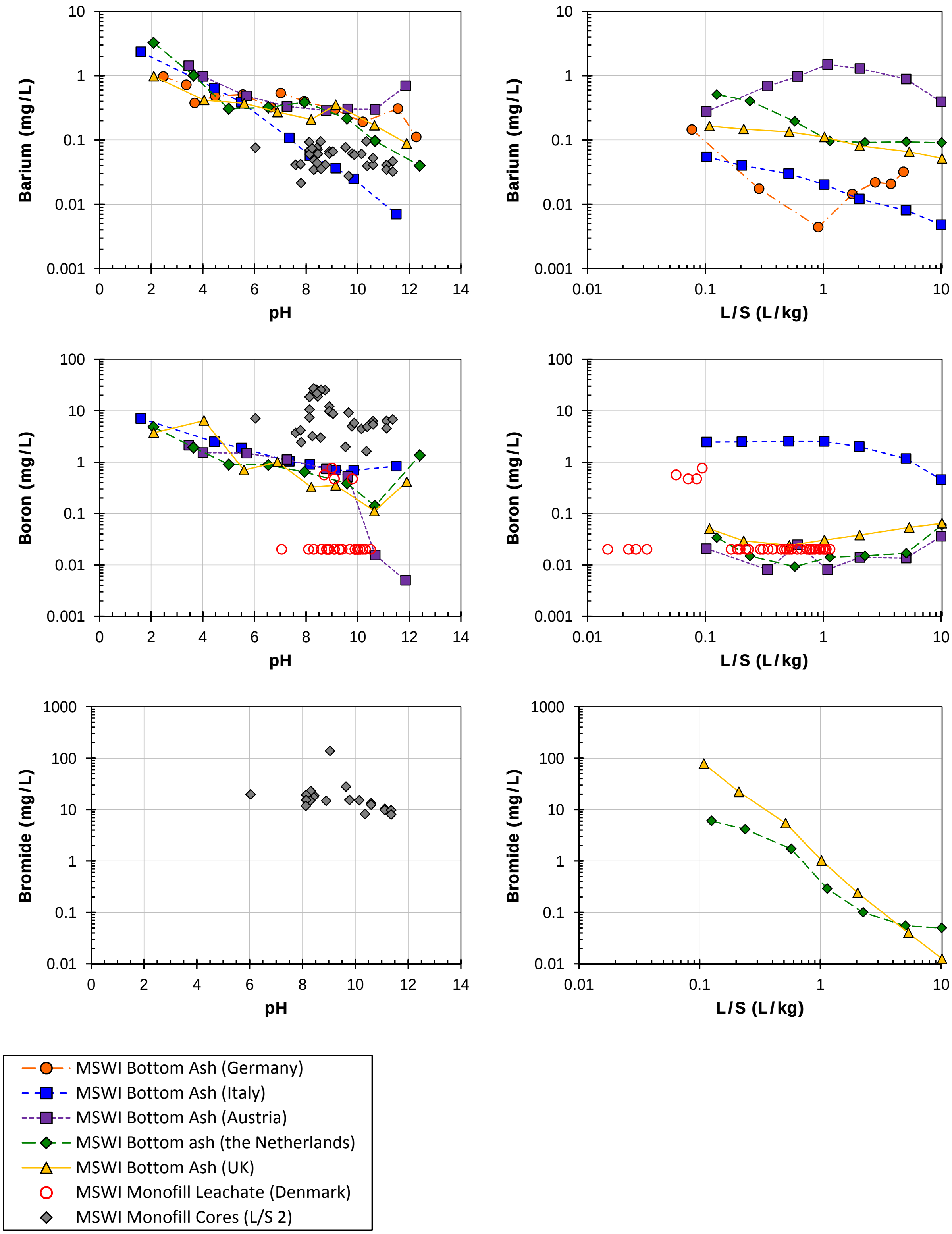

Figure D-3. Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).

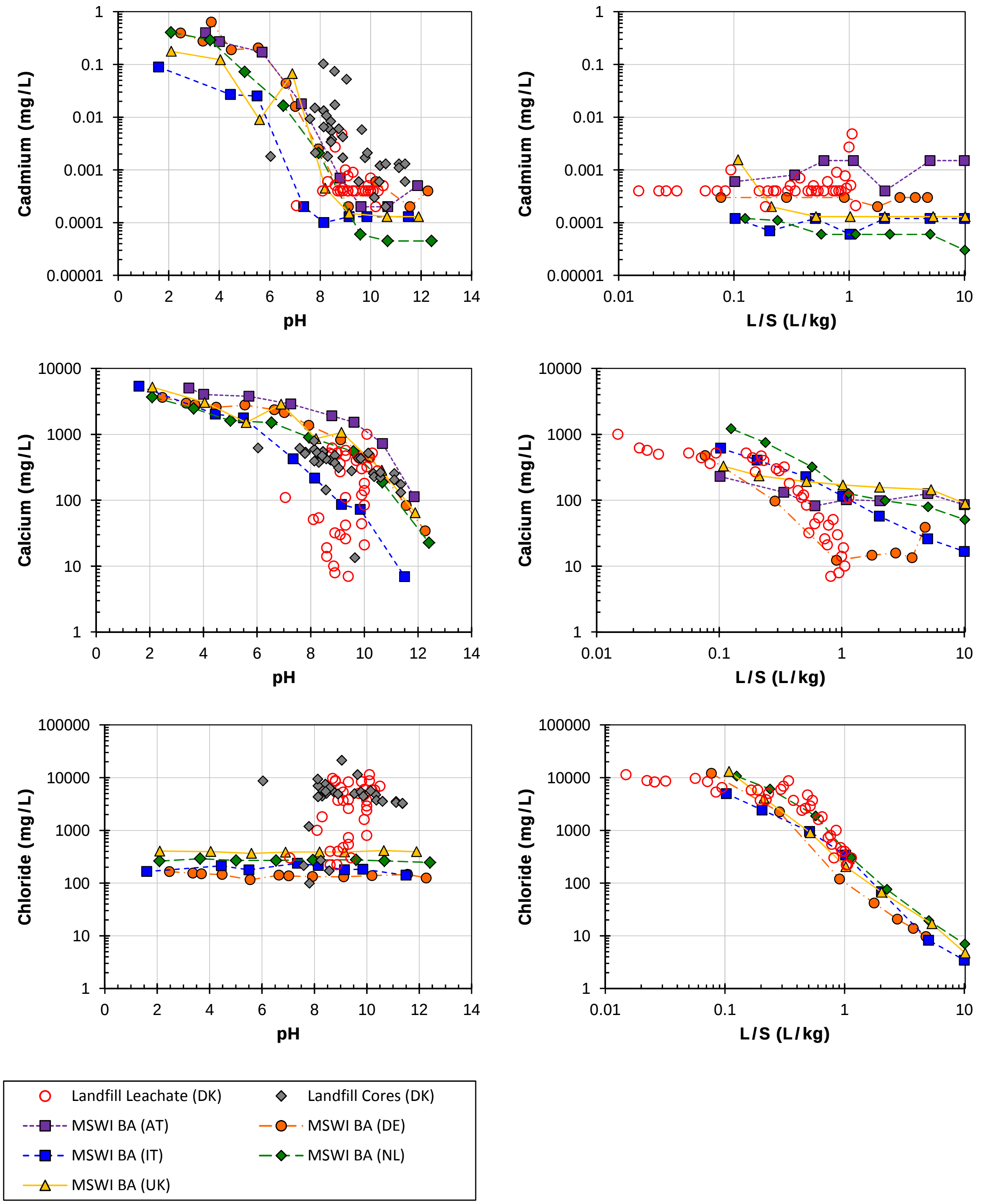

Figure D-4. **Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).**

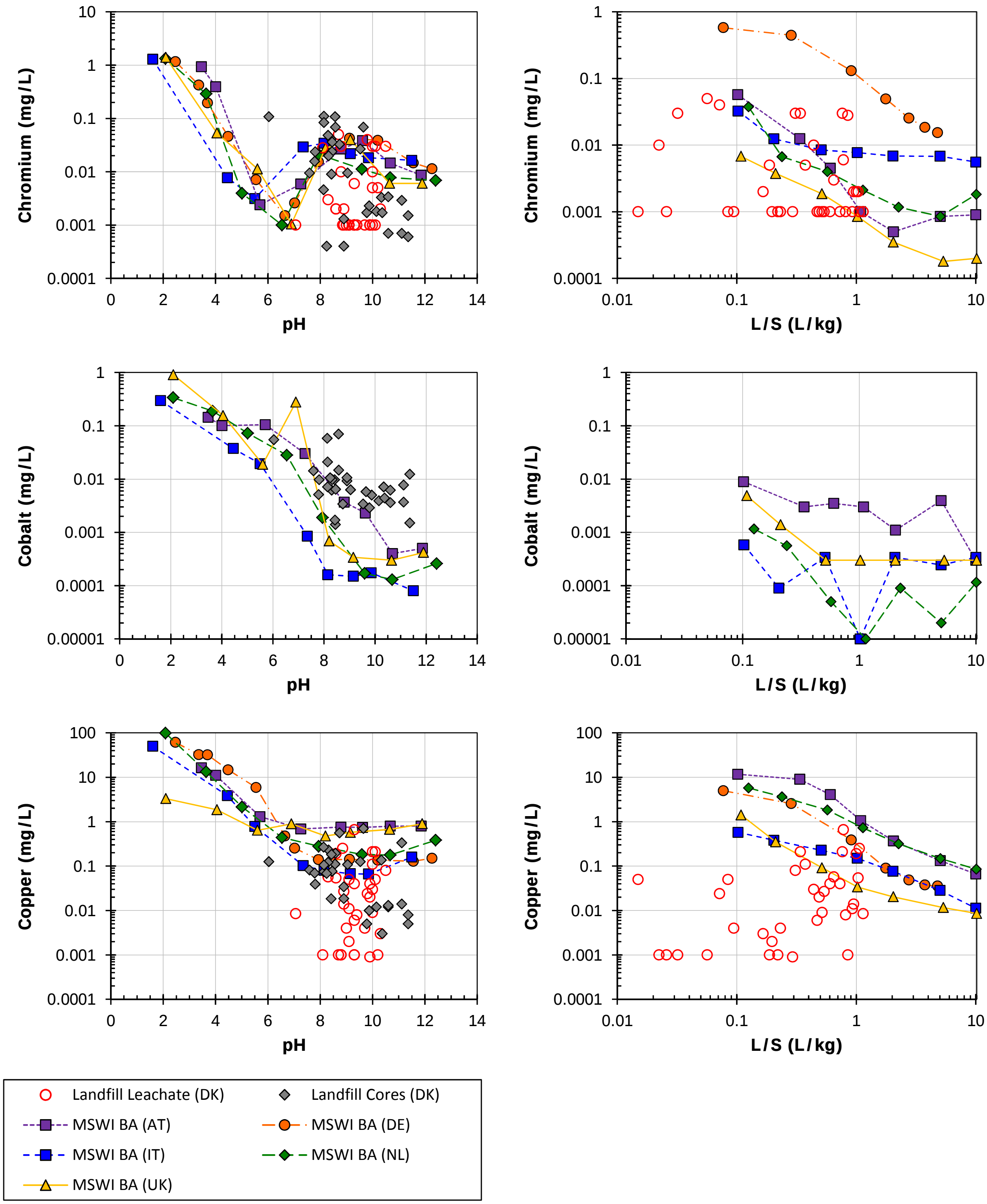

Figure D-5. Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).

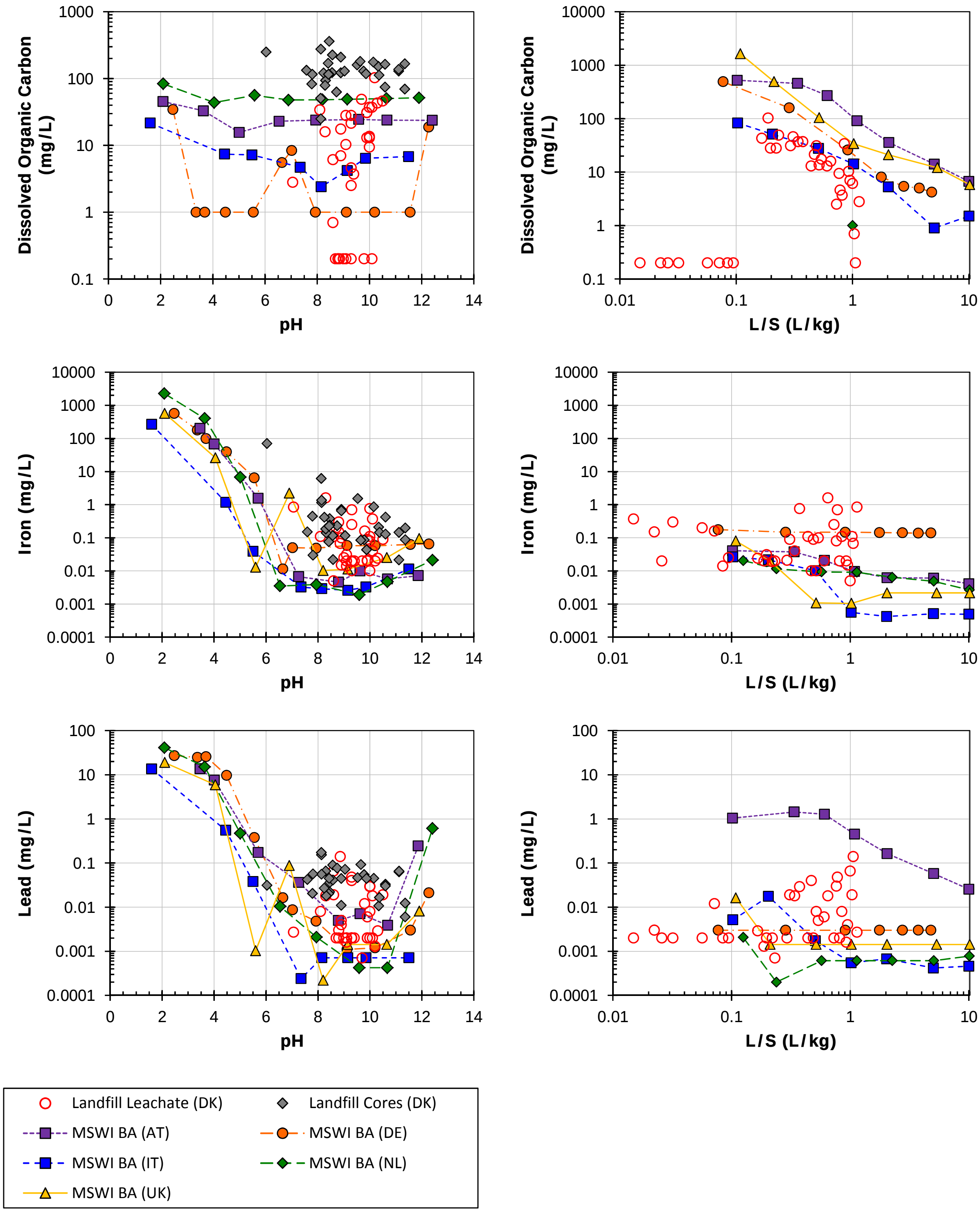

Figure D-6. Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).

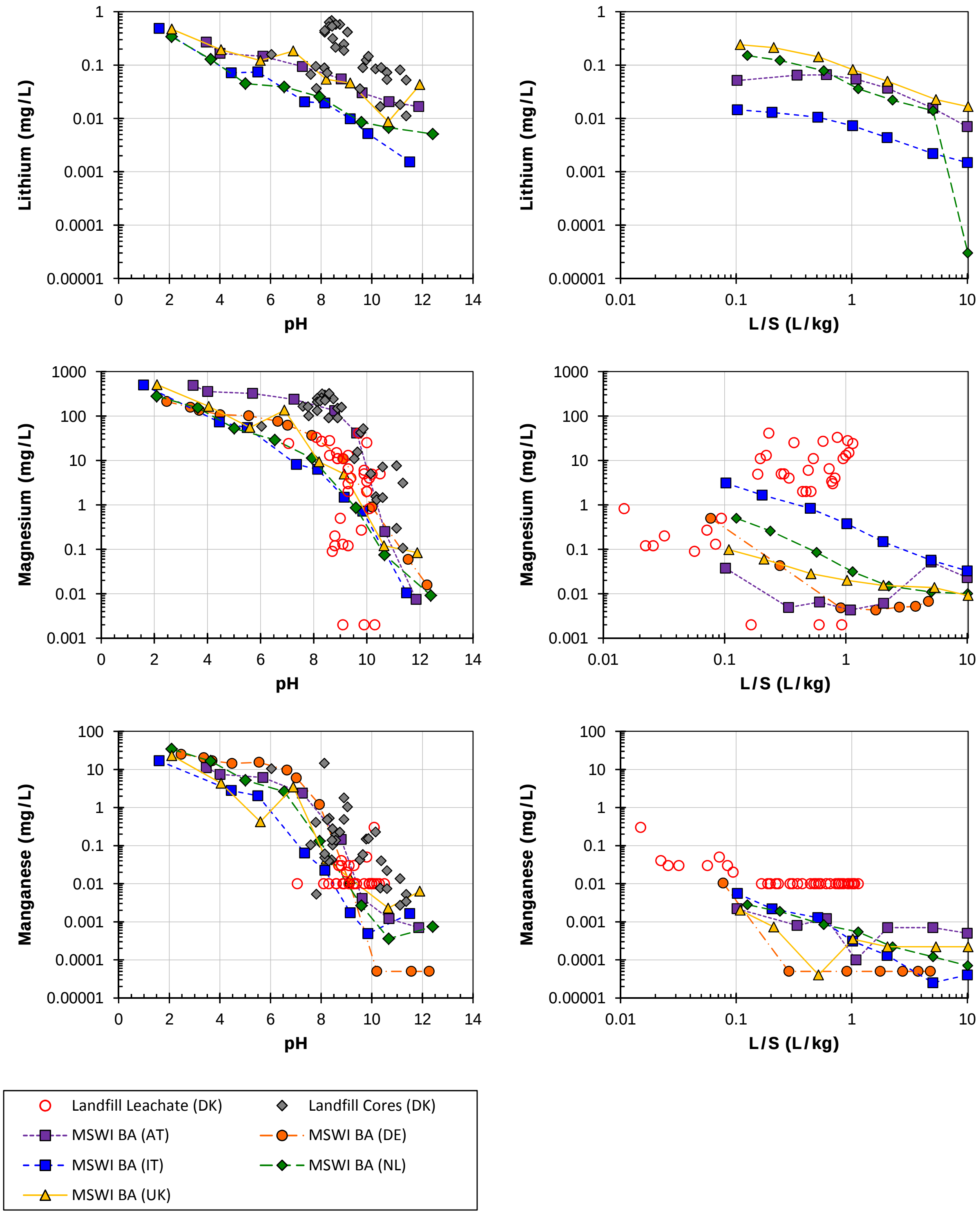

Figure D-7. Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).

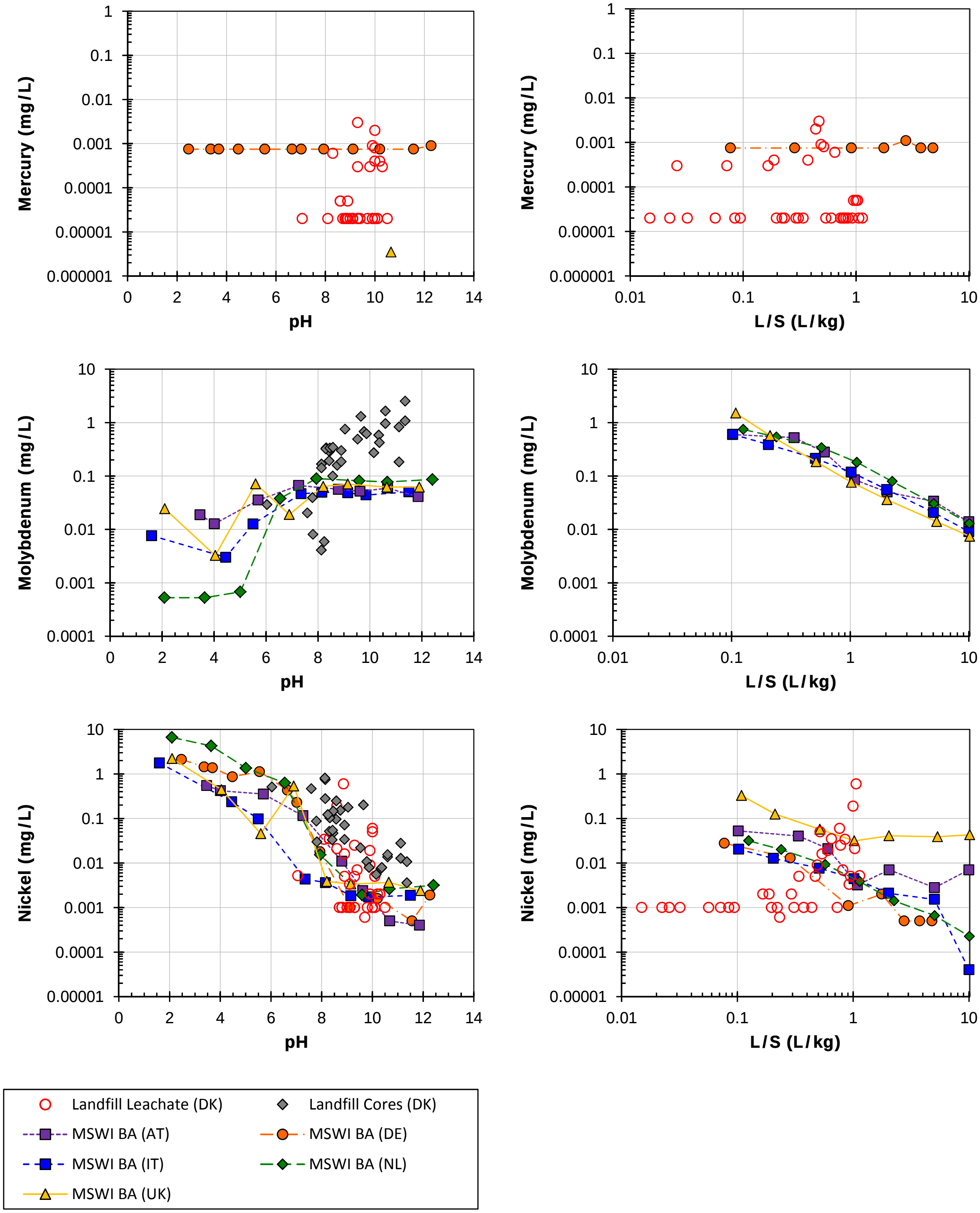

Figure D-8. Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).

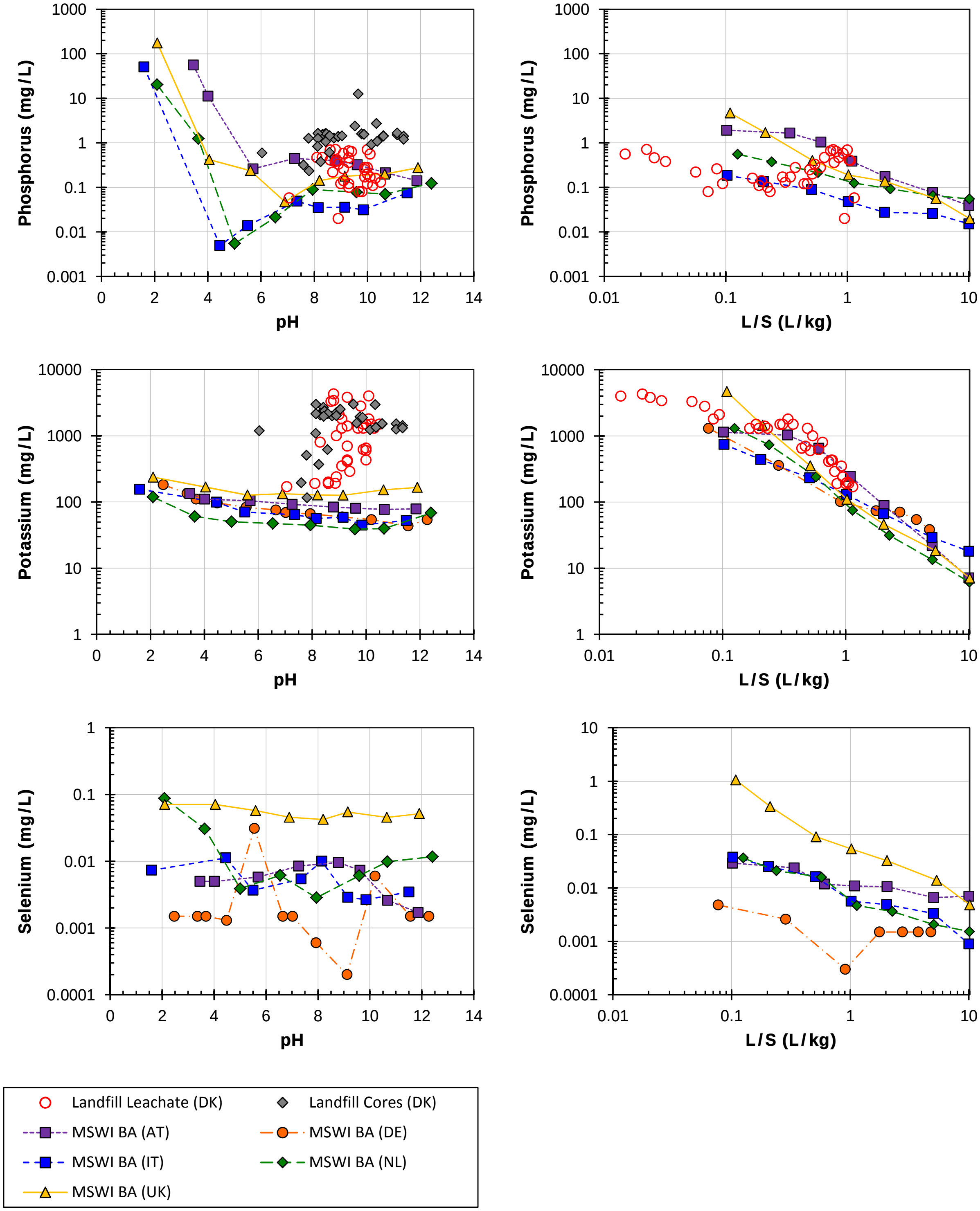

Figure D-9. Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).

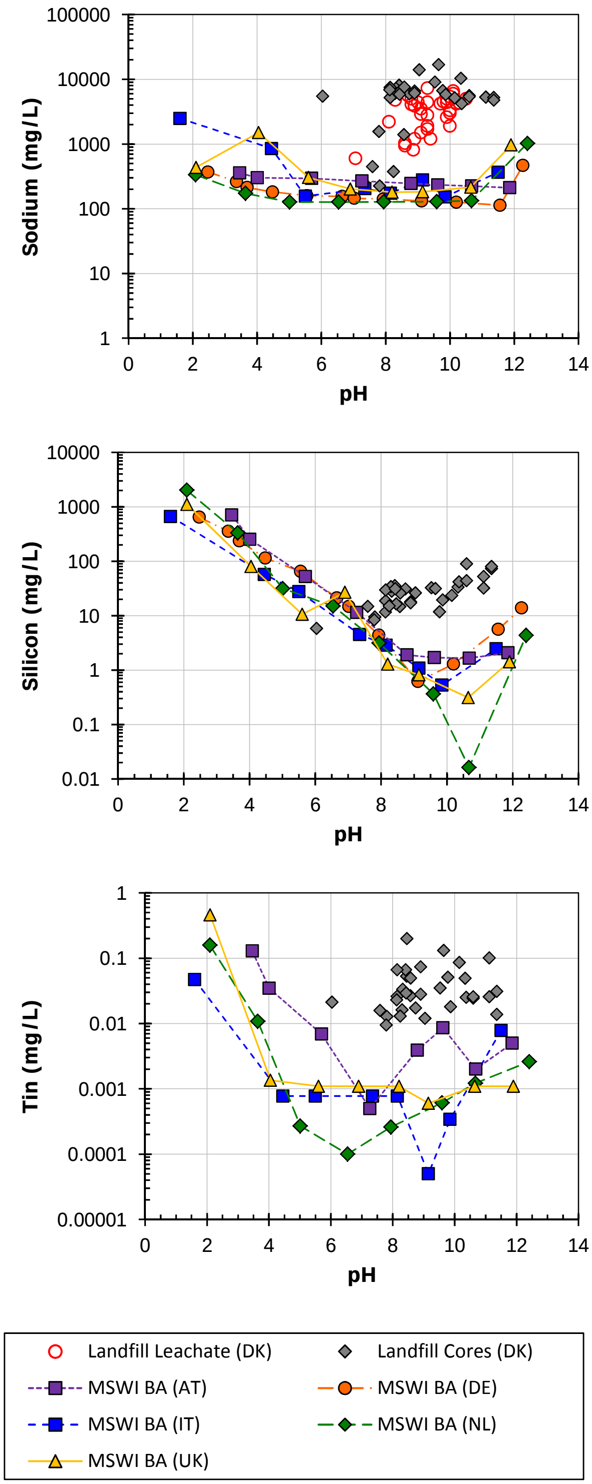

Figure D-10. Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).

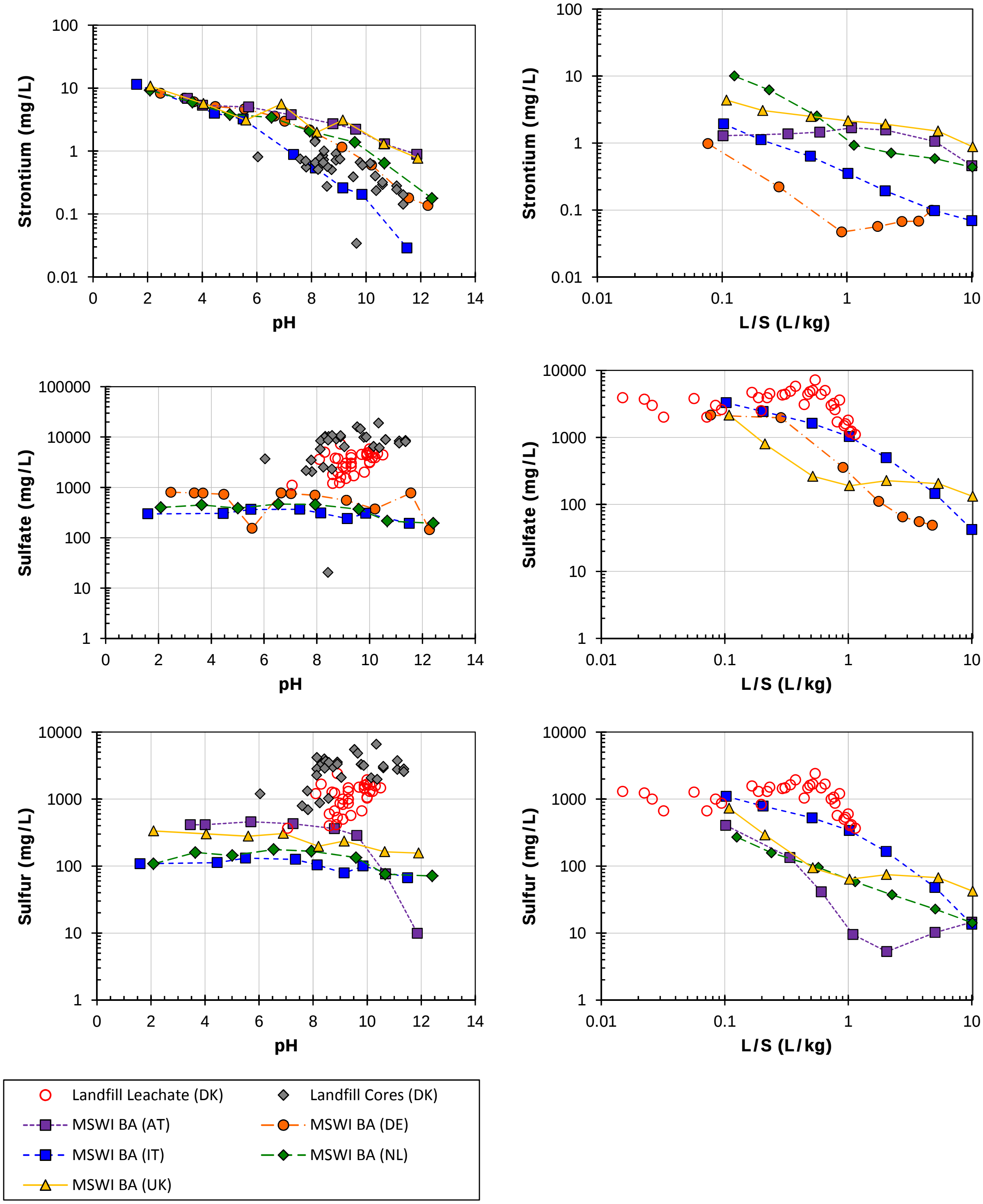

Figure D-11. Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).

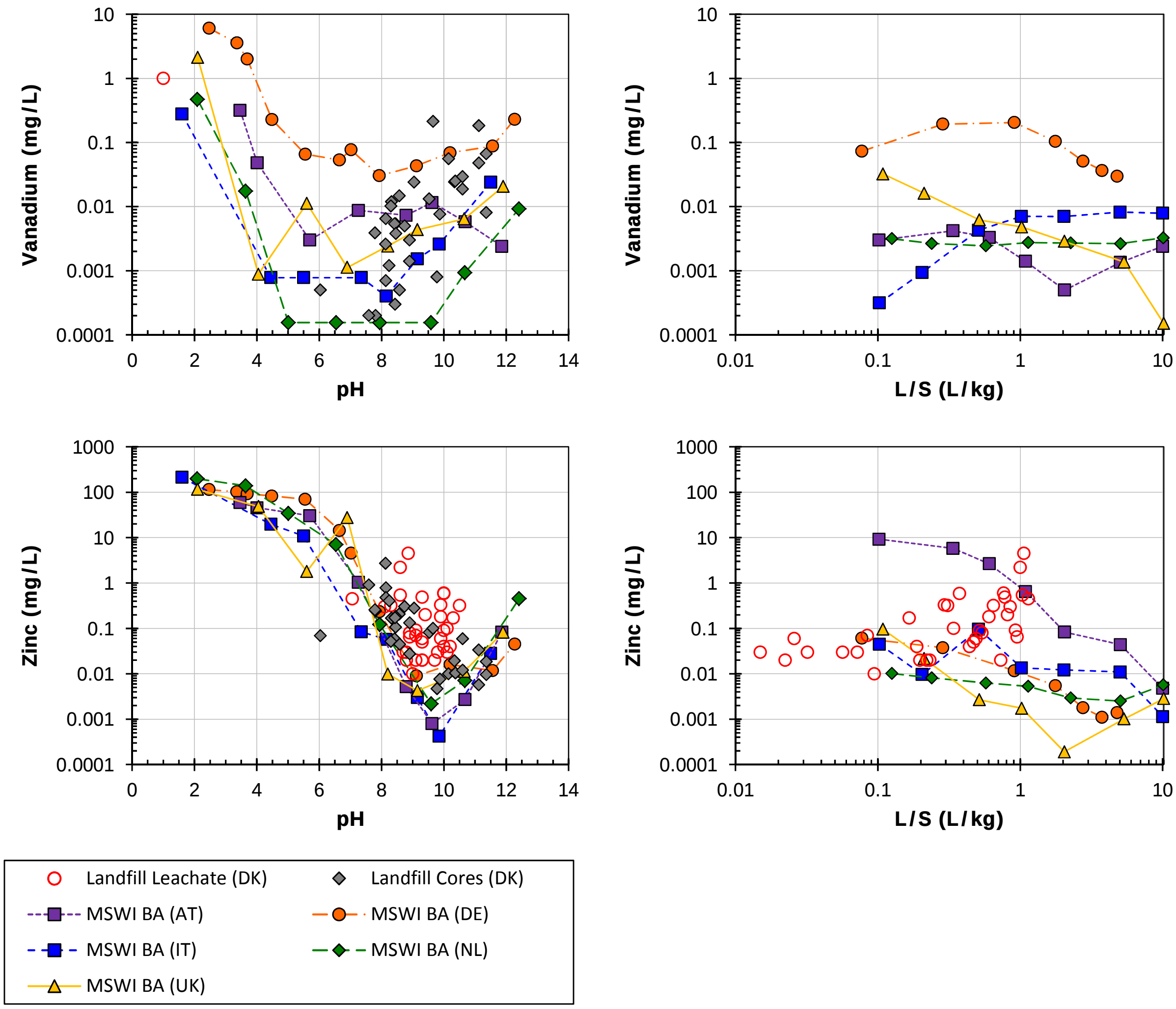

Figure D-12. Comparison of laboratory and field concentration results for a MSWI bottom ash landfill (Denmark).

APPENDIX E. MUNICPAL SOLID WASTE INCINERATOR BOTTOM ASH USE IN ROADBASE (SWEDEN)

Table E-1. Data Sources for Laboratory-to-Field Comparisons for MSWI Bottom Ash used in Roadbase (Sweden).

Legend ID	Source	Material Type	Data Type	Citation
Vändöra – Core 1	Sweden	Core composite from roadbase based on level of carbonation	pH-dependence Percolation	
Vändöra – Core 2	Sweden	Core composite from roadbase based on level of carbonation	pH-dependence Percolation	
Vändöra – Core 3	Sweden	Core composite from roadbase based on level of carbonation	pH-dependence Percolation	
Vändöra – Core 4	Sweden	Core composite from roadbase based on level of carbonation	pH-dependence Percolation	
Vändöra – Individual Cores (L/S 10 16 yrs)	Sweden	Cores from roadbase	Batch L/S (EN 12457-2)	
MSWI BA (NL)	The Netherlands	MSWI Bottom Ash	pH-dependence Percolation	ECN ongoing studies on MSWI BA
MSWI BA 2 (NL)	The Netherlands	MSWI Bottom Ash	pH-dependence Percolation	ECN ongoing studies on MSWI BA
MSWI BA (DE)	SIWAP, Germany	MSWI Bottom Ash	pH-dependence Percolation	Berger et al., 2005
MSWI BA (AT)	Austria, MSW Incinerator	MSWI Bottom Ash	pH-dependence Percolation	van der Sloot et al., 2000b
MSWI BA (UK)	UK, MSW Incinerator	MSWI Bottom Ash	pH-dependence Percolation	ECN studies on UK MSWI BA
MSWI BA (DE)	Germany, MSW Incinerator 1	MSWI Bottom Ash	pH-dependence Percolation	Berger et al., 2005

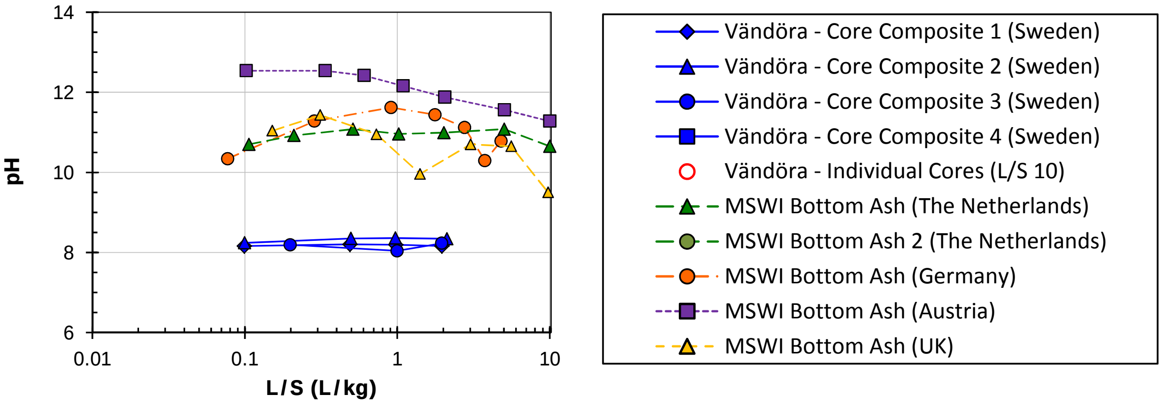

Figure E-1. pH from laboratory testing of Vändöra cores and composites from roadbasel (Sweden).

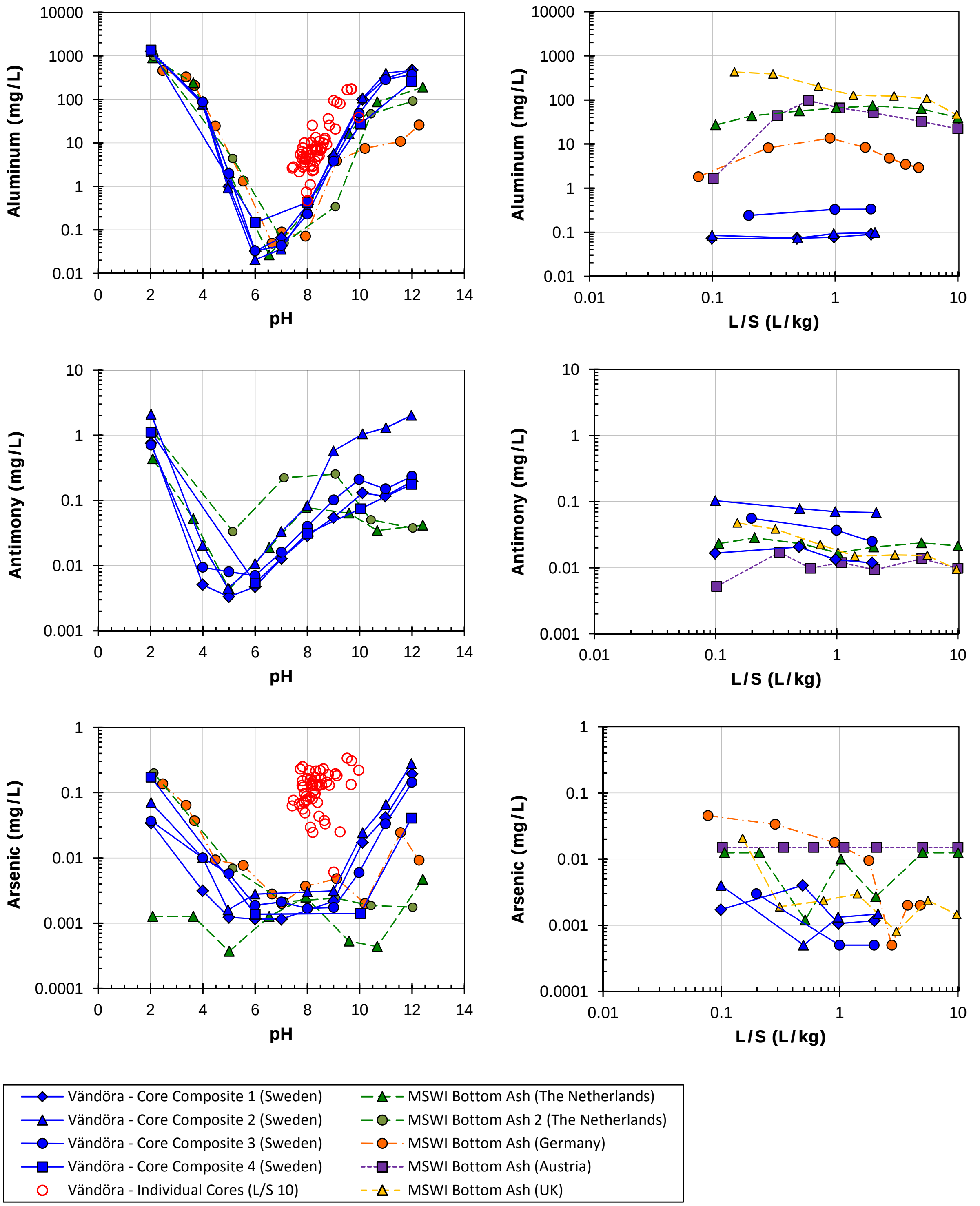

Figure E-2. **Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).**

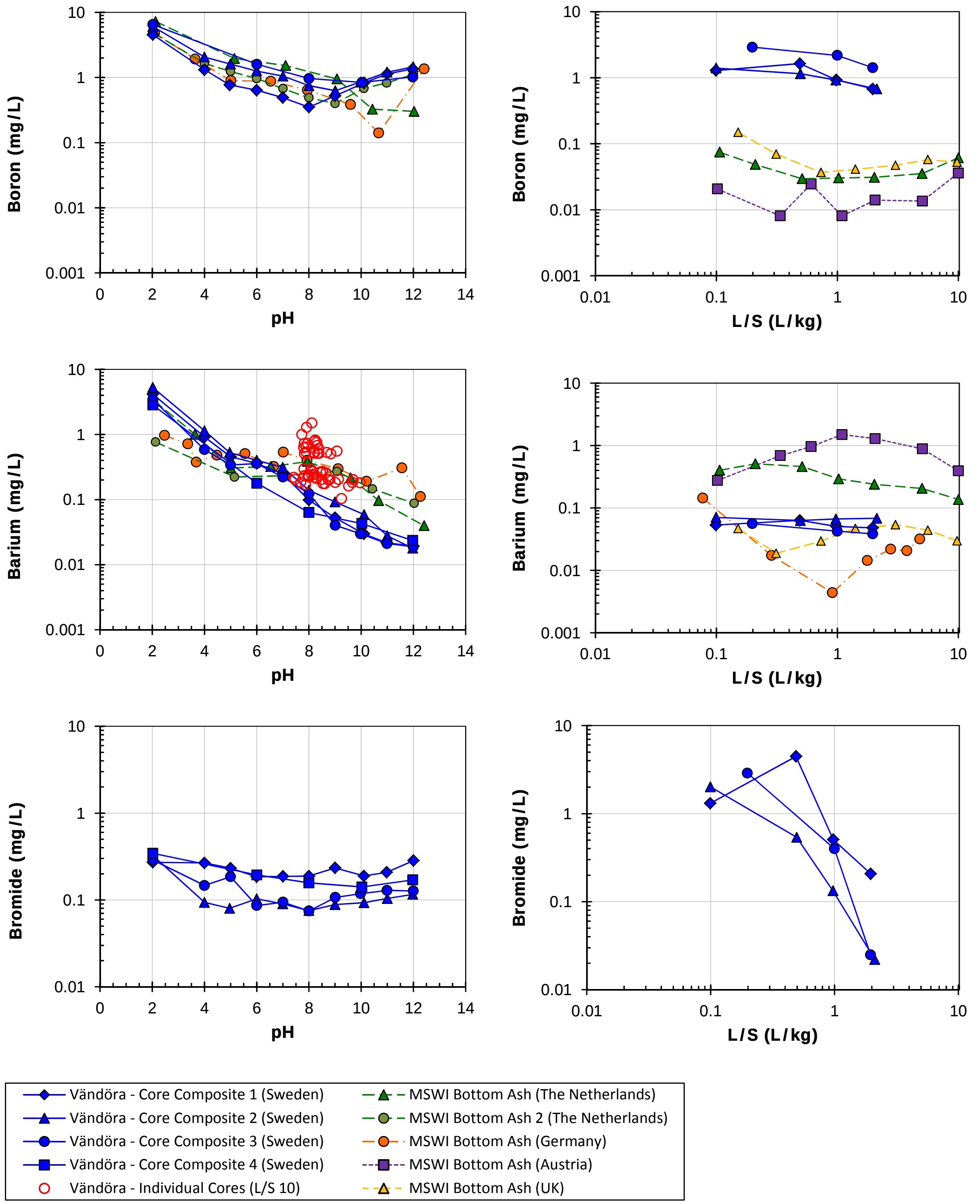

Figure E-3. **Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).**

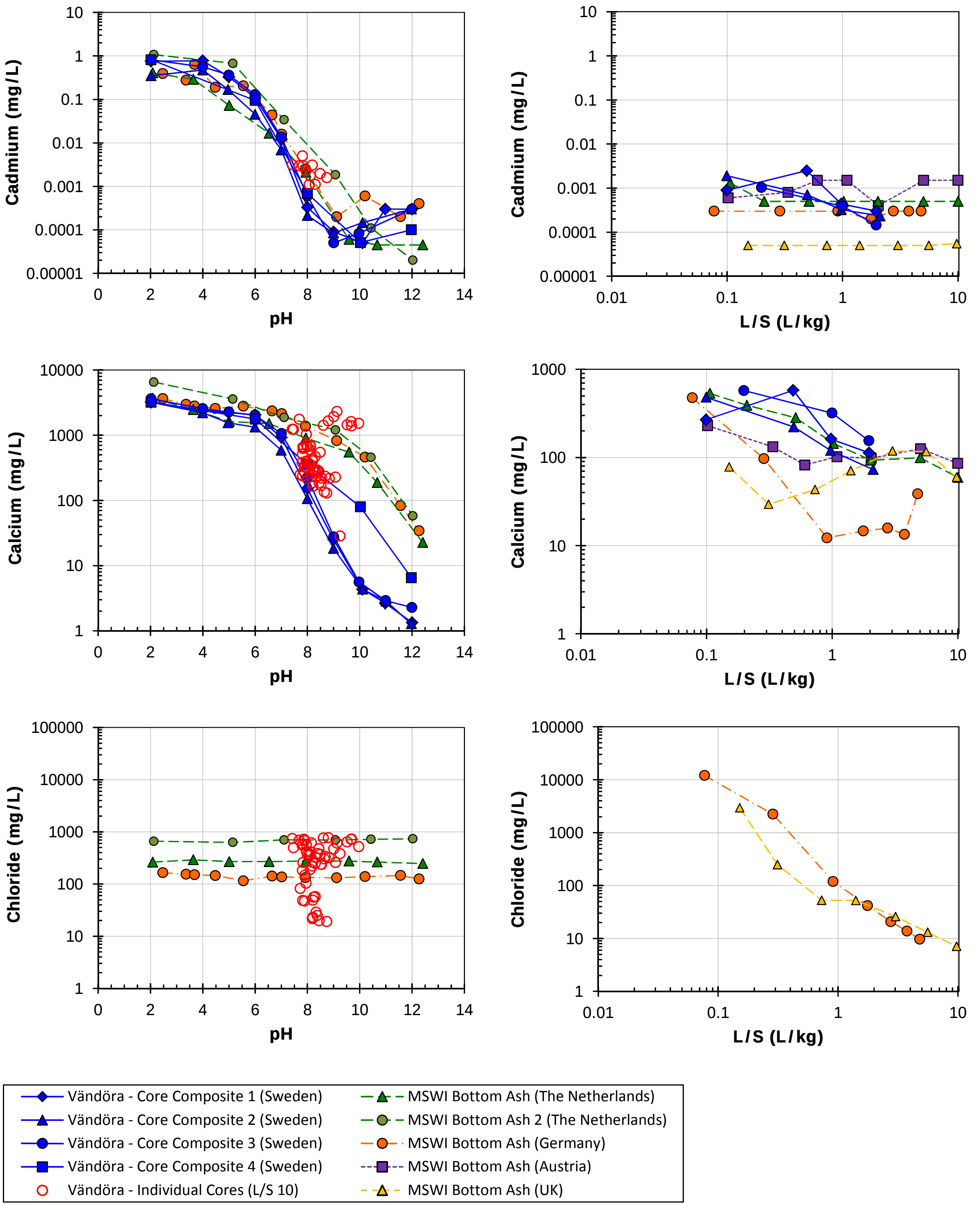

Figure E-4. Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).

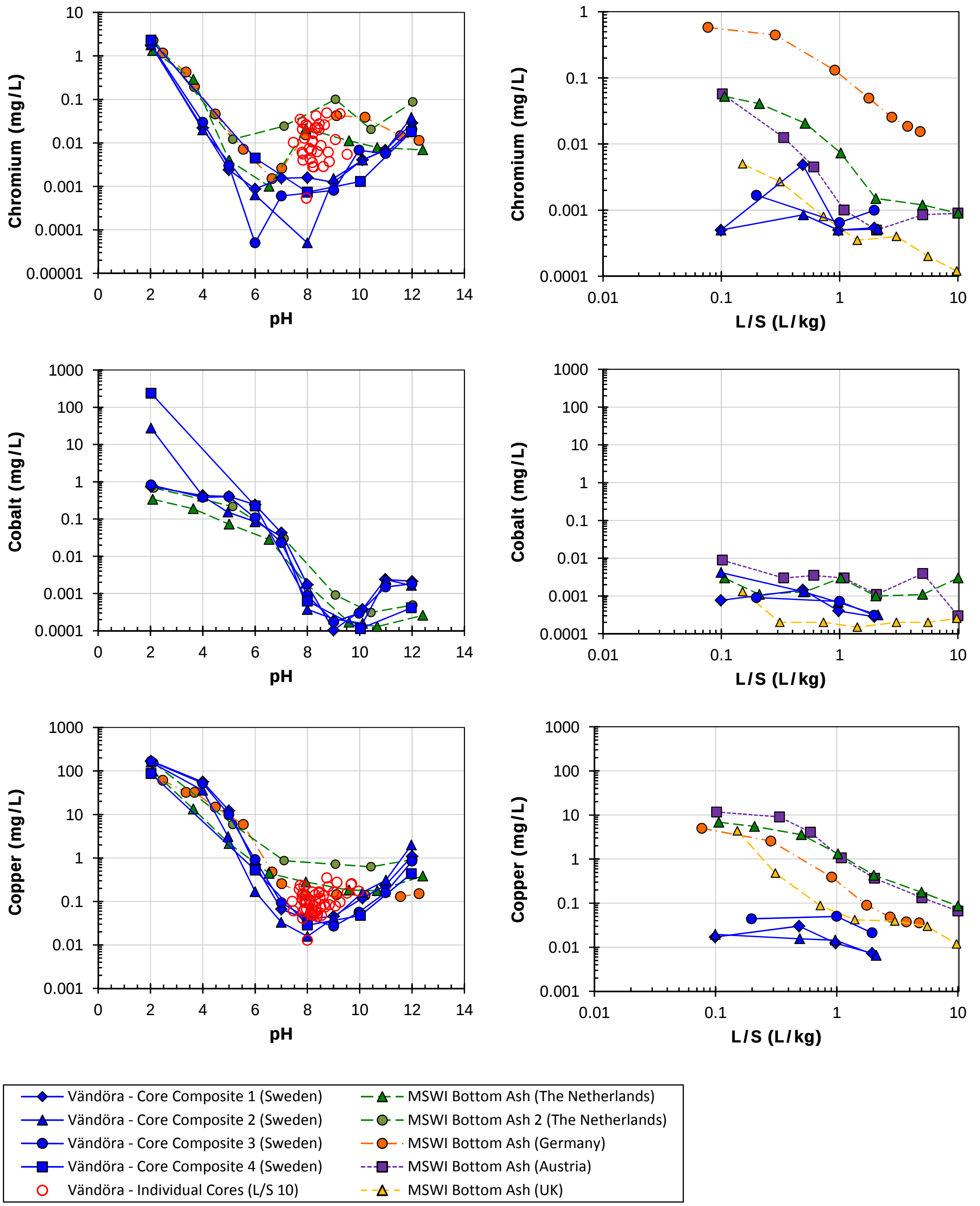

Figure E-5. **Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).**

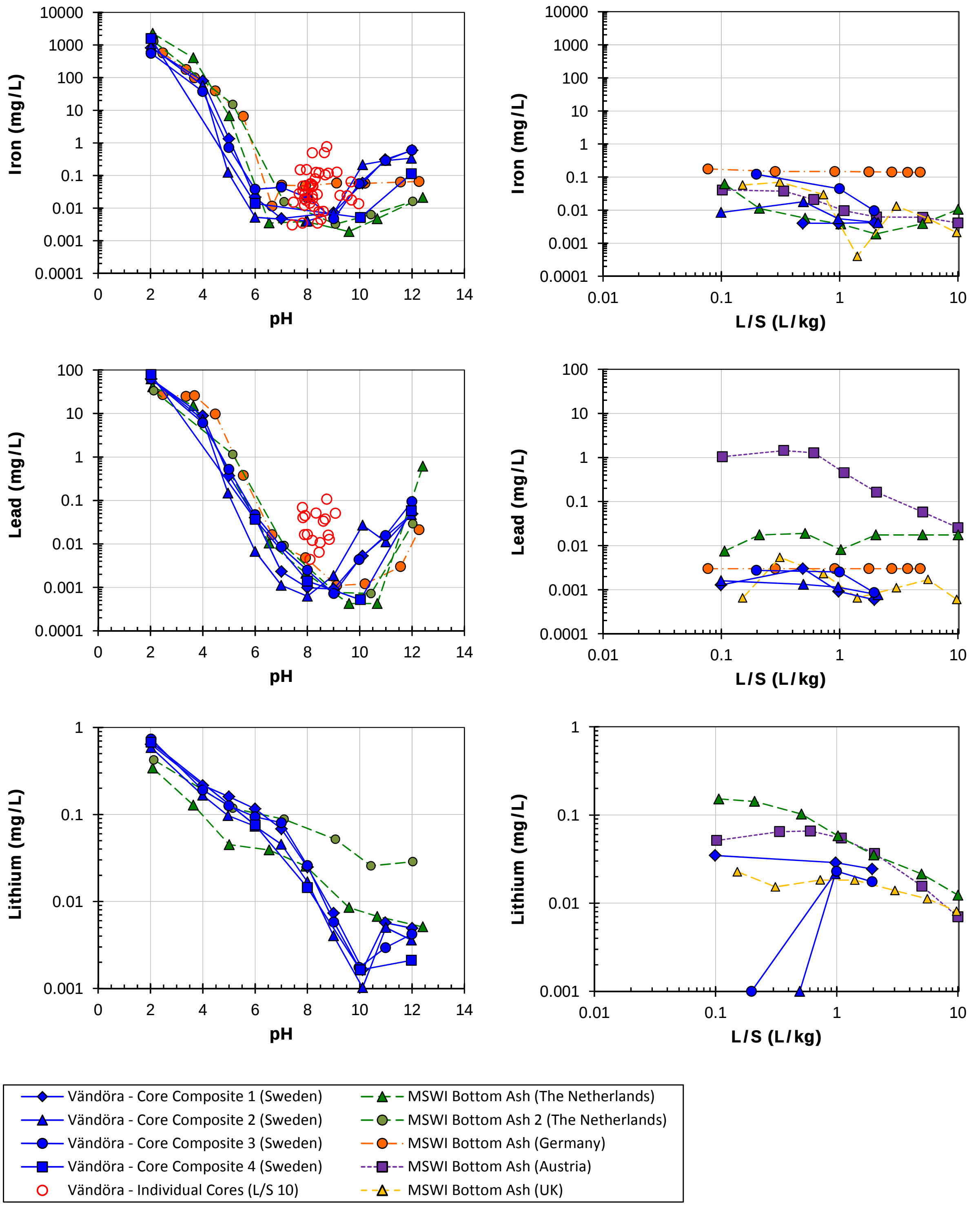

Figure E-6. Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).

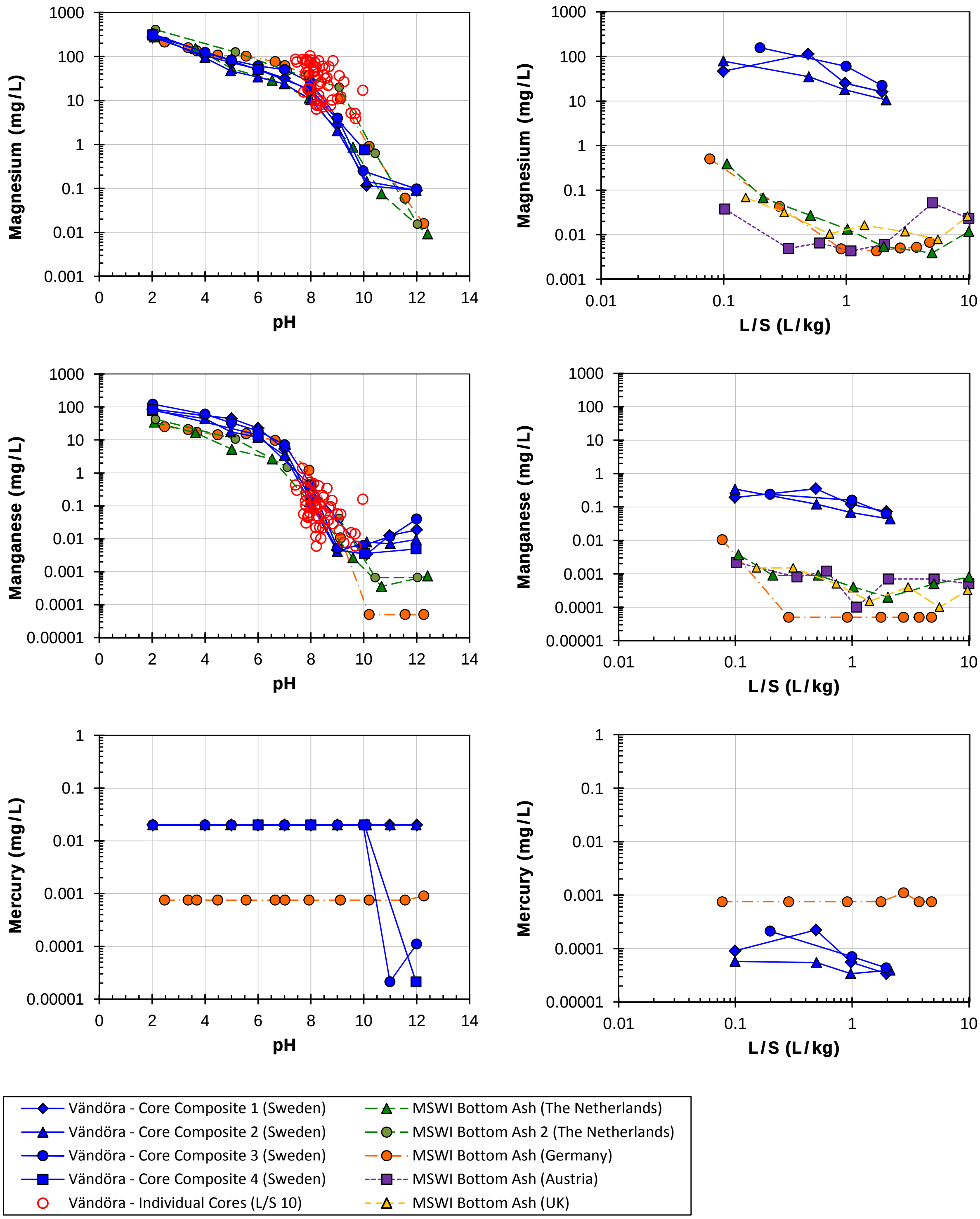

Figure E-7. Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).

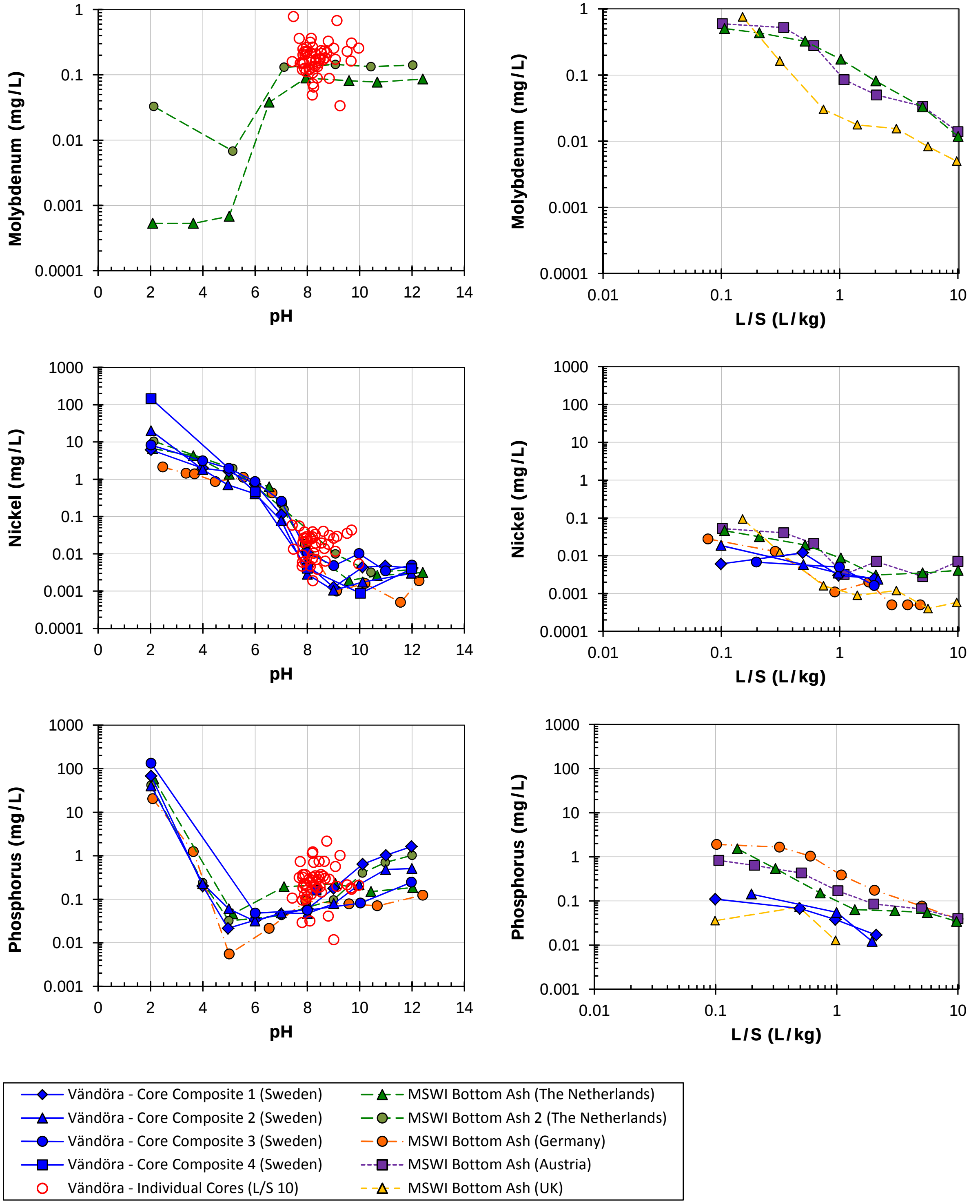

Figure E-8. Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).

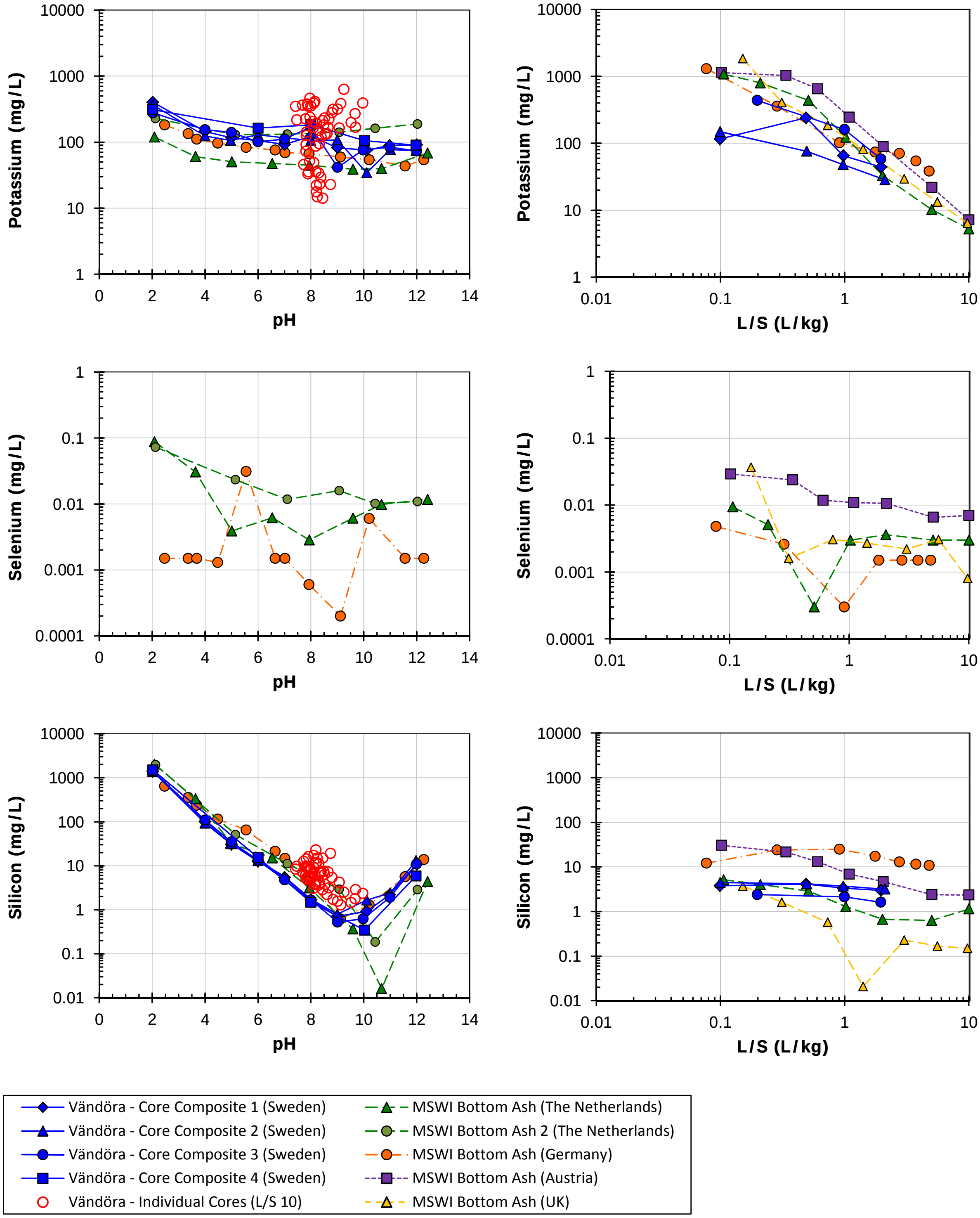

Figure E-9. Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).

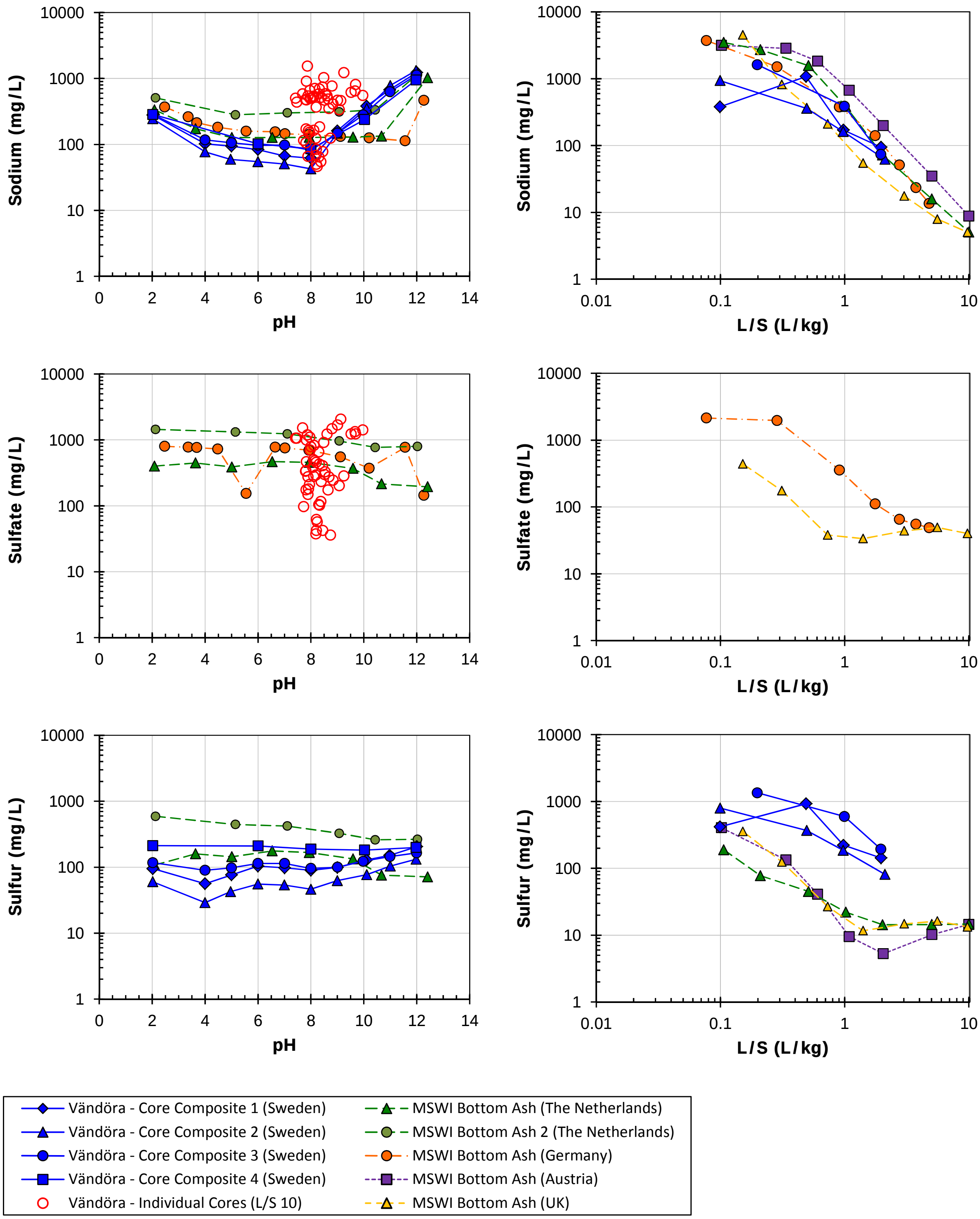

Figure E-10. Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).

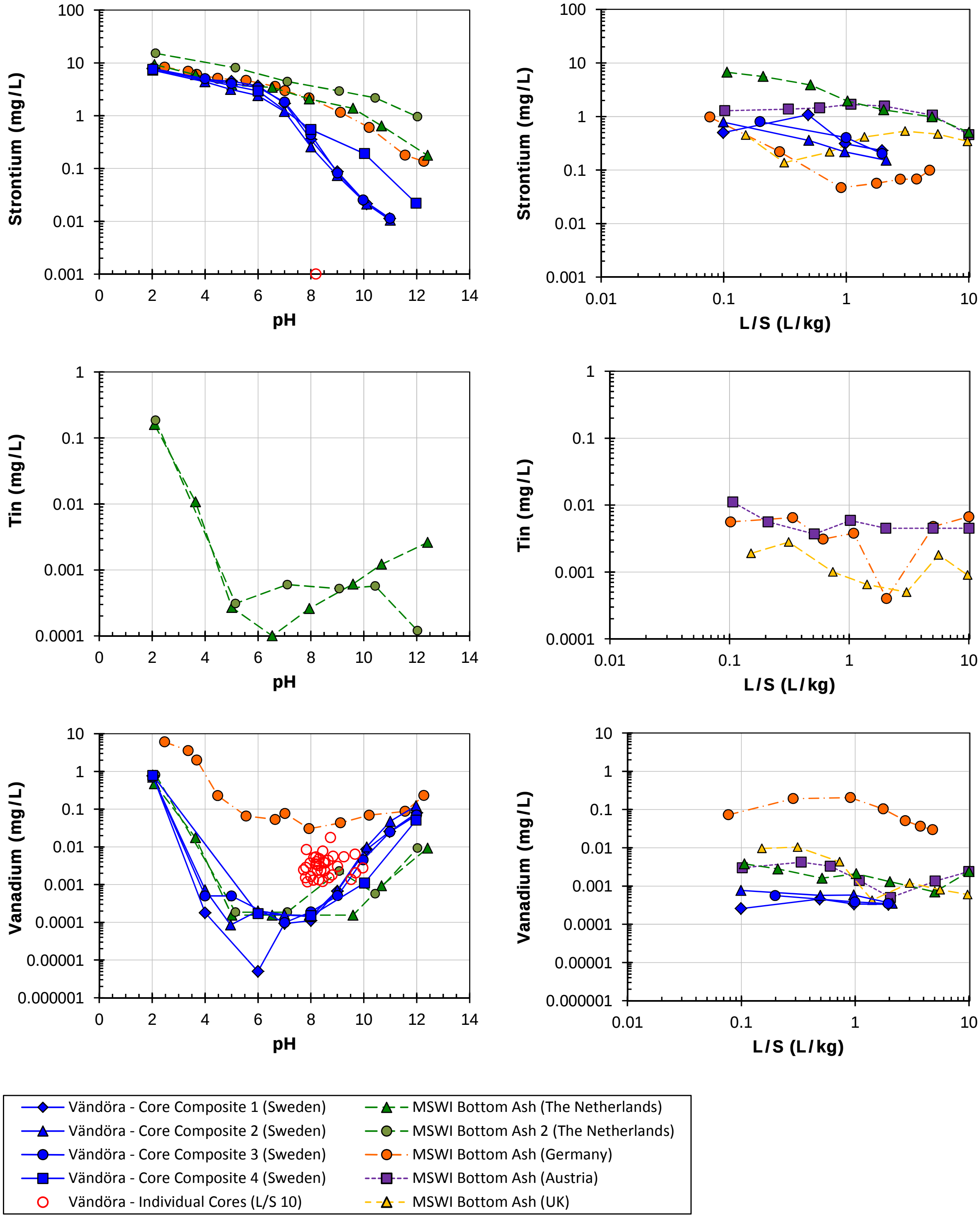

Figure E-11. Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).

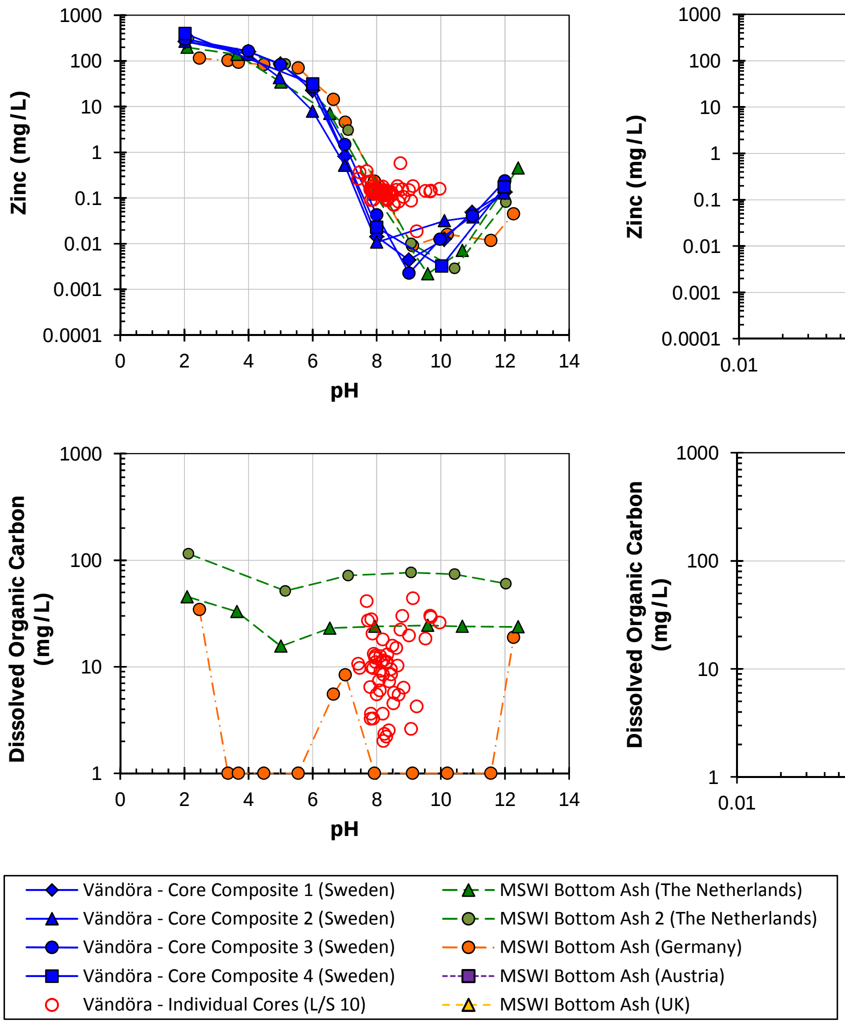

Figure E-12. Comparison of laboratory and field concentration results for MSWI bottom ash used in roadbase (Sweden).

APPENDIX F. INORGANIC INDUSTRIAL WASTE LANDFILL (THE NETHERLANDS)

Table F-1. Data Sources for Laboratory-to-Field Comparisons for Inorganic Waste Landfill.

Legend ID	Source	Material Type	Data Type	Citation
Inorganic Waste Mix	Nauerna Landfill, the Netherlands	Mixed Waste (predominantly inorganic – input to landfill)	pH-dependence (CEN/TS 14429) Percolation (CEN/TS 14405)	van der Sloot et al., 2003 van Zomeren and van der Sloot, 2006b
NAU-Lysimeter 13AA	Nauerna Landfill, the Netherlands	Leachate	-	van der Sloot et al., 2003 van Zomeren and van der Sloot, 2006b
NAU-Lysimeter 1	Nauerna Landfill, the Netherlands	Leachate	-	van der Sloot et al., 2003 van Zomeren and van der Sloot, 2006b

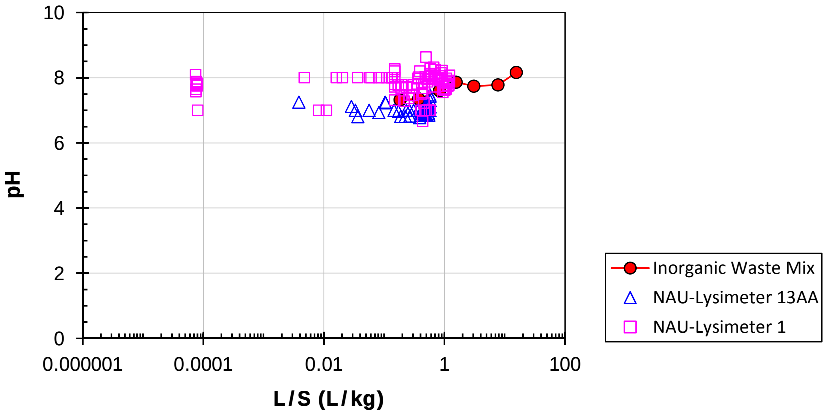

Figure F-1. **Comparison of laboratory and field pH results for an inorganic industrial waste landfill (The Netherlands).**

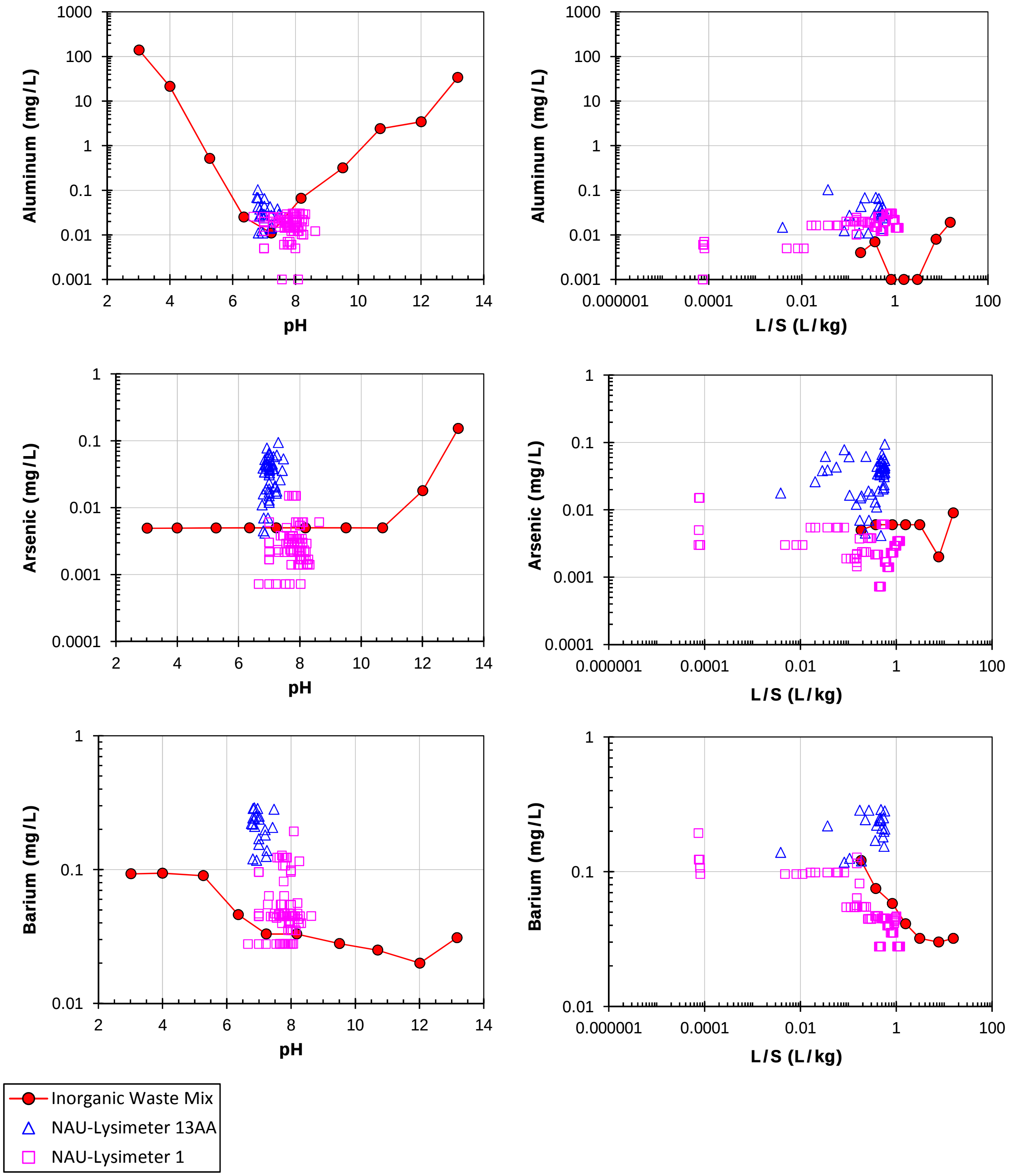

Figure F-2. Comparison of laboratory and field concentration results for an inorganic industrial waste landfill (The Netherlands).

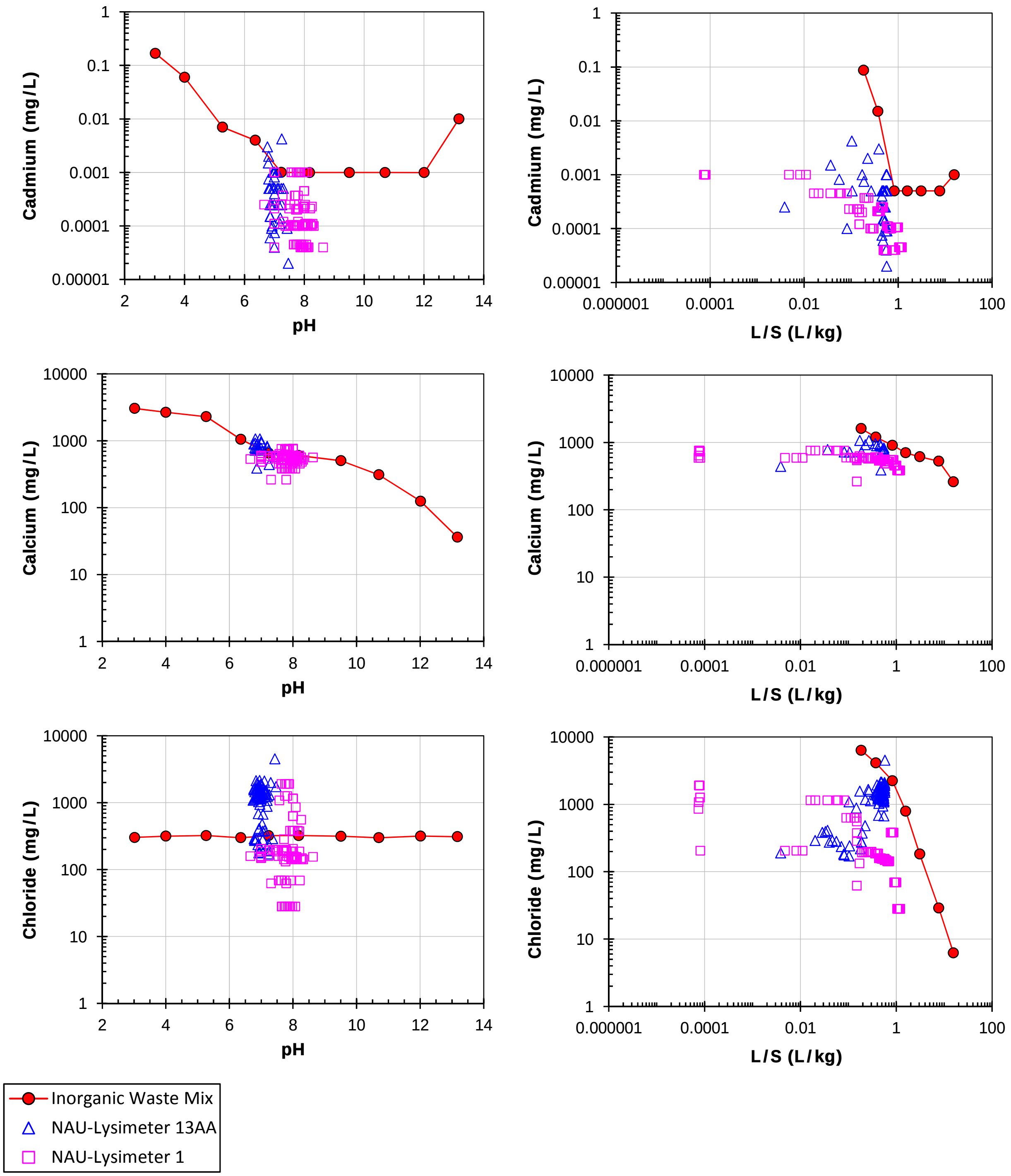

Figure F-3. **Comparison of laboratory and field concentration results for an inorganic industrial waste landfill (The Netherlands).**

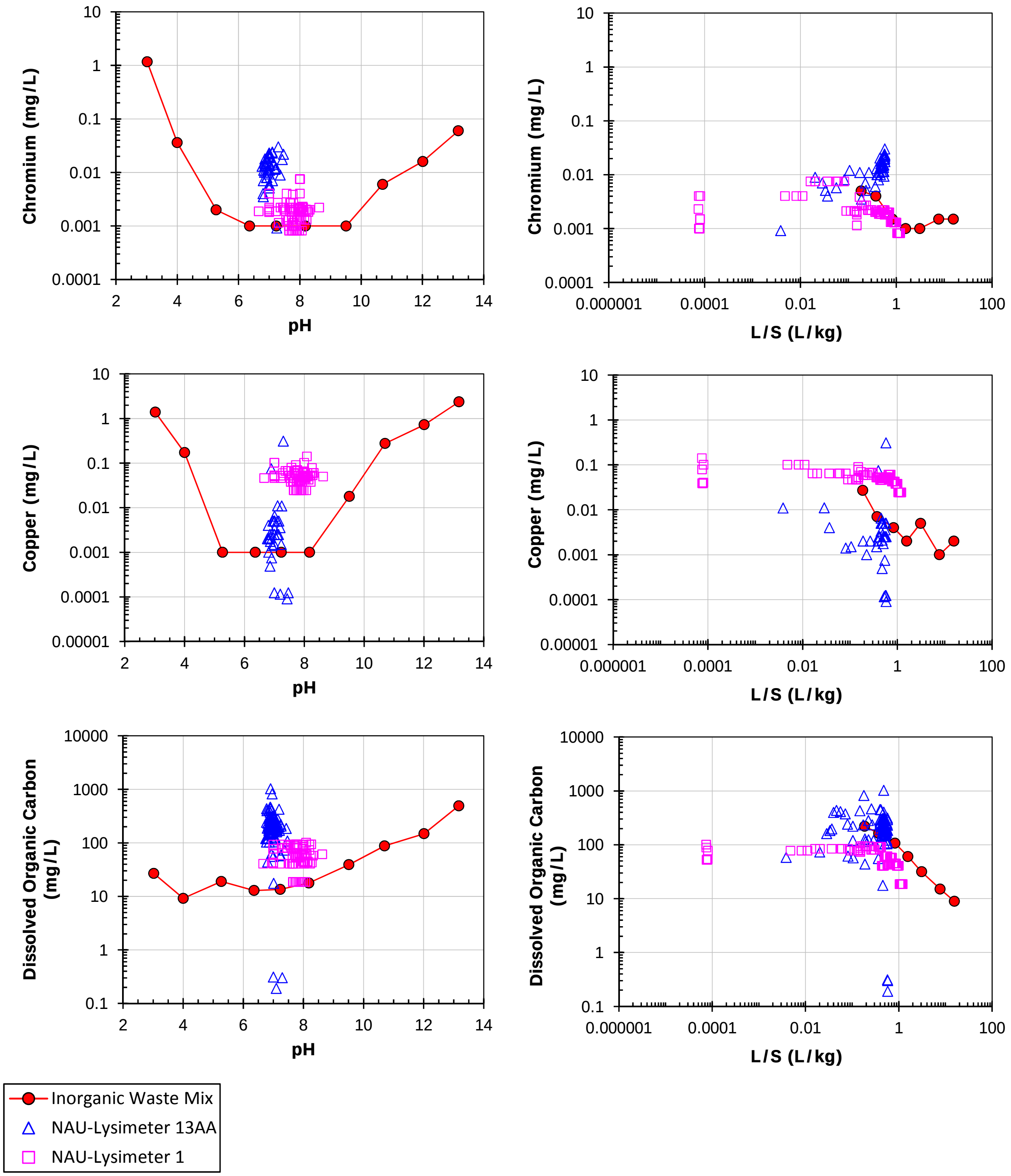

Figure F-4. **Comparison of laboratory and field concentration results for an inorganic industrial waste landfill (The Netherlands).**

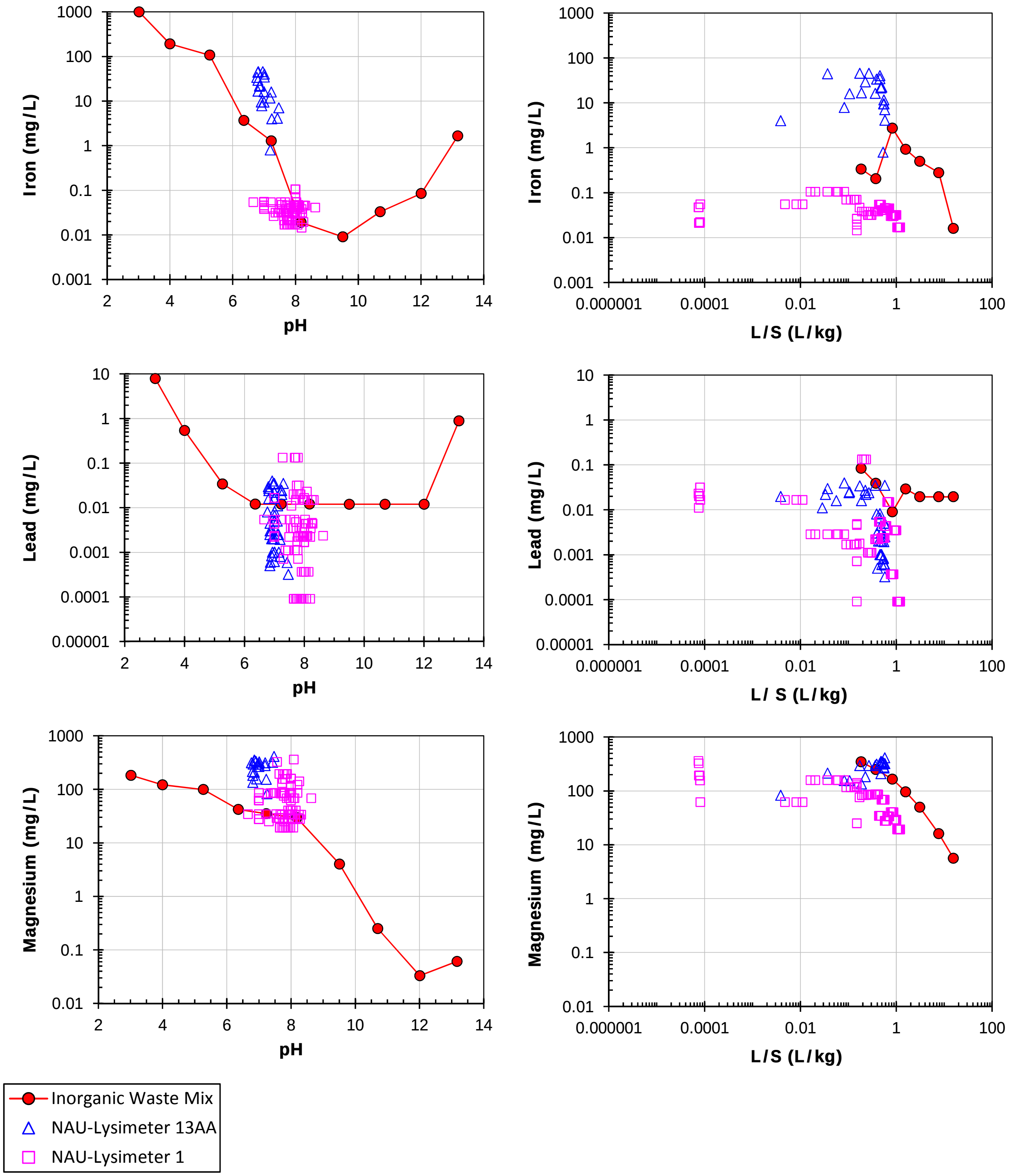

Figure F-5. **Comparison of laboratory and field concentration results for an inorganic industrial waste landfill (The Netherlands).**

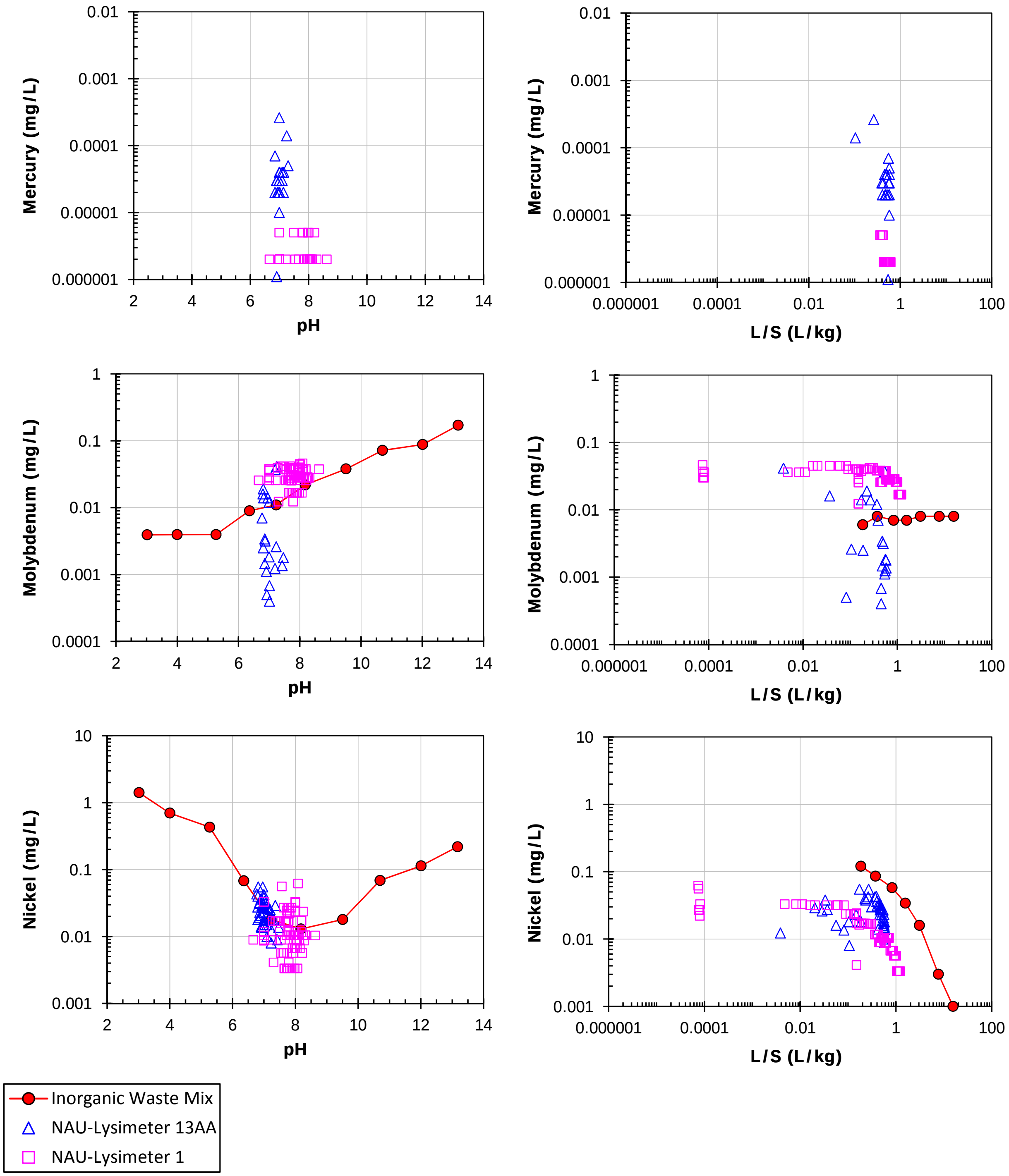

Figure F-6. **Comparison of laboratory and field concentration results for an inorganic industrial waste landfill (The Netherlands).**

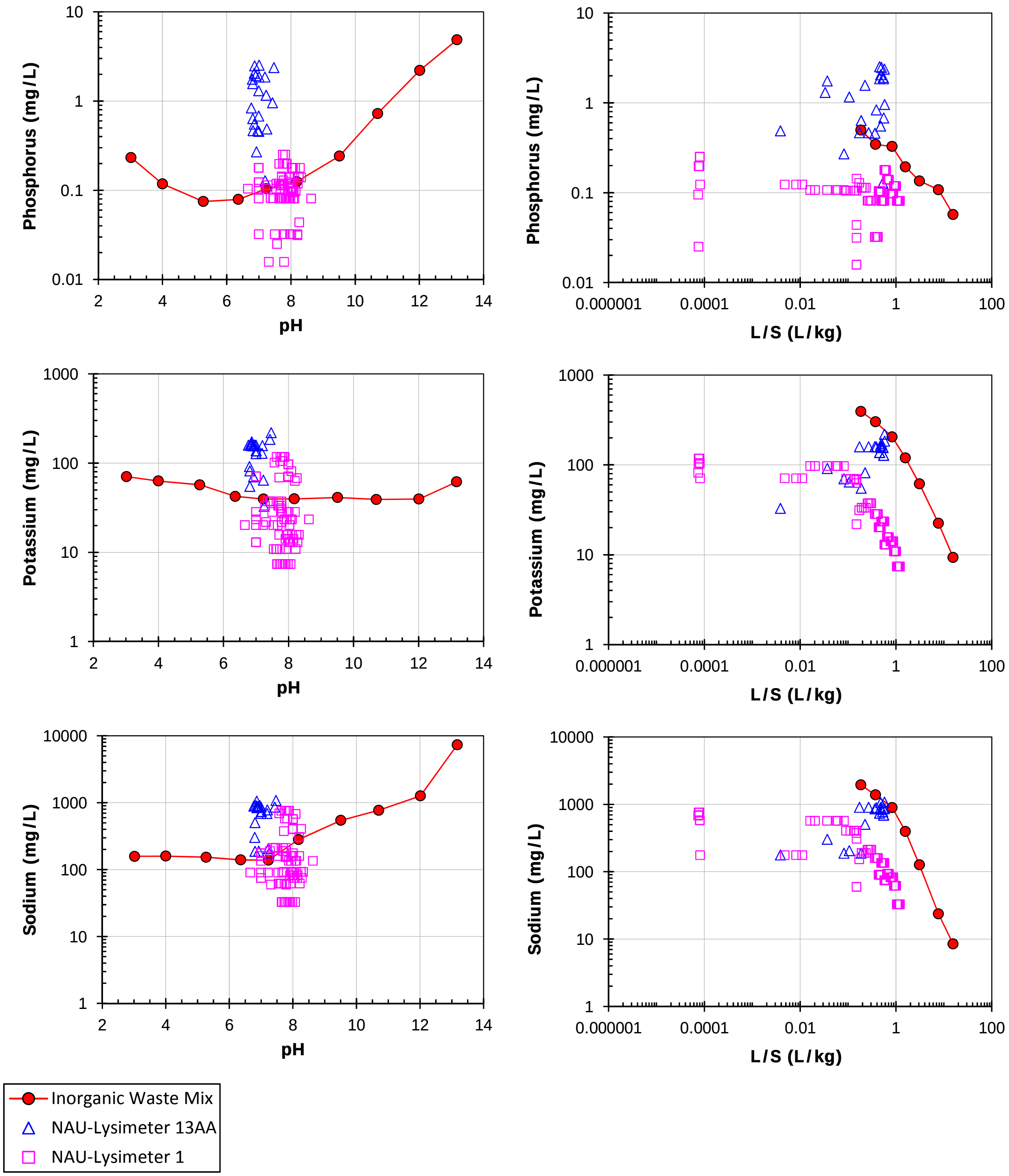

Figure F-7. Comparison of laboratory and field concentration results for an inorganic industrial waste landfill (The Netherlands).

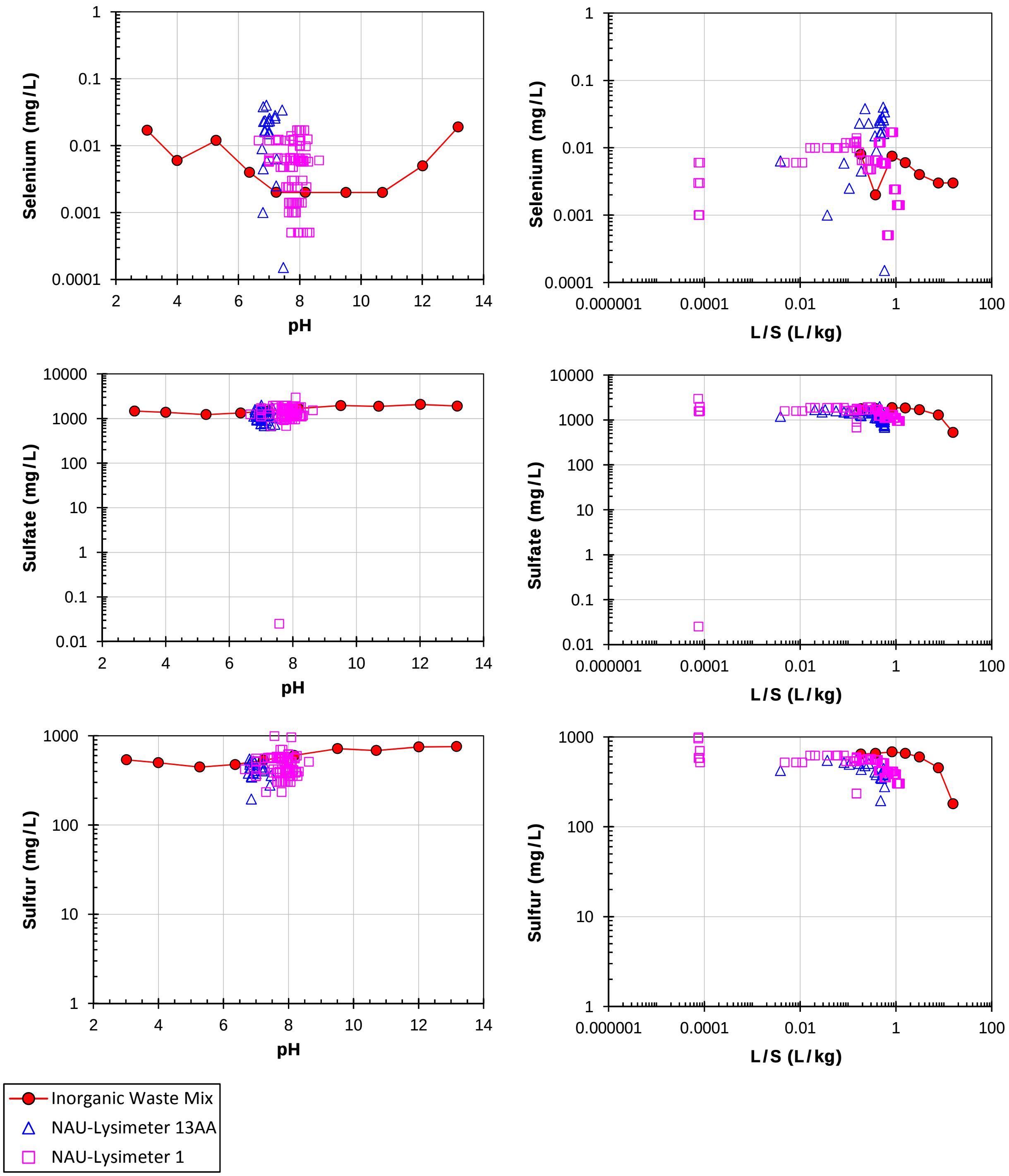

Figure F-8. **Comparison of laboratory and field concentration results for an inorganic industrial waste landfill (The Netherlands).**

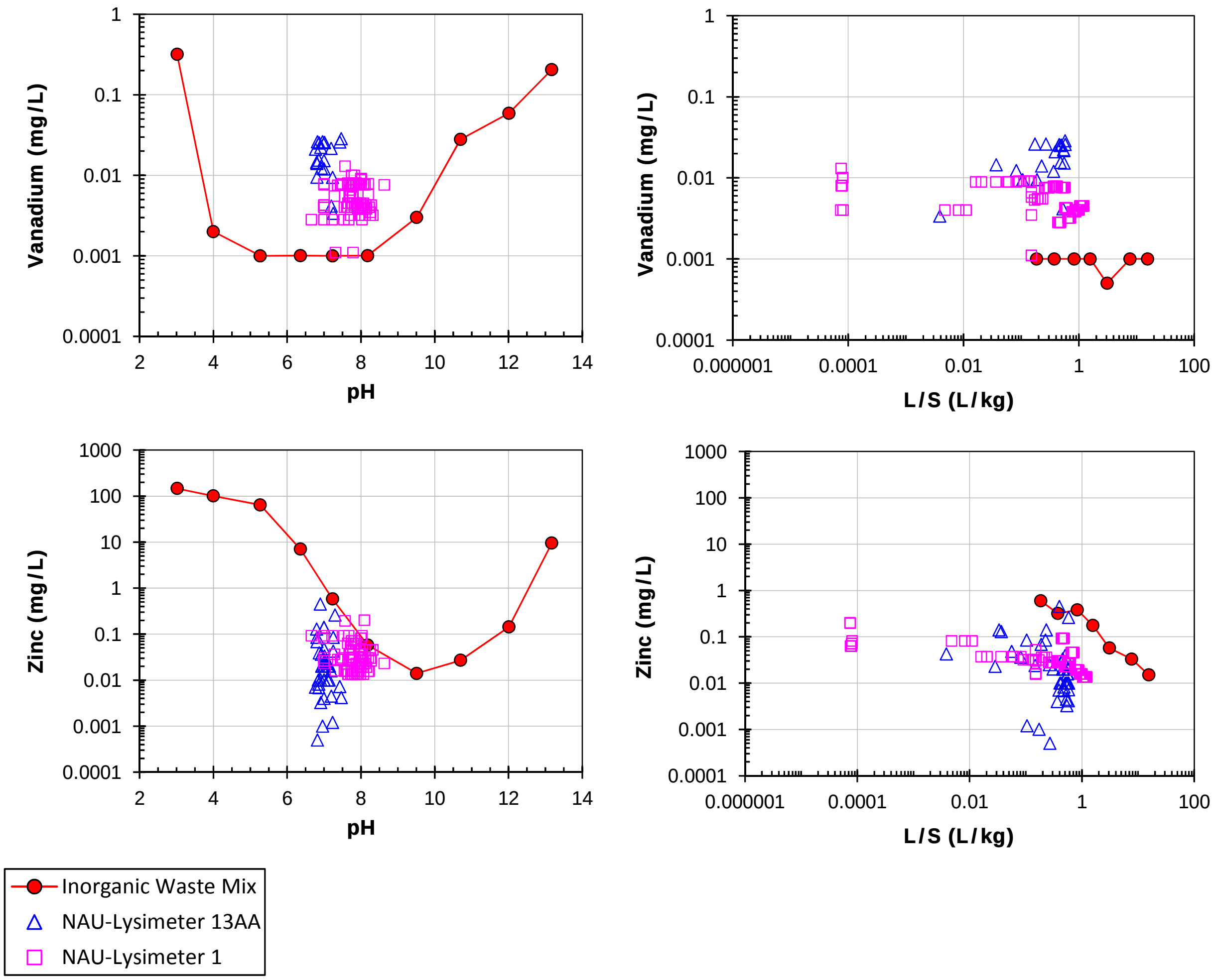

Figure F-9. Comparison of laboratory and field concentration results for an inorganic industrial waste landfill (The Netherlands).

APPENDIX G. MUNICIPAL SOLID WASTE LANDFILL (THE NETHERLANDS)

Table G-1. Data Sources for Laboratory-to-Field Comparisons for MSW Landfill

Legend ID	Source	Material Type	Data Type	Citation
MSW Organic Waste (initial)	Landgraaf, The Netherlands	Mixture of MSW organic waste	pH-dependence (CEN/TS 14429) Percolation (CEN/TS 14405)	Luning et al., 2006 van der Sloot et al., 2008a
MSW Landfill – Core Composite (8 yr)	Pilot-scale landfill, Landgraaf, The Netherlands	Composite of landfill cores after 8 years in landfill	pH-dependence (CEN/TS 14429) Percolation (CEN/TS 14405)	Luning et al., 2006 van der Sloot et al., 2008a
MSW Landfill – Individual Cores (L/S 10; 8 yr)	Pilot-scale landfill, Landgraaf, The Netherlands	Cored material after 8 years in landfill	Batch L/S (EN 12457-2)	Luning et al., 2006 van der Sloot et al., 2008a
MSW Landfill – Leachate (recirculation)	Pilot-scale landfill, Landgraaf, The Netherlands	Landfill Leachate	-	Luning et al., 2006 van der Sloot et al., 2008a

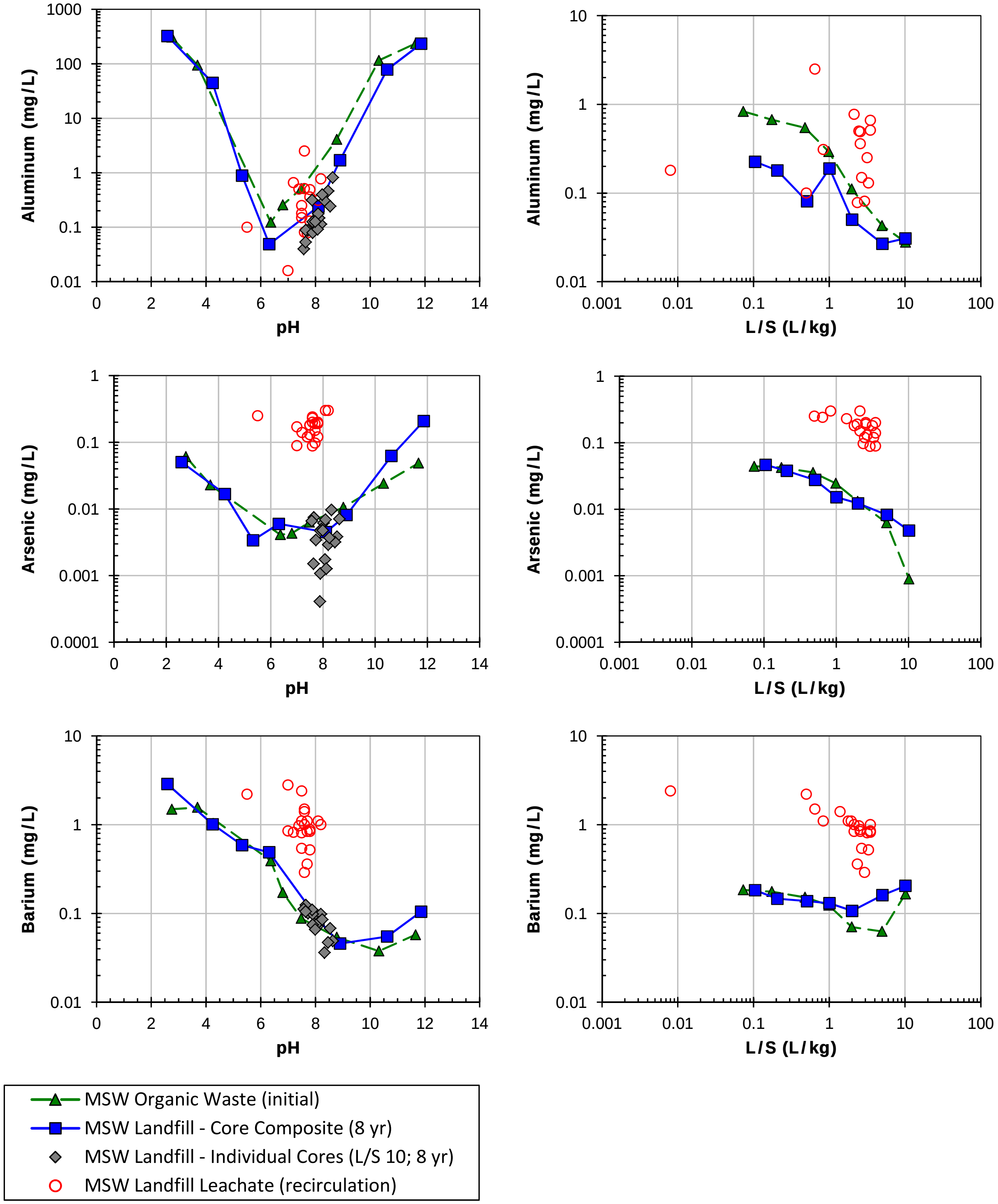

Figure G-1. Comparison of laboratory and field concentration results for a municipal solid waste landfill (The Netherlands).

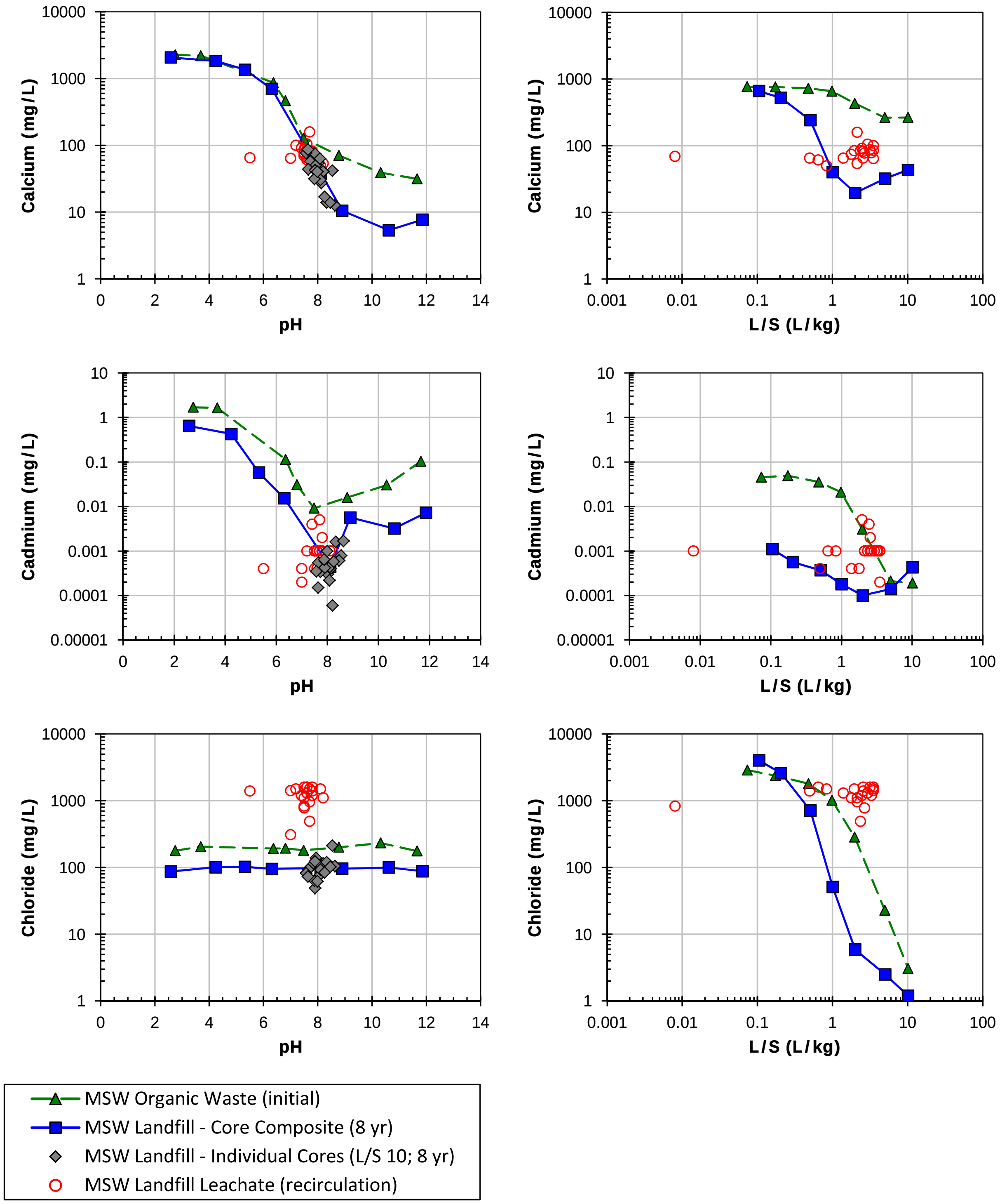

Figure G-2. **Comparison of laboratory and field concentration results for a municipal solid waste landfill (The Netherlands).**

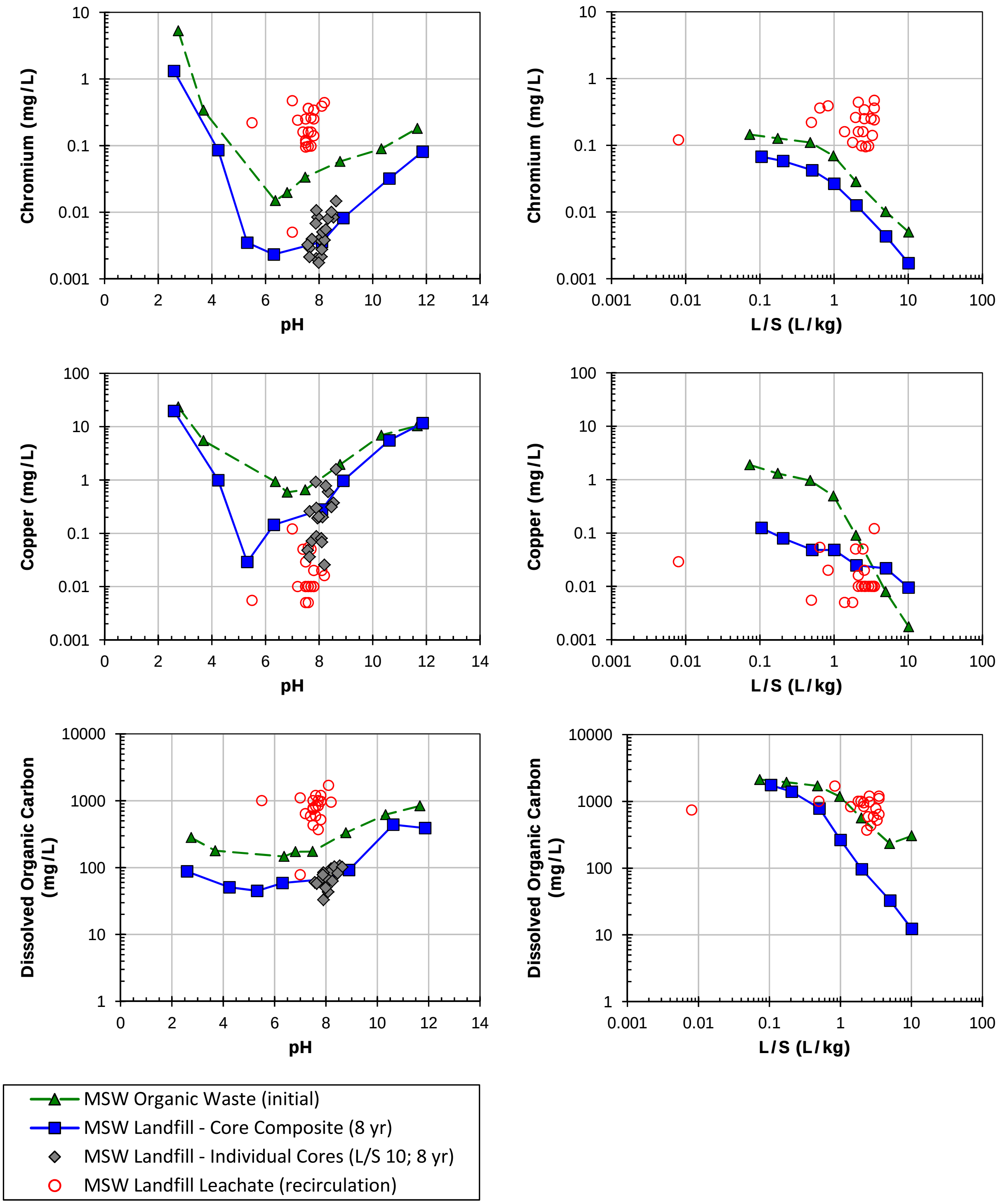

Figure G-3. Comparison of laboratory and field concentration results for a municipal solid waste landfill (The Netherlands).

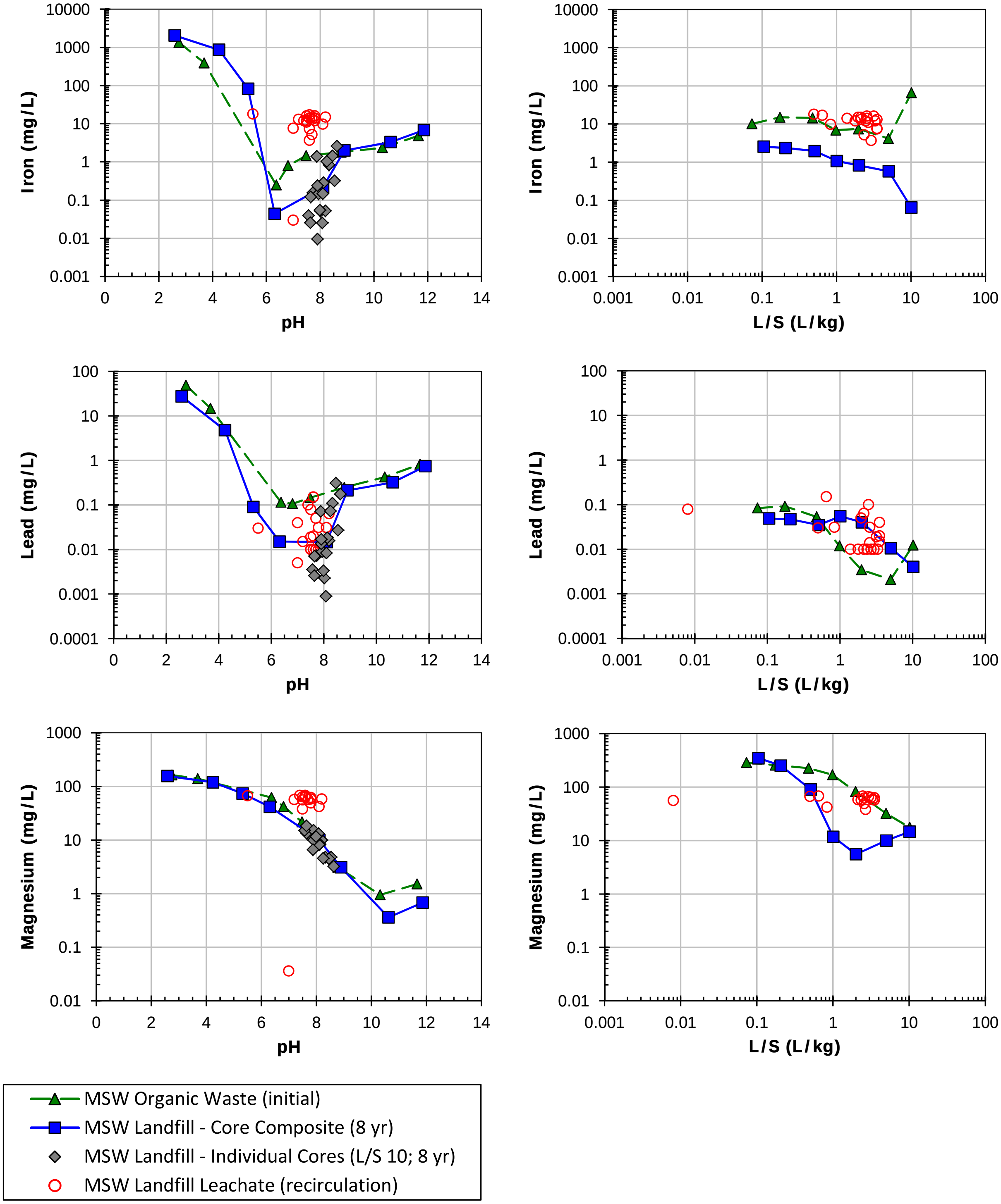

Figure G-4. Comparison of laboratory and field concentration results for a municipal solid waste landfill (The Netherlands).

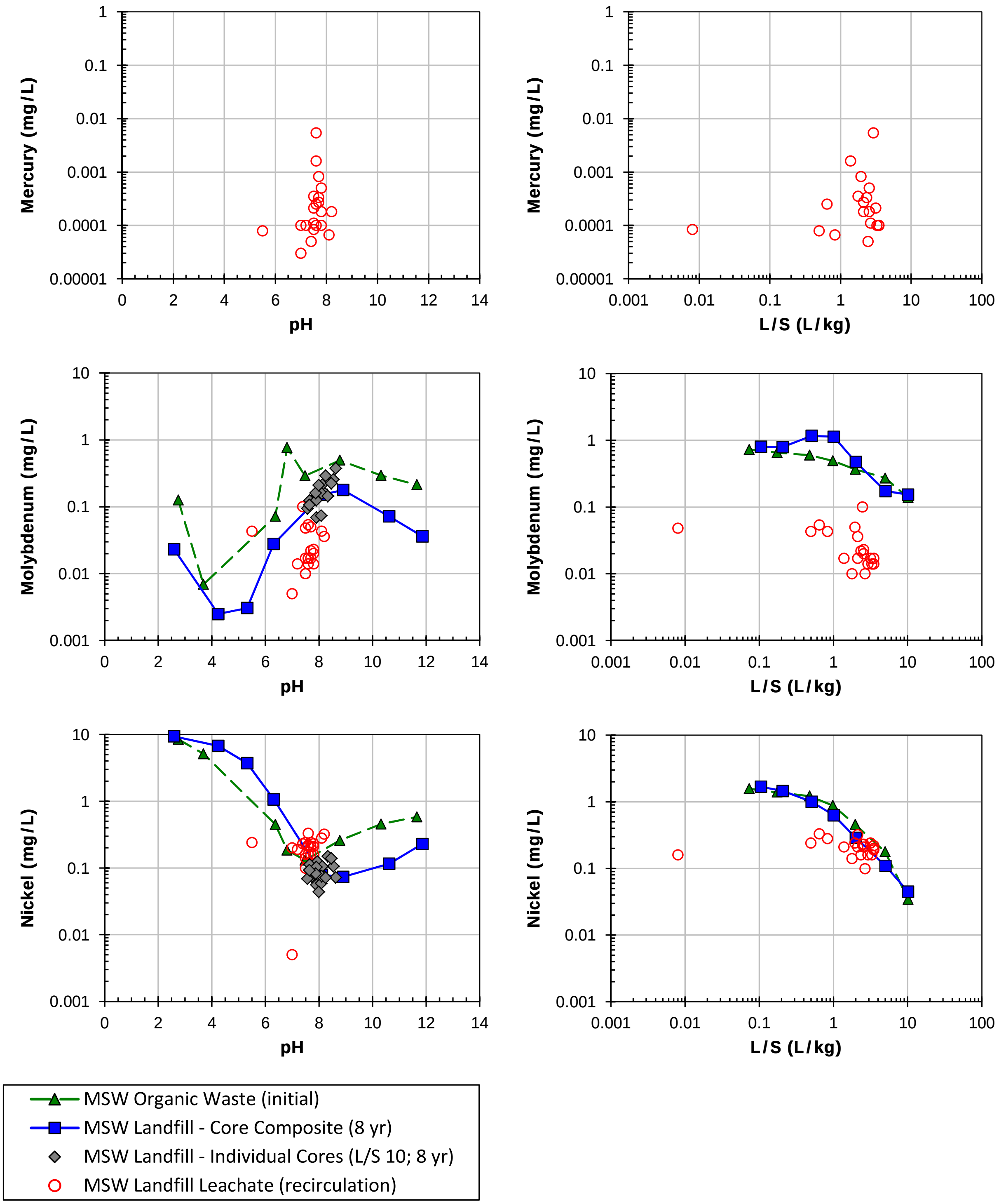

Figure G-5. Comparison of laboratory and field concentration results for a municipal solid waste landfill (The Netherlands).

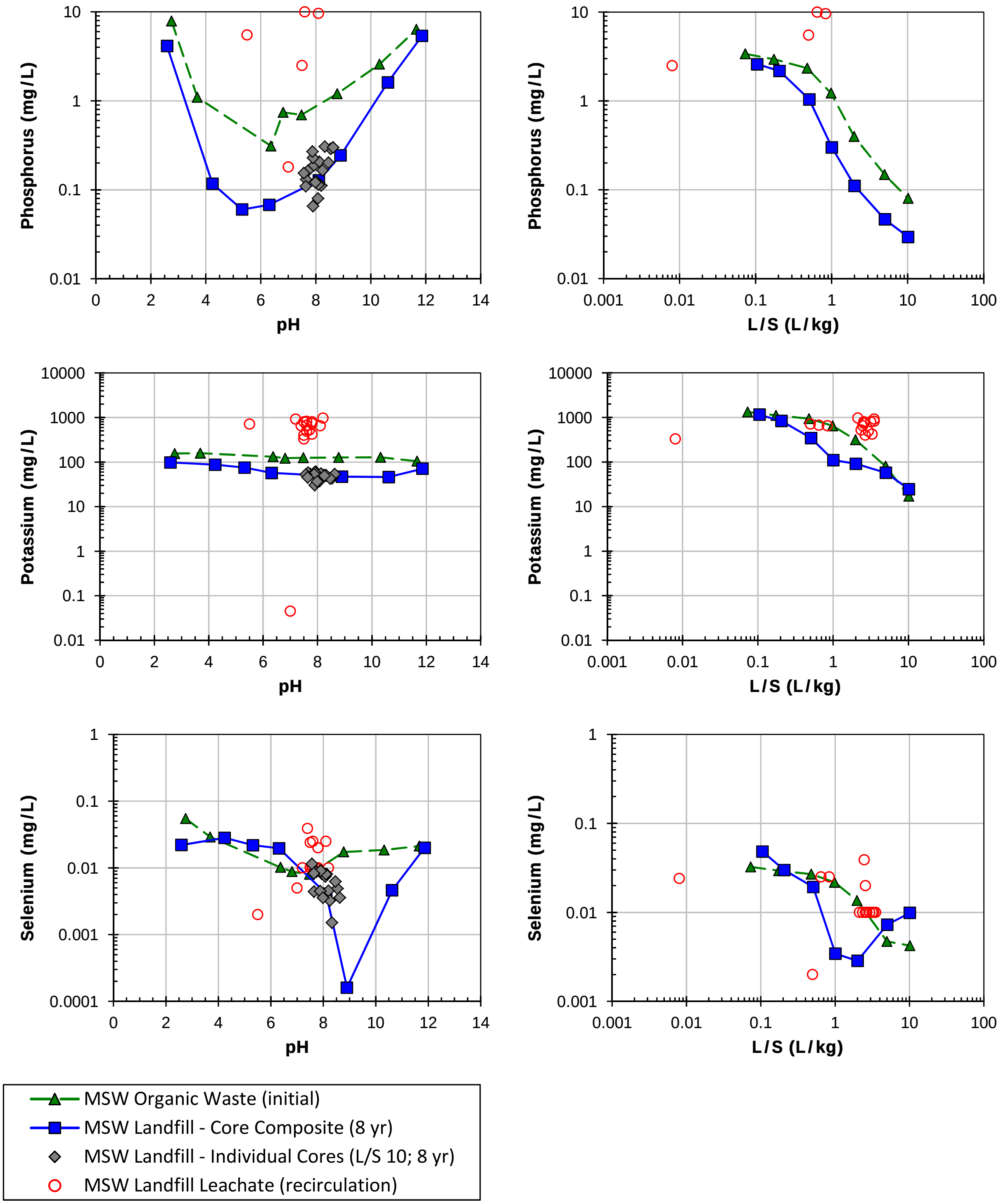

Figure G-6. **Comparison of laboratory and field concentration results for a municipal solid waste landfill (The Netherlands).**

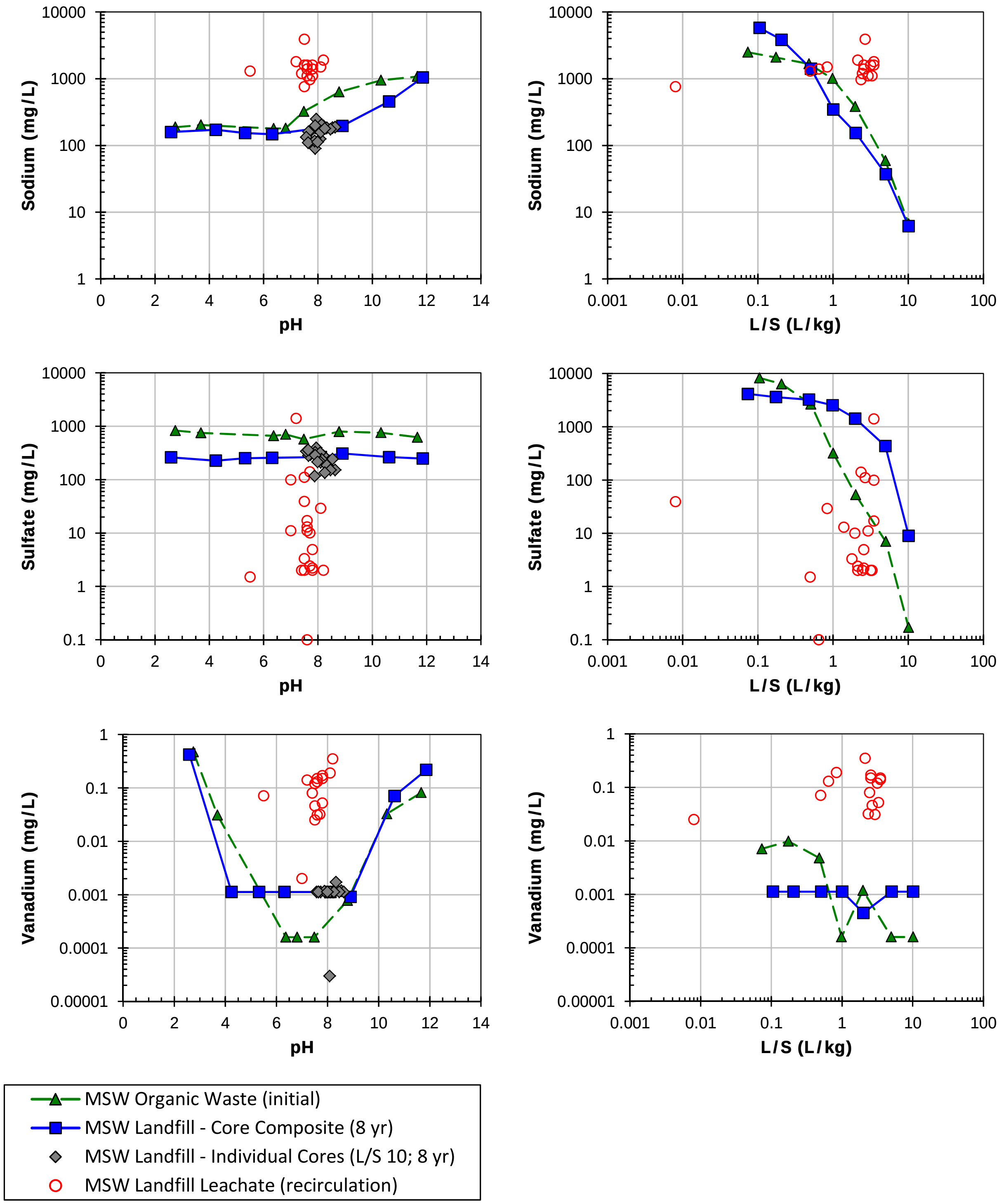

Figure G-7. Comparison of laboratory and field concentration results for a municipal solid waste landfill (The Netherlands).

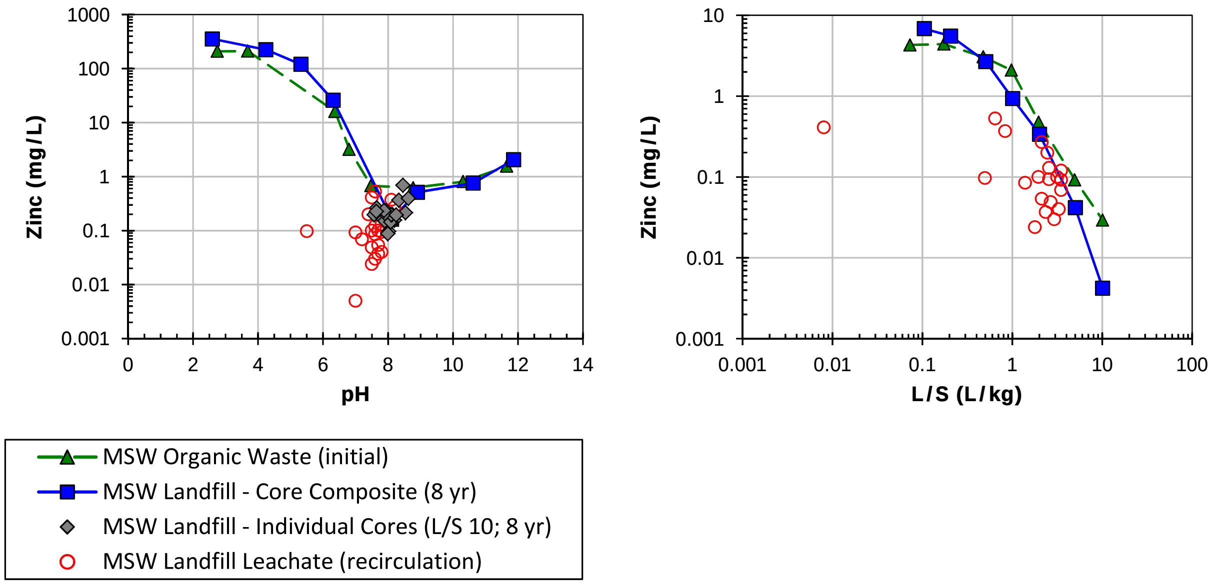

Figure G-8. **Comparison of laboratory and field concentration results for a municipal solid waste landfill (The Netherlands).**

APPENDIX H. STABILIZED MUNICIPAL SOLID WASTE INCINERATOR FLY ASH DISPOSAL (THE NETHERLANDS)

Table H-1. Data Sources for Laboratory-to-Field Comparisons for Stabilized Waste (The Netherlands).

Legend ID	Source	Material Type	Data Type	Citation
Fresh Stabilized Waste		S/S MSWI FA	pH-dependence (CEN/TS 14429) Percolation (CEN/TS 14405)	van Zomeren and van der Sloot, 2006b Keulen, 2010
Monofill – Individual Cores (10 yr)	Full-scale monofill,	Individual cores at depth > 12 m	Batch L/S (EN 12457-2) Percolation (CEN/TS 14405)	van Zomeren and van der Sloot, 2006b Keulen, 2010
Monofill Leachate	Full-scale monofill,	Field Leachate (bottom of drain)	-	van Zomeren and van der Sloot, 2006b Keulen, 2010
Cell B – Core Composite (4 yr)	Pilot Cell B (MSWI FA, 5x8x2.4m)	Composite – top layer uncovered cell	pH-dependence (CEN/TS 14429)	van Zomeren and van der Sloot, 2006b Keulen, 2010
Cell B – Individual Cores (L/S 10; 4 yr)	Pilot Cell B	Individual cores at depth	Batch L/S (EN 12457-2)	van Zomeren and van der Sloot, 2006b Keulen, 2010
Cell B Leachate	Pilot Cell B	Field Leachate (bottom of drain)	-	van Zomeren and van der Sloot, 2006b Keulen, 2010
Cell C – Composite (covered; 4 yr)	Pilot Cell C (MSWI FA, 5x8x2.4m)	Composite – top layer covered cell	pH-dependence (CEN/TS 14429)	van Zomeren and van der Sloot, 2006b Keulen, 2010
Cell C – Individual Cores (L/S 10; 4 yr)	Pilot Cell C	Individual cores at depth	Batch L/S (EN 12457-2)	van Zomeren and van der Sloot, 2006b Keulen, 2010
Cell C Leachate	Pilot Cell C	Field Leachate (bottom of drain)	-	van Zomeren and van der Sloot, 2006b Keulen, 2010
Cell D – Individual Cores (4 yr)	Pilot Cell D (MSWI FA, 5x8x2.4m)	Composite – top layer uncovered cell	pH-dependence (CEN/TS 14429)	van Zomeren and van der Sloot, 2006b Keulen, 2010
Cell D Leachate	Pilot Cell D	Field Leachate (bottom of drain)	-	van Zomeren and van der Sloot, 2006b Keulen, 2010

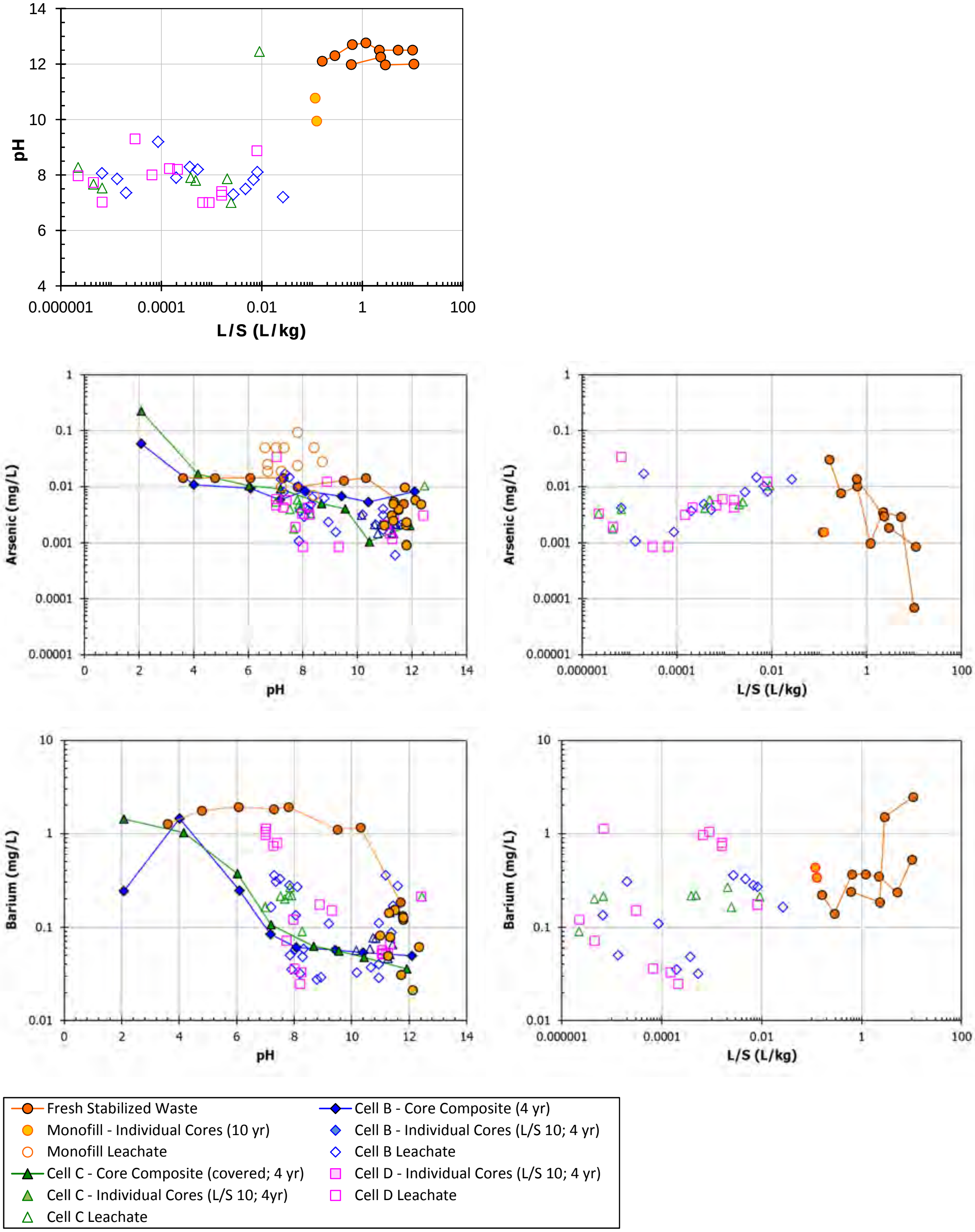

Figure H-1. **Comparison of laboratory and field pH for stabilized MSWI fly ash disposal (The Netherlands).**

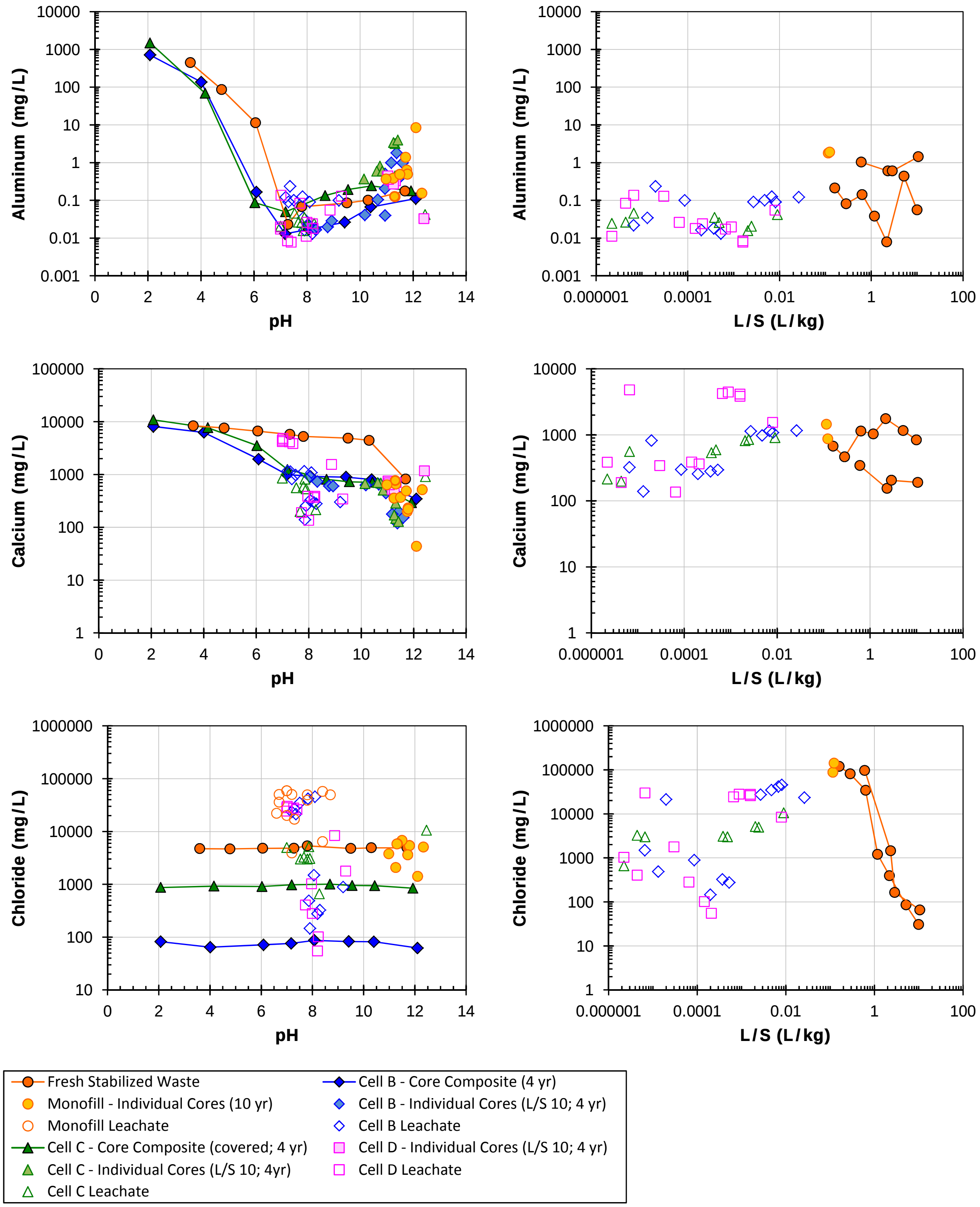

Figure H-2. Comparison of laboratory and field concentration results for stabilized MSWI fly ash disposal (The Netherlands).

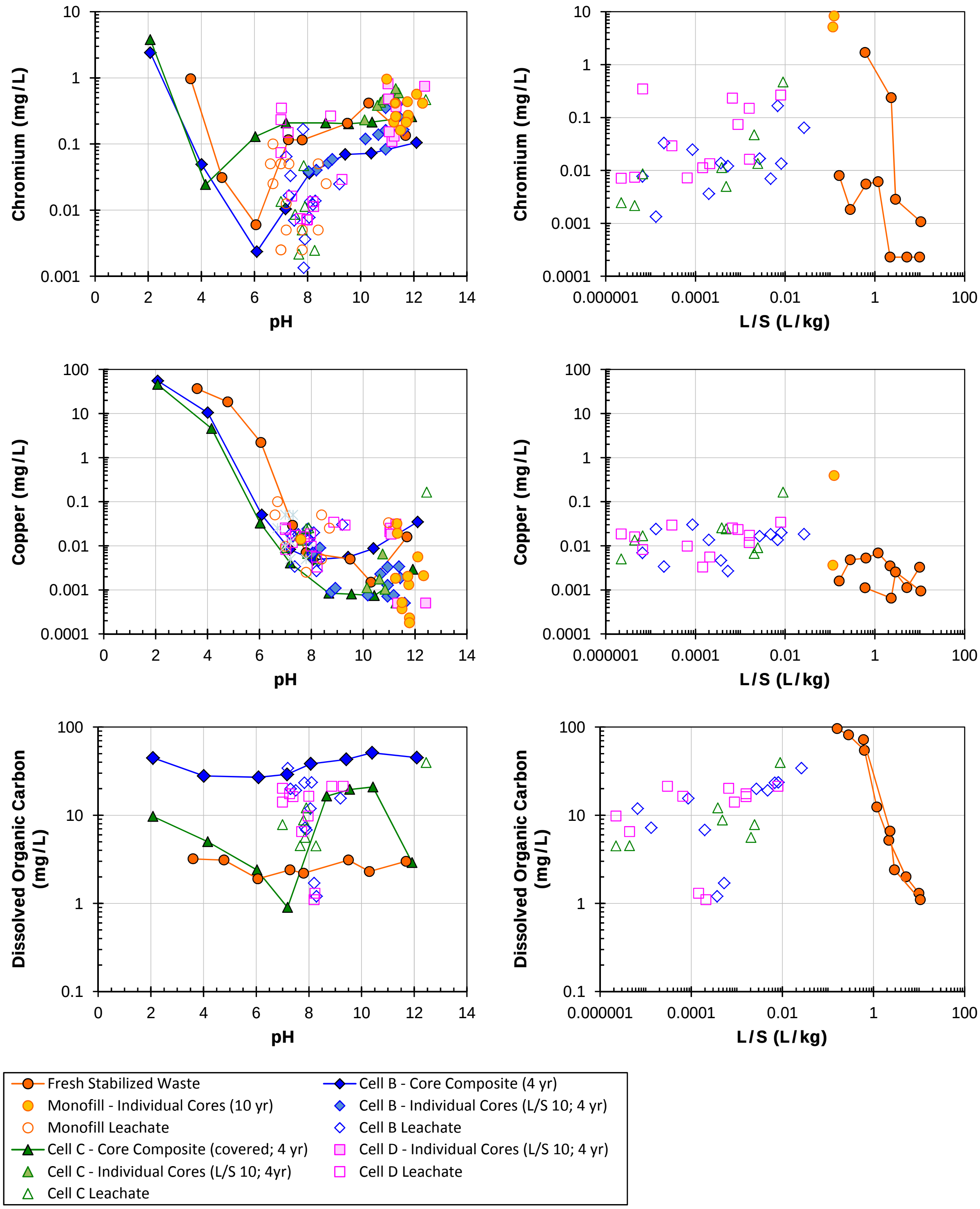

Figure H-3. Comparison of laboratory and field concentration results for stabilized MSWI fly ash disposal (The Netherlands).

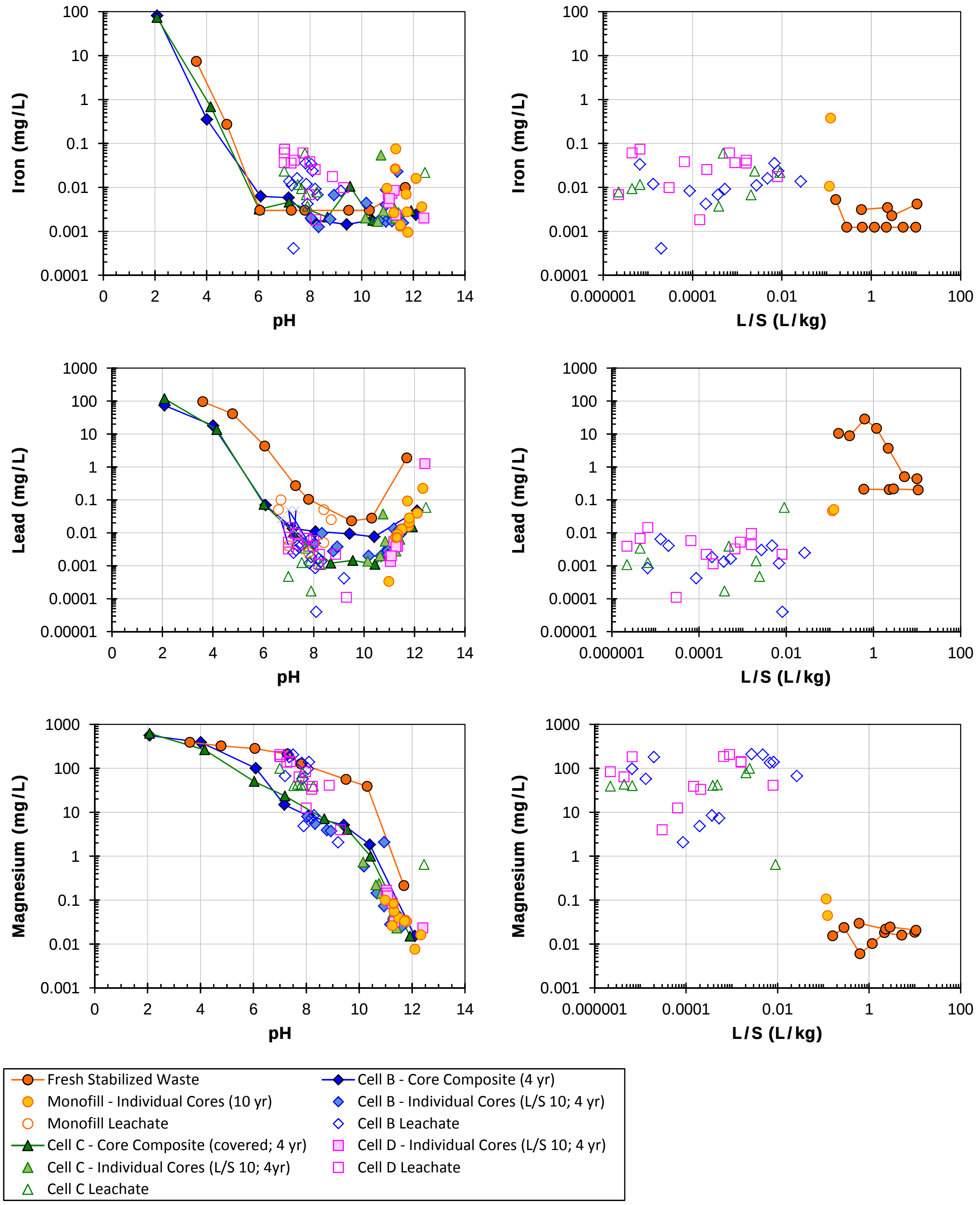

Figure H-4. **Comparison of laboratory and field concentration results for stabilized MSWI fly ash disposal (The Netherlands).**

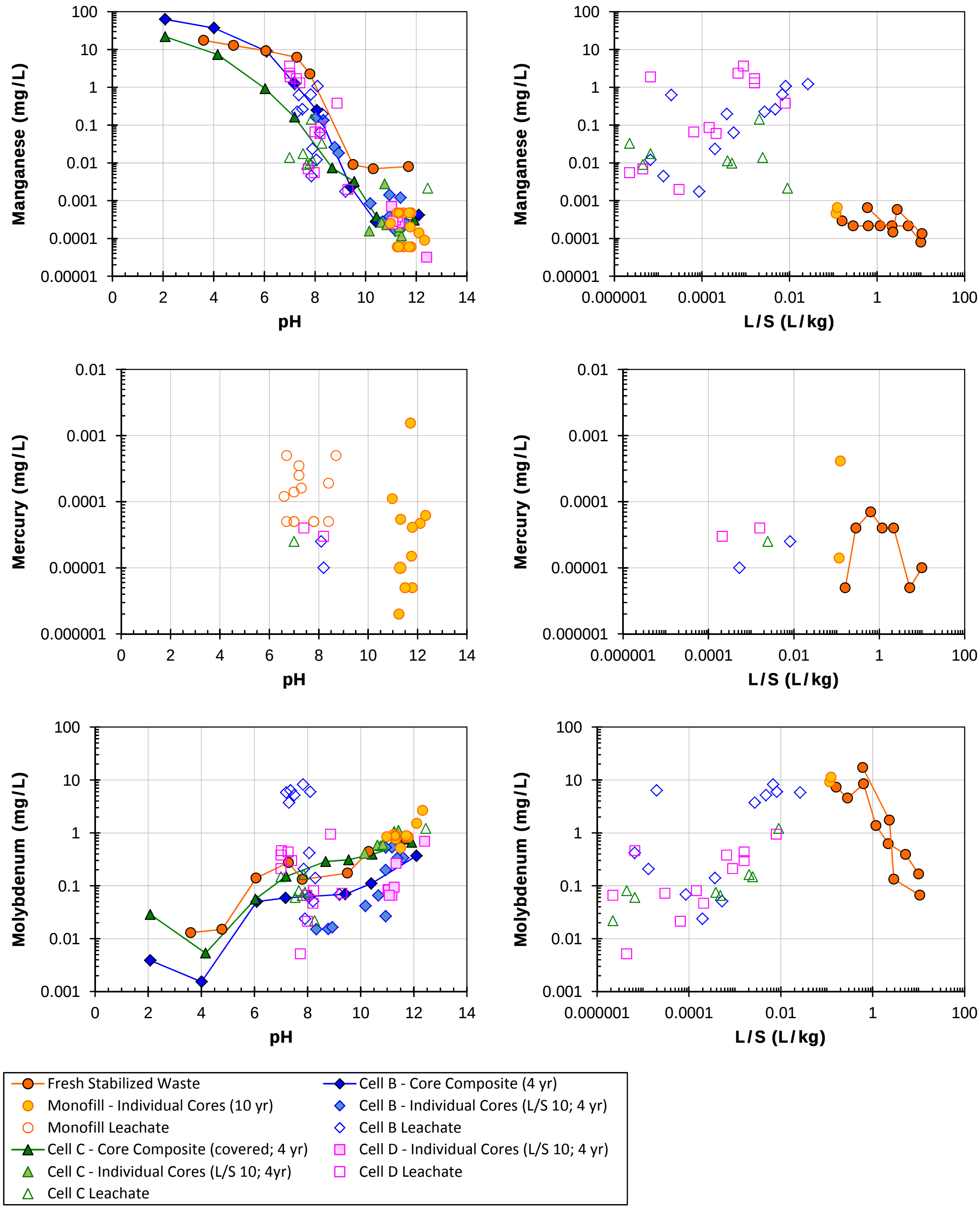

Figure H-5. **Comparison of laboratory and field concentration results for stabilized MSWI fly ash disposal (The Netherlands).**

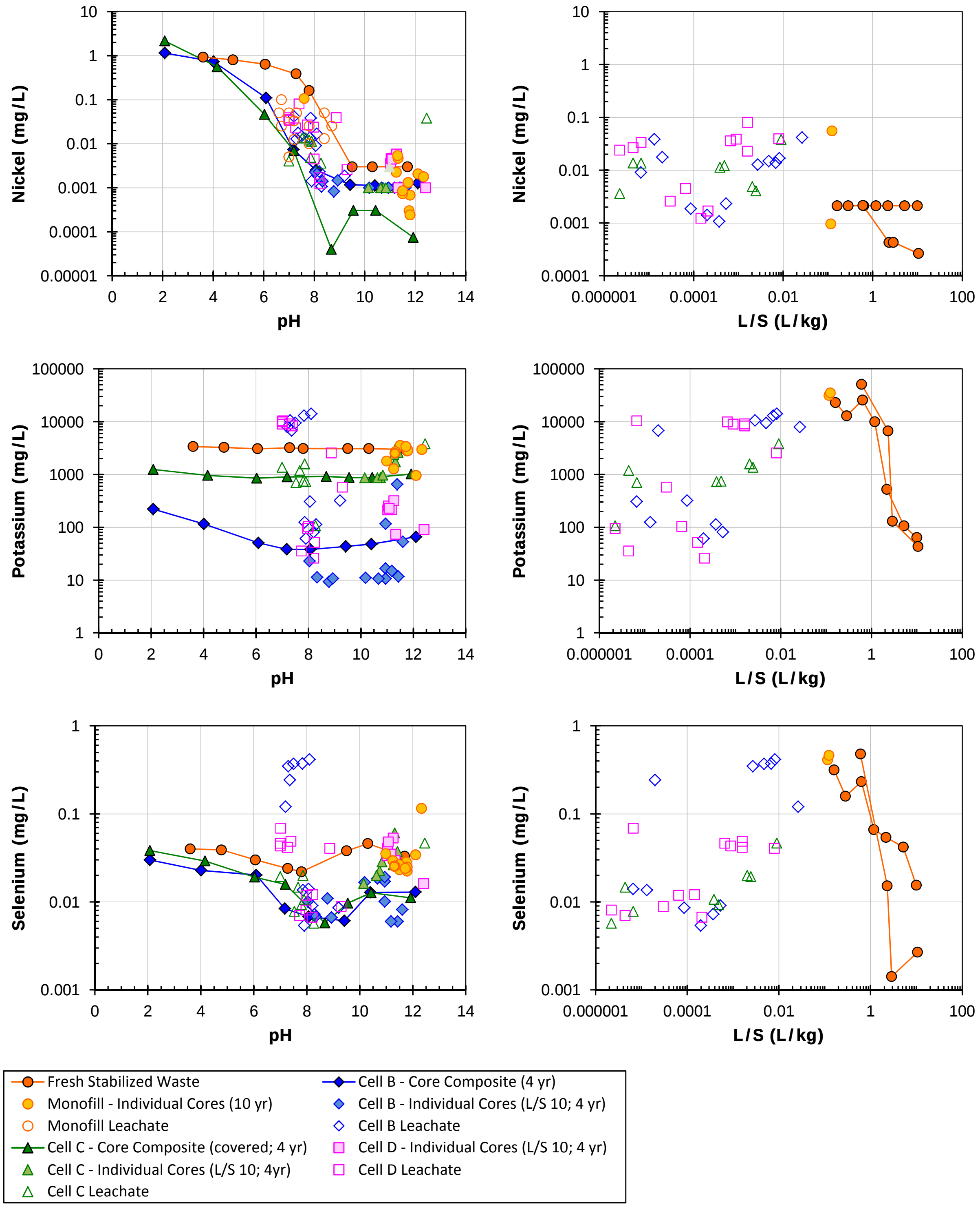

Figure H-6. Comparison of laboratory and field concentration results for stabilized MSWI fly ash disposal (The Netherlands).

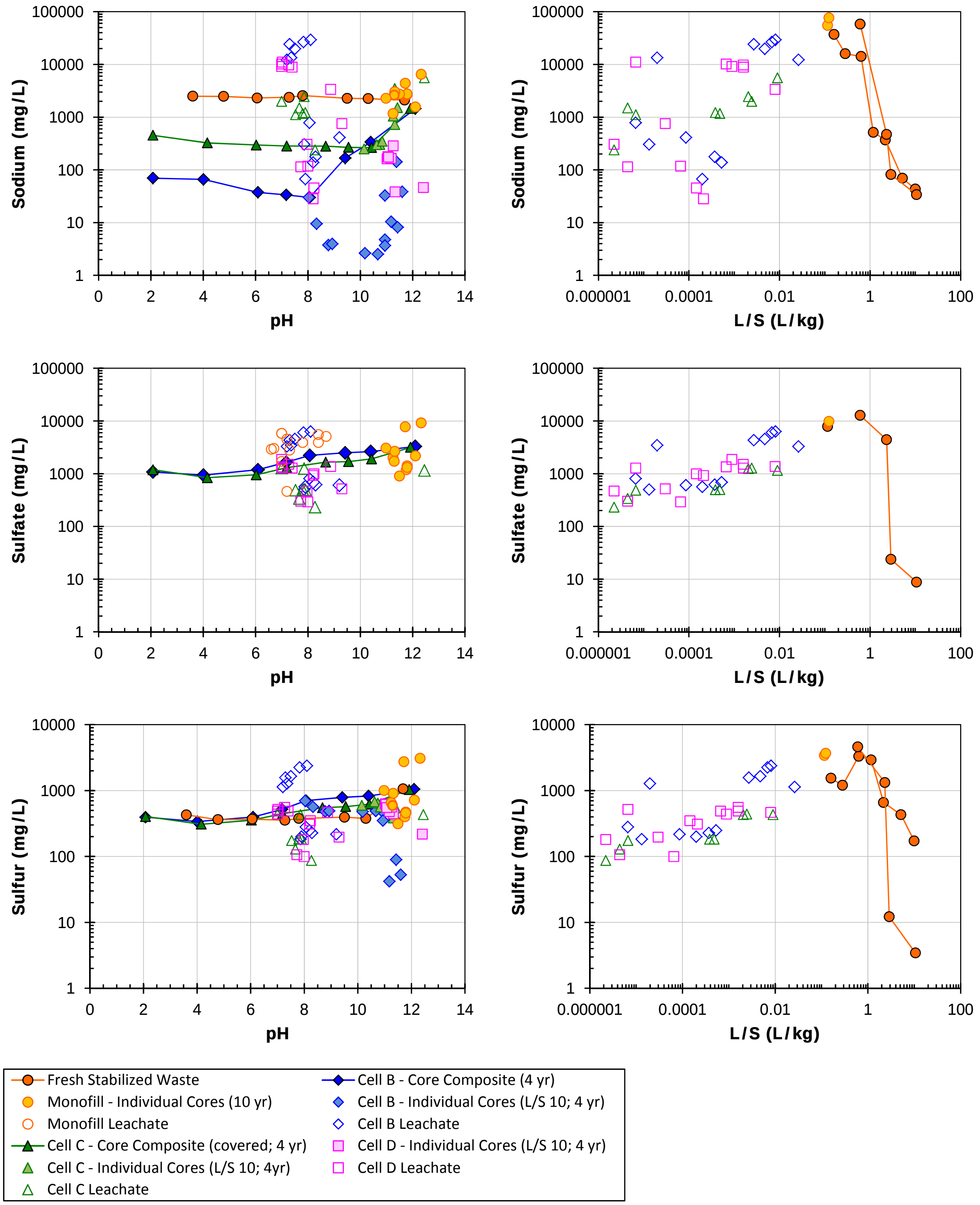

Figure H-7. Comparison of laboratory and field concentration results for stabilized MSWI fly ash disposal (The Netherlands).

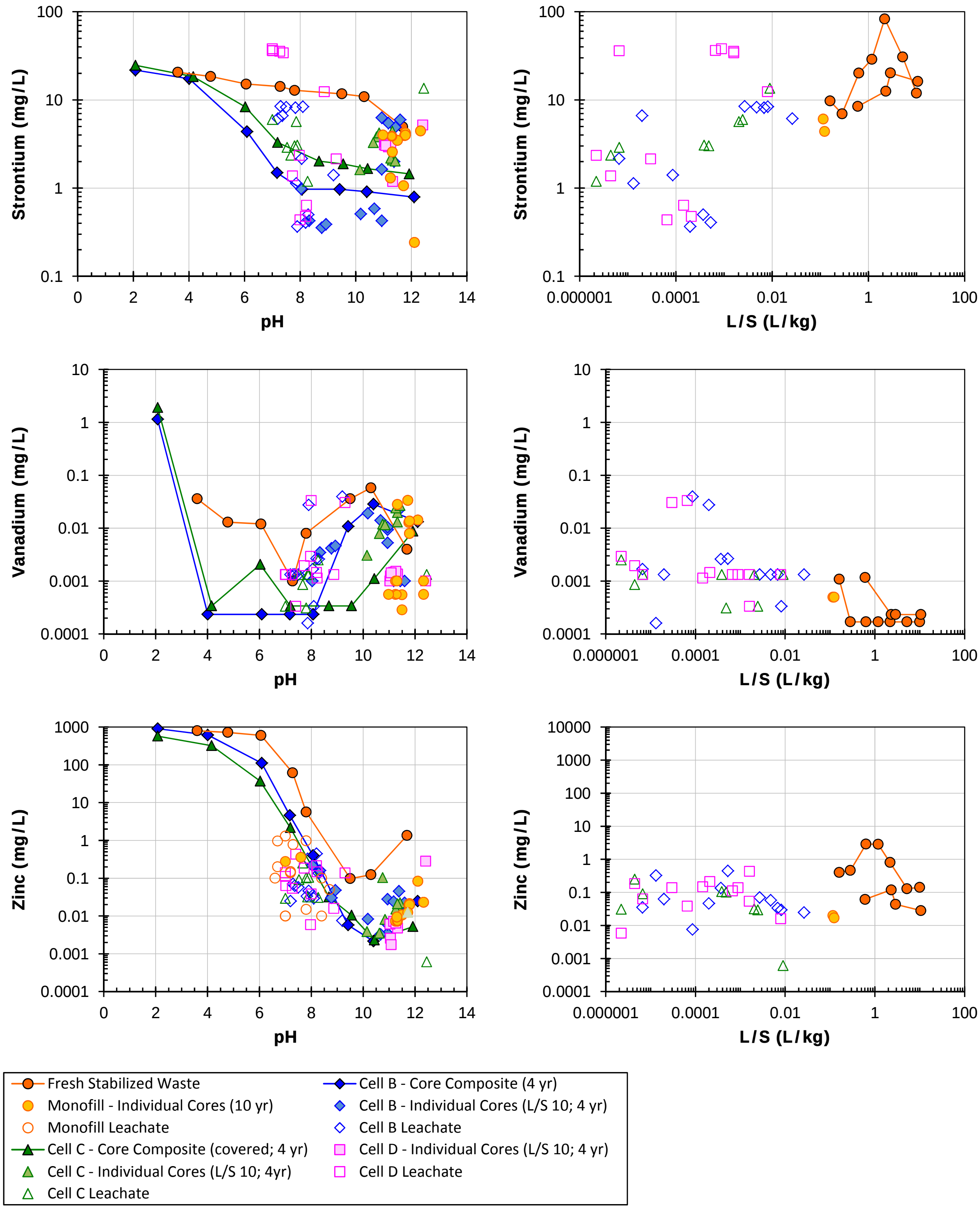

Figure H-8. Comparison of laboratory and field concentration results for stabilized MSWI fly ash disposal (The Netherlands).

APPENDIX I: PORTLAND CEMENT MORTARS AND CONCRETE

Table I-1. Data Sources for Laboratory-to-Field Comparisons for Portland Cement Mortars and Concrete

Legend ID	Source	Material Type	Data Type	Citation
Cement Mortar CEM I (DE)	Germany	CEM I type cement mortar	pH-dependence	Schießl, 2003
Concrete – Core (40 yr, rain exposed, DE)	Germany		pH-dependence	Schießl, 2003
Concrete – Core (40 yr, immersed, DE)	Germany		pH-dependence	Schießl, 2003
Roman Aqueduct - Core (2,000 yr; DE)		Core from Roman Aqueduct	pH-dependence	van der Sloot et al., 2011
Cement Mortar CEM I (NO)	Norway	CEM I type cement mortar	pH-dependence	Engelsen et al., 2009; 2010
RCA (fresh, NO)	Norway	Recycled Concrete Aggregate	pH-dependence	Engelsen et al., 2009; 2010
RCA – Roadbase (4 yr, <10 mm, NO)	Norway	Recycled Concrete Aggregate, recovered from roadbase (depth < 10 mm	pH-dependence	Engelsen et al., 2009; 2010
RCA – Roadbase (4 yr, 20-120 mm, NO)	Norway	Recycled Concrete Aggregate, recovered from roadbase	pH-dependence	Engelsen et al., 2009; 2010

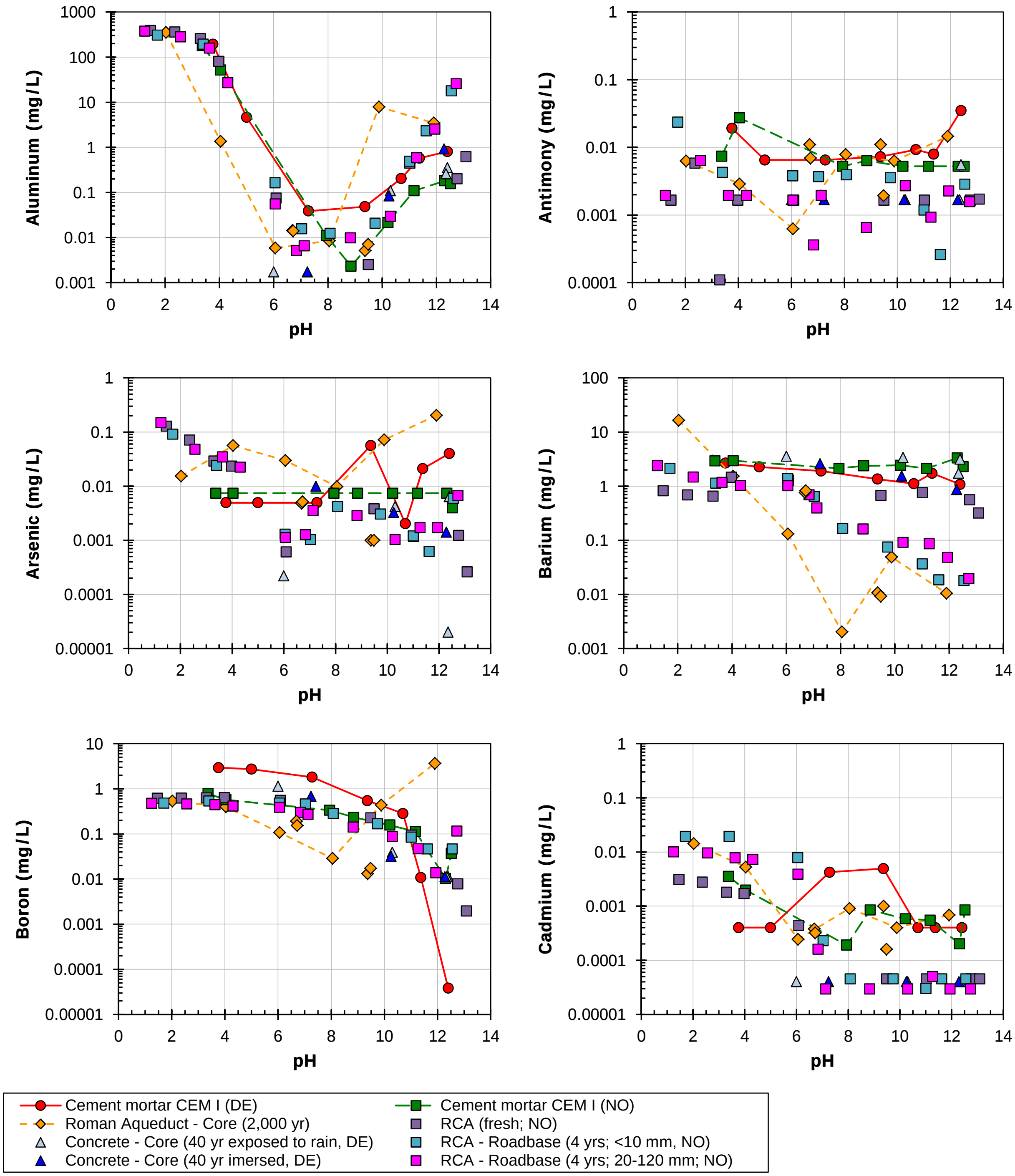

Figure I-1. Comparison of portland cement mortars, concretes and recycled aggregates.

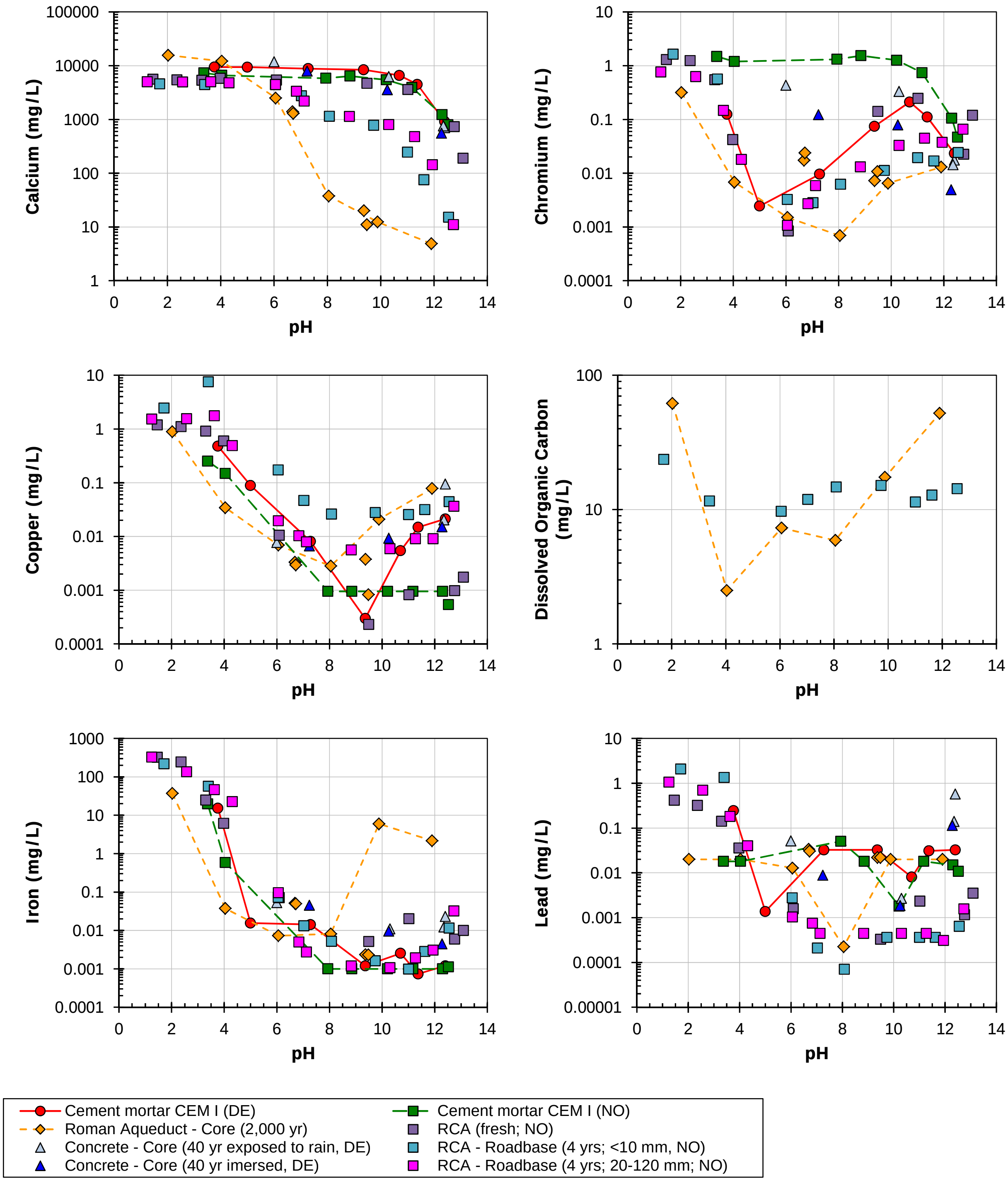

Figure I-2. Comparison of portland cement mortars, concretes and recycled aggregates.

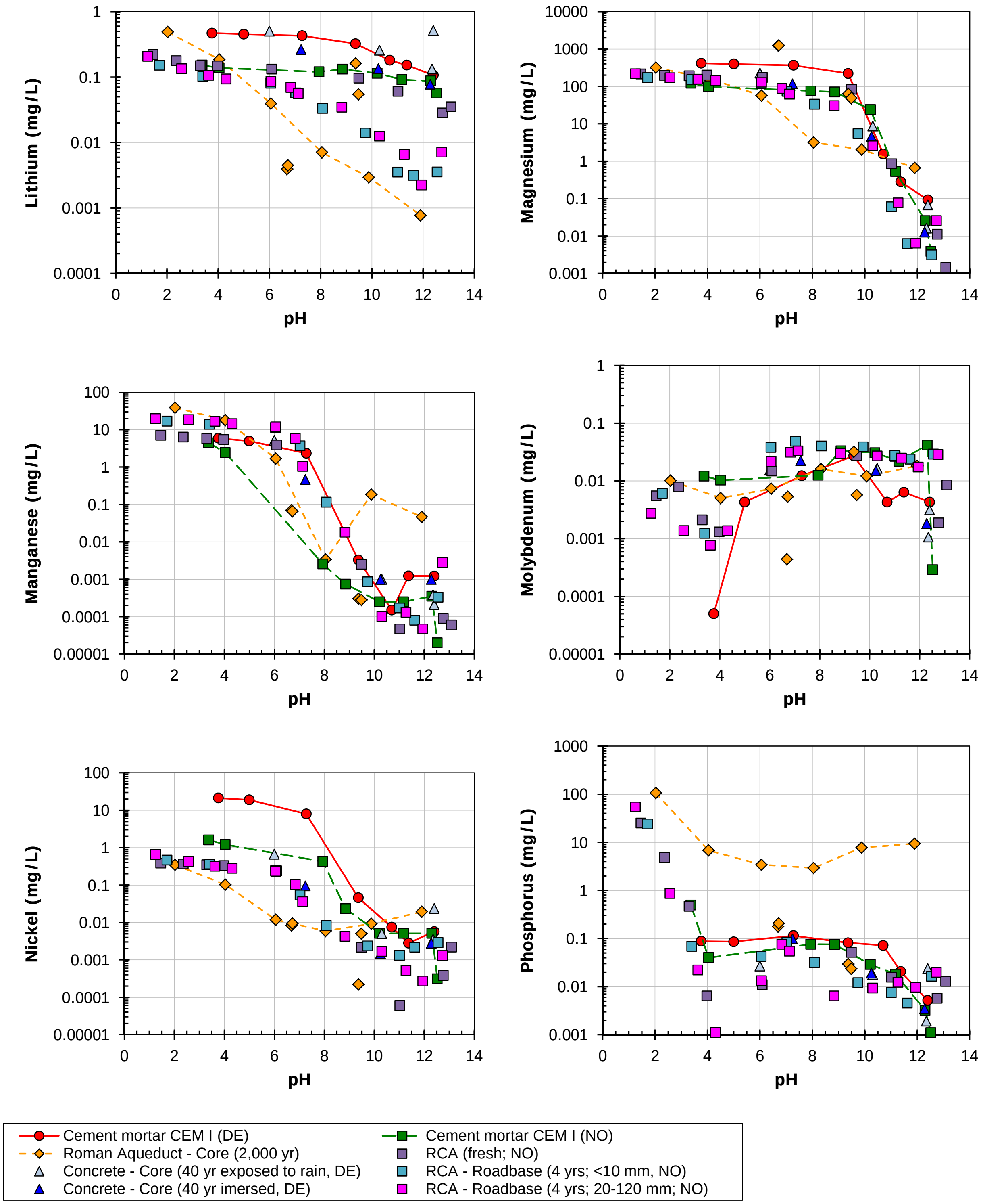

Figure I-3. **Comparison of portland cement mortars, concretes and recycled aggregates.**

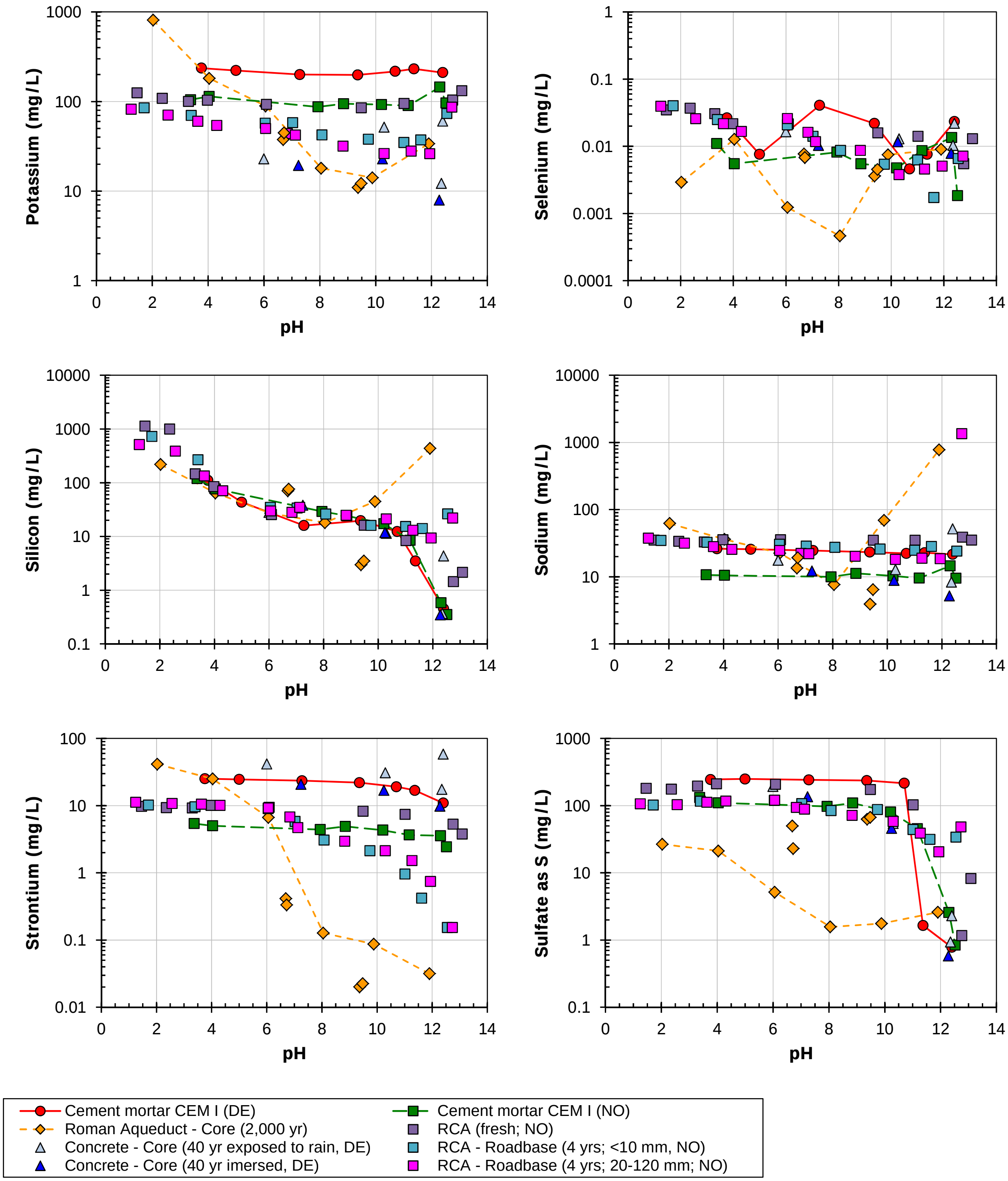

Figure I-4. **Comparison of portland cement mortars, concretes and recycled aggregates.**

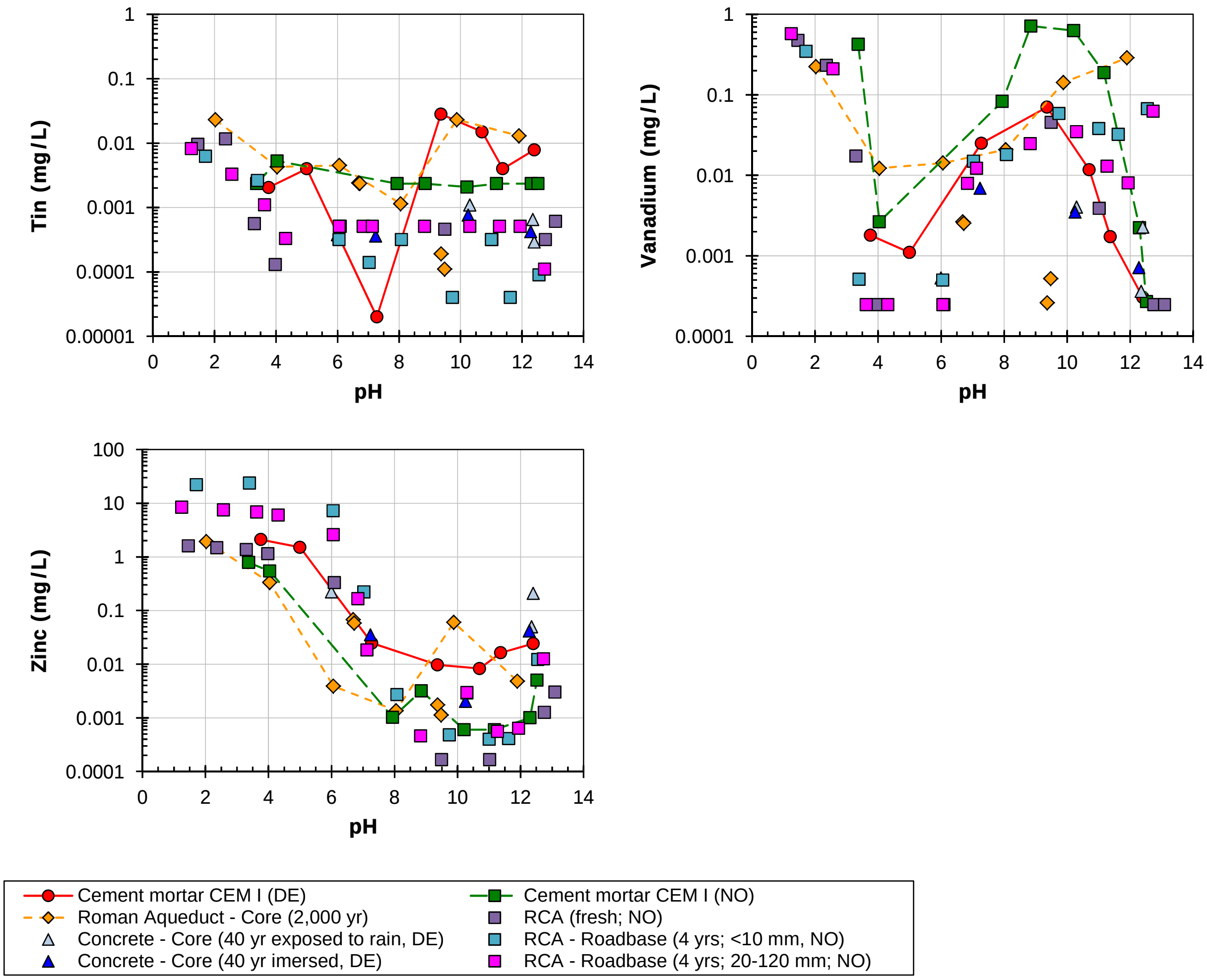

Figure I-5. Comparison of portland cement mortars, concretes and recycled aggregates.

The following are attachments to the testimony of Scott M. Payne, PhD, PG and Ian Magruder, M.S..

ATTACHMENT 18

DEQ
Montana Department
of Environmental Quality

April 22, 2019

Mr. Gordon Criswell
Talen Montana
PO Box 38
Colstrip, Montana

RE: DEQ Comments on *Units 1&2 Revised Remedy Evaluation Report, January 2019*

Gordon:

DEQ has reviewed the above-referenced document and does not approve the report. DEQ has identified issues with the predictive models that prevent DEQ from determining the adequacy of the remedial alternatives presented in the Report. DEQ requests that the models be modified to address these issues, and the report be re-submitted with a revised analysis of the results of the remedial alternatives. Please note that DEQ will not accept a remedy that leaves a long-term source in place if it is in contact with groundwater.

DEQ has provided general comments on this report—specifically regarding issues with the models—below. DEQ also requests a copy of the fate and transport modeling files.

DEQ would like to schedule a meeting to discuss these comments prior to re-submittal of the Report. If you have any questions in the meantime, please feel free to contact me at 406-444-6797 or sedinberg@mt.gov.

Sincerely,

Sara Edinberg
Hydrogeologist
Montana DEQ

cc: Aimee Reynolds, DEQ (electronic copy)
Ed Hayes, DEQ (electronic copy)
Al Hilty, Hydrometrics (electronic copy)
Bob Glazier, Geosyntec (electronic copy)
Cam Stringer, NewFields (electronic copy)

Steve Bullock, Governor I Shaun McGrath, Director I P.O. Box 200901 I Helena, MT 59620-0901 I (406) 444-2544 I www.deq.mt.gov

1. Overall, the MDEQ does not agree that Talen’s preferred remediation alternative (Alternative 5 or modified Alternative 5) will achieve the remediation objectives - as predicted by the fate and transport model. In addition, MDEQ does not agree with the assumption that all of the inflow to/at the SOEP is from the percolation through the evapotranspiration cap as presented in the Remedy Evaluation Report. Previous water balance evaluation at the SOEP and STEP Site indicated underflow from upgradient model areas and seepage/underflow from the Surge Pond area are adding water to the area beneath the SOEP. It is already evident that leaving the SOEP as-is creates a continual source of Constituents of Interest (COIs) to groundwater. Furthermore, capping the SOEP with a Type IV cover system does not eliminate the presence of groundwater within the ash. As long as groundwater is in contact with ash in unlined ponds, a source of COIs will be present, which poses a long-term risk to groundwater.

2. Prior to construction of the Stage I pond (SOEP) in 1975, the shallow groundwater table elevation in this area was presumably lower than the current center line pond bottom elevation of 3252 ft. amsl. As indicated in the Report, the water level in the fly ash reached a quasi-equilibrium several years after the reclamation program was completed in 2002. The water level is at approximately 3271 ft. amsl as indicated by groundwater elevation at well 2002A, which may be biased low due to active pumping in this area (e.g., 966A at ~3.9 gpm). This indicates that the local shallow groundwater table is likely to have been raised due to the coal combustion residuals (CCR) deposition, dam construction in the drainage valley, and the construction of Castle Rock Lake. The SOEP was constructed with a partial clay liner at the bottom of the pond and CCR in the SOEP is in direct contact with groundwater. Currently, it is estimated that at least 18-20 feet of fly ash in the SOEP will remain submerged (below the water table) in each of the alternatives, excluding Alternative 7. This saturated CCR will serve as a continuous, and long-term source of CCR COIs that will leach to the groundwater and re-emerge as a plume within and outside of Talen’s property after the capture system is shut down.

3. Seepage from the ponds in the Units 1&2 area appears to be entirely the result of infiltration of precipitation, as described in Appendix J (HELP model). Because this assumption is carried over into the fate and transport model, only vertical seepage is accounted for, when in reality, the ponds have both horizontal and vertical seepage components because portions of the ponds are in contact with groundwater. The result is that advective groundwater flow is not accounted for, and that discharge of COIs from the SOEP are likely underrepresented, while discharge of COIs from the single-lined STEP ponds may continue for much longer.

4. Boron and Sulfate concentrations in the initial model recharge, and concentration loading rates (Appendix D, Table 5-1) are generally much lower than the concentrations used in the SOEP/STEP mass discharge estimates for 2017 (Appendix I, Table 1). It appears that these concentration values were modified to fit the observed plume configuration. This may underestimate the mass of COIs actually leaching from the ponds and could significantly underestimate the predicted remediation timeframe. Because of the sensitivity of source concentrations in the model, as discussed in Appendix D, Section 8, it is especially important to ensure that accurate concentrations are being used in the source areas in order to provide an accurate prediction of the remedial alternative results.

5. Although Alternative 6 does attempt to model the saturated CCR material through a constant concentration boundary, it is not clear how the model accounts for the continuous source of COIs in the SOEP.

6. Due to the continued saturation of soils beneath the ponds after capture/injection system shutdown, DEQ recommends that the soils be sampled to determine whether they are a potential source, and if they contribute to plume re-emergence.

7. Because the proposed Alternative(s) do not meet the proposed cleanup criteria (PCC) at the point of compliance (POC), benchtop and field studies to determine the effectiveness of the permeable reactive barrier (PRB) and monitored natural attenuation (MNA) "contingency" plans should be implemented immediately, so that the additional measures are ready to be implemented as soon as possible.

8. To fully evaluate Alternative 6, DEQ requires additional detail related to how the masses of boron and sulfate are added to the model. MDEQ understands that the seepage through the cap will diminish; however, a seepage rate of zero does not seem technically correct. Additionally, it appears from Table 7-1 that the mass discharge across transect B-B' is unrealistically low for Alternative 6. Additional detail is required to show that mass loading is accurately applied to the model and the results of the model for this alternative are accurate and acceptable

9. Alternative 7, which includes removing CCR from the SOEP to a new landfill appears to be more effective at reducing boron concentrations beyond the POC long-term (compared to the other alternatives), since the SOEP is a major mass contributor to the groundwater plume. Removal of CCR at the SOEP will permanently remove the continuous, long-term source of CCR constituents to the groundwater. In addition, dewatering of A Cell and E Cell of STEP is included in the scope of Alternative 7, but was not included in the Mass Discharge Calculations for Ponds under Scenario 4 (Appendix I, Tables 3 &4). Please assure dewatering these Cells has been taken into account in the modeling input.

10. Alternative 7, which includes excavation of the SOEP, must include a dewatering component of the SOEP. Standard practices of ash excavation require that dewatering the ash prior to excavating is an essential step in the process. Not only is this step not included in Alternative 7, but costs for ash dewatering are not included. Additionally, dewatering the ash could begin prior to construction of the new CCR impoundment, which would reduce seepage from the SOEP and would likely lead to faster cleanup times under Alternative 7.

11. A Cell, E Cell, and the Old Clearwell were constructed with a single liner, and do not have leachate collection systems. Similar to the SOEP site, based on the groundwater elevation data, the shallow groundwater table in the STEP area is likely raised and the bottom portions of these ponds are or will be in contact with groundwater under natural conditions. The CCR material is currently separated from the groundwater by the single HDPE liner; however, the integrity of the single liner needs to be monitored for potential liner failure as long as it remains in place. Additionally, a contingency plan for removal should be developed for these ponds in the event that these ponds prove to be a continued source of COIs.

12. It is unclear from the text whether source concentrations were modified to reflect the removal of the ash (source material) in the SOEP in Alternative 7. The text (Appendix D, Executive Summary, “Model Limitations”) indicates that source concentrations were held constant throughout the simulations, which presumably includes Alternative 7. However, Alternative 7 source concentrations should revert to background values once the ash from the SOEP is removed.

ATTACHMENT 19

DEQ
Montana Department
of Environmental Quality

May 21, 2020

Mr. Gordon Criswell
Talen Montana, LLC
PO Box 38
Colstrip, Montana

Dear Gordon:

Thank you for providing the information on the Units 1&2 source control alternatives requested by DEQ. To recap, DEQ requested that Talen evaluate an alternative that included removal of coal ash in the Stage I/Stage II Ponds in a comment letter to Talen dated August 2, 2018. Talen agreed and included an excavation alternative for the Stage I Pond in the subsequent *Units 1&2 Revised Remedy Evaluation Report (January 2019)*; however, excavation was not identified as Talen's preferred alternative. DEQ provided a general comment letter on the revised Report describing deficiencies in the alternatives analysis and predictive modeling, noting that "DEQ will not accept an alternative that leaves a long-term source in place if it is in contact with groundwater" (DEQ, April 2019).

Talen agreed to provide a thorough analysis of source control options for the Stage I Pond, proposing that the report be split into two parts: the first part would address existing groundwater contamination resulting from historical pond seepage, while the second part would address source control alternatives for the Stage I Pond. Talen submitted Part 1 of the Revised Report on October 1, 2019. DEQ reviewed the report and solicited public comments, as required in Article V of the Administrative Order on Consent (AOC). Although the report included many components that would be required for groundwater to meet cleanup criteria, the report also included cap-in-place closure of the Stage II Ponds. The Stage II Ponds were constructed with a single HDPE liner, but the bottom of the ponds will remain in contact with groundwater in perpetuity. Talen identified a 36 to 400-year lifespan for the HDPE liners in the report, for exposed and unexposed conditions, respectively. This implies that the ash within the lined ponds would eventually be in direct contact with the groundwater.

As part of the split report process, DEQ required monthly update meetings with Talen on the status of the Part 2 Report. During the February 7, 2020 monthly meeting, DEQ indicated that Talen was not providing a thorough enough analysis for the Stage I excavation scenario, and requested an evaluation of Stage II Pond excavation. DEQ and Talen followed up on the request for a full excavation scenario during a conference call on March 13, 2020 with Talen and legal staff from both entities. Talen agreed to DEQ's request and provided a proposal for additional steps and a schedule for the excavation scenario on April 1, 2020. DEQ requested a more detailed presentation of alternatives that would be evaluated during a follow-up conference call on April 8, 2020. Talen presented a series of detailed alternatives to DEQ during a meeting on April 16, 2020. Of these alternatives, five were selected by Talen to be carried forward for further analysis. Talen estimated that evaluating all five of the additional alternatives would extend the submittal date to September 2020.

Per DEQ's request, Talen supplied modeled groundwater elevation information to DEQ on May 6, 2020 for the year 2055 (after shutdown of the capture/injection system operation) for the Stage II Pond area, assuming removal and backfilling/revegetation of the Stage I Pond. The model results showed water levels of up to 15 feet above the bottom of the lined A Cell, E Cell, and Old Clearwell. Of the five alternatives proposed for further analysis, four of the alternatives leave the Stage II Ponds in place, with a proposed gravity drain to draw water levels below the bottom of the ponds. DEQ believes that the use of a gravity drain for permanent water table depression is problematic for the following reasons:

- The cost of maintaining a gravity drain over many years will likely be very expensive; financial assurance to cover these costs would be required into perpetuity.
- The long-term ability of the gravity drain to maintain water levels below the Stage II Ponds may not be reliable. Background groundwater chemistry is highly mineralized, and has been known to cause scaling issues in existing piping associated with the plant structures; therefore, it is likely that scaling would be an ongoing issue in the gravity drain—even if the water does not exceed background concentrations—that would require routine maintenance in perpetuity to ensure the drain does not become clogged or blocked.
- The ability of gravity drain to maintain water levels below the Stage II Ponds during a high-water year, or other unexpected event, has not been considered.
- Lowering the water table elevation permanently may be problematic from a water rights standpoint.
- The volume of water that would need to be drained to maintain water levels at least 5 feet below the ponds (20 feet of total elevation decrease) has not been clearly defined; however, it is likely to be extensive.
- The final disposal location for this water has not been clearly defined, especially if concentrations of COCs are above cleanup criteria. If an infiltration gallery is to be used, the effects on the local water balance are unknown, including effects on Armells Creek.
- The timeline for installation and operation of the gravity drain is problematic. Operating the drain during groundwater capture/injection activities would result in desaturating layers that require groundwater capture, leaving COCs in the aquifer matrix that could mobilize if the layer becomes resaturated; thereby, decreasing the effectiveness of the capture/injection system. Waiting to operate the drain until after the capture/injection system is shut down would mean waiting 30+ years to operate a technology that may not be reliable and, if it does not operate as planned, could risk re-contamination of the groundwater.

Groundwater is protected in the State of Montana, and as a result, remediation activities throughout the state must take this into consideration. The state has not concurred with remediation plans that rely on gravity drains for long-term remedies The State has also advocated for source removal at waste disposal sites —most notably the Parrot Tailings in Butte—for the long-term benefit to groundwater.

Evaluating full removal of the ash in the Stage I and Stage II Ponds at Colstrip is consistent with the State's position on waste-in-place; therefore, DEQ requests that Talen not pursue alternatives that leave a source in contact with groundwater or rely on gravity drains for eliminating the contact (proposed Alternatives 7A, 7B, 7C, and 8D), and instead provide a thorough analysis of full removal (proposed Alternative 10).

While Talen’s proposed timeline for evaluating their proposed five source control alternatives is aggressive, a September deadline is longer than DEQ believes is reasonable. Eliminating analysis of four of the alternatives that rely on a gravity drain would greatly decrease the schedule for submission. Therefore, DEQ requests that an evaluation of Alternative 10 be submitted no later than July 3, 2020.

DEQ greatly appreciates Talen’s continued coordination and prompt communications with DEQ. Please feel free to contact DEQ on any questions or to discuss continued efforts.

Sincerely,

Jenny Chambers
Waste Management and Remediation Division Administrator
Montana DEQ

cc: Terri Mavencamp, DEQ
Sara Edinberg, DEQ
Ed Hayes, DEQ (legal)
Nick Whitaker, DEQ (legal)
Damon Obie, Talen Montana (legal)
Joshua Frank, Baker Botts LLP
Jen Petritz, Talen Montana
Robert Glazier, Geosyntec Consultants
Al Hilty, Hydrometrics
Cam Stringer, NewFields

ATTACHMENT 20

Appendix A. Hydrogeologic Site Characterization Report

SMARTER SOLUTIONS

EXCEPTIONAL SERVICE

VALUE

HYDROGEOLOGIC SITE CHARACTERIZATION REPORT

West Ash Pond Complex
Wood River Power Station
Alton, Illinois

FINAL

October 19, 2016

NATURAL
RESOURCE
TECHNOLOGY

ENVIRONMENTAL CONSULTANTS

NATURAL
RESOURCE
TECHNOLOGY
ENVIRONMENTAL CONSULTANTS

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HYDROGEOLOGIC SITE CHARACTERIZATION REPORT

WEST ASH POND COMPLEX
WOOD RIVER POWER STATION
ALTON, ILLINOIS

Project No. 2376

Prepared For:

Dynegy Operating Company
1500 Eastport Plaza Drive
Collinsville, IL 62234

Prepared By:

Natural Resource Technology, Inc.
234 W. Florida Street, Fifth Floor
Milwaukee, Wisconsin 53204

FINAL
October 19, 2016

Stuart J. Cravens

Stuart J. Cravens, PG
Principal Hydrogeologist

Nathaniel R Keller

Nathaniel R. Keller, PG
Hydrogeologist

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APPENDICES

1 INTRODUCTION

1.1 Overview

This Hydrogeologic Site Characterization Report was prepared by Natural Resource Technology, Inc. (NRT) in support of a Closure Plan for impoundments located at the Wood River Power Station (WRPS) which is owned by Dynegy Midwest Generation, LLC (DMG). This report and the Closure Plan will apply specifically to Coal Combustion Residuals (CCR) surface impoundments associated with the Wood River West Ash Pond Complex which includes the following components:

- West Ash Pond 1
- West Ash Pond 2E
- West Ash Pond 2W

In November 2015, in accordance with 40 CFR Part 257, Subpart D, DMG submitted to the Illinois Environmental Protection Agency (IEPA) a notice of intent to close the inactive West Ash Pond 2W. The notice of intent to close the West Ash Pond 2E and West Ash Pond 1 will be submitted by May 17, 2017. Another CCR unit, the Wood River East Ash Pond Complex is not the subject of this closure plan. However, information from previous investigations at this unit are incorporated herein to provide a more complete analysis of the site conditions.

Numerous hydrogeologic investigations have been performed concerning the CCR Units (Multi-Units) located at WRPS. The information presented in this site characterization report includes recent data collected to comply with the Federal CCR Rule (40 CFR Part 257) as well as comprehensive data collection and evaluations from prior hydrogeologic investigation reports (recent to oldest), including, but not limited to, the following:

- ***AECOM December 31, 2015, 30% Design Data Package for Dynegy Wood River Energy Complex West Ash Pond and East Pond CCR Units.*** A geotechnical program consisting of installation of auger borings, CPT soundings and piezometers to obtain information for compliance with requirements of the federal CCR rule.
- ***Kelron/NRT, August 26, 2009, Assessment of Potential for Groundwater Impact on Identified Water Wells, Dynegy Midwest Generation, Inc., Wood River Power Station, East Alton, Illinois.*** An assessment of the potential for impact to water quality in water wells within 2,500 feet of the WRPS property boundary, identified in the June 3, 2009 Water Well Survey report.
- ***Kelron/NRT, June 3, 2009, Water Well Survey, Dynegy Midwest Generation, Inc., Wood River Power Station, East Alton, Illinois.*** A survey to identify wells located within 2,500 feet of the WRPS property boundary.

- ***NRT, May 3, 2006, Transport Model Investigation for the New East Ash Pond, Dynegy Midwest Generation, Inc., Wood River Power Station, Alton, Illinois.*** Calibration of a groundwater flow and transport model to match conditions observed at the New East Ash Pond and utilization of the model to predict the effects of the New East Ash Pond on groundwater quality in the future.

- ***Kelron, December 17, 2004, Hydrogeologic Investigation for the Proposed New East Ash Pond, Dynegy Midwest Generation, Inc., Wood River Power Station, Illinois.*** An investigation to characterize the hydrogeology and groundwater quality at the location of the New East Ash Pond and former Old East Ash Pond and to collect input data for groundwater flow and transport modelling.

- ***NRT, August 2000, Investigation of Closure Options for the West Ash Impoundment, Dynegy Midwest Generation, Inc., Wood River Power Station, Madison County, Illinois.*** An investigation to characterize hydrogeology and groundwater quality at the Wood River West Ash Impoundment and evaluate the effectiveness of closure alternatives for protecting groundwater quality.

- ***Kelron, November 29, 1995, Groundwater Investigation Report, Wood River Ash Pond Expansion, Illinois Power Company.*** An investigation to characterize hydrogeology and groundwater quality near a proposed ash pond expansion near the existing West Ash Pond Complex including analysis of the groundwater monitoring network designed and installed for the ash pond expansion.

- ***Illinois State Water Survey (ISWS), May 1984, Groundwater Monitoring at the Wood River Power Station's Ash Disposal Ponds and Renovated Ash Disposal Area, Illinois Power Company.*** An investigation to design and implement a groundwater monitoring program for determining the impact of ash disposal practices on the local groundwater system. This report includes results from both the West and East Ash Pond Complexes.

In conjunction with this report, a Groundwater Monitoring Plan and a Groundwater Management Zone Application are being prepared to support the closure of the West Ash Pond Complex. In addition, the groundwater flow and transport models were updated to evaluate the effect of various ash pond closure scenarios on groundwater quality and to predict the fate and transport of CCR leachate components. Modeling has also been conducted to enable estimation of the time required for hydrostatic equilibrium of groundwater to be achieved beneath the West Ash Pond Complex.

1.2 Site Location and Background

The West Ash Pond Complex is comprised of West Ash Pond 1, West Ash Pond 2E and West Ash Pond 2W at the WRPS, located in Alton in Madison County, Illinois. The power plant and the West and East Ash Pond Complexes are situated on the east bank of the Mississippi River, about six river miles upstream from the confluence of the Mississippi and Missouri Rivers. The Wood River, a perennial stream that discharges into the Mississippi River, lies on eastern edge of the site.

The West Ash Pond Complex is located within Section 19 Township 5 North and Range 9 West. The cities of Alton, East Alton, and Wood River are within 2 miles of the impoundments. The WRPS is located in an area of heavy industrial activity. Metal refining, vinegar production, cardboard manufacturing, and sewage treatment occur within ½ mile of the plant. The site location is shown on Figure 1. The WRPS property is bordered on the south by the State Route 143 and the Mississippi River, the east by the Wood River, the north by vacant/abandoned industrial property and railroad tracks, and the west by vacant land/water retention ponds of the Mississippi River levee system operated by the Army Corps of Engineers.

Electrical generation at WRPS was shut down in June 2016, and the plant is closing its ash impoundments. This report includes closure of the West Ash Pond Complex, which consists of 3 inactive impoundments (Figure 2):

- West Ash Pond 1 (22 acres, inactive)
- West Ash Pond 2W (19 acres, inactive)
- West Ash Pond 2E (11.5 acres, inactive)

Pond 3 is also shown on Figure 2 and was used as a polishing pond when the complex was used for ash handling prior to 2006. It is not part of the West Ash Pond Complex. West Ash Pond 2E was constructed with a geomembrane liner system and West Ash Ponds 1 and 2W are unlined. The West Ash Pond Complex will be closed by leaving CCR in place and using an alternative geomembrane cover system. This design will control the potential for water infiltration into the closed CCR unit and will allow drainage of surface water off of the cover system (AECOM, 2016). All impoundments of the West Ash Pond Complex have been extensively evaluated during previous hydrogeologic investigations, groundwater quality assessments, and modeling.

1.3 Site History

WRPS began operation in 1949 and ash from the first coal fired unit was disposed of in the Old East Ash Pond (OEAP). The OEAP was located on the eastern edge of the site along the Wood River and was utilized for approximately 30 years until the West Ash Pond Complex was constructed in 1978. The West Ash Pond Complex was reworked several times, and individual ponds were renamed as shown below. This report references the pond designations used from 1997 to 1999, which is consistent with nomenclature used in documents and figures prepared in response to 40 CFR 257.

West Ash Pond Complex Designation					**Period When Designations Were Used**
Pond 1	*Pond 2W*	*Pond 2E*	*Pond 3*		← *1997-1999* *(used in this report)*
Pond 1	Pond 2		Pond 3	Pond 4	← 1993-1996

In addition to nomenclature changes, several modifications to the West Ash Pond Complex and its operation have been made following construction including the following:

- The primary pond was subdivided into two ponds (ponds 1 and 2) in 1993. At that time, the berm surrounding new pond 1 was raised. From 1993 to 1997 sluice water passed through the four ponds before discharge at the NPDES permitted outfall.
- During a plant shutdown in 1997, DMG began reconstruction of the ponds. All ash was removed from ponds 3 and 4, and a new double-lined pond (Ash Pond 3, previously called New Ash Pond #2) with leachate collection was constructed in their place.
- In 1998 DMG began mining ash from pond 2. After removing all ash from the eastern half of the pond, a new pond (Ash Pond 2E, also called New Ash Pond #1) with a composite clay/synthetic liner was constructed.
- Beginning in 1999 all fly ash was managed through a dry handling system. The dry ash was sold as cement additive and bottom ash was sluiced to the lined ponds (ponds 2E and 3) where the ash settled and the sluice water discharged via the NPDES permitted outfall.
- Ash was handled through the west pond complex until 2006-2007, at which time it was redirected to the New East Ash Pond (also called the Primary East Ash Pond) following its construction.
- Ash from ponds 1 (Old Ash Pond #1) and 2W (Old Ash Pond #2) has been mined periodically since closure in 2006.

2 GEOLOGY AND HYDROGEOLOGY

Significant site investigation and characterization has been completed at WRPS. The initial site investigation was completed in 1984 and has been supplemented by additional activities to characterize the geology, hydrogeology and groundwater quality. Additional investigations have been conducted at both the West and East Ash Pond Complexes and include groundwater monitoring, in addition to groundwater flow and transport modeling. The most recent investigation completed in 2015 by AECOM obtained geotechnical information to comply with the Federal CCR Rule. The most recent groundwater report (NRT, January 2016) summarized groundwater monitoring completed in 2015 and compared groundwater results to projections from the modeling completed at closure. While all data sources listed in Subsection 1.2 were reviewed, this report focuses on the results of more recent investigations where the data is the most complete.

2.1 Regional Geology

The WRPS and associated ash complexes are situated in the northern end of an area of extensive alluvial deposits known as the American Bottoms. The geology of this area was described by Bergstrom and Walker (1987) and is summarized here. Alluvial and glacial sediments fill the Mississippi River valley in this area commonly to depths of 100 feet but can extend to more than 140 feet. The sediments generally coarsen downward; the contact between the alluvium and glacial sediments is typically indistinguishable in the Wood River area. Very coarse sediments generally occur near the base of these valley-fill materials and these layers form a highly productive aquifer.

The sand and gravel in the Alton/Wood River area is overlain by low-permeability alluvial silt and clay and is underlain in places by low-permeability clay. Bedrock in the region consists of Pennsylvanian and Mississippian age shale, sandstone and limestone. The bedrock formations yield relatively little water compared to the overlying sand and gravel formation.

2.2 Site Geology

The geology has been extensively evaluated since the first borings and monitoring wells were installed in 1982. The geology at WRPS consists of the following units (beginning at the ground surface):

- Fill (consisting of clay, sand, and silt mixtures) and coal ash: primarily occurs within the impoundments, impoundment berms and the Wood River and Mississippi River levees
- Upper silty clay unit: Clay and silty clay alluvial deposits of the Mississippi River and Wood River

- Inter-sand unit: a thin (generally 5 feet or less) silty sand/ sand unit above the lower silty clay unit that is continuous across most of the site and may intersect the primary sand unit in the northern portion of the site
- Lower silty clay unit: Clay and silty clay alluvial deposits of the Mississippi River and Wood River
- Primary sand unit: Sand and gravel deposits that are highly variable, well to poorly sorted, with intermittent layers of clay and silt. This unit is the uppermost aquifer unit
- Silt and sandy silt, and silty clay diamicton only observed at depth near the east side of the New (Primary) East Ash Pond (NEAP)
- The bedrock at the WRPS may be the Mississippian-age St. Geneieve limestone, which dips gently to the east; elevation of the bedrock surface at the WRPS is estimated at approximately 300 feet above mean sea level (Hampton and O'Hearn, 1984).

For the purposes of this report, the silty clay units are combined because they are compositionally and hydraulically similar. The silt, sandy silt, and clay diamicton are not discussed further because they are only encountered on a limited portion of the site. A description of the units and their occurrence near the West Ash Pond Complex are included below. Boring locations of existing wells and recent AECOM boring/piezometer locations are shown on Figure 3. Boring logs are included in Appendix A and cross-sections depicting the geology are included in Figures 4 and 5. Laboratory reports for recent grain size analysis and hydraulic conductivity tests are included in Appendices B1 and B2, respectively.

2.2.1 Fill and Coal Ash

The thickest accumulations of coal ash at the West Ash Pond Complex occur in Pond 1 with a maximum depth of approximately 26 feet at boring WOR-B026. Ash thickness in Pond 2W ranged from 11 ft in boring WOR-B024 to 18.5 feet in WOR-B024. Within most areas of Pond 1 and Pond 2W the base of the coal ash (top of the silty clay unit) is at a fairly uniform elevation of approximately 407 feet (this is consistent with construction details in previous reports). No borings were advanced in Pond 2E because it is a lined unit; however, it is estimated that the maximum ash thickness is less than 25 feet (calculated from ground surface at 440 ft minus the liner elevation at 415 ft). Borings installed near or through berms did not indicate ash fill, with the exception of WOR-B018 which encountered 14 feet of ash fill at depth. The boring log for this location indicates that ash fill lies directly on top of the primary sand. However, based on the grain size analysis (81% fines) and cone penetrometer test (CPT) in the interval below the ash fill, it is likely that the silty clay unit underlies the ash at this location.

2.2.2 Silty Clay Units

The silty clay units are composed of layers and lenses of clay, silty clay, and silt with varying amounts of sand, but is predominantly clay and silty clay. Visual descriptions included on boring logs indicate both fat and lean clays. Across most of the site the silty clay unit is split into an upper and lower unit. The units are separated by the inter-sand unit which occurs at an elevation between approximately 408-418 feet. The presence and thickness of the inter-sand unit is discussed in detail below in subsection 2.2.3.

The upper silty clay unit and portions of the inter-sand were removed during impoundment construction in the vicinity of the West Ash Pond Complex, such that the CCR is in contact with the inter-sand unit (i.e. WOR-B015) or the lower silty clay (i.e. WOR-B016, B021, B024, B025, B026). In areas where both the upper silty clay unit and the inter-sand were removed, the lower silty clay unit separates the CCR of the West Ash Pond Complex impoundments from the primary sand unit and acts as a barrier to downward migrating leachate from Pond 1 and Pond 2W. In addition to the silty clay unit, Pond 2E and Pond 3 have designed liners consisting of polyethylene membrane and compacted clay which further limit the vertical migration of leachate. At the East Ash Pond complex where the upper silty clay unit is thin or absent (either naturally, or it was removed during construction, i.e. southeast portion of the NEAP), the potential exists for leachate to migrate into the inter-sand layer. In locations where the upper silty clay has been removed, the remaining thickness of the lower silty clay unit separates the ash fill from the primary sand unit.

The total thickness of the silty clay unit beneath West Ash Pond Complex ranges from less than 5 feet in the southeast corner of Pond 1 and the northwest section of Pond 2W (where the inter-sand layer was removed during filling), to greater than 20 feet beneath Pond 2E. Under the East Ash Pond Complex the minimum clay thickness is less than 5 feet in the southeast corner of the NEAP near Well 40M, and increases to the north up to 40 ft thick near Well 38. The thickness of the lower clay unit is shown in Figure 6. Based on the lateral extent and thickness of the unit, it appears clay and silt alluvial sediments were deposited in a historical channel of the Mississippi or Wood River which trends east-west across the center of the ash pond complex. The thickness of the silty clay unit decreases to the north and the south of the ash pond complex as the base of the unit approaches the ground surface.

Field testing of former Monitoring Wells 10 and 11, which were screened entirely within the silty clay unit, indicated a geometric mean horizontal hydraulic conductivity of 2.4 x 10^{-5} cm/s (NRT, 2000). Laboratory tests of vertical hydraulic conductivity on clay samples ranged from 1.7 x 10^{-8} cm/s (Kelron, 2004) to 1.2 x 10^{-6} cm/s (AECOM, 2015). Hydraulic conductivity values are summarized in Table 1. These low values are indicative of a confining layer.

2.2.3 Inter-Sand Unit

The inter-sand unit occurs between the upper and lower silty clay units beneath most portions of the site at an elevation between approximately 408 and 418 feet. The inter-sand unit is composed of heterogeneous fine to medium-grained sand and silty sand that ranges from well to poorly sorted. The inter-sand unit was encountered in borings located along the historical drainage channel shown in the clay thickness map (Figure 6). The top of the inter-sand unit is deepest at the center of the clay valley and rises to the south and to the north. Some historical borings (i.e. Wells 21, 22, 28, 30, in the northern portion of the site indicate that the inter-sand unit may intersect the primary sand unit, and no upper silty clay unit is present. However, interpretations from historical borings (prior to 2000) are difficult because soil was not continuously sampled. The maximum thickness of the inter-sand unit is 5 feet beneath the northwest corner of the NEAP at WOR-B002, and monitoring well 20. The inter-sand unit thins to the south to 1 foot in the southeast corner of the NEAP and may intersect the primary sand to the north where borings indicate the top of the primary sand unit rises to an elevation similar to that of the inter-sand (Wells 21 and 22).

There are no monitoring wells present onsite that are screened exclusively in the inter-sand unit, and no field hydraulic conductivities have been measured. However, based on the visual characterization (silty sand, fine sand) it is expected to be less than that of the primary sand unit. The hydraulic conductivity (estimated from literature values) in this unit is expected to be in the range of 10^{-4} to 10^{-3} cm/sec. (Fetter, 2001).

2.2.4 Primary Sand Unit

The primary sand unit is the uppermost aquifer of the American Bottoms area, and has been extensively developed for water supply. The estimated thickness of the permeable valley fill at WRPS is approximately 120 feet to 140 feet and the sand and gravel constitutes 80 to 100 feet of this thickness. According to the Illinois State Geological Survey (ISGS), the upper 80 feet of the valley fill has been extensively reworked due to river flooding events (Bergstrom and Walker, 1956). Below this depth, the deposits are glacial outwash and older alluvium. Large boulders are encountered below 80 feet, which can sometimes limit drill penetration and are likely remnants of older Illinoian till.

The top of the primary sand unit is mapped on Figure 7 and illustrates the former river channel which trends east-west across the site. The top of the primary sand ranges in elevation from approximately 420 ft in the northern portion of the WRPS property, to approximately 375 ft in a former channel located in the center of the West Ash Pond Complex. The top of the sand unit is near the surface (<5 feet below ground surface [bgs]) in the northern portion of the WRPS property (Wells 21 and 22) and is up to 60 feet deep in the center of the historical channel (Well 38).

Field testing of monitoring wells screened entirely within the sand and gravel unit indicate high horizontal hydraulic conductivities of 10^{-1} to 10^{-3} cm/sec (NRT, 2000 & Kelron, 2004), the geometric mean of all wells tested is 5.7×10^{-2} cm/sec (Kelron, 2004). A summary of the hydraulic conductivities measured in monitoring wells is included in Table 2. Hydraulic conductivity within the primary sand unit is variable within the stated range, but there is no correlation of hydraulic conductivity to elevation or depth within the sand unit (Kelron, 2004).

2.3 Hydrogeology

Monitoring wells were initially installed in 1982 around both the East and West Ash Pond Complexes. The number and location of monitored wells has been modified as knowledge of the site has increased and facility operations have changed. A summary of the current well network and construction details is included in Table 3. Since initial installations in 1982, the hydrogeology of the site had been characterized and described through multiple investigations and computer flow modeling. This section discusses information collected since 1995, including the existing well network and piezometers installed by AECOM in 2015 as well as appropriate historical data.

2.3.1 Groundwater Occurrence and Elevations

Groundwater is present at depth in the primary sand unit and, during periods of high river stage, it is also present in the inter-sand layer when groundwater elevations exceed approximately 410 ft. Measured groundwater elevations typically range from about 399 ft during low water conditions in Well 2 near the Mississippi River, to 432 ft in upgradient wells to the north. However, water elevations generally fluctuate between 402 and 414 feet. The Mississippi River and Wood River stages strongly influence and control the elevations in the groundwater.

A summary of groundwater elevations from 2010-2015 for existing wells is included in Table 4 and hydrographs for representative well locations are included in Appendix C. Table 5 summarizes water elevations from piezometers located within and adjacent to the West and East Ash Pond Complex

Water levels are elevated within the impoundments relative to groundwater elevations measured both outside and below the impoundment in the primary sand unit. Within the impoundment, measurements collected from L1 and AECOM piezometers P002, P003, P004, P005, P016, P025, and P026 indicate the CCR porewater elevation ranges between 418 and 431 (Table 5). Table 5 also includes elevations from piezometers P006, P008, P015, P020, P021 and P024 which are screened below the impoundments in the primary sand unit. Groundwater elevations in the primary sand unit are generally 10- 20 feet lower than those measured within the impoundment.

2.3.2 Groundwater Flow

Potentiometric maps prepared from elevation data measured in monitoring wells reveal groundwater flow directions are variable and significantly influenced by the Mississippi River stage. During base stage or low river levels, groundwater flow occurs in both a southwesterly direction toward the Mississippi River and southeasterly toward the Wood River. The horizontal gradient between well 29 and 2, as measured in 2015, is 0.001 feet/feet (ft/ft). A representative potentiometric map is shown in Figure 8

During spring flooding and high Mississippi River stages, groundwater flow is northerly, with either an easterly or westerly component. After flood levels subside, the flow direction reverts to more normal conditions and groundwater again discharges to the rivers. The flooding and high river stages only occur periodically and the dominant flow direction during any given year is toward the rivers. Horizontal gradients during flood events are high near the river, on the order of 0.003 ft/ft, although gradients can be aerially variable due to the transience of the system during flood stage. A potentiometric map of groundwater flow during high water level conditions is shown on Figure 9.

2.3.3 Vertical Groundwater Gradients

Nested monitoring wells were historically present at six locations (Wells 02/01, 04/03, 32/05, 08/07, 11/10, 13/12) and currently there are two sets of nested wells (Wells 39S/39M, 40S/40M) at WRPS. Wells 13, located adjacent to 12 on the northeast corner of the west ash complex, and 11, located on the northeast corner of the Old East Ash Pond, were screened in the silty clay, and historical elevations measured when both wells were present indicate general downward flow of water from the silty clay into the primary sand unit. Near the rivers, calculated gradients are flat, to upward (I.e. upward in wells 01/02, 40S/40M). A summary of representative historical and current vertical gradients is included in Table 6.

2.3.4 Water Well Assessment

According to database records of the ISGS, ISWS, and Illinois Environmental Protection Agency (Illinois EPA), there are 42 water wells within a 2,500 feet radius of the WRPS property boundary. Ten wells are designated as industrial/commercial wells used for dewatering or pressure relief of levees. The operational status of these wells is unknown, although information on the well logs suggests some may have been plugged. Five wells are community water supply wells operated by East Alton and the remaining 27 wells are industrial/commercial wells of unknown operational status. (NRT, 2009)

In addition to the above sources of water well information provided by State agencies, information was obtained from DMG personnel and the Olin Corporation. DMG does not own or operate any water wells on the WRPS property. Olin Corporation owns and operates wells on it's property east of the Wood River.

The results of the water well survey are provided in Appendix D. Based on all of the well information acquired from the listed sources, water supply wells within at least 2,500 feet of the WRPS property boundary are shown on Figure 2 in Appendix D. The current status of some of these wells (i.e., operational, abandoned, or sealed) is not known.

The results of the water well survey, combined with the information contained within the annual groundwater monitoring reports, indicate that there are no water wells, potable or non-potable, that are likely to be impacted by groundwater from the West Ash Pond Complex with the exception of wells located directly south of the WRPS. All other water wells, located to the northwest, north, northeast, east, and southeast, are either upgradient during most the year (i.e. are not downgradient of the prevailing southerly direction of groundwater flow), and/or are located beyond a groundwater to surface water discharge zone (i.e., Wood River). The potential for groundwater emanating from the West Ash Pond Complex to affect wells located anywhere but directly south of the WRPS is very low.

Based on existing monitoring well data there are no known groundwater quality impacts on water wells directly to the south of WRPS along the Mississippi River. These water wells, some of which may no longer exist, are utilized for either dewatering for construction activities or pressure relief for the adjacent levee. All of these water wells are for non-potable, non-contact use only. Although groundwater in the vicinity of these water wells may be impacted by inorganic parameter concentrations of boron and manganese, there is no known exposure pathway for human ingestion or contact of groundwater at these well locations.

3 GROUNDWATER QUALITY

3.1 Summary of Groundwater Monitoring Activities

Groundwater sampling at the West Ash Pond Complex was initiated in 1984; however, consistent data collection began in 1996. The following discussion presents an analysis of data collected from 2010 to 2015. Groundwater data from the East Ash Pond Complex is not included in this report.

Currently, groundwater monitoring is completed in accordance with the Closure Work Plan (CWP) (NRT, 2000) approved by the Illinois EPA on December 13, 2000. As called for by the 2000 CWP, DMG is required to sample groundwater quarterly, submit the results quarterly to the Illinois EPA, and provide an annual data assessment. However, some modifications to the 2000 CWP proposed in the "2005 Closure Work Plan Annual Report" and cover letter were approved by the Illinois EPA in a letter to DMG dated June 15, 2006. Modifications approved by the Illinois EPA include, reduction of monitoring frequency from quarterly to semiannually and semiannual submittals of data discs to Illinois EPA

The current monitoring program for groundwater consists groundwater samples collected from 12 monitoring wells and analyzed forfollowing parameters:

Laboratory Parameters		
Boron	Manganese (total)	Sulfate
Total Dissolved Solids (TDS)		
Field Parameters		
pH	Depth to Water (ft below mp)	
Specific Conductance	Groundwater Elevation (ft)	
Temperature		

Groundwater monitoring results are reported to the Illinois EPA annually in accordance with the approved Closure Work Plan with the most recent data and analysis submitted in a report titled '*2015 Closure Work Plan Annual Report*' dated January 20, 2016.

Additional groundwater monitoring was initiated in November 2015 at 7 existing well locations to comply with the 40 CFR 279 CCR rule. Sampling is conducted at 3 background wells and 4 downgradient wells for an expanded list of parameters, including the following:

Metals (totals)			
Antimony	Boron	Cobalt	Molybdenum
Arsenic	Cadmium	Lead	Selenium
Barium	Calcium	Lithium	Thallium
Beryllium	Chromium	Mercury	
Inorganics (totals)			
Fluoride	Chloride	Sulfate	Total Dissolved Solids
Field			
pH	Dissolved Oxygen	Specific Conductivity	Turbidity
Oxidation/Reduction Potential	Temperature		

Data for the expanded parameter list for the federal CCR sampling will be reported in accordance with the groundwater monitoring plan.

3.2 Groundwater Monitoring Results and Analysis

Analytical results from January 2010 through December 2015, are summarized in Appendix E. Statistics showing the minimum and maximum concentrations detected in the groundwater samples is included for each well in Table 6. Also, a comparison of groundwater data from wells to the Groundwater Quality Standards for Class I: Potable Groundwater is shown. The well locations are shown on Figure 3.

Parameters that have been detected in groundwater at concentrations exceeding the Class I groundwater quality standards include the following: boron, manganese, pH, and total dissolved solids (total filterable residue). A summary of recent exceedances is included below for parameters of concern. A statistical summary for the monitored inorganic groundwater quality parameters is provided in Table 7. Table 8 provides a summary of exceedances for 2010 through 2015, and are representative and consistent with historical data collected prior to 2010. Time-series graphs for each of the groundwater parameters at the 12 monitoring wells are included in Appendix F covering 2006 through 2015. Each of the parameters is discussed below.

Boron

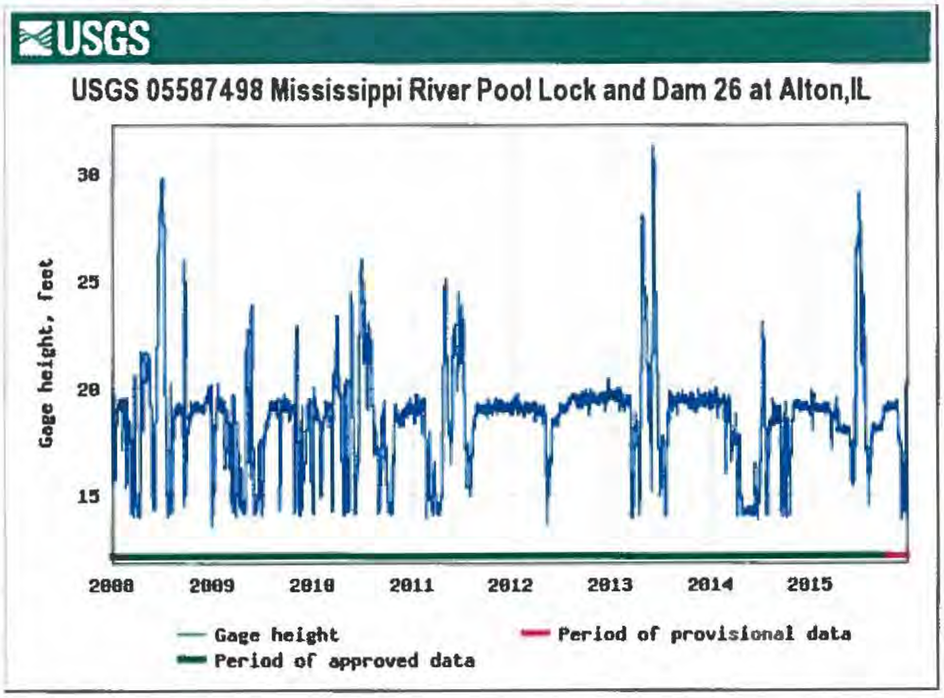
Boron exceeded the 2 mg/L standard at three of the 12 monitoring wells from 2013 through 2015. In 2012 only two wells exceeded the standard. Well 02 had boron concentrations of 2.50 and 3.45 mg/L, and Well 34 had a boron concentration of 5.95 mg/L in the 2nd Quarter that rose to 7.49 m/L in the 4th Quarter. Wells 02 and 34 are located to the south and downgradient of the West Ash Pond Complex. Well 12 had boron concentrations of 2.21 and 2.05 mg/L during the 2nd and 4th Quarters of 2015, respectively. Well 12 is located to the east and downgradient of the West Ash Pond Complex.

Annual median boron concentrations have decreased since the unlined ponds were removed from service (prior to 1998) in eight of the eleven downgradient monitoring wells (Table 9) currently monitored, while concentrations have increased only in wells 02, 12, and 34. The median boron concentration at Well 02 has ranged from 4.60 mg/L one year after the final unlined pond was removed from service to 2.10 mg/L in 2008, but increased to 2.98 mg/L in 2015. The concentrations have decreased from the peak concentration observed shortly after removing the unlined ponds from service, although the concentration trend has been slightly upward from 2012 to 2015.

The median boron concentration at Well 12 was 1.80 mg/L in 2011 and below the Class I Standard, but increased slightly from 2012 through 2015, beginning at 2.04 in 2012 to 2.13 mg/L in 2015. Annual median boron concentrations at Well 34 increased from 0.88 and 1.37 mg/L in 2011 and 2012, respectively, to 4.15, 3.99, and 6.72 mg/L in years 2013-2015, respectively. Based on Mann-Kendall trend analysis results, monitoring wells with a statistically significant upward Sen Slope trend are 02, 12, and 34 (Table 7). The monitoring wells with a statistically significant downward trend are 20 and 31.

The recent increases in boron (and other coal indicator parameters) may be attributed to several factors.

Mississippi River Stage: Unusually stable southerly groundwater flow directions prevailed from 2012 through 2015. Groundwater flow is generally southerly for two-thirds of the year, with flow reversals—caused by high water in the Mississippi River—for one-third of the year. Observed river stage data indicate fewer periods of high river stage and corresponding groundwater flow reversals since 2012 than prior to 2012 (see figure below). As a result, groundwater from beneath the West Ash Pond Complex is flowing south, and east toward Wells 02, 12 and 34 for longer periods than historically observed.



Levee Drainage Improvements: Factors that may have also disrupted groundwater flow direction and quality is significant construction activities which were conducted during 2014 and 2015 off-site between the West Ash Pond Complex and the Mississippi River levee by the Southwestern Illinois Flood Prevention District Council. Work completed during this time period included new relief well installations, existing relief well conversions and upgrades, drainage weirs for out letting water, blanket drain installation, placement of rip rap, and installation of new piping systems to handle groundwater from relief wells.

Ash Reuse/Recycling: Large amounts of ash were removed from Pond 1 in 2015 for beneficial reuse, possibly creating temporary ponding and increased infiltration within the ash excavations. The increased infiltration would result in increased mobilization of boron and other ash indicator parameters.

The observed increase in boron concentrations in these wells results from one, or a combination of the above factors.

Sulfate

Sulfate, like boron, is a primary indicator of coal ash leachate, and exceeded the 400 mg/L standard at wells 02 and 25 prior to removing the unlined impoundments from service in 1998. No wells have exceeded the sulfate standard for 18 consecutive years, from 1999 through 2015, with the exception of Well 02 in 2004. Since then, or for eleven consecutive years, sulfate concentrations have remained below the standard.

Sulfate concentrations in groundwater at the 11 downgradient wells ranged from below the detection limit of 5 mg/L to 307 mg/L during 2010- 2015. Sulfate concentrations indicate a statistically significant downward Sen Slope trend at Well 31 and background Well 36. Concentrations at Wells 02 and 34 indicate statistically significant upward trends (Table 7) consistent with trends in boron concentrations. However, although these concentrations are increasing, they remain below the Class I standard (400 mg/L). The sulfate concentration at Well 02 had a median concentration of 213 mg/L. Although the six year statistically significant trend at this well is upward, concentrations at Well 02 in 2014 and 2015 were below the peak measured during the same time period of 298 mg/L in 2013. Sulfate concentrations over the past six years at Well 34 are well below the Class I standard, with a median of 10 mg/L and a maximum concentration of 47 mg/L. The highest median sulfate concentration, 240 mg/L, was encountered at Well 25. This well is downgradient of and impacted by recharge through the off-site slag pile.

Manganese

Median manganese concentrations exceeded the Class I standard of 0.15 mg/L at 6 of the 12 monitoring wells in 2015 (Table 9), compared to 7 of the 12 monitoring wells in 2014. As in prior years, background

Monitoring Well 36 had one of the higher manganese concentrations during 2015, with a concentration of 3.19 mg/L in the 2nd Quarter. Only Monitoring Wells 04 and 34 had similarly high concentrations, ranging from 4.96 to 6.70 mg/L in 2015.Mann-Kendall analyses of manganese concentrations indicate statistically significant upward trends at downgradient Monitoring Wells 02, 04, 23, and 28.

The occurrence of elevated manganese concentrations in groundwater at the West Ash Pond Complex is primarily associated with natural geochemical factors and, only secondarily related to the impoundments. Manganese concentrations are generally highest (greater than 2 mg/L) in wells 04, 34, and 36, which are located nearest to the Mississippi River and where sulfate, and typically boron, concentrations are low, indicating the primary source of manganese in these wells is not related to the West Ash Pond Complex.

Concentrations of manganese generally decrease with distance from the river. Elevated manganese concentrations in groundwater, which do not correlate to elevated boron and sulfate, are indicative of both off-site sources located north of the West Ash Pond Complex and naturally occurring conditions unrelated to the ash ponds. EPRI research on the occurrence and distribution of manganese in groundwater at the West Ash Pond Complex System was presented previously in the 2003 and 2004 Closure Work Plan Annual Reports (Kelron, 2003 and 2004).

Total Dissolved Solids

TDS concentrations regularly exceed the Class I standard of 1,200 mg/L at Wells 25 and 31 located adjacent to the off-site slag pile. TDS reflects concentrations of major ions in groundwater. At Wells 25 and 31 the highest median TDS concentrations and the greatest statistical variability (as measured by standard deviation on Table 7) reflect elevated chloride concentrations (>500 mg/L) in the leachate from the slag pile. The highest observed TDS concentrations at Wells 25 and 31 in 2015 were 1,320 and 2,240 mg/L, respectively.

TDS concentration trends in wells other than 25 and 31 generally mirror those of sulfate, which is the major inorganic parameter related to the ash impoundments. The median concentrations of TDS in other wells ranged from 510 mg/L to 936 mg/L between January 2010 to December 2015 (Table 7).

pH

From 2010-2015, Wells 20 and 23 had median pH values lower than 6.5 Standard Units (S.U.) (Table 7). pH values measured in Wells 28, 31, and 34 were also below 6.5 S.U. at least once during the last 6 years. With the exception of well 34 all of these wells are located north and generally upgradient of the ash complex. The cause of frequent pH exceptions in wells 20 and 23 is not clear. However, these two wells are upgradient of the East and West Ash Pond Complexes near other wells (Wells 21 and 22) that also exhibited relatively low 2010-2015 median concentrations of boron (0.29 mg/L to 0.38 mg/L in 2015 [Table 7]). Measured

The lack of correlation between pH and the ash indicator parameter boron suggests that the low pH values observed at this facility are either naturally occurring or due to influences other than the East and West Ash Pond Complexes. This conclusion is supported by pH measurements from leachate well L1. This leachate well has yielded ash pore water samples on several occasions and pH values from those samples ranged from 6.9 to 8.3 S.U., with a median of 7.68 S.U. (Appendix A, 1998 Closure Work Plan Report). pH values from this well suggest that the ash leachate is neutral to alkaline and is therefore not the source of acidity causing low pH values in groundwater.

The pH concentrations as measured in the field exhibit significant upward trends at Wells 04, 22, 28, 31, and 34. Although these trends are upward, the pH measured at all monitoring wells remains near neutral and is below the maximum Class 1 groundwater standard of 9.0.

4 CONCLUSIONS

Based on extensive investigation and monitoring since 1984, the site has been well characterized and a detailed site conceptual model has been developed. In conjunction with the hydrogeologic investigation, a groundwater model has also been developed to predict the effect of various ash pond closure scenarios on groundwater quality. The groundwater model report is being submitted under separate cover.

WRPS and the West and East Ash Pond Complexes are located on top of river deposits which consist of three major geologic units:

- Silty Clay Unit
- Inter-sand Unit
- Primary Sand Unit

The ash fill lies on top of the silty clay unit, or the inter-sand unit in places where the upper silty clay was either not deposited, or removed during construction of the ash ponds. With the exception of the southeast portion of the NEAP, the ash fill is underlain by silty clay of variable thickness.

Groundwater is encountered in the primary sand unit, and occasionally in the inter-sand unit when Mississippi River water levels are high. The groundwater elevations are significantly influenced by the Mississippi and Wood Rivers, flowing toward the rivers during normal river stages and away from the rivers during flood events when river water recharges the groundwater. Based on hydraulic conductivities and vertical gradients, horizontal groundwater flow in the silty clay is negligible. Groundwater flow occurs in the primarily in the primary sand unit and occasionally in the inter-sand unit during river flooding events.

Water levels within the West Ash Pond Complex are elevated and generally 10-15 feet above groundwater outside of the impoundments. Groundwater quality effects from the West Ash Pond Complex occur within the primary sand unit where the silty clay is not present or possibly through the silty clay unit where it is thin. Groundwater in the inter-sand unit may be impacted during periods of high groundwater elevations when it becomes saturated.

Exceedances of Class I groundwater quality standards are present in monitoring wells at various locations around the West Ash Pond Complex for boron, manganese, and total dissolved solids. Measurements of pH collected from groundwater wells located immediately north of the West and East Ash Pond Complexes are also frequently below the Class I lower limit (6.5 S.U.) The exceedances of Class I groundwater quality standards for manganese, TDS and pH are attributable to either naturally occurring geochemical variability, or non-CCR sources and are not associated with the West Ash Pond Complex.

In general boron concentrations are declining, with the exception of wells 02, 12, and 34 which have shown recent increases. However, concentration increases at these wells remain below the peak concentrations measured following ash handling operational changes in 2000, and in 2006 when the impoundment stopped operation following the construction of the primary east ash pond. Increasing trends measured at these wells are attributed to one or a combination of the following factors:

- Less frequent recharge of groundwater from high Mississippi and Wood River stages
- Increased surface water ponding and infiltration within the impoundments resulting from ash excavations and recycling
- Construction of levee drainage and flood prevention improvements between the West Ash Pond Complex and the Mississippi River

Given the current groundwater data and site information, groundwater quality is expected to improve following closure, as capping will reduce the infiltration of water and leachate generation from the West Ash Pond Complex. Because CCR will remain in the West Ash Pond Complex, a groundwater monitoring plan and groundwater management zone application are being submitted with this closure plan. These documents will enable monitoring of improvements in groundwater quality until the Class 1 groundwater quality standards are achieved.

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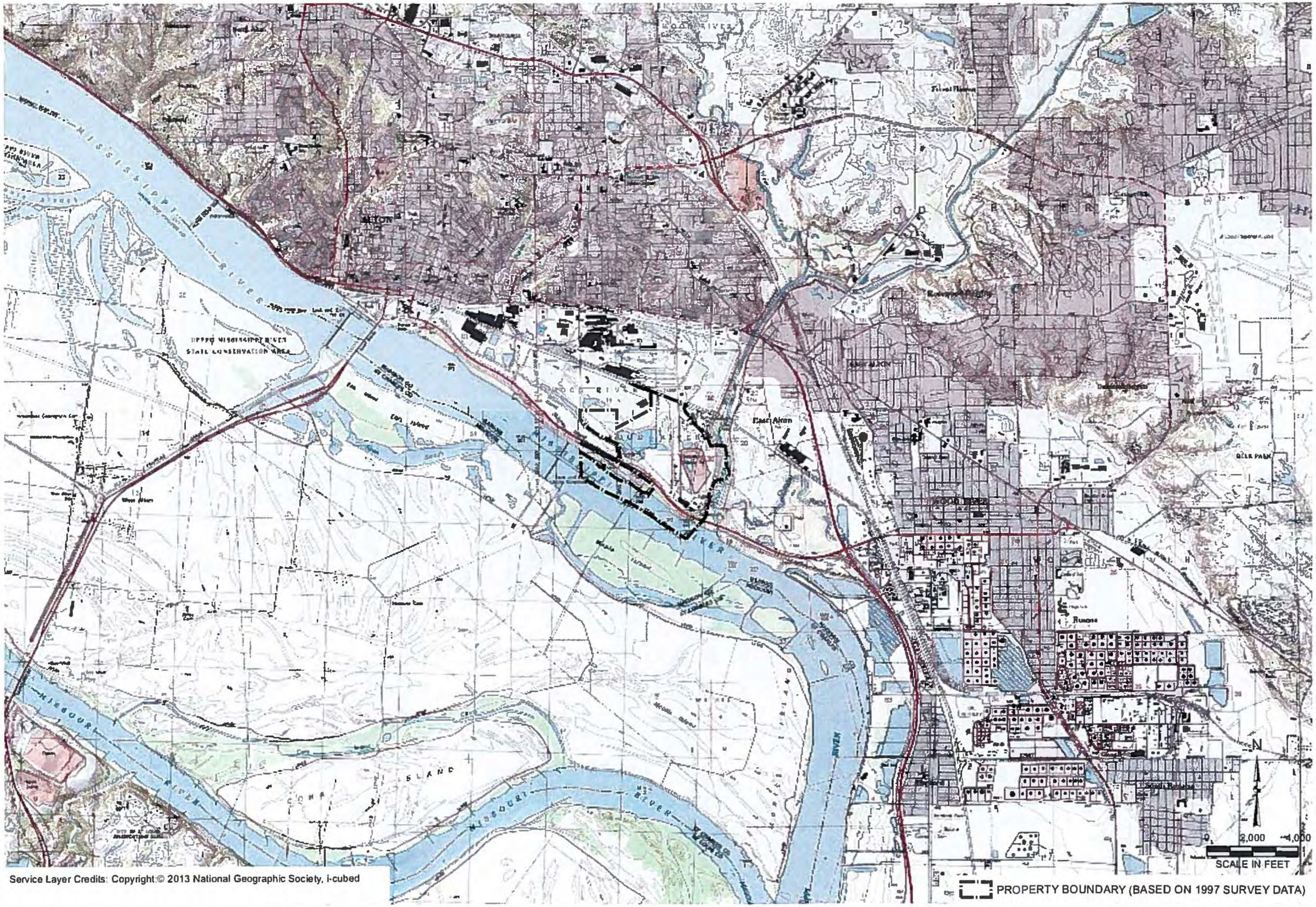
FIGURES



Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

PROPERTY BOUNDARY (BASED ON 1997 SURVEY DATA)

DRAWN BY/DATE:
SDS 7/15/16
REVIEWED BY/DATE:
NRK 7/15/16
APPROVED BY/DATE:
SJC 7/28/16

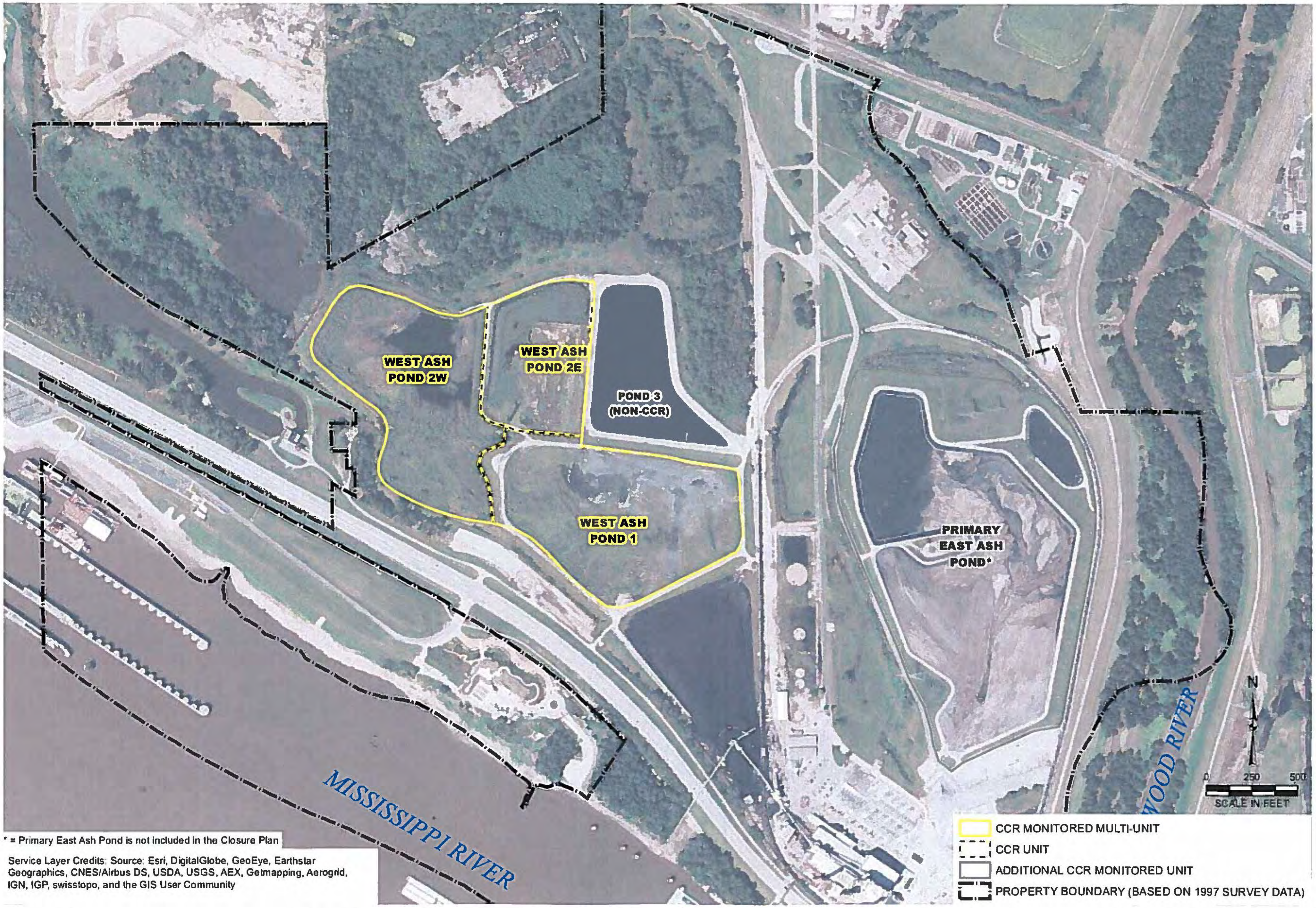
SITE LOCATION MAP

HYDROGEOLOGIC CHARACTERIZATION REPORT
WEST ASH POND COMPLEX
WOOD RIVER POWER STATION
ALTON, ILLINOIS

PROJECT NO: 2376

FIGURE NO: 1

NATURAL RESOURCE TECHNOLOGY



* = Primary East Ash Pond is not included in the Closure Plan

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

DRAWN BY/DATE:
SDS 7/15/16
REVIEWED BY/DATE:
NRK 7/15/16
APPROVED BY/DATE:
SJC 7/28/16

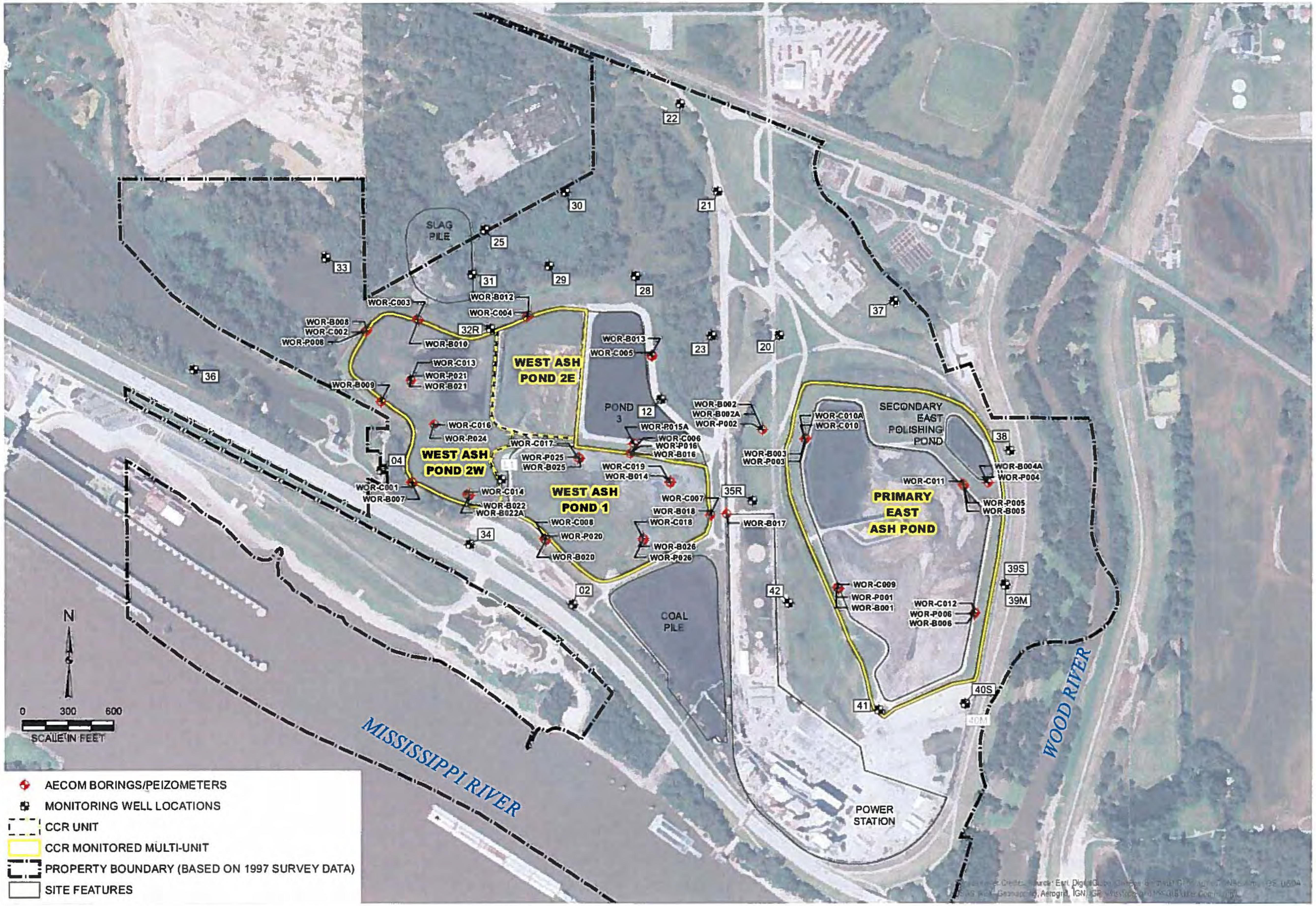
OVERVIEW OF ASH POND SYSTEM

HYDROGEOLOGIC CHARACTERIZATION REPORT
WEST ASH POND COMPLEX
WOOD RIVER POWER STATION
ALTON, ILLINOIS

PROJECT NO: 2376

FIGURE NO: 2

NATURAL RESOURCE TECHNOLOGY



DRAWN BY/DATE: SDS 7/15/16
REVIEWED BY/DATE: NRK 7/15/16
APPROVED BY/DATE: SJC 7/28/16

BORING AND MONITORING WELL LOCATION MAP

HYDROGEOLOGIC CHARACTERIZATION REPORT
WEST ASH POND COMPLEX
WOOD RIVER POWER STATION
ALTON, ILLINOIS

PROJECT NO: 2376

FIGURE NO: 3

NATURAL RESOURCE TECHNOLOGY

▨	SAND
▥	SILTY SAND/SILT
▩	CLAY/FAT CLAY
▦	SILTY CLAY
▧	ASH

🟨	SAND
☐	CLAY
▩	ASH
🟫	FILL

—	GEOLOGICAL CONTACT, DASHED WHERE INFERRED
▥	SCREEN
▮	WELL/BORING

NOTES:

1. COORDINATE SYSTEM IS NAD 83 ILLINOIS STATE PLANE WEST, US SURVEY FOOT
2. VERTICAL DATUM IS NAVD 88
3. AERIAL PHOTOGRAPHY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

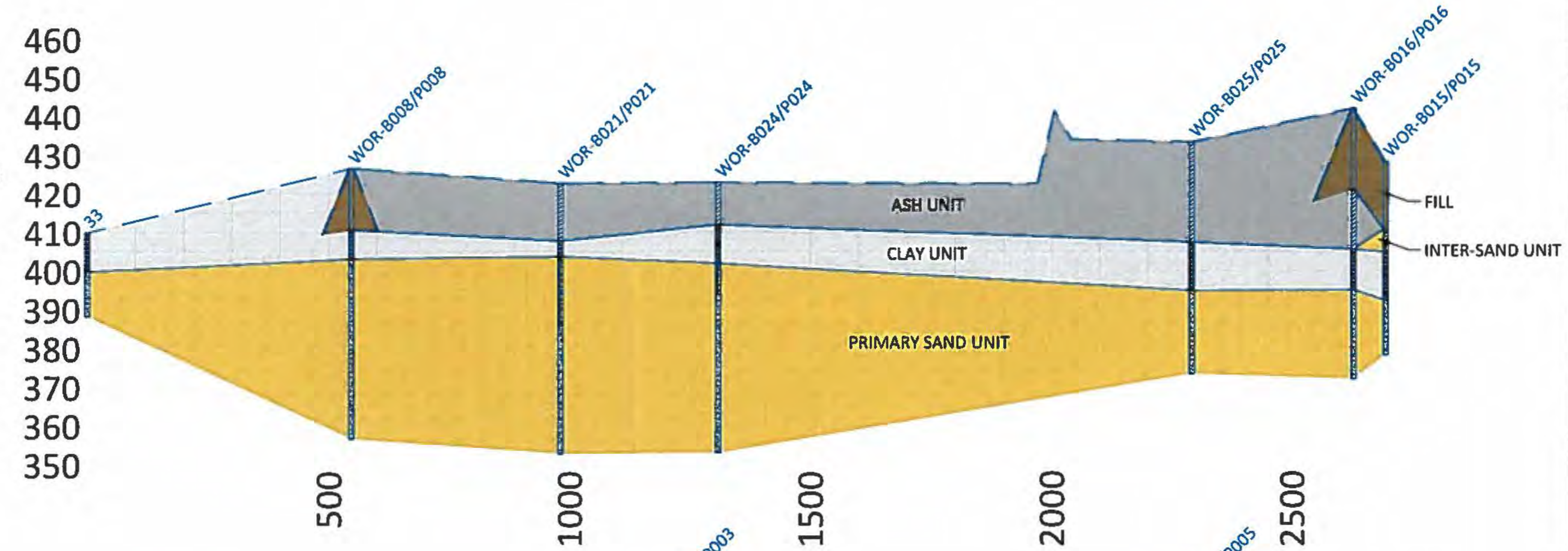
VERTICAL SCALE IN FEET 30

HORIZONTAL SCALE IN FEET 240

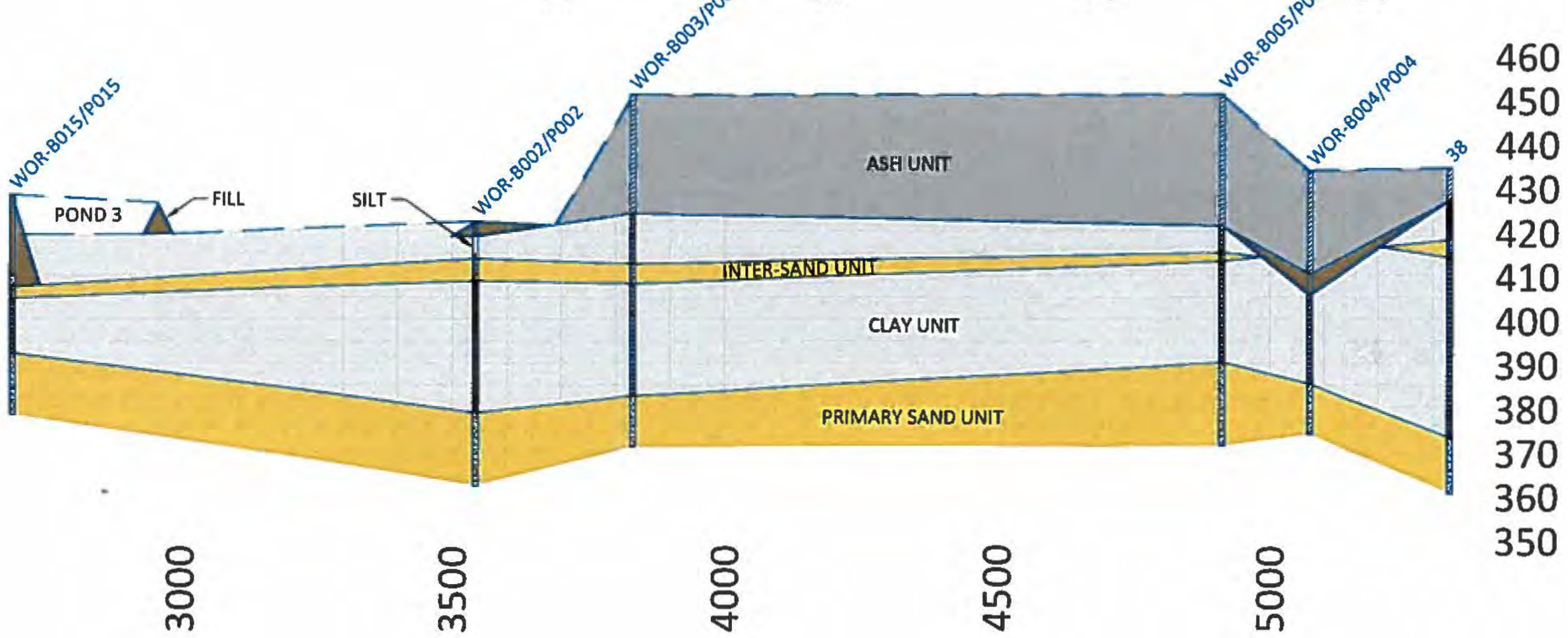
VERTICAL EXAGGERATION = 8

0 300 600
SCALE IN FEET

SECTION A-A'



SECTION A-A' (CONT.)



DRAWN BY: HJG DATE: 7/27/16
CHECKED BY: NRK DATE: 7/28/16
APPROVED BY: SJC DATE: 7/28/16
DRAWING NO: Fig 4A_Geol Xsects AA & BB
REFERENCE: .

GEOLOGIC CROSS-SECTION A-A'

HYDROGEOLOGIC CHARACTERIZATION REPORT
WEST ASH POND COMPLEX
WOOD RIVER POWER STATION
ALTON, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
2376/1.0

FIGURE NO.
4

▨ SAND

▨ SILTY SAND/SILT

▨ CLAY/FAT CLAY

▨ SILTY CLAY

▨ ASH

🟨 SAND

⬜ CLAY

⬛ ASH

🟫 FILL

WELL/BORING

GEOLOGICAL CONTACT, DASHED WHERE INFERRED

SCREEN

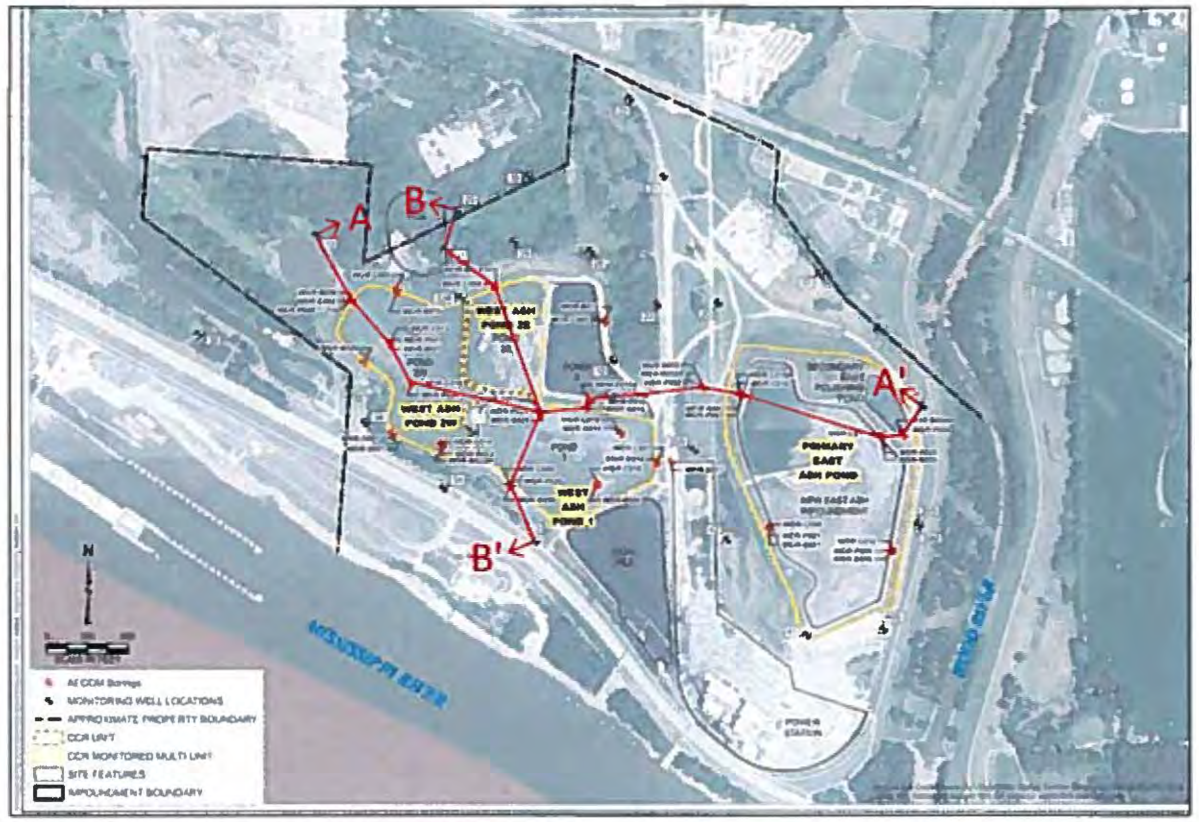
VERTICAL SCALE IN FEET 30

HORIZONTAL SCALE IN FEET 240

VERTICAL EXAGGERATION = 8

NOTES:

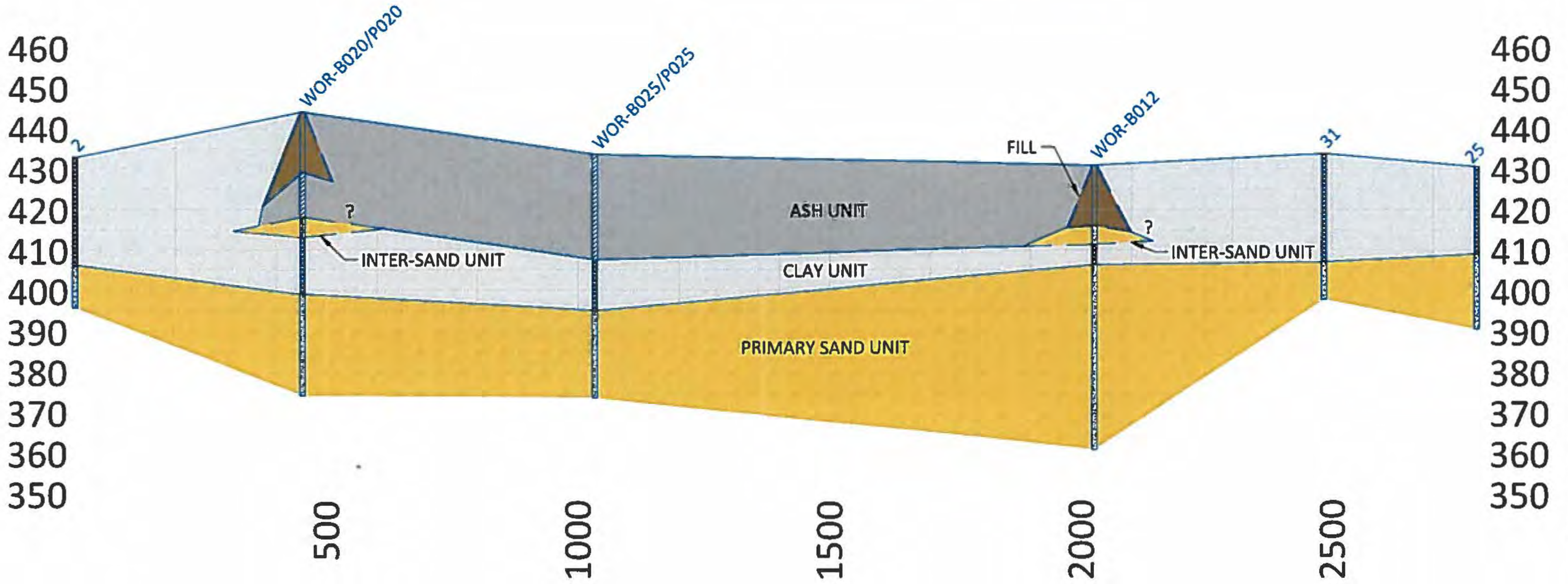
1. COORDINATE SYSTEM IS NAD 83 ILLINOIS STATE PLANE WEST, US SURVEY FOOT.
2. VERTICAL DATUM IS NAVD 88.
3. AERIAL PHOTOGRAPHY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY



0 250 500

SCALE IN FEET

SECTION B-B'



DRAWN BY: HJG DATE: 7/27/16

CHECKED BY: NRK DATE: 7/28/16

APPROVED BY: SJC DATE: 7/28/16

DRAWING NO: Fig 4A_Geol Xsects AA & BB

REFERENCE: .

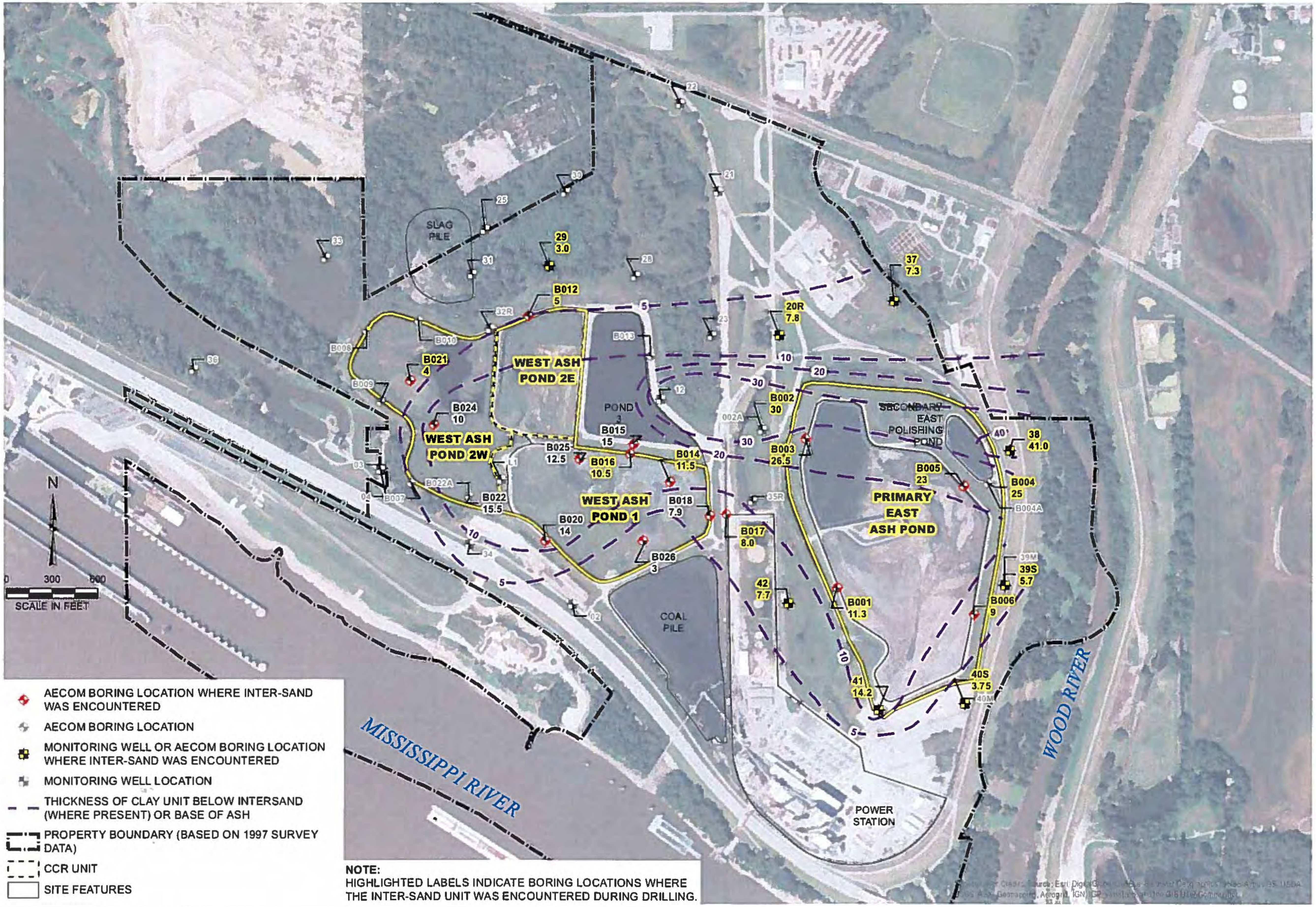
GEOLOGIC CROSS-SECTION
B-B'

HYDROGEOLOGIC CHARACTERIZATION REPORT
WEST ASH POND COMPLEX
WOOD RIVER POWER STATION
ALTON, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
2376/1.0

FIGURE NO.
5



♦ AECOM BORING LOCATION WHERE INTER-SAND WAS ENCOUNTERED

♦ AECOM BORING LOCATION

▣ MONITORING WELL OR AECOM BORING LOCATION WHERE INTER-SAND WAS ENCOUNTERED

▣ MONITORING WELL LOCATION

– – THICKNESS OF CLAY UNIT BELOW INTERSAND (WHERE PRESENT) OR BASE OF ASH

–·– PROPERTY BOUNDARY (BASED ON 1997 SURVEY DATA)

┄ CCR UNIT

☐ SITE FEATURES

NOTE:
HIGHLIGHTED LABELS INDICATE BORING LOCATIONS WHERE THE INTER-SAND UNIT WAS ENCOUNTERED DURING DRILLING.

DRAWN BY/DATE: SDS 7/15/16
REVIEWED BY/DATE: NRK 7/15/16
APPROVED BY/DATE: SJC 7/28/16

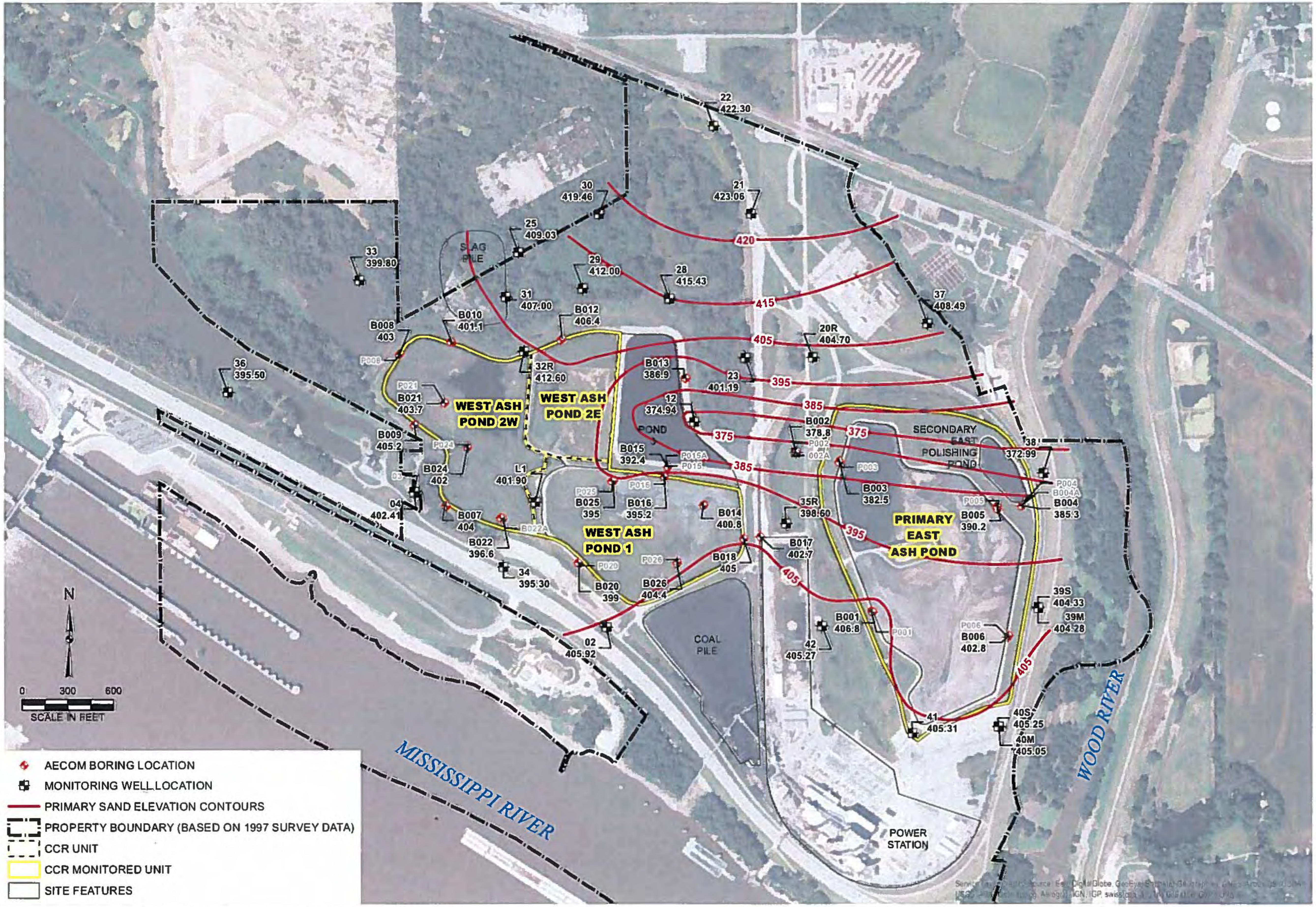
CLAY THICKNESS BELOW ASH COMPLEX OR INTER-SAND UNIT

HYDROGEOLOGIC CHARACTERIZATION REPORT
WEST ASH POND COMPLEX
WOOD RIVER POWER STATION
ALTON, ILLINOIS

PROJECT NO: 2376

FIGURE NO: 6

NATURAL RESOURCE TECHNOLOGY



DRAWN BY/DATE:
SDS 6/28/16
REVIEWED BY/DATE:
NRK 7/15/16
APPROVED BY/DATE:
SJC 7/28/16

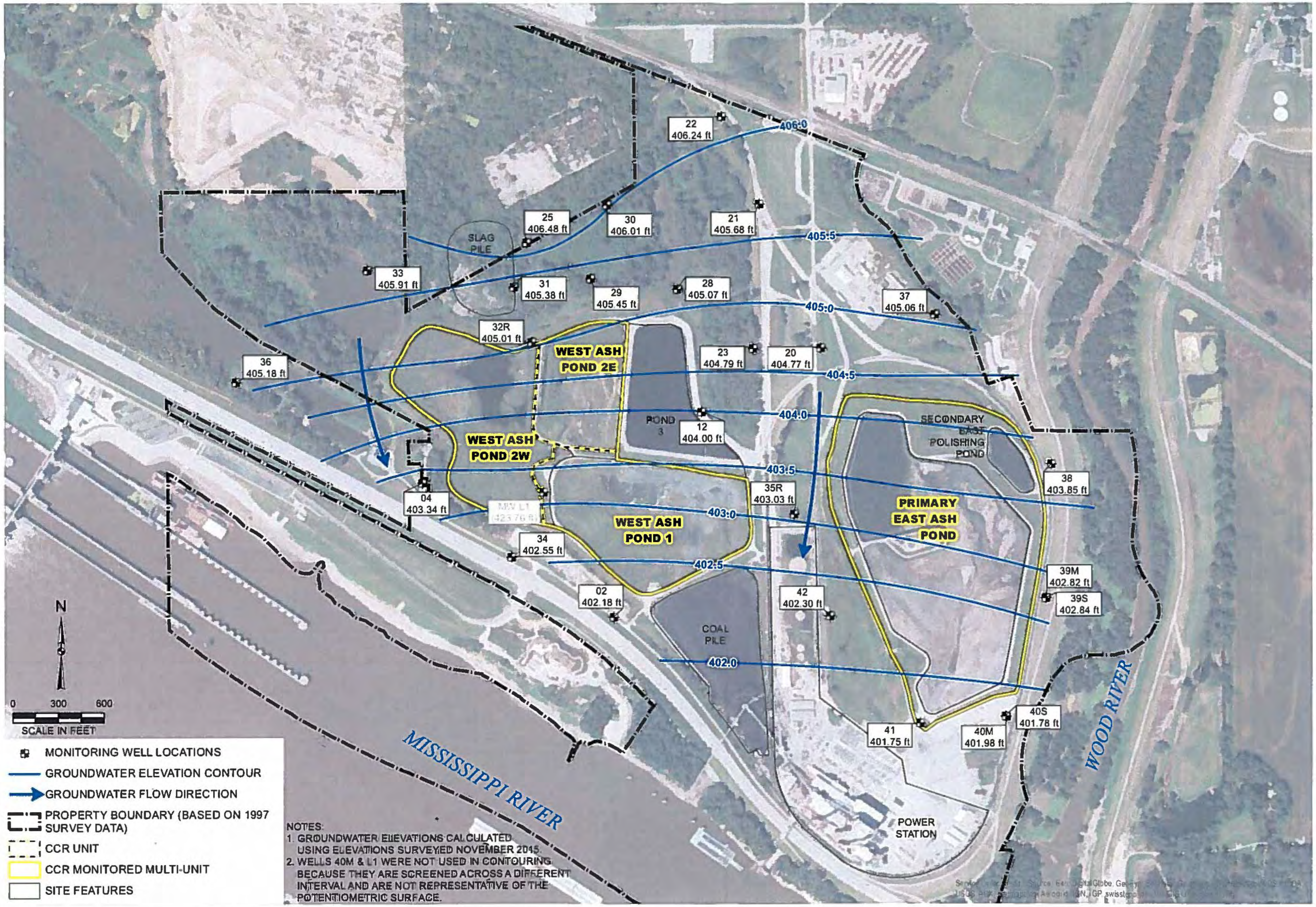
TOP OF PRIMARY SAND ELEVATION CONTOURS

HYDROGEOLOGIC CHARACTERIZATION REPORT
WEST ASH POND COMPLEX
WOOD RIVER POWER STATION
ALTON, ILLINOIS

PROJECT NO: 2376

FIGURE NO: 7

NATURAL RESOURCE TECHNOLOGY



NOTES:
1. GROUNDWATER ELEVATIONS CALCULATED USING ELEVATIONS SURVEYED NOVEMBER 2015.
2. WELLS 40M & L1 WERE NOT USED IN CONTOURING BECAUSE THEY ARE SCREENED ACROSS A DIFFERENT INTERVAL AND ARE NOT REPRESENTATIVE OF THE POTENTIOMETRIC SURFACE.

DRAWN BY/DATE:
SDS 7/15/16
REVIEWED BY/DATE:
NRK 7/15/16
APPROVED BY/DATE:
SJC 7/28/16

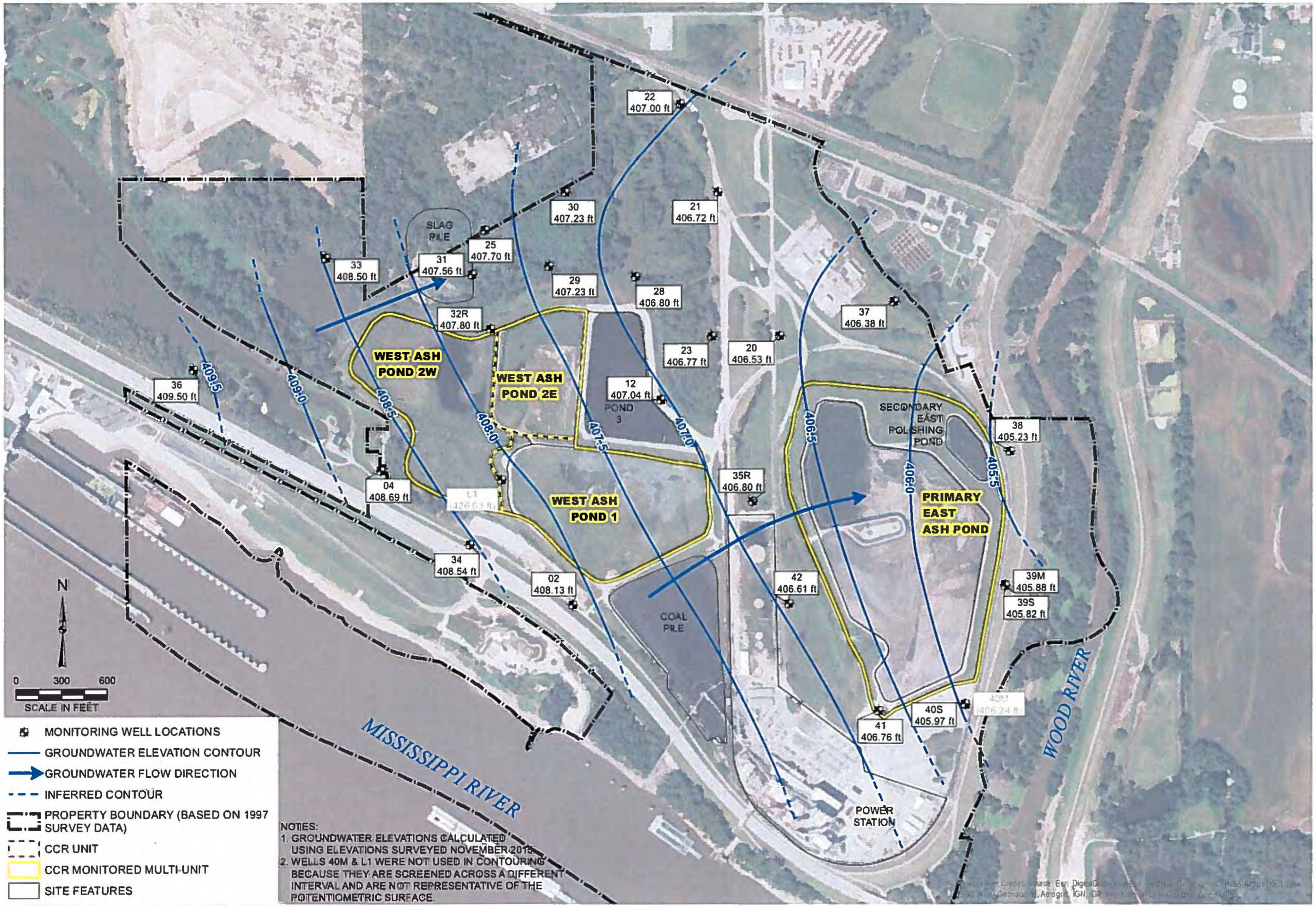
POTENTIOMETRIC SURFACE
NOVEMBER 3-5, 2015

HYDROGEOLOGIC CHARACTERIZATION REPORT
WEST ASH POND COMPLEX
WOOD RIVER POWER STATION
ALTON, ILLINOIS

PROJECT NO: 2376

FIGURE NO: 8

NATURAL RESOURCE TECHNOLOGY



NOTES:
1. GROUNDWATER ELEVATIONS CALCULATED USING ELEVATIONS SURVEYED NOVEMBER 2015.
2. WELLS 40M & L1 WERE NOT USED IN CONTOURING BECAUSE THEY ARE SCREENED ACROSS A DIFFERENT INTERVAL AND ARE NOT REPRESENTATIVE OF THE POTENTIOMETRIC SURFACE.

DRAWN BY/DATE:
SDS 7/15/16
REVIEWED BY/DATE:
NRK 7/15/16
APPROVED BY/DATE:
SJC 7/28/16

POTENTIOMETRIC SURFACE
MAY 21, 2015

HYDROGEOLOGIC CHARACTERIZATION REPORT
WEST ASH POND COMPLEX
WOOD RIVER POWER STATION
ALTON, ILLINOIS

PROJECT NO: 2376

FIGURE NO: 9

NATURAL RESOURCE TECHNOLOGY

TABLES

Table 1

Summary of Hydraulic Conductivity Test Results in the Clay Unit

drogeologic Characterization Report
Wood River Power Station

Boring/Well	Test Type[1]	Soil Type Description	Laboratory Vertical Hydraulic Conductivity cm/s	ft/day	Field Horizontal Hydraulic Conductivity cm/s	ft/day
10	a.	Silty Clay			2.3E-05	6.4E-02
11	a.	Silty Clay			2.6E-05	7.4E-02
13	b.	Silty Clay	3.0E-07	8.5E-04		
B-5-04-3	c.	Lean Clay	1.7E-08	4.8E-05		
B-5-04-6	c.	Sandy Lean Clay	1.2E-07	3.4E-04		
B-5-04-8	c.	Lean Clay	2.4E-08	6.8E-05		
WOR-B001	d.	Fat Clay	2.9E-07	8.2E-04		
WOR-B004	d.	Lean Clay	4.6E-07	1.3E-03		
WOR-B014	d.	Silt	1.2E-07	3.4E-04		
WOR-B022	d.	Silt w/ Sand, Lean Clay	1.2E-06	3.4E-03		
		Minimum Hydraulic Conductivity	1.7E-08	4.8E-05	2.3E-05	6.4E-02
		Maximum Hydraulic Conductivity	1.2E-06	3.4E-03	2.6E-05	7.4E-02
		Geometric Mean Hydraulic Conductivity	**1.1E-07**	**3.2E-04**	**2.4E-05**	**6.9E-02**

Test types:

a. Slug test analyzed with Hvorslev (1951) solution, Hampton and O'Hearn (1984)
b. Falling head permeameter test, Hampton and O'Hearn (1984)
c. Falling head permeameter test, Kelron Environmental (2004)
d. Falling head permeameter test, AECOM (2015)

Table 2
Summary of Hydraulic Conductivity Test Resultsin the Primary Sand
Hydrogeologic Characterization Report
Wood River Power Station

Well	Test Type[1]	Formation	Field Hydraulic Conductivity cm/s	Field Hydraulic Conductivity ft/d
Sand Units				
1	a.	Sand	2.5E-02	72
2	a.	Sand	2.0E-03	6
3	a.	Sand	7.8E-04	2
4	a.	Sand	1.8E-03	5
5	a.	Sand	8.1E-03	23
6	a.	Sand	1.2E-03	3
7	a.	Sand	4.2E-04	1
8	a.	Sand	4.2E-03	12
9	a.	Sand	3.2E-03	9
12	a.	Sand	2.3E-02	66
14	a.	Sand	3.5E-02	98
20	b.	Sand	1.3E-02	37
21	b.	Sand	2.1E-02	60
22	b.	Sand	2.3E-02	64
23	b.	Silty Clay (top) / Sand (bottom)	8.1E-03	23
24	b.	Sand	8.1E-03	23
25	b.	Sand	2.1E-03	6
32	c.	Sand	9.0E-02	255
33	c.	Sand	2.6E-02	74
34	c.	Sand	1.1E-03	3
37	d.	Sand	1.1E-01	306
38	d.	Sand	2.7E-02	75
39S	d.	Sand	5.5E-02	155
39M	d.	Sand	1.8E-01	510
40S	d.	Sand	9.5E-03	27
40M	d.	Sand	2.1E-01	587
41	d.	Sand	6.2E-02	175
42	d.	Sand	3.3E-02	95
	Minimum Hydraulic Conductivity		4.2E-04	1
	Maximum Hydraulic Conductivity		2.1E-01	587
	Geometric Mean Hydraulic Conductivity		**5.7E-02**	**33**

1. Test types:
    - a. nitrogen gas slug, analyzed using method of Hvorslev (1951), performed by Hampton and O'Hearn (1984)
    - b. PVC slug, analyzed using method of Bower & Rice (1976), performed by Kelron Environmental (1995)
    - c. PVC slug, analyzed using method of Bower & Rice (1976), performed by STMI (this report)
    - d. PVC slug and air slug, analyzed using Bower and Rice, 1976, performed by Kelron Environmental (2004)

Table 3

Summary of Existing Monitoring Well Network and AECOM Borings

Hydrogeologic Characterization Report

d River Power Station

✓ ✓

Boring/Well ID	Ground Surface at Time of Install	Measuring Point Elevation (2015)	Top of Screen Elevation	Bottom of Screen Elevation	Screen length	Total Boring Depth	
2	432.9	435.0	397.7	395.7	2	395.7	35.2-37.2
4	417.4	419.6	396.4	394.4	2	391.4	21-23
12	426.9	428.8	370.9	368.9	2	368.9	56-58
20R	425.2	427.2	406.3	386.7	20	385.2	
21	433.1	434.8	414.0	393.6	20	390.1	
22	433.3	435.0	410.0	394.8	15	390.8	
23	431.2	432.3	413.2	392.8	20	391.2	18-38
25	430.5	432.2	412.4	392.0	20	390.5	
28	420.4	422.6	400.0	385.0	15	384.4	
29	428.0	429.9	407.6	392.6	15	392.0	
30	430.5	432.3	410.1	395.1	15	394.5	
31	433.8	435.8	413.4	398.4	15	397.8	
32R	427.1	429.0	410.1	400.1	10	393.1	
33	409.8	411.8	399.8	389.8	10		
34	429.3	430.2	394.3	389.3	5		35-40
35R	422.6	424.7	399.6	394.6	5	394.6	
36	413.5	416.3	393.5	388.5	5		
37	429.29	432.44	405.4	400.3	5	398.3	
38	434.49	437.09	367.7	362.7	5	360.5	
39S	437.33	440.08	401.1	396.1	5	393.9	36-41
39M	437.28	440.03	369.9	364.9	5	362.8	67.4-72.4
40S	441.25	444.55	404.7	399.7	5	397.7	
40M	441.05	444.20	388.1	383.0	5	381.1	
41	448.11	450.96	401.9	396.8	5	394.1	
42	422.97	425.72	402.7	397.6	5	395.0	
L1	433.9	437.49	416.9	411.9	5		
L2	435.99	439.41	431.3	421.2	10		
L3	441.80	444.26	432.1	422.1	10		
L4	448.29	450.84	430.7	420.6	10	420.3	
AECOM Borings and Piezometers							
B001/P001	451.8	451.78	436.8	426.8	10.0	371.1	
B002/P002	422.3	425.35	407.3	397.3	10.0	362.3	
B003/P003	451.0	451.05	416.0	406.0	10.0	371	
B004/P004	433.8	436.60	418.8	408.8	10.0	373.8	
B005/P005	451.2	451.24	421.2	411.2	10.0	371.2	
B006/P006	451.3	451.32	401.3	391.3	10.0	371.3	
B007	426.5	NA	NA	NA	NA	356.5	
B008/P008	426.5	426.48	406.5	396.5	10.0	356.5	
B009	426.2	NA	NA	NA	NA	356.2	
B010	426.1	NA	NA	NA	NA	356.1	
B012	430.9	NA	NA	NA	NA	360.9	
B013	427.9	NA	NA	NA	NA	357.9	
B014	431.8	NA	NA	NA	NA	361.8	
B015/P015	428.4	428.45	393.4	383.4	10.0	378.4	
B016/P016	442.2	442.23	422.2	412.2	10.0	372.2	
B017	431.7	NA	NA	NA	NA	361.7	
B018	443.9	NA	NA	NA	NA	373.9	
B020/P020	444.0	444.05	404.5	394.5	10.0	374	
B021/P021	422.7	425.33	408.7	393.7	15.0	352.7	
B022	430.6	NA	NA	NA	NA	380.6	
B024/P024	423.0	425.46	408.0	393.0	15.0	353	
B025/P025	433.5	435.98	418.5	408.5	10.0	373.5	
B026/P026	431.4	433.81	415.4	405.4	10.0	402.9	

Table 4
Summary of [illegible]dwater Elevations (2010-2015)
Hydrogeologic Characterization Report
Wood River Power Station

Month-Year	02	04	12	20	21	22	23	25	28	29	30	31	32R	33	34	35R	36	37	38	39M	39S	40M	40S	41	42	L1R
March-10	406.4	407.1	407.42	406.78	408.52	408.84	407.9	408.89	408.02	403.32	408.71	408.24	407.98		406.04	406.74	407.77	407.77	406.91	406.27	406.32	405.56	405.79	405.57	406.15	415.3
June-10	414.36	411.93	413.61	412.6	413.41	413.36	413.52	412.88	413.12	412.87	413.06	412.59	412.82		413.67	414.33	412.65	413.61	414.12	414.54	414.55	414.89	414.89	414.95	414.62	429.2
September-10	413.47	411.74	412.33	410.78	411.62	411.7	411.89	411.59	411.54	411.64	411.63	411.62	411.89		413.17	413.07	412.27	411.97	412.76	413.13	413.13	413.41	413.54	413.52	413.42	428.94
November-10	406.7	407.26	408.07	407.41	409.22	409.58	408.55	409.56	408.75	408.88	409.35	408.78	408.42	408.77	406.82	407.43	408.28	408.18	407.55	400.74	400.57	406.65	406.78	406.5	406.86	426.78
March-11	412.76	411.24	409.51	406.56	407.01	406.84	408.24	407.8	407.8	408.07	407.48	408.51	409.16	409.28	412.73	410.31	411.23	407.49	409.07	409.77	409.52	411.14	410.68	411.81	411.02	430.1
June-11	418.78	414.38	416.68	415.82	416.21	415.86	416.56	415.04	415.79	415.38	415.4	414.96	415.27	412.44	416.76	418.14		417.29	417.79	418.42	418.38	418.82	418.91	419.18	418.79	430.05
September-11	405.73	405.68	407.53	407.36	409.28	409.68	408.3	409.25	408.5	408.59	409.17	408.12	407.7	407.81	405.45	406.86	406.75	408.52	407.54	406.67	406.73	405.9	406.09	405.8	406.3	426.13
November 11	403.01	403.23	405.03	404.79	406.86	407.29	405.86	407.21	406.04	406.17	406.81	405.82	405.36	405.79	402.68	404.13	404.75	406.14	405.1	403.93	404.03	402.85	402.8	402.74	403.4	425.48
March-12	408.16	408.92	407.01	405.19	406.33	406.5	406.48	407.29	406.53	406.94	406.82	407.45	407.52		408.53	406.98	408.59	406.09	406.14	405.95	405.83	406.44	406.18	406.85	406.81	429.53
June-12	404.6	405.38	405.73	404.69	406.44	406.8	405.93	407.13	406.27	406.62	406.92	406.62	406.32	407.12	404.54	405.06	406.86	405.24	404.88	404.48	404.52	404.12	404.16	404.2	404.67	426.3
August-12	400.55		402.77	402.28	406.04	404.78	401.65	404.9	403.75	404.17	404.66	404.22	403.72	405.29	401.04	401.66	404.39	403.22	402.5	401.53	401.58	400.34	400.65	400.26	401.01	424.18
November-12		404.06	402.1	401.11	402.98	403.46	402.36	404.21	402.79	403.37	403.68	403.7	403.27	405.25	401.35	401.24	404.35		401.43	400.43	400.41	399.79				423.75
February-13	401.8	404.41	402.64	401.59	403.43	403.66	402.81	404.31	403.16	403.61	403.85	397.57	403.53	405.2	402.55	401.88	404.79		402.03	401.04		400.75				426.86
May-13	417.9	415.13	415.32	413.1	412.11	411.02	413.98	403.81	413.14	412.96	411.77	413.07	413.78		416.55	416.77		414.35	416.3	417.19	417.25	417.82	417.72	418.39	417.82	430.05
August-13	404.19	407.36	407.06	406.96	409.1	409.57	407.99	409.27	408.37	408.61	403.24	407.39	407.74		404.63	406	406.91	408.02	406.79	405.8	405.89	404.61	403.23	404.35	405.24	427.63
November-13	401.95	404.27	403.51	402.76	404.63	405.09	403.95	405.37	404.32	404.72	405.06	404.81	404.44	405.83	402.64	402.65	405.72		403.01	401.93	401.93	401.11			401.8	425.68
February-14	403.71	406.46	403.47	401.96	403.55	403.94	403.34	405	403.63	404.2	404.27	405.76	404.63	406.34	429.11	403.11	406.6	402.89	402.3	401.6	401.14	401.83	401.34	401.34	401.11	426.59
May-14	409.78	410.8	408.58	406.83	407.54	407.53	408.01	408.41	408.03	408.41	408.07	408.63	408.84		410.44	408.94	410.33	407.34	407.79	407.97	407.93	408.56	408.45	409.03	409.1	428.92
September-14	406.62	409.2	407.07	405.8	407.46	407.83	404.11	408.18	407.31	407.74	407.96	408.01	407.85		408.27	406.34	406.46	406.79	406.34	405.83	405.78	405.68	405.67	405.79	405.87	428.03
November-14	403.98	405.7	405.91	405.75	407.75	408.18	406.85	407.88	407.15	407.43	407.94	407.27	406.78		404.33	405.3	406.37	406.88	405.74	404.79	404.85	403.82	403.88	403.81	404.57	428.94
March-15	402.75	405.24	404.27	403.43	405.28	405.67	404.62	405.88	405.06	405.46	405.69	405.53	405.25	406.54	404.16	403.13	406.06	404.63	403.61	402.48	402.48	401.69	401.63	401.76	402.32	
May-15	408.91	410.13	407.83	406.12	407.44	407.69	407.41	408.08	407.49	407.85	407.86	408.22	408.33	409.12	410.23	407.66	410.33	407.02	406.09	406.65	406.58	406.98	406.77	407.58	407.36	429.09
September-15	405.71	406.95	408.24	408.09	410.33	410.9	409.18	410.36	409.6	410.76	410.44	409.32	408.74	408.97	406.61	407.22	407.58	408.84	407.74	407	407.04	406.12	406.34	405.96	406.49	428.47
November-15	402.18	403.21	404	404.77	405.68	406.24	404.79	406.48	405.07	405.45	406.01	405.38	404.975	405.91	401.64	403.03	405.18	405.06	403.83	402.82	402.84	401.98	401.78	401.75	402.3	423.76

Table 5
Summary of Groundwater Elevations (AECOM Piezometers)
Hydrogeologic Characterization Report
Wood River Power Station

Date	WOR-P001	WOR-P002	WOR-P003	WOR-P004	WOR-P005	WOR-P006	WOR-P008	WOR-P015	WOR-P016	WOR-P020	WOR-P021	WOR-P024	WOR-P025	WOR-P026
10/29/2015	-	418.8	421.5	421.6	422.3	401.9	404.7	403.2	424.6	403.6	403.7	402.8	425.5	423.8
11/19/2015	-	421.8	421.7	421.8	422.0	403.3	407.5	405.1	426.0	406.0	406.9	406.6	427.8	426.9
12/14/2015	-	421.8	422.4	423.3	422.4	407.7	409.3	408.2	428.1	408.9	408.7	409.1	428.9	428.3
1/12/2016	-	420.6	423.2	425.2	423.1	415.5	411.3	414.0	430.0	414.5	411.5	412.2	431.1	431.0

Well screened at elevation within impoundment fill

Notes: 1. Water Surface Elevations from 10/29/15 updated to consider the PVC riser length for the open standpipe piezometers with sitckup cover

Table 6
Summary of Vertical Gradients
drogeologic Characterization Report
Wood River Power Station

	Well ID	Screen Elev. (ft)[1]	Formation	Vertical Gradient Range[2]		
				Min	Median	Max
Historical Well Nests (gradients measured prior to August, 2000)						
Shallow Well	02	385.3	Primary Sand	0.000	0.029	0.101
Deep Well	01	397.2	Primary Sand			
Shallow Well	04	384.3	Primary Sand	-0.183	-0.026	0.105
Deep Well	03	395.7	Primary Sand			
Shallow Well	32	405.1	Primary Sand	0.181	0.206	0.235
Deep Well	05	392.7	Primary Sand			
Shallow Well	08	402.9	Primary Sand	-0.008	0.000	0.030
Deep Well	07	389.6	Primary Sand			
Shallow Well	11	408.1	Clay Unit	0.185	0.204	0.385
Deep Well	10	381.6	Clay Unit			
Shallow Well	13	391.3	Clay Unit	-0.058	0.346	0.465
Deep Well	12	369.9	Primary Sand			
Current Well Nests (2010-2015)						
Shallow Well	39S	398.6	Primary Sand	-0.460	0.000	0.100
Deep Well	39M	367.4	Primary Sand			
Shallow Well	40S	402	Primary Sand	-1.380	-0.010	0.310
ep Well	40M	385.6	Primary Sand			

1. Center of screen
2. Based on dates when both wells were sampled, **negative** vaues indicate upward gradients while **positive** indicate downward gradients

Table 7

Statistical Summary of Groundwater Monitoring Parameters: January 2010 to December 2015

Hydrogeologic Characterization Report

Wood River Power Station

ON (dissolved - mg/L)

Monitoring Well Number	Number of Data Points	Mean	Median	Maximum	Minimum	Standard Deviation	Percent Non-Detects	Sen Slope Trend
02	11	2.67	2.56	3.45	2.20	0.41	0	0.17 **
04	12	0.38	0.36	0.49	0.32	0.05	0	0.00
12	12	1.99	2.03	2.32	1.30	0.28	0	0.08 **
20	24	0.30	0.30	0.47	0.19	0.07	0	-0.03 **
21	12	0.33	0.34	0.41	0.23	0.06	0	0.02
22	12	0.29	0.29	0.33	0.26	0.03	0	0.00
23	12	0.39	0.38	0.55	0.30	0.07	0	0.01
25*	12	0.60	0.60	0.83	0.39	0.12	0	-0.03
28	12	1.26	1.03	2.30	0.76	0.53	0	-0.08
31*	13	1.02	0.99	1.20	0.80	0.13	0	-0.05 **
34	12	3.04	1.37	7.49	0.80	2.75	0	0.99 **
$36^{\text{Bck Well}}$	10	0.11	0.12	0.16	0.08	0.03	0	0.01

MANGANESE (dissolved - mg/L)

Monitoring Well Number	Number of Data Points	Mean	Median	Maximum	Minimum	Standard Deviation	Percent Non-Detects	Sen Slope Trend
02	11	1.13	1.07	1.98	0.77	0.35	0	0.12 **
04	12	6.11	6.05	8.70	4.91	1.00	0	-0.03
12	12	0.48	0.46	0.64	0.31	0.10	0	0.05 **
20	24	0.019	0.005	0.12	0.003	0.03	63	0.00
21	12	0.039	0.005	0.35	0.003	0.10	58	0.00
22	12	0.018	0.005	0.15	0.003	0.04	83	0.00
23	12	0.26	0.098	1.01	0.006	0.31	0	0.05 **
25*	12	0.18	0.07	0.81	0.008	0.28	0	-0.01
28	12	1.32	1.25	3.54	0.26	0.94	0	0.26 **
31*	13	0.08	0.05	0.41	0.010	0.10	0	-0.01
34	12	5.44	5.65	7.75	3.20	1.28	0	0.23
$\mathbf{36}^{\text{Bck Well}}$	10	2.73	2.60	3.34	2.20	0.37	0	0.00

FATE (dissolved - mg/L)

Monitoring Well Number	Number of Data Points	Mean	Median	Maximum	Minimum	Standard Deviation	Percent Non-Detects	Sen Slope Trend
02	11	213	213	298	140	48	0	13.6 **
04	12	13	10	47	5.0	11	67	0.0
12	12	43	38	74	16	20	0	4.3
20	24	107	99	180	56	38	0	-7.0
21	12	128	117	236	74	41	0	-6.2
22	12	73	76	99	46	14	0	-3.7
23	12	161	154	219	123	29	0	4.9
25*	12	218	240	307	89	79	0	-14.3
28	12	178	179	285	68	59	0	7.2
31*	13	190	169	270	118	50	0	-28.9 **
34	12	14	10	47	5.0	12.4	42	1.1 **
$36^{\text{Bck Well}}$	10	13	10	33	10.0	7.2	60	-0.2 **

Notes: Sen Slope Trend is in milligrams per Liter per year; negative value (-) is downward trend; positive value is upward trend.

Significant trend based on Mann-Kendall test is indicated as bold with**.

Sample results below the method detection limit (MDL) for that parameter have been replaced by the detection limit.

* Wells within influence of off-site slag pile

▨ Wells with groundwater exceeding Class 1 groundwater standard for the given parameter in 2015

TOTAL DISSOLVED SOLIDS (mg/L)

Monitoring Well Number	Number of Data Points	Mean	Median	Maximum	Minimum	Standard Deviation	Percent Non-Detects	Sen Slope Trend
02	11	935	936	1,020	862	50	0	-1.3
04	12	898	918	1,000	740	86	0	**-36** **
12	12	493	497	570	436	37	0	-2.0
20	24	490	459	730	310	107	0	6
21	12	542	545	630	438	55	0	-1.4
22	12	510	510	628	408	61	0	-8
23	12	653	656	760	552	54	0	5.6
25*	12	1,299	1,365	1,710	690	355	0	-73
28	12	716	757	858	490	109	0	-11.1
31*	13	2,966	2,240	6,000	1,620	1,455	0	**-546** **
34	12	817	815	1,050	670	113	0	14
$36^{\text{Bck Well}}$	10	554	543	768	430	102	0	**-33** **

pH (Field / Standard Units)

Monitoring Well Number	Number of Data Points	Mean	Median	Maximum	Minimum	Standard Deviation	Sen Slope Trend
02	11	6.88	6.87	7.19	6.60	0.17	0.05
04	12	6.75	6.72	7.01	6.48	0.19	**0.08** **
12	12	6.87	6.94	7.21	6.54	0.19	0.04
20	24	6.46	6.42	7.14	6.12	0.29	0.00
21	12	6.85	6.90	7.32	6.44	0.24	0.04
22	12	6.91	6.96	7.08	6.53	0.15	**0.05** **
23	12	6.34	6.31	6.94	6.00	0.29	0.02
25*	12	6.86	6.82	7.46	6.54	0.25	0.06
28	12	6.80	6.84	6.99	6.39	0.19	**0.08** **
31*	13	6.75	6.86	7.39	6.10	0.41	**0.14** **
34	12	6.79	6.82	7.05	6.48	0.17	**0.06** **
$36^{\text{Bck Well}}$	10	6.97	6.95	7.32	6.65	0.19	0.03

Notes: Sen Slope Trend is in Standard Units per year; negative value (-) is downward trend; positive value is upward trend.
Significant trend based on Mann-Kendall test is indicated as bold with**.
Sample results below the method detection limit (MDL) for that parameter have been replaced by the detection limit.

* Wells within influence of off-site slag pile.

▨ Wells with groundwater exceeding Class 1 groundwater standard for the given parameter in 2015.

Table 8

Summary of Exceedances of Class I Groundwater Standards 2010 to 2015

Hydrogeologic Characterization Report

Wood River Power Station

Parameters Submitted to the IEPA for Routine Groundwater Monitoring	Class 1 Standard	unit	Number of exceedances of Class 1 Groundwater Standards between January 2010 and December 2015 (and year of last exceedance)^{2}											
			Current Monitoring Wells Monitored Semi-Annually for Reporting to the IEPA											
			02	04	12	20	21	22	23	25*	28	31*	34	36^{bck}
	Number of Samples		11	12	12	24	12	12	12	12	12	13	12	10
Boron	2.0	mg/L	**11$_{(2015)}$**	0	**6$_{(2015)}$**	0	0	0	0	0	2$_{(2013)}$	0	**5$_{(2015)}$**	0
Manganese	0.15	mg/L	**11$_{(2015)}$**	**12$_{(2015)}$**	**12$_{(2015)}$**	0	1$_{(2013)}$	0	5$_{(2014)}$	2$_{(2013)}$	**12$_{(2015)}$**	1$_{(2010)}$	**12$_{(2015)}$**	**10$_{(2015)}$**
pH^{1}	6.50 / 9.00	Std.	0	1$_{(2012)}$	0	**16$_{(2015)}$**	2$_{(2012)}$	0	**10$_{(2015)}$**	0	1$_{(2010)}$	4$_{(2012)}$	1$_{(2012)}$	0
Sulfate	400	mg/L	0	0	0	0	0	0	0	0	0	0	0	0
Total Dissolved Solids	1,200	mg/L	0	0	0	0	0	0	0	**7$_{(2015)}$**	0	**13$_{(2015)}$**	0	0
Groundwater Elevation	no Class 1 Standard													

^{bck} Background monitoring wells.

bold indicates exceedances in in 2015

[1] All pH exceedances are below the lower standard of 6.50 Standard Units.

[2] Parameters with exceedances of Class I groundwater standards in 2015 are highlighted for each monitoring well.

* Wells are within influence of off-site slag pile.

Table 9
Annual Medi on, Sulfate, , and Manganese Concentrations
Hydrogeologic Characterization Report
Wood River Power Station

Median Boron Concentration (mg/L)[1]

Well[2]	Position	In Service[3]	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	% Change[4]
02	Downgradient - S	2.45	3.85	4.60	3.35	4.45	3.60	2.70	2.40	2.30	2.60	2.70	2.10	2.45	2.30	2.45	2.30	2.73	3.06	2.98	21%
04	Downgradient - SW	0.63	0.58	0.57	0.60	0.55	0.54	0.47	0.45	0.48	0.46	0.46	0.42	0.34	0.35	0.44	0.40	0.33	0.35	0.42	-33%
12	Downgradient - E	1.80	1.60	1.50	1.50	1.40	1.40	1.40	1.60	1.70	2.30	2.20	1.85	2.00	1.65	1.80	2.04	2.20	2.12	2.13	18%
20	Downgradient - E	1.00	0.60	0.55	0.55	0.63	0.49	0.31	0.34	0.32	0.28	0.28	0.46	0.37	0.30	0.37	0.35	0.30	0.23	0.22	-78%
21	Downgradient - NE	0.49	0.42	0.55	1.10	1.85	0.88	0.55	0.68	0.40	0.41	0.39	0.26	0.31	0.26	0.33	0.35	0.37	0.28	0.37	-25%
22	Downgradient - N	0.42	0.23	0.28	0.26	0.32	0.36	0.27	0.28	0.30	0.26	0.28	0.30	0.28	0.28	0.31	0.28	0.29	0.31	0.30	-29%
23	Downgradient - E	2.40	1.45	1.50	2.05	1.02	0.83	0.53	0.48	0.50	0.51	0.57	0.39	0.36	0.33	0.40	0.38	0.40	0.49	0.35	-85%
25*	Downgradient - N	1.10	1.60	1.30	0.55	1.90	1.01	0.61	1.25	0.47	0.40	1.00	0.83	0.97	0.69	0.76	0.48	0.60	0.57	0.51	-53%
28	Downgradient - N	3.65	3.10	3.15	3.15	3.45	2.85	2.65	2.90	2.00	2.55	2.80	2.55	2.75	1.55	1.55	1.00	1.43	1.06	0.96	-74%
31*	Downgradient - N	2.50	1.30	1.20	1.25	1.65	2.05	1.85	1.70	1.25	1.15	1.55	1.30	1.30	1.10	1.20	0.99	0.99	0.93	0.85	-66%
34	Downgradient - S	0.24	0.28	0.12	0.22	0.32	0.38	0.59	0.69	1.38	4.70	2.18	1.15	1.30	1.13	0.88	1.37	4.15	3.99	6.72	2700%
36	Background - W			0.11	0.12	0.10	0.09	0.09	0.09	0.11	0.17	0.12	0.11	0.09	0.08	0.09	0.12	0.13	0.12	0.13	

Median Sulfate Concentration (mg/L)[1]

Well[2]	Position	In Service[3]	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	% Change[4]
02	Downgradient - S	360	305	280	335	330	350	390	405	370	300	280	160	225	160	185	220	293	204	221	-39%
04	Downgradient - SW	62	50	20	19	17	11	35	13	5.1	12	22	13	11	11	26	<7.5	10	<10.0	<10.0	-84%
12	Downgradient - E	96	175	190	155	145	115	91	74	72	96	74	77	51	28	33	51	54	51	44	-55%
20	Downgradient - E	130	95	105	88	72	90	57	78	65	55	58	130	103	87	100	156	125	83	71	-45%
21	Downgradient - NE	120	145	180	275	205	145	99	87	58	50	43	83	131	120	155	120	177	92	106	-12%
22	Downgradient - N	78	53	64	74	68	110	97	70	90	68	48	59.5	63	84.5	71	69	69	88	54	-31%
23	Downgradient - E	200	155	145	195	235	225	210	225	220	160	125	215	170	155	145	154	158	200	153	-24%
25*	Downgradient - N	220	235	240	195	180	260	225	180	185	160	126	120	245	275	240	231	206	186	172	-22%
28	Downgradient - N	180	200	195	190	180	165	135	170	140	180	72	195	205	155	124	149	232	244	164	-9%
31*	Downgradient - N	175	165	175	150	185	215	190	165	160	175	170	185	215	260	230	223	164	145	133.5	-24%
34	Downgradient - S	22	43	12	8	28	7	20	24	22	17	8.7	19	8	6	8	11	20	29	<10.0	-55%
36	Background - W			43	37	45	15	23	24	29	26	9.2	14	12	11	33	11	<10	<10.0	<10.0	

Median Manganese Concentration (mg/L)[1]

Well[2]	Position	In Service[3]	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	% Change[4]
02	Downgradient - S	0.735	0.570	0.735	0.905	0.950	0.960	0.995	0.990	1.10	0.890	0.865	0.870	1.15	0.885	0.900	0.770	1.26	1.13	1.67	127%
04	Downgradient - SW	11.50	9.10	8.30	8.20	7.65	7.30	7.20	8.20	7.20	6.65	8.05	6.70	6.50	7.05	5.75	5.89	6.62	5.52	5.82	-49%
12	Downgradient - E	0.660	0.760	0.690	0.675	0.650	0.585	0.570	0.525	0.500	0.415	0.560	0.430	0.370	0.365	0.385	0.485	0.450	0.543	0.600	-9%
20	Downgradient - E	<0.03	0.001	<0.005	0.006	0.009	0.008	0.005	0.009	<0.005	0.007	<0.005	<0.005	0.005	<0.005	<0.005	0.015	0.028	0.005	0.007	-77%
21	Downgradient - NE	<0.03	0.002	0.017	0.290	0.190	0.046	0.104	0.065	0.029	0.088	0.071	<0.005	0.022	<0.005	<0.005	0.007	0.179	0.009	0.029	-3%
22	Downgradient - N	<0.03	<0.005	<0.005	0.010	0.010	0.005	0.043	0.122	<0.005	<0.005	0.318	0.006	0.005	<0.005	<0.005	<0.005	0.078	0.010	<0.005	
23	Downgradient - E	0.261	0.120	0.059	0.310	0.550	0.123	0.270	0.081	0.040	0.205	0.455	0.065	0.010	0.025	0.042	0.244	0.400	0.760	0.066	-75%
25*	Downgradient - N	0.170	0.175	0.055	0.022	0.240	0.007	0.012	0.150	0.006	0.045	1.13	0.830	1.24	0.087	0.410	0.059	0.410	0.085	0.046	-73%
28	Downgradient - N	0.225	0.595	0.525	1.25	1.04	0.920	1.30	1.40	0.995	1.75	1.75	1.25	1.20	0.465	0.680	1.51	1.14	2.47	1.68	647%
31*	Downgradient - N	0.458	0.250	0.150	0.135	0.205	0.170	0.180	0.104	0.155	0.053	0.335	0.365	0.185	0.253	0.091	0.047	0.050	0.048	0.044	-90%
34	Downgradient - S	5.72	9.50	4.40	5.10	5.30	5.10	6.15	5.90	5.45	5.00	5.15	5.90	4.85	4.65	5.10	5.30	5.25	6.50	5.83	2%
36	Background - W			3.75	3.15	3.00	2.70	2.45	2.50	2.35	2.15	2.00	2.55	2.25	2.40	3.20	2.97	2.52	2.58	2.86	

Median pH (S.U.)[5]

Well[2]	Position	In Service[3]	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	% Change[4]
02	Downgradient - S	6.90	7.15	6.93	7.09	7.13	6.77	6.45	6.61	7.00	6.63	6.34	6.64	6.85	6.75	6.81	6.60	7.00	7.10	6.89	0%
04	Downgradient - SW	6.70	6.64	7.50	7.18	7.10	6.65	6.54	6.53	7.32	6.67	6.25	6.46	6.84	6.64	6.56	6.62	6.81	6.93	6.95	4%
12	Downgradient - E	7.11	6.84	7.35	7.39	6.94	6.70	6.52	6.54	7.66	6.95	6.60	6.63	6.93	6.86	6.71	6.85	6.75	7.09	6.96	-2%
20	Downgradient - E	6.78	6.46	6.28	6.51	6.56	6.39	6.06	6.59	7.16	6.52	6.51	6.38	6.35	6.25	6.34	6.54	6.64	6.52	6.25	-8%
21	Downgradient - NE	7.03	7.13	6.81	6.77	6.94	6.81	6.69	6.79	7.22	6.94	6.56	6.89	7.13	6.81	6.67	6.59	7.16	6.99	6.86	-2%
22	Downgradient - N	7.14	6.99	6.97	6.86	6.98	6.78	6.55	6.71	7.29	6.70	6.44	6.66	6.94	6.68	6.90	6.93	7.01	7.03	6.93	-3%
23	Downgradient - E	6.67	6.50	6.20	6.44	6.54	6.18	6.14	6.09	6.59	6.31	6.26	6.18	6.33	6.14	6.15	6.39	6.59	6.63	6.15	-8%
25*	Downgradient - N	6.98	6.57	6.66	6.71	6.73	6.64	6.65	6.57	7.50	6.86	6.38	6.49	6.86	6.76	6.62	6.76	7.24	6.99	6.83	-2%
28	Downgradient - N	7.16	6.97	6.88	6.88	6.86	6.77	6.42	6.86	7.45	6.78	6.47	6.61	6.98	6.52	6.63	6.89	6.95	6.96	6.83	-5%
31*	Downgradient - N	6.77	6.62	6.62	6.77	6.49	6.69	6.56	6.78	7.42	6.87	6.21	6.43	6.88	6.36	6.32	6.56	7.27	6.82	7.00	3%
34	Downgradient - S	6.72	6.47	7.89	7.40	7.26	6.69	6.46	6.51	7.34	6.58	6.42	6.55	6.93	6.72	6.62	6.69	6.93	6.88	6.94	3%
36	Background - W			7.77	7.52	7.13	6.85	6.65	6.72	7.53	6.78	6.68	6.68	7.05	6.89	6.87	6.87	7.32	6.95	7.04	

Notes
1 Shading indicates median concentration greater than Class I standard 0.15 mg/L for manganese. Blank indicates no samples taken during that year
2 * indicates wells within influence area of slag pile
3 All unlined ponds removed from service as of January 1998
4 Difference based on change in median concentration from In Service (before 1998) to current year; not calculated if both values were below the pre-1998 detection limits
5 pH limits include lower limit 6.5 and upper limit 9.0 S.U.

The following are attachments to the testimony of Scott M. Payne, PhD, PG and Ian Magruder, M.S..

APPENDIX A

BORING LOGS AND WELL CONSTRUCTION DETAILS

APPENDIX A1

AECOM LOGS

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

ject Number: 60440115

Log of Boring WOR-B001

Sheet 1 of 3

Date(s) Drilled	09/09/2015 12:00 AM to 09/09/2015 12:00 AM	Logged By	C.Dicke	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	80.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	451.08 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 801420.9 E 2306193.3 (ft NAD83)	Groundwater Level(s)	First encountered at 22.5 ft bgs (perched) and 47.5 ft on 9/9/2015 22.5 ft on 9/10/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	SAMPLES Number	SAMPLES Sampling Resist. OR Core RQD (%)	SAMPLES Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						451.1 / 0.0								
							Crushed LIMESTONE GRAVEL (8")								
							450.4 / 0.7								
450							449.8 / 1.3								
		▨	SS-1	38 50/5"	100		Soft, moist, brown, lean CLAY (CL) trace gravel [FILL]					0.25 - -			
							Very dense, moist, dark brown to black, poorly-graded fine SAND (SP) [BOTTOM ASH]								
		▨	SS-2	12 20 21	45		becomes dense								
	5														
445							445.1 / 6.0								
		▨	SS-3	4 6 12	78		Medium dense, moist, dartk brown to black, sandy SILT (ML), trace coal fragments [FLY ASH]								%G=8 %S=25 %M=52 %C=15
		▨	SS-4	12 15 12	50										
	10														
440															
		▨	SS-5	10 11 13	22										
	15														
435															
		▨	SS-6	4 4 2	78		becomes loose								%G=0 %S=25 %F=75
	20														
430															*Driller noted a change near 22.5 ft bgs*
							428.6 / 22.5								
							Loose, wet, dark gray SILT (ML) with sand [FILL]								
							427.1 / 24.0								
		▨	SS-7	1 7 8	78		Medium dense, moist, dark gray with brown grains, poorly-graded medium to coarse SAND (SP), trace silt [BOTTOM ASH]								
	25														
425															
		▨	SS-8	13 14 12	50		becomes fine sand with silt (SP-SM)								
	30														

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B001

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30													
420														*Driller noted a change near 32-33 ft bgs*
418.1	33.0					Hard, moist to dry, dark gray with brown staining, lean CLAY (CL) trace sand and root fragments [POSSIBLE FILL]								
		SS-9	8 11 13	89							4.0 4.5+ 4.5+			
	35													
415														
413.1	38.0					Stiff to very stiff, moist, gray, fat CLAY (CH) trace organics and fine sand seams [ALLUVIUM]								
		SS-10	3 2 4	100							1.75 2.0 2.0			
	40													
410		ST-1		88		becomes stiff	30 29.3 34.1	119.8 113.0	82	60	1.25			*%G=0 %S=0 %M=58 %C=42 UU=19.8 psi, k=2.9E-07*
406.8	44.2	SS-11	4 6 8	100		Medium dense, moist to wet, brown, poorly-graded SAND (SP), trace silt [ALLUVIUM]					1.25 1.25 -			
	45													
405														
		SS-12	4 4 5	100		becomes loose, wet								*Water on rods at 47.5 ft bgs* *%G=0 %S=97 %F=4%* *Switched to wash rotary at 50 ft bgs*
	50													
400														
		SS-13	7 17 17	78		becomes dense								
	55													
395														
		SS-14	7 8 10	72		becomes medium dense								
	60													
390														
		SS-15	10 29 20	100		becomes dense, gray 4" coarse sand layer at 64.5' bgs								
	65													

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B001

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
385														
		SS-16	12 17 18	78										
	70													
380														
		SS-17	8 7 7	80		becomes medium dense								%G=1 %S=98 %F=1
	75													
375														
		SS-18	8 9 10	44										
	80					371.1 80.0 End of Boring at 80 ft								
370														
	85													
365														
	90													
360														
	95													
355														
	100													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

Project Number: 60440115

Log of Boring WOR-B002

Sheet 1 of 2

Date(s) Drilled	09/15/2015 12:00 AM to 09/15/2015 12:00 AM	Logged By	N.Sanna	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	60.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	422.3 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802453.5 E 2305700 (ft NAD83)	Groundwater Level(s)	First encountered at 9.5 ft on 9/15/2015 Measured 3 ft bgs on 10/29/2015 and 0.5 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	SAMPLES Number	SAMPLES Sampling Resist. OR Core RQD (%)	SAMPLES Recovery (%)	Graphic Symbol	Elevation (feet)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						422.3		0.0								
							422.1	TOPSOIL (2")	0.2								
								Very loose, moist, gray SILTY SAND (SM) [FILL]									
			SS-1	2 1 2	89												
420																	
							418.8	Very loose, moist, brown SILT (ML) with sand, trace roots [Possible Ash Fill]	3.5								
			SS-2	1 1 2	100												
	5																
								becomes stiff									
415			ST-1		100					25.0		31	8	2.0 1.6 1.7	0.28 0.28 0.3		*GUS sampler used %G=0 %S=1 %M=88 %C=11*
							413.8	Very loose, wet, gray and brown SILTY SAND (SM) [Possible Ash Fill]	8.5								
			SS-3	1 1 1	100												
	10																
410																	
							408.8	Very soft to soft, wet, gray with brown mottling, SILTY CLAY (CL-ML)	13.5								
			SS-4	WOH/12" 2	100												
	15																
405																	
							403.8	Soft, wet, gray fat CLAY (CH) [ALLUVIUM]	18.5								
			SS-5	WOH/6" 1 2	100							80	44				
	20																
400																	
			SS-6	WOH/18"	100			becomes very soft						0.5 0.25 0.25			
	25																
395																	
			SS-7	WOH/18"	100												
	30																

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B002

Sheet 2 of 2

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
	30					▨									
390						▨									
		▨	SS-8	WOH/18"	100	▨									
	35	▤	ST-2		96	▨		60.8 62.7	101.1 100.3 101.1	86	52	0.5 0.5 0.6	0.18 0.28 0.31		*%G=0 %S=0 %M=29 %C=71 UU=12.3 psi*
385						▨									
		▨	SS-9	WOH/12" 1	100	▨	becomes with trace sand								
	40					▨									
380						▨									
							378.8 ― 43.5								
		▨	SS-10	7 6 5	100		Medium dense, wet, gray, poorly-graded, fine to medium SAND (SP) [ALLUVIUM]								*Switched to wash rotary at 43.5 ft bgs %G=0 %S=98 %F=2*
	45														
375															
		▨	SS-11	5 5 10	72		becomes with trace organics								*%G=0 %S=95 %F=5*
	50														
370															
		▨	SS-12	8 12 14	67										
	55														
365															
		▨	SS-13	11 12 14	33		becomes with well-rounded gravel without organics 362.3 becomes with trace gravel 60.0								
	60						End of Boring at 60 ft								
360															
	65														

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

ject Number: 60440115

Log of Boring WOR-B002A

Sheet 1 of 1

Date(s) Drilled	09/21/2015 12:00 AM to 09/22/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	30.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	422.3 ft NAVD88
Borehole Backfill	Well WOR-P002 Installed	Sampling Method(s)	Shelby Tube (ST)	Hammer Data	Automatic Hammer
Boring Location	N 802453.4 E 2305700.5 (ft NAD83)	Groundwater Level(s)	First encountered at 9.5 ft on 9/15/2015 Measured 3 ft bgs on 10/29/2015 and 0.5 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core ROD (%)	Recovery (%)	MATERIAL DESCRIPTION Elevation (feet)		Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
						422.3		0.0								
						422.1	Offset boring to WOR-B002. Augered to 13 ft bgs without sampling. Based on visual observation of auger cuttings, soils appear to be similar to WOR-B002.	0.								
						418.8		3.5								
						413.8		8.5								
						408.8		13.5								
			ST-1		92											
						403.8		18.5								
			ST-2		67											
						392.3		30.0								

End of Boring at 30 ft

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B003

Sheet 1 of 3

Date(s) Drilled	09/09/2015 12:00 AM to 09/10/2015 12:00 AM	Logged By	C.Dicke	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	80.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	451.0 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802400.4 E 2305984.4 (ft NAD83)	Groundwater Level(s)	First Encountered at 38 ft on 9/10/2015 Measured 29.5 on 10/29/2015 and 29.4 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0				451.0 / 0.0 Crushed LIMESTONE GRAVEL (8")								
					450.3 / 0.7 Dry to moist, brown lean CLAY (CL) [FILL]								
450		SS-1	40 50/4"	100	449.7 / 1.3 Very dense, moist, black, poorly-graded SAND (SP) trace silt, trace gravel [BOTTOM ASH]								
		SS-2	7 10 12	94	447.5 / 3.5 Medium dense, gray SILT (ML) with sand [FLY ASH] 2" wet sand layer								
445	5	SS-3	5 9 11	83	3" coarse sand layer								
					444.0 / 7.0 Medium dense, moist, brown, poorly-graded fine to medium SAND (SP), trace silt [FILL]								
		SS-4	8 15 19	89	441.8 / 9.2 Dense, moist to dry, black to dark gray, poorly-graded SAND (SP) with silt, trace coal fragments [BOTTOM ASH]								
440	10												
		SS-5	10 10 13	78	437.5 / 13.5 Medium dense, moist to dry, gray silty SAND (SM) [FLY ASH]								%G=12 %S=35 %F=54
435	15												
		SS-6	11 22 20	56	becomes dense								
430	20	ST-1		0									GUS sampler used
		SS-7	2 2 3	56	becomes loose								%G=3 %S=24 %F=74 Water inside augers at 24.5' bgs on 9/10 @ 0900
425	25	ST-2		96									GUS sampler used
					424.0 / 27.0 Very stiff, moist, dark gray, lean CLAY (CL) with trace organics, with to trace fine sand seams interbedded								
		SS-8	3 3 6	89						2.25 2.75 2.75			
	30												

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Project: Dynegy

Project Location: **Wood River Power Station, Alton, IL**

oject Number: **60440115**

Log of Boring WOR-B003

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES			Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)		Elevation (feet) / Depth (feet)								
	30													
420														
		SS-9	WOH 2 3	100		becomes medium stiff with interbedded fine sand seams, trace organics [ALLUVIUM]					0.5 0.7 0.5	0.4 0.45 0.4		
	35													
415		ST-3		100			27.3 27.8	122.5 122.0 121.3	28	8	1.0			%G=0 %S=7 %M=65 %C=28 SG=2.60, Organic Content = 2.6%
						412.5 — 38.5								*Water on rods near 38 ft bgs*
		SS-10	1 2 2	100		Soft to medium stiff, wet, gray with brown oxidation staining, SILTY CLAY (CL-ML) to SILT (ML), trace sand [ALLUVIUM]					0.5 0.5 0.5	0.4 0.4 0.35		
	40													
410														
						408.0 — 43.0								
						Soft, moist, gray fat CLAY (CH) with interbedded fine sand seams [ALLUVIUM]								
		SS-11	WOH/12" 1	100							0.0 0.0 0.0	0.15 0.2 0.15		
	45													
405														
		ST-4		88			56.7		94	64	0.5	0.4		%G=0 %S=0 %M=44 %C=56 UU = 7.1 psi
		SS-12	WOH 2 2	100		becomes without sand seams					0.25 0.25 0.25	0.2 0.3 0.15		
	50													
400														
		SS-13	WOH 1 2	100							0.25 0.25 0.25	0.3 0.35 0.3		
	55													
395														
		SS-14	WOH/12" 2	100		becomes dark gray with trace organics 1" silt layer					0.25 0.25 0.0	0.2 0.2 0.15		
	60					1" silt layer								*Switched to washed rotary at 60 ft bgs*
390														
		SS-15	WOH 1 2	89		becomes interbedded with dark gray clay seams interbedded	58.7		85	57	0.25 0.25 0.0	0.3 0.35 0.3		%G=0 %S=1 %M=32 %C=67
	65													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B003

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
385					▨									
		SS-16	12 12 14	78		382.5 — 68.5 Medium dense, wet, gray, poorly-graded fine to medium SAND (SP), trace silt [ALLUVIUM]								
	70													
380														
		SS-17	14 15 17	56		becomes dense								%G=0 %S=94 %F=6
	75													
375														
		SS-18	13 19 29											
	80					371.0 — 80.0 End of Boring at 80 ft								
370														
	85													
365														
	90													
360														
	95													
355														
	100													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B004

Sheet 1 of 2

Date(s) Drilled	09/15/2015 12:00 AM to 09/15/2015 12:00 AM	Logged By	N.Sanna	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	60.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	433.8 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802104.7 E 2307178.8 (ft NAD83)	Groundwater Level(s)	First Encountered at 8 ft on 9/15/2015 Measured at 12.2 ft bgs on 10/29/2015 and 12 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core ROD (%)	Recovery (%)		Elevation (feet) 433.8 — Depth (feet) 0.0								
	0						433.4 5" TOPSOIL 0.4								
			SS-1	4 8 9	56		Medium dense, moist, gray SILTY SAND (SM) [ASH]								
430			SS-2	4 3 3	89		becomes loose 3" brown silt layer								
	5		ST-1		100			57.0		NP	NP	<0.5 <0 5			*%G=0 %S=33 %M=63 %C=4 GUS sampler used*
25			SS-3	WOH/18"	100		becomes very loose, wet								
	10						4" coal layer								
420			SS-4	WOH/12" 1	100		420.3 — 13.5 Very loose, wet, gray SILT (ML) with sand [FILL - POSSIBLE ASH FILL]	28.8							*%G=0 %S=18 %M=53 %C=17 Organic Content=1.4%*
	15														
415			SS-5	WOH/12" 1	100		becomes gray and brown								
	20														
410			SS-6	WOH/18"	100		410.3 — 23.5 Very soft, wet, gray and brown SILTY CLAY (CL-ML) with sand [POSSIBLE FILL]								
	25														
05			SS-7	WOH/6" 1 2	100		405.3 — 28.5 Medium stiff to stiff, wet, gray lean CLAY (CL) [ALLUVIUM]					1.0 1.25 1.0			
	30														

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B004

Sheet 2 of 2

Elevation (feet)	Depth (feet)	SAMPLES Type Number	 Sampling Resist. OR Core RQD (%)	 Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30	ST-2		83		becomes stiff	51.1 46.3	106.4 106.3	45	29	1.5 1.75 1.6			*%G=0 %S=1 %M=69 %C=30 k=4.6E-07, Organic Content = 3.8%*
400	35	SS-8	WOH/12" 1	100		becomes very soft								
395	40	SS-9	WOH/18"	100			43.8		44	22				
390	45	SS-10	WOH/12" 1	100		become with light gray mottling and trace organics								
						385.3 / 48.5								
385	50	SS-11	3 2 3	100		Loose, wet, gray, SILTY SAND (SM) [ALLUVIUM]								*%G=0 %S=55 %F=45*
380	55	SS-12	3 3 8	100		becomes medium dense								*%G=0 %S=77 %F=23*
375	60	SS-13	4 7 7	6		becomes with trace coal fragments and organics								
						373.8 / 60.0								
						End of Boring at 60 ft								
370	65													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

Project Number: 60440115

Log of Boring WOR-B004A

Sheet 1 of 1

Date(s) Drilled	09/21/2015 12:00 AM to 09/21/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	30.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	433.8 ft NAVD88
Borehole Backfill	Well WOR-P004 Installed	Sampling Method(s)	Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802104.7 E 2307178.8 (ft NAD83)	Groundwater Level(s)	8 ft on 9/15/2015 12.5 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	SAMPLES Number	SAMPLES Sampling Resist. OR Core RQD (%)	SAMPLES Recovery (%)	MATERIAL DESCRIPTION Elevation (feet)	MATERIAL DESCRIPTION	MATERIAL DESCRIPTION Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0					433.8		0.0								
						433.4	Offset boring to WOR-B004. Augered to 21 ft bgs without sampling. Based on visual observation of auger cuttings, soils appear to be similar to WOR-B004.	0.4								
430	5															
425	10															
						420.3		13.5								
420	15															
415	20															
		▤	ST-1		96											*GUS sampler used*
						410.3		23.5								
410		▤	ST-2		100											*GUS sampler used*
	25															
						405.3		28.5								
405	30						403.8		30.0							

End of Boring at 30 ft

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B005

Sheet 1 of 3

Date(s) Drilled	09/10/2015 12:00 AM to 09/11/2015 12:00 AM	Logged By	C.Dicke	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	80.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	451.2 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802087.1 E 2307018.7 (ft NAD83)	Groundwater Level(s)	First Encountered at 30 ft on 9/11/2015 Measured 29 ft bgs on 10/29/2015 and 29.2 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core ROD (%)	Recovery (%)	MATERIAL DESCRIPTION	Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0					451.2	0.0								
					Crushed LIMESTONE GRAVEL (10")	450.4	0.8								
450		SS-1	4 50/2"	63	Dry to moist, brown, lean CLAY (CL) trace sand [FILL]	450.0	1.3								
					Very dense, dry, black, poorly-graded SAND (SP) with silt, trace coal fragments as gravel [BOTTOM ASH]										
	5	SS-2	20 37 24	78	becomes dense	445.2	6.0								
445		SS-3	6 7 8	83	Medium dense, dark gray SILTY SAND (SM) trace coal fragments as coarse sand and fine gravel [BOTTOM ASH]			22.9							%G=7 %S=36 %M=45 %C=12
	10	SS-4	6 17 20	89	becomes dense, dry to moist										
440															
	15	SS-5	10 15 14	78	becomes medium dense, moist										
435															
	20	SS-6	7 8 9	94		431.2	20.0								
430		SS-7	WOH 1 1	44	Very loose, moist to wet dark gray SILT (ML) with sand [FLY ASH] becomes very loose, moist to wet										
		ST-1		92				64.2		NP	NP				*GUS sampler used %G=0 %S=4 %M=93 %C=3*
425	25	ST-2		0											*GUS sampler used Stopped @ 25 ft bgs on 9/10/15 @ 1600, Started 9/11/15 at 0815 Driller noted harder drilling at 27'-28' bgs, possible cobble*
	30	SS-8	3 5 4	94		421.2	30.0								

Project: Dynegy

Project Location: **Wood River Power Station, Alton, IL**

oject Number: **60440115**

Log of Boring WOR-B005

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
420	30	ST-3		100		Very soft, wet, gray lean CLAY (CL) with sand [ALLUVIUM]	25.4 26.8 26.9	115.1 117.9 118.9	30	10	0.0			*Water on rods at 30'* *GUS sampler used* *%G=0 %S=17* *%M=74 %C=9*
		SS-9	WOH 2 3	100		becomes gray with brown mottling					0.0 0.0 0.0			
415	35					416.5 — 34.6 Very soft, wet, brown with gray mottling and oxidation staining, SILTY CLAY (CL-ML) with sand [ALLUVIUM]								*Switched to washed rotary at 35'*
410	40	SS-10	2 1 1	100		becomes brown with oxidation staining			23	7	0.0 0.0 0.0	0.15 0.1 0.1		*%G=0 %S=26* *%F=74*
405	45	SS-1	WOH/12" 3	100		407.7 — 43.5 Very soft, wet, gray, lean CLAY (CL) with interbedded silt seams [ALLUVIUM] becomes stiff, moist to wet					0.0 0.0 1.0	0.15 0.1 0.15		
	50	SS-12	WOH/12" 2	100		becomes soft to medium stiff, without silt seams					0.25 0.5 0.5	0.5 0.45 0.3		
400		ST-4		0										*Shelby tube was discarded due to low recovery*
	55	SS-13	2 1 2	100		becomes moist, dark gray, with trace organics					0.5 0.5 0.5	0.55 0.6 0.45		
395		ST-5		92			47.2 45	109.6 112.8 109.0	47	27	- - 0.5	- - 0.55		*%G=0 %S=2* *%M=61 %C=37*
	60	SS-14	2 2 4	100							0.25 0.5 0.5			
390						390.2 — 61.0 Medium dense, wet, gray, SILTY SAND (SM) [ALLUVIUM]								
	65	SS-15	6 10 16	78										*%G=0 %S=63* *%F=37*

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

roject Number: 60440115

Log of Boring WOR-B005

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	SAMPLES Sampling Resist. OR Core RQD (%)	SAMPLES Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
385														
		SS-16	8 12 16	56										
380	70													
		SS-17	15 32 35	89		becomes dense								
375	75													
		SS-18	12 13 12	67		becomes medium dense, poorly-graded SAND (SP), trace silt								*%G=0 %S=93* *%F=7*
	80					371.2 — 80.0 End of Boring at 80 ft								
370														
365	85													
360	90													
355	95													
	100													

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B006

Sheet 1 of 3

Date(s) Drilled	09/14/2015 12:00 AM to 09/14/2015 12:00 AM	Logged By	N.Sanna	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	80.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	451.3 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 801250.9 E 2307088.8 (ft NAD83)	Groundwater Level(s)	First Encountered at 47.5 ft on 9/14/2015 Measured 49.4 ft bgs on 10/29/2015 and 48.1 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
451.3	0 / 0.0						Crushed LIMESTONE GRAVEL								
450															
449.5	1.8	▨	SS-1	18 50/4"	80		Very dense, moist, gray, sandy SILT (ML), trace gravel [FLY ASH]								
		▨	SS-2	8 13 16	67		becomes medium dense								
	5														
445		▨	SS-3	4 4 11	61										*%G=8 %S=20 %F=72*
		▨	SS-4	11 14 15	89										
	10														
440															
		▨	SS-5	6 9 9	61										
	15														
435															
432.8	18.5	▨	SS-6	1 1 1			Very loose, moist, gray with black streaks SILT (ML) with sand [FLY ASH]								
	20														
430 / 430.3	21.0	▥	ST-1		96		Dense, moist, dark brown SILTY SAND (SM), trace gravel [POSSIBLE FILL]					2.8 3.5 2.8	0.22 0.25		*GUS sampler used*
		▨	SS-7	18 13 21	78		becomes gray, with gravel								
	25														
425															
424.3	27.0						Hard, moist, dark gray lean CLAY (CL), trace sand [ALLUVIUM]								
		▨	SS-8	5 7 10	100							>4.5 4.5			
	30														

Project: Dynegy

Project Location: **Wood River Power Station, Alton, IL**

Project Number: **60440115**

Log of Boring WOR-B006

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
420	30	ST-2		67		becomes very stiff	22.5 22.1	124.5	43	22	2.75 2.75 3.0	0.72 0.72 0.8		*%G=0 %S=1* *%M=65 %C=32*
415	35	SS-9	3 3 5	100										
412.8	38.5													
410	40	SS-10	4 6 6	67		Medium dense, moist, gray, poorly-graded fine SAND (SP) [ALLUVIUM]								
405	45	SS-11	2 2 3	94		becomes loose, with brown mottling								*%G=0 %S=9* *%F=91*
400	50	SS-12	4 7 11	94		becomes medium dense, wet, fine to coarse sand								*Switched to wash rotary at 50' bgs*
395	55	SS-13	9 8 10	61		becomes gray								*%G=0 %S=95* *%F=5*
390	60	SS-14	10 12 14	61		becomes fine to medium sand								
	65	SS-15	8 11 15	61										

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B006

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
385					▨									
	70	SS-16	6 10 17	56	▨									
380					▨									
	75	SS-17	11 17 20	56	▨	becomes dense								
375					▨									
	80	SS-18	8 10 14	56	▨	becomes medium dense 371.3 — 80.0 End of Boring at 80 ft								
370														
	85													
365														
	90													
360														
	95													
355														
	100													

AECOM

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

Project Number: 60440115

Log of Boring WOR-B007

Sheet 1 of 3

Date(s) Drilled	09/15/2015 12:00 AM to 09/15/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	426.5 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802111.4 E 2303395 (ft NAD83)	Groundwater Level(s)	23 ft on 9/15/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						426.5 / 0.0 Very stiff to hard, moist, gray lean CLAY (CL) [FILL]								
425		SS	SS-1	6 7 9	83							4.5 4.0 4.0			
	5	ST	ST-1		71										
420		SS	SS-2	4 7 8	78		becomes stiff with silt lenses					2.0 2.0 2.0			
	10	ST	ST-2		50										
415		SS	SS-3	6 5 9	78		becomes very stiff					4.0 4.5 4.0			
	15	SS	SS-4	5 5 9	94							4.0 4.5 4.5			
410		SS	SS-5	4 5 9	72		410.5 / 16.0 Very stiff, moist, gray with brown mottling, lean CLAY (CL) [ALLUVIUM]					4.0 4.0 2.5			
	20	SS	SS-6	4 4 8	78							4.0 4.0 4.0			
405		ST	ST-3		71										
							404.0 / 22.5 ▽ Loose, wet, gray, poorly-graded medium SAND (SP), trace clay lenses interbedded [ALLUVIUM]								
	25	SS	SS-7	4 5 9	100										
400		SS	SS-8	4 2 6	72										
	30	SS	SS-9	6 6 6	89		becomes medium dense with fine sand								

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B007

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30														
395															
		SS-10	4 4 8	89		becomes with wood fragments									
	35														
390															
		SS-11	5 6 8	78											
	40														
385															
		SS-12	4 5 7	72		becomes with trace wood fragments									
	45														
380															
		SS-13	2 2 2	61		378.0 Soft to medium stiff, moist, dark gray CLAY (CL-CH) [ALLUVIUM]	48.5					0.5 1.0 0.75			
	50														
375															
		SS-14	2 3 2	50		373.0 Loose, wet, gray, poorly-graded medium SAND (SP) [ALLUVIUM]	53.5								
	55														
370															
		SS-15	5 6 7	50		becomes medium dense									
	60														
365															
		SS-16	9 11 12	67		becomes with trace coarse sand									
	65														

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

Project Number: 60440115

Log of Boring WOR-B007

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
360														
		SS-17	5 5 8	39		becomes medium to coarse sand								
	70					356.5 — 70.0 End of Boring at 70 ft								
355														
	75													
350														
	80													
345														
	85													
340														
	90													
335														
	95													
330														
	100													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B008

Sheet 1 of 3

Date(s) Drilled	09/11/2015 12:00 AM to 09/14/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	426.5 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 803106.7 E 2303105.1 (ft NAD83)	Groundwater Level(s)	First Encountered at 23 ft on 9/11/2015 Measured 21.8 ft bgs on 10/29/2015 and 19 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						426.5 / 0.0 Very stiff, moist, dark brown, lean CLAY (CL), trace gravel [FILL]								
425			SS-1	3 4 5	83							3.5 4.0 3.5			
			SS-2	7 8 10	0										
	5														
420			ST-1		46										
			SS-3	3 4 5	83		becomes stiff					1.5 2.5 1.5			
	10														
415			SS-4	3 5 9	100		becomes very stiff, gray					3.0 2.0 2.5			
			ST-2		75										
	15														
410			SS-5	4 5 5	89		410.5 / 16.0 Very stiff, moist, gray, lean CLAY (CL) [ALLUVIUM]					3.25 3.0 3.0			
			ST-3		75										
	20														
405															
			SS-6	2 3 2			403.0 / 23.5 Loose, wet, gray, poorly-graded medium SAND (SP) [ALLUVIUM]								
	25														
400			SS-7	3 4 8			becomes medium dense, brown								
			SS-8	3 6 11											
	30														

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

roject Number: 60440115

Log of Boring WOR-B008

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30													
395														
		SS-9	6 8 8	61										
	35													
390														
		SS-10	5 5 7	50										
	40													
385														
		SS-11	9 9 12	89										
	45													
380														
		SS-12	8 9 10	44										
	50													
375														
		SS-13	6 7 7	61		becomes with trace coarse sand								
	55													
370														
		SS-14	5 6 5	39		becomes with trace fine gravel and coarse sand								
	60													
365														
		SS-15	8 8 12	50		becomes with gravel								
	65													

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B008

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES			Graphic Symbol	MATERIAL DESCRIPTION			Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)		Elevation (feet)		Depth (feet)								
360																
		SS-16	14 16 19				becomes dense									
	70					356.5	End of Boring at 70 ft	70.0								
355																
	75															
350																
	80															
345																
	85															
340																
	90															
335																
	95															
330																
	100															

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

roject Number: 60440115

Log of Boring WOR-B009

Sheet 1 of 3

Date(s) Drilled	09/14/2015 12:00 AM to 09/15/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	426.2 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802638.5 E 2303193.6 (ft NAD83)	Groundwater Level(s)	21 ft on 9/14/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
426.2	0.0						Very stiff, moist, gray, lean CLAY (CL) [FILL]								
425		▨	SS-1	6 7 8	67							3.5 3.5 3.0			
	5	▥	ST-1		96										
420		▨	SS-2	5 7 8	100		becomes with root fibers					2.5 2.5 2.0			
	10	▥	ST-2		94			16.2	130.6	32	17				%G=0 %S=6 %M=73 %C=21
415		▨	SS-3	7 9 10	89		becomes hard without root fibers					4.5 4.5 4.5			
	15	▨	SS-4	7 8 11	78		becomes very stiff					3.5 3.5 3.5			
410		▨	SS-5	6 6 9	83							3.5 3.0 3.5			
407.7	18.5						Stiff, moist, gray lean CLAY (CL) [ALLUVIUM]								
	20	▨	SS-6	3 3 4	72							1.5 1.5 1.75			
405.2	21.0						Loose, wet, brown, poorly-graded medium SAND (SP) [ALLUVIUM]								
405		▨	SS-7	4 4 4	50										
	25	▨	SS-8	4 4 5	89		becomes with fine-grained sand								
400		▨	SS-9	4 6 6	100		becomes medium dense, trace fine-grained sand								
	30	▨	SS-10	3 4 4	100		becomes loose								

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B009

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30													
395		SS-11	6 10 12	61		becomes medium dense								
		SS-12	3 5 7	56										
	35													
390														
		SS-13	6 8 9	50										
	40													
385														
		SS-14	11 13 15	56		becomes gray								
	45													
380														
		SS-15	9 9 10	67										
	50													
375														
		SS-16	4 6 8	67										
	55													
370														
		SS-17	6 8 9	61		becomes with trace coarse sand								
	60													
365														
		SS-18	10 10 6	50										
	65													

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

ject Number: 60440115

Log of Boring WOR-B009

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES			Graphic Symbol	MATERIAL DESCRIPTION			Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)		Elevation (feet)		Depth (feet)								
360																
		SS-19	10 12 12	50												
	70					356.2		70.0								
							End of Boring at 70 ft									
355																
	75															
350																
	80															
345																
	85															
340																
	90															
335																
	95															
330																
	100															

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

…oject Number: 60440115

Log of Boring WOR-B010

Sheet 1 of 3

Date(s) Drilled	09/11/2015 12:00 AM to 09/11/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	426.1 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 803174.2 E 2303445.3 (ft NAD83)	Groundwater Level(s)	28 ft on 9/11/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0					▨	426.1 / 0.0 Stiff, moist, brown fat CLAY (CH), trace sand [FILL]								
425		▨	SS-1	6 6 9	56	▨									
		▨	SS-2	5 8 10	89	▨	becomes very stiff								
	5					▨									
420		▤	ST-1		83	▨	becomes gray			58	39	3.5			*ST-1 Upper Portion %G=0 %S=2 %M=59 %C=39*
						▨	419.1 / 7.0 Very stiff, moist, dark brown to gray lean CLAY (CL) with sand [FILL]	17.2	130.3	29	15	3.75 4.25			*ST-1 Lower Portion %G=0 %S=24 %M=50 %C=26*
	10	▤	ST-2		88	▨	becomes hard	15.9	131.9 122.9	29 43	11 27	4.5 4.5 4.5			*ST-2 Upper Portion %G=0 %S=19 %M=63 %C=18* *ST-2 Lower Portion %G=0 %S=14 %M=65 %C=21*
415		▨	SS-3	6 5 6	78	▨	becomes stiff								
						▨	413.1 / 13.0 Very stiff, moist, brown lean CLAY (CL), trace to with silty fine sand lenses interbedded [ALLUVIUM]								
	15	▤	ST-3		83	▨						3.0 3.0 3.0			
410		▨	SS-4	8 8 7	72	▨									
		▤	ST-4		71	▨	becomes stiff					2.0 2.0 2.5			
	20					▨	406.1 / 20.0 Stiff, moist, dark gray fat CLAY (CH) [ALLUVIUM]								
405		▨	SS-5	3 3 4	100	▨		41.6		73	39				
	25	▤	ST-5		58	▨									
400							401.1 / 25.0 Very loose, moist, gray, poorly-graded medium SAND (SP)								
		▨	SS-6	1 1 2	17		becomes wet								
	30														

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B010

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type	 Number	 Sampling Resist. OR Core RQD (%)	 Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30														
395		▨	SS-7	12 9 9	50		becomes medium dense								
		▨	SS-8	6 6 6	61			16.9		NP	NP				%G=0 %S=91 %F=9
	35														
390															
		▨	SS-9	6 6 9	50										
	40														
385															
		▨	SS-10	13 16 17	56		becomes dense								
	45														
380															
		▨	SS-11	7 8 9	44		becomes medium dense			NP	NP				%G=2 %S=95 %F=2
	50														
375															
		▨	SS-12	5 7 8	50										
	55														
370															
		▨	SS-13	5 6 8	11		becomes with gravel								
	60														
365															
		▨	SS-14	8 5 6	50		becomes with coarse sand			NP	NP				%G=6 %S=91 %F=4
	65														

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B010

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
360															
		SS-15	7 8 9	61											
	70					356.1	70.0								
						End of Boring at 70 ft									
355															
	75														
350															
	80														
345															
	85														
340															
	90														
335															
	95														
330															
	100														

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B012

Sheet 1 of 3

Date(s) Drilled	09/10/2015 12:00 AM to 09/10/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	430.9 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 803201.5 E 2304163.2 (ft NAD83)	Groundwater Level(s)	18.5 ft on 9/10/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
430.9	0.0						Very stiff, moist, brown lean CLAY (CL) [FILL]								
		▨	SS-1	3 8 10	44			18.8		32	16				%G=0 %S=5 %M=68 %C=27
		▨	SS-2	5 3 7	33										
		▨	SS-3	4 4 5	17		becomes stiff, gray					1.75			
		▨	SS-4	4 5 8	72		becomes very stiff with wood fragments					2.25 2.5 2.0			
		▨	SS-5	3 4 6	100			22.6		42	20	2.5 2.5 2.5			%G=0 %S=25 %M=45 %C=30
		▨	SS-6	5 5 7	61		becomes stiff with sand					1.5 1.5 1.75			
415.9	15.0						Loose, moist, brown, poorly-graded fine grained SAND (SP) [POSSIBLE FILL]								
		▨	SS-7	4 4 5	67										
							▽								
		▨	SS-8	3 3 3	56										
411.4	19.5						Medium stiff, moist, gray lean CLAY (CL) with sand seams [ALLUVIUM]								
		▤	ST-1		96			28.2 34.7 40.5	115.4 113.0	NP	NP				%G=0 %S=3 %M=88 %C=10
		▨	SS-9	0 5 9	89							1.0 0.5 0.5			
406.4	24.5						Medium dense, wet, brown, poorly-graded medium SAND (SP) [ALLUVIUM]								
		▨	SS-10	3 3 3	100		becomes loose								

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B012

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	SAMPLES Sampling Resist. OR Core RQD (%)	SAMPLES Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30													
400														
		SS-11	10 10 12	61		becomes medium dense								
		SS-12	10 10 10	50										
	35													
395														
		SS-13	7 9 10	44										
	40													
390														
		SS-14	8 9 9	50		becomes gray								
	45													
385														
		SS-15	11 11 10	50										
	50													
380														
		SS-16	7 8 9	44										
	55													
375														
		SS-17	12 15 18	50		becomes dense								
	60													
370														
		SS-18	1 2 1	61		Organic clay layer from 64 to 65 ft bgs								
	65													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B012

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
365														
		SS-19	4 4 8	44		becomes medium dense								
		SS-20	7 7 8	72										
	70					360.9 70.0 End of Boring at 70 ft								
360														
	75													
355														
	80													
350														
	85													
345														
	90													
340														
	95													
335														
	100													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

roject Number: 60440115

Log of Boring WOR-B013

Sheet 1 of 3

Date(s) Drilled	09/09/2015 12:00 AM to 09/09/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	427.9 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802940.4 E 2304969.1 (ft NAD83)	Groundwater Level(s)	16 ft on 9/9/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core ROD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0					▨	427.9 Stiff, moist, brown sandy lean CLAY (CL) [FILL]	0.0								
		▨	SS-1	3 6 10	67								2.0 2.5 2.25			
425																
	5	▨	SS-2	3 8 7	89		becomes very stiff to hard, gray, trace sand		20.4		38	19	2.5 3.0 3.0			%G=2 %S=7 %M=58 %C=34
		▨	SS-3	6 6 7	94								4.0 4.0 4.25			
420																
	10	▨	SS-4	3 5 10	78								2.5 2.5 2.5			
415																
	15	▨	SS-5	2 2 3	67		becomes stiff						1.5 1.5 2.0			
		▨	SS-6	1 1 2	83	▨	411.9 Soft, wet, brown and gray lean CLAY (CL) [POSSIBLE FILL]	16.0								
410																
	20	▤	ST-1		88				28.9	117.5	44	26				%G=0 %S=1 %M=81 %C=18
		▨	SS-7	1 1 2	100	▨	406.9 Soft, moist, gray, fat CLAY (CH) [ALLUVIUM]	21.0					0.75 0.75 1.0			
405																
	25	▨	SS-8	1 2 1	100								<0.5	0.3		
		▨	SS-9	0 1 1	100											
400																
	30	▨	SS-10	1 1 1	61				44.5		58	30				%G=0 %S=2 %M=58 %C=40

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

roject Number: 60440115

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Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30													
396.9	31.0	SS-11	2 1 2	100		Very loose, wet, gray, sandy SILT (ML)								%G=0 %S=14 %F=86
395														
		SS-12	1 1 2	78										
	35													
		SS-13	1 1 1	100										
390														
389.4	38.5	SS-14	0 1 1	100		Soft, moist to wet, gray, lean CLAY (CL)						0.3		
	40													
386.9	41.0	SS-15	1 1 1	44		Very loose, wet, gray poorly-graded medium SAND (SP) [ALLUVIUM]								%G=0 %S=93 %F=7
385														
	45													
380														
		SS-16	6 7 7	56		becomes medium dense								
	50													
375														
		SS-17	3 3 3	50		becomes loose								
	55													
370														
		SS-18	6 7 9	67		becomes medium dense with coarse sand								%G=0 %S=96 %F=4
	60													
365														
		SS-19	9 10 11	72		becomes trace gravel								
	65													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

jject Number: 60440115

Log of Boring WOR-B013

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Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION			Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)		Elevation (feet)		Depth (feet)								
360																	
		▨	SS-20	9 12 16	50			becomes trace to with gravel									
	70						357.9		70.0								
								End of Boring at 70 ft									
355																	
	75																
350																	
	80																
345																	
	85																
340																	
	90																
335																	
	95																
330																	
	100																

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B014

Sheet 1 of 3

Date(s) Drilled	08/26/2015 12:00 AM to 08/26/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	431.8 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST)	Hammer Data	Automatic Hammer
Boring Location	N 802115.2 E 2305092.8 (ft NAD83)	Groundwater Level(s)	6 ft on 8/26/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type Number	 Sampling Resist. OR Core RQD (%)	 Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0					431.8 / 0.0 Very loose, moist, black, SILT (ML) with sand [FLY ASH]								
430														
		SS-1	WOH/18"	11										
	5													
						becomes loose to very loose, wet ▽								
425		SS-2	2 3 1	56										
		SS-3	1 1 1	44										
	10													
420		SS-4	WOH/18"	89										
		SS-5	1 1 1	72										
	15													
415		SS-6	1 1 0	83										
		SS-7	0 1 0	61		412.3 / 19.5								
	20					Very loose to loose, moist, gray SILT (ML) [ALLUVIUM]								
410		SS-8	WOH/18"	56			51.4		NP	NP				
		SS-9	2 1 2	78										
	25													
		ST-1		12										
405											<0.50	0.325		
		ST-2		100		becomes elastic SILT (MH)	72.1 68.1 68 7	98.4 98.7	74	35	<0.50	0.325		*%G=1 %S=19* *%M=45 %C=35*
	30													

Project: Dynegy

Project Location: **Wood River Power Station, Alton, IL**

oject Number: **60440115**

Log of Boring WOR-B014

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30													
400.8	31.0					Loose, wet, gray SILTY SAND (SM) [ALLUVIUM]								
400														
		SS-10	2 3 3	67										%G=0 %S=74 %F=26
	35													
395														
						becomes dense, poorly-graded medium SAND								
		SS-11	15 16 24	67										
	40													
						becomes medium dense								
390		SS-12	9 9 10	78										
		SS-13	6 9 14	89										
	45													
385.8	46.0					Medium dense, wet, gray, poorly-graded fine SAND (Sm) with silt								
385		SS-14	8 11 14	89										%G=0 %S=93 %F=7
		SS-15	10 16 12	56		becomes medium dense								
	50													
						becomes dense								
380		SS-16	12 20 26	67										
		SS-17	9 24 26	89										
	55													
375		SS-18	13 21 23	100										
		SS-19	8 10 7	78										%G=1 %S=93 %F=6
	60													
370		SS-20	6 6 8	33										
		SS-21	9 9 10	67										
	65													

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B014

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
						░		becomes with fine gravel									
365		▨	SS-22	8 11 10	50	░											
		▨	SS-23	6 7 9	56	░											
	70						361.8		70.0								
								End of Boring at 70 ft									
360																	
	75																
355																	
	80																
350																	
	85																
345																	
	90																
340																	
	95																
335																	
	100																

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

pject Number: 60440115

Log of Boring WOR-B015

Sheet 1 of 2

Date(s) Drilled	09/03/2015 12:00 AM to 09/04/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	50.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	428.4 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802361.9 E 2304856 (ft NAD83)	Groundwater Level(s)	18.5 ft on 9/3/2015 Measured 25.3 ft bgs on 10/29/2015 and 23.3 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						428.4 / 0.0 Very stiff, gray and brown, lean CLAY (CL) with sand [FILL]								
			SS-1	3 4 6	44							2.5 2.5 2.5			
425			SS-2	3 3 4	100							2.0 2.0 2.0			
	5		SS-3	6 7 7	56							3.5 3.5 3.0			
420			SS-4	6 9 8	39		becomes hard, brown, without sand					4.5 4.0 4.5			
	10		SS-5	6 7 9	56		becomes gray					4.0 4.5 4.5			
415			SS-6	8 8 10	100		becomes dark gray, with root fibers								
	15		SS-7	3 3 5	100		becomes stiff, gray and brown					1.5 1.5 1.5			
410			SS-8	3 2 2	33		409.9 / 18.5 Very loose, wet, gray, poorly-graded medium SAND (SP) [POSSIBLE FILL]								
	20		SS-9	1 1 1	89		407.4 / 21.0 Very loose, wet, gray SILT (ML) with root fibers								
405			SS-10	WOH/6" 1 1	100		404.9 / 23.5 Soft to very soft, moist, gray fat CLAY (CH) [ALLUVIUM]					<0.5	0.05		
	25		SS-11	1 1 2	100								0.1		
400			ST-1		100			73.9 82.6 72.6	92.3 93.2 93.9	103	71				*%G=0 %S=1* *%M=63 %C=36* *GUS sampler used*
	30														

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

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Sheet 2 of 2

Elevation (feet)	Depth (feet)	SAMPLES Type Number	SAMPLES Sampling Resist. OR Core RQD (%)	SAMPLES Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30	ST-1		100	▨					71				
		SS-12	1 1 2	100	▨							0.15		
395														
		SS-13	WOH/18"	100	▨	becomes with trace shell fragments						0.2		
	35													
						392.4 / 36.0								
		SS-14	8 9 9	44		Medium dense, wet, gray, poorly-graded medium SAND (SP) [ALLUVIUM]								
390														
		SS-15	12 14 16	39		becomes dense with fine sand								
	40													
		SS-16	8 8 8	33		becomes medium dense								
385														
		SS-17	6 5 6	72										
	45													
		SS-18	7 9 13	100										
380														
		SS-19	10 10 11	67										
	50					378.4 / 50.0								
						End of Boring at 50 ft								
375														
	55													
370														
	60													
365														
	65													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B015A

Sheet 1 of 1

Date(s) Drilled	09/23/2015 12:00 AM to 09/23/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	30.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	428.4 ft NAVD88
Borehole Backfill	Well WOR-P015 Installed	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST)	Hammer Data	Automatic Hammer
Boring Location	N 802361.9 E 2304856 (ft NAD83)	Groundwater Level(s)	18.5 ft on 9/3/2015 Measured 25.3 ft bgs on 10/29/2015 and 23.3 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						428.4 Offset boring to WOR-B015. Augered to 13 ft bgs without sampling. Based on visual observation of auger cuttings, soils appear to be similar to WOR-B015.	0.0								
425	5															
420	10															
415		ST	ST-1		79				21.6	127.7 125.2	39	23				%G=0 %S=10 %M=63 %C=26
	15	ST	ST-2		58				18.9 21.4	127.9 125.8	34	16				%G=0 %S=10 %M=63 %C=26
410							409.9	18.5								
	20						407.4	21.0								
405							404.9	23.5								
	25	ST	ST-3		100											
400		ST	ST-4		96											
	30						398.4	30.0								

End of Boring at 30 ft

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B016

Sheet 1 of 3

Date(s) Drilled	09/02/2015 12:00 AM to 09/03/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	442.2 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802298.6 E 2304833.3 (ft NAD83)	Groundwater Level(s)	21 ft on 9/2/2015 Measured 17.7ft bgs on 10/29/2015 and 16.2 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						442.2 0.0 Stiff to very stiff, moist to dry, brown lean CLAY (CL) [FILL]								
440			SS-1	6 9 8	50										
	5		SS-2	9 7 14	78					31	11				%G=0 %S=14 %F=86
435			SS-3	10 11 19	72										
	10		SS-4	13 15 18	89		becomes hard and gray								
430			SS-5	8 8 12	61		becomes very stiff								
	15		SS-6	7 8 7	44										
425			SS-7	3 3 2	78		becomes medium stiff					1.5 1.5 1.5			
	20		SS-8	1 1 1	67		becomes soft								
420			SS-9	WOH/18"	89		421.2 21.0 Very loose, moist to wet, gray SILT (ML) [FLY ASH]								
			ST-1		4										*GUS sampler used*
	25		ST-2		100										*GUS sampler used*
415															
	30		SS-10	WOH/18"	33										

AECOM

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B016

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30													
410		SS-11	WOH/18"	78		becomes with trace sand	39.0		NP	NP				%G=0 %S=0 %F=95 Organic Content = 2.8%
		SS-12	WOH/18"	100										
	35													
405		SS-13	1 2 2	89		405.7 36.5 Medium stiff, moist, gray fat CLAY (CL) [ALLUVIUM]					1.0 1.0 0.75			
	40	ST-3		96										
400		SS-14	0 1 2	100										
	45	SS-15	2 1 2	100			68.8		86	59				
395		SS-16	11 12 15	100		395.2 47.0 Medium dense, wet, gray, poorly-graded SAND (SP) [ALLUVIUM]					0.75 0.75 -			
	50	SS-17	10 11 13	61										
390		SS-18	13 14 15	50										
	55	SS-19	10 13 14	11										
385		SS-20	15 21 33	72		becomes very dense								
	60	SS-21	18 19 23	67		becomes dense								
380		SS-22	9 17 18	72										
	65	SS-23	16 19 22	89										

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

roject Number: 60440115

Log of Boring WOR-B016

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES			Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
375		▨ SS-24	12 17 22	89										
		▨ SS-25	12 15 15	89										
	70					372.2 70.0 End of Boring at 70 ft								
370														
	75													
365														
	80													
360														
	85													
355														
	90													
350														
	95													
345														
	100													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B017

Sheet 1 of 3

Date(s) Drilled	09/16/2015 12:00 AM to 09/16/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	431.7 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 801904.6 E 2305465.1 (ft NAD83)	Groundwater Level(s)	16 ft on 9/16/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						431.7 Very stiff, moist, gray lean CLAY (CL) [FILL]	0.0								
430			SS-1	2 2 3	39								2.0 2.5 2.0			
			SS-2	2 3 4	44		becomes stiff						0.75 1.25 1.75			
	5						becomes moist to dry									
425			SS-3	3 2 4	39								3.0 3.5 3.0			
			SS-4	3 4 5	33								2.5 2.0 2.0			
	10															
420			ST-1		46											
			SS-5	3 4 4	94		becomes stiff, moist						1.0 1.5 1.0			
	15															
415			ST-2		92											
							414.2 Very loose, wet, brown, poorly-graded medium SAND (SP) [POSSIBLE FILL]	17.5								
			SS-6	2 1 1	100											
	20															
							410.7 Soft moist, gray lean CLAY (CL) [ALLUVIUM]	21.0								
410			SS-7	1 1 1	100											
			ST-3		100								0.5 0.5 0.5			
	25															
405			SS-8	1 2 2	100		becomes medium stiff						1.0 0.75 1.0			
							402.7 Medium dense, wet, gray, poorly-graded fine SAND (SP) with silt [ALLUVIUM]	29.0								
			SS-9	6 7 9	89											
	30															

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B017

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)		Elevation (feet) Depth (feet)								
	30														
400															
		▨	SS-10	9 9 12	44										
	35														
395															
		▨	SS-11	12 12 18	56		becomes fine to medium sand								
	40														
390															
		▨	SS-12	7 13 13	72										
	45														
385															
		▨	SS-13	16 16 17	78		becomes dense								
	50														
380															
		▨	SS-14	12 13 16	67		becomes medium dense								
	55														
375															
		▨	SS-15	15 16 13	78		becomes medium sand, trace fine sand								
	60														
370															
		▨	SS-16	10 13 16											
	65														

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

roject Number: 60440115

Log of Boring WOR-B017

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet)		Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
365						▨											
		▨	SS-17	23 25 18	61	▨		becomes dense with coarse sand and gravel									
	70						361.7		70.0								
								End of Boring at 70 ft									
360																	
	75																
355																	
	80																
350																	
	85																
345																	
	90																
340																	
	95																
335																	
	100																

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

Project Number: 60440115

Log of Boring WOR-B018

Sheet 1 of 3

Date(s) Drilled	09/04/2015 12:00 AM to 09/04/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	443.9 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 801895.2 E 2305355.3 (ft NAD83)	Groundwater Level(s)	17 ft on 9/4/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
443.9	0 / 0.0						Loose, moist, brown, poorly-graded fine SAND (SP), trace to with clay [FILL]								
		▨	SS-1	6 5 5	61					30	9				%G=0 %S=4 %F=96
440	5	▨	SS-2	9 6 9	28		becomes medium dense								
		▨	SS-3	9 14 23	61		becomes dense								
435	10	▨	SS-4	13 14 20	50										
		▨	SS-5	9 12 15	39		becomes medium dense			NP	NP				%G=0 %S=57 %F=43
430	15	▨	SS-6	13 15 15	61										
		▨	SS-7	11 12 12	33										
426.9	17.0						Medium dense, wet, gray, poorly-graded medium SAND (SP) with gravel and coal, with layers of bottom ash interbedded [ASH]								
425	20	▨	SS-8	4 5 4	28										
		▨	SS-9	1 1 2	67			21.1							%G=16 %S=46 %M=28 %C=9
420	25	▨	SS-10	WOH/18"	11										
		▨	SS-11	6 6 9	22		wood railroad tie								
415	30	▨	SS-12	3 4 4	6										

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B018

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES			Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
	30					412.9 31.0								
		SS-13	1 1 1	100		Very loose, wet, brown and gray, poorly graded fine to medium SAND (SP) [ALLUVIUM]	27.4							%G=0 %S=19 %F=81
410	35	SS-14	2 2 3	22		becomes loose								
		SS-15	5 5 6	22		becomes medium dense								
405	40	SS-16	4 3 3	28		becomes loose								%G=0 %S=83 %F=17
		SS-17	6 9 8	72		becomes medium dense								
400	45	SS-18	6 7 8	61										
		SS-19	6 7 11	50		becomes light gray with clay								
395	50	SS-20	9 11 15	56										
		SS-21	9 6 11	61										
390	55	SS-22	9 11 16	33										
		SS-23	9 11 16	89										%G=0 %S=94 %F=6
385	60	SS-24	8 12 10	72										
		SS-25	10 15 16	89		becomes dense								
380	65	SS-26	11 12 14	56		becomes medium dense								

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B018

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	Elevation (feet)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)												
		▨	SS-27	14 22 25	72			becomes dense									
375		▨	SS-28	16 15 16	67												
	70						373.9	End of Boring at 70 ft	70.0								
370																	
	75																
365																	
	80																
360																	
	85																
355																	
	90																
350																	
	95																
345																	
	100																

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B020

Sheet 1 of 3

Date(s) Drilled	09/08/2015 12:00 AM to 09/09/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	444.0 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 801731.3 E 2304276.8 (ft NAD83)	Groundwater Level(s)	15 ft on 9/8/2015 Measured 40.5 ft bgs on 10/29/2015 and 38 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						444.0 / 0.0 Medium dense, moist, brown, poorly-graded fine to medium SAND (SP), trace silt [FILL]								
		▨	SS-1	11 12 14	78										
440	5	▨	SS-2	4 7 9	72			19.6							%G=0 %S=11 %M=55 %C=34
		▨	SS-3	8 14 22	83		becomes dense								
435	10	▨	SS-4	8 10 10	72		becomes with silt	22.7							%G=0 %S=13 %M=51 %C=36
430		▨	SS-5	10 11 12	61		becomes gray								
	15						429.0 / 15.0 Very loose, wet, gray SILT(ML) with slag [FLY ASH]								
425		▨	SS-6	1 WOH/12"	100			42.6							%G=0 %S=19 %M=66 %C=14
	20						424.0 / 20.0 Very loose, wet, gray poorly-graded medium-grained SAND (SP) [BOTTOM ASH]								
		▨	SS-7	1 WOH/12"	89										
420	25	▨	SS-8	2 1 2	100			42.9							%G=8 %S=62 %M=23 %C=7
							418.0 / 26.0 Very loose, wet, gray, SILTY SAND (SM) [POSSIBLE FILL]								
		▨	SS-9	WOH/18"	89										
415	30	▨	SS-10	1 1 1	100										

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B020

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	 Sampling Resist. OR Core RQD (%)	 Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30	SS-11	1 1 1	100										%G=1 %S=19 %F=81
410	35	SS-12	WOH/12" 1	100										
		SS-13	2 2 4	100		407.0 — 37.0 Medium stiff, moist, gray, fat CLAY (CL) [ALLUVIUM]								
405	40	ST-1		100										GUS sampler used
400	45	ST-2		44		399.0 — 45.0 Medium dense, wet, light gray, poorly-graded fine to medium SAND (SP) [ALLUVIUM]	54.8 33.3	103.6	60	39				%G=0 %S=2 %M=49 %C=49
395	50	SS-14	13 13 15	100			19.6							%G=0 %S=93 %F=7
390	55	SS-15	8 11 15	67		becomes with coarse sand								
385	60	SS-16	13 14 19	50		becomes dense								
380	65	SS-17	16 20 22	50										

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

Project Number: 60440115

Log of Boring WOR-B020

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES			Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)		Elevation (feet) / Depth (feet)								
375		SS-18	8 8 11	61	▨	becomes medium dense								
	70					374.0 / 70.0 End of Boring at 70 ft								
370														
	75													
365														
	80													
360														
	85													
355														
	90													
350														
	95													
345														
	100													

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

roject Number: 60440115

Log of Boring WOR-B021

Sheet 1 of 3

Date(s) Drilled	08/28/2015 12:00 AM to 08/28/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	422.7 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802779.5 E 2303390.7 (ft NAD83)	Groundwater Level(s)	Frist Encountered at 6 ft bgs and 19 ft on 8/28/2015 Measured 19 ft bgs on 10/29/2015 and 18.4 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						Very loose, moist to wet, gray sandy SILT (ML) [FLY ASH]	422.7	0.0								
420																	
			SS-1	2 1 1	67												%G=0 %S=29 %M=63 %C=5
	5																
			SS-2	WOH/18"	78		becomes wet										
415																	
			ST-1		0												
	10																
			ST-2		100												GUS sampler used
410																	
			SS-3	WOH/18"	0												
	15						Stiff, moist, gray lean CLAY (CL) [ALLUVIUM]	407.7	15.0								
			SS-4	3 5 6	89					26.9		47	23				%G=0 %S=0 %F=100
405																	
			ST-3		0		Loose, wet, gray SILTY SAND (SM) [ALLUVIUM]	403.7	19.0								
	20																
			SS-5	3 4 4	89												
400							6" clay layer										
			SS-6	4 5 5	100												%G=0 %S=56 %F=44
	25																
			SS-7	7 7 8	56		becomes medium dense										
395																	
			SS-8	6 7 8													
	30																

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B021

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES			Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
	30													
		SS-9	7 8 9	61										
390														
		SS-10	7 8 8	50										
	35													
						386.7 / 36.0								
		SS-11	3 4 5	67		Loose, wet, gray, poorly-graded SAND (SP) [ALLUVIUM]								%G=1 %S=96 %F=3
385														
		SS-12	5 4 4	72										
	40													
		SS-13	5 13 13	67										
380														
		SS-14	6 5 8	89										%G=0 %S=97 %F=3
	45													
		SS-15	3 3 5	61										
375														
		SS-16	3 6 7	56		becomes trace to with coal fragments as gravel								
	50													
		SS-17	5 6 6	67										
370														
						becomes medium to coarse sand								
		SS-18	6 6 10	44										
	55													
		SS-19	5 5 7	33										
365														
		SS-20	4 9 10	28										
	60													
						becomes with fine gravel								
		SS-21	15 12 11	50										
360														
		SS-22	10 15 16											
	65													

Log of Boring WOR-B021

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES			Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)		Elevation (feet) Depth (feet)								
		SS-23	7 7 7	56										
355														
		SS-24	7 7 9											
	70					352.7 70.0 End of Boring at 70 ft								
350														
	75													
345														
	80													
340														
	85													
335														
	90													
330														
	95													
325														
	100													

Report: 5 GEO_SOIL K:\PROJECTS\D\DYNEGY\60428794_WOODRIVER\DOCS\LOGS\DYNEGY_WOOD RIVER RE DYNEGY LIBRARY.GLB

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B022

Sheet 1 of 2

Date(s) Drilled	09/01/2015 12:00 AM to 09/01/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	50.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	430.6 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802021.8 E 2303775.5 (ft NAD83)	Groundwater Level(s)	6 ft on 9/1/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
430	0					430.6 / 0.0 Loose, moist, gray, SILT (ML) with sand [FLY ASH]								
		SS-1	4 5 5											
425	5													
		SS-2	4 3 3	61		becomes wet with bottom ash								
		SS-3	1 3 1	83		becomes very loose								
420	10													
		SS-4	WOH/6" 1 1	72										
		ST-1		42		becomes trace sand	122.7 113.5 65.0	85.7	NP	NP				*GUS sampler used %G=0 %S=6 %M=83 %C=11*
415	15													
		ST-2		100			58.3 73.6 73.7 24.3 23 25	93.2 86.6 - 122.3 120.6 -	NP 39	NP 23				*GUS sampler used Upper: %G=0 %S=11 %F=89 Lower: %G=0 %S=4 %M=67 %C=30 SG=2.50, k=1.2E-06*
						412.1 / 18.5 Stiff, moist, gray, lean CLAY (CL) [ALLUVIUM]								
410	20													
		SS-5	4 5 5	89							2.0 2.0 1.75			
		SS-6	3 4 4	94		becomes with sand					2.0 2.0 2.0			
405	25													
		SS-7	2 3 3	89							1.25 1.50 1.50			
		SS-8	2 3 2	100		becomes medium stiff to stiff					1.0 1.25 1.0			
	30													

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AECOM

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B022

Sheet 2 of 2

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
400	30					▨									
		▨	SS-9		100	▨	becomes medium stiff	38.5		46	21	0.5 0.75 0.5			
396.6	34.0	▨	SS-10	2 3 4	72	▥	Loose, wet, dark gray, SILTY SAND (SM) [ALLUVIUM]								
395	35					▥									
		▨	SS-11	5 7 10	89	▥	becomes medium dense								%G=0 %S=81 %F=19
		▨	SS-12	4 8 9	56	▥									
390	40					▥	becomes interbedded with clay lenses								
		▨	SS-13	6 9 12	67	▥									
		▨	SS-14	5 9 10	72	▥									
385	45					▥									
		▨	SS-15	4 4 6	61	▥									
		▨	SS-16	5 5 7	72	▥									
380.6	50.0						End of Boring at 50 ft								
380	50														
375	55														
370	60														
	65														

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

Project Number: 60440115

Log of Boring WOR-B022A

Sheet 1 of 1

Date(s) Drilled	09/01/2015 12:00 AM to 09/01/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	30.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	430.6 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802021.8 E 2303775.5 (ft NAD83)	Groundwater Level(s)	6 ft on 9/1/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Elevation (feet)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
430	0					430.6	Offset boring to WOR-B022. Augered to 8 ft bgs without sampling. Based on visual observation of auger cuttings, soils appear to be similar to WOR-B022.	0.0								
425	5															
			ST-1		96											GUS sampler used
420	10		ST-2		96											GUS sampler used
415	15		ST-3		42											GUS sampler used
			ST-4		100	412.1		18.5								GUS sampler used
410	20															
405	25															
	30					400.6		30.0								

End of Boring at 30 ft

AECOM

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B024

Sheet 1 of 3

Date(s) Drilled	08/31/2015 12:00 AM to 08/31/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	70.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	423.0 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802489.4 E 2303542.5 (ft NAD83)	Groundwater Level(s)	21 ft on 8/31/2015 Measured 20.3 ft bgs on 10/29/2015 and 18.9 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION (Elevation (feet) / Depth (feet))	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0					423.0 / 0.0 Very loose, moist, gray, SILT (ML) with sand [ASH]								
420														
	5	SS-1	WOH/18"	0										
		SS-2	WOH/18"	100		becomes with trace sand								%G=1 %S=9 %F=91
415		ST-1		100										
	10	ST-2		100										
						412.0 / 11.0 Stiff to medium stiff, moist, gray fat CLAY (CH) with rock fragments [FILL]								
410														
	15	SS-5	2 3 3	78			36.1		58	29	1.25 1.25 1.0			
						407.0 / 16.0 Stiff to medium stiff, moist, gray fat CLAY (CH) [ALLUVIUM]								
		SS-6	1 1 0	67							1.0 1.0 1.25			
405														
	20	SS-7	1 1 1	89							0.5 0.5 0.75			
						402.0 / 21.0 Loose, wet, gray SILTY SAND (SM), trace organics [ALLUVIUM]								
		SS-8	3 2 3	78										
400														
	25	SS-9	2 2 2	89			33.8							%G=0 %S=64 %F=36 Organic Content = 2.8%
		SS-10	3 2 2	56										
395														
						394.5 / 28.5 Loose, wet, gray poorly-graded medium grained SAND (SP) [ALLUVIUM]								
	30	SS-11	1 2 3	89										

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

oject Number: 60440115

Log of Boring WOR-B024

Sheet 2 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	SAMPLES Sampling Resist. OR Core RQD (%)	SAMPLES Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30													
		SS-12	4 4 5	44										
390														
		SS-13	3 2 4	56										*%G=0 %S=96 %F=4*
	35													
		SS-14	2 2 2	100	▨	387.0 36.0 Soft to medium stiff, gray fat CLAY (CH) [ALLUVIUM]					0.5 0.5 0.5			
385														
		SS-15	1 1 1	56		384.5 38.5 Very loose, wet, gray poorly-graded fine SAND (SP) [ALLUVIUM]								
	40													
		SS-16	10 19 16	89		becomes dense, poorly-graded medium SAND								
380														
		SS-17	8 8 9	94		becomes medium dense								
	45													
		SS-18	1 1 1	89	▨	377.0 46.0 Soft, moist to wet, lean CLAY (CL)								
375														
	50													
		SS-19	10 12 10	89		372.0 51.0 Medium dense, wet, gray, poorly-graded fine SAND (SP) [ALLUVIUM]								
370														
		SS-20	8 5 2	61		becomes loose, poorly-graded medium SAND								
	55													
		SS-21	8 7 9	44		becomes medium dense								
365														
		SS-22	7 8 8	56										
	60													
360														
		SS-23	8 9 10	50		becomes interbedded with clay lenses								
	65													

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

Project Number: 60440115

Log of Boring WOR-B024

Sheet 3 of 3

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		SS-24	6 9 10	39											
355															
		SS-25	6 7 8	50											
	70					353.0 End of Boring at 70 ft	70.0								
350															
	75														
345															
	80														
340															
	85														
335															
	90														
330															
	95														
325															
	100														

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

Project Number: 60440115

Log of Boring WOR-B025

Sheet 1 of 2

Date(s) Drilled	09/02/2015 12:00 AM to 09/02/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	60.0 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	433.5 ft NAVD88
Borehole Backfill	Cement Grout	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 802267.5 E 2304498.5 (ft NAD83)	Groundwater Level(s)	6 ft on 9/2/2015 Measured 8 ft bgs on 10/29/2015 and 8.2 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0					433.5 / 0.0 Loose, moist, gray, SILT (SM) with sand [FLY ASH]								
430		SS-1	3 4 2	100										
	5													
						▽ becomes very loose, wet								
		SS-2	WOH/18"	100										
425		ST-1		100										*GUS sampler used*
	10													
		SS-3	WOH/18"	100										
420		SS-4	WOH/18"	56										
	15													
		SS-5	WOH/6" 1 WOH/6"	72										
415		SS-6	WOH/18"	17										
	20													
		SS-7	WOH/18"	0										
410		SS-8	WOH/18"	100										
	25													
						407.5 / 26.0 Very soft, moist, gray fat CLAY (CH) [ALLUVIUM]								
		SS-9	WOH/12" 1	61										
405		ST-2		0										
	30													

Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

roject Number: 60440115

Log of Boring WOR-B025

Sheet 2 of 2

Elevation (feet)	Depth (feet)	SAMPLES Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	MATERIAL DESCRIPTION Elevation (feet) / Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	30													
		ST-3		83			64 66.6 63.3	- 99 99.8	94	56	0.35			*%G=0 %S=0 %M=15 %C=85*
400		SS-10	WOH/6" 0 WOH/6"	100										
	35													
		SS-11	1 2 2	100		becomes soft to medium stiff, lean to fat CLAY (CL-CH)					0.5 0.5 0.75			*%G=0 %S=0 %F=100*
395						395.0 — 38.5								
		SS-12	5 9 12	67		Medium dense, wet, gray poorly-graded SAND (SP) [ALLUVIUM]								
	40													
		SS-13	12 15 21	44		becomes dense								
390		SS-14	9 15 16	72										*%G=1 %S=90 %F=9*
	45													
		SS-15	19 21 24	67										
385		SS-16	8 8 8	61		becomes medium dense								*%G=0 %S=93 %F=7*
	50													
380		SS-17	6 10 7	78										
	55													
375		SS-18	2 2 4	50		becomes loose								
	60					373.5 — 60.0 End of Boring at 60 ft								
370														
	65													

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Project: Dynegy

Project Location: Wood River Power Station, Alton, IL

ject Number: 60440115

Log of Boring WOR-B026

Sheet 1 of 1

Date(s) Drilled	09/16/2015 12:00 AM to 09/16/2015 12:00 AM	Logged By	B. Clayton	Checked By	V. Gautam
Drilling Method	Hollow Stem Auger / Mud Rotary	Drill Bit Size/Type	3 1/4" ID HSA, 3 3/8" Tricone	Borehole Depth	28.5 ft
Drill Rig Type	CME-550 ATV	Drilling Contractor	Terracon	Surface Elevation	431.4 ft NAVD88
Borehole Backfill	Well WOR-P026 Installed	Sampling Method(s)	2" ID Split Spoon (SS), Shelby Tube (ST), Gregory Undisturbed Sampler (GUS)	Hammer Data	Automatic Hammer
Boring Location	N 801728.8 E 2304914.5 (ft NAD83)	Groundwater Level(s)	5 ft on 9/16/2015 Measured 7.6 ft bgs on 10/29/2015 and 6.9 ft on 11/19/2015		

Elevation (feet)	Depth (feet)	SAMPLES Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Graphic Symbol	Elevation (feet)	MATERIAL DESCRIPTION	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
	0						431.4	Loose, moist, dark gray SILT (ML) [FLY ASH]	0.0								
430			SS-1	2 6 3	72												
			SS-2	WOH/18"	100			becomes very loose									
	5							becomes wet	▽								
							424.9	Very loose, wet, light gray, poorly-graded medium SAND (SP) [BOTTOM ASH]	6.5								
425			ST-1		75												
			SS-3	1 1 1	89												
	10																
420			SS-4	1 1 1	94												
							417.9	Very loose, wet, dark gray SILT (ML) [FLY ASH]	13.5								
			SS-5	1 1 1	100												
	15																
415			SS-6	WOH/6" 1 WOH/6"	100												
			SS-7	1 1 1	100												
	20																
410			ST-2		92												
							407.4	Medium stiff, moist, gray lean to fat CLAY (CL-CH) [ALLUVIUM]	24.0								
			SS-8	1 2 3	100									1.0 1.0 1.0			
	25																
405			SS-9	3 5 8	89												
							404.4	Medium dense, wet, brown, poorly-graded medium SAND (SP)	27.0								
							402.9	End of Boring at 28.5 ft	28.5								
	30																

The following are attachments to the testimony of Scott M. Payne, PhD, PG and Ian Magruder, M.S..

APPENDIX A2

HISTORICAL BORING LOGS

B-1: Illinois State Water Survey: 1982 Boring and Piezometer Logs (Hampton and O'Hearn, 1984)

RECORD OF SUBSURFACE EXPLORATION

PROJECT Illinois Power - Wood River Power Plant Monitoring Wells
JOB NO. 82-1344
BORING M-7
SHEET 1 OF 2

Soil Classification System Unified
Surface Elevation —

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL AND TYPE	SAMPLE ADVANCED / RECOVERED (in)	SEE REMARK #	DESCRIPTION OF MATERIALS (Color Modifier MATERIAL. Classification)	BLOWS (per 6 in)	DRY UNIT WEIGHT (pcf)	Shear Strength, tsf SVΔ QP/2□ QU/2○ 0 ½ 1 1½ 2 2½ PL + NMC • LL x 0 50 100 Rock Quality Designation 0 50 100
5	1	SS	24/15	1	Gray Fine Sand and Fly Ash, FILL	2-3-4		
10	2	SS	24/19			1/12-2		
15	3	SS	24/20		Fly Ash with Clay Seams and Fine to Medium Sand, FILL	3-8-7		
20	4	SS	24/24			13-8-9		
25	5	SS	24/18		Grayish Brown Fine SAND, Trace Silty Clay, and Fly Ash, Fill	6-2-1		
30	6	SS	24/16		Gray CLAY	3-4-6		
35	7	SS	24/21			3-5-6		

DRILLING METHOD Hollow Augers
DATE DRILLED 12-20-82
DRILLED BY Bignall
LOGGED BY Hileman
PIEZOMETER See Sketch

GROUNDWATER LEVELS

Encountered at 40.0 Feet
___ Hours after completion ___ Feet
___ after completion ___ et
___ after completion ___ et

NOTE: Refer to the attached GENERAL NOTES and NOTATION USED ON RECORDS OF SUBSURFACE EXPLORATION for abbreviations, explanations, and qualifications relative to this log.

John Mathes & Associates, Inc.

RECORD OF SUBSURFACE EXPLORATION

PROJECT Illinois Power - Wood River
Power Plant Monitoring Wells
JOB NO. 82-1344

BORING M-7
SHEET 2 OF 2

DESCRIPTION OF MATERIALS
(Color Modifier MATERIAL. Classification)
Soil Classification System Unified
Surface Elevation —

Shear Strength, tsf: SV△ QP/2□ QU/2○ — 0, ½, 1, 1½, 2, 2½
PL + NMC • LL × — 0, 50, 100
■ Rock Quality Designation — 0, 50, 100

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL AND TYPE	SAMPLE ADVANCED / RECOVERED (in)	SEE REMARK #	DESCRIPTION OF MATERIALS	BLOWS (per 6 in)	DRY UNIT WEIGHT (pcf)
					Gray CLAY	2-2-5	
40	8	SS	24/24				
45	9	SS	24/16		Brown to Gray Fine to Medium SAND Trace Silt and Clay	12-11-16	
50	10	SS	24/14		Brown Fine to Medium SAND, Trace Coarse Sand	10-11-15	
55							
60	11	SS	42/20			10-12-14	
					TOB		
65					REMARKS:		
					1. Two-foot Long Split-spoon Used Entire Boring, Blow Counts Shown For First 18 Inches.		
70							

DRILLING METHOD Hollow Augers
DATE DRILLED 12-20-82
DRILLED BY Bignall
LOGGED BY Hileman
PIEZOMETER See Sketch

GROUNDWATER LEVELS

Encountered at ____ Feet
____ Hours after completion ____ Feet
____ after completion ____ Feet
____ after completion ____ Feet

NOTE: Refer to the attached GENERAL NOTES and NOTATION USED ON RECORDS OF SUBSURFACE EXPLORATION for abbreviations, explanations, and qualifications relative to this log.

John Mathes & Associates, Inc.

RECORD OF SUBSURFACE EXPLORATION

PROJECT Illinois Power - Wood River
Power Plant Monitoring Wells
JOB NO. 82-1344

BORING M-8
SHEET 1 OF 1

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL AND TYPE	SAMPLE ADVANCED / RECOVERED (in)	SEE REMARK #	DESCRIPTION OF MATERIALS (Color Modifier MATERIAL. Classification) Soil Classification System Unified Surface Elevation —	BLOWS (per 6 in)	DRY UNIT WEIGHT (pcf)	Shear Strength, tsf SV△ QP/2□ QU/2○ 0 ½ 1 1½ 2 2½ PL + NMC • LL x 0 50 100 ■ Rock Quality Designation 0 50 100
				1				
40								
	1	SS	24/24	2	Gray CLAY, Trace Silt	1-2-3		
45								
	2	SS	24/24	3	Brown Fine to Medium SAND	4-13-16		
					TOB			
50								
55								
60								
65								
70								

REMARKS:

1. Drilled Down to 41' Took First Sample.
2. Two-foot Long Split-spoon Used Entire Boring, Blow Counts for First 18 Inches.
3. Ten Inches Blow-in, Drove Split-spoon, Washed Out, Drilled Down to 47'.

DRILLING METHOD Hollow Augers
DATE DRILLED 12-21-82
DRILLED BY Bignall
LOGGED BY Hileman
PIEZOMETER See Sketch

GROUNDWATER LEVELS

Encountered at 34.1 Feet
__ Hours after completion __ Feet
__ after completion __ Feet
__ after completion __ Feet

NOTE: Refer to the attached GENERAL NOTES and NOTATION USED ON RECORDS OF SUBSURFACE EXPLORATION for abbreviations, explanations, and qualifications relative to this log.

John Mathes & Associates, Inc.

RECORD OF SUBSURFACE EXPLORATION

PROJECT Illinois Power - Wood River Power Plant Monitoring Wells
BORING M-9
SHEET 1 OF 1
JOB NO. 82-1344

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL AND TYPE	SAMPLE ADVANCED / RECOVERED (in)	SEE REMARK #	DESCRIPTION OF MATERIALS (Color Modifier MATERIAL. Classification) Soil Classification System Unified Surface Elevation —	BLOWS (per 6 in)	DRY UNIT WEIGHT (pcf)	Shear Strength, tsf SV△ QP/2□ QU/2○ 0 ½ 1 1½ 2 2½ PL + NMC • LL × 0 50 100 Rock Quality Designation 0 50 100
5	1	SS	18/16		Gray to Brown CLAY, Trace Sand	2-2-2		
10	2	SS	18/16			2-3-3		
15	3	SS	18/17		Gray CLAY	2-4-6		
20	4	SS	18/14			1-1-2		
25	5	SS	18/18		Gray Silty CLAY, Trace Sand	2-2-3		
30	6	SS	18/14			WH-1-1		
					Brown Fine to Medium SAND			
35	7	SS	18/9		TOB	12-17-17		

DRILLING METHOD Hollow Augers
DATE DRILLED 12-20-82
DRILLED BY Roberts
LOGGED BY Schaefer
PIEZOMETER See Sketch

GROUNDWATER LEVELS

Encountered at 19.3 Feet
___ Hours after completion ___ Feet
___ after completion ___ Feet
___ after completion ___ Feet

NOTE: Refer to the attached GENERAL NOTES and NOTATION USED ON RECORDS OF SUBSURFACE EXPLORATION for abbreviations, explanations, and qualifications relative to this log.

John Mathes & Associates, Inc.

RECORD OF SUBSURFACE EXPLORATION

PROJECT Illinois Power - Wood River Power Plant Monitoring Wells
JOB NO. 82-1344

BORING M-10
SHEET 1 OF 2

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL AND TYPE	SAMPLE ADVANCED / RECOVERED (in)	SEE REMARK #	DESCRIPTION OF MATERIALS (Color Modifier MATERIAL. Classification) Soil Classification System Unified Surface Elevation —	BLOWS (per 6 in)	DRY UNIT WEIGHT (pcf)	Shear Strength, tsf SV△ QP/2□ QU/2○ 0 ½ 1 1½ 2 2½ PL + NMC • LL x 0 50 100 Rock Quality Designation 0 50 100
				1				
5	1	SS	18/16		Gray to Brown Silty CLAY	3-5-8		
10	2	SS	18/18		Gray Clayey SILT, Trace Fine Sand	4-7-10		
15	3	SS	18/18		Gray Silty CLAY	2-3-3		
20	4	SS	18/18	2	Trace Fine Sand	1/12-2		
25	5	SS	18/6		Brown Fine SAND, Trace Clay	1-1-2		
30	6	SS	18/18		Gray Silty CLAY, Trace Fine Sand	1-2-2		
35	7	SS	18/18		Gray CLAY, Trace Silt	WH-1-2		

DRILLING METHOD Hollow Augers
DATE DRILLED 12-21-82
DRILLED BY Roberts
LOGGED BY Schaefer
PIEZOMETER See Sketch

GROUNDWATER LEVELS

Encountered at 19.3 Feet
___ Hours after completion ___ Feet
___ after completion ___ Feet
___ after completion ___ Feet

NOTE: Refer to the attached GENERAL NOTES and NOTATION USED ON RECORDS OF SUBSURFACE EXPLORATION for abbreviations, explanations, and qualifications relative to this log.

mathes

John Mathes & Associates, Inc.

RECORD OF SUBSURFACE EXPLORATION

PROJECT Illinois Power - Wood River Power Plant Monitoring Wells
JOB NO. 82-1344
BORING M-10
SHEET 2 OF 2

DEPTH (ft)	SAMPLE NUMBER	SAMPLE INTERVAL AND TYPE	SAMPLE ADVANCED / RECOVERED (in)	SEE REMARK #	DESCRIPTION OF MATERIALS (Color Modifier MATERIAL. Classification) Soil Classification System Unified Surface Elevation –	BLOWS (per 6 in)	DRY UNIT WEIGHT (pcf)	Shear Strength, tsf SV△ QP/₂□ QU/₂○ 0 ½ 1 1½ 2 2½ PL + NMC • LL x 0 50 100 [redacted] Rock Quality Designation 0 50 100
					Gray CLAY, Trace Silt			
40	8	SS	18/18			WH-1-2		
45	9	SS	18/18			WH-WH-2		
50	10	SS	18/18			WH-1-2		
55	11	SS	18/18		TOB	WH-WH-3		
60								
65								
70								

REMARKS:

1. Approx. 6" Fly Ash at Surface
2. Pulled SS, 18" Blow-in, Added Water, Continued Drilling.

DRILLING METHOD Hollow Augers
DATE DRILLED 12-21-82
DRILLED BY Roberts
LOGGED BY Schaefer
PIEZOMETER See Sketch

GROUNDWATER LEVELS

Encountered at ______ Feet
____ Hours after completion ____ Feet
____ after completion ____ Feet
____ after completion ____ t

NOTE: Refer to the attached GENERAL NOTES and NOTATION USED ON RECORDS OF SUBSURFACE EXPLORATION for abbreviations, explanations, and qualifications relative to this log.

mathes

John Mathes & Associates, Inc.

RECORD OF SUBSURFACE EXPLORATION

PROJECT Illinois Power - Wood River
Power Plant Monitoring Wells
JOB NO. 82-1344

BORING M-11
SHEET 1 OF 1

DEPTH (ft)	SAMPLE			SEE REMARK #	DESCRIPTION OF MATERIALS (Color Modifier MATERIAL. Classification) Soil Classification System Unified Surface Elevation —	BLOWS (per 6 in)	DRY UNIT WEIGHT (pcf)	Shear Strength, tsf SV△ QP/2□ QU/2○ 0 ½ 1 1½ 2 2½ PL + NMC ● LL x 0 50 100 ▬ Rock Quality Designation 0 50 100
	NUMBER	INTERVAL AND TYPE	ADVANCED / RECOVERED (in)					
				1				
5								
10								
15								
					Gray Silty CLAY			
20	1	SS	18/14			1-1-4		
					Gray Fine SAND			
25	2	SS	18/16			1-1-0		
30	3	SS	18/18		- with Gray Clay	1-1-2		
					TOB			
					REMARKS:			
					1. Drilled Down to 19', Took First Sample.			
35								

DRILLING METHOD Hollow Auger
DATE DRILLED 12-22-82
DRILLED BY Roberts
LOGGED BY Schaefer
PIEZOMETER See Sketch

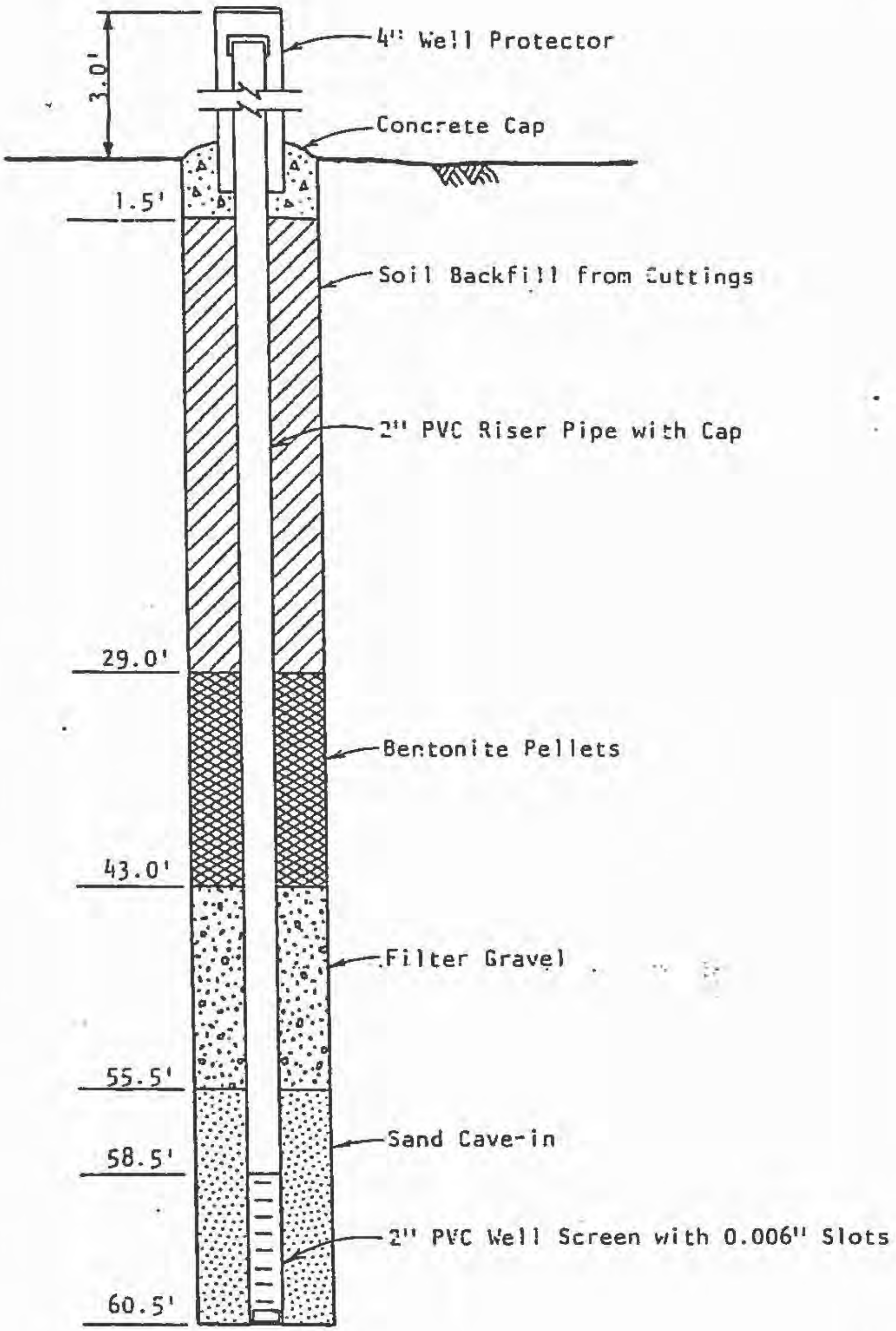
GROUNDWATER LEVELS

Encountered at — Feet
___ Hours after completion ___ Feet
___ after completion ___ eet
___ after completion ___ et

NOTE: Refer to the attached GENERAL NOTES and NOTATION USED ON RECORDS OF SUBSURFACE EXPLORATION for abbreviations, explanations, and qualifications relative to this log.

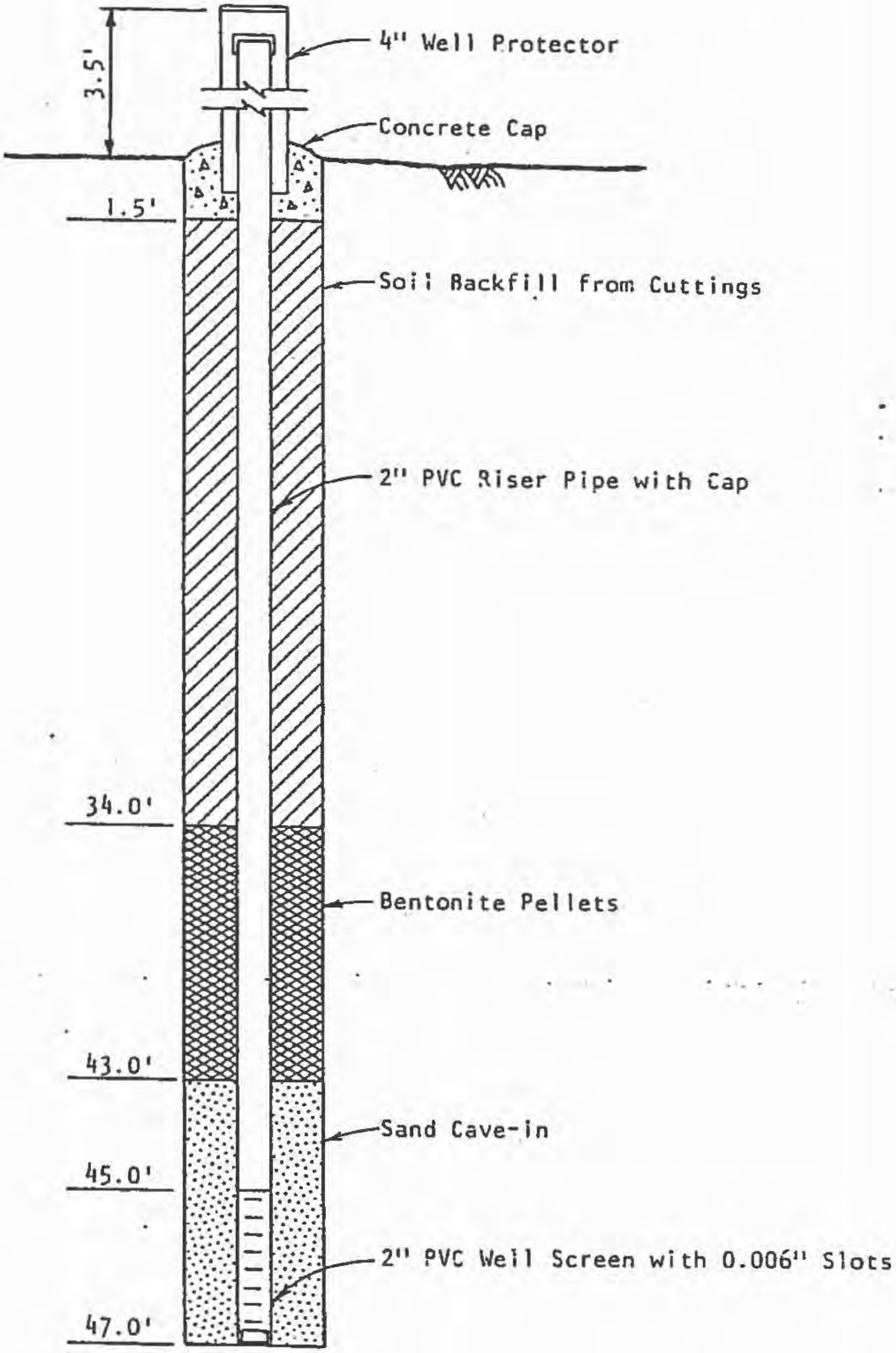
mathes

John Mathes & Associates, Inc.



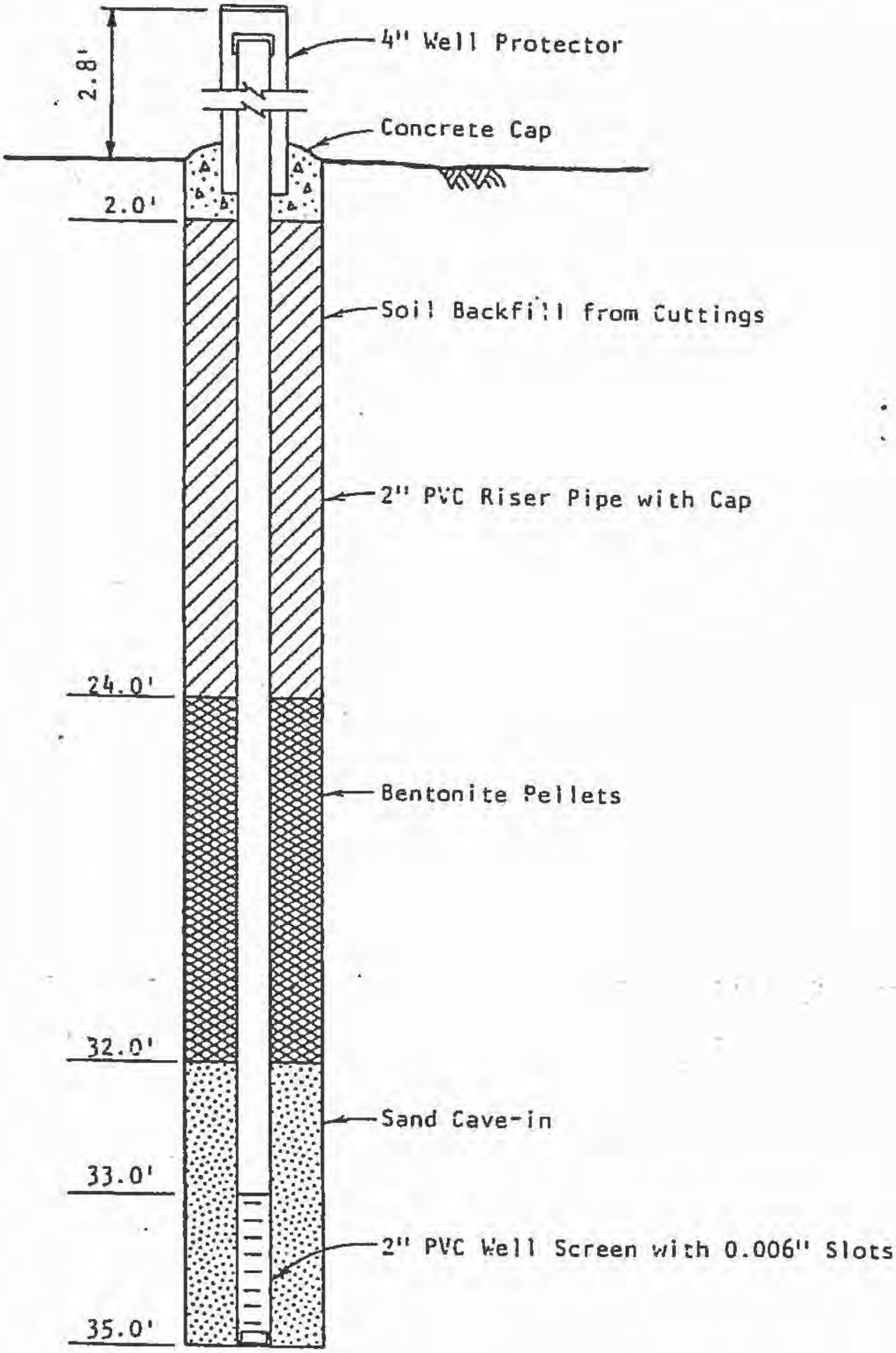
PIEZOMETER M-7

John Mathes & Associates, Inc.



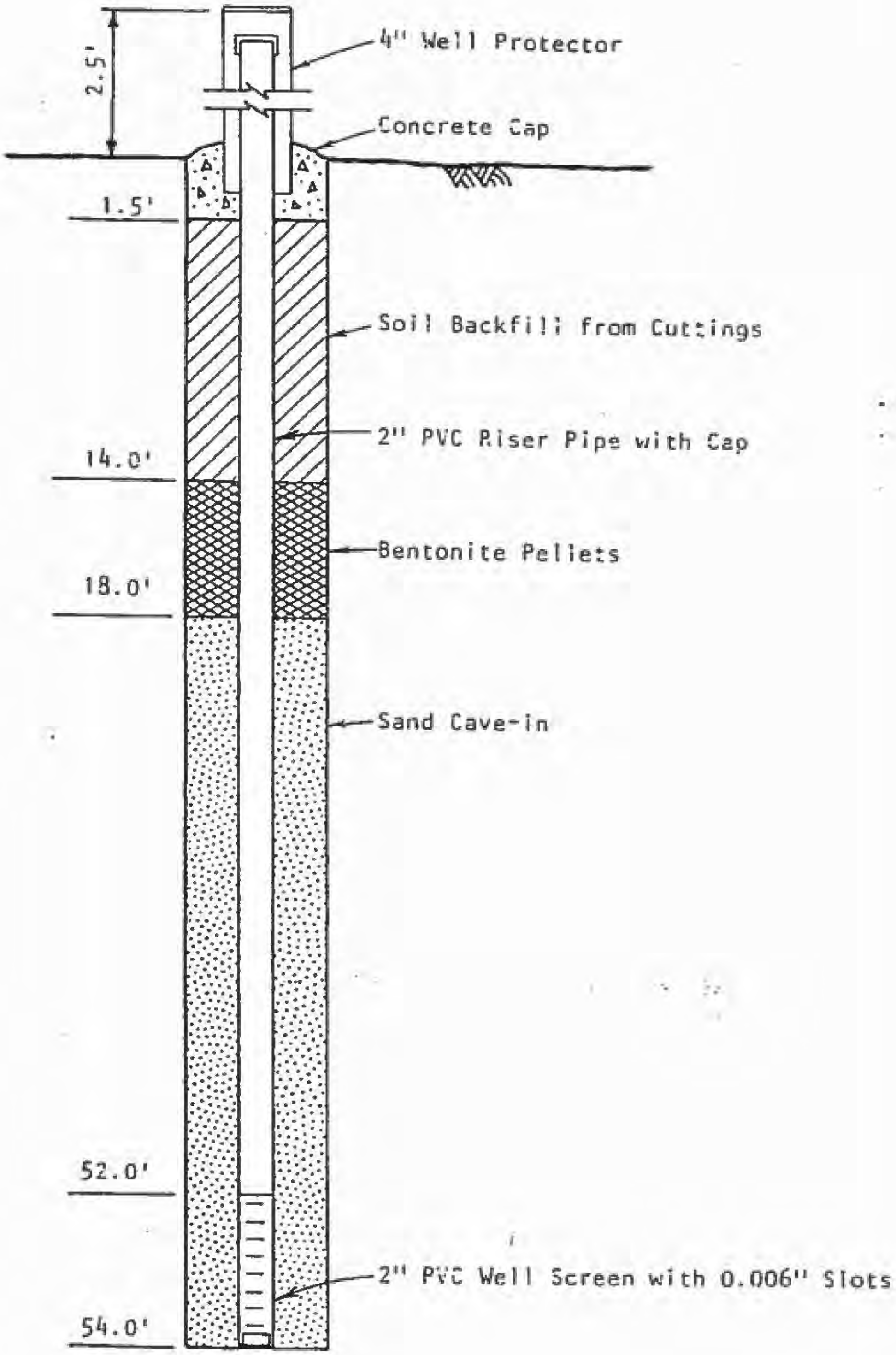
PIEZOMETER M-8

John Mathes & Associates, Inc.



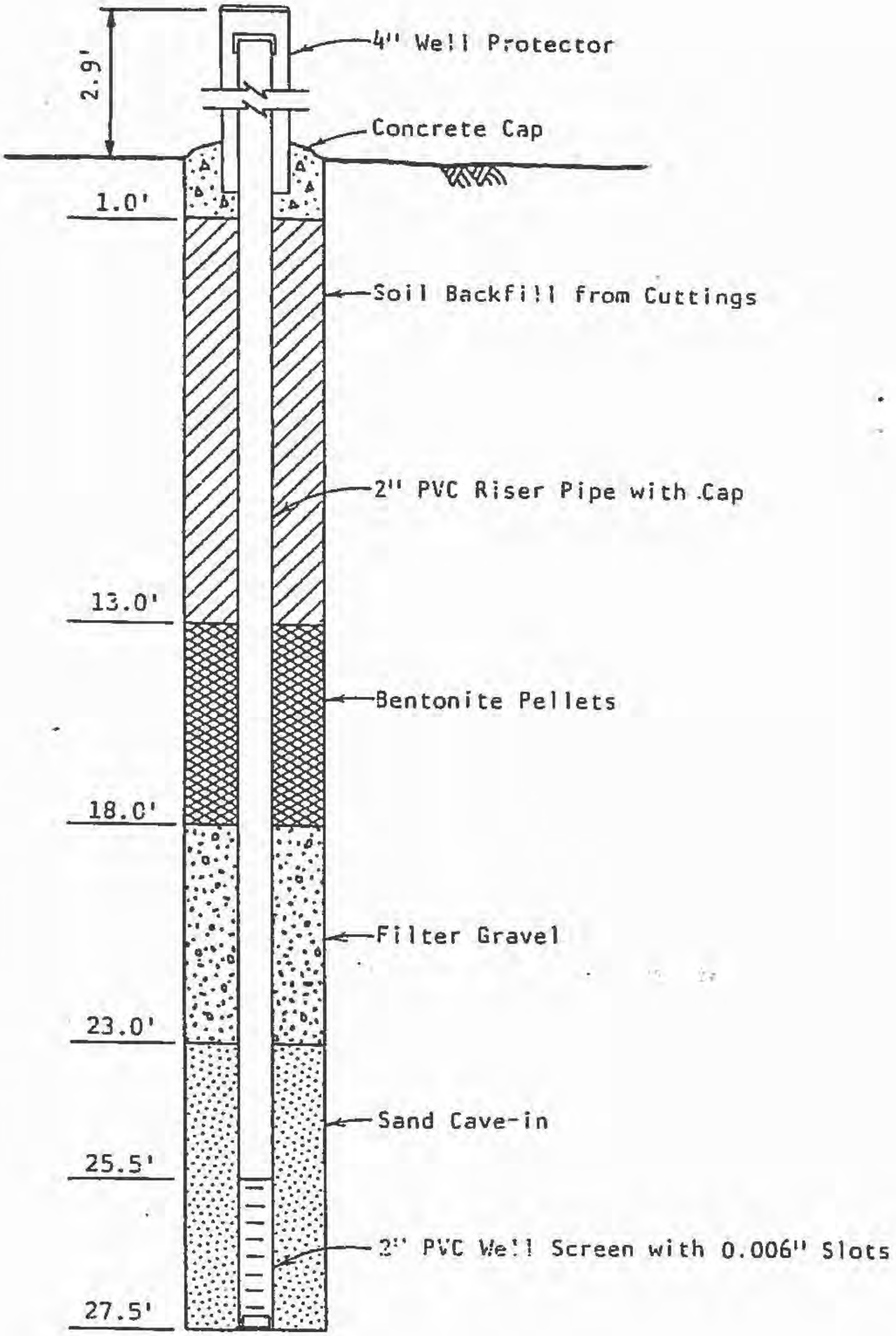
PIEZOMETER M-9

John Mathes & Associates, Inc.



PIEZOMETER M-10

John Mathes & Associates, Inc.



PIEZOMETER M-11

John Mathes & Associates, Inc.

B-2: Kelron Environmental: 1994-1995 Boring and Well Logs (Kelron, 1995)

KELRON environmental

Geologic Field Observations

Serial No. ______ Borehole, Monitoring Well, or Test Pit No. B-20

(Record this location on the Group List) Group List Number ______

Location Type: ☒ Borehole ☐ Test Pit ☐ Other 8.25" OD/4.25" ID Auger Page 1 of 1

Site Name Illinois Power Company - Wood River Project No. 940100 Phase.Task ______

Date 11-15-94 Start Time 1115 Logged by (print name) Stu Cravens

Depth (feet)	Sample No.	Sampler Type	Sample Depth (feet)		Sample Recovery (inches)	Field Description of Material, Comments, and Observations	Pocket Penetrometer	USCS Symbol	Air Monitoring		
			Top	Bottom					Borehole	Breathing Zone	Sample
0						Silty clay loam, organic					
0.5						Silty CLAY, med to dk br, dry to moist		CL			
	1	SS	10	12	15	*(7/8/8/10); SAND w/ silt, fine gr, lt brown, moist		SP-SM			
	2	SS	20	22	16	*(9/12/9/11);					
20						SILT, dk brown		ML			
20.5						SAND, fine gr, med brown		SP			
21						med gr, wet					
	3	SS	25	27		*(8/8/8/9);					
25						SAND, fine to med gr,					
	4	SS	30	32	24	*(6/3/4/9)					
31						SAND w/ silt, fine gr, brown-gray		SP-SM			
	5	SS	35	36	12	*(9/13)					
40						END BOREHOLE					

Drilling Fluids ☐ None

Type water

Amount Lost all

Source IP Wood River Hydrant

Groundwater Measurements ☐ Groundwater Not Encountered

Date	11/15/94		
Time	1230		
Depth (feet)	22.6'		

Comments Whitney and Associates, Inc.; Driller - Steve Winslow, Asst - Scott Osmulski

ATV Auger Rig, CME-450. *Split-Spoon Blow Counts: 24", 2" diam, 140# hammer

Geologist's Signature ______ Date 11/15/94 Reviewer ______ Date ______

KELRON environmental

Geologic Field Observations

Serial No. ______ Borehole, Monitoring Well, or Test Pit No. B-26

(Record this location on the Group List) Group List Number ______

Location Type: ☒ Borehole ☐ Test Pit ☐ Other 8.25" OD/4.25" ID Auger Page 1 of 1

Site Name Illinois Power Company - Wood River Project No. 950100 Phase.Task ______

Date 06-02-95 Start Time 1135 Logged by (print name) Stu Cravens

Depth (feet)	Sample No.	Sampler Type	Sample Depth (feet)		Sample Recovery (Inches)	Field Description of Material, Comments, and Observations	Pocket Penetrometer	USCS Symbol	Air Monitoring		
			Top	Bottom					Borehole	Breathing Zone	Sample
0						Silty clay loam, organic					
1						Silty CLAY, med br, moist		CL			
	1	SS	5	7	16	*(2/2/3/2)					
5						Silty CLAY, dk br, saturated					
6						lt br to lt gray					
	2	SS	10	12	19	*(2/3/2/3) Silty CLAY					
	3	SS	15	17	22	*(2/2/3/3)					
15						Silty CLAY, med br, saturated					
16						CLAY, med gray, very moist					
	4	SS	20	22	24	*(2/3/3/4) CLAY, same as above					
31						END BOREHOLE					

Drilling Fluids ☐ None

Type water

Amount Lost all

Source East Alton Municipal

Groundwater Measurements	☐ Groundwater Not Encountered		
Date	6/2/95		
Time	1445		
Depth (feet)	+0.15'(als)		

Comments Whitney and Associates, Inc.; Driller - Tim Fehl, Asst - James Bowman

ATV Auger Rig, CME-450. *Split-Spoon Blow Counts: 24", 2" diam, 140# hammer

Geologist's Signature ______ Date 6/2/95 Reviewer* ______ Date

KELRON environmental

Geologic Field Observations

Serial No. ____________ Borehole, Monitoring Well, or Test Pit No. B-27

(Record this location on the Group List) Group List Number ____________

Location Type: ☒ Borehole ☐ Test Pit ☐ Other 8.25" OD/4.25" ID Auger Page 1 of 1

Site Name Illinois Power Company - Wood River Project No. 950100 Phase.Task ____________

Date 06-02-95 Start Time 0945 Logged by (print name) Stu Cravens

Depth (feet)	Sample No.	Sampler Type	Sample Depth (feet)		Sample Recovery (inches)	Field Description of Material, Comments, and Observations	Pocket Penetrometer	USCS Symbol	Air Monitoring		
			Top	Bottom					Borehole	Breathing Zone	Sample
0						Silty clay loam, organic					
1						Silty CLAY, med br, very moist		CL			
	1	SS	5	7	24	*(3/4/5/7)					
5						Silty CLAY, lt br to lt gray, moist					
	2	SS	10	12	24	*(7/8/9/16)					
10						Silty CLAY, dk br					
11						SAND, med gr, lt br, very moist		SP			
	3	SS	15	17	20	*(not recorded)					
15						SAND, med to crse grain, saturated					
32						END BOREHOLE					

Drilling Fluids ☐ None

Type water

Amount Lost all

Source East Alton Municipal

Groundwater Measurements ☐ Groundwater Not Encountered

Date	6/2/95		
Time	1120		
Depth (feet)	9.7'		

Comments Whitney and Associates, Inc.; Driller - Tim Fehl, Asst - James Bowman

ATV Auger Rig, CME-450. *Split-Spoon Blow Counts: 24", 2" diam, 140# hammer

Geologist's Signature ____________ Date 6/2/95 Reviewer ________ Date

TELEPHONE
309 673-2131

TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-O-PAC

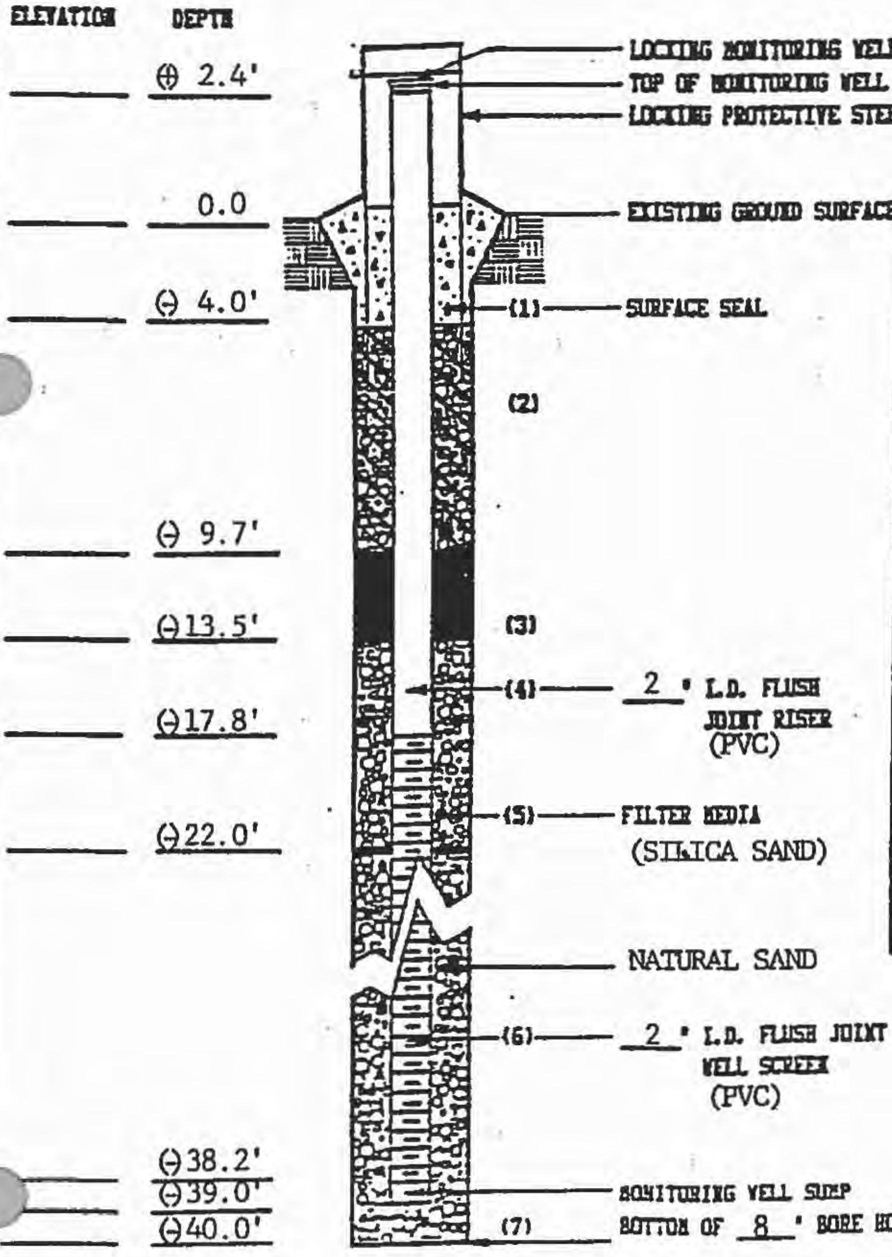
SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

INSTALLED BY Winslow

DATE 11-28-94

TYPICAL MONITORING WELL DIAGRAM

PROJECT Illinois Power - Wood River Station
MONITORING WELL NO. MW-20
LOCATION Wood River, Illinois
INSTALLATION DATE 11-16-94
MONITORING WELL LOCATION See Environmental Engineer's Site Plan



1. SURFACE SEAL Concrete Encasement
2. ANNULAR BACKFILL Cement/ Bentonite Grout
3. LOWER SEAL Bentonite Pellets
4. RISER TYPE Schedule 40 PVC
5. FILTER MEDIA 4.0 Flint Shot Silica Sand
6. SCREEN TYPE Schedule 40 PVC
SLOT SIZE 0.010" LENGTH 20.4'
7. BACKFILL TYPE Natural Sand

BENCHMARK

DRILLING METHOD 4.25" I.D. Hollow Stem Augers
WATER LEVEL @ 24+ HOURS ⊖21.0'
REMARKS

TELEPHONE
309 673-2131

TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-O-PAC

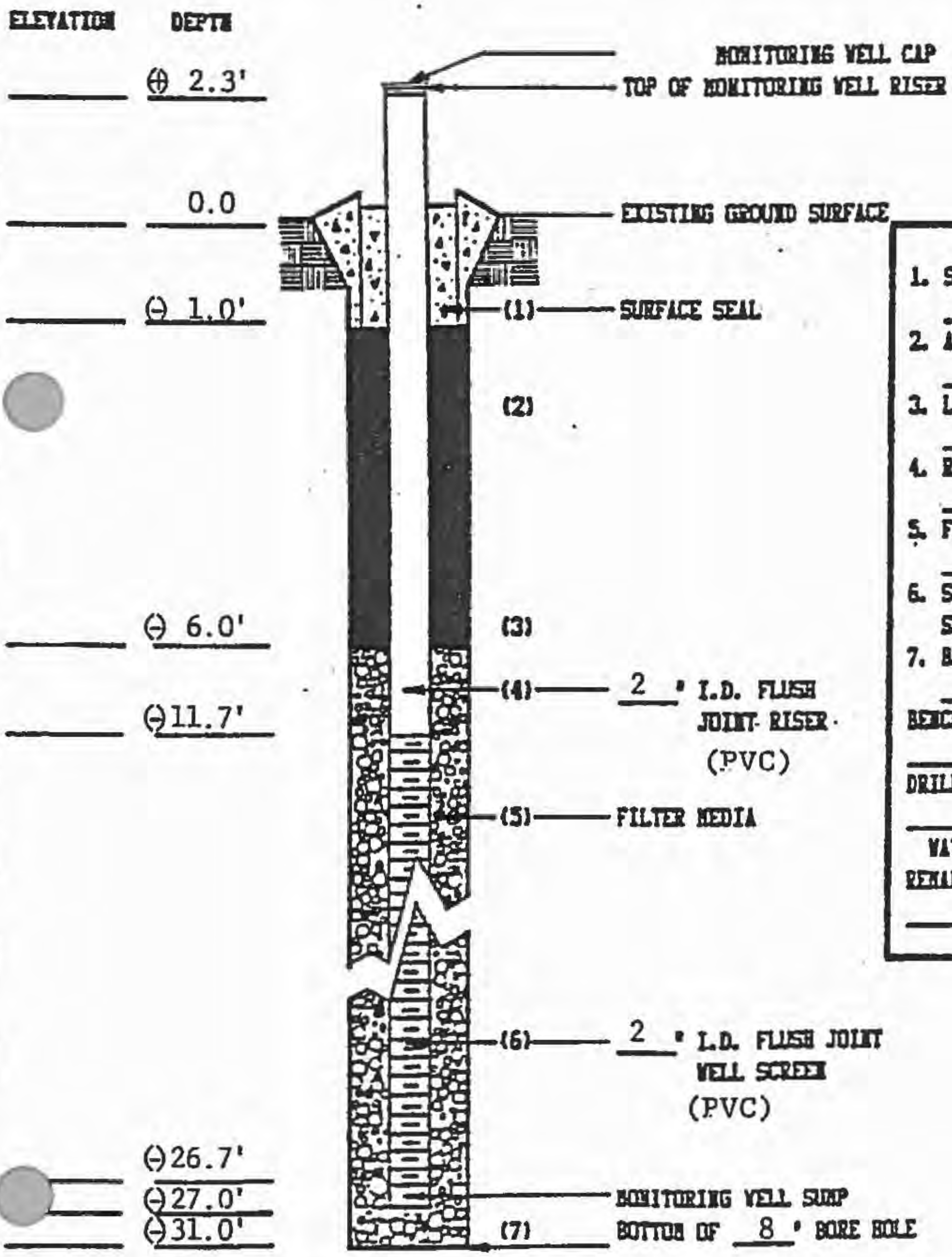
SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

INSTALLED BY Fehl

DATE 6-30-95

TYPICAL MONITORING WELL DIAGRAM

PROJECT Illinois Power - Wood River Station
MONITORING WELL NO. TMW-26
LOCATION Wood River, Illinois
INSTALLATION DATE 6-02-95
MONITORING WELL LOCATION See Environmental Engineer's Site Plan



1. SURFACE SEAL Auger Cuttings
2. ANNULAR BACKFILL Bentonite Pellets
3. LOWER SEAL Bentonite Pellets
4. RISER TYPE Schedule 40 PVC
5. FILTER MEDIA #12 Flint Shot Silica Sand
6. SCREEN TYPE Schedule 40 PVC
SLOT SIZE 0.006" LENGTH 15.0'
7. BACKFILL TYPE Natural Sand

BENCHMARK

DRILLING METHOD 4.25" I.D. Hollow Stem Auger

WATER LEVEL @ 3 HOURS (+)0.2'

REMARKS

TELEPHONE
309 673-2131

TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-O-PAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

INSTALLED BY: Fehl

DATE: 6-30-95

TYPICAL MONITORING WELL DIAGRAM

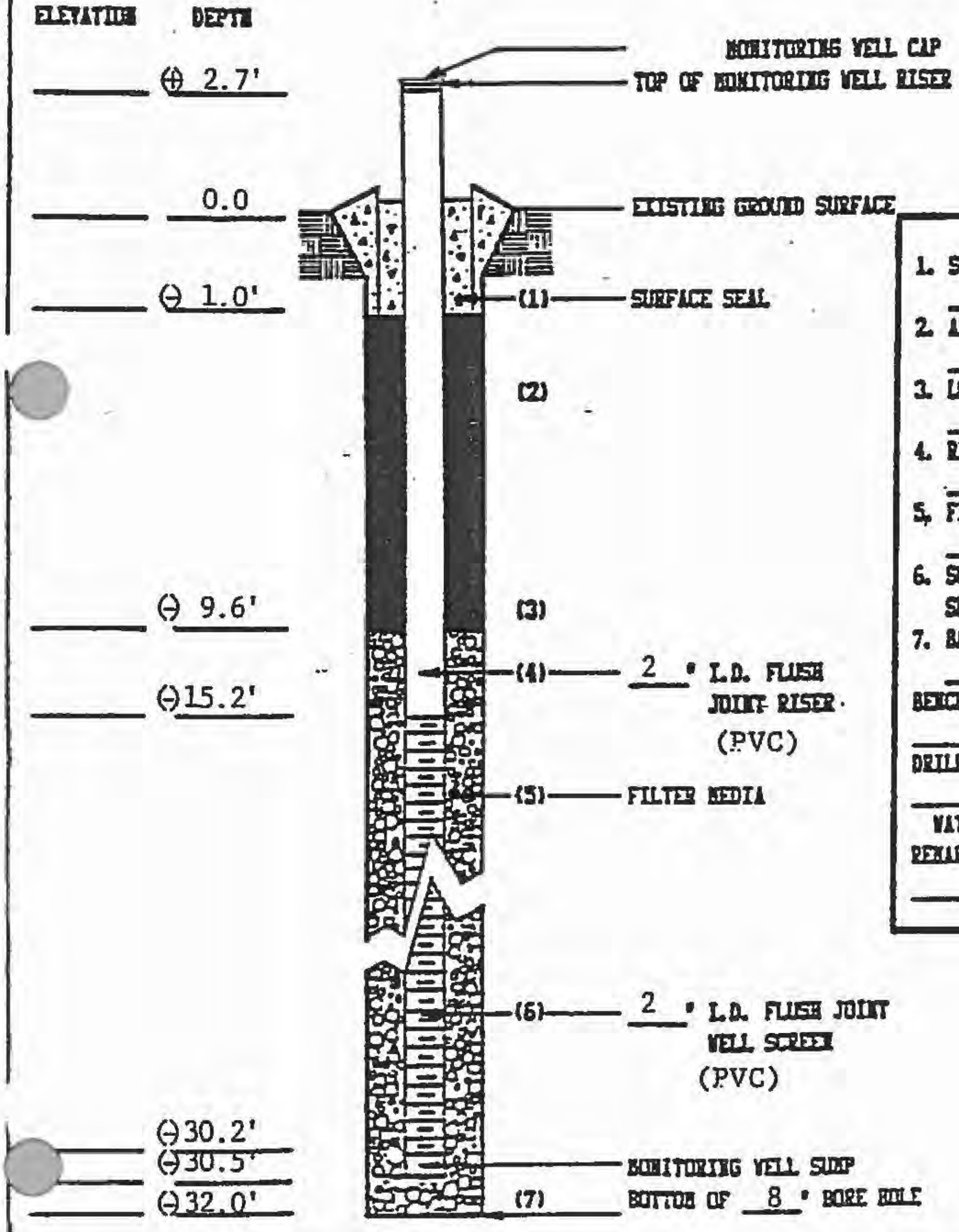
PROJECT: Illinois Power - Wood River Station

MONITORING WELL NO.: TMW-27

LOCATION: Wood River, Illinois

INSTALLATION DATE: 6-02-95

MONITORING WELL LOCATION: See Environmental Engineer's Site Plan



1. SURFACE SEAL: Auger Cuttings
2. ANNULAR BACKFILL: Bentonite Pellets
3. LOWER SEAL: Bentonite Pellets
4. RISER TYPE: Schedule 40 PVC
5. FILTER MEDIA: Natural Sand
6. SCREEN TYPE: Schedule 40 PVC
   SLOT SIZE: 0.006" LENGTH: 15.0'
7. BACKFILL TYPE: Natural Sand

BENCHMARK:

DRILLING METHOD: 4.25" I.D. Hollow Stem Auger

WATER LEVEL @ 1.5 HOURS (-)9.7'

REMARKS:

B-3: Natural Resource Technology: 1999 Boring and Well Log (NRT, 2000)

Project Name/No. Illinois Power - Wood River Plant 135-1.4		**Boring No.** 35	**Start Date** 1/5/99	**Page** 1
Driller Boart-Longyear, Schofield, WI	**Logged by:** Steve Mueller/STMI		**End Date** 1/5/99	**Depth to Water** ~6 Feet
Boring Depth 28 Feet	**Boring Diameter** 8 Inches	**Surface Elevation** Feet	**Drill Method** 4 1/4-in. ID HSA	**Northing**
Well Depth 28 Feet	**Well Diameter** 2-in I.D.	**TOC Elev.** Feet	**Sample Method** 2-ft. split-spoon	**Easting**

Sample	Blows/6 inches	Sample Depth (ft)	Recovery (%)	Graphic Log	Classification	Description	Comments
				▨	CL	SILTY CLAY, dark topsoil with marsh grass 0-1/2 ft., slightly plastic, soft, grayish brown, saturated below 6 ft.	
☒	1, 1	5	100				7-ft by 6-in O.D. steel stick-up casing to 3 ft below grade.
☒	1, 1	10	100				Bentonite chips 0-20 ft.
☒	1, 1, 2, 2	15	100	▨	CL	CLAY, trace fine sand, medium plastic, soft, brownish gray, moist.	Sch. 40 PVC* casing flush-threaded to 5-ft section of 0.01-in factory-slotted PVC screen.
☒	1, 2, 3, 5	20	50	▥	ML	SILT, medium stiff, dark gray, saturated.	Fine silica sand 20-20.5 ft; Red Flint #30 silica sand pack 20.5-28 ft.
☒	1, 1, 1, 6	25	25	░	SP	SAND, well sorted/rounded, fine- to medium-grained, predominantly quartz, loose, gray (salt & pepper), saturated.	*For datalogger installation, a 4-ft section of 4-in ID casing (above ground) was coupled to 2-in ID casing (below ground) using a rubber boot and hose clamps.
						END OF BORING - 28.0 feet	
		30					

KELRON
Environmental

LOG OF BORING MW35R

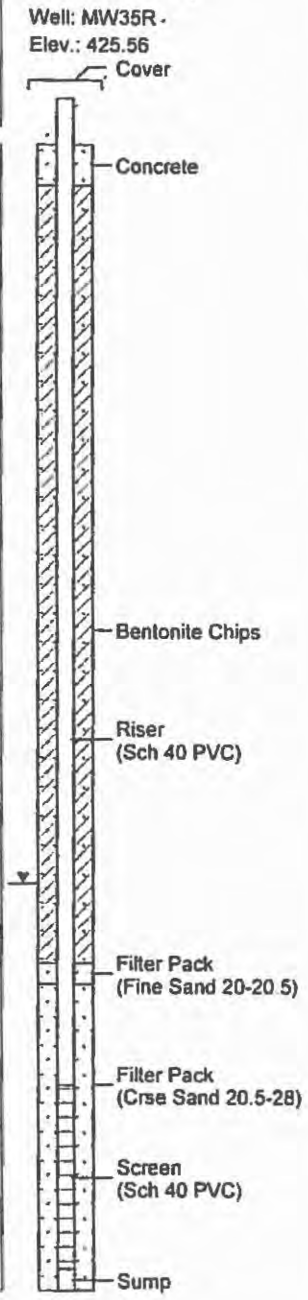
(Page 1 of 1)

New East Ash Pond: Replacement Well MW35R
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 19 NE/NE/SE

Date Started/Finished	: 11/13/2008
Hole Diameter	: 8.5 inches
Drilling Method	: Hollow-Stem
Sampling Method	: Split-Spoon
Drilling Company	: Philip Services Corp.
Driller	: Jerry Bignall
Geologist	: Stuart Cravens (Kelron)
Land Surface Elevation	: 422.56
Top of Casing Elevation	425.56
X,Y Coordinates	: 509084, 801955

Depth in Feet	DESCRIPTION	Surf. Elev. 422.56	Samples	Recovery Inches	Blow Count	Qp TSF	USCS	GRAPHIC
0	SILTY CLAY, grayish brown. Replacement for Destroyed Well MW35 (drilled 1/5/99 / sealed 11/13/08); see boring log from MW35 for full description of lithology.	422 417 412					CL	▨
15	CLAY, trace fine sand, brownish gray	407					CL	▨
20	SILT, dark gray.	402					ML	▥
25	SAND, well sorted/rounded, fine to medium-grained, loose, gray, saturated.	397	1	14			SP	⁘
30	END BOREHOLE AT 28 FEET BLS							



B-4: Shively Geotechnical: 2003 Boring Logs for Dynegy Rail Loop (Shively, 2003)

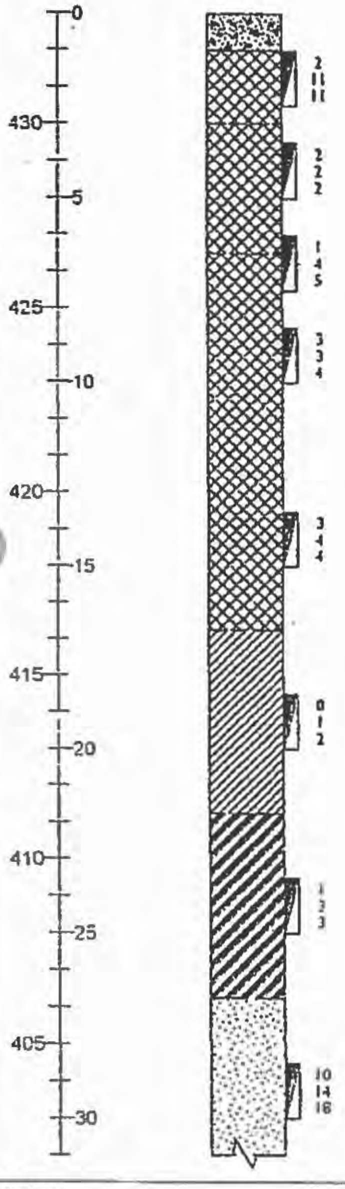
APPENDIX B: BORING LOGS

Boring Logs
General Notes
Notations used on Boring Logs
Unified Soil Classification

LOG OF BORING B - 01

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 433 Feet (Approximate)

Date Drilled: 3/27/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: HSA and Mud Rotary
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
0				SLAG and Base ROCK, FILL				
	2 11 11	17/18		Dark Gray Silty CLAY and Crushed LIMESTONE, FILL			3	
430	2 2 2	17/18	CL	Dark Gray-Brown Silty CLAY, Possible FILL		0.5 Qp	41	
5	1 4 5	17/18	SC	Brown Clayey SAND, Possible FILL		2.0 Qp	14	
425	3 3 4	18/18					13	Began Mud Rotary at 9.5 Feet
10				-Dark Gray-Brown below 12.0 feet				
420	3 4 4	15/18					15	
15			CL	Dark Gray Silty CLAY				
415	0 1 2	9/18					27	
20			CH	Dark Gray-Brown CLAY				
410	1 3 3	14/18				1.6 Qp	31	
25			SP	Dark Gray-Brown Fine SAND				
405	10 14 16	17/18						
30			SP					

(continued)

Notes:

GROUNDWATER

∇ First Observed During Drilling - N/A
▼ At Completion - N/A

Piezometer Installed: No

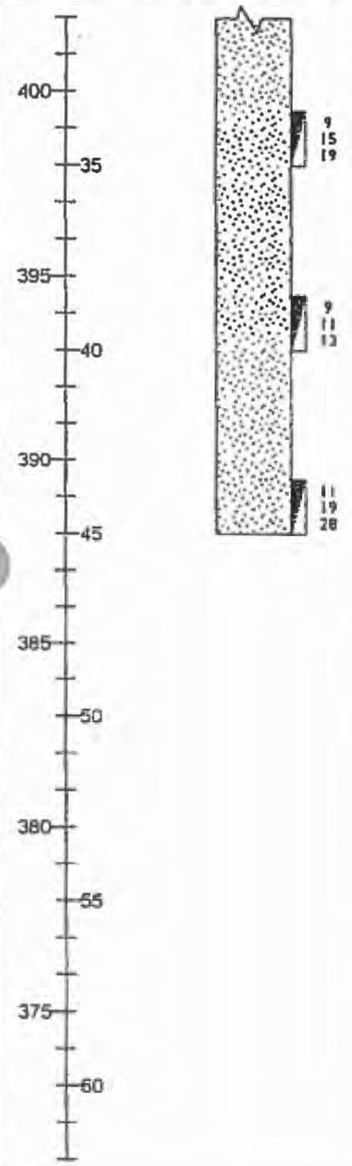
Shively Geotechnical, Inc.

Missouri (314) 770-1001
Illinois (618) 398-1414

LOG OF BORING B - 01 (Cont.)

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 433 Feet (Approximate)

Date Drilled: 3/27/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: HSA and Mud Rotary
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				Dark Gray-Brown Fine SAND *(continued)*				
	9 15 19	15/18						
				-Gray below 37.0 Feet				
	9 11 13	14/18						
				-Fine to Medium Grained below 42.0 Feet				
	11 19 28	12/18						
				TD - 45.0 Feet				

Notes:

GROUNDWATER

▽ First Observed During Drilling - N/A

▼ At Completion - N/A

Piezometer Installed: No

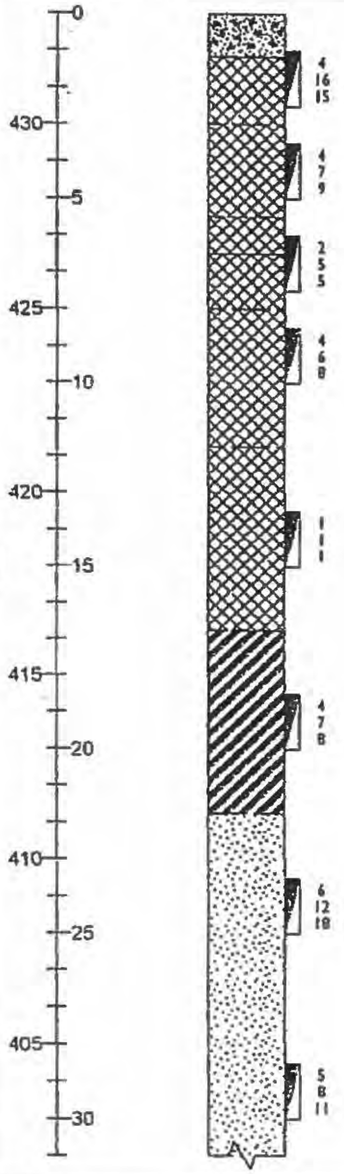
Shively Geotechnical, Inc.

Missouri (314) 770-1001
Illinois (618) 398-1414

LOG OF BORING B - 02

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 433 Feet (Approximate)

Date Drilled: 3/27/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: HSA and Mud Rotary
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows .	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				SLAG and Base ROCK, FILL				
	4 16 15	14/18		Dark Gray Silty CLAY and Crushed LIMESTONE, FILL			19	
	4 7 9	18/18	SC	Gray-Brown Clayey SAND, FILL			6	
	2 5 5	15/18	CL	Dark Gray-Brown Silty CLAY, FILL				
			SC	Gray-Brown Clayey SAND, FILL		0.8 Qp	24	
	4 6 8	15/18		Gray-Brown Clayey SAND and Crushed LIMESTONE, FILL		1.3 Qp	11	Began Mud Rotary at 9.5 Feet
	1 1 1	4/18	SP	Dark Gray-Brown Clayey SAND, with Gravel, Possible FILL			26	
	4 7 8	18/18	CH	Dark Gray-Brown CLAY		1.3 Qp	32	
	6 12 18	15/18	SP	Gray Fine SAND				
	5 8 11	12/18		-Gray-Brown 27.0 to 42 Feet				
			SP					

(continued)

Notes:

GROUNDWATER

⊻ First Observed During Drilling - N/A
⊻ At Completion - N/A

Piezometer Installed: No

Shively
Geotechnical, Inc.

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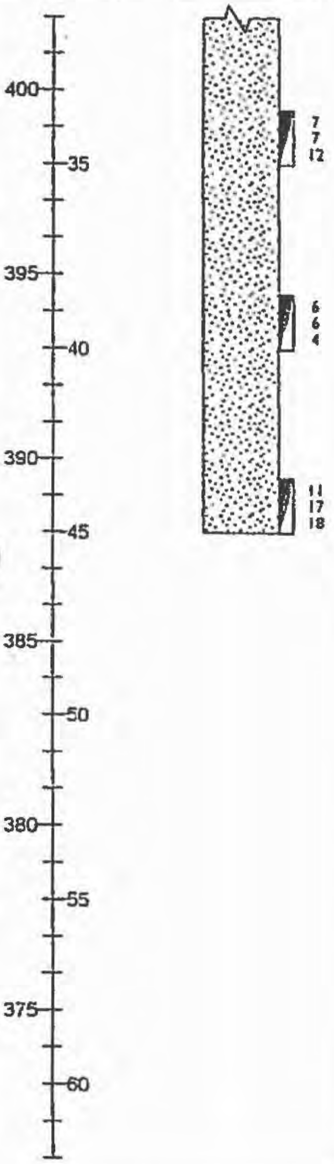
LOG OF BORING B - 02 (Cont.)

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 433 Feet (Approximate)

Date Drilled: 3/27/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: HSA and Mud Rotary
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				Gray Fine SAND *(continued)*				
	7 7 12	12/18						
	6 6 4	10/18						
				-Dark Gray-Brown, Fine to Medium Grained below 42.0 Feet				
	11 17 18	14/18						
				TD - 45.0 Feet				

Notes:

GROUNDWATER

∇ First Observed During Drilling - N/A
∇ At Completion - N/A

Piezometer Installed: No

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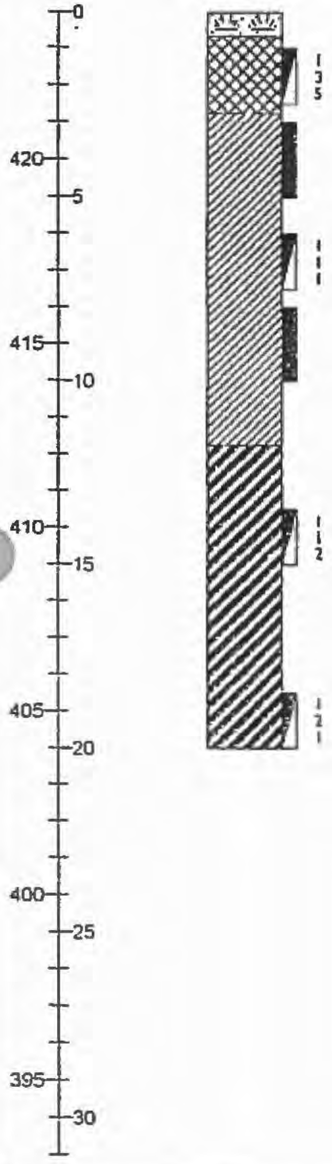
LOG OF BORING B - 04

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 424 Feet (Approximate)

Date Drilled: 3/26/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
			TOPSOIL				
1 3 5	16/18	CL	Dark Gray-Brown Silty CLAY, Possible FILL		2.3 Qp	23	
	12/24	CL	Gray-Brown Silty CLAY	95		26	
1 1 1	18/18					27	
	22/24			94		29	LL = 42 PL = 18 PI = 24 G_s = 2.65
		CH	Dark Gray CLAY				
1 1 2	18/18					34	
1 2 1	18/18					60	
			TD - 20.0 Feet				

Notes:

GROUNDWATER

▽ First Observed During Drilling - Dry
▼ At Completion - Not Recorded

Piezometer Installed: No

Shively Geotechnical, Inc.

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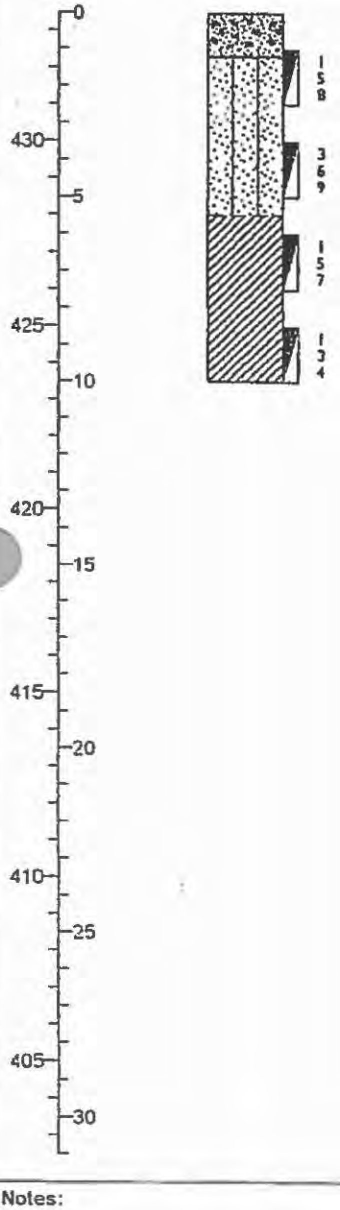
Illinois (618) 398-1414

LOG OF BORING B - 05

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 433.5 Feet (Approximate)

Date Drilled: 3/26/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
		Base ROCK, FILL				
13/18	SM	Brown Silty SAND			23	
		-Gray-Brown below 3.0 Feet				
15/18				3.0 Qp	21	
13/18	CL	Gray Brown Silty CLAY, trace Sand		2.6 Qp	20	
		-Very Dark Gray below 8.0 Feet				
15/18				2.5 Qp	20	
		TD - 10.0 Feet				

Notes:

GROUNDWATER

▽ First Observed During Drilling - Dry
▼ At Completion - Dry

Piezometer Installed: No

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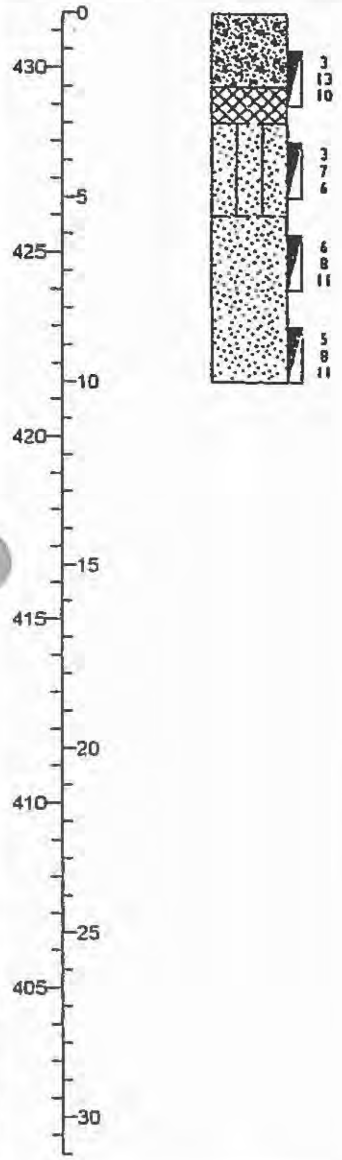
LOG OF BORING B - 06

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 431.5 Feet (Approximate)

Date Drilled: 3/26/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
	3 13 10	16/18		Base ROCK, FILL			4	
				Dark Gray-Brown Silty CLAY, with Crushed Limestone, FILL				
	3 7 6	11/18	SM	Brown Silty SAND			24	
	6 8 11	18/18	SP	Gray-Brown Fine SAND			12	
	5 8 11	15/18					8	
				TD - 10.0 Feet				

Notes:

GROUNDWATER

∇ First Observed During Drilling - Dry
∇ At Completion - Dry

Piezometer Installed: No

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Geotechnical, Inc.

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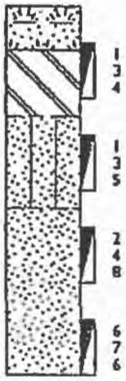
LOG OF BORING B - 07

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 430 Feet (Approximate)

Date Drilled: 3/26/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
430—0				TOPSOIL				
	1 3 4	14/18	CL-CH	Dark Brown Silty CLAY		1.5 Qp	23	
425—5	1 3 5	15/18	SM	Brown Silty SAND			20	
	2 4 8	17/18	SP	Gray-Brown Fine SAND			6	
420—10	6 7 6	18/18					6	
				TD - 10.0 Feet				
415—15								
410—20								
405—25								
400—30								

Notes:

GROUNDWATER

∇ First Observed During Drilling - Dry
▼ At Completion - Dry

Piezometer Installed: No

Shively Geotechnical, Inc.

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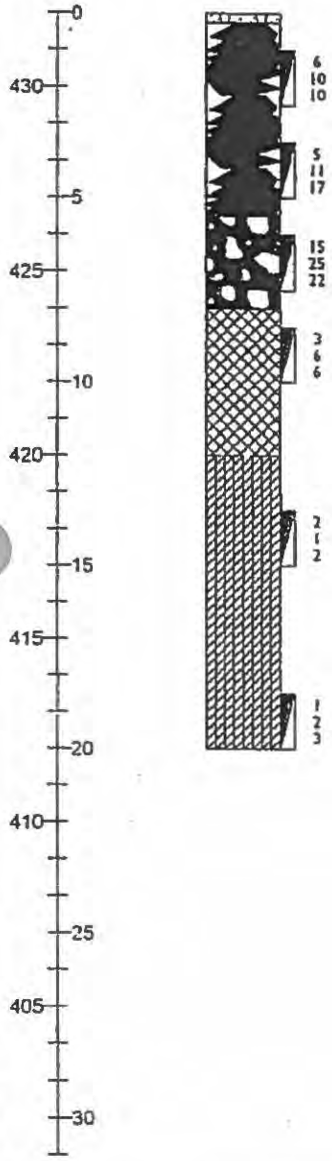
LOG OF BORING B - 08

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 432.0 Feet (Approximate)

Date Drilled: 1/16/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				TOPSOIL				
	6 10 10	16/18		Gray FLYASH, FILL			25	
	5 11 17	15/18		-with Bottom Ash below 4.0 Feet		1.3 Qp	32	
	15 25 22	17/18		Dark Gray BOTTOM ASH, with Flyash, FILL			15	
	3 6 6	17/18	CL	Dark Gray Silty CLAY, trace Bottom Ash, FILL		4.5 Qp	17	
	2 1 2	13/18	CL-ML	Brown Clayey SILT		1.3 Qp	25	
	1 2 3	18/18		-Gray-Brown below 17.0 feet		0.8 Qp	27	
				TD - 20.0 Feet				

Notes:

GROUNDWATER

- ▽ First Observed During Drilling - Dry
- ▼ At Completion - Dry

Piezometer Installed: No

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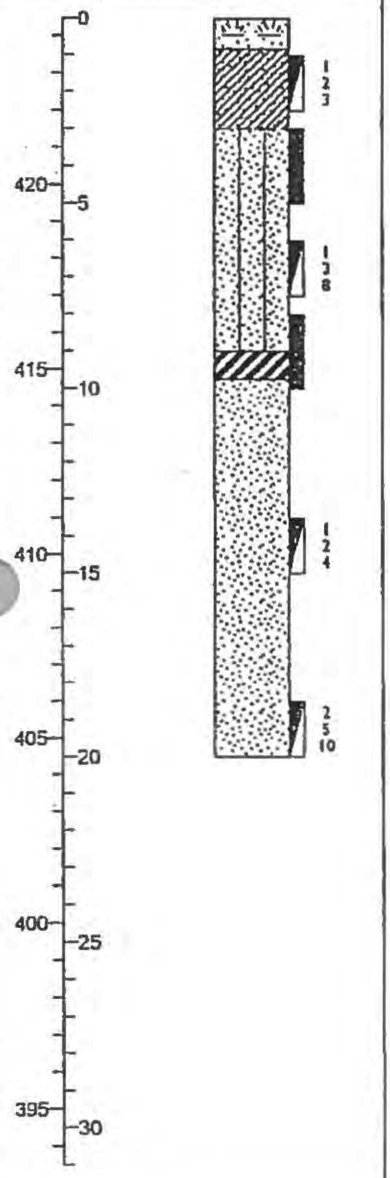
LOG OF BORING B - 09

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
roject Number: SG9-2554
Elevation: 424.5 Feet (Approximate)

Date Drilled: 3/26/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				TOPSOIL				
	1 2 3	13/18	CL	Dark Brown Sandy CLAY		1.2 Qp	20	
		7/24	SM	Gray-Brown Silty SAND			5	
	1 3 8	18/18				1.0 Qp	24	
		20/24			84	0.8 Qp	37	
			CH	Dark Gray-Brown CLAY				
			SP	Gray-Brown Fine SAND				
	1 2 4	13/18					3	
	2 5 10	18/18					15	
				TD - 20.0 Feet				

Notes:

GROUNDWATER

▽ First Observed During Drilling - Dry
▼ At Completion - Not Recorded

Piezometer Installed: No

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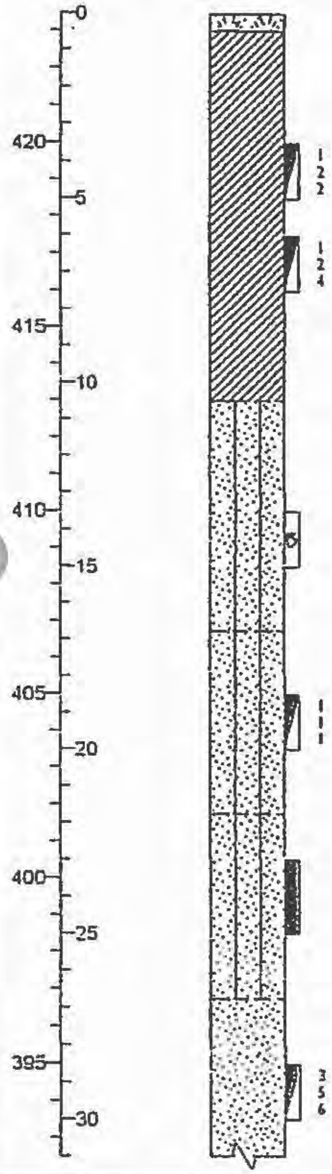
LOG OF BORING B - 10

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 423.5 Feet (Approximate)

Date Drilled: 3/28/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: HSA and Mud Rotary
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				TOPSOIL				
			CL	Dark Brown Silty CLAY				
	1 2 2	16/18				0.75 Qp	26	
				-Gray-Brown below 5.5 Feet				
	1 2 4	15/18				1.3 Qp	23	
			SM	Gray Fine SAND, with Silt				
		18						
								Began Mud Rotary at 15.0 Feet
			SM	Dark Gray-Brown Silty SAND				
	1 1 1	18/18						
			SM	Dark Gray Fine SAND, with Silt				
		24			92		30	
			SP	Dark Gray Fine SAND				
	3 5 6	13/18						

(continued)

Notes:

GROUNDWATER

∇ First Observed During Drilling - N/A
▼ At Completion - N/A

Piezometer Installed: No

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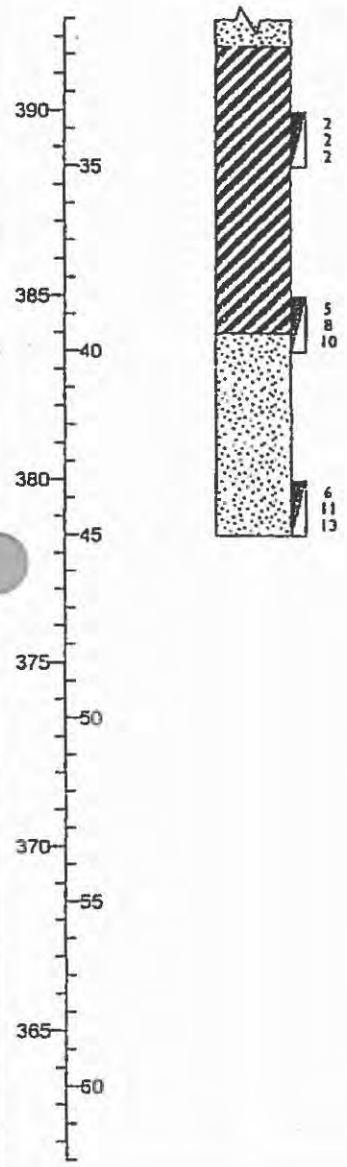
LOG OF BORING B - 10 (Cont.)

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 423.5 Feet (Approximate)

Date Drilled: 3/28/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: HSA and Mud Rotary
Logged By: Meyer/Kinsella



Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
	CH	Dark Gray CLAY				
16/18					33	
18/18					40	
	SP	Dark Gray Fine SAND				
		- Gray below 42.0 Feet				
10/18						
		TD - 45.0 Feet				

Notes:

GROUNDWATER

▽ First Observed During Drilling - N/A
▼ At Completion - N/A

Piezometer Installed: No

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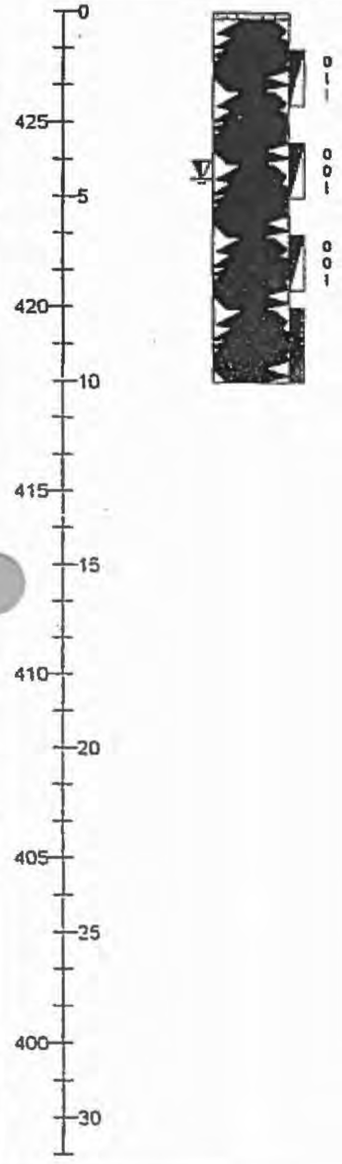
LOG OF BORING B - 12

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 428.0 Feet (Approximate)

Date Drilled: 1/17/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				TOPSOIL				
				Gray FLYASH, FILL				
	0 1 1	18/18					69	
				-with Organics 3.0 to 8.0 Feet				
	0 0 1	9/18					56	
	0 0 1	15/18				0.4 Qp	35	
		21/24			87	0.4 Qp	34	UU = 0.20 TSF
				TD - 10.0 Feet				

Notes:

GROUNDWATER
- ▽ First Observed During Drilling - Dry
- ▼ At Completion - Dry
- ▽ 4 days After Completion - 4.5 Feet

Piezometer Installed: No

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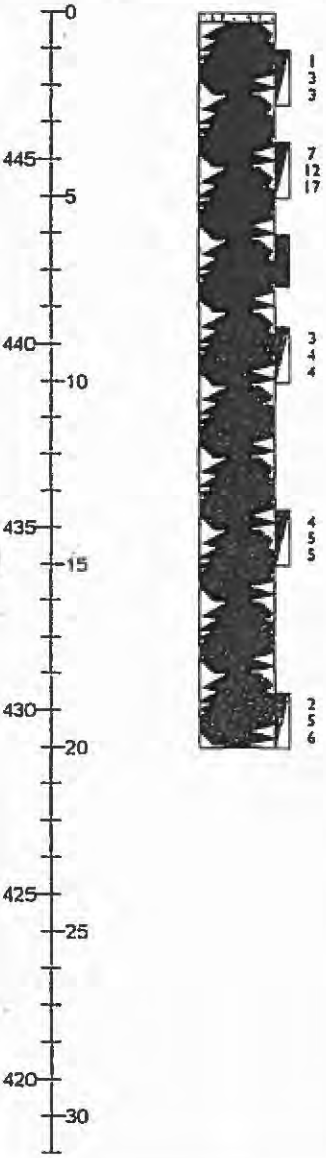
Illinois (618) 398-1414

LOG OF BORING B - 13

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 449 Feet (Approximate)

Date Drilled: 1/16/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				TOPSOIL Gray FLYASH, FILL				
	1 3 3	12/18				1.2 Qp	26	
	7 12 17	9/18					24	
		14/17		-trace Bottom Ash below 5.5 Feet			29	
	3 4 4	12/18					34	
	4 5 5	17/18				0.5 Qp	28	
	2 5 6	NSD/18				1.8 Qp	37	
				TD - 15.0 Feet				

Notes:

GROUNDWATER
- ☐ First Observed During Drilling - Dry
- ☐ At Completion - Dry
- ☐ 1 days After Completion - Dry
- 5 days After Completion - dry

Piezometer Installed: No

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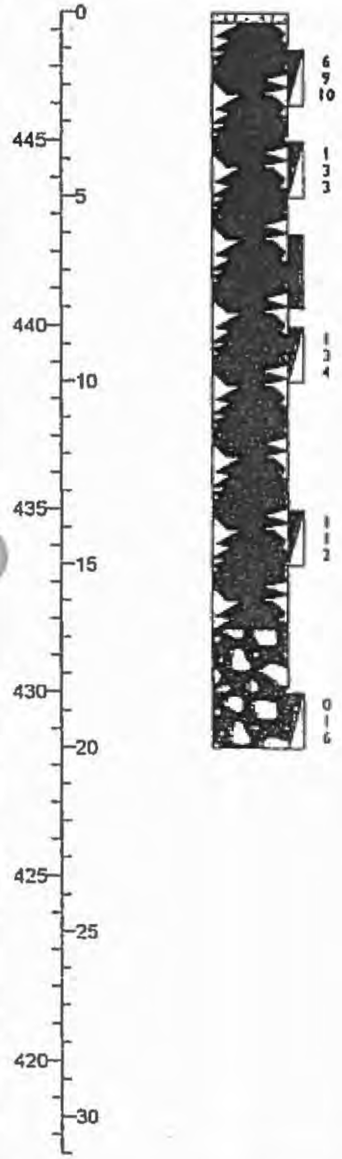
LOG OF BORING B - 14

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 448.5 Feet (Approximate)

Date Drilled: 1/17/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
0				TOPSOIL				
				Gray FLYASH, FILL				
	6 9 10	13/18					22	
445	1 3 3	14/18					25	
		13/24			60		28	
440	1 3 4	14/18				1.6 Qp	38	
435	1 1 2	13/18				0.5 Qp	43	
				Dark Gray FLYASH and BOTTOM ASH, FILL				
430	0 1 6	17/18				0.5 Qp	40	
20				TD - 20.0 Feet				

Notes:

GROUNDWATER

♀ First Observed During Drilling - Dry
♀ At Completion - Dry
♀ 4 days After Completion - Dry
Piezometer Installed: No

Shively Geotechnical, Inc.

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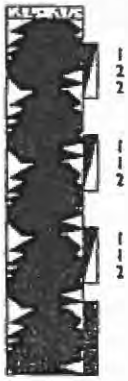
LOG OF BORING B - 16

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 440 Feet (Approximate)

Date Drilled: 1/17/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
440 — 0				TOPSOIL				
	1 2 2	14/18		Gray FLYASH, trace Bottom Ash, FILL		1.7 Qp	30	
435 — 5	1 1 2	15/18				0.7 Qp	32	
	1 1 2	18/18				1.4 Qp	30	
		15/24			54		44	
430 — 10				TD - 10.0 Feet				
425 — 15								
420 — 20								
415 — 25								
410 — 30								

Notes:

GROUNDWATER
- ∇ First Observed During Drilling - Dry
- ∇ At Completion - Dry
- ∇ 4 days After Completion - Dry

Piezometer Installed: No

Shively Geotechnical, Inc.

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Illinois (618) 398-1414

LOG OF BORING B - 17

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
roject Number: SG9-2554
Elevation: 440 Feet (Approximate)

Date Drilled: 1/17/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
440 - 0				TOPSOIL				
	1 1 3	18/18		Gray FLYASH, trace Boiler Slag, FILL		0.9 Qp	29	
		22/24		Gray BOTTOM ASH and BOILER SLAG, trace Flyash, FILL	86		11	
435 - 5	∇							
	1 1 1	18/18		Gray FLYASH, FILL -with Bottom Ash 5.5 to 8.0 Feet		0.9 Qp	58	
	6 6 5	18/18				2.4 Qp	45	
430 - 10				TD - 10.0 Feet				
425 - 15								
420 - 20								
415 - 25								
410 - 30								

Notes:

GROUNDWATER

∇ First Observed During Drilling - 6.0 Feet
∇ At Completion - Dry
∇ 4 days After Completion - Dry
Piezometer Installed: No

Shively Geotechnical, Inc.

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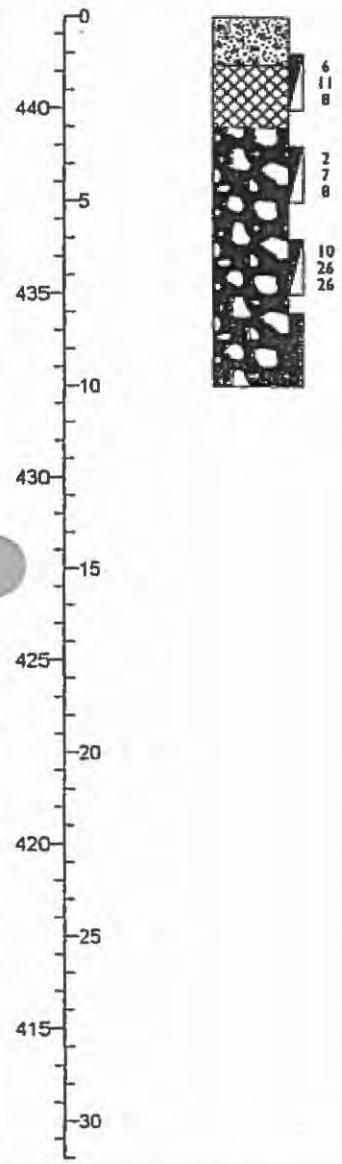
LOG OF BORING B - 18

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 442.5 Feet (Approximate)

Date Drilled: 1/17/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				Base ROCK, FILL				
	6 11 8	10/18		Brown Silty CLAY, with Sand, Crushed Limestone, FILL			5	
	2 7 8	8/18		Gray BOTTOM ASH, with Flyash, FILL		3.2 Qp	16	
	10 26 26	17/18				4.5+ Qp	19	
		23/24			78		20	
				TD - 10.0 Feet				

Notes:

GROUNDWATER

▽ First Observed During Drilling - Dry
▽ At Completion - Dry
▽ 4 days After Completion - Dry
Piezometer Installed: No

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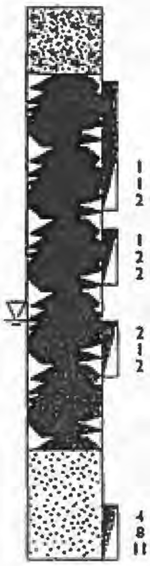
LOG OF BORING B - 19

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 440 Feet (Approximate)

Date Drilled: 1/17/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
440 - 0				Base ROCK, FILL				
		17/24		Gray FLYASH, FILL -with Crushed Limestone to 4.0 Feet	68		35	
435 - 5	1 1 2	16/18				0.3 Qp	43	
	1 2 2	14/18					43	
430 - 10	2 1 2	17/18				0.5 Qp	46	
			SP	Gray-Brown Fine SAND				
425 - 15	4 8 11	16/18						
				TD - 15.0 Feet				
420 - 20								
415 - 25								
410 - 30								

Notes:

GROUNDWATER

∇ First Observed During Drilling - 8.5 Feet
∇ At Completion - Dry
∇ 4 days After Completion - Dry
Piezometer Installed: No

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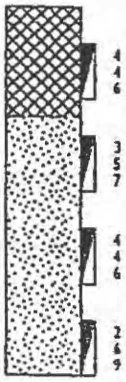
LOG OF BORING B - 20

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 435 Feet (Approximate)

Date Drilled: 3/28/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
435—0	4 4 6	13/18		Brown Silty CLAY, trace Sand, Gravel, FILL		3.0 Qp	20	
430—5	3 5 7	16/18	SP	Gray-Brown Fine to Medium SAND			8	
	4 4 6	14/18					7	
	2 6 9	13/18		-Fine to Coarse Grained below 8.0 Feet			3	
425—10				TD - 10.0 Feet				
420—15								
415—20								
410—25								
405—30								

Notes:

GROUNDWATER

☿ First Observed During Drilling - NSD
☿ At Completion - NSD

Piezometer Installed: No

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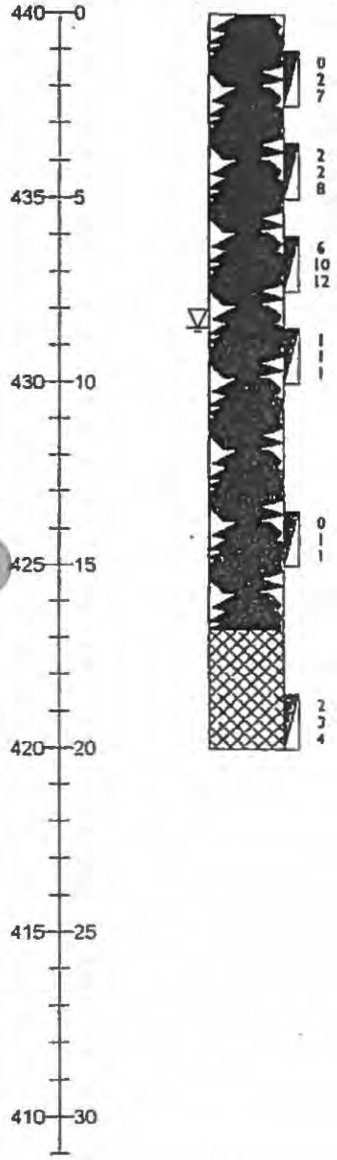
LOG OF BORING B - 21

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 440 Feet (Approximate)

Date Drilled: 3/11/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				Dark Gray FLYASH, FILL				
	0 2 7	13/18				0.9 Qp	29	
	2 2 8	10/18		-trace Bottom Ash 3.0 to 5.5 Feet		1.2 Qp	43	
	6 10 12	15/18		-with Bottom Ash 5.5 to 8.0 feet		1.0 Qp	17	
	1 1 1	17/18					60	
	0 1 1	16/18					56	
			CL	Dark Gray-Brown Silty CLAY, Possible FILL				
	2 3 4	16/18				1.6 Qp	27	
				TD - 20.0 Feet				

Notes:

GROUNDWATER

∇ First Observed During Drilling - 8.5 Feet
▼ At Completion - Dry

Piezometer Installed: No

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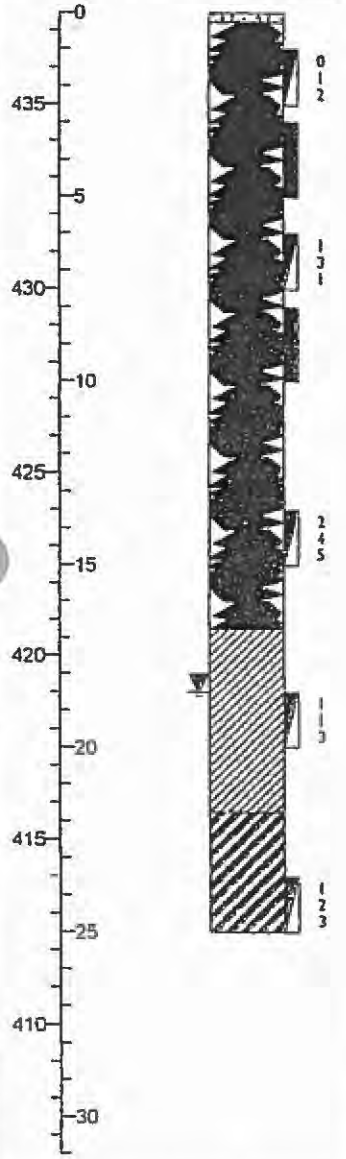
Illinois (618) 398-1414

LOG OF BORING B - 22

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 437.5 Feet (Approximate)

Date Drilled: 3/11/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				TOPSOIL				
	0 1 2	10/18		Very Dark Gray FLYASH, FILL -trace Bottom Ash to 5.5 Feet		2.1 Qp	42	
		24/24			70	1.2 Qp	36	
	1 3 1	8/18		-Dark Gray, with Boiler Slag 5.5 to 8.0 Feet		0.8 Qp	18	
		24/24		-Gray below 8.0 Feet	60		58	
	2 4 5	18/18				1.2 Qp	24	
			CL	Dark Gray-Brown Silty CLAY				
	1 1 3	18/18				1.9 Qp	28	
			CH	Gray-Brown CLAY				
	1 2 3	18/18				1.8 Qp	46	
				TD - 25.0 Feet				

Notes:

GROUNDWATER

- ⊽ First Observed During Drilling - Dry
- ⊻ At Completion - 18.5 Feet

Piezometer Installed: No

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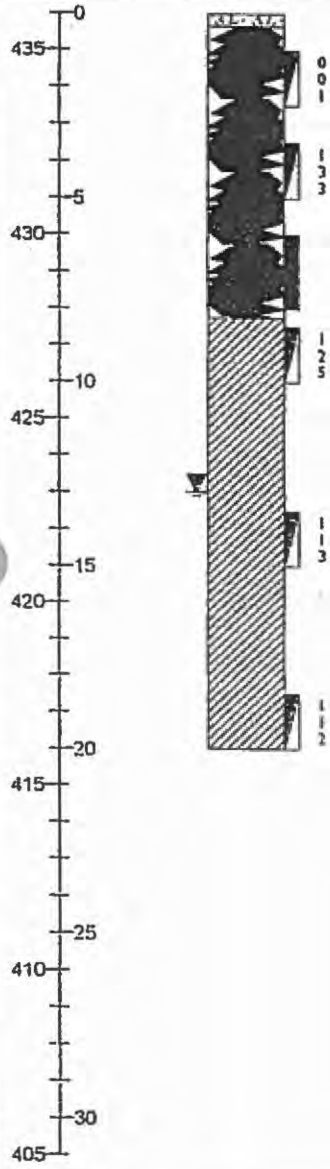
LOG OF BORING B - 23

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 436 Feet (Approximate)

Date Drilled: 3/11/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				TOPSOIL				
				Gray FLYASH, FILL				
	0 0 1	14/18					45	
	1 3 3	11/18					48	
		23/24			63		46	
	1 2 5	15/18	CL	Dark Gray-Brown Silty CLAY		1.4 Qp	22	
	1 1 3	18/18				0.5 Qp	27	
	1 1 2	17/18					25	
				TD - 20.0 Feet				

Notes:

GROUNDWATER

▽ First Observed During Drilling - Dry
▼ At Completion - 13.0 Feet

Piezometer Installed: No

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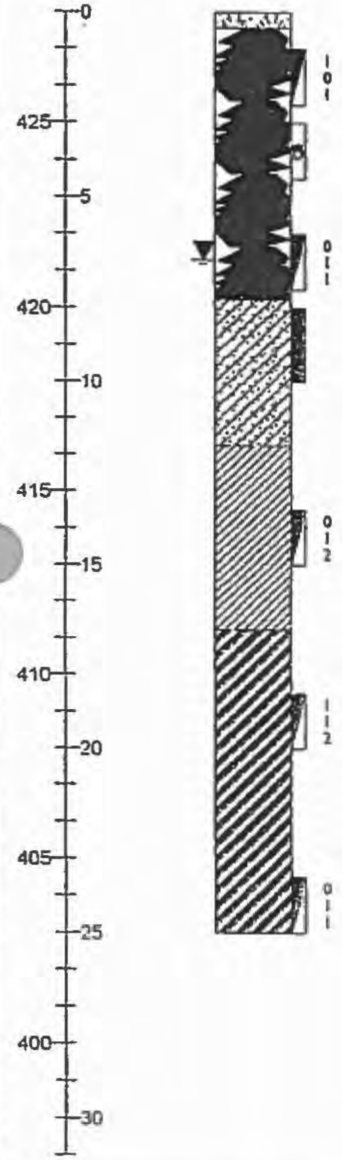
Illinois (618) 398-1414

LOG OF BORING B - 24

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 428 Feet (Approximate)

Date Drilled: 3/11/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella

Elevation/ Depth (feet) — Graphic Log Sampler Symbols and SPT Blows



Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
		TOPSOIL				
14/18		Dark Gray FLYASH, FILL			58	
7/18		-trace Bottom Ash 3.0 to 5.5 Feet			36	No Recovery in Shelby Tube, Pushed Split-Spoon Sampler
12/18		-with Bottom Ash below 5.5 Feet			25	
24/24	SC	Dark Gray-Brown Fine SAND, with Clay	108	0.5 Qp	25	CU
16/18	CL	Dark Gray-Brown Silty CLAY			29	
15/18	CH	Dark Gray CLAY		0.8 Qp	47	
18/18					51	
		TD - 25.0 Feet				

Notes:

GROUNDWATER
∇ First Observed During Drilling - Dry
▼ At Completion - 6.7 Feet

Piezometer Installed: No

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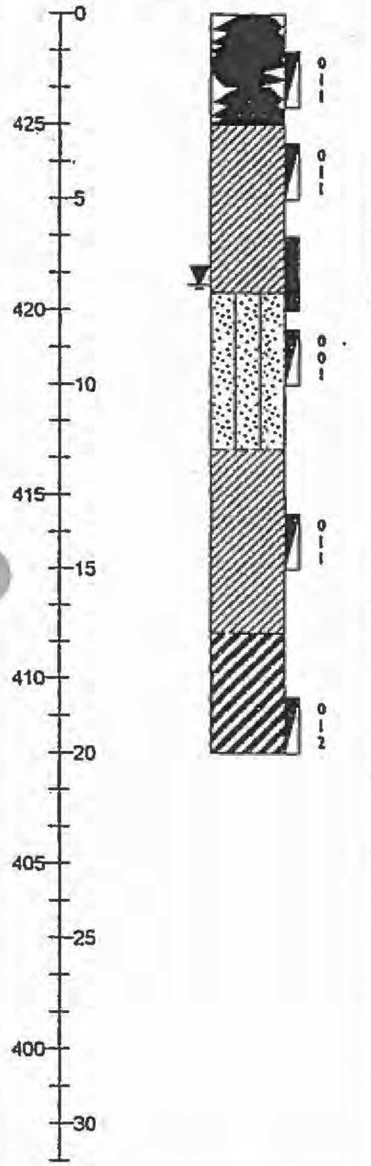
LOG OF BORING B - 25

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 428 Feet (Approximate)

Date Drilled: 3/11/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
	0-1-1	9/18		Dark Gray FLYASH, trace Bottom Ash, FILL		0.2 Qp	46	
	0-1-1	16/18	CL	Dark Brown Silty CLAY, with Sand			25	
		24/24			110	0.4 Qp	22	
	0-0-1	17/18	SM	Gray-Brown Silty SAND			30	
	0-1-1	16/18	CL	Dark Gray Silty CLAY, with Sand		0.2 Qp	28	
	0-1-2	17/18	CH	Dark Gray-Brown CLAY			51	
				TD - 20.0 Feet				

Notes:

GROUNDWATER

∇ First Observed During Drilling - Dry
▼ At Completion - 7.3 Feet

Piezometer Installed: No

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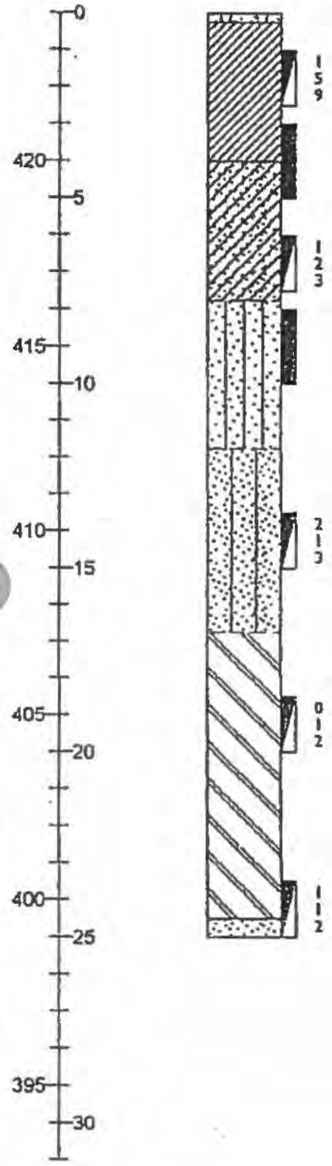
LOG OF BORING B - 26

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 424 Feet (Approximate)

Date Drilled: 3/13/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
		TOPSOIL				
11/18	CL	Dark Brown Silty CLAY -with Roots to 3.0 Feet		0.75 Qp	18	
		-with Sand below 3.0 Feet				
14/24	SC	Dark Brown Clayey SAND	98	1.0 Qp	24	
12/18				1.0 Qp	17	
23/24	ML	Gray-Brown SILT, with Clay, Sand	95	0.9 Qp	24	
	SM	Gray SAND, with Silt				
9/18					28	
	CL-CH	Dark Gray Silty CLAY				
16/18					35	
12/18					34	
	SP	Gray Fine SAND TD - 25.0 Feet				

Notes:

GROUNDWATER

⊻ First Observed During Drilling - Dry
⊻ At Completion - Dry

Piezometer Installed: No

Shively
Geotechnical, Inc.

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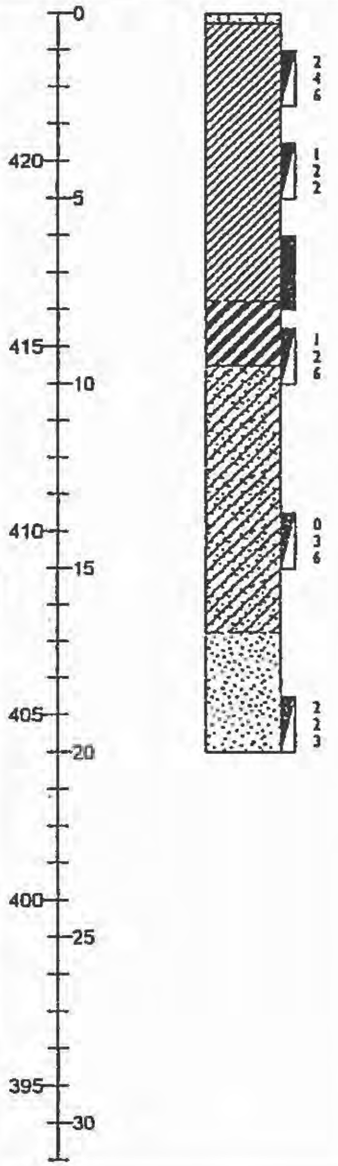
Illinois (618) 398-1414

LOG OF BORING B - 27

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 424 Feet (Approximate)

Date Drilled: 3/13/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
				TOPSOIL				
	2 4 6	14/18	CL	Dark Gray Brown Silty CLAY		3.8 Qp	19	
	1 2 2	13/18		-Dark Brown, trace Sand 3.0 to 5.5 Feet			25	
				-Gray-Brown below 5.5 Feet				
		21/24			96	1.2 Qp	25	
			CH	Gray-Brown CLAY				
	1 2 6	15/18				1.2 Qp	29	
			SC	Gray-Brown Fine SAND, with Clay				
	0 3 6	13/18				0.75 Qp	25	
			SP	Gray-Brown Fine SAND				
	2 2 3	14/18					3	
				TD - 20.0 Feet				

Notes:

GROUNDWATER

∇ First Observed During Drilling - Dry
▼ At Completion - Dry

Piezometer Installed: No

Shively
Geotechnical, Inc.

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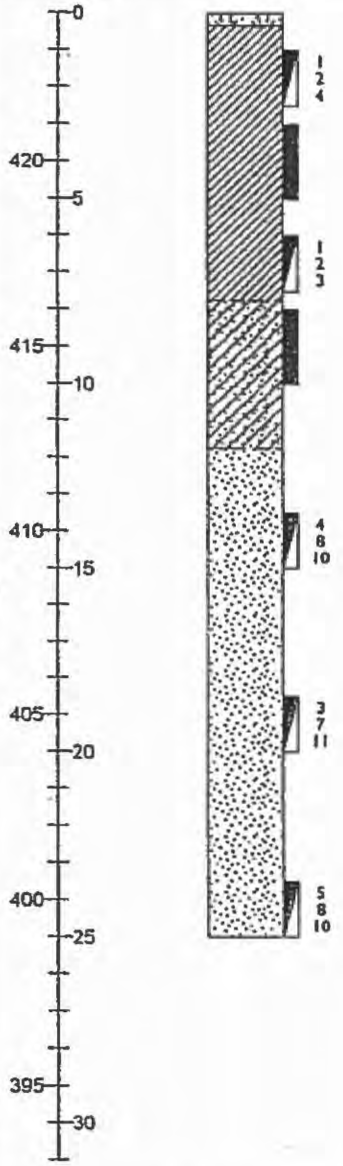
LOG OF BORING B - 28

Project Name: Dynegy Rail Loop
Project Location: Wood River, Illinois
Project Number: SG9-2554
Elevation: 424 Feet (Approximate)

Date Drilled: 3/13/03
Drilling Contractor: Meyer Drilling, Inc.
Drilling Method: Hollow Stem Auger
Logged By: Meyer/Kinsella



Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
			TOPSOIL				
		CL	Dark Brown Silty CLAY				
1 2 4	17/18				0.75 Qp	26	
	15/24		-Dark Gray-Brown below 3.0 Feet	98	0.75 Qp	24	
1 2 3	18/18				1.2 Qp	26	
	18/24	SC	Gray-Brown Clayey SAND	103	0.5 Qp	17	
		SP	Gray-Brown Fine SAND				
4 8 10	16/18					3	
3 7 11	18/18					4	
			-Fine to Medium Grained below 22.0 Feet				
5 8 10	17/18					14	
			TD - 25.0 Feet				

Notes:

GROUNDWATER
▽ First Observed During Drilling - Dry
▼ At Completion - Dry

Piezometer Installed: No

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KEY TO SYMBOLS

Strata Symbols

- ░ Base Rock
- ▦ Fill
- ▨ USCS Low Plasticity Silty Clay
- ▨ USCS High Plasticity Clay
- ░ USCS Poorly-graded Sand
- ░ Topsoil
- ▥ USCS Silty Sand
- ▧ USCS Low to High Plasticity Clay
- ■ Flyash
- ■ Bottom Ash and/or Boiler Slag
- ▦ USCS Low Plasticity Clayey Silt
- ▨ USCS Low Plasticity Sandy Clay
- ▨ USCS Clayey Sand
- ▥ USCS Sandy Silt

Soil Samplers

- ◩ Split Spoon
- ■ Shelby Tube
- ✋ Grab Sample

DD - Dry Density
Qp - Pocket Penetrometer
USCS - Unified Soil Classification System
USC - Unconfined Compressive Strength
MC - Moisture Content
LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index
HYD - Hydromter Test Performed
CU - Consolidated Undrained Triaxial Test Performed
G_s - Specific Gravity
NSD - Non-supplied Data

GENERAL NOTES

The number of borings is based on topographic and geologic factors: the magnitude of loading; the size, shape, and value of the structure; consequences of failure; and other factors. The type and sequence of sampling is selected to reduce the possibility of undiscovered anomalies and increase drilling efficiency. Attempts are made to detect and/or identify occurrences during drilling and sampling such as encounter of water, boulders, gas, zones of lost circulation, relative ease or resistance of drilling progress, unusual sample recovery, variation in driving resistance, unusual odors, etc. However, lack of mention of such variations does not preclude their presence.

Although attempts are made to obtain stabilized groundwater levels, the levels shown on the Boring Logs may not have stabilized, particularly in more permeable cohesive soils. Consequently, the indicated groundwater levels may not represent present or future levels. Groundwater levels may vary significantly over time due to the effects of precipitation, infiltration, or other factors not evident at the times indicated.

Unless otherwise noted, soil classifications indicated on the Boring logs are based on visual observations and are not the result of classification tests. Although visual classifications are performed by experienced technicians or engineers, classifications so made may not be conclusive.

Generally, variations in texture less than one foot in thickness will be described as seams while thicker strata will be logged as individual strata. However, minor anomalies and changes of questionable lateral extent may appear only in the verbal description. The lines indicating changes in strata on the Boring Logs are approximate boundaries only as the actual material change may be between samples or may be a gradual transition. Changes in materials observed by field or laboratory personnel are indicated by solid single lines whereas estimated material changes between recovered samples are indicated by double solid lines.

Samples chosen for laboratory testing are selected in such a manner so as to determine selected physical characteristics of each material encountered. However, as samples are recovered only intermittently and only representative samples are tested, the results of such tests may not conclusively represent the characteristics of all subsurface materials present.

NOTATIONS USED ON BORING LOGS

Approximate Proportions

Trace	<15%
With	15-29%
Modifier	>30%

Clay or clayey may be used as a major material or modifier, regardless of relative proportion, if the clay content is sufficient to dominate the soil properties.

	Particle Size
Boulders	>12 inches
Cobbles	12 Inches - 3 Inches
Gravel	
Coarse	3 Inches - 3/4 Inch
Fine	3/4 Inch - No. 4 Sieve (4.75mm)
Sand	
Coarse	No. 4 - No. 10 Sieve (2.00mm)
Medium	No. 10 - No. 40 Sieve (0.42mm)
Fine	No. 40 - No. 200 Sieve (0.074mm)
Silt	No. 200 Sieve - 0.005 mm
Clay	<0.005 mm

SPT Blow Count

Number of impacts of a 140 pound hammer falling a distance of 30 inches to cause a standard split-barrel sampler, 1 3/8 inches I.D., to penetrate a distance of 6 inches. The number impacts for the first 6 inches of penetration is known as the seating drive. The sum of the impacts for the last 12 inches of penetration is the Standard Penetration Test Resistance or "N" value. For example, if Blows = 6-8-11, then "N" = 8+11 or 19.

Other Notations

50/3 - impacts to cause sampler to penetrate the indicated number of inches, 50 blows for 3 inches in this case
WR - Sampler penetrated under the static loading of the weight of the drill rod
WH - Sampler Penetrated under the static loading of the weight of the hammer and drill rod
X - No Blow Count

Laboratory Test Symbols

QP - Calibrated Penetrometer
QU - Unconfined Compressive Strength
LL - Liquid Limit
PL - Plastic Limit
MC - Natural Moisture Content

NOTATIONS USED ON BORING LOGS, (Cont.)

Drilling, Sampling, & Groundwater Level Symbols

AR - Auger Refusal
AS - Auger Sample
BS - Bag or Bulk Sample
DB - Drag Bit
DCI - Dry Cave-In
FA - Flight Auger
LS - Large 2 1/2 Inches Dia. Split-Barrel Sample
NC - NX Conventional Rock Core
NW - NX Wireline Rock Core
RB - Rotary Rock Bit
SR - Split-Barrel Refusal
SS - Standard 1 3/8 Inches Dia. Split-Barrel Sample
TOB - Termination of Boring
3T - Thin-Walled Tube Sample, 3 Inches Diameter
TR - Thin-Walled Tube Refusal
WB - Wash Bore
WCI - Wet Cave-In
WS - Wash Sample

Description Abbreviations

App - Apparent
Bk - Black
Bld - Boulder(s)
Br - Brown, Brownish
Calc - Calcareous
Cbl - Cobble(s)
Cl - Clay, Clayey
Co - Coarse
Conc - Concretion(s)
Dk - Dark
Fi - Fine
Frac - Fractured
Frag - Fragment(s)
Gr - Gray, Grayish
Grv - Gravel, Gravelly
Inb - Interbedded
Jt - Joint(s)
Lig - Lignite
Ls - Limestone
Lt - Light
Med - Medium
Mot - Mottled
Org - Organic(s)
Oxi - Oxidation, Oxidized
Pkt - Pocket(s)
Pt - Peat, Peaty
Rd - Red, Reddish
Rt - Root(s)
Sa - Sand, Sandy
Sh - Shale, Shaley
Si - Silt, Silty
Slk - Slickensided, Slickensides
Sm - Seam(s)
Sp - Spot(s)
Stn - Stain(s)
Stk - Streak(s)
Tr - Trace
v - Very
w/ - With
Yel - Yellow, Yellowish

Unified Soil Classification System

Coarse-Grained Soils

GW - Well-graded gravels, gravel-sand mixtures, little or no fines
GP - Poorly graded gravels, gravel-sand mixtures, little or no fines
GM - Silty gravels, gravel-sand-silt mixtures
GC - Clayey gravels, gravel-sand-clay mixtures
SW - Well-graded sands, gravelly sands, little or no fines
SP - Poorly graded sands, gravelly sands, little or no fines
SM - Silty sands, sand-silt mixtures
SC - Clayey sands, sand-clay mixtures

Fine-Grained Soils

ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity
CL - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
OL - Organic silts and organic silty clays of low plasticity
MH - Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
CH - Inorganic clays of high plasticity, fat clays
OH - Organic clays of medium to high plasticity, organic silts
PT - Peat and other highly organic soils

The following are attachments to the testimony of Scott M. Payne, PhD, PG and Ian Magruder, M.S..

B-5: URS Corporation: 2004 Boring Logs for New East Ash Pond Design

Figure No.

LOG of BORING No. B-5-04-1

Sheet 1 of 3

DATE 6/7/04 SURFACE ELEVATION, FT 436.0 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
0				Grass and organic soil	435.8									Boring advanced using 4.25" I.D. Hollow stem augers
	▨	3 3 5	89	Loose, moist, dark gray, fly ash FILL with gray silty clay	0.3									
	▨	4 4 3	100	Becomes moist to wet										
5														
	▨	WH WH WH	100	Becomes very loose and wet ▽										
	▤	P	17											
10														Begin Mud Rotary drilling
	▨	WH WH WH	50											
15				Becomes very soft to very loose										
					419.0									
				Medium stiff, wet, gray, low plastic sandy silty CLAY (CL-ML)	17.0									
	▨	WH 1 2	100				1.3			23				
20														
														Drillers accidentally put a spiltspoon on rods

Completion Depth: 65.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: 6 ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Logged by: G. Jones

URS

Figure No.

LOG of BORING No. B-5-04-1

Sheet 2 of 3

DATE 6/7/04 SURFACE ELEVATION, FT 436.0 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
25														
		P	100	Becomes soft to medium stiff, tan/gray, sand grades out			0.8							
					408.0									
		WH WH 1	100	Medium stiff, wet, tan/gray, high plastic, Silty CLAY (CH)	28.0		1.8			36	79	25		
30														
		P	100				1.5							
35														Losing mud in hole: approximately 20 gallons
					398.0									
				Very soft, wet, gray, low plastic sandy CLAY (CL)	38.0									
		5 6 7	100		397.0									
				Medium dense, wet, gray, fine grained SAND (SP)	39.0									
40														
		11 16 13	83	Becomes medium grained						21				
45														
					389.0									
				Medium dense, wet, gray, fine grained silty SAND (SP-SM)	47.0									
		6 12 13	83											

Completion Depth: 65.0 Ft.

Water Depth: 6 ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

Figure No.

LOG of BORING No. B-5-04-1

Sheet 3 of 3

DATE 6/7/04 SURFACE ELEVATION, FT 436.0 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
50														
				Medium dense, wet, gray, fine to medium grained SAND (SP)	384.0 52.0									
	▨	10 11 10	72											
55														
	▨	3 4 5	100	Becomes loose										
60														
				Medium dense, wet, gray, well graded SAND (SW)	373.0 63.0									
	▨	12 13 15	56											
65				Bottom of boring at 65'	371.0 65.0									Approximately 30 to 40 gallons of mud lost
70														

Completion Depth: 65.0 Ft.

Water Depth: 6 ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

URS

Figure No.

LOG of BORING No. B-5-04-2

Sheet 1 of 3

DATE 6/1/04 SURFACE ELEVATION, FT 436.0 DATUM NGVD LOCATION See Figure 1

DEPTH, ft	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
0				Medium dense, moist, dark gray, fly ash FILL										Boring advanced using 4.25" I.D. Hollow stem augers
		3 6 6	67											
		P	100				2.0							
5														
		1 WH WH	100	Soft, moist, gray, low plastic clayey SILT to silty CLAY (CL-ML)	429.5 6.5		0.8							
		1 WH WH	0											
10														Begin Mud Rotary drilling
		1 WH WH	67	Becomes very soft, plasticity increases			0.5							
15														
		P	100				0.5			29 28 27 27 25	28	15	1.2	
20														
				Medium stiff, wet, gray, low plastic, clayey sandy SILT (ML) with some soft seams	414.0 22.0									
		1 1 WH	100				1.0							

Completion Depth: 60.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: N/A ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Logged by: G. Jones

URS

Figure No.

LOG of BORING No. B-5-04-2

Sheet 2 of 3

DATE 6/1/04 SURFACE ELEVATION, FT 436.0 DATUM NGVD LOCATION See Figure 1

DEPTH, ft	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
25														
		WH WH WH	100	Becomes very soft Becomes medium stiff, plasticity increases, sand grades out			0.5 0.75							
30														
				Stiff, moist to wet, gray, high plastic, Silty CLAY (CH)	404.5 31.5									
		P	100				1.3			56 39 43 56	84	19	1.3	
35														
				Becomes moist, silt grades out										
		WH WH WH	100				1.0							
40														
		WH WH WH	100				1.3							
45														
		WH WH WH	100				1.3			55	74	26		

Completion Depth: 60.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: N/A ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Logged by: G. Jones

Figure No.

LOG of BORING No. B-5-04-2

Sheet 3 of 3

DATE 6/1/04 SURFACE ELEVATION, FT 436.0 DATUM NGVD LOCATION See Figure 1

DEPTH, ft	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
50						▨								
	▥	WH WH 1	100	Becomes low plastic		▨	1.8							
55						▨								
	▥	WOH 2 7	100		376.2	▨	1.8							
60				Medium dense, wet, gray, fine grained SAND (SP)	59.8 376.0 60.0									Approximately 5 gallons of mud lost
				Bottom of boring at 60'										
65														
70														

Completion Depth: 60.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: N/A ft., After ATD hrs.

____ ft., After ____ hrs.

____ ft., After ____ hrs.

Logged by: G. Jones

Figure No.

LOG of BORING No. B-5-04-3

Sheet 1 of 3

DATE 6/4/04 SURFACE ELEVATION, FT 435.6 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
0				Grass and organic soil	435.4									
		1 1 1	100	Very loose, dry to moist, gray, fly ash FILL	0.3									Boring advanced using 4.25" I.D. Hollow stem augers
		WH WH 1	44	Becomes moist to wet										
5														
		WH 1 1	89	Becomes wet ∇										
		1 1 1	100											
10														Begin Mud Rotary drilling
		WH 2 1	100											
15				Stiff, moist, brown / gray, low plastic sandy silty CLAY (CL)	420.6 15.0									
		P	100				1.8							
20														
		P	100											
		WH 1 2	100	Becomes wet, brown/tan, low to medium plastic, sand grades out			1.5							

Completion Depth: 60.0 Ft.

Water Depth: 6 ft., After ATD hrs.

Project No.: 21561435.00000

ft., After hrs.

Project Name: Dynegy Wood River

ft., After hrs.

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

8/10/04 WCCXS 21561435 DYNEGY.GPJ

URS

Figure No.

LOG of BORING No. B-5-04-3

Sheet 2 of 3

DATE 6/4/04 SURFACE ELEVATION, FT 435.6 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
25	▥	P	100			▨	1.5							Environmental Sample Shelby Tube
	▥	P	100	Becomes medium stiff to stiff		▨	1.0							
30	▥					▨				52 33 35 38	40	16	1.3	
35	▨	WH WH WH	100	Becomes stiff, low plastic		▨	1.3							
				Medium dense loose, wet, gray, fine grained silty SAND (SP / SM)	398.6 37.0									
40	▨	4 6 5	94							35				
				Dense, wet, gray, medium grained SAND (SP)	392.6 43.0									
45	▨	10 15 17	89											
	▨	6 9 17	67	Becomes medium to coarse grained										

Completion Depth: 60.0 Ft.

Water Depth: 6 ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

8/10/04 WCCXS 21561435 DYNEGY.GPJ

URS

Figure No.

LOG of BORING No. B-5-04-3

Sheet 3 of 3

DATE 6/4/04 SURFACE ELEVATION, FT 435.6 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
50														
				Dense, wet, gray, well graded SAND (SW)	383.6 52.0									
	▨	12 15 17	67											
55														
				Medium dense, wet, gray, fine grained SAND (SP)	378.6 57.0									
	▨	9 11 14	67											
60				Bottom of boring at 60'	375.6 60.0									Approximately 25 gallons of mud lost
65														
70														

Completion Depth: 60.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: 6 ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Logged by: G. Jones

Figure No.

LOG of BORING No. B-5-04-4

Sheet 1 of 3

DATE 6/7/04 SURFACE ELEVATION, FT 446.1 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
0				Medium dense, moist, gray, fly ash FILL										Boring advanced using 4.25" I.D. Hollow stem augers
	▨	3 7 6	100											
	▨	2 3 6	83	Becomes loose										
5														
	▨	1 1 4	100	Becomes moist to wet										
	▨	3 2 1	100	Becomes wet ∇										
10														Begin Mud Rotary drilling
	▨	WH 1 WH	100											
15														
	▥	P	75							50 49 54 59			1.2 2.0	
20														
	▨	WR	100	Becomes very soft, with some coal fragments										

Completion Depth: 65.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: 9.5 ft., After ATD hrs.

____ ft., After ____ hrs.

____ ft., After ____ hrs.

Logged by: G. Jones

Figure No.

LOG of BORING No. B-5-04-4

Sheet 2 of 3

DATE 6/7/04 SURFACE ELEVATION, FT 446.1 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
25														
				Very stiff, wet, gray / tan, low plastic sandy silty CLAY (CL)	419.1 27.0									
		1 4 5	100				3.5			20	28	19		
30														
		P	0											
35														
		1 1 1		Becomes moist, sand grades out			2.0							
40														
		P	100											
45				Loose to medium dense, wet, brown, fine grained silty SAND (SM)	401.1 45.0									
		5 4 12	72	Becomes medium dense, fine to medium grained										

Completion Depth: 65.0 Ft.

Water Depth: 9.5 ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

Figure No.

LOG of BORING No. B-5-04-4

Sheet 3 of 3

DATE 6/7/04 SURFACE ELEVATION, FT 446.1 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
50														
	▨	11 15 12	89											
55														
	▨	6 6 5	56											
60														
					383.1									
	▨	9 11 30		Dense, wet, fine to coarse grained silty SAND (SW) with some soft, gray silty clay seams	63.0									
65					381.1									
				Bottom of boring at 65'	65.0									Approximately 10 gallons of mud lost
70														

Completion Depth: 65.0 Ft.

Water Depth: 9.5 ft., After ATD hrs.

Project No.: 21561435.00000

ft., After hrs.

Project Name: Dynegy Wood River

ft., After hrs.

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

URS

LOG of BORING No. B-5-04-5

Sheet 1 of 3

DATE 6/8/04 SURFACE ELEVATION, FT 443.9 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
0				Grass and organic soil	443.7									
				Loose, moist, gray, fly ash FILL	0.3									Boring advanced using 4.25" I.D. Hollow stem augers
		2 3 3	100											
		2 3 2	89											Rods are wet
5				∇										
		P	71											
										17 33				
		1 3 8	94	Becomes medium dense										
10														Begin Mud Rotary drilling
		5 3 2	78	Becomes soft and wet										
15														
		1 2 3	94											
20														
		1 WH WH	100											

Completion Depth: 70.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: 5 ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Logged by: G. Jones

Figure No.

LOG of BORING No. B-5-04-5

Sheet 2 of 3

DATE 6/8/04 SURFACE ELEVATION, FT 443.9 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
25														
				Very stiff, moist, brown / gray, low plastic sandy silty CLAY (CL)	416.9 27.0									
		3 2 3	100				2.5			27				
30														
		P	0											
35														
				Loose, wet, brown, fine grained silty SAND (SM)	405.9 38.0									
		4 3 4	83											
				Very stiff, moist, brown, low to medium plastic sandy silty CLAY (CL)	404.9 39.0									
40				Loose, wet, brown, fine grained silty SAND (SM)	404.2 39.8									
		8 11 12	56	Becomes medium dense, fine to medium grained						26				
45														
				Medium dense, wet, fine to coarse grained SAND (SW)	396.9 47.0									
		7 9 14	72											

Completion Depth: 70.0 Ft.

Water Depth: 5 ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

URS

Figure No.

LOG of BORING No. B-5-04-5

Sheet 3 of 3

DATE 6/8/04 SURFACE ELEVATION, FT 443.9 DATUM NGVD LOCATION See Figure 1

DEPTH, ft	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
50														
				Medium dense, wet, gray, fine to medium grained silty SAND (SM)	391.9 52.0									
	▨	9 10 11	89											
55														
	▨	7 8 12	50	Becomes fine grained										
60														
	▨	16 19 16	67	Becomes dense, fine to medium grained										
65														
				Dense, wet, fine to coarse grained silty SAND (SW)	376.9 67.0									
	▨	15 20 17	61											
70				Bottom of boring at 70'	373.9 70.0									Approximately 70 gallons of mud lost

Completion Depth: 70.0 Ft.

Water Depth: 5 ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

LOG of BORING No. B-5-04-6

Sheet 1 of 3

DATE 6/2/04 SURFACE ELEVATION, FT 441.6 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
0				Loose, moist, gray, fly ash FILL										Boring advanced using 4.25" I.D. Hollow stem augers
		1 5 5	100											
5		1 7 6	100											
		1 1 WH	100	Becomes wet										
10		P	71							40 38 41 37				Begin Mud Rotary drilling
15		WH WH 1	100											Rods are grinding
20		1 WH 3	89											
					418.6									
		1 2 3		Very stiff, moist, brown / tan, medium plastic silty CLAY (CL)	23.0		2.3			26	36	17		

Completion Depth: 60.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: ___ ft., After ___ hrs.

___ ft., After ___ hrs.

___ ft., After ___ hrs.

Logged by: G. Jones

URS

Figure No.

LOG of BORING No. B-5-04-6

Sheet 2 of 3

DATE 6/2/04 SURFACE ELEVATION, FT 441.6 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
25		P	92											
				Medium, wet, tan / gray, fine grained silty SAND (SM)	414.6 27.0									
		5 7 5	100											
30														
				Soft to medium stiff, wet, tan / brown, silty CLAY (CH)	409.6 32.0									
		WH WH 3	100				0.5			39	57	15		
35														
		P	67											
40				Medium dense, wet, tan, fine grained silty SAND (SM)	401.6 40.0									
		15 8 18	94											
45														
				Medium dense, tan wet, well graded SAND (SW)	394.6 47.0									
		11 6 11	67											

Completion Depth: 60.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: ____ ft., After ____ hrs.

____ ft., After ____ hrs.

____ ft., After ____ hrs.

Logged by: G. Jones

URS

Figure No.

LOG of BORING No. B-5-04-6

Sheet 3 of 3

DATE 6/2/04 SURFACE ELEVATION, FT 441.6 DATUM NGVD LOCATION See Figure 1

DEPTH, ft	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
50														
	▨	8 7 7	56	Becomes gray										
55														
				Medium dense, wet, gray, coarse grained SAND (SP)	384.6 57.0									
	▨	12 12 13	50											
60				Bottom of boring at 60'	381.6 60.0									Approximately 50 to 60 gallons of mud lost
65														
70														

Completion Depth: 60.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: ____ ft., After ____ hrs.

____ ft., After ____ hrs.

____ ft., After ____ hrs.

Logged by: G. Jones

URS

Figure No.

LOG of BORING No. B-5-04-7

Sheet 1 of 3

DATE 6/1/04 SURFACE ELEVATION, FT 439.9 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
0				Soft, moist, dark gray, fly ash FILL										Boring advanced using 4.25" I.D. Hollow stem augers
		2 1 1	89											
		2 1 2	100	Becomes loose, black and gray bottom ash and fly ash FILL										
5														
		P	100							18 14 32 17			0.3 1.4	
		4 7 9	72	Becomes medium dense, bottom ash grades out										
10														
				With same bottom ash	429.4 10.5									
		7 11 9	72											
		4 8 13	89	Hard, dry, brown, low plastic, sandy Silty CLAY (CL)	425.9 14.0		>4.5							
15														Begin Mud Rotary drilling
		2 4 6	78	Becomes moist										
20														
				Very stiff, moist, gray, high plastic CLAY (CH)	417.9 22.0									
		P	100				2.5			25 26				

Completion Depth: 60.0 Ft.

Water Depth: N/A ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

URS

Figure No.

LOG of BORING No. B-5-04-7

Sheet 2 of 3

DATE 6/1/04 SURFACE ELEVATION, FT 439.9 DATUM NGVD LOCATION See Figure 1

DEPTH, ft	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
25										37 38	90	20	1.7	
				Loose, moist, brown and tan, fine grained silty SAND (SM)	412.9 27.0									
		2 2 3	83											
30														Stop drilling (6/1/04) Resume drilling (6/2/04)
				Stiff, wet, brown, medium plastic sandy silty CLAY (CL)	407.9 32.0									
		WH 2 2	83				1.5							
35														
		P	0											
40														
				Dense, wet, brown, fine grained silty SAND (SM) with gravel fragments	397.9 42.0									
		11 17 16	89											
45														
				Dense, wet, brown, well graded SAND (SW) with gravel fragments	392.9 47.0									
		13 18 13	94											

Completion Depth: 60.0 Ft.
Water Depth: N/A ft., After ATD hrs.
Project No.: 21561435.00000
ft., After hrs.
Project Name: Dynegy Wood River
ft., After hrs.
Drilling Contractor: Harriss Drilling Co.
Logged by: G. Jones

URS

Figure No.

LOG of BORING No. B-5-04-7

Sheet 3 of 3

DATE 6/1/04 SURFACE ELEVATION, FT 439.9 DATUM NGVD LOCATION See Figure 1

DEPTH, ft	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
50														
	▨	6 8 9	56	Becomes medium dense, gravel grades out										
55														
	▨	5 11 18	67											
				Medium dense, wet, gray, coarse grained SAND (SP)	380.4 59.5									
60				Bottom of boring at 60'	379.9 60.0									Approximately 50 gallons of mud lost
65														
70														

Completion Depth: 60.0 Ft.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Water Depth: N/A ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Logged by: G. Jones

URS

Figure No.

LOG of BORING No. B-5-04-8

Sheet 1 of 3

DATE 6/3/04 SURFACE ELEVATION, FT 441.5 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
0				Medium dense, moist, gray, fly ash FILL										Boring advanced using 4.25" I.D. Hollow stem augers
	▨	3 7 9	100											
	▨	2 3 2	100	Becomes loose										
5														
	▨	1 1 WH	100	Becomes very loose										
	▨	WH WH 1	100	Becomes wet ∇										
10														Begin Mud Rotary drilling
	▥	P	75							59 60 53 59			1.5 1.4 3.1	
15														
	▨	1 WH 1	100											
20														
					418.5									
	▨	1 1 2	100	Very stiff, wet, gray, medium plastic silty CLAY (CL)	23.0									

Completion Depth: 60.0 Ft.

Water Depth: 9 ft, After ATD hrs.

ft, After hrs.

ft, After hrs.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

8/10/04 WCCXS 21561435 DYNEGY.GPJ

URS

Figure No.

LOG of BORING No. B-5-04-8

Sheet 2 of 3

DATE 6/3/04 SURFACE ELEVATION, FT 441.5 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
25		P	100											
		WH WH WH	100	Becomes stiff, low plastic, with some sand			1.3			29				
30														
		P	100											
35														
		P	100											
				Dense, moist to wet, brown, fine grained silty SAND (SM)	404.5 37.0									
		13 15 16	100											
40														
		11 14 12	89	Becomes medium dense, wet										
45														
		10 11 11	89											

Completion Depth: 60.0 Ft.

Water Depth: 9 ft., After ATD hrs.

Project No.: 21561435.00000

ft., After hrs.

Project Name: Dynegy Wood River

ft., After hrs.

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

Figure No.

LOG of BORING No. B-5-04-8

Sheet 3 of 3

DATE 6/3/04 SURFACE ELEVATION, FT 441.5 DATUM NGVD LOCATION See Figure 1

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	RECOVERY, %	DESCRIPTION	STRATUM EL / DEPTH	SYMBOL	PP, TSF	PID, ppm	FIELD Qu, KSF	NMC, %	LL	PI	Qu, KSF	NOTES
50				Becomes gray										
					388.5									
	▨	9 15 18	61	Dense, wet, gray, fine to medium grained SAND (SP)	53.0									
55														
	▨	5 11 22	61	Becomes fine grained	381.5									
60				Bottom of boring at 60'	60.0									
65														
70														

Completion Depth: 60.0 Ft.

Water Depth: 9 ft., After ATD hrs.

ft., After hrs.

ft., After hrs.

Project No.: 21561435.00000

Project Name: Dynegy Wood River

Drilling Contractor: Harriss Drilling Co.

Logged by: G. Jones

Appendix C

Boring and Well Completion Reports: 2004 Hydrogeologic Investigation

C-1: Boring/Well Construction Logs for 2004 Hydrogeologic Investigation

C-2: IEPA Well Completion Reports

C-1: Boring/Well Construction Logs for 2004 Hydrogeologic Investigation

KELRON
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LOG OF BORING L4

(Page 1 of 1)

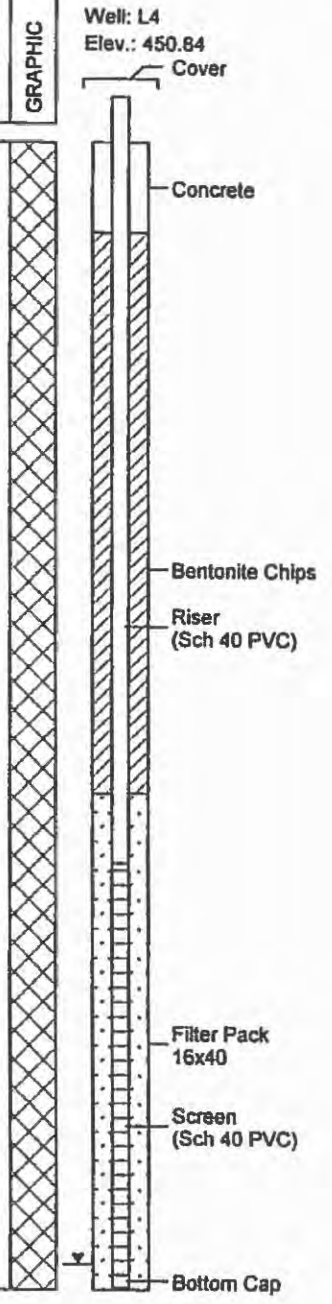
New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SE/SW/SW

Date Started/Finished : 6/25/2004
Hole Diameter : 8.5 inches
Drilling Method : Hollow-Stem
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 448.29
Top of Casing Elevation 450.84
X,Y Coordinates : 509914, 800602

Depth in Feet	DESCRIPTION	Surf. Elev. 448.29	Samples	Recovery inches	Blow Count	Qp TSF	USCS	GRAPHIC
0	FLYASH with intermittent layers of bottom ash	448						
5	SEE BORING LOG OF MONITORING WELL MW41 FOR FULL DESCRIPTION OF LITHOLOGY	443						
10		438						
15		433					FL	
20		428						
25		423						
	END BOREHOLE AT 28 FEET BLS							
30								



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Environmental

LOG OF BORING MW37

(Page 1 of 2)

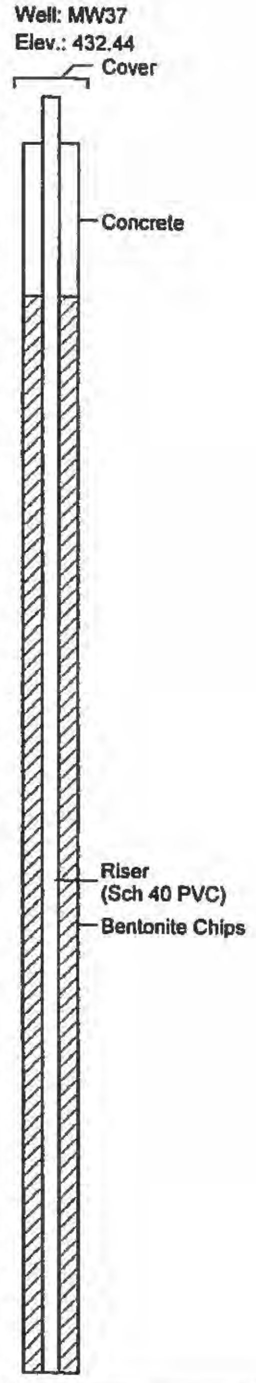
New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 NE/SW/NW

Date Started/Finished : 6/10/2004
Hole Diameter : 8.5 inches
Drilling Method : Hollow-Stem
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 429.29
Top of Casing Elevation 432.44
X,Y Coordinates : 510008, 803283

Depth in Feet	DESCRIPTION	Surf. Elev. 429.29	Samples	Recovery inches	Blow Count	Qp TSF	USCS
0	Silty CLAY, trace fine sand and gravel, roots; non-plastic, brown, moist (FILL) - brown-gray	429	1	19	1 3 5 5	2.25	CL
2	- low plasticity, mottled w/ red-brown Fe-oxidation	427	2	19	0 3 5 6	3.5	
4	- little fine sand, trace fine gravel	425	3	20	2 3 4 5	2.0	
	SAND, fine, poorly graded, light gray (FILL)						SP
6	Silty CLAY, little sand, trace gravel; low plasticity, light brown-gray (FILL) - trace wood, medium plasticity	423	4	17	1 2 4 4	1.5	CL
8	Clayey SAND with silt, fine, poorly graded; medium gray (FILL)	421	5	17	0 2 3 4	1.25	SC
10	Silty CLAY, trace fine sand and gravel; medium plasticity, tan to brown-gray (FILL)	419	6	19	1 4 8 10	3.25	CL
	SAND, trace silt and clay, fine grained, poorly graded, brown (FILL) - 1/2-inch shard of porcelain at 11.17 feet BLS						SP
12	Sandy SILT, some clay, low plasticity (FILL)	417	7	22	2 5 3 4	1.25	ML
14	Silty CLAY, little sand; low plasticity, brown-gray - medium plasticity, medium brown w/ red-brown Fe-oxidation mottling, wet - low plasticity, light gray, moist CLAY, medium to high plasticity, light brown-gray	415	8	24	0 0 2 3	0.75	CL
16							ML



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KELRON
Environmental

LOG OF BORING MW37

(Page 2 of 2)

New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 NE/SW/NW

Date Started/Finished : 6/10/2004
Hole Diameter : 8.5 inches
Drilling Method : Hollow-Stem
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 429.29
Top of Casing Elevation 432.44
X,Y Coordinates : 510008, 803263

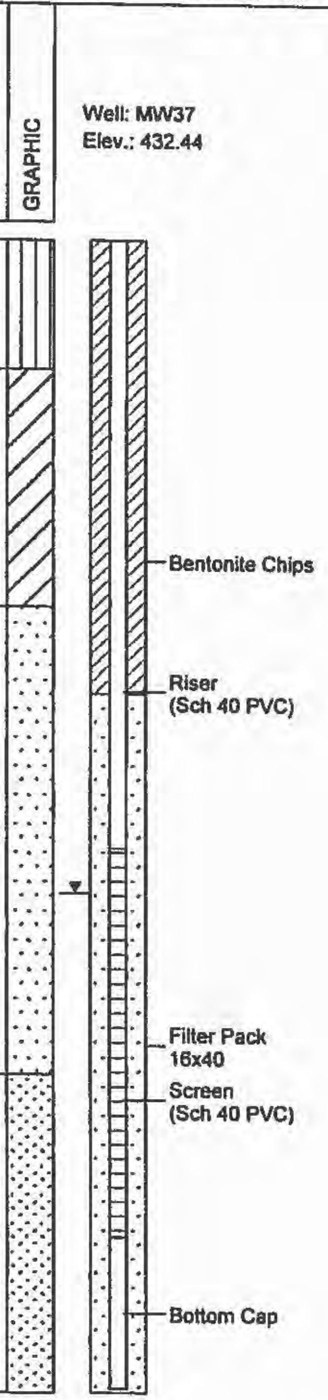
Depth in Feet: 16, 18, 20, 22, 24, 26, 28, 30, 32

Surf. Elev. 429.29: 413, 411, 409, 407, 405, 403, 401, 399

DESCRIPTION	USCS
Clayey SILT, non-plastic, light brown - little sand, medium gray, wet	ML
CLAY with silt, high plasticity, medium gray, wet - moist	CH
SAND, fine to medium, well graded, brown, wet	SW
SAND, fine, poorly graded	SP

END BOREHOLE AT 31 FEET BLS

Samples	Recovery inches	Blow Count	Qp TSF
9	20	1 1 1 1	0.75
10	24	0 0 1 2	0.75
11	18	2 4 7 8	0.75
12	19	2 3 6 7	
13	16	2 5 11 15	
14	24		
15	24	1 3 6 8	



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KELRON
Environmental

LOG OF BORING MW38

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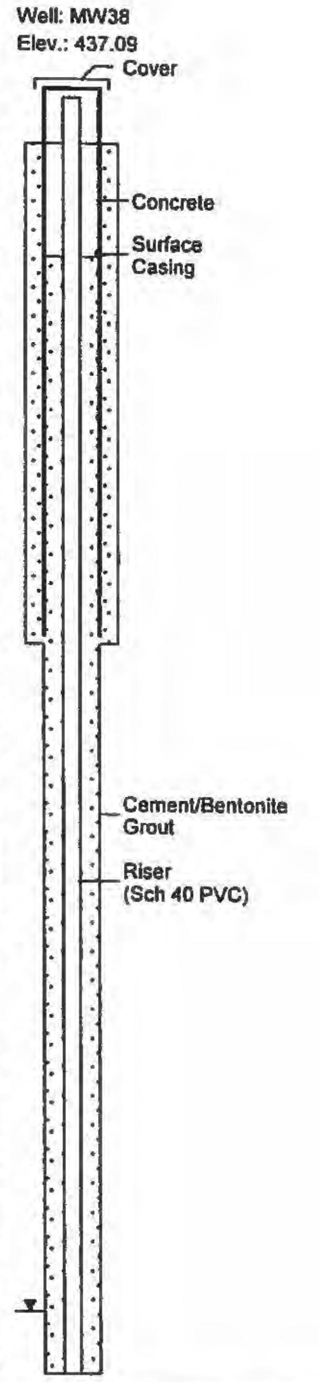
New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 NW/NE/SW

Date Started/Finished : 6/18 - 6/24/2004
Hole Diameter : 12.5 / 8.5 inches
Drilling Method : Hollow-Stem
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 434.49
Top of Casing Elevation 437.09
X,Y Coordinates : 510770, 802284

Depth in Feet	DESCRIPTION	Surf. Elev. 434.49	Samples	Recovery inches	Blow Count	Qp TSF	USCS
0	Silty CLAY, with sand, roots, brown, moist						
	FLYASH, trace coal, light gray, wet	434	1	24	2 1 1 1	0.75	FL
			2	19	2 0 0 0	<0.5	
5	Note: Surface Casing = 10.75-inch O.D. PVC installed to 10 feet below grade.	429	3	24	0 0 0 0	<0.5	
			4	18	1 0 0 0	<0.5	
	Silty CLAY, with few wood, roots, organics; low plasticity, dark gray with black mottling, wet - no roots or wood, light-medium gray, moist - trace sand and gravel, few wood, olive gray		5	24	0 3 8 8	1.75	CL
10		424					
	Silty CLAY; high plasticity, medium gray, wet		6	22	0 0 0 0	0.5	CH
15		419					
	Silty SAND, with clay, fine sand; medium brown to gray						SM
	SILT to Sandy SILT, find sand; light gray		7	24	2 2 2 2	2.0	ML
	Silty CLAY, trace fine sand; light gray w/ brown mottling						CL
20	Silty SAND, fine; poorly graded, light brown	414					SM
	SAND, fine; poorly graded, medium brown grading to medium gray		8	18	0 0 0 0	0.75	SP
							CL
25							



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KELRON
Environmental

LOG OF BORING MW38

(Page 2 of 3)

New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

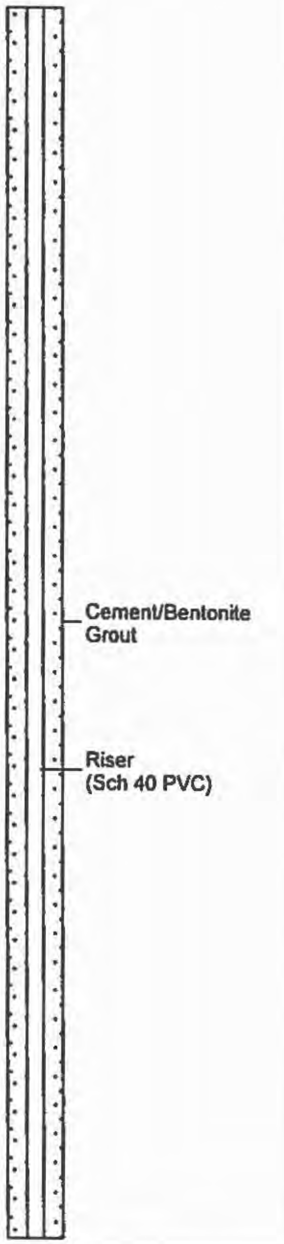
Location: Twp 5N, Rng 9W, 20 NW/NE/SW

Date Started/Finished : 6/18 - 6/24/2004
Hole Diameter : 12.5 / 8.5 inches
Drilling Method : Hollow-Stem
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 434.49
Top of Casing Elevation 437.09
X,Y Coordinates : 510770, 802284

Depth in Feet	DESCRIPTION	Surf. Elev. 434.49	Samples	Recovery inches	Blow Count	Qp TSF	USCS
25	Silty CLAY, with silt and fine sand; low to medium plasticity, medium gray, moist to wet	409					CL
	SAND, fine; poorly graded, medium gray, wet				0		SP
	CLAY, fat, high plasticity, medium gray, moist		9	21	1 2 2	1.5	
30		404					
	- olive gray - trace shells (1/2-inch intact shell at 34.58 feet)		10	24	1 2 2 3	1.0	
35		399					
	- no shells						
			11	24	0 0 0 0	1.0	CH
40		394					
			12	24	0 0 0 0	1.0	
45		389					
			13	23	0 0 0 0	1.0	
50							

Well: MW38
Elev.: 437.09



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Environmental

LOG OF BORING MW38

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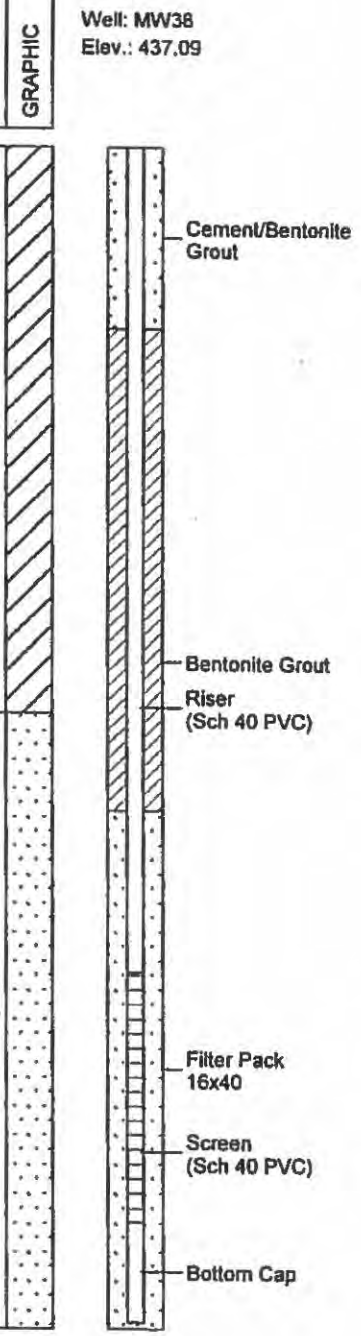
New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 NW/NE/SW

Date Started/Finished	: 6/18 - 6/24/2004
Hole Diameter	: 12.5 / 8.5 inches
Drilling Method	: Hollow-Stem
Sampling Method	: Split-Spoon
Drilling Company	: Hanss Drilling Services, Inc.
Driller	: John McMullan
Geologist	: Stuart Cravens (Kelron)
Land Surface Elevation	: 434.49
Top of Casing Elevation	437.09
X,Y Coordinates	: 510770, 802284

Depth in Feet	DESCRIPTION	Surf. Elev. 434.49	Samples	Recovery inches	Blow Count	Qp TSF	USCS
50							
		384					
	- dark gray grading to light gray		14	24	0 0 0 2	1.25	
55							
		379					CH
	- olive gray		15	24	0 0 1 2	1.25	
60							
		374					
	SAND, fine to medium; well graded, dark gray, wet						
			16	2			
65	- trace coarse sand						
		369	17	17	6 10 11 12		
							SW
70							
		364					
	- fine to coarse sand, trace fine gravel, medium gray		18	9	10 12 12 14		
	END BOREHOLE AT 74 FEET BLS						
75							



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KELRON
Environmental

LOG OF BORING MW39

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New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SW/NE/SW

Date Started/Finished : 6/14 - 6/15/2004
Hole Diameter : 8.5 / 3.875 Inch
Drilling Method : Hollow Stem / Rotary
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 437.3
X,Y Coordinates : 510737, 601409

Depth in Feet	DESCRIPTION	Surf. Elev. 437.3	Samples	Recovery inches	Blow Count	Qp TSF	USCS	GRAPHIC
0	Silty CLAY, trace gravel, roots, dk brown, moist FLYASH, trace coal, light to medium gray, moist - dark gray, wet	437	1	24	5 5 5 4	1.25	FL	
	NO WELL INSTALLED SEE BORING LOGS FOR NESTED WELLS MW39S AND MW39M FOR WELL DIAGRAM AND CONSTRUCTION		2	6	2 1 1 1	<0.5		
5	- moist	432	3	18	0 0 1 2	1.0	FL	
	- wet		4	8	1 1 0 0	<0.5		
	Silty CLAY, medium plasticity, light brown, moist CLAY, trace roots, light to medium gray with orange-brown mottling		5	18	1 1 2 4	<0.5		
10	- dark gray	427	6	24	3 4 5 5	3.0	CL	
	- 1/2 inch sandy clay seams at 12.42 and 13.25 feet Silty CLAY, dark gray		7	24	1 3 3 4	1.25		
15	Clayey SAND (fine), poorly graded, moist Silty CLAY, high plasticity, dark gray; 1/2 inch sand seam at 14.63 feet Clayey SAND (fine) with silt, poorly graded, medium gray	422	8	17	1 2 2 2	1.0	SC CH SC	
	Silty CLAY w/ few wood (maxium size 3 by 10 mm), high organics, high plasticity, dark gray, moist		9	13	2 2 3 4	1.5		
	- olive gray - with orange-brown mottling		10	21	0 2 4 5	1.5	CH	
20		417	11	22	2 3 5 7	2.5		
	Sandy CLAY SAND (fine) with silt, medium gray, wet - light brown		12	20	0 3 7 11	2.5		
	- light gray		13	19	4 5		SP-SM	
25								

KELRON
Environmental

LOG OF BORING MW39

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New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SW/NE/SW

Date Started/Finished : 6/14 - 6/15/2004
Hole Diameter : 8.5 / 3.875 inch
Drilling Method : Hollow Stem / Rotary
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 437.3
X,Y Coordinates : 510737, 801409

Depth in Feet	DESCRIPTION	Surf. Elev. 437.3	Samples	Recovery inches	Blow Count	Op TSF	USCS	GRAPHIC
25								
		412	13	19	8 9		SP-SM	
			14	20	2 2 2 2	1.0		
	Silty CLAY, trace leaves and wood, trace shells (<2 mm), high plasticity, olive gray, moist		15	24	0 0 4 7	1.25	CH	
30	Clayey SILT grading to SILT, trace fine sand, trace shells (<2 mm), light brown, wet	407	16	15	4 6 8 8	0.75	ML	
			17	17	6 11 14 17			
	SAND (fine to medium), trace fine gravel, well graded, wet						SW	
35	SAND (fine), few silt, poorly graded, medium gray, wet	402	18	15	6 6 8 10		SP	
			19	20	6 8 11 13			
40		397	20	19	6 12 13 13			
			21	17	7 11 13 14			
			22	14	6 9 16 21			
45		392						
	SAND (fine to medium, trace coarse), well graded		23	15	11 13 15 15		SW	
50								

KELRON
Environmental

LOG OF BORING MW39

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New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SW/NE/SW

Date Started/Finished : 6/14 - 6/15/2004
Hole Diameter : 8.5 / 3.875 inch
Drilling Method : Hollow Stem / Rotary
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 437.3
X,Y Coordinates : 510737, 801409

Depth in Feet	DESCRIPTION	Surf. Elev. 437.3	Samples	Recovery Inches	Blow Count	Qp TSF	USCS	GRAPHIC
50	SAND (fine to medium, trace coarse), well graded	387						
			24	17	9 20 45 52			
55		382						
60		377						
			25	13	6 10 11 11		SW	
65		372						
	- fine to coarse, trace fine gravel, light gray		26	16	5 7 11 15			
70		367						
			27	14	8 12 15 20			
75								

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LOG OF BORING MW39

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New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SW/NE/SW

Date Started/Finished : 6/14 - 6/15/2004
Hole Diameter : 8.5 / 3.875 inch
Drilling Method : Hollow Stem / Rotary
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 437.3
X,Y Coordinates : 510737, 801409

Depth in Feet	DESCRIPTION	Surf. Elev. 437.3	Samples	Recovery inches	Blow Count	Qp TSF	USCS	GRAPHIC
75	SAND (fine to medium, trace coarse), well graded	362						⁘
80		357						⁘
			28	16	9 20 22 24			⁘
85		352					SW	⁘
90		347						⁘
			29	17	9 16 19 27			⁘
95		342						⁘
100								

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Environmental

LOG OF BORING MW39

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New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SW/NE/SW

Date Started/Finished	: 6/14 - 6/15/2004	Driller	: John McMullan
Hole Diameter	: 8.5 / 3.875 inch	Geologist	: Stuart Cravens (Kelron)
Drilling Method	: Hollow Stem / Rotary	Land Surface Elevation:	437.3
Sampling Method	: Split-Spoon	X,Y Coordinates	: 510737, 801409
Drilling Company	: Harriss Drilling Services, Inc.		

Depth in Feet	DESCRIPTION	Surf. Elev. 437.3	Samples	Recovery inches	Blow Count	Qp TSF	USCS	GRAPHIC
100		337					SW	
	Sandy SILT, fine to coarse sand, trace fine gravel, light gray, moist SILT, trace fine sand and gravel, light gray, moist		30	24	15 25 21 27	2.25	ML	
105		332						
110		327						
	Silty CLAY, trace sand and fine gravel (subangular to rounded), larger clasts are limestone and quartz, very hard, moist. Diamicton.						CL	
115		322						
120		317						
			31	24	12 22 29 38	>4.5		
	END BOREHOLE AT 124 FEET BLS							
125								

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KELRON
Environmental

LOG OF BORING MW39M

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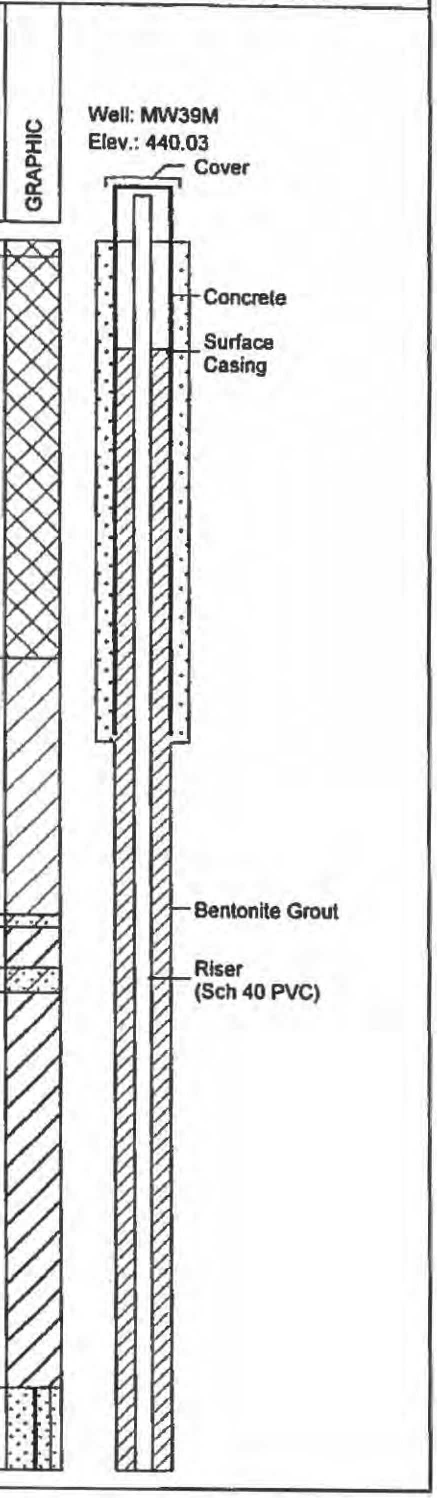
New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SW/NE/SW

Date Started/Finished : 6/17/2004
Hole Diameter : 12.5 / 8.5 inches
Drilling Method : Hollow Stem / Rotary
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 437.28
Top of Casing Elevation 440.03
X,Y Coordinates : 510738, 801412

Depth in Feet	DESCRIPTION	Surf. Elev. 437.28	Samples	Recovery Inches	USCS
0	Silty CLAY, trace gravel, roots, dk brown, moist	437			FL
	FLYASH, trace coal, light to medium gray, moist		1	24	
	- dark gray, wet				
	WELL MW39M BLIND DRILLED BASED ON ADJACENT BORING MW39. SEE BORING MW39 FOR FULL LOG.		2	6	
5	- moist	432	3	18	FL
	Note: Surface Casing = 10.75-inch O.D. PVC installed to 10.0 feet below grade.		4	8	
	- wet				
	Silty CLAY, medium plasticity, light brown, moist		5	18	
10	CLAY, trace roots, light to medium gray with orange-brown mottling				
	- dark gray	427	6	24	CL
	- 1/2 inch sandy clay seams at 12.42 and 13.25 feet				
	Silty CLAY, dark gray		7	24	
	Clayey SAND (fine), poorly graded, moist				SC
15	Silty CLAY, high plasticity, dark gray; 1/2 inch sand seam at 14.63 feet		8	17	CH
	Clayey SAND (fine) with silt, poorly graded, medium gray	422			SC
	Silty CLAY w/ few wood (maxium size 3 by 10 mm), high organics, high plasticity, dark gray, moist		9	13	
	- olive gray		10	21	
20	- with orange-brown mottling	417			CH
			11	22	
	Sandy CLAY		12	20	
	SAND (fine) with silt, medium gray, wet - light brown				SP-SM
25	- light gray		13	19	



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KELRON
Environmental

LOG OF BORING MW39M

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New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

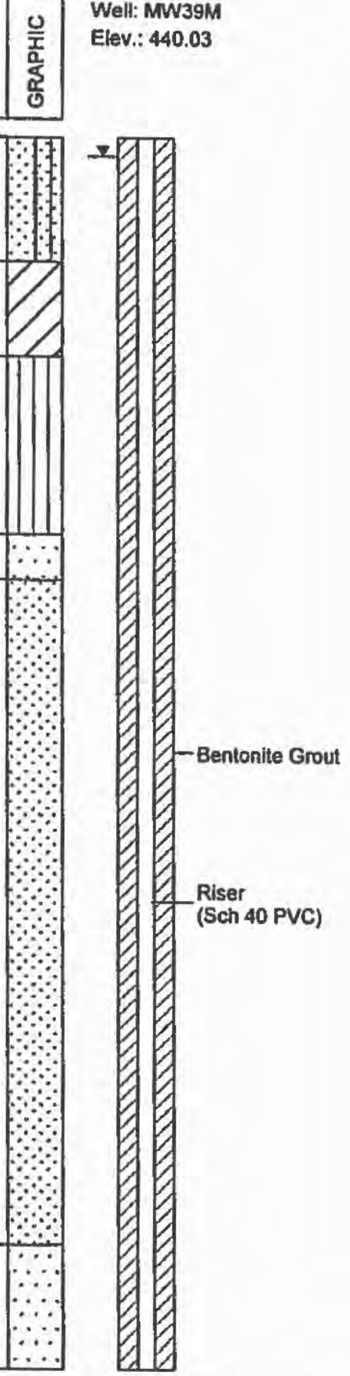
Location: Twp 5N, Rng 9W, 20 SW/NE/SW

Date Started/Finished : 6/17/2004
Hole Diameter : 12.5 / 8.5 inches
Drilling Method : Hollow Stem / Rotary
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 437.28
Top of Casing Elevation 440.03
X,Y Coordinates : 510736, 801412

Depth in Feet	DESCRIPTION	Surf. Elev. 437.28	Samples	Recovery Inches	USCS
25		412	13	19	SP-SM
			14	20	
	Silty CLAY, trace leaves and wood, trace shells (<2 mm), high plasticity, olive gray, moist		15	24	CH
30	Clayey SILT grading to SILT, trace fine sand, trace shells (<2 mm), light brown, wet	407	16	15	ML
			17	17	
	SAND (fine to medium), trace fine gravel, well graded, wet				SW
35	SAND (fine), few silt, poorly graded, medium gray, wet	402	18	15	SP
			19	20	
40		397	20	19	
			21	17	
			22	14	
45		392			
	SAND (fine to medium, trace coarse), well graded		23	15	SW
50					

Well: MW39M
Elev.: 440.03



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KELRON
Environmental

LOG OF BORING MW39M

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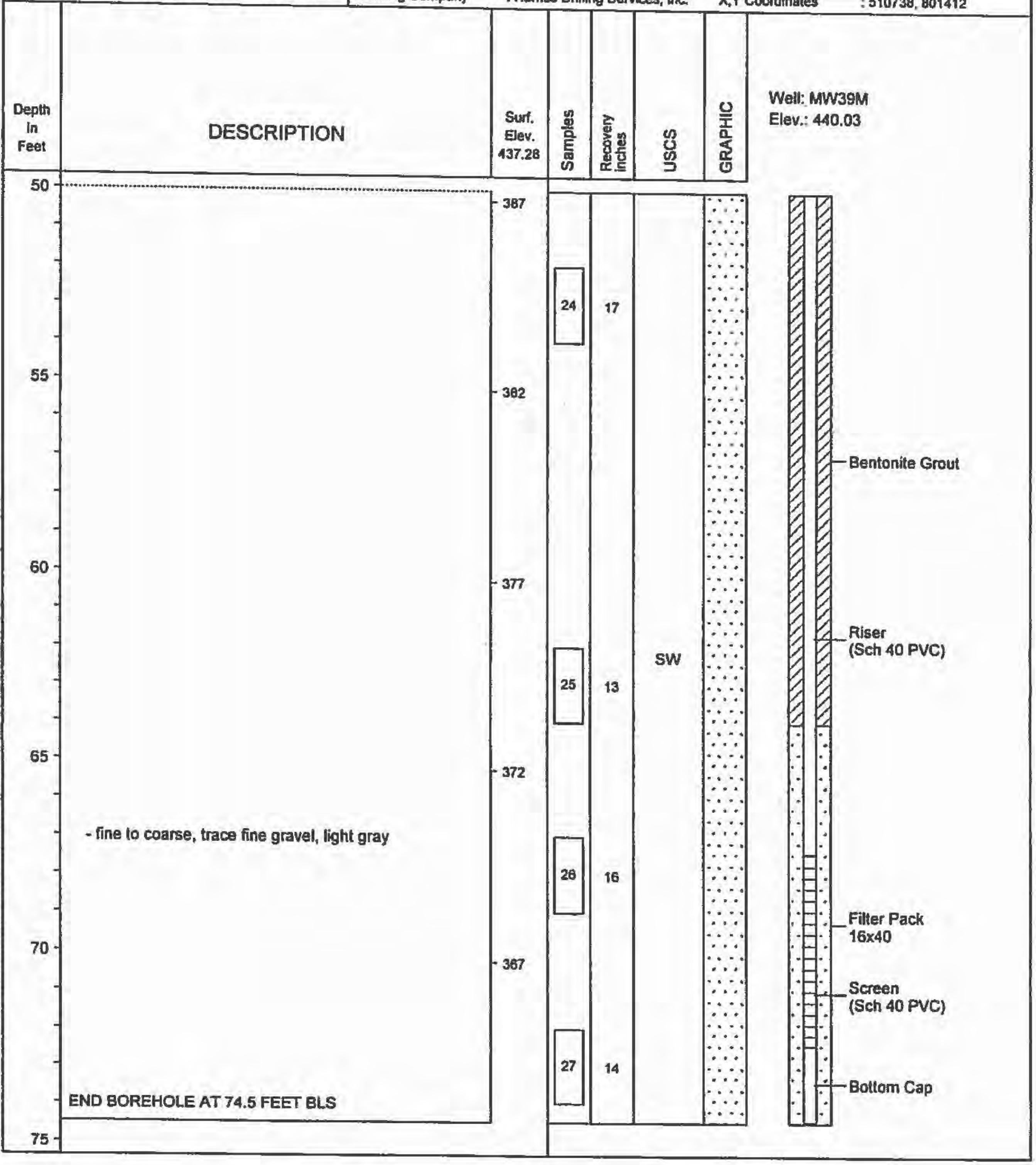
New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SW/NE/SW

Date Started/Finished	: 6/17/2004
Hole Diameter	: 12.5 / 8.5 inches
Drilling Method	: Hollow Stem / Rotary
Sampling Method	: Split-Spoon
Drilling Company	: Harriss Drilling Services, Inc.
Driller	: John McMullan
Geologist	: Stuart Cravens (Kelron)
Land Surface Elevation	: 437.28
Top of Casing Elevation	440.03
X,Y Coordinates	: 510738, 801412



- fine to coarse, trace fine gravel, light gray

END BOREHOLE AT 74.5 FEET BLS

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KELRON
Environmental

LOG OF BORING MW39S

(Page 1 of 2)

New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

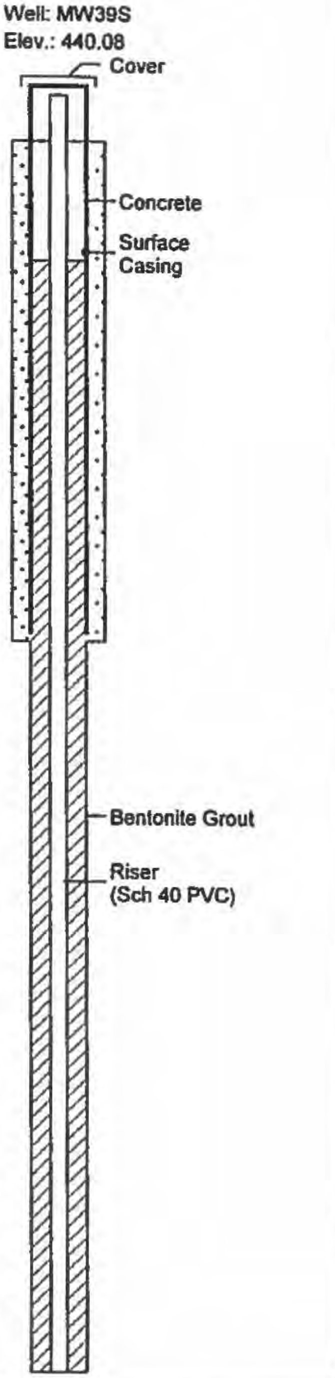
Location: Twp 5N, Rng 9W, 20 SW/NE/SW

Date Started/Finished : 8/16/2004
Hole Diameter : 12.5 / 8.5 inches
Drilling Method : Hollow Stem / Rotary
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 437.33
Top of Casing Elevation 440.08
X,Y Coordinates : 510737, 801406

Depth in Feet	DESCRIPTION	Surf. Elev. 437.33	Samples	Recovery inches	USCS
0					
	Silty CLAY, trace gravel, roots, dk brown, moist	437			FL
	FLYASH, trace coal, light to medium gray, moist		1	24	
	- dark gray, wet				
	WELL MW39S BLIND DRILLED BASED ON ADJACENT BORING MW39. SEE BORING MW39 FOR FULL LOG.		2	6	
					FL
5	- moist	432	3	18	
	Note: Surface Casing = 10.75-inch O.D. PVC installed to 10.0 feet below grade.		4	8	
	- wet				
	Silty CLAY, medium plasticity, light brown, moist		5	18	
	CLAY, trace roots, light to medium gray with orange-brown mottling				
10	- dark gray	427	6	24	CL
	- 1/2 inch sandy clay seams at 12.42 and 13.25 feet		7	24	
	Silty CLAY, dark gray				
	Clayey SAND (fine), poorly graded, moist				SC
15	Silty CLAY, high plasticity, dark gray; 1/2 inch sand seam at 14.63 feet				CH
	Clayey SAND (fine) with silt, poorly graded, medium gray	422	8	17	SC
	Silty CLAY w/ few wood (maxium size 3 by 10 mm), high organics, high plasticity, dark gray, moist		9	13	
	- olive gray		10	21	CH
20	- with orange-brown mottling	417			
			11	22	
	Sandy CLAY				
			12	20	
	SAND (fine) with silt, medium gray, wet				
	- light brown		13	19	SP-SM
	- light gray				
25					

GRAPHIC



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KELRON
Environmental

LOG OF BORING MW39S

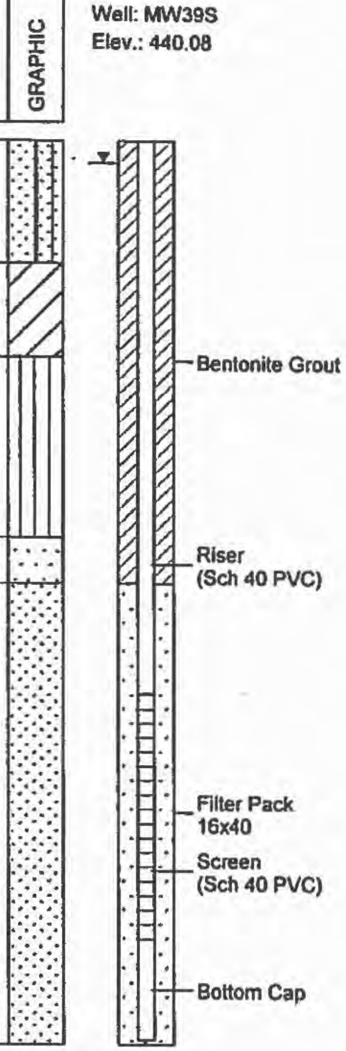
(Page 2 of 2)

New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SW/NE/SW

Date Started/Finished	: 6/16/2004
Hole Diameter	: 12.5 / 6.5 inches
Drilling Method	: Hollow Stem / Rotary
Sampling Method	: Split-Spoon
Drilling Company	: Harriss Drilling Services, Inc.
Driller	: John McMullan
Geologist	: Stuart Cravens (Kelron)
Land Surface Elevation	: 437.33
Top of Casing Elevation	440.08
X,Y Coordinates	: 510737, 801406

Depth in Feet	DESCRIPTION	Surf. Elev. 437.33	Samples	Recovery inches	USCS
25					
		412	13	19	SP-SM
			14	20	
	Silty CLAY, trace leaves and wood, trace shells (<2 mm), high plasticity, olive gray, moist		15	24	CH
30	Clayey SILT grading to SILT, trace fine sand, trace shells (<2 mm), light brown, wet				
		407	16	15	ML
			17	17	
	SAND (fine to medium), trace fine gravel, well graded, wet				SW
	SAND (fine), few silt, poorly graded, medium gray, wet				
35		402	18	15	
			19	20	
			20	19	SP
40		397			
			21	17	
			22	14	
	END BOREHOLE AT 43.4 FEET BLS				
45		392			
50					



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KELRON
Environmental

LOG OF BORING MW40M

(Page 1 of 3)

New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

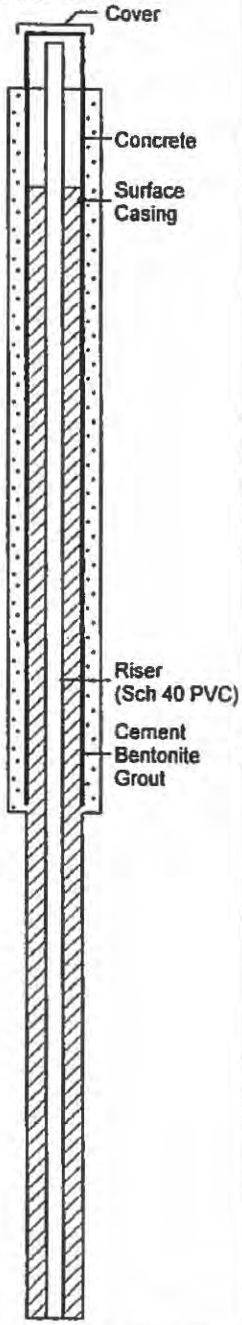
Location: Twp 5N, Rng 9W, 20 SE/SW/SW

Date Started/Finished	: 6/10 - 6/14/2004	Driller	: John McMullan
Hole Diameter	: 12.5 / 8.5 inches	Geologist	: Stuart Cravens (Kelron)
Drilling Method	: Hollow Stem	Land Surface Elevation	: 441.05
Sampling Method	: Split-Spoon	Top of Casing Elevation	444.20
Drilling Company	: Harriss Drilling Services, Inc.	X,Y Coordinates	: 510477, 800633

Depth in Feet	DESCRIPTION	Surf. Elev. 441.05	USCS
0	FILL - Gravel (coarse), sand, clay, brown, dry	441	FL
	FLYASH, trace coal, medium to dark gray, moist		FL
5	- wet	436	
	- moist		
	- bottom ash with flyash seams		
	- flyash		
	- bottom ash with trace coal, moist to wet		
10	- flyash, wet	431	
	Note: Surface Casing = 10.75 inch O.D. PVC installed to 14.5 feet below grade.		
	Silty CLAY, few roots, low to medium plasticity, dark gray, moist		CL
15	SILT, dark gray, wet	426	ML
	SAND (fine to medium) with clay, well graded, brown, moist		SW
	Silty CLAY, low plasticity, light ray, moist		CL
	SAND (fine to medium) with clay, trace fine gravel, well graded, light brown, moist		SW
20	SAND (fine), poorly graded	421	SP
	- fine to coarse, well graded		SW
	- fine, poorly graded		SP
25			

Samples	Recovery Inches	Qp TSF	Blow Count
1	21	0.5	7 7 8 9
2	18	0.5	1 3 3 4
3	22	1.0	1 2 3 7
4	22	1.5	3 10 11 11
5	24	1.75	8 10 9 8
6	24	<0.5	1 2 1 1
7	24	2.0	0 0 1 4
8	21	>4.5	5 7 14 15
9	18		3 8 11 13
10	18		4 9 11 14
11	19		5 8 10 10
12	20		2 6 20 31

Well: MW40M
Elev.: 444.20



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KELRON
Environmental

LOG OF BORING MW40M

(Page 2 of 3)

New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

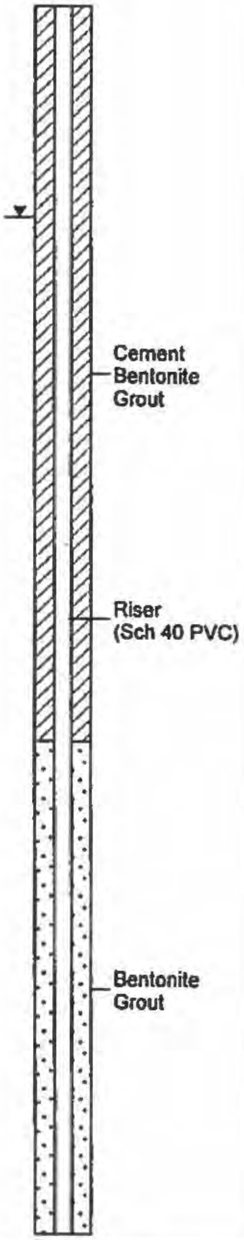
Location: Twp 5N, Rng 9W, 20 SE/SW/SW

Date Started/Finished : 6/10 - 6/14/2004
Hole Diameter : 12.5 / 8.5 inches
Drilling Method : Hollow Stem
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 441.05
Top of Casing Elevation 444.20
X,Y Coordinates : 510477, 800833

Depth In Feet	DESCRIPTION	Surf. Elev. 441.05	Samples	Recovery Inches	Qp TSF	Blow Count	USCS
25		416					SP
	- fine to medium, well graded, wet						
30		411	13	19		2 9 19 18	SW
	CLAY, Clayey SILT, and Silty CLAY in alternating layers		14	22	0.75	1 1 2 2	CH-ML
35	- Clayey SILT at 34.75 to 35 feet has trace roots, black organics, non-plastic, olive gray	406	15	21	1.0	0 1 2 3	
	SAND (fine), poorly graded, olive gray, wet		16	23		0 0 2 4	SP
	Silty CLAY, non to high plasticity, olive gray, moist		17	24	1.0	0 1 1 8	CL
40	SAND (fine to medium), trace coarse sand, well graded, olive gray, wet	401					SW
	SAND (fine), poorly graded		18	24	0.75	0 1 2 4	SP
	Silty CLAY, high plasticity, moist						CH
	SAND (fine), poorly graded, medium gray, wet		19	24		0 3 4 6	SP
45		396	20	24		1 1 2 3	
	CLAY with silt, high plasticity, olive gray, moist		21	14	1.0	1 1 2 4	CL
			22	0		0 1 3 5	
50							SW

Well: MW40M
Elev.: 444.20



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LOG OF BORING MW40M

(Page 3 of 3)

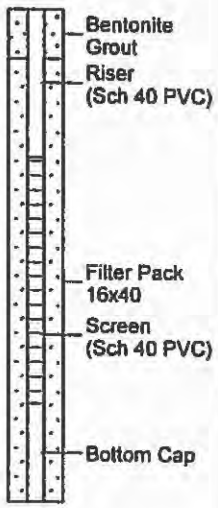
New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SE/SW/SW

Date Started/Finished	: 6/10 - 6/14/2004	Driller	: John McMullan
Hole Diameter	: 12.5 / 8.5 inches	Geologist	: Stuart Cravens (Kelron)
Drilling Method	: Hollow Stem	Land Surface Elevation:	441.05
Sampling Method	: Split-Spoon	Top of Casing Elevation	444.20
Drilling Company	: Harriss Drilling Services, Inc.	X,Y Coordinates	: 510477, 800633

Depth in Feet	DESCRIPTION	Surf. Elev. 441.05	Samples	Recovery inches	Qp TSF	Blow Count	USCS	GRAPHIC
50	SAND (fine to medium), well graded, dark gray, wet	391	23	5		3 4 6 6		
55		386	24	15		1 5 13 23	SW	
			25	13		3 6 18 23		
60	END BOREHOLE AT 60.0 FEET BLS	381						
65		376						
70		371						
75								

Well: MW40M
Elev.: 444.20



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KELRON
Environmental

LOG OF BORING MW40S

(Page 1 of 2)

New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

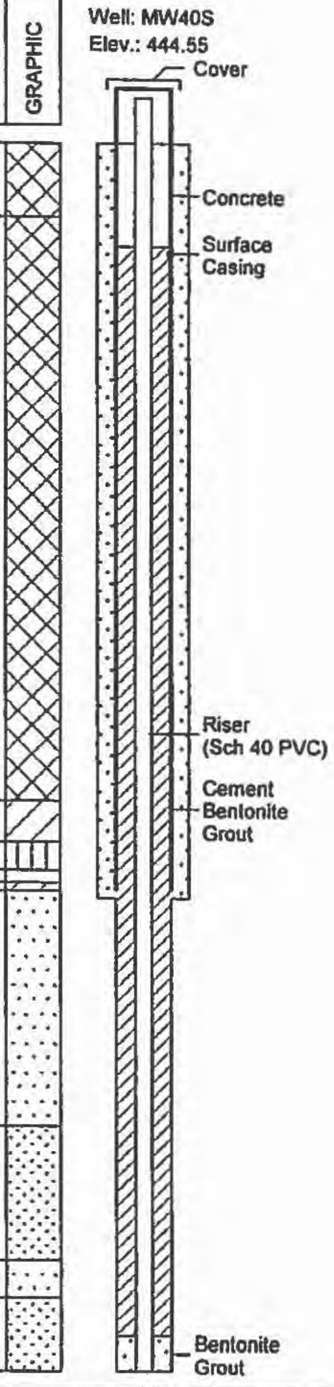
Location: Twp 5N, Rng 9W, 20 SE/SW/SW

Date Started/Finished : 6/18 - 6/21/2004
Hole Diameter : 12.5 / 8.5 inches
Drilling Method : Hollow Stem
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 441.25
Top of Casing Elevation 444.55
X,Y Coordinates : 510473, 800637

Depth in Feet	DESCRIPTION	Surf. Elev. 441.25	Samples	Recovery Inches	USCS
0	FILL - Gravel (coarse), sand, clay, brown, dry	441	1	21	FL
	FLYASH, trace coal, medium to dark gray, moist		2	18	FL
	WELL MW40S DRILLED BASED ON ADJACENT BORING MW40M. SEE BORING MW40M FOR FULL LOG.				
5	- wet		3	22	
	- moist	436			
	- bottom ash with flyash seams				
	- flyash		4	22	
	- bottom ash with trace coal, moist to wet				
			5	24	
10	- flyash, wet	431	6	24	
	Note: Surface Casing = 10.75-inch O.D. PVC installed to 15.2 feet below grade.				
			7	24	
	Silty CLAY, few roots, low to medium plasticity, dark gray, moist				CL
15	SILT, dark gray, wet		8	21	ML
	SAND (fine to medium) with clay, well graded, brown, moist	426			SW
	Silty CLAY, low plasticity, light ray, moist				CL
	SAND (fine to medium) with clay, trace fine gravel, well graded, light brown, moist		9	18	SW
			10	18	
20	SAND (fine), poorly graded	421	11	19	SP
	- fine to coarse, well graded		12	20	SW
	- fine, poorly graded				SP
25					

GRAPHIC



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LOG OF BORING MW40S

(Page 2 of 2)

New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

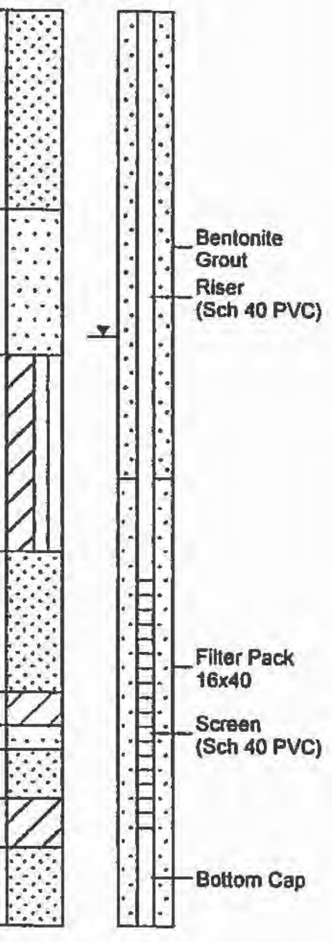
Location: Twp 5N, Rng 9W, 20 SE/SW/SW

Date Started/Finished	: 6/18 - 6/21/2004
Hole Diameter	: 12.5 / 8.5 inches
Drilling Method	: Hollow Stem
Sampling Method	: Split-Spoon
Drilling Company	: Harriss Drilling Services, Inc.
Driller	: John McMullan
Geologist	: Stuart Cravens (Kelron)
Land Surface Elevation	: 441.25
Top of Casing Elevation	444.55
X,Y Coordinates	: 510473, 800637

Depth in Feet	DESCRIPTION	Surf. Elev. 441.25	Samples	Recovery inches	USCS
25		416			SP
	- fine to medium, well graded, wet				
30		411	13	19	SW
	CLAY, Clayey SILT, and Silty CLAY in alternating layers		14	22	CH-ML
35	- Clayey SILT at 34.75 to 35 feet has trace roots, black organics, non-plastic, olive gray	406	15	21	
	SAND (fine), poorly graded, olive gray, wet		16	23	SP
	Silty CLAY, non to highly plastic, olive gray, moist		17	24	CL
40	SAND (fine to medium), trace coarse sand, well graded, olive gray, wet	401			SW
	SAND (fine), poorly graded		18	24	SP
	Silty CLAY, high plasticity, moist				CH
	SAND (fine), poorly graded, medium gray, wet		19	24	SP
	END BOREHOLE AT 43.6 FEET BLS				
45		396			
50					

GRAPHIC

Well: MW40S
Elev.: 444.55



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LOG OF BORING MW41

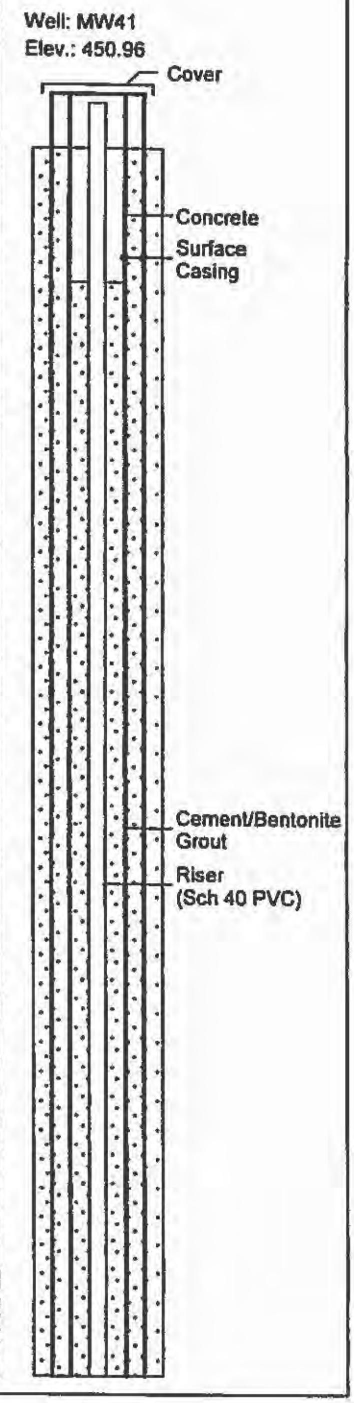
(Page 1 of 3)

New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SE/SW/SW

Date Started/Finished	: 6/21 - 6/23/2004	Driller	: John McMullan
Hole Diameter	: 12.5 / 8.5 inches	Geologist	: Stuart Cravens (Kelron)
Drilling Method	: Hollow-Stem	Land Surface Elevation	: 448.11
Sampling Method	: Split-Spoon	Top of Casing Elevation	450.96
Drilling Company	: Harriss Drilling Services, Inc.	X,Y Coordinates	: 509810, 800592

Depth In Feet	DESCRIPTION	Surf. Elev. 448.11	Samples	Recovery Inches	Blow Count	Qp TSF	USCS	GRAPHIC
0	FLYASH, medium gray, moist	448	1	20	2 3 5 8			▨
5	Note: Surface Casing = 10.75-inch O.D. PVC installed to 24.5 feet below grade. Cement-bentonite grout around surface casing extends to 30 feet below grade.	443						
	- wet		2	24	8 12 12 11	2.5		
10		438					FL	
	- moist							
	- bottom ash, trace coal, wet		3	18	1 5 8 5	0.5		
15		433						
	- alternating layers of bottom ash and flyash, light to medium gray, moist to wet		4	21	7 9 7 7	1.0		
20								



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LOG OF BORING MW41

(Page 2 of 3)

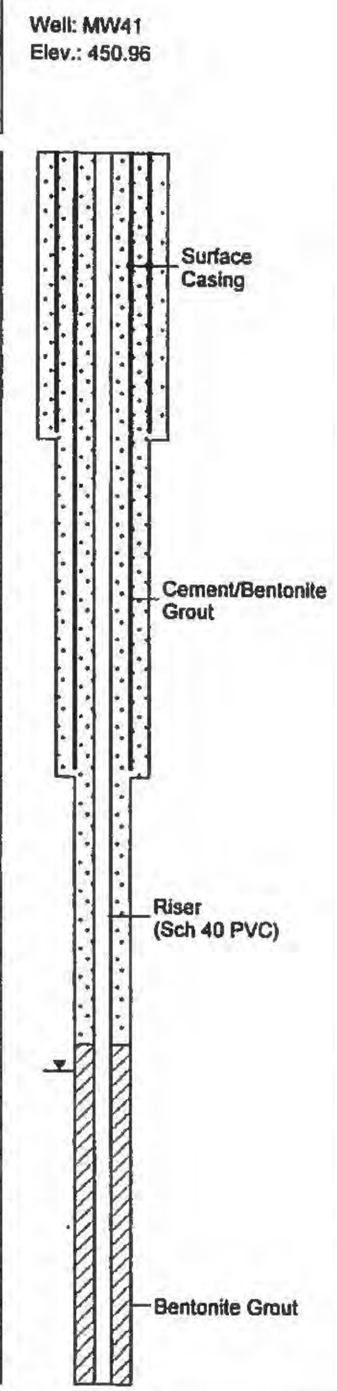
New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SE/SW/SW

Date Started/Finished : 6/21 - 6/23/2004
Hole Diameter : 12.5 / 8.5 inches
Drilling Method : Hollow-Stem
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 448.11
Top of Casing Elevation 450.96
X,Y Coordinates : 509910, 800592

Depth in Feet	DESCRIPTION	Surf. Elev. 448.11	Samples	Recovery Inches	Blow Count	Qp TSF	USCS
20		428	5	20	5 7 7 5	1.5	
			6	21	5 8 7 6	1.0	
25		423	7	22	6 13 13 8	1.5	FL
	- bottom ash, dark gray, wet		8	7			
	- flyash						
	CLAY, few roots, high plasticity, dark gray, wet		9	21	0 2 3 3	2.25	
30		418					
	Silty CLAY, high plasticity, light gray, moist						
	- dark gray		10	23	0 2 2 3	1.0	CH
35		413					
	CLAY, few silt, high plasticity, medium gray w/ intermittent brown mottling		11	24	1 3 3 5	1.75	
40							



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KELRON
Environmental

LOG OF BORING MW41

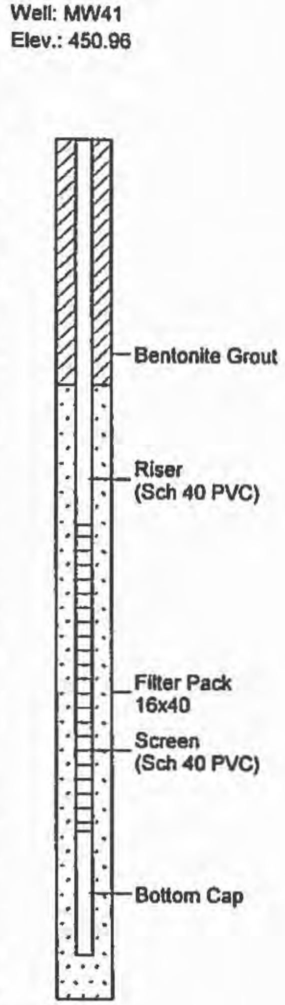
(Page 3 of 3)

New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 SE/SW/SW

Date Started/Finished	: 6/21 - 6/23/2004
Hole Diameter	: 12.5 / 8.5 inches
Drilling Method	: Hollow-Stem
Sampling Method	: Split-Spoon
Drilling Company	: Harriss Drilling Services, Inc.
Driller	: John McMullan
Geologist	: Stuart Cravens (Kelron)
Land Surface Elevation	: 448.11
Top of Casing Elevation	450.96
X,Y Coordinates	: 509910, 800592

Depth in Feet	DESCRIPTION	Surf. Elev. 448.11	Samples	Recovery inches	Blow Count	Qp TSF	USCS
40		408	12	24	2 2 2 2	1.75	CH
	SILT, brown, wet						MI
	SAND (fine), few silt, poorly graded, light grading to medium brown, wet		13	24	2 12 16 17	1.5	SP
45	CLAY, trace silt, medium gray, moist	403	14	24	3 8 12 16		CL
	SAND (fine to medium), trace coarse sand and fine gravel, well graded, light brown, wet - medium brown		15	20	0 6 13 15		SW
50		398					
	- medium brown-gray		16	15	8 10 8 7		
	END BOREHOLE AT 54 FEET BLS						
55		393					
60							



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LOG OF BORING MW42

(Page 1 of 2)

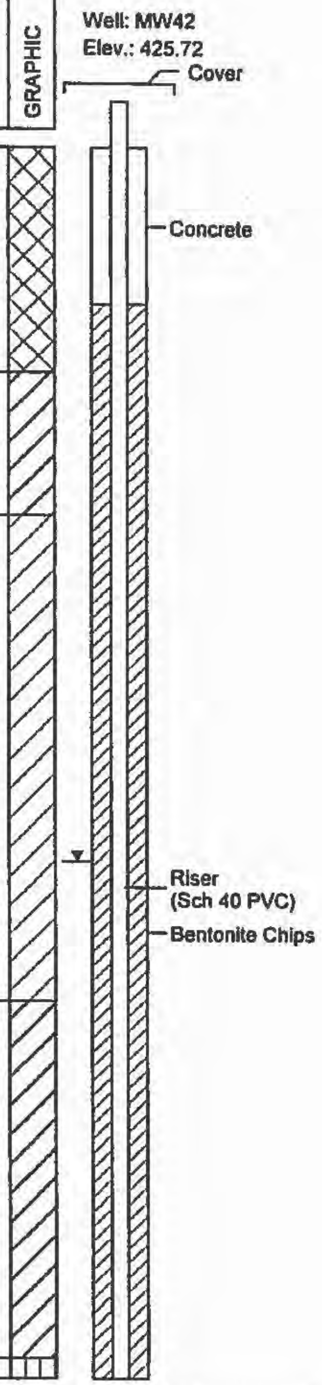
New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 NW/SW/SW

Date Started/Finished : 6/22/2004
Hole Diameter : 8.5 inches
Drilling Method : Hollow-Stem
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 422.97
Top of Casing Elevation 425.72
X,Y Coordinates : 509319, 801288

Depth In Feet	DESCRIPTION	Surf. Elev. 422.97	Samples	Recovery Inches	Blow Count	Qp TSF	USCS
0	FILL - Silty CLAY with large white gravel, few sand, roots, dark brown, dry	422	1	8	4 5 6 6		FL
2	CLAY with roots, high plasticity, medium brown with light gray mottling - light brown	420	2	21	2 4 4 4	1.5	CH
4	Silty CLAY, trace fine sand, roots, low-medium plasticity, light brown, moist	418	3	16	1 2 3 3	1.25	CL
6	- no roots, black organics, with light gray mottling	416	4	19	1 2 2 3	1.0	
8	- 0.5-inch sand seam (fine to medium grain size), light brown, wet - 1.5-inch sand seam (fine to medium grain size)	414	5	16	0 1 2 3	1.5	
10	CLAY, high plasticity, light gray with orange-brown mottling, moist - 1.5-inch clayey sand seam (fine), medium brown, wet	412	6	23	0 1 2 2	1.5	CH
12		410	7	22	0 1 1 2	1.5	
14			8	20	0 2	1.0	ML



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LOG OF BORING MW42

(Page 2 of 2)

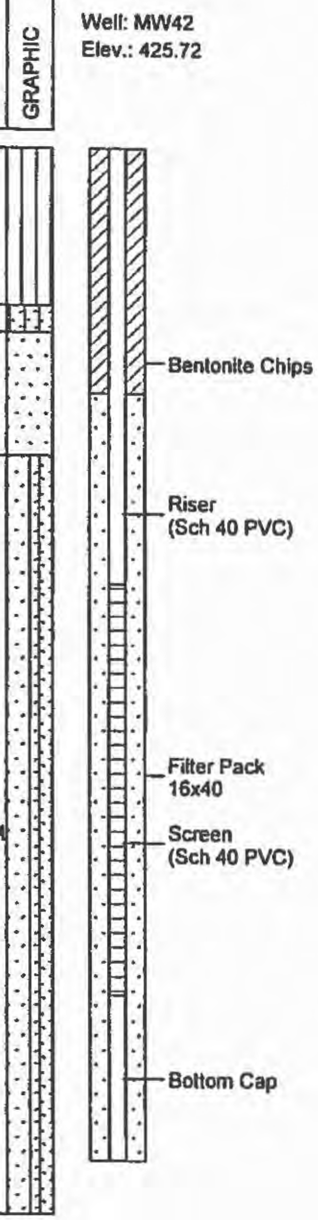
New East Ash Pond Hydrogeologic Investigation
Wood River Power Station
Dynegy Midwest Generation, Inc.

Location: Twp 5N, Rng 9W, 20 NW/SW/SW

Date Started/Finished : 6/22/2004
Hole Diameter : 8.5 inches
Drilling Method : Hollow-Stem
Sampling Method : Split-Spoon
Drilling Company : Harriss Drilling Services, Inc.

Driller : John McMullan
Geologist : Stuart Cravens (Kelron)
Land Surface Elevation: 422.97
Top of Casing Elevation 425.72
X,Y Coordinates : 509319, 801288

Depth in Feet	DESCRIPTION	Surf. Elev. 422.97	Samples	Recovery Inches	Blow Count	Qp TSF	USCS
15	SILT, trace fine sand, non-plastic, light brown, wet - few fine sand	407	8	20	4 6	1.0	ML
17	Clayey SILT, brown-gray Silty SAND (fine), medium brown SAND (fine to medium), well graded, medium brown	405	9	21	2 3 5 5	<0.5	SM SW
19	SAND (fine) with silt, trace medium sand poorly graded, medium brown-gray	403	10	24	5 6 9 9		
21		401	11	22	3 4 5 5		
23		399	12	24	3 8 15 4		SW-SM
25		397	13	24	2 3 4 4		
27		395	14	24	2 3 3 4		
	END BOREHOLE AT 28 FEET BLS						
29							



The following are attachments to the testimony of Scott M. Payne, PhD, PG and Ian Magruder, M.S..

APPENDIX B

GRAIN SIZE ANALYSES AND LABORATORY HYDRAULIC CONDUCTIVITY TEST RESULTS

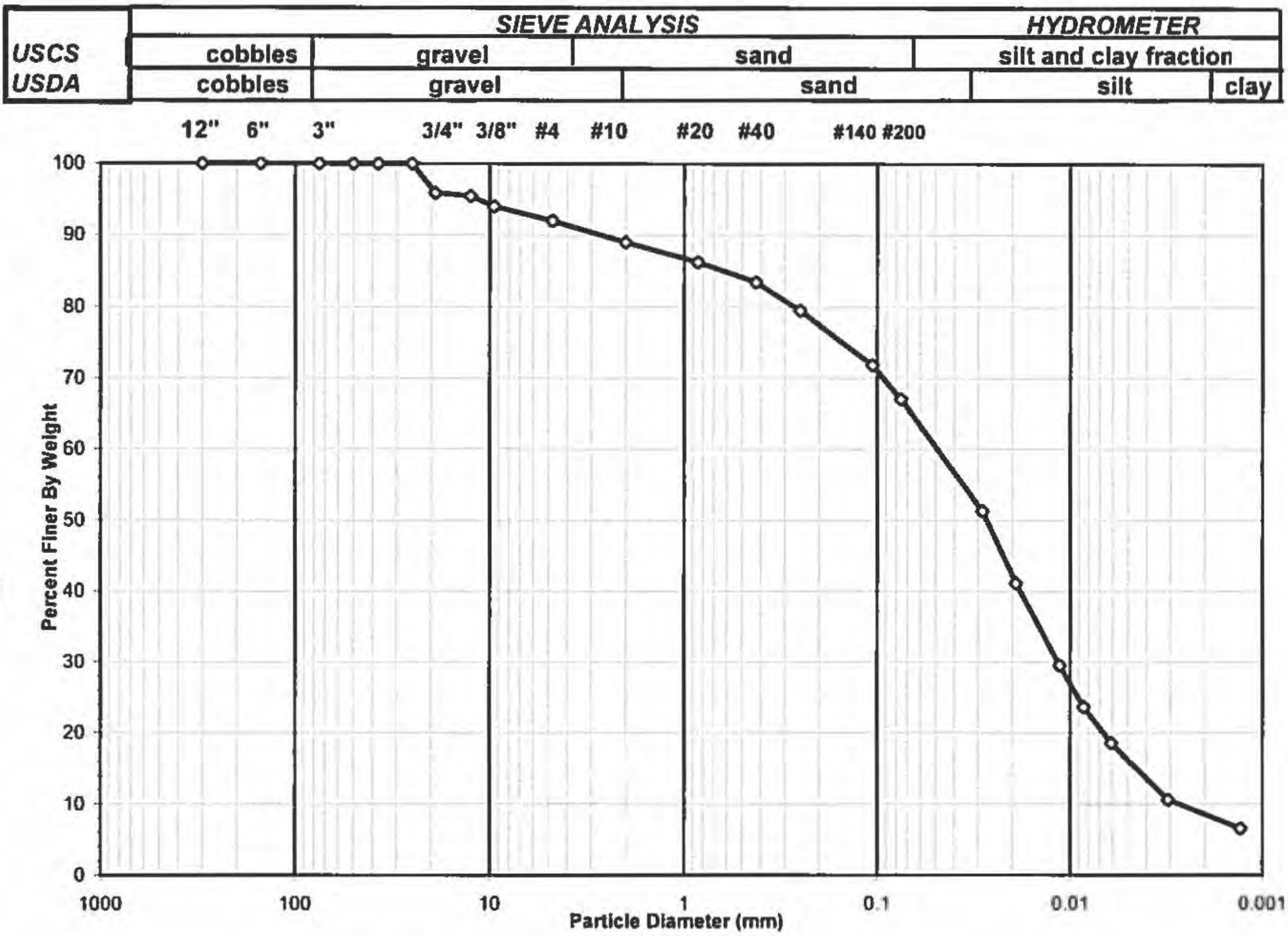
APPENDIX B1

GRAIN SIZE ANALYSES

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	6.0-7.5
Project No.:	2015-485-004	Sample No.:	SS-3
Lab ID:	2015-485-004-001	Soil Color:	Gray



USCS Summary		
Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	8.00
#4 To #200	*Sand*	24.93
Finer Than #200	*Silt & Clay*	67.07

USCS Symbol:

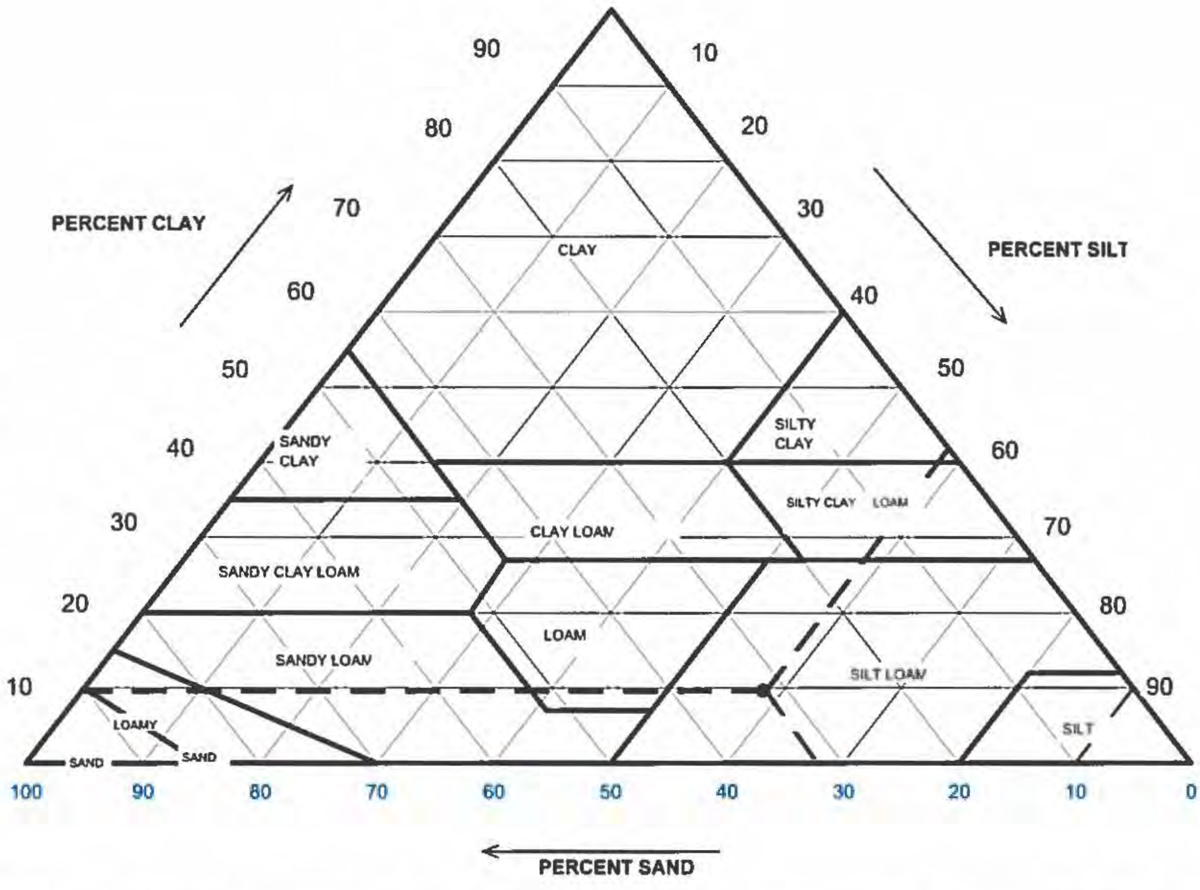
cl, ASSUMED

USCS Classification:

SANDY LEAN CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	6.0-7.5
Project No.:	2015-485-004	Sample No.:	SS-3
Lab ID:	2015-485-004-001	Soil Color:	Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	11.02	**0.00**
2	88.98	*Sand*	28.53	**32.06**
0.05	60.45	*Silt*	51.91	**58.33**
0.002	8.55	*Clay*	8.55	**9.60**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	6.0-7.5
Project No.:	2015-485-004	Sample No.:	SS-3
Lab ID:	2015-485-004-001	Soil Color:	Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1414	Tare No.	NA
Weight of Tare & Wet Sample (g)	590.10	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	475.10	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.50	Weight of Tare (g)	NA
Weight of Water (g)	115.00	Weight of Water (g)	NA
Weight of Dry Sample (g)	329.60	Weight of Dry Sample (g)	NA
Moisture Content (%	**34.9**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	329.60
Dry Weight of -3/4" Sample (g)	94.81	Weight of - #200 Material (g)	221.06
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	108.54
Dry Weight of +3/4" Sample (g)	13.73		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	13.73	4.17	4.17		95.83	**95.83**
1/2"	12.5	1.23	0.37	4.54		95.46	**95.46**
3/8"	9.50	4.76	1.44	5.98		94.02	**94.02**
#4	4.75	6.65	2.02	8.00		92.00	**92.00**
#10	2.00	9.94	3.02	11.02		88.98	**88.98**
#20	0.85	9.43	2.86	13.88		86.12	**86.12**
#40	0.425	8.99	2.73	16.60		83.40	**83.40**
#60	0.250	12.95	3.93	20.53		79.47	**79.47**
#140	0.106	25.18	7.64	28.17		71.83	**71.83**
#200	0.075	15.68	4.76	32.93		67.07	**67.07**
Pan	-	221.06	67.07	100.00		-	-

Tested By	RAL	Date	10/8/15	Checked By	KC	Date	10/12/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	6.0-7.5
Project No.:	2015-485-004	Sample No.:	SS-3
Lab ID:	2015-485-004-001	Soil Color:	Gray

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		41.5	22.5	6.18	35.3	76.4	0.01305	0.0284	**51.2**
5		34.5	22.5	6.18	28.3	61.3	0.01305	0.0190	**41.1**
16		26.5	22.5	6.18	20.3	43.9	0.01305	0.0113	**29.5**
30		22.5	22.5	6.18	16.3	35.3	0.01305	0.0085	**23.7**
60		19.0	22.4	6.22	12.8	27.6	0.01307	0.0061	**18.5**
250		13.5	22.5	6.18	7.3	15.8	0.01305	0.0031	**10.6**
1440		10.5	23	6.00	4.5	9.7	0.01297	0.0013	**6.5**

Soil Specimen Data		**Other Corrections**		
Tare No.	633			
Weight of Tare & Dry Material (g)	146.90	a - Factor	0.99	
Weight of Tare (g)	96.13			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	67.07	
Weight of Dry Material (g)	45.8			
		Specific Gravity	2.7	Assumed

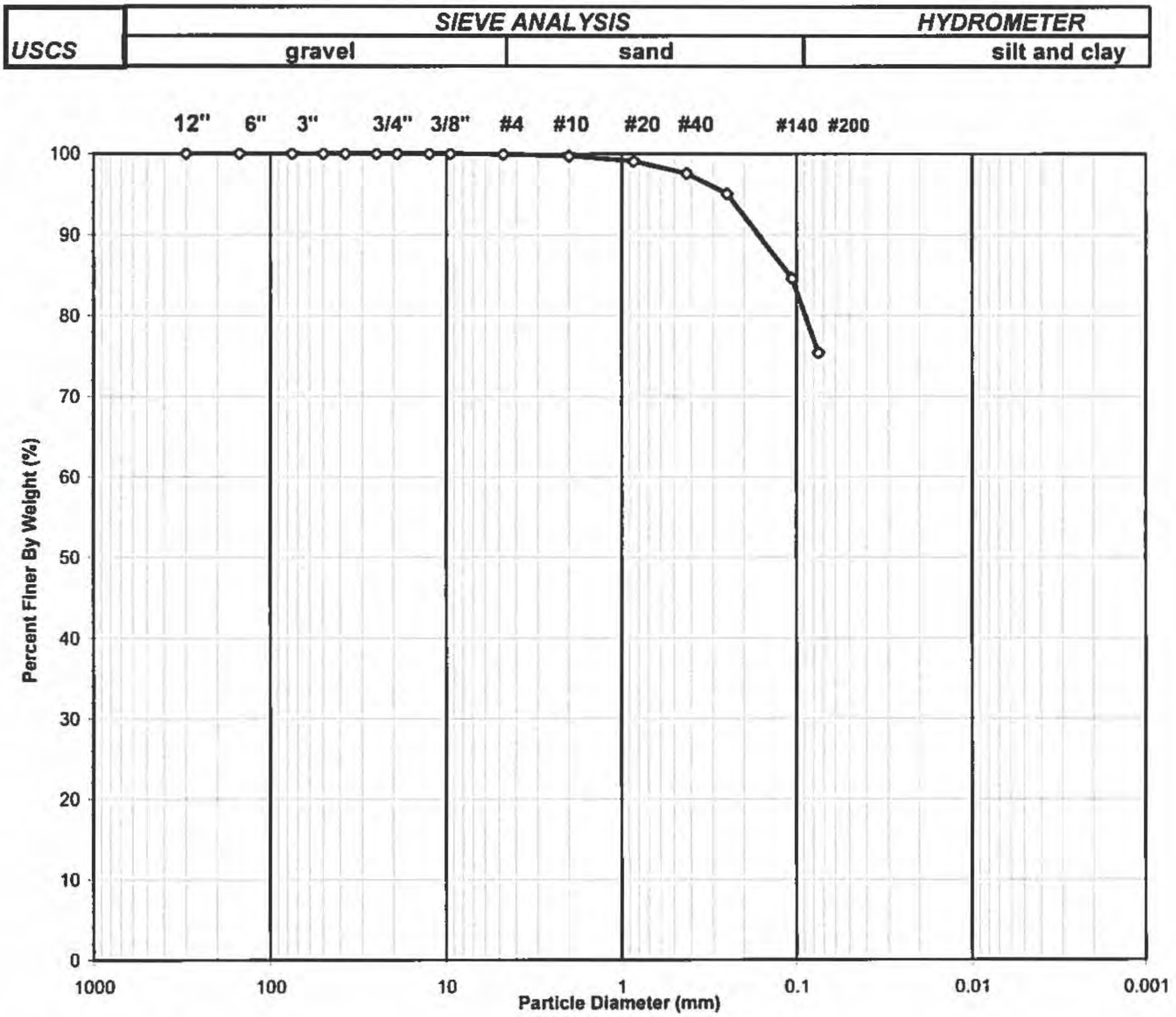
Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 10/8/15 Checked By KC Date 10/12/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	18.5-20.0
Project No.:	2015-485-004	Sample No.:	SS-6
Lab ID:	2015-485-004-002	Soil Color:	Gray



USCS Symbol:
ml, ASSUMED

USCS Classification:
SILT WITH SAND

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	18.5-20.0
Project No.:	2015-485-004	Sample No.:	SS-6
Lab ID:	2015-485-004-002	Soil Color:	Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1432	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	396.76	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	345.22	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.48	Weight of Tare (g):	NA
Weight of Water (g):	51.54	Weight of Water (g):	NA
Weight of Dry Sample (g):	199.74	Weight of Dry Sample (g):	NA
Moisture Content (%):	**25.8**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	199.74
Dry Weight of - 3/4" Sample (g):	49.1	Weight of - #200 Material (g):	150.60
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	49.14
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

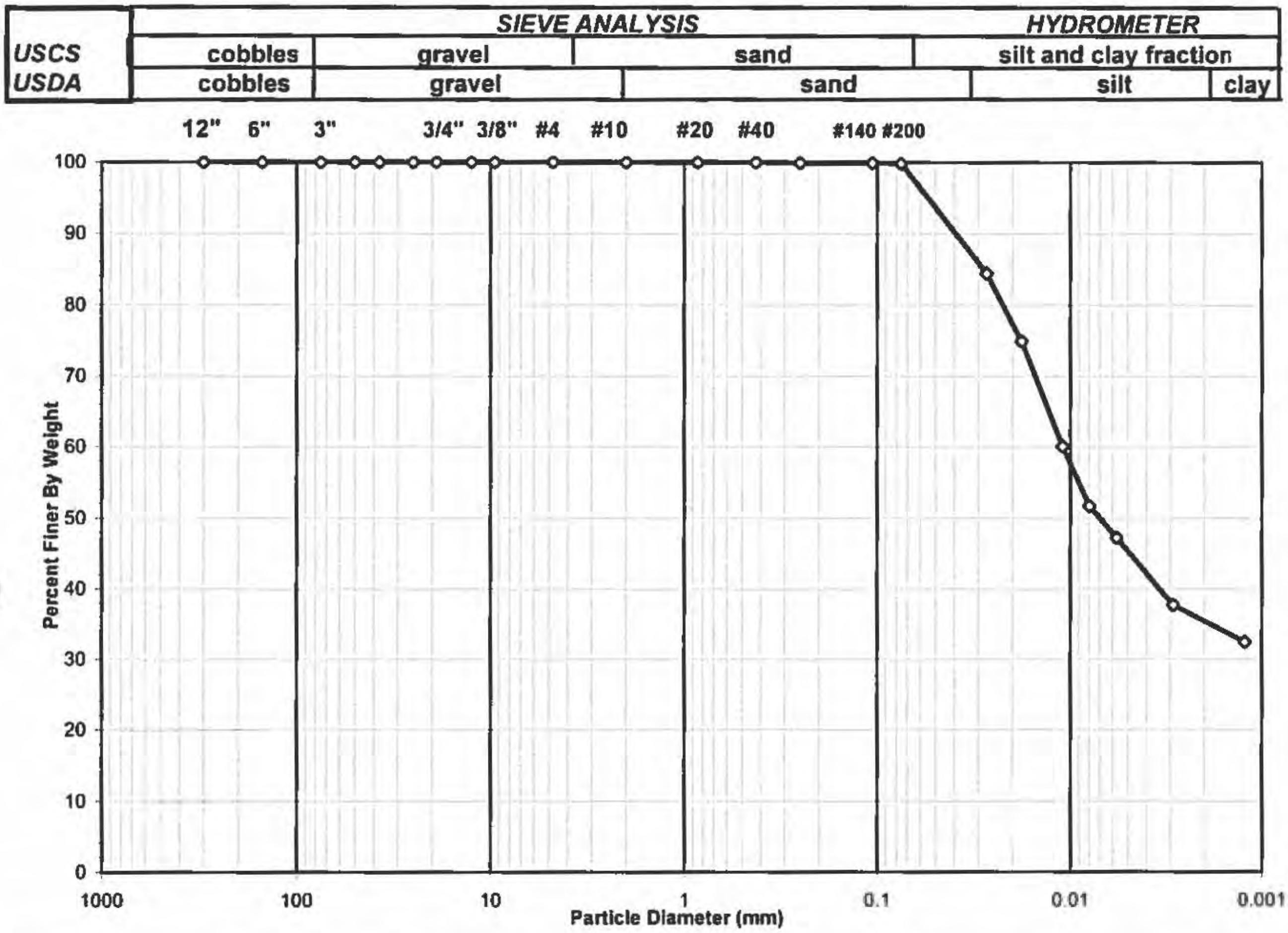
Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.20	0.10	0.10	99.90	**99.90**
#10	2.00	0.39	0.20	0.30	99.70	**99.70**
#20	0.850	1.22	0.61	0.91	99.09	**99.09**
#40	0.425	3.06	1.53	2.44	97.56	**97.56**
#60	0.250	4.95	2.48	4.92	95.08	**95.08**
#140	0.106	20.99	10.51	15.43	84.57	**84.57**
#200	0.075	18.33	9.18	24.60	75.40	**75.40**
Pan	-	150.60	75.40	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	41.0-41.5
Project No.:	2015-485-004	Sample No.:	ST-1
Lab ID:	2015-485-004-003	Soil Color:	Brown / Gray



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	0.18
Finer Than #200	*Silt & Clay*	99.82

USCS Symbol:

CH, TESTED

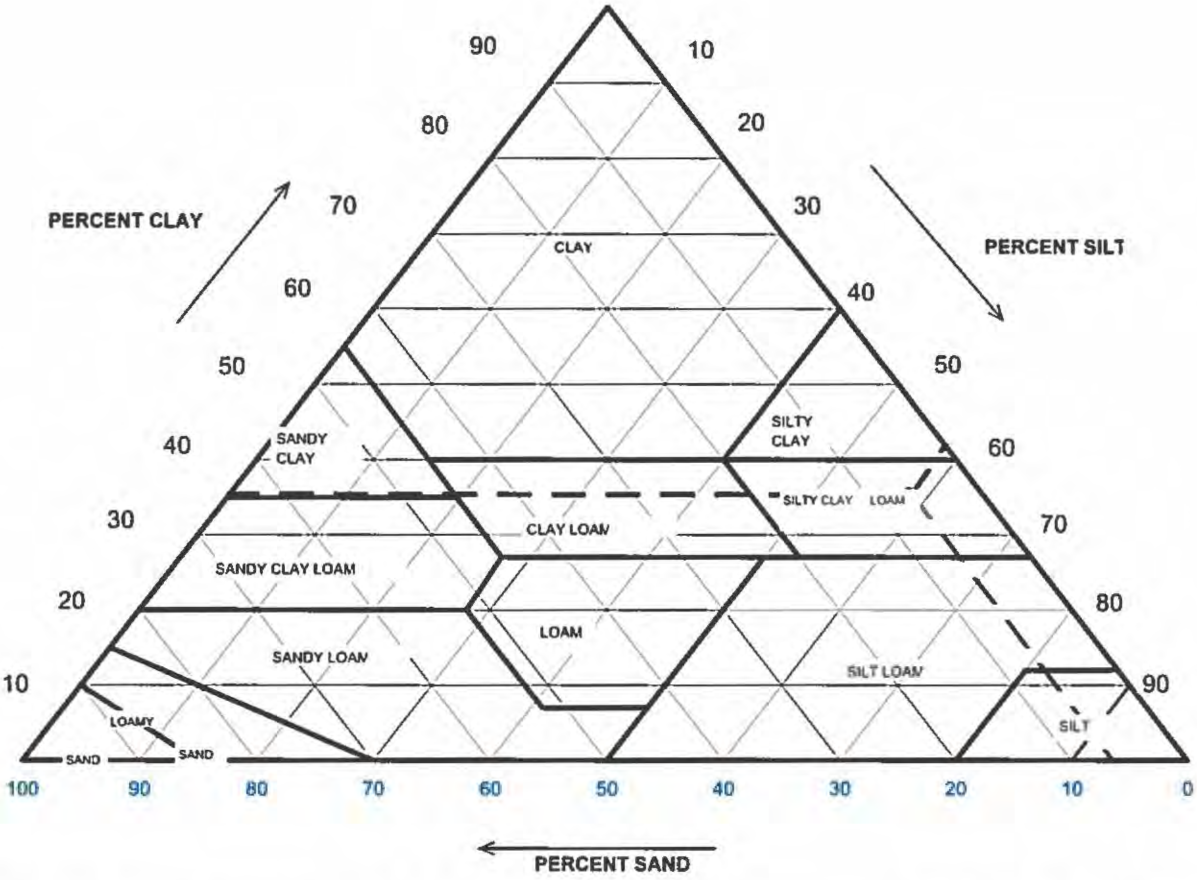
USCS Classification:

FAT CLAY

USDA CLASSIFICATION CHART

Client: AECOM
Client Reference: Dynegy - Wood River Pwr. Sta. 60440115
Project No.: 2015-485-004
Lab ID: 2015-485-004-003

Boring No.: B-1
Depth (ft): 41.0-41.5
Sample No.: ST-1
Soil Color: Brown / Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.00	**0.00**
2	100.00	*Sand*	6.33	**6.33**
0.05	93.67	*Silt*	58.28	**58.28**
0.002	35.39	*Clay*	35.39	**35.39**

USDA Classification: ***SILTY CLAY LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	41.0-41.5
Project No.:	2015-485-004	Sample No.:	ST-1
Lab ID:	2015-485-004-003	Soil Color:	Brown / Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	25	Tare No.	NA
Weight of Tare & Wet Sample (g)	808.14	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	654.30	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	203.65	Weight of Tare (g)	NA
Weight of Water (g)	153.84	Weight of Water (g)	NA
Weight of Dry Sample (g)	450.65	Weight of Dry Sample (g)	NA
Moisture Content (%	**34.1**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	450.65
Dry Weight of -3/4" Sample (g)	0.80	Weight of - #200 Material (g)	449.85
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	0.80
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.00	0.00	0.00		100.00	**100.00**
#20	0.85	0.05	0.01	0.01		99.99	**99.99**
#40	0.425	0.14	0.03	0.04		99.96	**99.96**
#60	0.250	0.08	0.02	0.06		99.94	**99.94**
#140	0.106	0.24	0.05	0.11		99.89	**99.89**
#200	0.075	0.29	0.06	0.18		99.82	**99.82**
Pan	-	449.85	99.82	100.00		-	-

Tested By RAL Date 10/7/15 Checked By KC Date 10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	41.0-41.5
Project No.:	2015-485-004	Sample No.:	ST-1
Lab ID:	2015-485-004-003	Soil Color:	Brown / Gray

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		46.0	22.9	6.04	40.0	84.6	0.01299	0.0272	**84.4**
5		41.5	22.9	6.04	35.5	75.0	0.01299	0.0179	**74.9**
15		34.5	22.9	6.04	28.5	60.2	0.01299	0.0109	**60.1**
30		30.5	22.9	6.04	24.5	51.8	0.01299	0.0080	**51.7**
60		28.5	22.6	6.15	22.4	47.3	0.01303	0.0057	**47.2**
250		24.0	22.5	6.18	17.8	37.7	0.01305	0.0029	**37.6**
1440		21.5	22.5	6.18	15.4	32.5	0.01305	0.0012	**32.4**

Soil Specimen Data		**Other Corrections**		
Tare No.	1019			
Weight of Tare & Dry Material (g)	153.15	a - Factor	0.99	
Weight of Tare (g)	101.37			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	99.82	
Weight of Dry Material (g)	46.8			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

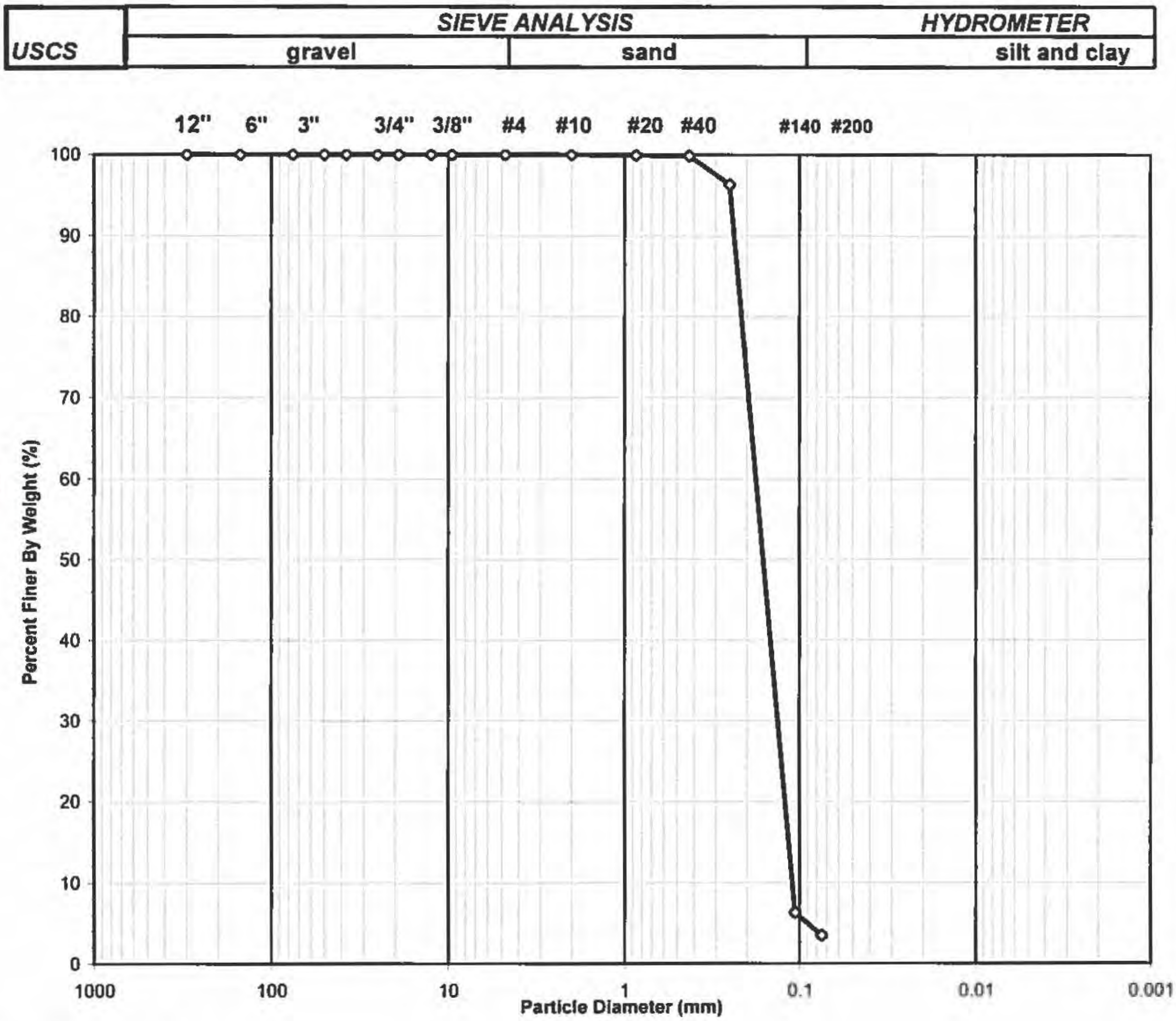
Tested By TO Date 10/7/15 Checked By KC Date 10/14/15

geotechnics
geotechnical & geosynthetic testing

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	48.5-50.0
Project No.:	2015-485-004	Sample No.:	SS-12
Lab ID:	2015-485-004-004	Soil Color:	Brown



USCS Symbol:
SP

USCS Classification:
POORLY GRADED SAND

D60 = 0.18 **CC = 0.91**
D30 = 0.13 **CU = 1.61**
D10 = 0.11

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

DCN: CT-S3C DATE 3/20/13 REVISION: 3

geotechnics
geotechnical & geosynthetic testing

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	48.5-50.0
Project No.:	2015-485-004	Sample No.:	SS-12
Lab ID:	2015-485-004-004	Soil Color:	Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1435	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	491.90	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	423.80	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.48	Weight of Tare (g):	NA
Weight of Water (g):	68.10	Weight of Water (g):	NA
Weight of Dry Sample (g):	278.32	Weight of Dry Sample (g):	NA
Moisture Content (%):	**24.5**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	278.32
Dry Weight of - 3/4" Sample (g):	268.6	Weight of - #200 Material (g):	9.73
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	268.59
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

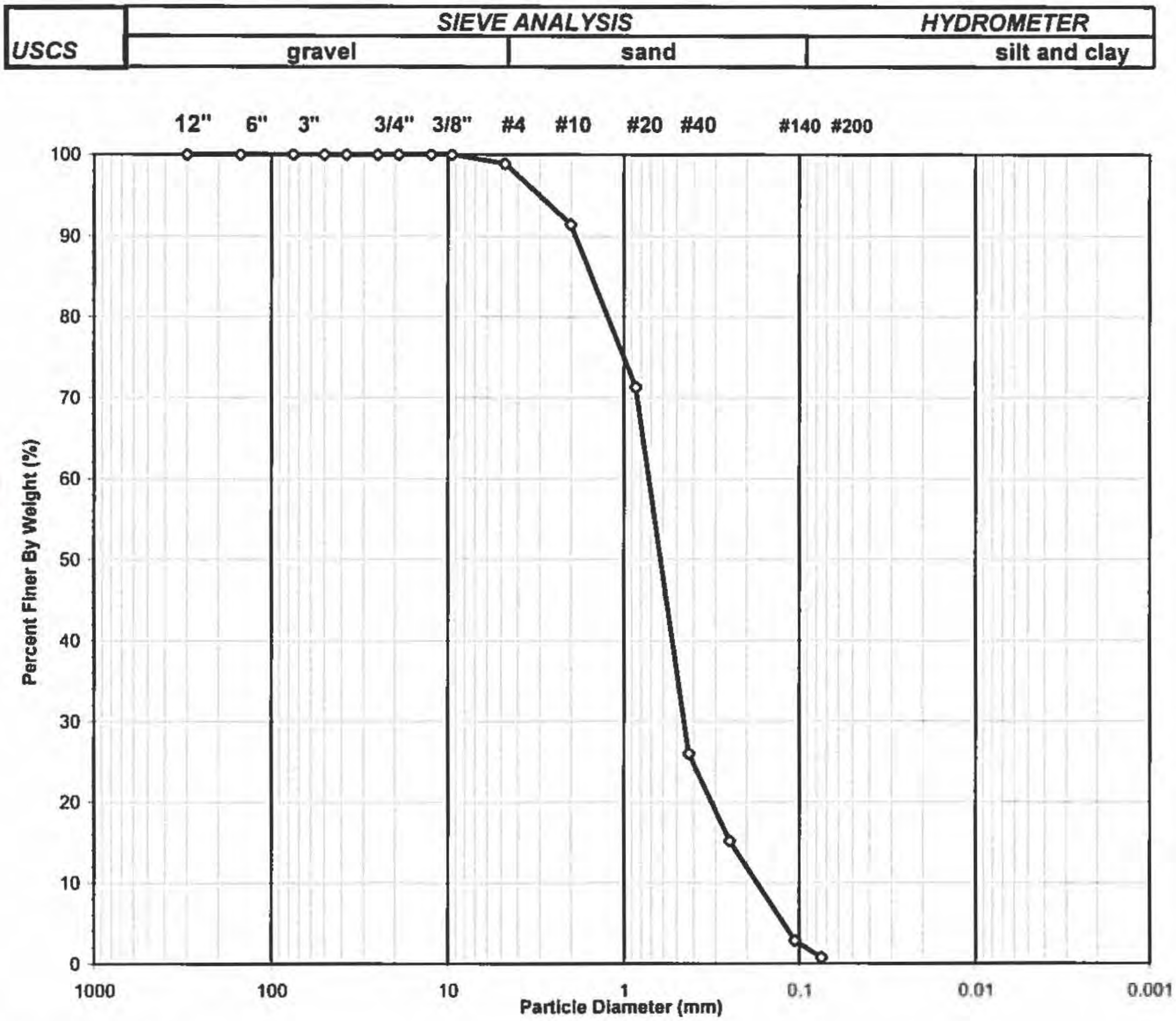
Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.00	0.00	0.00	100.00	**100.00**
#20	0.850	0.10	0.04	0.04	99.96	**99.96**
#40	0.425	0.26	0.09	0.13	99.87	**99.87**
#60	0.250	9.84	3.54	3.66	96.34	**96.34**
#140	0.106	250.51	90.01	93.67	6.33	**6.33**
#200	0.075	7.88	2.83	96.50	3.50	**3.50**
Pan	-	9.73	3.50	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	73.5-75.0
Project No.:	2015-485-004	Sample No.:	SS-17
Lab ID:	2015-485-004-005	Soil Color:	Brownish Gray



USCS Symbol:
SP

USCS Classification:
POORLY GRADED SAND

D60 =	**0.71**	**CC =**	**1.64**
D30 =	**0.45**	**CU =**	**4.09**
D10 =	**0.17**		

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-1
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	73.5-75.0
Project No.:	2015-485-004	Sample No.:	SS-17
Lab ID:	2015-485-004-005	Soil Color:	Brownish Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1420	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	516.10	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	466.60	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.71	Weight of Tare (g):	NA
Weight of Water (g):	49.50	Weight of Water (g):	NA
Weight of Dry Sample (g):	321.89	Weight of Dry Sample (g):	NA
Moisture Content (%):	**15.4**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	321.89
Dry Weight of - 3/4" Sample (g):	319.4	Weight of - #200 Material (g):	2.51
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	319.38
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

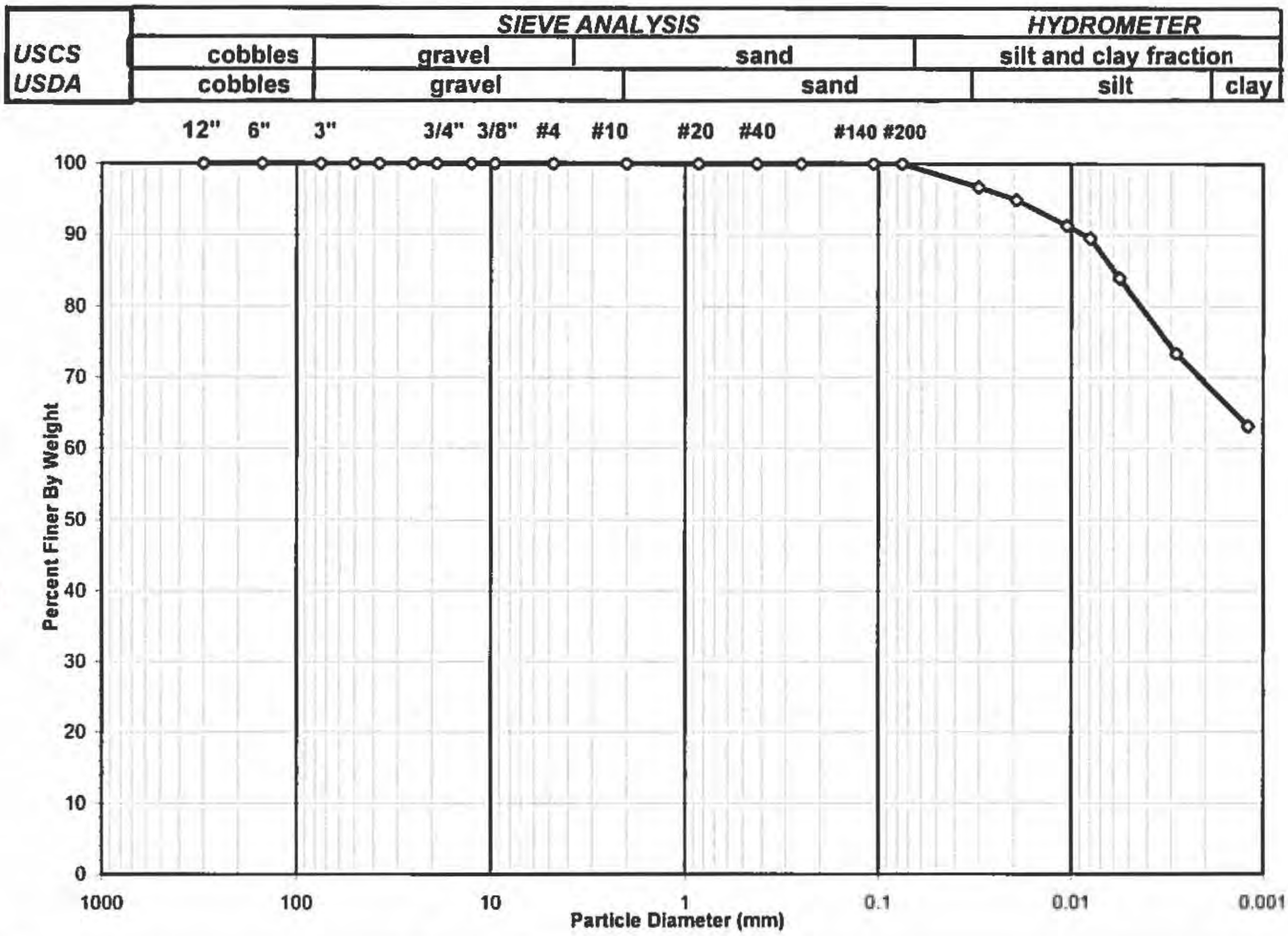
Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	3.62	1.12	1.12	98.88	**98.88**
#10	2.00	24.03	7.47	8.59	91.41	**91.41**
#20	0.850	64.66	20.09	28.68	71.32	**71.32**
#40	0.425	145.90	45.33	74.00	26.00	**26.00**
#60	0.250	34.97	10.86	84.87	15.13	**15.13**
#140	0.106	39.50	12.27	97.14	2.86	**2.86**
#200	0.075	6.70	2.08	99.22	0.78	**0.78**
Pan	-	2.51	0.78	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-2
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	35.4-35.9
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-007	Soil Color:	Gray



USCS Summary		
Sieve Sizes (mm)		**Percentage**
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	0.02
Finer Than #200	*Silt & Clay*	99.98

USCS Symbol:

CH, TESTED

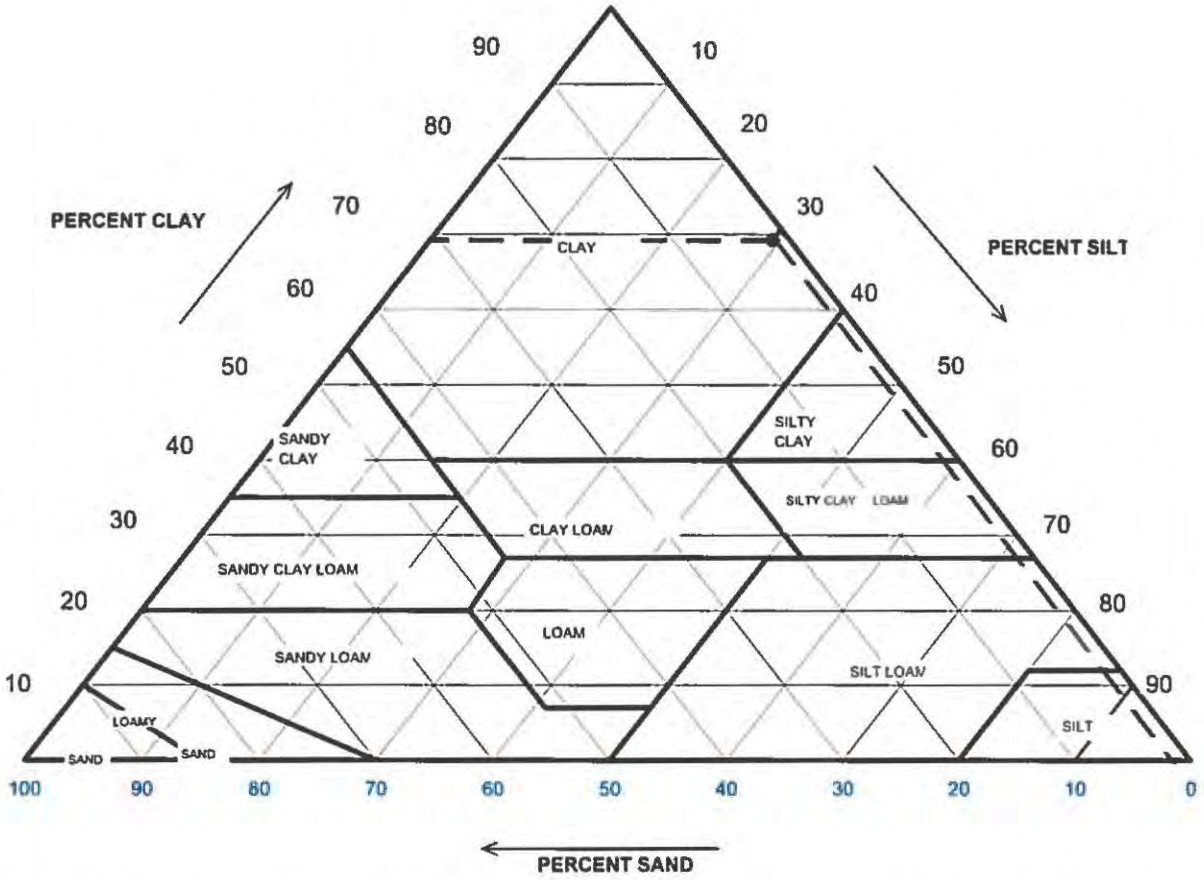
USCS Classification:

FAT CLAY

USDA CLASSIFICATION CHART

Client: AECOM
Client Reference: Dynegy - Wood River Pwr. Sta. 60440115
Project No.: 2015-485-004
Lab ID: 2015-485-004-007

Boring No.: B-2
Depth (ft): 35.4-35.9
Sample No.: ST-2
Soil Color: Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.00	**0.00**
2	100.00	*Sand*	1.49	**1.49**
0.05	98.51	*Silt*	29.34	**29.34**
0.002	69.17	*Clay*	69.17	**69.17**

USDA Classification: ***CLAY***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-2
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	35.4-35.9
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-007	Soil Color:	Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	24	Tare No.	NA
Weight of Tare & Wet Sample (g)	925.25	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	646.70	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	202.45	Weight of Tare (g)	NA
Weight of Water (g)	278.55	Weight of Water (g)	NA
Weight of Dry Sample (g)	444.25	Weight of Dry Sample (g)	NA
Moisture Content (%	**62.7**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	444.25
Dry Weight of -3/4" Sample (g)	0.11	Weight of - #200 Material (g)	444.14
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	0.11
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.00	0.00	0.00		100.00	**100.00**
#20	0.85	0.00	0.00	0.00		100.00	**100.00**
#40	0.425	0.00	0.00	0.00		100.00	**100.00**
#60	0.250	0.05	0.01	0.01		99.99	**99.99**
#140	0.106	0.04	0.01	0.02		99.98	**99.98**
#200	0.075	0.02	0.00	0.02		99.98	**99.98**
Pan	-	444.14	99.98	100.00		-	-

Tested By	HL	Date	9/29/15	Checked By	KC	Date	10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-2
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	35.4-35.9
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-007	Soil Color:	Gray

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		33.0	23.1	5.97	27.0	96.7	0.01296	0.0302	**96.7**
5		32.5	23.1	5.97	26.5	94.9	0.01296	0.0192	**94.9**
17		31.5	23.1	5.97	25.5	91.4	0.01296	0.0105	**91.3**
30		31.0	23.1	5.97	25.0	89.6	0.01296	0.0079	**89.5**
62		29.5	22.9	6.04	23.5	83.9	0.01299	0.0056	**83.9**
250		26.5	23	6.00	20.5	73.3	0.01297	0.0028	**73.3**
1440		23.5	23.4	5.86	17.6	63.1	0.01291	0.0012	**63.1**

Soil Specimen Data		Other Corrections		
Tare No.	925			
Weight of Tare & Dry Material (g)	132.42	a - Factor	0.99	
Weight of Tare (g)	99.75			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	99.98	
Weight of Dry Material (g)	27.7			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 9/29/15 Checked By KC Date 10/14/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-2
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	43.5-45.0
Project No.:	2015-485-004	Sample No.:	SS-10
Lab ID:	2015-485-004-008	Soil Color:	Brownish Gray

USCS Symbol:

SP

USCS Classification:

POORLY GRADED SAND

D60 =	**0.18**	**CC =**	**0.91**
D30 =	**0.13**	**CU =**	**1.60**
D10 =	**0.11**		

Tested By	HL	Date	10/5/15	Checked By	KC	Date	10/12/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-2
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	43.5-45.0
Project No.:	2015-485-004	Sample No.:	SS-10
Lab ID:	2015-485-004-008	Soil Color:	Brownish Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1452	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	569.50	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	490.10	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.28	Weight of Tare (g):	NA
Weight of Water (g):	79.40	Weight of Water (g):	NA
Weight of Dry Sample (g):	344.82	Weight of Dry Sample (g):	NA
Moisture Content (%):	**23.0**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	344.82
Dry Weight of - 3/4" Sample (g):	338.8	Weight of - #200 Material (g):	6.01
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	338.81
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

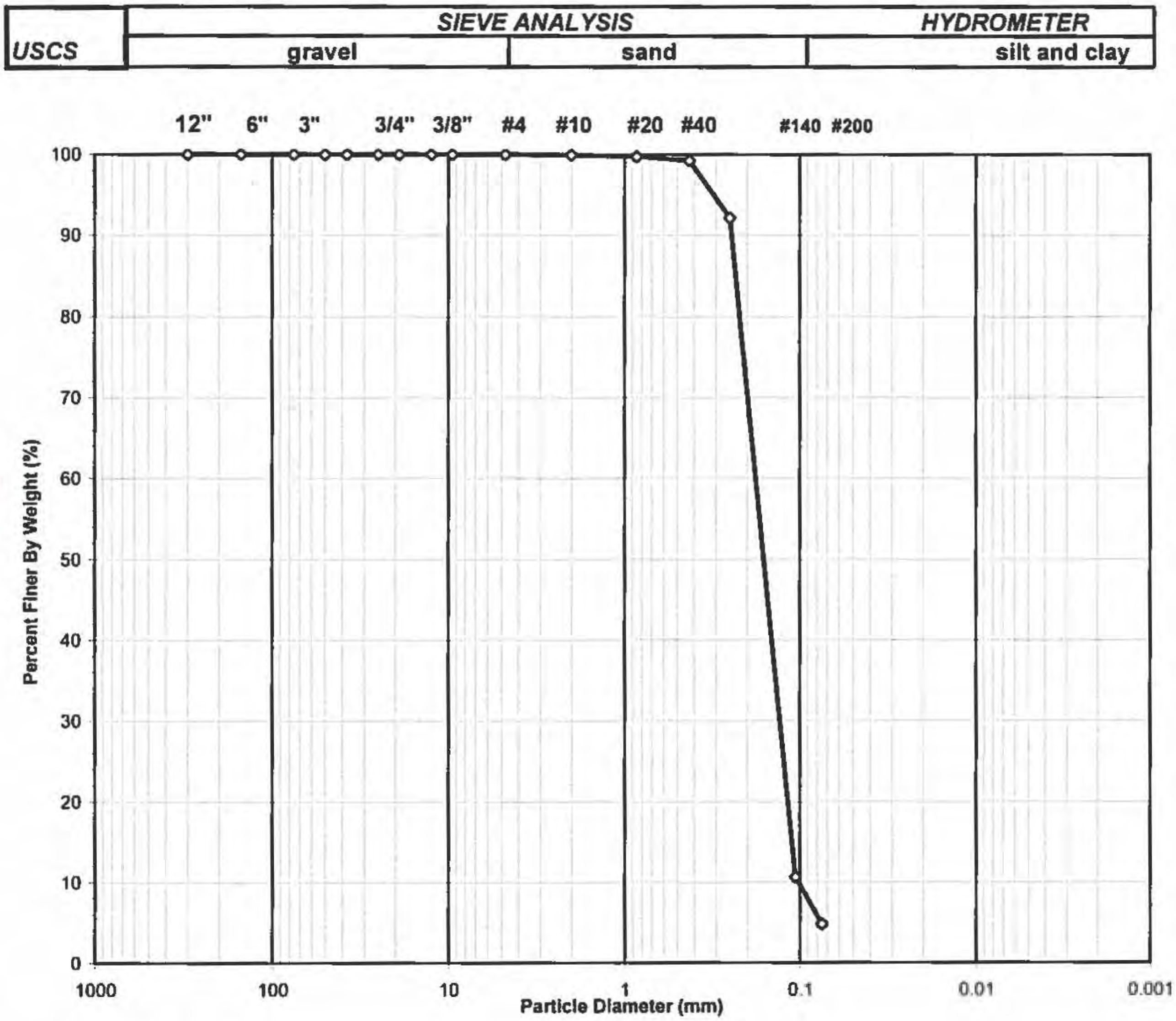
Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.16	0.05	0.05	99.95	**99.95**
#20	0.850	0.57	0.17	0.21	99.79	**99.79**
#40	0.425	2.29	0.66	0.88	99.12	**99.12**
#60	0.250	12.55	3.64	4.52	95.48	**95.48**
#140	0.106	313.90	91.03	95.55	4.45	**4.45**
#200	0.075	9.34	2.71	98.26	1.74	**1.74**
Pan	-	6.01	1.74	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-2
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	48.5-50.0
Project No.:	2015-485-004	Sample No.:	SS-11
Lab ID:	2015-485-004-009	Soil Color:	Brown / Gray



USCS Symbol:
SP

USCS Classification:
POORLY GRADED SAND

D60 =	**0.18**	**CC =**	**0.93**
D30 =	**0.13**	**CU =**	**1.75**
D10 =	**0.10**		

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-2
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	48.5-50.0
Project No.:	2015-485-004	Sample No.:	SS-11
Lab ID:	2015-485-004-009	Soil Color:	Brown / Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1441	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	618.80	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	509.50	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	143.96	Weight of Tare (g):	NA
Weight of Water (g):	109.30	Weight of Water (g):	NA
Weight of Dry Sample (g):	365.54	Weight of Dry Sample (g):	NA
Moisture Content (%):	**29.9**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	365.54
Dry Weight of - 3/4" Sample (g):	347.9	Weight of - #200 Material (g):	17.63
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	347.91
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

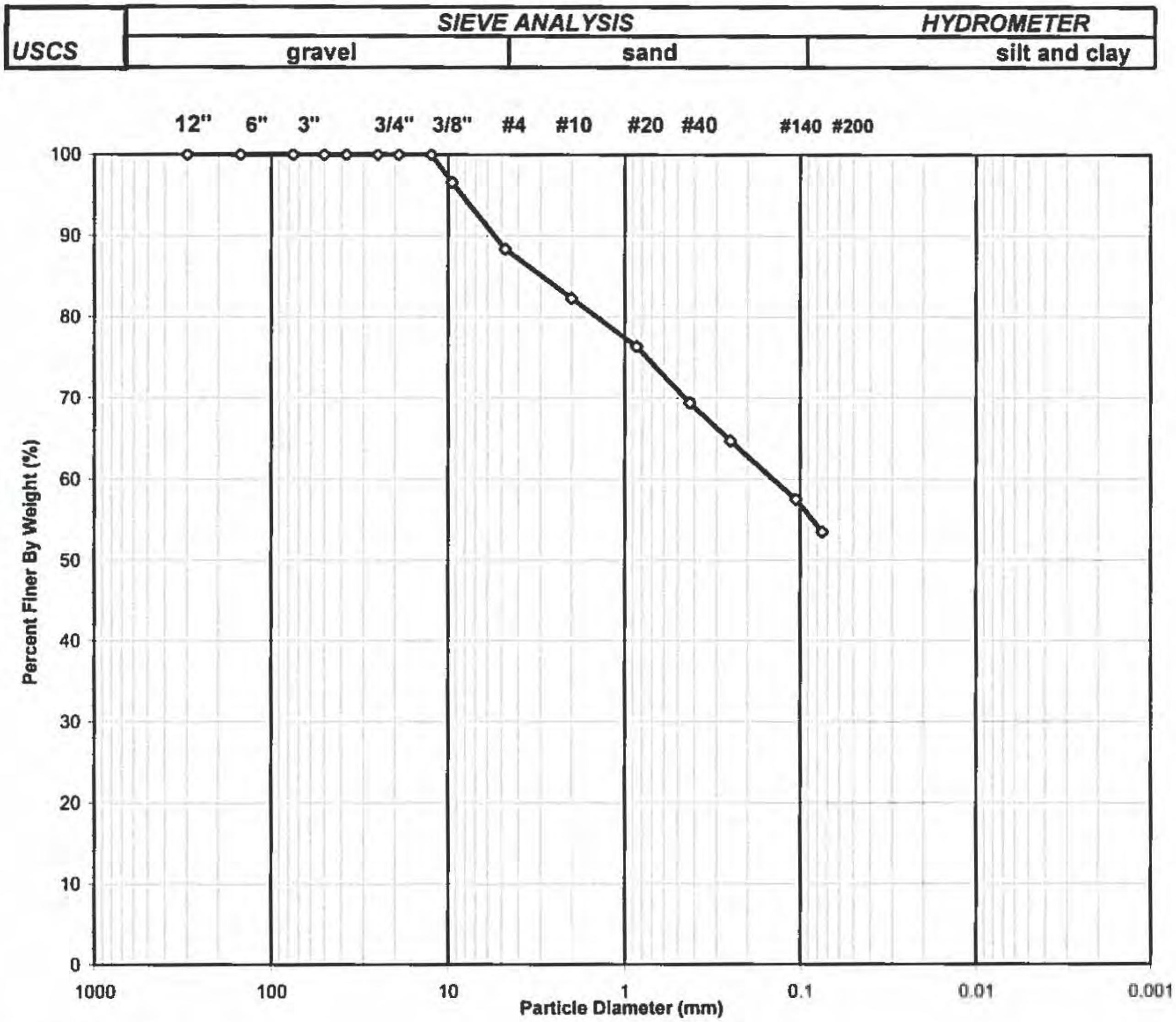
Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.12	0.03	0.03	99.97	**99.97**
#10	2.00	0.26	0.07	0.10	99.90	**99.90**
#20	0.850	0.63	0.17	0.28	99.72	**99.72**
#40	0.425	1.90	0.52	0.80	99.20	**99.20**
#60	0.250	25.90	7.09	7.88	92.12	**92.12**
#140	0.106	297.80	81.47	89.35	10.65	**10.65**
#200	0.075	21.30	5.83	95.18	4.82	**4.82**
Pan	-	17.63	4.82	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	13.5-15.0
Project No.:	2015-485-004	Sample No.:	SS-5
Lab ID:	2015-485-004-010	Soil Color:	Gray



USCS Symbol:
ml, ASSUMED

USCS Classification:
SANDY SILT

Tested By	HL	Date	10/5/15	Checked By	KC	Date	10/12/15

geotechnics
geotechnical & geosynthetic testing

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	13.5-15.0
Project No.:	2015-485-004	Sample No.:	SS-5
Lab ID:	2015-485-004-010	Soil Color:	Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1437	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	350.70	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	318.60	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.77	Weight of Tare (g):	NA
Weight of Water (g):	32.10	Weight of Water (g):	NA
Weight of Dry Sample (g):	173.83	Weight of Dry Sample (g):	NA
Moisture Content (%):	**18.5**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	173.83
Dry Weight of - 3/4" Sample (g):	80.7	Weight of - #200 Material (g):	93.13
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	80.70
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	6.05	3.48	3.48	96.52	**96.52**
#4	4.75	14.23	8.19	11.67	88.33	**88.33**
#10	2.00	10.50	6.04	17.71	82.29	**82.29**
#20	0.850	10.34	5.95	23.66	76.34	**76.34**
#40	0.425	12.12	6.97	30.63	69.37	**69.37**
#60	0.250	8.07	4.64	35.27	64.73	**64.73**
#140	0.106	12.58	7.24	42.51	57.49	**57.49**
#200	0.075	6.81	3.92	46.42	53.58	**53.58**
Pan	-	93.13	53.58	100.00	-	-

Tested By	HL	Date	10/5/15	Checked By	KC	Date	10/12/15

geotechnics
geotechnical & geosynthetic testing

SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client: AECOM
Client Reference: Dynegy-Wood River Pwr. Sta. 60440115
Project No.: 2015-485-004
Lab ID: 2015-485-004-011

Boring No.: B-3
Depth (ft): 23.5-25.0
Sample No.: SS-7
Soil Color: Dark Brown

USCS Symbol:
cl, ASSUMED

USCS Classification:
LEAN CLAY WITH SAND

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	23.5-25.0
Project No.:	2015-485-004	Sample No.:	SS-7
Lab ID:	2015-485-004-011	Soil Color:	Dark Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1429	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	226.40	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	211.66	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.86	Weight of Tare (g):	NA
Weight of Water (g):	14.74	Weight of Water (g):	NA
Weight of Dry Sample (g):	66.80	Weight of Dry Sample (g):	NA
Moisture Content (%):	**22.1**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	66.80
Dry Weight of - 3/4" Sample (g):	17.5	Weight of - #200 Material (g):	49.26
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	17.54
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

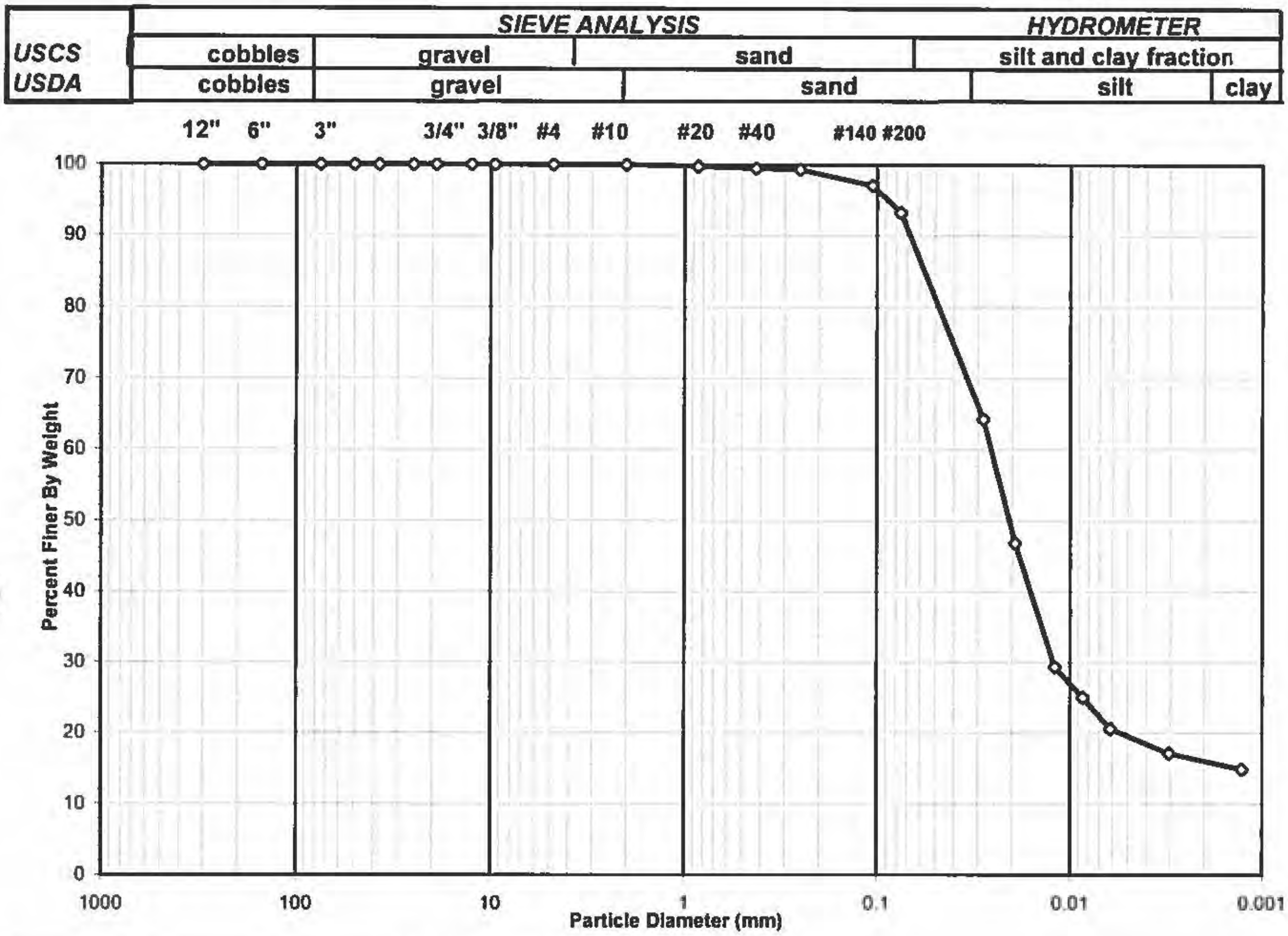
Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	1.69	2.53	2.53	97.47	**97.47**
#10	2.00	2.24	3.35	5.88	94.12	**94.12**
#20	0.850	1.97	2.95	8.83	91.17	**91.17**
#40	0.425	1.23	1.84	10.67	89.33	**89.33**
#60	0.250	1.71	2.56	13.23	86.77	**86.77**
#140	0.106	5.73	8.58	21.81	78.19	**78.19**
#200	0.075	2.97	4.45	26.26	73.74	**73.74**
Pan	-	49.26	73.74	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	35.9-36.4
Project No.:	2015-485-004	Sample No.:	ST-3
Lab ID:	2015-485-004-012	Soil Color:	Brown



Sieve Sizes (mm)	USCS Summary	Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	6.72
Finer Than #200	*Silt & Clay*	93.28

USCS Symbol:

CL, TESTED

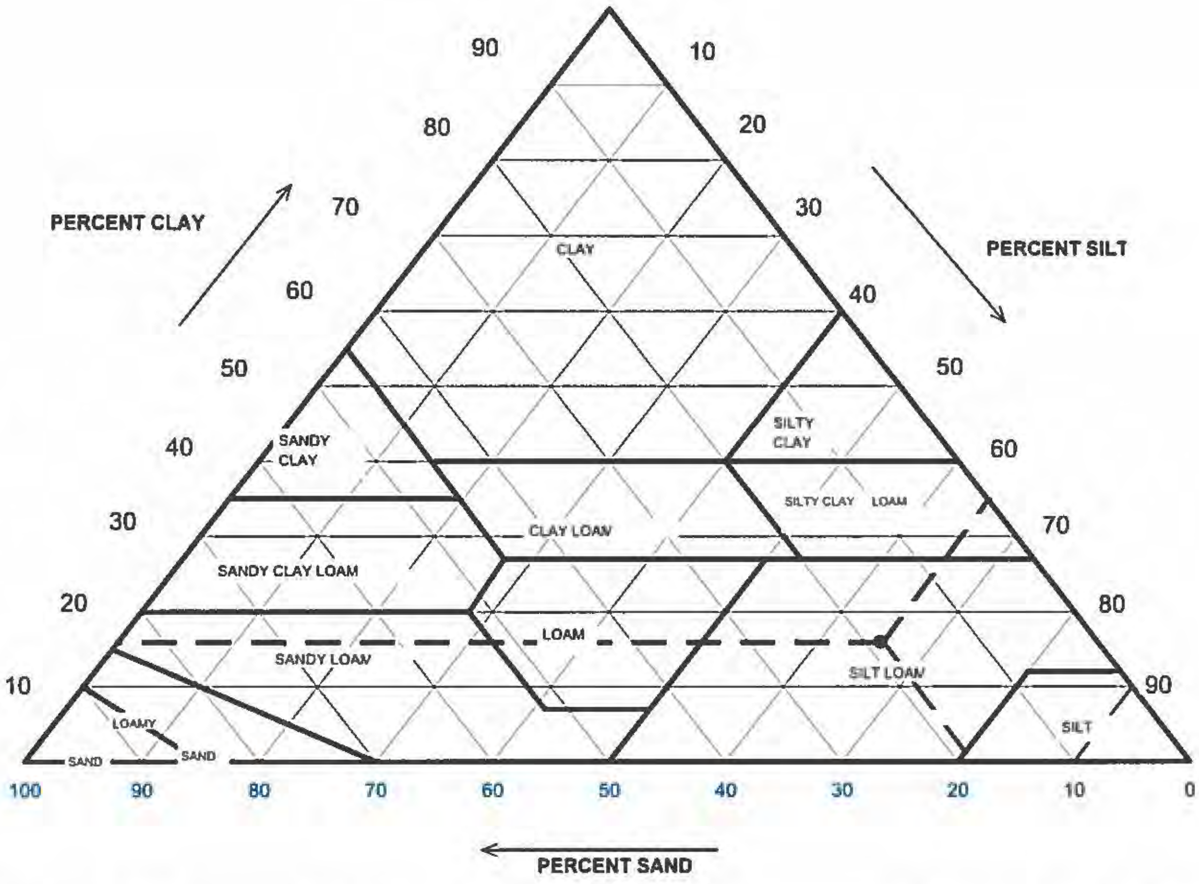
USCS Classification:

LEAN CLAY

geotechnics
geotechnical & geosynthetic testing

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	35.9-36.4
Project No.:	2015-485-004	Sample No.:	ST-3
Lab ID:	2015-485-004-012	Soil Color:	Brown



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.04	**0.00**
2	99.96	*Sand*	18.65	**18.65**
0.05	81.31	*Silt*	65.29	**65.32**
0.002	16.02	*Clay*	16.02	**16.03**

USDA Classification: ***SILT LOAM***

geotechnics
geotechnical & geosynthetic testing

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	35.9-36.4
Project No.:	2015-485-004	Sample No.:	ST-3
Lab ID:	2015-485-004-012	Soil Color:	Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	8	Tare No.	NA
Weight of Tare & Wet Sample (g)	1008.46	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	856.30	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	201.38	Weight of Tare (g)	NA
Weight of Water (g)	152.16	Weight of Water (g)	NA
Weight of Dry Sample (g)	654.92	Weight of Dry Sample (g)	NA
Moisture Content (%	**23.2**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	654.92
Dry Weight of -3/4" Sample (g)	44.00	Weight of - #200 Material (g)	610.92
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	44.00
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.26	0.04	0.04		99.96	**99.96**
#20	0.85	1.42	0.22	0.26		99.74	**99.74**
#40	0.425	1.54	0.24	0.49		99.51	**99.51**
#60	0.250	1.20	0.18	0.67		99.33	**99.33**
#140	0.106	14.85	2.27	2.94		97.06	**97.06**
#200	0.075	24.73	3.78	6.72		93.28	**93.28**
Pan	-	610.92	93.28	100.00		-	-

Tested By RAL Date 10/8/15 Checked By KC Date 10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	35.9-36.4
Project No.:	2015-485-004	Sample No.:	ST-3
Lab ID:	2015-485-004-012	Soil Color:	Brown

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		43.0	22.5	6.18	36.8	68.9	0.01305	0.0281	**64.3**
5		33.0	22.5	6.18	26.8	50.2	0.01305	0.0193	**46.8**
15		23.0	22.5	6.18	16.8	31.5	0.01305	0.0119	**29.4**
30		20.5	22.5	6.18	14.3	26.8	0.01305	0.0086	**25.0**
60		18.0	22.4	6.22	11.8	22.0	0.01307	0.0062	**20.6**
250		16.0	22.5	6.18	9.8	18.4	0.01305	0.0031	**17.1**
1440		14.5	23	6.00	8.5	15.9	0.01297	0.0013	**14.8**

Soil Specimen Data		Other Corrections		
Tare No.	963			
Weight of Tare & Dry Material (g)	158.72	a - Factor	0.99	
Weight of Tare (g)	100.81			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	93.28	
Weight of Dry Material (g)	52.9			
		Specific Gravity	2.7	Assumed

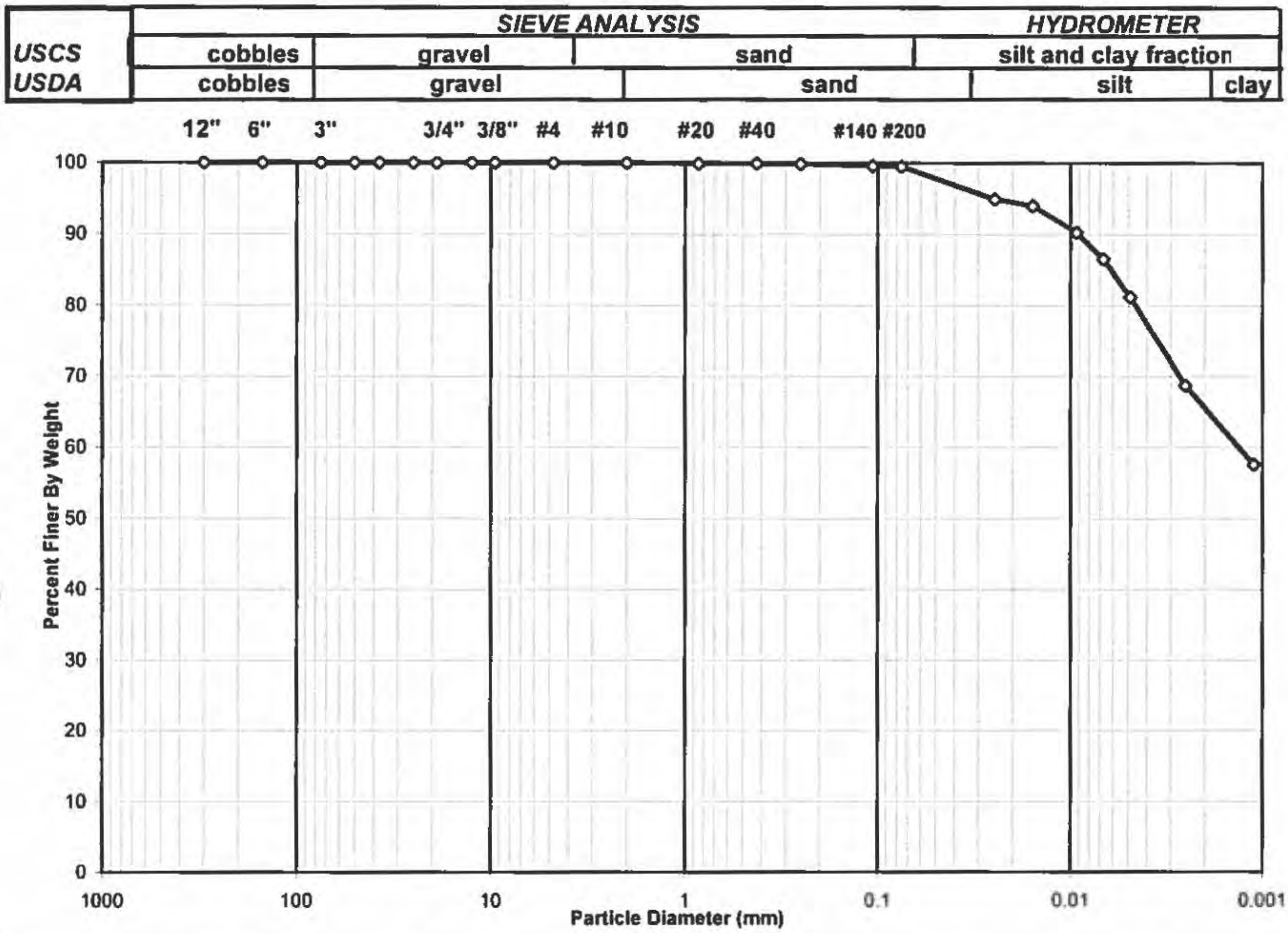
Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 10/8/15 Checked By KC Date 10/14/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	63.5-65.0
Project No.:	2015-485-004	Sample No.:	SS-15
Lab ID:	2015-485-004-013	Soil Color:	Brown / Gray



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	0.50
Finer Than #200	*Silt & Clay*	99.50

USCS Symbol:

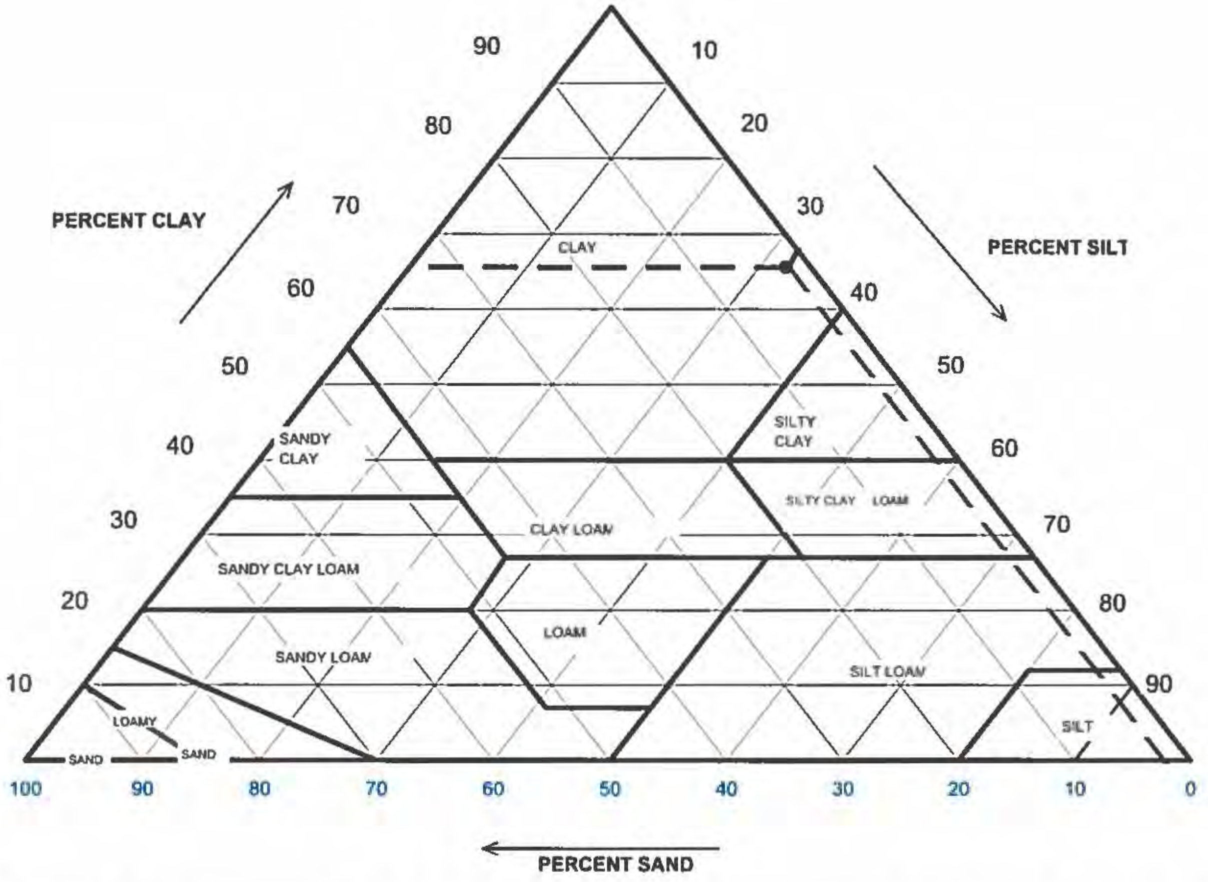
CH, TESTED

USCS Classification:

FAT CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	63.5-65.0
Project No.:	2015-485-004	Sample No.:	SS-15
Lab ID:	2015-485-004-013	Soil Color:	Brown / Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.04	**0.00**
2	99.96	*Sand*	2.12	**2.12**
0.05	97.84	*Silt*	32.25	**32.27**
0.002	65.59	*Clay*	65.59	**65.61**

USDA Classification: ***CLAY***

geotechnics
geotechnical & geosynthetic testing

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	63.5-65.0
Project No.:	2015-485-004	Sample No.:	SS-15
Lab ID:	2015-485-004-013	Soil Color:	Brown / Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1427	Tare No.	NA
Weight of Tare & Wet Sample (g)	400.30	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	309.37	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.62	Weight of Tare (g)	NA
Weight of Water (g)	90.93	Weight of Water (g)	NA
Weight of Dry Sample (g)	163.75	Weight of Dry Sample (g)	NA
Moisture Content (%	**55.5**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	163.75
Dry Weight of -3/4" Sample (g)	0.82	Weight of - #200 Material (g)	162.93
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	0.82
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.07	0.04	0.04		99.96	**99.96**
#20	0.85	0.11	0.07	0.11		99.89	**99.89**
#40	0.425	0.01	0.01	0.12		99.88	**99.88**
#60	0.250	0.10	0.06	0.18		99.82	**99.82**
#140	0.106	0.40	0.24	0.42		99.58	**99.58**
#200	0.075	0.13	0.08	0.50		99.50	**99.50**
Pan	-	162.93	99.50	100.00		-	-

Tested By	HL	Date	10/5/15	Checked By	KC	Date	10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	63.5-65.0
Project No.:	2015-485-004	Sample No.:	SS-15
Lab ID:	2015-485-004-013	Soil Color:	Brown / Gray

Elapsed Time		**R Measured**	**Temp.**	**Composite Correction**	**R Corrected**	**N**	**K Factor**	**Diameter**	**N'**
(min)			**(°C)**			**(%)**		**(mm)**	**(%)**
0		NA	NA	NA	NA	NA	NA	NA	NA
2		57.5	20.7	6.83	50.7	95.4	0.01333	0.0247	**94.9**
5		57.0	20.7	6.83	50.2	94.5	0.01333	0.0157	**94.0**
15		55.0	20.7	6.83	48.2	90.7	0.01333	0.0093	**90.3**
30		53.0	20.7	6.83	46.2	87.0	0.01333	0.0067	**86.5**
60		50.0	21.1	6.68	43.3	81.6	0.01327	0.0049	**81.2**
250		43.0	22.1	6.33	36.7	69.1	0.01311	0.0025	**68.7**
1440		37.0	22.2	6.29	30.7	57.8	0.01310	0.0011	**57.5**

Soil Specimen Data		**Other Corrections**		
Tare No.	528			
Weight of Tare & Dry Material (g)	149.93	a - Factor	0.99	
Weight of Tare (g)	92.36			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	99.50	
Weight of Dry Material (g)	52.6			
		Specific Gravity	2.7	Assumed

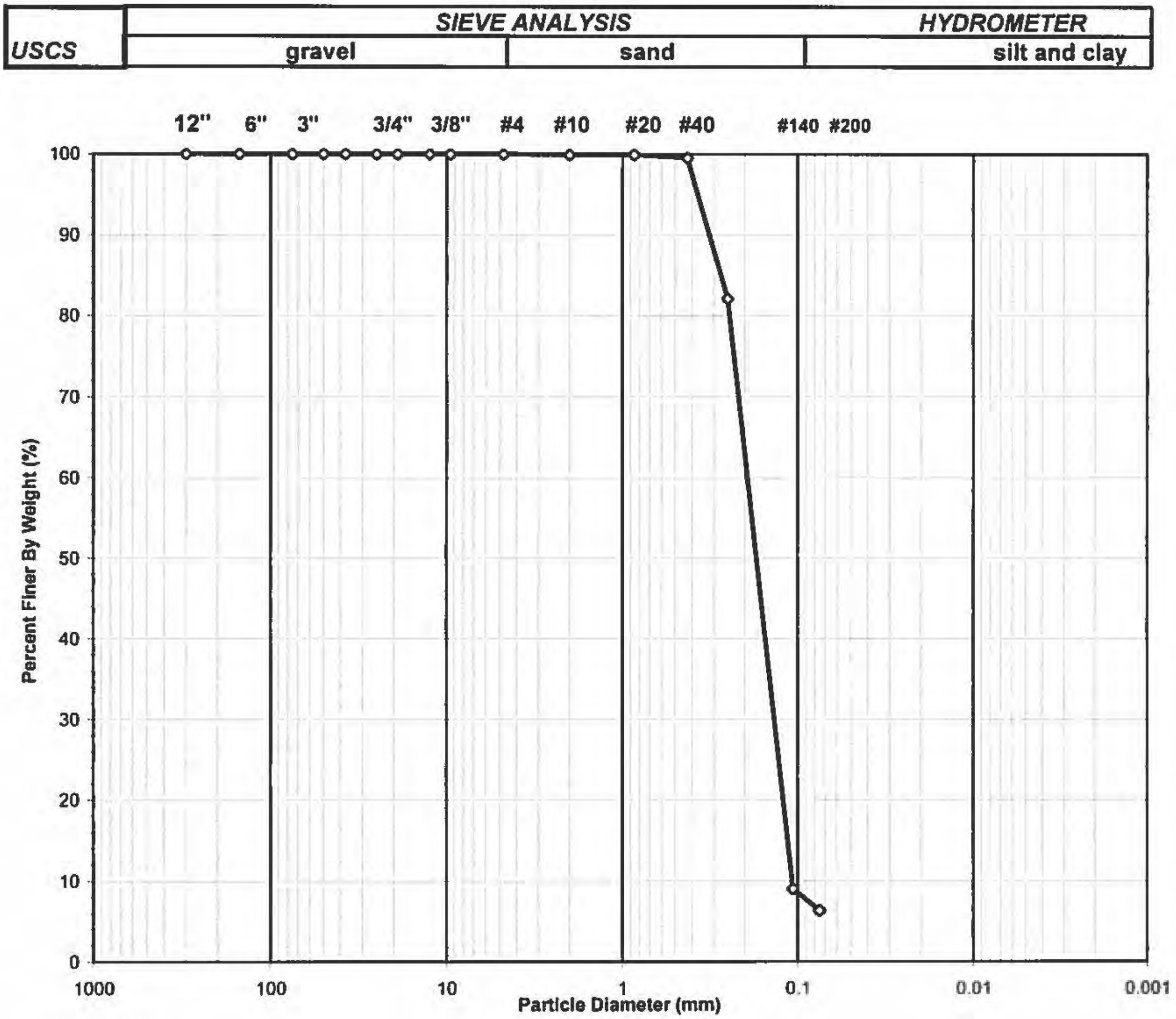
Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 10/12/15 Checked By KC Date 10/14/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	73.5-75.0
Project No.:	2015-485-004	Sample No.:	SS-17
Lab ID:	2015-485-004-014	Soil Color:	Brown / Gray



USCS Symbol:

sp-sm, ASSUMED

USCS Classification:

POORLY GRADED SAND WITH SILT

D60 = 0.19 **CC = 0.89**

D30 = 0.14 **CU = 1.80**

D10 = 0.11

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

geotechnics
geotechnical & geosynthetic testing

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-3
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	73.5-75.0
Project No.:	2015-485-004	Sample No.:	SS-17
Lab ID:	2015-485-004-014	Soil Color:	Brown / Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	679	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	377.70	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	327.97	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	95.02	Weight of Tare (g):	NA
Weight of Water (g):	49.73	Weight of Water (g):	NA
Weight of Dry Sample (g):	232.95	Weight of Dry Sample (g):	NA
Moisture Content (%):	**21.3**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	232.95
Dry Weight of - 3/4" Sample (g):	218.3	Weight of - #200 Material (g):	14.70
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	218.25
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.11	0.05	0.05	99.95	**99.95**
#20	0.850	0.08	0.03	0.08	99.92	**99.92**
#40	0.425	1.02	0.44	0.52	99.48	**99.48**
#60	0.250	40.58	17.42	17.94	82.06	**82.06**
#140	0.106	170.19	73.06	91.00	9.00	**9.00**
#200	0.075	6.27	2.69	93.69	6.31	**6.31**
Pan	-	14.70	6.31	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	13.5-15.0
Project No.:	2015-485-004	Sample No.:	SS-4
Lab ID:	2015-485-004-015	Soil Color:	Gray / Brown

USCS Summary		
Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	18.17
Finer Than #200	*Silt & Clay*	81.83

USCS Symbol:

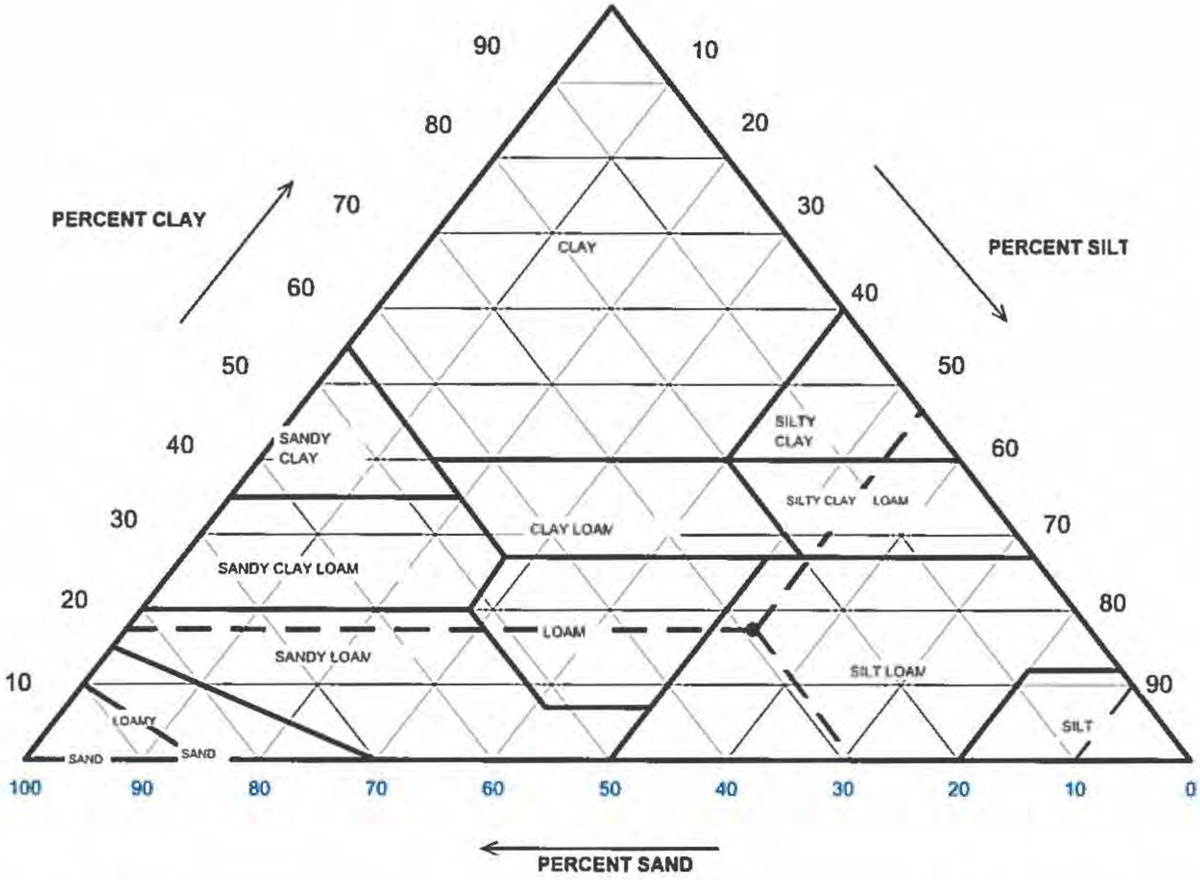
cl, ASSUMED

USCS Classification:

LEAN CLAY WITH SAND

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	13.5-15.0
Project No.:	2015-485-004	Sample No.:	SS-4
Lab ID:	2015-485-004-015	Soil Color:	Gray / Brown



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat (%)
		Gravel	0.00	**0.00**
2	100.00	*Sand*	29.02	**29.02**
0.05	70.98	*Silt*	53.63	**53.63**
0.002	17.35	*Clay*	17.35	**17.35**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	13.5-15.0
Project No.:	2015-485-004	Sample No.:	SS-4
Lab ID:	2015-485-004-015	Soil Color:	Gray / Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	2343	Tare No.	NA
Weight of Tare & Wet Sample (g)	497.30	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	409.30	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	93.48	Weight of Tare (g)	NA
Weight of Water (g)	88.00	Weight of Water (g)	NA
Weight of Dry Sample (g)	315.82	Weight of Dry Sample (g)	NA
Moisture Content (%	**27.9**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	315.82
Dry Weight of -3/4" Sample (g)	57.40	Weight of - #200 Material (g)	258.42
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	57.40
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.00	0.00	0.00		100.00	**100.00**
#20	0.85	0.49	0.16	0.16		99.84	**99.84**
#40	0.425	1.75	0.55	0.71		99.29	**99.29**
#60	0.250	7.33	2.32	3.03		96.97	**96.97**
#140	0.106	31.42	9.95	12.98		87.02	**87.02**
#200	0.075	16.41	5.20	18.17		81.83	**81.83**
Pan	-	258.42	81.83	100.00		-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	13.5-15.0
Project No.:	2015-485-004	Sample No.:	SS-4
Lab ID:	2015-485-004-015	Soil Color:	Gray / Brown

Elapsed Time		**R Measured**	**Temp.**	**Composite Correction**	**R Corrected**	**N**	**K Factor**	**Diameter**	**N'**
(min)			**(°C)**			**(%)**		**(mm)**	**(%)**
0		NA	NA	NA	NA	NA	NA	NA	NA
2		39.5	20.7	6.83	32.7	69.5	0.01333	0.0295	**56.9**
5		31.5	20.7	6.83	24.7	52.5	0.01333	0.0199	**43.0**
20		22.5	20.7	6.83	15.7	33.4	0.01333	0.0106	**27.3**
30		20.5	20.7	6.83	13.7	29.1	0.01333	0.0088	**23.8**
60		19.5	21.1	6.68	12.8	27.3	0.01327	0.0062	**22.3**
250		17.0	22.1	6.33	10.7	22.7	0.01311	0.0030	**18.6**
1440		15.5	22.2	6.29	9.2	19.6	0.01310	0.0013	**16.0**

Soil Specimen Data		**Other Corrections**		
Tare No.	644			
Weight of Tare & Dry Material (g)	151.17	a - Factor	0.99	
Weight of Tare (g)	99.66			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	81.83	
Weight of Dry Material (g)	46.5			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 10/12/15 Checked By KC Date 10/14/15

geotechnics
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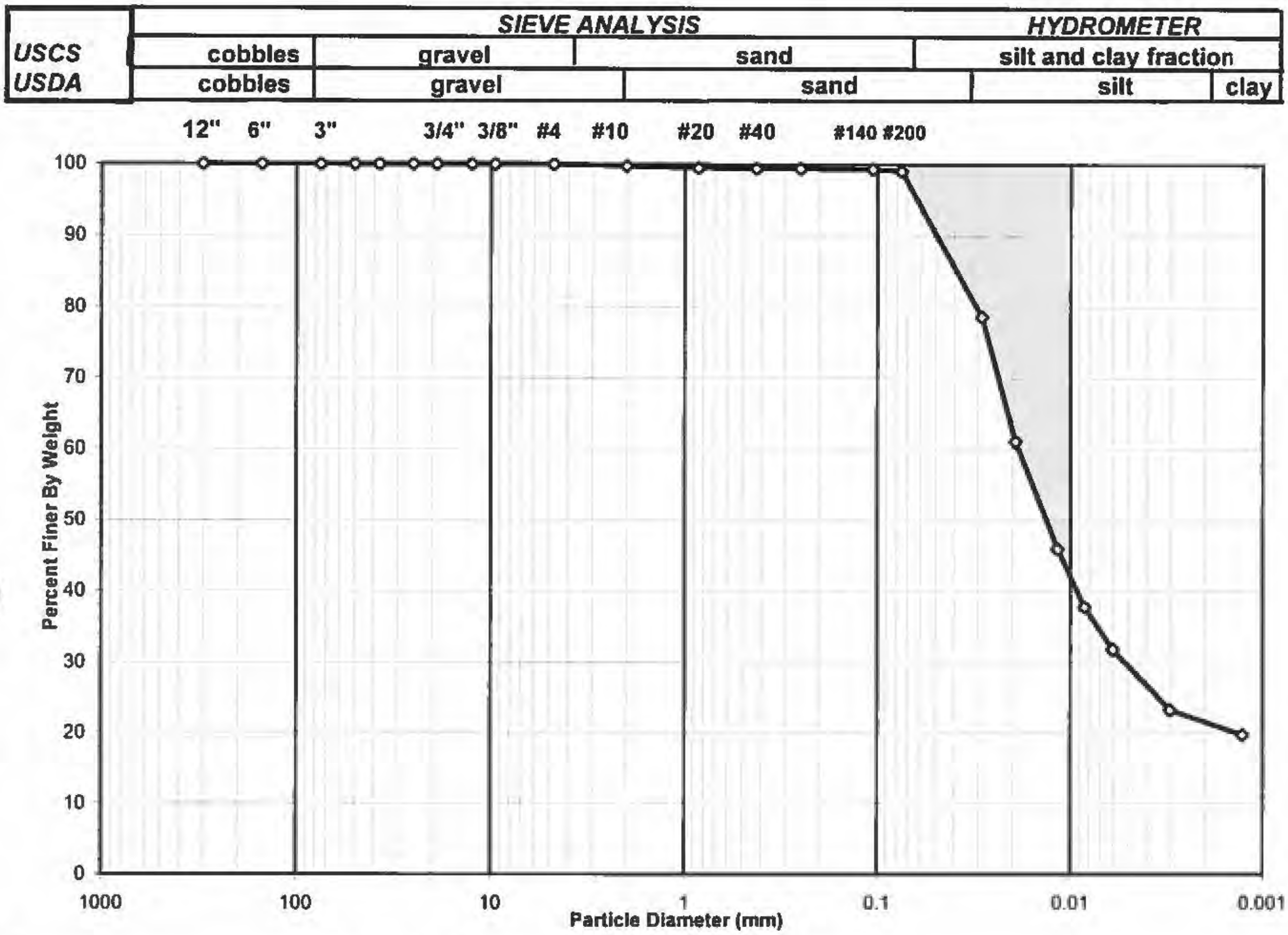
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	31.2-31.7
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-016	Soil Color:	Gray



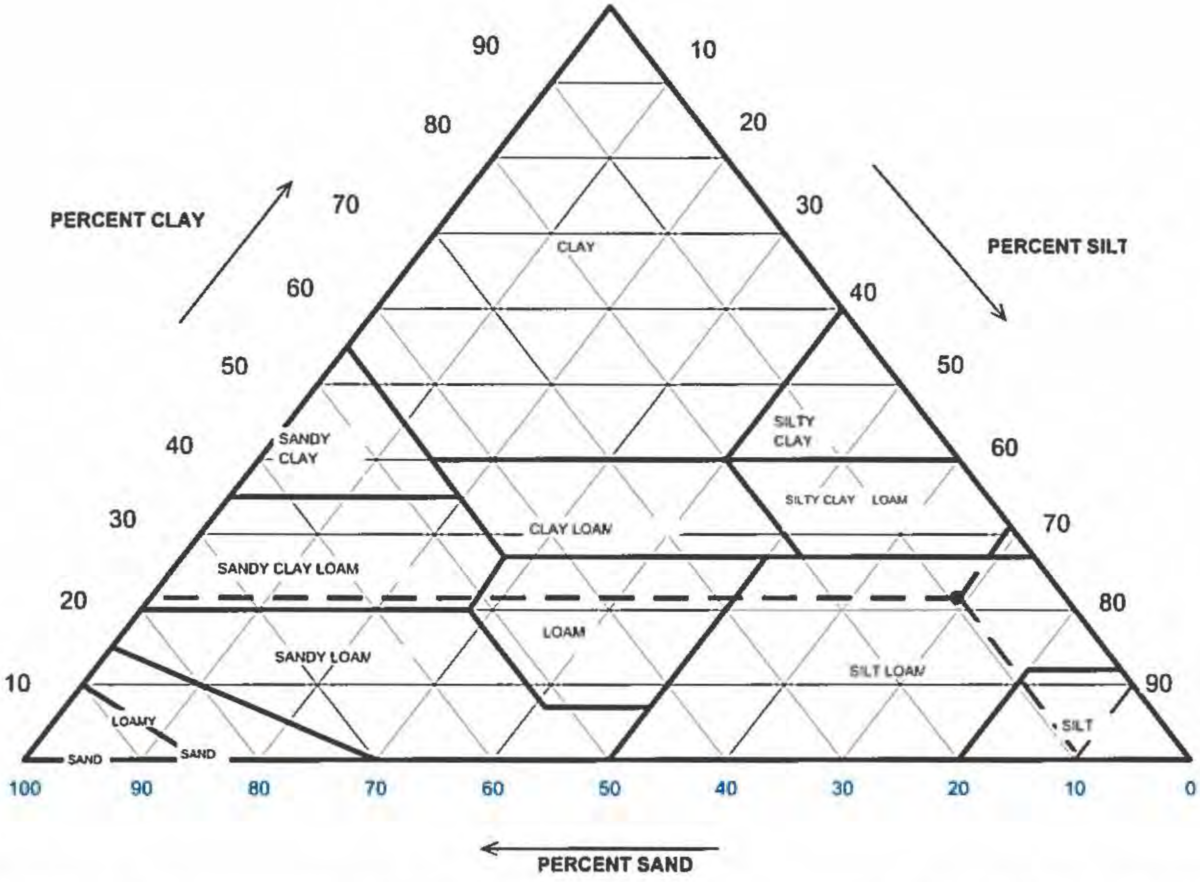
USCS Summary		
Sieve Sizes (mm)		**Percentage**
Greater Than #4	*Gravel*	0.03
#4 To #200	*Sand*	0.88
Finer Than #200	*Silt & Clay*	99.09

USCS Symbol:
CL, TESTED

USCS Classification:
LEAN CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	31.2-31.7
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-016	Soil Color:	Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.23	**0.00**
2	99.77	*Sand*	9.31	**9.33**
0.05	90.46	*Silt*	68.88	**69.04**
0.002	21.58	*Clay*	21.58	**21.63**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	31.2-31.7
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-016	Soil Color:	Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1445	Tare No.	NA
Weight of Tare & Wet Sample (g)	741.60	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	553.20	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	146.37	Weight of Tare (g)	NA
Weight of Water (g)	188.40	Weight of Water (g)	NA
Weight of Dry Sample (g)	406.83	Weight of Dry Sample (g)	NA
Moisture Content (%	**46.3**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	406.83
Dry Weight of -3/4" Sample (g)	3.71	Weight of - #200 Material (g)	403.12
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	3.71
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.14	0.03	0.03		99.97	**99.97**
#10	2.00	0.79	0.19	0.23		99.77	**99.77**
#20	0.85	1.13	0.28	0.51		99.49	**99.49**
#40	0.425	0.32	0.08	0.59		99.41	**99.41**
#60	0.250	0.17	0.04	0.63		99.37	**99.37**
#140	0.106	0.35	0.09	0.71		99.29	**99.29**
#200	0.075	0.81	0.20	0.91		99.09	**99.09**
Pan	-	403.12	99.09	100.00		-	-

Tested By AMC Date 9/30/15 Checked By KC Date 10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	31.2-31.7
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-016	Soil Color:	Gray

Elapsed Time		**R Measured**	**Temp.**	**Composite Correction**	**R Corrected**	**N**	**K Factor**	**Diameter**	**N'**
(min)			**(°C)**			**(%)**		**(mm)**	**(%)**
0		NA	NA	NA	NA	NA	NA	NA	NA
2		39.5	23.4	5.86	33.6	79.3	0.01291	0.0286	**78.6**
5		32.0	23.4	5.86	26.1	61.6	0.01291	0.0192	**61.1**
15		25.5	23.4	5.86	19.6	46.3	0.01291	0.0116	**45.9**
30		22.0	23.4	5.86	16.1	38.1	0.01291	0.0084	**37.7**
60		19.5	23.3	5.89	13.6	32.1	0.01293	0.0060	**31.8**
250		16.0	22.9	6.04	10.0	23.5	0.01299	0.0030	**23.3**
1440		14.5	22.9	6.04	8.5	20.0	0.01299	0.0013	**19.8**

Soil Specimen Data		**Other Corrections**		
Tare No.	949			
Weight of Tare & Dry Material (g)	144.21	a - Factor	0.99	
Weight of Tare (g)	97.22			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	99.09	
Weight of Dry Material (g)	42.0			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 9/30/15 Checked By KC Date 10/14/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	48.5-50.0
Project No.:	2015-485-004	Sample No.:	SS-11
Lab ID:	2015-485-004-018	Soil Color:	Gray

USCS Symbol:
sm, ASSUMED

USCS Classification:
SILTY SAND

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

page 1 of 2 **DCN: CT-S3C DATE 3/20/13 REVISION: 3**

geotechnics
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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	48.5-50.0
Project No.:	2015-485-004	Sample No.:	SS-11
Lab ID:	2015-485-004-018	Soil Color:	Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	301	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	655.70	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	523.00	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	105.97	Weight of Tare (g):	NA
Weight of Water (g):	132.70	Weight of Water (g):	NA
Weight of Dry Sample (g):	417.03	Weight of Dry Sample (g):	NA
Moisture Content (%):	**31.8**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	417.03
Dry Weight of - 3/4" Sample (g):	231.4	Weight of - #200 Material (g):	185.64
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	231.39
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.88	0.21	0.21	99.79	**99.79**
#10	2.00	0.09	0.02	0.23	99.77	**99.77**
#20	0.850	0.90	0.22	0.45	99.55	**99.55**
#40	0.425	7.35	1.76	2.21	97.79	**97.79**
#60	0.250	38.63	9.26	11.47	88.53	**88.53**
#140	0.106	121.70	29.18	40.66	59.34	**59.34**
#200	0.075	61.84	14.83	55.49	44.51	**44.51**
Pan	-	185.64	44.51	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-4
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	53.5-55.0
Project No.:	2015-485-004	Sample No.:	SS-12
Lab ID:	2015-485-004-019	Soil Color:	Gray

USCS Symbol:
sm, ASSUMED

USCS Classification:
SILTY SAND

Tested By	HL	Date	10/5/15	Checked By	KC	Date	10/12/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client: AECOM
Client Reference: Dynegy-Wood River Pwr. Sta. 60440115
Project No.: 2015-485-004
Lab ID: 2015-485-004-019

Boring No.: B-4
Depth (ft): 53.5-55.0
Sample No.: SS-12
Soil Color: Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	929	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	694.40	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	605.10	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	100.14	Weight of Tare (g):	NA
Weight of Water (g):	89.30	Weight of Water (g):	NA
Weight of Dry Sample (g):	504.96	Weight of Dry Sample (g):	NA
Moisture Content (%):	**17.7**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	504.96
Dry Weight of - 3/4" Sample (g):	390.6	Weight of - #200 Material (g):	114.38
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	390.58
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.57	0.11	0.11	99.89	**99.89**
#20	0.850	2.41	0.48	0.59	99.41	**99.41**
#40	0.425	12.04	2.38	2.97	97.03	**97.03**
#60	0.250	67.76	13.42	16.39	83.61	**83.61**
#140	0.106	230.47	45.64	62.03	37.97	**37.97**
#200	0.075	77.33	15.31	77.35	22.65	**22.65**
Pan	-	114.38	22.65	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

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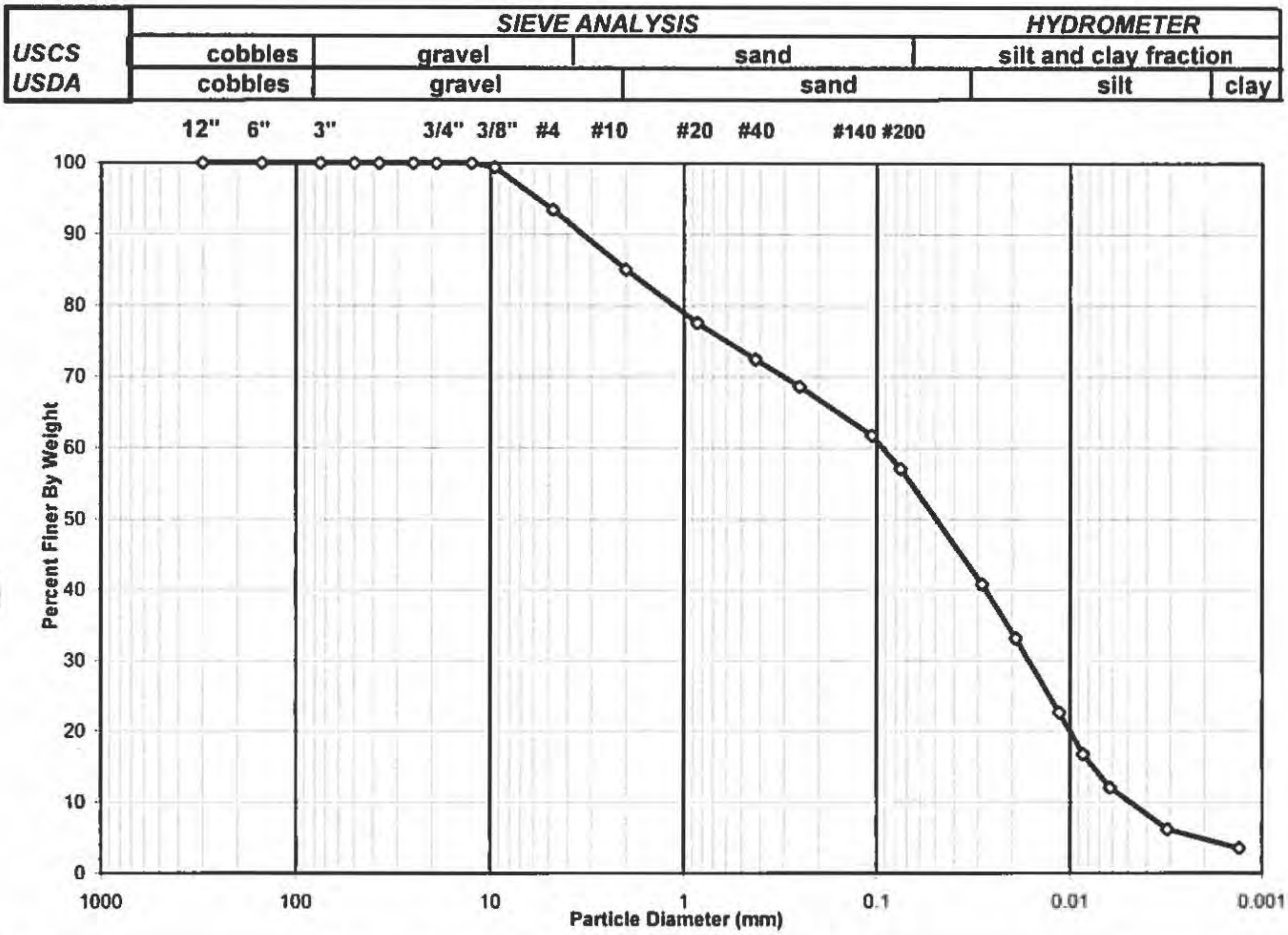
SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	6.0-7.5
Project No.:	2015-485-004	Sample No.:	SS-3
Lab ID:	2015-485-004-020	Soil Color:	Gray



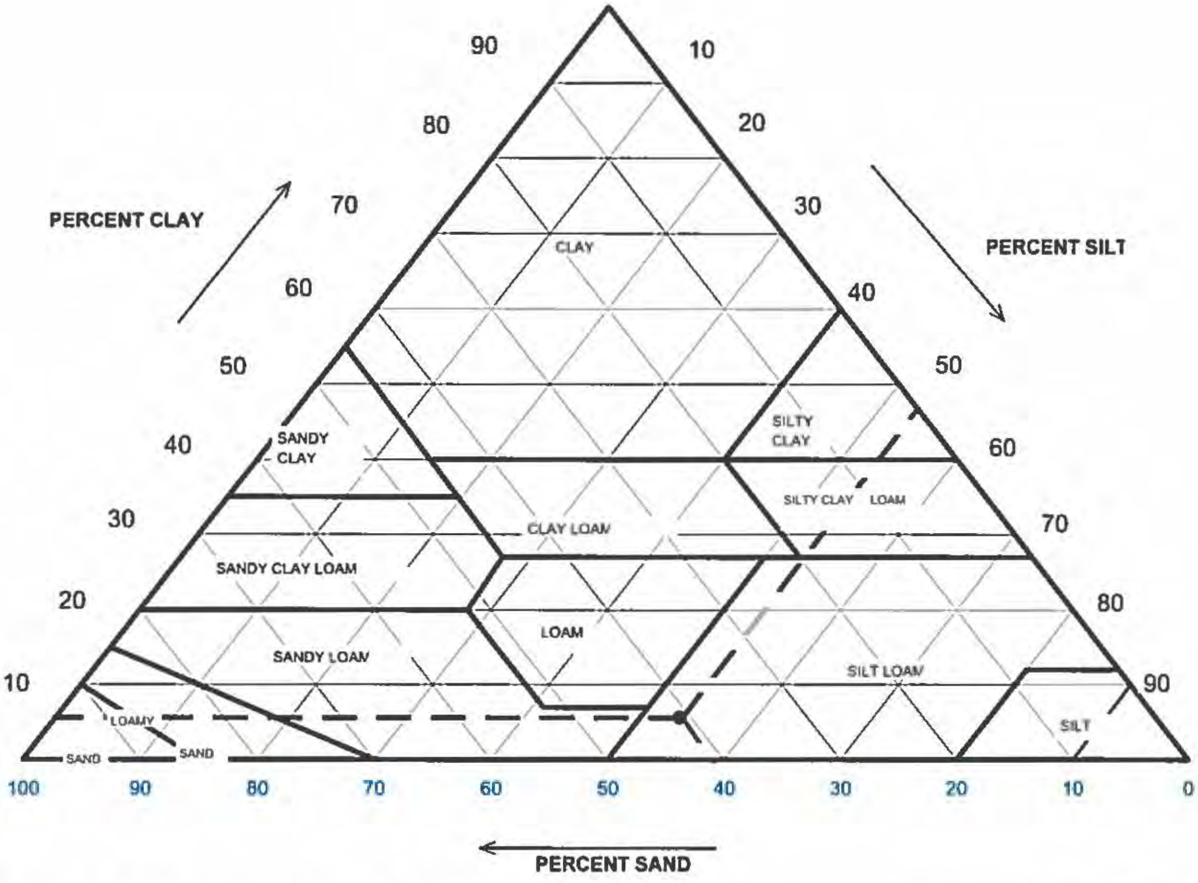
USCS Summary		
Sieve Sizes (mm)		**Percentage**
Greater Than #4	*Gravel*	6.55
#4 To #200	*Sand*	36.36
Finer Than #200	*Silt & Clay*	57.09

USCS Symbol:
ml, ASSUMED

USCS Classification:
SANDY SILT

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	6.0-7.5
Project No.:	2015-485-004	Sample No.:	SS-3
Lab ID:	2015-485-004-020	Soil Color:	Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	14.99	**0.00**
2	85.01	*Sand*	34.80	**40.93**
0.05	50.21	*Silt*	45.40	**53.40**
0.002	4.82	*Clay*	4.82	**5.66**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	6.0-7.5
Project No.:	2015-485-004	Sample No.:	SS-3
Lab ID:	2015-485-004-020	Soil Color:	Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	889	Tare No.	NA
Weight of Tare & Wet Sample (g)	470.70	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	399.92	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	100.62	Weight of Tare (g)	NA
Weight of Water (g)	70.78	Weight of Water (g)	NA
Weight of Dry Sample (g)	299.30	Weight of Dry Sample (g)	NA
Moisture Content (%	**23.6**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	299.30
Dry Weight of -3/4" Sample (g)	128.44	Weight of - #200 Material (g)	170.86
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	128.44
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	1.92	0.64	0.64		99.36	**99.36**
#4	4.75	17.69	5.91	6.55		93.45	**93.45**
#10	2.00	25.25	8.44	14.99		85.01	**85.01**
#20	0.85	22.24	7.43	22.42		77.58	**77.58**
#40	0.425	15.42	5.15	27.57		72.43	**72.43**
#60	0.250	11.29	3.77	31.34		68.66	**68.66**
#140	0.106	20.75	6.93	38.28		61.72	**61.72**
#200	0.075	13.88	4.64	42.91		57.09	**57.09**
Pan	-	170.86	57.09	100.00		-	-

Tested By RAL Date 10/8/15 Checked By KC Date 10/12/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	6.0-7.5
Project No.:	2015-485-004	Sample No.:	SS-3
Lab ID:	2015-485-004-020	Soil Color:	Gray

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		41.0	22.5	6.18	34.8	71.3	0.01305	0.0286	**40.7**
5		34.5	22.5	6.18	28.3	58.0	0.01305	0.0190	**33.1**
16		25.5	22.5	6.18	19.3	39.6	0.01305	0.0114	**22.6**
30		20.5	22.5	6.18	14.3	29.3	0.01305	0.0086	**16.7**
60		16.5	22.4	6.22	10.3	21.1	0.01307	0.0062	**12.0**
250		11.5	22.5	6.18	5.3	10.9	0.01305	0.0031	**6.2**
1440		9.0	23	6.00	3.0	6.1	0.01297	0.0013	**3.5**

Soil Specimen Data		Other Corrections		
Tare No.	925			
Weight of Tare & Dry Material (g)	153.10	a - Factor	0.99	
Weight of Tare (g)	99.77			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	57.09	
Weight of Dry Material (g)	48.3			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 10/8/15 Checked By KC Date 10/12/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	38.5-40.0
Project No.:	2015-485-004	Sample No.:	SS-10
Lab ID:	2015-485-004-021	Soil Color:	Brown

USCS Symbol:
CL-ML, TESTED

USCS Classification:
SILTY CLAY WITH SAND

Tested By	HL	Date	10/5/15	Checked By	KC	Date	10/12/15

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	38.5-40.0
Project No.:	2015-485-004	Sample No.:	SS-10
Lab ID:	2015-485-004-021	Soil Color:	Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	503	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	659.90	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	544.20	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	93.31	Weight of Tare (g):	NA
Weight of Water (g):	115.70	Weight of Water (g):	NA
Weight of Dry Sample (g):	450.89	Weight of Dry Sample (g):	NA
Moisture Content (%):	**25.7**	**Moisture Content (%):**	**NA**

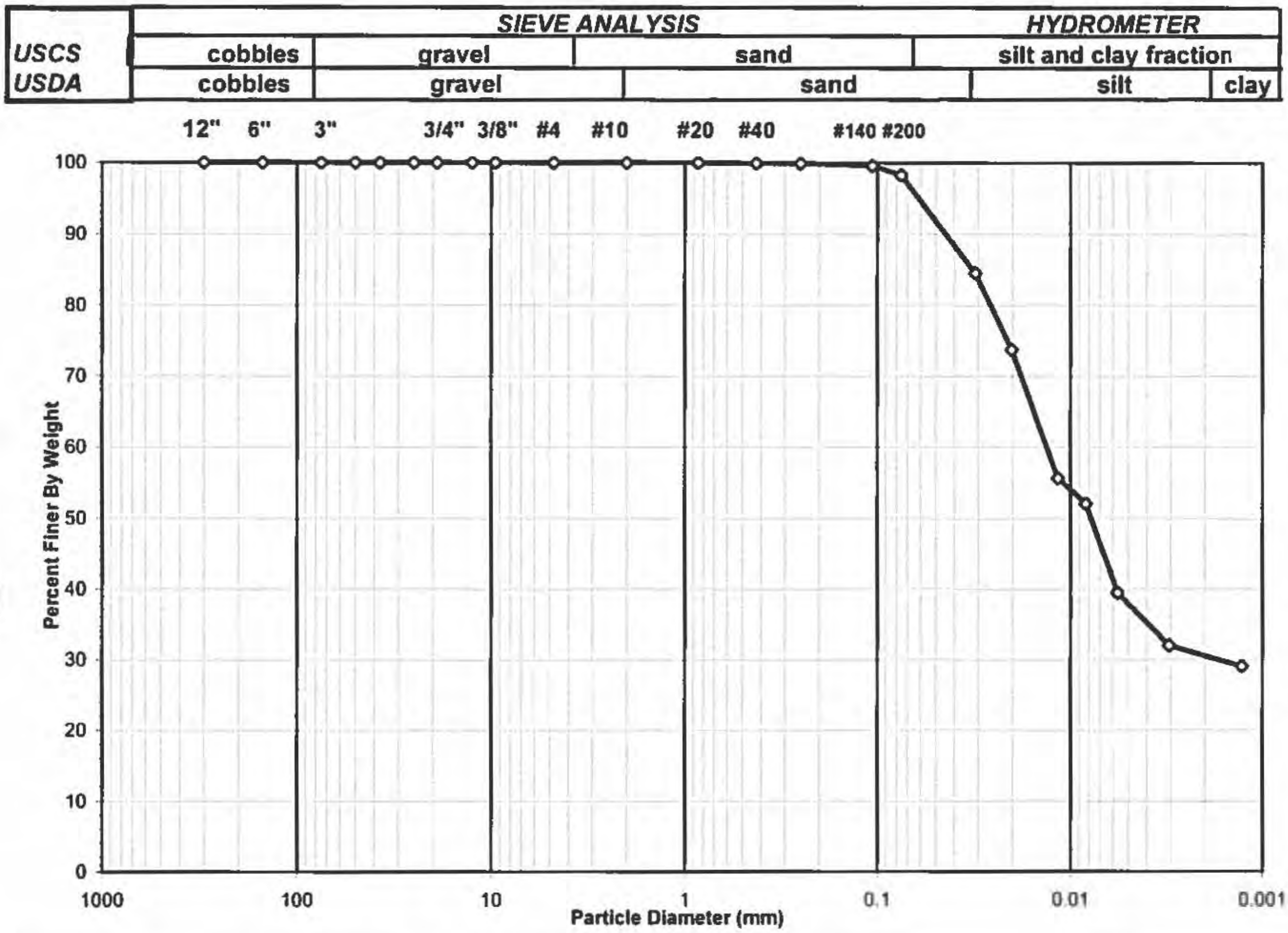
Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	450.89
Dry Weight of - 3/4" Sample (g):	117.0	Weight of - #200 Material (g):	333.94
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	116.95
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.12	0.03	0.03	99.97	**99.97**
#20	0.850	0.77	0.17	0.20	99.80	**99.80**
#40	0.425	1.63	0.36	0.56	99.44	**99.44**
#60	0.250	6.85	1.52	2.08	97.92	**97.92**
#140	0.106	64.39	14.28	16.36	83.64	**83.64**
#200	0.075	43.19	9.58	25.94	74.06	**74.06**
Pan	-	333.94	74.06	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	55.0-55.5
Project No.:	2015-485-004	Sample No.:	ST-5
Lab ID:	2015-485-004-022	Soil Color:	Gray



USCS Summary

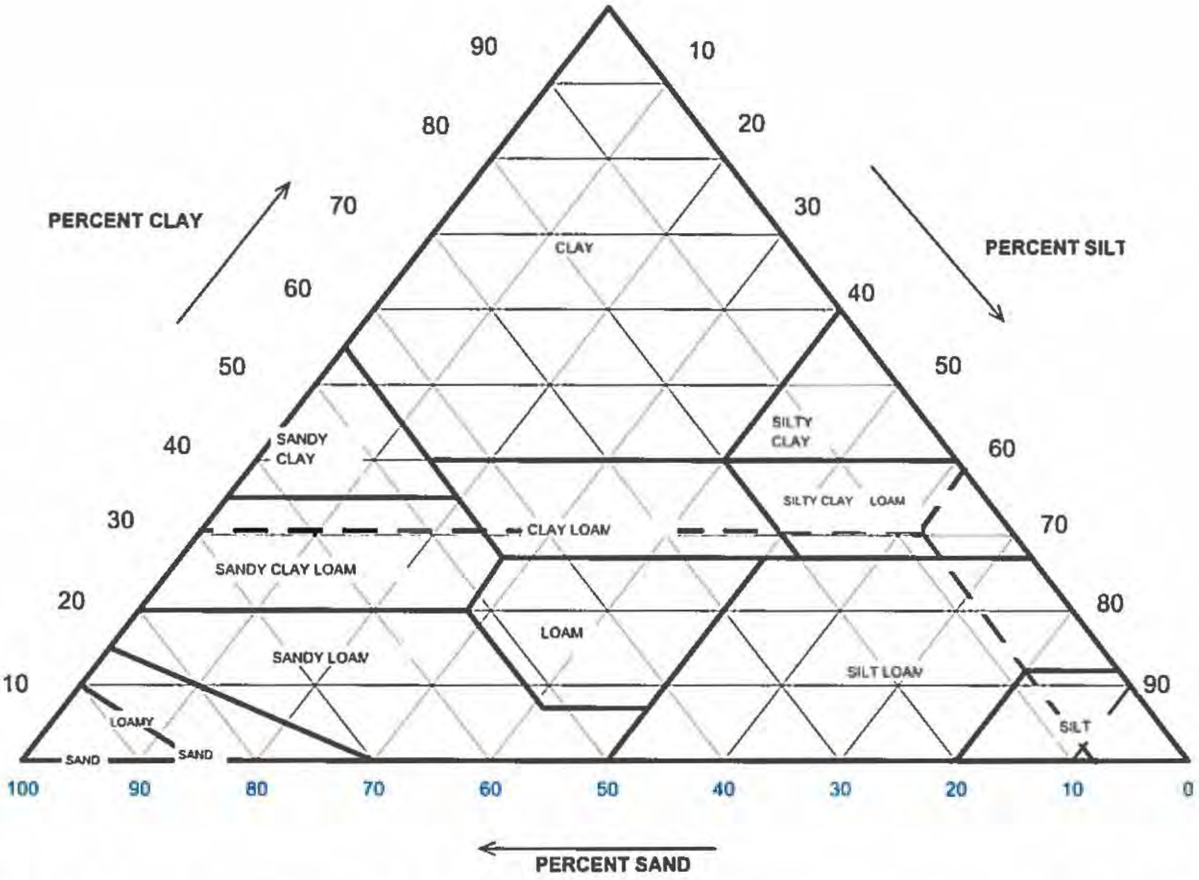
Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	1.68
Finer Than #200	*Silt & Clay*	98.32

USCS Symbol:
CL, TESTED

USCS Classification:
LEAN CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	55.0-55.5
Project No.:	2015-485-004	Sample No.:	ST-5
Lab ID:	2015-485-004-022	Soil Color:	Gray



Particle Size	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
(mm)	(%)		(%)	(%)
		Gravel	0.01	**0.00**
2	99.99	*Sand*	8.03	**8.03**
0.05	91.96	*Silt*	61.40	**61.41**
0.002	30.56	*Clay*	30.56	**30.56**

USDA Classification: ***SILTY CLAY LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	55.0-55.5
Project No.:	2015-485-004	Sample No.:	ST-5
Lab ID:	2015-485-004-022	Soil Color:	Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	2324	Tare No.	NA
Weight of Tare & Wet Sample (g)	551.05	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	415.03	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	97.71	Weight of Tare (g)	NA
Weight of Water (g)	136.02	Weight of Water (g)	NA
Weight of Dry Sample (g)	317.32	Weight of Dry Sample (g)	NA
Moisture Content (%	**42.9**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	317.32
Dry Weight of -3/4" Sample (g)	5.34	Weight of - #200 Material (g)	311.98
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	5.34
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.04	0.01	0.01		99.99	**99.99**
#20	0.85	0.03	0.01	0.02		99.98	**99.98**
#40	0.425	0.07	0.02	0.04		99.96	**99.96**
#60	0.250	0.10	0.03	0.08		99.92	**99.92**
#140	0.106	1.06	0.33	0.41		99.59	**99.59**
#200	0.075	4.04	1.27	1.68		98.32	**98.32**
Pan	-	311.98	98.32	100.00		-	-

Tested By	PC	Date	9/28/15	Checked By	KC	Date	10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	55.0-55.5
Project No.:	2015-485-004	Sample No.:	ST-5
Lab ID:	2015-485-004-022	Soil Color:	Gray

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		29.5	22.7	6.11	23.4	86.0	0.01302	0.0312	**84.5**
5		26.5	22.7	6.11	20.4	75.0	0.01302	0.0201	**73.7**
16		21.5	22.7	6.11	15.4	56.6	0.01302	0.0116	**55.6**
32		20.5	22.7	6.11	14.4	52.9	0.01302	0.0083	**52.0**
71		17.0	22.8	6.07	10.9	40.2	0.01300	0.0057	**39.5**
250		15.0	22.6	6.15	8.9	32.6	0.01303	0.0031	**32.0**
1440		14.0	23.1	5.97	8.0	29.5	0.01296	0.0013	**29.0**

Soil Specimen Data		**Other Corrections**		
Tare No.	927			
Weight of Tare & Dry Material (g)	129.95	a - Factor	0.99	
Weight of Tare (g)	98.02			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	98.32	
Weight of Dry Material (g)	26.9			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 9/30/15 Checked By KC Date 10/14/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	63.5-65.0
Project No.:	2015-485-004	Sample No.:	SS-15
Lab ID:	2015-485-004-023	Soil Color:	Gray / Brown

USCS Symbol:

sm, ASSUMED

USCS Classification:

SILTY SAND

Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	63.5-65.0
Project No.:	2015-485-004	Sample No.:	SS-15
Lab ID:	2015-485-004-023	Soil Color:	Gray / Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	958	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	489.50	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	411.20	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	97.44	Weight of Tare (g):	NA
Weight of Water (g):	78.30	Weight of Water (g):	NA
Weight of Dry Sample (g):	313.76	Weight of Dry Sample (g):	NA
Moisture Content (%):	**25.0**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	313.76
Dry Weight of - 3/4" Sample (g):	197.6	Weight of - #200 Material (g):	116.14
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	197.62
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.01	0.00	0.00	100.00	**100.00**
#20	0.850	0.11	0.04	0.04	99.96	**99.96**
#40	0.425	0.20	0.06	0.10	99.90	**99.90**
#60	0.250	4.89	1.56	1.66	98.34	**98.34**
#140	0.106	64.46	20.54	22.20	77.80	**77.80**
#200	0.075	127.95	40.78	62.98	37.02	**37.02**
Pan	-	116.14	37.02	100.00	-	-

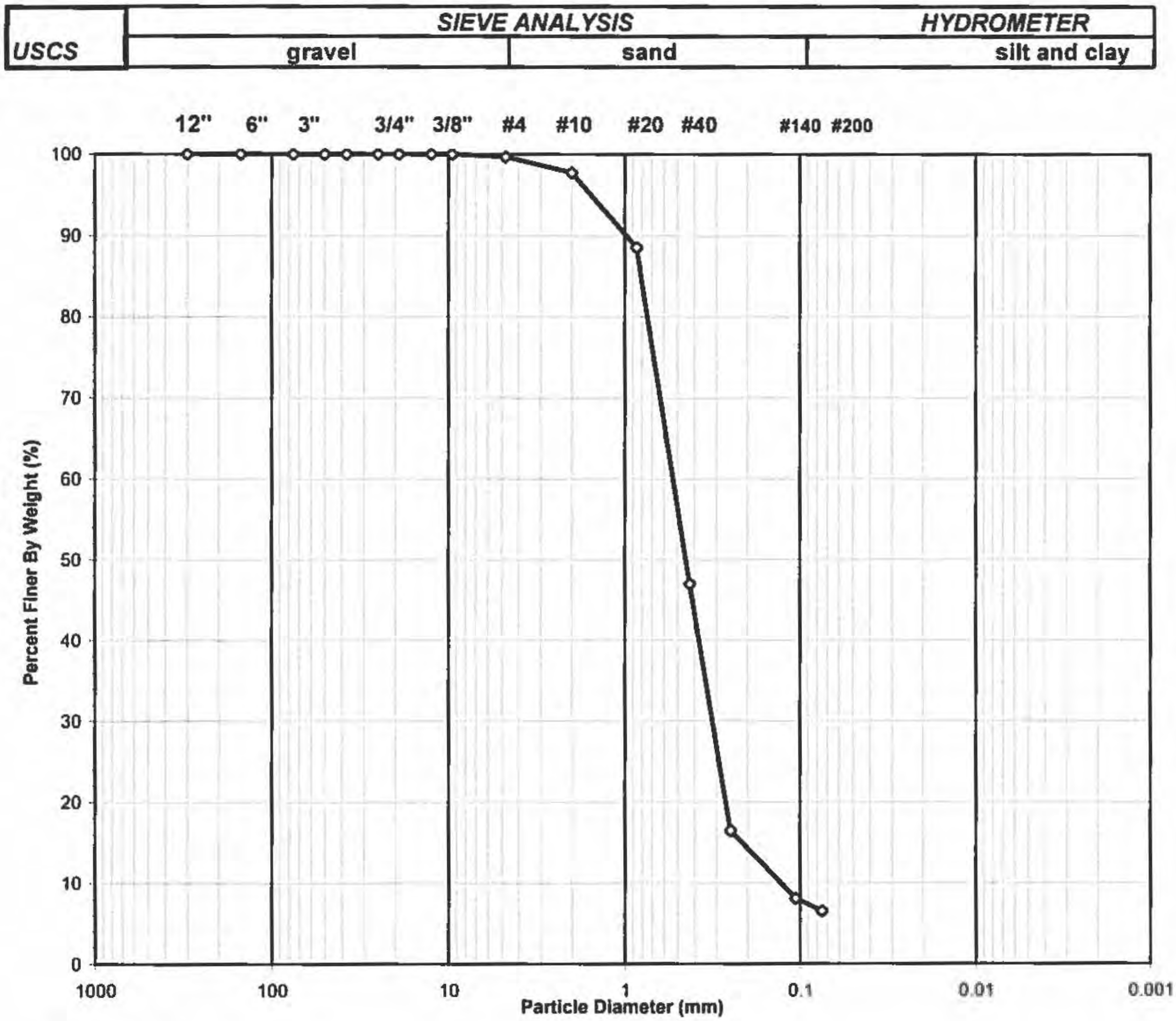
Tested By HL Date 10/5/15 Checked By KC Date 10/12/15

geotechnics
geotechnical & geosynthetic testing

SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client: AECOM
Client Reference: Dynegy-Wood River Pwr. Sta. 60440115
Project No.: 2015-485-004
Lab ID: 2015-485-004-024

Boring No.: B-5
Depth (ft): 78.5-80.0
Sample No.: SS-18
Soil Color: Brown



USCS Symbol:
sp-sm, ASSUMED

USCS Classification:
POORLY GRADED SAND WITH SILT

D60 = 0.53
D30 = 0.32
D10 = 0.13
CC = 1.47
CU = 4.09

Tested By HL Date 10/5/15 Checked By KC Date 10/14/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-5
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	78.5-80.0
Project No.:	2015-485-004	Sample No.:	SS-18
Lab ID:	2015-485-004-024	Soil Color:	Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1018	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	443.40	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	392.07	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	94.62	Weight of Tare (g):	NA
Weight of Water (g):	51.33	Weight of Water (g):	NA
Weight of Dry Sample (g):	297.45	Weight of Dry Sample (g):	NA
Moisture Content (%):	**17.3**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	297.45
Dry Weight of - 3/4" Sample (g):	278.1	Weight of - #200 Material (g):	19.39
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	278.06
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	1.06	0.36	0.36	99.64	**99.64**
#10	2.00	5.78	1.94	2.30	97.70	**97.70**
#20	0.850	27.26	9.16	11.46	88.54	**88.54**
#40	0.425	123.61	41.56	53.02	46.98	**46.98**
#60	0.250	90.69	30.49	83.51	16.49	**16.49**
#140	0.106	25.03	8.41	91.92	8.08	**8.08**
#200	0.075	4.63	1.56	93.48	6.52	**6.52**
Pan	-	19.39	6.52	100.00	-	-

Tested By HL Date 10/5/15 Checked By KC Date 10/14/15

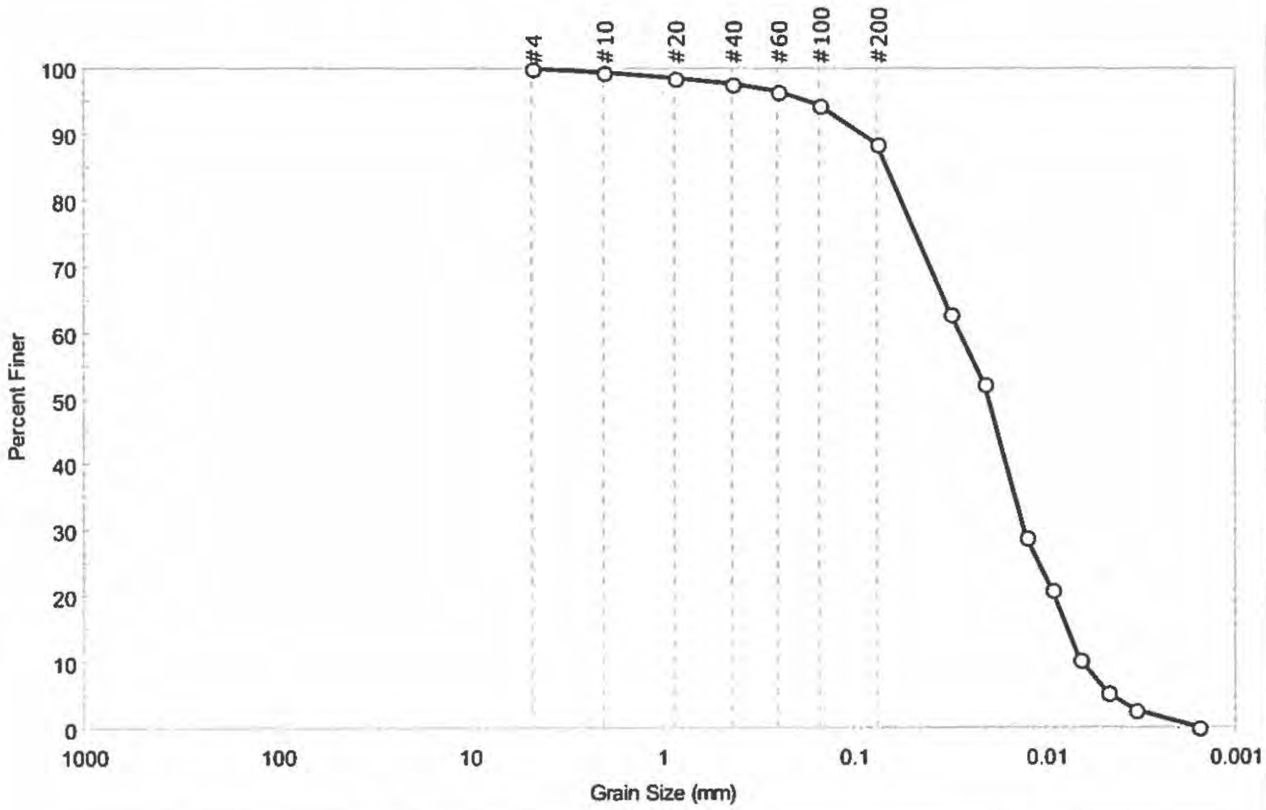
DCN. CT-S3C DATE 3/20/13 REVISION: 3

GeoTesting EXPRESS

Client:	AECOM				
Project:	Dynegy Wood River Power Station				
Location:	Alton, IL			Project No:	GTX-303782
Boring ID:	WOR-B006	Sample Type:	tube	Tested By:	jbr
Sample ID:	ST-1 (Top)	Test Date:	12/17/15	Checked By:	emm
Depth :	20-22 ft	Test Id:	356847		

Test Comment: ---
Visual Description: Moist, gray silt
Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	11.4	88.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	95		
#200	0.075	89		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0314	63		
---	0.0205	52		
---	0.0127	29		
---	0.0091	21		
---	0.0067	10		
---	0.0047	5		
---	0.0034	3		
---	0.0016	0		

Coefficients

D_{85} =0.0665 mm	D_{30} =0.0130 mm
D_{60} =0.0280 mm	D_{15} =0.0076 mm
D_{50} =0.0196 mm	D_{10} =0.0065 mm
C_u =4.308	C_c =0.929

Classification

ASTM Silt (ML)

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-6
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	6.0-7.5
Project No.:	2015-485-004	Sample No.:	SS-3
Lab ID:	2015-485-004-025	Soil Color:	Gray

USCS Symbol:
ml, ASSUMED

USCS Classification:
SILT WITH SAND

Tested By HL Date 10/5/15 Checked By KC Date 10/14/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-6
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	6.0-7.5
Project No.:	2015-485-004	Sample No.:	SS-3
Lab ID:	2015-485-004-025	Soil Color:	Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	516	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	351.00	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	301.48	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	89.96	Weight of Tare (g):	NA
Weight of Water (g):	49.52	Weight of Water (g):	NA
Weight of Dry Sample (g):	211.52	Weight of Dry Sample (g):	NA
Moisture Content (%):	**23.4**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	211.52
Dry Weight of - 3/4" Sample (g):	48.9	Weight of - #200 Material (g):	151.27
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	60.25
Dry Weight of + 3/4" Sample (g):	11.39		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	11.39	5.38	5.38	94.62	**94.62**
1/2"	12.50	0.00	0.00	5.38	94.62	**94.62**
3/8"	9.50	3.20	1.51	6.90	93.10	**93.10**
#4	4.75	2.88	1.36	8.26	91.74	**91.74**
#10	2.00	3.93	1.86	10.12	89.88	**89.88**
#20	0.850	4.35	2.06	12.17	87.83	**87.83**
#40	0.425	4.44	2.10	14.27	85.73	**85.73**
#60	0.250	4.98	2.35	16.63	83.37	**83.37**
#140	0.106	15.69	7.42	24.05	75.95	**75.95**
#200	0.075	9.39	4.44	28.48	71.52	**71.52**
Pan	-	151.27	71.52	100.00	-	-

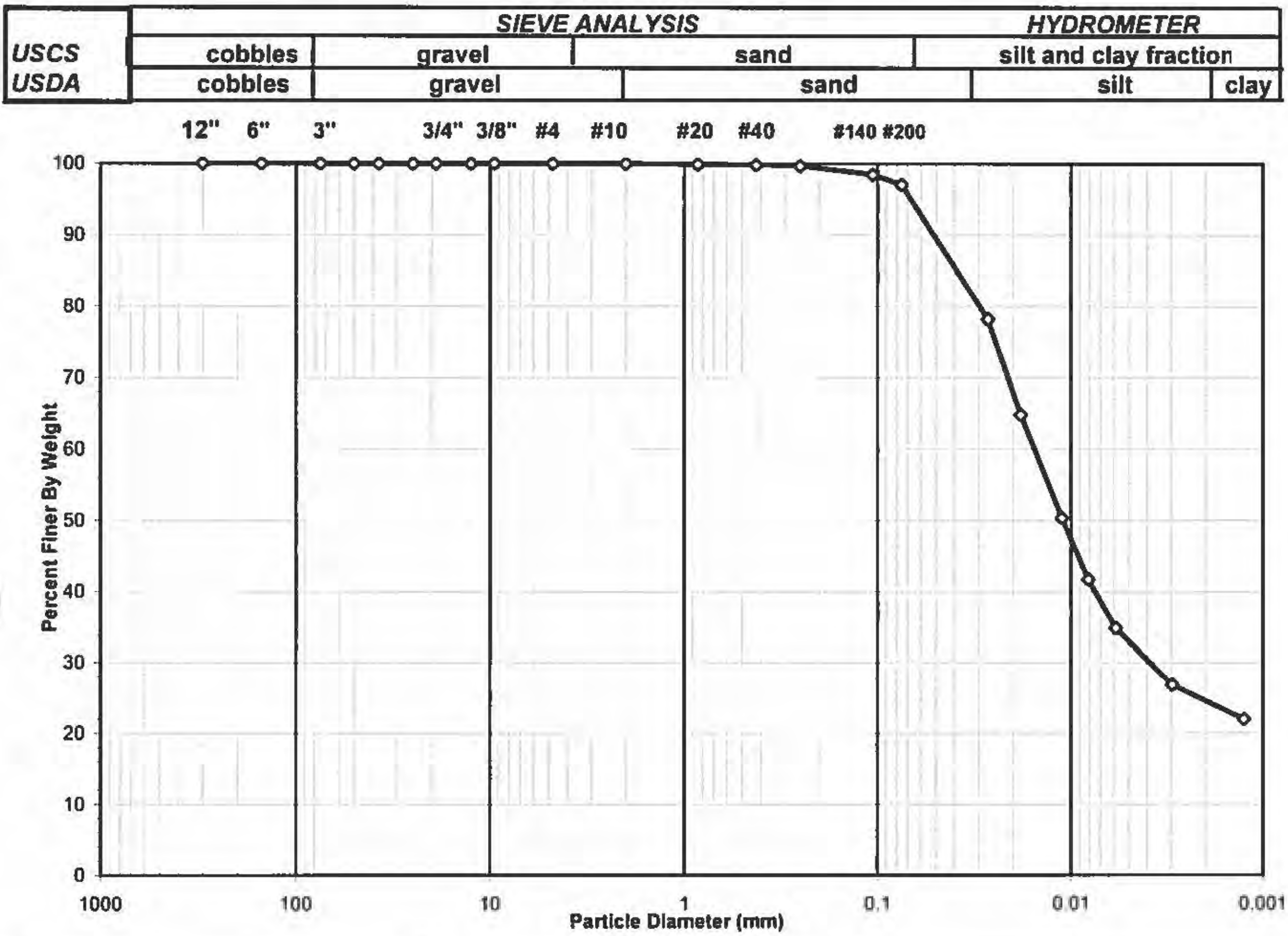
Tested By HL Date 10/5/15 Checked By KC Date 10/14/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

geotechnics
geotechnical & geosynthetic testing

Client:	AECOM	Boring No.:	B-6
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	31.4-31.8
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-026	Soil Color:	Dark Brown



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	2.96
Finer Than #200	*Silt & Clay*	97.04

USCS Symbol:

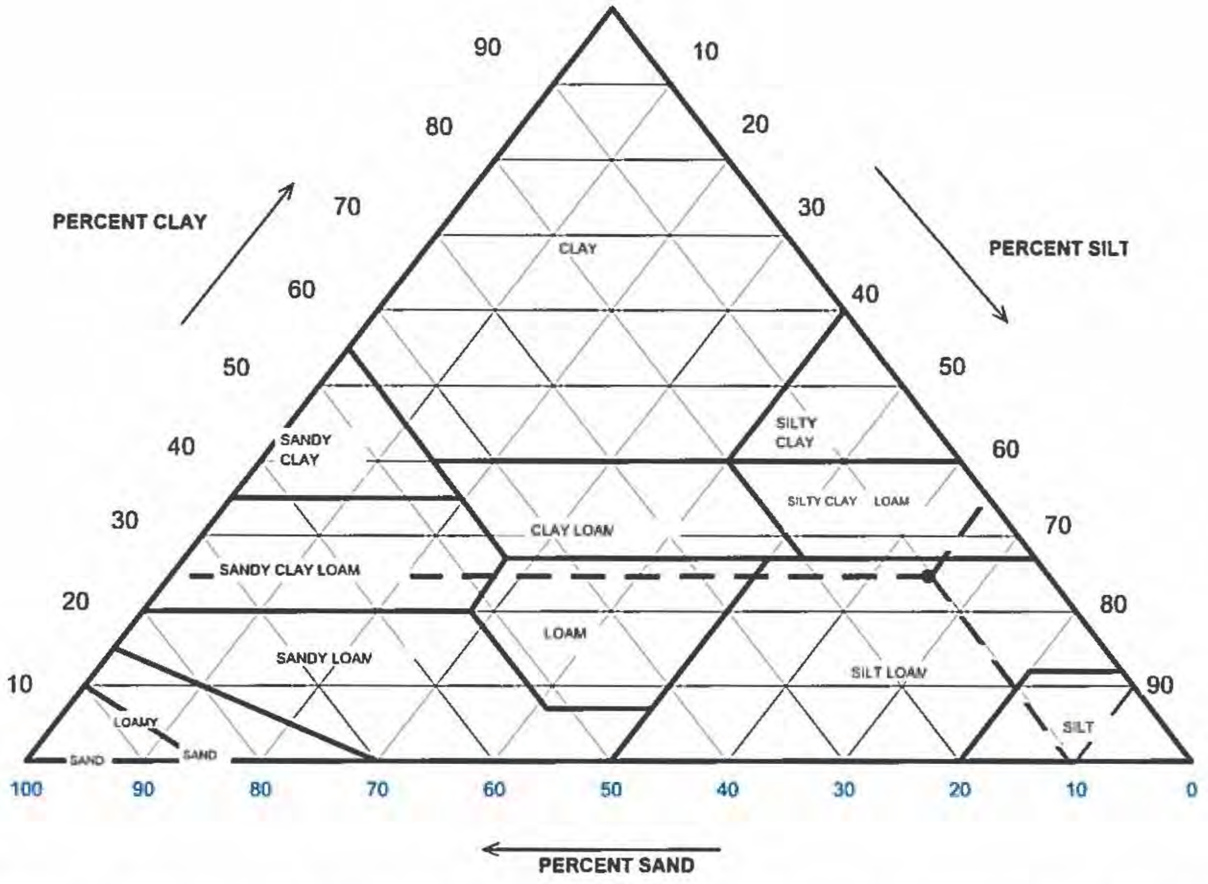
CL, TESTED

USCS Classification:

LEAN CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-6
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	31.4-31.8
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-026	Soil Color:	Dark Brown



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.00	**0.00**
2	100.00	*Sand*	10.41	**10.41**
0.05	89.59	*Silt*	64.93	**64.93**
0.002	24.66	*Clay*	24.66	**24.66**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-6
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	31.4-31.8
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-026	Soil Color:	Dark Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1428	Tare No.	NA
Weight of Tare & Wet Sample (g)	916.18	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	776.80	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.62	Weight of Tare (g)	NA
Weight of Water (g)	139.38	Weight of Water (g)	NA
Weight of Dry Sample (g)	631.18	Weight of Dry Sample (g)	NA
Moisture Content (%	**22.1**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	631.18
Dry Weight of -3/4" Sample (g)	18.69	Weight of - #200 Material (g)	612.49
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	18.69
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.00	0.00	0.00		100.00	**100.00**
#20	0.85	0.32	0.05	0.05		99.95	**99.95**
#40	0.425	0.68	0.11	0.16		99.84	**99.84**
#60	0.250	0.97	0.15	0.31		99.69	**99.69**
#140	0.106	7.64	1.21	1.52		98.48	**98.48**
#200	0.075	9.08	1.44	2.96		97.04	**97.04**
Pan	-	612.49	97.04	100.00		-	-

Tested By AMC Date 9/30/15 Checked By KC Date 10/14/15

geotechnics
geotechnical & geosynthetic testing

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-6
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	31.4-31.8
Project No.:	2015-485-004	Sample No.:	ST-2
Lab ID:	2015-485-004-026	Soil Color:	Dark Brown

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		46.5	23.4	5.86	40.6	80.6	0.01291	0.0269	**78.2**
5		39.5	23.4	5.86	33.6	66.7	0.01291	0.0181	**64.7**
15		32.0	23.4	5.86	26.1	51.8	0.01291	0.0111	**50.3**
30		27.5	23.4	5.86	21.6	42.9	0.01291	0.0081	**41.6**
60		24.0	23.3	5.89	18.1	35.9	0.01293	0.0059	**34.8**
250		20.0	22.9	6.04	14.0	27.7	0.01299	0.0030	**26.9**
1440		17.5	22.9	6.04	11.5	22.7	0.01299	0.0013	**22.1**

Soil Specimen Data		**Other Corrections**		
Tare No.	690			
Weight of Tare & Dry Material (g)	150.15	a - Factor	0.99	
Weight of Tare (g)	95.22			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	97.04	
Weight of Dry Material (g)	49.9			
		Specific Gravity	2.7	Assumed

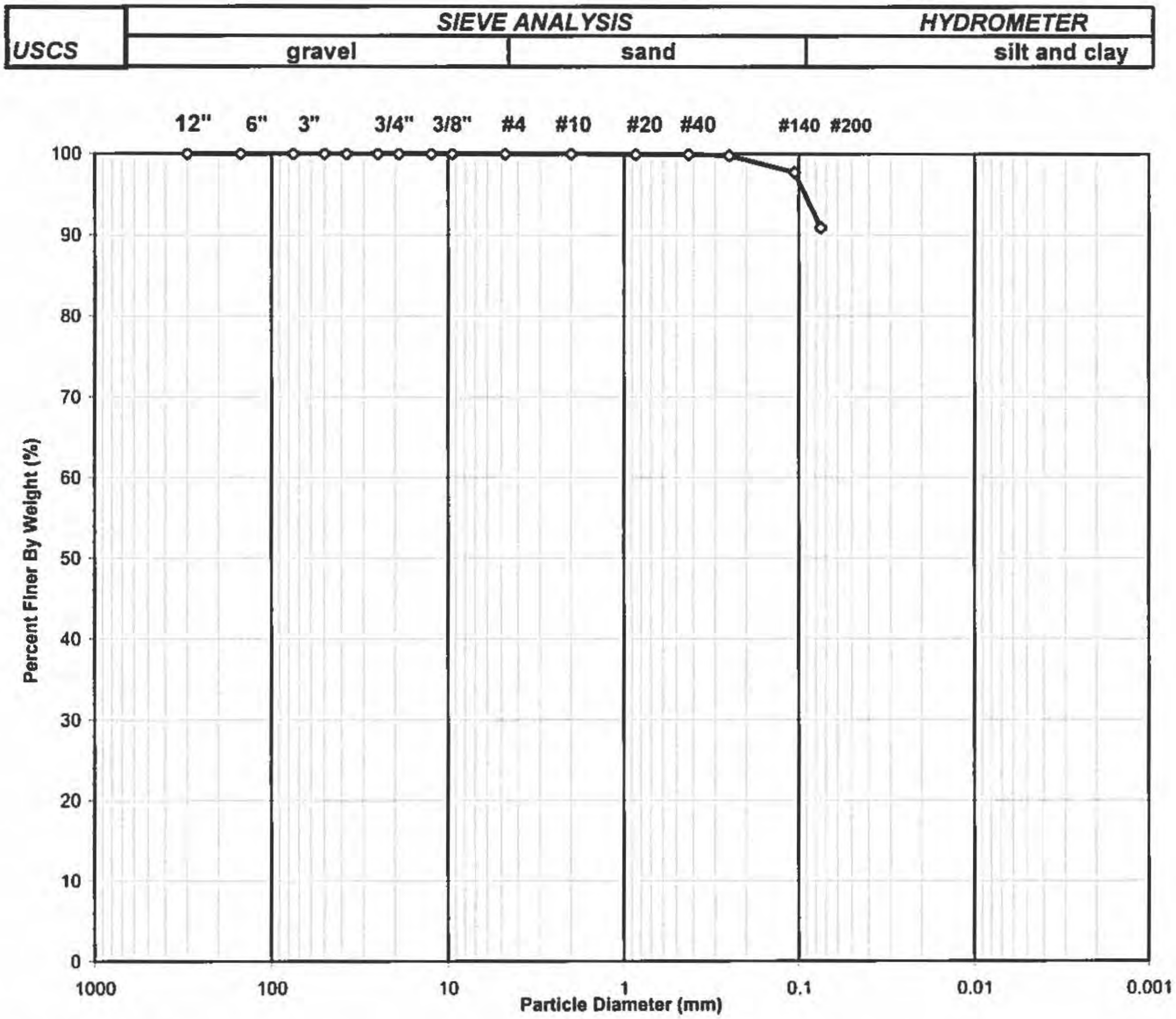
Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 9/30/15 Checked By KC Date 10/14/15

geotechnics
geotechnical & geosynthetic testing

SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-6
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	43.5-45.0
Project No.:	2015-485-004	Sample No.:	SS-13
Lab ID:	2015-485-004-027	Soil Color:	Brown



USCS Symbol:
ml, ASSUMED

USCS Classification:
SILT

Tested By	HL	Date	10/5/15	Checked By	KC	Date	10/14/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-6
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	43.5-45.0
Project No.:	2015-485-004	Sample No.:	SS-13
Lab ID:	2015-485-004-027	Soil Color:	Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	923	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	519.10	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	413.30	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	99.21	Weight of Tare (g):	NA
Weight of Water (g):	105.80	Weight of Water (g):	NA
Weight of Dry Sample (g):	314.09	Weight of Dry Sample (g):	NA
Moisture Content (%):	**33.7**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	314.09
Dry Weight of - 3/4" Sample (g):	28.5	Weight of - #200 Material (g):	285.61
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	28.48
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.00	0.00	0.00	100.00	**100.00**
#20	0.850	0.11	0.04	0.04	99.96	**99.96**
#40	0.425	0.21	0.07	0.10	99.90	**99.90**
#60	0.250	0.30	0.10	0.20	99.80	**99.80**
#140	0.106	6.51	2.07	2.27	97.73	**97.73**
#200	0.075	21.35	6.80	9.07	90.93	**90.93**
Pan	-	285.61	90.93	100.00	-	-

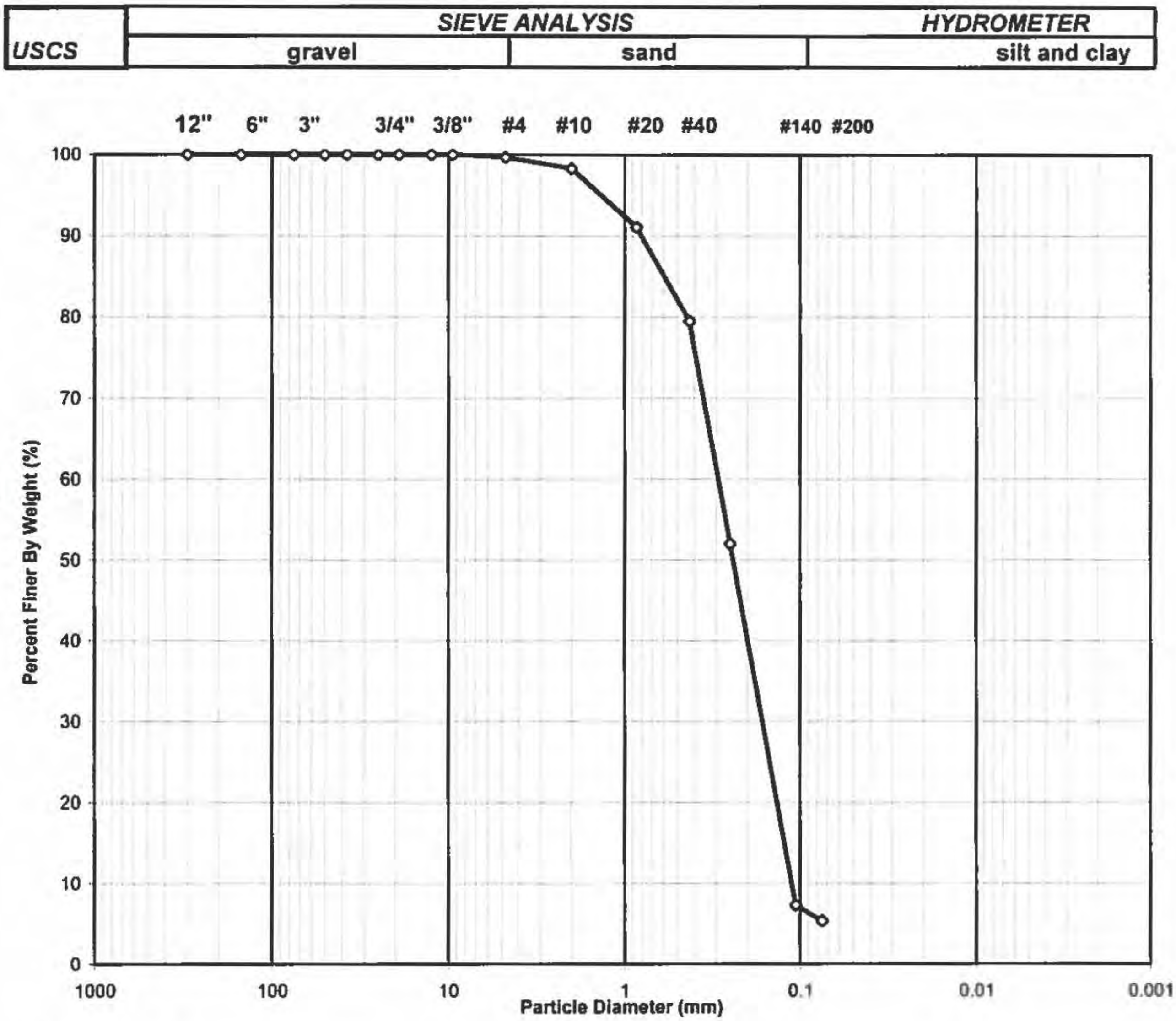
Tested By HL Date 10/5/15 Checked By KC Date 10/14/15

The following are attachments to the testimony of Scott M. Payne, PhD, PG and Ian Magruder, M.S..

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-6
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	53.5-55.0
Project No.:	2015-485-004	Sample No.:	SS-15
Lab ID:	2015-485-004-028	Soil Color:	Brown



USCS Symbol:

sp-sm, ASSUMED

D60 = 0.29 CC = 0.82

USCS Classification:

POORLY GRADED SAND WITH SILT

D30 = 0.16 CU = 2.61

D10 = 0.11

Tested By	HL	Date	10/5/15	Checked By	KC	Date	10/14/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-6
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	53.5-55.0
Project No.:	2015-485-004	Sample No.:	SS-15
Lab ID:	2015-485-004-028	Soil Color:	Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	664	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	453.20	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	387.73	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	95.38	Weight of Tare (g):	NA
Weight of Water (g):	65.47	Weight of Water (g):	NA
Weight of Dry Sample (g):	292.35	Weight of Dry Sample (g):	NA
Moisture Content (%):	**22.4**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	292.35
Dry Weight of - 3/4" Sample (g):	276.7	Weight of - #200 Material (g):	15.61
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	276.74
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	1.00	0.34	0.34	99.66	**99.66**
#10	2.00	4.11	1.41	1.75	98.25	**98.25**
#20	0.850	21.05	7.20	8.95	91.05	**91.05**
#40	0.425	33.86	11.58	20.53	79.47	**79.47**
#60	0.250	80.27	27.46	47.99	52.01	**52.01**
#140	0.106	130.70	44.71	92.69	7.31	**7.31**
#200	0.075	5.75	1.97	94.66	5.34	**5.34**
Pan	-	15.61	5.34	100.00	-	-

Tested By	HL	Date	10/5/15	Checked By	KC	Date	10/14/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B009
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.4-9.9
Project No.:	2015-485-007	Sample No.:	ST-2
Lab ID:	2015-485-007-001	Soil Color:	Brown

Sieve Sizes (mm)	USCS Summary	Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	6.03
Finer Than #200	*Silt & Clay*	93.97

USCS Symbol:

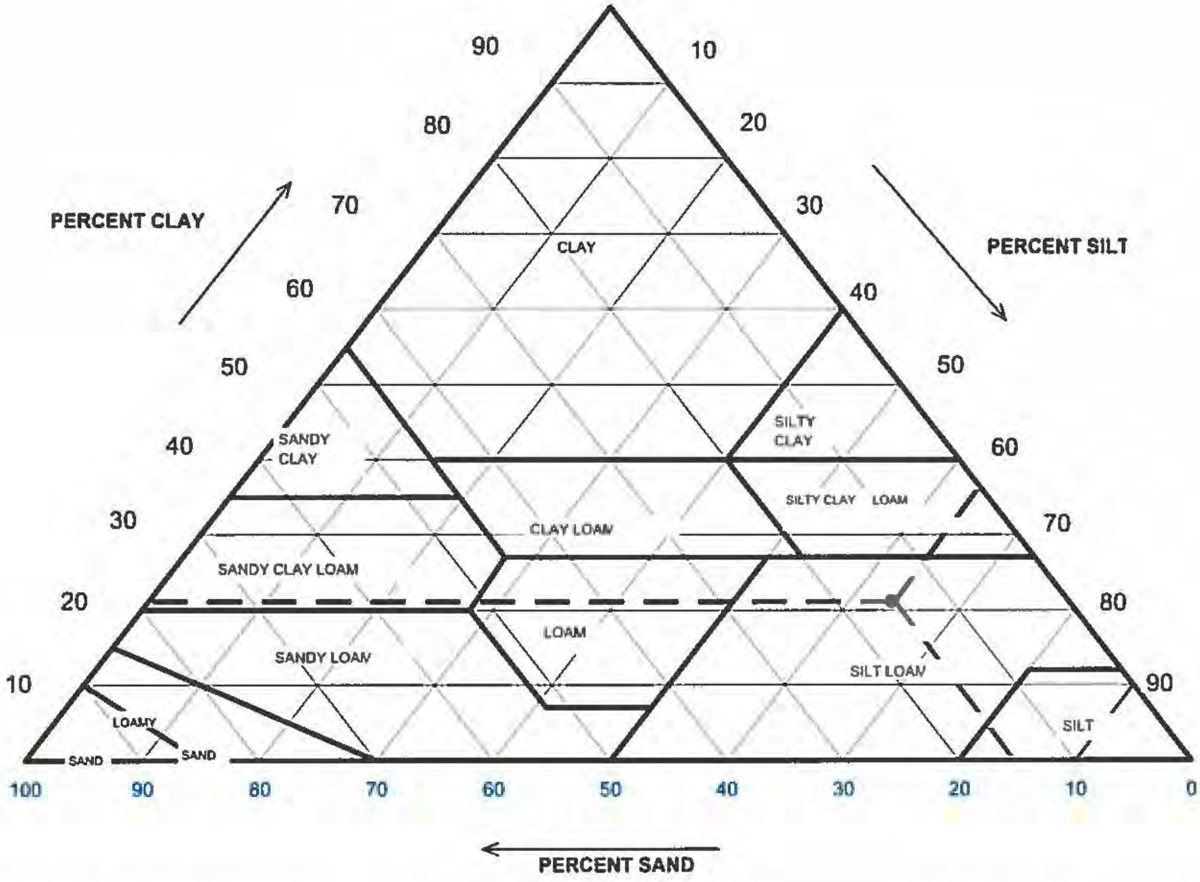
CL, TESTED

USCS Classification:

LEAN CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	WOR-B009
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.4-9.9
Project No.:	2015-485-007	Sample No.:	ST-2
Lab ID:	2015-485-007-001	Soil Color:	Brown



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.03	**0.00**
2	99.97	*Sand*	15.16	**15.16**
0.05	84.81	*Silt*	63.71	**63.73**
0.002	21.11	*Clay*	21.11	**21.11**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B009
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.4-9.9
Project No.:	2015-485-007	Sample No.:	ST-2
Lab ID:	2015-485-007-001	Soil Color:	Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1464	Tare No.	NA
Weight of Tare & Wet Sample (g)	1196.43	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	1035.40	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.16	Weight of Tare (g)	NA
Weight of Water (g)	161.03	Weight of Water (g)	NA
Weight of Dry Sample (g)	890.24	Weight of Dry Sample (g)	NA
Moisture Content (%	**18.1**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	890.24
Dry Weight of -3/4" Sample (g)	53.72	Weight of - #200 Material (g)	836.52
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	53.72
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.01	0.00	0.00		100.00	**100.00**
#10	2.00	0.27	0.03	0.03		99.97	**99.97**
#20	0.85	1.35	0.15	0.18		99.82	**99.82**
#40	0.425	1.96	0.22	0.40		99.60	**99.60**
#60	0.250	2.58	0.29	0.69		99.31	**99.31**
#140	0.106	24.10	2.71	3.40		96.60	**96.60**
#200	0.075	23.45	2.63	6.03		93.97	**93.97**
Pan	-	836.52	93.97	100.00		-	-

Tested By HL Date 11/9/15 Checked By KC Date 11/11/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B009
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.4-9.9
Project No.:	2015-485-007	Sample No.:	ST-2
Lab ID:	2015-485-007-001	Soil Color:	Brown

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		40.0	21.6	6.50	33.5	77.3	0.01319	0.0291	**72.6**
5		33.0	21.6	6.50	26.5	61.1	0.01319	0.0195	**57.4**
15		25.0	21.6	6.50	18.5	42.7	0.01319	0.0119	**40.1**
30		22.0	21.6	6.50	15.5	35.7	0.01319	0.0086	**33.6**
60		19.0	21.9	6.40	12.6	29.1	0.01314	0.0062	**27.3**
250		17.0	22.2	6.29	10.7	24.7	0.01310	0.0030	**23.2**
1440		15.0	22.2	6.29	8.7	20.1	0.01310	0.0013	**18.9**

Soil Specimen Data		Other Corrections		
Tare No.	301			
Weight of Tare & Dry Material (g)	153.91	a - Factor	0.99	
Weight of Tare (g)	105.99			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	93.97	
Weight of Dry Material (g)	42.9			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

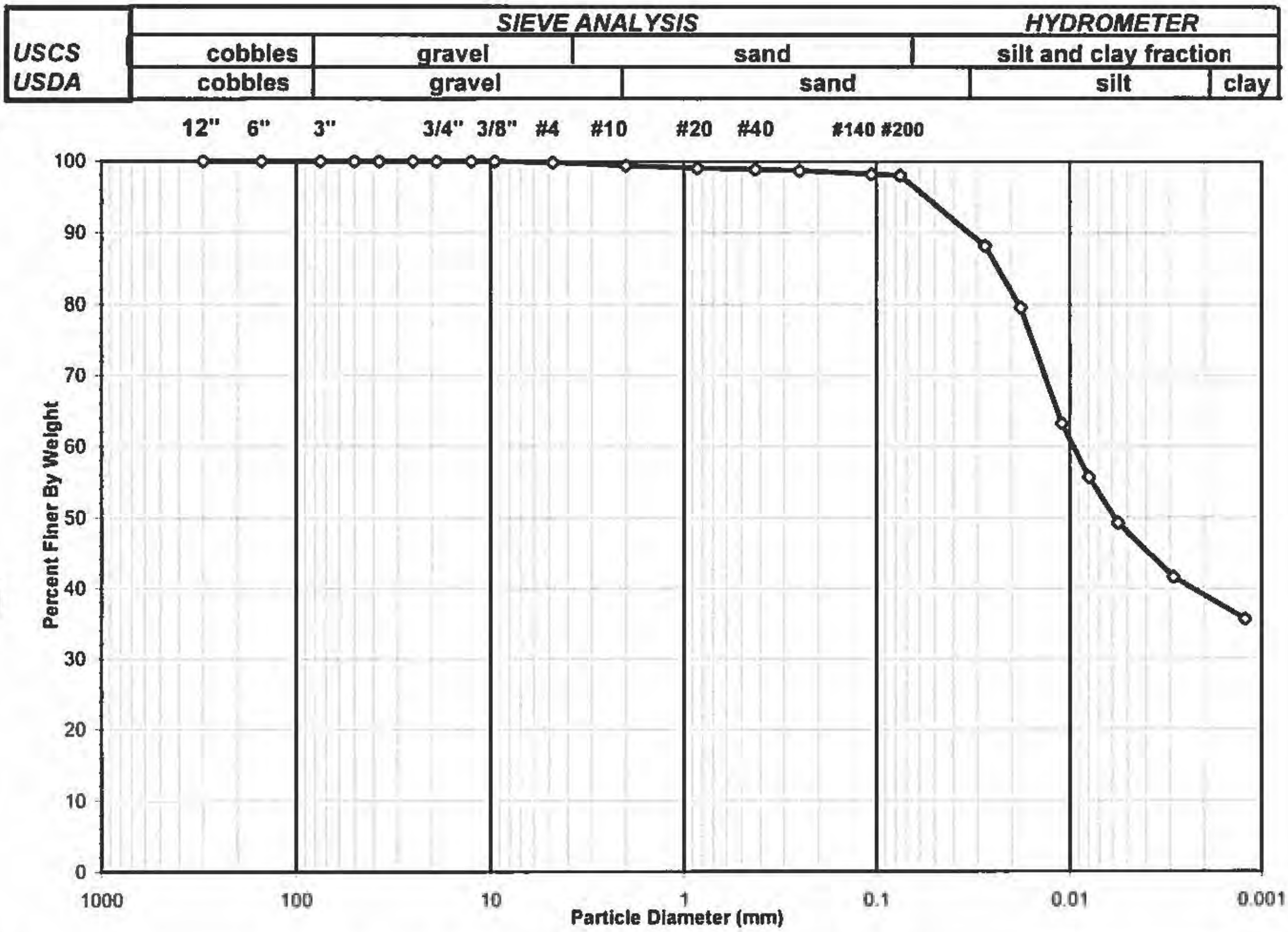
Tested By TO Date 11/9/15 Checked By KC Date 11/11/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client: AECOM
Client Reference: Dynegy - Wood River Pwr. Sta. 60440115
Project No.: 2015-485-006
Lab ID: 2015-485-006-001

Boring No.: B-10
Depth (ft): 6.5-6.9
Sample No.: ST-1
Soil Color: Dark Brown



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.19
#4 To #200	*Sand*	1.83
Finer Than #200	*Silt & Clay*	97.99

USCS Symbol:

CH, TESTED

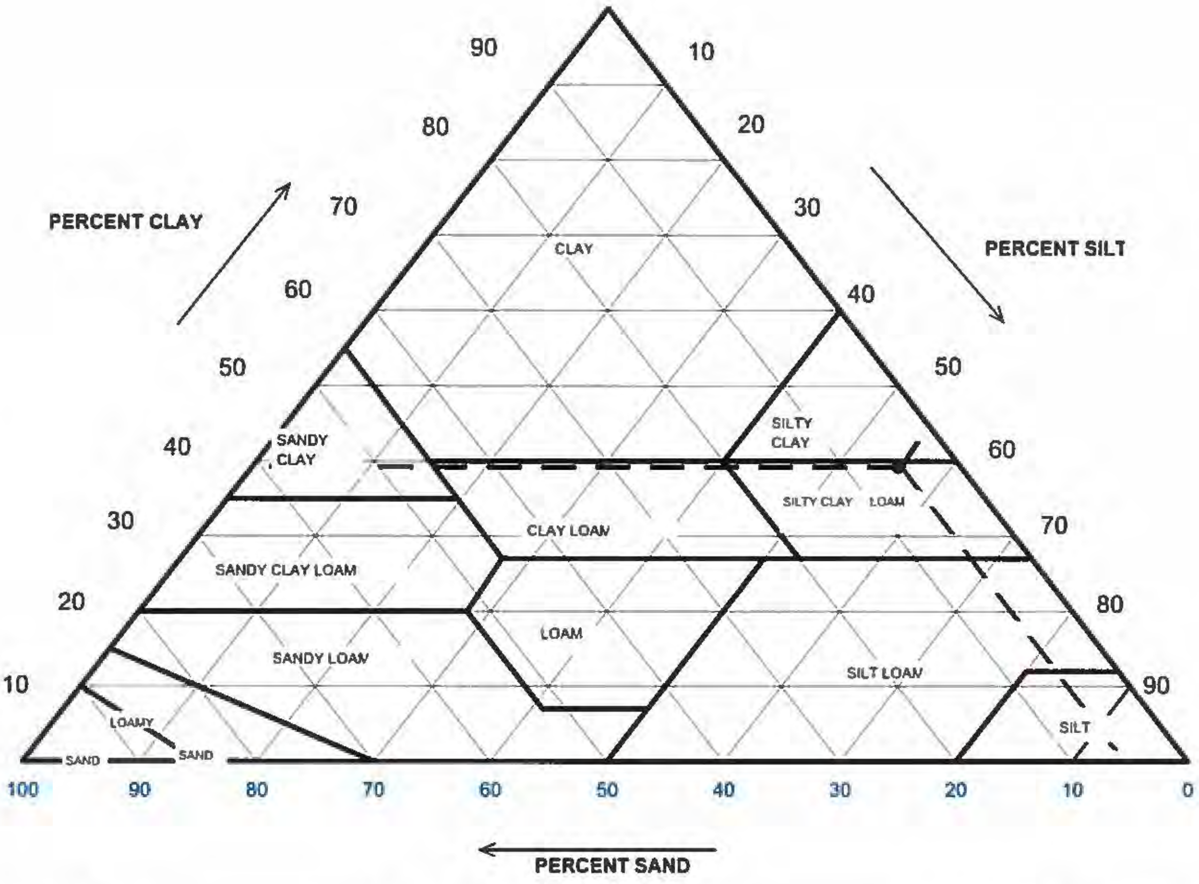
USCS Classification:

FAT CLAY

USDA CLASSIFICATION CHART

Client: AECOM
Client Reference: Dynegy - Wood River Pwr. Sta. 60440115
Project No.: 2015-485-006
Lab ID: 2015-485-006-001

Boring No.: B-10
Depth (ft): 6.5-6.9
Sample No.: ST-1
Soil Color: Dark Brown



Particle Size	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat
(mm)	(%)		(%)	(%)
		Gravel	0.63	**0.00**
2	99.37	*Sand*	5.30	**5.34**
0.05	94.07	*Silt*	55.08	**55.43**
0.002	38.99	*Clay*	38.99	**39.23**

USDA Classification: ***SILTY CLAY LOAM***

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	6.5-6.9
Project No.:	2015-485-006	Sample No.:	ST-1
Lab ID:	2015-485-006-001	Soil Color:	Dark Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	659	Tare No.	NA
Weight of Tare & Wet Sample (g)	698.18	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	570.50	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	95.44	Weight of Tare (g)	NA
Weight of Water (g)	127.68	Weight of Water (g)	NA
Weight of Dry Sample (g)	475.06	Weight of Dry Sample (g)	NA
Moisture Content (%	**26.9**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	475.06
Dry Weight of -3/4" Sample (g)	9.55	Weight of - #200 Material (g)	465.51
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	9.55
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.88	0.19	0.19		99.81	**99.81**
#10	2.00	2.11	0.44	0.63		99.37	**99.37**
#20	0.85	1.62	0.34	0.97		99.03	**99.03**
#40	0.425	0.79	0.17	1.14		98.86	**98.86**
#60	0.250	0.89	0.19	1.32		98.68	**98.68**
#140	0.106	2.17	0.46	1.78		98.22	**98.22**
#200	0.075	1.09	0.23	2.01		97.99	**97.99**
Pan	-	465.51	97.99	100.00		-	-

Tested By	RAL	Date	10/23/15	Checked By	KC	Date	10/29/15

geotechnics
geotechnical & geosynthetic testing

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	6.5-6.9
Project No.:	2015-485-006	Sample No.:	ST-1
Lab ID:	2015-485-006-001	Soil Color:	Dark Brown

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		47.0	22	6.36	40.6	90.0	0.01313	0.0272	**88.2**
5		43.0	22	6.36	36.6	81.1	0.01313	0.0179	**79.5**
15		35.5	22	6.36	29.1	64.5	0.01313	0.0110	**63.2**
30		32.0	22	6.36	25.6	56.8	0.01313	0.0080	**55.6**
63		29.0	22.1	6.33	22.7	50.2	0.01311	0.0056	**49.2**
250		25.5	22	6.36	19.1	42.4	0.01313	0.0029	**41.5**
1440		22.5	22.7	6.11	16.4	36.3	0.01302	0.0012	**35.6**

Soil Specimen Data		Other Corrections		
Tare No.	960			
Weight of Tare & Dry Material (g)	144.85	a - Factor	0.99	
Weight of Tare (g)	95.14			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	97.99	
Weight of Dry Material (g)	44.7			
		Specific Gravity	2.7	Assumed

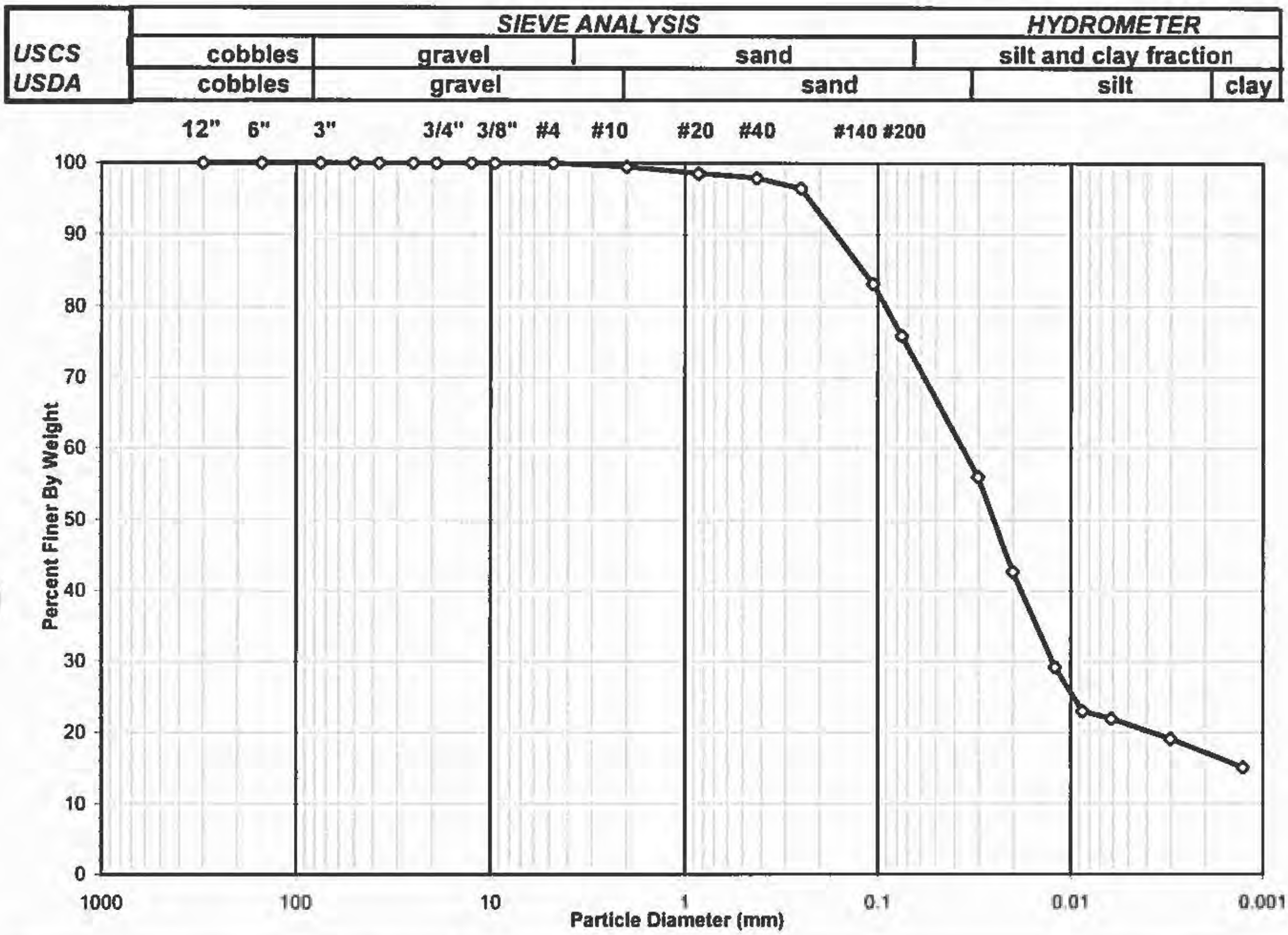
Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 10/27/15 Checked By KC Date 10/29/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	7.4-7.9
Project No.:	2015-485-002	Sample No.:	ST-1
Lab ID:	2015-485-002-001	Soil Color:	Gray



USCS Summary Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.03
#4 To #200	*Sand*	24.16
Finer Than #200	*Silt & Clay*	75.81

USCS Symbol:

CL, TESTED

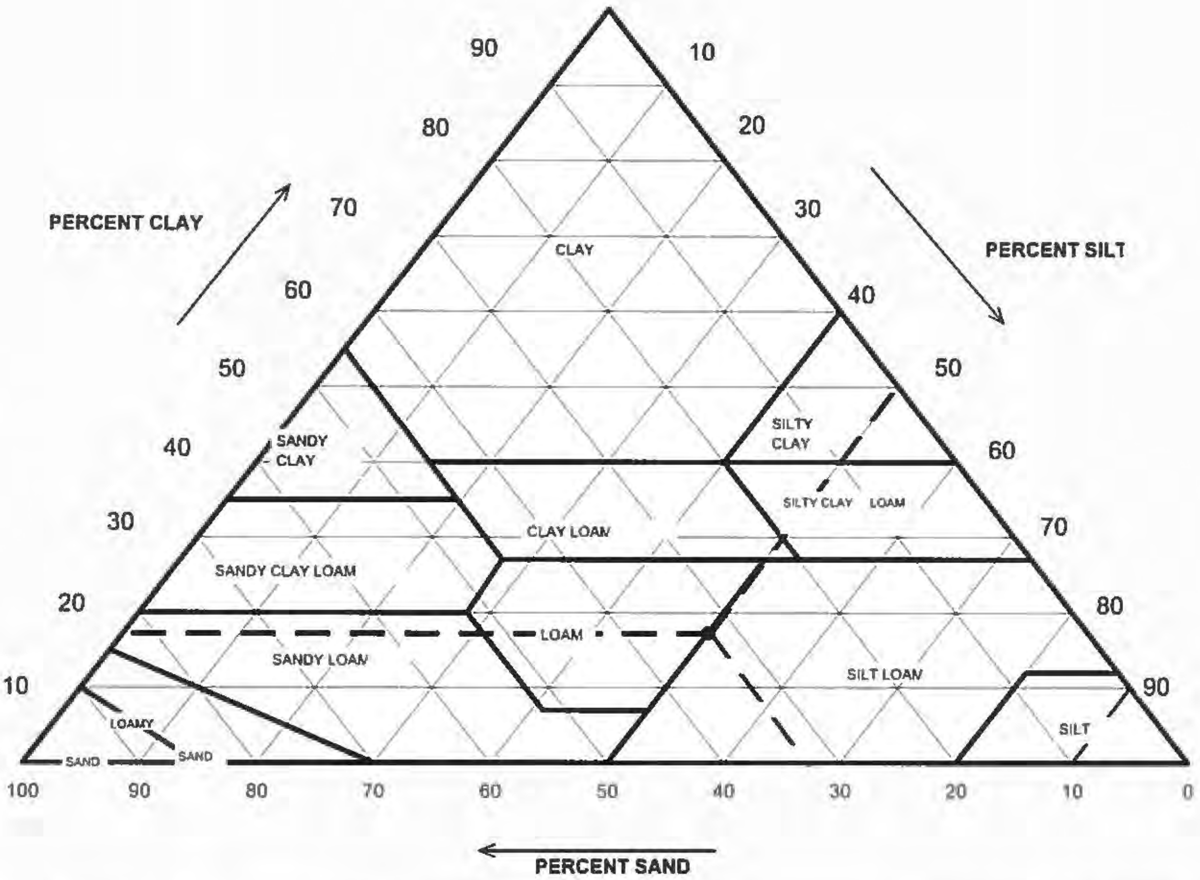
USCS Classification:

LEAN CLAY WITH SAND

USDA CLASSIFICATION CHART

Client: AECOM
Client Reference: Dynegy - Wood River Pwr. Sta. 60440115
Project No.: 2015-485-002
Lab ID: 2015-485-002-001

Boring No.: B-10
Depth (ft): 7.4-7.9
Sample No.: ST-1
Soil Color: Gray



Particle Size	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
(mm)	(%)		(%)	(%)
		Gravel	0.51	**0.00**
2	99.49	*Sand*	32.52	**32.69**
0.05	66.97	*Silt*	49.82	**50.07**
0.002	17.15	*Clay*	17.15	**17.24**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	7.4-7.9
Project No.:	2015-485-002	Sample No.:	ST-1
Lab ID:	2015-485-002-001	Soil Color:	Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1435	Tare No.	NA
Weight of Tare & Wet Sample (g)	1047.20	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	908.00	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.42	Weight of Tare (g)	NA
Weight of Water (g)	139.20	Weight of Water (g)	NA
Weight of Dry Sample (g)	762.58	Weight of Dry Sample (g)	NA
Moisture Content (%	**18.3**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	762.58
Dry Weight of -3/4" Sample (g)	184.50	Weight of - #200 Material (g)	578.08
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	184.50
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.24	0.03	0.03		99.97	**99.97**
#10	2.00	3.67	0.48	0.51		99.49	**99.49**
#20	0.85	7.50	0.98	1.50		98.50	**98.50**
#40	0.425	4.38	0.57	2.07		97.93	**97.93**
#60	0.250	10.95	1.44	3.51		96.49	**96.49**
#140	0.106	101.85	13.36	16.86		83.14	**83.14**
#200	0.075	55.91	7.33	24.19		75.81	**75.81**
Pan	-	578.08	75.81	100.00		-	-

Tested By RAL Date 9/25/15 Checked By KC Date 10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	7.4-7.9
Project No.:	2015-485-002	Sample No.:	ST-1
Lab ID:	2015-485-002-001	Soil Color:	Gray

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		33.0	23.3	5.89	27.1	73.8	0.01293	0.0302	**55.9**
5		26.5	23.3	5.89	20.6	56.1	0.01293	0.0200	**42.5**
15		20.0	23.3	5.89	14.1	38.4	0.01293	0.0120	**29.1**
30		17.0	23.3	5.89	11.1	30.2	0.01293	0.0087	**22.9**
60		16.5	23.3	5.89	10.6	28.9	0.01293	0.0062	**21.9**
250		15.0	23.7	5.75	9.2	25.2	0.01287	0.0030	**19.1**
1440		13.0	23.8	5.71	7.3	19.8	0.01285	0.0013	**15.0**

Soil Specimen Data		Other Corrections		
Tare No.	528			
Weight of Tare & Dry Material (g)	133.73	a - Factor	0.99	
Weight of Tare (g)	92.37			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	75.81	
Weight of Dry Material (g)	36.4			
		Specific Gravity	2.7	Assumed

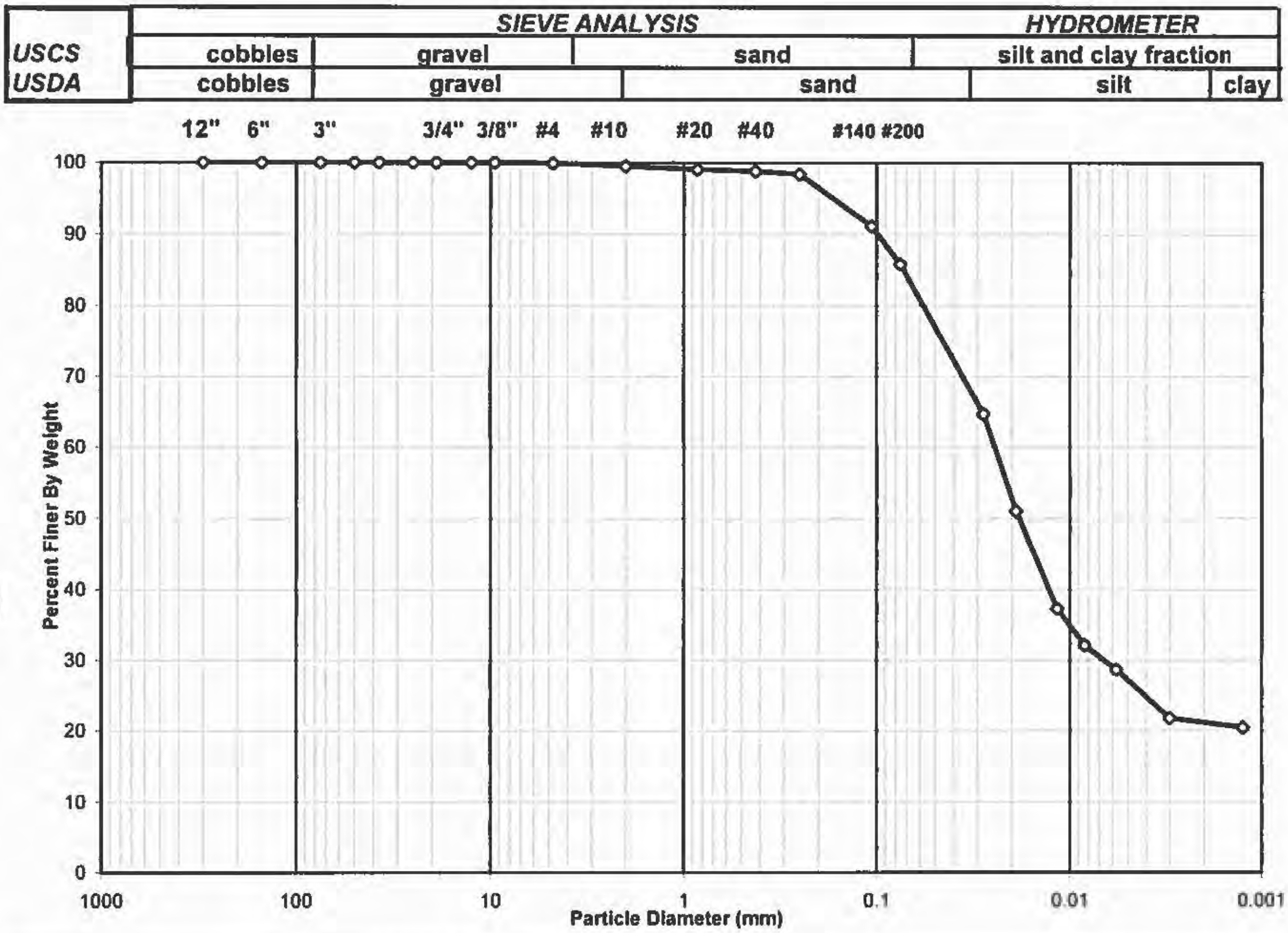
Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By DB Date 9/25/15 Checked By KC Date 10/14/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.0-9.4
Project No.:	2015-485-006	Sample No.:	ST-2
Lab ID:	2015-485-006-002	Soil Color:	Brown & Gray



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.07
#4 To #200	*Sand*	14.08
Finer Than #200	*Silt & Clay*	85.84

USCS Symbol:

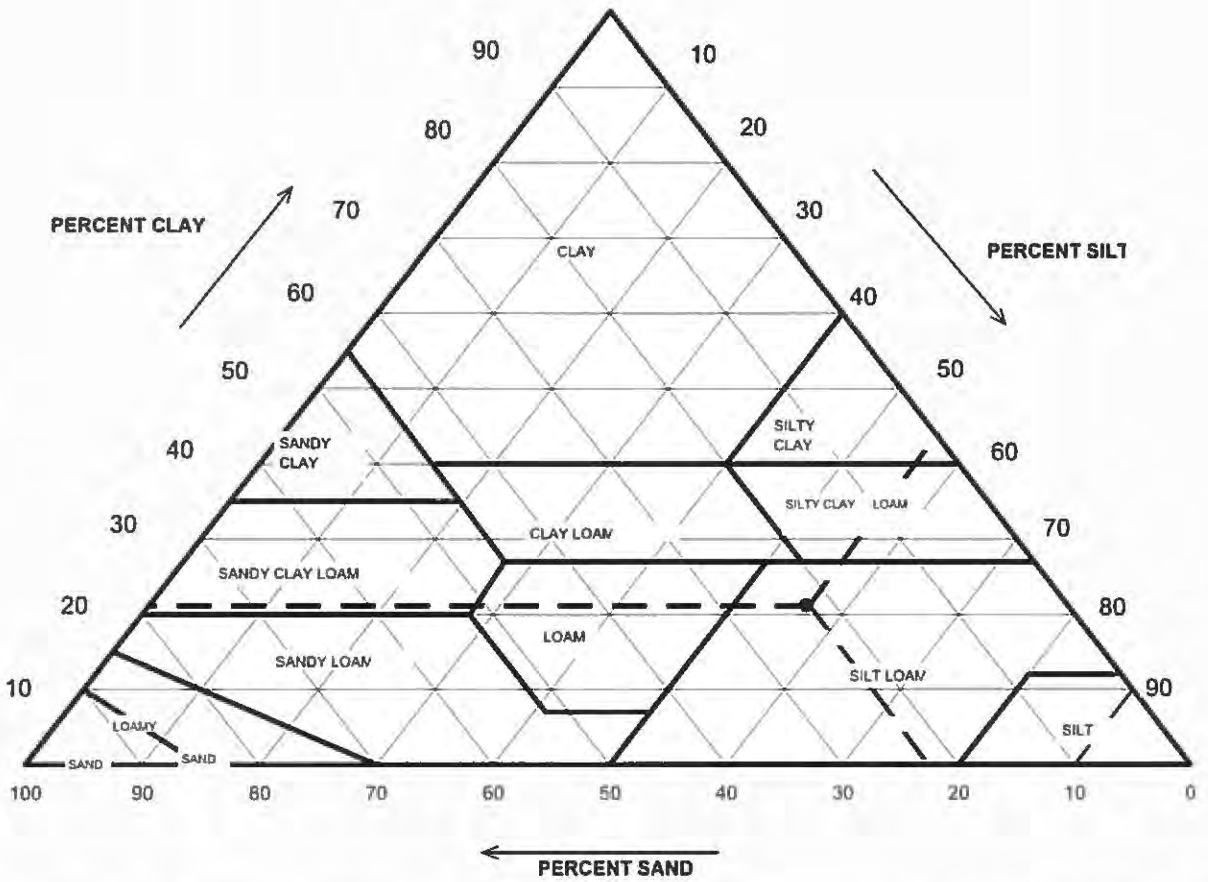
CL, TESTED

USCS Classification:

LEAN CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.0-9.4
Project No.:	2015-485-006	Sample No.:	ST-2
Lab ID:	2015-485-006-002	Soil Color:	Brown & Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.52	**0.00**
2	99.48	*Sand*	22.33	**22.45**
0.05	77.15	*Silt*	56.03	**56.32**
0.002	21.12	*Clay*	21.12	**21.23**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.0-9.4
Project No.:	2015-485-006	Sample No.:	ST-2
Lab ID:	2015-485-006-002	Soil Color:	Brown & Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	516	Tare No.	NA
Weight of Tare & Wet Sample (g)	832.75	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	711.00	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	90.03	Weight of Tare (g)	NA
Weight of Water (g)	121.75	Weight of Water (g)	NA
Weight of Dry Sample (g)	620.97	Weight of Dry Sample (g)	NA
Moisture Content (%	**19.6**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	620.97
Dry Weight of -3/4" Sample (g)	87.90	Weight of - #200 Material (g)	533.07
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	87.90
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.46	0.07	0.07		99.93	**99.93**
#10	2.00	2.77	0.45	0.52		99.48	**99.48**
#20	0.85	2.72	0.44	0.96		99.04	**99.04**
#40	0.425	1.52	0.24	1.20		98.80	**98.80**
#60	0.250	2.78	0.45	1.65		98.35	**98.35**
#140	0.106	44.49	7.16	8.82		91.18	**91.18**
#200	0.075	33.16	5.34	14.16		85.84	**85.84**
Pan	-	533.07	85.84	100.00		-	-

Tested By	RAL	Date	10/23/15	Checked By	KC	Date	10/29/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.0-9.4
Project No.:	2015-485-006	Sample No.:	ST-2
Lab ID:	2015-485-006-002	Soil Color:	Brown & Gray

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		44.0	22	6.36	37.6	75.4	0.01313	0.0280	**64.7**
5		36.0	22	6.36	29.6	59.3	0.01313	0.0189	**50.9**
15		28.0	22	6.36	21.6	43.3	0.01313	0.0116	**37.2**
30		25.0	22	6.36	18.6	37.3	0.01313	0.0084	**32.0**
66		23.0	22.1	6.33	16.7	33.4	0.01311	0.0057	**28.7**
250		19.0	22	6.36	12.6	25.3	0.01313	0.0030	**21.7**
1440		18.0	22.7	6.11	11.9	23.8	0.01302	0.0013	**20.4**

Soil Specimen Data		**Other Corrections**		
Tare No.	693			
Weight of Tare & Dry Material (g)	147.68	a - Factor	0.99	
Weight of Tare (g)	93.24			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	85.84	
Weight of Dry Material (g)	49.4			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

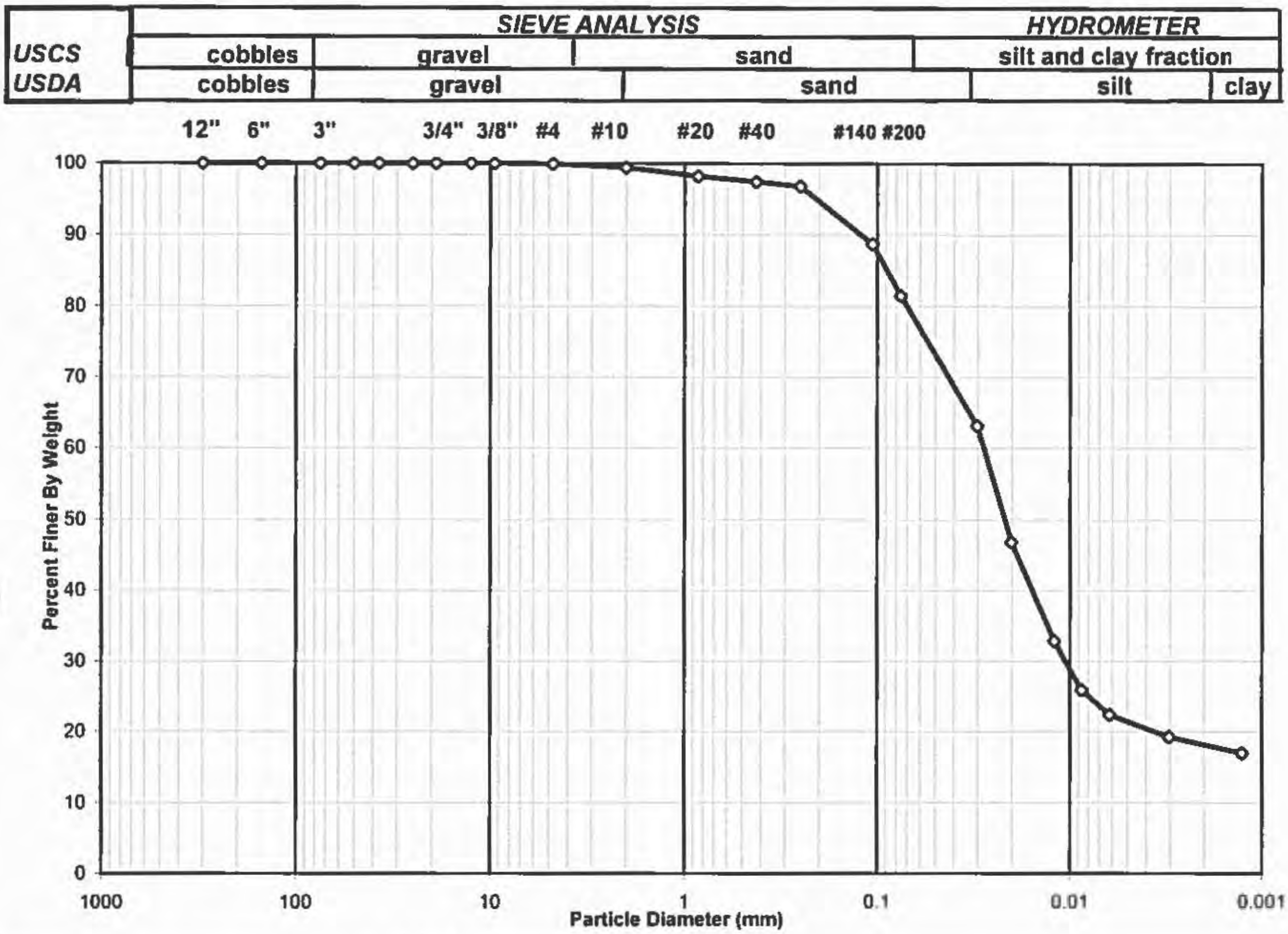
Tested By TO Date 10/27/15 Checked By KC Date 10/29/15

geotechnics
geotechnical & geosynthetic testing

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.9-10.4
Project No.:	2015-485-002	Sample No.:	ST-2
Lab ID:	2015-485-002-002	Soil Color:	Brown / Gray



USCS Summary		
Sieve Sizes (mm)		**Percentage**
Greater Than #4	*Gravel*	0.05
#4 To #200	*Sand*	18.50
Finer Than #200	*Silt & Clay*	81.45

USCS Symbol:

CL, TESTED

USCS Classification:

LEAN CLAY WITH SAND

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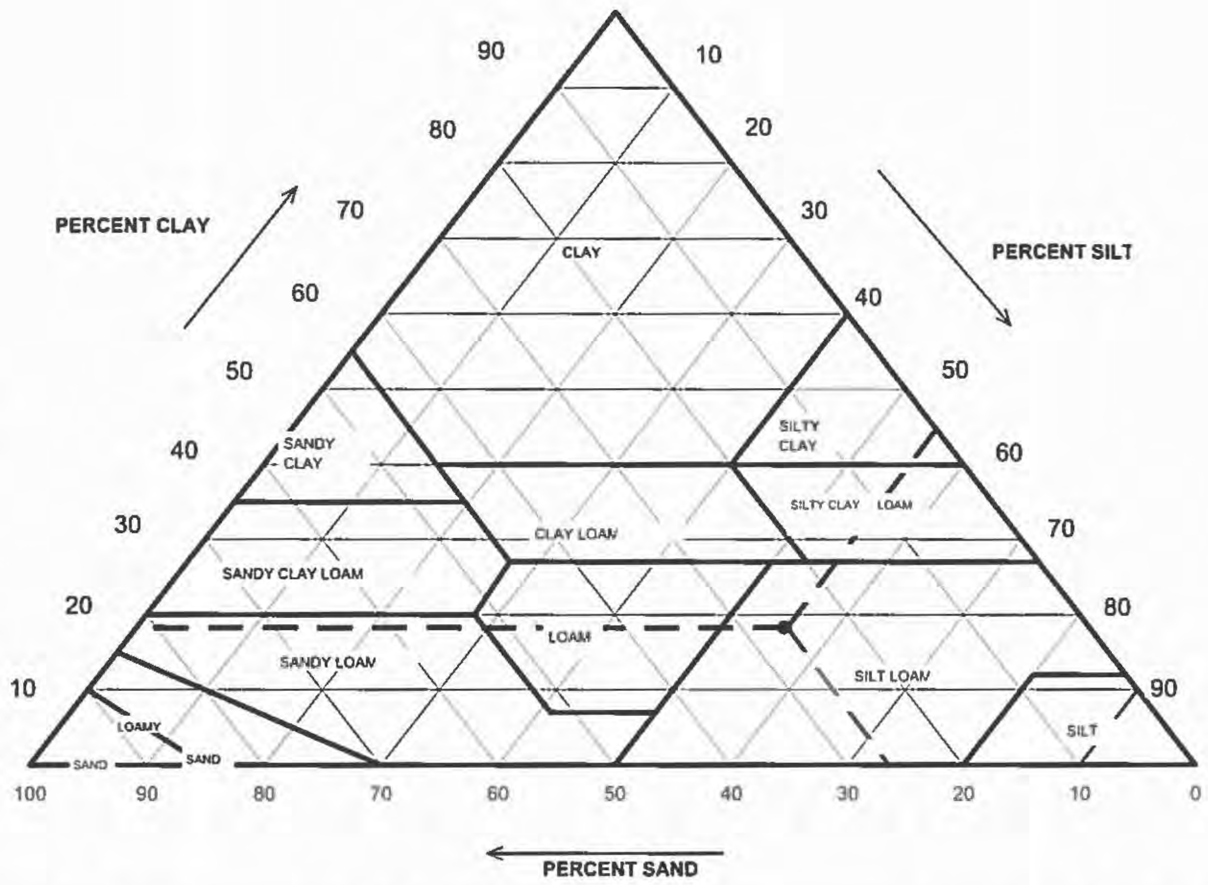
geotechnical & geosynthetic testing

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.9-10.4
Project No.:	2015-485-002	Sample No.:	ST-2
Lab ID:	2015-485-002-002	Soil Color:	Brown / Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.59	**0.00**
2	99.41	*Sand*	26.11	**26.26**
0.05	73.31	*Silt*	55.17	**55.50**
0.002	18.14	*Clay*	18.14	**18.24**

USDA Classification: ***SILT LOAM***

geotechnics
geotechnical & geosynthetic testing

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.9-10.4
Project No.:	2015-485-002	Sample No.:	ST-2
Lab ID:	2015-485-002-002	Soil Color:	Brown / Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1453	Tare No.	NA
Weight of Tare & Wet Sample (g)	1061.81	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	924.50	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	137.42	Weight of Tare (g)	NA
Weight of Water (g)	137.31	Weight of Water (g)	NA
Weight of Dry Sample (g)	787.08	Weight of Dry Sample (g)	NA
Moisture Content (%	**17.4**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	787.08
Dry Weight of -3/4" Sample (g)	146.00	Weight of - #200 Material (g)	641.08
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	146.00
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.38	0.05	0.05		99.95	**99.95**
#10	2.00	4.24	0.54	0.59		99.41	**99.41**
#20	0.85	9.39	1.19	1.78		98.22	**98.22**
#40	0.425	6.35	0.81	2.59		97.41	**97.41**
#60	0.250	4.52	0.57	3.16		96.84	**96.84**
#140	0.106	64.08	8.14	11.30		88.70	**88.70**
#200	0.075	57.04	7.25	18.55		81.45	**81.45**
Pan	-	641.08	81.45	100.00		-	-

Tested By	RAL	Date	9/25/15	Checked By	KC	Date	10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-10
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	9.9-10.4
Project No.:	2015-485-002	Sample No.:	ST-2
Lab ID:	2015-485-002-002	Soil Color:	Brown / Gray

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		33.0	23.3	5.89	27.1	77.5	0.01293	0.0302	**63.2**
5		26.0	23.3	5.89	20.1	57.5	0.01293	0.0201	**46.8**
15		20.0	23.3	5.89	14.1	40.3	0.01293	0.0120	**32.9**
30		17.0	23.3	5.89	11.1	31.8	0.01293	0.0087	**25.9**
60		15.5	23.3	5.89	9.6	27.5	0.01293	0.0062	**22.4**
250		14.0	23.7	5.75	8.2	23.6	0.01287	0.0030	**19.2**
1440		13.0	23.8	5.71	7.3	20.8	0.01285	0.0013	**17.0**

Soil Specimen Data		Other Corrections		
Tare No.	2337			
Weight of Tare & Dry Material (g)	135.04	a - Factor	0.99	
Weight of Tare (g)	95.43			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	81.45	
Weight of Dry Material (g)	34.6			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By DB Date 9/25/15 Checked By KC Date 10/14/15

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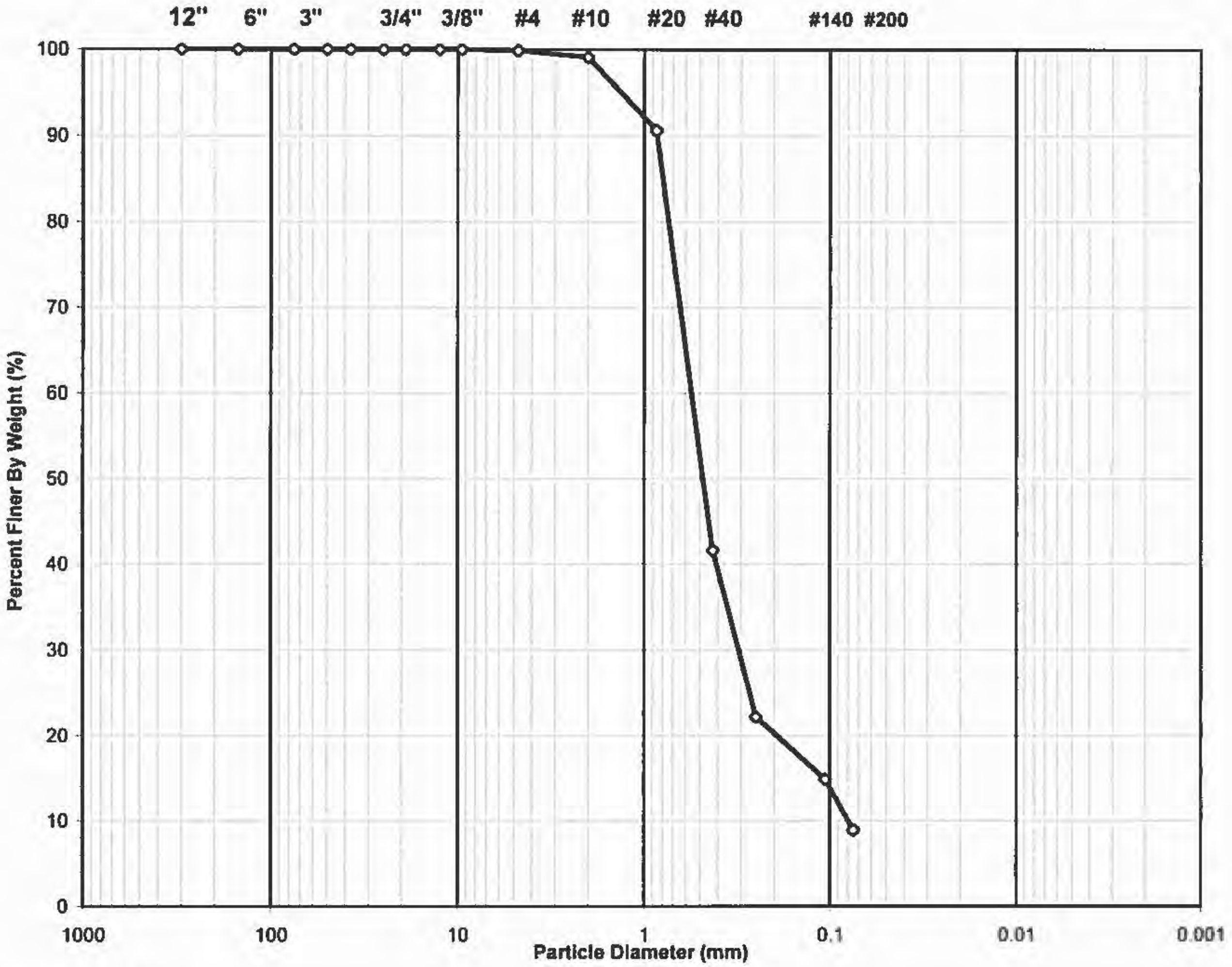
SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B010
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	33.5-35
Project No.:	2015-485-009	Sample No.:	SS-8
Lab ID:	2015-485-009-001	Soil Color:	Brown

USCS	*SIEVE ANALYSIS*		*HYDROMETER*
	gravel	sand	silt and clay



USCS Symbol:
sw-sm, ASSUMED

USCS Classification:
WELL-GRADED SAND WITH SILT

D60 =	0.55	CC =	2.17
D30 =	0.31	CU =	6.90
D10 =	0.08		

Tested By HL Date 11/13/15 Checked By KC Date 11/16/15

geotechnics
geotechnical & geosynthetic testing

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B010
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	33.5-35
Project No.:	2015-485-009	Sample No.:	SS-8
Lab ID:	2015-485-009-001	Soil Color:	Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1441	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	371.28	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	339.40	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	143.84	Weight of Tare (g):	NA
Weight of Water (g):	31.88	Weight of Water (g):	NA
Weight of Dry Sample (g):	195.56	Weight of Dry Sample (g):	NA
Moisture Content (%):	**16.3**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	195.56
Dry Weight of - 3/4" Sample (g):	178.1	Weight of - #200 Material (g):	17.43
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	178.13
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.24	0.12	0.12	99.88	**99.88**
#10	2.00	1.55	0.79	0.92	99.08	**99.08**
#20	0.850	16.54	8.46	9.37	90.63	**90.63**
#40	0.425	95.95	49.06	58.44	41.56	**41.56**
#60	0.250	37.80	19.33	77.77	22.23	**22.23**
#140	0.106	14.44	7.38	85.15	14.85	**14.85**
#200	0.075	11.61	5.94	91.09	8.91	**8.91**
Pan	-	17.43	8.91	100.00	-	-

Tested By HL Date 11/13/15 Checked By KC Date 11/16/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B010
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	48.5-50
Project No.:	2015-485-009	Sample No.:	SS-11
Lab ID:	2015-485-009-002	Soil Color:	Brown

USCS Symbol:

SP

USCS Classification:

POORLY GRADED SAND

D60 =	**0.75**	**CC =**	**1.35**
D30 =	**0.50**	**CU =**	**3.02**
D10 =	**0.25**		

Tested By HL Date 11/13/15 Checked By KC Date 11/16/15

WASH SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client: AECOM
Client Reference: Dynegy-Wood River Pwr. Sta. 60440115
Project No.: 2015-485-009
Lab ID: 2015-485-009-002

Boring No.: B010
Depth (ft): 48.5-50
Sample No.: SS-11
Soil Color: Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1498	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	545.70	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	488.90	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	149.35	Weight of Tare (g):	NA
Weight of Water (g):	56.80	Weight of Water (g):	NA
Weight of Dry Sample (g):	339.55	Weight of Dry Sample (g):	NA
Moisture Content (%):	**16.7**	**Moisture Content (%):**	**NA**

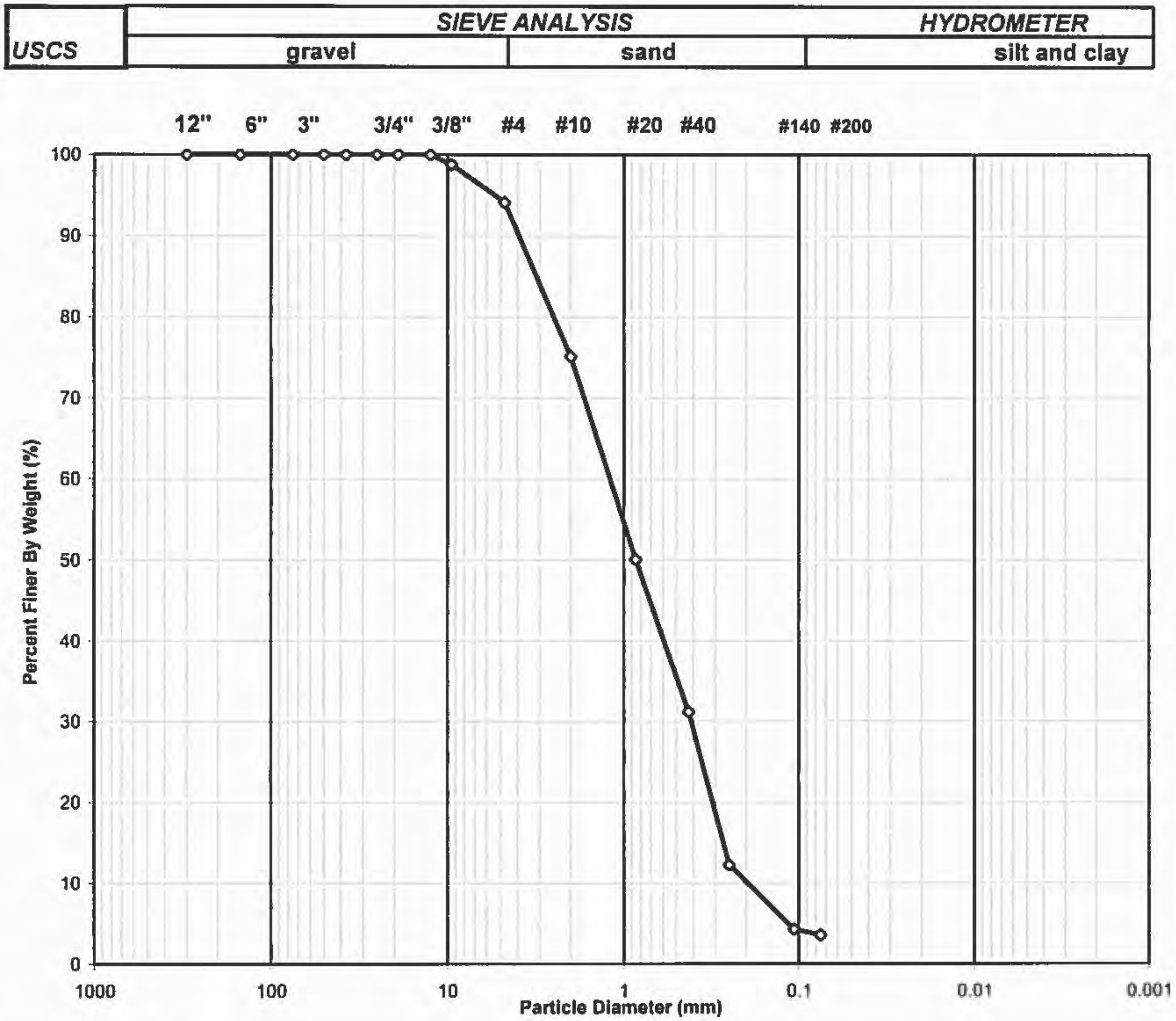
Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	339.55
Dry Weight of - 3/4" Sample (g):	330.7	Weight of - #200 Material (g):	8.89
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	330.66
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	3.58	1.05	1.05	98.95	**98.95**
3/8"	9.50	3.17	0.93	1.99	98.01	**98.01**
#4	4.75	1.37	0.40	2.39	97.61	**97.61**
#10	2.00	6.34	1.87	4.26	95.74	**95.74**
#20	0.850	89.69	26.41	30.67	69.33	**69.33**
#40	0.425	176.04	51.85	82.52	17.48	**17.48**
#60	0.250	25.28	7.45	89.96	10.04	**10.04**
#140	0.106	22.97	6.76	96.73	3.27	**3.27**
#200	0.075	2.22	0.65	97.38	2.62	**2.62**
Pan	-	8.89	2.62	100.00	-	-

Tested By HL Date 11/13/15 Checked By KC Date 11/16/15

SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B010
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	63.5-65.0
Project No.:	2015-485-009	Sample No.:	SS-14
Lab ID:	2015-485-009-003	Soil Color:	Brown



USCS Symbol:
SP

USCS Classification:
POORLY GRADED SAND

D60 =	1.19	CC =	0.72
D30 =	0.41	CU =	6.03
D10 =	0.20		

Tested By	HL	Date	11/13/15	Checked By	KC	Date	11/16/15

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B010
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	63.5-65.0
Project No.:	2015-485-009	Sample No.:	SS-14
Lab ID:	2015-485-009-003	Soil Color:	Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1451	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	340.80	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	340.80	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.79	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Sample (g):	196.01	Weight of Dry Sample (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	196.01
Dry Weight of - 3/4" Sample (g):	189.1	Weight of - #200 Material (g):	6.91
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	189.10
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

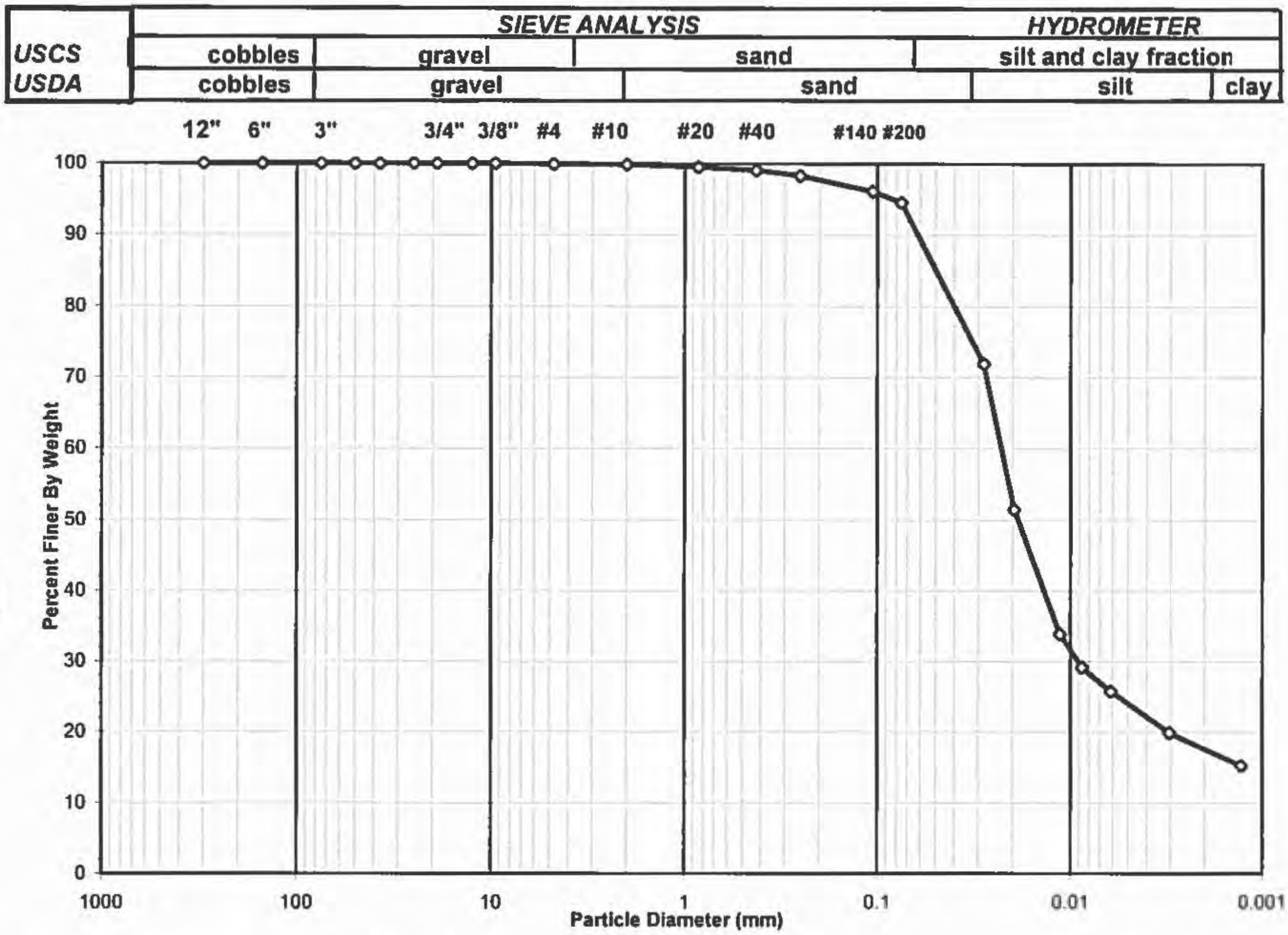
Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	2.39	1.22	1.22	98.78	**98.78**
#4	4.75	9.12	4.65	5.87	94.13	**94.13**
#10	2.00	37.19	18.97	24.85	75.15	**75.15**
#20	0.850	49.11	25.05	49.90	50.10	**50.10**
#40	0.425	37.04	18.90	68.80	31.20	**31.20**
#60	0.250	37.27	19.01	87.81	12.19	**12.19**
#140	0.106	15.63	7.97	95.79	4.21	**4.21**
#200	0.075	1.35	0.69	96.47	3.53	**3.53**
Pan	-	6.91	3.53	100.00	-	-

Tested By HL Date 11/13/15 Checked By KC Date 11/16/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	1.0-2.5
Project No.:	2015-485-003	Sample No.:	SS-1
Lab ID:	2015-485-003-001	Soil Color:	Brown



USCS Summary		
Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.05
#4 To #200	*Sand*	5.37
Finer Than #200	*Silt & Clay*	94.57

USCS Symbol:

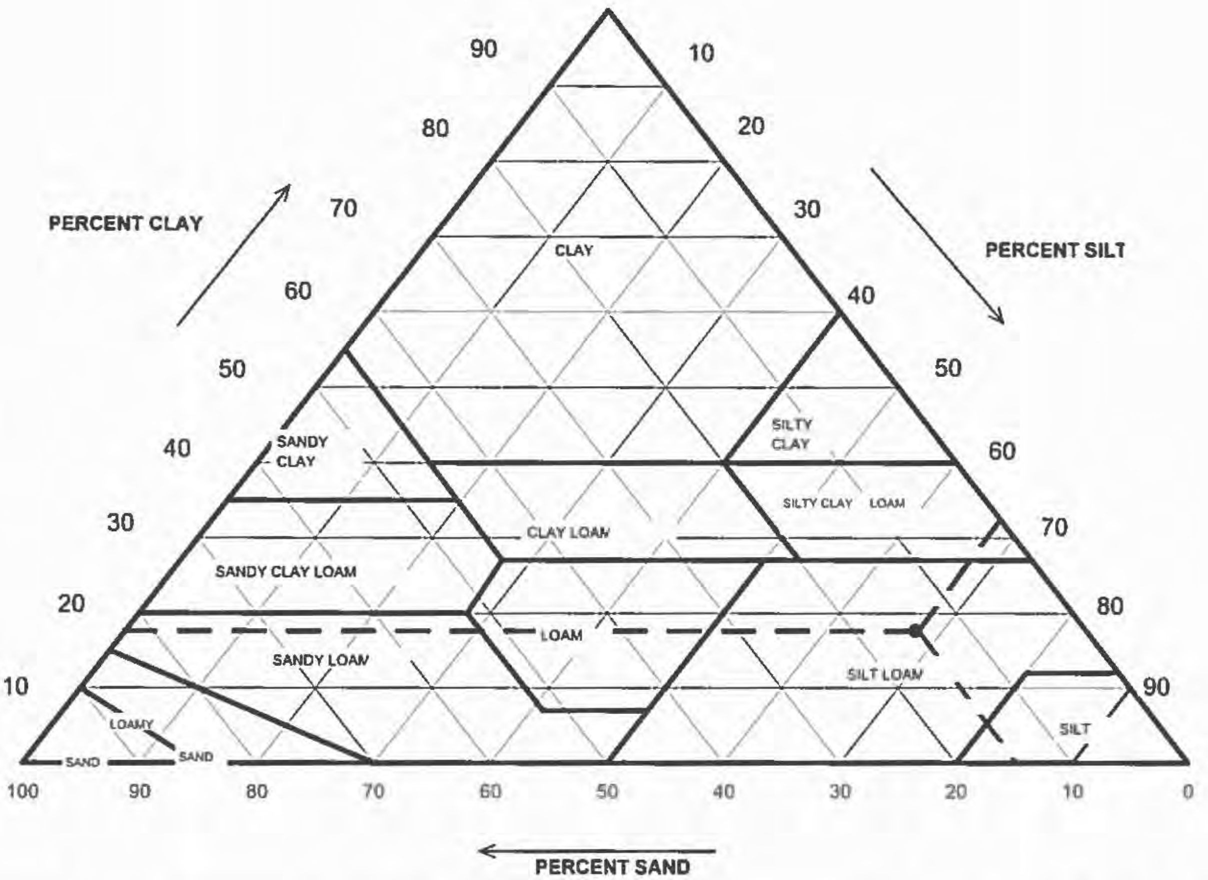
CL, TESTED

USCS Classification:

LEAN CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	1.0-2.5
Project No.:	2015-485-003	Sample No.:	SS-1
Lab ID:	2015-485-003-001	Soil Color:	Brown



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat (%)
		Gravel	0.16	**0.00**
2	99.84	*Sand*	14.63	**14.65**
0.05	85.22	*Silt*	67.62	**67.73**
0.002	17.60	*Clay*	17.60	**17.62**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	1.0-2.5
Project No.:	2015-485-003	Sample No.:	SS-1
Lab ID:	2015-485-003-001	Soil Color:	Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1449	Tare No.	NA
Weight of Tare & Wet Sample (g)	348.22	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	348.22	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.54	Weight of Tare (g)	NA
Weight of Water (g)	0.00	Weight of Water (g)	NA
Weight of Dry Sample (g)	202.68	Weight of Dry Sample (g)	NA
Moisture Content (%	**0.0**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	202.68
Dry Weight of -3/4" Sample (g)	11.00	Weight of - #200 Material (g)	191.68
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	11.00
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.11	0.05	0.05		99.95	**99.95**
#10	2.00	0.21	0.10	0.16		99.84	**99.84**
#20	0.85	0.74	0.37	0.52		99.48	**99.48**
#40	0.425	0.81	0.40	0.92		99.08	**99.08**
#60	0.250	1.57	0.77	1.70		98.30	**98.30**
#140	0.106	4.48	2.21	3.91		96.09	**96.09**
#200	0.075	3.08	1.52	5.43		94.57	**94.57**
Pan	-	191.68	94.57	100.00		-	-

Tested By HL Date 10/12/15 Checked By KC Date 10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	1.0-2.5
Project No.:	2015-485-003	Sample No.:	SS-1
Lab ID:	2015-485-003-001	Soil Color:	Brown

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		45.5	20.7	6.83	38.7	76.0	0.01333	0.0280	**71.9**
5		34.5	20.7	6.83	27.7	54.4	0.01333	0.0194	**51.4**
17		25.0	20.7	6.83	18.2	35.7	0.01333	0.0113	**33.8**
30		22.5	20.7	6.83	15.7	30.8	0.01333	0.0086	**29.1**
60		20.5	21.1	6.68	13.8	27.1	0.01327	0.0062	**25.7**
250		17.0	22.1	6.33	10.7	21.0	0.01311	0.0030	**19.8**
1440		14.5	22.2	6.29	8.2	16.1	0.01310	0.0013	**15.3**

Soil Specimen Data		**Other Corrections**		
Tare No.	2331			
Weight of Tare & Dry Material (g)	149.10	a - Factor	0.99	
Weight of Tare (g)	93.71			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	94.57	
Weight of Dry Material (g)	50.4			
		Specific Gravity	2.7	Assumed

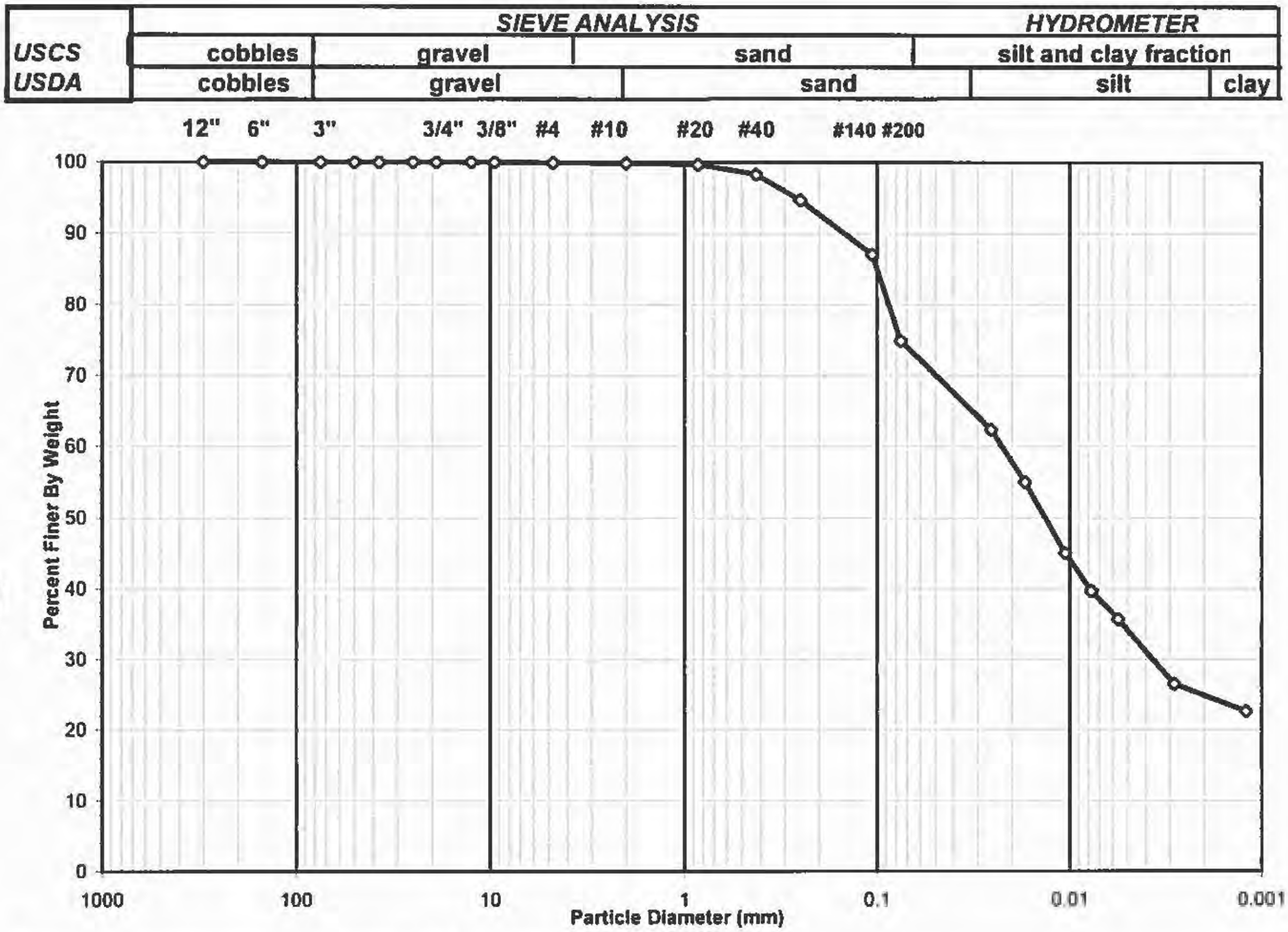
Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 10/12/15 Checked By KC Date 10/14/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	11.0-12.5
Project No.:	2015-485-003	Sample No.:	SS-5
Lab ID:	2015-485-003-002	Soil Color:	Dark Brown



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.06
#4 To #200	*Sand*	25.02
Finer Than #200	*Silt & Clay*	74.92

USCS Symbol:

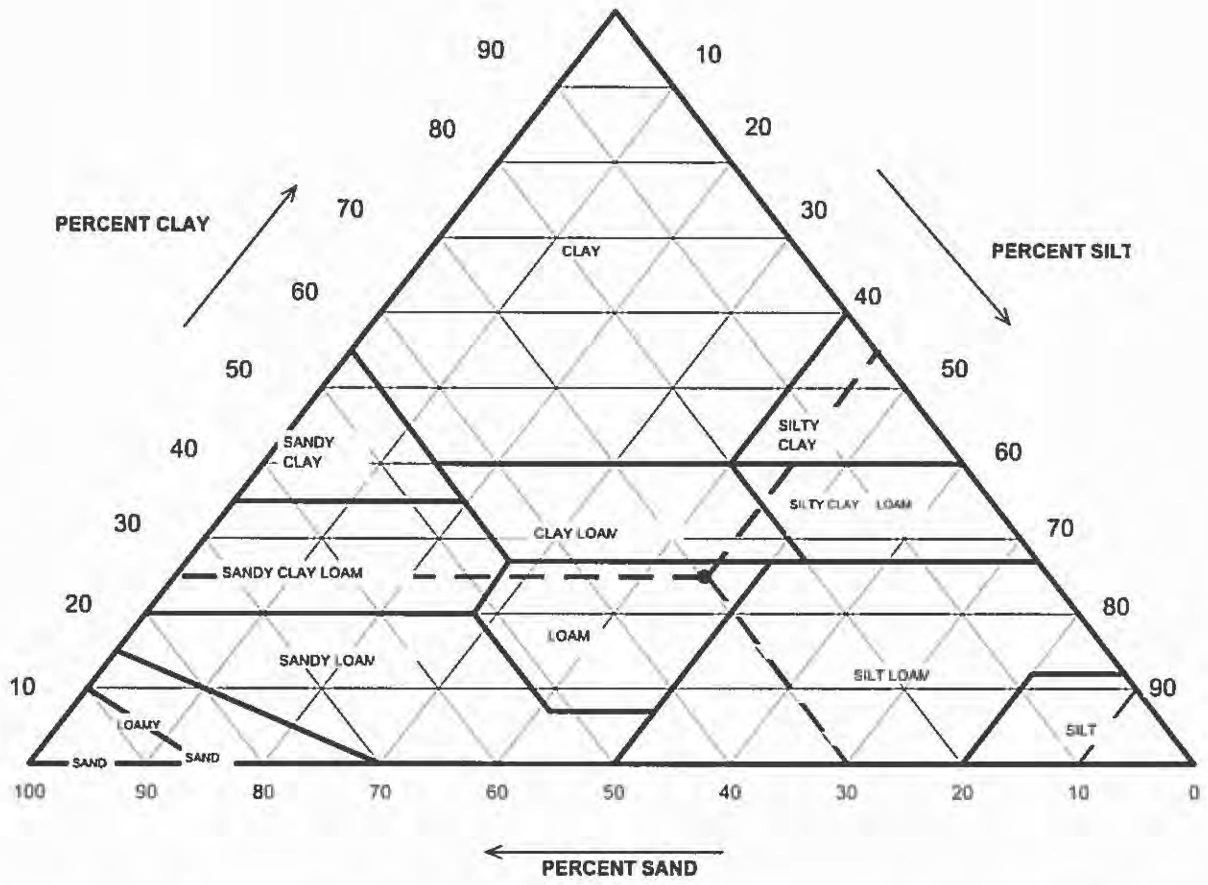
CL, TESTED

USCS Classification:

LEAN CLAY WITH SAND

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	11.0-12.5
Project No.:	2015-485-003	Sample No.:	SS-5
Lab ID:	2015-485-003-002	Soil Color:	Dark Brown



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.14	**0.00**
2	99.86	*Sand*	29.70	**29.74**
0.05	70.16	*Silt*	45.27	**45.33**
0.002	24.89	*Clay*	24.89	**24.93**

USDA Classification: ***LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	11.0-12.5
Project No.:	2015-485-003	Sample No.:	SS-5
Lab ID:	2015-485-003-002	Soil Color:	Dark Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1447	Tare No.	NA
Weight of Tare & Wet Sample (g)	467.20	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	410.30	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.34	Weight of Tare (g)	NA
Weight of Water (g)	56.90	Weight of Water (g)	NA
Weight of Dry Sample (g)	264.96	Weight of Dry Sample (g)	NA
Moisture Content (%	**21.5**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	264.96
Dry Weight of -3/4" Sample (g)	66.45	Weight of - #200 Material (g)	198.51
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	66.45
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.16	0.06	0.06		99.94	**99.94**
#10	2.00	0.20	0.08	0.14		99.86	**99.86**
#20	0.85	0.54	0.20	0.34		99.66	**99.66**
#40	0.425	3.68	1.39	1.73		98.27	**98.27**
#60	0.250	9.53	3.60	5.33		94.67	**94.67**
#140	0.106	20.39	7.70	13.02		86.98	**86.98**
#200	0.075	31.95	12.06	25.08		74.92	**74.92**
Pan	-	198.51	74.92	100.00		-	-

Tested By PC Date 10/2/15 Checked By KC Date 10/12/15

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HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	11.0-12.5
Project No.:	2015-485-003	Sample No.:	SS-5
Lab ID:	2015-485-003-002	Soil Color:	Dark Brown

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		53.0	22.1	6.33	46.7	83.2	0.01311	0.0256	**62.3**
5		47.5	22.1	6.33	41.2	73.4	0.01311	0.0171	**55.0**
15		40.0	22.1	6.33	33.7	60.0	0.01311	0.0106	**44.9**
30		36.0	22.1	6.33	29.7	52.9	0.01311	0.0077	**39.6**
60		33.0	22.1	6.33	26.7	47.5	0.01311	0.0056	**35.6**
250		26.0	22.6	6.15	19.9	35.4	0.01303	0.0029	**26.5**
1440		23.0	22.9	6.04	17.0	30.2	0.01299	0.0012	**22.6**

Soil Specimen Data		Other Corrections		
Tare No.	528			
Weight of Tare & Dry Material (g)	153.11	a - Factor	0.99	
Weight of Tare (g)	92.54			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	74.92	
Weight of Dry Material (g)	55.6			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 10/2/15 Checked By KC Date 10/12/15

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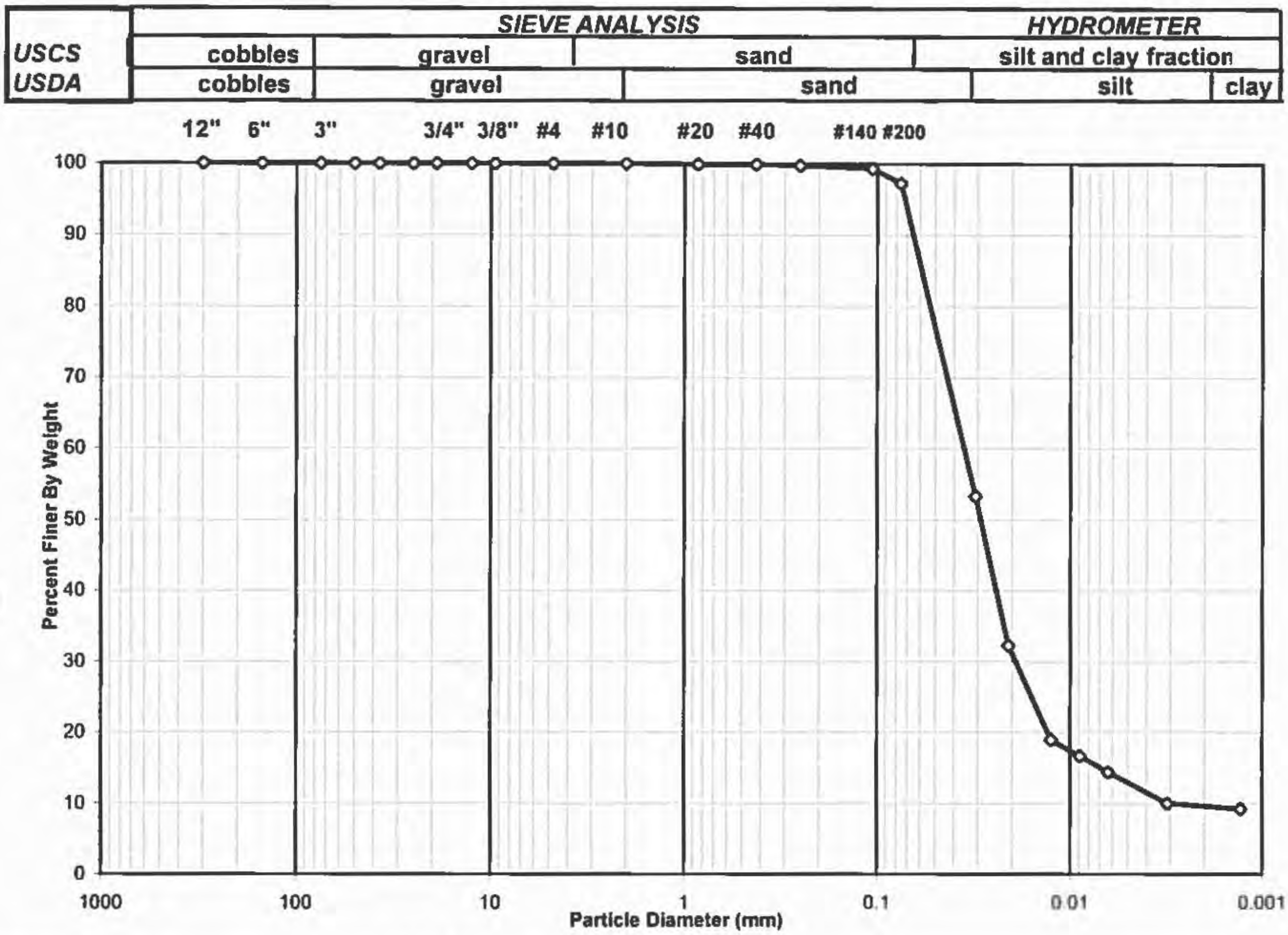
SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	21.9-22.4
Project No.:	2015-485-002	Sample No.:	ST-1
Lab ID:	2015-485-002-003	Soil Color:	Brown / Gray



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	2.76
Finer Than #200	*Silt & Clay*	97.24

USCS Symbol:

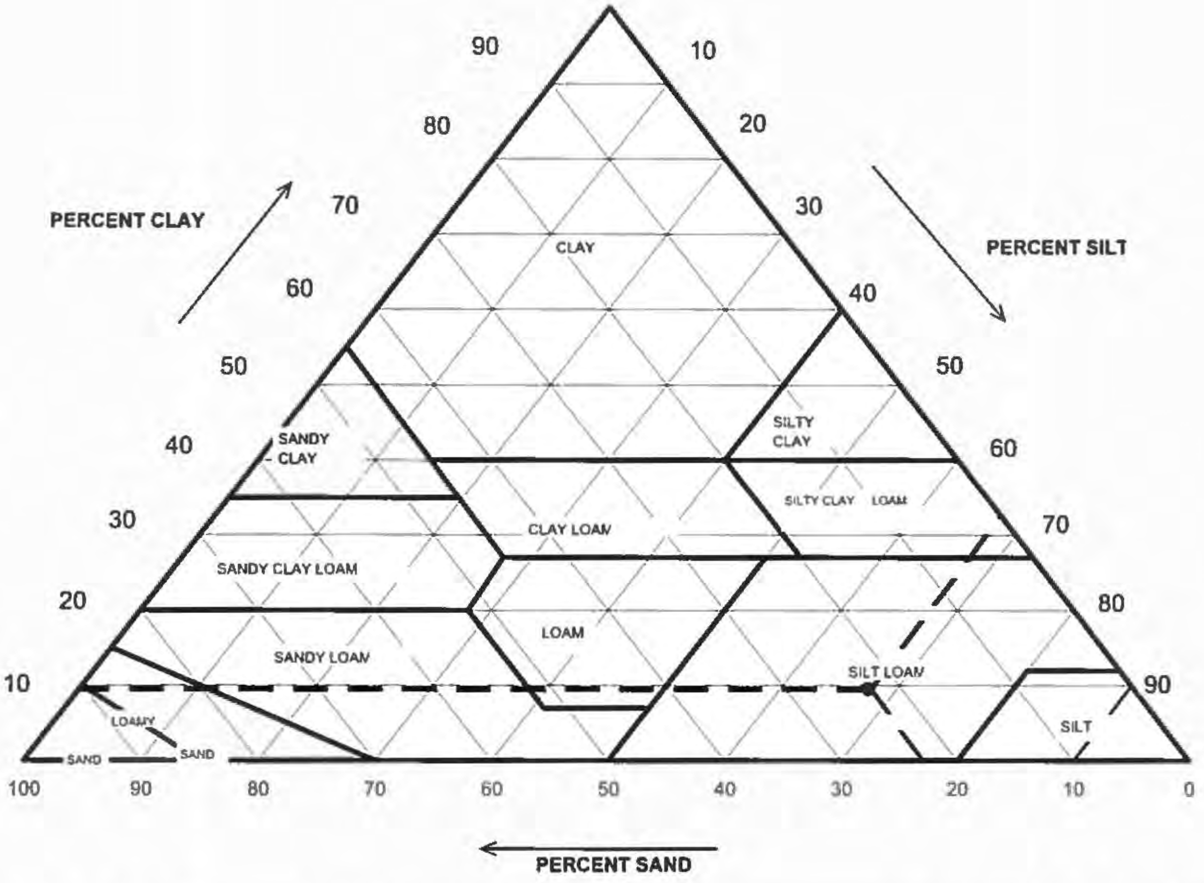
ML, TESTED

USCS Classification:

SILT
(NON-PLASTIC FINES)

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	21.9-22.4
Project No.:	2015-485-002	Sample No.:	ST-1
Lab ID:	2015-485-002-003	Soil Color:	Brown / Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.00	**0.00**
2	100.00	*Sand*	22.84	**22.84**
0.05	77.16	*Silt*	67.58	**67.58**
0.002	9.58	*Clay*	9.58	**9.58**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	21.9-22.4
Project No.:	2015-485-002	Sample No.:	ST-1
Lab ID:	2015-485-002-003	Soil Color:	Brown / Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	889	Tare No.	NA
Weight of Tare & Wet Sample (g)	777.76	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	603.40	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	100.66	Weight of Tare (g)	NA
Weight of Water (g)	174.36	Weight of Water (g)	NA
Weight of Dry Sample (g)	502.74	Weight of Dry Sample (g)	NA
Moisture Content (%	**34.7**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	502.74
Dry Weight of -3/4" Sample (g)	13.88	Weight of - #200 Material (g)	488.86
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	13.88
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.00	0.00	0.00		100.00	**100.00**
#20	0.85	0.24	0.05	0.05		99.95	**99.95**
#40	0.425	0.39	0.08	0.13		99.87	**99.87**
#60	0.250	0.50	0.10	0.22		99.78	**99.78**
#140	0.106	2.37	0.47	0.70		99.30	**99.30**
#200	0.075	10.38	2.06	2.76		97.24	**97.24**
Pan	-	488.86	97.24	100.00		-	-

Tested By HL Date 9/27/15 Checked By KC Date 10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-12
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	21.9-22.4
Project No.:	2015-485-002	Sample No.:	ST-1
Lab ID:	2015-485-002-003	Soil Color:	Brown / Gray

Elapsed Time		**R Measured**	**Temp.**	**Composite Correction**	**R Corrected**	**N**	**K Factor**	**Diameter**	**N'**
(min)			**(°C)**			**(%)**		**(mm)**	**(%)**
0		NA	NA	NA	NA	NA	NA	NA	NA
2		30.0	23.1	5.97	24.0	54.8	0.01296	0.0309	**53.3**
5		20.5	23.1	5.97	14.5	33.2	0.01296	0.0208	**32.3**
15		14.5	23.1	5.97	8.5	19.5	0.01296	0.0125	**18.9**
30		13.5	23.1	5.97	7.5	17.2	0.01296	0.0089	**16.7**
60		12.5	22.9	6.04	6.5	14.7	0.01299	0.0063	**14.3**
250		10.5	23	6.00	4.5	10.3	0.01297	0.0031	**10.0**
1440		10.0	23.4	5.86	4.1	9.5	0.01291	0.0013	**9.2**

Soil Specimen Data		**Other Corrections**		
Tare No.	960			
Weight of Tare & Dry Material (g)	143.73	a - Factor	0.99	
Weight of Tare (g)	95.35			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	97.24	
Weight of Dry Material (g)	43.4			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 9/29/15 Checked By KC Date 10/14/15

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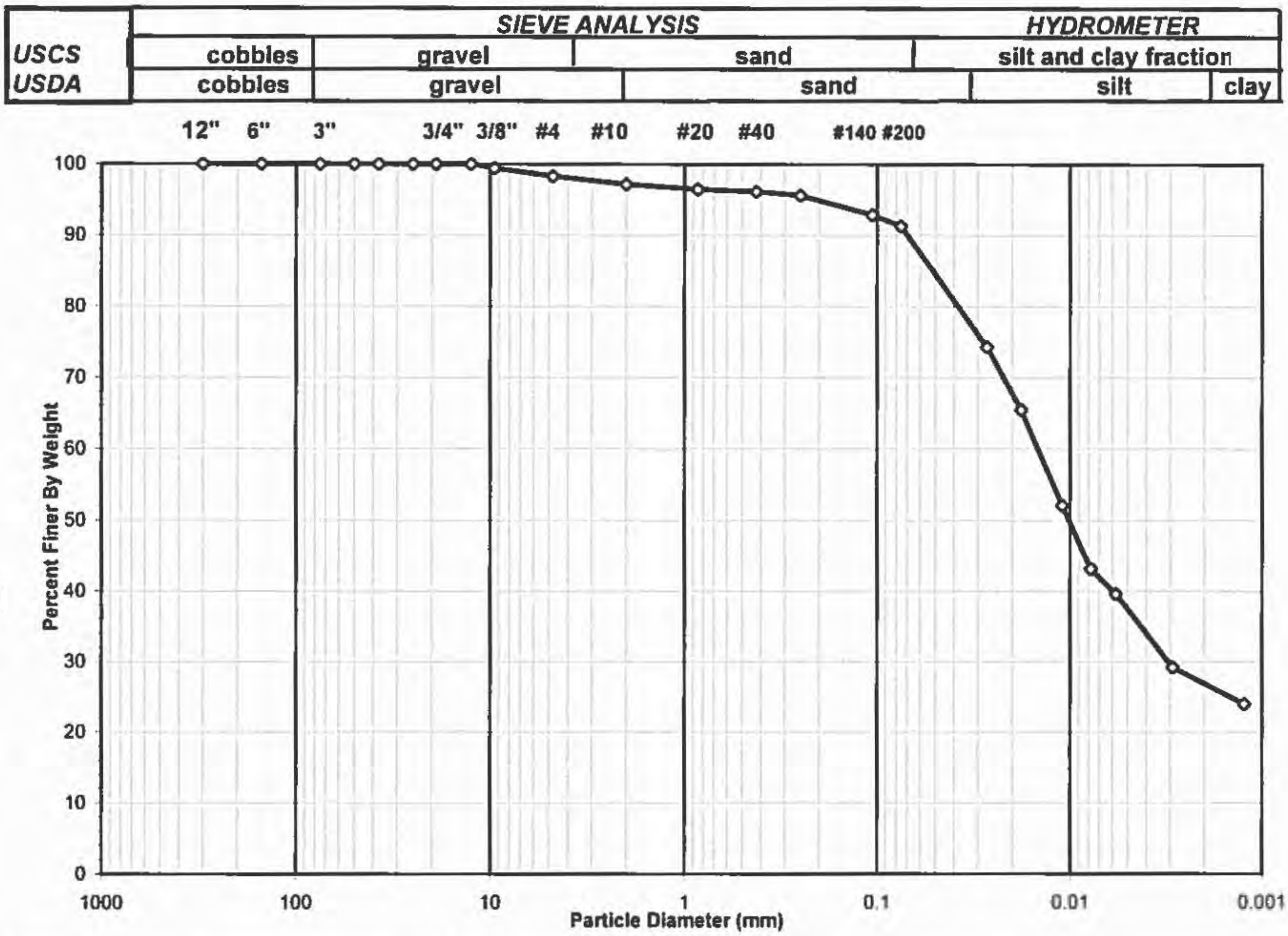
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (2007)

Client: AECOM
Client Reference: Dynegy - Wood River Pwr. Sta. 60440115
Project No.: 2015-485-003
Lab ID: 2015-485-003-003

Boring No.: B-13
Depth (ft): 3.5-5.0
Sample No.: SS-2
Soil Color: Dark Brown



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	1.74
#4 To #200	*Sand*	6.98
Finer Than #200	*Silt & Clay*	91.28

USCS Symbol:

CL, TESTED

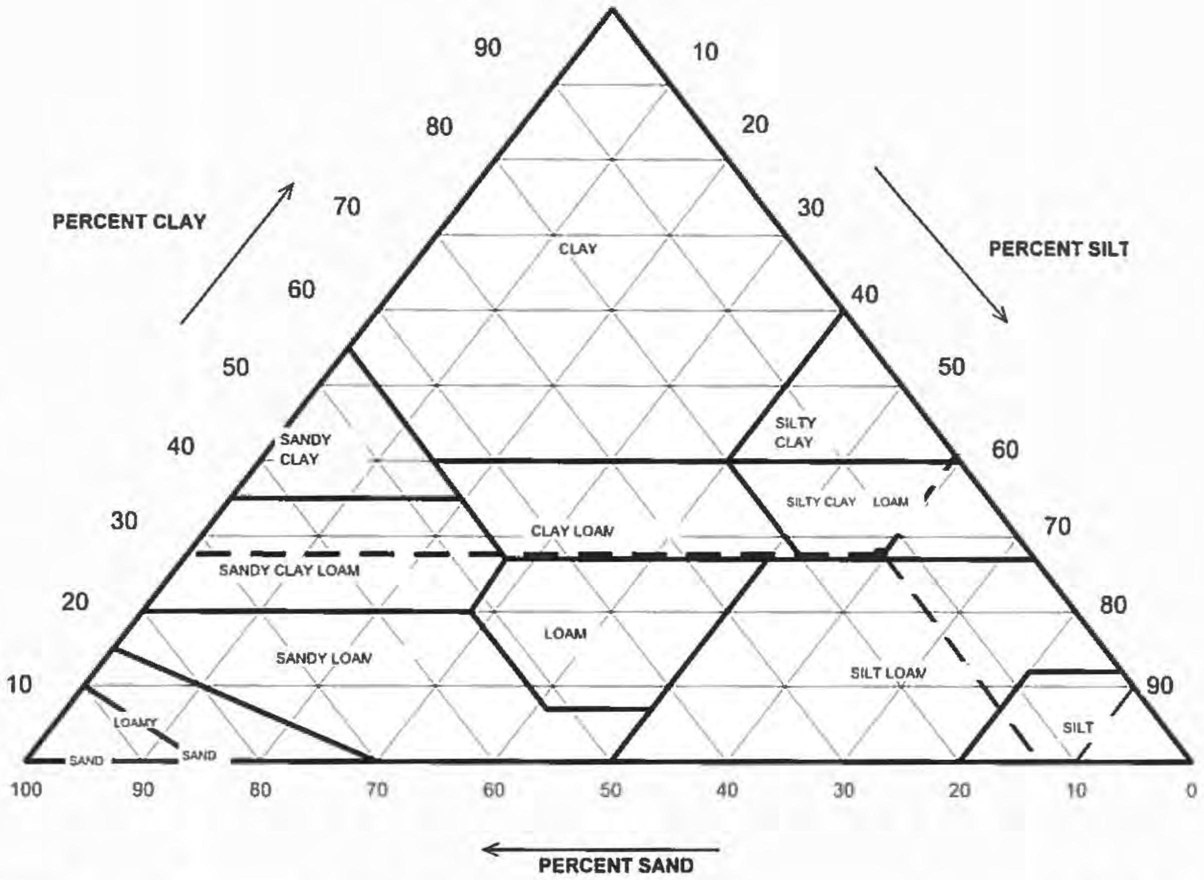
USCS Classification:

LEAN CLAY

USDA CLASSIFICATION CHART

Client: AECOM
Client Reference: Dynegy - Wood River Pwr. Sta. 60440115
Project No.: 2015-485-003
Lab ID: 2015-485-003-003

Boring No.: B-13
Depth (ft): 3.5-5.0
Sample No.: SS-2
Soil Color: Dark Brown



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	2.86	**0.00**
2	97.14	*Sand*	12.57	**12.94**
0.05	84.57	*Silt*	57.69	**59.39**
0.002	26.88	*Clay*	26.88	**27.67**

USDA Classification: ***SILTY CLAY LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	3.5-5.0
Project No.:	2015-485-003	Sample No.:	SS-2
Lab ID:	2015-485-003-003	Soil Color:	Dark Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1434	Tare No.	NA
Weight of Tare & Wet Sample (g)	527.30	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	462.90	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.04	Weight of Tare (g)	NA
Weight of Water (g)	64.40	Weight of Water (g)	NA
Weight of Dry Sample (g)	317.86	Weight of Dry Sample (g)	NA
Moisture Content (%	**20.3**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	317.86
Dry Weight of -3/4" Sample (g)	27.72	Weight of - #200 Material (g)	290.14
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	27.72
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	1.93	0.61	0.61		99.39	**99.39**
#4	4.75	3.60	1.13	1.74		98.26	**98.26**
#10	2.00	3.55	1.12	2.86		97.14	**97.14**
#20	0.85	2.09	0.66	3.51		96.49	**96.49**
#40	0.425	1.19	0.37	3.89		96.11	**96.11**
#60	0.250	1.64	0.52	4.40		95.60	**95.60**
#140	0.106	8.78	2.76	7.17		92.83	**92.83**
#200	0.075	4.94	1.55	8.72		91.28	**91.28**
Pan	-	290.14	91.28	100.00		-	-

Tested By PC Date 10/2/15 Checked By KC Date 10/12/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	3.5-5.0
Project No.:	2015-485-003	Sample No.:	SS-2
Lab ID:	2015-485-003-003	Soil Color:	Dark Brown

Elapsed Time		**R Measured**	**Temp.**	**Composite Correction**	**R Corrected**	**N**	**K Factor**	**Diameter**	**N'**
(min)			**(°C)**			**(%)**		**(mm)**	**(%)**
0		NA	NA	NA	NA	NA	NA	NA	NA
2		48.0	22.1	6.33	41.7	81.4	0.01311	0.0269	**74.3**
5		43.0	22.1	6.33	36.7	71.7	0.01311	0.0178	**65.4**
15		35.5	22.1	6.33	29.2	57.0	0.01311	0.0110	**52.0**
32		30.5	22.1	6.33	24.2	47.2	0.01311	0.0078	**43.1**
60		28.5	22.1	6.33	22.2	43.3	0.01311	0.0058	**39.5**
250		22.5	22.6	6.15	16.4	32.0	0.01303	0.0029	**29.2**
1440		19.5	22.9	6.04	13.5	26.3	0.01299	0.0012	**24.0**

Soil Specimen Data		**Other Corrections**		
Tare No.	644			
Weight of Tare & Dry Material (g)	155.53	a - Factor	0.99	
Weight of Tare (g)	99.86			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	91.28	
Weight of Dry Material (g)	50.7			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By	TO	Date	10/6/15	Checked By	KC	Date	10/12/15

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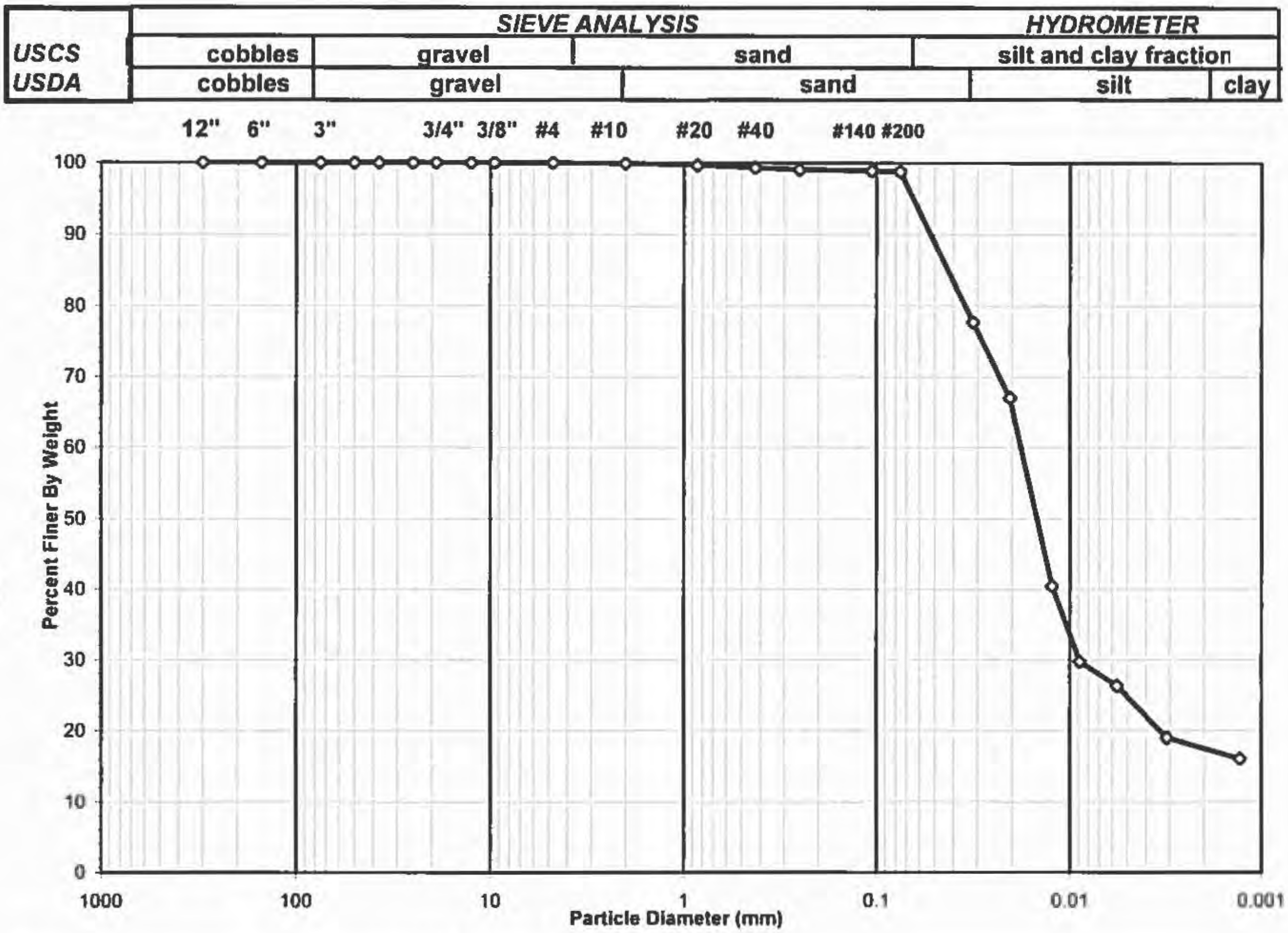
SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM		Boring No.:	B-13
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115		Depth (ft):	18.9-19.4
Project No.:	2015-485-002		Sample No.:	ST-1
Lab ID:	2015-485-002-004		Soil Color:	Brown



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	1.21
Finer Than #200	*Silt & Clay*	98.79

USCS Symbol:

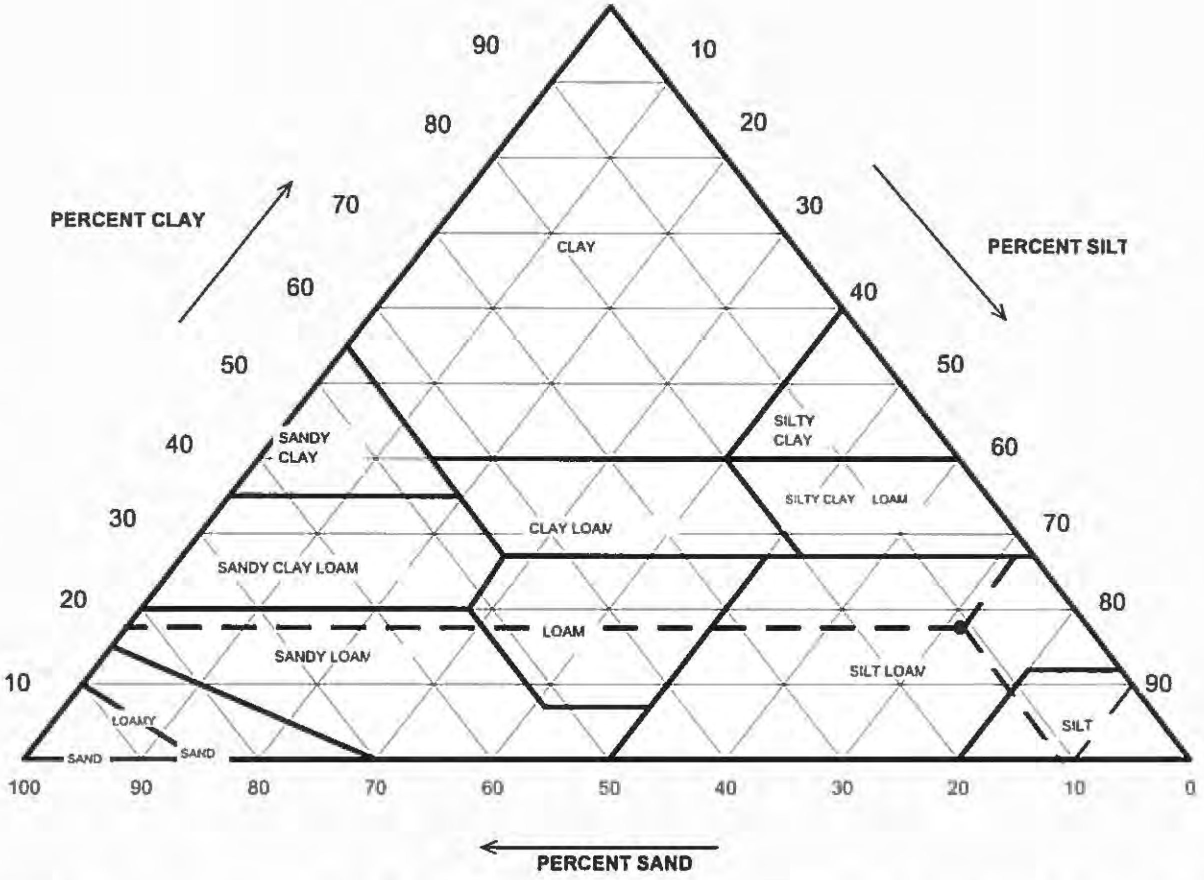
CL, TESTED

USCS Classification:

LEAN CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	18.9-19.4
Project No.:	2015-485-002	Sample No.:	ST-1
Lab ID:	2015-485-002-004	Soil Color:	Brown



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.05	**0.00**
2	99.95	*Sand*	11.05	**11.06**
0.05	88.90	*Silt*	71.40	**71.43**
0.002	17.50	*Clay*	17.50	**17.51**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	18.9-19.4
Project No.:	2015-485-002	Sample No.:	ST-1
Lab ID:	2015-485-002-004	Soil Color:	Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1465	Tare No.	NA
Weight of Tare & Wet Sample (g)	922.04	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	734.20	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	97.72	Weight of Tare (g)	NA
Weight of Water (g)	187.84	Weight of Water (g)	NA
Weight of Dry Sample (g)	636.48	Weight of Dry Sample (g)	NA
Moisture Content (%	**29.5**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	636.48
Dry Weight of -3/4" Sample (g)	7.73	Weight of - #200 Material (g)	628.75
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	7.73
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.34	0.05	0.05		99.95	**99.95**
#20	0.85	1.60	0.25	0.30		99.70	**99.70**
#40	0.425	2.23	0.35	0.66		99.34	**99.34**
#60	0.250	1.64	0.26	0.91		99.09	**99.09**
#140	0.106	1.44	0.23	1.14		98.86	**98.86**
#200	0.075	0.48	0.08	1.21		98.79	**98.79**
Pan	-	628.75	98.79	100.00		-	-

Tested By	PC	Date	9/28/15	Checked By	KC	Date	10/14/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	18.9-19.4
Project No.:	2015-485-002	Sample No.:	ST-1
Lab ID:	2015-485-002-004	Soil Color:	Brown

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		28.0	22.7	6.11	21.9	78.6	0.01302	0.0315	**77.6**
5		25.0	22.7	6.11	18.9	67.8	0.01302	0.0203	**67.0**
15		17.5	22.7	6.11	11.4	40.9	0.01302	0.0123	**40.4**
30		14.5	22.7	6.11	8.4	30.1	0.01302	0.0089	**29.8**
74		13.5	22.8	6.07	7.4	26.7	0.01300	0.0057	**26.3**
250		11.5	22.6	6.15	5.4	19.2	0.01303	0.0031	**19.0**
1440		10.5	23.1	5.97	4.5	16.3	0.01296	0.0013	**16.1**

Soil Specimen Data		**Other Corrections**		
Tare No.	947			
Weight of Tare & Dry Material (g)	132.91	a - Factor	0.99	
Weight of Tare (g)	100.33			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	98.79	
Weight of Dry Material (g)	27.6			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 9/28/15 Checked By KC Date 10/14/15

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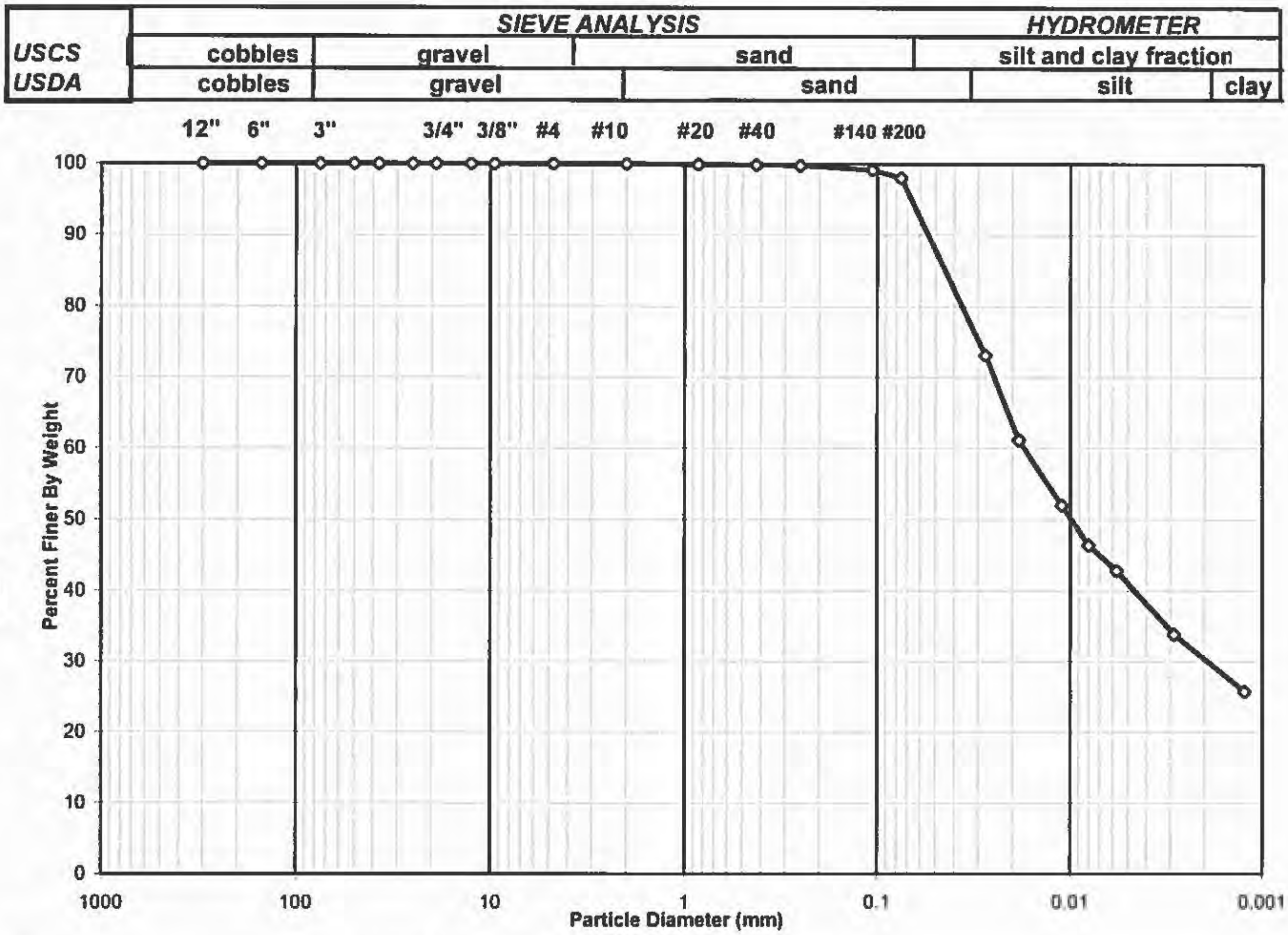
SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	28.5-30.0
Project No.:	2015-485-003	Sample No.:	SS-10
Lab ID:	2015-485-003-004	Soil Color:	Brown / Gray



USCS Summary Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	1.98
Finer Than #200	*Silt & Clay*	98.02

USCS Symbol:

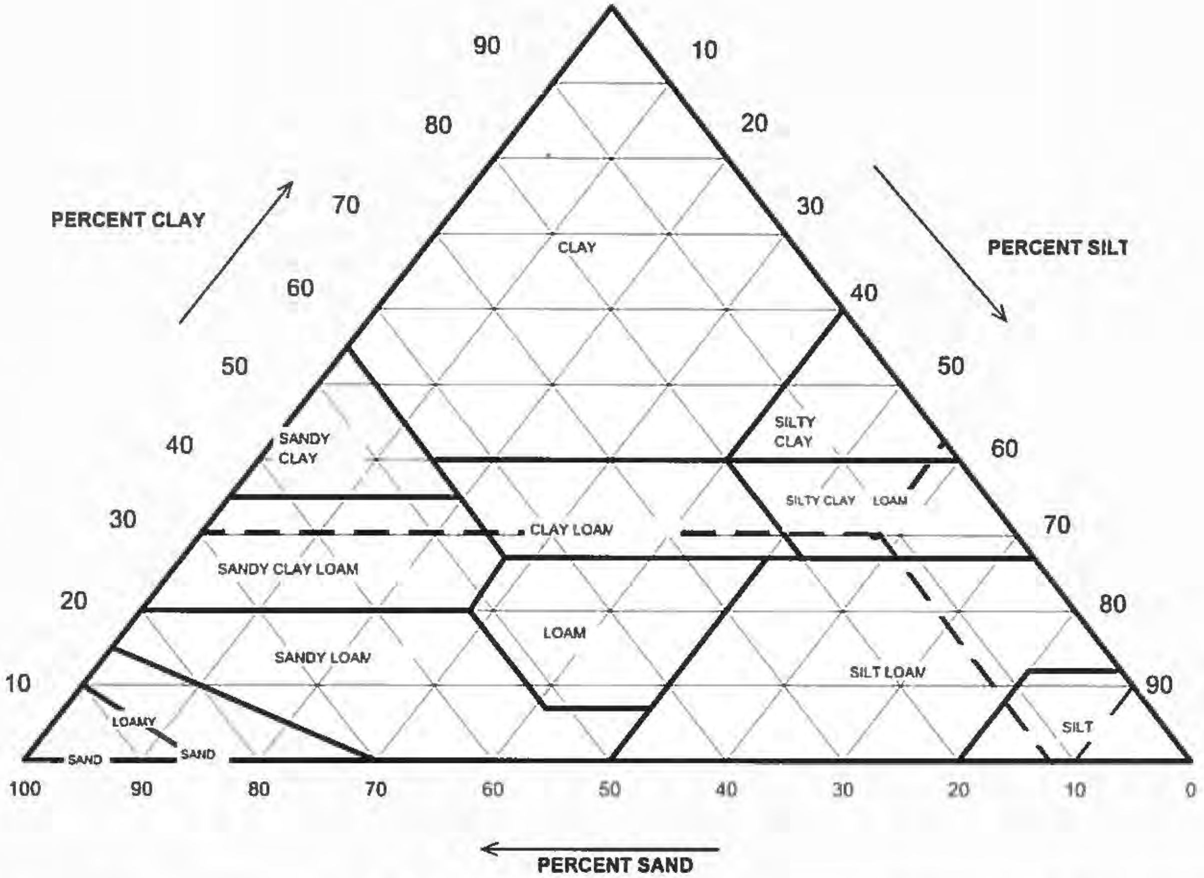
CH, TESTED

USCS Classification:

FAT CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	28.5-30.0
Project No.:	2015-485-003	Sample No.:	SS-10
Lab ID:	2015-485-003-004	Soil Color:	Brown / Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.02	**0.00**
2	99.98	*Sand*	12.01	**12.01**
0.05	87.97	*Silt*	57.66	**57.67**
0.002	30.31	*Clay*	30.31	**30.32**

USDA Classification: ***SILTY CLAY LOAM***

DCN: CT-S3A DATE: 3/18/13 REVISION: 11

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	28.5-30.0
Project No.:	2015-485-003	Sample No.:	SS-10
Lab ID:	2015-485-003-004	Soil Color:	Brown / Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1455	Tare No.	NA
Weight of Tare & Wet Sample (g)	428.80	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	342.67	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.30	Weight of Tare (g)	NA
Weight of Water (g)	86.13	Weight of Water (g)	NA
Weight of Dry Sample (g)	197.37	Weight of Dry Sample (g)	NA
Moisture Content (%	**43.6**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	197.37
Dry Weight of -3/4" Sample (g)	3.91	Weight of - #200 Material (g)	193.46
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	3.91
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.03	0.02	0.02		99.98	**99.98**
#20	0.85	0.10	0.05	0.07		99.93	**99.93**
#40	0.425	0.15	0.08	0.14		99.86	**99.86**
#60	0.250	0.23	0.12	0.26		99.74	**99.74**
#140	0.106	1.22	0.62	0.88		99.12	**99.12**
#200	0.075	2.18	1.10	1.98		98.02	**98.02**
Pan	-	193.46	98.02	100.00		-	-

Tested By PC Date 10/2/15 Checked By KC Date 10/12/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	28.5-30.0
Project No.:	2015-485-003	Sample No.:	SS-10
Lab ID:	2015-485-003-004	Soil Color:	Brown / Gray

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		46.0	22.1	6.33	39.7	74.6	0.01311	0.0274	**73.1**
5		39.5	22.1	6.33	33.2	62.4	0.01311	0.0184	**61.1**
15		34.5	22.1	6.33	28.2	53.0	0.01311	0.0110	**51.9**
30		31.5	22.1	6.33	25.2	47.3	0.01311	0.0080	**46.4**
60		29.5	22.1	6.33	23.2	43.6	0.01311	0.0057	**42.7**
250		24.5	22.6	6.15	18.4	34.5	0.01303	0.0029	**33.8**
1440		20.0	22.9	6.04	14.0	26.2	0.01299	0.0012	**25.7**

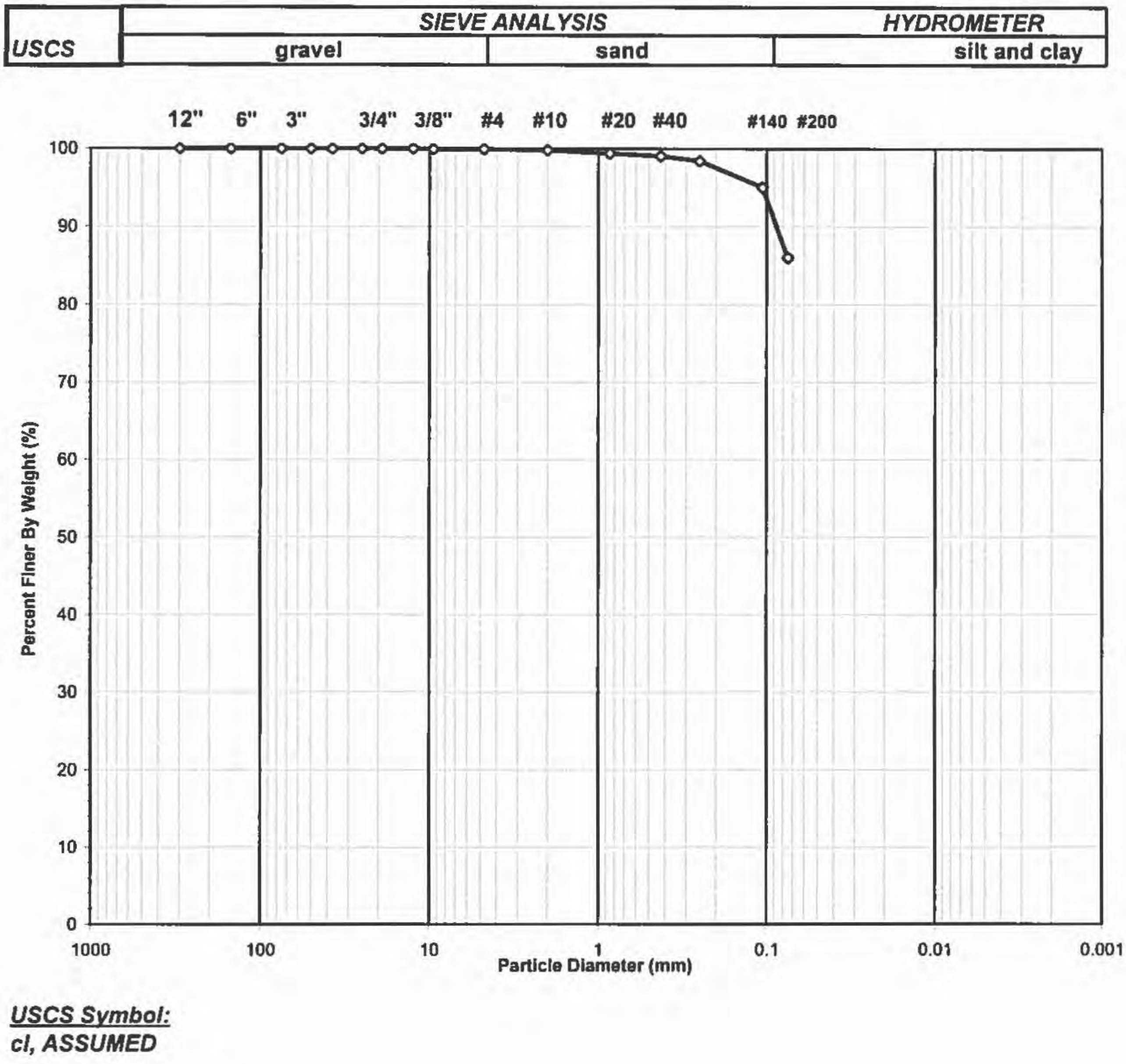
Soil Specimen Data		**Other Corrections**		
Tare No.	975			
Weight of Tare & Dry Material (g)	153.89	a - Factor	0.99	
Weight of Tare (g)	96.22			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	98.02	
Weight of Dry Material (g)	52.7			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 10/6/15 Checked By KC Date 10/12/15

SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	31.0-32.5
Project No.:	2015-485-003	Sample No.:	SS-11
Lab ID:	2015-485-003-005	Soil Color:	Dark Gray



USCS Symbol:
cl, ASSUMED

USCS Classification:
LEAN CLAY

Tested By PC Date 10/2/15 Checked By KC Date 10/2/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	31.0-32.5
Project No.:	2015-485-003	Sample No.:	SS-11
Lab ID:	2015-485-003-005	Soil Color:	Dark Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	28	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	652.78	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	525.50	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	203.60	Weight of Tare (g):	NA
Weight of Water (g):	127.28	Weight of Water (g):	NA
Weight of Dry Sample (g):	321.90	Weight of Dry Sample (g):	NA
Moisture Content (%):	**39.5**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	321.90
Dry Weight of - 3/4" Sample (g):	45.2	Weight of - #200 Material (g):	276.73
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	45.17
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.27	0.08	0.08	99.92	**99.92**
#4	4.75	0.06	0.02	0.10	99.90	**99.90**
#10	2.00	0.44	0.14	0.24	99.76	**99.76**
#20	0.850	1.19	0.37	0.61	99.39	**99.39**
#40	0.425	1.20	0.37	0.98	99.02	**99.02**
#60	0.250	1.98	0.62	1.60	98.40	**98.40**
#140	0.106	10.92	3.39	4.99	95.01	**95.01**
#200	0.075	29.11	9.04	14.03	85.97	**85.97**
Pan	-	276.73	85.97	100.00	-	-

Tested By	PC	Date	10/2/15	Checked By	KC	Date	10/2/15

page 2 of 2

DCN: CT-S3C DATE 3/20/13 REVISION: 3

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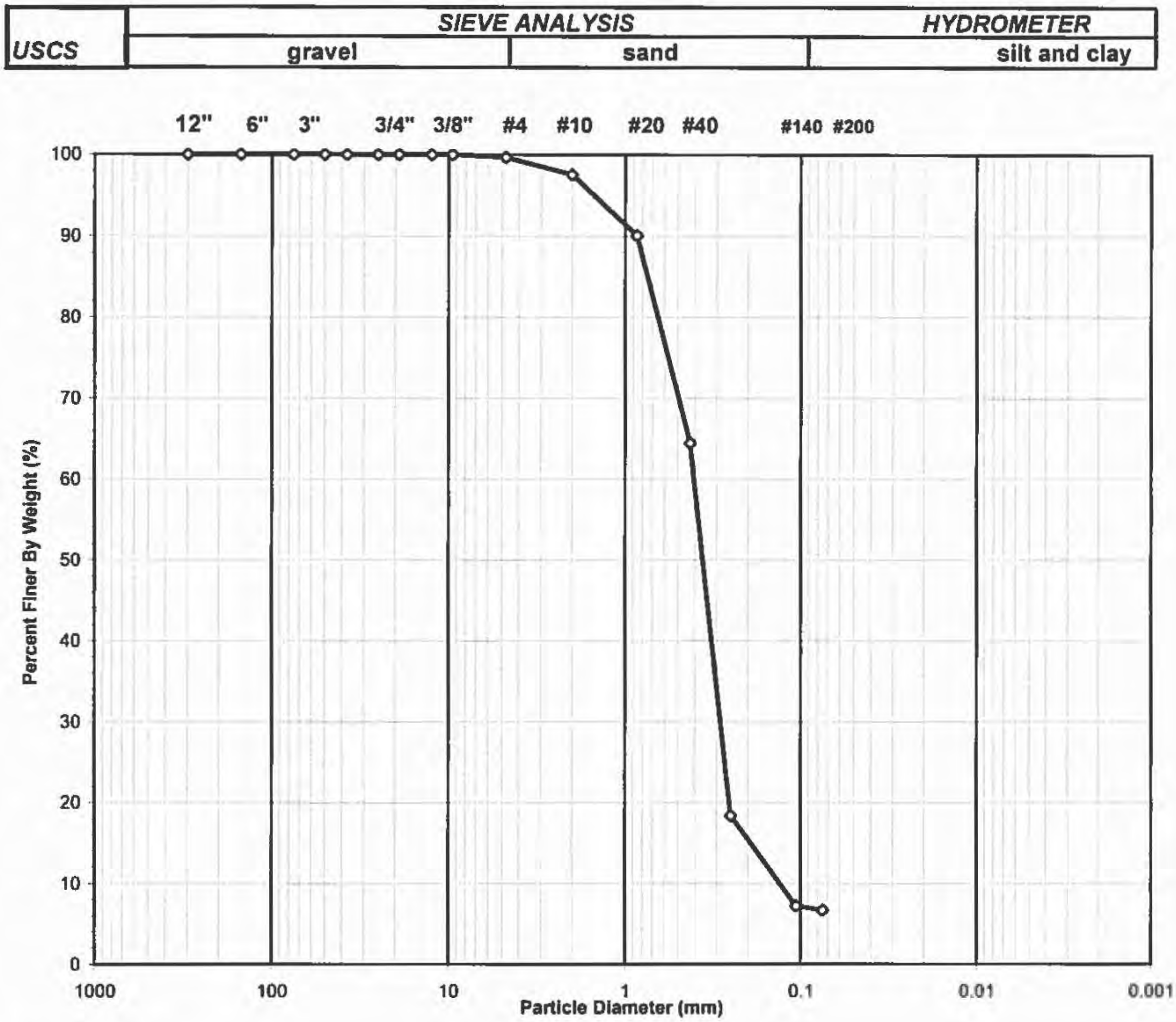
geotechnics
geotechnical & geosynthetic testing

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	41.0-42.5
Project No.:	2015-485-003	Sample No.:	SS-15
Lab ID:	2015-485-003-006	Soil Color:	Brownish Gray



USCS Symbol:
sp-sm, ASSUMED

USCS Classification:
POORLY GRADED SAND WITH SILT

D60 =	0.40	CC =	1.54
D30 =	0.29	CU =	3.07
D10 =	0.13		

Tested By	PC	Date	10/2/15	Checked By	KC	Date	10/2/15

page 1 of 2 DCN: CT-S3C DATE 3/20/13 REVISION: 3

geotechnics
geotechnical & geosynthetic testing

WASH SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	41.0-42.5
Project No.:	2015-485-003	Sample No.:	SS-15
Lab ID:	2015-485-003-006	Soil Color:	Brownish Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1418	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	594.30	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	526.00	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.23	Weight of Tare (g):	NA
Weight of Water (g):	68.30	Weight of Water (g):	NA
Weight of Dry Sample (g):	380.77	Weight of Dry Sample (g):	NA
Moisture Content (%):	**17.9**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	380.77
Dry Weight of - 3/4" Sample (g):	355.5	Weight of - #200 Material (g):	25.32
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	355.45
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

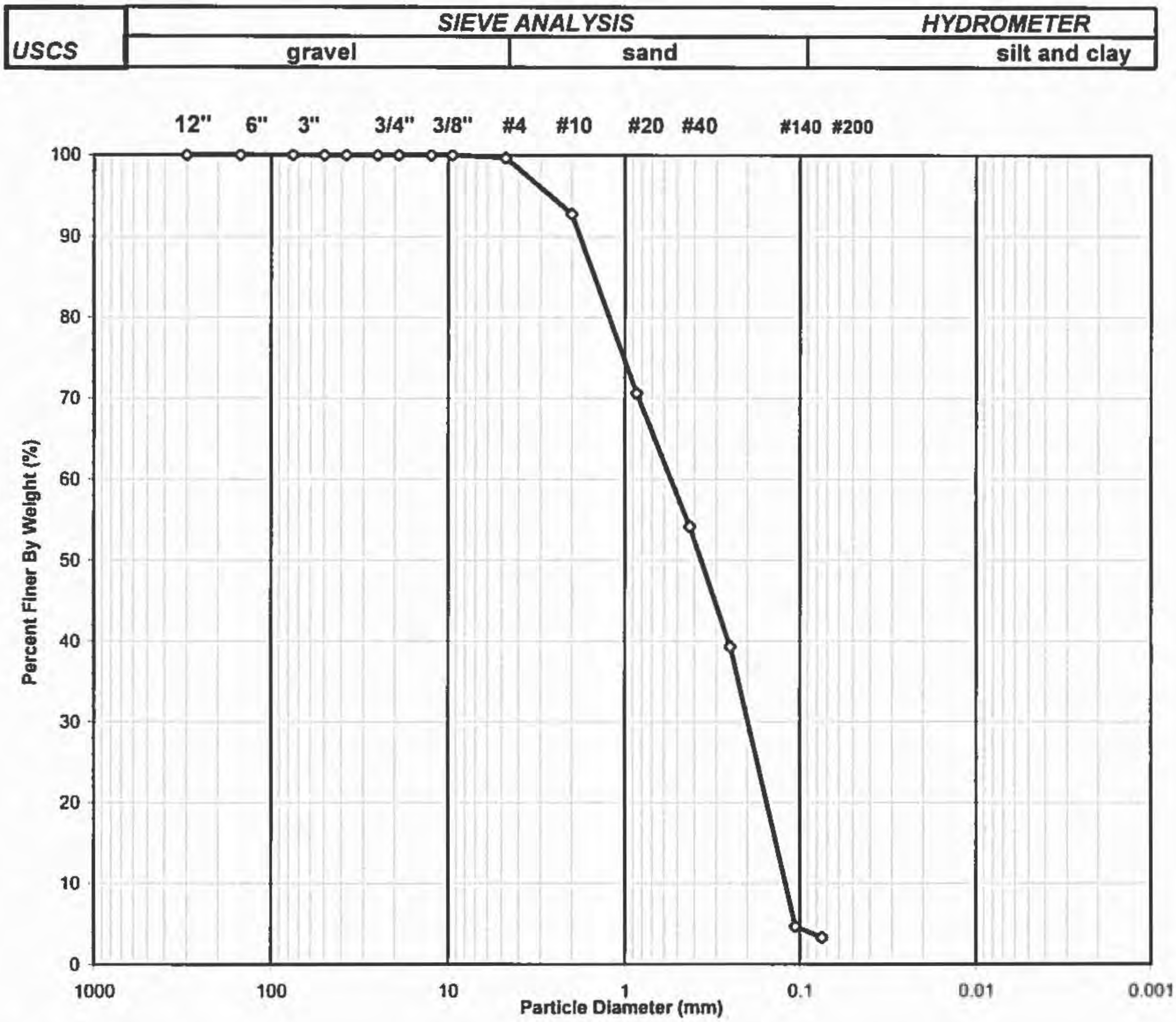
Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	1.31	0.34	0.34	99.66	**99.66**
#10	2.00	7.86	2.06	2.41	97.59	**97.59**
#20	0.850	28.66	7.53	9.94	90.06	**90.06**
#40	0.425	97.29	25.55	35.49	64.51	**64.51**
#60	0.250	175.70	46.14	81.63	18.37	**18.37**
#140	0.106	42.56	11.18	92.81	7.19	**7.19**
#200	0.075	2.07	0.54	93.35	6.65	**6.65**
Pan	-	25.32	6.65	100.00	-	-

Tested By PC Date 10/2/15 Checked By KC Date 10/2/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	58.5-60.0
Project No.:	2015-485-003	Sample No.:	SS-18
Lab ID:	2015-485-003-007	Soil Color:	Brown / Gray



USCS Symbol:
SP

USCS Classification:
POORLY GRADED SAND

D60 =	0.54	CC =	0.60
D30 =	0.20	CU =	4.48
D10 =	0.12		

Tested By PC Date 10/2/15 Checked By KC Date 10/2/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	B-13
Client Reference:	Dynegy-Wood River Pwr. Sta. 60440115	Depth (ft):	58.5-60.0
Project No.:	2015-485-003	Sample No.:	SS-18
Lab ID:	2015-485-003-007	Soil Color:	Brown / Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1424	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	618.50	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	542.80	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.08	Weight of Tare (g):	NA
Weight of Water (g):	75.70	Weight of Water (g):	NA
Weight of Dry Sample (g):	396.72	Weight of Dry Sample (g):	NA
Moisture Content (%):	**19.1**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	396.72
Dry Weight of - 3/4" Sample (g):	383.8	Weight of - #200 Material (g):	12.90
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	383.82
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

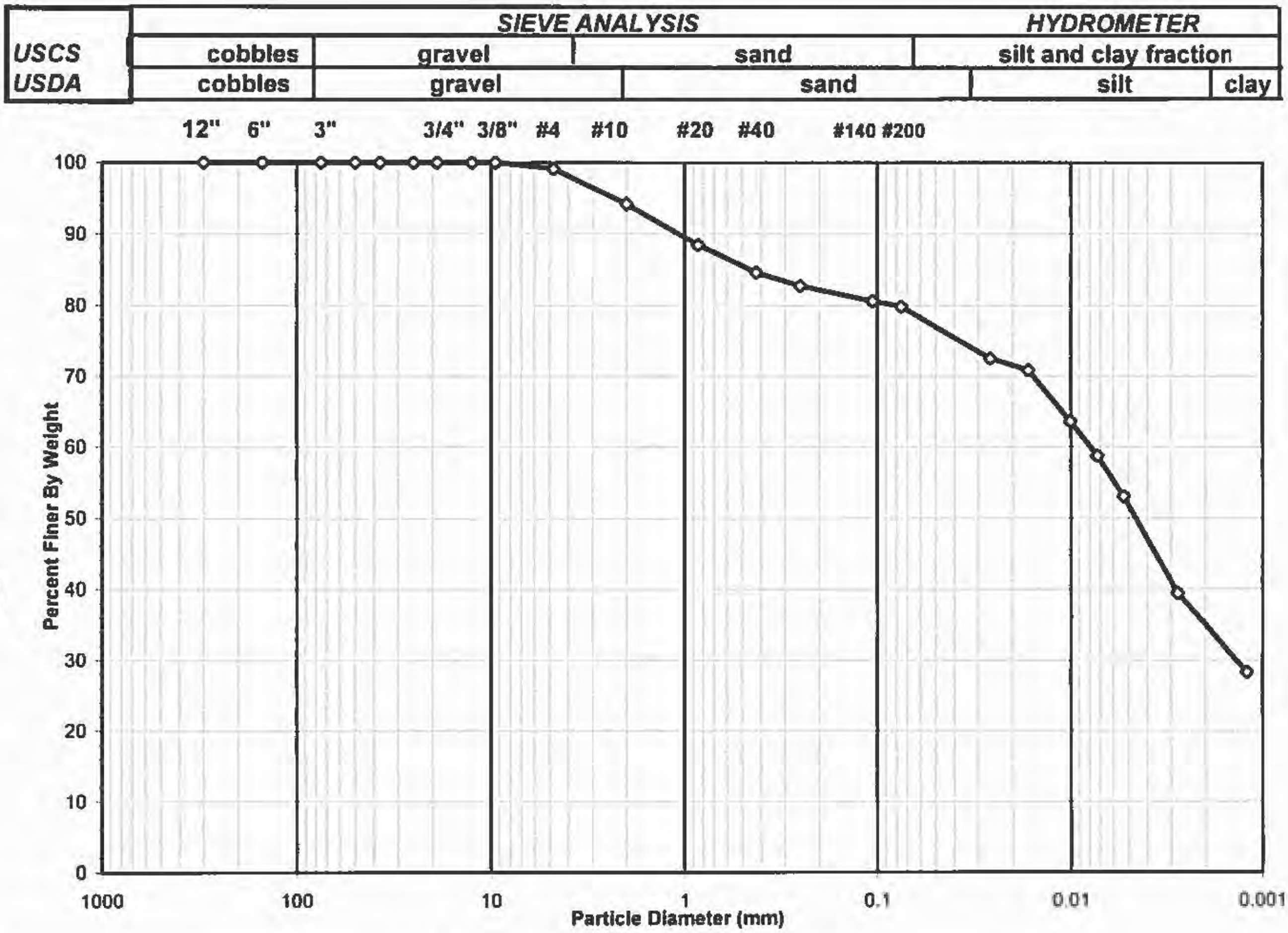
Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	1.46	0.37	0.37	99.63	**99.63**
#10	2.00	27.08	6.83	7.19	92.81	**92.81**
#20	0.850	87.93	22.16	29.36	70.64	**70.64**
#40	0.425	65.25	16.45	45.81	54.19	**54.19**
#60	0.250	59.20	14.92	60.73	39.27	**39.27**
#140	0.106	137.40	34.63	95.36	4.64	**4.64**
#200	0.075	5.50	1.39	96.75	3.25	**3.25**
Pan	-	12.90	3.25	100.00	-	-

Tested By PC Date 10/2/15 Checked By KC Date 10/2/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B014
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	29.2-29.7
Project No.:	2015-485-001	Sample No.:	ST-2
Lab ID:	2015-485-001-002	Soil Color:	Gray



USCS Summary		
Sieve Sizes (mm)		**Percentage**
Greater Than #4	*Gravel*	0.88
#4 To #200	*Sand*	19.36
Finer Than #200	*Silt & Clay*	79.76

USCS Symbol:

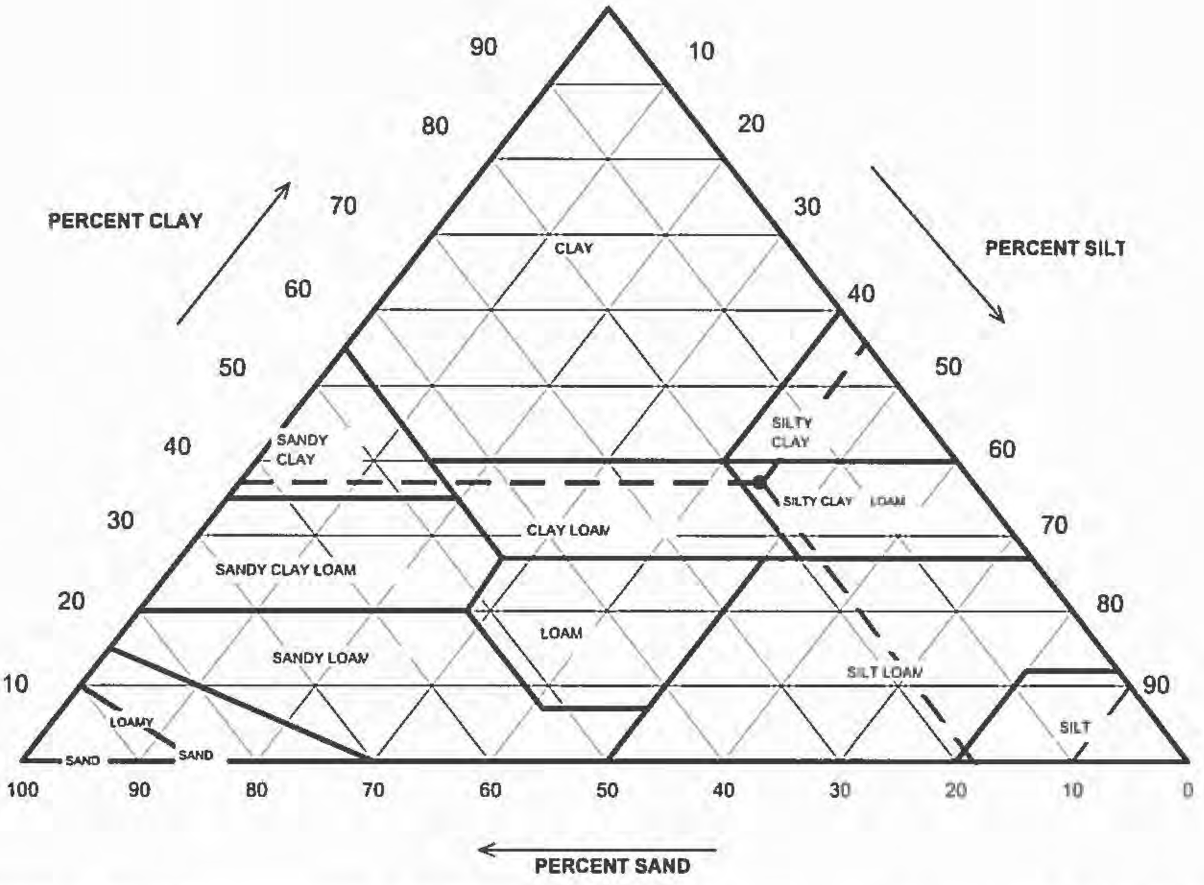
MH, TESTED

USCS Classification:

ELASTIC SILT WITH SAND

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	WOR-B014
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	29.2-29.7
Project No.:	2015-485-001	Sample No.:	ST-2
Lab ID:	2015-485-001-002	Soil Color:	Gray



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	5.72	**0.00**
2	94.28	*Sand*	17.31	**18.36**
0.05	76.97	*Silt*	41.96	**44.50**
0.002	35.02	*Clay*	35.02	**37.14**

USDA Classification: ***SILTY CLAY LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B014
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	29.2-29.7
Project No.:	2015-485-001	Sample No.:	ST-2
Lab ID:	2015-485-001-002	Soil Color:	Gray

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1440	Tare No.	NA
Weight of Tare & Wet Sample (g)	892.56	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	588.30	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.59	Weight of Tare (g)	NA
Weight of Water (g)	304.26	Weight of Water (g)	NA
Weight of Dry Sample (g)	442.71	Weight of Dry Sample (g)	NA
Moisture Content (%	**68.7**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	442.71
Dry Weight of -3/4" Sample (g)	89.61	Weight of - #200 Material (g)	353.10
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	89.61
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	3.90	0.88	0.88		99.12	**99.12**
#10	2.00	21.42	4.84	5.72		94.28	**94.28**
#20	0.85	25.85	5.84	11.56		88.44	**88.44**
#40	0.425	16.88	3.81	15.37		84.63	**84.63**
#60	0.250	8.57	1.94	17.31		82.69	**82.69**
#140	0.106	9.51	2.15	19.46		80.54	**80.54**
#200	0.075	3.48	0.79	20.24		79.76	**79.76**
Pan	-	353.10	79.76	100.00		-	-

Tested By	RAL	Date	9/15/15	Checked By	KC	Date	9/17/15

geotechnics
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HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B014
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	29.2-29.7
Project No.:	2015-485-001	Sample No.:	ST-2
Lab ID:	2015-485-001-002	Soil Color:	Gray

Elapsed Time		**R Measured**	**Temp.**	**Composite Correction**	**R Corrected**	**N**	**K Factor**	**Diameter**	**N'**
(min)			**(°C)**			**(%)**		**(mm)**	**(%)**
0		NA	NA	NA	NA	NA	NA	NA	NA
2		51.0	22.4	6.22	44.8	90.9	0.01307	0.0260	**72.5**
5		50.0	22.4	6.22	43.8	88.9	0.01307	0.0166	**70.9**
15		45.5	22.4	6.22	39.3	79.7	0.01307	0.0100	**63.6**
30		42.5	22.4	6.22	36.3	73.6	0.01307	0.0073	**58.7**
60		39.0	22.3	6.25	32.7	66.5	0.01308	0.0053	**53.0**
250		30.5	22.6	6.15	24.4	49.4	0.01303	0.0028	**39.4**
1440		23.5	22.8	6.07	17.4	35.4	0.01300	0.0012	**28.2**

Soil Specimen Data		**Other Corrections**		
Tare No.	925			
Weight of Tare & Dry Material (g)	153.69	a - Factor	0.99	
Weight of Tare (g)	99.91			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	79.76	
Weight of Dry Material (g)	48.8			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 9/15/15 Checked By KC Date 9/17/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B014
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	33.5-35.0
Project No.:	2015-485-001	Sample No.:	SS-10
Lab ID:	2015-485-001-003	Soil Color:	Gray

USCS Symbol:
sm, ASSUMED

USCS Classification:
SILTY SAND

Tested By	JP	Date	9/12/15	Checked By	KC	Date	9/15/15

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B014
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	33.5-35.0
Project No.:	2015-485-001	Sample No.:	SS-10
Lab ID:	2015-485-001-003	Soil Color:	Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1425	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	477.30	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	413.70	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.92	Weight of Tare (g):	NA
Weight of Water (g):	63.60	Weight of Water (g):	NA
Weight of Dry Sample (g):	268.78	Weight of Dry Sample (g):	NA
Moisture Content (%):	**23.7**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	268.78
Dry Weight of - 3/4" Sample (g):	197.8	Weight of - #200 Material (g):	70.97
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	197.81
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.43	0.16	0.16	99.84	**99.84**
#20	0.850	3.14	1.17	1.33	98.67	**98.67**
#40	0.425	11.56	4.30	5.63	94.37	**94.37**
#60	0.250	12.24	4.55	10.18	89.82	**89.82**
#140	0.106	65.91	24.52	34.70	65.30	**65.30**
#200	0.075	104.53	38.89	73.60	26.40	**26.40**
Pan	-	70.97	26.40	100.00	-	-

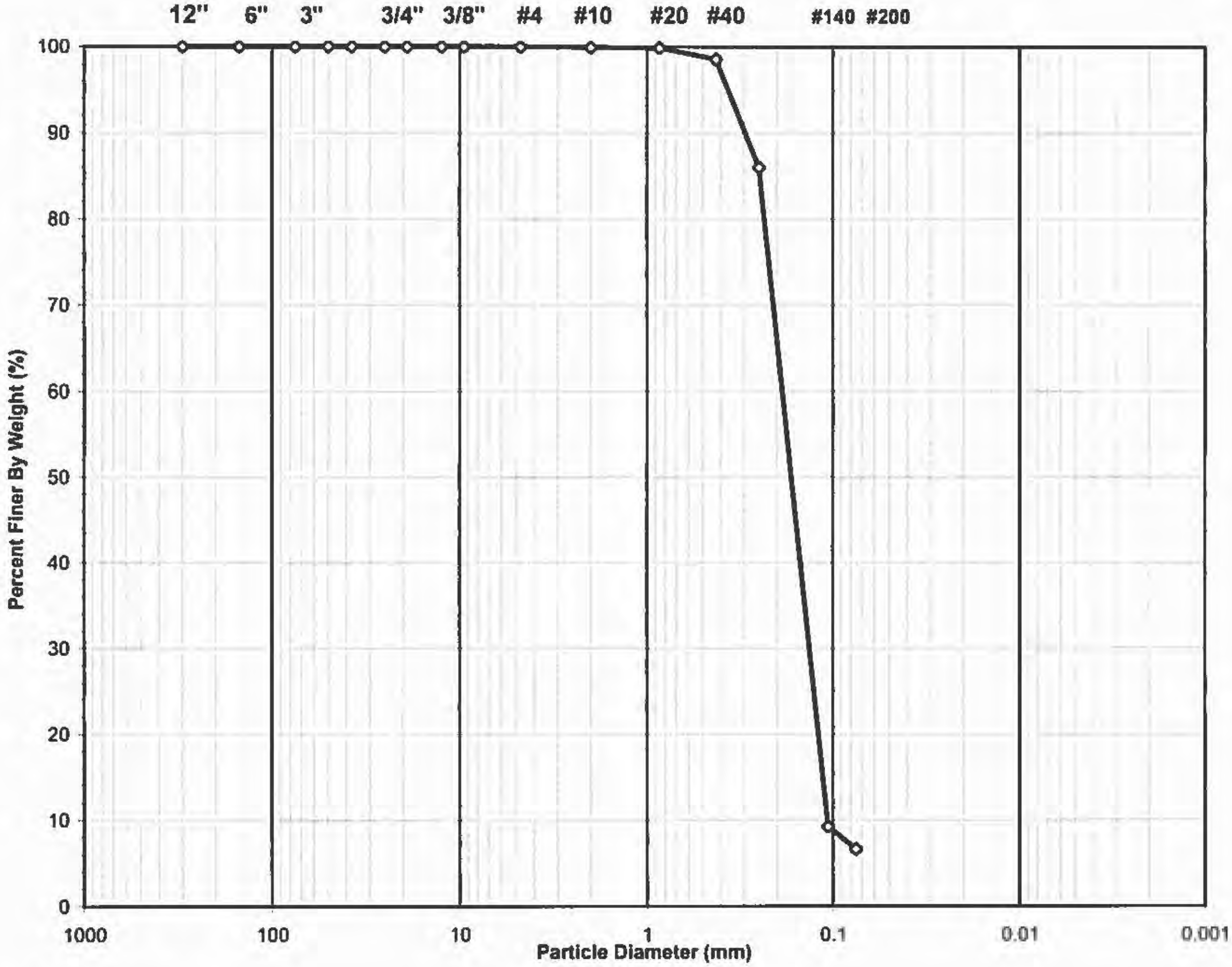
Tested By JP Date 9/12/15 Checked By KC Date 9/15/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B014
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	46.0-47.5
Project No.:	2015-485-001	Sample No.:	SS-14
Lab ID:	2015-485-001-004	Soil Color:	Gray

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol:
sp-sm, ASSUMED

USCS Classification:
POORLY GRADED SAND WITH SILT

D60 =	**0.19**	**CC =**	**0.89**
D30 =	**0.13**	**CU =**	**1.75**
D10 =	**0.11**		

Tested By JP Date 9/12/15 Checked By KC Date 9/15/15

geotechnics
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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B014
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	46.0-47.5
Project No.:	2015-485-001	Sample No.:	SS-14
Lab ID:	2015-485-001-004	Soil Color:	Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1438	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	538.80	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	450.40	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.53	Weight of Tare (g):	NA
Weight of Water (g):	88.40	Weight of Water (g):	NA
Weight of Dry Sample (g):	305.87	Weight of Dry Sample (g):	NA
Moisture Content (%):	**28.9**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	305.87
Dry Weight of - 3/4" Sample (g):	285.7	Weight of - #200 Material (g):	20.13
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	285.74
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.12	0.04	0.04	99.96	**99.96**
#20	0.850	0.30	0.10	0.14	99.86	**99.86**
#40	0.425	3.94	1.29	1.43	98.57	**98.57**
#60	0.250	38.46	12.57	14.00	86.00	**86.00**
#140	0.106	234.90	76.80	90.80	9.20	**9.20**
#200	0.075	8.02	2.62	93.42	6.58	**6.58**
Pan	-	20.13	6.58	100.00	-	-

Tested By JP Date 9/12/15 Checked By KC Date 9/15/15

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B014
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	58.5-60.0
Project No.:	2015-485-001	Sample No.:	SS-19
Lab ID:	2015-485-001-005	Soil Color:	Gray

USCS Symbol:

sp-sm, ASSUMED

USCS Classification:

POORLY GRADED SAND WITH SILT

D60 =	**0.45**	**CC =**	**0.68**
D30 =	**0.18**	**CU =**	**4.16**
D10 =	**0.11**		

Tested By	JP	Date	9/12/15	Checked By	KC	Date	9/15/15

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B014
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	58.5-60.0
Project No.:	2015-485-001	Sample No.:	SS-19
Lab ID:	2015-485-001-005	Soil Color:	Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1454	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	692.38	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	590.70	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	138.40	Weight of Tare (g):	NA
Weight of Water (g):	101.68	Weight of Water (g):	NA
Weight of Dry Sample (g):	452.30	Weight of Dry Sample (g):	NA
Moisture Content (%):	**22.5**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	452.30
Dry Weight of - 3/4" Sample (g):	425.1	Weight of - #200 Material (g):	27.25
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	425.05
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	1.70	0.38	0.38	99.62	**99.62**
#4	4.75	1.33	0.29	0.67	99.33	**99.33**
#10	2.00	24.35	5.38	6.05	93.95	**93.95**
#20	0.850	71.79	15.87	21.93	78.07	**78.07**
#40	0.425	90.12	19.92	41.85	58.15	**58.15**
#60	0.250	72.81	16.10	57.95	42.05	**42.05**
#140	0.106	149.68	33.09	91.04	8.96	**8.96**
#200	0.075	13.27	2.93	93.98	6.02	**6.02**
Pan	-	27.25	6.02	100.00	-	-

Tested By JP Date 9/12/15 Checked By KC Date 9/15/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B015A
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	14.4-14.9
Project No.:	2015-485-007	Sample No.:	ST-1
Lab ID:	2015-485-007-002	Soil Color:	Brown

USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.29
#4 To #200	*Sand*	10.42
Finer Than #200	*Silt & Clay*	89.29

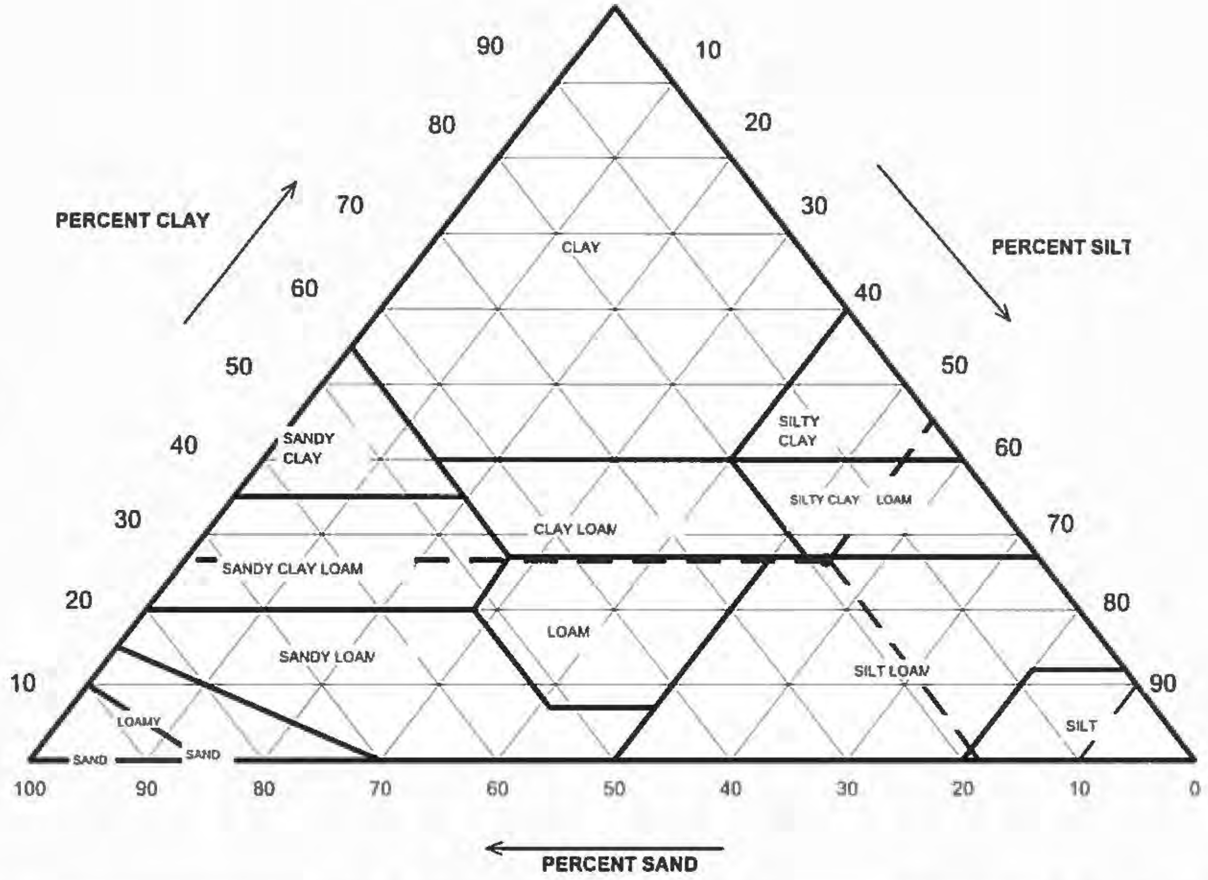
USCS Symbol:
CL, TESTED

USCS Classification:
LEAN CLAY

USDA CLASSIFICATION CHART

Client: AECOM
Client Reference: Dynegy - Wood River Pwr. Sta. 60440115
Project No.: 2015-485-007
Lab ID: 2015-485-007-002

Boring No.: WOR-B015A
Depth (ft): 14.4-14.9
Sample No.: ST-1
Soil Color: Brown



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.75	**0.00**
2	99.25	*Sand*	18.30	**18.44**
0.05	80.95	*Silt*	54.56	**54.97**
0.002	26.39	*Clay*	26.39	**26.59**

USDA Classification: ***SILT LOAM***

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B015A
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	14.4-14.9
Project No.:	2015-485-007	Sample No.:	ST-1
Lab ID:	2015-485-007-002	Soil Color:	Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	1451	Tare No.	NA
Weight of Tare & Wet Sample (g)	1119.84	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	953.50	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	144.72	Weight of Tare (g)	NA
Weight of Water (g)	166.34	Weight of Water (g)	NA
Weight of Dry Sample (g)	808.78	Weight of Dry Sample (g)	NA
Moisture Content (%	**20.6**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	808.78
Dry Weight of -3/4" Sample (g)	86.59	Weight of - #200 Material (g)	722.19
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	86.59
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	2.31	0.29	0.29		99.71	**99.71**
#10	2.00	3.76	0.46	0.75		99.25	**99.25**
#20	0.85	1.56	0.19	0.94		99.06	**99.06**
#40	0.425	2.84	0.35	1.29		98.71	**98.71**
#60	0.250	12.08	1.49	2.79		97.21	**97.21**
#140	0.106	41.07	5.08	7.87		92.13	**92.13**
#200	0.075	22.97	2.84	10.71		89.29	**89.29**
Pan	-	722.19	89.29	100.00		-	-

Tested By HL Date 11/5/15 Checked By KC Date 11/9/15

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B015A
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	14.4-14.9
Project No.:	2015-485-007	Sample No.:	ST-1
Lab ID:	2015-485-007-002	Soil Color:	Brown

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		44.5	23.1	5.97	38.5	76.9	0.01296	0.0275	**68.6**
5		38.0	23.1	5.97	32.0	63.9	0.01296	0.0184	**57.1**
15		31.5	23.1	5.97	25.5	50.9	0.01296	0.0112	**45.5**
30		28.5	23.1	5.97	22.5	44.9	0.01296	0.0081	**40.1**
63		25.5	23.3	5.89	19.6	39.1	0.01293	0.0057	**34.9**
250		22.0	23.5	5.82	16.2	32.3	0.01290	0.0029	**28.8**
1440		19.0	23.2	5.93	13.1	26.1	0.01294	0.0012	**23.3**

Soil Specimen Data		Other Corrections		
Tare No.	1092			
Weight of Tare & Dry Material (g)	153.90	a - Factor	0.99	
Weight of Tare (g)	99.27			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	89.29	
Weight of Dry Material (g)	49.6			
		Specific Gravity	2.7	Assumed

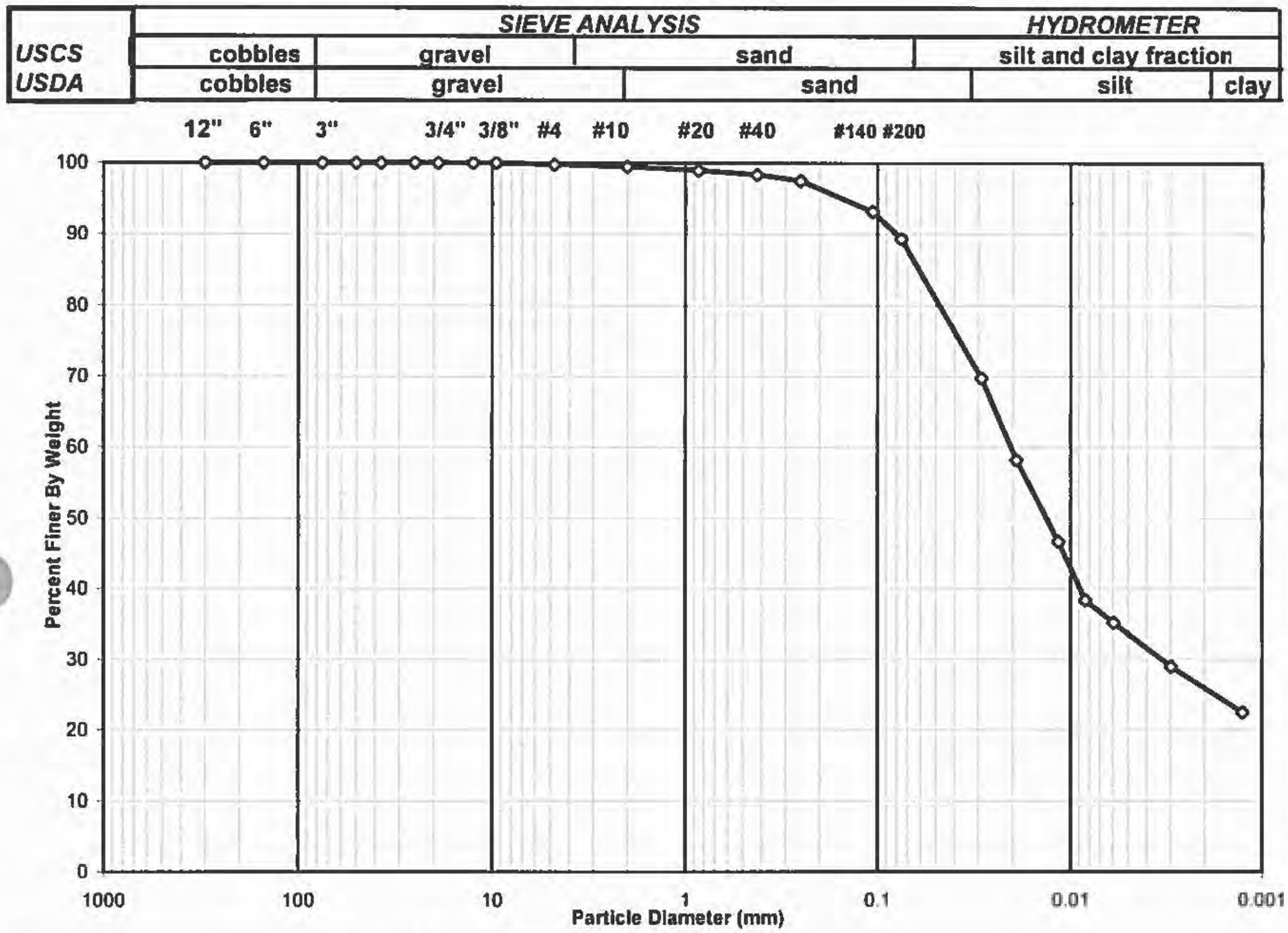
Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 10/27/15 Checked By KC Date 11/9/15

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B015A
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	15.0-15.5
Project No.:	2015-485-007	Sample No.:	ST-2
Lab ID:	2015-485-007-003	Soil Color:	Dark Brown



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.23
#4 To #200	*Sand*	10.43
Finer Than #200	*Silt & Clay*	89.34

USCS Symbol:

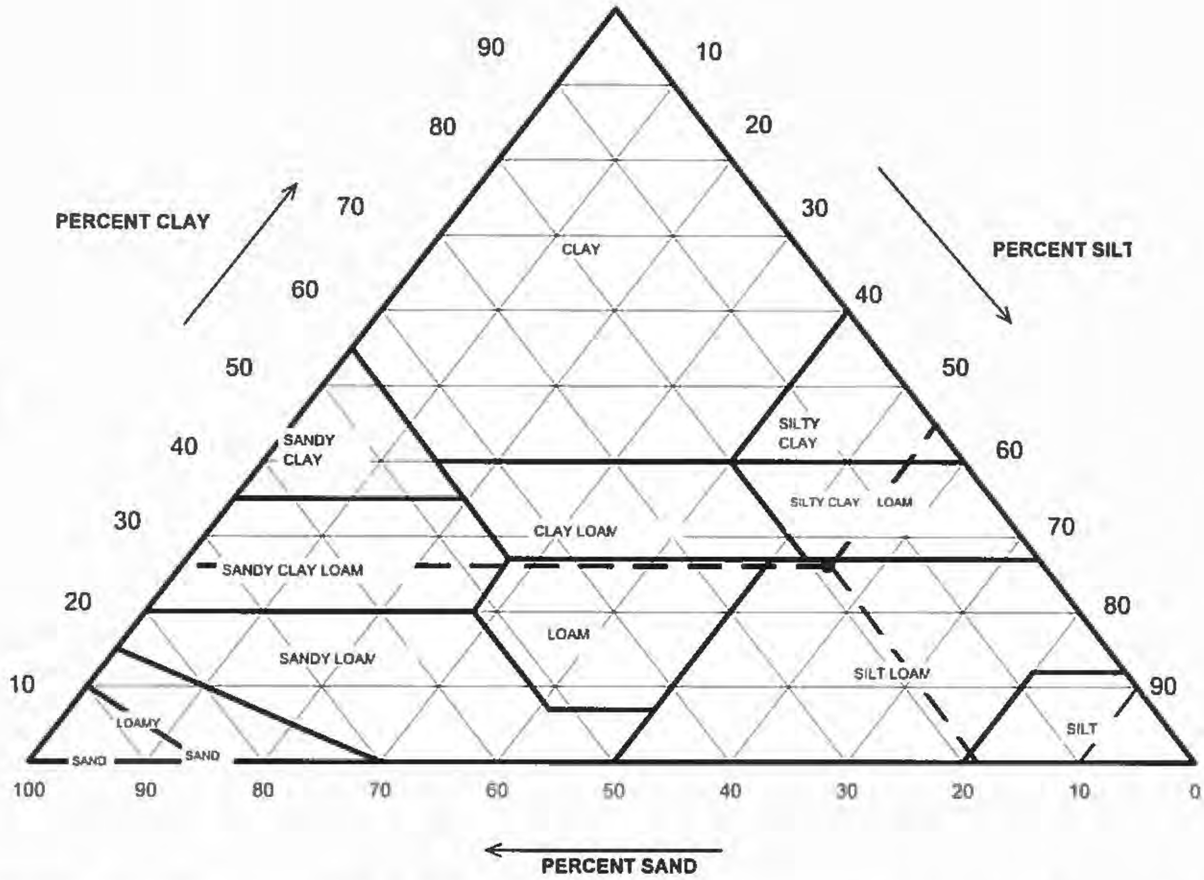
CL, TESTED

USCS Classification:

LEAN CLAY

USDA CLASSIFICATION CHART

Client:	AECOM	Boring No.:	WOR-B015A
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	15.0-15.5
Project No.:	2015-485-007	Sample No.:	ST-2
Lab ID:	2015-485-007-003	Soil Color:	Dark Brown



Particle Size (mm)	Percent Finer (%)	USDA SUMMARY	Actual Percentage (%)	Corrected % of Minus 2.0 mm material for USDA Classificat. (%)
		Gravel	0.52	**0.00**
2	99.48	*Sand*	18.49	**18.58**
0.05	81.00	*Silt*	55.03	**55.32**
0.002	25.96	*Clay*	25.96	**26.10**

USDA Classification: ***SILT LOAM***

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AECOM	Boring No.:	WOR-B015A
Client Reference:	Dynegy - Wood River Pwr. Sta. 60440115	Depth (ft):	15.0-15.5
Project No.:	2015-485-007	Sample No.:	ST-2
Lab ID:	2015-485-007-003	Soil Color:	Dark Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	925	Tare No.	NA
Weight of Tare & Wet Sample (g)	816.12	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	690.10	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	99.76	Weight of Tare (g)	NA
Weight of Water (g)	126.02	Weight of Water (g)	NA
Weight of Dry Sample (g)	590.34	Weight of Dry Sample (g)	NA
Moisture Content (%	**21.3**	**Moisture Content (%**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	590.34
Dry Weight of -3/4" Sample (g)	62.94	Weight of - #200 Material (g)	527.40
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	62.94
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	1.38	0.23	0.23		99.77	**99.77**
#10	2.00	1.67	0.28	0.52		99.48	**99.48**
#20	0.85	3.22	0.55	1.06		98.94	**98.94**
#40	0.425	3.13	0.53	1.59		98.41	**98.41**
#60	0.250	5.31	0.90	2.49		97.51	**97.51**
#140	0.106	25.23	4.27	6.77		93.23	**93.23**
#200	0.075	23.00	3.90	10.66		89.34	**89.34**
Pan	-	527.40	89.34	100.00		-	-

Tested By PC Date 10/31/15 Checked By KC Date 11/2/15