

Table 1. Particle-size distribution of the core samples taken from the bore hole drilling at C&H Farm, using the hydrometer method. Analyses were determined by the Division of Agriculture University of Arkansas System Soil Testing and Research Laboratory, Fayetteville, AR.

Sample ID	Depth	Particle-size distribution [†]		
		Sand	Silt	Clay
	feet	%		
B-1S-1	0.5	24.2	33.1	42.7
B-1S-2	5	28.3	41.9	29.9
B-1S-3	10	5.1	8.1	86.9
B-1S-4	13.5	2.2	2.8	95.1
B-1S-5	18.5	8.9	1.5	89.7
B-1S-6	25	37.6	40.2	22.2

[†] Following the method detailed by Huluka, G., and Miller, R. 2014. Particle Size Determination by Hydrometer Method. In: F.J. Sikora and K.P. Moore, editors, Soil test methods from the southeastern United States. Southern Coop. Ser. Bull. 419. p. 180-184. Available at <http://www.clemson.edu/sera6/MethodsManualFinalSERA6.pdf>.

Table 2. Physio-chemical properties of the core samples taken from the bore hole drilling at C&H Farm. Analyses were determined by the Division of Agriculture University of Arkansas System Soil Testing and Research Laboratory, Fayetteville, AR. #

Sample ID	Depth	pH †	Electrical conductivity ‡	Total dissolved phosphorus ‡	Chloride ‡	Nitrate-N plus Nitrite-N ¶	Ammonium-N ¶	Total N	Total C	Loss on ignition §
	feet		µmhos/cm	mg/kg						%
B-1S-1	0.5	4.71	89	2.12	3.8	16.3	5.8	234	1483	1.52
B-1S-2	5	5.2	62	1.97	3.8	7.2	7.4	231	2048	1.34
B-1S-3	10	7.85	571	2.16	72.6	1.2	3.8	471	18436	2.53
B-1S-4	13.5	7.71	458	3.08	93	0.7	6	699	2007	2.84
B-1S-5	18.5	7.88	770	2.17	251.4	Not enough sample		605	4313	2.25
B-1S-6	25	8.72	183	2.15	99.8	0.3	2.1	0	101871	0.29
B-1S-1 duplicate	0.5					17	5.5	284	1557	1.92

All core samples were dried at 60 °C and ground to pass through a 2mm sieve, any material that would not crush (mortar and pestle) to pass the 2mm screen was discarded.

† Measurement conducted on a solid:water ratio of 1:2 with a JKEM pH robot, using an equilibration time of 15 minutes and sample is stirred while reading. Following the method detailed by Sikora, F.J., and D.E. Kissel. 2014. Soil pH. In: F.J. Sikora and K.P. Moore, editors, Soil test methods from the southeastern United States. Southern Coop. Ser. Bull. 419. p. 48-53. Available at <http://www.clemson.edu/sera6/MethodsManualFinalSERA6.pdf>.

‡ Measurement conducted on a solid:water ratio of 1:2, using an equilibration time of 15 minutes. Following the soluble salts method detailed by Wang, J.J., T. Provin, and H. Zhang. 2014. Measurement of soil salinity and sodicity. In: F.J. Sikora and K.P. Moore, editors, Soil test methods from the southeastern United States. Southern Coop. Ser. Bull. 419. P.185-193. Available at <http://www.clemson.edu/sera6/MethodsManualFinalSERA6.pdf>.

¶ Loss on ignition is equivalent to organic matter. Soil dried for 2 hours at 120°C. Following the method detailed by Zhang, H., and J.J. Wang. 2014. Loss on ignition method. In: F.J. Sikora and K.P. Moore, editors, Soil test methods from the southeastern United States. Southern Coop. Ser. Bull. 419. p.155-157. Available at <http://www.clemson.edu/sera6/MethodsManualFinalSERA6.pdf>. Total N and C are determined by combustion on an Elementar VarioMax CM.

§ Method used for ammonium-nitrogen: 5g soil/15ml 2N KCl, shake for 15 minutes, filtered through Whatman 4 paper; analyzed on a Skalar autoanalyzer using a modified Berthelot reaction. Ammonia is chlorinated to monochloramine which reacts with salicylate to 5-aminosalicylate. After oxidation and oxidative coupling a green complex is formed. The absorption of the formed complex is measured at 660nm. Method used for nitrate-nitrogen plus nitrite-nitrogen, same KCl extraction as for ammonium-N, also analyzed on the Skalar using a method based on the cadmium reduction method. The sample is passed through a column containing granulated copper-cadmium to reduce the nitrate to nitrite. The nitrite (originally present plus reduced nitrate) is determined by diazotizing with sulfanilamide and coupling with a-naphthylenediamine dihydrochloride to form a highly colored azo dye which is measured at 540nm.

Table 3. Total elemental composition of core samples taken from the bore hole drilling at C&H Farm, using the EPA305b digest method. Analyses were determined by the Division of Agriculture University of Arkansas System Soil Testing and Research Laboratory, Fayetteville, AR. †

Sample ID	Depth	Total Phosphorus	Total Potassium	Total Calcium	Total Magnesium	Total Sulfur	Total Sodium	Total Iron	Total Manganese	Total Zinc	Total Copper	Total Boron
	feet	mg/kg										
B-1S-1	0.5	281	1101	1262	1024	62.8	18.7	49571	364	33.2	7.4	12.5
B-1S-2	5	220	879	805	847	53.9	13.1	31119	1745	30.4	6.2	8.9
B-1S-3	10	1031	3488	69480	3417	7.2	296.0	51696	1169	273.0	23.55	12.9
B-1S-4	13.5	929	4030	7468	3844	5.2	308.0	60251	1366	333.5	26.35	14.2
B-1S-5	18.5	747	3434	14752	3516	0.5	368.5	50122	1620	183.5	24.65	13.9
B-1S-6	25	56	112	382176	895	<0.1	105.0	1764	227	8.4	0.5	1.0
B-1S-1 duplicate	0.5	275	1174	1228	1072	67.9	20.7	45645	392	35.5	7.9	12.2

† All core samples were dried at 60 °C and ground to pass through a 2mm sieve, any material that would not crush (mortar and pestle) to pass the 2mm screen was discarded. All analyses used subsamples from the ground material. Laboratory QA/QC includes among other standard protocols, that with every set of samples digested, a blank and a certified soil from North American Proficiency Test Program (<http://www.naptprogram.org/>) is included as a check, along with at least one sample in duplicate. If the check is out of bounds by more than 2.5 time the Mean Absolute Deviation value, the sample is digested again and rerun. The digest and duplicate for this set of core samples all met this criteria.

Table 4. Mehlich-3 extractable elemental composition of core samples taken from the bore hole drilling at C&H Farm. Analyses were determined by the Division of Agriculture University of Arkansas System Soil Testing and Research Laboratory, Fayetteville, AR. †

Sample ID	Depth	Phosphorus	Potassium	Calcium	Magnesium	Sulfur	Sodium	Iron	Manganese	Zinc	Copper	Boron
	feet	mg/kg										
B-1S-1	0.5	0.75	87	1390	149	46	7.0	55.4	32.5	0.41	0.30	<0.01
B-1S-2	5	1.09	97	873	112	37.9	7.5	91.9	295.2	0.35	0.35	<0.01
B-1S-3	10	4.16	287	18133	704	3.8	233.4	35.6	39.6	9.95	0.60	<0.01
B-1S-4	13.5	0.84	314	7036	708	1.5	234.9	44.9	44.7	16.2	0.80	<0.01
B-1S-5	18.5	6.07	280	12742	594	3.1	280.2	49.0	81.4	6.66	0.92	<0.01
B-1S-6	25	0.59	14	34332	97	4.0	32.4	9.4	21.8	0.59	0.07	<0.01

† All core samples were dried at 60 °C and ground to pass through a 2mm sieve, any material that would not crush (mortar and pestle) to pass the 2mm screen was discarded. Sample extracted with Mehlich-3 solution and element determined by ICP (equipped with cyclonic quartz spray chamber and optimist quartz nebulizer) following the method detailed by Zhang, H., D.H. Hardy, R. Mylavarapu, and J.J. Wang. 2014. Mehlich-3. *In*: Sikora, F.J. and K.P. Moore, editors, Soil test methods from the southeastern United States. Southern Coop. Ser. Bull. 419. Clemson Univ., Clemson, S.C. p. 101-110. Available at <http://www.clemson.edu/sera6/MethodsManualFinalSERA6.pdf>.

Arkansas Department of Environmental Quality Chain of Custody for Compliance or Enforcement Samples



Facility, Project, Complaint Name, Property Owner C+H Hog Farms, INC. DRILLING OPERATION			AFIN #/ County NEWTON		Sample Characteristics				Parameters Requested				ADEQ Division or Other (Describe) OFFICE OF WATER QUALITY		Media Code		Preservation Code												
Printed Names of Sampler(s) HARBOR ENVIRONMENTAL / JASON BOLENBAUGH PRESENT					Grab	Composite	No. of Containers	Preservation Code	Media Code	SEE TABLE 6-1						<input type="checkbox"/> CSI <input type="checkbox"/> Other Compliance <input type="checkbox"/> Complaint <input type="checkbox"/> Fish Kill <input checked="" type="checkbox"/> Other (describe)		W = water G = groundwater L = liquid (not water) S = soil or solid E = edible tissue F = whole fish B = other	A = Cool to 4°C 26°C B = Sulfuric Acid C = Nitric Acid D = NaOH E = Sodium Thiosulfate F = Other (specify)										
Sample ID	Date Collected mm/dd/yy	Time Collected hh:mm																							Sample Remarks	Latitude (dd.ddddd)	Longitude (dd.ddddd)	Lab #	
B-15-1	9/21/16	10:00	X													1	A	S											
B-15-2	9/21/16	13:13	X													1	A	S											
B-15-3	9/21/16	13:29	X													1	A	S											
B-15-4	9/21/16	13:42	X													1	A	S											
B-15-5	9/21/16	13:57	X													1	A	S											
B-15-6	9/21/16	14:32	X		1	A	S																						
ALL SEALS UNBROKEN 9/21/16 18:00																													
<i>James Burke</i>																													
Relinquished by <i>James Burke</i>			Date	Time	Received by James Burke				Date	Time	Notes SAMPLES FOR VOFA																		
Relinquished to Laboratory by			Date	Time	Received for Laboratory by				Date	Time																			