APPENDIX C

WELL DEVELOPMENT LOGS

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number:
Form Completed by: R. Goins, L. Flippen
Well Developed by (person/firm): R. Goins / Shaw E&I
L. Flippen / Shaw E&I

Parcel No.: HR-1042
Well No.: HR-1042-MW01
Date started: 6/5/02

Monitoring Well Information

Development Method: Surge & Purge
Development Equipment: Whale pump, tubing, PID, Horiba U-10, Orion Turbidimeter
Casing Diameter: 2in

Beginning Measurments
Depth to Water (ft): 26.5' bTOC
Total depth of Well (ft): 32.0 bTOC

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date) (Purge Rate, Pump Position, Misc.)
10:32	∅	26.5	6.10	0.047	999	4.27	20.8	cloudy (red brown)	pump - 31.5' bTOC rate 0.18 gpm
10:47	2.7	27.1	5.96	0.041	328	4.00	21.9	"	pump 31.5' bTOC rate 0.42 gpm @ 6/6/02 0.42 gpm
11:02	~~11.7~~ 9 (RS) 6/5/02	28.2	5.67	0.033	675	5.05	18.7	cloudy (lt. red brown)	pump 31.5' bTOC rate 0.42 gpm @ 0.30 gpm
11:17	~~18.0~~ 13.5 (RS)	29.9	6.10	0.030	153	6.45	18.3	pt. cloudy lt. red brown	pump - 31.5' bTOC stop purging
11:32	~~18.0~~ 13.5 (RS)	27.2	5.91	0.029	634	6.66	19.4	cloudy (red brown)	pump - 31.0' bTOC rate - 0.25 gpm
11:42	~~20.5~~ 16.0 (RS)	—	rate	change	—				rate - 0.19 gpm
11:47	~~21.4~~ 16.9 (RS)	27.85	6.10	0.029	49	6.95	19.7	pt. cloudy slightly clear	pump 30.5' bTOC rate - 0.21 gpm

TD - DTW = WC x 2'/4' well = One PV x 5 = Min PV + H20 to install well = Minimum H20 to remove

32 - 26.5 = 5.5 x 0.163 = 0.89 x 5 = 4.45 + 150 = 154.45

ac'd [signature]
6/10/02

Parcel No.: HR-1079
Well ID: HR-1079-MW01
Date: 6/5/02

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date)
12:02	~~24.55~~ 20.05	27.91	5.76	0.028	56	6.69	19.8	pt. cloudy slightly clear	pump-30.0' bTOC rate-0.18 gpm
12:17	~~27.25~~ 22.75	27.94	5.84	0.029	101	7.03	19.6	pt. cloudy (lt. red/brown)	pump-30.5' bTOC rate-0.18 gpm
~~12:47~~	~~32.65~~	~~27.87~~	~~5.87~~	~~0.028~~	~~121~~	~~6.89~~	~~20.9~~	~~cloudy (lt. red/brown)~~	~~pump-31.5' bTOC rate-0.34 gpm~~
~~13:02~~	~~34.85~~	~~28.72~~	~~5.78~~	~~.030~~	~~24~~	~~7.14~~	~~20.5~~	~~clear~~	~~pump 31.5', PR .34 gpm~~
12:32	25.45	27.90	5.66	0.029	33	6.78	20.6	clear	pump-31.5' bTOC rate-0.18 gpm
12:47	28.15	27.87	5.87	0.029	121	6.89	20.9	cloudy (lt. red/brown)	pump-31.5' bTOC rate-0.34 gpm
13:02	33.25	28.72	5.78	0.030	24	7.14	20.5	clear	pump-31.5' bTOC rate-0.34 gpm
13:17	38.35	29.00	5.95	0.028	29	7.10	20.5	clear	pump-31.5' bTOC rate-0.34 gpm
13:32	43.45	29.20	5.85	.029	76	7.23	19.2	cloudy	pump at 31.5', PR .25
13:47	47.20	28.70	5.61	0.029	9.7	6.77	19.7	clear	pump 31.5' bTOC rate-0.25 gpm
14:02	50.95	28.61	5.47	.027	2.9	6.51	19.3	clear	pump At 31.5 PR .25 gpm
14:17	54.20	28.55	5.52	0.026	25	6.71	19.8	clear	pump-31.5' bTOC, rate-0.25 gpm

Parcel No.: HR-1049
Well ID: HR-1049 cm
Date: 6/5/02

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date)
14:32	58.45	28.57	5.50	.028	2.7	6.96	20.3	clear	Depth 31.5, PR .25 gpm
14:47	62.20	28.56	5.42	0.026	6.3	6.57	20.1	clear	" , "
15:02	65.95	28.58	5.57	.029	7.0	6.87	19.5	clear	Depth 31.5, PR .25 gpm
15:17	69.70	28.63	5.49	.028	11.0	6.71	19.6	clear	Depth 31.5, PR .25 gpm
15:32	73.45	28.65	5.65	0.026	10.3	6.96	19.3	clear	" "
15:47	77.20	28.62	5.73	0.028	4.3	7.02	19.4	clear	" , "
16:02	80.95	—	—	stop purging	—	—	—	—	stop purging due to lightning and rain
:	—	—	6/6/02	—	—	—	—	—	
09:00	80.45	26.7	5.40	0.032	63	6.34	18.7	pt. cloudy lt. brown	pump 315' btoc, rate - 0.25 gpm
09:15	84.20	27.73	5.43	0.027	29	6.33	18.7	clear	" , "
09:30	87.95	27.97	5.45	0.027	20	6.99	18.4	clear	" , "
09:45	91.20	28.13	5.52	0.026	6.9	6.57	18.5	"	" , "

Parcel No.: HR-1040
Well ID: HR-1040-MW01
Date: 6/6/02

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date)
10:00	95.45	28.18	5.11	0.025	17.2	5.89	18.5	clear	pump - 31.5' bTOC, rate - 0.25 gpm
10:15	99.20	28.21	5.75	0.025	12.9	6.50	18.6	"	" , "
10:30	102.95	28.10	5.54	0.026	3.6	6.23	19.0	"	" , "
10:45	106.7	28.07	5.60	0.025	5.4	6.53	19.2	"	" , "
11:00	110.45	28.05	5.63	0.025	11.3	6.68	19.1	"	" , "
11:15	114.20	28.06	6.00	0.025	12.8	7.00	18.8	"	" , "
11:30	117.95	28.10	5.86	0.030	7.5	6.77	18.9	clear	" , "
11:45	121.70	28.15	5.72	0.026	5.6	6.58	19.0	clear	pump - 31.5' bTOC rate - 0.25 gpm
11:50	125.45	28.20	5.65	0.028	8.9	6.63	19.1	clear	" , "
:									Finish developing, 8 hr period ended. Collected photosample in 1L polybottle.
:									
:									
:									
:									

R. Sorini 6/6/02
Final Entry

Groundwater Well Development Log

Fort McClellan, Alabama

Project Number: 796 887
Form Completed by: Lee Flippen
Well Developed by (person/firm): Lee Flippen / The Shaw Group
Reggie Goins

Parcel No.: HR 104 Q
Well No.: MW02
Date started: 6-6-02

Monitoring Well Information

Development Method: Surge + purge
Development Equipment: Grund-fos pump, control Box, Horiba U-10, AquaPast II, Heron water indicator
Casing Diameter: 2" .163

K. Hollow

Beginning Measurements
Depth to Water (ft): ~~43~~ 43.51' TOC (43.51')
Total depth of Well (ft): 73.85' TOC

PID 1.5 BZ 0.0 Screen - 52.5' - 72.5'

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date) (Purge Rate, Pump Position, Misc.)
									– Surged well screen –
10:35	Ø	43.51	7.13	.487	999+	2.46	20.6	Brown	Depth 73', Purge Rate 0.9 gpm
10:50	13.5	43.53	7.67	.317	999+	5.70	18.1	Brown	Depth 73', PR 0.9 gpm
11:05	27.0	43.51	7.84	.307	999+	5.77	18.2	Brown	Depth 73', PR .9 gpm
11:20	40.5	43.58	7.89	.304	999+	5.46	17.9	Brown	Depth 73', PR .9 gpm
11:35	54.0	43.49	7.91	.296	999+	5.64	17.8	Brown	Depth 73', PR .9 gpm
11:50	67.5	43.58	7.96	.283	999+	6.31	17.9	Brown	Depth 73', PR .9 gpm
12:05	81.0	43.58	8.03	.285	999+	5.84	18.1	Brown	Depth 71', PR .9 gpm

TD - DTW = WC x 2'/4' well = One PV x 5 = Min PV + H20 to install well = Minimum H20 to remove

73.85 - 43.51 = 30.34 x .163 = 4.95 x 5 = 24.73 + 300 g = 324.73 g

QC'd [illegible]
6/10/02

Parcel No.: HR104Q
Well ID: MW02
Date: 6-6-02

Lee FLIPPEN

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date)
12:20	94.5	43.57	8.03	.281	999+	6.20	18.2	Brown	Depth 69', PR .9gpm
12:35	108.0	43.68	8.06	.278	999+	6.08	18.2	Brown	Depth 67', PR .9gpm
12:50	121.5	43.66	8.01	.280	999+	6.15	17.9	Brown	Depth 65', PR .9gpm
13:05	135.0	43.71	8.03	.271	999+	5.83	18.3	Brown	Depth 63', PR .9gpm
13:20	148.5	43.76	8.03	.268	999+	5.97	18.6	Brown	Depth 61', PR .9gpm
13:35	162.0	43.77	8.13	.261	999+	5.98	19.1	Brown	Depth 59', PR .9gpm
13:50	175.5	43.54	8.21	.260	999+	6.11	18.8	Brown	Depth 57', PR .9gpm
14:05	189.0	43.81	7.06	.230	813	4.63	19.1	Brown	Depth 55', PR .9gpm
14:20	202.5	43.80	7.79	.247	999+	5.80	18.9	Brown	Depth 53', PR .9gpm
4hrs 14:35	216.0	43.53	8.17	.254	999+	6.03	18.5	Brown	Depth 73', PR .9gpm
14:50	229.5	43.51	8.24	.254	999+	6.18	18.5	Brown	Depth 73', PR .9gpm
15:05	243.0	43.48	8.20	.251	753	5.95	18.3	Brown	Depth 73', PR .9gpm
15:20	256.5	43.46	8.24	.249	999+	6.14	18.1	Brown	Depth 73', PR .9gpm
5hrs 15:35	270.0	43.44	8.25	.247	577	6.05	18.1	Brown	Depth 73', PR .9gpm

Parcel No.: HR104Q
Well ID: MW02
Date: 6-6-02

Lee FLIPPEN

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date)
15:50	283.5	43.45	8.23	0.246	378	5.92	18.0	Brown	Depth 73', PR .9gpm
16:05	297.0	43.73	8.23	.245	325	5.75	17.9	cloudy	-Stopped parameters- ~~Lee Flippen~~ 6-6-02
6-7-02 09:25	297.0	41.72	6.59	.245	999+	6.32	18.3	Brown	6-7-02 Depth 73', PR 1.0 gpm
09:40	312.0	44.06	7.30	.241	999+	6.53	18.6	Brown	Depth 73', PR-1.0gpm
6hrs 09:55	327.0	44.03	7.48	.249	446	6.00	18.9	cloudy	-Reached Target Purge volume- Depth 73', PR .4gpm
10:10	333.0	42.65	7.51	.248	999+	6.60	19.4	Brown	Depth 71', PR .4gpm
10:25	339.0	42.54	6.85	.179	409	3.93	20.3	cloudy	Depth 60', PR .3gpm
10:40	343.5	42.48	6.78	.279	999	5.51	20.6	Brown	Depth 60', PR .3gpm
7hrs 10:55	348.0	42.51	7.36	.251	396	5.32	20.6	cloudy	Depth 60', PR .3gpm
11:10	352.5	42.49	7.38	.250	413	5.40	20.7	cloudy	Depth 60', PR .3gpm
11:25	357.0	42.50	7.39	.248	216	5.24	20.5	cloudy	Depth 60', PR .3gpm
11:40	361.5	42.49	7.42	.246	92	5.38	20.9	Cloudy	Depth 60', PR .3gpm
8hrs 11:55	366.0	42.51	7.41	.248	51	5.48	21.4	cloudy	Depth 60', PR .3gpm
									-Stopped parameters- -Took 1 ℓ H_2O Photo Sample- -Well Developed- ~~Lee Flippen~~ 6-7-02