APPENDIX D

WELL DEVELOPMENT LOGS

Reconstructed Log For RNG-201-MW01

Groundwater Well Development Log

Fort McClellan, Alabama

oject Number: 774645
rm Completed by: O. Allen
ell Developed by (person/firm): R. Goins, L. Flippin

Parcel No.: 201
Well No.: MW01
Date started: 8/29/01 - 9/10/01

Monitoring Well Information

velopment Method: Bailer Horiba U-10
velopment Equipment: Turbidity meter, Orion

sing Diameter: 2"

Beginning Measurments	8/29	8/30	8/31	9/10
Depth to Water (ft):	40.00	40.00	40.00	36.53
Total depth of Well (ft):	40.08	40.10	40.10	36.87

2001 Time 24hr /29/01	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.)	
2 :30	Ø	40.00	No Water						PG#13 (8-27-01 Log Book)	RG
0 :15	Ø	40.00	No Water						PG#63 (7-13-01 Log Book)	LF
9 :20	Ø	40.00	No Water						PG#66 (7-13-01 Log Book)	LF
3 :25	Ø	36.53	No water		One	Reading	Taken		PG#28 (8-27-01 Log Book)	RG
:			5.97	.239	999	7.53	22.4	Dark Brown	well Dry PG 29	RG
3 :30	Ø	33.41	DTW Check		water	in well	will	sample		WG
:										

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

unable to explain DTW of 40.00 on 8/29, 8/30, 8/31. Maybe developers @ wrong location. Check of Well Construction Log Revealed well Depth of 34.0' BGS.

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.7/00

Well was sampled @ 13:45 on 01/31/02 PP pump by RG.

4- 2-02; 8:38 ;THE IT GROUP IT KNOXVILLE ;2568483551 # 2/ 2

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 796887
Form Completed by: Lee FLIPPEN
Well Developed by (person/firm): Lee FLIPPEN / IT Corp.

Parcel No.: RNG201
Well No.: MW02
Date started: 9-4-01

PID 0.0 BZ 0.0 PID #82394

Monitoring Well Information

Screen 28-38 ft.

Development Method: Surge + Purge
Development Equipment: whale Pumps, 12v. Battery
Horiba U-10 #4014, AquaFast II #2028, Heron #2038
Casing Diameter:

Beginning Measurments
Depth to Water (ft): 23.21 TOC
Total depth of Well (ft): 45.10 TOC

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 Entire Well—
12:15	Ø	23.21	5.32	.052	999+	6.09	18.4	orange	Depth 38 ft. PR = .65 gpm
12:30	9.75	26.89	5.07	.055	380	5.59	17.3	orange	" "
12:45	19.5	27.70	5.02	.055	135	6.61	17.3	cloudy	" "
13:00	29.25	28.74	4.98	.052	71	6.19	17.6	clear	" "
13:15	39.0	29.29	4.98	.053	44	6.74	17.7	clear	" "
13:30	48.75	29.53	5.01	.054	45	6.31	17.8	clear	Depth 38 ft. PR .60 gpm
13:45	57.75	29.90	5.04	.054	38	6.03	17.7	clear	" "

WC = 21.89

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

45.10 - 23.21 = 21.89 x .163 3.57 x 5 = 17.85 + 120g = 137.85g

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11/17/00

QC'd by 09/10/01

Parcel No.: RNG 201
Well ID: MW02
Date: 9-4-01

9-5-01 PID 0.0 BZ 0.0

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
14:00	66.75	30.0	5.05	.055	53	6.15	17.5	clear	Depth 38 ft. PR .6 gpm
24hrs 14:15	75.75	30.02	5.10	.056	54	6.70	17.7	Clear	Depth 36 ft, PR .6 gpm
14:30	84.75	29.68	5.41	.099	377	5.85	18.5	cloudy	-Pumps stopped - Moved to 38 ft. - Depth 38 ft. PR .6 gpm
14:45	93.75	29.96	5.60	.060	46	5.78	17.7	clear	Depth 38 ft. PR .6 gpm
15:00	102.75	29.77	5.58	.060	41	6.18	18.0	clear	" "
36hrs 15:15	111.75	29.74	5.64	.060	33	6.26	18.0	clear	" "
15:30	120.75	29.75	5.65	.061	17.2	5.58	17.9	clear	" "
15:45	129.75	29.77	5.63	.061	12.4	6.17	17.8	clear	" "
16:00	138.75	29.78	5.60	.062	10.6	6.15	17.9	clear	— Stopped Parameters — Target 1 Reache ~~[illegible]~~ 9-4-01
9-5-01 10:10	138.75	23.40	5.02	.074	180	5.78	19.6	cloudy clearing	9-5-01 Started Parameters - Depth 28 ft. PR .25 gpm
1hrs 10:25	142.5	25.23	5.16	.040	180	6.15	20.1	cloudy	-Moved to 30 ft. - Depth 28 ft. PR .25 gpm
10:40	146.25	26.03	5.25	.043	82	5.77	19.5	cloudy	Depth 30 ft PR .25 gpm
10:55	150.0	27.43	5.32	.045	78	5.96	18.5	cloudy	Depth 30 ft PR .25 gpm

Parcel No.: RNG201
Well ID: MW02
Date: 9-5-01

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
11:10	153.75	27.62	5.30	.042	26	5.61	19.6	clear	-Moved to 34ft. — 1120hrs Depth 32 ft. PR. 25gpm
11:25	157.5	27.72	5.44	.047	106	5.65	19.3	clear	Depth 34ft PR. 25gpm
11:40	161.25	27.49	5.44	.047	54	5.71	20.2	clear	Depth 34ft. PR .25gpm
11:55	165.0	27.60	5.55	.047	36	5.21	19.5	clear	Depth 34ft PR. 25gpm
12:10	168.75	28.13	5.58	.047	33	5.36	19.0	clear	Depth 36 ft. PR. 25gpm
12:25	172.5	28.29	5.51	.052	130	5.60	19.0	-cloudy- clearing	-cloudy- Depth 36 ft. PR. 25gpm
12:40	176.25	28.56	5.43	.051	40	5.65	18.6	clear	Depth 36 ft PR. 25gpm
12:55	180.0	28.31	5.43	.053	26	5.17	20.0	clear	Depth 38ft. PR. 25gpm
13:10	183.75	27.18	5.73	.080	29	5.56	21.5	clear	Depth 38 ft. PR. 25 gpm
13:25	187.5	26.93	— Pumps stopped — Stopped parameters change						Removed Pumps from Well and cleaned off Mud.
13:40	187.5	— Purged Mud From Bottom of Well —							Purge Rate .5gpm
13:55	195.0	Pumps stopped — Surged Pumps clean in Well							Restarted Purging Purge Rate .5gpm
14:15	205.0	Purged Mud From Well							Purged Mud From Well Purge Rate .25gpm
1500	216.25	— stopped Purging — 8 hrs Development time — ~~[illegible]~~ 9-5-01							

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07/20/99

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 774645 27020300
Form Completed by: Z. Parham
Well Developed by (person/firm): Z. Parham (TT), J. Fisher (TT)

Parcel No.: 201
Well No.: AOC-201-MW03
Date started: 9.4.01

Monitoring Well Information

Development Method: surge/purge
Development Equipment: whale pump, PID, water level meter, Horiba U-10, Turbidity Meter
Casing Diameter: 2"

Beginning Measurments
Depth to Water (ft): 28.36'
Total depth of Well (ft): 41.85'

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.)
13:45	0.0	28.36	5.24	0.112	>1000	3.68	19.4	cloudy	pump at bottom of well, PR=1.0 gpm
14:00	15.0	38.59'	5.28	0.049	963	6.34	18.6	milky	
14:15	30.0	38.70'	5.31	0.045	>1000	6.58	18.5	cloudy	PR=0.25 gpm
14:30	33.75	40.57'	5.46	0.046	181	6.64	21.6	clear	
14:45									Pump stopped working for 5 min.
14:50	37.50	39.40'	5.49	0.055	>1000	5.45	25.4	muddy	resumed pumping @ 0.25 gpm
15:05									well dry

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

41.85 - 28.36 = 13.49 x 0.163 = 2.199 x 5 = 10.99 + 75 = 85.99

Parcel No.: 201
Well ID: MW03
Date: 9.4.01

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)
15:25									well not recharged 80%; Done developing for 9.4.01
10:15	37.50	30.94'							beginning development on 9.5.01 pump set at 36.85'. PR = 0.25 gpm
10:30	41.25	33.53'	5.35	0.110	116	7.86	20.2°	clear	
2hrs 10:45	45.00	35.63'	5.46	0.057	79.5	7.36	20.9°	clear	
11:00	48.75	36.61'	5.43	0.045	36.5	7.68	20.3°	clear	
11:15	52.50	37.23'	5.51	0.043	44.9	7.18	21.7°	clear	pump lowered to 38.85'.
11:30	56.25	38.00'	5.58	0.038	34.3	7.51	20.5°	clear	
3hrs 11:45	60.00	39.18'	5.65	0.039	127.7	7.38	21.3°	cloudy	Pump lowered to 40.85' PR = 0.125
12:00	61.87	39.81'	5.65	0.042	56.7	7.22	22.9°	clear	pump lowered to 41.85'
12:15	63.75	40.33'	5.68	0.042	620	7.22	23.3°	cloudy	
12:30	65.62	40.80'	5.79	0.049	141.4	6.63	24.3°	cloudy	
4hrs 12:45									Well dry

Water Quality Equipment Used _____

Comments _____

Parcel No.: RNG 201
Well ID: MW03
Date: 9-6-01

9-6-01 PID 0.9 BZ 0.0 TD 41.85 ft. 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
12:00	65.62	30.10	5.25	.066	999+	6.02	25.1	orange	9-6-01 WC = 11.75 ft. Depth 38 ft. PR .15 gpm
12:15	67.87	31.74	5.12	.041	448	5.97	23.1	orange	Depth 36 ft. PR .15 gpm
12:30	70.12	32.72	4.97	.039	171	6.17	23.7	orange	" "
12:45	72.37	33.37	4.99	.038	115	5.64	25.0	cloudy	" "
13:00	74.62	Below Pumps	4.95	.037	78	5.27	25.6	cloudy	— 5 hrs — Development Time Depth 36 FT PR .05
13:15	75.37	"	4.94	.037	70	5.25	27.4	cloudy	" "
13:30	76.12	"	4.99	.037	56	5.40	27.2	cloudy	Depth 36 ft. PR .07 gpm
13:45	77.17	"	5.24	.036	47	5.46	25.2	cloudy	" "
14:00	78.22	"	5.27	.036	137	5.28	25.8	cloudy	" " 6 hrs
14:15	79.27	"	5.26	.034	52	5.07	28.3	cloudy	" "
14:30	80.32	"	5.47	.034	32	5.45	29.0	clear	" "
14:45	81.37	"	5.48	.033	28	5.33	27.8	clear	" "
15:00	82.42	"	5.47	.033	18.7	5.32	26.2	clear	" "

hrs

Parcel No.: RNG 201
Well ID: MW03
Date: 9-6-01

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
15:15	83.47	Below Pumps	5.25	.032	34	5.65	23.9	clear	Depth 36 ft. PR .07 gpm
15:30	84.52	"	5.14	.032	35	6.19	23.3	clear	" "
15:45	85.54	"	5.03	.032	28	6.08	23.7	clear	" "
16:00	86.59	"	4.99	.031	39	6.06	23.4	clear	-8 hrs Development Time- Target PV reached
:									Took 1l. H2O sample
:									Lee Hoppen 9-6-01
:									
:									
:									
:									
:									
:									
:									
:									

Lee Hoppen 9-6-01

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 796887
Form Completed by: R Grains
Well Developed by (person/firm): R Grains / FT Corp

Parcel No.: RIVG-201
Well No.: MW04
Date started: 8/5/01

Monitoring Well Information

Development Method: Surge + Purge
Development Equipment: Whale pump, 250 gal tank, water meter, PID, Horiba U-10, Orion Turbidity Meter
Casing Diameter: 2"

Beginning Measurments
Depth to Water (ft): 26.91' TOC
Total depth of Well (ft): 42.35' TOC

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.)
10:53	—	26.91	6.34	0.247	999	4.65	20.9	brown (muddy)	0.5 ft from bottom 0.47 gal/min
10:58	2.15	—	—	—	—	—	—	—	problem w/ pump
11:03	2.15	—	—	—	—	—	—	—	resume pumping @ 0.5 gal/min
11:18	9.65	31.58	6.04	0.240	915	5.70	21.7	brown	0.43 gal/min raised pump 1 ft
11:33	16.1	35.43	6.33	0.249	335	5.58	19.8	lt. brown	0.21 gal/min
11:48	19.1	33.62	6.37	0.249	76	5.06	23.3	pt. clear	0.15 gal/min
12:03	21.35	32.44	6.47	0.249	99	4.50	22.7	lt. brown	0.10 gal/min

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

42.35 - 26.91 = 15.44 x 0.163 = 2.52 x 5 = 12.6 + 80 gal = 92.6 gal

Parcel No.: RNG-201
Well ID: MW04
Date: 9/6/01

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)
12:18	22.85	31.98	6.52	0.250	14	9.46	23.1	clear	0.75 gal/min 0.5 ft from bottom
12:33	34.1	40.10	6.63	0.248	999	5.48	23.7	brown	0.40 gal/min
12:48	40.1	40.14	6.53	0.269	308	6.26	21.4	lt brown	0.33 gal/min
13:03	45.05	*BTOP	6.31	0249	277	5.98	21.4	"	0.43 gal/min
13:18	51.50	*BTOP	6.75	0.254	88	6.56	22.0	"	0.43 gal/min
13:23	—	—	—	—	—	—	—	—	Well is dry
14:10	51.50	28.03	6.31	0.259	39	6.18	27.2	pt. clear	0.13 gal/min 0.5' from bottom → lowered 2ft.
14:25	53.0	28.62	6.33	0.248	57	6.82	26.1	"	0.19 gal/min
14:40	55.85	28.10	6.41	0.254	98	6.61	23.1	lt. brown	0.37 gal/min
14:55	61.40	29.10	6.38	0.253	77	5.75	20.9	"	0.33 gal/min
15:10	65.45	29.25	6.25	0.254	37	5.98	21.3	pt. clear	0.27 gal/min
15:25	69.50	29.03	6.05	0.255	33	5.02	22.5	"	0.25 gal/min

Water Quality Equipment Used See page 1 of 4 - K.H. 9/10/01

***Comments** BTOP - Water level is "Beneathe the top of Pump"

Parcel No.: RNG-201
Well ID: MW04
Date: 9/6/01

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)
15:40	73.25	29.08	6.19	0.257	30	5.65	23.0	pt. clear	0.25 gal/min
11:05	73.25	27.36	~~6.35~~ 6.03 RA	0.223	39	5.39	23.4	"	9/6/01 0.27 gal/min - 1ft from bottom
11:20	77.30	29.40	6.09	0.224	29	5.85	22.1	clear	0.27 gal/min 2ft from position
11:35	81.35	29.90	6.21	0.223	29	5.62	22.0	"	2ft from position
11:50	85.4	30.25	6.37	0.223	29	5.53	22.7	"	0.27 gal/min
12:05	89.45	30.33	6.34	0.223	24	5.72	24.3	"	2ft from position
12:20	93.50	30.30	6.40	0.224	25	5.61	24.3	"	0.27 gal/min
12:35	97.55	30.30	6.38	0.224	30	5.70	24.4	"	2ft from position
12:50	101.6	30.31	6.31	0.225	25	5.72	23.5	"	0.27 gal/min
13:05	105.65	30.65	6.39	0.226	19	5.65	24.3	"	0.18 gal/min
13:20	108.35	29.85	6.41	0.227	24	5.56	25.0	"	"
13:35	111.05	29.47	6.38	0.227	22	5.28	24.0	"	1.0ft from position

Water Quality Equipment Used See page 1 of 4 K.Ft 9/10/01

Comments

Parcel No.: RNG-201
Well ID: MW04
Date: 9/6/01

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)
13:50	113.75	29.31	6.40	0.226	15	5.49	24.2	clear	0.18 gal/min
14:05	116.45	29.18	6.52	0.227	11	5.56	25.0	"	"
14:20	119.15	29.10	6.48	0.226	11	5.62	25.2	"	"
14:35	121.85	29.06	6.51	0.225	10	5.55	24.9	"	" collected photo sample.
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:									
:									

Final Entry
Reginald Bain 9/6/01

Water Quality Equipment Used See page 1 of 4 K.A. 9/10/01

Comments