

APPENDIX C

WELL DEVELOPMENT LOGS

Groundwater Well Development Log

Fort McClellan, Alabama

Project Number: 796887
 Form Completed by: David Tindle
 Well Developed by (person/firm): David Tindle

Parcel No.: 135 (Q-X)
 Well No.: HR135QMW01
 Date started: 10-02-00

Monitoring Well Information

Development Method: Purge, Surge
 Development Equipment: well Pump, water level meter,
turbidity meter, Horiba
 Casing Diameter: 2 in

Beginning Measurements

Depth to Water (ft): 25.29 ft TOC
 Total depth of Well (ft): 41.81 ft TOC
 Purge Volume = 63.45 gallons

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)
14:55	9	30.67	5.34	.037	118	3.46	18.3	clear	10-2-00
09:28	DT 10/5/00								10-5-00 DT 10/5/00
15:05	17	30.41	5.07	.029	563	5.82	18.3	cloudy	
15:07	22	Dry							10-5-00 DT 10/5/00 Well Purged Dry
09:28	24.5	26.91	5.50	.024	50	6.07	19.3	Brown	Pump at 40 ft + TOC 10-05-00 Flow rate is 2 gallons/min.
09:45	27.5	27.87	5.45	.023	183	5.37	19.9	cloudy	0933 Raise pump to 38 ft from TOC
10:00	30.5	28.51	5.49	.022	238	5.45	19.9	cloudy	0948 Raise pump to 35 ft from TOC

Purge Volume = Total depth (41.81 ft from TOC) - water level (25.29 ft from TOC) = 16.52 feet of water

16.52 ft of water x .163 (2 in diameter) = 26.9 gallons of water one well volume

26.9 gallon x 5 well volumes = 13.45 gallons of water + (50) gallons of water added during installation = 63.45 gallons of water to
Purge from well

Parcel No.: 135
 Well ID: WRI350 MW1
 Date: 10-5-00

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)
10:15	33.5	29.02	5.44	.022	256	5.43	20.5	cloudy	1007 Raise pump to 34ft
10:30	36.5	29.31	5.46	.020	220	5.64	20.7	cloudy	1020 Raise pump to 32 ft from TOC
10:45	38.5	29.01	5.47	.021	226	5.40	21.0	cloudy	to 10:35 Lower pump to 35 ft from TOC, slow pump
11:00	40.5	28.99	5.47	.023	256	5.35	21.9	cloudy	Rate to .133 gallons per minute
11:15	43.5	29.65	5.47	.019	128	5.67	20.6	cloudy	1052 Lower pump to 37ft from TOC
11:30	46.5	30.8	5.46	.021	214	5.74	20.4	cloudy	1105 Raise pump to 35 ft from TOC
11:45	48.49.25	32.26	5.45	.022	239	5.27	22.4	cloudy	Increase flow rate to .250 gal per min 1135 slow pump to .189 gallons a minute
12:00	52.00	32.40	5.45	.020	146	5.45	23.3	cloudy	Lower pump to (11:50) 37ft from TOC
12:15	55.00	32.0	5.47	.020	113	5.49	23.3	cloudy	
12:30	57.00	29.2	5.46	.021	86.2	5.25	22.8	cloudy clearing	
12:45	59.00	29.1	5.42	.021	79.9	5.39	22.7	clearing	
13:00	61.60	29.05	5.43	.021	69.2	5.40	22.5	clearing	

Parcel No.: 135
 Well ID: HR135GMW01
 Date: 10-5-00

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)
13:15	63.00	29.02	5.50	.021	62.7	4.95	22.1	clear	10-5-00
13:30	65.00	29.02	5.48	.021	56.7	4.88	22.2	clear	Flow rate is .133 gallons per min.
13:45	67.00	29.02	5.48	.021	53.2	5.12	22.0	clear	
14:00	69.00	29.02	5.46	.021	48.4	5.20	21.6	clear	
14:15	71.00	29.08	5.52	.020	46.9	5.82	21.8	clear	
14:30	73.00	29.02	5.43	.021	44.3	5.71	21.5	clear	
14:45	75.00	29.05	5.55	.020	42.7	6.16	21.5	clear	
15:00	77.00	29.12	5.46	.020	39.8	4.50	21.4	clear	
15:15	79	29.17	5.45	.021	37.3	5.20	21.3	clear	
15:30	81	29.20	5.50	.020	37.0	5.30	21.2	clear	
15:45	83.00	29.20	5.45	.020	33.80	5.33	21.1	clear	
16:00	85.00	29.30	5.45	.020	36.70	5.19	21.1	clear	

Parcel No.: 135
 Well ID: HR135QAW01
 Date: 10-5-00

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)
6:25	88.00	29.05	5.52	.020	37.8	6.65	21.4	clear	
16:40	90.00	29.02	5.50	.020	34.2	6.00	21.3	clear	
:									well developed per Basewide Installation sampling and analysis plan
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Groundwater Well Development Log

Fort McClellan, Alabama

Project Number: 796887
 Form Completed by: David Tindell
 Well Developed by (person/firm): David Tindell

Parcel No.: 135(QX)
 Well No.: HR13SQAW02
 Date started: 10-3-00

Monitoring Well Information

Development Method: Surge/Purge
 Development Equipment: Horiba, PZP, with Pump, turbidity meter
 Casing Diameter: 2 in (2" Inches)

Beginning Measurements
 Depth to Water (ft): 18.87 TOC
 Total depth of Well (ft): 70C

Purge volume = 68.05
 $41 - 18.87 (\text{water level}) = 22.13 \text{ ft} \times 20 \text{ C}$
 $22.13 \times .163 (2 \text{ inch diam}) = 3.61$
 $3.61 \times 5 \text{ well volume} = 18.05$
18.05 + 50 (during dev) = 68.05 gallons

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)
16:20	21	32.4	5.93	.044	999	4.15	18.1	Brown	10-02-00
10:10	41	24.4	5.62	.033	122	5.53	19.8	clear	10-03-00 Pump set at 30R+1
10:30	45	24.82	5.67	.030	32	5.27	20.5	clear	
10:45	49	24.82	5.71	.031	24	5.14	20.5	clear	
11:00	52	24.85	5.70	.032	30	5.24	20.8	clear	
11:15	55	24.87	5.71	.032	23	5.28	21.2	clear	
11:30	58.0	24.89	5.72	.032	29	5.30	21.0	clear	

Purge volume = 3.61 gallons
 Target volume minimum = 18.05 + 50 gallons used during well installation (Potable H₂O) = 68.05 gallons

Parcel No.: 135
 Well ID: HR135QM402
 Date: 10-3-00

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)	
13:30	64.0	23.85	5.39	.040	21	5.80	22.0	clear	30 ft TOC is where pump is set ↓	.4 gpm
13:45	67.0	24.19	5.62	.027	52	5.41	20.9	cloudy		.2 gpm
14:00	71.0	24.40	5.64	.031	164	6.01	20.6	cloudy		.26 gpm
14:15	76.0	24.50	5.71	.038	318	5.88	22.10	cloudy	slow pump pump rate at 1.5 gal/min	.33 gpm
14:35	79.0	24.39	5.62	.029	78	5.78	22.6	cloudy		.2 gpm
14:55	82.0	24.38	5.63	.029	76.4	5.51	22.4	cloudy		.2 gpm
15:10	84.0	24.40	5.67	.029	20.4	5.96	22.7	cloudy		.13 gpm
15:25	86.0	24.40	5.60	.028	62.6	5.50	22.3	cloudy	Increase pump rate to ~1.5 gallons/min.	.13 gpm
15:50	90.0	24.44	5.61	.028	53.7	5.00	22.0	cloudy		.26 gpm
16:15	94.0	24.75	6.00	.060	1117	5.71	20.70	Brown	16:05 Lower pump to 37 ft TOC, Increased flow	.26 gpm
16:30	97.0	25.0	5.68	.035	234	5.85	20.9	cloudy	rate to .33 gallons per minutes	.2 gpm
16:45	100.00	25.20	5.67	.031	116	5.60	20.70	cloudy		.2 gpm

Parcel No.: 135
 Well ID: HA135Qm402
 Date: 10-3-00

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)	
17:00	103.0	25.40	5.67	.030	75	5.80	20.50	cloudy		2.9pm
10:40	106.0	22.50	5.60	.030	999	5.34	26.7	Brown	10-4-00 ↓ Pump at 35 ft from TOC	2.9pm
10:55	110	23.50	5.56	.026	999	6.20	21.7	Brown	Pump rate is .19 gal/hr per minute	2.6pm
11:10	113	23.40	5.55	.027	227	4.93	23.20	cloudy	Purge rate increased to .26 gal/hr per minute	2.8pm
11:25	116	23.50	5.55	.027	100	5.23	23.70	cloudy	Purge rate lowered to .20 gal/hr per minute	2.5pm
11:40	119	23.20	5.58	.025	113.2	4.90	23.50	cloudy		2.9pm
11:55	122	23.17	5.57	.025	132.6	5.20	23.50	cloudy		2.5pm
12:10	125	23.11	5.60	.026	132.1	4.76	23.60	cloudy		2.8pm
12:25	128.0	23.11	5.57	.026	112.0	4.84	23.70	cloudy	30 feet from	2.5pm
12:45	132.0	23.20	5.58	.026	93.5	5.07	23.60	cloudy	AGSE pump at 30 ft from TOC, for turbidity reasons	2.6pm
13:00	135	24.20	5.57	.024	213	5.62	22.0	cloudy		2.5pm
13:15	138	24.50	5.50	.024	130	5.33	21.80	cloudy		2.9pm

Parcel No.: 135
 Well ID: HR135Qmw02
 Date: HR135Qmw02
10-4-00

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)
13:30	141	25.0	5.54	.024	124.1	5.52	21.70	cloudy	
13:45	144	25.70	5.53	.024	120	5.50	21.80	cloudy	
14:00	147	25.74	5.59	.024	116	4.96	21.7	cloudy	1410 Lower Pump to 40ft from TOC
14:15	150	24.71	5.92	.076	999	4.92	24.8	Brown	
14:30	153	24.60	5.65	.027	241	5.81	22.6	Brown	
14:45	156	24.1	5.57	.024	180	4.38	23.1	cloudy	Lower Pump Raise Pump to 38ft from TOC
15:00	158.5	24.5 23.5	5.52	.022	78	5.40	23.6	clear	
15:15	161.0	24.51 23.51	5.49	.021	38	5.01	23.8	clear	Raise Pump to 30ft from TOC
15:30	163.0	24.50 23.50	5.51 5.48	.021	32.0	5.69	23.7	cloudy	Raise Pump to 28ft from TOC
15:45	165.0	23.3	5.51	.020	81.9	5.62	23.4	cloudy	Raise Pump to 25ft from TOC
16:05	167.0	23.32	5.49	.019	70.4	5.73	22.90	cloudy	
Well Developed		Photo Sample Taken							

Time Limit

10-4-00

* TOTAL of 167 gallons removed from monitoring well HR-135Q-mw02