APPENDIX C

WELL DEVELOPMENT LOGS

Groundwater Well Development Log

Fort McClellan , Alabama

oject Number: 796887
rm Completed by: R. Goins
ell Developed by (person/firm): R. Goins / Shaw E&I

Parcel No.: HR-137Q
Well No.: HR-137QX-MW01
Date started: 6/18/02

Monitoring Well Information

velopment Method: Surge + Purge
velopment Equipment: whale Pump, tubing, Horiba U-X, Orion turbidity meter, PID.
sing Diameter: 2in

Beginning Measurments 11.1 RG 6/25/02
Depth to Water (ft): ~~22.95~~ bTOC
Total depth of Well (ft): 34.05' 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.)
10:06	Q	11.1	5.87	0.142	999	2.50	18.5	cloudy (tan)	pump - 0.5 ft from bottom rate - 0.375 gpm
10:11	1.875	—	—	rate	change	—	—	—	rate - 0.15 gpm
10:21	3.375	21.35	6.04	0.127	999	3.78	19.2	cloudy (tan)	rate - 0.107 gpm
10:36	6.58	21.93	6.17	0.129	838	2.11	19.2	"	rate - 0.27 gpm
6:51	10.63	24.50	6.25	0.135	765	3.33	19.5	cloudy (tan)	stop purging.
1:06	10.63	23.86	6.36	0.114	999	2.45	19.2	"	rate - 0.25 gpm
1:14	12.63	—	—	rate	change	—	—	—	rate - 0.13 gpm

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

4.05 - 11.1 = 22.95 x 0.163 = 3.74 x 5 = 18.7 gal + 100 gal = 118.7 gal

oc'd Kent Hyde
6/25/02

Parcel No.: HR-137q
Well ID: HR-137q-mw01
Date: 6/13/02

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)
11:21	13.54	26.20	6.26	0.112	999	3.49	20.8	cloudy (tan)	rate 0.1 gpm
11:36	15.04	27.95	6.30	0.116	999	2.76	21.9	"	rate 0.1 gpm
11:51	16.54	30.00	6.40	0.114	999	2.70	21.0	"	rate 0.1 gpm stop purging
12:25	16.54	27.15	6.48	0.119	999	3.63	20.6	"	rate 0.09 gpm
12:40	17.89	31.98	6.32	0.113	999	2.60	21.5	"	rate 0.09 gpm
12:45	18.34	—	well	is	dry	—	—	—	—
									6/19/02
10:40	18.34	12.50	7.01	.106	>999	6.01	19.3	tan opaque	
10:55	19.84	17.50	6.60	.101	>999	3.85	19.5	tan cloudy	.1 gpm 1 ft off bottom
11:10	21.34	21.0	6.34	.106	501	3.73	19.3	cloudy	.1 gpm 3 ft off bottom
11:25	22.84	21.7	6.32	.095	398	5.30	20.1	"	.1 gpm 5 ft off bottom
11:40	24.34	22.3	6.50	.091	>999	4.99	20.7	"	.1 gpm 7 ft off bottom
11:55	25.84	23.0	6.61	.091	"	5.40	20.3	"	.12 gpm 5 ft off bottom
12:10	27.64	23.7	6.11	.080	"	5.93	19.8	"	.19 gpm .5 ft off bottom
12:25	31.49	25.3	6.40	.086	"	6.35	19.0	"	.25 gpm .5 ft off bottom

Parcel No.: HR 137Q
Well ID: MW01
Date: 6/19/02

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)
12:40	34.25	28.3	6.34	.083	>999	7.24	18.9	cloudy	.25 gpm .5 ft off bottom
12:45	38.00	well	goes	dry					6 19 02
11:00	38.00	13.1	6.35	.089	>999	3.09	20.3	tan cloudy	.1 gpm .5' off bottom 6 20 02
11:15	39.5	17.9	6.27	.089	>999	3.86	20.6	"	.1 gpm (depth sounder
11:30	41	20.8	6.18	.067	>999	5.86	21.0	"	.1 gpm
11:45	42.5	21.5	6.54	.070	313	4.24	20.7	"	.125 gpm
12:00	44.375	22.5	6.24	.067	270	6.79	20.0	"	.125 gpm
12:15	46.25	23.9	6.34	.073	572	6.67	20.1	"	.125 gpm
12:30	48.125	25.9	6.40	.062	612	6.84	19.4	"	.125 gpm
12:45	50	22.85	6.40	.065	>999	6.54	19.8	"	.125 gpm
13:00	52	31.06	6.77	.073	>999	5.87	19.2	"	.5 gpm
13:02	53	well	goes	dry					6 20 02 3rd time dry

6/21/02 0910 PHOTO SAMPLE → 502 ← PHOTO SAMPLE 6 21 02

Groundwater Well Development Log

Fort McClellan , Alabama

oject Number: 296887
rm Completed by: R. Goins
ell Developed by (person/firm): R. Goins, J. Alexander / Shaw E&I

Parcel No.: HR-137
Well No.: HR-137Q-MW02
Date started: 6/18/02

Monitoring Well Information

velopment Method: Surge + Purge
velopment Equipment: whale pump, tubing, Horiba U-10, Orion Turbidity Meter, PID
sing Diameter: 2in

Beginning Measurments
Depth to Water (ft): 13.65' bTOC
Total depth of Well (ft): 33.95' 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.)
14:15	Q	13.65	6.40	0.086	999+	1.67	17.4	muddy (darkbrown)	pump-0.5ft from bottom rate-0.83gpm
14:20	4.15	—	—	rate	change	—	—	—	rate-0.1gpm
14:30	5.65	19.30	5.90	0.081	999+	1.77	18.9	cloudy (darkbrown)	"
14:45	7.15	18.91	6.01	0.084	999+	3.70	19.1	"	rate-0.16gpm
15:00	9.55	20.53	6.19	0.066	999+	3.64	18.4	"	"
15:15	11.95	20.55	5.82	0.069	999+	3.75	18.1	cloudy (darkbrown)	"
15:30	14.35	21.00	5.67	0.069	999+	3.79	18.1	"	rate-0.83gpm

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

33.95 − 13.65 = 20.30 x 0.163 = 3.3 x 5 = 16.5 + 70 = 86.5 gal

acc'd [illegible] 6/25/02

Parcel No.: HR-1378
Well ID: HR-1378-MW02
Date: 6/18/02

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)
15:45	26.85	30.90	5.75	0.094	999+	1.99	16.7	muddy	rate - 0.83 gpm
15:48	29.34			well	is	dry			
14:30	26.85	14.08	7.67	.058	>999	7.09	18.5		6 19 02 [signature] .33 gpm .5' off bottom
14:35	28.5	19.00		changing flow rate					.1 gpm .5 ft off bottom
14:45	30	19.15	6.97	.052	>999	5.65	20.0	tan v. cloudy	.19 gpm 2 ft off bottom
15:00	32.85	20.7	5.50	.049	"	6.04	18.3	"	.25 gpm 4' off bottom
15:15	36.6	23.05	5.52	.048	"	5.76	17.8	"	.25 gpm 6 ft off bottom
15:30	40.35	24.75	6.02	.076	"	5.15	18.0	"	.1
15:45	41.85	23.98	5.59	.051	"	3.76	19.1	"	.1
16:00	43.35	23.76	5.51	.058	"	5.17	16.6	"	1 gpm
16:07	50.35	well	goes	dry					[signature] 61902
13:30	50.35	14.55	6.50	.064	>999	6.02	23.8	tan v. cloudy	11 ft off bottom .1 gpm [signature] 62002
13:45	51.85	16.65	6.06	.038	625	5.95	22.4	"	13 ft off bottom .1
14:00	53.35	17.8	6.40	.038	667	5.91	21.4	"	" "

Parcel No.: HR 137@MW02
Well ID: MW02
Date: 6 20 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)
14:15	54.85	18.2	6.77	.042	422	5.52	21.5	tan v. cloudy	13 ft off bottom .1 gpm
14:30	56.35	18.72	6.32	.044	763	5.12	19.8	"	13 ft off bottom .15 gpm
14:45	58.60	19.5	5.65	.044	894	4.57	20.1	"	13 ft off bottom .15 gpm
15:00	60.85	20.7	6.02	.045	>999	5.21	20.1	"	13 ft off bottom .15 gpm
15:15	63.1	21.2	6.36	.073	>999	3.48	19.4	"	1 ft off bottom .15 gpm
15:30	65.35	22.5	5.68	.044	842	4.83	18.7	"	" "
15:45	67.60	23.15	6.19	.040	405	5.72	19.4	"	1 ft off bottom .15 gpm
16:00	69.85	23.92	5.72	.042	471	4.81	18.6	"	.5 ft off bottom .3 gpm
16:15	74.35	27.55	5.58	.047	>999	4.74	17.5	"	.5 gpm
16:18	81.85	well goes dry							.5 gpm
6/21/02 09:35	PHOTO SAMPLE →				27	←	PHOTO SAMPLE		62102
:									

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 796887
Form Completed by: J. Alexander
Well Developed by (person/firm): J. Cunningham

Parcel No.: HR 1370
Well No.: MW03
Date started: 7/9/02

Monitoring Well Information

Development Method: bailing
Development Equipment: water-level indicator, bailer

Casing Diameter: 2"

Beginning Measurments
Depth to Water (ft): 26.13 ' bTOC
Total depth of Well (ft): 26.70 ' 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.)
15:25	0.8	26.13	6.33	.058	644	7.29	19.86	tan cloudy	small amount of water in bailer 7/9 02
14:05	"	26.63	Dry	well					7/10 02
09:00	"	26.59	Dry	well					7/11 02
:									
:									
:					7/11/02				
:									

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

QC'd [illegible]
7/31/02

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number:
Form Completed by: Nicole Badon/
Well Developed by (person/firm): NICOLE BADON, JEFF ALEXANDER

Parcel No.: 137Q
Well No.: MW04
Date started: 6/18/02

Monitoring Well Information

Development Method: surge/purge
Development Equipment: Whale Pump

Casing Diameter: 2"

Beginning Measurments
Depth to Water (ft): 33.9' TOC
Total depth of Well (ft): 49.8' 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.)
10:06	3.0	38.8	5.49	0.088	+999	5.51	18.3	Milky brown	Pump near bottom of well 1gpm
10:21	13.5	46.12	5.61	0.076	+999	6.70	20.5	Milky brown	0.1 gpm at 1016
10:36	15	47.22	5.42	0.062	+999	7.92	21.9	Milky brown	0.1 gpm
10:51	16.5	47.62	5.67	0.077	+999	6.16	22.6	cloudy	
11:06	18	48.36	5.78	0.077	+999	7.05	23.1	Cloudy	
11:19	—	Purged	—	dry	—	—	—	—	
11:44	—	47.67	—	—	—	—	—	—	

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

49.8' − 33.9' = 15.9' x 0.163 = 2.59 x 5 = 12.95 + 100 gallons = 112.95 gallons

acb KAS 6/25/02

Parcel No.: HR-137Q
Well ID: MW04
Date: 6/18/02

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) rate	depth
12:24	—	45.42							6/18/02	
08:30	18	35.50	5.50	.075	>999	6.89	19.0	tan cloudy	6/19/02 .07 gpm	.5 ft off bottom
08:45	19.05	37.20	5.45	.044	301	6.54	19.4	cloudy	.07 gpm	2 ft
09:00	20.10	40.00	5.54	.035	456	7.50	19.7	"	.07 gpm	4 ft
09:15	21.15	40.90	5.64	.037	134	7.43	20.4	"	.07 gpm	5'
09:30	22.20	41.50	5.77	.039	548	7.44	20.7	"	.07 "	4'
09:45	23.25	42.70	5.83	.040	963	6.82	21.0	"	.07	.5'
10:00	24.30	43.50	5.72	.039	>999	7.32	21.3	"	.5	.5'
10:05	26.80	well	goes	dry					.5	.5'
08:25	26.80	35.9	5.54	.068	>999	6.50	22.7	tan cloudy	.1	.5'
08:40	28.30	37.9	6.13	.036	187	7.41	21.0	sl cloudy	.1	.5'
08:55	29.80	39.7	5.60	.035	319	7.29	23.7	cloudy	.1	.5'

6/19/02
6/20/02

Parcel No.: H 1370
Well ID: MW04
Date: 6 2002

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) rate	depth (off bottom)
09:10	31.30	40.7	5.54	.035 ~~.068~~ 6/21/02	293 ~~999~~ 6/26/02	7.19	22.7	cloudy	.1 gpm	.5' off bottom
09:25	32.80	41.9	6.13	.035	285 ~~187~~ 6/26/02	6.69	21.0	"	.1	"
09:40	34.30	43.2	5.60	.034	336 ~~319~~ 6/26/02	7.20	21.7 ~~23.7~~ 6/26/02	"	.1	"
09:55	35.80	44.6	5.65	.035	423 ~~293~~ 6/26/02	7.22	21.7	"	.125	"
10:10 ~~09~~	37.675	47.0	5.87	.037	530	6.75	21.6	"	.125	"
10:15	39.55	well	goes	dry					.125	"
08:15	PHOTO		SAMPLE	→	101	← PHOTO	SAMPLE		6/21/02	
:										
:										
:										
:										
:										

6/21/02

APPENDIX D

SURVEY DATA

Survey Data
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft amsl)	Top of Casing Elevation (ft amsl)
HR-137Q-DEP01	1180890.02	684802.66	1144.06	NA
HR-137Q-DEP02	1179791.11	685646.04	1292.85	NA
HR-137Q-DEP03	1180773.91	685626.35	1175.30	NA
HR-137Q-DEP04	1180306.58	685270.75	1245.31	NA
HR-137Q-DEP05	1180735.73	685392.29	1191.37	NA
HR-137Q-DEP06	1181507.81	685353.13	1101.80	NA
HR-137Q-DEP07	1181100.26	685343.39	1142.70	NA
HR-137Q-DEP08	1180595.53	685338.18	1196.30	NA
HR-137Q-DEP09	1181000.10	684677.03	1122.60	NA
HR-137Q-GP01	1181034.76	684992.75	1157.43	NA
HR-137Q-GP02	1180891.60	685074.95	1186.64	NA
HR-137Q-GP03	1180759.30	685120.07	1203.83	NA
HR-137Q-GP04	1180532.25	685740.44	1225.30	NA
HR-137Q-GP05	1180835.89	685653.74	1185.45	NA
HR-137Q-GP06	1180512.16	685822.05	1243.27	NA
HR-137Q-GP07	1180537.89	685614.81	1207.92	NA
HR-137Q-GP08	1180585.13	685431.45	1208.26	NA
HR-137Q-GP09	1180206.95	685480.19	1268.17	NA
HR-137Q-GP10	1180501.33	685288.19	1220.40	NA
HR-137Q-GP11	1180548.39	685486.70	1217.99	NA
HR-137Q-GP12	1180651.16	685389.23	1190.50	NA
HR-137Q-GP13	1180483.86	685431.57	1220.30	NA
HR-137Q-GP14	1180529.90	685742.07	1214.80	NA
HR-137Q-GP15	1180771.08	685185.29	1199.70	NA
HR-137Q-GP16	1180890.83	684799.23	1139.50	NA
HR-137Q-GP17	1180580.33	685889.46	1263.40	NA
HR-137Q-GP18	1180496.12	685548.73	1219.60	NA
HR-137Q-GP19	1180422.06	685434.87	1229.00	NA
HR-137Q-GP20	1180402.02	685479.68	1232.90	NA
HR-137Q-GP21	1180324.51	685762.72	1221.50	NA
HR-137Q-GP22	1180330.38	685958.49	1289.30	NA
HR-137Q-GP23	1180248.01	685827.61	1259.20	NA
HR-137Q-GP24	1180199.75	685143.58	1265.60	NA
HR-137Q-GP25	1180175.21	685983.67	1318.30	NA
HR-137Q-GP26	1180104.40	685183.95	1271.40	NA
HR-137Q-GP27	1180828.77	685368.97	1155.50	NA
HR-137Q-GP28	1180819.61	685358.20	1176.00	NA
HR-137Q-GP29	1180746.72	685629.63	1173.70	NA
HR-137Q-GP30	1180736.86	685343.33	1186.90	NA
HR-137Q-GP31	1180709.37	685845.47	1245.60	NA
HR-137Q-GP32	1180569.47	686074.43	1255.50	NA
HR-137Q-GP33	1180366.55	685672.94	1217.60	NA
HR-137Q-GP34	1180350.39	685349.87	1230.40	NA
HR-137Q-GP35	1180364.34	684977.13	1252.00	NA
HR-137Q-GP36	1180280.35	686137.93	1288.30	NA

Survey Data
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft amsl)	Top of Casing Elevation (ft amsl)
HR-137Q-GP37	1180190.13	685334.89	1241.70	NA
HR-137Q-GP38	1180034.82	685908.52	1315.70	NA
HR-137Q-GP39	1180012.80	685012.25	1312.00	NA
HR-137Q-GP40	1179981.45	685679.44	1247.70	NA
HR-137Q-GP41	1180012.04	685655.38	1250.50	NA
HR-137Q-GP42	1179804.11	685291.41	1307.80	NA
HR-137Q-MW01	1180506.49	685655.31	1194.30	1196.27
HR-137Q-MW02	1180585.09	685618.00	1190.09	1192.28
HR-137Q-MW03(W)	1180685.30	685394.60	1186.80	1188.94
HR-137Q-MW03(SB)	1180635.90	685431.48	1207.61	NA
HR-137Q-MW04	1180469.62	685432.03	1223.25	1225.43
HR-137Q-SW/SD01	1179985.14	685682.02	1247.70	NA
HR-137Q-SW/SD02	1180556.21	685657.85	1188.20	NA
HR-137Q-SW/SD03	1181222.48	685416.61	1126.80	NA
HR-137Q-SW/SD04	1181389.88	685342.72	1110.60	NA
XRF Samples				
HR-137Q-0_0	1180585	685395	NS	NA
HR-137Q-E100_0	1180585	685495	NS	NA
HR-137Q-E200_0	1180585	685595	NS	NA
HR-137Q-E300_0	1180585	685695	NS	NA
HR-137Q-E400_0	1180585	685795	NS	NA
HR-137Q-E500_0	1180585	685895	NS	NA
HR-137Q-E600_0	1180585	685995	NS	NA
HR-137Q-W100_0	1180585	685295	NS	NA
HR-137Q-W200_0	1180585	685195	NS	NA
HR-137Q-W300_0	1180585	685095	NS	NA
HR-137Q-W400_0	1180585	684995	NS	NA
HR-137Q-W500_0	1180585	684895	NS	NA
HR-137Q-N100_0	1180685	685395	NS	NA
HR-137Q-N100_E100	1180685	685495	NS	NA
HR-137Q-N100_E200	1180685	685595	NS	NA
HR-137Q-N100_E300	1180685	685695	NS	NA
HR-137Q-N100_E400	1180685	685795	NS	NA
HR-137Q-N100_E500	1180685	685895	NS	NA
HR-137Q-N100_E600	1180685	685995	NS	NA
HR-137Q-N100_W100	1180685	685295	NS	NA
HR-137Q-N100_W200	1180685	685195	NS	NA
HR-137Q-N100_W300	1180685	685095	NS	NA
HR-137Q-N100_W400	1180685	684995	NS	NA
HR-137Q-N100_W500	1180685	684895	NS	NA
HR-137Q-N200_0	1180785	685395	NS	NA
HR-137Q-N200_E100	1180785	685495	NS	NA
HR-137Q-N200_E200	1180785	685595	NS	NA
HR-137Q-N200_E300	1180785	685695	NS	NA
HR-137Q-N200_W100	1180785	685295	NS	NA

Survey Data
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft amsl)	Top of Casing Elevation (ft amsl)
HR-137Q-N200_W200	1180785	685195	NS	NA
HR-137Q-N200_W300	1180785	685095	NS	NA
HR-137Q-N200_W400	1180785	684995	NS	NA
HR-137Q-N200_W500	1180785	684895	NS	NA
HR-137Q-N200_W600	1180785	684795	NS	NA
HR-137Q-N200_W700	1180785	684695	NS	NA
HR-137Q-N300_0	1180885	685395	NS	NA
HR-137Q-N300_E100	1180885	685495	NS	NA
HR-137Q-N300_E200	1180885	685595	NS	NA
HR-137Q-N300_E300	1180885	685695	NS	NA
HR-137Q-N300_W100	1180885	685295	NS	NA
HR-137Q-N300_W200	1180885	685195	NS	NA
HR-137Q-N300_W300	1180885	685095	NS	NA
HR-137Q-N300_W400	1180885	684995	NS	NA
HR-137Q-N300_W500	1180885	684895	NS	NA
HR-137Q-N300_W600	1180885	684795	NS	NA
HR-137Q-N300_W700	1180885	684695	NS	NA
HR-137Q-N400_0	1180985	685395	NS	NA
HR-137Q-N400_E100	1180985	685495	NS	NA
HR-137Q-N400_E200	1180985	685595	NS	NA
HR-137Q-N400_E300	1180985	685695	NS	NA
HR-137Q-N400_W100	1180985	685295	NS	NA
HR-137Q-N400_W200	1180985	685195	NS	NA
HR-137Q-N400_W300	1180985	685095	NS	NA
HR-137Q-N400_W400	1180985	684995	NS	NA
HR-137Q-N400_W500	1180985	684895	NS	NA
HR-137Q-N400_W600	1180985	684795	NS	NA
HR-137Q-N400_W700	1180985	684695	NS	NA
HR-137Q-N500_0	1181085	685395	NS	NA
HR-137Q-N500_E100	1181085	685495	NS	NA
HR-137Q-N500_E200	1181085	685595	NS	NA
HR-137Q-N500_E300	1181085	685695	NS	NA
HR-137Q-N500_W100	1181085	685295	NS	NA
HR-137Q-N500_W200	1181085	685195	NS	NA
HR-137Q-N500_W300	1181085	685095	NS	NA
HR-137Q-N500_W400	1181085	684995	NS	NA
HR-137Q-N500_W500	1181085	684895	NS	NA
HR-137Q-N500_W600	1181085	684795	NS	NA
HR-137Q-N500_W700	1181085	684695	NS	NA
HR-137Q-S080_E680	1180505	686075	NS	NA
HR-137Q-S100_0	1180485	685395	NS	NA
HR-137Q-S100_E100	1180485	685495	NS	NA
HR-137Q-S100_E200	1180485	685595	NS	NA
HR-137Q-S100_E300	1180485	685695	NS	NA
HR-137Q-S100_E400	1180485	685795	NS	NA

Survey Data
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft amsl)	Top of Casing Elevation (ft amsl)
HR-137Q-S100_E500	1180485	685895	NS	NA
HR-137Q-S100_E600	1180485	685995	NS	NA
HR-137Q-S100_W100	1180485	685295	NS	NA
HR-137Q-S100_W200	1180485	685195	NS	NA
HR-137Q-S100_W300	1180485	685095	NS	NA
HR-137Q-S100_W400	1180485	684995	NS	NA
HR-137Q-S100_W500	1180485	684895	NS	NA
HR-137Q-S200_0	1180385	685395	NS	NA
HR-137Q-S200_E100	1180385	685495	NS	NA
HR-137Q-S200_E200	1180385	685595	NS	NA
HR-137Q-S200_E300	1180385	685695	NS	NA
HR-137Q-S200_E400	1180385	685795	NS	NA
HR-137Q-S200_E500	1180385	685895	NS	NA
HR-137Q-S200_E600	1180385	685995	NS	NA
HR-137Q-S200_E685	1180385	686080	NS	NA
HR-137Q-S200_W100	1180385	685295	NS	NA
HR-137Q-S200_W200	1180385	685195	NS	NA
HR-137Q-S200_W300	1180385	685095	NS	NA
HR-137Q-S275_E575	1180310	685970	NS	NA
HR-137Q-S300_0	1180285	685395	NS	NA
HR-137Q-S300_E100	1180285	685495	NS	NA
HR-137Q-S300_E200	1180285	685595	NS	NA
HR-137Q-S300_E300	1180285	685695	NS	NA
HR-137Q-S300_E400	1180285	685795	NS	NA
HR-137Q-S300_E500	1180285	685895	NS	NA
HR-137Q-S300_E600	1180285	685995	NS	NA
HR-137Q-S300_E700	1180285	686095	NS	NA
HR-137Q-S300_W100	1180285	685295	NS	NA
HR-137Q-S300_W200	1180285	685195	NS	NA
HR-137Q-S300_W300	1180285	685095	NS	NA
HR-137Q-S300_W400	1180285	684995	NS	NA
HR-137Q-S400_0	1180185	685395	NS	NA
HR-137Q-S400_E100	1180185	685495	NS	NA
HR-137Q-S400_E200	1180185	685595	NS	NA
HR-137Q-S400_E300	1180185	685695	NS	NA
HR-137Q-S400_E400	1180185	685795	NS	NA
HR-137Q-S400_E500	1180185	685895	NS	NA
HR-137Q-S400_E600	1180185	685995	NS	NA
HR-137Q-S400_E700	1180185	686095	NS	NA
HR-137Q-S400_W100	1180185	685295	NS	NA
HR-137Q-S400_W200	1180185	685195	NS	NA
HR-137Q-S400_W300	1180185	685095	NS	NA
HR-137Q-S400_W400	1180185	684995	NS	NA
HR-137Q-S500_0	1180085	685395	NS	NA
HR-137Q-S500_E100	1180085	685495	NS	NA

Survey Data
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft amsl)	Top of Casing Elevation (ft amsl)
HR-137Q-S500_E200	1180085	685595	NS	NA
HR-137Q-S500_E300	1180085	685695	NS	NA
HR-137Q-S500_E400	1180085	685795	NS	NA
HR-137Q-S500_E500	1180085	685895	NS	NA
HR-137Q-S500_E600	1180085	685995	NS	NA
HR-137Q-S500_W100	1180085	685295	NS	NA
HR-137Q-S500_W200	1180085	685195	NS	NA
HR-137Q-S500_W300	1180085	685095	NS	NA
HR-137Q-S500_W400	1180085	684995	NS	NA
HR-137Q-S600_0	1179985	685395	NS	NA
HR-137Q-S600_E300	1179985	685695	NS	NA
HR-137Q-S600_E400	1179985	685795	NS	NA
HR-137Q-S600_W100	1179985	685295	NS	NA
HR-137Q-S600_W200	1179985	685195	NS	NA
HR-137Q-S600_W300	1179985	685095	NS	NA
HR-137Q-S700_0	1179885	685395	NS	NA
HR-137Q-S700_W100	1179885	685295	NS	NA
HR-137Q-S700_W200	1179885	685195	NS	NA
HR-137Q-S700_W300	1179885	685095	NS	NA
HR-137Q-S800_W100	1179785	685295	NS	NA

Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983.

Elevations referenced to the North American Vertical Datum of 1988.

ft amsl - Feet above mean sea level
NA - Not applicable.
NS - Not surveyed.
(SB) - Direct-push soil boring location.
(W) - Monitoring well location.

APPENDIX E

VARIANCE REPORTS

INTERNATIONAL TECHNOLOGY CORPORATION

Variance No: PARCEL137Q-XJULY2002.VR01

Linked w/NC No: x

Date of Issue: 7-16-02

Page _1 of 1__

Project Name: **Fort McClellan** – CK10

Project Number: 796887.11020300

-Variance Report -

I.Description: (by the person identifying the change)

FINAL SITE-SPECIFIC FIELD SAMPLING PLAN, FORMER 81 MILLIMETER MORTAR RANGE, PARCEL 137Q-X

The Final Site-Specific Field Sampling Plan (FSSFSP) proposed a surface soil sample, subsurface soil sample, and groundwater sample at sample location HR-137Q-MW03. Permanent residuum monitoring well HR-137Q-MW03 was moved approximately 80 feet northwest of direct-push soil boring location HR-137Q-MW03. A groundwater sample was not collected from monitoring well HR-137Q-MW03.

Identified by: Jeffrey J. Tarr, PG – IT Site Manager

Date: 7-16-02

II. Justification for Variance:

The FSSFSP proposed sample location HR-137Q-MW03 approximately 75 feet northwest and downgradient of a trench and pit. Permanent residuum monitoring well HR-137Q-MW03 was not installed at its proposed location because competent bedrock was encountered at approximately 22 feet below ground surface (bgs) and groundwater was not present. Several attempts were made to install the well, but competent bedrock was encountered. Therefore, a decision was made to move the well approximately 80 feet further northwest and downgradient of the direct-push soil boring location HR-137Q-MW03. Competent bedrock was encountered at approximately 25 feet bgs after the well was relocated and groundwater was not present. A decision was made to install the well on top of competent bedrock at that location with the intent of having groundwater enter the well screen during periods of heavy rainfall. During groundwater sampling activities groundwater was present, but not enough to collect a sample. Currently, this well is being monitored for the presence of groundwater. Should the well contain groundwater, a sample will be collected for chemical analysis.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan, Site-Specific Safety and Health Plan, and Site-Specific Unexploded Ordnance Safety Plan Attachments; Former 81 mm Mortar Range, Parcel 137Q-X, Fort McClellan, Calhoun County, Alabama, April 2002.

Distribution List:
1. Jeanne Yacoub, IT Project Manager
2. Steve Moran, IT Technical Lead
3. Jeffrey Tarr, IT Site Manager
4. Randy McBride, IT QA Officer
5. Mr. Ellis Pope, US Army Corps of Engineers
6. Mr. Ross McCollum, US Army Corps of Engineers

- Signatures -

Requested by: Jeffrey Tarr, PG - IT Site Manager Jeffrey J. Tarr 7-16-02 Date

Approved by: COE 7/17/02 Date

Project Manager Approval: Jeanne Yacoub 8/12/02 Date

QA Approval: Randall L. McBride 08-05-02 Date

INTERNATIONAL TECHNOLOGY CORPORATION	**Variance No:** PARCEL137Q-XFEBRUARY2003.VR1
	Linked w/NC No: x
	Date of Issue: 2-13-03
	Page _1 of 1__
Project Name: **Fort McClellan** – CK10	Project Number: 796887.11020300

-Variance Report -

I.Description: (by the person identifying the change)

FINAL SITE-SPECIFIC FIELD SAMPLING PLAN, FORMER 81MM MORTAR RANGE, PARCEL 137Q-X.

The Final Site-Specific Field Sampling Plan (FSSFSP) proposed a surface water sample and sediment sample at sample locations HR-137Q-SW/SD01, HR-137-SW/SD02, HR-137Q-SW/SD03, HR-137Q-SW/SD04, and HR-137Q–SW/SD05. Surface water and sediment samples were not collected at these locations. Depositional soil samples HR-137Q-DEP02, HR-137Q-DEP03, HR-137Q-DEP04, HR-137Q-DEP05, and HR-137Q-DEP06 were collected at these locations, respectively.

Identified by: Nicole Badon, Geologist	Date: 2-13-03

II. Justification for Variance:

The FSSFSP proposed a surface water sample and sediment sample at sample locations HR-137Q-SW/SD01, HR-137-SW/SD02, HR-137Q-SW/SD03, HR-137Q-SW/SD04, and HR-137Q–SW/SD05. Sample location HR-137Q-SW/SD01 was proposed in the eastern intermittent stream, south of the site investigation area and up-slope of a trench and scattered debris. Sample location HR-137Q-SW/SD02 was proposed in the eastern intermittent stream, north and down-slope of the trench. Sample location HR-137Q-SW/SD03 was proposed in the western intermittent stream, south and up-slope of the trench. Sample location HR-137Q-SW/SD04 was proposed in the western intermittent stream, north and down-slope of the trench. Sample location HR-137Q-SW/SD05 was proposed in the northern portion of the site at the convergence of the east and west intermittent stream channels. However, surface water and sediment were not present at any of these locations during sample collection. Therefore, depositional soil samples HR-137Q-DEP02, HR-137Q-DEP03, HR-137Q-DEP04, HR-137Q-DEP05, and HR-137Q-DEP06 were collected at each respective location to determine the presence or absence of contamination. This variance will not alter the scope or intent of the Site Investigation at Parcel 137Q-X.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan, Site-Specific Safety and Health Plan, and Site-Specific Unexploded Ordnance Safety Plan Attachments; Former 81mm Mortar Range, Parcel 137Q-X, Fort McClellan, Calhoun County, Alabama, April 2002.

Distribution List:
1. Jeanne Yacoub, IT Project Manager
2. Steve Moran, IT Technical Lead
3. Jeffrey Tarr, IT Site Manager
4. Randy McBride, IT QA Officer
5. Mr. Lee Coker, US Army Corps of Engineers
6. Mr. Darryl Stabile, US Army Corps of Engineers

- Signatures -

Requested by: Jeffrey Tarr, PG - IT Site Manager	2-13-2003 Date
Approved by: Stanley E. Parrott	5/8/03 Date
Project Manager Approval: Jeanne Yacoub	4/28/03 Date
QA Approval: Randy McBride	2-17-03 Date

Shaw
Shaw Environmental & Infrastructure, Inc.

Variance No: VARIANCE 137Q SW_SD March2004.VR1
Linked w/NC No:
Date of Issue: 03-08-04

Page _1 of 1__

Project Name: Fort McClellan
Project Number: 796887.15020300

-Variance Report -

I.Description: **(by the person identifying the change)**

Former 81mm Mortar Range, Parcel 137Q-X
February 2003

Change Sample designation from HR-137Q-SW/SD05 to HR-137Q-DEP07. Surface water will not be collected at this location.

Identified by: Greg W. Sylwester
Date: 03-08-04

II. Justification for Variance:

The work plan proposed a surface water sample be collected with sediment at this location. However, due to the intermittent nature of this drainage feature, surface water is present only immediately following heavy rain events. Therefore, a depositional sample will be collected in place of the proposed surface water/sediment sample.

III. Applicable Document/Work Plan: **(by the person identifying the change)**

Remedial Investigation; Site Specific Field Sampling Plan; Former 81 mm Mortar Range, Parcel 137Q-X
February 2003

Distribution List:
1. Jeanne Yacoub, Shaw Project Manager
2. Steve Moran, Shaw Principal Investigator
3. Jeffrey Tarr, Shaw Technical Lead
4. Jack Gregston, Shaw Site Manager
5. Randy McBride, Shaw QA Officer
6. Damon Young , US Army Corps of Engineers
7. Lee Coker, US Army Corps of Engineers

- Signatures -

Requested by: 22 March 2004 Date
Approved by: 29 ~~MARCH~~ APRIL 2004 Date
Project Manager Approval: 3/23/04 Date
QA Approval: 3-31-04 Date

Shaw
Shaw Environmental & Infrastructure, Inc.

Variance No: VARIANCE 137Q SW_SD March2004.VR2
Linked w/NC No:
Date of Issue: 03-08-04

Project Name: Fort McClellan
Project Number: 796887.15020300

-Variance Report -

I.Description: **(by the person identifying the change)**

Former 81mm Mortar Range, Parcel 137Q-X
February 2003

Change Sample designation from HR-137Q-SW/SD06 to HR-137Q-DEP08. Surface water will not be collected at this location.

Identified by: Greg W. Sylwester
Date: 03-08-04

II. Justification for Variance:

The work plan proposed a surface water sample be collected with sediment at this location. However, due to the intermittent nature of this drainage feature, surface water is present only immediately following heavy rain events. Therefore, a depositional sample will be collected in place of the proposed surface water/sediment sample.

III. Applicable Document/Work Plan: **(by the person identifying the change)**

Remedial Investigation; Site Specific Field Sampling Plan; Former 81 mm Mortar Range, Parcel 137Q-X
February 2003

Distribution List:
1. Jeanne Yacoub, Shaw Project Manager
2. Steve Moran, Shaw Principal Investigator
3. Jeffrey Tarr, Shaw Technical Lead
4. Jack Gregston, Shaw Site Manager
5. Randy McBride, Shaw QA Officer
6. Damon Young , US Army Corps of Engineers
7. Lee Coker, US Army Corps of Engineers

- Signatures -

Requested by: [signature] 22 March 2004 Date
Approved by: [signature] 29 ~~MARCH~~ APRIL 2004 Date
Project Manager Approval: [signature] 3/23/04 Date
QA Approval: [signature] 3-31-04 Date

Shaw
Shaw Environmental & Infrastructure, Inc.

Variance No: VARIANCE 137Q SW_SD March2004.VR3
Linked w/NC No:
Date of Issue: 03-08-04

Project Name: Fort McClellan
Project Number: 796887.15020300

-Variance Report -

I.Description: **(by the person identifying the change)**

Former 81mm Mortar Range, Parcel 137Q-X
February 2003

Change Sample designation from HR-137Q-SW/SD07 to HR-137Q-DEP09. Surface water will not be collected at this location.

Identified by: Greg W. Sylwester
Date: 03-08-04

II. Justification for Variance:

The work plan proposed a surface water sample be collected with sediment at this location. However, due to the intermittent nature of this drainage feature, surface water is present only immediately following heavy rain events. Therefore, a depositional sample will be collected in place of the proposed surface water/sediment sample.

III. Applicable Document/Work Plan: **(by the person identifying the change)**

Remedial Investigation; Site Specific Field Sampling Plan; Former 81 mm Mortar Range, Parcel 137Q-X
February 2003

Distribution List:
1. Jeanne Yacoub, Shaw Project Manager
2. Steve Moran, Shaw Principal Investigator
3. Jeffrey Tarr, Shaw Technical Lead
4. Jack Gregston, Shaw Site Manager
5. Randy McBride, Shaw QA Officer
6. Damon Young , US Army Corps of Engineers
7. Lee Coker, US Army Corps of Engineers

- Signatures -

Requested by: Jack Gregston 22 March 2004 Date
Approved by: 29 APRIL 2004 Date
Project Manager Approval: Jeanne Yacoub 3/23/04 Date
QA Approval: Randall L. McBride 3-31-04 Date