Shaw Group Inc.

KAFB Geophysical Logging QC Form

Date: 4/26/11

Project/Site: KAFB | Casing: PVC | Shaw QC GP: D. Castaneda
Location: BFF | Diameter: 5" | Logging Firm: Jet West
Hole ID: KAFB-106078 | Well Depth: 620ft | Screen Type/ Size: PVC
↳ bottom of screen @ 588.5

Tool 1 - Induction and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps) Pre-log n/a Post-log n/a
2) Induction Cal. Coil Test (cps) Pre-log (D) n/a Post-log (D) n/a
Pre-log (M) n/a Post-log (M) n/a
3) Induction Zero Test (cps) Pre-log (D) n/a Post-log (D) n/a
Pre-log (M) n/a Post-log (M) n/a

Survey Depth Information	Repeat Log Depth Information
Reference: ground surface	Reference: ground surface
Total Depth (ft): 597.34	Repeat Interval (ft): 150 → 10
Log Survey Information	**Repeat Log Survey Information**
Start Time: 1026	Start Time: 1050
Logging Speed (ft/min): 30	Logging Speed (ft/min): ~~150 → 10~~ DC 4/27 30
End Time: 1047	End Time: 1055
Start Depth/End Depth (ft): 8.53 - 8.84	Start Depth/End Depth (ft): 8.53 - 8.59
Depth Error (ft): 0.31	Depth Error (ft): 0.06

Comments: Induction tool did not work on 4/26. Had to repair tool & performed log on (4/27/11)

Tool 2 - Neutron and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps) Pre-log n/a Post-log n/a
2) Neutron Attached Source (cps) Pre-log n/a Post-log n/a
3) Neutron Removed Source (cps) Pre-log n/a Post-log n/a

Survey Depth Information	Repeat Log Depth Information
Reference: ground surface	Reference: ground surface
Total Depth (ft): 597.35	Repeat Interval (ft): 130 → 10
Log Survey Information	**Repeat Log Survey Information**
2nd log time: 1248 Start Time: 1143	Start Time: 1236
2nd log speed: 30 Logging Speed (ft/min): 30	Logging Speed (ft/min): ~~130 → 10~~ DC 4/26 30
1307 End Time: 1203	End Time: 1241
9.15 - 9.49 Start Depth/End Depth (ft): 9.15 - 9.5	Start Depth/End Depth (ft): 9.15 - 9.22
0.34 Depth Error (ft): 0.35	Depth Error (ft): 0.07

Comments: multiple bad data points coming up as errors in main log D. Walker was recording depths of errors so he could delete them and interpolate between two adjacent values. re-booted system a couple times & errors went away. re-peat log went so well that we decided to re-log main log as opposed to fixing the 70+ error points

Shaw Group Inc.

KAFB Geophysical Logging QC Form

Date: 4/27/11

Project/Site: KAFB	**Casing:** PVC	**Shaw QC GP:** D. Castaneda	
Location: just outside BFF	**Diameter:** 5"	**Logging Firm:** Jet West	
Hole ID: KAFB-106062	**Well Depth:** 616 ft	**Screen Type/ Size:** PVC	

Tool 1 - Induction and Natural Gamma Ray Logs ↳ 590ft bottom of screen

1) GR Background and Sleeve (cps)	Pre-log	n/a	Post-log	n/a
2) Induction Cal. Coil Test (cps)	Pre-log (D)	n/a	Post-log (D)	n/a
	Pre-log (M)	n/a	Post-log (M)	n/a
3) Induction Zero Test (cps)	Pre-log (D)	n/a	Post-log (D)	n/a
	Pre-log (M)	n/a	Post-log (M)	n/a

Survey Depth Information		**Repeat Log Depth Information**	
Reference:	ground surface	Reference:	ground surface
Total Depth (ft):	595.04	Repeat Interval (ft):	260 → 160
Log Survey Information		**Repeat Log Survey Information**	
Start Time:	1338	Start Time:	1402
Logging Speed (ft/min):	28	Logging Speed (ft/min):	28
End Time:	1358	End Time:	1406
Start Depth/End Depth (ft):	5.66 - 6.01	Start Depth/End Depth (ft):	5.66 - 5.81
Depth Error (ft):	0.35	Depth Error (ft):	0.15

Comments:

Tool 2 - Neutron and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps)	Pre-log	n/a	Post-log	n/a
2) Neutron Attached Source (cps)	Pre-log	n/a	Post-log	n/a
3) Neutron Removed Source (cps)	Pre-log	n/a	Post-log	n/a

Survey Depth Information		**Repeat Log Depth Information**	
Reference:	ground surface	Reference:	ground surface
Total Depth (ft):	595.56	Repeat Interval (ft):	200 → 100
Log Survey Information		**Repeat Log Survey Information**	
Start Time:	1425	Start Time:	1449
Logging Speed (ft/min):	28	Logging Speed (ft/min):	~~30~~ DG 4/27 27
End Time:	1446	End Time:	1454
Start Depth/End Depth (ft):	6.28 - 6.61	Start Depth/End Depth (ft):	6.28 - 6.39
Depth Error (ft):	0.33	Depth Error (ft):	0.11

Comments:

Shaw Group Inc.

KAFB Geophysical Logging QC Form

Date: 4/28/11

Project/Site: KAFB | Casing: PVC | Shaw QC GP: D. Castaneda
Location: just outside BFF | Diameter: 5" | Logging Firm: Jet West
Hole ID: KAFB-106081 | Well Depth: 595 ft | Screen Type/ Size: PVC
↳ bottom of screen @ 581 ft

Tool 1 - Induction and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps) Pre-log n/a Post-log n/a
2) Induction Cal. Coil Test (cps) Pre-log (D) n/a Post-log (D) n/a
Pre-log (M) n/a Post-log (M) n/a
3) Induction Zero Test (cps) Pre-log (D) n/a Post-log (D) n/a
Pre-log (M) n/a Post-log (M) n/a

Survey Depth Information	Repeat Log Depth Information
Reference: ground surface	Reference: ground surface
Total Depth (ft): 594.08	Repeat Interval (ft): 260 → 140

Log Survey Information	Repeat Log Survey Information
Start Time: 1116	Start Time: 1142
Logging Speed (ft/min): 29	Logging Speed (ft/min): 29
End Time: 1137	End Time: 1146
Start Depth/End Depth (ft): 5.57 - 5.92	Start Depth/End Depth (ft): 5.57 - 5.79
Depth Error (ft): 0.35	Depth Error (ft): ~~0.0~~ DG 4/12 0.22

Comments:

Tool 2 - Neutron and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps) Pre-log n/a Post-log n/a
2) Neutron Attached Source (cps) Pre-log n/a Post-log n/a
3) Neutron Removed Source (cps) Pre-log n/a Post-log n/a

Survey Depth Information	Repeat Log Depth Information
Reference: ground surface	Reference: ground surface
Total Depth (ft): 594.33	Repeat Interval (ft): 120 → 10

Log Survey Information	Repeat Log Survey Information
Start Time: 1027	Start Time: 1051
Logging Speed (ft/min): 29	Logging Speed (ft/min): 28
End Time: 1049	End Time: 1055
Start Depth/End Depth (ft): 6.19 - 6.59	Start Depth/End Depth (ft): 6.19 - 6.27
Depth Error (ft): 0.4	Depth Error (ft): 0.08

Comments:

Shaw Group Inc.

KAFB Geophysical Logging QC Form

Date: 4/28/11

Project/Site: KAFB | Casing: PVC | Shaw QC GP: D. Castaneda
Location: Site trailer by BFI | Diameter: 5" | Logging Firm: Jet West
Hole ID: KAFB-106061 | Well Depth: 603 ft | Screen Type/ Size: PVC

↳ 588.2 ft bottom of screen

Tool 1 - Induction and Natural Gamma Ray Logs

PM check

1) GR Background and Sleeve (cps) Pre-log n/a Post-log 57 + 148
2) Induction Cal. Coil Test (cps) Pre-log (D) n/a Post-log (D) 4422
Pre-log (M) n/a Post-log (M) 7076
3) Induction Zero Test (cps) Pre-log (D) n/a Post-log (D) 905
Pre-log (M) n/a Post-log (M) 1102

Survey Depth Information		Repeat Log Depth Information	
Reference:	ground surface	Reference:	ground surface
Total Depth (ft):	593.13	Repeat Interval (ft):	200 → 100
Log Survey Information		**Repeat Log Survey Information**	
Start Time:	1445	Start Time:	1509
Logging Speed (ft/min):	29	Logging Speed (ft/min):	29
End Time:	1505	End Time:	1512
Start Depth/End Depth (ft):	8.53 - 8.88	Start Depth/End Depth (ft):	8.53 - 8.63
Depth Error (ft):	0.35	Depth Error (ft):	0.10

Comments:

Tool 2 - Neutron and Natural Gamma Ray Logs

PM check

1) GR Background and Sleeve (cps) Pre-log n/a Post-log 47.6 + 150
2) Neutron Attached Source (cps) Pre-log n/a Post-log 347
3) Neutron Removed Source (cps) Pre-log n/a Post-log 0.1

Survey Depth Information		Repeat Log Depth Information	
Reference:	ground surface	Reference:	ground surface
Total Depth (ft):	593.33	Repeat Interval (ft):	180 → ~~60~~ 45
Log Survey Information		**Repeat Log Survey Information**	
Start Time:	1530	Start Time:	1553
Logging Speed (ft/min):	28.9	Logging Speed (ft/min):	29
End Time:	1550	End Time:	1558
Start Depth/End Depth (ft):	9.15 - 9.39	Start Depth/End Depth (ft):	9.15 - 9.26
Depth Error (ft):	0.24	Depth Error (ft):	0.11

Comments:

Shaw Group Inc.

KAFB Geophysical Logging QC Form

Date: 4/29/11

Project/Site: KAFB | Casing: PVC | Shaw QC GP: D. Castaneda
Location: National | Diameter: 5" | Logging Firm: Jet West
Hole ID: KAFB-106048 | Well Depth: 564 ft | Screen Type/ Size: PVC
↳ bottom of screen @ 550 ft

Tool 1 - Induction and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps)	Pre-log n/a	Post-log n/a
2) Induction Cal. Coil Test (cps)	Pre-log (D) n/a	Post-log (D) n/a
	Pre-log (M) n/a	Post-log (M) n/a
3) Induction Zero Test (cps)	Pre-log (D) n/a	Post-log (D) n/a
	Pre-log (M) n/a	Post-log (M) n/a

Survey Depth Information	Repeat Log Depth Information
Reference: ground surface	Reference: ground surface
Total Depth (ft): 556.63	Repeat Interval (ft): 260 → 140
Log Survey Information	**Repeat Log Survey Information**
Start Time: 1259	Start Time: 1323
Logging Speed (ft/min): 28	Logging Speed (ft/min): 29
End Time: 1319	End Time: 1327
Start Depth/End Depth (ft): 8.53 - 8.82	Start Depth/End Depth (ft): 8.53 - 8.64
Depth Error (ft): 0.29	Depth Error (ft): 0.11

Comments:

Tool 2 - Neutron and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps)	Pre-log n/a	Post-log n/a
2) Neutron Attached Source (cps)	Pre-log n/a	Post-log n/a
3) Neutron Removed Source (cps)	Pre-log n/a	Post-log n/a

Survey Depth Information	Repeat Log Depth Information
Reference: ground surface	Reference: ground surface
Total Depth (ft): 556.71	Repeat Interval (ft): 250 → 140
Log Survey Information	**Repeat Log Survey Information**
Start Time: 1208	Start Time: 1233
Logging Speed (ft/min): 28	Logging Speed (ft/min): 29
End Time: 1228	End Time: 1237
Start Depth/End Depth (ft): 9.15 - 9.46	Start Depth/End Depth (ft): 9.15 - 9.28
Depth Error (ft): 0.31	Depth Error (ft): 0.13

Comments:

Shaw Group Inc.

KAFB Geophysical Logging QC Form

Date: 4/30/11

Project/Site: KAFB	**Casing:** PVC	**Shaw QC GP:** D. Castaneda
Location: San Pedro Way	**Diameter:** 3"	**Logging Firm:** Jet West
Hole ID: KAFB-106141	**Well Depth:** 458 ft	**Screen Type/ Size:** PVC

Tool 1 - Induction and Natural Gamma Ray Logs ↳ bottom of screen @ 450 ft

1) GR Background and Sleeve (cps) Pre-log n/a Post-log n/a

2) Induction Cal. Coil Test (cps) Pre-log (D) n/a Post-log (D) n/a

Pre-log (M) n/a Post-log (M) n/a

3) Induction Zero Test (cps) Pre-log (D) n/a Post-log (D) n/a

Pre-log (M) n/a Post-log (M) n/a

Survey Depth Information	**Repeat Log Depth Information**
Reference: ground surface	Reference: ground surface
Total Depth (ft): 450.5	Repeat Interval (ft): 260 → 140
Log Survey Information	**Repeat Log Survey Information**
Start Time: 1239	Start Time: 1258
Logging Speed (ft/min): 29	Logging Speed (ft/min): 29
End Time: 1254	End Time: 1302
Start Depth/End Depth (ft): 8.53 - 8.77	Start Depth/End Depth (ft): 8.53 - 8.62
Depth Error (ft): 0.24	Depth Error (ft): 0.09

Comments:

Tool 2 - Neutron and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps) Pre-log n/a Post-log n/a

2) Neutron Attached Source (cps) Pre-log n/a Post-log n/a

3) Neutron Removed Source (cps) Pre-log n/a Post-log n/a

Survey Depth Information	**Repeat Log Depth Information**
Reference: ground surface	Reference: ground surface
Total Depth (ft): 450.57	Repeat Interval (ft): 250 → 135
Log Survey Information	**Repeat Log Survey Information**
Start Time: 1320	Start Time: 1340
Logging Speed (ft/min): 27	Logging Speed (ft/min): 29
End Time: 1336	End Time: 1344
Start Depth/End Depth (ft): 9.15 - 9.38	Start Depth/End Depth (ft): 9.15 - 9.23
Depth Error (ft): 0.23	Depth Error (ft): 0.08

Comments:

Shaw Group Inc.

KAFB Geophysical Logging QC Form

Date: 4/30/11

Project/Site: KAFB
Location: San Pedro Way
Hole ID: KAFB-106084

Casing: PVC
Diameter: 5"
Well Depth: 590 ft

Shaw QC GP: D. Castañeda
Logging Firm: Jet West
Screen Type/ Size: PVC
↳ bottom of screen @ 581 ft

Tool 1 - Induction and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps)	Pre-log	n/a	Post-log (PM check)	52 & 148
2) Induction Cal. Coil Test (cps)	Pre-log (D)	n/a	Post-log (D)	4462
	Pre-log (M)	n/a	Post-log (M)	7033
3) Induction Zero Test (cps)	Pre-log (D)	n/a	Post-log (D)	903
	Pre-log (M)	n/a	Post-log (M)	1050

Survey Depth Information		Repeat Log Depth Information	
Reference:	ground surface	Reference:	ground surface
Total Depth (ft):	584.49	Repeat Interval (ft):	280 → 140
Log Survey Information		**Repeat Log Survey Information**	
Start Time:	1524	Start Time:	1548
Logging Speed (ft/min):	30	Logging Speed (ft/min):	27
End Time:	1544	End Time:	1552
Start Depth/End Depth (ft):	8.53 - 8.80	Start Depth/End Depth (ft):	8.53 - 8.69
Depth Error (ft):	0.27	Depth Error (ft):	0.16

Comments:

Tool 2 - Neutron and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps)	Pre-log	n/a	Post-log (PM check)	49 & 147
2) Neutron Attached Source (cps)	Pre-log	n/a	Post-log	347
3) Neutron Removed Source (cps)	Pre-log	n/a	Post-log	0.2

Survey Depth Information		Repeat Log Depth Information	
Reference:	ground surface	Reference:	ground surface
Total Depth (ft):	584.84	Repeat Interval (ft):	280 → 160
Log Survey Information		**Repeat Log Survey Information**	
Start Time:	1417	Start Time:	1440
Logging Speed (ft/min):	29	Logging Speed (ft/min):	30
End Time:	1436	End Time:	1444
Start Depth/End Depth (ft):	9.15 - 9.5	Start Depth/End Depth (ft):	9.15 - 9.32
Depth Error (ft):	0.35	Depth Error (ft):	0.17

Comments:

Shaw Group Inc.

KAFB Geophysical Logging QC Form

Date: 5/1/11

Project/Site: KAFB | Casing: PVC | Shaw QC GP: D. Castaneda
Location: San Pedro Way | Diameter: 3" | Logging Firm: Jet West
Hole ID: KAFB-106142 | Well Depth: 459 ft | Screen Type/ Size: PVC/10ft

Tool 1 - Induction and Natural Gamma Ray Logs — AM check → bottom of screen @ 450 ft

1) GR Background and Sleeve (cps)	Pre-log	62 & 157	Post-log	n/a
2) Induction Cal. Coil Test (cps)	Pre-log (D)	4626	Post-log (D)	n/a
	Pre-log (M)	7169	Post-log (M)	n/a
3) Induction Zero Test (cps)	Pre-log (D)	920	Post-log (D)	n/a
	Pre-log (M)	1122	Post-log (M)	n/a

Survey Depth Information		**Repeat Log Depth Information**	
Reference:	ground surface	Reference:	ground surface
Total Depth (ft):	450.13	Repeat Interval (ft):	450 → 340
Log Survey Information		**Repeat Log Survey Information**	
Start Time:	0821	Start Time:	0842
Logging Speed (ft/min):	29	Logging Speed (ft/min):	29
End Time:	0837	End Time:	0846
Start Depth/End Depth (ft):	8.53 - 8.83	Start Depth/End Depth (ft):	8.53 - 8.81
Depth Error (ft):	0.30	Depth Error (ft):	0.28

Comments:

Tool 2 - Neutron and Natural Gamma Ray Logs — AM check

1) GR Background and Sleeve (cps)	Pre-log	52 + 152	Post-log	n/a
2) Neutron Attached Source (cps)	Pre-log	344	Post-log	n/a
3) Neutron Removed Source (cps)	Pre-log	0.15	Post-log	n/a

Survey Depth Information		**Repeat Log Depth Information**	
Reference:	ground surface	Reference:	ground surface
Total Depth (ft):	450.14	Repeat Interval (ft):	120 → 10
Log Survey Information		**Repeat Log Survey Information**	
Start Time:	0919	Start Time:	~~1036~~ DG 5/1/11 0936
Logging Speed (ft/min):	30	Logging Speed (ft/min):	30
End Time:	0933	End Time:	~~1040~~ DG 5/1/11 0940
Start Depth/End Depth (ft):	9.15 - 9.41	Start Depth/End Depth (ft):	9.15 - 9.73
Depth Error (ft):	0.26	Depth Error (ft):	0.08

Comments:

Shaw Group Inc.

KAFB Geophysical Logging QC Form

Date: 5/1/11

Project/Site: KAFB | Casing: PVC | Shaw QC GP: D. Castaneda
Location: VA parking lot | Diameter: 5" | Logging Firm: Jet West
Hole ID: KAFB - 106098 | Well Depth: 559 | Screen Type/ Size: PVC / 15 ft
↳ bottom of screen @ 546 ft

Tool 1 - Induction and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps) Pre-log n/a Post-log n/a
2) Induction Cal. Coil Test (cps) Pre-log (D) n/a Post-log (D) n/a
Pre-log (M) n/a Post-log (M) n/a
3) Induction Zero Test (cps) Pre-log (D) n/a Post-log (D) n/a
Pre-log (M) n/a Post-log (M) n/a

Survey Depth Information	**Repeat Log Depth Information**
Reference: ground surface	Reference: ground surface
Total Depth (ft): 551.27	Repeat Interval (ft): 160 → 10
Log Survey Information	**Repeat Log Survey Information**
Start Time: 1104	Start Time: 1125
Logging Speed (ft/min): 30	Logging Speed (ft/min): 30
End Time: 1123	End Time: 1130
Start Depth/End Depth (ft): 8.53 - 8.87	Start Depth/End Depth (ft): 8.53 - 8.64
Depth Error (ft): 0.34	Depth Error (ft): 0.11

Comments:

Tool 2 - Neutron and Natural Gamma Ray Logs

1) GR Background and Sleeve (cps) Pre-log n/a Post-log n/a
2) Neutron Attached Source (cps) Pre-log n/a Post-log n/a
3) Neutron Removed Source (cps) Pre-log n/a Post-log n/a

Survey Depth Information	**Repeat Log Depth Information**
Reference: ground surface	Reference: ground surface
Total Depth (ft): 551.55	Repeat Interval (ft): 150 → 10
Log Survey Information	**Repeat Log Survey Information**
Start Time: 1024	Start Time: 1045
Logging Speed (ft/min): 30	Logging Speed (ft/min): 30
End Time: 1042	End Time: 1050
Start Depth/End Depth (ft): 9.15 - 9.42	Start Depth/End Depth (ft): 9.15 - 9.25
Depth Error (ft): 0.27	Depth Error (ft): 0.1

Comments:

Shaw Group Inc.

KAFB Geophysical Logging QC Form

Date: 5/1/11

Project/Site: KAFB
Location: VA parking lot
Hole ID: KAFB – 106138

Casing: PVC
Diameter: 3"
Well Depth: 457 ft ↳ bottom of screen @ 450ft

Shaw QC GP: D. Castaneda
Logging Firm: Jet West
Screen Type/ Size: PVC/10ft

Tool 1 - Induction and Natural Gamma Ray Logs

PM check

1) GR Background and Sleeve (cps) Pre-log n/a Post-log 45 & 138

2) Induction Cal. Coil Test (cps) Pre-log (D) n/a Post-log (D) 4552
Pre-log (M) n/a Post-log (M) 7088

3) Induction Zero Test (cps) Pre-log (D) n/a Post-log (D) 910
Pre-log (M) n/a Post-log (M) 1068

Survey Depth Information		Repeat Log Depth Information	
Reference:	ground surface	Reference:	ground surface
Total Depth (ft):	449.27	Repeat Interval (ft):	300 → 190

Log Survey Information		Repeat Log Survey Information	
Start Time:	1504	Start Time:	1523
Logging Speed (ft/min):	28	Logging Speed (ft/min):	28
End Time:	1519	End Time:	1527
Start Depth/End Depth (ft):	8.53 – 8.81	Start Depth/End Depth (ft):	8.53 – 8.69
Depth Error (ft):	0.28	Depth Error (ft):	0.16

Comments:

Tool 2 - Neutron and Natural Gamma Ray Logs

PM check

1) GR Background and Sleeve (cps) Pre-log n/a Post-log 43 & 147

2) Neutron Attached Source (cps) Pre-log n/a Post-log 339

3) Neutron Removed Source (cps) Pre-log n/a Post-log 0.4

Survey Depth Information		Repeat Log Depth Information	
Reference:	ground surface	Reference:	ground surface
Total Depth (ft):	449.44	Repeat Interval (ft):	120 → 10

Log Survey Information		Repeat Log Survey Information	
Start Time:	1359	Start Time:	~~1416~~ DC 5/1 1423
Logging Speed (ft/min):	30	Logging Speed (ft/min):	28
End Time:	1414	End Time:	~~1420~~ DC 5/1 1427
Start Depth/End Depth (ft):	9.15 – 9.52	Start Depth/End Depth (ft):	9.15 – ~~9.26~~ DC 5/1 9.25
Depth Error (ft):	0.37	Depth Error (ft):	~~0.11~~ DC 5/1 0.10

Comments: had to re-do repeat section b/c file did not record log.