Appendix C

Observation Logs of Borehole Videotapes of Water Wells

Owner	Address	Date of Borehole Video	Page
Cloninger	7780 Bainbridge Rd	12-01-09	C - 2
Pierce	8139 Bainbridge Rd	04-15-10	C - 4
Police Station	8353 Bainbridge Rd	10-15-09	C - 7
Adams	17820 English Dr	05-14-09 04-01-10	C - 9 C - 13
Stover	17860 English Dr	09-02-09	C - 16
Burns	17888 English Dr	09-03-09	C - 18
Szabo	17904 English Dr	04-01-10	C -22
Maguire	17925 English Dr	04-15-10	C - 24
Cooper	17954 English Dr	09-02-09	C - 26
Payne (new)	17975 English Dr	12-01-09	C - 28
Payne (old)	17975 English Dr	12-01-09	C - 30
Jordan	17990 English Dr	01-11-08 03-17-08 09-02-09	C - 33 C - 36 C - 38
Czernicki	17995 English Dr	12-01-09	C - 41
Johnson	17926 Kingswood Dr	03-17-08 09-03-09	C - 43 C - 44
Calo	17969 Kingswood Dr	01-11-08 10-15-09	C - 47 C - 49
de Gaetano	17971 Kingswood Dr	03-17-08 09-02-09	C - 51 C - 53
McGee	7859 Scotland Dr	10-15-09	C - 57
Buddenhagen	7897 Scotland Dr	05-14-09 12-01-09	C - 60 C - 63
Mechler	7898 Scotland Dr	04-01-10	C - 65
Mowery	7915 Scotland Dr	09-03-09	C - 67
Komocki	7950 Scotland Dr	03-17-08 09-02-09	C - 69 C - 70
Kukoleck	7969 Scotland Dr	03-17-08 12-01-09	C - 74 C - 77
Bastifell	7981 Scotland Dr	10-15-09	C - 79
Kobella	Chester Township	11-15-09	C - 81
Roller	Chester Township	05-14-09	C - 83

Borehole Videotape Observation Log

Date: 12-1-09 Page 1 of 2

Address: 7780 Bainbridge Road	**Property owner:** Cloninger
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TB & TT	• Owner reports well has had gas for many, many years prior to English well overpressurization
Video interpreter: ~~ES~~ Bair	• spider eggs, webs
Video datum: ground | top of tripod | other	• lots of bacteria colonies (white)
Type of casing: (steel) | PVC	• pump set in Berea Ss.
Diameter of casing (in):	• many high angle fractures/joints
Depth to pitless adapter (ft):	• GS @ 92, 105, 108 and 116.5 & 120'
Depth to water (ft): 72.6	• terrible bacteria in upper part of well
Condition of casing: good | bad | (ugly)	• 5' drawdown after 20 mins pumping @ 13gpm (Q_t = 260 gals)
Length of casing (ft): 52.7	• more gbs & another GS could be below pump in Berea, not seen when pump was on.
Centralizers / torque arrestors: yes | no	Elev = 1023'
Depth to pump (ft): 128	
Depth of videotape (ft): 138	
Reach borehole bottom: (yes) | no	
ODNR well log number: none	
County well log number: none	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip # 1 Pumping rate, when pump on (gpm):

Depth (ft)	Time (min)	Feature	Comments
7.0	3:30		First casing joint
30	4:20		bacteria colonies (white) → disgusting
36	4:40		" " "
52.7	5:45		bottom of casing – high corroded % w/ bact.
72.6	7:50	WL	water level → pump off
80		V	bacteria coating walls
83		V	" " "
84		BP V	centralizer, big BP
90	9:20	gbs	
92		V gbs	shale
95.7		BP	no gbs
87			ASCENDING
			DESCENDING

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Page 2 of 2

Trip # 1 Pumping rate when pump on (gpm): 13

	Depth (ft)	Time (min)	Feature	Comments
	95	11:50	BP	no gbs
	102	12:30	V	
	105.1	12:44	BP	
	119	13:30	BP	
	126	13:55		centralizer
	128.4		V	Pump, top
	129		BP	
	130	14:25		bottom of pump
	134		Ss	~~Shale~~ Berea sandstone
	138	15:05	V V	bottom of well, shale
4	92	15:55 GS		ASCENDING
	99		gbs	a few small gbs
	86		gbs	
	72.7	19:52	WL	gbs
		21:00		Pump on
				DESCENDING
	73.7	21:20	gbs WL	rolling
	75	21:34	gbs	camera submersed
	80	22:30	gbs	gbs bouncing off walls
	85		gbs	centralizer
	90	23:30	gbs	rolling
	95	23:50	gbs	rolling
	100	24:15	gbs	" "
1	105	24:40	GS BP	rolling less below 106
2	108.9	25:00	GS BP	(lower right)
	110	25:28	gbs	few gbs but still rolling
	115	26:03	gbs	much slower rolling
3	116.5	26:20	GS	right side & left deepest
	116.9	27:00		no gbs, camera below, GS → not yet
5	117-118-119	27:50	1 gb	isolated small gbs
	120		BP gbs	big BP, top of Berea Ss., no gbs below 121'
	123	28:30	Ss	
	126.5	28:50		centralizer, top of pump
		28:55		ASCENDING
3	116.5	29:25	GS BP	
2	110		GS BP	
1	105.4	30:30	GS BP	
	100	32:03	gbs	Rolling
	90	32:24	gbs	" "
	79.5	32:45	WL	" "
	~80	41:45	WL	" "
				ASCENDING 45:50 out of well

GS gbs seen on ascension, too many to identify 92 as GS on descension w/ pump on

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 4-15-10 Page 1 of 3

Address: 8139 Bainbridge Rd.	Property owner: PIERCE
City / Township: Bainbridge	County: Geauga
Latitude:	Longitude:

Camera (new) | old	Comments:
Camera operators: TB & TT	• Cuyahoga Sh | Berea Ss contact at 173'
Video interpreter: ~~TS~~ Bair	• Much bacteria between 45-150'
Video datum: ground | top of tripod | (other)	• GS zone in Berea Ss @193'-184'
Type of casing: (steel) | PVC	• gbs rising from debris at bottom of well ⇒ deeper GS below bottom of well
Diameter of casing (in):	• Berea Ss top @ ~ 910'
Depth to pitless adapter (ft):	• well pumped down completely, dry
Depth to water (ft): 124	
Condition of casing: good | bad | ugly	Basement well w/ jet pump
Length of casing (ft): 43.5	GROUND ELEV = 1100'
Centralizers / torque arrestors: (yes) | no	Video elev = 1095.5'
Depth to pump (ft): 195	
Depth of videotape (ft): 210.4	
Reach borehole bottom: (yes) | no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip # ___ no pumping Pumping rate, when pump on (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
~~3505~~	3:08		Re-setting depth counter room LEL=0.3% w. LEL=100%
	3:38		Descending ⇒ sealed shut for yrs.
43.5	6:05		Bottom of casing in Sharon Ss.
45.0		BP	Shale, bacteria
54.3			Water cascading along borehole walls
59.3	7:50		Rock pop out
63.9		BP	Bacteria on walls
68.9	8:48	BP	" " "
79.5	9:50		Rock pop out
83.0	10:10	BP	White colonies of bacteria on walls
93.4	11:23	BP	More water cascading, white bact. colon.
108	12:51		Bacteria
114.6		BP	Even more water cascading down walls

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

→ 101.3 — Ss

Pierce 4-15-10

Page 2 of 3

Trip #___ no pumping Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
124.2	15:00	WL	no gbs breaking water surface
124.6	15:40	no gbs	Camera below WL, lots of bacteria
130.2	16:23	" "	Shale
134.4	17:03	V	Shale
137		no gbs	Shale
144	18:18	gb	One gb
150	18:39		Centralizer
157	19:30		Shale, much less bacteria below central.
163	20:05		Siltstone
173.2		Big BP	Contact Cuya/ Berea Ss.
177.7	21:00	Ss	no gbs
183.3	21:33	Ss	no gbs
188		Ss	
195	23:00		top of pump
196.6		no gbs	pump
			ASCENDING
185.5		BP	
180	24:58	Ss	
179		V	
173		Big BP	Contact Cuya Sh/ Berea Ss
167			Shale
163			Siltstone
158	28:41	no gbs	Shale
155			Shale
150			Much bacteria
140	30:08	no gbs	Bacteria
130	30:50		Bacteria, cloudy water
124	31:10	no gbs	WL
123.4	33:05		DESCENDING pump on
129	33:35	no gbs	Camera below WL, cloudy water
132	34:09	"	" " " "
144	35:06	"	" " " "
150	35:30	"	Centralizer
152	36:39	"	Camera below WL, cloudy
155.9	37:00	"	" " "
170	37:58	"	" " " Cuyahoga Sh
176	38:35	"	" " " Berea Ss
178.8	38:45	gbs	Very fine gbs (lots!)

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone St = siltstone WL = water level in well

Pierce 4-15-10

Page 3 of 3

Trip #___ pumping Pumping rate when pump on (gpm): 10gpm

Depth (ft)	Time (min)	Feature	Comments
184	39:07	GS gbs	Very fine
193.6	39:50	GS gbs	Gobs of very fine gbs on right side
192.9		GS gbs	" " " " " "
195	40:25	GS gbs	Top of pump in view gbs
196	41:02	gbs	Top of pump
199			Below pump
207		gbs	
210.4	42:29	gbs	Bottom of borehole (large, individual gbs)
209.4	43:08	gbs	" " " , large individual gbs
209.6	44:20	gbs	" " " " " "
			ASCENDING pump off WL @ pump well dry
198	46:29	gbs	Bottom of pump
195	47:45	gbs	Top of pump
190.7	49:03	WL	murky water
175.4	57	WL	
50	1:17		
	1:21		out of borehole Room LEL = 0% Wellhead LEL = 0.5%
			done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 10-15-09 Page 1 of 2

Address: 8353 Bainbridge Road	**Property owner:** Police Dept.
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TT/TB	• Gas source beds at 172' → Cuyahoga; 226' → Cuya/Berea contact
Video interpreter: ESBair	• Enormous pump is damaging well — rocks (shale) spalling off sides onto pump, pump so strong a vortex is made
Video datum: (ground) | top of tripod | other	• Letters from Ohio EPA in 2004 & 2007 warn of natural gas in well
Type of casing: (steel) | PVC	ELEV = 1143'
Diameter of casing (in): large	
Depth to pitless adapter (ft):	
Depth to water (ft):	
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 138	
Centralizers / torque arrestors: yes | no	
Depth to pump (ft): 250	
Depth of videotape (ft): 250	
Reach borehole bottom: yes | (no)	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip # Pump off — Pumping rate, when pump on (gpm):

Depth (ft)	Time (min)	Feature	Comments
138			Bottom of casing
140		BP Sh	Shale
143		V	Giant vug (cavern) in sidewall
147		BP	
148		BP	
154		BP	Big
164		WL	1 gb
166		BP V	vug — cavern
169		BP	void — vug
173		V	
175		V	
178		V Sh	Shale
208			Rock lodged sideways in borehole

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Police Dept. (10-15-09)

Trip #___ Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
227		BP	Giant opening — Contact Cuya/Berea
228		BP	Ss
230		BP	Ss
241		BP	
242		BP	
243		BP	
248			Another rock lodged in borehole
250			Top of pump
			ASCENDING
			DESCENDING (pump on)
166		gbs	
170		gbs	steady stream
172		GS	Source opening upper left side
173		gbs	very murky water, gas bubbles going past camera
162		gbs	Rising gas bubbles raising WL, like fart on a beer
196		gbs	very murky view
202		gbs	" " "
219		gbs	" " "
223		gbs	" " "
226-227		BP GS	view cleared, vortex of rock debris moving down past pump, gas moving up → AMAZING, overpumping, well pump is too big!
226		GS	
240			Vortex, no gbs
247			Rock lodged
247.8			Big rock in borehole
			ASCENDING
			done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 5-14-09 Page 1 of 4

Address: 17820 English	**Property owner:** ADAMS
City / County: Bainbridge Twp, Geauga	**Well location map:**
Latitude:	
Longitude:	
Camera: (new) | old	
Camera operators: TB&TT	
Video interpreter: ESBair	
Video datum: ground | top of casing | other	
Type of casing: (steel) | PVC	**Comments:** • Spider eggs at top of well • Highly rusted casing, flaking off • Casing deeply pitted • Casing above WL is a bacteria incubator → awful
Diameter of casing (in):	
Length of casing stickup (ft):	
Depth to pitless adapter (ft): 2.9	
Depth to water (ft): 131	
Condition of casing: good | bad | (ugly).	
Length of casing (ft): Can't tell: bacteria	
Centralizers / torque arrestors: yes | no	
Depth to pump (ft): never seen >278	
Depth of well (ft):	
ODNR well log: (yes) | no 1994	
ODNR well log number: 78164	
Reported casing length (ft): 97	
Reported depth of well (ft): 300	ELEV = 1115'

Trip # 1 (downhole) / uphole Pump: on (off) Pumping rate (gpm):___

Depth (ft)	Time (min)	Feature	Comments
53.7	5:30		Casing rusted + bacteria
96	8:15		Lens covered, no view
95	9:20		Several types of bacteria; gray, black, white.
96.4	10:50		Black anoxic zone, white mounds of bacteria
110.6	12:40		Bacteria-rich → No.
129.7	15:20		Can see down to WL through bacteria
130.9	16:13	WL	Water level
136	17:00		Below WL, water turbid w/ bacteria
143	17:52	gb	Can't see borehole or casing walls
147.7	18:25		Murky water, bacteria-laden
162	19:00		Camera is peeling bacteria layers off drop pipe

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Adams

Page 2 of 4

Trip # 1 (downhole) uphole Pump: (on) off Pumping rate (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
171	21:35		Bacteria "tent" across borehole
182	23:00		Obstruction in borehole (centralizer or pump)
			- Too much bacteria to tell
~~191~~	~~24:35~~		- Centralizer - got past it
191	24:50		Borehole slightly cleaner below centralizer
201	25:50		Centralizer
207–206	27:00		~~Passage~~ Borehole walls covered w/ bacteria
			ASCENDING
206.4	32:00		Can't assess bedrock lithology because of
130.7	35:20	WL	thick bacteria build up on walls
0	40:30		Camera out of well to clean lens
0	40:50		DESCENDING
110.6	45:20		Lots of cascading water from
111			Odd bacterial ~~extension~~ into borehole wall
128.3	47:35	WL	Borehole walls covered w/ bacteria
126	54:30		Pump on
134	56:22	WL	Rapid WL decline, lots of bacteria colonies
143.6	59:50	WL	Cascading water on wall
154.2	1:06:35	WL	Nasty-looking water
164.6	1:14:35	WL	Bacteria sluffing off walls into water
166.0	1:16:00	WL	Water dripping off lens, cascading water
169.7	1:19:00	WL	Great sluffing of bacteria mat into water
170.6	1:20:00	WL	More sluffing
174.0	1:22:35	WL	
184.5	1:33:37	WL	Still no gbs since pump has been on
188.6	1:38:30	WL	Bubbles on water surface, not gbs: froth
			from bacteria & organic material, no
			bubbles rising from below, lack
			pressure to pop. Gbs pop.
194.0	1:46:10	WL	No gbs seen yet
197	1:50	WL	Small bubbles from cascading water. No pop.
200.2	1:56:15	WL	Water dripping off camera lens Froth
201.9	1:59:00	WL	Water dripping off lens.
202.8	1:59:25		Camera dunked below WL, no gbs seen yet
	2:03:55		END of file
205.6	0:00:05	WL	BEGIN second file
206.8	2:22		Camera dunked below WL, no gbs yet
207.5	4:57	WL	Bubbles sliding down discharge pipe to WL,
			these are not gbs

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Adams

Page 3 of 4

Trip # 1 (downhole) uphole Pump: (on) off Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
211.5	11:30	WL	
214.7	19:50	WL	
220.8	32:20	WL	SOS, cascading water, froth, no gbs
222.7	42:30	WL	
226.0	43:10		Camera below WL, murky, no gbs
230.2	43:50		Bacterial tent, broken through
238.2	45:50		Murky water, some mechanical attachment on pipe (pump? no, pipe—murky)
245	46:45		SOS
255	47:43		SOS
258	48:00		Bacteria blob
		ASCENDING	
239.9		DESCENDING	
		ASCENDING / DESCENDING	
228.6	52:10	WL	
231.1	59:20		Gross bacterial slime sinking into WL
232.2	1:01:20	gbs	Finally, small bit present? (surface cell)?
232.1		WL	
234	1:06:20		Camera diving below WL
246	1:07:25		Rising camera, murky, walls covered w/ bacteria
239.3	1:08:25		Lowering camera
244.3	1:09:42	gb	Single bubble, large
255	1:12:30		Murky, much bacteria
256	1:13:00		Odd device on discharge pipe
257.7	1:13:25		Bacterial blob on centralizer?
265	1:16		
275	1:16:47		
		ASCENDING	
237.9	1:19:20	WL	
238	1:21:00	gbs	Tiny ones rising while bacteria falls (sinks to pump)?
241	1:25	gbs	" " " " "
246.4	1:29:15	gb	large one, upper left
246	1:30:21	WL	
247.3	1:31:00	gb	Upper left
248.3	1:31:35	gbs	" "
249.2	1:33	gbs	" " larger
250.7	1:34	gbs	Behind discharge pipe → several
251.2	1:35	gbs	Right side
251.1	1:35:30	WL	
252.2	1:36:50	WL	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Page 4 of 4

Trip # 1 (downhole) / uphole Pump: (on) / off Pumping rate (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
255.2	1:37:40	gbs	Bacteria blob
257.1	1:39:15	gbs	
257.7	1:39:30		Big bacteria blob
259.2	1:40	gbs	Shale-looking bedrock w/ ribbing seen under bacterial coating
266.7	1:42:4	gbs	
272.9	1:43:50	gbs	
275.7	1:44	gbs	
			ASCENDING
256.4	1:45	WL	
			DESCENDING
276.2	1:46:57		Bacterial blob across borehole
276.2	1:48:02	gbs	
276.2	1:48:16	gbs	Big gas release, built up under "tent" of bacteria
276.8	1:50:40	gbs	Moving up through bacterial "tent"
277	1:51	gbs	Using camera to poke through "tent" releases lots of gas
			ASCENDING
258.8	1:53:15	WL	
			DESCENDING
276.4	1:54:35	gbs	Lots of gas bubbles
278.5	1:55:15		Clear image for a few seconds
276.6	1:59:50	gbs	Lots, big bubbles
	2:01:30		ASCENDING
256.1	2:02:35	WL	
			# END #

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Borehole Videotape Observation Log

Date: 4-1-2010 Page 1 of 3

Address: 17820 English Dr.	**Property owner:** Adams
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TB & TT	• Wellbore cleared & brushed previous day
Video interpreter: ES Bair	• One GS bed BP found at 152.3', much, much higher than in previous video
Video datum: (ground) | top of tripod | other	• GS in Cuyahoga Sh.
Type of casing: (steel) | PVC	• Top of Berea ≈ 204'
Diameter of casing (in):	• Top of Bedford ≈ 261'
Depth to pitless adapter (ft):	• Poor well → rapid drawdown, slow recovery; few joints & bedding planes. Well went dry.
Depth to water (ft): 148.5	
Condition of casing: good | (bad) | ugly	ELEV = 1115'
Length of casing (ft): 96	
Centralizers / torque arrestors: yes | (no)	
Depth to pump (ft):	
Depth of videotape (ft): 305	
Reach borehole bottom: yes | (no)	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip #___ not pumping Pumping rate, when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
95.9	6:20	Sh	Bottom of casing
100.2		BP	thin
101.7		BP	thin
103.0		V	
107.3	7:10	BP	thin
113		V	shale
121		BP	
123.3	8:24	BP	
139	9:32		shale ribbing
144		BP	
146.7	10:10	BP	thin
148.5	10:30	WL	gbs breaking water surface
150		gbs	Camera below WL

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Adams
4-1-2010

Page 2 of 3

Trip #___ Pump off Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
152.3	11:20	GS BP	Lower right, Consytent bubbling
152.3	13:20	GS	Continuous line of gbs
153.0	16:20	sh	no gbs
160			no gbs
169	17:55	BP	no gbs
193	20:00	BP	S. HStone bed, no gbs
204.1	21:45	BP	Sandstone/Sh contact, Top of Berea Ss
218		no gbs	
235	26:10	no gbs	
261		sh	Ribbed walls → shale, Bedford Shale
267	30:30		Shale, murky water
272		no gbs	Shale
277	38:03		Top of pump
287			Murky water
290	39:25		Blackness
302			" "
305			" "
			ASCENDING
295	42:00		Blackness
270			Murky water
147.5	45:40	gbs WL	Pump off
147.8	49:27	gbs	Pump on *
			DESCENDING
151.2	50:00	gbs	
152.3		GS	
152.5	50:16	no gbs	Below gas source bed
160	51:44	WL	WL seen below & dropping quickly
162	52:40	no gbs	
162	54:40		Pump off
162	56:40	no gbs	very slow WL recovery
161.3	60:00		WL rising slowly
	1:12:00		Pump on
176	1:15	no gbs	
186	1:17:15	"	
191	1:18:40	WL	Rapid drawdown
225	1:22:45	no gbs	
253	1:26		Ascending

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Adams
4-1-2010

Trip #___ Pump on Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
237	1:29	WL	
			DESCENDING
260	1:31:13	no gbs	
275	1:32:40	" "	
277.8	1:33		pump
281			murky water
290	1:34		" "
297	1:34:50		" "
			ASCENDING
277.4	1:40	WL	WL at pump, well goes dry
			END

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 9-2-09 Page 1 of 2

Address: 17860 English Dr.	**Property owner:** STOVER
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TB/TT	• Casing deeply rusted, flaking
Video interpreter: ESBair	• Bad, terrible bacteria
Video datum: (ground) | top of tripod | other	• Hole in casing at 15' letting soil water, bacteria, sediment into well → health hazard
Type of casing: (steel) | PVC	• No gas seen at all
Diameter of casing (in):	• When WL moves down (seasonal), black bacteria dessicates and falls down borehole
Depth to pitless adapter (ft): 3.5	• Disgusting well
Depth to water (ft): 27	
Condition of casing: good | bad | (ugly)	
Length of casing (ft): 28.2	
Centralizers / torque arrestors: yes | (no)	
Depth to pump (ft): 82	
Depth of videotape (ft): 82	
Reach borehole bottom: yes | (no)	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	ELEV = 1112'

Trip #___ Pump off Pumping rate, when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
26.8	2:09	WL	
28.2	2:40		Bottom of casing, qtz pebbles, Sharon Ss
34.7	3:30		Black bacteria coating borehole walls
39.5	4:10		Below 39.5' white bacteria coat walls
52.8	6:00		White colonies of bacteria on right
56.5		V	
59.5		V	
78.5		BP	Shale (Cuyahoga)
82.3	9:15		Top of pump
	10:50		Can't get camera past pump
			ASCENDING (see next page)

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Stover (9-2-09)

Trip #___ Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
26.6	14:00	WL	
			DESCENDING (pump on)
26.6	17:30		pump on
27.7		V	
28.2	19:00		water entering along BP
28.5	22:05	WL	no gbs seen so far
30	23:35		camera below WL, no gbs seen
40	25:30	Ss	Sharon Ss. " " " "
			ASCENDING (pump on)
29.2	27:40	WL	no gbs, cascading water,
28.8	40:23	WL	WL not dropping, steady-state
			Pump off
27.3	42:00	WL	no gbs
27.1	54:00	WL	no gbs
	54:25		Ascending
			done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 9/3/09 Page 1 of 2

Address: 17888 English	**Property owner:** Burns
City / County: Bainbridge Twp, Geauga	**Well location map:**
Latitude:	
Longitude:	
Camera: (new) | old	
Camera operators: TT & TB	
Video interpreter: ~~ES~~ Bair	
Video datum: ground | top of casing | other	
Type of casing: (steel) | PVC	**Comments:**
Diameter of casing (in):	• No gas seen on Run #1 with pump off (0-140ft deep)
Length of casing stickup (ft):	
Depth to pitless adapter (ft): 3.8	
Depth to water (ft): 31.4 - 31.6	• No gas seen on Run #2 with pump on/off/on. WL drawdown from 31.5 - 71.1, no gb.
Condition of casing: good | (bad) | ugly	
Length of casing (ft): 55.7	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft): 140	• Much bacteria
Depth of well (ft): >141	
	• Casing in poor shape
2 **ODNR well log:** (yes) | no 1964, 1993	
ODNR well log number: 286665, 168386	
Reported casing length (ft): 1993 → ?	ELE = 1095'
Reported depth of well (ft): 150	

Trip # 1 (downhole) / uphole Pump: on / (off) Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
31.6	2:50	WL	Lots of bacteria just below WL
50.6	3:45		Centralizer
55.7	4:00		Bottom of casing
57.3	4:35	VJ	Shale
68.1		BP	
74.6		BP	Shale
77.0		BP, VJ	
78.8		VJ	
79.5		VJ	Shale
85		VJ	
87.8	7:24	VJ BP	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Burns

Trip # 1 (downhole) / uphole Pump: on / (off) Pumping rate (gpm):___

Depth (ft)	Time (min)	Feature	Comments
89.3		BP	
90-91	8:00	2VF BP	Big feature, void cut back into borehole
93-114		Sh	Nothing remarkable but bacteria
127	11:35	Sh	Top of ~~pump~~ centralizer, trying to get past
130	13:25	Sh	Past ~~pump~~ centralizer
140	14:00		Top of pump, trying to get past
			FILE #2
140.6	2:00		Bacteria falling on top of pump
	4:00		ASCENDING
129		BP	
			• No gas bubbles seen from ~~0 ft~~ on first run w/ pump off.

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Burns

Page 3 of __

Trip # 2 downhole / uphole Pump: on / off Pumping rate (gpm):___

Depth (ft)	Time (min)	Feature	Comments
30.5	11:00 – 12:53		~~[illegible]~~ Very little cascading water
	12:53		Pump on
37.3	14:07		no gb
36.2	15:34	WL	no gb
35.4	17:00	WL	pump off
	17:08	WL	pump on
44+	18:00	WL	no gb
49	18:40	WL	no gb
49.0	19:30		no gb pump off
46.5	20:25		no gb
46	20:35	WL	no gb
	20:50		pump on
			File #3
48	0:10		Lowering down to WL
54	0:40	WL	
57	1:00		WL below casing no gb
56.0	2:30		watching for gb's, none yet
~~[illegible]~~			pump off, then on
56.9			Spurting water from BP
59.6	5:06		Cascading water, much; no gb but much
			turbulence from cascading & inflowing
			water
60.1	5:20	WL	
60.2	5:30 – 7:25		Below WL, no gb, much bacteria
*	~~[illegible]~~ 4:50 – 4:59		Black bacteria seen sliding off BP
			when pump on
60.2	7:30		pump on, bacteria moving down to pump
60.2	8:30	WL	Gobs of cascading water
63.4	9:40	WL	Camera below WL, no gb, much bacteria
63.4	11:25		no gb, pump off
63.4	12:10	WL	pump on, no gb
65.7		WL	Lots of cascading water
66.4	15:10		no gb (camera below WL), pump off
66.4	17:00		pump back on, dropping WL
66.7	17:45	gb?	– from gas or falling water ?
68.7	18:50		camera below WL ~~[illegible]~~, no gb seen below WL,
			appareat gb just bubbles from cascading
71.2	20:15	no gb	pump on WL water

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone Lms = limestone WL = water level in well

— New file —

Burns

Page 4 of __

Trip #___ downhole / uphole Pump: on / off Pumping rate (gpm):___

Depth (ft)	Time (min)	Feature	Comments
71.2	0:20	no gb	pump on, camera below WL
71.2	2:00	no gb	WL
			ASCENDING

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Borehole Videotape Observation Log

Date: 4-1-2010 Page 1 of 2

Address: 17904 English Dr.	**Property owner:** Szabo
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TB/TT	• Casing is awful, rust flaking off, at bottom of borehole
Video interpreter: ~~E.S~~ Bair	• No methane gbs seen when not pumping or when pumping
Video datum: (ground) | top of tripod | other	• air bubbles (soil air) enter well when pumping, known to be air because LEL=0 in wellhead and WL at same depth.
Type of casing: steel | PVC	
Diameter of casing (in): 5 1/8 ID	
Depth to pitless adapter (ft):	
Depth to water (ft): 20.6	
Condition of casing: good | bad | (ugly)	
Length of casing (ft): 27	
Centralizers / torque arrestors: yes | (no)	
Depth to pump (ft): 42.7	
Depth of videotape (ft): 47.1	
Reach borehole bottom: (yes) | no	
ODNR well log number:	ELEV = 1082'
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip #___ Pumping rate, when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments Pump off
5.0	1:12		Holes in extremely rusted casing, flaking
5.5			Terrible casing, holes for sediment & bacteria to enter
10	2:30		Rusted Casing
11	2:40		Holes in casing.
14.0	3:05		Big hole in casing
19.3	5:05		Can see WL below, bacteria on walls
20.6		WL	no gbs
25.1	6:12		Black bacteria
26.7	6:30		Bottom of casing, shale, no gbs
27.4		V	Shale
31.5			Bacteria & black particles on shale ribs
32		V	Shale.
34		V	Bacteria

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Szabo 4-1-2010

Page 2 of 2

Trip #___ pump off Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
35		V	no gbs
37.4		V	shale
38.9		V	
42	11:00		Bacteria blob on top of pump
43.7		V	no gbs
45.3	11:43	no gbs	Bacteria falling to bottom, rust flakes too
47.1		no gbs	Bottom of borehole, sediments & bacteria
			ASCENDING
19.4	15:05	WL	pump on, no gbs
21.0	15:32	WL	no gbs, shale
25.2	16:30	no gbs	Camera below WL
25.5	17:14	WL	no gbs
26.6	17:30		air bubbles entering right side just below
			casing (LEL=0), air at water table
26.6	19:30		air continues to enter (soil air), LEL=0,
			WL dropping
26.6	20:00		Strongly squirting water entering casing
			as WL drop deeper, wellhead LEL=0
26.6	20:40		water pouring in, LEL=0
27.8	21:20	no gbs	Camera below WL, no gbs from below
34.0	22:12	no gbs	
39.0	22:50	no gbs	
41.9	23:15		pump, no gbs
44.8	24:00		bottom of borehole visible
47.1			bottom
			ASCENDING
44.9	25:00	V	
	32:42		end

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 4-15-10 Page 1 of 2

Address: 17925 English Dr.	Property owner: Maguire
~~City~~ / Township: Bainbridge	County: Geauga
Latitude:	Longitude:

Camera: (new) | old	Comments:
Camera operators: TB & TT	• Casing is awful, terribly corroded, flaky off into well, awful rust
Video interpreter: ~~TS~~ Bair	• GS at 44.5 feet in Cuyahoga sh.
Video datum: (ground) | top of tripod | other	• When WL goes below 44.5', no gbs seen in well, gas goes into open borehole
Type of casing: (steel) | PVC	• Awful casing
Diameter of casing (in):	• Rust spawls off into well, pile of rust at bottom of well
Depth to pitless adapter (ft):	
Depth to water (ft): 36	
Condition of casing: good | bad | (ugly)	
Length of casing (ft): 40.5	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft): 58	
Depth of videotape (ft): 75-76	
Reach borehole bottom: (yes) | no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip #___ NO PUMPING Pumping rate, when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
36	2:08	WL	Awful bacteria
40.5	2:45		Bottom of casing, severely rusted, flaking
42.2		no gbs	Centralizer, Shale
44.9		2V	no gbs
47.6	4:02	BP	no gbs
50.9	4:27	BP, V	no gbs
55.6	4:54	BP	pop off, no gbs
57.5	5:14		top of pump
60.2	7:43		past pump
61	8:00	2V	Shale
62.8	8:26	V	Shale, no gbs
75.2	9:35		Bottom of borehole, much red & black sed.
			ASCENDING

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Maguire 4-15-10

Page 2 of 2

Trip #___ no pumping Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
72.0	10:05	no gbs	
66.0	10:35	V	
62.9	10:55	V	pop out, shale
60.8	11:18	2V	
36.0	14:50	WL	no gbs
	15:10	DESCENDING	pump on
40.0	15:40	gbs	
44.5		GS	BP, V, upper left, above V joint, shale
44.4	18:00	GS	BP, V " " " " " "
44.3	18:21	WL	
45.5	19:45	WL	no gbs, camera below GS
46.3	19:53		no gbs, camera " " & below WL
47.6	20:18	no gbs	
46.2	20:55	"	Camera above WL, no gbs breaking surface
47.2	21:20	no gbs	
49.8	22:50	no gbs	Camera below WL
		ASCENDING	pump off
45.3	24:20		Cascading water entering well, NW corner at V, BP, camera above WL
44.8	26:00	no gbs	rising WL
43.8	26:32	WL	no gbs
42.7		no gbs	quick WL recovery
	30:40		PUMP ON
44.5	31:15	gbs	Camera below WL
44.5	32:34		PUMP OFF/ON
46.5		WL	no gbs
	33:50	WL	PUMP OFF
44.7		no gbs	
44.1		no gbs	
43.1	35:0	"	
22.0		"	
	39:06	out of borehole	
			done
			"
			Wellhead LELs range: 0-32%

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 9-2-09 Page 1 of 2

Address: 17954 English Dr.	Property owner: COOPER
~~City~~/ Township: Bainbridge	County: Geauga
Latitude:	Longitude:

Camera: (new) | old	Comments:
Camera operators: TB&TT	• Well in garage floor
Video interpreter: ESBaur	• Orange rust stain in concrete → overflow from well
Video datum: (ground) | top of tripod | other	• Bacteria on casing above WL
	• NO gas seen in well when pump off/on
Type of casing: (steel) | PVC	• Casing in terrible condition
Diameter of casing (in):	• Sharon Ss. well
Depth to pitless adapter (ft):	
Depth to water (ft): 0.8	
Condition of casing: good | bad | (ugly)	
Length of casing (ft): 20	
Centralizers / torque arrestors: yes | (no)	
Depth to pump (ft): 29	
Depth of videotape (ft): 36	
Reach borehole bottom: (yes) | no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	ELEV = 1050'

Trip # 1 Pumping rate, when pump on (gpm):

Depth (ft)	Time (min)	Feature	Comments
0.8	1:55	WL	• gobs of bacteria above WL
5.0	2:38		red & black bacteria on steel casing
9.0	2:55		black bacteria
19.7	3:45	Sh/St	bottom of casing
21.0	4:00	V	
22.6	5:40	BP	Sharon Ss, conglomeratic bed w/ pebbles
27.5	6:10	V	
28.9	6:25	V	Pump
31.7	7:10	2V	Ss
33.3	8:00	2V	Ss
36.0	8:25	2V	bottom of borehole
			• NO gbs seen

Off Pump

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Page 2 of 2

Trip # 2 Pump on Pumping rate when pump on (gpm): 10

Depth (ft)	Time (min)	Feature	Comments
			ASCENDING (Pump off)
35.4	9:12	St/Ss	
18.7	11:12		bottom of casing
3.7	12:50		below WL, no gbs seen yet
0.8	14:12	WL	
0.8	14:18		Pump on (DESCENDING)
3.3	15:00	WL	
			Pump off
	16:18		Pump on
			Pump off
	17:48		Pump on
3.7	18:30		no gbs yet
4.7	21:19		no gbs yet
19.7	22:45	Ss	below WL, base of casing, no gbs
27.5	24:30	Ss/St	" " " "
30.0	27:20		across from pump, below WL, no gbs
35.5	28:25	St/Ss	bottom of well, no gbs seen
			ASCENDING → DESCENDING
5.5	31:20	WL	no gbs yet
5.4	34:40	WL	" " "
5.7	35:08		no gbs seen w/ camera just below WL
5.6	38:55		" " " " "
19.4	40:45		" " " " "
			ASCENDING
8.0	42:00		No gbs seen
			Exiting well
			No gas bubbles seen, ever.

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

NEW WELL

Borehole Videotape Observation Log

Date: 12-1-09 Page 1 of 2

Address: 17975 English Dr.	**Property owner:** Payne
~~City~~ / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TT & TB	• This is the newer (1973) well
Video interpreter: ~~ES~~ Bair	• Sharon Ss. well, good yield, little drawdown
Video datum: ground | top of tripod | other	• Never saw gbs when pump on or off.
Type of casing: (steel) | PVC	
Diameter of casing (in):	
Depth to pitless adapter (ft): 3.2	
Depth to water (ft): 5.6	
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 27.7	
Centralizers / torque arrestors: yes | no	
Depth to pump (ft): 29.2	
Depth of videotape (ft): 29.2	
Reach borehole bottom: yes | (no)	
ODNR well log number: 172879, 445269	
County well log number:	
Reported casing length (ft): 29	
Reported depth of well (ft): 40	
Other: 2 wells on property	Elev = 1055'

Trip # 1 Pumping rate, when pump on (gpm): 13

Depth (ft)	Time (min)	Feature	Comments
5.6	1:42	WL	
5.8			murky water
13	2:16		murky water w/ suspended particles
29.2	3:30		top of pump, rock seen barely, casing to 29' long
		~~ASCENDING~~	
7.00	5:40		
5.6	6:12	WL	Pump on
6.2	6:31	WL	very slow drawdown
6.5	7:30	WL	no gbs seen
6.9	10:00	WL	no gbs seen
7.3	11:00		no gbs below WL
10.0	12:20		Murky, no gbs

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Page 2 of 2

Trip # 1 Pumping rate when pump on (gpm): 13

Depth (ft)	Time (min)	Feature	Comments
16.0	13:00		murky but no gbs
20.0	13:39		" " "
23.0	14:00		" " "
28.3			bottom of casing
29.0	15:11		Not shale, Sharon Ss.
26.4	15:45		no gbs
27.3	16:30		particles moving downward to pump
~~10.0~~	~~17:49~~		ASCENDING
10.0	17:49		
7.4	18:10	WL	Drawdown = 7.4 - 5.6' = 1.8' in 16 min
			while producing 200 gals
			DESCENDING
18.0	20:00		below WL, no gbs
28.9	21:23		no gbs
			ASCENDING quickly
7.6	22:00	WL	
	23:48		camera out of well @ 10:39 a.m.

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

OLD WELL

Borehole Videotape Observation Log

Date: 12-1-09 Page 1 of 3

Address: 17975 English Drive	**Property owner:** Payne (old well)
~~City~~ Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TB & TT	• Holes in casing upper 8',
Video interpreter: ~~ES~~ Bair	• Casing deeply corroded @ 28',
Video datum: ground | top of tripod | other	• well deepened after orginally constructed
	• well not used since 1973
Type of casing: (steel) | PVC	36 to ~ 40 Sharon Ss w/ congl.
Diameter of casing (in):	40 to 139 Cuyahoga Shale
Depth to pitless adapter (ft):	139 to TD Berea Ss.
Depth to water (ft): 73.6	
Condition of casing: good | bad | (ugly)	• GS @ 107.1
Length of casing (ft): 35	• no gbs below 107.5
Centralizers / torque arrestors: yes | no	• old well 68" inches from house, just off deck (1956)
Depth to pump (ft): 102	
Depth of videotape (ft): 160	Elev = 1055'
Reach borehole bottom: (yes) | no	
ODNR well log number: 172879, ~~145269~~	
County well log number:	
Reported casing length (ft): 40	
Reported depth of well (ft): 123	
Other: 2 wells on property	

Trip # 1 12:19 p.m. Pumping rate, when pump on (gpm): 13

Depth (ft)	Time (min)	Feature	Comments
35.8			Bottom of casing
36	1:50	VV	Sharon conglomerate, white pebbles, dripping water
39		BP	
40		V	
50		BP	Shale
60	2:57	BP	
67	3:14	BP	
73.6	3:35	WL	Cascading water
	4:26		PUMP ON
75.3	4:45	WL gbs	roiling
78.1	5:15	WL gbs	roiling, cascading water
79	5:50	BP gbs	roiling, cascading water
81.2	6:35	gbs	roiling & cascading water

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Page 2 of 3

Trip # 1 Pumping rate when pump on (gpm): 13

Depth (ft)	Time (min)	Feature	Comments
82	7:10	V	
93	8:30	gbs	Camera below WL, murkey view
102		gbs	Top of pump
103.5			past pump
			DESCENDING INTO BLACK ZONE
140	12:40		Clears up slightly
145			Dark again
155	13:17		Clears up again
159.7	14:00		Bottom of borehole
			ASCENDING
86.1	16:05	WL V	roiling gbs
86.5		WL gbs	shale
86.9	23:00	WL gbs	roiling
87.5	31:40	WL	Camera below WL, murky, gbs
102			top of pump
105		gbs	
105.6	39:30	gbs	gbs bottom left
105.3	42:45	gbs	gbs " " , murkey
	43:00		ASCENDING
88	47:30	WL gbs	roiling
87.8	52:00	WL gbs	roiling
	53:00		camera below WL, descending
102	54:15	gbs	top of pump, clearer but still murky
	55:35		ASCENDING
88.	56:37	WL	
	59:35		Camera out of borehole @ 1:19 p.m.
			Pump remains on, crew returns at 3:44
			to re-video hopefully cleaner well
Trip #2	SLO-MO		upper part, above WL
35	1:50		Bottom of casing
40		V	
44		V	
51		V	
60		BP	
62		V	
66.8		BP	
73.3		WL	
			Top of pg. 3

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Trip # 2 3:44 p.m. Pumping rate when pump on (gpm): 13

Depth (ft)	Time (min)	Feature	Comments
35.6	1:30		Bottom of casing – Sharon Conq.
40-41			bottom of conglomerate
66.7	3:15	BP	
71		V	
79-80		BP	
89.1		WL	rolling
89.3		gbs	below WL
92	4:50	gbs	
95		gbs	some v. big
97		BP	
98			fewer gbs, smaller
101	5:40		top of pump, gbs passing by
103.3		gbs	
105.6	6:20	gbs	Shale
107.1		GS BP	right side, two on same BP @1:00 & 3:00
107.5	6:56	no gbs	no gbs rising from below camera
110	7:50	no gbs	
115		no gbs	
120.7	9:00	St	siltstone layer no gbs
125		Sh	no gbs
132		St	no gbs
139		BP	Contact between Cuya Sh / Berea Ss
140		Ss	Berea Ss.
144		V	no gbs
146			murky no gbs
150	12:20		murky
159	13:25		bottom of borehole
			ASCENDING
139	16:23	no gbs	
125	18:00	no gbs	
127		V	
120	18:25	no gbs	Shale
108	19:35	no gbs	
107.0	19:50	GS	left side @ 9:00 shale
106.8	20:20	GS	2 on left side @ 9:00 & 7:00
102	22:20		pump
97	23:00	gbs	gbs bouncing off shale walls
92	23:50	gbs	
89.2	24:00+	WL	gbs
			ASCENDING
	31:20		Camera out of well

same

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

15.6' drawdown after ≈ 4 hrs. pumping Q total = 4,800 gals.

Borehole Videotape Observation Log

Date: 1-11-2008 Page 1 of 3

Address: 17990 English Dr.	**Property owner:** JORDAN
City / Township: Bainbridge	**County:**
Latitude:	**Longitude:**

Camera: new | (old)	**Comments:**
Camera operators: TB/TT	• Reset depth counter @ t = 4:21 min.
Video interpreter: TSBeer	• No gas below 135'
Video datum: (ground) | top of tripod | other	• Gas sources @ 77-78, 89-90, 93, 97-98, 105, 132
Type of casing: (steel) | PVC	
Diameter of casing (in):	
Depth to pitless adapter (ft):	
Depth to water (ft): 83	
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 71	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft):	
Depth of videotape (ft): 157	
Reach borehole bottom: (yes) no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	ELEV = 1043'

Trip # ___ Pump off Pumping rate, when pump on (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
71		Sh	Bottom of casing
74-75		2V	
• 77-78		BP GS	
81-82		V gbs	vigorous bubbles below WL
83		WL	
83-90		gbs	vigorous
94		gbs	less gas below 93'
• 93	9:50	BP GS	source of gas at BP
98		gbs	
105	12:25	gbs	lots
110-137			no gbs seen
137	14:33	BP	
141	SS	BP, V	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

JORDAN 1-11-08

pump off

Trip #___ Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
148-149		BP Ss	
157	15:10		Bottom of well
			ASCENDING
140	Ss		Berea Ss.
132	Ss		Top of Berea Ss.
129		Sh	Cuyahoga Sh
109	19:00	Sh	
105		GS	Gas source on lower left (7:00)
104		gbs	
100		gbs Sh	
98-97		SG	Gas source
95		SG	
91		gbs	
88		BP V SG	Source of gas
83		WL	
81		V	
77		V	
3			pitless adapter
			DESCENDING — Pump on
69		Sh	Bottom of casing
72-74	31:00	V	
74			Cascading water
79+		WL	Roiling gas > GS @ 77-78
80	33:00	WL	Roiling gas
81	37:00	WL gbs	
84		Sh	
88		gbs	
89		GS	gbs from below also
92		gbs	fewer
89-90		GS	Roiling gas
82	41:10	gbs	Roiling gas
80		WL	" " "
79	47:00	WL	" " "
85		gbs	" " "
89-90		GS	
100		gbs	Roiling gas
110	51:30		"
120		gbs	" "

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone St = siltstone WL = water level in well

JORDAN (1-11-08)

PUMP ON

Trip #___ Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
122			Rolling gas, centralizer
132-134	54:00	GS	" " " Berea Ss contact
135			no gas
139			no gas
143	55:30		Leaf in well, no gas
138			no gas
134	56:15	GS	Rolling gas
130		gbs	" "
125	59:15	gbs	" "
120	59:45	gbs	" "
115	1:00:10	gbs	" "
110		gbs	" "
105	1:00:45	gbs	" "
100		gbs	" "
90		gbs	" "
80+	1:01:45	WL	Rolling gas

* No gas below Berea/Cuyahoga contact

done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 3-17-08 Page 1 of 2

Address: 17990 English Dr.	**Property owner:** JORDAN
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: new | (old)	**Comments:**
Camera operators: TB/TT	• Gas sourcebeds at 90', 96', 107'
Video interpreter: ~~ES~~ Bair	• Far fewer sourcebeds than on 1-11-2008
Video datum: (ground) | top of tripod | other	• Bottom (deepest) gas source rose from 132' (1-11-2008) to 107' (3-17-08), 25' up in two months while nearby wells purging (overpumping)
Type of casing: (steel) | PVC — top	
Diameter of casing (in):	
Depth to pitless adapter (ft): 3.0	
Depth to water (ft): 82	
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 70-71	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft): ~134	
Depth of videotape (ft):	
Reach borehole bottom: yes | no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip #___ pump on Pumping rate, when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
71		Sh	Bottom of casing
73	5:35	V	
78	5:50	BP V	Pump on
82	6:05	WL gbs	
87		V gbs	
90		BP GS	major source of gas
97	7:30	gbs	
99		V	
103			torque/centralizer
128		BP	
129	10:55		pump
135		BP	
139		BP	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

JORDAN (3-17-08)

Trip #___ pump on Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
148		BP	
153		BP	
158	13:40		Bottom of hole
			ASCENDING
134	15:30		stuck on pump
~136		gbs	16:30, 17:30, 18:10; past pump @ 18:50
117	20:00		
109			centralizer
108	20:40	gbs	
107	20:50	BP GS	Gas source bed
96	22:05	GS	left side, large bubbles
92	22:30	gbs	
			DESCENDING
95		gbs	
96		GS	(same as above, left), large gbs
90		WL	
102	26:05	~~GS~~	
90	26:45	WL	Rolling gbs
90	28:00	WL	gbs
			- error in depth counter @ 28:40
			- fixed???
91		V gbs	
88		WL	
76-77			Casing bottom → error 26'
10'	36:00		Pitless adapter

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 9-2-2009 Page 1 of 3

Address: 17990 English Dr.	**Property owner:** JORDAN
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TT & TB	• PVC stickup, steel casing
Video interpreter: ESBair	• Three major gas sources
Video datum: (ground) | top of tripod | other	@ 76.2'
	@ 88-89'
Type of casing: (steel) | (PVC) top	@ 102' (seen 3 times)
Diameter of casing (in):	• No gas below 103'
Depth to pitless adapter (ft):	
Depth to water (ft): 66.9	
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 70.6	
Centralizers / torque arrestors: yes | no	
Depth to pump (ft): 126	
Depth of videotape (ft): 154	
Reach borehole bottom: (yes) | no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	ELEV = 1043'

Trip # pump off Pumping rate, when pump on (gpm):

Depth (ft)	Time (min)	Feature	Comments
66.9		WL	gbs infrequently breaking surface, Japanese beetles
69		gb	one
70.7		BP Sh	casing ends in shale
74.6		V gb	one gb
79.2		2V	
85.9		V	
90-91		BP	
92-96		gbs	frequent
100.7		BP	
103			Bacteria rich zone - centralizer
104.4		BP	
106-110		BPs	
123			Bacteria rich zone

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

JORDAN (9-2-09)

Trip #___ pump off Page 2 of 3

Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
126		Sh	Pump (top of assembly) cable hung-up
			ASCENDING
67.6		WL	Pump on PUMP ON
68.2		WL gbs	Roiling gas bubbles at surface
70.5		WL gb	Roiling " " "
70.9		gb	Below WL now, roiling
76.2		BP GS	Source bed for gas
81.9		gbs	Below WL roiling gbs passing camera
84.6		gbs	" " " " "
90		gbs	less gbs
91.9		gbs	much less gas
102.6			no gbs
101.8		GS	upper left corner of video
102.3			no gas
103			no gas
113			no gas
120		gb	single, large bubble ⇒ deeper source?
128			Past pump!!!
129.6			no gas
133		Sh	no gas
133.5		BP	no gas
134		BP Ss	Top of Berea Ss
135		BP	no gas
140		BP	no gas
150		BP	no gas
153.7		Ss	Bottom of well, much bacteria
			NEW FILE
			ASCENDING (pump on)
137.3		VBP	
135		BP	no gas
133-134		Sh/Ss	Contact Cuya/Berea no gas
119		Sh	no gas
115		Sh	" "
110		Sh	" "
106.3		BP	" "
102.3		GS	upper left corner
102.1		gbs	abundant

sand

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone St = siltstone WL = water level in well

JORDAN (9-2-09)

Trip #___ pump on Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
100		gbs	abundant
95		gbs	
90		gbs	
88-87		gbs	increase in gbs
88.2		GS	on right side
72.4		WL	Roiling gas
73		WL	" "
81		gbs	Japanese beetle
90		gbs	
100		gbs	less than above
102.8		GS	same GS, no gbs from below as WL drops
			ASCENDING
68.8		WL	water level declining
			DESCENDING
84		gbs	abundant
86-89		GS	Gas source bed
90		gbs	less gbs
92		gbs	
88		gbs	much more gbs added at 88-89'
85		gbs	
69		WL	
			done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 12-1-09 Page 1 of 2

Address: 17995 English Drive	**Property owner:** Czernicki
~~City~~ Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TT & TB	• Highly degraded casing 34 to 42'
Video interpreter: E Bair	• Gas sources between 70-73', perhaps along 3 BPs.
Video datum: ground | top of tripod | other	• No gbs at 74.8', all GSs above 74.8'
Type of casing: (steel) | PVC	• Odd white specks at original water level are moving, larvae?
Diameter of casing (in):	• Well needs cleaning.
Depth to pitless adapter (ft):	
Depth to water (ft): 53.5	
Condition of casing: good | (bad) | ugly	
Length of casing (ft): 53	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft): 75	
Depth of videotape (ft):	
Reach borehole bottom: yes | no	
ODNR well log number: no log	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	Elev = 1046'

Trip # 1 Pumping rate, when pump on (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
42	2:50		Centralizer
53.5	3:57	WL	water level w/ bacteria
52.8			bottom of casing – corroded steel pattern
55		VV	shale
57.5		BP	
61	7:12	V	64' => tape in well
62.8		V	centralizer
67			shale
71		BP V	
74.8	8:55		centralizer, camera can't get past, top of pump
			ASCENDING
65		V	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Page 2 of __

Trip #___ Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
53.3		WL	White specks/colonies/larvae? moving, crawling, creepy
			PUMP ON
55		V	
56		V	
57		V gbs	cascading water
60		V gbs	
64.7		gbs	shale
65		V	
68		gbs	
70.8		BP GS	Gas source on large BP, lots of gas
71.8		BP GS	right side @ 3:00
72.8		GS	
74.8			no gbs
74.3		WL	well going dry, cascading water at top of pump
			PUMP OFF
		WL	recovering, rising up borehole
70.8		GS BP	
69.1		WL	
69.3		gbs	
68.3		WL	
63			cascading water, centralizer
63.2		V	pissing cherub causing cascading H_2O
62.9			pissing cherub from afar
61.9		vugs	2 more cherubs pissing
60		V	
56		V	
55		BP	cascading water
			-END-

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 3-17-08 Page 1 of 1

Address: 17926 Kingswood	**Property owner:** JOHNSON
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: new | (old)	**Comments:**
Camera operators: TB & TT	• Casing – clean shallow
Video interpreter: ES Bair	– pitted & corroded
Video datum: (ground) | top of tripod | other	~50'
Type of casing: (steel) | PVC	
Diameter of casing (in):	
Depth to pitless adapter (ft):	
Depth to water (ft): 75'	
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 53.5	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft):	
Depth of videotape (ft):	
Reach borehole bottom: yes | no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	ELEV = 1088'

Trip #___ pump off Pumping rate, when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
53.5		Sh	Shale at bottom of casing
55		V	
57		V	
59		V	
61		V	
68		V	
71-72		V	
74		V	
75	10:15	V WL	water level in well
79		BP	
80-81		V	
85	12:05	BP	
90+			Centralizer — end of video, cannot get camera deeper

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 9-3-09 Page 1 of 3

Address: 17926 Kingswood	**Property owner:** JOHNSON
City / Township:	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TT & TB	• Deepest gas seen at 135, rising from below. GS deeper than 135'
Video interpreter: ESBair	• Major GS at 113', which is above WL in well when pumping for prolonged time.
Video datum: (ground) | top of tripod | other	• Shale at 113' (Cuyahoga)
Type of casing: (steel) | PVC	• Black bacteria zone across from GS
Diameter of casing (in):	
Depth to pitless adapter (ft):	
Depth to water (ft): 55.1	
Condition of casing: good | bad | ugly	
Length of casing (ft): 54	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft): > 148	
Depth of videotape (ft): 148	
Reach borehole bottom: yes | (no)	
ODNR well log number:	ELEV = 1088'
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip # pump off — Pumping rate, when pump on (gpm):

Depth (ft)	Time (min)	Feature	Comments
54	3:20		Bottom of casing
54.6	5:40	BP	Shale
55.1	5:53	WL	water level in well, much bacteria on walls & drop pipe
68		ZV	
80	9:30	Sh	Gobs of wet red/orange bacteria
91	10:25		centralizer
93		BP	
95	11:06		Black bacteria & some red bacteria
97	11:28	BP	
105	12:20	Sh	Black & red bacteria
113	13:25	BP	Black bacteria
116	14:40		" "
123	15:00		Completely black, no vision, bact. on lens?

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Johnson (9-3-09)

Trip #___ Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
126	16:20		Completely black
127.8	16:45	Sh	Broke through black bacteria zone
134.1	17:35	Sh	Awful looking bacteria
139	18:00		Borehole walls much cleaner
143.5	18:35	BP Sh	
148	19:40		Centralizer, black bacteria
			ASCENDING
62	25:30	V	
55		WL	
2.2	28:30		Pittess adapter
			DESCENDING
54	32:55	V BP	Bottom of casing
	34:25		Pump on PUMP ON
58	35:06	WL	Bactera at WL moving down
62	36:15	WL	WL dropping, no gbs
65.9	37:15	WL	Cascading water, no gbs
70		BP V	no gbs
72.5	39:20	V, WL	
74.7	40:10	WL	
77.5	40:48	gbs	Roiling gas (first seen)
79.7	41:40	WL	gbs
83.7	42:45	WL gbs	
87			Centralizer
88	44:10	BP	
91.8		WL gbs	Black bacteria on walls
95.4		WL gbs	" " "
97.7	47.25	WL gbs	" " "
100.5	48:35	WL gbs	" " "
103	49:25		Centralizer
104.7	50:00	WL	Roiling gas, black bacteria on walls
108.9		WL gbs	
112.1		WL	water dripping off lens
112.8	53:20	WL, BP	Steady flow of water at BP, on right, burping suggests gas source
116.5	54:30	WL gbs	Lots of cascading water
120			centralizer
121.7	56:20	WL, gbs	
124.3	57:18	BP WL	gbs

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone St = siltstone WL = water level in well

Johnson (9-3-09)

Page 3 of 3

Trip #___ pump on Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
126		BP	
129	59:10	WL Sh	Cascading water
131		WL	
135	1:01:40	gbs	Gas bubbles seen below WL
138	1:03:05	WL	
140			Blackness ↓ deeper GS
143	1:03:50		" "
147.9			Blackness
148.2	1:04:35		" "
141			Clearer
144		WL	Lots of cascading water
142.7	1:08:26	WL	
			ASCENDING (pump off)
142	1:10	WL	no gbs seen breaking WL surface
141			camera below WL, no gbs seen
139	1:15:40		" " " "
136		WL	no gbs seen
133	1:26:05	gbs	a few small gbs seen rising from below
130		gbs	very small
127	1:36:30	WL	Lots of cascading water, no gbs seen
123	1:44:45	WL	" " " "
120	1:50:20	WL	gb – one
119		gb	
116	1:59:20	gb	one
115	2:00:25		Cascading water
			END of FILE
			NEW FILE
112.9	0:10	BP GS	Lots of gas emanating @ 112.9
			DONE

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 1-11-09 Page 1 of 2

Address: 17969 Kingswood	**Property owner:** CALO
~~City~~ / Township: Bainbridge Twp.	**County:** Geauga
Latitude:	**Longitude:**

Camera: new | (old)	**Comments:**
Camera operators: TB & TT	• Black anoxic zone
Video interpreter: ~~ESBair~~	• GS beds @ 104' and 113'
Video datum: (ground) | top of tripod | other	• Top of Cuyahoga ≅ 60'
Type of casing: (steel) | PVC	• Top of Berea @ 144'
Diameter of casing (in):	• No gbs below 114'
Depth to pitless adapter (ft):	
Depth to water (ft): 81	
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 55-56	
Centralizers / torque arrestors: yes | no	
Depth to pump (ft): 135	
Depth of videotape (ft): 151	
Reach borehole bottom: (yes) | no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	Elev = 1054'

Trip # 1 Pumping rate, when pump on (gpm):

Depth (ft)	Time (min)	Feature	Comments
56		Bottom of casing → Sharon Ss.	
62	NO PUMPING		Shale
69-70		BP 2V	Cascading water
70		V	
75		V	
81		WL gbs	water level, gas bubbles breaking surface
85		gbs	shale
92		gbs	
101		BP V	
103		BP	gas less than above
106		V	Shale
114		BP	no gbs
132		BP	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Page 2 of 2

Trip # CALO Pumping rate when pump on (gpm):

Depth (ft)	Time (min)	Feature	Comments
144		Ss	Top of Berea
146-151			Big bacterial buildup, hiding Ss
151			Bottom of borehole
			-no gas seen below 114'
			ASCENDING 88' to 81'
81	PUMP		Pump on
88	ON	BP	Cascading water, roiling gas
101		V	
104		BP	water inflow, roiling decreases as WL goes below 104'
107-108		V	
113-114		WL GS	Source bed @ 113', no gbs below 114'
109		WL BP	
106		WL BP	
104		BP GS	Source bed, big burps of gas lifting WL
103		WL gbs	Roiling
101		WL gb	
93		gb	
92		gb	
91		gb	
88		gb	
120-135			Cascading water off camera lens, no vision
	135		Top of pump

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 10-15-09 Page 1 of 2

Address: 17969 Kingswood	**Property owner:** CALO
City / County: Bainbridge Twp, Geauga	**Well location map:**
Latitude:	
Longitude:	
Camera: (new) | old	
Camera operators: TB & TT	
Video interpreter: ESBaw	
Video datum: ground | top of casing | other	
Type of casing: (steel) | PVC	**Comments:**
Diameter of casing (in):	• Casing highly corroded 55-63'
Length of casing stickup (ft):	• Deepest gas source bed @ 113'
Depth to pitless adapter (ft):	• No gbs seen below 114'
Depth to water (ft): 70	• Bottom of gas zone @ 114' in Cuyahoga Shale
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 62.4	
Centralizers / torque arrestors: yes | no	
Depth to pump (ft):	
Depth of well (ft): 135'	
ODNR well log: yes | no	
ODNR well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	Elev = 1054'

Trip # 1 (downhole) / uphole Pump: on (off) Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
62.4	6:10	Sh	Bottom of casing
69.9	6:40	gb WL	Cascading water → bubbles + gb
73	7:00	gb	
83	7:43	gb	bacteria on walls
89		BP	
95		gb	
100.9	9:40	gb	
103.8			bacteria pod
110.5	11:00	gb	
113.6	11:35	GS BP	Shale BP
120	13:50		orange bacteria, no gbs

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Calo

Page 2 of 2

Trip # 1 downhole / uphole Pump: on / off Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
131	14:40		Cloudy, no gb
135.7	15:05		Top of pump
			ASCENDING
112	17:15	GS	gbs
90	18:00	gb	
70	18:50	WL	gbs
			DESCENDING
70.1	21:20	gb	Pump on leaf on WL
76.0	22:00	gb	WL dropping, rolling gas
87.0	23:10	gb WL	Cascading water on lens, rolling gas WL
98.9	24:45	WL	rolling gb & cascading water
106	25:50	WL	rolling gb " "
117	27:20	WL	" " " , water level below GS seen earlier, gas going to borehole above WL
124.9	28:20	WL	
127.4	28:55	WL	no gbs
133.0	29:20		darkness → too near pump, blurred
132.8	31:45	WL	cascading water, no gas ; pump off image on/off
127.6	34:15	WL	no gb seen in murky water just below WL
119.6	38:10	WL	
117.9	39:00	WL	no gbs, cascading water
115.3	40:25	WL	no gbs, " "
114.0	41:20	WL	" " " "
114.2	42:16		below WL, no gbs
113.4	43:00	gb GS	gbs back as WL rises to GS @ 113.6
106	45:10	WL	gbs
105.5	46:50		Below WL, gbs seen
104	47:30	gbs	Rolling gas at WL, cascading water
100.1	50:15	gbs	WL rising, rolling gas
			ASCENDING faster
58.1	53:20		water dripping off camera lens above WL

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Borehole Videotape Observation Log

Date: 3-17-08 Page 1 of 2

Address: 17971 Kingswood	**Property owner:** de Gaetano
~~City~~ / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: new | (old)	**Comments:**
Camera operators: TT & TB	• 1 gas source seen at 164' (Big gas)
Video interpreter: ~~ES~~ Bair	• no gas seen below 164'
Video datum: (ground) | top of tripod | other	• drawdown 114'–164' in 25 minutes (50')
Type of casing: (steel) | PVC	
Diameter of casing (in):	
Depth to pitless adapter (ft):	
Depth to water (ft): 114	
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 95	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft): 181–182	
Depth of videotape (ft): 188	
Reach borehole bottom: yes | (no)	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	ELEV = 1070'

Trip # ___ pump on Pumping rate, when pump on (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
95	6:40	Sh	Bottom of casing
104		V	
106			Cascading water
111		V	
113		V	
114		WL	Camera above WL, not submerged
115		WL V	
116		BP WL	no gbs
117		WL	no gbs
119	11:10	WL	no gbs
121		WL	" "
123	12:18	WL	no gbs
124		gbs	first gas bubbles seen

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

deGaetano ('08) Page 2 of 2

Trip #___ Pump on Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
125+	13:00	gbs	Roiling @ WL
128	15:00	WL gbs	" "
129	16:40	V	" "
130	17:25	WL gbs	Roiling
133	18:25	WL gbs	" "
136	19:35	WL gbs	" "
142	22:35	WL gbs	" "
143		V	" "
144		V	" "
146	24:30	WL gbs	
150	26:40	WL gbs	large bubbles, burps
152	27:40	WL gbs	Roiling
154		WL gbs	" "
157	31:30	WL gbs	cascading water
160	33:20	WL gbs	
163+	37:30	BP V	Spurting water @ BP Cuya/Berea cont.
164		gbs GS	Big gas
166	41:30	BP	
167		Ss	
170	WL	WL	No gbs seen below WL (camera dunked)
174			Below WL, no gbs seen
180			" " " cloudy water
188			Camera cord snagged uphole
170			Cascading water, unclear image
168			" " " "
170	45:07		" " " "
181-182	46:48		Pump
176			no gbs seen
172			" "
165	47:42		" "
164	47:42	GS	Roiling gas
164	48:17	GS	" "
150			Unclear image
135	49:15		" "
80	50:45		
35	52:00		
			done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 9-02-09 Page 1 of 4

Address: 17971 Kingswood Dr.	**Property owner:** de Gaetano
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TB & TT	• Casing pitted and spawling off
Video interpreter: ~~ES~~ Bair	• Gobs of bacteria
Video datum: (ground) | top of tripod | other	• Drawdown = 53.6'
	• Δ fluid pressure = 23.2 psi
Type of casing: (steel) | PVC	• 3 gas source zones
Diameter of casing (in):	115-116
Depth to pitless adapter (ft):	120-121
Depth to water (ft): 95.2	131
Condition of casing: good | (bad) | ugly	• no gas bubbles seen below 131'
Length of casing (ft): 95	• Cuya/Berea contact @ 164'
Centralizers / torque arrestors: (yes) | no	• Berea/Bedford contact @ approx. 197'
Depth to pump (ft): 222	
Depth of videotape (ft):	ELEV = 1070'
Reach borehole bottom: yes | no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip # 1 Pump off Pumping rate, when pump on (gpm):

Depth (ft)	Time (min)	Feature	Comments
95		Sh	Bottom of casing
95.2		WL	
102		BP, Sh	
111		V	Lots of bacteria. No gas bubbles
113		V	
115.9		BP	
125		BP	
128-129	6:00	V	
130		BP	
136		BP	
140.5		BP	
142-143		V	
149		V	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

deGaetano ('09) Page 2 of 4

Trip # 1 Pump off Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
152.8		BP	
163		BP Sh	Bottom of Cuyahoga shale
165	9:10	BP Ss	Top of Berea Ss
179		Ss	centralizer
190		BP Ss	no gbs
194		BP Ss	
197		St/Sh	Bedford Shale
199.6		Sh V	
205		BP Sh	
216	11:30		Debris leaves on centralizer
222	12:00		Pump — Gould's
			ASCENDING → DESCEND w/ pump on
95	33:18	gb	pump on
97.3	33:45	gbs	Rolling gas bubbles, below WL
100.5		gbs	abundant gbs
110	35:02	gbs	" "
114		V gbs	gbs
115.6		BP GS	gas source bed
118		gbs	less gas bubbles
125	37:00	BP	no gbs
120.7	37:45	BP GS	big gas bubbles
120.7	41:30	BP GS	more frequent burping over time as hydrostatic pressure on wellbore ↓
125	42:45	gbs	
129		gbs	large bubbles
131	43:46	BP V GS	
130.8		GS	
136.7	46:00	GS	2 openings producing gbs
>120.4	46:50	WL	Rolling gas
120			Cascading water — water bubble on lens
120.9		BP	
132.8		WL	
140	49:00		no gbs seen; no gas below 131'
147			cloudy, no gbs
140	50:21		" "
136.6	50:40	WL	Cascading water
142			Cloudy ↓
150			Cloudy
155			Less cloudy, no gbs
160			no gbs
163.8	53:00	BP	water swirling as enter wellbore

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone St = siltstone WL = water level in well

deGaetano ('09) Page 3 of 4

Trip #___ Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
163.4		BP	no gbs
164-165			Berea Ss, no gbs
168.9	55:05		no gas
163.7	56:16	BP	no gas, swirling water, big BP @ contact of Cuyo / Berea
150			cloudy
148.2		WL	cascading water, clear
155	new file	WL	Cloudy, no gas
165			Swirling water
175			no gbs
180			centralizer
190	2:52		no gas
217	4:20		no gas
222			pump
210	10:00		no gas seen
190	10:58		" " "
164-165			Berea contact, swirling water
148.8	12:00	WL	
			PUMP OFF (Recovery)
			ASCENDING w/ camera
3.3	20:00		pitless adapter
0	20:25		camera out of hole cleaning lens
0	21:05		camera back in borehole
95	23:30		bottom of casing
115.1	24:00		WL just below camera & rising
116		gbs	pump on
116.9	25:25	gbs	few
118.8	25:56	gbs	more
121	26:30	gbs	abundant
124	27:35	gbs	
126+		gbs	
	new file		+ time stamp
126.7+		gbs V	abundant
129-130		BP	no gas, cascading water
131.9	2:08		no gbs
136.2	4:00		no gbs
140	5:44		" "
140+	5:50		below WL, cloudy, no gas
141.2	6:30	WL	above WL, cascading water,

water level below gas zones

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

deGaetano ('09) Page 4 of 4

Trip #___ Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
148.1	11:00	WL	water droplet on lens, cloudy, no gas seen
152.2	14:25	WL	" " " "
153.3	16:06	WL	" " " "
			ASCENDING
135	16:44		
			Done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 10-15-09 Page 1 of 3

Address: 7859 Scotland	**Property owner:** McGEE
City / County: Bainbridge Twp, Geauga	**Well location map:**
Latitude:	
Longitude:	
Camera: (new) | old	
Camera operators: TB&TT	
Video interpreter: ESBair	• Well under front steps
Video datum: ground | top of casing | other	
Type of casing: steel | PVC	**Comments:**
Diameter of casing (in):	• Well in basement, jet pump
Length of casing stickup (ft):	• Well deepened by current owner, from to
Depth to pitless adapter (ft): None	• Deepest source of gas at 112' in shale (Cuyahoga)
Depth to water (ft): 78.3	• No gas seen below 112'
Condition of casing: good | (bad) | ugly	• Bottom of gas in Cuyahoga Shale
Length of casing (ft): 64	• 6 Sources at 93' 101' 111'
Centralizers / torque arrestors: yes | (no)	ELEV = 1025'
Depth to pump (ft): 130	
Depth of well (ft):	
ODNR well log: yes | no	
ODNR well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	

Trip # 1 (downhole) / uphole Pump: on / (off) Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
64	2:30	Sh	Bottom of steel casing
69.9	3:45		Bacteria mounds on walls
78.3	4:30	WL	some cascading water, no gbs seen yet
81.8	6:05	V	
85.9		gb	
91-91.9		Siltstone layer	
97.8	8:10	gb Sh	
101		BP	gobs of bacteria
123.7		BP	
128	13:45		globs of bacteria on top of pump
129	18:45		ASCENDING

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

McGee
(10-15-09)

Page 2 of 3

Trip #___ Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
95	19:55	gbs	
77.8	21:00	WL	gbs – some
77.9	26:28	WL	PUMP ON
79.2	28:23	gbs	individual bubbles
79.2	29:00	gbs	groups of gbs as WL drops
78.7		WL	bacteria blobs
85	30:00	gbs	
90.5	Sh	BP	Shale
93		Sh BP	
101	31:15	GS	Source bed of gas
105		gbs	
107		gbs	
118–112	32:00	GS BP	Shale (111.8–112)
111.7	33:15	GS	BP no gbs seen rising from below
111.5		GS	more gbs as WL drops
122	38:45	Ss	no gbs (Berea nearby
124		BP	Big BP contact w/ Cuya/Berea
128.3	39:30	Ss	Top of pump
			ASCENDING
125	41:10	Ss	no gbs
124		BP	Big, no gbs, gas in Cuyahoga Sh
119	43:15	St	
116	43:34	Sh	no gbs
112	44:10	Sh	" "
111.5	44:25	GS	gbs @ BP
110		gbs	
104	47:10	gbs	
100.5		GS	gbs
92.9	48:50	GS	gbs
79.1	49:50	WL	gbs, bacteria
	50:30		DESCENDING
85		gbs	
97	51:48	gbs	
101.4		gbs	
111.8	53:00	GS BP	Shale, gas emanating from BP behind pipe
114	55:25		no gbs
118			no gbs
120		St	no gbs
120	56:30	St	no gbs
122	56:40	St	no gbs
124	56:50	BP	no gbs, contact between Cuya/Berea
			ASCENDING @ major BP

same

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

(10-15-09) McGee

Page 3 of 3

Trip #___ downhole / uphole Pump: on / off Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
117	59:44	Sh	no gbs
118	1:00:30	Ss	no gbs
115	1:01:20	Sh	no gbs
111.6	1:02	GS BP	gas emanating from shale BP
105	1:03	gbs	
101.3	1:04	GS	gas emanating from shale BP
97	1:09	gbs	
93.2		gbs	
92.7		siltstone	bed about 12" thick
90.5	1:11:27	gbs	Shale
82		gbs	
79.4	1:12:50	WL	
66		V	
		-H-	END -H-

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Borehole Videotape Observation Log

Date: 5-14-09 Page 1 of 3

Address: 7897 Scotland	**Property owner:** BUDDENHAGEN
City / County: Bainbridge Twp., Geauga	**Well location map:**
Latitude:	
Longitude:	
Camera: (new) | old	
Camera operators: TB & TT	
Video interpreter: ~~TB~~ Bair	
Video datum: ground | top of casing | other	
Type of casing: steel | (PVC)	**Comments:**
Diameter of casing (in):	• Deepest GS bed seen @ 90'
Length of casing stickup (ft):	• Some gas bubbles ascending from below 90'
Depth to pitless adapter (ft): 3.0'	• Shallowest GS bed @ 89.8' ~ 90'
Depth to water (ft): 76.4	• Shale present throughout depth of borehole
Condition of casing: (good) | bad | ugly	• Cuyahoga Shale source @ 90'
Length of casing (ft): 57.4	• Berea contact ~ 134'
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft): ~~116~~ 128.4'	Ele = 1032'
Depth of well (ft):	
ODNR well log: (yes) | no	
ODNR well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	

Trip # 1 (downhole) / uphole Pump: on / (off) Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
57.4	3:15	Sh	Bottom of casing
57.5		BP	Big opening at bottom of casing, dripping water
73	4:50		water dripping off lens, cascading water
76.4	6:25	WL	Lots of bacteria
84.1			Centralizer, lots of bacteria 76-84'
84.2		gb	Gas bubbles while getting camera past centraliz
88	13:50	Sh	less bacteria below centralizer
111	16:00	gbs	
115-113	16:18	V	
129.8	18:00	Sh	Centralizer
134.1	18:25	Sh/Ss	Big bacteria buildup Berea Contact

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Buddenhagen

Page 2 of 3

Trip # 1 (downhole) / uphole Pump: (on) / off Pumping rate (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
145.6	19:40	Ss	Top of pump, gobs of bacteria
149	22:30		Camera past pump
164.2		BP	
>164			Water turns murky
174.6	29:00		Bottom of borehole
		ASCENDING	
114		V	
			PUMP ON
90.8	38:20	gbs	
90.8	~40:30		PUMP OFF/ON
86.7		Sh	
84.5	44:30		Centralizer
80.5	45:10	WL	
80.6	47:30	WL	
81.9	54:45	WL	Cascading water
81.3	55:30	WL	" " "
	57:10		ASCENDING
79.6	58:00	WL	Water level about 1½' below camera
79.6	102:35	gb	Persistant gas bubbling on right above WL
	103:00		DESCENDING
81.8		WL gbs	gas from below, not a lot
82.2	105:30	gbs	more & larger gbs
85.1	109:55	gbs	gas from below centralizer
89.8	1:10:30	gbs BP GS	Source of gas at BP & from below
~~86.6~~			ASCENDING
85.6	1:14:30	V gbs	
84.2	1:16:40	gbs	Gas rising through centralizer
84.1	1:18:00	WL gbs	
	1:26		DESCENDING
90.0	1:27:30	GS gbs	Shale, gas source BP + gbs from below
98	1:30:07	gbs	
104.0	1:31:00	V BP gbs	
110.0	1:32:05	gbs	
114.4	1:33	V	
123	1:33:55	gb	Shale
128.4	1:35		Top of pump
			ASCENDING
114	1:39:30	V	
112	1:40	gb	

sample

115

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Page 3 of 3

Trip # 1 downhole / uphole Pump: on / off Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
108.7	1:41:25	gbs	
110	1:43	gbs	
109.7	1:45:03	gbs	
112.3	1:48:45	gbs	
103.7		V	
90.3	1:51:48	gbs	
89.1	1:52	BP gbs	no gas seen emanating from GS on ascent
89	1:53:40	BP gbs	" " "
86		V gbs	
84.8	1:54:40	gbs	Centralizer
84.5	1:55:30	WL gbs	Cascading water & gbs
81.3	2:02:15	gbs	
			END of TAPE

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Borehole Videotape Observation Log

Date: 12-1-09 Page 1 of 2

Address: 7897 Scotland	**Property owner:** Buddenhagen
~~City~~ / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TB & TT	• more bacteria than in 5/09
Video interpreter: ES Bair	• 455 gallons in ~35 minutes w/ 5 feet of drawdown → v good well
Video datum: ground | top of tripod | other	• Unseen, except for bacteria motion, GS @ ~90' is consistent w/ 5/09
Type of casing: steel | (PVC)	• gbs from deeper source seen in 5/09, not seen in 12/09 but water was murky.
Diameter of casing (in):	
Depth to pitless adapter (ft): 2.8	
Depth to water (ft): 79.6	
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 58	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft):	
Depth of videotape (ft): 130	
Reach borehole bottom: yes | (no)	
ODNR well log number: 125131, 932760	
County well log number: (1954) (2001)	
Reported casing length (ft): 41 57	
Reported depth of well (ft): 78 180	
Other: 2 wells	Elev = 1032'

Trip #___ Pumping rate, when pump on (gpm): 13

Depth (ft)	Time (min)	Feature	Comments
58	2:10	BP	bottom of casing
70's			lots of bacteria in well
79.6		WL	much bacteria, white lump colonies
79.6	4:18		Pump on
85	5:40		Centralizer, cascading water
~86	5:50	WL	Camera below WL, rolling gbs
85.2	6:20	gbs	at WL
	7:03		camera below WL, murky
85.5	8:00		centralizer, camera hung up → gbs GS?
89.4	14:00		past centralizer, very murky water →
95.9	15:15		murky water → downward ○ bacteria
95.9	17:00		no gbs, GS is above this depth
110	18:45		no gbs

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Buddenhagen

Page 2 of 2

Trip # 1

Pumping rate when pump on (gpm): 13

Depth (ft)	Time (min)	Feature	Comments
125	20:00		no gbs, much bacteria in water
129.8	20:30		centralizer
	23:35		ASCENDING
120	25:30		much bacteria moving downward to pump
110	29:10		no gbs seen
100	30:38		no gbs seen
95	31:25		" " "
91.5	34:00		" " " downward water motion
89.1	35:30		swirling motion, near GS
86.9	38:00		" " "
85.3	39:42	WL	gbs, swirling water, cascading water in lens
			Pump off
81.3	42:37		
			ASCENDING
	45:57		Camera out of well

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 4-1-2010 Page 1 of 2

Address: 7898 Scotland Drive	**Property owner:** Mechler
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TB	• LEL=0 in basement
Video interpreter: ~~T. Blair~~	• Wellhead LEL=0 before, during, and after videotaping
Video datum: (ground) | top of tripod | other	• No gas seen when well not pumping
Type of casing: (steel) | PVC	• No gas seen when well pump.
Diameter of casing (in):	• Original basement well, jet pump.
Depth to pitless adapter (ft):	
Depth to water (ft): 3.1	
Condition of casing: good | bad | (ugly)	
Length of casing (ft): 17	
Centralizers / torque arrestors: yes | (no)	
Depth to pump (ft): jet pump 28'	
Depth of videotape (ft): 37.4	
Reach borehole bottom: (yes) | no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	ELEV = 1040'

Trip #___ pump off Pumping rate, when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
3.2		WL	Bacteria colonies
3.6			Camera below WL, white bacteria colonies
8.4	2:35		Bacteria encrusted
12.5	2:55		Black zone → casing w/ black bacteria
16.7	3:30		" "
17.0			Approx. bottom of casing, difficult to see
17.6		Sh	
22.3		BP V	no gbs, shale
26.7	4:50	ZV	
31.8	5:45	V	shale
37.2	7:00	no gbs	Bottom of borehole, red & black particles
			ASCENDING

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Mechler 4-1-2010

Trip #___ pumpoff Page 2 of 2

Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
25.0	8:35	no gbs	
0	12:20		Camera removed from well to clean off water droplet
3.2	12:55	no gbs	Pump on *
5.0	13:20	" "	
6.5	15:30	" "	
6.8	16:55	" "	slow drawdown
20	19:01	no gbs	shale
28	20:02	" "	
36.9	21:15	no gbs	bottom of borehole
			ASCENDING
4.2	24:01	WL	
	24:48		out of well
			Done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 9-3-09 Page 1 of __

Address: 7915 Scotland Dr.	**Property owner:** MOWERY
City / Township: Bainbridge Dr.	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TB & TT	• Poor well — slow recovery — big bacteria
Video interpreter: ESBair	• No gbs seen
Video datum: (ground) | top of tripod | other	• No GS seen
Type of casing: (steel) | PVC	DISGUSTING WELL!
Diameter of casing (in):	
Depth to pitless adapter (ft):	
Depth to water (ft): 39	
Condition of casing: good | bad | (ugly)	
Length of casing (ft): 38.9	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft): 64	
Depth of videotape (ft): 64	
Reach borehole bottom: yes | (no)	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	ELEV = 1025'

Trip #__ Pump off Pumping rate, when pump on (gpm):__

Depth (ft)	Time (min)	Feature	Comments
23.9	2:35		Rust spalling off casing falling down wellbore
38.9		Sh	Bottom of casing
39.1	4:45	WL	Shale, many prominent bedding planes
41.7	5:30		Gray, white bacteria coating walls, black too
42		V	
44.6	6:30	Sh	Bacteria colonies all over walls, rust falling
48	7:40	BP	
55	9:00		Centralizer
59.5	10:05	V	
62.3			Centralizer
63.8	11:00		Top of pump
64.5	11:20		Rock popout (whole) lodged against pump
	12:00		ASCENDING

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

MOWERY (9-3-09)

Trip #___ Pumping rate when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
49		BP	
44		BP	
40	13:56	V	
38.9	13:57	WL	Vadose air (@ WL) entering borehole at bottom of casing, no LEL reading → air
39.3	16:03	WL	
			DESCENDING — pump on
44	18:18	WL	
~~58.9~~			
49.3	19:20		Bacterial scale popped off wall, exposing Shale
49.6		V	
51.9	20:30	WL	Cascading water
56	21:30	WL	Centralizer
59	22:00	V	
62		WL	Top of pump assembly
64	23:10	WL	Pump, cascading water, pump stops, No gbs seen at all / dry well
63.5	29:45	WL	Water dripping off camera, cascading water
62.8	33:10		no gbs seen w/ camera below WL
62.0		WL	Centralizer
60.9	37:30	WL	Water level rising very slowly
59.6	41:30	V	
58.1	49:17	WL	no gbs seen
58.1	50:14	WL	Camera dunked below WL, no gbs seen
56.6	56:20	WL	
	1:01:00		ASCENDING
			Done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 3-17-08 Page 1 of __

Address: 7950 Scotland Dr	**Property owner:** KOMOCKI / Phipps
~~City~~ / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: new | (old)	**Comments:**
Camera operators: TB/TT	• Poor image w/ old camera
Video interpreter: ~~ESBair~~	• Depth markers difficult to see against washed out white background
Video datum: (ground) | top of tripod | other	• gas in well, no idea of depth to source bed of gas
Type of casing: steel | (PVC)	
Diameter of casing (in):	
Depth to pitless adapter (ft): 1.0	
Depth to water (ft): 96	
Condition of casing: (good) | bad | ugly	
Length of casing (ft):	
Centralizers / torque arrestors: yes | no	
Depth to pump (ft):	
Depth of videotape (ft):	
Reach borehole bottom: yes | no	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip #___ Pumping rate, when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
96	6:10	WL	Within PVC casing, bacteria clump
100	7:52		Camera below WL
128			Centralizer, cannot get past
			ASCENDING
92	12:12	WL	Several few below camera
	12:20		Pump on
	14:00	gbs	Pump off — a few gbs
	16:35		Pump on
100	18:35	WL	
103	22:01	WL	
103+	27:10	WL	
			ASCENDING done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 9-2-09 #1 Page 1 of __

Address: 7950 Scotland	**Property owner:** Komocki / Phipps
City / County: Bainbridge Twp, Geauga	**Well location map:**
Latitude:	
Longitude:	
Camera: (new) | old	
Camera operators: TB & TT	
Video interpreter: ESBair	
Video datum: ground | top of casing | other	
Type of casing: steel | (PVC)	**Comments:**
Diameter of casing (in):	• First of two videos on 9-2-09
Length of casing stickup (ft):	• Casing ends at 149.5', remainder of borehole at smaller diameter, Berea Ss. ledge at smaller dia at 149.5'
Depth to pitless adapter (ft): 2.5	
Depth to water (ft): 96.5	
Condition of casing: (good) | bad | ugly	• No gas bubbles seen but flow system not stressed much
Length of casing (ft):	
Centralizers / torque arrestors (yes) | no	• Second video made after centralizers removed — same day
Depth to pump (ft):	
Depth of well (ft):	
ODNR well log (yes) | no	
ODNR well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	Ele=1056' • Ss/Sh contact @ 181'

Trip # 1 (downhole) / uphole Pump: on (off) Pumping rate (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
96.5	4:22	WL	Bacteria clumps on WL
108	8:30		Bacteria on discharge line, camera snagged on electrical tape
130	9:55		Centralizer — big one; camera snagged
132	11:25		Camera gets past centralizer
149.6	12:20	Ss	Bottom of casing — Berea Ss.
170.0	15:00		Centralizer w/ $9000 camera
170.0	18:00		Ramming centralizer, trying to get past
170.0	18:58		ASCENDING
149.7	20:00		Bottom of casing
149.7	20:47		Pump on — pipe ~~stuck~~ twists

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

no gbs seen as WL was falling

Page __ of __

Trip # 1 (downhole) / uphole Pump (on) / off Pumping rate (gpm):___

Depth (ft)	Time (min)	Feature	Comments
149.7	55:15	Ss	Camera at same position since 20:47 waiting for WL to fall into Ss
150	55:21	Ss	Camera descending
170	56:35		Centralizer
170	58:32		Stimied by centralizer
			END
			• Mrs. Komocki granted permission to pull pump line & pump from well to remove centralizers. This was done by Harper ~~Drilling~~ Well Services.
			• Another borehole video was made later in the afternoon with the camera now cleared to get past centralizers.
			* ~~Contact of Berea Ss w/ Bedford Shale at 181.6'~~

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Borehole Videotape Observation Log

Date: 9-3-2009 #2 Page 1 of __

Address: 7950 Scotland	**Property owner:** Komocki/Phipps
City / County: Bainbridge Twp, Geauga	**Well location map:**
Latitude:	
Longitude:	
Camera: (new) | old	
Camera operators: TB & TT	
Video interpreter: ES Bair	
Video datum: ground | top of casing | other	
Type of casing: steel | (PVC)	**Comments:**
Diameter of casing (in):	• well has been in continuous use since Dec. 2008 event
Length of casing stickup (ft):	• Usual well because all of the Cuyahoga shale is cased off and the well is open to Berea Ss and Bedford shale only
Depth to pitless adapter (ft): 2.5	• ~~Second~~ second of two borehole videos on 9-3-09
Depth to water (ft): 96.5	• Gas only enters well at bottom of casing in Berea Ss., no gbs below this, no GS below this
Condition of casing: (good) | bad | ugly	• Centralizers removed to get camera deeper
Length of casing (ft): 149.5	Ele = 1056'
Centralizers / torque arrestors: yes | (no) removed	
Depth to pump (ft): 185	
Depth of well (ft): 194	
ODNR well log: yes | no	
ODNR well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	

Trip # 1 (downhole) / uphole Pump: on / (off) Pumping rate (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
96.5	3:48	WL	Casing, murky water w/ some bacteria
118.0	5:05		Casing
149.5	6:55	Ss	~~Bottom~~ Bottom of casing — Berea Ss ledge
163.3	9:15	Ss	no gbs yet
174.7	11:05	Ss BPs	
181.3	11:46	Ss/Sh	contact w/ underlying Bedford Sh
181.3		BP	Large BP, no gbs yet
185.4	14:25		Top of pump
	17:30		ASCENDING
96.3	20:50	WL	no gbs yet
	22:20		Pump on

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Komocki

Page 2 of __

Trip # 2 (downhole) uphole Pump: (on) off Pumping rate (gpm): ___

Depth (ft)	Time (min)	Feature	Comments Pump on @ 22:20
106.2	23:29	WL	Water level still in casing to 149.5' depth.
107	23:40		Camera plunged under WL, murky w/ bacteria
115.5	25:35	WL	Camera above WL & descending w/ WL
119.0	26:45	gbs	2 Gas bubbles breaking water surface
126.2	27:10		Camera below water surface
133.2	28:04	gbs	Lots of small gbs
145.7	29:00	gbs	Lots more small gbs
150	29:15	gbs	Roiling gas
149.5	30:24	gbs	Gas bubbles & swirling water entering borehole
	BP	GS	at very bottom of casing in Ss → turbulence
			seen in gbs & bacteria (snapshot)
152.5	31:25		No gbs seen in water, gbs entering at 149.5'
155	37:02	Berea Ss	Descending but bacteria masking view
185 (182)	41:25	Bed. Sh	Murky view, no gbs seen
186	41:53		Pump, clear view, no gbs from below
190	43:00	Sh	Got camera past pump into shale, no gbs seen
194	44:10		Bottom of well, no gbs
	45:35	ASCENDING	
186	46:30		Pump
180	47:20		Murkier view → bacteria on lens
151	51:26	gbs	Roiling gbs, just below GS BP
148.3	52:00	WL	Roiling gbs → entering borehole @ 149.5'
149	53:26	WL	
			End of file
149.2	0:00		Open next file
149.2	1:00	gbs	Roiling w/ swirling water
149.5		BP gbs	Ledge of Berea Ss seen w/ roiling & swirling
149.5	2:40	WL	Squirting water from sides of borehole
			as WL in well drops. Gbs released into
			open borehole causing LEL readings to
			increase in borehole headspace because
			pressure in borehole is atm., no hydrostatic?
161.5	6:50		Murky image, bacteria covering lens
161.5	10:54	ASCENDING (pump off)	
149.3	11:25	gbs	Roiling
131.3	12:35	WL gbs	WL rising rapidly → good well!
125.0	13:29	gbs WL	
100.0	21:07	gbs WL	
	26:08		END

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Borehole Videotape Observation Log

Date: 3-17-08 Page 1 of 3

Address: 7969 Scotland Dr.	**Property owner:** KUKOLECK
City / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera: new | (old)	**Comments:**
Camera operators: TB & TT	• Gas source beds @ 84' 97' 105'
Video interpreter: ES Bair	
Video datum: (ground) | top of tripod | other	
Type of casing: (steel) | PVC	
Diameter of casing (in):	
Depth to pitless adapter (ft): 2	
Depth to water (ft): 74	
Condition of casing: (good) | (bad) | ugly	
Length of casing (ft): 33 - 34	
Centralizers / torque arrestors: yes | (no)	
Depth to pump (ft): 116 - 117	
Depth of videotape (ft): ~~88~~ 117	
Reach borehole bottom: yes | (no)	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	ELEV = 1036'

Trip #___ Pump off Pumping rate, when pump on (gpm):___

Depth (ft)	Time (min)	Feature	Comments
33	4:00		Bottom of casing
35		V Sh	Shale (Cuyahoga)
37		2V	
40-42	4:40	V	
48		V	
52		V	
55		2V	
64		2V	
66		2V	Shale
74	7:12	WL V	Water level in well
76		Sh	Shale
80		Sh	" "
82	8:20	2V	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Kukoleck (3-17-08)

Page 2 of 3

Trip # 1 downhole / uphole Pump: on / off Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
85		V	Shale
89		2V	
92		V	
97		V	
99		BP	
105	11:50	BP	Shale
109		BP	
114	12:48	BP	
117	13:05		Pump or torque arrestor, much bacteria
		ASCENDING	
<76	16:20	WL	
36	19:00		Casing okay
	21:11		End of file
6	0		New file, DESCENDING
33-34			Bottom of casing
72	3:58	WL	Pump on
73	4:01	gbs	
81	4:43	gbs	
86	5:30	V gbs	
95		gbs	
105	7:00	gbs	
113	7:40	gbs	Top of pump → gas rising from below pump
113	9:01	gb	From below pump
		ASCENDING	
90	11:30		
85	12:01	V	
84	12:06	BP GS	
81	12:45	WL	Few gbs, then many, then roiling
	14:40	DESCENDING	
93	~~12:50~~	V	16:00
97	16:20	V	
108	17:30		
	17:40	gbs	ASCENDING
105	18:11	gbs GS	
			DESCENDING
114	20:20		
			ASCENDING
96	22:20	gbs	
97	22:35	gbs GS BP	Gas source on BP at back & right

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening

Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Kukoleck (3-17-08) Page 3 of 3

Trip # 1 downhole / (uphole) Pump: (on) / off Pumping rate (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
85	24:25	WL	gbs, mild roiling as WL drops to 85'
84		V	
	25:30+		ASCENDING Pump off
54	27:25	V	
46		V	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Borehole Videotape Observation Log

Date: 12/1/09 Page 1 of 2

Address: 7969 Scotland	**Property owner:** Kukoleck
~~City~~ / Township: Bainbridge	**County:** Geauga
Latitude:	**Longitude:**

Camera (new) | old	**Comments:**
Camera operators: TB & TT	• Open part of borehole totally in shale
Video interpreter: ES Bair	• uncertain about GS @ 86'
Video datum: ground | top of tripod | other	• certain of GS @ 106-107'
Type of casing: (steel) | PVC	• certain about GS below centralizer @ 108'
Diameter of casing (in):	• Pumped from 33:40 to 6:20 (27 min 20 seconds) @ 13 gpm for a total of ~ 360 gals and 1-foot of drawdown → Berea Ss. must be exposed in borehole below 108'
Depth to pitless adapter (ft): 2.9	
Depth to water (ft): 59.7	
Condition of casing: good | (bad) | ugly	
Length of casing (ft): 34.5	
Centralizers / torque arrestors: (yes) | no	
Depth *to* pump (ft): 108 (?)	
Depth of videotape *(ft)*: 107	
Reach borehole bottom: yes | (no)	
ODNR well log number: 125132, 691212	Elev = 1036'
County well log number:	
Reported casing length (ft): 38 36	
Reported depth of well (ft): 80 140	
Other: 2 wells (1954) (1989)	

Trip # 1 Pumping rate, when pump on (gpm): 13

Depth (ft)	Time (min)	Feature	Comments
34.5			bottom of casing
36.4		BP	Shale
37.8		BP	Shale
59.7	5:45	WL	lots of bacteria
	6:20	WL	Pump on, Japanese beetle on WL
60.5	6:50	WL	bacteria colonies (white bumps)
60.6		gbs	railing, camera under WL
64.7		BP V	
68.1	8:00	gbs	
70.5		V gbs	
71.5		V gbs	
74.3		BP gbs	
76.7		V gbs	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Page 2 of 2

Trip # 1 Pumping rate when pump on (gpm): 13

Depth (ft)	Time (min)	Feature	Comments
78	8:50	BP gbs	Shale
82.6		V BP gbs	
86.3		V	
88	9:35	no gbs	
88.6	10:15	no gbs	
87.7		1 gbs	- deeper source
85.2		1 gbs	- " "
~~86.0~~		~~GS~~	
85.4	11:53	gbs	many
86.4	12:15	V	
87.9	12:25	gbs	
89.2	12:45	gbs	shale
90.5		V gbs	
93		BP gbs	
94.3		BP gbs	
98			shale
100.4	14:35	gbs	
100.8		BP gbs	
102.3		BP	
105.7+	15:35	GS BP	upper right side
106.7+	16:06	GS BP	lower left side, immediately above centralizer, shale
106.2	16:45	GS BP	
106.8	17:08	GS	GS deeper than centralizer, gbs getting past centralizer at 7:00
107.5	17:30	gbs	trying get past centralizer, shale
105.8	19:20	GS BP	left side BP @ 8:00
107.7	20:20	gbs	ramming speed
106.3	21:30	GS gbs	
103.1	23:00	gbs	
90	24:53	gbs	
84.9	25:38	gbs	
85.7	25:50	GS Sh	BP @ 12:00 noon → maybe (uncertain)
84.6	26:40	gbs	
88.0	27:50	gbs	Shale
85.1	29:10	gbs	
		ASCENDING	
60.1	33:40	WL	roiling
34.2	35:00	BP	
	36:27		out of well

same

same

deeper GS below centralizer

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Borehole Videotape Observation Log

Date: 10-15-09 Page 1 of 2

Address: 7981 Scotland	**Property owner:** BASTIFELL
City / County: Bainbridge Twp, Geauga	**Well location map:**
Latitude:	
Longitude:	
Camera: (new) | old	
Camera operators: TB & TT	
Video interpreter: ESBair	1037' Ele = ~~1085~~
Video datum: ground | top of casing | other	
Type of casing: (steel) | PVC	**Comments:**
Diameter of casing (in):	• Rusting, flaking casing at top Fog on lens until dunked in WL
Length of casing stickup (ft):	
Depth to pitless adapter (ft):	
Depth to water (ft): 58.5	• No gas source seen below 78'
Condition of casing: good | (bad) | ugly	• Bottom of gas zone at ~78' w/in Cuyahoga Shale
Length of casing (ft): 34	
Centralizers / torque arrestors: (yes) | no ???	
Depth to pump (ft):	
Depth of well (ft): >112	
ODNR well log (yes) | no 1993	
ODNR well log number: ~~886~~ 768348	
Reported casing length (ft): 37	
Reported depth of well (ft): 150	

Trip # 1 (downhole) / uphole Pump: on / (off) Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
34	2:40	Sh	Bottom of casing
>58.5	4:25	WL	
58.5	4:30	gb	
	4:40		ASCENDING w/out fog on lens
52		BP	
38		BP	
			DESCENDING — crud on lens
58.5	8:35	WL	Much bacteria
64.2	9:05	gb	
63.9	9:40	gb	big bubbles from depth
69.5	9:50	BP, V	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Page 2 of 2

Trip # 1 (downhole) uphole Pump: on / (off) Pumping rate (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
67.6	10:10	gb	
74	11:40	V	
75.4	12:25	V	
78		V	
90	13:55		Bacteria pod
108		Sh	
111	15:10		Centralizer – could not get past
		ASCENDING to WL	
66.5	19:25	gb	
•	19:29	GS BP	big bedding plane, bacteria on opposite wall
	21:55		Pump On
58.5	22:10	gb	lots of roiling gb at WL
• 69+	23:10	GS BP	large bubbles emanating from big BP
72.3	24:05	gb	small bubbles
74.4	24:25	gb	" " " "
! 74.4	24:45	GS V	emanating from vertical joint ≠BP
! 77.9	25:40	GS V	" " " "
		ASCENDING to pumping WL	
60.4	27:00	WL	
		DESCENDING	
• 68.9	27:38	GS	BP source
• 78.0	28:50	GS V	gas emanating from VJ ≠BP (small)
79.7	30:56	gb	very small bubbles
104.3	34:10		Bacteria fallening through water column
110.9	35:10		centralizer
111.2	36:40		no gas seen rising from below
		ASCENDING	
90.6	39:00		no gas from below, much orange bacteria rust falling
• 68.9	40:35	GS	
61.2	41:25	WL	
		DESCENDING	
• 74.3		GS	
89.5	44:		Orange bacteria/rust falling onto ledge
85.0	44:53		no gb
		ASCENDING – pump off	no gb
80.0	46:30		no gbs
77.8	47:08	gb	agitating water w/ camera to get gas out

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Borehole Videotape Observation Log

Date: 11-25-09 Page 1 of 2

Address: 7174 Sherman Road	**Property owner:** KOBELLA
City / Township: Chester	**County:** Geauga
Latitude:	**Longitude:**

Camera: (new) | old	**Comments:**
Camera operators: TB & TT	- GS at 72 from sandstone
Video interpreter: ~~ES~~ Bair	- Poor steel casing ↓ tiny gbs
Video datum: (ground) | top of tripod | other	- Some bacteria
Type of casing: (steel) | PVC	
Diameter of casing (in):	
Depth to pitless adapter (ft):	
Depth to water (ft): 68	
Condition of casing: good | (bad) | ugly	
Length of casing (ft): 58.5	
Centralizers / torque arrestors: (yes) | no	
Depth to pump (ft): 92	
Depth of videotape (ft): 92.5	
Reach borehole bottom: yes | (no)	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip # ___ Pump off Pumping rate, when pump on (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
53			Rusting, flaking casing
58.5	3:50		Bottom of casing
59.0	4:35		Bacteria
62.4		BP	Sandstone
63.1	5:12	BP	" "
65		BP	" "
66.1	5:50	BP	" "
67.5		BP	" "
68.1	6:07	WL	water level in borehole
68.3		gbs	Very small gbs collecting on camera lens
70.6	7:10	gbs BP	Sandstone
71.9		BP	Bacteria
75.7			ASCENDING to clear lens

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Kobella

Page 2 of 2

Trip #___ downhole / uphole Pump: on / (off) Pumping rate (gpm):___

Depth (ft)	Time (min)	Feature	Comments
75	12:21		
68	12:35	WL	
68.2	13:35	gbs	Tiny gbs
68.2	13:52		Pump on
69.1	14:20	gbs	
69.4	14:45	gbs	Ss, tiny gbs
69.8	15:03	gbs	" " " WL
72	17:00	GS	Tiny gbs, right side — 2 openings
74	17:15	Ss	no gbs
78	17:37	Ss	no gbs
84	18:09	Ss	"
89	18:34	Ss	no gbs, centralizer
			ASCENDING
80	19:22	no gbs	
75	19:40	no gbs	
71.7	20:05	gbs	GS on right side — two openings
70.3	20:46	WL	tiny gbs
70.3	22:00		Camera above water level, tiny gbs
72.0	28:31		Camera below water level, tiny gbs
90.1	29:35	no gbs	Centralizer — above pump
92.5	30:20	no gbs	Pump
93.2	31:02		Well screen (pump) opening
			ASCENDING
70	32:18		
50	33:20		
10	35:20		
0	36:50		Out of well
			done
			"

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone WL = water level in well

Borehole Videotape Observation Log

Date: 5-14-09 Page 1 of 2

Address: 12803 S. Woodside Dr.	Property owner: ROLLER
~~City~~ / Township: Chester	County: Geauga
Latitude:	Longitude:

Camera: (new) | old	Comments:
Camera operators: TB & TT	• No gas seen
Video interpreter: ~~ES~~ Bair	• Lots of BP & V joints
Video datum: (ground) | top of tripod | other	
Type of casing: (steel) | PVC	
Diameter of casing (in):	
Depth to pitless adapter (ft):	
Depth to water (ft): 126	
Condition of casing: (good) | bad | ugly	
Length of casing (ft): 127	
Centralizers / torque arrestors: yes | (no)	
Depth to pump (ft): 184	
Depth of videotape (ft): 184.6	
Reach borehole bottom: yes | (no)	
ODNR well log number:	
County well log number:	
Reported casing length (ft):	
Reported depth of well (ft):	
Other:	

Trip # ___ pump off Pumping rate, when pump on (gpm): ___

Depth (ft)	Time (min)	Feature	Comments
85.5	7:00		Old looking casing behind wiring
121	12:05		Corrosion of casing, isolated
125.7	12:40	WL	Water level just above top of rock
126.4	13:30		Bottom of Casing
130.3	14:04	V BP	Pop out
133.0	14:43	BP	
133.7	14:50	2V	
133.3	15:37	BP 2V	
133.9	16:05	BP V	Big
134.8	16:35	V	
135.8	16:50	BP	
136.7	17:10	V	Pop out
138.4		V	

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone St = siltstone WL = water level in well

Roller
5-14-2009

Page 2 of 2

Down-hole Trip Pump: on / (off) Pumping rate (gpm):

Depth (ft)	Time (min)	Feature	Comments
141		V	Shale
144.3	17:55	V	
148.9		BP	
150.5		BP V	
153.5		V	
155.6	19:30		Drill bit spin out
156.1			Drill bit spin out
158.8		BP	
161.9	20:20	2V	Huge pop out, bacteria
164.1	21:32	BP	
167.9	22:00	BP	Big Cuyahoga Shale – Orangeville, Aurora Silt Hst.
169.9		BP	
170.5		BP	
172.0	22:44	BP	
172.6	22:50	BP	w/ black particles on shelf
177			Shale
184	24:05	BBS	centralizer on top of pump
184.6	25:52		Top of pump
			ASCENDING quickly
			done

BP = prominent bedding plane V = prominent vertical joint gb = gas bubbles from greater depth GS = gas source opening
Sh = shale Ss = sandstone Lms = limestone