

**Appendix 1.** Location, physical characteristics, borehole-geophysical logs and interpreted structures for well Act 1.

This well was logged from July 24, 2007 through July 27, 2007 (ID act1.072407) and is located at the North Acton Recreational Area. This is a public recreation facility along Rte 119 in Acton, MA. The site is approximately 56 meters above sea level. The well sits along an athletic field approximately 100 meters from a man made pond. Reported yield is 5 gpm. There are outcrops of bedrock approximately 25 meters from the well. The well was drilled as part of a suite of wells that are used for watering the athletic fields. Of the three wells drilled act1.072407 had the lowest yield so it is unused. The other two wells, one of which is less than 25 meters away are currently in use. They were not, however, in use during logging.

Overburden is approximately three meters thick and consists of glacial till. There are scattered clasts and a few small boulders. The bedrock unit is the schist of the Nashoba formation, a fine to medium grained, well foliated, gray to silvery-gray quartz-mica schist that may contain biotite, garnet and sillimanite.

The well is 152 meters deep. Casing length is 7.6 meters. There were 25 fractures identified during logging, 7 subhorizontal fractures, 17 tectonic fractures and 1 FPF. The water table was at 5.02 meters depth. Heat pulse flowmeter measurements were taken under ambient and pumping conditions. The well was pumped at a rate of 0.5 gallons per minute for approximately 2 hours and 50 minutes. Two flowing fractures were identified at depths of 24 and 70 meters. Of the flowing fractures, both were tectonic fractures.

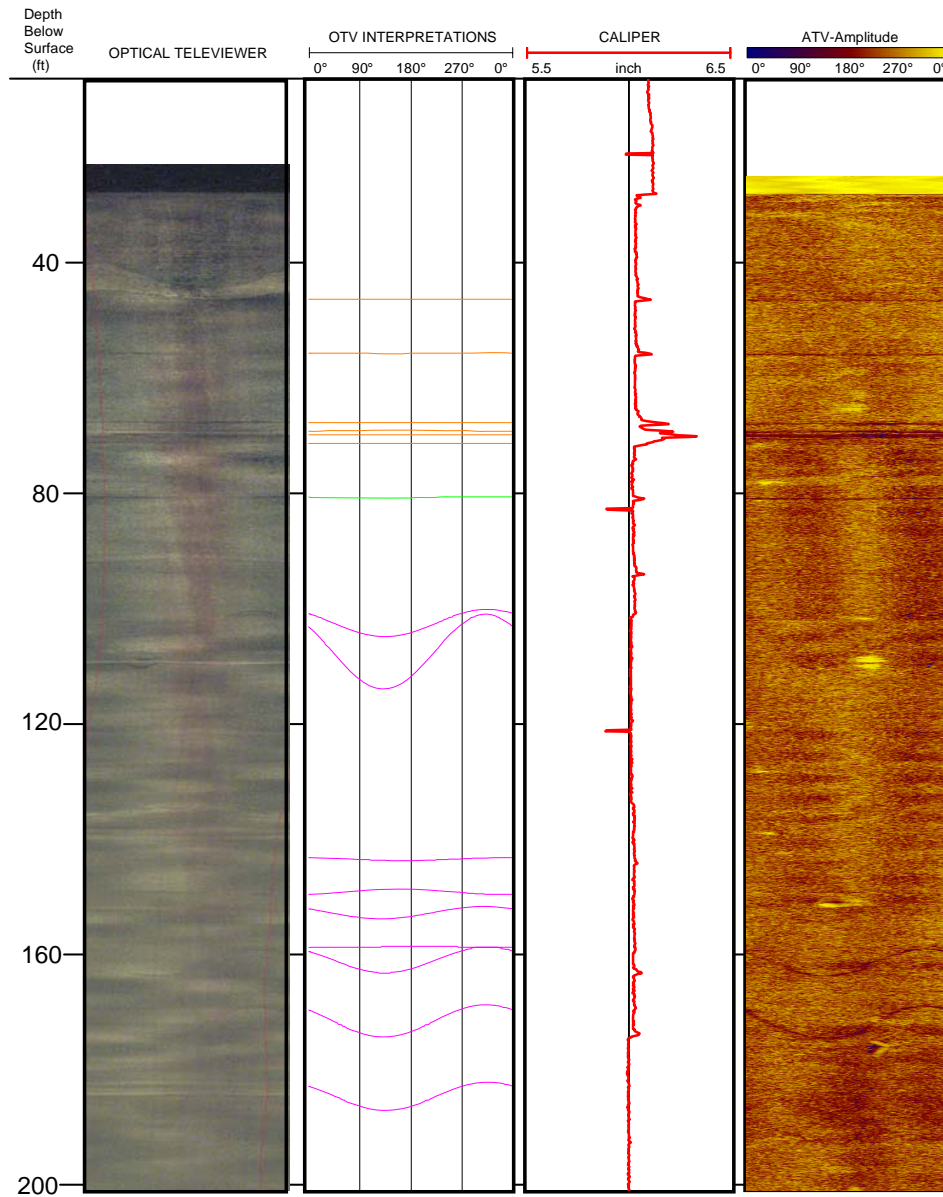
**Appendix 1, continued.** Location, physical characteristics, borehole-geophysical logs and interpreted structures for well Act 1 (Azimuths and dips follow right hand rule, t=tectonic, s = sheeting, p = foliation parallel fractures). Flow data under pumping conditions have not been normalized.

Site ID: act1.072407  
 Location: "NARA" Acton, MA  
 Elevation (m) 56  
 Reported Yield (gpm) 5  
 Rock Type: Nashoba Formation Schist

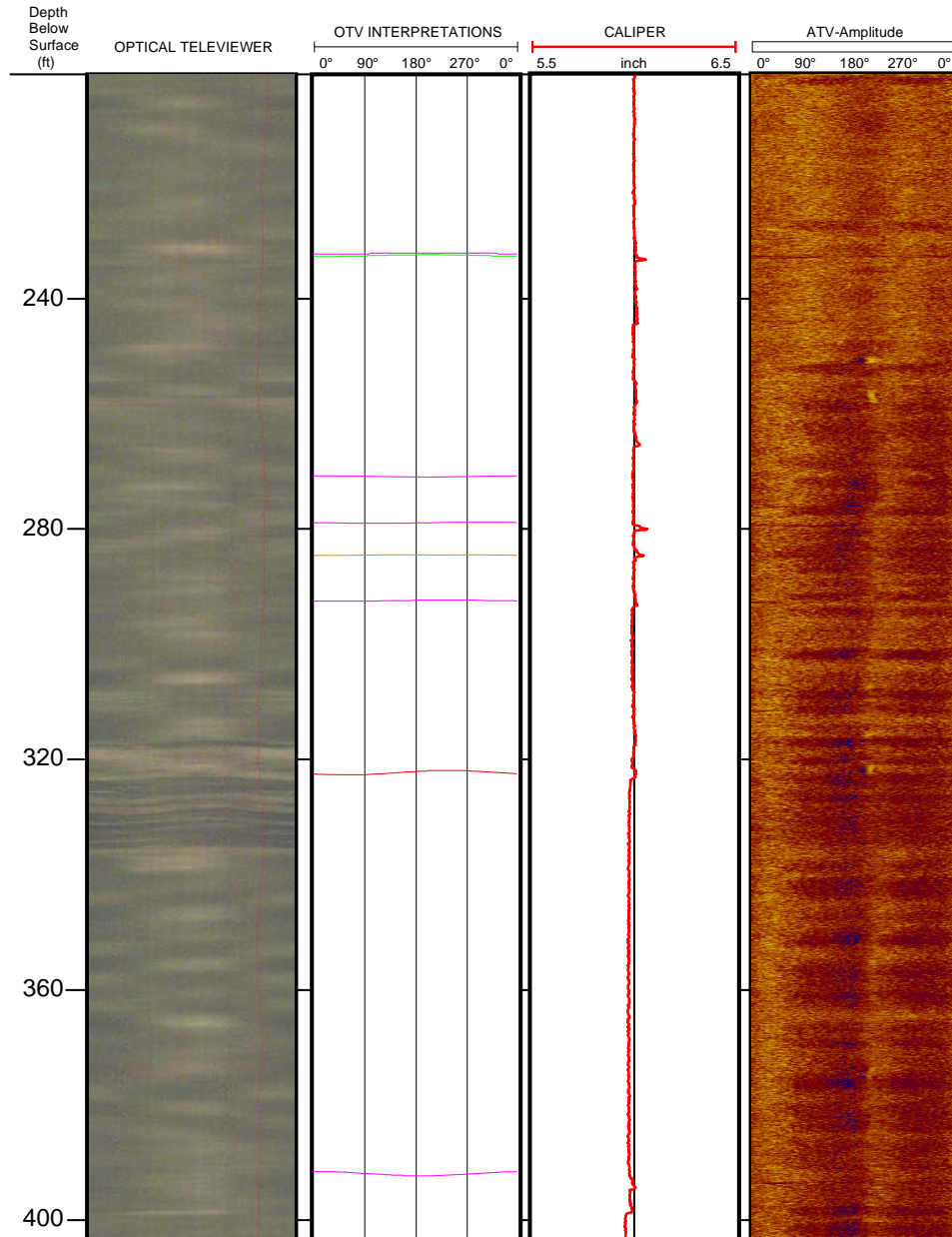
Depth to water: 16.5 ft 5.02 m  
 Depth of casing: 25 ft 7.62 m  
 Depth of well: 500 ft 152.40 m  
 Land surface to MP: 1.45 ft 0.44 m

Fractures						Ambient			Pump at 0.5 gpm		
number	depth (m)	depth (ft)	Azimuth	Dip	Type	Flow (y/n)	gpm	notes	Flow (y/n)	gpm	notes
1	14.1	46.3	270	9	s	n	0		n	0.36	
2	17.0	55.7	54	17	s	n	0		n	0.36	
3	20.6	67.7	276	10	s	n	0		n	0.36	
4	21.1	69.1	246	23	s	n	0		n	0.36	
5	21.3	69.9	142	14	s	n	0		n	0.36	
6	21.7	71.2	23	13	s	n	0		n	0.36	
7	24.6	80.7	24	34	t	y	0	flow out	y	0.36	flow in
8	31.2	102.5	44	86	t	n	0.01		n	0.13	
9	32.8	107.5	42	89	t	n	0.01		n	0.13	
10	43.7	143.5	76	57	t	n	0.01		n	0.13	
11	45.5	149.2	250	71	t	n	0.01		n	0.13	
12	46.6	152.8	38	81	t	n	0.01		n	0.13	
13	48.4	158.7	285	35	t	n	0.01		n	0.13	
14	49.1	161.0	44	86	t	n	0.01		y	0.13	
15	52.3	171.5	42	87	t	n	0.01		n	0.13	
16	56.3	184.6	45	86	t	n	0.01		n	0.13	
17	70.7	232.1	300	35	t	n	0.01		n	0.13	
18	70.8	232.4	293	41	t	y	0.01	flow in	y	0.13	flow in
19	82.6	270.9	108	35	t	n	0		n	0	
20	85.0	278.9	22	32	t	n	0		n	0	
21	86.7	284.4	303	23	s	n	0		n	0	
22	89.1	292.4	326	29	t	n	0		n	0	
23	98.2	322.3	327	68	p	n	0		n	0	
24	119.5	392.0	99	66	t	n	0		n	0	
25	146.5	480.7	55	59	t	n	0		n	0	

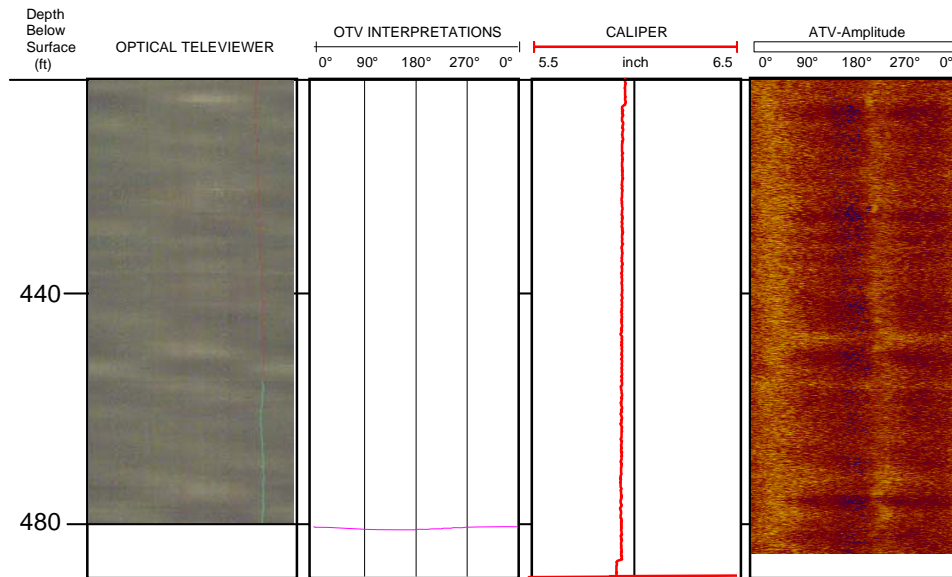
**Appendix 1, continued.** Interpreted features for Act 1. Optical televiewer interpretations indicated by color: orange – subhorizontal sheeting joint; magenta – tectonic joint; red – foliation parallel fracture (FPF); cyan – transmissive subhorizontal sheeting joint; green – transmissive tectonic joint; grey – transmissive foliation parallel fracture (FPF). OTV – optical televiewer; ATV – acoustic televiewer.



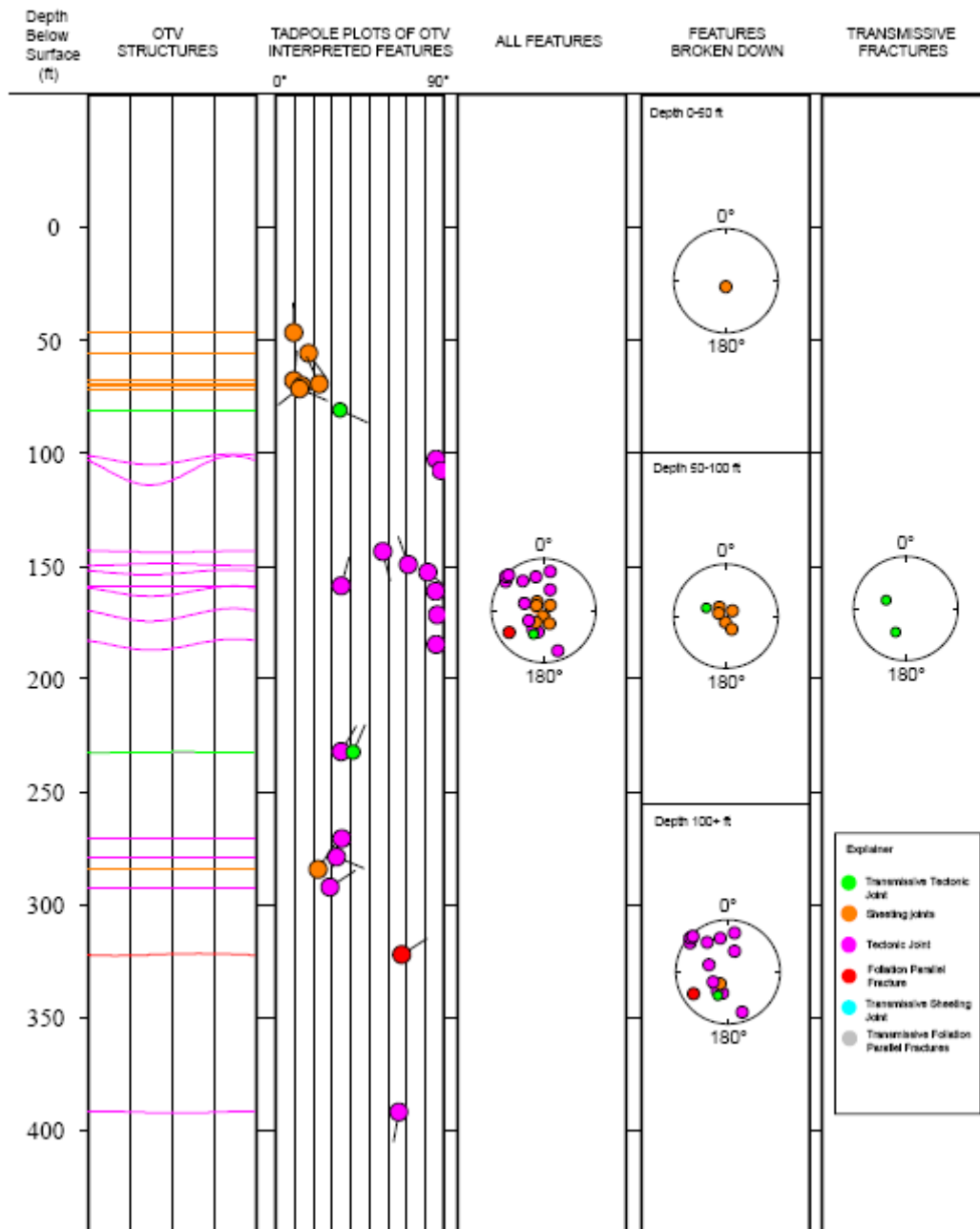
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**Appendix 1, continued.** Tadpole plots and stereoplots of interpreted optical televiewer (OTV) structures for Act 1. In the tadpole plot depth is plotted along the y-axis and magnitude of the dip plotted on the x-axis. The tail of the tadpole points in the direction of the dip, relative to true north, which is toward the top of the page. The stereonets represent poles to planar features plotted on a lower-hemisphere equal-area stereonet. Stereonets use right hand rule convention. Colors on the OTV structures plot correspond to those in the tadpole explanation.



**Appendix 1, continued.** Composite log for Act 1 of natural gamma, fluid resistivity, fluid temperature and heat pulse flowmeter data under ambient and stressed (pumping) conditions. For the heat pulse flowmeter data collected under pumping conditions, the well was pumped at 0.5 gallons per minute and flow data have been normalized.

