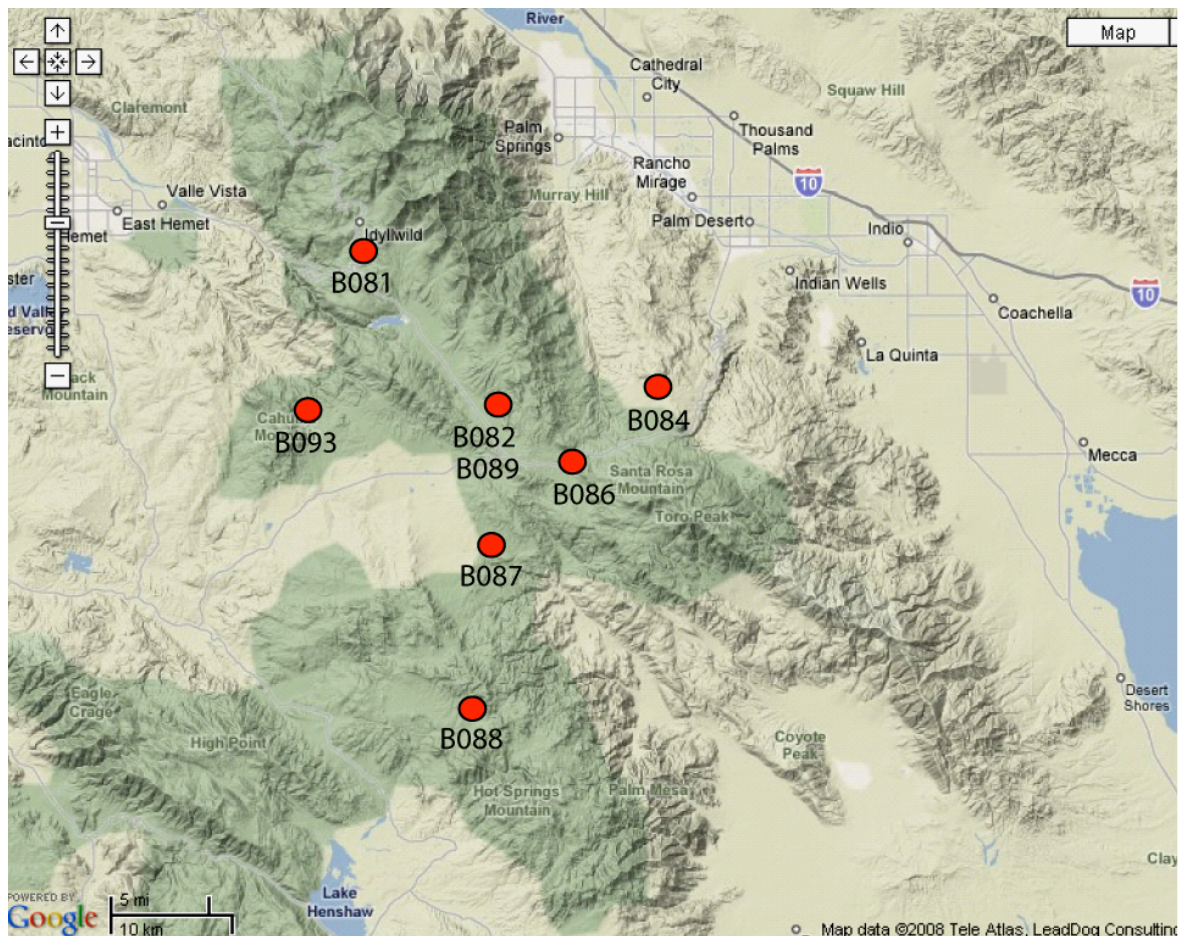


Station Notes for B089, Pathfinder II, pathfi089bcs2006

Latitude:	33.6 (WGS 84)
Longitude:	-116.596 (WGS 84)
Elevation:	1362 m / 4469 ft
Install Depth:	132.8 m / 437 ft
Orientations:	CH0=291, CH1=231, CH2=171, CH3=141
Install Date:	28 August 2006
GTSM Technologies #:	US19
Executive Process Software:	Version 1.14
Logger Software:	Version 2.12
Home Page:	http://pbo.unavco.org/station/overview/B089
Notes Last Updated:	February 5, 2019

• Install depth is from the top of the casing to the bottom of the strainmeter.

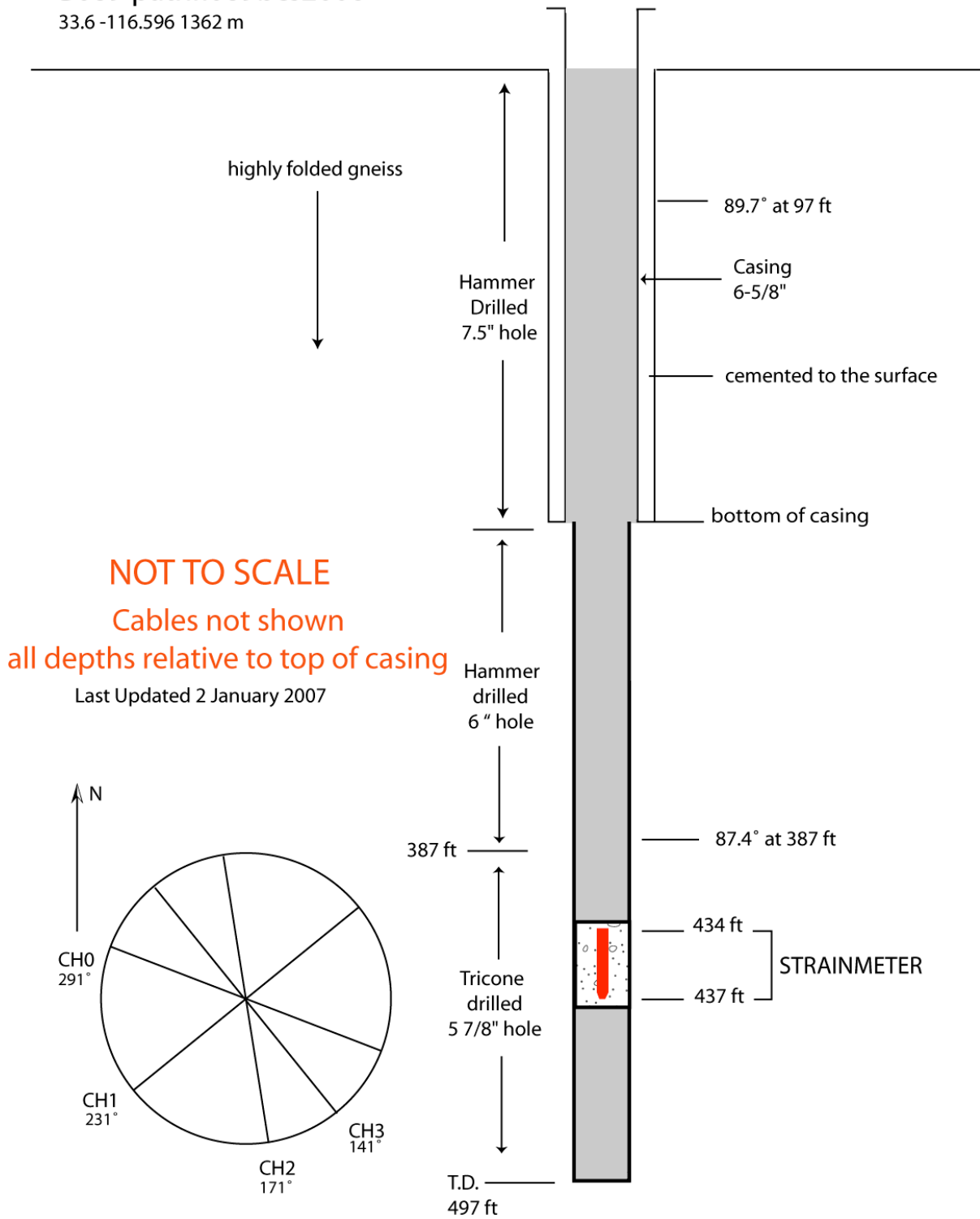
• Orientations are in degrees East of North.



Anza PBO strainmeter network, February 2008.

B089 pathfi089bcs2006

33.6 -116.596 1362 m



Instrumentation at Strainmeter

Instrument	Units	Bottle/ASCII Scale Factor	SEED Scale Factor
Pore Pressure	Hecto Pascals	N/A	N/A
GTSM Barometer	Kilopascals	1.0	0.0001
Rain Gauge	Millimeters/hour	1.0	0.252
Down hole Temperature Sensor	Degrees Celsius	1.0	0.0001
Logger Temperature Sensor	Degrees Celsius	1.0	0.0001
Setra Barometer	Hecto Pascals	Not installed at this time	

1. Installation notes

This site is located in the Garner Valley next to a north south running ridge. Site geology consists of highly folded gneiss. Original drilled depth was 504 ft. Seven ft of hole was lost after drilling. The hole was filled to 450 ft using 8 96lb bags of neat cement with a grouter. The next day we used a 3 section dumb bailer to bring the hole to 439 ft. Before the installation we used a sand bailer to remove soft cement. Install went well except a bad wrap on the strainmeter cable reel which caused a 5 min delay in the install.

This strainmeter is part of a 2-strainmeter cluster. Strainmeter B082 is sited a few 100 meters from B089.

2. General Information

- From installation to January 8, 2007 - Power issues were causing station power to drop below 12 volts causing the logger to shut down for several hours. Large transients in strain were recorded every time the station restarted. (at least once a day).
- Starting on January 2, 2007, a strain signal was observed on B082 and B089. The signal coincides with 75-125 yards of dirt (100-150 tons) being placed around B089.
- Starting on March 27, 2007, a repetitive signal appeared.
- Pumping started on April 25, 2007 producing a saw tooth like strain signal. The other repetitive signal is also still occurring.
- Operator logs show environmental door as always open.
- Sensitivities of all EH channels corrected on March 4, 2010.
- April 4, 2010 - Magnitude 7.2 - BAJA CALIFORNIA, MEXICO
- A new well was drilled 900 ft north west of B082 and 500 ft west of B089. The well was completed by March 21, 2014. Mud drilling was used to a depth of 290'. Grade to a depth of 160' was through coarse sand and crystal, and took 9 hours to drill. 160' to 290' was coarse sand and granite, drilled at a rate of 50' per 8 hours. At 290' the drilling mud kept disappearing and the progress stopped. Ground water started seeping in the hole at about 20' below grade sending the drilling mud to the bottom of the hole filling it up to 270'. The well was flushed out, producing 22 GPM at 100'. At the depth of 260 feet 30 GPM was produced. They will install a pump in 6 to 8 weeks.

3. Strainmeter Maintenance

- January 8, 2007- Michael Hasting visited the site. He installed new flex charge controller to GTSM batteries and replaced wires from solar panels to flex charger. Placed radio on LVD

of flex charger. Upgraded RT Controller firmware to version 1.17. Upgraded GSP firmware to version 135_309.s3. He also noted that an estimated 100-150 tons of dirt had been placed directly on the site around on January 2-3, 2007.

- January 20, 2007 – The solar system at B089 was upgraded.
- January 22, 2007 – Wade Johnson visited the site to get B089 back online (the breaker to the solar panels was off).
- February 15, 2007 – The equipment rack and new power system were installed. Seismic, Marmot, Intuicom (for Pathfinder II), NetRS were off from approx 1130-1300 PST. GTSM was running the whole time.
- April 24, 2007 – Michael Hasting visited the Pathfinder Ranch to do some maintenance on B082.
- July 25, 2007 - Steve Smith visited the pathfinder sites.
 - 3:00 pm (PST) - arrive at Pathfinder Ranch
 - 3:05 - Doors opened
 - 3:10 - Batteries @ 13.31 V -- Solar @ 13.37V
 - Backpanel UVID -- 20662
 - Intuicomd UVID -- 22126
 - 3:26 - Doors closed
 - 4:30 - Doors opened
 - 4:32 - Solar charging at 4.6A in good sun
 - 4:39 - Doors closed
 - 6:24 - Doors opened
 - 6:25 - Checked battery connections -- all tight
 - Battery type is DEKA - 8G31DT
 - 6:26 - Doors closed at DC site
 - 6:27 - Leaving the area
- July 26, 2007 – Steve Smith continues work at the Pathfinders sites.
 - 12:30 pm (PST) - Arrive at site
 - 12:31 - Doors opened
 - 3 batteries unloaded into hut
 - 12:34 - Doors closed
 - 3:38 - Doors opened
 - 3:44 - 3 New batteries wired into the "bus"
 - 3:49 - New battery bus @ 12.92V
 - 3:50 - Doors closed
 - 3:52 - Left Pathfinder Ranch
- July 27, 2007 – Steve Smith finishes up work at the pathfinder sties.
 - 12:54 pm (PST) - Doors opened
 - 12:56 - Got voltage and current
 - Charging current for solar was 3.3A - Partly cloudy skies
 - Battery voltage @ 12.91
 - 12:57 - Doors closed
 - 1:30 - Leaving Pathfinder Ranch
- February 20, 2008 UTC – Tim Dittman visited the site.
 - 22:45 - On site.
 - 22:50 - Replace broken solar panel.
 - 22:50 - Tune GTSM, braid solar leads, vacuum and caulk hut, and tighten lugs.
 - 23:15 - Off site.

- March 18, 2009 – The logger was upgraded from version 1.15 to 2.02.2.
- June 17, 2009 – Upgraded RT boards to 1.20.
- June 23, 2009 – Mike Gottlieb at site. Upgraded power box to SP318 / 27133. This will resolve the out of range pressure as well.
- October 13, 2009 – Mike Gottlieb took the Midtronics battery tester to the site and got the following result. There are 6 batteries on site with the following conductances in S: 630, 750, 750, 690, 738, 786. He measured two new batteries for a reference and got 810 and 978 S. The theoretical conductance for these batteries is 1200 S. He will remove these old batteries and put 10 new batteries in this week. Hopefully this will resolve the restarting issue.
- October 15, 2009 – Removed 6 old batteries and replaced them with 10 new ones. All of these batteries tested in the 850-1000 S range. Mike will follow over the next few days to see if the station stays online at night.
- Feb 18, 2010 – Mike Gottlieb was onsite to get B082 back online.
- March 22, 2010 – Mike Gottlieb moved the station to A/C power, and installed an A/C backpanel. This should resolve all power related issues.
- November 23, 2010 – A septic field was dug up near this station.
- February 22, 2010 – Dirt will be moved near/around B089 this week.
- April 19, 2011 – Pathfinder Ranch will be moving logs and dirt next to B089 this week and next week. April 29, 2011 they will be getting a large Alpine climbing tower installed close to B089. It will sit above ground and weigh about 80,000 lbs.
- June 2, 2011 – Landowners notified Mike Gottlieb that they would be moving dirt around B089 2nd to ~8th June 2011.
- April 17, 2013 – Mike replaced the logger board with a modified logger board in an attempt to reduce thermal noise. There was no noticeable difference. Secured electronics with velcro, zip ties, and double sided tape. Batteries have not been secured yet.
- January 23, 2014 – Liz applied the coldstart command to try and fix the GSP time being invalid. GPS time was still bad, station will need a new powerbox.
- March 18, 2014 – Coldstart command was sent, but was unsuccessful in fixing the timing. The clock was off by 22 minutes at the time.
- April 1, 2014 – Powerbox was replaced. Station now has GPS time again.
- April 21, 2014 – Mike Gottlieb received email that the land owners would be moving dirt by B089.
- April 31, 2014 – Power box replaced the week of April 31.

- October 16, 2014 – Landowners will be moving dirt 600ft from the Strainmeter for the next few weeks.
- January 21, 2015 – Set quadrature on the GTSM.
- December 27, 2016 – Investigated power issues. Visible corrosion on terminals of power isolation block. 13.4 V in, 1.3 V out (should be 16V out). Power block needs to be replaced. Confirmed RT firmware was 1.20. Adjusted quadrature and chop delays. Made small adjustments to all channels. Turned on event mode, set trigger/aftershock to 300/60. Confirmed all other strain-logger.conf settings were correct for this powerbox.
- December 21, 2018 – Swapped in a new IOTA charge controller. The back panel was removed temporarily so that new holes could be drilled for two of the four mounting screws.