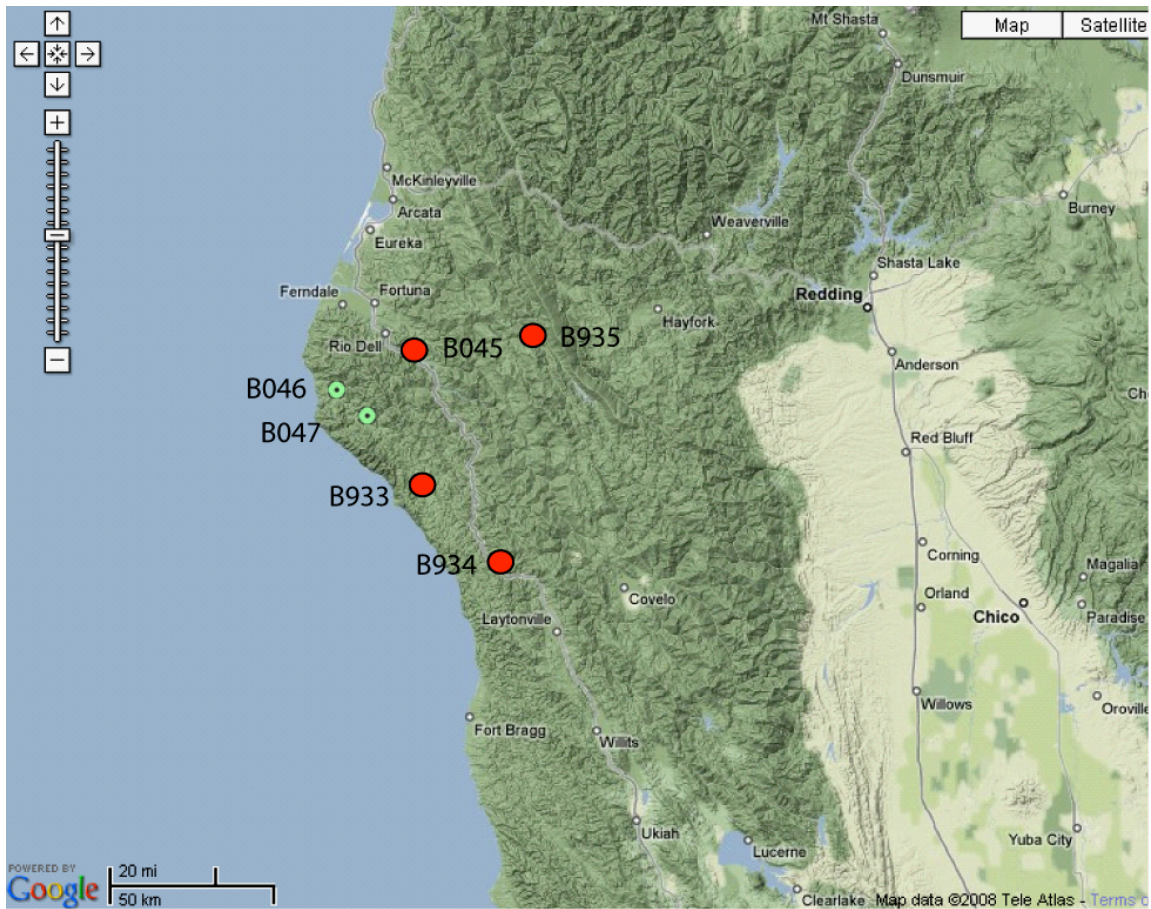


Station Notes for B045, rdcrst045bcn2008

| | |
|-----------------------------|---|
| Latitude: | 40.4360 (WGS 84) |
| Longitude: | -123.9965 (WGS 84) |
| Elevation: | 29.4 m / 96 ft |
| Install Depth: | 224.6 m / 737 ft |
| Orientations: | CH0=227.7, CH1=167.7, CH2=107.7, CH3=77.7 |
| Install Date: | September 17, 2008 |
| GTSM Technologies #: | US37 |
| Executive Process Software: | Version 1.14 |
| Logger Software: | Version 2.02.2 |
| Home Page: | http://pboweb.unavco.org/stations/?checkkey=B045 |
| Notes Last Updated: | April 2, 2019 |

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

Orientations are in degrees East of North.



Mendocino PBO strainmeters, October, 2008. Green dots represent boreholes that only have a seismometer.

B045 rdcrst045bcn2008

40.4360 -123.9965 29.4 m

150 ft - Still in medium gray siltstone with some fine sand-sized clasts.

249 ft - Small fracture.

327 - 332 ft - harder dark gray shale.
332 ft - back into siltstone

380 ft - Mudstone with shale interbeds.

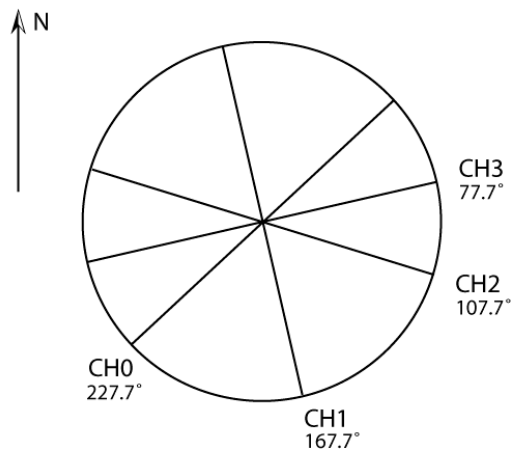
410 ft - Silty claystone.

470 ft - Mudstone with traces of shale.

500 ft - Mudstone with shale beds.

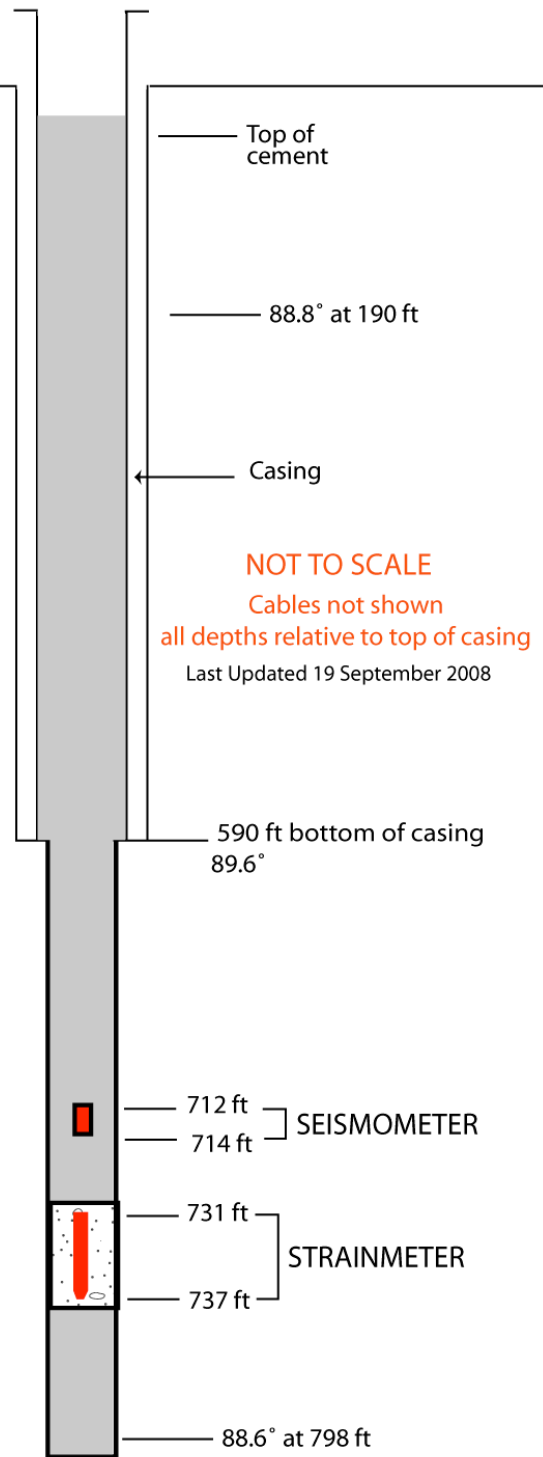
510 ft - Mudstone with trace shale.

590 ft - Shale/lithified siltstone.



804 ft - Mudstone/Siltstone

T.D. ———
804 ft, 88.3°



Instrumentation at Strainmeter

| Instrument | Units | Bottle/ASCII Scale Factor | SEED Scale Factor |
|------------------------------|------------------|---------------------------|-------------------|
| Pore Pressure | Hecto Pascals | None Installed | --- |
| 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 | None Installed | |

1. Installation notes

September 16, 2008 UTC

16:00 Raise bottom from 746'10" to 741'4".

September 17, 2008 UTC

00:15 Cement set up enough to trip bailer.

00:45 Mixing Penn Grout (DJ805 AM806).

01:00-01:15 Lower US 73 to 737'.

01:25 Turn on instrument (using environmental box US78 not 73. Box 73 has failed Ch0).

01:33 Renamed B045, T = 1.685 and climbing.

02:00 Off site.

September 18, 2008 UTC

00:00 Lower seismometer #29 to 714'.

V - 2.545 kOhm

H1 - 2.537 kOhm

H2 - 2.503 kOhm

00:30-02:00 Trip in tremie to bottom, 720'.

September 18, 2008

15:30 On site, strainmeter off.

16:30 Cement truck arrives, pump 5 yds.

19:30 Done cementing.

23:00 Strainmeter on, install uphole electronics.

01:30 Turn off comms, leave site on generator.

2. General Information

- Sensitivities of all EH channels corrected on March 4, 2010

3. Strainmeter Maintenance

- Nov 3, 2008 – Todd Williams visited the site to work on the TEG
9:00 AM Local time - Meet Blue Star Gas
9:15- 9:30 - Determine the tank is full, and the regulator is the reason the TEG is not getting enough PSI to fire.
9:30-10:30 - Blue Star unloads the new 250gal tank, and loads old full tank on truck. They replaced the regulator on the gas line to the TEG.
10:30-10:40 - Pressure from tank to regulator is ~125psi, and the pressure out of regulator into TEG 9.25 psi. Soap test of lines shows no leaks.
10:40 - Blue Star gas off site.
10:45 - Fire up TEG, and monitor voltage on the TEG DC block.
11:50 - 6.8 volts is the stable reading on TEG, with gauge ~0.5mm below 6 psi.
11:50-12:05 - Swap jumper from slots 3 & 4 to slots 1&2 on the wiring block. TEG now

charging enclosure at 13.6v

12:05-12:25 - Verified & monitored TEG volt/amp meter and turn on backpanel breakers for main power supply in enclosure. Disconnect the solar panel array from the BSM and taped off leads to BSM power supply. The solar panels were left onsite, with the cabling bundled outside of enclosure underneath panels. Battery voltage on a single primary TEG battery in the enclosure was up from 12.1 to 12.5v. Wired up and connected 3 battery bank to be charged up (9.8v starting voltage). Switch TEG to 'remote' mode, TEG remains on as it should to continue charging dead 3 battery bank on seismometer side. BSM has 3 battery bank, which upon turning on the back panel, charged from 12.1 to 12.6v. BSM remained powered up as normal. Verified power into timer by manually turning timer on/off and leaving TEG in 'auto' mode. All devices powered up except router and VSAT. The main battery voltage was 11.8v (non-BSM side) when leaving the site. The status of VSAT deployment, cisco config, etc. is unknown at this time.

12:30 - Off site.

- 19 February 2009 – Liz Von Boskirk visited the site at 11:00 am local time, to see why it was not online. When she arrived the TEG was running and all hardware was powered. She connect to the V-SAT which was operational. On further inspection the Cisco Router was turned to off. She turned it on, and could surf the web with her laptop. She collected metadata and left the site.
- March 27, 2009 – Todd Williams got the site running, and Wade upgraded the logger to software version 2.02.2.
- June 5, 2009 – Liz Van Boskirk visited the site from 7:30 to 8:30 local time. She upgraded the RT firmware to version 1.20 and adjusted the quadrature.
Pre-adjustment observations:
Chan0 off
Chan1 slightly off
Chan2 slightly off
Chan3 slightly off
- Nov 18, 2009 – Korey Dausz visited the site. The TEG was not running and Korey restarted the TEG. He reset the strainmeter power box at 8:30 local time. He returned to the site on Nov 20, 2009 to check the TEG and battery voltages.
- Jan 20, 2010 – When Liz VanBoskirk arrived on site the TEG was not running. The battery bank to the GTSM was 4+ volts and the battery bank to the equipment read 3+ volts. The rain gauge was filled with water due to a clog, which was cleared. The TEG was checked for any gas leaks with soapy water, no leaks were found. There was a gas smell.
- Jan 21, 2010 – Liz arrived on site with new batteries and replaced all battery banks. After examining the TEG the starter had a corroded tip. This was refilled back into a sharp point. As the starter was placed back into the TEG it was also measured for the optimal starting distance from the back wall plane and marked for future reference. The TEG now ignites, and was monitored for 45 minutes. The GTSM quadratures are adjusted.
- April 6, 2010 form 11:45 to 13:45 PT – Liz replaced the Q330. Satellite tracking is low on the GTSM and Q330.
- June 30, 2010 - PG&E completed construction the week of June 21-25. Liz arrived and shut down the TEG, stopped all propane flow, and removed the power wiring from the panel. The pole was activated and the site was plugged in. The power flow was checked using a volt meter.

- January 15, 2011 – Chad Pyatt deployed a temporary broadband sensor at the site to get seismic data to orient the borehole seismometer. He also collected Birddog data from the borehole seismometer.
- March 4, 2011 – Temporary broadband seismometer deployed, and borehole seismometer metadata collected with the Birddog.
- March 21, 2012 – The TEG was removed from the site.
- March 27, 2012 – Warren Gallaher developed a method to determine the length of cable in-situ using time domain reflectometry. The calculated cable length value was compared to install values at the site to determine gross accuracy of the method. An oscilloscope was configured as a time domain reflectometer and was used to verify the length of the seismometer cable. The calculated length was 715', which corresponded to the value documented during installation (712-714').
- March 28, 2012 – A broadband seismometer, marmot, and Q330 were temporarily deployed onsite.
- March 7, 2013 – Rain gauge was cleaned out.
- March 27, 2013 – Marmot was remotely rebooted.
- May 13, 2013 – The GPS coldstart command was issued remotely.
- May 21, 2013 – Adam Woolace swapped the power box.
- October 9, 2015 – Completed station documentation, When checking VSAT x-pol, transmit test failed. Replaced VSAT ODU, and tried another IDU, but nothing seemed to work. Configured and installed an LS300, but cell service was marginal at the site. Further work will be required for VSAT.
- November 17, 2015 – Adam Woolace visited station to upgrade cell antenna from standard redbull to directional yagi. The signal improved from -115 to about -102. The cell modem was still slow but reachable when he arrived home. It still doesn't seem to be good enough to stream data. He will install a cell booster next week. Rain gauge was clogged and overflowing. Adam unplugged the hole and cleaned the screen.
- October 12, 2016 – Swapped malfunctioning VSAT IDU, site is back online.
- November 16, 2017 – Visited station to complete GTSM down-hole testing.
- August 7, 2018 – Swapped 6 batteries at station.
- March 27, 2019 – Adjusted quadrature. chop was fine and did not need adjustment.