PEDIMENT GOLD LLC

McGee Mtn. Project Geothermal Temperature Probe Activity

May 24 through May 30, 2010

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McGee Mtn., Nevada Project: Looking southeast, from the access road to the Painted Hills Mine.

A summary of geothermal probe activities during May 2010 at Geothermal Technical Partners McGee Mtn. Project, Nevada.

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McGee Mtn. Project Geothermal Temperature Probe Activity

from May 24 through May 30, 2010

Purpose: The purpose of direct push technology ("DPT") probe activity at the McGee Mtn. Project, Nevada was to 1) determine bottom hole temperatures using nominal 1.5 inch probe tooling to place resistance temperature detectors ("RTD") and 2) take water samples, if possible, to characterize the geothermometry of the system.

Pediment Gold LLC ("PGL") and Geothermal Technical Partners Inc. ("GTP") conducted a joint research and technology development effort. Three methods of RTD placement and temperature data collection were initially considered: 1) semi-permanent placement of the RTD through the probe rods to the bottom of the hole, and then retrieve the probe rods immediately to use on the next site, 2) temporary RTD placement inside the probe rods with the drive point still in place and 3) a variation of 2), removing the drive point by pulling back prior to RTD placement, but still leaving the rods in place to keep the hole open.

Ground to probe rod equilibration rate data were also acquired to determine appropriate time intervals to leave RTD's in contact with ground conditions for optimum results.

Results: A total of 23 holes were probed in five days for a cumulative total of 857.5 ft. at 21 sites at the McGee Mtn., Nevada project area. The probed holes ranged in depth from a maximum of 75ft to a minimum of 10ft and averaged 37.3ft. The average temperature of the 23 holes was 18.9^{o}C, corrected (from an average of 23.8^{o}C, uncorrected) with a range of 42.0^{o}C (site MMTG#19) for a maximum and 12.0^{o}C, corrected (site MMTG#1b, at the base station) for the minimum, see Figure 1 for locations and Table 1 for the probe data.

A total of seven (7) water samples were collected around the McGee Mtn. Project area from stock wells and springs, see Figure 1 for the water sample locations and Table 2 for the water sample field data. No water was encountered in any of the probed holes, with the exception of MMTG#10, and no water was collected.

Techniques were developed and modified in the field to set the RTD's to determine bottom hole temperatures in unconsolidated overburden. The overburden, whether we were probing in the Painted Hills Mine area at an elevation of 4,800ft or in the bottom of the valley near Gridley Lake, at an elevation of 4,342ft, consisted primarily of damp, viscous clay with variations that included large boulders to sand

and gravel. The original strategy was to probe holes to depth, retreat the rods several feet to deploy the removable point, set expendable RTDs through the tooling string, then complete rod removal and begin the process with the recovered rods at the next site. Unfortunately, the probe holes would not stand open in the viscous clay, so we adapted by leaving the rods in the ground with RTD's at the bottom of the hole to equilibrate, typically overnight.

Typically in most Nevada settings, the areas of deepest probe penetration are in the basins, the furthest from the ranges and larger cobbles and boulders. The McGee Mtn. Project area was no different, as the deepest hole was in the valley bottom, Gridley Lake southeast area (MMTG#10) was 75ft and the shallowest, when probing for depth and not a baseline hole, was in the north Painted Hills area, (MMTG#18) and was just 12ft deep. Although a second hole just 15ft east of the shallowest hole (MMTG#18) was 52ft deep (MMTG#19), illustrating the variability of the unconsolidated lithologies.

Temperature results for the probed holes and water sample sites are spatially presented in Figure 3.

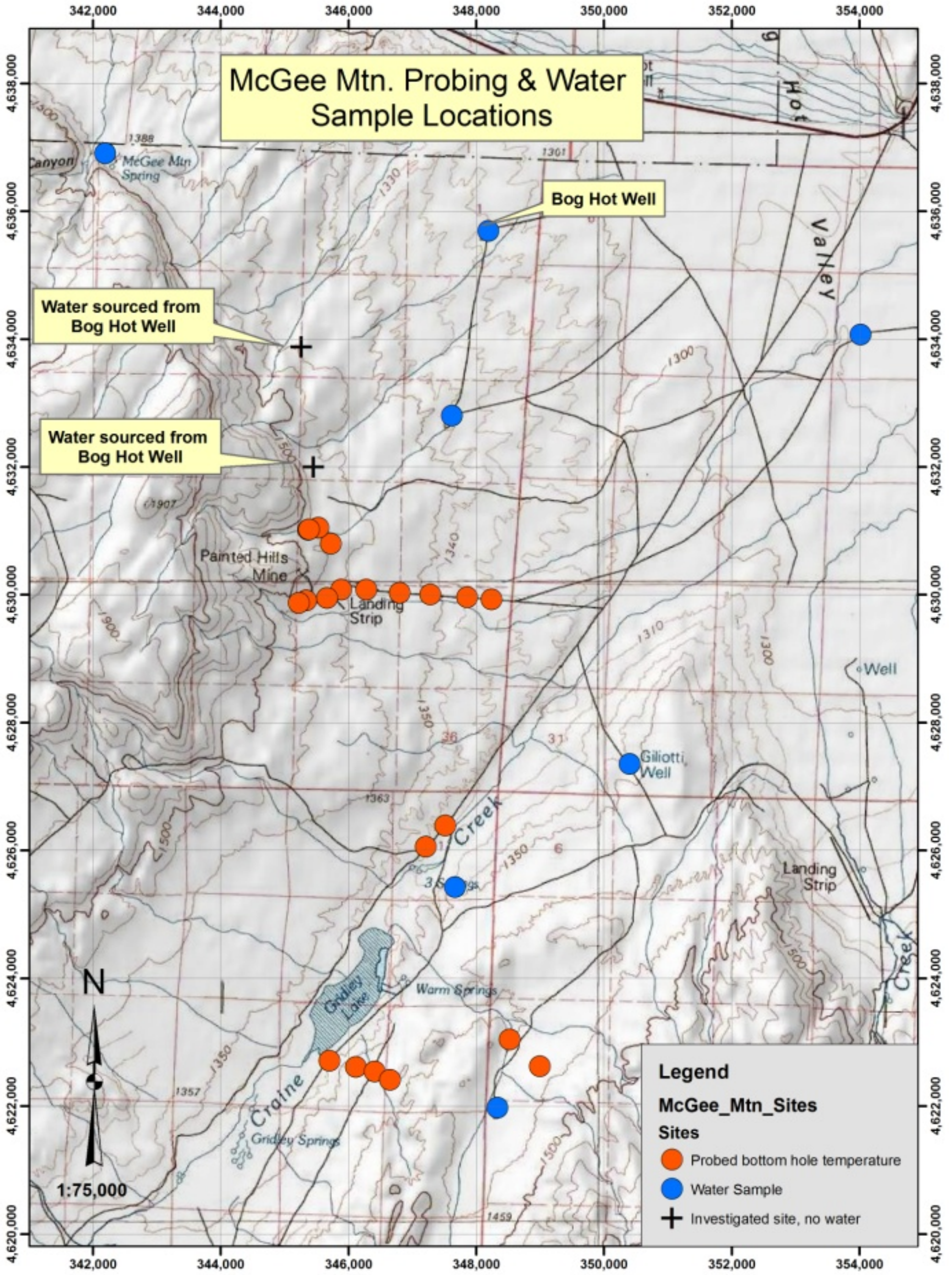


Figure 1: Location Map of McGee Mtn. Probe Holes, Water Sample Sites, and Investigated Sites (100K USGS Base map).

Table 1: McGee Mtn. Project Probe Temperature Production and Data Summary

			NAD27, Z11						
Site ID	**Area**	**Date**	**UTM_E_m**	**UTM_N_m**	**Elev_ft**	**TD_ft**	**Temperature Device**	**Final_T_C**	**Corr_T_C**
MMTG#1	Painted Hills	5/25/2010	348318	4629724	4372	45.0			
MMTG#1a	Painted Hills	5/25/2010	348317	4629724	4372	15.0	50ft RTD		
MMTG#1b	Painted Hills	5/25/2010	348317	4629723	4372	10.0	110ft RTD#3 & Therm#5936	15.7	12.0
MMTG#2	Painted Hills	5/25/2010	347939	4629755	4393.4	38.0	50ft RTD	17.7	14.0
MMTG#3	Painted Hills	5/25/2010	347362	4629797	4435.8	40.0	100ft RTD	19.1	13.5
MMTG#4	Painted Hills	5/25/2010	346884	4629828	4474.6	51.0	150ft RTD	21.6	15.5
MMTG#5	Painted Hills	5/25/2010	346362	4629874	4548.2	41.5	110ft RTD#11	20.1	18.0
MMTG#6	Painted Hills	5/25/2010	345970	4629873	4605.9	26.5	110ft RTD#5	21.0	15.5
MMTG#7	Painted Hills	5/26/2010	345747	4629746	4653.6	20.0	50ft RTD	19.6	15.5
MMTG#8	Painted Hills	5/26/2010	345420	4629705	4733.4	33.0	100ft RTD	25.5	19.5
MMTG#9	Painted Hills	5/26/2010	345305	4629667	4754.7	50.0	150ft RTD	38.0	32.0
MMTG#10	Gridley Lake	5/27/2010	345786	4622505	4401.7	75.0	100ft RTD	21.6	16.0
MMTG#11	Gridley Lake	5/27/2010	346199	4622410	4451.8	44.0	50ft RTD	17.2	13.0
MMTG#12	Gridley Lake	5/27/2010	346493	4622339	4480.4	29.5	150ft RTD	21.6	15.5
MMTG#13	Gridley Lake	5/27/2010	346732	4622204	4537.3	26.0	110ft RTD#5	19.1	14.5
MMTG#14	Gridley Lake	5/27/2010	347594	4626187	4341.4	50.0	110ft RTD#7	18.9	14.4
MMTG#15	Gridley Lake	5/27/2010	347293	4625855	4362.2	32.0	110ft RTD#15	18.9	14.4
MMTG#16	N. Painted Hills	5/28/2010	345805	4630592	4676.3	43.0	50ft RTD	21.7	18.0
MMTG#17	N. Painted Hills	5/28/2010	345610	4630842	4763.2	55.0	150ft RTD	32.1	26.0
MMTG#18	N. Painted Hills	5/28/2010	345449	4630812	4807.7	12.0	110ft RTD#5	42.6	37.6
MMTG#19	N. Painted Hills	5/28/2010	345463	4630815	4802.2	52.0	110ft RTD#5	47.4	42.0
MMTG#20	NE Gridley Lake	5/29/2010	348600	4622835	4600.4	52.0	150ft RTD	22.3	16.0
MMTG#21	NE Gridley Lake	5/29/2010	349076	4622416	4708.3	17.0	50ft RTD	18.8	15.0

21	**Total Sites**	**23**	**Total Holes**		**Total =**	**857.5**	**ft**	**23.8**	
					Avg. Depth =	37.3	ft	**Avg. Temp.**	**18.9**

Probe temperature results, see Figure 2, are plotted as a cumulative frequency for all 21 sites. The arrow in the diagram indicates the first major inflection point a 16^{o}C.

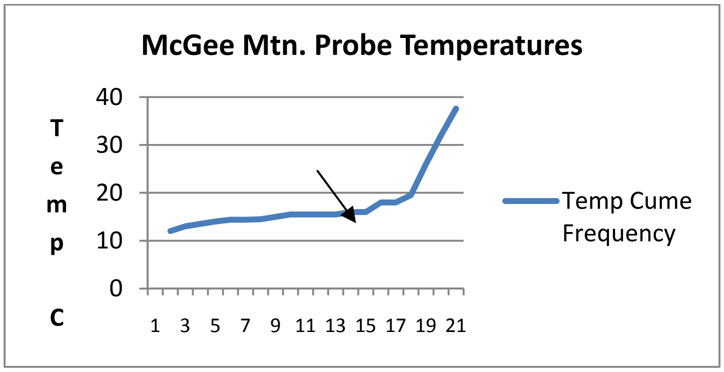


Figure 2: Probe Temperature cumulative frequency plot.

Table 2: McGee Mtn. Project Water Sample Data

		Date	NAD27, Z11					
Site ID	**Area**		**UTM_E_m**	**UTM_N_m**	**Elev_ft**	**SWL_Ft**	**Sample Type**	**Condition**
MM001	Gillotti Well	5/26/2010	350479	4627146	4415	UNK	Stock well	flowing on arrival
MM002	NE Gridley Lake	5/28/2010	347750	4625220	4404	6	Spring	flowing
MM003	NA	5/28/2010	NA	NA	NA	NA	Distilled Water Blank	NA
MM004	E Gridley Lake	5/28/2010	348412	4621772	4648	UNK	Stock well	flowing on arrival
MM005	NE Painted Hills Mine	5/28/2010	347697	4632595	4395	141	Stock well	not flowing on arrival
MM006	Bog Hot Well (SW most)	5/29/2010	348271	4635486	4317	63	Stock well	not flowing on arrival
MM007	McGee Mtn. Spring	5/29/2010	342274	4636703	4684	8	Spring	flowing
MM008	Bog Hot Valley Central	5/29/2010	354094	4633863	4223	7	Windmill	not flowing on arrival

	Field Data							
Site ID	**Temp_C**	**Hard_PPM**	**Alk_PPM**	**NO3_PPM**	**NO2_PPM**	**Cond_uS**	**pH**	**SO4_PPM**
MM001	18	75	80	0	0	349	8.61	42
MM002	12	150	80	0	0	773	7.49	110
MM003	NA	NA	NA	NA	NA	NA	NA	NA
MM004	20	1000	180	40	0	593	6.62	63
MM005	16	150	180	0	0	994	7.98	330
MM006	15	150	300	0	0	642	7.78	110
MM007	12	75	40	20	0	166	7.29	9
MM008	13	75	40	0	0	160	7.72	6

NA = not applicable

UNK = Unknown

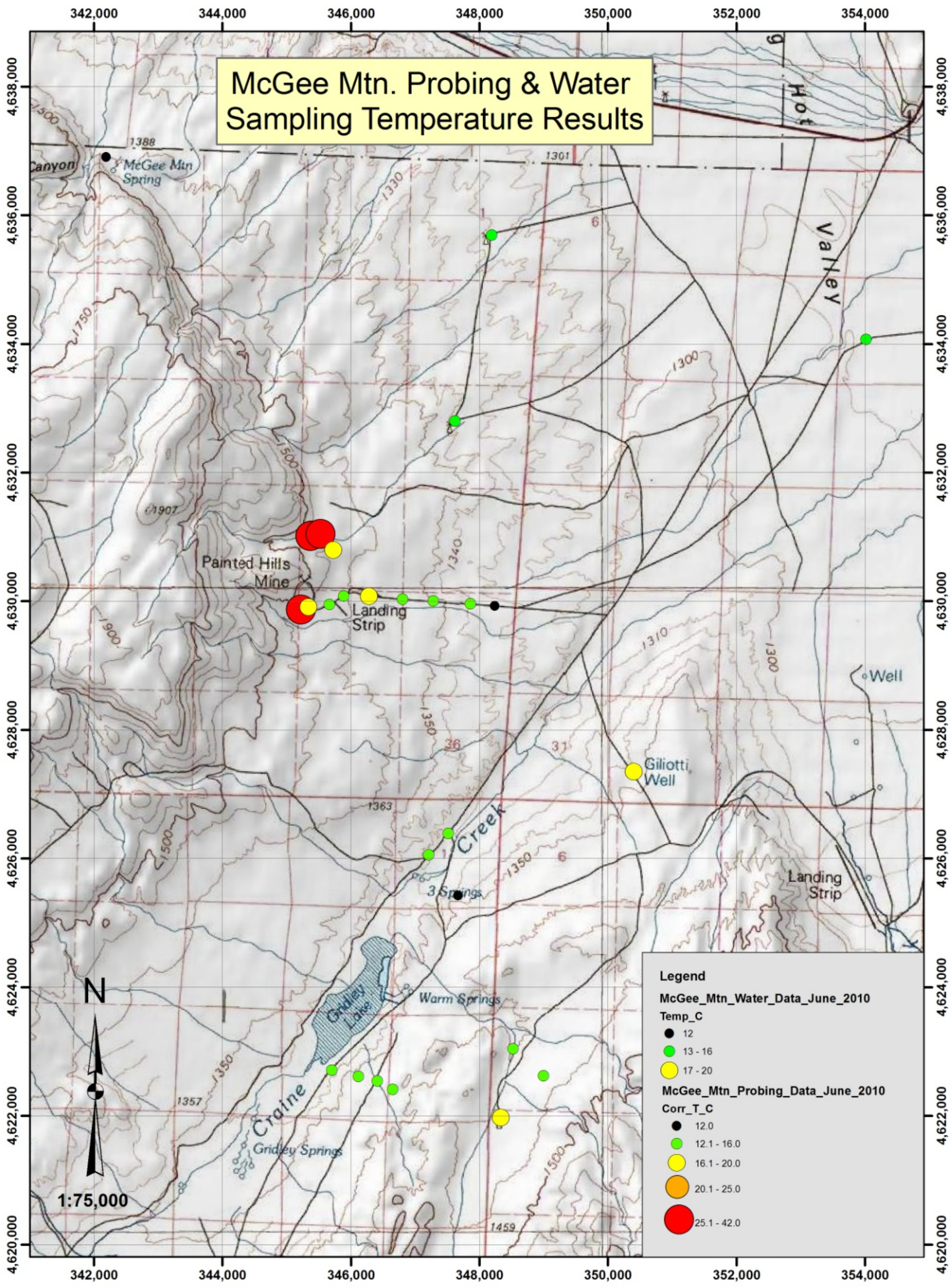


Figure 3: McGee Mtn. Project Probe and Water Temperature Results Map.

The McGee Mtn. project baseline ground temperature was collected at site MMTG#1, (348,318E X 4,629,724N Datum: NAD27, Z11) was determined to be 12°C during the term of the project, see Figure 4. Two sensors were placed in the baseline hole: an RTD and a VWR thermometer. The thermometer had a probe with an epoxy tip sensor and a 3m (10ft) cable, to facilitate placing in the hole simultaneously taped to the RTD.

Thermometer details: VWR® Traceable® Sentry Minimum/Maximum Memory (VWR Part No. 61161-289); A serial numbered certificate is provided from an ISO 17025 calibration laboratory accredited by A2LA to indicate instrument traceability to standards provided by the National Institute of Standards and Technology.

Temperature Range:	–50 to 70°C (–58 to 158°F)
Resolution:	1.0°
Accuracy:	±1.0°C

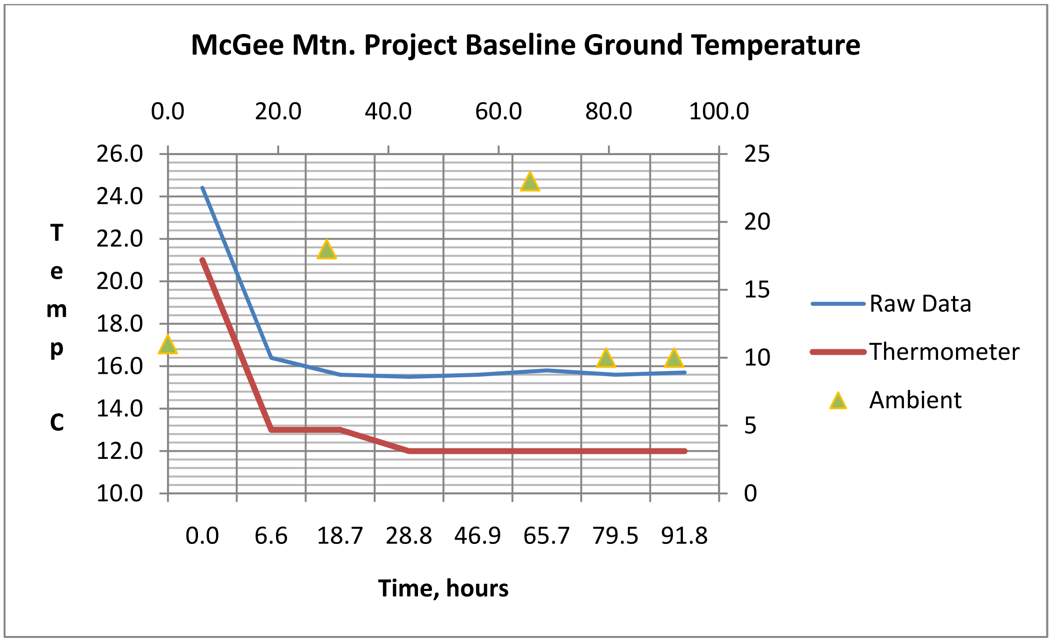


Figure 4: McGee Mtn. Project Baseline Ground Temperature collected at site MMTG#1.

The McGee Mtn. project probe to ground temperature equilibration took approximately 2 hours to equilibrate to 13°C, the upper error limit of the thermometer derived static ground temperature of 12°C (+/- 1°C) and four hours to assume 12.4°C, for a fifteen minute plateau, see Figure 5. The inflection at 1hr 15mins is the result of the sensor being pushed from approximately 16 inches above the disposable point (in "air") for the first hour and a quarter, onto and in direct contact with the disposable point.

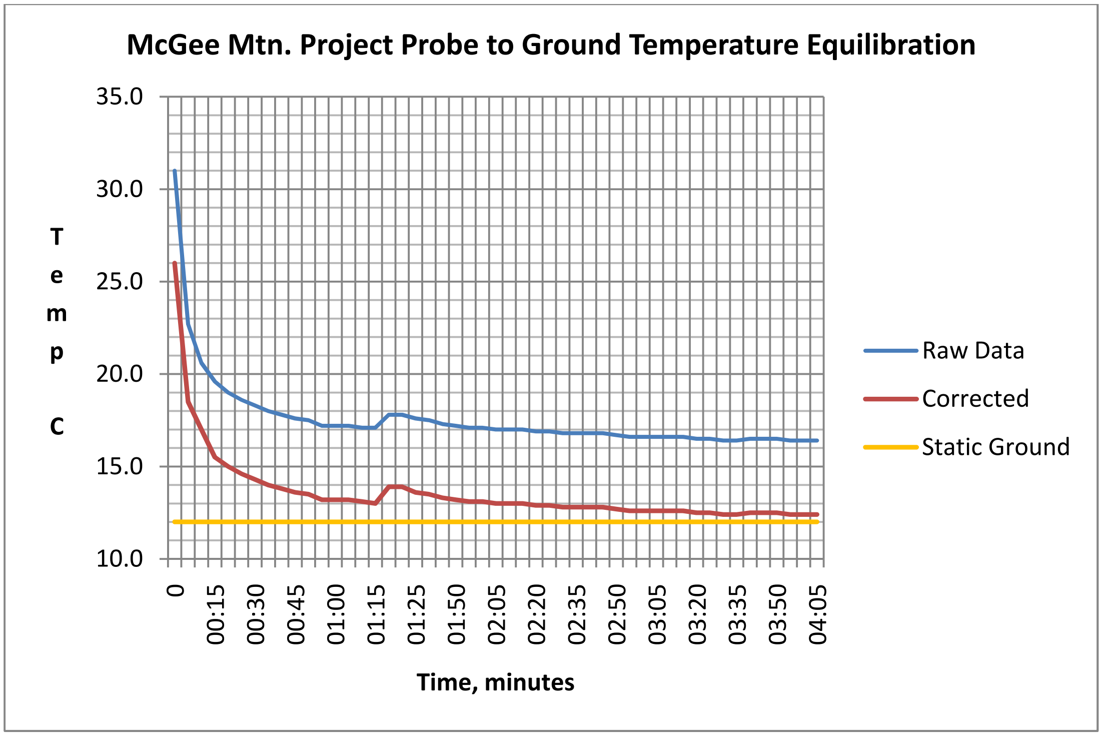


Figure 5: McGee Mtn. Project Ground to Probe Equilibration plot of cooling time.

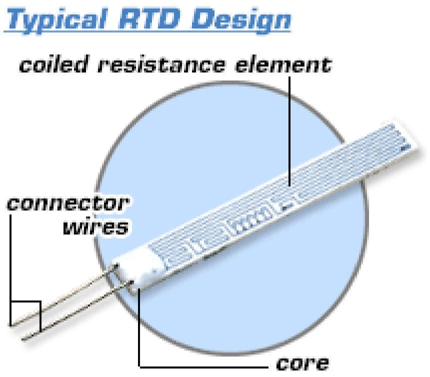
Resistance Temperature Detector ("RTD"):

RTD Primer: The following is excerpted from http://www.omega.com/rtd.html.

Resistance Temperature Detectors ("RTD"), as the name implies, are sensors used to measure temperature by correlating the resistance of the RTD element with temperature. Most RTD elements consist of a length of fine coiled wire wrapped around a ceramic or glass core. The element is usually quite fragile, so it is often placed inside a sheathed probe to protect it. The RTD element is made from a pure material whose resistance at various temperatures has been documented. The material has a predictable change in resistance as the temperature changes; it is this predictable change that is used to determine temperature.

Common Resistance Materials for RTDs:

Platinum (most popular and accurate)
Nickel
Copper
Balco (rare)
Tungsten (rare)



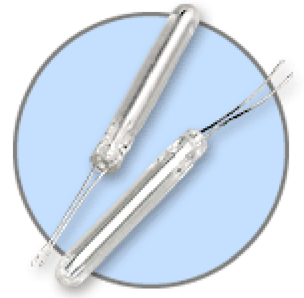
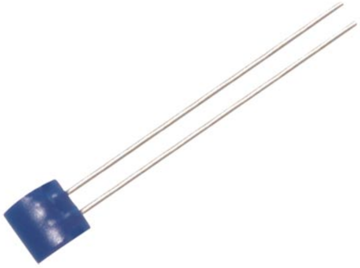
Benefits of Using an RTD: The RTD is one of the most accurate temperature sensors. Not only does it provide good accuracy, it also provides excellent stability and repeatability. Most OMEGA standard RTDs comply with DIN-IEC Class B. The accuracy of an OMEGA standard RTDs is shown in the table below.

RTDs are also relatively immune to electrical noise and therefore well suited for temperature measurement in industrial environments, especially around motors, generators and other high voltage equipment.

Accuracy for Standard OMEGA RTDs

Temperature °C	Ohms	°C
-200	±056	±1.3
-100	±0.32	±0.8
0	±0.12	±0.3
100	±0.30	±0.8
200	±0.48	±1.3
300	±0.64	±1.8
400	±0.79	±2.3
500	±0.93	±2.8
600	±1.06	±3.3
650	±1.13	±3.6
700	±1.17	±3.8
800	±1.28	±4.3
850	±1.34	±4.6

Styles of RTDs:

RTD Elements: The RTD element is the simplest form of RTD. It consists of a piece of wire wrapped around a ceramic or glass core. Because of their compact size, RTD elements are commonly used when space is very limited.	 1PT100G RTD Elements
RTD Surface Elements: A surface element is a special type of RTD element. It is designed to be as thin as possible thus providing good contact for temperature measurement of flat surfaces.	
RTD Probes: The RTD probe is the most rugged form of RTD. A probe consists of an RTD element mounted inside a metal tube, also known as a sheath. The sheath protects the element from the environment. OMEGA offers a wide variety of probes in various configurations.	

RTD Terms

- **RTD (Resistance Temperature Detector):** An acronym for resistance temperature detector or device. A resistance temperature detector operates on the principle of the change in electrical resistance in wire as a function of temperature.
- **RTD Element:** Sensing portion of the RTD which can be made most commonly of platinum, nickel, or copper. OMEGA features two styles of elements: wire wound and thin film.
- **RTD Probe:** An assembly composed of an element, a sheath, a lead wire, and a termination or connection. The standard OMEGA® RTD probe is made with a 100 ohm platinum European curve element (alpha = 0.00385).
- **Platinum RTD:** Also known as Pt RTD, Platinum RTD's are typically the most linear, stable, repeatable, and accurate of all RTD's. Platinum wire was chosen by OMEGA because it best meets the needs of precision thermometry.

- **Thin Film RTD:** Thin film RTD's are made up of a thin layer of a base metal embedded into a ceramic substrate and trimmed to produce the desired resistance value. OMEGA RTD's are made by depositing platinum as a film on a substrate and then encapsulating both. This method allows for the production of small, fast response, accurate sensors. Thin film elements conform to the European curve/DIN 43760 standards and the “0.1% DIN” standard tolerance.
- **Class A RTD:** Highest RTD Element tolerance and accuracy, Class A (IEC-751), Alpha = 0.00385
- **Class B RTD:** Most Common RTD Element tolerance and accuracy, Class B (IEC-751), Alpha = 0.00385
- **Alpha .00385 Curve:** European Curve meets “0.1% DIN” standard tolerance and conforms to the DIN 43760 standard
- **Wire Wound:** The standard RTD elements used in OMEGA’s probe assemblies are made of 99.99% pure platinum wire wound about a ceramic or glass core and hermetically sealed within a ceramic or glass capsule.

McGee Mtn. Project RTD Discussion:

When wire is added to the TFD or RTD unit, wire resistance increases and therefore temperature appears higher than actual. In the case of the TFD's used on this project, we used various lengths of 3 strand 18guage bell wire ranging from 50ft to 150ft. An increase in temperature readings as a function of bell wire length can be quite profound, as illustrated by Table 3. The 500ft TFD was initially constructed at the end of a 500ft roll of wire and then trimmed, affording an opportunity to measure the two temperatures, providing a 14.1°C difference. Note that none of the devices measured were close to the ambient air temperature as measured by the two VWR thermometers.

Device	Bell Wire L(ft)	Temp_C	Difference_C
VWR Thermometer 1	0	15	
VWR Thermometer 2	0	16	15.5
RTD Probe - 3ft lead	0	16.7	1.2
50ft RTD Probe	50	18.6	3.1
100ft RTD Probe	100	20.5	5.0
150ft RTD Probe	150	22.3	6.8
500ft TFD	500	34.4	18.9
110ft TFD, cut from 500ft	110	20.3	4.8

Table 3: Temperature as a function of 18 gauge bell wire length. Data acquired on May 21, 2010 in the PGL warehouse in ambient temperature conditions.

We used an RTD meter to take temperature readings of the RTD devices. The RTD meter used is an Omega HH804U, serial number 090298, has an accuracy (18°C to 28°C ambient) of ± (0.05%rdg +0.2°C) on °C scale or when the meter reads 21.0°C the temperature is accurate to within ± 0.2105 °C or a range of 20.79 to 21.21°C. The meter is capable of reading two temperatures simultaneously, however not equally as noted in Table 4, dependent on wire length the difference varied from 0.8°C to 1.7°C. We compenstated in the field by using just the T1 port for readings.

Device	T1_C	T2_C	T1 - T2	T2 as %T1
50ft RTD Probe	24.0	23.2	0.8	96.7%
100ft RTD Probe	25.1	24.7	0.4	98.4%
150ft RTD Probe	27.0	25.3	1.7	93.7%

Table 4: RTD Meter HH804U readings of RTD devices by switching the T1 and T2 ports at ambient temperature.

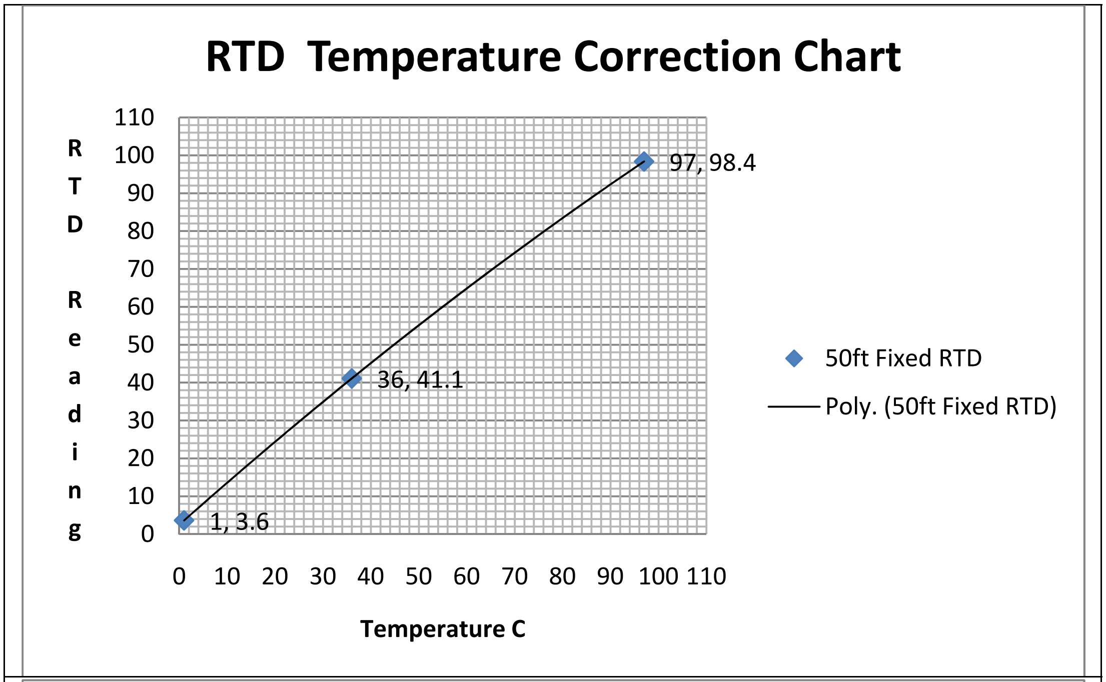
RTD/TFD Temperature Correction Curves:

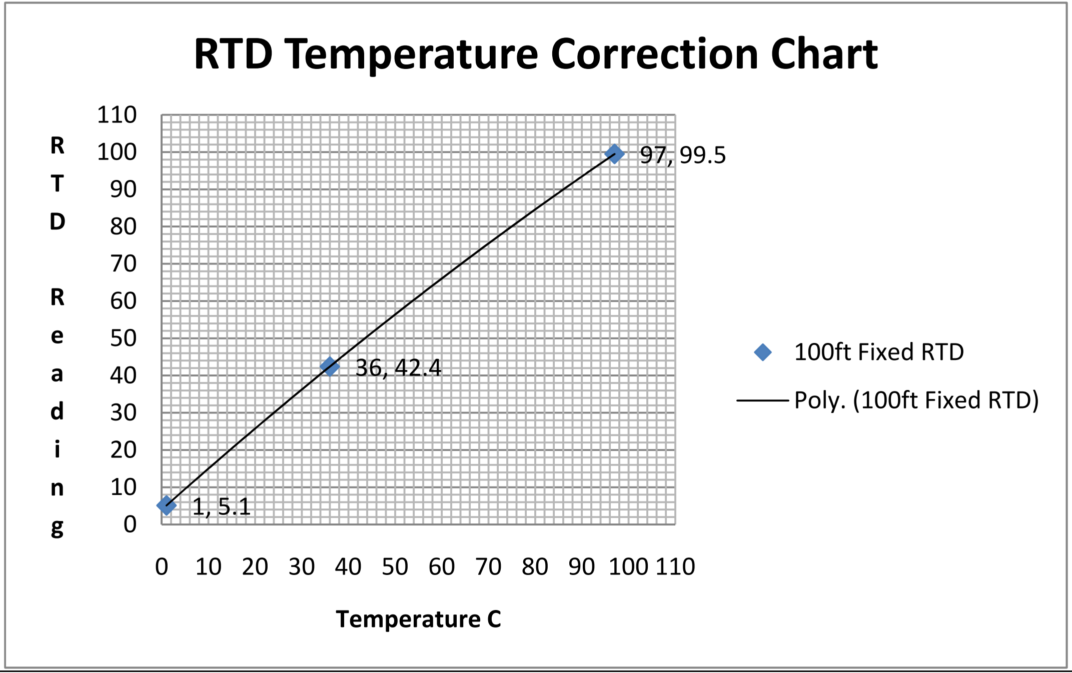
A series of temperature correction curves were also created to accommodate different wire and RTD configurations to facilitate correcting the raw field data:

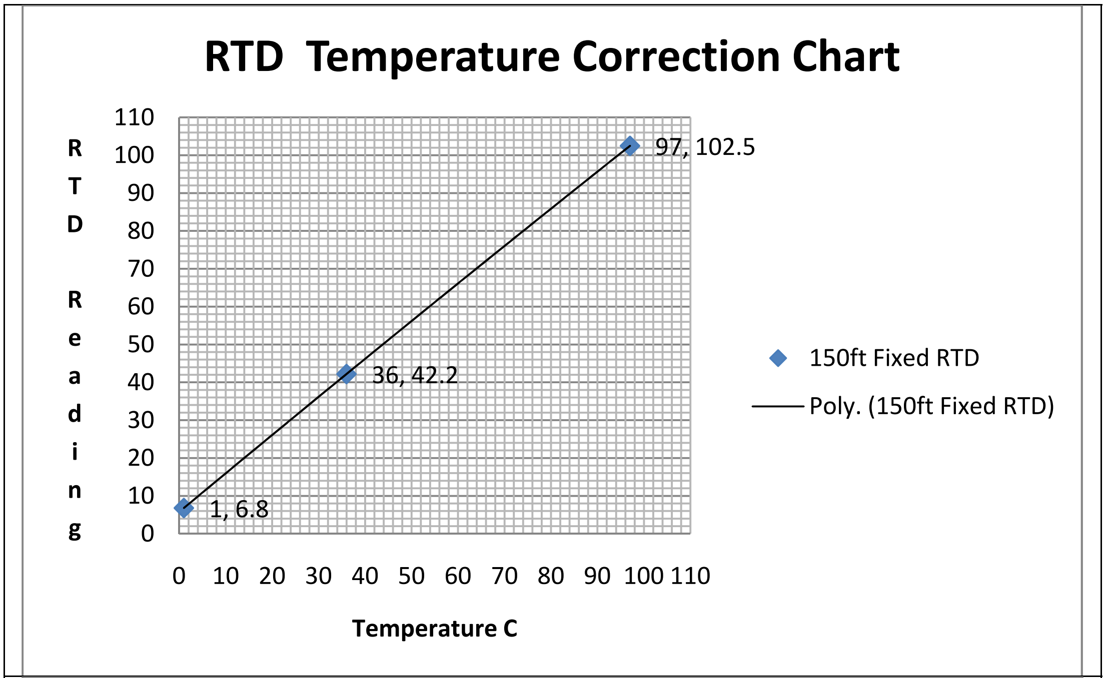
1. 50ft RTD temperature correction chart: the device consisted of a factory assembled RTD probe (Omega PR-10-2-100-1/4-6-E) with 3ft leads, soldered to 18guage bell wire for a total length of 50ft and then sleeved in 50ft of ½" OD high density polyethylene ("HDPE")tubing to give the unit rigidity to enable pushing to depth. The single unit was constructed for repeated use.
2. 100 ft RTD temperature correction chart: the device is similar to above.

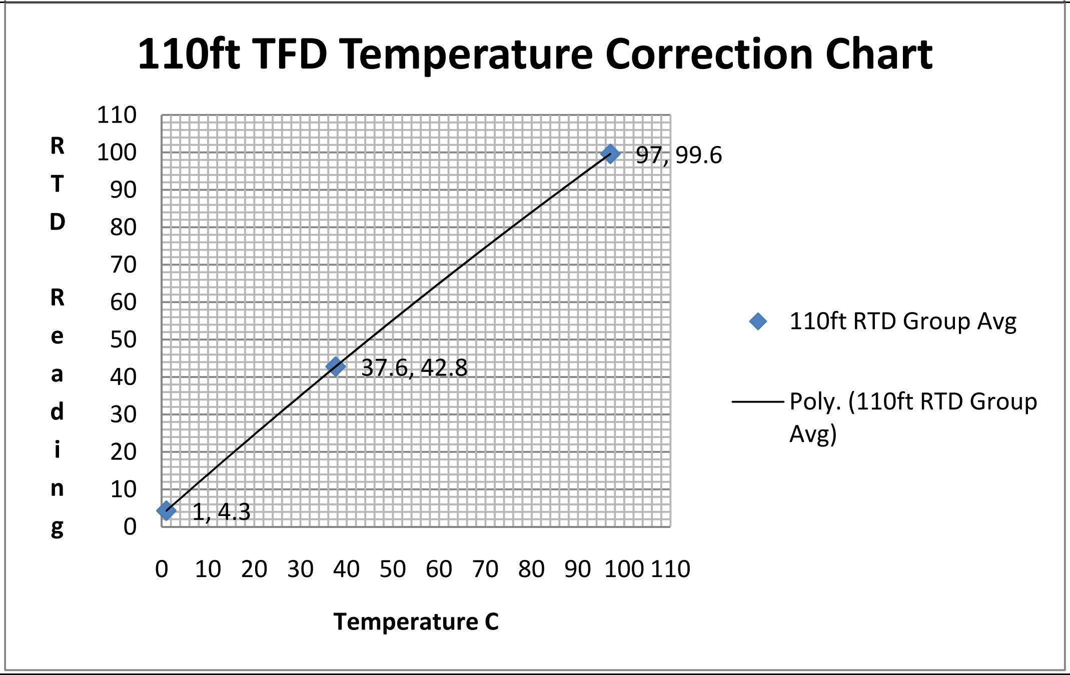
3. 150 ft RTD temperature correction chart: the device is similar to above.
4. 110ft TFD temperature correction chart: these devices consisted of PGL site built TFDs assembled for disposable deployment as 110ft long modules. Units were sleeved in HDPE on an as needed basis in the field. There were 15 of these units at the beginning of the calibration trials, four units failed in laboratory conditions and another unit failed in the field.

The RTD/TFD calibration consisted of taking readings at three (3) temperature points: 1) freezing bath, 2) warm bath, and 3) boiling bath. All of the units were subjected to an ice bath, consisting of 20lbs of ice and a gallon of water added to an open topped cooler. The probe ends were suspended in the ice bath to avoid touching the bottom or sides of the cooler and the units were all read using the Omega HH804U RTD meter, serial number 090298 and results recorded. All of the units were subjected to a warm bath, consisting of ½ gallon of boiling water added to several gallons of hot tap water in the same cooler used for the ice bath. The probe ends were suspended in the warm bath to avoid touching the bottom or sides of the cooler and the units were all read using the Omega HH804U RTD meter, serial number 090298 and results recorded. All of the RTD units were subjected to a boiling water bath, consisting of maintaining a boil using an electric kettle, fortunately limiting the number of devices that could be placed in the bath. The RTD probes were done first and were quite robust with no resulting damage. Two of the 110ft TFD units were added to the bath and failed immediately. The heat shrink tubing glue loosened and allowed water to penetrate damaging the units. The results of the RTD probe units were all read using the Omega HH804U RTD meter, serial number 090298 and results recorded.


RTD Temperature Correction Chart
RTD Reading
110
100
90
80
70
60
50
40
30
20
10
0
97, 98.4
36, 41.1
1, 3.6
0 10 20 30 40 50 60 70 80 90 100 110
Temperature C
50ft Fixed RTD
Poly. (50ft Fixed RTD)


RTD Temperature Correction Chart
RTD Reading
110
100
90
80
70
60
50
40
30
20
10
0
97, 99.5
36, 42.4
1, 5.1
0 10 20 30 40 50 60 70 80 90 100 110
Temperature C
100ft Fixed RTD
Poly. (100ft Fixed RTD)


RTD Temperature Correction Chart
RTD Reading
110
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100 110
Temperature C
97, 102.5
36, 42.2
1, 6.8
150ft Fixed RTD
Poly. (150ft Fixed RTD)


110ft TFD Temperature Correction Chart
RTD Reading
110
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100 110
Temperature C
97, 99.6
37.6, 42.8
1, 4.3
110ft RTD Group Avg
Poly. (110ft RTD Group Avg)

Notes on Resistance Temperature Detector ("RTD") Construction: Factory assembled RTD vs. Do it yourself

Resistance temperature detectors were chosen at the McGee Mtn. Project to record bottom hole temperatures at depths ranging from ten (10) feet to seventy five (75) feet. Prior to field work, we considered using a probe bottom hole temperature acquisition strategy of probing holes to maximum depth and then placing "disposable" RTD's at the bottom, recover the rods, plug and abandon the hole, and then move on to the next hole to repeat the process all over again. In this fashion, RTD's could equilibrate from the time placed until project completion. What we needed was a cost effective, potentially disposable RTD solution. What we discovered was that building your own RTD's may not be as cost effective as using pre-built RTD's.

An estimate of probe hole production at six (6) holes per day times five (5) days might require up to thirty (30) disposable RTD's. We had two choices: 1) use pre-assembled RTD's (ie. Omega part # PR-10-2-100-1/4-6-E) at a cost of $63.00 apiece (total $$1,890.00), see Figure 7, OR 2) develop a cheaper alternative RTD using Omega Thin Film Devices ("TFD"), see Figure 6, at a cost of $25.00 apiece (total $750.00). At first blush, the initially cheaper TFD alternative appealed to our hyper cost sensitive demeanors. After all, they were potentially going to end up at the bottom of the hole, never to be recovered.

What we discovered is that the labor component in assembling a fully functional device is substantial and that the device failure rate is very high. I constructed the first TFD RTD to develop a process flow and to better understand some of the pitfalls. Based on that experience, I made a few design changes and passed on the task of assembling another fourteen devices to Mike Schramm. It took him 22 hours of assembly time to construct the fourteen (14) devices for an average of 1.6 hours per device. This is a conservative estimate of time, as I participated in several of the steps and did not record my time and actually built the first device. Each time an assembly step was completed, each of the TFD devices had to be tested to make certain that it was still functional and if not, repaired. It wasn't until after the final assembly and calibration testing did we understand that we had lost four of the devices: two (2) came unglued in the boiling test and were damaged by water; another two (2) had erratic readings and were removed; and finally one (1) failed in the field with erratic readings and was removed from service.

The average cost to build fifteen (15) 110ft TFD devices was $107.00 apiece, however when you remove the five (5) failed devices, the average cost of the ten (10) remaining functional devices was $161.00 apiece. See Table 5 for details.

Table 5: Costs to Construct 110ft RTD's using TFD's.

Actual Costs to Construct 110ft RTD's using TFD's

Source	Invoice #	Item	Cost
Omega.com	281282	TFD's - used 15 @$25.00 per	375.00
Omega.com	281282	Potting Compound	36.00
Omega.com	281282	Shipping	13.00
Sandy's Electronic Parts, Reno	193265	Heat Shrink Tubing, mini grabber clips	61.03
The Home Depot, Reno	8/14/2010	1,500ft 18-3 bell wire, butane torch	247.61
Sandy's Electronic Parts, Reno	194608	Heat Shrink Tubing	9.16
Sandy's Electronic Parts, Reno	194545	Heat Shrink Tubing	21.01
Sandy's Electronic Parts, Reno	194477	Heat Shrink, ring eyes #0, pliers	22.23
Mike Schramm - GeoTech		Labor - 22 hrs @$37.50 per	825.00
		Total Cost	1,610.04
		Average cost for (15) 110ft RTD's	$107
		Failed Units - 4 lab, 1 field	
		Average cost for (10) functional 110ft TFD RTD's	**$161**

Note: each "Unit" consisted of 110ft of 18-3 bell wire soldered to a single ring terminal (26-24 wire size; #0 stud size).

The bell wire was soldered into the #0 ring and the wire port left open to receive the legs of the TFD and crimped.

In contrast, I estimate that if we used Omega's pre-assembled RTD's with three (3) leads, the cost of assembling 15 devices would only be about $113.00 apiece, see Table 6 for details. Furthermore, the devices, because the TFD (or similar device) is embedded in a protected stainless steel probe sheath and all of the water proofing of the connections are completely contained, the units are much more robust when placed in field use.

Table 6: Estimated Cost to Construct 110ft RTD's using pre-assembled RTD's.

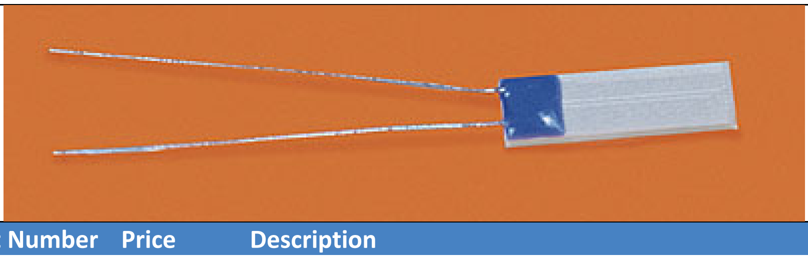
Estimated Costs to Construct 110ft RTD's using pre-assembled RTD's (PR-10-2-100-1/4-6-E)

Source	Invoice #	Item	Cost
Omega.com		RTD Probes - 15 @$63.00 per	945.00
Omega.com		Shipping	13.00
Sandy's Electronic Parts, Reno		Heat Shrink Tubing, mini grabber clips	61.03
The Home Depot, Reno		1,500ft 18-3 bell wire, butane torch	247.61
Sandy's Electronic Parts, Reno		Heat Shrink, ring eyes #0, pliers	22.23
Mike Schramm - GeoTech		Labor - 11 hrs @$37.50 per	412.50
		Total Cost	1,701.37
		Average cost for (15) 110ft RTD's	**$113**

Note: each "Unit" consisted of 110ft of 18-3 bell wire with a soldered ring terminal (26-24 wire size; #0 stud size)

The bell wire was soldered into the #0 ring and the wire port left open to receive the legs of the RTD.

The McGee Mtn. Project probe used Thin Film Detectors ("TFD") acquired from Omega Engineering (http://www.omega.com) at a cost of $25.00 apiece, see Figure 6.



Part Number	Price	Description
⊞ TFD	$25.00	9.5 x 1.9 x 0.9 mm (0.37 x 0.075 x 0.035")

Figure 6: Omega Thin Film Detector - Flat RTD Element

Note on Assembling Omega "TFD" Series RTD Elements to Extension Wires: These RTD elements are made with platinum coated nickel lead wires. Since platinum does not easily wet with most soft solders, we advise that they be spot welded or silver soldered to extension wires when required. (http://www.omega.com)

We also learned that in order to accomplish silver soldering, it was very likely that the heat required to silver solder (depending on the silver alloy - 1200^{o}F to over 1800^{o}F) would destroy the ceramic device in which the platinum wire was embedded with a thermal shock. A hot plate is typically used to slowly raise the temperature of the object to be soldered, the TFD in this case, until it reaches the target soldering temperature. We simply weren't prepared to go that far this time.

Part Number	Price	Description
PR-10-2-100-1/4-6-E	$63.00	RTD probe, lead type 2 (3-wire configuration), 100 ohms, 1/4 " dia. SS sheath, 6" with 36" PFA insulated leads terminating in stripped ends, European curve (alpha 0.00385)

Figure 7: General Purpose RTD (PT100) Probes with No Transition Junction Between Leads and Sheath

Figure 8: Caltronics un-insulated Ring Terminal 26-24 wire size, #0 stud size (RT-90)

Figure 8 is a ring terminal use to connect the 3 strand 18 guage bell wire to the TFD. The bell wire was looped through the ring and soldered in place (one single and one double). The TFD leads were then placed in the barrel connectors and crimped. The whole thing was then potted and covered with several layers of heat shrink tubing.

Direct Push Technology: Direct push technology ("DPT") machines push tools and sensors into the ground without the use of drilling to remove soil to make a path for the tool. A DPT machine relies on a nominal amount of static (vehicle) weight combined with percussion as the energy for advancement of the tool string. Probing tools do not remove cuttings from the probe hole but depend on compression of soil or rearrangement of soil particles to permit advancement of the tool string (Geoprobe). The same compression that allows passage of the tooling then rebounds with litho static head during tool use and removal.

PGL used a Geoprobe brand 6600 series, mounted on a Ford F-550 and powered by the vehicle engine through a power take-off ("PTO") unit for the McGee Mtn. Project. The total weight of the F-550 with the mounted Geoprobe equipment is approximately 20,000 lbs. The percussive force is supplied by the Geoprobe GH60 series hammer at a rate of 32 Hz or 1,920 cycles per minute. The hydraulic downforce is 32,000 lbs. and the retraction force is 42,000 lbs. Hydraulic downforce is only used to lift the static (vehicle) rear-end weight to apply (load) downward pressure on the probe rods, so facilitating the DPT to use the static weight in combination with percussion.

DPT machines evolved from the environmental sector where the power source and mast have been used with various tooling configurations to acquire soil gas, soil sampling with augur and direct push tubes, monitor well installation, geophysics, and geotechnical. Pediment Gold LLC has considerable experience, since 2006, taking mineral exploration water samples in Nevada's basins using DPT and has developed a number of specific techniques and methods to overcome a variety of unconsolidated lithologies.

The McGee Mtn. Project was probed using nominal 1 ½ inch tooling and removable drive points to access the unconsolidated formation to check for water availability and to access the sidewalls of the formation, see Figure 9. DPT penetration is limited to fine grained unconsolidated lithologies and can tolerate some coarser fractions, to an extent. However, boulders or even cobbles can cause the tooling to deflect and bend, usually rendering the tooling useless, although it will often serve the purpose for that hole.

Ultimately, DPT penetration is limited by frictional losses between the probe tooling (point and rods) and the lithologies eventually prevent further penetration. The friction can generate probe tooling point temperatures of up to 40^{o}C, as measured during this project activity. The massive steel tooling (1 ½ inch outside diameter and ⅝ inch inside diameter) required over 4 hours to equilibrate with a static ground temperature of 12^{o}C (+/- 0.5^{o}C). The equilibration test actually took 4hrs and 5 minutes to cool to a calculated 12.4^{o}C.

Generally, once DPT rods are driven into the ground, it is considered prudent to pull the rods out to use in the next hole. Tool wear can then be efficiently tracked and the most worn rods can be put in a leading configuration repeatedly. The information gained when pulling rods, such as pull back pressures or stuck rods, noises (ie. screeching of steel sliding by rocks), bent tooling, etc. all then contribute to developing some local knowledge of the lithology to avoid destroying equipment in the sampling process.

The methodology we used at the McGee Mtn. project was modified from our norm and involved setting the rods to depth, pulling back less than two feet, to enable access to formation conditions, and then setting an RTD at the bottom of the hole. The rods were then left in place to equilibrate with the ground temperature, often overnight.

Typically, the DPT operator pushes tooling until it can't go any further or hits "rejection". Pulling back immediately upon reaching the maximum resistance is important for two reasons: 1) it confirms whether the rods are stuck or free, and 2) it develops a "cellar" in the hole. The latter was very important in several situations. Damp, viscous clay was always encountered at McGee Mtn. and when higher temperature conditions (+40^{o}C) were encountered, the clay from overlying formations was smeared on the leading rod and then dried in place by the higher temperature. When it came time to pull the rods out, some 12 hours later, the 42,000 lbs of hydraulic pullback was overcome by the additional friction resulting in stuck tooling. However, since the "cellar" was in place, we were able to drive the rods down, which broke the baked clay off the tooling and then we were able recover the rods.

On the other hand, if the drive point terminated in cool viscous clay and the rods were pulled back, the result might be that several rods (+10ft) were filled with clay from the litho static pressure. To pull the drive point or not, that is the question and in the end, that is the art of the so-called science.

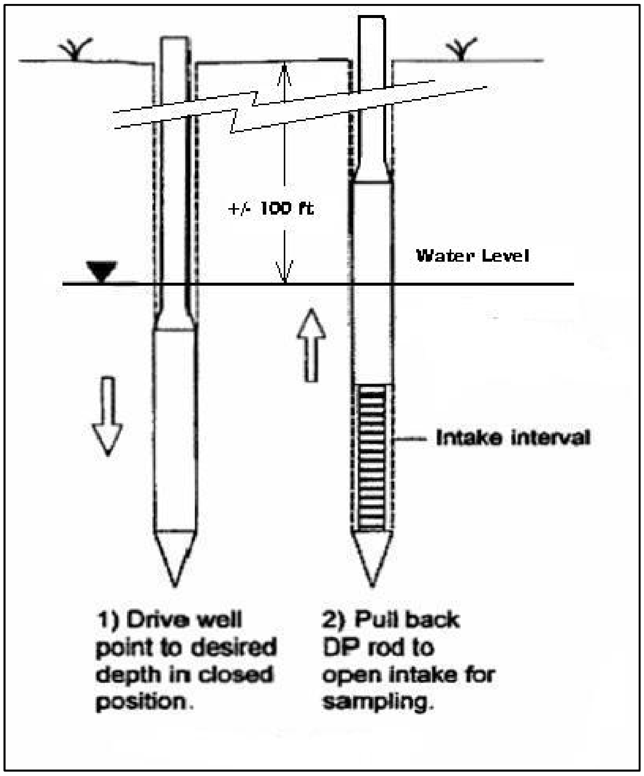


Figure 9: Illustration of DPT removable probe point being used to acquire a water sample.

Daily Activity Summaries:

May 24, 2010: 7:00 AM: Our two man crew assembled consisting of Ken Tullar, crew leader, and Mike Schramm, geotechnician. We began the final gear assembly and loaded into two vehicles, the F-550 and F-350. Mobilization departure from Reno, Nevada was at 1 PM bound for Denio Junction, Nevada with stops at Lovelock for lunch at McDonald's, Winnemucca for groceries at Raley's, and Paradise Valley for diesel fuel. The crew arrived at Denio Junction at approximately 7:00 PM. Lodging was secured at Denio Junction Motel (6505 Hwy 140N, Denio, Nv. 775-941-0171). That evening the crew drove to the McGee Mtn. project site to ascertain field conditions and to locate an adequate site to conduct an equilibration test for the next morning. Continental Lake, normally a dry playa, was completely covered in water. The Knot Creek access road was wet and sloppy with mud and there was standing water several inches deep in roadside ditches and low spots on the desert floor.

May 25, 2010: The crew departed from the motel at 6:30 am with both vehicles to site MMTG#1 where a 45ft hole was probed and a ground to steel temperature equilibration was conducted, with readings every 5 minutes. Breakfast was cooked on a portable grill while the equilibration data were collected. A second hole to 15ft was probed to test whether it was practical to insert a stainless RTD into formation, some distance above the deployed point. Finally, a third hole was probed to 10ft to set up a base station to acquire long term, multi-day data. The equilibration data acquisition was concluded by 12:00 noon. Another five sites were occupied and probed (MMTG#2 through #6) in the afternoon by setting rods and leaving them in the ground overnight to equilibrate. Also sleeved several of the 110ft RTD's that we had pre-wired in the office into 100ft of HDPE tubing for deployment. The F-550 was left in the field at the Painted Hills Mine site and the F-350 used to transport the crew back to the motel.

May 26, 2010: The crew left the motel at 6:30am and once on site around 7:00am, began reading the RTD's, pulling rods, and abandoning holes. The first new site of the day, MMTG#7 was probed at 11:00am and in succession, MMTG#8 and MMTG#9 in the Painted Hills Mine workings area. Significant rain/hail began upon completion of MMTG #9 with an accumulation of >1/2 inch. The red clay was soaked to several inches deep and made moving the F-550 to a new site impossible. KNT drove the Painted Hill Mine north access and determined it was too wet for the F550. The crew spent the rest of the afternoon with the F-350 doing access reconnaissance in the Gridley Lake south area, looking for better drained conditions – and found them. Water sampled the Gillotti Well. Returned to site MMTG#9 by 5:30pm, recovered rods, and plugged/abandoned holes and proceeded to MMTG#8 and #7 to do the same.

May 27, 2010: The crew prepared to leave motel at 6:30am, however torrential downpour began about 6:00am and continued through 7:00am. Given the crew's experience with muddy conditions the afternoon before, we decided to check out an alternate access route to Painted Hills Mine north. Only partial success, although the access route was sandy and well drained, it petered out into less than a goat trail with a mile more to go. The F350 developed a tire leak and the crew stopped to repair it on the access route back into the Painted Hills Mine. While repairing the tire, Rick Zehner and Jane (?) drove out of the Painted Hill Mine. We exchanged progress discussons, geologic insight and mutually decided to probe the Gridley Lake southeast area. The crew probed sites MMTG#10 through #15 in the afternoon, set rods and RTD's for overnight equilibration. We irreparably damaged a sidewall on the F-550 on access route to MMTG#13. Field activities were concluded by 7:30pm.

May 28, 2010: Breakfast at the Denio Motel at 6:30am and departed for the field by 7:00am. The crew read the RTD's and pulled rods from sites MMTG#15 and #14. I sent Mike to continue pulling rods at sites MMTG#10 through #14, while I water sampled a spring (MM002) at NE Gridley Lake and a flowing stock well in SE Gridley Lake (MM004). I met Mike at MMTG#10 to complete the rod pulling and moved to site MMTG#16, North Painted Hills Mine by 2:30pm. Set rods and RTD's in sites MMTG#16 through #19 by 5:00pm. We decided to leave the F-550 at the extreme end of the access route to minimize travel through the boulder strewn route. In the evening, the crew water sampled a stock well NE of the Painted Hills Mine.

May 29, 2010: On site MMTG#19 at 7:00am to read the RTD, pull rods and plug/abandon the hole. Completed recovery and plugging activities for MMTG#18 through #16 in the morning. Arrived on site MMTG#20, the Knot Creek access road, by noon and set MMTG#20 and #21 by 1:30pm. During that afternoon, the crew water sampled Bog Hot Well (MM006), checked out the access to two stock ponds located on the 24,000 scale USGS topographic map to the SW of Bog Hot, on the range front. Both stock ponds were plumbed into a common pipeline sourced from Bog Hot Well. Water sampled McGee Mtn. Spring (MM007) and Bog Hot Valley Central (MM008). The crew then completed pulling the rods and plugged/abandoned the holes by 7:00pm. The Geoprobe was driven into Denio Junction that evening.

May 30, 2010: AM, The crew drove to the field to recover the RTD and thermometer from MMTG#1 site base station, after which the hole was plugged and abandoned. The crew returned to Denio Junction, recovered the Geoprobe and began demobilization back to Reno via Winnemucca. Once in Winnemucca, we used the car wash for approximately an hour and a half to clean the equipment and gear. Continued on to Reno by mid-afternoon, where equipment and gear were stowed.

Probe Methods and Procedures Photos:

Figure 10: Geoprobe in typical probing configuration

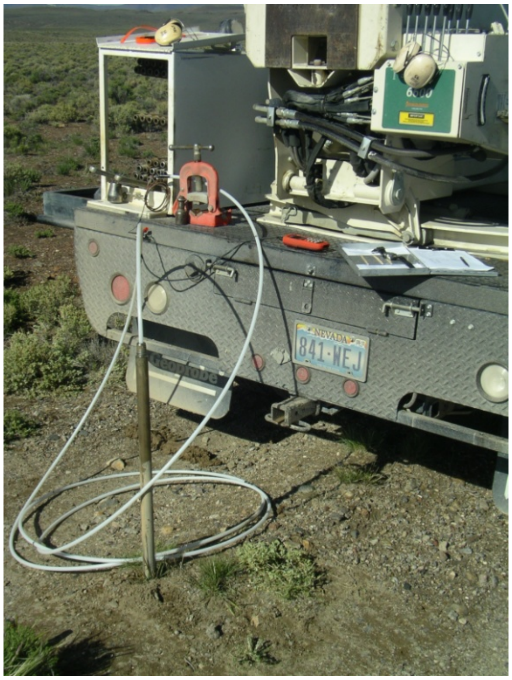


Figure 11: The equilibration test at site MMTG#1: The probe rods were at depth, the RTD Installed and temperature recorded over time.

Water Sample Site Photos:

Figure 12: Water sample MM001 was taken from the Gillotti Well. The stock well was a 220V submersible pump that was running on arrival.

Figure 13: Water sample MM002 was collected from a developed spring. The water sample was taken from the spring box collection culvert using a rope to lower the sample pitcher some 10ft below the surface.

Figure 14: Water sample MM004 was a stock well being pumped by a 220V submersible that was running on arrival as seen in the photo to the left. Note the white (CaCO3) precipitate on the tank. The photo on the right is the wellhead. Damage to the environmental seal around the wellhead was noted and may be the source of nitrogen noted in the sample, as the adjacent pasture may have funneled cow manure during wet periods.

Figure 15: Water sample MM005 is a stock well that was not running on arrival. The generator was turned on, after adding gasoline, to run the well prior to sampling. The photo to the left is the wellhead and the photo on the right is the stock tank. Note the white (CaCO3) precipitate on the tank.

Figure 16: Water sample MM006 was taken at Bog Hot Valley Well. The 220V submersible pump was not running on arrival. The pump was turned on by flipping on the 220V breaker switch located on the pole and run for a period of time prior to sampling. The wellhead is in the photo to the right.

Figure 17: Water sample MM007 is McGee Mtn. Spring. The developed spring box, a vertical culvert, is located just at the base of the cliff to the right of the upper right corner of the sample bottle.

Figure 18: Water sample MM008 was taken from a non-functioning windmill. Mike Schramm is holding a makeshift block and tackle (minus the block) that we used to hold the top of the well in a position to get a bailer down the well. The windmill's pump rod is broken just above the top of the picture, just under the vanes. A large raven's nest with fledglings attest that it's been broken for a number of years.

Figure 19: All water samples were filtered using the NALGENE Filter Holder with Receiver (Cat. No. 300-4050) and a Mighty Vac vacuum pump.

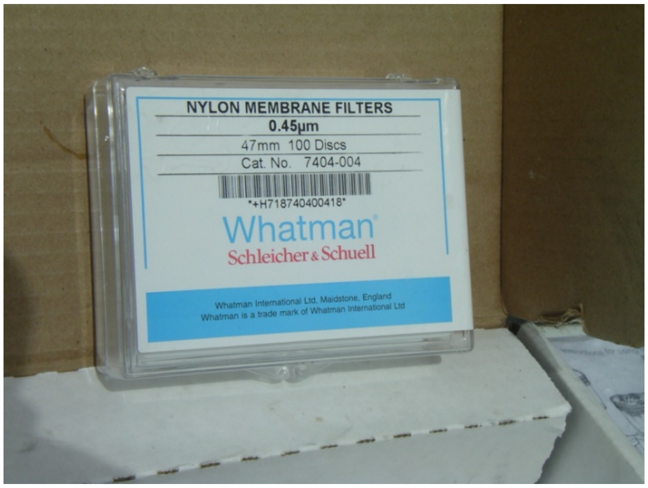


Figure 20: Filter media used for the program was Whatman Schleicher & Schuell Nylon Membrane Filters 0.45Um, 47mm, Cat. No. 7404-004.

Tool and Tire Loss, Geoprobe Maintenance: A total of 85ft (17 rods) of serviceable rods (replacement cost ~$106/rod NEW) were lost in MMTG#1 (20ft; 4 rods) and in MMTG#10 (65ft; 13 rods) that were likely pinched in a boulder or coarse gravel layer at the bottom of the hole. A total of 20ft (4 rods) were bent into an unserviceable condition in MMTG#16 (5ft; 1 rod) and MMTG#17 (15ft; 3 rods) probing in an area of large boulders exposed on the surface. Probe rods have a theoretical life-span of some 10,000ft per rod under ideal conditions. When greater resistance or boulders are encountered, the theoretical lifespan can be dramatically truncated by either wearing out the connections or simply bending rods.

Typically, when operating with a single string in the ground at a time, it's possible to place the most worn rods at the beginning of the string with a first in, last out approach, so that in the event of tool loss, the most worn string is in jeopardy. Unfortunately, by setting rods in as many as six holes a day, that ability to choose which rods led was not possible. Both good rods, those recently placed in service, and fair, those nearing the end of their serviceable life, were well mixed.

The F-550 ripped a sidewall on a rear dual tire on the access route between MMTG#12 and MMTG#13 that completely destroyed the tire. Tires for the F-550 are considered, by Les Schwab, to be commercial tires and not subject to their usual road hazard warranty. The replacement cost was $402.75. In contrast, a sidewall on the F-350 was damaged by a thorn and was replaced, at no cost, under the Les Schwab road hazard warranty.

The Geoprobe required a main slide bushing to be replaced at a cost of $50.00 for the part plus labor. Apparently the bushing(s) wear with time and use and require periodic replacement.

The total replacement cost for the damaged equipment is estimated to be; 1) $106.00 per rod times 21 rods (105ft) or $2,226.00; 2) tire replacement cost was $402.75; and 3) the Geoprobe bushing replacement was $50.00 (plus labor) for a total of $2,678.75.

Notes on Accommodations at Denio Junction: There is only one motel/restaurant within a reasonable distance of the project, the Denio Junction Motel. Room charges were $50.00 per night. An adequate and hearty breakfast is served beginning at 6:30am or sometimes later, depending on when the help shows up. Dinner stops being served at 7:00pm, which we never attended because we were still working in the field.

I'd highly recommend taking a portable trailer into either the field – the simplest and cleanest – or if a sense of community is desired, occupying one of the trailer spots at the motel or across the highway. The motel does have "guest" showers and washing machines. The trailer would have the advantage of being able to control personal hygiene, the quality and timing of food preparation and some office space to collate data in the evenings.

Additional Equipment Required Next Time: A good full range reference thermometer is necessary, the VWR used had a maximum range of 70^{o}C (1^{o}C resolution and +/- 1^{o}C accuracy). VWR DIGITAL THERM TIMER ALARM Part No. *82021-170* $58.91

VWR* Alarm Thermometer. Reads [degree]F and C. Audible alarm signals out of set range temperatures. Auto alarm reset. Range: -50 to 260[degree]C. NIST traceable. Includes 18.4cm probe with 91.4cm cable and battery.

Temperature Range:	–50 to 300°C (–58 to 572°F)
Temperature Accuracy:	±0.5° from –20 to 70°C, ±1° up to 120°C, ±2° above 120°C and below –20°C
Resolution:	0.1°

Attachment A: McGee Mtn. Project Probe Field Notes

PGL FIELD SHEET

Date 5·25·10 Time 7:00 Am Observer KNT, MS

Site / Sample ID

NAD [✓ 27] or 83

Site ID TMTG#1

Eastings 348,318

Sample ID

Northings 4,629,724

Source

Project Mc Gee Mtn

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	**Time**
TD (ft)	45	Start (0 ft)	
Top of Screen (ft)		Dry Hole, No Water	
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

TD: 45, 15, 10

Notes: Probed 3 holes: #1 to 45', only able to get RTD to 39', when pulled back lost 20' in hole
#2 to 15', pulled point off to get exposure to formation, OK recov
Set 11:30 Am #3 to 10', set 110' RTD #3 8'8" from surface in naked hole
for baseline temp

Notes: Pushed 15' of rods, pulled back ~30" to expose formation
Push 50' RTD to bottom of hole on top of point temp = 34°C

275
215
(60)
- 15
45

@7:45	31.0°C	on point, then pulled back 16"
@7:49	23.6	
@7:50	22.7	
7:55	20.6	
8:00	19.6	
8:05	19.0	
8:10	18.6	
8:15	18.3	
:20	18.0	
:25	17.8	
:30	17.6	
:35	17.5	
:40	17.2	
:45	17.2	
:50	17.2	
56	17.1	
9:00	17.1	
9:01	17.8	Pushed RTD down 16" on to point
9:05	17.8	
9:10	17.6	
9:22	17.5	
9:28	17.3	
9:35	17.2	
9:40	17.1	

Ambient

#3 hole (to 10', 110' RTD #3, set @ 8'8")

Time:		Thermometer (#5936)	RTD	
5·25	12:10 PM	21°C	24.4	
5·25	6:47 PM	13°C	16.4°	
5·26	6:50 Am	13°C	15.6/15.5	
5·26	5:00 PM	12°C	15.5	Ambient 18°C
5·27	11:05 Am	12°C	15.6	
5·28	5:53 PM	12.0°C	15.8	Ambient 28°C
5·29	7:40 Am	12.0°C	15.6	Ambient 10°C
5·30	8:00 Am	12.0°C	15.7	Ambient 10°C

45 ft hole, 20" from

@ 9:10	17.9 w/ 100' RTD
@ 9:20	17.4
@ 9:28	17.4
9:35	17.1
9:40	16.9

Ambient air temp 11°C 1005AM

RTD Equlibration Worksheet

Date: 5·25·2010

Location: 348,313 E, 4,629,724 Site MM #1

Setup Description: Road Center 45' deep Ø ← 20" → Ø 15' deep

Drove hole to 45' Left tip in place

T1 RAW Data w/50' RTD

T2 w/100' RTD Raw Data

Time:	Interval (min):		RTD A:		RTD:B		Control:		
7:45Am	0	Air	31.0°C	16" off					
7:49	5		23.6	Bottom					
7:50	10		22.7						
755	15		20.6						
8:00	20		19.6						
8:05	25		19.0						
8:10	30		18.6						
8:15	35		18.3						
8:20	40		18.0						
8:25	45		17.8						
8:30	50		17.6						
8:35	55		17.5		45'				
8:40	60		17.2		Hole				
8:45	65		17.2						
8:50	70		17.2						
856	75		17.1						
9:00	80		17.1						
9:01	85	On bottom	17.8	Pushed to					
9:05	90		17.8	bottom	Start@9:10				
9:10	95		17.6		17.9				
9:22	100		17.5		17.4				
9:28	105		17.3		17.4				
9:35	110		17.2		17.1				
9:40	115		17.1		16.9				
9:45	120		—		—				
9:50	125		17.0		16.9				
9:55	130		17.0		17.1				
10:00	135		17.0		17.1				
10:05	140		16.9		16.7				
10:10	145		16.9		16.7				
10:18	150		16.8		16.6				
10:20	155		16.8		16.6				
10:25	160		16.8		16.6				
10:30	165		16.8		16.7				
10:35	170		16.7		16.4				

5·20 –

			T_1		T_2				
10:40 Am	175		16.6		16.4				
10:45	180		16.6		16.2				
10:50	185		16.6		16.1				
10:55	190		16.6		16.1				
11:00	195		16.6		16.0				
11:05	200		16.5		16.0				
11:10	205		16.5		16.4				
11:15	210		16.4		16.1				
11:20	215		16.4		15.8	(moved the meter from truck to ground)			
11:25	220		16.5		15.7				
11:30	225		16.5		15.8				
11:35	230		16.5		15.5	Pope			
11:40	235		16.4		15.5	Drill 3rd hole to 10'			
11:45	240		16.4		15.5				
11:50	245		16.4		15.4				
	250								
	255								
	260								
	265								
	270								
	275								
	280								
	285								
	290								
	295								
	300								
	305								
	310								
	315								
	320								
	325								
	330								
	335								
	340								
	345								
	350								
	355								
	360								
	365								
	370								
	375								
	380								
	385								
	390								
	395								
	400								
	405								

PGL FIELD SHEET

Date 5-25-10 Time 12:20PM Observer KNT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG #2 Eastings 347,939

Sample ID Northings 4,629,755

Source **Project** McGee Mtn

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	38	Start (0 ft)	12:20PM
Top of Screen (ft)		38ft	12:40PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type TempGradient

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes:

Notes: @12:45Pm pull back 3', from 38ft, to recover tip ~~f/~~ rd.

Set 50' RTD & Tape @ Top

Note — Joint contribution of clay prevented pushing RTD to bottom of hole - had to backflush w/ H2O to bottom -

Set RTD @ 38', taped in place, move to next site. 1Pm

Reading 5·25·2010 @ 6:45Pm = 17.9°C

5·26·2010 @ 6:53AM = 17.7C

Plugged + Abandoned 5·26·2010 @ 9:10Am

Pulled back 3ft.

Backflushed w/ H2O prior to RTD deployment

PGL FIELD SHEET

Date 5-25-10

Time 1:05PM

Observer KWT

Site / Sample ID

NAD 27 or 83

Site ID MMTG#3

Eastings 347,362

Sample ID

Northings 4,629,797

Project McGee Mtn

Source

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	40	Start (0 ft)	1:05PM
Top of Screen (ft)		40 ft TD	1:30
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Cleaned rods w/ point in place - backflushed w/ H_2O from bottom up. Put 100' RTD in bottom to equilibrate.
Moved to next hole 1:40 Pm

Notes: 5-25 Reading @ 6:41 PM => 19.6°C 5.25.2010 100' RTD Fixed
5-26-2010 @ 6:55 PM 19.1°C

Plugged + Abandoned 9:45AM 5.26.2010

Point in place.
Backflush w/ H_2O prior to setting RTD

PGL FIELD SHEET

Date 5·25·10 Time 1:55Pm Observer KAT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTC#4 Eastings 346,884

Sample ID Northings 4,629,828

Project Mc Gee MtN

Source

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	**Time**
TD (ft)	51	Start (0 ft)	1:50 Pm
Top of Screen (ft)		51 Ft	2:45 Pm
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Left point ON, flushed with water. Set 150ft RTD in hole to equilibrate. Reading @ 6:40 Pm 22.2°C 5·25·10
@ 6:56 Am 21.6°C 5·26·10
Dry hole

Notes: Plugged + Abandoned 10:10 Am

Point in place
Back Flush w/ H2O

PGL FIELD SHEET

Date 5·25·10 Time 2:50 PM Observer KNT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG#5

Eastings 346,362

Sample ID

Northings 4,629,374

Source

Project McGee Mtn

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	41.5	Start (0 ft)	2:50PM
Top of Screen (ft)		41.5Ft	3:15PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Gradient

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: flushed rods w/ water, String 110' RTD #11, into 90ft. of HDPE, set in bottom of hole, to equilibrate
5·25·2010 @ 6:10PM = 600°C, bad reading, Not repairable / Replaced w/#7

Notes: 5·25·2010 @ 6:35PM = 21.5°C using 110' RTD #7
5·26·2010 @ 7:00AM = 20.1°C using 110' RTD #7

Plugged & Abandoned 5·26·2010 by 10:45 AM

Point in place
Back flushed w/H2O

PGL FIELD SHEET

Date 5·25·10
Time 4:15 PM
Observer KWT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMT#6
Eastings 345,970
Sample ID
Northings 4,629,873

Source

Project McGee Mtn

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	26.5	Start (0 ft)	4:00PM
Top of Screen (ft)		26.5 ft	4:15PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad.
Temp (C)
Hard ppm
Alk ppm
NO3 ppm
NO2 ppm
Cond uS
pH
SO4 ppm

Filtering

☐ Canister #
☐ Disc Tt#

Reagents

☐
☐
☐

Soil Sample

☐ Taken as Site ID
☐ Or as ID

Notes: flush bottom @ 4:15-4:20 ; 110' RTD #5 installed @ bottom ~5PM
@6PM 5·25·2010 = 25.6°C
@7:10AM 5·26·2010 = 21.0°C

Notes: Plugged and Abandoned 5·26·2010 8:00AM

Point in place
Back flushed w/ H2O

PGL FIELD SHEET

Date 5·26·10 Time 11:10AM Observer KNT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG#7

Eastings 345,747

Sample ID

Northings 4,629,746

Project McGee Mtn

Source

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	20	Start (0 ft)	11:00AM
Top of Screen (ft)		20ft	11:10AM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Probed 20ft, very tight, hit several boulders
Set 50' RTD, check if working = 50°C, Added water
~6hrs to equilibrate 19.6°C @ 5:10PM 5·26·2010

Notes: P&A 5·26·2010 6:30PM

Point in place, T=50°C (corrected = 44.5°C), then
Back flush w/H2O

PGL FIELD SHEET

Date 5·26·10 Time 12:00 Observer KNT

Site / Sample ID

NAD 27 or 83

Site ID MMTG#3

Eastings 345,420

Sample ID

Northings 4629705

Project McGee Mtn

Source

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	**Time**
TD (ft)	33	Start (0 ft)	11:30 AM
Top of Screen (ft)		33ft.	11:45 AM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Dry hole. Back flushed w/ water. Set 100' RTD = 42.4°E 12:02PM
@5:15PM 5·26·10 25.4°C / 25.5°C / 25.6°C

Notes: P&A 5·26·2010 6:15PM

Point in place
Backflushed w/ H_2O

PGL FIELD SHEET

Date 5·26·10 Time 1:45PM Observer KNT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG#9

Eastings 345,305E

Sample ID

Northings 4,629,667N

Source

Project McGree Mtn

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

TD (ft) 50

Top of Screen (ft)

SWL (ft)

Purge Vol. (Gal.)

Depth (ft)	Time
Start (0 ft)	1:00PM
50ft	1:40PM

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Pulled point to check for water w/ meter. Dry hole. Added ~1 gal to bottom of hole.

used 150' RTD, fixed = 46.6°C @ 1:45PM

38.0°C @ 5:20PM 5·26·2010

Notes: Rained/sleeted significantly ~ 1/2 inch. Roads too wet to mobilize probe. Began recon of other areas to avoid tearing up/rutting existing roads.

P&A 6:00 PM 5·26·2010

Pulled point to check for H_2O

Dry hole. Backflushed w/ H_2O

PGL FIELD SHEET

Date 5·27·2010 Time 1:25PM Observer KJT

Site / Sample ID

NAD [✓ 27] or 83

Site ID KTG MM#10

Eastings 345,786

Sample ID

Northings 4,622,505

Project McGee Mtn

Source

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	75	Start (0 ft)	11:35 AM
Top of Screen (ft)		75ft	12:05PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID_______

Notes: Drove point to 75ft, rejection, Stuck rods. Backfilled w/ clean H2O, set RTD as deep As possible, Set 100' RTD.
RTD Depth = 75ft.
Rods recovered: 10'
Move to next hole @ 1:30PM

Notes: RTD@ 5:20PM 21.7°C 5·27·2010
RTD@ 12:00 PM 21.6°C 5·28·2010

Total steel lost ~ 65ft.
" " recovered: 10ft.

PGL FIELD SHEET

Date 5·27·10 Time 2:15PM Observer KJT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG#11

Eastings 346,199

Sample ID

Northings 4,622,410

Source

Project McGee Mtn

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	44	Start (0 ft)	1:46PM
Top of Screen (ft)		44ft	2:06PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: on site 1:35PM → Set 50ft RTD – backflushed w/ H2O to clean out tan/gray viscous clay. RTD wants to float in hole – need to evacuate rinse water.

Notes: Site is in drainage bottom. Note clasts of massive, multicolored silica to wht, opal. found several clasts (float) to 3" inch diameter, bagged several

@ 5:16PM T= 18.7°C 5·27·10 ✓

@ 11:00 AM T= 17.2 C 5/28/10 RECOVER SENSOR + STEEL

Waypoint 040

PGL FIELD SHEET

Date 5·27·2010

Time 2:45pm

Observer KWT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG#12

Eastings 346,493

Sample ID

Northings 4,622,339

Project McGee Mtn

Source

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	29.5	Start (0 ft)	2:45PM
Top of Screen (ft)		29.5ft	3:00PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad.

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: first two probed holes encountered boulders @ < 5 ft. moved rig ~ 10 ft, re-probe to DryHole! No mud/clay.

Notes: Site is in a SE to NW trending drain. Found white opaline silica cementing a Tv (gry clasts) conglomerate. Abundant white coatings on alluvial rxs. Stg fizz w/ HNO_3 (only acid available.) Silica is not abundant! Also note light gray to brown silica + opal (white) in drainage.

$CaCO_3$

Rock, float sample taken 150' SENSOR RTD!

@ 5:45 5/27/10 T = 26°C

@ 10:36 AM 5/28/2010 T = 21.6

PGL FIELD SHEET

Date 5·27·2010 Time 3:50 PM Observer KWT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG#13 Eastings 346,732

Sample ID Northings 4,622,204

Project Mc Gee Mtn.

Source

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	26ft.	Start (0 ft)	4:00PM
Top of Screen (ft)		26ft	4:30PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad.

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Site is in drainage bottom @ confluence of 2 drains

Notes: flat tire on outside dual left tire of F550 - tore out sidewall traversing from site MMTG #12 to #13. ~30 min to change.

Note white $CaCO_3$ coatings on rxs in drain.

Set RTD, 110' #5 T = 28.7°C @ 5:05PM

No water added, pulled back 2 ft, then set RTD.

9:59AM RECOVER RTD#5 @ SITE#13 5/28/2010 T = 19.1 c @ 10:05AM

RECLAIMED SITE @ 10:25 AM

Waypoint #42

PGL FIELD SHEET

Date 5·27·10
Time Arrived 5:30 PM
Observer KNT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG#4
Eastings 347,594
Sample ID
Northings 4,626,187

Source

Project McGee Mtn

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	50ft	Start (0 ft)	5:35 PM
Top of Screen (ft)		50ft	7:00 PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad
Temp (C)
Hard ppm
Alk ppm
NO3 ppm
NO2 ppm
Cond uS
pH
SO4 ppm

Filtering

☐ Canister #
☐ Disc Tt#

Reagents

☐
☐
☐

Soil Sample

☐ ~~Taken as Site ID~~
☐ ~~Or as ID~~

Notes: Probed hole, attempted to produce water, trip back, re-entered - 2nd attempt to determine water + pulled back 10 ft. set RTD 110' #7 @ 50'

Notes: @ 9:10 Am 5·28·2010 = 18.9°C / 19.0°C

P&A @ 9:30 Am 5·28·2010

PGL FIELD SHEET

Date 5·27·10 Time 7:25PM Observer KWT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG#5 Eastings 347,293

Sample ID Northings 4625855

Source **Project** McGee Mtn

☒ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	37 Ft	Start (0 ft)	7:00 PM
Top of Screen (ft)		32 Ft	7:30 PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Set RTD, 110 ft #15 in bottom fixed point on bottom - did not hit rejection (out of rods), flushed w/ H2O.

Notes: 5·28·2010 @ 7:55 AM T = 18.9°C. ~~5·29·2010~~

Geolog Note - site is in the drainage bottom. Abundant high + low Temp silica. Some wht to clear, possible opal. Mixed bag of alluvial contribution. No white coatings noted on clasts.

Silicified sandstone (?), bedded noted ~ 100yds to west

@ Road intersection 347,260 E x 4,625,823N, rubble crop (to A collection - only noted next to road, suspicious - possible leaverite).

S ↓ N

@ 347,260E x 4625943N, (S. End rubble to sub crop) Attitude N90E, 32°N dip lt brwn, wk FeOx sandstone to coarse sandy conglomerate, silicified N65

@ 347,271E x 4,625,959N (N. End), N95E, 25°N dip (Tt dimensions ~ 60 Ft x 15 Ft)

@ 347,245E N110°E, 20°N dip 4,625,969N

@ 347,197E x 4,626,024N outcrop of ss/cgl that forms contour, ~ 100yds long, 10' vert. N85°E, 5°N dip Note cross bedding relationships see photo

Brunton Declination = 17°E

P&A 8:30 Am 5·28·2010

PGL FIELD SHEET

Date 5·28·10 Time 2:30 PM Observer KNT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG#16 Eastings 345,805E

Sample ID Northings 4,630,592N

Source **Project** McGee Mtn

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	43	Start (0 ft)	2:30PM
Top of Screen (ft)		43ft	2:45PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: @ Site ~ 2:00 pm from moving of recovering rods pulled back 2ft to check for water, note damp gray clay; used water level meter - dry. Set 50ft RTD 34.1°C @ 2:55 PM

Notes: Abundant, wht to clear opalin float. Bent 1 rod

5·29·2010 @ 7:55 Am 21.7°C

P&A 5·29·2010

PGL FIELD SHEET

Date 5·28·10 Time 4:30PM Observer KNT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MMTG#17 Eastings 345,610E

Sample ID Northings 4,630,842N

Source **Project** McGee Mtn

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	**Time**
TD (ft)	55	Start (0 ft)	~4:10PM
Top of Screen (ft)		55ft	4:30PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐

☐

☐

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Pulled back 2ft to check for water, encountered red clay blockage in rods. Had to flush w/ water to clear.

Notes: Spent ~ 1hr working on access in drainage to site #18 moved boulders, improved access.

Set RTD 150ft, initial reading 34.2°C @ 4:45PM 5·28·2010

Reread 32.1°C @ 8:00AM 5·29·2010

Bent 3 rods

PGL FIELD SHEET

Date 5·28·10 Time 4:55PM Observer KWT

Site / Sample ID

Site ID MMTG#18 Eastings 345,449

Sample ID Northings 4,630,812

Source **Project** McGee Mtn.

☒ Geoprobe ☐ Drilling ☐ PGL 2009(Recon)

Geoprobing

TD (ft) 12

Top of Screen (ft)

SWL (ft)

Purge Vol. (Gal.)

Depth (ft)	Time
Start (0 ft)	5:00PM
12ft	5:05PM

Field Data

Site Type Temp Grad

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐ Au: 1 mL A

☐ Au: 6 drops A1

☐ TM: 1 mL M

Soil Sample

☐ Taken as Site ID

☐ Or as ID_______

Notes: Onsite @ 4:55PM, hit something solid (bedrock or large boulder?) Added water to cool. Dry Hole. Did not set RTD @ End of day.
5·29·2010 - 8:15 AM, pulled RTD from #19 (110' RTD #5), let cool to 18°C, inserted in #18 (31.3°C + rising by 8:17 AM)
39.9°C @ 8:27 AM
42.6°C @ 8:45 AM

P&A 5·29·2010 9:15 Am

PGL FIELD SHEET

Date 5·28·10 Time 5:07PM Observer KWT

Site / Sample ID

Site ID MMTG#19 Eastings 345,463

Sample ID Northings 4,630,315

Source **Project** McGee Mtn

☐ Geoprobe ☐ Drilling ☐ PGL 2009(Recon)

Geoprobing

TD (ft) 52ft

Top of Screen (ft)

SWL (ft)

Purge Vol. (Gal.)

Depth (ft)	Time
Start (0 ft)	5:10PM
5:25PM	52ft

Field Data

Site Type Temp Grad.

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

☐ Au: 1 mL A

☐ Au: 6 drops A1

☐ TM: 1 mL M

Soil Sample

☐ Taken as Site ID

☐ Or as ID_______

Notes: Moved ~ 50ft East from #18 on road access
Set 110ft RTD #5, initial reading 55.40 5:35PM 5·28·2010
47.4°C 8:05AM 5·29·2010

P&A 5·29·2010 8:00 Am

PGL FIELD SHEET

Date 5·29·10 Time 11:50AM Observer KNT

Site / Sample ID

Site ID MMTG#20 Eastings 348,600
Sample ID Northings 4,622,835

Source **Project** McGee Mtn
☒ Geoprobe ☐ Drilling ☐ PGL 2009(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	52	Start (0 ft)	11:20 AM
Top of Screen (ft)		52ft	11:45AM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad
Temp (C)
Hard ppm
Alk ppm
NO3 ppm
NO2 ppm
Cond uS
pH
SO4 ppm

Filtering
☐ Canister #
☐ Disc Tt#

Reagents
☐ Au: 1 mL A
☐ Au: 6 drops A1
☐ TM: 1 mL M

Soil Sample
☐ Taken as Site ID
☐ Or as ID______

Notes: Pulled back 2ft, no resistance. (Could have gone deeper!) Pushed ½" HDPE to bottom, no clay. Set 150' RTD; Bottom hole temp = 33.4°C.
5·29·10 @ 7:05PM = 22.3° C
P&A 5·29·10 @ 7:15PM

PGL FIELD SHEET

Date 5·29·2010 Time 1:15PM Observer KNT

Site / Sample ID

Site ID MMTG#21 Eastings 349,076
Sample ID Northings 4,622,416

Source **Project** McGee Mtn
☐ Geoprobe ☐ Drilling ☐ PGL 2009(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	17	Start (0 ft)	12:30PM
Top of Screen (ft)		17ft	12:45PM
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Temp Grad
Temp (C)
Hard ppm
Alk ppm
NO3 ppm
NO2 ppm
Cond uS
pH
SO4 ppm

Filtering
☐ Canister #
☐ Disc Tt#

Reagents
☐ Au: 1 mL A
☐ Au: 6 drops A1
☐ TM: 1 mL M

Soil Sample
☐ Taken as Site ID
☐ Or as ID______

Notes: Set 20' RTD, initial reading = 37.0°C
Dry hole.
Probed to 17', moved 2ft, probed 2nd hole, same result

5·29·10 @ 6:45PM = 18.8° C P&A 5·29·10 @ 6:50 PM

Attachment B: McGee Mtn. Project Water Sample Site Field Notes

PGL FIELD SHEET

Date 5·26·10 Time 3:45Pm Observer K. Tullase

Site / Sample ID

NAD [✓ 27] or 83

Site ID MM001

Eastings 350,479

Sample ID

Northings 4,627,146

Source

Project Mc Gee Mtn

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	**Time**
TD (ft)		Start (0 ft)	
Top of Screen (ft)			
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type StockWell

Temp (C) 18

Hard ppm 75

Alk ppm 80

NO3 ppm 0

NO2 ppm 0

Cond uS 349

pH 8.61

SO4 ppm 42

Filtering

☐ Canister #

☐ Disc Tt#

Reagents

~~☐~~ MM001Si NONE

☑ MM001CA 1 ml HNO_3

~~☐~~ MM002 AN - NONE

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Clear water taken from discharge pipe, flowing well on [illegible] 220V pump. Note white $CaCO_3$ precipitates on pipe! Geology = Tsediments + volcanic gravel veneer.

Notes: All samples filtered to 0.45um

Gillotti Well EL = 4415ft.

walked to site @

PGL FIELD SHEET

Date 5·28·10 Time 10:00 Am Observer KNT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MM002

Eastings 347,750

Sample ID

Northings 4,625,220

Source

Project Mc Gee Mtn

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	**Time**
TD (ft)		Start (0 ft)	
Top of Screen (ft)			
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Spring

Temp (C) 12°

Hard ppm 150

Alk ppm 80

NO3 ppm 0

NO2 ppm 0

Cond uS 773

pH 7.49

SO4 ppm 110

Filtering

~~☐ Canister #~~

~~☐ Disc Tt#~~

0.45um filter

Reagents

☐ MM002S: — None

☑ MM002CA + 1ml HNO_3

☐ MM002AN — None

Soil Sample

☐ Taken as Site ID

☐ Or as ID______

Notes: 3' diameter culvert vertical in ground – SWL ~ 5 ft below surface. Improved spring

El = 4404 NE Gridley Lake

Notes: Note white bacterial (?) growth in water

Spring drains to NW trending meadow ~ 100 ft long x 30' wide

Spring runoff drains to pivot troughs ~ 150 yds Away.

MM002

Completed water sample @ 10:50 Am

PGL FIELD SHEET

Date 5·28·10 Time 6:20 PM Observer KNT

Site / Sample ID NAD 27 or 83

Site ID MM003 Eastings

Sample ID Northings

Source **Project** McGee Mtn.

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Field Data

Site Type Blank

Temp (C)

Hard ppm

Alk ppm

NO3 ppm

NO2 ppm

Cond uS

pH

SO4 ppm

Filtering

~~☐ Canister #~~

~~☐ Disc Tt#~~

0.45um

Reagents

~~☐~~ Si - NONE

☑ CA - 1ml HNO_3

~~☐~~ AN - NONE

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Geoprobing **Depth (ft)** **Time**

TD (ft) Start (0 ft)

Top of Screen (ft)

SWL (ft)

Purge Vol. (Gal.)

Notes: filtered all water, Added 1ml HNO_3 to MM003 CA ✓
used a single 0.45um filter for rinse and final sample.
Used distilled water.

Notes:

PGL FIELD SHEET

Date 5·28·10 Time 11:05Am Observer KWT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MM002 Eastings 348,412

Sample ID Northings 4,621,772

Source **Project** McGee Mtn

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

Depth (ft) **Time**

TD (ft) Start (0 ft)

Top of Screen (ft)

SWL (ft)

Purge Vol. (Gal.)

Field Data

Site Type Stock Well

Temp (C) 20°C

Hard ppm 1000/1000

Alk ppm 300/180

NO3 ppm 40/40

NO2 ppm 0/0

Cond uS 593

pH 6.62

SO4 ppm 63

Filtering

☐ Canister #

☐ Disc Tt#

0.45um filter ✓ 1

Reagents

☑ 004 Si None 40ml DW

☑ 004 CA + 1ml HNO_3

☐ 004 AN — None

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Stock well casing failed, environmental seal probably leaks, cow feces likely responsible for NO_3??
Water clear, grn Algae
El = 4648 ft

Notes: Pasture, well stomped – basalt to mafic volcanic float dominant, some white ($CaCO_3$) coatings noted

EL = 4648 ft.

PGL FIELD SHEET

Date 5·28·10 Time 6:20 Pm Observer KNT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MM005 Eastings 347,697

Sample ID Northings 4,632,595

Source **Project** Mc Gee Mtn

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)		Start (0 ft)	
Top of Screen (ft)			
SWL (ft)			
Purge Vol. (Gal.)			

Field Data

Site Type Stock Well

Temp (C) 16°

Hard ppm 150

Alk ppm 180

NO3 ppm 0

NO2 ppm 0

Cond uS 994

pH 7.98

SO4 ppm 330

Filtering

☐ Canister #

☒ Disc Tt# 1

0.45um ✓

Reagents

☑ Si - NONE

☑ Ca + 1ml HNO_3

☑ An - NONE

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Stock well not running on arrival. Added gasoline to generator + pumped ~ 25 min, flow rate = 10 L/min. Picture ✓
Well head is accessible for SWL (no meter) 220V submersible.

Notes: Geology - light colored felsic volcanic float (green to pale green). Note white $CaCO_3$ coating on the stock tank.

Used the 5um disc filter/syringe as a pre-filter.

EL = 4395 ft.

PGL FIELD SHEET

Date 5·29·10 Time 1:50 PM Observer KWT

Site / Sample ID NAD [✓ 27] or 83

Site ID MM006 Eastings 348,271

Sample ID Northings 4,635,486

Source **Project** McGee Mtn.

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

	Depth (ft)	Time
TD (ft)	Start (0 ft)	
Top of Screen (ft)		
SWL (ft)		
Purge Vol. L ~~(Gal.)~~ 1500		

Field Data

Site Type Stock Well

Temp (C) 15

Hard ppm 150

Alk ppm 300

NO3 ppm 0

NO2 ppm 0

Cond uS 642

pH 7.78

SO4 ppm 110

Filtering

☐ ~~Canister #~~

☒ Disc Tt# 1

✓ 0.45um

Reagents

~~☐~~ Si - NONE

☑ Ca - 1ml HNO_3

~~☐~~ An - NONE

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Turned 220V pump ON @ 1:50 PM, flow = 2L/3sec = 60L/min

Run pump ~ 25min before sampling

White $CaCO_3$ precipitate on discharge pipe + tank.

Notes: Geology = Tseds, pasture.

Location = Bog Hot well (SW) on 24K map.

EL = 4317 ft.

PGL FIELD SHEET

Date 5.29.10 Time 4:30 PM Observer KNT

Site / Sample ID

NAD [✓ 27] or 83

Site ID MM007 Eastings 342,376

Sample ID Northings 4,636,505

Source **Project**

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Field Data

Site Type Spring

Temp (C) 12

Hard ppm 75

Alk ppm 40

NO3 ppm 20

NO2 ppm 0

Cond uS 166

pH 7.29

SO4 ppm 9

Filtering

☐ ~~Canister #~~

☒ Disc Tt#

0.45um ✓

Reagents

☑ Si - NONE

☑ CA + 1ml HNO3

☑ AN - NONE

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Geoprobing

		Depth (ft)	Time
TD (ft)		Start (0 ft)	
Top of Screen (ft)			
SWL (ft)			
Purge Vol. (Gal.)			

Notes: Took sample from spring collection culvert (w/lid) @ outcrop face on cliff (NOT troughs). Water is milky.

Notes: Pre-filtered w/ 5um syringe filter, then used (1) 0.45um filter per each 120ml sample. Very slow.

McGee Mtn Spring on 24K map.

EL = 4694 ft.

PGL FIELD SHEET

Date 5·29·10

Time 6:15PM

Observer KNT.

Site / Sample ID

NAD [✓ 27] or 83

Site ID MM008

Eastings 354,094

Sample ID

Northings 4,633,863

Source

Project Mc Gee Mtn.

☐ Geoprobe ☐ Drilling ☐ PGL 2010(Recon)

Geoprobing

		Depth (ft)	Time
TD (ft)	?	Start (0 ft)	
Top of Screen (ft)			
SWL (ft)	7		
Purge Vol. (Gal.)			

Field Data

Site Type Windmill

Temp (C) 13

Hard ppm 75

Alk ppm 40

NO3 ppm 0

NO2 ppm 0

Cond uS 160

pH 7.72

SO4 ppm 6

Filtering

☐ Canister #

☒ Disc Tt# 2

0.45um

Reagents

☑ Si - NONE

☑ Ca +1ml HNO3

☑ An - none

Soil Sample

☐ Taken as Site ID

☐ Or as ID

Notes: Took sample from approximately 25ft below surface. Non-pumping or functional windmill. Used bailer to 25ft.

Notes: Water is orange (FeOx, rusty), pre-filtered w/ 5um syringe filter, used 0.45um apparatus to finish. (1) filter per 250ml. Sample site is on playa.

EL = 4223ft.

Attachment C: McGee Mtn. Project Water Sample Protocol

FIELD SAMPLING PROTOCOL FOR MAJOR CATION AND ANION WATER SAMPLING OF THERMAL SPRINGS AND WELLS

Prior to Trip:

Packaging - preparation prior to trip, secure in Ziplock bag, for each sample:
-60ml bottle high density polyethylene ("HDPE"), marked "Sequence#Si"
-125ml HDPE bottle (cations), marked "Sequence#Ca"
-125ml HDPE bottle (anions), marked "Sequence#An"

Day of sample collection:

-Collect/inspect bottles and paperwork
-Calibrate Conductivity (weekly, 2 standards) and pH (daily, 3 buffers) beforehand

At the Sample Site:

Site description:

-Document the date, time, and place being sampled
-Take a photo of the sample site with the marked bottle in the photo for later site identification
-Note precipitates associated with water (FeOOH etc), algae, odor, and gas discharges (evaluate vigor for future gas sampling)
-Note presence/absence of plants, animals (bats, snakes, deer, etc), and insects/larvae
-Record local geology and rock alteration on field sheets (particularly when info unrecorded in office database). Collect rock samples with peculiar or interesting alteration.
-Note GPS locations in UTM coordinates, set to datum NAD83 (record if otherwise)
-Label bottles with sequential number (i.e. the first McGee Mountain sample would be MM001Si, MM001Ca, MM001An.

Temperature measurement:

-Keep thermocouple datalogger warmer than 50^{o}F, keep out of sun for extended periods. RTD's and its datalogger are not subject to this requirement
- Thermocouple or thermometer to be placed at point of sampling
-Allow time for thermocouples to stabilize

Sample/Bottle handling:

-Rinse Si bottle with30ml of Distilled Water 3 times and then charge it with 40ml of Distilled Water, then add 10ml of filtered sample water.
-Rinse cation bottle 3 times with 60ml (50% volume of sample bottle) of filtered water, discard, then add 120ml of filtered sample water and finally 1ml environmental grade HNO3.
-Rinse anion bottle bottle 3 times with 60ml (50% volume of sample bottle) of filtered water, discard, then add 120ml of filtered sample water. Do NOT add a preservative.
-Minimize water-sediment disturbance and air-water contact

- Take care walking not to slosh the sample
- If dusty environment, cover equipment, bag the bottles, and wait for dust to settle
- After sampling, cap bottles quickly and keep within Ziploc bags

Spring sampling:

-Collect water by submerging 1/4" polyethylene tubing into orifice or up-flow zone and pump for >=2 minutes to flush
-Minimize stirred sediment and air-water contact
-Connect tubing end to top of vacuum flask and vacuum bulb to side fitting

- Begin suction and let flow via siphon
- Keep vacuum flask as close to spring level as possible

-When pumping is impractical (water pipe, spring mounds), use beaker to collect

Sample collection and Filtering:

-Avoid dirty water in vacuum pumps. If water enters, pump distilled water to displace
-Wet filter surface w drops of distilled water before placing 0.45um membrane in filter area
-Use forceps to handle and place filter medium in the holder
-Rinse the filter apparatus 3x with distilled water. If water is limited, use final rinse of sampling equipment as first rinse of filter
-Pump hand vacuum 2-5x to move water, with periodic squeezes afterward. Avoid excessive vacuum, which could stress equipment could boil hotter samples
-Avoid release trigger on front of vacuum pump, as contaminated water from pump could enter filter or flask (unless connecting hose is first removed). Monitor and drain water collecting in vacuum hose.
-Pre-filter when significant debris is present through a stacked 20, 5, and/or 1.6 um filter as practicable using clean filters.

Sampling:

-All equipment, including 60ml syringe, must be rinsed 3x with filtered site water
-Use a separate volume of raw sample site water for pH and conductivity measure (T, pH, specific conductance (SC), and total dissolved solids (TDS) measure in rinsed beaker with Oakton meter)
-Fill bottle with filtered water for all others, in preferred order
-Rinse anion bottles with filtered water (avoid dirt on bottle surfaces), discard rinse water and cap immediately. Fill anion bottle to top, cap with black polyseal, with no bubbles present. Or, absent black polyseal, squeeze the anion bottle to forma meniscus and screw on the lid.
-Fill cation bottle, leaving a few cm^3 of headspace. Use a 60mL syringe to measure 120mL volume of water.
-Fill 60ml Si last

- fill to 60ml syringe with ~12ml. Expel air, set to 10ml, and slowly squirt into Si sample bottle
- lightly touch plunger to bottom of syringe – conical tip should retain water

-After sample collection, rinse inside and outside of equipment with distilled water. Wipe with Kimwipes or paper towels. If rinsing not possible (i.e., hiking site), rinse thoroughly with water at next site.