-----Original Message-----
From: Jercinovic, Devon [mailto:djercinovic@eaest.com]
Sent: Saturday, December 3, 2016 11:19 AM
To: Agnew, Diane, NMENV <Diane.Agnew@state.nm.us>; BODOUR, ADRIA A CIV USAF HAF AFCEC/CZRX <adria.bodour.1@us.af.mil>
Cc: Morse, Earl <emorse@eaest.com>; Marley, Robert <rmarley@eaest.com>; Amy Sanchez <Amy.E.Sanchez@usace.army.mil>; Salazar, Carlos F CIV USARMY CESPA (US) <Carlos.F.Salazar@usace.army.mil>; Simpler, Trent W CIV USARMY CESPA (US) <Trent.Simpler@usace.army.mil>; Phaneuf, Mark J SPA (Mark.J.Phaneuf@usace.army.mil) <Mark.J.Phaneuf@usace.army.mil>; Linda Dreeland <Linda.Dreeland@usace.army.mil>; Julie McNeill <jmcneill@portageinc.com>; Kieling, John, NMENV <john.kieling@state.nm.us>; McQuillan, Dennis, NMENV <dennis.mcquillan@state.nm.us>
Subject: RE: KAFB-106239 Downhole Geophysical Logging Information

All,

Attached is the factory calibration EA requested for the two downhole tools (2PEA-1000 and 2PGA-1000) that will be utilized for open borehole logging at 106239..

Information has already been provided on the 4RSP calibration box used to verify calibration of the logging tools in the field.

As mentioned before, all of the information will also be compiled into the Work Plan (revision 2) currently in progress.

Thank you, Devon

Devon E. Jercinovic, PG, PMP
EA Engineering, Science, and Technology, Inc., PBC Program Manager II
320 Gold Ave. SW, Suite 1300
Albuquerque, NM 87102
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-----Original Message-----
From: Agnew, Diane, NMENV [mailto:Diane.Agnew@state.nm.us]
Sent: Friday, December 02, 2016 2:30 PM
To: BODOUR, ADRIA A CIV USAF HAF AFCEC/CZRX <adria.bodour.1@us.af.mil>
Cc: Morse, Earl <emorse@eaest.com>; Marley, Robert <rmarley@eaest.com>; Jercinovic, Devon <djercinovic@eaest.com>; Amy Sanchez <Amy.E.Sanchez@usace.army.mil>; Salazar, Carlos F CIV USARMY CESPA (US) <Carlos.F.Salazar@usace.army.mil>; Simpler, Trent W CIV USARMY CESPA (US) <Trent.Simpler@usace.army.mil>; Phaneuf, Mark J SPA (Mark.J.Phaneuf@usace.army.mil) <Mark.J.Phaneuf@usace.army.mil>; Linda Dreeland <Linda.Dreeland@usace.army.mil>; Julie McNeill

<jmcneill@portageinc.com>; Kieling, John, NMENV <john.kieling@state.nm.us>; McQuillan, Dennis, NMENV <dennis.mcquillan@state.nm.us>
Subject: RE: KAFB-106239 Downhole Geophysical Logging Information

Dear Devon,

I have received and reviewed your reply to my email dated November 29, 2016. The additional detail provided in the two attachments, along with the in-line comment responses in the body of your email, adequately address the requirements of Condition 2 in NMED's November 16, 2016 letter approving with conditions the Work Plan for Bulk Fuels Facility Expansion of the Dissolved-Phase Plume Groundwater Treatment System Design Revision 1.

Thank you,

Diane

Diane Agnew
New Mexico Environment Department
(505) 222-9555 (Direct)
(505) 660-3809 (Mobile)

-----Original Message-----
From: BODOUR, ADRIA A CIV USAF HAF AFCEC/CZRX [mailto:adria.bodour.1@us.af.mil]
Sent: Friday, December 2, 2016 11:40 AM
To: Agnew, Diane, NMENV <Diane.Agnew@state.nm.us>
Cc: Morse, Earl <emorse@eaest.com>; Marley, Robert <rmarley@eaest.com>; Jercinovic, Devon <djercinovic@eaest.com>; Amy Sanchez <Amy.E.Sanchez@usace.army.mil>; Salazar, Carlos F CIV USARMY CESPA (US) <Carlos.F.Salazar@usace.army.mil>; Simpler, Trent W CIV USARMY CESPA (US) <Trent.Simpler@usace.army.mil>; Phaneuf, Mark J SPA (Mark.J.Phaneuf@usace.army.mil) <Mark.J.Phaneuf@usace.army.mil>; Linda Dreeland <Linda.Dreeland@usace.army.mil>; Julie McNeill <jmcneill@portageinc.com>
Subject: RE: KAFB-106239 Downhole Geophysical Logging Information

Hi Diane,

Thanks for letting me know that you didn't get this message. Please see below and attached about the geophysicals on extraction well KAFB-106239.

Cheers, Adria

-----Original Message-----
From: Jercinovic, Devon [mailto:djercinovic@eaest.com]
Sent: Thursday, December 01, 2016 5:07 PM
To: Amy Sanchez <Amy.E.Sanchez@usace.army.mil>; Salazar, Carlos F CIV USARMY CESPA (US) <Carlos.F.Salazar@usace.army.mil>; Simpler, Trent W CIV USARMY CESPA (US) <Trent.Simpler@usace.army.mil>; Phaneuf, Mark J SPA

(Mark.J.Phaneuf@usace.army.mil) <Mark.J.Phaneuf@usace.army.mil>; Linda Dreeland <Linda.Dreeland@usace.army.mil>; BODOUR, ADRIA A CIV USAF HAF AFCEC/CZRX <adria.bodour.1@us.af.mil>; Julie McNeill <jmcneill@portageinc.com>
Cc: Morse, Earl <emorse@eaest.com>; Marley, Robert <rmarley@eaest.com>
Subject: FW: KAFB-106239 Downhole Geophysical Logging Information
Importance: High

Diane, the USACE has asked me to forward responses (in blue below) to your comments received Tuesday. We have provided additional information in responses and provided two attachments for your review.

We have also requested documentation from the manufacturer on the unit calibration, but may not receive until tomorrow. As we are scheduled to log the hole either late Saturday or Sunday.I did not want to hold up other responses while we wait.

Please let us know what additional information you may require. When we get resolution on responses, all information provided via email will be incorporated into the R2 Work Plan as requested.

Thank you, Devon

Devon E. Jercinovic, PG, PMP

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From: Agnew, Diane, NMENV [mailto:Diane.Agnew@state.nm.us]
Sent: Tuesday, November 29, 2016 2:17 PM
To: Jercinovic, Devon <djercinovic@eaest.com>
Cc: Simpler, Trent (Trent.Simpler@usace.army.mil) <Trent.Simpler@usace.army.mil>; Phaneuf, Mark J SPA
(Mark.J.Phaneuf@usace.army.mil) <Mark.J.Phaneuf@usace.army.mil>; Amy Sanchez <Amy.E.Sanchez@usace.army.mil>; Salazar, Carlos F SPA <Carlos.F.Salazar@usace.army.mil>; Linda Dreeland <Linda.Dreeland@usace.army.mil>; adria.bodour.1@us.af.mil; Julie McNeill <jmcneill@portageinc.com>; Morse, Earl <emorse@eaest.com>; Marley, Robert <rmarley@eaest.com>
Subject: RE: KAFB-106239 Downhole Geophysical Logging Information

Hello Devon,

I have reviewed your email along with the attached memo from the EA contracted geophysical logging company. This information was sent to respond to Condition 2 in NMED's November 16, 2016 letter approving the Work Plan for Bulk Fuels Facility Expansion of the Dissolved-Phase Plume Groundwater Treatment System Design Revision 1. Unfortunately, the information provided does not adequately address the requirements of Condition 2 for the following reasons:

* There is no information nor detail on calibration methods to be used, either in the shop or in the field, to demonstrate that the instrumentation is calibrated and operating properly. It is not clear how the proposed "MIS Model 4RSP-1000" compares to the instrumentation that will actually be used for logging, what input/output will be used to verify instrument calibration, or what actions will be taken if the logging tool(s) fail calibration.

Agreed and providing addition information: The MIS Model 4RSP-1000 will be used on this project and is factory calibrated. The equipment includes software to perform a field calibration verification as described on the attached field form. If the unit fails the calibration, the backup tool string will be utilized and confirmed with for field calibration before use.

* EA appears to be relying on paragraph 3 of the memo to respond to the request for information on equipment decontamination. The memo proposes a procedure for decontamination and it is clear GeoCam Inc. requires input and confirmation from EA. Additionally, the memo does not describe how the investigation derived waste (IDW) liquid from the equipment decontamination will be managed upon generation.

Agreed and providing additional information: Decontamination prior to deployment down the borehole will be performed in a polyethylene trough placed on a plastic liner at the drilling site. The GCI field operator will spool 580-Ft of wireline onto pad in a figure eight pattern. The wireline will be laid into the trough and soaked in an AlconoxTM solution. After 20 minutes, the wireline will be spooled back onto the winch while being cleaned by a wiper wrapped around the cable. The downhole tools and sheave will be cleaned in the same solution contained in the trough. The same procedure will be performed following the logging and prior to demobilization from the site. All IDW water will be contained in the trough until decontamination is completed and subsequently transferred to a storage container suitable for storage in the EA IDW yard pending analytical results.

* EA's geophysical subcontractor is proposing both downhole and up-hole passes with the logging instrumentation for quality control. There is no discussion of what metrics will be followed once the logs have been submitted "for review by EA Engineering to ensure repeatability." The language in the email below implies the review will occur during post-processing when it would be too late to repeat logging of an interval, if needed, as presumably the well construction will be complete by then.

Agreed and providing clarification: The repeatability evaluation is performed in the field before the logging tool is removed from the borehole.
The operator will perform the downhole pass and the uphole pass and the log will be processed for downhole and uphole runs. The logs will be laid either next to, or on top of one another in the field to visually confirm repeatability. There is no automated (statistical) comparison of the logs for repeatability. An example sample log comparing the downhole and uphole passes is attached. Once the logging operator confirms the validity of the data, he will finalize, print and provide to EA staff onsite one copy of the repeatability report for final approval. Once approved, the logging truck will rig down and the final geophysical log will be emailed to EA.

* The GeoCam Inc. statement of qualifications demonstrates that this is a subcontractor with the capability to conduct the proposed logging but the statement "This is one of 2 firms we routinely utilize on EPA projects for similar open borehole logging" is insufficient for demonstrating how calibration and data quality will be measured and verified.

Agreed. Additional information on calibration is provided in Item 1 and information on repeatability (data quality) in Item 3.

*   It is clear from the memo that EA's subcontractor is relying on EA
oversight of the logging to verify calibration and quality control metrics.
Bullet 2 in the email below implies that the logs will not be reviewed until after processing. Not only is this inconsistent with the memo from GeoCam Inc. it does not address documentation of field oversight and calibration.

Agreed with clarification: The field equipment is factory calibrated and field checked with manufacturer's internal software linked to the acquisition tool. The operator fills out the Calibration Verification Form
(attached) and EA is responsible for approving the record indicating that the verification was performed. EA has requested that the manufacturer provide the most recent calibration certificate or similar evidence of calibration.

NMED understands that the intention of the geophysical logging at 106239 is meant to supplement the lithology logs from the mud rotary drilling of the borehole. Additionally, this log will likely be incorporated into future sequence stratigraphy to verify and enhance our model for the subsurface geology in the plume core. For those reasons, it is crucial that the geophysical data collected from the open borehole of 106239 be of sufficient quality to be used for those purposes.

NMED cannot approve the information as provided. Please provide the additional information identified above in order to meet the requirements of Condition 2 of NMED's November 16th letter. Please let me know if you have any questions or would like to schedule a meeting to discuss further.

Diane Agnew

New Mexico Environment Department

(505) 222-9555 (Direct)

(505) 660-3809 (Mobile)

From: Jercinovic, Devon [mailto:djercinovic@eaest.com]
Sent: Wednesday, November 23, 2016 1:00 PM

To: Agnew, Diane, NMENV <Diane.Agnew@state.nm.us <mailto:Diane.Agnew@state.nm.us> >
Cc: Simpler, Trent (Trent.Simpler@usace.army.mil <mailto:Trent.Simpler@usace.army.mil>) <Trent.Simpler@usace.army.mil <mailto:Trent.Simpler@usace.army.mil> >; Phaneuf, Mark J SPA (Mark.J.Phaneuf@usace.army.mil <mailto:Mark.J.Phaneuf@usace.army.mil>) <Mark.J.Phaneuf@usace.army.mil <mailto:Mark.J.Phaneuf@usace.army.mil> >; Amy Sanchez <Amy.E.Sanchez@usace.army.mil <mailto:Amy.E.Sanchez@usace.army.mil> >; Salazar, Carlos F SPA <Carlos.F.Salazar@usace.army.mil <mailto:Carlos.F.Salazar@usace.army.mil> >; Linda Dreeland <Linda.Dreeland@usace.army.mil <mailto:Linda.Dreeland@usace.army.mil> >; adria.bodour.1@us.af.mil <mailto:adria.bodour.1@us.af.mil> ; Julie McNeill <jmcneill@portageinc.com <mailto:jmcneill@portageinc.com> >; Morse, Earl <emorse@eaest.com <mailto:emorse@eaest.com> >; Marley, Robert <rmarley@eaest.com <mailto:rmarley@eaest.com> >
Subject: KAFB-106239 Downhole Geophysical Logging Information

Diane,

Per Condition 2 of the approval for the Revision 1 of the Work Plan, NMED requested that additional information be included in the work plan regarding the downhole geophysical logging of KAFB-106239. We will include the required information in the next revision of the work plan in progress now. Additionally, we have attached the information we received today to this email for your review in advance, as the geophysical logging is scheduled for Thursday, December 1, 2017 (assuming we maintain the current drilling footage rate).

* EA proposed downhole geophysical logging to supplement the lithologic information due to limitations of mud logging.

* There are no field forms involved, the entire process is automated with only reports being provided after processing, typically electronic, but we can request hard copy as well.

* The information is brief but does describe procedure, calibration, and decontamination required.

* This is one of 2 firms we use routinely utilize on EPA projects for similar open borehole logging.

Please let me know if you require additional information.

Thank you, Devon

Devon E. Jercinovic, PG, PMP

EA Engineering, Science, and Technology, Inc., PBC

Program Manager II

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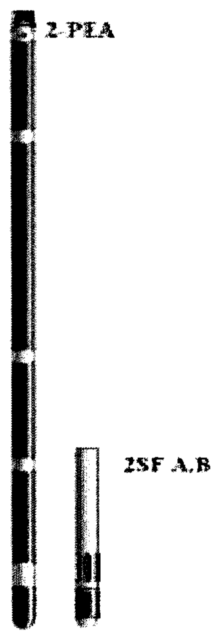
2PEA-1000 & 2PEA-1000/F PolyElectric Probes

Overview

The 2PEA-1000 PolyElectric probe and the 2PGA-1000 PolyGamma probe combine to make a multiparameter probe. The totally digital probe combination measures 8, 16, 32, and 64inch (0.2, 0.4, 0.8, 1.6 meter) normal resistivity, single point resistance, self potential, and natural gamma. When the 2PEA-1000/F PolyElectric probe is used with the 2PGA-1000 PolyGamma probe, fluid resistivity and fluid temperature are also measured. These probe combinations operate with the MGX II series portable digital logger or the Series V digital logger. The normal resistivity measurements, single point resistance, and self potential measurements are designed for surveying open (uncased) fluid filled boreholes.The 8" (20 cm) normal resistivity spaced response, and the single point resistance, are similar to a ***focused*** resistivity log as they define thin beds.

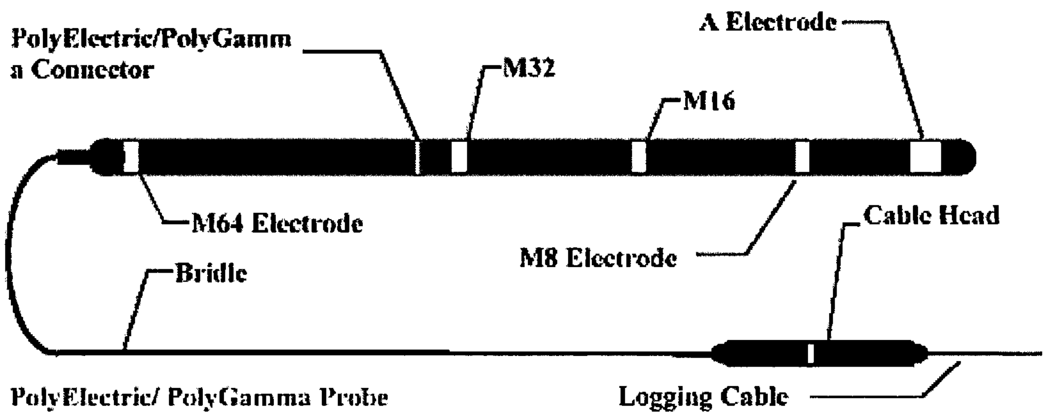


Connectors and Layout

The function of each electrode is listed below, starting with the bottom electrode and proceeding towards the top of the probe. For more information on the function of these electrodes, consult the Theory of Operation section of this document. Connectors for the tool are as follows. The PolyGamma probe top described below is a standard single conductor probe top. Other variations of probe tops and wiring can be ordered from the factory. The connector between the PolyElectric and PolyGamma probes is a ring style connector. The numbering of the rings begins from the inner most ring (ring 1) and proceeds to the outer ring (ring 6).

PolyElectric Bridle

The bridle must be connected between the cable head and the top of the PolyElectric -PolyGamma Probe combination as illustrated. The bridle provides electrical isolation from the logging cable armor for normal resistivity logging. The 2PEA-1000/F has fluid temperature and fluid resistivity sensors located on the bottom of the probe. Please call for more information.



Electrodes:

Electrode	***Functional Name***
Bottom electrode	'A' electrode or Current Electrode, and 'R': single point resistance electrode
Second from bottom	'M8' electrode: 8inch normal resistivity measure electrode
Third from bottom	'M16' electrode: 16inch normal resistivity measure electrode
Fourth from bottom	'M32' electrode: 32inch normal resistivity measure electrode
Top electrode	'M64' electrode: 64inch normal resistivity measure electrode; and 'SP': self potential electrode
Cable Armor	'N' electrode: measure reference electrode
Surface Electrode	'B' electrode: current return electrode (Mudplug)

PolyGamma Probe Top Connector:

Pin	**Signal**	**Origin**
Probe top housing	Probe power ground	Armor
Center pin in probe top	Probe power positive	Center conductor

PolyElectric Probe Top and PolyGamma Probe Bottom Connectors:

Ring	**Signal**	**Origin**
1	SP, R or 64" Normal	Electrode below probe top
2	Center conductor	Center pin on probe top
3	Pulse return	Returns Gamma pulse to center conductor
4	Pulse	Output from Gamma circuit
5	Armor	Armor of probe top
6	P. S. Control	PolyElectric Probe

Theory of Operation

Normal Resistivity Measurements

The normal resistivity and single point resistance measurements are accomplished by measuring the amount of survey current that the logger and probe produce between the 'A' electrode and the mudplug (or armor during the 'normal resistivity using armor' operational mode). A voltage is measured for each resistance or resistivity channel. All voltage measurements are made with respect to the armor. The quotient between the voltage and current for each channel is used to calculate the reported value.

For the normal resistivity measurements, Ohm's law can be written

$$\frac{V}{I} = R = \frac{\rho \cdot l}{A} \quad \text{or} \quad \rho = \frac{A \cdot V}{l \cdot I} \quad \text{or} \quad \rho = G \cdot \frac{V}{I}$$

where r is resistivity (ohm-meters), R is resistance (ohms), l is the distance the survey current travels (meters), A is the cross sectional area that the current travels through (meters 2), V is voltage (volts), and I is current (amps). The quantity (A/l) is called the geometric factor G (meters). The geometric factor is approximately 12.5 times the 'AM' spacing, in meters. The survey current leaves the 'A' electrode in all directions, diverging as it does so. In a homogenous medium, concentric spheres centered around the 'A' electrode, and with radius 'AM', delineate the volume of investigation for the normal resistivity measurement. 'AM' refers to the distance between the 'A' and 'M' electrodes. The volume of investigation (in a homogenous medium) for the 8 inch normal resistivity measurement is a sphere with an 8 inch radius; the volume of investigation for the 64 inch normal resistivity measurement is a sphere with a 64 inch radius. These spheres are called equipotential surfaces. The voltage is measured between an equipotential surface (sphere surrounding the volume of investigation) and the reference (armor). This voltage is divided by the measured value of the survey current, and the result multiplied by the geometric factor to obtain resistivity.

The normal resistivity circuits report the average resistivity of the material in the volume of investigation and the volume of investigation may vary for heterogeneous mediums. Therefore, the measured resistivity is called the apparent resistivity. Many computer programs are available to convert apparent resistivity to true resistivity. These programs usually require a geologic model and the apparent resistivity data to calculate true resistivity. Some programs calculate synthetic logs such as invasion profile, synthetic focused resistivity logs, and porosity logs.

Single Point Resistance Measurement

Refer to Ohm's law from above for the explanation of the single point resistance measurement. As the survey current leaves the 'A' electrode, the current diverges, and the cross sectional area A through which it travels becomes very large compared to l. The quantity (l/A) in the first equation approaches zero as the distance from the 'A' electrode increases. Therefore most of the measured resistance is a result of the survey current near the 'A' electrode and also at the mudplug where the current converges. The resistance indicated by the single point resistance circuit, is the sum if the resistance near the mudplug, and the resistance near the 'A' electrode. Since the resistance near the mudplug does not change, any excursion indicated in the single point resistance log is a result of the change in resistance near the 'A' electrode.

When the PolyElectric - PolyGamma probe combination is operated in 'R-SP' mode, the current generator and all measure circuits are contained in the logger at the surface. The mudplug is used as the current return ('B') and reference ('N') electrodes. The top electrode on the probe functions as the current ('A') and measure ('M') electrodes. In this mode, the top electrode on the probe is connected to the cable line center conductor. Since the probe requires no power, this mode of operation is sometimes referred to as the 'passive' mode.

SP measurement

The SP (self potential) circuits measure the DC (direct current) voltage between the top electrode on the probe and the armor. The resistivity circuits utilize an AC (alternating current) survey current so that the SP circuits are not affected. When the PolyElectric - PolyGamma probe combination is operated in 'R-SP' mode, the current generator and all measure circuits are contained in the logger at the surface. The mudplug is used as the current return ('B') and reference ('N') electrodes. The top electrode on the probe functions as the current ('A') and measure ('M') electrodes. In this mode, the top electrode on the probe is connected to the cable line center conductor. Since the probe requires no power, this mode of operation is sometimes referred to as the 'passive' mode. This mode may give better SP log results near the water level in the borehole.

Fluid Resistivity Measurement

The fluid resistivity measurement generates a survey current between small current ('A' and 'B') electrodes located inside the survey tube. Small measure ('M' and 'N') electrodes, located between the current electrodes, are used to measure the potential difference generated in the fluid by the current electrodes. The process is identical to that of the normal resistivity measurements, except that the volume of investigation is entirely contained in the survey tube.

Fluid Temperature Measurement

The fluid temperature measurement uses a solid-state temperature-sensing device. The electrical output of this device is proportional to the temperature of the fluid. The thermal mass of the temperature sensor is kept as low as practical so that the time required for the sensor to respond to a change in temperature is minimal.

Derived Measurements

Measurements from the PolyElectric probe can be combined to make derived quantities. Lateral resistivity logs and synthetic LL7 logs can be obtained from normal resistivity logs. Mud invasion profiles can be determined with multiple spaced resistivity logs. These profiles illustrate rock permeability. Mud resistivity can be calculated from the fluid resistivity. Mud resistivity can then be used to calculate porosity. Many of these calculated measurements can be made in real time while logging the data. For more information about these and other derived measurements, consult Terraplus.

Length 2PEA-1000	74 inches (188 cm)
Length 2PEA-1000/F	87 inches (221 cm)
Diameter	1.55 inches (40 mm)
Weight 2PEA-1000	16 lbs. (7.3 Kg)
Weight 2PEA-1000/F	22 lbs. (10 Kg)
Operating Temperature	0 to 70 degrees C
Storage Temperature	-40 to 125 degrees C
Maximum Pressure	2000 psi (13.8 Pa)
Low Range Normal Resistivity Measurement	0 to 250 ohm-meters
High Range Normal Resistivity Measurement	0 to 2500 ohm-meters
Normal Resistivity Accuracy	1 %
Normal Resistivity Resolution	0.02 %
Low Range Single Point Resistance Measurement	0 to 500 ohms
High Range Single Point Resistance Measurement	0 to 5000 ohms
Single Point Resistance Accuracy	1 %
Single Point Resistance Resolution	0.02 %
Self Potential Measurement Range	-1.5 to 1.5 VDC
Self Potential Measurement Accuracy	1 %
Self Potential Measurement Resolution	0.04 %
Fluid Resistivity Measurement Range	0-100 ohm-meters
Fluid Resistivity Accuracy	1 %
Fluid Resistivity Resolution	0.02 %
Fluid Temperature Measurement Range	-20 to 70 degrees C
Fluid Temperature Accuracy	0.5 %
Fluid Temperature Resolution	0.05 %

2PGA-1000 (GAMMA-RAY SCINTILLOMETER SP/SPR PROBE)

DESCRIPTION

The 2PGA-1000 Poly-Gamma-Ray Scintillometer is a combination probe providing natural gamma, spontaneous potential (SP), and single point resistance (SPR), measurements. The operator must make these measurements in two separate runs. i.e. the gamma is made in one run and the SP, and SPR are made together on the second run. The Poly-Gamma probe is also the base foundation for the Poly series of probes. The Poly-Gamma when connected to a Poly resistivity probe is capable of making multiple resistivity measurements along with the, above-mentioned, Poly Gamma measurements, all in one run.
The Poly-Gamma probe can be operated as a stand-alone probe or connected to the Poly-Resistivity section either with the MGX II or Matrix systems.

The SP and SPR measurements must be run in open (uncased), fluid filled, boreholes. The natural gamma may be run in any borehole conditions within specifications.

The 2PGA-1000 Gamma tool is also used in uranium exploration as a reconnaissance/evaluation tool, which reads elevated scintillometer counts within zones of radioactive mineralization (<2% equivalent $U_3 0_8$). When calibrated, the equivalent concentration of $U_3 0_8$ can be determined from the raw gamma counts.

SPECIFICATIONS

Length	79.5 cm (31.3")
Diameter	41 mm (1.63")
Weight	3.2 Kg (7 lbs)
Pressure Rating	13,790 kPa (2000 PSI)
Operating Temperature	-10 to + 70°C
Sensor (Detector)	Na(tl) scintillation 22.2 mm dia. x 76.2 mm long (0.875 x 3")
Measurement Range	0 - 100,000 CPS gamma ± 1,500 mV SP 1 - 500 Ohms SPR
Accuracy	± 1% of full scale
Resolution	0.02% of full scale

Terraplus Inc.
52 West Beaver Cr. Rd. #12, Richmond Hill, ON. Canada L4B 1L9
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MOUNT SOPRIS INSTRUMENTS
4975 East 41st Avenue
Denver, Colorado 80216
(303) 279-3211
tech.support@mountsopris.com

CERTIFICATE OF CALIBRATION

Product Type: 2PEA-1000
Serial Number: 5531
Calibration Date: 8-14-12

Product Type: 2PGA-1000
Serial Number: 3720
Calibration Date: 7-18-06

Customer: Geo Cam Inc.
ASTM Standard (if applicable): N/A

This document is to certify that the product listed above has been built and tested to conform to the calibration standards set forth by Mount Sopris Instruments and ASTM Standards (where applicable). If there are any questions regarding the calibration of this product please contact Mount Sopris Instruments.

Steve Phung
Production Supervisor