MEASUREMENT TECHNOLOGIES

FOURTH QUARTER QUALITY ASSURANCE REPORT
FOR
TRUE GEOTHERMAL ENERGY COMPANY MONITORING PROGRAM
KILAUEA MIDDLE EAST RIFT ZONE, ISLAND OF HAWAII

Submitted to:

Ms. Renee Taylor

True Geothermal Energy Company

Prepared by:

Measurement Technologies

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EXECUTIVE SUMMARY

An executive summary of the air quality audit results are as follows:

- The aerometric analyzer audit results were satisfactory. The sulfur dioxide (SO_2) and hydrogen sulfide (H_2S) analyzers meet the slope, intercept and correlation coefficient criteria. Both analyzers exhibited excellent slope results.

- The meteorological equipment audit results were satisfactory, with on exception. The wind speed sensor at the air quality site 1 was damaged by the auditor during the audit and could not be audited.

- The particulate sampler audit results were satisfactory.

- The operational procedures followed at the monitoring sites are consistent with EPA guidelines, and all instrument/analyzer calibrations were conducted in a proper and timely manner. All documentation was found to be complete, concise, and up to date.

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1.0 Introduction

True Geothermal Energy Company (True) contracted Measurement Technologies to assemble and operate two ambient air/meteorological monitoring stations for the True/Mid-Pacific Development Project (True/Mid). The monitoring program is used in support of the incremental exploration and development of the Kilauea Middle East Rift Zone Geothermal Resources Subzone (GRS), Puna District Island of Hawaii.

As part of the monitoring program, Measurement contracted to provide four quality assurance audits (one each monitoring quarter) for each monitoring station during the operational year. The quality assurance audits will consist of verifying the accuracy of each measured air quality/meteorological parameter, with independent standards or by using side-by-side comparisons with calibrated collocated sensors.

This document represents the results and methodology used to conduct the fourth quarter quality assurance audit. The audit was performed by Mr. Joel Cordes of Measurement Technologies, on December 10 and 11, 1990. In addition to this introduction, Section 2.0 presents a description of the monitoring network. A description of the field audit procedures is contained in Section 3.0. Section 4.0 documents the certification and validation of the equipment and standards used for the audit. Section 5.0 presents the results of the audit. Appendix A contains copies of the audit data sheets. Station inspection checklists are presented in Appendix B.

Present for the audit was the field operator, Mr. Steve Avery.

2.0 Monitoring Network Description

The monitoring network consists of two monitoring stations located approximately 7 miles west of Pahoa, Hawaii. The primary monitoring site is designated as "Site 1 Air Quality/Met." This site is located in the Kaohe Homesteads near the end of Kaohe Homesteads Road in a large 5 acre residential home lot. The second monitoring site is designated as "Site 2 MET". This site is located at the Drilling site D-1. The monitoring stations and parameters monitored are identified in Table 2-1.

Table 2-1. Parameters Monitored

PARAMETER	SITE 1	SITE 2
SULFUR DIOXIDE (SO_2)	X	
HYDROGEN SULFIDE (H_2S)	X	8 PLS
WIND DIRECTION	X	X
WIND SPEED	X	X
VERTICAL WIND SPEED		X
SIGMA THETA	X	X
SIGMA W		X
TEMPERATURE	X	
PRECIPITATION	X	
RAIN WATER (ANIONS & DISSOLVED METALS)	3 PLS	
METALS (ATMOSPHERIC PARTICULATE)	X	
TOTAL SUSPENDED PARTICULATES (TSP)	X	
INHALEABLE PARTICULATES (PM-10)	X	
RADON		X

2.1 Site 1 Air Quality/Met

The monitoring station is located 800 feet north of a residence, in an open field approximately 400 by 600 feet in area. A portable shelter houses the aerometric analyzers and data acquisition equipment. The meteorological equipment is mounted on a 10 meter retractable tower attached to the south side of the shelter. A heated stainless steel intake manifold for the SO_2 and H_2S analyzers extends one meter above the roof. The integrated sampler and particulate samplers (PM-10 and TSP) are located on a wooden platform about 30 feet west of the monitoring shelter. The inlets to the particulate samplers are 1 meter above the ground. The inlet to the integrated sampler is 1.5 meters above the ground. The air quality station obtains electrical power from one of two propane generators housed in a small building about 150 feet west of the monitoring station.

The three plastic rain gages for collection of rainwater samples are located in the Kaohe Homestead area on residential properties along Kaohe Homesteads Road. The first rain gage is located next to the particulate platform at the monitoring station. The second gage is located at a residential lot about 1,200 feet northeast of the station. The third rain gage is located at a large commercial horticulture farm about 1,200 feet to the northeast of the second rain gage site. The tipping bucket precipitation gage for continuous collection of real time data is located on the monitoring shelter roof.

Sulfur dioxide and hydrogen sulfide is measured using Meloy Laboratories flame photometric analyzers. Wind speed and wind direction are monitored with the Met One model 014 three-cup anemometer and the Met One model 024 light weight air foil wind direction sensor. Temperature is measured with a Met One model 060 temperature sensor mounted in a Met One naturally aspirated

radiation shield. Precipitation is measured with a Weathertronics 6010 tipping bucket rain gage.

Data acquisition is performed by an Odessa Engineering DSM 3260 air quality/meteorological data acquisition-system (DSM). The DSM retrieves, processes, and stores the collected data on a solid state data cartridge. The cartridge is backed up by a printed hardcopy using a Star NX1000 dot matrix-printer. The data stored on the cartridge is retrieved by removing the cartridge and forwarding it to Measurement Technologies' office in San Luis Obispo, California. The data is stored and processed on an IBM-AT compatible computer system equipped with a data management software package.

The air quality station is equipped with a Radian RAD III gas dilution calibrator which provides the precise gas concentrations to perform daily Level 2 checks, multipoint calibrations, Level 1 and precision checks on the sulfur dioxide and hydrogen sulfide analyzers.

2.2 Site 2 MET

The meteorological station is located at Drilling site D-1. Meteorological sensors are located atop a 10 meter retractable tower, located at the edge of the large water storage pond. A NEMA 4 enclosure is mounted at the base of the tower to house an Odessa DSM 3260/MET system, charger and battery. A solar panel is mounted on the tower to supply power for the DSM, meteorological sensors and charge the battery.

Eight passive hydrogen sulfide dosimeter badges are placed on fence posts located along the perimeter of the drilling site. These badges are located to the N, NE, E, SE, S, SW, W and NW perimeter of the drilling area. A Radon detector is located south of the drilling platform.

Wind speed and wind direction are monitored with a Weathermeasure model W203 three-cup anemometer, and a Weathermeasure model W204 air foil wind direction sensor. Vertical wind speed is monitored with a R. M. Young Gill propeller anemometer.

The data acquisition is handled by an Odessa Engineering DSM 3260 meteorological data acquisition system (DSM). The DSM retrieves, processes, and stores the data on a solid state data cartridge. The data stored on the cartridge is retrieved and stored identically to site 1 (Air Quality / Met) data. A portable TI terminal/printer is used to retrieve real time data and to print out back-up daily summaries.

3.0. Performance Audit Procedures and Equipment Description

3.1. Audit Procedures

3.1.1. Sulfur Dioxide, Hydrogen Sulfide

The sulfur dioxide and hydrogen sulfide analyzers were audited by producing three upscale gas concentrations plus zero by diluting National Bureau of Standards (NBS) traceable standard gases with zero air. This was done using an audit calibrator equipped with mass flow controllers.

Audit concentrations were introduced into each analyzer upstream of the sample filters and lines (through as much of the sample train as practical). Each analyzer was allowed to sample each audit concentration until a stable response was obtained. The analyzer responses were observed by keying the data acquisition system to provide 5-minute averages. In addition the efficiency of the SO_x scrubber on the H_2S analyzer was tested by introducing an upscale SO_2 concentration to the analyzer, and noting its response. The gas ranges used to conduct the audits are presented in Table 3-1.

Table 3-1. Audit Gas Ranges

Range ppb
0
30 - 80
150 - 200
350 - 450

3.1.2 Wind Direction

A transit was used to determine the accuracy of the orientation of the wind vane. This was done by measuring the azimuth of the crossarm. A correction of + 11^{o} was made for the magnetic declination. The vane accuracy was then tested by holding the wind vane parallel to the crossarm and noting the data acqusition response. The linearity of the sensor was checked by holding the wind vane at the four cardinal points.

3.1.3 Wind Speed

The wind speed sensor at both sites were tested by connecting 300 and 600 revolution per minute (RPM) continuous speed synchronous motors to the sensor shaft. The manufacturer's algorithm was used to convert RPM to miles per hour (MPH) and the results were compared to the data acquisition system output.

3.1.4 Temperature

The temperature sensor was checked by collocation with an NBS-traceable thermometer. The thermometer reading was compared to the temperature output on the data acqusition system.

3.1.5 Precipitation

The precipitation gauge was audited by adding a known volume of water the inlet funnel of the gauge. The gauge inlet is 8" in diameter. According to the manufacturer's specifications, if 80 cc of water is slowly added to the gauge, the precipitation gauges tipping mechanism should tip 10 times (1 tip per 8 cc of water. This should result in the data acquistion system recording 0.10" of precipitation.

3.1.6 Particulate Sampler

The samplers were audited using the procedures described in "The Quality Assurance Handbook for Air Pollution Measurement Systems", Section 2.2.8.1, January 1983, and Section 2.0.12.11, June 1984. The procedure consists of placing an audit orifice on each sampler inlet with a sample filter in place. The sampler is then turned on and allowed to warm up for about five minutes. After warm up, the following data are recorded:

- Orifice pressure drop in inches of water;
- Ambient temperature and barometric pressure;
- Indicated station sampler flow as read by the sampler chart recorder.

The audit flow is then calculated using the orifice calibration. The TSP and PM-10 sampler flows are calculated in standard conditions. The values are compared to their respective station flows as a percent difference. In addition the PM-10 flow under normal sampling conditions is evaluated with respect to its deviation in percent difference from the ideal design flow of the sampler (40 ACFM).

3.1.7 Integrated Sampler

The integrated sampler is audited by measuring the flows at several points with a certified mass flow meter. The measured flows are then compared with the indicated station flows per the calibration curve for the sampler, and the results are presented in percent difference.

3.1.8 Station Evaluation

A checklist was completed as part of the systems audit at each monitoring station. Copies of the checklists are presented in Appendix B.

3.2 Audit Equipment Description

3.2.1 Audit Calibrator

The audit calibrator used to conduct the audits of the air quality analyzers was a Measurement Technologies Model 2000 mass flow controlled dynamic gas dilution calibrator. The calibrator contained a 10,000 sccm dilution mass flow controller and a 50 sccm source gas mass flow controller. The calibrator produced precise concentrations by diluting high level gas standards with zero air (which was produced by a clean air system which removed all concerned compounds from the dilution and zero air). The clean air system consisted of a permeation dryer to dry the air and packed activated charcoal and Purafil columns to remove any ozone, sulfur dioxide and hydrogen sulfide present in the air.

The audit calibrator flow rates were measured and corrected to standard conditions prior to the audit and quarterly using an NBS traceable Hastings bubble flowmeter. The auditor had available an NBS traceable bubblemeter to verify flows if there were any indications that an audit flow was incorrect.

3.2.2 Wind Speed Motors

Two Met One Inc. continuous speed synchronous motors were used to audit the wind speed sensors. One motor operated at 300 RPM and the other at 600 RPM. These motors are tested once a year for accuracy by the manufacturers.

3.2.3 Miscellaneous Audit Equipment

An NBS traceable thermometer was used for auditing the temperature sensor. The barometer used for the particulate sampler audits was verified by comparison with a National Weather Service barometer before the audit. A transit was used for

determining the orientation of the wind direction vane. A Sierra orifice kit was used to perform flow rate audits of the particulate samplers.

4.0 Audit Standards Verification

Where applicable each audit standard was verified or certified using the appropriate methods specified in the applicable EPA guidelines.

4.1 Gas Standards

Two gas standards were used for the audit. The cylinder containing sulfur dioxide (SO_2) was certified to be accurate within 2 percent using EPA Protocol No. 2 by the manufacturer (Scott-Marrin, Inc.). Protocol No. 2, requires a direct comparison between the audit gas and National Bureau of Standards (NBS) Standard Reference Material (SRM). This traceability protocol is contained in EPA-600/4-77-027a, Quality Assurance Handbook for Air Pollution Measurement Systems, Vol II, Section 2.0.7.

The cylinder containing hydrogen sulfide (H_2S) was blended and verified to be accurate within 2 percent of an NBS SRM. There is currently no EPA protocol for hydrogen sulfide gas.

4.2 Audit Calibrator

The audit calibrator was a Measurement Technologies Model 2000 mass flow controlled dynamic gas dilution calibrator. The calibrator was previously described in Section 3.2.1. Audit flow rates were measured before the audit using an NBS traceable Hastings bubble flowmeter.

4.3 Particulate Sampler Audit Equipment

A Sierra orifice was used for auditing the PM-10 and TSP samplers. The orifice is checked annually against an NBS traceable roots meter.

4.4 Meteorological Audit Equipment

An NBS traceable thermometer was used for auditing the temperature sensor. Synchronous motors used for auditing the windspeed sensors are tested for accuracy on an annual basis. The transit used for the wind vane calibration test is periodically checked by a transit and theodalite calibration company.

5.0 Audit Criteria and Results

5.1 Audit Criteria For Ambient Air Quality Analyzers

The EPA-recommended audit criteria for aerometric analyzers used in the measurement of criteria pollutants is presented in Table 5-1. These criteria are taken from EPA-600/4-77-027a, Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. II, May, 1977.

Table 5-1. Analyzer Audit Accuracy Specifications

Slope	
Excellent	$\leq \pm 5\%$ between analyzer response and audit concentration
Satisfactory	$\pm 6\%$ to $\pm 15\%$ between analyzer response and audit concentration
Unsatisfactory	$> \pm 15\%$ between analyzer response and audit concentration
Intercept	
Satisfactory	$\leq \pm 3\%$ of the analyzer range
Unsatisfactory	$\geq \pm 3\%$ of the analyzer range
Correlation Coefficient	
Satisfactory	0.9950 to 1.000
Unsatisfactory	< 0.9950

5.2 Audit Criteria For Meteorological Instruments

The EPA recommended audit criteria for meteorological instruments is presented in Table 5-2. These criteria are taken from EPA-600/4-82-060, Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. IV, Meteorological Measurements, February, 1983.

Table 5-2. Meteorological Audit Accuracy Specifications

Parameter	Tolerance
Wind speed[1]	±0.2m/s (< 5m/s) ±5% (> 5m/s)
Wind direction[2]	±2°
Temperature	±0.25°C
Precipitation	±0.01"

1 This criteria was adjusted to be consistent with the accuracy specifications for wind speed sensors in EPA-450/4-007, Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), May 1987.

2 This criteria is an accuracy criteria which only applies to the accuracy of the audit point where the sensor is aligned with the crossarm. The linearity criteria used by ABB Environmental is ± 3° which conforms with the accuracy specification for wind direction sensors in the PSD guidelines.

5.3 Audit Criteria For Particulate & Integrated Sampler

The EPA recommended audit criteria for particulate and integrated samplers is ± 7 % difference between the audit flow and actual flow rate. The PM-10 sampler is also audited for its operational flow's deviation from 40 ACFM. The acceptable accuracy is ± 10%.

5.4 Audit Results

Completed audit data sheets for each audit parameter are presented in Appendix A. All aerometric analyzers and meteorological equipment demonstrated satisfactory results. Completed station inspection checklists are presented in Appendix B.

5.4.1 Ambient Air Quality Analyzers

The SO_2 and the H_2S analyzers demonstrated satisfactory results to the audit tests.

5.4.2 Meteorological Equipment Audit Results

All meteorological sensors demonstrated satisfactory results to the audit tests, with the exception of the wind speed sensor at the air quality site 1. The reed switch on the wind speed sensor was damaged when the cups were being removed for the audit. A replacement sensor was unavailable at the site and was being sent from Measurement's office in San Luis Obispo, CA. As a result, the wind speed sensor at Site 1 could not be audited.

5.4.3 Particulate Samplers

The particulate samplers demonstrated satisfactory results to the audit tests.

APPENDIX A

H_2S AUDIT

DATE: December 10, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: J. Cordes

ANALYZER MFR: Meloy Labs CALIBRATOR MFR: Measurement Tech.

MODEL NUMBER: SA285E MODEL NUMBER: 2000

ANALYZER S/N: 7E033 CALIBRATOR S/N: 2000-103

AUDIT GAS CYL. NO: JJ22413 AUDIT GAS CONC: 50.7 PPM

H_2S AUDIT DATA

Gas Setting/ Flow(cc)	Dilution Setting/ Flow(cc)	H_2S Input (ppb)	H_2S Output (ppb)	Percent Difference
45/44.7	5/5149	436	445	2.1
20/20.4	5/5149	200	204	2.0
10/10.0	7/7096	71	76	7.0
--	--	0	6	--
Slope: 1.0076 Y-Intercept: 4.7 Corr.Coef: 1.0000				

79 ppb SO_2 injected through scrubber.
Analyzer response = ~~6~~ 0 ppb

SO_2 AUDIT

DATE: December 10, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: J. Cordes

ANALYZER MFR: Meloy Labs CALIBRATOR MFR: Measurement Tech.

MODEL NUMBER: SA285E MODEL NUMBER: 2000

ANALYZER S/N: 7E034 CALIBRATOR S/N: 2000-103

AUDIT GAS CYL. NO: JJ8945 AUDIT GAS CONC: 48.8 PPM

SO_2 AUDIT DATA

Gas Setting/ Flow(cc)	Dilution Setting/ Flow(cc)	SO_2 Input (ppb)	SO_2 Output (ppb)	Percent Difference
45/44.7	5/5149	420	437	4.0
20/20.4	5/5149	193	200	3.6
10/10.0	6/6190	79	84	6.3
--	--	0	7	--
Slope: 1.0265 Y-Intercept: 4.4 Corr.Coef: .9999				

71 ppb H_2S injected through scrubber.
Analyzer response = ~~6~~ 0 ppb

WIND DIRECTION AUDIT

DATE: December 10, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: J. Cordes

PARAMETER: Wind Direction SENSOR MFR: Met One

MODEL NUMBER: 024 S/N: G1260

WIND DIRECTION AUDIT DATA

Audit Point	DAS Output	Difference
360°	001°	1°
090°	090°	0°
180°	180°	0°
270°	271°	1°

NOTE: Crossarm Orientation = 0°
Data corrected for 11° WMD

WIND SPEED AUDIT

DATE: December 10, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: J. Cordes

PARAMETER: Wind Speed SENSOR MFR: Met One

MODEL NUMBER: 014 S/N: F1717

WIND SPEED AUDIT DATA

RPM	Audit Point	Das Output	Difference

NOTE: Unable to audit due to a ~~malfunctioning~~ damaged wind speed sensor.

TEMPERATURE AUDIT

DATE: December 10, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: J. Cordes

PARAMETER: Temperature SENSOR MFR: Met One

MODEL NUMBER: 060 S/N: None

TEMPERATURE AUDIT DATA

Audit Point	DAS Output	Difference
71.6°F	72.0°F	0.4°F

PRECIPITATION AUDIT

DATE: December 10, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: J. Cordes

PARAMETER: Precipitation SENSOR MFR: Weathertronics

MODEL NUMBER: P501 S/N: None

PRECIPITATION AUDIT DATA

Volume Added	Audit Point	Das Output	Difference
32cc	0.04"	0.04"	0.00

TSP SAMPLER AUDIT

Project: True Geothermal

Station: Air Quality, Site 1 HI-VOL NO: #1

Date of Audit: December 11, 1990 Audit Kit No.: Sierra #1

Time of Audit: 1000 - 1010 Temperature: 294°K

Auditor: J. Cordes Barometric. Pres: 739.1 mm Hg

HI-VOLUME SAMPLER DATA

Manometer Reading (" H_2O)	Uncorrected Flow Q_i from Orifice Calibration Table ("H_2O vs. Flow)	Calibration Flow * (Q_i x FCF) SCFM	Chart Reading SCFM	Diff. %
5.9	41.4	41.7	41.9	.5

* Flow referenced to calibration conditions

Flow Correction Factor (FCF) = $((298 \times P2)/(T2 \times 760))^{0.5}$

where: T_2 and P_2 are the ambient temperature and barometric pressure during the audit.
Deviation from ideal flow of 40 ACFM = 4.5%

PM-10 SAMPLER AUDIT

Project: True Geothermal

Station: Air Quality, Site 1 HIVOL NO: #2

Date of Audit: December 11, 1990 Audit Kit No.: Sierra #1

Time of Audit: 1030 - 1040 Temperature: 294 ^{o}K

Auditor: J. Cordes Barometric Pres.: 739.1 mm Hg

PM-10 SAMPLER DATA

Manometer Reading (" H_2O)	Uncorrected Flow Q_i from Orifice Calibration Table ("H_2O vs. Flow)	Calibration Flow * (Q_i x FCF) SCFM	Chart Reading SCFM	Diff. %
5.5	40.0	40.3	40.3	0.0

* Flow referenced to Actual conditions

Flow Correction Factor (FCF) = $((T2 \times 760) / (298 \times P2))^{0.5}$

where: T_2 and P_2 are the ambient temperature and barometric pressure during the audit.
Deviation from ideal flow of 40 ACFM = 4.5%

WIND DIRECTION AUDIT

DATE: December 10, 1990 PROJECT: True Geothermal

SITE: MET, Site 2 AUDITOR: J. Cordes

PARAMETER: Wind Direction SENSOR MFR: Weathermeasure

MODEL NUMBER: W204 S/N: 2066

WIND DIRECTION AUDIT DATA

Audit Point	DAS Output	Difference
359°	0°	1°
089°	090°	1°
179°	179°	0°
269°	271°	2°

NOTE: Crossarm Orientation = 359°
Data corrected for 11° WMD

WIND SPEED AUDIT

DATE: December 10, 1990 PROJECT: True Geothermal

SITE: MET, Site 2 AUDITOR: J. Cordes

PARAMETER: Wind Speed SENSOR MFR: Weathermeasure

MODEL NUMBER: W203 S/N: 1256

WIND SPEED AUDIT DATA

RPM	Audit Point	Das Output	Difference
0	0.0 mph	0.0 mph	0.0 mph
300	16.9 mph	16.9 mph	0.0 mph
600	33.4 mph	33.0 mph	0.4 mph

VERTICAL WIND SPEED AUDIT

DATE: December 10, 1990 PROJECT: True Geothermal

SITE: MET, Site 2 AUDITOR: J. Cordes

PARAMETER: Vertical Wind Speed SENSOR MFR: R. M. YOUNG

WIND SPEED AUDIT DATA

RPM	Audit Point	Das Output	Difference
0	0.0 mph	0.0 mph	0.0 mph
300 cw	3.3 mph	3.2 mph	0.1 mph
300 ccw	-3.3 mph	-3.3 mph	0.0 mph
600 cw	6.6 mph	6.7 mph	0.1 mph
600 ccw	-6.6 mph	-6.6 mph	0.0 mph

APPENDIX B

STATION INSPECTION CHECKLIST

PROJECT: True Geothermal

SITE: Air Quality, Site 1 DATE: December 10, 1990

Auditor: J. Cordes

	YES	NO
1. Is the shelter secured when unattended?	Y	
2. Is the equipment power supply regulated?	Y	
3. Is heating and air conditioning adequate?	Y	
4. Is the station kept between 22°C and 25°C?	Y	
5. Is the station clean and orderly?	Y	
6. Are all gas cylinders properly secured?	Y	
7. Is the sample intake system glass or Teflon?		N
8. Is the sample intake system clean?	(Unknown)	
9. Does the sample intake system meet all siting criteria?	Y	
10. Is the station adequately lighted?	Y	
11. Is there an up to date and legible station log?	Y	
12. Is there a stripchart or hardcopy backup to the data acquisition system?	Y	
13. Does the station have a complete set of instrument manuals?	Y	
14. Does the site operator complete a site checklist at each visit?	Y	
15. Is the site visited at least every 3 days?	Y	

COMMENTS: Intake manifold is stainless steel

STATION INSPECTION CHECKLIST

PROJECT: True Geothermal

SITE: Met, Site 2 DATE: December 10, 1990

Auditor: J. Cordes

	YES	NO
1. Is the shelter secured when unattended?	Y	
2. Is the equipment power supply regulated?	Y	
3. Is heating and air conditioning adequate?	NA	
4. Is the station kept between 22°C and 25°C?	NA	
5. Is the station clean and orderly?	Y	
6. Are all gas cylinders properly secured?	NA	
7. Is the sample intake system glass or Teflon?	NA	
8. Is the sample intake system clean?	NA	
9. Does the sample intake system meet all siting criteria?	NA	
10. Is the station adequately lighted?	NA	
11. Is there an up to date and legible station log?	Y	
12. Is there a stripchart or hardcopy backup to the data acquisition system?	Y	
13. Does the station have a complete set of instrument manuals?		N
14. Does the site operator complete a site checklist at each visit?	Y	
15. Is the site visited at least every 3 days?	Y	

COMMENTS: The MET site is a remote solar/battery powered station. Manuals for the equipment are kept at the air quality station (Site 1).

A hardcopy is printed with a portable terminal printer when the operator visits the site.

MEASUREMENT TECHNOLOGIES

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