APPENDIX 17

CORRELATION AND CHI-SQUARE TEST GEOSTATISTICAL ANALYSES RESULTS

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1. Introduction

This appendix describes the results of the correlation analyses and the Chi-square test conducted. The correlation analysis consisted of:

a. global linear correlations between selected geoscience parameters along the section lines and the combined section data;
b. multivariate linear correlations by lithology per section and combined sections; and
c. domain analysis by geographic/geologic sub-element along the sections (i.e., Stillwater Range, DVFZ, and valley).

2. Global Linear Correlation Results

The first step in the geostatistical analysis was to determine which parameters to analyze and these are:

- Fracture Intensity (FracInten)
- Coulomb Stress Change (CSC)
- P-wave velocity (Vp)
- Lithologic Density (LithDen)
- Dilatation
- Resistivity (MT)
- Vertical Stress (VertStress)
- Temperature

The listed geoscience parameters were selected based on (1) preliminary analyses indicating that other geoscience parameters were not significant, (2) SME input, (3) poor parameter resolution, and/or (4) no known potential for inferring EGS. LithDen, an assigned density value for each of the major stratigraphic units, was the parameter used to translate lithology, a categorical data set, into a numerical data set. Appendix 15-Table 15-2 presents the data type for each of these parameters (e.g., measured, modeled, etc.) along the individual section lines presented in Plate 1.

For statistical purposes having such varied data types is non-ideal. However, we treat these data as if each dataset is independent and can be used for geostatistical analysis. This is based on the concept that whatever parameter uncertainty exists can be considered a measurement error, and is, at least from a practical standpoint, unbiased.

The association of selected geoscience parameters was evaluated using a correlation analysis which identified the correlation coefficient, a statistic that summarizes the linear relationship between two variables. The square of the correlation coefficient indicates the "goodness" of the regression line fit to the data (r^2-value). Note that a positive correlation between two factors does not necessarily reflect a causal relationship for there may be another factor (or factors) in play. Taylor (1990) reported that "Correlation coefficients should…indicate whether an investigation should be taken to look for causal relationships or other matters to understand the data." However, such investigation is beyond the scope of this study. Further efforts were undertaken to also qualitatively analyze the spread of the data and the number of data points to see if the reflected r^2 values are valid (see Tables 17.1 through 17.4).

Sectional Data Analysis

The global linear correlations were conducted on the individual cross-section data sets C-C' through F-F' (Plate 1) and the combined sections. This discussion describes the results of three types of analyses (1) bivariate, (2) multivariate, and (3) domain. These analyses produce a correlation coefficient which describes the correlation between the variables being evaluated. The results of this analysis are divided into two broad categories (1) non-correlated parameters is where the correlation coefficient is less than 0.7400 and (2) correlated parameters where the correlation coefficient is greater than 0.7400. A correlation coefficient of 0.7400 equates to a r-squared value of 0.55 which for the purposes of this

study is not negligible. Figure 16-1 presents the results of this analysis for the combined section data set and is representative of the analysis conducted for each individual section. Table 17.1 summarizes the results of this analysis.

Correlations

	FracIntens	LithDensity	VertStress	CSC	Dilatation	Temperature	VP-seismic	MTdata
FracIntens	1.0000	0.1530	-0.0461	-0.0128	0.0179	0.0663	0.0495	-0.0944
LithDensity	0.1530	1.0000	0.7341	-0.0969	-0.3139	0.8267	0.7888	0.3030
VertStress	-0.0461	0.7341	1.0000	-0.1149	-0.2018	0.9033	0.8523	0.4520
CSC	-0.0128	-0.0969	-0.1149	1.0000	0.1510	-0.1111	-0.1089	-0.0081
Dilatation	0.0179	-0.3139	-0.2018	0.1510	1.0000	-0.1868	-0.1269	-0.2491
Temperature	0.0663	0.8267	0.9033	-0.1111	-0.1868	1.0000	0.9166	0.3652
VP-seismic	0.0495	0.7888	0.8523	-0.1089	-0.1269	0.9166	1.0000	0.3581
MTdata	-0.0944	0.3030	0.4520	-0.0081	-0.2491	0.3652	0.3581	1.0000

There are 343 missing values. The correlations are estimated by REML method.

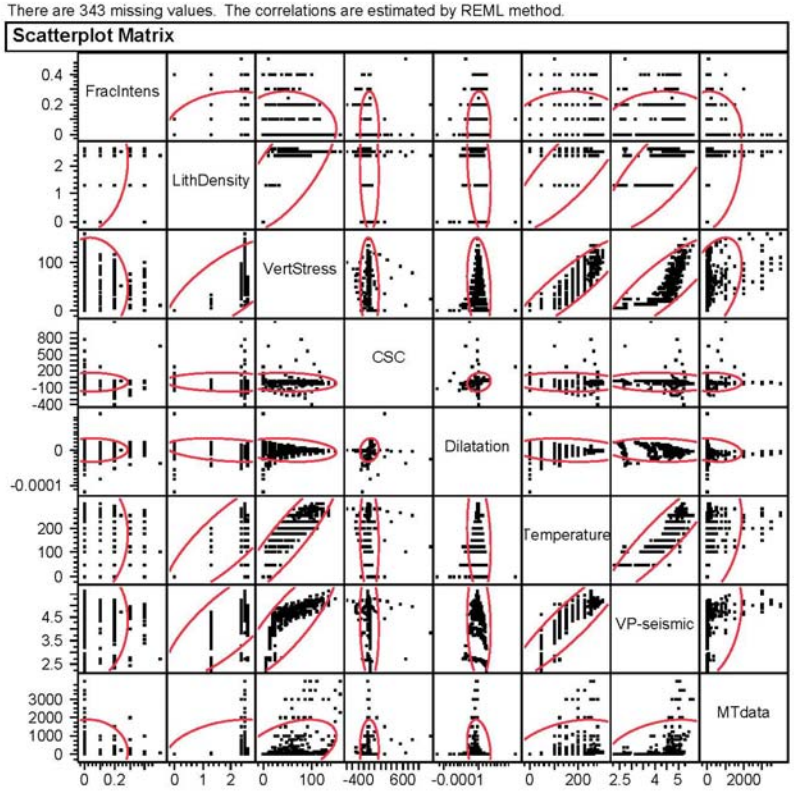

Figure 17.1. Correlation Matrix for the Combined Section Data (C-C', D-D', E-E' and F-F' in Plate 1). Correlation Coefficients between parameters are shown in upper table. The scatterplot matrix graphically shows the relationship between the coupled parameters. The red ellipse per scatterplot shows the grouping data points used in the correlation coefficient determination.

2.1 BIVARIATE ANALYSIS

The selected geoscience parameters which are correlated are:

1. LithDen (Appendix 15-Table 15.4) with:
   (a) VertStress along sections D-D' and F-F' but the scatterplots for these data are not well-behaved (Table 17.1) ; and
   (b) Temperature and Vp along all sections and the combined sections but the scatterplots for these data are not well-behaved (Table 17.1).
2. VertStress (Appendix 15-Table 15.4) with:
   (a) Temperature and Vp along all section lines and the combined sections, except that scatterplots for sections D-D' and E-E' are not well-behaved.
3. CSC (Appendix 15-Table 15.10) with:

(a) dilatation along sections C-C' and D-D' but the scatterplot for section D-D' is not well-behaved.

4. Temperature (Appendix 15-Table 15.9) with:
   (a) Vp across all sections and the combined sections.

2.2 MULTIVARIATE ANALYSIS

The aforementioned global linear correlation per section and for all combined sections examined any correlation among the selected geoscience parameters on an entire cross-section basis. As a result, the varying geologic formations and varying geologic environments (e.g., Stillwater Range and valley) were not considered. This section and the next, presented below, evaluate these factors.

Table 17.2 summarizes the results of global linear correlations by the major identified formations (Q-Tbf, Tmb, Kgr, Jz, and Tr; see Section 2.1.1 in the main report for a formation description). As in the aforementioned analysis, correlation coefficients <0.7400 (r-squared values <0.55) are not considered significant. Geoscience parameter correlations per lithologic formation follow.

Quaternary-Tertiary Basin Fill (QTbf)

1. VertStress-Temperature show no correlation along C-C' but is correlated along all other sections and the combined sections. However, the scatterplot for the combined sections is not well-behaved.
2. VertStress-Vp is correlated along all sections and the combined sections.
3. CSC-Dilatation is correlated along sections C-C' and F-F' only.
4. CSC-Temperature is **negatively correlated** along sections C-C' and D-D'.
5. CSC-Vp is correlated only along section D-D' but the scatter plot is not well-behaved.
6. Temperature-Vp is correlated only along sections D-D' through F-F'.

Tertiary Miocene Basalt (Tmb)

1. FracInten-CSC is correlated along section F-F' but the scatter plot is not well-behaved.
2. FracInten-Dilatation is correlated along section F-F' but the scatter plot is not well-behaved.
3. FracInten-Temperature is **negatively correlated** along section F-F' but the scatter plot is not well-behaved.
4. FracInten-Vp is **negatively correlated** along section F-F' but the scatter plot is not well-behaved.
5. VertStress-CSC is **negatively correlated** along section E-E'.
6. CSC-Dilatation is correlated along sections D-D' and F-F' but **negatively correlated** along E-E'. However, the scatterplot for section F-F' is not well-behaved.
7. CSC-Temperature is correlated along section E-E' and **negatively correlated** along sections D-D' and F-F' whose scatterplot is not well-behaved.
8. CSC-Vp is **negatively correlated** along sections D-D' and E-E'.
9. CSC-Resistivity (MT) is **negatively correlated** along sections D-D' through F-F' whose scatterplot is not well-behaved.
10. Dilatation-Temperature is **negative correlated** along D-D' through F-F' and the combined sections. However, the scatterplot for section F-F' is not well-behaved.
11. Dilatation-Vp is **negatively correlated** along sections D-D' and F-F' but the scatterplot for F-F' is not well-behaved.

12. Temperature-Vp is correlated along section D-D'.
13. Temperature-Resistivity (MT) is correlated along sections D-D' through F-F' and the combined sections. However, the scatterplot for section F-F' is not well-behaved.

Cretaceous Granite (Kgr)

1. VertStress-Vp is correlated along sections E-E' and F-F'.
2. CSC-Dilatation is correlated along sections C-C' and D-D'.
3. CSC-Resistivity (MT) is **negatively correlated** along section C-C'.
4. Temperature-Vp is correlated along section D-D'.

Jurassic Humboldt Igneous Complex (Jz)

1. VertStress-Temperature Is correlated long all sections and the combined sections. However, the scatterplot for section C-C' is not well-behaved.
2. VertStress-Vp Is correlated long all sections and the combined sections. However, the scatterplot for section C-C' is not well-behaved.
3. CSC-Dilatation is correlated along sections C-C' through F-F' but not correlated along the combined sections.
4. CSC-Vp is correlated along sections C-C' and D-D' but the scatterplot for C-C' is not well-behaved. However, the scatterplot for section C-C' is not well-behaved.
5. CSC-Resistivity (MT) is **negatively correlated** along section C-C'.
6. Dilatation-Vp is correlated along sections C-C' and D-D', and the combined sections. However, the scatterplot for section C-C' is not well-behaved.
7. Temperature-Vp is correlated along sections CC-C' through E-E' and the combined sections.

Triassic Meta-Sediments (Tr)

1. VertStress-CSC-is correlated along section E-E'.
2. VertStress-Dilatation is correlated along all sections and the combined sections.
3. VertStress-Temperature is correlated along all sections and the combined sections.
4. VertStress-Vp is correlated along sections D-D' through F-F' and the combined sections.
5. CSC-Dilatation is correlated along sections C-C' through E-E'.
6. CSC-Temperature is correlated along section E-E'.
7. Dilatation-Temperature is correlated along sections C-C' and E-E', and the combined sections but **negatively correlated** along section F-F'. The scatterplot for the combined sections is not well-behaved.
8. Dilatation-Vp is correlated along sections E-E' and F-F'.
9. Temperature-Vp is correlated along all sections and in the combined sections.

Table 17.2 and 17.3 presents the aforementioned data in a format designed to show the geoscience parameters correlations with respect to lithology. Lithologic units are described in Section 2.1.1 in the main report. The following correlations are noted:

1. FracInten-CSC is correlated only along section F-F' for the Tmb.
2. FracInten-Dilatation is correlated only along section F-F' for the Tmb.
3. FracInten-Temperature is **negatively correlated** only along section F-F' for the Tmb.
4. FracInten-Vp is **negatively correlated** only along section F-F' for the Tmb.

5. VertStress-CSC is **negatively correlated** along section E-E’ for the Tmb and Tr.
6. VertStress-Temperature is correlated across all sections and the combined sections for the QT (except section C-C’), Jz, and Tr.
7. VertStress-Vp is correlated across all sections and the combined sections for the QT, Kgr, Jz, and Tr (except for section C-C’).
8. CSC-Dilatation is correlated along sections C-C’ and F-F’ for the QT, D-D’ and F-F’ for the Tmb and **negatively correlated** along section E-E’ for the Tmb, along sections C-C’ and D-D’ for the Kgr, across sections C-C’ through F-F’ in the Jz, and across C-C’ through E-E’ for the Tr.
9. CSC-Temperature is **negatively correlated** along sections C-C’ and D-D’ for the QT, is **negatively correlated** along sections C-C’ and F-F’ and correlated along section E-E’ for the Tmb, and correlated along section F-F’ for the Tr.
10. CSC-Vp is **negatively correlated** along section D-D’ for the QT, **negatively correlated** along section D-D’ and E-E’ for the Tmb, correlated along section C-C’ and D-D’ for the Jz, and **negatively correlated** along sections D-D’ and E-E’ for the Tr.
11. CSC-Resistivity is **negatively correlated** along F-F’ for the Jz.
12. Dilatation-Temperature is **negatively correlated** along sections D-D’ through F-F’ and the combined section for the Tmb, and correlated along sections C-C’, E-E’ and the combined section for Tr and **negatively correlated** along section F-F’ for the Tr..
13. Dilatation-Vp is **negatively correlated** along sections D-D’ and F-F’ for the Tmb, correlated along sections C-C’, D-D’ and the combined sections in the Jz, and correlated along E-E’ and F-F’ for the Tr.
14. Temperature-Vp is correlated along sections D-D’ through F-F’ for the QT, along section D-D’ for the Tmb, and Kgr, along sections C-C’ through E-E’ and the combined sections for the Jz, and across all sections in the Tr.

The causal relationships for the correlated and negatively correlated data are beyond the scope of this investigation. It is noteworthy, however, that the bulk of the negative correlations occur in the Tmb.

Table 17.1. Linear correlation analysis between selected geoscience parameters along the indicated four cross-section lines (Figure 48B in main report) and the combined data sets from all four section lines. Only correlation coefficients of 0.7400 (r-square value of 0.55) or greater are shown. A "0" indicates a correlation less than 0.7400. A gray-shaded cell indicates self-correlation. Blue shaded values indicate limited data points, a limited data distribution, too large a data spread, and/or too many outliers. A green-shaded cell indicates a repeated parameter couple.

Cross-Section	Geoscience Parameter							
	FracInten[1]	LithDen[2]	VertStress[3]	CSC[4]	Dilatation[5]	Temperature	Vp[6]	MT[7]
FracInten								
No correlation coefficients >0.7400 were found (except for the parameter self-correlation) in cross-section data C-C' through F-F' or the combined cross-section data; see text for an explanation.								
LithDen								
C-C'	0		0	0	0	0.842	0.7567	0
D-D'	0		0.7577	0	0	0.8383	0.7849	0
E-E'	0		0	0	0	0.7985	0.7610	0
F-F'	0		0.7577	0	0	0.8513	0.8470	0
Combined	0		0			0.8267	0.7888	
VertStress								
C-C'	0	0		0	0	0.898	0.8292	0
D-D'	0	0.7570		0	0	0.9388	0.8473	0
E-E'	0	0		0	0	0.8982	0.8856	0
F-F'	0	0.7577		0	0	0.8924	0.8480	0
Combined	0	0		0	0	0.9085	0.8599	0
CSC								
C-C'	0	0	0		0.9067	0	0	0
D-D'	0	0	0		0.8319	0	0	0
E-E'	0	0	0		0	0	0	0
F-F'	0	0	0		0	0	0	0
Combined	0	0	0		0	0	0	0
Dilatation								
No meaningful correlations found or are repeated parameters couples from above.								
Temperature								
C-C'	0			0	0		0.9039	0
D-D'	0			0	0		0.9287	0
E-E'	0			0	0		0.9039	0
F-F'	0			0	0		0.9271	0
Combined	0			0	0		0.9107	0
Vp and MT								
No meaningful correlation or are repeated parameter couples from above.								

[1]Fracture Intensity
[2]Lithologic Density
[3]Vertical Stress
[4]Coulomb Stress Change
[5]Dilatation
[6]P-wave velocity
[7]Resistivity

1.3 GEOLOGIC DOMAIN ANALYSIS

The selected geoscience parameters gridded along the sections identified above were analyzed on a domain basis within the Calibration Area. That is, it was recognized that the global correlation analysis described above integrated the correlation between selected geoscience parameters along the entire cross-section analyzed. Some of the data (i.e. MT resistivity sections) shows a qualitative difference within domains present in the sections. The geologic domain analysis focuses the correlation analysis on three geologic domains within each cross-section and the overall Calibration Area, i.e., the Stillwater Range, the DVFZ, and the Valley. Table 17.3 summarizes the results of the Geologic Domain Analysis and the following correlation coefficients were found to be significant (>0.7400) per domain:

Stillwater Range

1. VertStress - Dilatation;
2. VertStress – Temperature;
3. VertStress-Vp;
4. Dilatation-Temperature;
5. Dilatation – Vp; and
6. Temperature – Vp.

Dixie Valley Fault Zone

1. VertStress-Temperature;
2. VertStress –Vp; and
3. Temperature-Vp.

Valley

1. LithDen-VertStress;
2. LithDen –Temperature but the scatterplot for this correlation is not well-behaved;
3. VertStress-Temperature;
4. VertStress –Vp;
5. CSC – Dilatation;
6. Dilatation-Temperature which is **negatively correlated;**
7. Dilatation **-**Vp, which is **negatively correlated**; and
8. Temperature-Vp

Table 17.2. Summary of correlation coefficients for multivariate analysis with lithologies per individual cross-section (Figure 48B in the main report) and combined sections. Only correlation coefficients of 0.7400 (r-squared value of 0.55) are presented. A "0" indicates a correlation coefficient less than 0.7400. Stipple pattern indicates limited data points, a limited data distribution, too large data spread, and/or too many outliers. Negative correlations are presented in red font.

Geoscience Parameters	Geoscience Cross-sections				
	CC'	DD'	EE'	FF'	Combined
FracInten - LithDen[1]	*No correlation coefficient >0.7400 across all formations reviewed*				
FracInten - VertStress[2]	*No correlation coefficient >0.7400 across all formations reviewed*				
FracInten - CSC[3]	*No correlation coefficient >0.7400*				
	0	0	0	0.8588	0
	No correlation coefficient >0.7400 in the Kgr, Jz, and Tr formations				
FracInten - Dilatation	*No correlation coefficient >0.7400*				
	0	0	0	0.9694	0
	No correlation coefficient >0.7400 in the Kgr, Jz, and Tr formations				
FracInten - Temperature	*No correlation coefficient >0.7400*				
	0	0	0	-0.8650	0
	No correlation coefficient >0.7400 in the Kgr, Jz, and Tr formations				
FracInten - Vp[4]	*No correlation coefficient >0.7400*				
	0	0	0	-0.9873	0
	No correlation coefficient >0.7400 in the Kgr, Jz, and Tr formations				
FracInten - Resistivity	*No correlation coefficienet >0.7400 across all formations reviewed*				
LithDen -CSC, -VertStress, Dilatation, Temperature, -Vp, and -MT	*No correlation coefficienet >0.4 across all formations reviewed*				
VertStress - CSC	*No correlation coefficient >0.7400*				
	0	0	-0.9385	0	0
	No correlation coefficient >0.7400 in the Kgr and Jz formations				
	0	0	0.7703	0	0
VertStress - Dilatation	*No correlation coefficient >0.7400 in the QT, Kgr, and Jz formations*				
	0.7481	0.7450	0.8009	0.7764	0.7459
	0	0.8848	0.8432	0.8304	0.7932
VertStress - Temperature	*No correlation coefficient >0.7400 in the Tmb and Kgr formations*				
	0.8326	0.9101	0.8896	0.7616	0.8483
	0.7725	0.8209	0.8696	0.8514	0.7865
VertStress - Vp	0.9051	0.9493	0.9293	0.9453	0.9220
	0	0	0.7950	0.8970	0
	0.8677	0.7405	0.8318	0.9387	0.8564
	0	0.7676	0.8264	0.8532	0.7523

Parameter	Geoscience Cross-sections				
	CC'	DD'	EE'	FF'	Combined
CSC - Dilatation	0.9766	0	0	0.8878	0
	0	0.9990	-0.8703	0.9583	0
	0.7783	0.7544	0.0000	0	0
	0.9823	0.9252	0.7794	0.8440	0
	0.9723	0.9593	0.9421	0	0
CSC - Temperature	-0.7888	-0.8276	0	0	0
	0	-0.9345	0.7935	-0.9999	0
	No correlation coefficient >0.7400 in the Kgr and Jz formations				
	0	0	0.8504	0	0
CSC - Vp	0	0.7575	0	0	0
	0	-0.9488	-0.7750	0	0
	No correlation coefficient >0.7400				
	0.7995	0.8952	0	0	0
	No correlation coefficient >0.7400				
CSC - Resistivity (MT)	*No correlation coefficient >0.7400*				
	0	-0.8718	-0.8909	-0.8955	0
	-0.8631	0	0	0	0
	0	0	0	-0.7956	0
	No correlation coefficient >0.7400				
Dilatation - Temperature	*No correlation coefficient >0.7400*				
	0	-0.9462	-0.9352	-0.9623	-0.7478
	No correlation coefficient >0.7400 in the Kgr and Jz formations				
	0.7495	0	0.8020	0.7706	0.7438
Dilatation - Vp	*No correlation coefficient >0.7400*				
	0	-0.9470	0	-0.8228	0
	No correlation coefficient >0.7400				
	0.8001	0.8448	0	0	0.7900
	0	0	0.7506	0.8118	0
Dilatation - Resistivity (MT)	*No correlation coefficienet >0.7400 across all formations reviewed*				
Temperature - Vp	0	0.8410	0.8467	0.8459	0
	0	0.8804	0	0	0
	0	0.8695	0	0	0
	0.8164	0.8442	0.7648	0	0.8554
	0.8706	0.9099	0.7430	0.8462	0.8102
Temperature - Resistivity (MT)	*No correlation coefficient >0.7400*				
	0	0.9111	0.8683	0.8891	0.8231
	No correlation coefficient >0.7400 in the Kgr, Jz, and Tr formations				

Parameter	Geoscience Cross-sections				
	CC'	DD'	EE'	FF'	Combined
VertStress - Resistivity (MT)	*No correlation coefficient >0.7400 across all formations reviewed*				
VertStress - Dilatation	*No CC >0.7400 in the QT, Kgr, and Jz*				
	0.7481	0.7450	0.8009	0.7764	0.7459
VertStress -	0	0.8848	0.8432	0.8304	0.7932
	0	0.8848	0.8432	0.8304	0.7932
VertStress - Temperature	*No correlation coefficient >0.7400 in the Tmb and Kgr formations*				
	0.8326	0.9101	0.8896	0.7616	0.8483
	0.7725	0.8209	0.8696	0.8514	0.7865
VertStress - Vp	0.9051	0.9493	0.9293	0.9453	0.9220
	0	0	0.7950	0.8970	0
	0.8677	0.7405	0.8318	0.9387	0.8564
	0	0.7676	0.8264	0.8532	0.7523
VertStress - Resistivity	*No correlation coefficient >0.7400 across all formations reviewed*				
Dilatation - Resistivity	*No correlation coefficient >0.7400 across all formations reviewed*				
Temperature - Vp	0	0.8410	0.8467	0.8459	0
	0	0.8804	0	0	0
	0	0.8804	0	0	0
	0	0.8695	0	0	0
	0.8164	0.8442	0.7648	0	0.8554
	0.8706	0.9099	0.7430	0.8462	0.8102
Temperature - Resistivity (MT)	*No correlation coefficient >0.7400*				
	0	0.9111	0.8683	0.8891	0.8231
	No correlation coefficient >0.7400 in the Kgr, Jz, and Tr formations				
Vp - Resistivity (MT)	*No correlation coefficienet >0.7400 across all formations reviewed*				

EXPLANATION

	QTbf	[1]Fracture Intensity - Lithologic Density
	Tmb	[2]Vertical Stress
	Kgr	[3]Coulomb Stress Change
	Jz	[4]P-wave velocity
	Tr	[5]Magnetotellurics

Notes:

a. Jurassic Boyer Ranch (Jbr) is not considered due to limited occurrence of this formation.

b. Teritary Volcanic Formation (Tv) is not considered due to limited occurrence of this formation.

Table 17.3. Selected geoscience parameter multivariate correlation coefficient analysis by lithology and geologic cross-sections. A "X" represents a correlation coefficient >0.7400. A blank indicates a correlation coefficient <0.7400. A black "X" indicates a positive correlation coefficient and a red "X" indicates a negative coefficient. Blue shaded values indicate limited data points, a limited data distribution, too large a data spread, and/or too many outliers. The data used to construct this table is presented in Table 17.2.

Parameter	Cross-sections				
	CC'	DD'	EE'	FF'	Combined
QT					
FracInten -coupled parameters					
LithDen-coupled parameters					
VertStress - CSC					
VertStress - Dilatation					
VertStress - Temperature		X	X	X	X
VertStress - Vp	X	X	X	X	X
VertStress - Resistivity (MT)					
CSC - Dilatation	X			X	
CSC - Temperature	X	X			
CSC - Vp		X			
CSC - Resistivity (MT)					
Dilatation - Temperature					
Dilatation - Vp					
Dilatation - Resistivity (MT)					
Temperature - Vp		X	X	X	
Temperature - Resistivity (MT)					
Vp - Resistivity (MT)					
Tmb					
FracInten - LithDen[1]					
FracInten - VertStress2					
FracInten - CSC[3]				X	
FracInten - Dilatation				X	
FracInten - Temperature				X	
FracInten - Vp4				X	
FracInten - Resistivity (MT5)					
LithDen-coupled parameters					
VertStress - CSC			X		
VertStress - Dilatation					
VertStress - Temperature					
VertStress - Vp					
VertStress - Resistivity (MT)					
CSC - Dilatation		X	X	X	
CSC - Temperature		X	X	X	
CSC - Vp		X	X		
CSC - Resistivity (MT)		X	X	X	
Dilatation - Temperature		X	X	X	X
Dilatation - Vp		X		X	
Dilatation - Resistivity (MT)					
Temperature - Vp		X			
Temperature - Resistivity (MT)		X	X	X	X
Vp - Resistivity (MT)					

Parameter	Cross-sections				
	CC'	DD'	EE'	FF'	Combined
Kgr					
FracInten -coupled parameters					
LithDen-coupled parameters					
VertStress - CSC					
VertStress - Dilatation					
VertStress - Temperature					
VertStress - Vp			X	X	
VertStress - Resistivity (MT)					
CSC - Dilatation	X	X			
CSC - Temperature					
CSC - Vp					
CSC - Resistivity (MT)	X				
Dilatation - Temperature					
Dilatation - Vp					
Dilatation - Resistivity (MT)					
Temperature - Vp		X			
Temperature - Resistivity (MT)					
Vp - Resistivity (MT)					
Jz					
FracInten - LithDen[1]					
FracInten - VertStress2					
FracInten - CSC[3]					
FracInten - Dilatation					
FracInten - Temperature					
FracInten - Vp4					
FracInten - Resistivity (MT5)					
LithDen-coupled parameters					
VertStress - CSC					
VertStress - Dilatation					
VertStress - Temperature	X	X	X	X	X
VertStress - Vp	X	X	X	X	X
VertStress - Resistivity (MT)					
CSC - Dilatation	X	X	X	X	
CSC - Temperature					
CSC - Vp	X	X			
CSC - Resistivity (MT)				X	
Dilatation - Temperature					
Dilatation - Vp	X	X			X
Dilatation - Resistivity (MT)					
Temperature - Vp	X	X	X		X
Temperature - Resistivity (MT)					
Vp - Resistivity (MT)					

Parameter	Cross-sections				
	CC'	DD'	EE'	FF'	Combined
Tr					
FracInten -coupled parameters					
LithDen-coupled parameters					
VertStress - CSC			X		
VertStress - Dilatation	X	X	X	X	X
VertStress - Temperature	X	X	X	X	X
VertStress - Vp		X	X	X	X
VertStress - Resistivity (MT)					
CSC - Dilatation	X	X	X		
CSC - Temperature			X		
CSC - Vp		X	X		
CSC - Resistivity (MT)					
Dilatation - Temperature	X		X	X	X
Dilatation - Vp			X	X	
Dilatation - Resistivity (MT)					
Temperature - Vp	X	X	X	X	X
Temperature - Resistivity (MT)					
Vp - Resistivity (MT)					

Table 17.4. Summary of results of a geologic domain analysis in the Calibration Area (see Figure 48B in the main report). Three domains shown: Stillwater Range (SR), Dixie Valley Fault Zone (DVFZ), and valley. Only correlation coefficients >0.7400 are shown. A "0" indicates a correlation coefficient <0.7400. Negatively correlated values are indicated in red and a minus sign. Green shaded values indicate limited data points, a limited data distribution, too large a data spread, and/or too many outliers.

Geoscience Parameters	SR	DVFZ	Valley
FracInten[1] with all geoscience	0	0	0
LithDen[2] - VertStress[3]	0	0	**0.8025**
LithDen - CSC[4]	0	0	0
LithDen - Dilatation	0	0	0
LithDen - Temperature	0	0	**0.7824**
LIthDen - Vp[5]	0	0	0
LIthDen - Resistivity (MT[6])	0	0	0
VertStress - CSC	0	0	0
VertStress - Dilatation	**0.8555**	0	0
VertStress - Temperature	**0.9148**	**0.9102**	**0.8998**
VertStress - Vp	**0.7805**	**0.8069**	**0.8326**
VertStress - Resistivity (MT)	0	0	0
CSC - Dilatation	0	0	**0.7259**
CSC - Temperature	0	0	0
CSC - Vp	0	0	0
CSC - Resistivity (MT)	0	0	0
Dilatation - Temperature	**0.9166**	0	**-0.8798**
Dilatation - Vp	**0.7918**	0	**-0.8045**
Dilatation - MT	0	0	0
Temperature - Vp	**0.7979**	**0.9128**	**0.8948**
Temperature - Resistivity (MT)	0	0	0
Vp - Resistivity (MT)	0	0	0

Notes:
[1]Fracture Intensity
[2]Lithologic Density
[3]Vertical Stress
[4]Coulomb Stress Change
[5]P-wave velocity
[6]Magnetotelluric resistivity

3. Chi-Squared Test

A Chi-Square test was conducted on the correspondence between the gravity/magnetic geologic model and the generalized geology model presented in Plate 1. Figure 17.2 presents the result of this analysis. A high degree of correlation was found between the two models. The Chi-Squared statistic indicates that the degree of correspondence observed is unlikely if both models were independent. The 11 measures of association also suggest a reasonable agreement between the two models. The Gravity/Magnetic Task Leader, Dr. Karlin (Section 1.3 in the main report) provides a discussion of his approach in conducting the joint gravity/magnetic modeling gravity and has reported that he conducted his modeling efforts independent of the generalized geology modeling (Plate 1), with the exception of modeling the surface geology and using 62-21 for a constraint on the depth to the basin-fill. Based on his analysis, it is reported herein that the geology and the gravity/magnetic model were developed independently. This correspondence of the models allows for the use of the Gravity-Magnetic inferred Lithology model as a complimentary data-set to the Geologic sections for inferring the lithology type to be used for EGS Favorability Mapping.

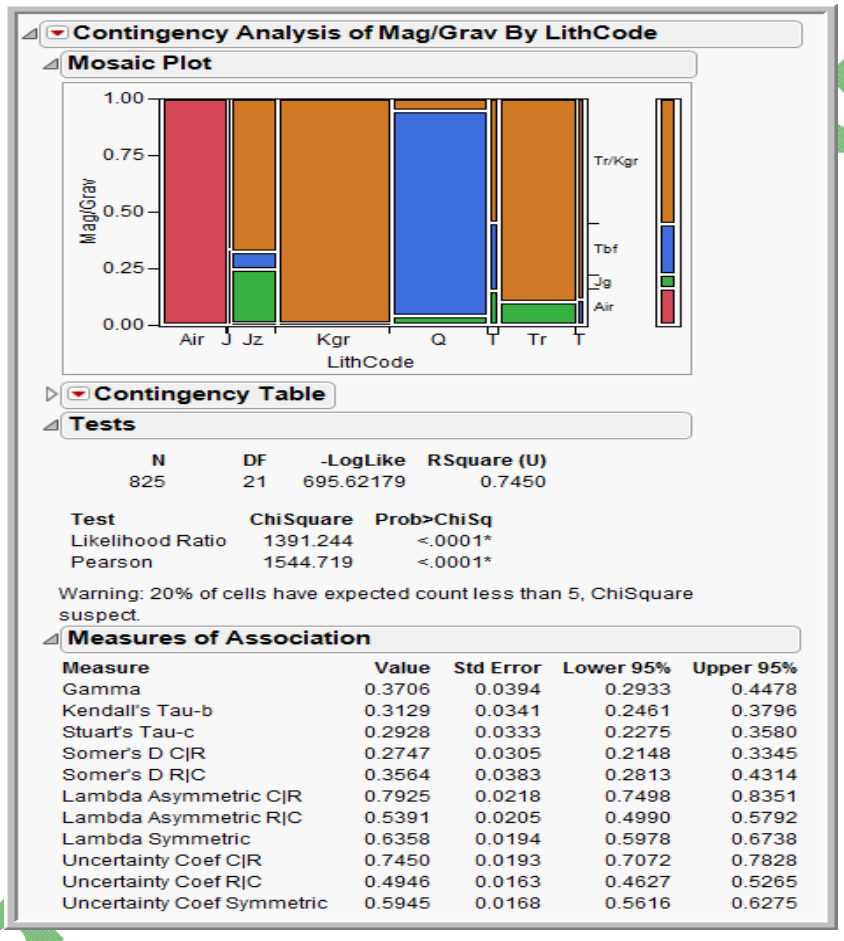

Figure 17.2. Chi-Square Test for the Geologic Model vs. the Gravity-Magnetic inferred Lithology Model for data along the four key cross-sections (C-C', D-D', E-E' and F-F'). The R-square value for combined sections is 0.7450 while the values for the individual sections are 0.8033, 0.7166, 0.7749 and 0.8006 respectively. The geologic units correlate with the Gravity-Magnetic units as follows: Jz corresponds with Jg, Kgr and Tr corresponds with Tr/Kgr, and Q corresponds with Tbf. Air is in respect to values above the surface.