

**U.S. DEPARTMENT OF ENERGY  
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT**

**NUCLEAR WASTE TECHNICAL REVIEW BOARD  
FULL BOARD MEETING**

**SUBJECT: SUMMARY REMARKS**

**PRESENTER: DR. JEREMY M. BOAK**

**PRESENTER'S TITLE  
AND ORGANIZATION: CHIEF, TECHNICAL ANALYSIS BRANCH  
U.S. DEPARTMENT OF ENERGY  
LAS VEGAS, NEVADA**

**PRESENTER'S  
TELEPHONE NUMBER: (702) 794-7588**

**ARLINGTON, VIRGINIA  
JANUARY 12, 1994**

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# WBS Elements Grouped by Priority and Functional Program

## Priority 1

WBS	SCP Number	Title	Funding
<b>1.2.3 Site Investigations Total Priorities 1-4</b>			<b>58965</b>
<b>Programs: Priority 1: ESF DESIGN SUPPORT</b>			Priority 1 Total: <b>22655</b>
<b>Two Deep Boreholes (Systematic Drilling Program)</b>			Subtotal: <b>9312</b>
1.2.3.2.2.2.1	8.3.1.4.3.1	Systematic Acq. of Site Specific Subsurface Info.	455
1.2.3.2.2.2.2	8.3.1.4.3.2	3-D Rock Charact. Models	302
1.2.3.5.1		Sample Management Facility	2233
1.2.3.5.2.1	8.3.1	Common-to-Drilling Support	2487
1.2.3.5.2.2	8.3.1	Engineering, Design and Drilling	1818
1.2.3.5.3.17	8.3.1.4.3.1	Geostatistical Drillholes	1500
1.2.3.5.3.23		Access & Pad Construction	100
1.2.3.9.3		Test Interference Evaluations	167
1.2.3.9.4		Tracers, Fluids and Materials	133
1.2.3.9.6		Field Test Coordinator Support	117
<b>Four Ramp Boreholes (Soil &amp; Rock Properties)</b>			<b>4931</b>
1.2.3.2.6.2.1	8.3.1.14.2.1	Surface Fac. Explor. Program	220
1.2.3.2.6.2.2	8.3.1.14.2.2	Surface Fac. Lab Tests & Material Prop.	71
1.2.3.2.6.2.3	8.3.1.14.2.3	Surface Fac. Field Tests & Char. Meas.	425
1.2.3.5.1		Sample Management Facility	1117
1.2.3.5.2.1	8.3.1	Common-to-Drilling Support	1243
1.2.3.5.2.2	8.3.1	Engineering, Design and Drilling	897
1.2.3.5.3.20	8.3.1.14.2.1	Surface Facilities Drillholes	700
1.2.3.5.3.23		Access & Pad Construction	50
1.2.3.9.3		Test Interference Evaluations	83
1.2.3.9.4		Tracers, Fluids and Materials	67
1.2.3.9.6		Field Test Coordinator Support	58

# WBS Elements Grouped by Priority and Functional Program

## Priority 1

WBS	SCP Number	Title	Funding
<b>Stratigraphy/Structure for ESF Design Support</b>			Subtotal: <b>1955</b>
1.2.3.2.2.1.1	8.3.1.4.2.1	Vert. and Lat. Dist. of Strat. Units in Site	300
1.2.3.2.2.1.2	8.3.1.4.2.2	Structural Features Within the Site Area	350
1.2.3.2.8.4.2	8.3.1.17.4.2	Loc. & Rec. of Falt. Near Prosp. Surf. Facil.	110
1.2.3.5.2.4		Title III Engineering For SBT	15
1.2.3.5.3.22	8.3.1.17.4.8	In Situ Strs. Drlhle. & Tsts., & Qua. Flt.	100
1.2.3.9.5		3-D Site Model	1080
<b>Laboratory Testing of ESF and Borehole Samples</b>			Subtotal: <b>2282</b>
1.2.3.2.7.1.1	8.3.1.15.1.1	Lab. Thermal Properties	880
1.2.3.2.7.1.2	8.3.1.15.1.2	Lab. Thermal Expansion Testing	332
1.2.3.2.7.1.3	8.3.1.15.1.3	Lab. Determin. of Mech. Prop. of Intact	470
1.2.3.2.7.1.4	8.3.1.15.1.4	Lab. Determin. of the Mech. Prop. of	600
<b>Geophysics</b>			Subtotal: <b>780</b>
1.2.3.11.1		Borehole Geophysical Logging	580
1.2.3.11.3		ESF Geophysics	200
<b>Coordination and Planning</b>			Subtotal: <b>3395</b>
1.2.3.1		Coordination and Planning	3395

# WBS Elements Grouped by Priority and Functional Program

## Priority 2

WBS	SCP Number	Title	Funding
<b>Programs: Priority 2: ESF Testing</b>			Priority 2 Total: <b>11561</b>
<b>Geologic Mapping of the ESF</b>			Subtotal: <b>1006</b>
1.2.3.2.2.1.2	8.3.1.4.2.2	Structural Features Within the Site Area	1006
<b>Geologic Studies</b>			Subtotal: <b>294</b>
1.2.3.2.1.1.1	8.3.1.3.2.1	Min, Petrol. & Rock Chemistry of Tmsp.	142
1.2.3.2.1.1.2	8.3.1.3.2.2	Mineralogic & Geochemical Alteration	72
1.2.3.2.7.2.2	8.3.1.15.2.2	Site Ambient Thermal Conditions	80
<b>ESF Hydrology Tests</b>			Subtotal: <b>355</b>
1.2.3.3.1.2.2	8.3.1.2.2.2	Water Movement Tracer Tests	355
<b>Pneumatic and Hydraulic Properties Testing before TBM</b>			Subtotal: <b>5895</b>
1.2.3.3.1.2.3	8.3.1.2.2.3	Perc. in the UZ - Surf. Based Study	1000
1.2.3.3.1.2.4	8.3.1.2.2.4	Perc. in the UZ - ESF Study	4220
1.2.3.3.1.2.6	8.3.1.2.2.6	Gaseous-Phase Movement in UZ	350
1.2.3.3.1.2.7	8.3.1.2.2.7	UZ Hydrochemistry	325
<b>Underground Test Equipment &amp; Testing Support</b>			Subtotal: <b>2531</b>
1.2.3.5.2.2	8.3.1	Engineering, Design and Drilling Support	600
1.2.3.5.2.3	8.3.1.2.2.3.2	Integrated Data Acquisition System (IDAS)	100
1.2.3.9.3		Test Interference Evaluations	250
1.2.3.9.4		Tracers, Fluids and Materials	200
1.2.3.9.6		Field Test Coordinator Support	175
1.2.3.9.7		ESF Field Test Coordinator	1206
<b>Geophysics</b>			Subtotal: <b>395</b>
1.2.3.11.2		Surface Geophysics	295
1.2.3.11.3		ESF Geophysics	100
<b>Coordination and Planning</b>			Subtotal: <b>1085</b>
1.2.3.1		Coordination and Planning	1085

# WBS Elements Grouped by Priority and Functional Program

## Priority 3

WBS	SCP Number	Title		Funding
<b>Programs: Priority 3: Otherwise Irretrievable Data</b>			Priority 3 Total:	<b>7343</b>
<b>Ongoing Geochemistry Experiments</b>			Subtotal:	<b>1178</b>
1.2.3.2.1.1.1	8.3.1.3.2.1	Min. Petrol. & Rock Chemistry of Trnsp.		162
1.2.3.2.1.1.2	8.3.1.3.2.2	Mineralogic & Geochemical Alteration		80
1.2.3.2.1.2.2	8.3.1.3.3.2	Kinetics and Thermo-dynamics of Mineral		186
1.2.3.4.1.2.1	8.3.1.3.4.1	Batch Sorption Studies		90
1.2.3.4.1.3.1	8.3.1.3.5.1	Dissolved Species Concentration Limits		250
1.2.3.4.1.4.1	8.3.1.3.6.1	Dynamic Transport Column Exp.		290
1.2.3.4.1.4.2	8.3.1.3.6.2	Diffusion		120
<b>Tectonics/Seismicity Measurements</b>			Subtotal:	<b>1878</b>
1.2.3.2.5.5.2	8.3.1.8.5.2	Charact. of Igneous Intrusive Features		140
1.2.3.2.8.4.1	8.3.1.17.4.1	Historical and Current Seismicity		1693
1.2.3.2.8.4.10	8.3.1.17.4.10	Geodetic Leveling		45
<b>Hydrologic Monitoring</b>			Subtotal:	<b>2215</b>
1.2.3.3.1.1.1	8.3.1.2.1.1	Precip. & Meteor. Monitor. for Region.		200
1.2.3.3.1.1.2	8.3.1.2.1.2	Runoff & Streamflow		400
1.2.3.3.1.1.3	8.3.1.2.1.3	Regional Ground-water Flow System		150
1.2.3.3.1.2.1	8.3.1.2.2.1	UZ Infiltration		500
1.2.3.3.1.2.2	8.3.1.2.2.2	Water Movement Tracer Tests		90
1.2.3.3.1.2.7	8.3.1.2.2.7	UZ Hydrochemistry		100
1.2.3.3.1.3.1	8.3.1.2.3.1	Site SZ Ground-water flow system		655
1.2.3.3.1.3.2	8.3.1.2.3.2	SZ Hydrochemistry		120
<b>Coordination &amp; Planning</b>			Subtotal:	<b>2072</b>
1.2.3.1		Coordination and Planning		2072

# WBS Elements Grouped by Priority and Functional Program

## Priority 4

WBS	SCP Number	Title		Funding
<b>Programs: Priority 4: Other Key Scientific Studies</b>			Priority 4 Total:	<b>17406</b>
<b>C-Well Testing</b>			Subtotal:	<b>2676</b>
1.2.3.1		Coordination and Planning		937
1.2.3.3.1.1.4	8.3.1.2.1.4	Regional Hydro. Sys. Synth. & Modeling		100
1.2.3.3.1.3.1	8.3.1.2.3.1	Site SZ Ground-water flow system		714
1.2.3.5.3.11	8.3.1.2.3.1.2	Multiple Well Interference Tests at		500
1.2.3.3.1.3.3	8.3.1.2.3.3	SZ Hydro. Sys. Synthesis & Modeling		425
<b>Framework Studies</b>			Subtotal:	<b>1150</b>
1.2.3.2.2.1.1	8.3.1.4.2.1	Vert. and Lat. Dist. of Strat. Units in Site		950
1.2.3.2.2.1.2	8.3.1.4.2.2	Structural Features Within the Site Area		200
<b>UZ Percolation</b>			Subtotal:	<b>3915</b>
1.2.3.3.1.2.3	8.3.1.2.2.3	Perc. in the UZ - Surf. Based Study		2890
1.2.3.3.1.2.9	8.3.1.2.2.9	Site UZ Modeling & Synthesis		100
1.2.3.5.3.5	8.3.1.2.2.3.2	UZ, Vert. and Seis. Prof., & Prot. Drhls. &		750
1.2.3.5.1		Sample Management Facility		175
<b>UZ Infiltration</b>			Subtotal:	<b>285</b>
1.2.3.1		Coordination and Planning		110
1.2.3.3.1.2.1	8.3.1.2.2.1	UZ Infiltration		175
<b>EQ 3/6 Support</b>			Subtotal:	<b>626</b>
1.2.3.4.2		Geochemical Modelling		381
1.2.3.1		Coordination and Planning		245

# WBS Elements Grouped by Priority and Functional Program

## Priority 4

WBS	SCP Number	Title		Funding
<b>Geochemistry Studies</b>			Subtotal:	<b>4812</b>
1.2.3.2.1.1.1	8.3.1.3.2.1	Min, Petrol. & Rock Chemistry of Trnsp.		421
1.2.3.2.1.1.2	8.3.1.3.2.2	Mineralogic & Geochemical Alteration		589
1.2.3.4.1.1	8.3.1.3.1	Groundwater Chemistry Model		186
1.2.3.4.1.2.1	8.3.1.3.4.1	Batch Sorption Studies		681
1.2.3.4.1.2.3	8.3.1.3.4.3	Sorption Models		162
1.2.3.4.1.3.1	8.3.1.3.5.1	Dissolved Species Concentration Limits		818
1.2.3.4.1.3.2	8.3.1.3.5.2	Colloid Behavior		70
1.2.3.4.1.4.1	8.3.1.3.6.1	Dynamic Transport Column Exp.		534
1.2.3.4.1.5.1	8.3.1.3.7.1	Retardation Sensitivity Analysis		601
1.2.3.4.1.5.2	8.3.1.3.7.2	Demo. of Application Laboratory Data		500
1.2.3.10.1		Characterization Techniques for the Altered Zone		125
1.2.3.10.2		Characterization of Thermal Effects on the Altered Zone		125


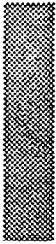









# WBS Elements Grouped by Priority and Functional Program





## Priority 4

WBS	SCP Number	Title	Funding
<b>Programs: Priority 4: Other Key Scientific Studies continued</b>			
<b>Tectonics</b>			Subtotal: <b>1715</b>
1.2.3.2.5.3.1	8.3.1.8.3.1	Effects of Tect. Proc. & Events on Avg. Perc. Flux Rates	80
1.2.3.2.8.3.1	8.3.1.17.3.1	Relevant EQ Sources	200
1.2.3.2.8.3.3	8.3.1.17.3.3	Grd. Mot. from Region. EQ & U/G Nuc.	145
1.2.3.2.8.3.4	8.3.1.17.3.4	Eff. of Local Site Geol. on Surf. & Subsurf. Motions	65
1.2.3.2.8.4.3	8.3.1.17.4.3	Quat. Faulting w/in 100 km of Yucca Mtn.	350
1.2.3.2.8.4.4	8.3.1.17.4.4	Quat. Faulting in NE-Trending Fault Zones	120
1.2.3.2.8.4.5	8.3.1.17.4.5	Detachment Faults	195
1.2.3.2.8.4.6	8.3.1.17.4.6	Quat. Faulting W/in the Site Area	390
1.2.3.2.8.4.12	8.3.1.17.4.12	Tectonic Models & Synthesis	170
<b>Volcanism</b>			Subtotal: <b>1065</b>
1.2.3.2.5.1.1	8.3.1.8.1.1	Probability of Volcanic Eruption	167
1.2.3.2.5.1.2	8.3.1.8.1.2	Effects of a Volc. Erupt. Penetrating the	365
1.2.3.2.5.5.1	8.3.1.8.5.1	Charact. of Volcanic Features	533
<b>Climatology</b>			Subtotal: <b>1102</b>
1.2.3.6.2.1.2	8.3.1.5.1.2	Paleoclim. Study of Lake, Playa, & Marsh Deposits	244
1.2.3.6.2.1.3	8.3.1.5.1.3	Climatic Implications of Terrestrial Paleocology	58
1.2.3.6.2.1.6	8.3.1.5.1.6	Future Regional Climate and Environments	600
1.2.3.6.2.2.1	8.3.1.5.2.1	Quaternary Regional Hydrology	200
<b>Resource Assessment</b>			Subtotal: <b>60</b>
1.2.3.7.2.1	8.3.1.9.2.1	Natural Resource Assessment	60

## FY1994 Site Budget

WBS	SCP Number	Title	Budget	PA Data?
<b>1.2.3 SITE INVESTIGATIONS</b>			<b>58965</b>	
<b>1.2.3.1 Coordination and Planning</b>			<b>7844</b>	
<b>1.2.3.2 Geology</b>			<b>13361</b>	
1.2.3.2.1.1.1	8.3.1.3.2.1	Mineralogy, Petrology & Rock Chemistry of Transport Pathways	725	
1.2.3.2.1.1.2	8.3.1.3.2.2	Mineralogic & Geochemical Alteration	741	
1.2.3.2.1.2.2	8.3.1.3.3.2	Kinetics and Thermodynamics of Mineral Evolution	186	
1.2.3.2.2.1.1	8.3.1.4.2.1	Vertical and Lateral Distribution of Stratigraphic Units in Site Area	1250	
1.2.3.2.2.1.2	8.3.1.4.2.2	Structural Features Within the Site Area	1856	
1.2.3.2.2.2.1	8.3.1.4.3.1	Systematic Acquisition of Site Specific Subsurface Information	455	
1.2.3.2.2.2.2	8.3.1.4.3.2	3-D Rock Characteristics Models	302	
1.2.3.2.5.1.1	8.3.1.8.1.1	Probability of Volcanic Eruption	167	
1.2.3.2.5.1.2	8.3.1.8.1.2	Effects of a Volcanic Eruption Penetrating the Repository	365	
1.2.3.2.5.3.1	8.3.1.8.3.1	Effects of Tectonic Processes & Events on Average Percolation Flux Rates	80	
1.2.3.2.5.5.1	8.3.1.8.5.1	Characteristics of Volcanic Features	533	
1.2.3.2.5.5.2	8.3.1.8.5.2	Characteristics of Igneous Intrusive Features	140	
1.2.3.2.6.2.1	8.3.1.14.2.1	Surface Facilities Exploration Program	220	
1.2.3.2.6.2.2	8.3.1.14.2.2	Surface Facilities Lab Tests & Material Properties Measurements	71	
1.2.3.2.6.2.3	8.3.1.14.2.3	Surface Facilities Field Tests & Characteristics Measurements	425	
1.2.3.2.7.1.1	8.3.1.15.1.1	Laboratory Thermal Properties	880	
1.2.3.2.7.1.2	8.3.1.15.1.2	Laboratory Thermal Expansion Testing	332	
1.2.3.2.7.1.3	8.3.1.15.1.3	Laboratory Determination of Mechanical Properties of Intact Rock	470	
1.2.3.2.7.1.4	8.3.1.15.1.4	Laboratories Determination of the Mechanical Properties of Fractures	600	
1.2.3.2.7.2.2	8.3.1.15.2.2	Site Ambient Thermal Conditions	80	
1.2.3.2.8.3.1	8.3.1.17.3.1	Relevant Earthquake Sources	200	
1.2.3.2.8.3.3	8.3.1.17.3.3	Ground Motion from Regional Earthquakes & Underground Nuclear Explosions	145	
1.2.3.2.8.3.4	8.3.1.17.3.4	Effect of Local Site Geology on Surface & Subsurface Motions	65	
1.2.3.2.8.4.1	8.3.1.17.4.1	Historical and Current Seismicity	1693	
1.2.3.2.8.4.2	8.3.1.17.4.2	Location & Recency of Faulting Near Prospective Surface Facilities	110	


## FY1994 Site Budget

WBS	SCP Number	Title	Budget	PA Data?
<b>1.2.3.2 Geology (continued)</b>			<b>13361</b>	
1.2.3.2.8.4.3	8.3.1.17.4.3	Quaternary Faulting within 100 km of Yucca Mountain	350	
1.2.3.2.8.4.4	8.3.1.17.4.4	Quaternary Faulting in NE- Trending Fault Zones	120	
1.2.3.2.8.4.5	8.3.1.17.4.5	Detachment Faults	195	
1.2.3.2.8.4.6	8.3.1.17.4.6	Quaternary Faulting within the Site Area	390	
1.2.3.2.8.4.10	8.3.1.17.4.10	Geodetic Leveling	45	
1.2.3.2.8.4.12	8.3.1.17.4.12	Tectonic Models & Synthesis	170	
<b>1.2.3.3 Hydrology</b>			<b>12569</b>	
1.2.3.3.1.1.1	8.3.1.2.1.1	Precipitation & Meteorology Monitoring for Regional Hydrology	200	
1.2.3.3.1.1.2	8.3.1.2.1.2	Runoff & Streamflow	400	
1.2.3.3.1.1.3	8.3.1.2.1.3	Regional Ground-water Flow System	150	
1.2.3.3.1.1.4	8.3.1.2.1.4	Regional Hydrology System Synthesis & Modeling	100	
1.2.3.3.1.2.1	8.3.1.2.2.1	Unsaturated Zone Infiltration	675	
1.2.3.3.1.2.2	8.3.1.2.2.2	Water Movement Tracer Tests	445	
1.2.3.3.1.2.3	8.3.1.2.2.3	Percolation in the Unsaturated Zone - Surface Based Study	3890	
1.2.3.3.1.2.4	8.3.1.2.2.4	Percolation in the Unsaturated Zone - ESF Study	3920	
1.2.3.3.1.2.6	8.3.1.2.2.6	Gaseous-Phase Movement in the Unsaturated Zone	350	
1.2.3.3.1.2.7	8.3.1.2.2.7	Unsaturated Zone Hydrochemistry	425	
1.2.3.3.1.2.9	8.3.1.2.2.9	Site Unsaturated Zone Modeling & Synthesis	100	
1.2.3.3.1.3.1	8.3.1.2.3.1	Site Saturated Zone Ground-water flow system	1369	
1.2.3.3.1.3.2	8.3.1.2.3.2	Saturated Zone Hydrochemistry	120	
1.2.3.3.1.3.3	8.3.1.2.3.3	Saturated Zone Hydrologic System Synthesis & Modeling	425	
<b>1.2.3.4 Geochemistry</b>			<b>4683</b>	
1.2.3.4.1.1	8.3.1.3.1	Groundwater Chemistry Model	186	
1.2.3.4.1.2.1	8.3.1.3.4.1	Batch Sorption Studies	771	
1.2.3.4.1.2.3	8.3.1.3.4.3	Sorption Models	162	
1.2.3.4.1.3.1	8.3.1.3.5.1	Dissolved Species Concentration Limits	1068	
1.2.3.4.1.3.2	8.3.1.3.5.2	Colloid Behavior	70	

## FY1994 Site Budget

WBS	SCP Number	Title	Budget	PA Data?
<b>1.2.3.4 Geochemistry (continued)</b>			<b>4683</b>	
1.2.3.4.1.4.1	8.3.1.3.6.1	Dynamic Transport Column Experiments	824	■
1.2.3.4.1.4.2	8.3.1.3.6.2	Diffusion	120	■
1.2.3.4.1.5.1	8.3.1.3.7.1	Retardation Sensitivity Analysis	601	■
1.2.3.4.1.5.2	8.3.1.3.7.2	Demonstration of Application Laboratory Data	500	
1.2.3.4.2		Geochemical Modelling	381	
<b>1.2.3.5 Drilling</b>			<b>14385</b>	
1.2.3.5.1		Sample Management Facility	3525	
1.2.3.5.2.1	8.3.1	Common-to-Drilling Support	3730	
1.2.3.5.2.2	8.3.1	Engineering, Design and Drilling Support	3315	
1.2.3.5.2.3	8.3.1.2.2.3.2	Integrated Data Acquisition System (IDAS)	100	
1.2.3.5.2.4		Title III Engineering For SBT	15	
1.2.3.5.3.5	8.3.1.2.2.3.2	Unsaturated Zone, Vertical and Seismic Profiles & Prototype Drillholes & Tests	750	■
1.2.3.5.3.11	8.3.1.2.3.1.2	Multiple Well Interference Tests at C-Hole Complex	500	
1.2.3.5.3.17	8.3.1.4.3.1	Geostatistical Drillholes	1500	■
1.2.3.5.3.20	8.3.1.14.2.1	Surface Facilities Drillholes	700	
1.2.3.5.3.22	8.3.1.17.4.8	In Situ Stress Drillhole & Tests & Quaternary Fault Trenchs	100	
1.2.3.5.3.23		Access and Pad Construction	150	
<b>1.2.3.6 Climatology and Meteorology</b>			<b>1102</b>	
1.2.3.6.2.1.2	8.3.1.5.1.2	Paleoclimate Study of Lake, Playa, & Marsh Deposits	244	■
1.2.3.6.2.1.3	8.3.1.5.1.3	Climatic Implications of Terrestrial Paleoecology	58	■
1.2.3.6.2.1.6	8.3.1.5.1.6	Future Regional Climate and Environments	600	■
1.2.3.6.2.2.1	8.3.1.5.2.1	Quaternary Regional Hydrology	200	■
<b>1.2.3.7 Resource Potential</b>			<b>60</b>	
1.2.3.7.2.1	8.3.1.9.2.1	Natural Resource Assessment	60	

**FY1994 Site Budget**

<b>WBS</b>	<b>SCP Number</b>	<b>Title</b>	<b>Budget</b>	<b>PA Data?</b>
<b>1.2.3.9 Special Studies</b>			<b>3536</b>	
1.2.3.9.3		Test Interference Evaluations	500	
1.2.3.9.4		Tracers, Fluids and Materials	400	
1.2.3.9.5		3-D Site Model	1080	
1.2.3.9.6		Field Test Coordinator Support	350	
1.2.3.9.7		ESF Field Test Coordinator	1206	
<b>1.2.3.10 Altered Zone Characterization</b>			<b>250</b>	
1.2.3.10.1		Characterization Techniques for the Altered Zone	125	
1.2.3.10.2		Characterization of Thermal Effects on the Altered Zone	125	
<b>1.2.3.11 Geophysics</b>			<b>1175</b>	
1.2.3.11.1		Borehole Geophysical Logging	580	
1.2.3.11.2		Surface Geophysics	295	
1.2.3.11.3		ESF Geophysics	300	