MTM E-14-B-24 Mexcaltepec

Technical Report on the Tuligtic Project, Puebla State, Mexico

Prepared For:
Almaden Minerals Ltd.
Suite 1103, 750 West Pender St.
Vancouver, British Columbia, Canada
V6C 2T8

Prepared by:
APEX Geoscience Ltd. [1]
Suite 1278, 885 West Georgia St.
Vancouver, British Columbia, Canada
V6C 3E8

And

Giroux Consultants Ltd.[2]
Suite 1215, 675 West Hastings St.
Vancouver, British Columbia, Canada
V6B 1N2

[1] Kristopher J. Raffle, B.Sc., P. Geo.
[2] Gary H. Giroux, P.Eng., MASc.

12 February 2014
Vancouver, British Columbia, Canada

Contents

1 Summary 1
2 Introduction 7
3 Reliance on Other Experts 7
4 Property Description and Location 8
5 Accessibility, Climate, Local Resources, Infrastructure and Physiography 12
6 History 13
7 Geological Setting and Mineralization 14
7.1 Regional Geology 14
7.2 Property Geology 17
7.3 Mineralization 19
7.3.1 Steam Heated Alteration, Replacement Silification and Other Surficial Geothermal Manifestations 21
8 Deposit Types 22
8.1 Epithermal Gold-Silver Deposits 22
8.2 Porphyry Copper-Gold-Molybdenum and Lead-Zinc Skarn Deposits 26
9 Exploration 26
9.1 Rock Geochemistry 26
9.2 Soil Geochemistry 27
9.3 Ground Geophysics 29
9.3.1 Magnetics 29
9.3.2 Induced Polarization / Resistivity 29
9.3.3 CSAMT / CSIP 30
10 Drilling 30
10.1 Introduction 30
10.2 Main Ixtaca and Ixtaca North Zones 33
10.3 Chemalaco Zone 39
11 Sample Preparation, Analyses and Security 45
11.1 Sample Preparation and Analyses 45
11.1.1 Rock Grab and Soil Geochemical Samples 45
11.1.2 Almaden Drill Core 46
11.1.3 Author's Drill Core 47
11.2 Quality Assurance / Quality Control Procedures 48
11.2.1 Analytical Standards 49
11.2.2 Blanks 53
11.2.3 Duplicates 54
11.3 Independent Audit of Almaden Drill Hole Database 56
11.3.1 Collar Coordinate and Downhole Survey Databases 56
11.3.2 Drill Core Assay Database 56
12 Data Verification 56
13 Mineral Processing and Metallurgical Testing 57
13.1 Overview 57
14 Mineral Resource Estimate 59
14.1 Data Analysis 59
14.2 Composites 63

14.3 Variography ... 65
14.4 Block Model ... 66
14.5 Bulk Density ... 67
14.6 Classification ... 70
14.7 Block Model Verification ... 79
15 Adjacent Properties ... 85
15.1 Santa Fe Metals Corp. Cuyoaco Property ... 85
15.1.1 Pau Skarn Project ... 85
15.1.2 Santa Anita Project ... 85
15.2 Minera Frisco S.A. de C.V. Espejeras ... 86
16 Other Relevant Data and Information ... 86
17 Interpretation and Conclusions ... 86
18 Recommendations ... 91
19 Date and Signature Page ... 93
20 Certificate of Author ... 94
20.1 K.J. Raffle Certificate of Author ... 94
20.2 G.H. Giroux Certificate of Author ... 95
21 References ... 96

APPENDIX 1: List of Drill Holes on the Tuligtic Project ... 98
APPENDIX 2: Contact Plots ... 110
APPENDIX 3: Semivariogram Models for Gold in Each Domain ... 120

Tables

Table 1-1. Measured Resource with AuEq Cut-off for Mineralized Portion of Blocks ... 4
Table 1-2. Indicated Resource with AuEq Cut-off for Mineralized Portion of Blocks ... 4
Table 1-3. Inferred Resource with AuEq Cut-off for Mineralized Portion of Blocks ... 5
Table 1-4. Comparison of 2014 vs. 2013 Mineral Resource Calculation for Mineralized Portion of Blocks (with 0.5 g/t AuEq Cut-off) ... 5
Table 1-5. Overall and Modelled Recovery Parameters for the Ixtaca Deposit ... 6
Table 4-1. Tuligtic Project Mineral Claims ... 8
Table 4-2. Exploitation Claim Minimum Expenditure/Production Value Requirements ... 11
Table 8-1. Classification of Epithermal Deposits ... 23
Table 10-1. Tuligtic Project Drilling Summary 2010 – 2013 ... 31
Table 10-2. Tuligtic Project Down Hole Survey Statistics ... 32
Table 10-3. Section 10+675E Significant Drill intercepts (Main Ixtaca and Ixtaca North Zones) ... 36
Table 10-4. Section 10+375E Significant Drill intercepts (Main Ixtaca Zone) ... 38
Table 10-5. Section 50+050N Significant Drill intercepts (Chemalaco Zone) ... 40
Table 12-1. Authors Independent Drill Core Sample Assays ... 57
Table 13-1. Metallurgical Composite Head Assay ... 58
Table 13-2. Overall and Modelled Recovery Parameters for the Ixtaca Deposit ... 58
Table 14-1: Assay statistics for gold and silver sorted by mineralized zone ... 61
Table 14-2: Cap Levels for Gold and Silver ... 63
Table 14-3: Capped Assay statistics for gold and silver sorted by domain ... 63

Table 14-4: 3 m Composite statistics for gold and silver sorted by mineralized zone ... 64
Table 14-5: Pearson Correlation Coefficients for Au – Ag in Geologic Domains 65
Table 14-6: Semivariogram Parameters for Gold and Silver 66
Table 14-7: Specific Gravity Determinations sorted by Cross Section 68
Table 14-8: Specific Gravity Determinations sorted by Lithology 68
Table 14-9: Kriging Parameters for Gold in each Domain 70
Table 14-10: Measured Resource for Mineralized Portion of Blocks 73
Table 14-11: Indicated Resource for Mineralized Portion of Blocks 73
Table 14-12: Inferred Resource for Mineralized Portion of Blocks 73
Table 14-13: M + I Resource for Mineralized Portion of Blocks 74
Table 14-14: Measured Resource for Total Blocks 75
Table 14-15: Indicated Resource for Total Blocks 75
Table 14-16: Inferred Resource for Total Blocks 75
Table 14-17: M +I Resource for Total Blocks 76
Table 14-18: Measured Resource for Mineralized Portion of Blocks 76
Table 14-19: Indicated Resource for Mineralized Portion of Blocks 77
Table 14-20: Inferred Resource for Mineralized Portion of Blocks 77
Table 14-21: Measured + Indicated Resource for Mineralized Portion of Blocks 77
Table 14-22: Measured Resource for Total Blocks 78
Table 14-23: Indicated Resource for Total Blocks 78
Table 14-24: Inferred Resource for Total Blocks 78
Table 14-25: Measured + Indicated Resource for Total Blocks 79
Table 14-26: Comparison of Composite Mean Au Grade to Block Mean Au Grade 79
Table 17-1. Overall and Modelled Recovery Parameters for the Ixtaca Deposit 89
Table 17-2: Measured Resource for Mineralized Portion of Blocks 90
Table 17-3: Indicated Resource for Mineralized Portion of Blocks 90
Table 17-4: Inferred Resource for Mineralized Portion of Blocks 90
Table 17-5: Measured + Indicated Resource for Mineralized Portion of Blocks 91
Table 18-1. Budget for Proposed 2014 Exploration, Tuligtic Project 92

Figures

Figure 4-1. General location 9
Figure 4-2. Tuligtic Project Mineral Claims 10
Figure 7-1. Regional Geology 16
Figure 7-2. Property Geology 18
Figure 8-1. Schematic Cross-section of an Epithermal Au-Ag Deposit 25
Figure 9-1. Exploration Overview Showing Gold in Soil Anomalies and Extent of Geophysical Surveys 28
Figure 10-1. Drill Hole Locations 35
Figure 10-2. Section 10+675E through the Ixtaca Main and North Zones 42
Figure 10-3. Section 10+375E through the Ixtaca Main Zone 43
Figure 10-4. Section 50+050N through the Chemalaco Zone 44
Figure 11-1. QA/QC Analytical Standards 51
Figure 11-2. QA/QC Blanks 54
Figure 11-3. QA/QC Duplicates 55

Figure 14-1: Isometric view looking N showing the geologic solids 60
Figure 14-2: Lognormal Cumulative Frequency Plot for Au as a Function of Domain ... 62
Figure 14-3: Lognormal Cumulative Frequency Plot for Ag as a Function of Domain ... 62
Figure 14-4: Isometric view looking NW showing blocks with ASH in brown, MHG in red, LGLM in blue, LGSH in green, NEHG in purple and NELGSH in orange 67
Figure 14-5: IXTACA 2250 Level Plan showing estimated gold in blocks 80
Figure 14-6: IXTACA 2200 Level Plan showing estimated gold in blocks 81
Figure 14-7: IXTACA 2150 Level Plan showing estimated gold in blocks 82
Figure 14-8: IXTACA 2100 Level Plan showing estimated gold in blocks 83
Figure 14-9: IXTACA 2050 Level Plan showing estimated gold in blocks 84

1 Summary

This Technical Report (the "Report") is written for the Tuligtic Gold-Silver Project (the "Property" or the "Tuligtic Property"), which is held 100 percent (%) by Compania Minera Gorrión S.A. de C.V. (Minera Gorrión), a wholly owned subsidiary of Almaden Minerals Ltd. (together referred to as "Almaden"). The Tuligtic Project comprises two mineral claims totalling 14,229.55 hectares (ha) located within Puebla State, 80 kilometres (km) north of Puebla City, and 130 km east of Mexico City. This report is written to comply with standards set out in National Instrument (NI) 43-101 for the Canadian Securities Administration (CSA), and is a technical summary of available geologic, geophysical, geochemical and diamond drill hole information along with a resource update for the project.

During 2013, Almaden retained APEX Geoscience Ltd. ("APEX"), and Giroux Consultants Ltd. (Giroux), to complete an independent technical report on behalf of Almaden specific to the Tuligtic Gold-Silver Project that encompasses the Ixtaca Zone deposit that includes the Ixtaca Main, North and Chemalaco zones. The lead author, Mr. Kristopher J. Raffle, P.Geo., Principal of APEX, an independent qualified person as defined by NI 43-101, conducted a property visit on November 20, 2013 and on previous occasions on September 23, 2012 and between October 17 and 20, 2011. The second author, Mr. Gary H. Giroux, P.Eng., MASc., an independent qualified person and Principal of Giroux is responsible for the Mineral Resource Estimate presented in Section 14 of the Technical Report. Mr. Raffle is responsible for all other sections of the Technical Report.

Almaden acquired the Cerro Grande claims of the Tuligtic Project in 2001 following the identification of surficial clay deposits that were interpreted to represent high-level epithermal alteration. Subsequent geologic mapping, rock, stream silt, soil sampling and induced polarization (IP) geophysical surveys identified porphyry copper and epithermal gold targets within an approximately 5 x 5 km area of intensely altered rock. In July 2010 Almaden initiated a diamond drilling program to test epithermal alteration within the Tuligtic Property, resulting in the discovery of the Ixtaca Zone. The first hole, TU-10-001 intersected 302.42 metres of 1.01 g/t Au and 48 g/t Ag and multiple high grade intervals including 44.35 metres of 2.77 g/t Au and 117.7 g/t Ag.

Within the Tuligtic Project, argillaceous limestone of the Late Jurassic to Early Cretaceous Upper Tamaulipas formation is underlain by transitional calcareous clastic rocks including siltstone, grainstone, mudstone, and shale. During the Laramide orogeny the carbonate package was intensely deformed into a series of thrust-related east verging anticlines. Calcareous shale units appear to occupy the cores of the anticlines while the thick bedded limestone/mudstone units occupy the cores of major synclines at the Ixtaca Zone. Limestone basement units are crosscut by intensely altered intermediate composition dykes. The deformed Mesozoic sedimentary sequence is discordantly overlain by epithermal altered Cenozoic bedded crystal tuff of the upper Coyoltepec subunit.

Between 2001 and 2013, Almaden's exploration at the Tuligtic Property included geologic mapping and prospecting, alteration mineralogic characterisation, rock and soil geochemical sampling, ground magnetics, IP and resistivity, Controlled Source Audio-frequency Magnetotelluric (CSAMT), and Controlled Source Induced Polarization (CSIP) geophysical surveys resulting in the identification of five anomalous zones: the Ixtaca, Ixtaca East, Caleva, Azul, and Sol zones. Since 2010, a total of 423 diamond drill holes have been drilled at the Tuligtic Gold-Silver Project, totalling 137,438 m.

The previous maiden NI 43-101 compliant mineral resource estimate for the Ixtaca Deposit was derived from the drilling of 225 diamond drill holes between July, 2010 and November 13, 2012. The maiden resource for the Ixtaca deposit was announced on January 31, 2013 and consisted of an indicated mineral resource of 56.99 million-tonnes, comprising 2.02 million-ounces AuEq at an average grade of 1.10 g/t AuEq; and an inferred mineral resource of 41.53 million-tonnes, comprising 1.55 million-ounces AuEq at an average grade of 1.16 g/t AuEq, each using a cut-off grade of 0.5 g/t AuEq. Ixtaca Deposit mineralization has been classified as measured, indicated and inferred mineral resource according to the definitions from NI 43-101 and from CIM (2005). A cut-off of 0.50 g/t AuEq has been highlighted as a possible cut-off for open pit mining. At this time, however, no economic studies have been completed and the economic cut-off is unknown.

The 225 holes drilled between July, 2010 and November 13, 2012 totalled 81,971 m and identified the Main Ixtaca, Ixtaca North and Chemalaco zones. Diamond drilling at 25 to 50 m section spacing defined the Main Ixtaca and Ixtaca North as NE-oriented sub-vertical zones and a strike length of approximately 650 m. High-grade mineralization was intersected to depths of 200 to 300 m vertically from surface. The Chemalaco Zone was identified as dipping moderately-steeply over a strike length of 350 m along a series of five ENE (070 degrees) oriented sections spaced at intervals of 50 to 100 m. High grade mineralization having a true-width ranging from less than 30 and up to 60 m was intersected beneath approximately 30 m of tuff to a vertical depth of 550 m, or approximately 600 m down-dip.

During 2013 and subsequent to the November 13, 2012 cut-off of the maiden mineral resource estimate, Almaden drilled 198 holes totalling 55,467 m. A total of 79 holes were drilled at the Main Ixtaca Zone, 40 holes at the Ixtaca North Zone and 79 holes at the Chemalaco Zone. Drilling during 2013 focused on expanding the deposit and upgrading resources previously categorized as inferred to higher confidence measured and indicated categories.

The Main and North zones have been defined over 650 m and tested over 1000 m strike length with high-grade mineralization intersected to depths up to 350 m vertically from surface. The strike length of the Chemalaco Zone has been extended to 450 m with high-grade mineralization intersected to a vertical depth of 550 m, or approximately 700 m down-dip. An additional sub-parallel zone has been defined underneath the Chemalaco Zone dipping 25 to 50 degrees to the WSW, intersected to a vertical depth of 250 m, approximately 400 m down-dip over a 250 m strike length.

The epithermal vein system at the Main Ixtaca and Ixtaca North zones is associated with two subparallel ENE (060 degrees) trending, subvertical to steeply north dipping dyke zones. A series of 2 m to over 20 m true width dykes occur within an approximately 100 m wide zone. The Ixtaca North dyke zone is narrower and comprises a steeply north-dipping zone of two or three discrete dykes ranging from 5 to 20 m in width. Epithermal vein mineralization occurs both within the dykes and sedimentary host rocks, with the highest grades often occurring within or marginal to the dykes. Vein density decreases outward to the north and south from the dyke zones resulting in the formation of two high-grade zones that lack sharp geologic boundaries. On surface, the Main Ixtaca and Ixtaca North zones are separated by a steep sided ENE trending valley.

The bulk of Main Ixtaca and Ixtaca North Zone mineralization is bound within an ENE-verging asymmetric synform. The synform is cored by a structurally thickened sequence of argillaceous limestone that grades laterally and at depth through transition units, into calcareous shale at depth. The Limestone sequence thins to the west along the rising limb of an ENE-verging antiform. The Main Ixtaca and Ixtaca North vein systems and the dykes transect the antiform sub-perpendicular to the strike of the fold axis. Vein density decreases within shale units coring the antiform, and mineralization is confined near the axis of the antiform within a west dipping tabular zone of low-grade mineralization having a true thickness ranging from 150 to 200 m. Mineralized basement rocks are unconformably overlain by crystal tuff, which is also mineralized. High-grade zones of mineralization are present within the tuff vertically above the Main Ixtaca and Ixtaca North vein systems. The high-grade zones transition laterally into low grade mineralization, which together form a broad tabular zone of mineralization at the base of the tuff unit.

The Chemalaco Zone (also known as the Northeast Extension) has a strike length of approximately 450 m as defined by drilling along a series of ENE (070 degrees) oriented sections spaced at intervals of 25 to 50 m, and near-surface oblique NNW-SSE oriented drill holes. The Chemalaco Zone dips moderately-steeply at approximately 55 degrees to the WSW. Chemalaco Zone mineralization is interpreted to occur within the hinge zone of a shale cored antiform. Near surface along the axis of the antiform a narrow zone of structurally thinned, brecciated, and mineralized limestone is unconformably overlain by mineralized tuff rocks. At a vertical depth of approximately 50 m below surface, high-grade shale-hosted mineralization dips moderately-steeply WSW sub-parallel to the interpreted axial plane of the antiform. The footwall of the high-grade zone is marked by a distinct 20 to 30 m true-thickness felsic porphyry dyke (Chemalaco Dyke), which is also mineralized. The Chemalaco Dyke has been interested in multiple drill holes ranging from 250 to 550 m vertically below surface, and its lower contact currently marks the base of Chemalaco Zone mineralization.

Based upon the results of the diamond drilling since November 13, 2012, an update to the maiden mineral resource for the Ixtaca deposit has been prepared by Giroux Consultants Ltd. Preliminary metallurgy has shown roughly equivalent metal recoveries for Au and Ag, therefore the mineral resource estimate is presented at a series of AuEq cut-offs based on a three years trailing average price of $1,540 per-ounce Au, and $30 per-ounce Ag, and assuming one could mine to the limits of the mineralized solids and no edge dilution is included. Ixtaca Zone mineralization has been classified as a Measured, Indicated and Inferred Mineral Resource according to the definitions from NI 43-101 and from CIM (2005). A cut-off of 0.50 g/t AuEq has been highlighted as a possible cut-off for open pit mining (Tables 1-1 to 1-3). At this time, however, no economic studies have been completed and the economic cut-off is unknown. Table 1-4 below compares the 2013 maiden mineral resource estimate with the updated 2014 mineral resource estimate.

Table 1-1. Measured Resource with AuEq Cut-off for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	76,450,000	0.31	19.77	0.70	767	48,590	1,713
0.20	56,390,000	0.40	25.36	0.89	725	45,980	1,621
0.25	49,780,000	0.44	27.91	0.98	704	44,670	1,573
0.30	44,590,000	0.48	30.27	1.07	682	43,400	1,528
0.40	36,490,000	0.55	34.89	1.23	641	40,930	1,438
0.50	**30,440,000**	**0.61**	**39.44**	**1.38**	**599**	**38,600**	**1,351**
0.60	25,880,000	0.67	43.81	1.53	561	36,450	1,271
0.70	22,320,000	0.73	48.00	1.67	525	34,450	1,196
0.80	19,430,000	0.79	52.07	1.80	494	32,530	1,127
1.00	15,620,000	0.88	58.66	2.03	444	29,460	1,018
2.00	6,000,000	1.33	86.51	3.01	256	16,690	581

Table 1-2. Indicated Resource with AuEq Cut-off for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	207,050,000	0.25	13.16	0.50	1,631	87,600	3,342
0.20	146,240,000	0.32	17.08	0.65	1,490	80,310	3,056
0.25	126,310,000	0.35	18.88	0.72	1,421	76,670	2,912
0.30	109,150,000	0.38	20.76	0.79	1,344	72,850	2,762
0.40	81,850,000	0.45	24.76	0.93	1,189	65,160	2,458
0.50	**62,610,000**	**0.52**	**28.88**	**1.08**	**1,049**	**58,140**	**2,182**
0.60	48,940,000	0.59	33.11	1.23	927	52,100	1,942
0.70	39,520,000	0.65	37.09	1.37	828	47,130	1,746
0.80	32,950,000	0.71	40.60	1.50	750	43,010	1,588
1.00	23,850,000	0.81	47.06	1.73	624	36,090	1,327
2.00	5,910,000	1.39	72.81	2.81	265	13,830	534

Table 1-3. Inferred Resource with AuEq Cut-off for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	100,440,000	0.21	9.81	0.40	685	31,680	1,301
0.20	62,950,000	0.29	13.75	0.56	587	27,830	1,127
0.25	51,760,000	0.32	15.66	0.63	539	26,060	1,048
0.30	43,410,000	0.36	17.52	0.70	498	24,450	974
0.40	31,040,000	0.43	21.22	0.84	424	21,180	836
0.50	**22,700,000**	**0.50**	**24.99**	**0.98**	**362**	**18,240**	**717**
0.60	17,290,000	0.57	28.41	1.12	314	15,790	622
0.70	13,630,000	0.63	31.56	1.25	277	13,830	546
0.80	10,960,000	0.70	34.51	1.37	245	12,160	482
1.00	7,700,000	0.79	39.81	1.57	197	9,860	389
2.00	1,200,000	1.18	73.69	2.61	45	2,840	101

Where Mineralized Portion of Blocks means one could mine to the boundaries of the mineralized domains.

Table 1-4. Comparison of 2014 vs. 2013 Mineral Resource Calculation for Mineralized Portion of Blocks (with 0.5 g/t AuEq Cut-off)

Year	Measured Resource			Indicated Resource			Inferred Resource		
	Tonnes	Grade AuEq (g/t)	Contained Metalx1000 AuEq (ozs)	Tonnes	Grad e AuEq (g/t)	Contained Metalx1000 AuEq (ozs)	Tonnes	Grade AuEq (g/t)	Contained Metalx1000 AuEq (ozs)
2014	30,440,00	1.38	1,351	62,610,00	1.08	2,182	22,700,00	0.98	717
2013	-	-	-	56,990,00	1.10	2,019	41,530,00	1.16	1,552

Diamond drilling by Almaden has resulted in the identification of a measured mineral resource of 30.44 million-tonnes, comprising 1.35 million-ounces AuEq at an average grade of 1.38 g/t AuEq; an indicated mineral resource of 62.61 million-tonnes, comprising 2.18 million-ounces AuEq at an average grade of 1.08 g/t AuEq; and an inferred mineral resource of 22.70 million-tonnes, comprising 0.72 million-ounces AuEq at an average grade of 0.98 g/t AuEq.

In 2012, metallurgical testwork was completed on each of the Ixtaca Zone geologic domains in: limestone, limestone/dyke high grade (HG), shale (Chemalaco Zone) and volcanic tuff material. Modelling indicates that a combination of grinding to a p_{80} of 100-150µm, plus gravity recovery on the cyclone underflow, with recovery of gold and silver by means of bulk flotation, is a viable process route for the Ixtaca resource. A summary of metallurgical parameters for the main zones tested for this process route is presented in Table 1-5. While an acceptable economic baseline has been established, further opportunities exist for optimising the gold and silver recoveries from the resource. Further metallurgical work, including mineralogical work, process optimization of flotation and investigation of alternate reagent combinations on existing and fresh domain samples is planned for 2014.

Table 1-5. Overall and Modelled Recovery Parameters for the Ixtaca Deposit

Sample	**Head**		**Flotation only**		**Gravity**	**Combined Float + GRG**	
	Au (g/t)	Ag (g/t)	Au (Wt%)	Ag (Wt%)	Au (Wt%)	Au (Wt%)	Ag (Wt%)
Dyke	0.73	45.6	94.4	87.0	48.4	98.8	87.0
Limestone	0.76	49.3	85.7	79.9	58.7	90.5	79.9
Limestone/Dyke HG	2.01	123.5	92.0	88.8	58.7	96.8	88.8
Shale	0.93	46.4	93.2	83.5	54.9	97.9	83.5
Tuff (volcanic)	0.8	13.0	52.3	63.2	15.1	55.2	63.2

Based on the results of diamond drilling and the updated mineral resource estimate, limited additional drilling may be warranted to upgrade the inferred and indicated part of the Ixtaca mineral resource.

Additional diamond drilling may include up to 10,000 metres to upgrade the Ixtaca mineral resource. The estimated cost to complete additional diamond drilling is $1,100,000 (Phase 1). Baseline environmental, hydro-geological and open pit optimization engineering studies should be ongoing in order to work towards the completion of a preliminary economic assessment (PEA). The estimated cost to complete engineering studies is $500,000 (Phase 2).

2 Introduction

This Technical Report (the “Report”) is written for the Tuligtic Project (the “Property” or the “Tuligtic Property”), which is held 100 percent (%) by Compania Minera Gorrión S.A. de C.V. (Minera Gorrión), a wholly owned subsidiary of Almaden Minerals Ltd. (together referred to as “Almaden”). The Tuligtic Project comprises two mineral claims totalling 14,229.55 hectares (ha) within Puebla State, Mexico (Figure 4-1).

During 2013, Almaden retained APEX Geoscience Ltd. (“APEX”) and Giroux Consultants Ltd. (Giroux) to complete an updated independent technical report on behalf of Almaden specific to the Ixtaca Zone within the Tuligtic Property. The lead author, Mr. Kristopher J. Raffle, P.Geo., Principal of APEX, an independent qualified person as defined by NI 43-101, conducted a property visit on November 20, 2013 and on previous occasions on September 23, 2012 and between October 17 and 20, 2011. The second author, Mr. Gary H. Giroux, P.Eng., MASc., an independent qualified person and Principal of Giroux is responsible for the mineral resource estimate presented in Section 14 of the Technical Report. Mr. Raffle is responsible for all other sections of the Technical Report.

This report is written to comply with standards set out in National Instrument (NI) 43-101 for the Canadian Securities Administration (CSA), and is a technical summary of available geologic, geophysical, geochemical and diamond drill hole information. The authors, in writing this report use sources of information as listed in the references section. Government reports were prepared by qualified persons holding post-secondary geology, or related university degree(s), and are therefore deemed to be accurate. These reports, which were used as background information, are referenced in this Report in the “Geological Setting and Mineralization” section below. All currency amounts referred to in this Report are in Canadian dollars or Mexican pesos where indicated. All units in this Report are metric and Universal Transverse Mercator (UTM). Coordinates in this report and accompanying illustrations are referenced to North American Datum (NAD) 1983, Zone 14.

3 Reliance on Other Experts

With respect to legal title to the Cerro Grande and Cerro Grande 2 mineral claims, which comprise the Tuligtic Property, the authors have relied on the opinion of Lic. Mauricio Heiras Garibay. In a report provided to the authors on August 20, 2012, Mr. Heiras warrants that Minera Gorrión maintains 100% ownership of the two mineral claims comprising the Tuligtic Property via a December 13, 2011 Assignment of Rights Agreement completed with Minera Gavilán, S.A. de C.V., also a wholly owned subsidiary of Almaden. The claims are shown as being in good standing and held 100% by Minera Gavilán, S.A. de C.V on the Mexico Integrated System of Mining Administration (SIAM) website (http://www.economia-dgm.gob.mx/cartografia/).

4 Property Description and Location

The Tuligtic Project consists of two mineral claims totaling 14,229.55 ha (Table 4-1, and Figure 4-2). Almaden acquired the claims during 2001 as part of a regional exploration program. Minera Gorrión maintains 100% ownership of the two mineral claims comprising the Tuligtic Property via a December 13, 2011 Assignment of Rights Agreement completed with Minera Gavilán S.A. de C.V. also a wholly owned subsidiary of Almaden. The Property is not subject to any royalties, back-in rights, payments or other agreements and encumbrances. Almaden holds three (3) additional mineral claims having a total area of approximately 58,700 ha that surround the Tuligtic Project (Figure 4-2).

Table 4-1. Tuligtic Project Mineral Claims

Claim Name	Claim Number	Valid Until Date	Area (hectares)
Cerro Grande	219469	March 5, 2059	11,201.55
Cerro Grande 2	233434	February 23, 2059	3,028
		Total	**14,229.55**

The Property is located at: 19 degrees 40 minutes north latitude and 97 degrees 51 minutes west longitude; or UTM NAD83 Zone 14 coordinates: 618,800 m east and 2,176,100 m north. The Tuligtic Project is road accessible and is located within Puebla State, 80 kilometres (km) north of Puebla City, and 130 km east of Mexico City.

Following an amendment to the Mining Law of Mexico (the “Mining Law”) on April 28, 2005, there is no longer a distinction between the exploration mining concessions and exploitation mining concessions. The Mining Law permits the owner of a mining concession to conduct exploration for the purpose of identifying mineral deposits and quantifying and evaluating economically usable reserves, to prepare and to develop exploitation works in areas containing mineral deposits, and to extract mineral products from such deposits. Mining concessions have a duration of 50 years from the date of their recording in the Registry and may be extended for an equal term if the holder requests an extension within five years prior to the expiration date.

To maintain a claim in good standing holders are required to provide evidence of the exploration and/or exploitation work carried out on the claim under the terms and conditions stipulated in the Mining Law, and to pay mining duties established under the Mexican Federal Law of Rights, Article 263. Exploration work can be evidenced with investments made on the lot covered by the mining claim, and the exploitation work can be evidenced the same way, or by obtaining economically utilizable minerals. The Regulation of the Mining Law indicates the minimum exploration expenditures or the value of the mineral products to be obtained (Table 4-2).

Figure 4-1. General location

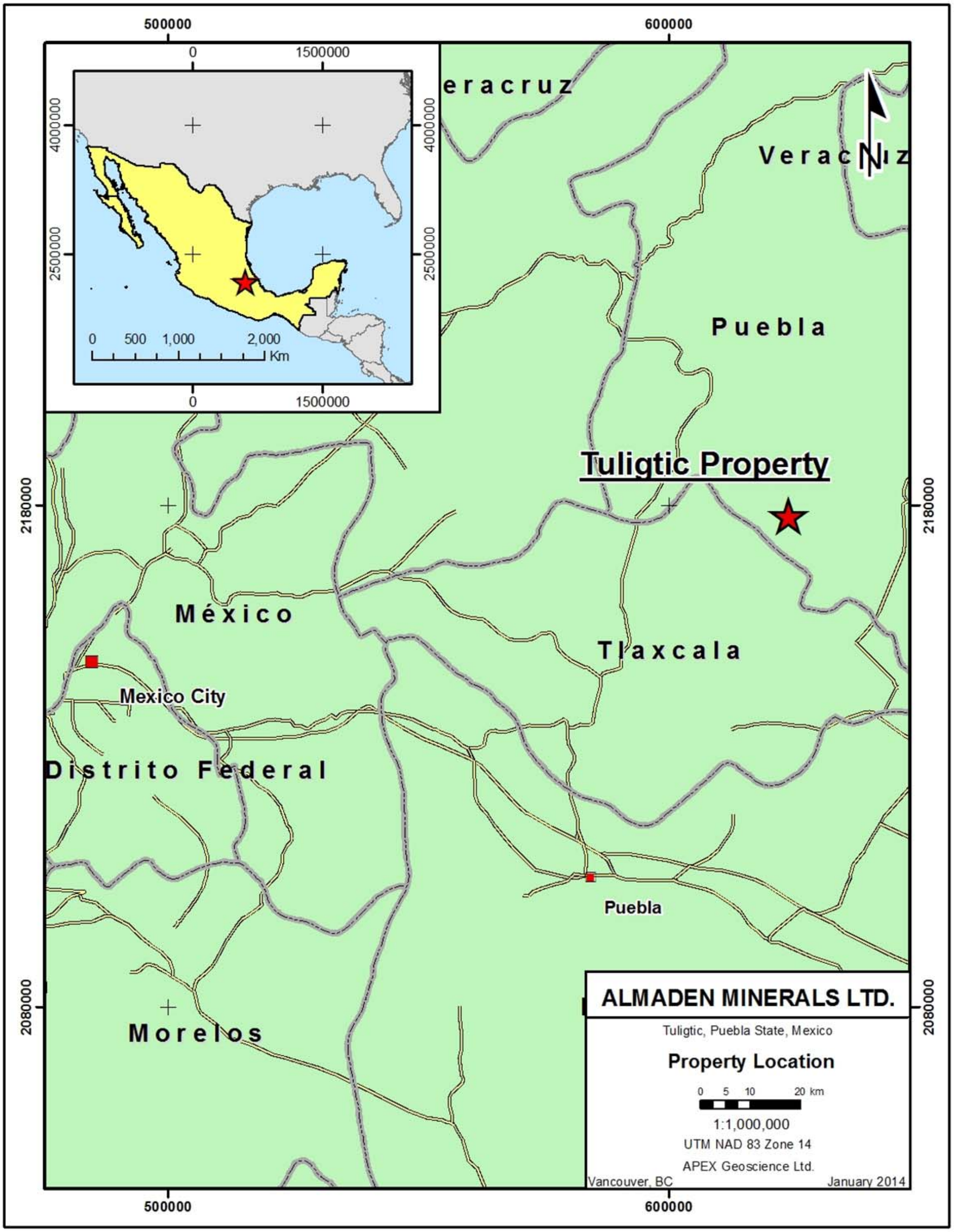


Figure 4-2. Tuligtic Project Mineral Claims

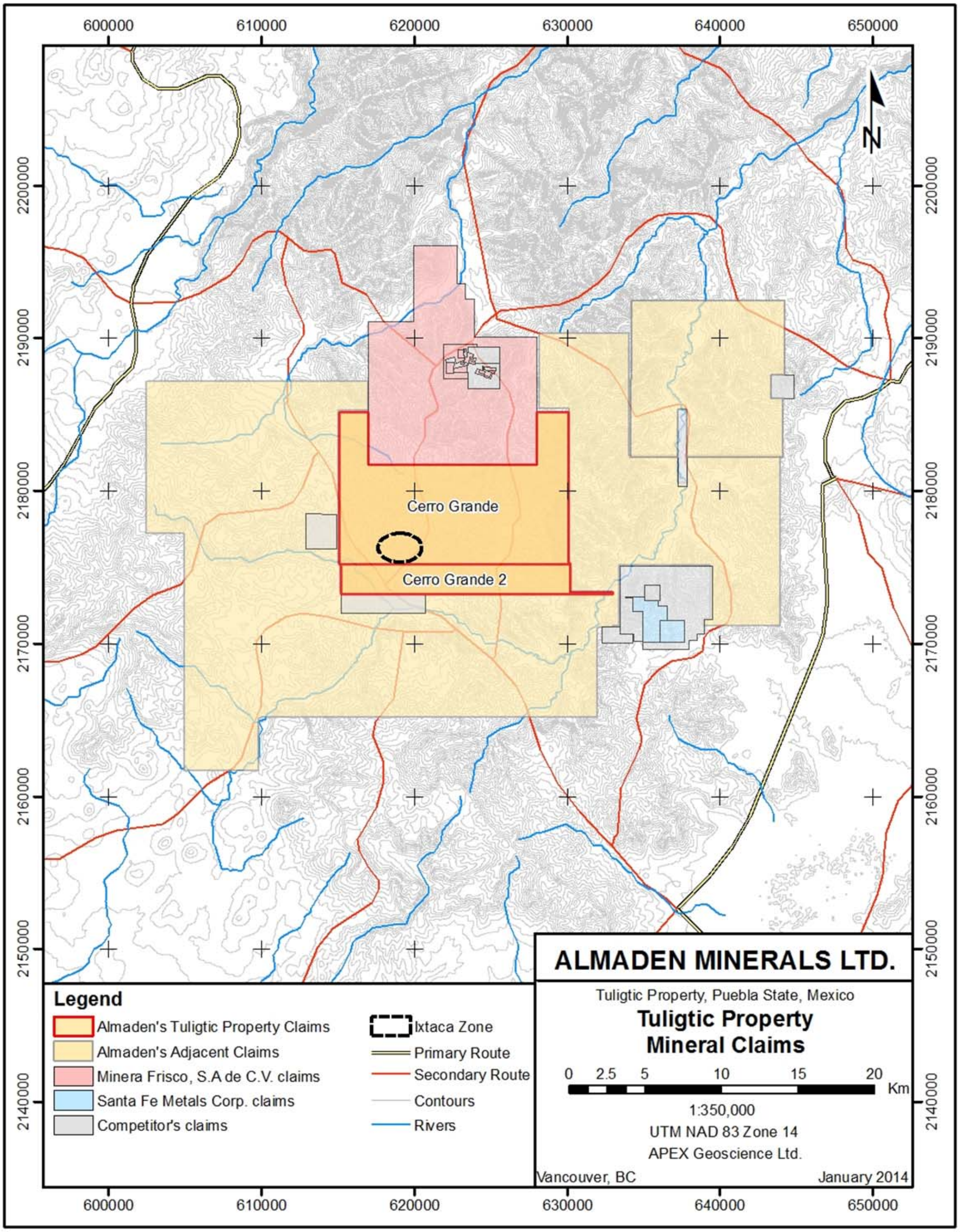


Table 4-2. Exploitation Claim Minimum Expenditure/Production Value Requirements

Area (hectares)	Fixed quota in Pesos (CAD$)	Additional annual quota per hectare in Pesos (CAD$ per hectare)			
		1st year	2nd to 4th year	5th to 6th year	7th year and after
<30	262.24 (20.98)	10.48 (0.84)	41.95 (3.36)	62.93 (5.03)	63.93 (5.11)
30 - 100	524.49 (41.96)	20.97 (1.68)	83.91 (6.71)	125.88 (10.07)	125.88 (10.07)
100 - 500	1,048.99 (83.92)	41.95 (3.36)	125.88 (10.07)	251.75 (20.14)	251.75 (20.14)
500 - 1000	3,146.98 (251.76)	38.81 (3.10)	119.91 (9.59)	251.75 (20.14)	503.51 (40.28)
1000 - 5000	6,293.97 (503.52)	35.66 (2.85)	115.39 (9.23)	251.75 (20.14)	1,007.03 (80.56)
5000 - 50000	22,028.92 (1,762.31)	32.52 (2.60)	111.19 (8.90)	251.75 (20.14)	2,014.07 (161.13)
> 50000	209,799.28 (16,783.94)	29.37 (2.35)	104.9 (8.39)	251.75 (20.14)	2,014.07 (161.13)

*Using a conversion of 1 MEX peso = 0.08 CAD$

The Tuligtic Property is currently subject to annual exploration/exploitation expenditure requirements of approximately CAD$130,000.00 per year.

Subject to the Mexico Mining Laws, any company conducting exploration, exploitation and refining of minerals and substances requires previous authorization from the Secretary of Environment and Natural Resources (SEMARNAT). Because mining exploration activities are regulated under Official Mexican Norms (specifically NOM-120) submission of an Environmental Impact Statement ("Manifestacion de Impacto Ambiental" or "MIA") is not required provided exploration activities to not exceed disturbance thresholds established by NOM-120. Exploration activities require submission to SEMARNAT of a significantly less involved "Preventive Report" (Informe Preventivo) which outlines the methods by which the owner will maintain compliance with applicable regulations. If the exploration activities detailed within the Preventive Report exceed the disturbance thresholds established by NOM-120, SEMARNAT will inform the owner that an MIA is required within a period of no more than 30 days.

The present scale of exploration activities within the Tuligtic Project are subject to NOM-120 regulation. In future, if significantly increased levels of exploration activities are anticipated submission of an Environmental Impact Statement may be required. Almaden has negotiated surface land use agreements with landowners within the area affected by diamond drilling activities.

At present, the author is not aware of any environmental liabilities to which the Property may be subject, or any other significant risk factors that may affect access, title, or Almaden's right or ability to perform work on the Property.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The Ixtaca deposit, the epithermal gold-silver target within the Tuligtic Property, is located 8 km northwest of the town of San Francisco Ixtacamaxtitlán, the county seat of the municipality of Ixtacamaxtitlán, Puebla State.

The project is accessible by driving 40 km east along Highway 119 from Apizaco, an industrial centre located approximately 50 km north of Puebla City, and then north approximately 20 km along a gravel road to the town of Santa Maria. The trip from Apizaco to site can be driven in approximately 1.5 hours. There is also access to the Property using gravel roads from the northeast via Tezhuitan and Cuyoaco, from the south via Libres and from the northwest via Chignahuapan. The Xicohtencatl Industrial complex lies 30 km southwest by paved road from the Tuligtic Project, and houses agricultural, chemical, biomedical and industrial manufacturing facilities and is serviced by rail. Puebla, the fourth largest city in Mexico has a population in excess of 4 million people, and includes one of the largest Volkswagen automotive plants outside Germany.

The Topography on the Tuligtic Project is generally moderate to steep hills with incised stream drainages. Elevation ranges from 2,300 metres (m) above sea level in the south to 2,800 m in the north. Vegetation is dominantly cactus and pines and the general area is also somewhat cultivated with subsistence vegetables, bean and corn crops. The region has a temperate climate with average temperatures ranging from 19°C in June to 10°C in December. The area experiences about 600 mm of precipitation annually with the majority falling during the rainy season, between June and September.

Exploration can be conducted year round within the Property; however, road building and drilling operations may be impacted by weather to some degree during the rainy season.

Electricity is available on the Property as the national electricity grid services nearby towns such as Santa Maria and Zacatepec. Water for exploration is available from year-round natural springs located at higher elevations above and upstream of the Ixtaca deposit.

Almaden has negotiated surface land use agreements with landowners within the area affected by diamond drilling activities. Additional or revised landowner agreements may be required in the event advanced operations are anticipated (for example potential tailings storage areas, potential waste disposal areas, and potential processing plant sites). The Mining Law provides claim owners the right to obtain the expropriation, temporary occupancy or creation of land easements necessary to carry out exploration and mining operations.

6 History

Throughout the Property there is evidence that surficial clay deposits were once mined. This clay alteration attracted Almaden to the area and was interpreted to represent high-level epithermal alteration. To the best of the authors knowledge no modern exploration was conducted on the project prior to Almaden's acquisition of claims during 2003.

On May 9, 2002 Almaden entered into a joint venture agreement with BHP Billiton World Exploration Inc. (BHP) to undertake exploration in eastern Mexico. Initial helicopter-borne reconnaissance programs were completed in May 2003 and March 2004 on select targets within the joint venture area of interest. The work resulted in the acquisition of five (5) separate properties, in addition to the previously acquired Cerro Grande claim of the present day Tuligtic Property. Following a review of the initial exploration data, effective January 20, 2005, BHP relinquished its interest in the six properties to Almaden (Almaden, 2005). The joint venture was terminated in 2006 (Almaden, 2006).

During January 2003, Almaden completed a program of geologic mapping, rock, stream silt sampling and induced polarization (IP) geophysical surveys at the Tuligtic Property (then known as the "Santa Maria Prospect"). The exploration identified both a porphyry copper and an epithermal gold target within an approximately 5 x 5 km area of intensely altered rock. At the porphyry copper target, stockwork quartz-pyrite veins associated with minor copper mineralization overprint earlier potassic alteration within a multi-phase intrusive body. A single north-south oriented IP survey line indentified a greater than 2 km long elevated chargeability response coincident with the exposed altered and mineralized intrusive system. Volcanic rocks exposed 1 km to the south of the mineralized intrusive display replacement silicification and sinter indicative of the upper parts of an epithermal system (the "Ixtaca Zone"). Quartz-calcite veins returning anomalous values in gold and silver and textural evidence of boiling were identified within limestone roughly 100 m below the sinter. The sinter and overlying volcanic rocks are anomalous in mercury, arsenic, and antimony (Almaden, 2004).

Additional IP surveys and soil sampling were conducted in January and February 2005, further defining the porphyry copper target as an area of high chargeability and elevated copper, molybdenum, silver and gold in soil. A total of eight (8) east-west oriented lines, 3 km in length, spaced at intervals of 200 m were completed over mineralized intrusive rocks intermittently exposed within gullies cutting through the overlying unmineralized ash deposits (Almaden, 2006).

The Tuligtic Property was optioned to Pinnacle Mines Ltd. in 2006 and the option agreement was terminated in 2007 without completing significant exploration (Almaden, 2007).

The Property was subsequently optioned to Antofagasta Minerals S.A. (Antofagasta) on March 23, 2009. During 2009 and 2010 Antofagasta, under Almaden operation, carried out IP geophysical surveys and a diamond drill program targeting the copper porphyry prospect (Figures 7-2, 9-1). Three additional IP survey lines were completed, and in conjunction with the previous nine (9) IP lines, a 2 x 2.5 km chargeability high anomaly, open to the west and south, was defined (Almaden, 2011). The 2009 drilling consisted of 2,973 m within seven (7) holes that largely intersected skarn type mineralization. Highlights of the drill program include 38 metres (m) of 0.13% Copper (Cu) from 164 to 202 m and 0.11% Cu from 416 to 462 m within hole DDH-01; 20 m of 0.17% Cu from 94 to 114 m and 26 m of 0.14% Cu from 316 to 342 m in hole DDH-02; 58 m of 0.17% Cu from 366 to 424 m in hole DDH-03 (including 14 m of 0.27% Cu from 410 to 424 m); 2 m of 0.63% Cu from 18 to 20 m in hole DDH-04; and 20 m of 0.11% Cu from 276 to 296 m and 8 m of 0.13% Cu in hole DDH-05. Molybdenum values were anomalous ranging up to 801 parts-per-million (ppm) (0.08%). Elevated gold values were also encountered including 2 m of 1.34 grams-per-tonne (g/t) from 178 to 180 m in DDH-01. On February 16, 2010, Almaden announced that Antofagasta has terminated its option to earn an interest in the Property (Almaden, 2009).

In July 2010 Almaden initiated a preliminary diamond drilling program to test epithermal alteration within the Tuligtic Property, resulting in the discovery of the Ixtaca Zone. The target was based on exploration data gathered by Almaden since 2001 including high gold and silver in soil and a chargeability and resistivity high anomaly (derived from an IP geophysical survey conducted by Almaden) topographically beneath Cerro Caolin, a prominent clay and silica altered hill. This alteration, barren in gold and silver, had been interpreted by Almaden to represent the top of an epithermal system which required drill testing to depth. The first hole, TU-10-001 intersected 302.42 metres of 1.01g/t gold and 48g/t silver and multiple high grade intervals including 44.35 metres of 2.77g/t gold and 117.7 g/t silver.

7 Geological Setting and Mineralization

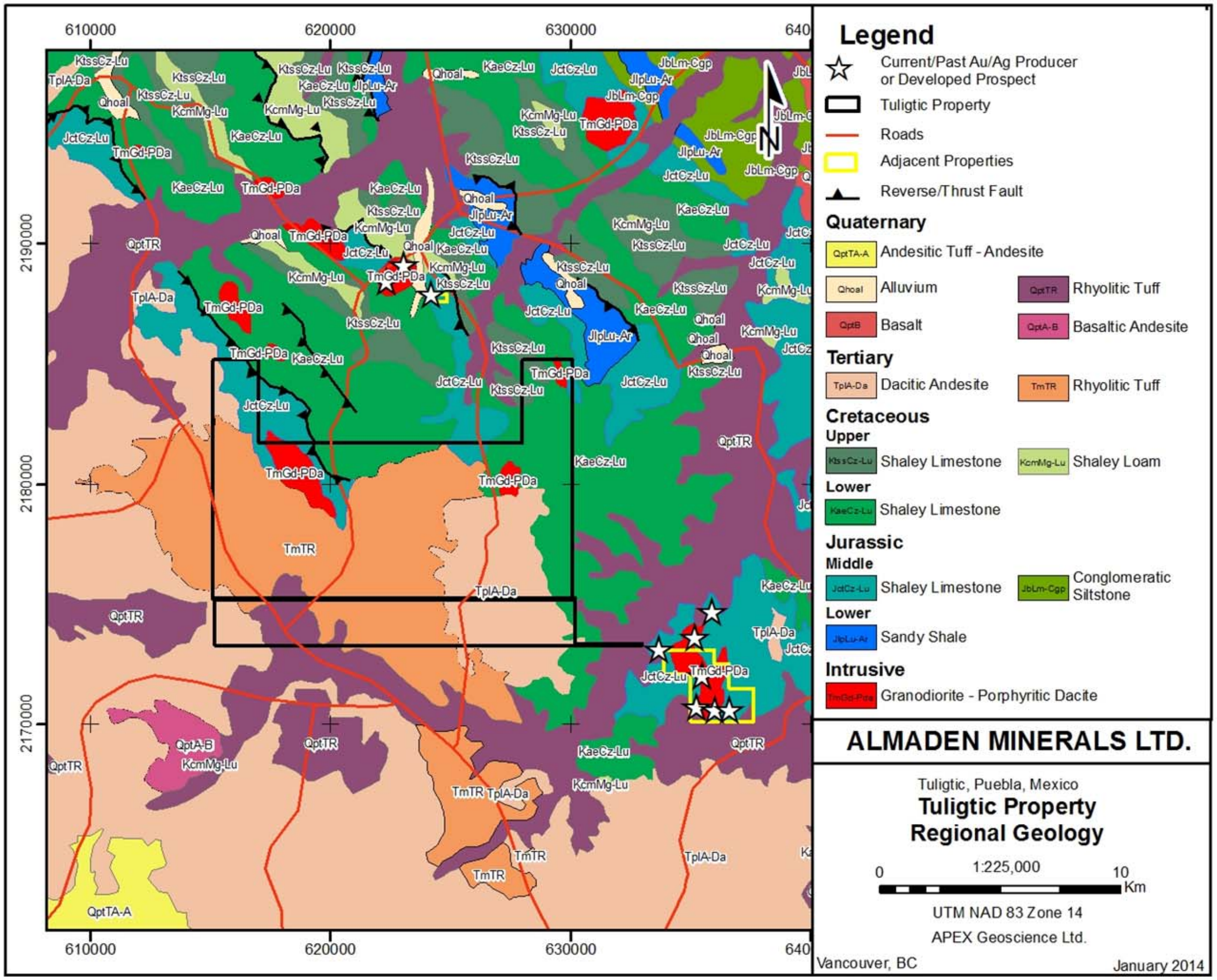
7.1 Regional Geology

The Tuligtic project is situated within the Trans Mexican Volcanic Belt (TMVB), a Tertiary to recent intrusive volcanic arc extending approximately east-west across Mexico from coast to coast and ranging in width from 10 to 300 km (Figure 7-1). The TMVB is the most recent episode of a long lasting magmatic activity which, since the Jurassic, produced a series of partially overlapping arcs as a result of the eastward subduction of the Farallon plate beneath western Mexico (Ferrari, 2011). The basement rocks of the eastern half of the TMVB are Precambrian terranes, including biotite orthogneiss and granulite affected by granitic intrusions, grouped into the Oaxaquia microcontinent (Ferrari et al., 2011; Fuentes-Peralta and Calderon, 2008). These are overlain by the Paleozoic Mixteco terrane, consisting of a metamorphic sequence known as the Acatlan complex and a fan delta sedimentary sequence known as the Matzitzi formation. Another sedimentary complex is found on top of the Mixteco terrane, represented by various paleogeographic elements such as the Mesozoic basins of Tlaxiaco, Zongolica, Zapotitlan, and Tampico-Misantla (Fuentes-Peralta and Calderon, 2008). The subducting plates associated with the TMVB are relatively young, with the Rivera plate dated at 10 Ma (million years) and the Cocos plate at 11 to 17 Ma.

The timing and nature of volcanism in the TMVB has been described by Garcia-Palomo et al. (2002). The oldest volcanic rocks in the central-eastern part of the TMVB were erupted ~13.5 Ma ago, followed by a nearly 10 Ma hiatus. Volcanic activity in the area resumed around 3.0-1.5 Ma. The composition of volcanic rocks ranges from basalt to rhyolite and exhibits calc-alkaline affinity. Extensive silicic volcanism in this area has been related to partial melting of the lower crust, hydrated by infiltration of slab-derived fluids during flat subduction (Ferrari et al., 2011). The Sierra Madre Occidental (SMO) style of volcanism is silicic and explosive as opposed to intermediate and effusive volcanism characteristic of the TMVB. Volcanic centres in the region were controlled by NE-SW trending normal faults, associated with horst-and-graben structures, resulting from a stress field with a least principal stress (σ_3) oriented to the NW.

The regional trend of the arc rocks is WNW, though more northerly trending transform faults, forming at a high angle to the TMVB, provide a structural control on the volcanic units (Coller, 2011). Compressional strike-slip and extensional faults also developed as a result of compressional and extensional periods during subduction. The NE-SW San Antonio fault system, which was still active during Late Pliocene, before the reactivation of the Taxco-Queretaro fault system, is characterized by extensional left-lateral oblique-slip kinematics (Coller, 2011). Bellotti et al. (2006) showed that NNW trending regional faults were right lateral in the Miocene, whereas the NNE to N-S trending faults observed at Ixtaca by Coller (2011) are related to the regional horst-and-graben development and likely to be purely extensional with possibly a component of right lateral movement, or trans-tensional.

Figure 7-1. Regional Geology



7.2 Property Geology

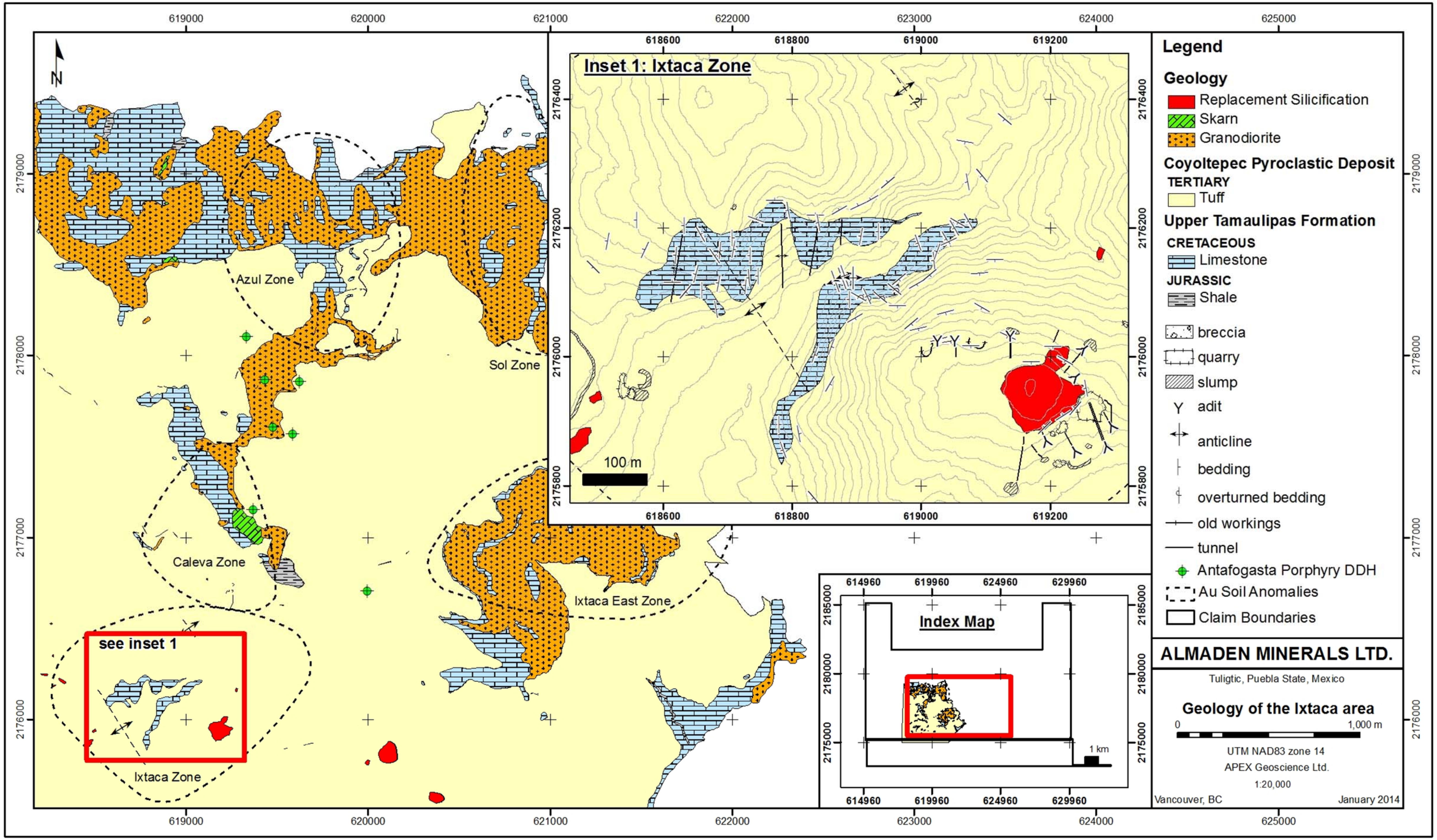
The stratigraphy of the Tuligtic area can be divided into two main sequences: a Mesozoic sedimentary rock sequence related to the Zongolica basin and a sequence of late Tertiary igneous extrusive rocks belonging to the TMVB (Fuentes-Peralta & Calderon, 2008; Tritlla et al., 2004). The sedimentary sequence is locally intruded by plutonic rocks genetically related to the TMVB (Figure 7-2). The sedimentary complex at Tuligtic corresponds to the Upper Tamaulipas formation (Reyes-Cortes 1997). This formation, Late Jurassic to Early Cretaceous in age, has regionally been described (Reyes-Cortes, 1997) as a sequence of grey-to-white limestone, slightly argillaceous, containing bands and nodules of black flint. The drilling conducted by Almaden has allowed for more detailed characterisation of the Upper Tamaulipas Formation carbonate units in the Tuligtic area. The sequence on the Project consists of clastic calcareous rocks. An argillaceous limestone (termed mudstone) grades into what have been named transition units and shale. The transition units are calcareous siltstones and grainstones. These rocks are not significant in the succession but mark the transition from mudstone to underlying calcareous shale. Typical of the transition units are coarser grain sizes. The lower calcareous “shale” units exhibit pronounced laminated bedding and are typically dark grey to black in colour, although there are green coloured beds as well. The shale units appear to have been subjected to widespread calc-silicate alteration.

Both the shale and transition units have very limited surface exposure and may be recessive. The entire carbonate package of rocks were intensely deformed by the Laramide orogeny, showing complex thrusting and chevron folding in the hinge zones of a series of thrust-related east verging anticlines in the Ixtaca area (Tritlla et al., 2004; Coller, 2011). The calcareous shale units appear to occupy the cores of the anticlines while the thick bedded limestone/mudstone units occupy the cores of major synclines identified in the Ixtaca zone.

The Tamaulipas limestones were intruded in the mid-Miocene by a series of magmatic rocks. The compositions are very variable, consisting of hornblende-biotite-bearing tonalites, quartz-plagioclase-hornblende diorites, and, locally, aphanitic diabase dykes (Carrasco-Nunez et al., 1997). In the central part of the Tuligtic project porphyry mineralization is hosted by and associated with a hornblende-biotite-quartz phyric granodiorite body. The contact between the granodiorite and the limestone is marked by the development of a prograde skarn.

In the Ixtaca epithermal area of the project, the limestone basement units are crosscut by intermediate dykes that are often intensely altered. In the vicinity of the Ixtaca zone these dykes are well mineralized especially at their contacts with limestone country rock. Petrography has shown that epithermal alteration in the dykes, marked by illite, adularia, quartz and pyrite has overprinted earlier calc-silicate endoskarn mineralogies (Leitch, 2011). Two main orientations have been identified for dykes in the Ixtaca area;

Figure 7-2. Property Geology



060 degrees (parallel to the Main Ixtaca and Ixtaca North zones) and 330 degrees (parallel to the Chemalaco Zone).

An erosional unconformity surface was formed subsequent to the intrusion of the porphyry mineralization-associated granodiorites. This paleo topographical surface locally approximates the current topography. Although not well exposed the unconformity is marked by depression localised accumulations of basal conglomerate comprised of intrusive and sedimentary boulders.

This deformed Mesozoic sedimentary sequence is discordantly overlain by late Cenozoic extrusive rocks whose genetic and tectonic interrelations are yet to be fully explained. Two main volcaniclastic units have been recognized in the area of Tuligtic: the Coyoltepec Pyroclastic deposit and the Xaltipan Ignimbrite (Carrasco-Nunez et al., 1997). Both units were covered by a thin (up to 1 m) quaternary 'tegument' (Morales-Ramirez 2002) of which only a few patches are left in the area of the property, but it is still widespread in the surrounding areas. This tegument is unconsolidated and composed of a very recent ash fall tuff rich in heavy minerals (mainly magnetite, apatite, and pyroxene).

The extensively altered pre-mineral Coyoltepec pyroclastic deposit has been divided by Carrasco-Nunez et al. (1997) into two subunits: the lower Coyoltepec subunit, which is not exposed in the area of the project, consists of a stratified sequence of surge deposits and massive, moderately indurated pyroclastic flow deposits with minor amounts of pumice and altered lithic clasts.

The upper Coyoltepec subunit, the main unit outcropping in the Tuligtic area, consists of a basal breccia or conglomerate overlain by bedded crystal tuff. The basal breccia is comprised of a lithic rhyolite tuff matrix composed of massive, indurated, coarse-gravel sized, lithic-rich pyroclastic flow deposits with pumice, andesitic fragments, free quartz, K-feldspar, plagioclase crystals, and minor amounts of limestone and shale clasts (Tritlla et al., 2004). The Coyoltepec volcanics are altered and mineralized. Gold silver mineralization is marked by widespread disseminated pyrite and quartz-calcite veinlets. The Coyoltepec volcanics are locally oxidised and weathered near surface and along structures.

The post-mineral Xaltipan ignimbrite is not seen in the Ixtaca area and mainly found in topographic lows south of the Tuligtic property. It consists of a very recent (0.45 ± 0.09 Ma, Carrasco-Nunez et al., 1997), pinkish to brownish-grey rhyolitic ignimbrite unit with different grades of welding, containing abundant pumice fragments, andesite lithic fragments, and small clasts of black obsidian (Tritlla et al., 2004).

7.3 Mineralization

Two styles of alteration and mineralization have been identified in the area: (1) copper-molybdenum porphyry style alteration and mineralization hosted by diorite and quartz-diorite intrusions; (2) silver-gold low-sulphidation epithermal quartz-bladed calcite veins hosted by carbonate rocks and spatially associated with overlying volcanic hosted texturally destructive clay alteration and replacement silicification.

Outcropping porphyry-style alteration and mineralization is observed in the bottoms of several drainages where the altered intrusive complex is exposed in erosional windows beneath post mineral unconsolidated ash deposits. Multiple late and post mineral intrusive phases have been identified crossing an early intensely altered and quartz-veined medium-grained feldspar phyric diorite named the Principal Porphyry. Other intrusive types include late and post mineral mafic dykes and an inter-mineral feldspar-quartz phyric diorite. Late mineral mafic dykes are fine grained and altered to chlorite with accessory pyrite. Calc-silicate (garnet-clinopyroxene) altered limestone occurs in proximity to the intrusive contacts and is crosscut by late quartz-pyrite veins. Early biotite alteration of the principal porphyry consists of biotite-orthoclase flooding of the groundmass. Quartz veins associated with early alteration have irregular boundaries and are interpreted to be representative of A-style porphyry veins. These are followed by molybdenite veins which are associated with the same wall rock alteration. Chalcopyrite appears late in the early alteration sequence. Late alteration is characterized by intense zones of muscovite-illite-pyrite overprinting earlier quartz-K-feldspar-pyrite ± chalcopyrite veining and replacing earlier hydrothermal orthoclase and biotite. Stockwork quartz-pyrite crosscuts the A-style veins and is associated with muscovite-illite alteration of biotite. The quartz-sericite alteration can be texturally destructive resulting in white friable quartz veined and pyrite rich rock. Pyrite is observed replacing chalcopyrite and in some instances chalcopyrite remains only as inclusions within late stage pyrite grains.

Epithermal mineralization on the Tuligtic property is considered to have no genetic relationship to the porphyry alteration and mineralization described above. The epithermal system is well preserved and there is evidence of a paleosurface as steam heated kaolinite and replacement silica alteration occur at higher elevations where the upper part of the Coyoltepec pyroclastic deposit is preserved.

The veining of Ixtaca epithermal system displays characteristics representative of intermediate and low sulphidation deposits. These include typical ore and gangue mineralogy (electrum, sphalerite, galena, adularia, carbonates), mineralization dominantly in open space veins (colloform banding, cavity filling). Assaying has indicated high contents of gold and silver. The high gold contents are rare in Mexico, where epithermal systems are dominantly silver-rich. Mineralized hydrothermal breccias showing multiphase development are commonly encountered within the main veins. Hydrothermal silicic/carbonate breccia zones occur within the limestone and dip steeply. These breccias are dominantly controlled by the main faults.

The Upper Tamaulipas formation, the dykes that crosscut it and the upper Coyoltepec volcanic subunit are the main host rocks to the epithermal vein system at Ixtaca. In the Main and Ixtaca North zones veining strikes dominantly ENE-WNW (060 degrees) parallel to a major dyke trend and at a very high angle to the N to NNW bedding and fold structures within the limestones. The veins of the Chemalaco Zone are hosted by the shaley carbonate units and strike to the NNW, dipping to the SSW. In the footwall to Chemalaco Zone a parallel dyke has been identified which is altered and mineralized. The Chemalaco Zone and the dyke are interpreted to strike parallel to bedding and to core an antiform comprised of shale.

There appear to be two major sets of veins which are related to the large structural setting. The main set of veins strike ENE (060 degrees) and dip steeply to the north and south and are hosted by limestone and dykes that crosscut the limestone. The second set of veins strike NNW (330 degrees) and dip shallowly to the west and is likely related to pre-existing bedding and structures within the limestone and shaley units. The Chemalaco Zone of veining strikes NNW (330 degrees) and is hosted by west dipping shale interpreted to core an overturned antiform.

Studies of mineral assemblages in hand specimen, transmitted and reflected light microscopy and SEM analyses were carried out in order to construct a paragenetic sequence of mineral formation. This work completed by Herrington (2011) and Staffurth (2012) revealed that veining occurred in three main stages. The first stage is barren calcite veining. This is followed by buff brown and pink colloform carbonate and silicate veins containing abundant silver minerals and lower gold. The third stage of veining contains both gold and silver mineralization. The dominant gold-bearing mineral is electrum, with varying Au:Ag ratios. The majority of grains contain 40-60 wt (weight) % gold but a few have down to 20 wt% (Staffurth, 2012). Gold content occasionally varies within electrum grains, and some larger grains seem to be composed of aggregates of several smaller grains of differing composition (Staffurth, 2012). Electrum often appears to have been deposited with late galena-clausthalite both of which are found as inclusions or in fractures in pyrite. It is also closely associated with silver minerals as well as sphalerite and alabandite. Gold is also present in uytenbogaardtite (Ag_3AuS_2). This mineral is associated with electrum, chalcopyrite, galena, alabandite, silver minerals and quartz in stage three mineralization (Herrington, 2011; Staffurth, 2012). Apart from electrum, the dominant silver bearing minerals are polybasite (-pearceite) and argentian tetrahedrite plus minor acanthite-naumannite, pyrargyrite and stephanite. They are associated with sulphides (Figure 8-1) or are isolated in gangue minerals (Staffurth, 2012).

The vein-related mineralization at Ixtaca does not have hard geologic boundaries. The mineralized zones are essentially vein zones, the outer boundaries of which are grade boundaries associated with decreased vein density.

7.3.1 Steam Heated Alteration, Replacement Silification and Other Surficial Geothermal Manifestations

One of the most striking features of the Ixtaca epithermal system is the kaolinite alteration, replacement silicification, and sinter carapace that remains uneroded in the vicinity of the Ixtaca Zone. This alteration has been identified over a roughly 5 x 5 km area and is interpreted to represent the upper levels of a preserved epithermal system. All three alteration types have formed in the tuffaceous units. When the source alkali-choride epithermal fluids boil, along with water vapour, CO_2 and H_2S also separate.

These gases rise and above the water table H_2S condenses in the vadose zone forming H_2SO_4. Near surface, the H_2SO_4 alters volcanic rocks to kaolinite and alunite and can dissolve volcanic glass (Hedenquist and Henley 1985b). This process is interpreted to be responsible for the kaolinite alteration, known as steam-heated alteration in the economic geology literature (eg White and Hedenquist, 1990). The resulting silica laden fluid can transport and re-precipitate silica at the water table in permeable host rocks. This mechanism can result in large tabular alteration features often referred to as a silica caps. Since gold is not transported by the gases or sulphuric acid, the silica cap is usually devoid of gold and silver, which is the case at Ixtaca (White and Hedenquist, 1990).

Sinter is diagnostic of modern epithermal systems where silica-rich fluids emanate as hot springs at the earth's surface. Sinters are the highest level manifestation of an epithermal system and consequently the first feature to be removed by erosion. Most epithermal gold-silver deposits that have been recognized show some degree of erosion and ancient sinters are typically poorly preserved in the geological record. The presence of preserved steam heated and replacement silica alteration and sinter at Ixtaca is thus a clear indication that the deposit was not significantly affected by erosion. At Ixtaca, the sinter facies and replacement silicification, where preserved, are located within the altered volcanic units.

8 Deposit Types

The principal deposit-type of interest on the Tuligtic Property is low- to intermediate-sulphidation epithermal gold-silver mineralization. This style of mineralization has been recognized at the Ixtaca Zone but property-scale high level epithermal alteration suggests that mineralization of this type can exist elsewhere on the project. These deposits are described more fully below. The Tertiary bodies intruding the Tamaulipas Limestones and the Tertiary volcanics, makes the Property also prospective for Porphyry copper-gold-molybdenum (Cu-Au-Mo) and peripheral Pb-Zn Skarn deposits.

8.1 Epithermal Gold-Silver Deposits

Gold and silver deposits that form at shallow crustal depths (<1,500 m) are interpreted to be controlled principally by the tectonic setting and composition of the mineralizing hydrothermal fluids. Three classes of epithermal deposits (high-sulphidation, intermediate-sulphidation and low-sulphidation) are recognized by the oxidation state of sulphur in the mineralogy, the form and style of mineralization, the geometry and mineralogy of alteration zoning, and the ore composition (Hedenquist et al., 2000; Hedenquist and White, 2005). Overlapping characteristics and gradations between epithermal classes may occur within a district or even within a single deposit. The appropriate classification of a newly discovered epithermal prospect can have important implications to exploration.

High-sulphidation and intermediate-sulphidation systems are most commonly hosted by subduction-related andesite/dacite volcanic arc rocks, which are dominantly calc-alkaline in composition. Low-sulphidation systems are more restricted, generally to rift-related bimodal (basalt, rhyolite) or alkalic volcanic sequences. The gangue mineralogy, metal contents and fluid inclusion studies indicate that near neutral pH hydrothermal fluids with low to moderate salinities form low- and intermediate-sulphidation class deposits whereas high-sulphidation deposits are related to more acidic fluids with variable low to high salinities. Low- and intermediate-sulphidation deposits are typically more vein-style while high-sulphidation deposits commonly consist primarily of replacement and disseminated styles of mineralization with subordinate veining. The characteristics of silver-gold mineralization in the Ixtaca Zone include banded, colloform and brecciated carbonate-quartz veining including locally abundant Mn-carbonate and rhodochrosite, indicating that this is primarily an intermediate-sulphidation epithermal district.

The mineralization discovered to date at Ixtaca exhibits features of both the low- and intermediate sulphidation epithermal classes (see Table 8-1). Several of the larger examples of this deposit type occur in Mexico and include the prolific historic epithermal districts of Pachuca, Guanajuato and Fresnillo.

Table 8-1. Classification of Epithermal Deposits

	Low-Sulphidation	Intermediate-Sulphidation	High-Sulphidation
Metal Budget	Au- Ag, often sulphide poor	Ag - Au +/- Pb - Zn; typically sulphide rich	Cu - Au - Ag; locally sulphide-rich
Host Lithology	bimodal basalt-rhyolite sequences	andesite-dacite; intrusion centred district	andesite-dacite; intrusion centred district
Tectonic Setting	rift (extensional)	arc (subduction)	arc
Form and Style of Alteration/ Mineralization	vein arrays; open space veins dominant; disseminated and replacement ore minor stockwork ore common; overlying sinter common; bonanza zones common	vein arrays; open space veins dominant; disseminated and replacement ore minor; stockwork ore common; productive veins may be km-long, up to 800 m in vertical extent	verins subordinate, locally dominant; disseminated and replacement ore common; stockwork ore minor.
Alteration Zoning	ore with quartz-illite-adularia (argillic); barren silicification and propylitic (quartz-chlorite-calcite +/- epidote) zones; vein selvedges are commonly narrow	ore with sericite-illite (argillic-sericitic); deep base metal-rich (Pb-Zn +/- Cu) zone common; may be spatially associated with HS and Cu porphyry deposits	ore in silicic core (vuggy quartz) flanked by quartz-alunite-kaolinite (advanced argillic); overlying barren lithocap common; Cu-rich zones (enargite) common
Vein Textures	chalcedony and opal common; laminated colloform-crustiform; breccia; bladed calcite (evidence for boiling)	chalcedony and opal uncommon; laminated colloform-crustiform and massive common; breccias; local carbonate-rich, quartz-poor veins; rhodochrosite common, especially with elevated base metals	chalcedony and opal uncommon; laminated colloform-crustiform veins uncommon; breccia veins; rhodochrosite uncommon

Hydrothermal Fluids	low salinity, near neutral pH, high gas content (CO_2, H_2S); mainly meteoric	moderate salinities; near neutral pH	low to high salinities; acidic; strong magmatic component?
Examples	McLaughlin, CA; Sleeper and Midas, NV; El Penon, Chile; Hishikari, Japan	Arcata Peru; Fresnillo Mexico; Comstock NV; Rosia Montana Romania	Pierina Peru; Summitville CO

*Altered after Taylor, 2007

The low- and intermediate-sulphidation epithermal gold-silver deposits are generally characterised by open space fill and quartz-carbonate veining, stockworks and breccias associated with gold and silver often in the form of electrum, argentite and pyrite with lesser and variable amounts of sphalerite, chalcopyrite, galena, rare tetrahedrite and sulphosalt minerals, which form in high-level (epizonal) to near-surface environments.

The epithermal veins form when carbonate minerals and quartz precipitate from a cooling and boiling alkali-chloride fluid. Alkali-chloride geothermal fluids are formed from magmatic gases and convecting groundwater and are near neutral in composition. These fluids convect in the upper crust perhaps over a 10 kilometer deep vertical interval and can transport gold, silver and other metals. At roughly 2 km depth these fluids begin to boil, releasing CO_2 and H_2S (carbon-dioxide and hydrogen-sulphide). Both these now separated gases form separate fluids, each forming alteration zones with distinct mineralogy (Hedenquist et al., 2000).

Above the water table H_2S condenses in the vadose zone to form a low pH H_2SO_4 (hydrogen-sulphate) dominant acid sulphate fluid (Hedenquist and White, 1990). These fluids can result in widespread tabular steam-heated alteration zones dominated by fine grained and friable kaolinite and alunite. Steam-heated waters collect at the water table and create aquifer-controlled strataform blankets of dense silicification known as silica caps (Shoenet al., 1974; Hedenquist et al.,, 2000). Since gold is not transported by the gases or sulphuric acid, the silica cap and overlying kaolinite alteration is usually devoid of gold and silver (Hedenquist et al. 2000).

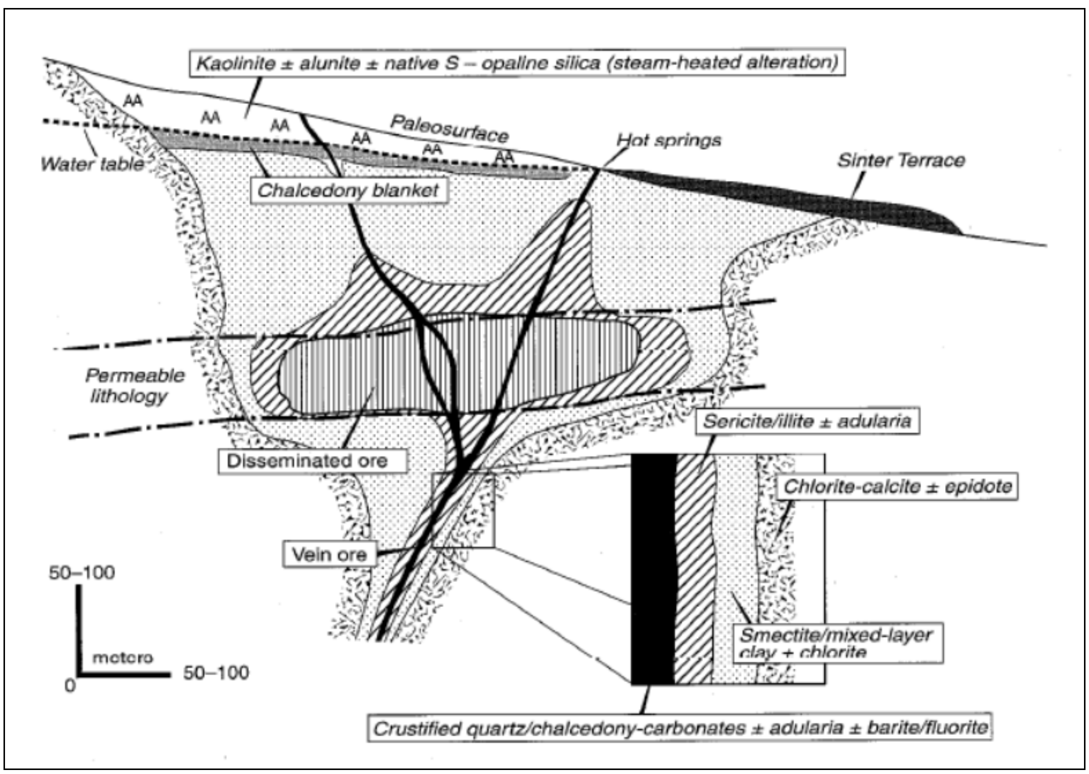
Bicarbonate fluids are the result of the condensation of CO_2 in meteoric water. These fluids are also barren of gold and silver and generally form carbonate dominated alteration on the margins of the geothermal cell.

As the source alkali chloride fluids boil and cool, quartz and carbonate deposit in the fractures along which the fluids are ascending to form banded carbonate-quartz veins. Gold and silver present within the fluid also precipitate in response to the boiling of the fluid. Potassium-feldspar adularia is also a common mineral that deposits in the veins in response to boiling. As carbonate and quartz precipitates, individual fractures can be sealed and the boiling fluid must then find another weak feature to continue rising. Gases which accumulate beneath the sealed fracture causes the pressure to increase until the seal is broken. This results in a substantial change in pressure which propagates catastrophic boiling in turn causing gold, bladed calcite and amorphous silica to precipitate rapidly. Once the fluids return to equilibrium the quartz crystals again precipitate under passive conditions and seal the vein again until the process recurs. This episodic sealing and fracturing results in the banded textures common in these vein systems.

Ore zones are typically localized in structures, but may occur in permeable lithologies. Upward-flaring ore zones centred on structurally controlled hydrothermal conduits are typical. Large (bigger than 1 m wide and hundreds of metres in strike length) to small veins and stockworks are common with lesser disseminations and replacements. Vein systems can be laterally extensive but ore shoots have relatively restricted vertical extent. High-grade ores are commonly found in dilational zones in faults at flexures, splays and in stockworks.

These deposits form in both subaerial, predominantly felsic, volcanic fields in extensional and strike-slip structural regimes and island arc or continental andesitic stratovolcanoes above active subduction zones. Near-surface hydrothermal systems, ranging from hot spring at surface to deeper, structurally and permeability focused fluid flow zones are the sites of mineralization. The ore fluids are relatively dilute and cool solutions that are mixtures of magmatic and meteoric fluids. Mineral deposition takes place as the solutions undergo cooling and degassing by fluid mixing, boiling and decompression.

Figure 8-1. Schematic Cross-section of an Epithermal Au-Ag Deposit



*Hedenquist, 2000

8.2 Porphyry Copper-Gold-Molybdenum and Lead-Zinc Skarn Deposits

In Porphyry Cu-Au-Mo deposit types, stockworks of quartz veinlets, quartz veins, closely spaced fractures, and breccias containing pyrite and chalcopyrite with lesser molybdenite, bornite and magnetite occur in large zones of economically bulk-mineable mineralization in or adjoining porphyritic intrusions and related breccia bodies. Disseminated sulphide minerals are present, generally in subordinate amounts. The mineralization is spatially, temporally and genetically associated with hydrothermal alteration of the host rock intrusions and wall rocks.

These deposit types are commonly found in orogenic belts at convergent plate boundaries, commonly linked to subduction-related magmatism. They also occur in association with emplacement of high-level stocks during extensional tectonism related to strike-slip faulting and back-arc spreading following continent margin accretion (Panteleyev, 1995).

Many Au skarns are related to plutons formed during oceanic plate subduction, and there is a worldwide spatial, temporal and genetic association between porphyry Cu provinces and calcic Au skarns. The Au skarns are divided into two types. Pyroxene-rich Au skarns tend to be hosted by siltstone-dominant packages and form in hydrothermal systems that are sulphur-rich and relatively reduced. Garnet-rich Au skarns tend to be hosted by carbonate-dominant packages and develop in more oxidizing and/or more sulphur-poor hydrothermal systems. The gold is commonly present as micron-sized inclusions in sulphides, or at sulphide grain boundaries. To the naked eye, ore is generally indistinguishable from waste rock. Due to the poor correlation between Au and Cu in some Au skarns, the economic potential of a prospect can be overlooked if Cu-sulphide-rich outcrops are preferentially sampled and other sulphide-bearing or sulphide-lean assemblages are ignored (Ray, 1998).

9 Exploration

Between 2004 and 2013, Almaden's exploration at the Tuligtic Property has included rock and soil geochemical sampling, ground magnetics, IP and resistivity, Controlled Source Audio-frequency Magnetotelluric (CSAMT), and Controlled Source Induced Polarization (CSIP) geophysical surveys. The work to date has resulted in the identification of five anomalous areas: the Ixtaca, Ixtaca East, Caleva, Azul, and Sol zones (Figures 7-2, 9-1). Detailed exploration results for the Tuligtic Property were disclosed in a previous technical report for the Tuligtic Property by Raffle et al. (2013) and are summarized below.

9.1 Rock Geochemistry

Between 2004 and 2011 a total of 436 rock geochemical samples were collected on the Property over a 6 x 6 km area. Rock sampling, guided by concurrent soil geochemical surveys, was concentrated around the Ixtaca Zone and an area extending 4 km to the NNE over the copper porphyry target located between the Caleva and Azul zone soil geochemical anomalies (Figures 7-2, 9-1).

Rock grab samples collected by Almaden were from both from representative and apparently mineralized lithologies in outcrop, talus and transported boulders within creeks throughout the Property. Rock samples ranging from 0.5 to 2.5 kilograms (kg) in weight and were placed in uniquely labelled poly samples bags and their locations were recorded using handheld GPS accurate to plus or minus 5 m accuracy.

Of the 436 rock grab samples collected, a total of 45 samples returned assays of greater than 100 parts-per-billion (ppb) gold (Au), and up to 6.14 grams-per-tonne (g/t) Au. A total of 49 rock samples returned assays of greater than 10 g/t silver (Ag) and up to 291 g/t Ag.

Gold and silver mineralization occurs within the Ixtaca Zone, and is associated with anomalous arsenic, mercury (± antimony). To the northeast of the Ixtaca Zone zinc, copper and locally anomalous gold, silver and lead (± arsenic) values occur in association with calc-silicate skarn and altered intrusive rocks.

Basement carbonate units, altered intrusive, and locally calc-silicate skarn mineralization occur as erosional windows beneath unmineralized tuff of the upper Coyoltepec subunit. Surface mineralization at the Ixtaca Zone occurs as limestone boulders containing quartz vein fragments and high level epithermal alteration within overlying volcanic rocks. Epithermal alteration and mineralization is observed overprinting earlier skarn and porphyry style alteration and mineralization. Numerous small skarn-related showings exist on the project. At the Caleva soil anomaly, a 200 x 100 m skarn zone hosts sphalerite, galena and chalcopyrite quartz vein stockwork mineralization along the contact zone between limestone and altered and mineralized intrusive rocks to the east.

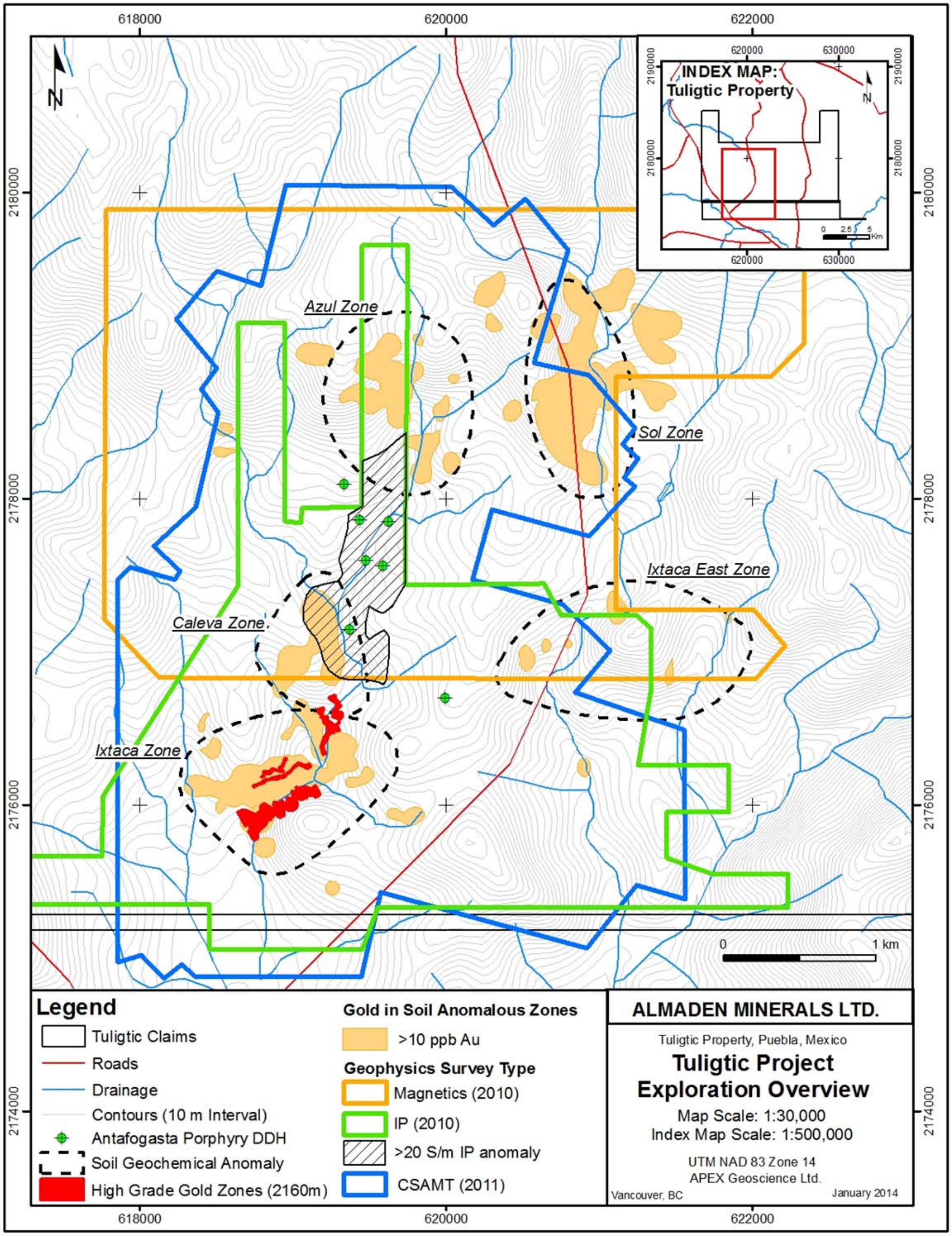
9.2 Soil Geochemistry

The collection of 4,760 soil samples by Almaden between 2005 and 2011 resulted in the identification of five anomalous areas: the Ixtaca, Ixtaca East, Caleva, Azul, and Sol zones (Figure 7-2). During 2013, an additional 1,035 soil samples were collected to extend soil grid lines to the west and locally infill existing grid lines, for a total of 5,795 soil samples.

Samples were collected at 50 m intervals along a series of 200 m spaced east-west oriented lines. Infill lines spaced at 100 m were completed over gold and silver anomalies at the Caleva and Ixtaca East zones, and an unnamed anomaly 2.5 km west of the Ixtaca Zone. Subsequently, detailed 50 m x 50 m grid sampling of the Ixtaca Zone and select grid infill of the Azul and Sol zones was completed. Soil samples were collected by hand from a small hole dug with a non-metallic pick or hoe. The sample depth was typically 10 cm, or at least deep enough to be below the interpreted surficial organic layer. Sample bags were labelled with a unique sample number.

Anomalous thresholds (greater than the 95th percentile) for gold and silver are calculated to be 17.1 ppb Au and 0.59 ppm Ag, respectively. A total of 288 samples contain anomalous Au, including 141 samples with coincident Ag anomalies.

Figure 9-1. Exploration Overview Showing Gold in Soil Anomalies and Extent of Geophysical Surveys



APEX Geoscience Ltd.

The Ixtaca Zone produces the largest Au and Ag response within the Tuligtic Property (Figure 9-1). Base metals do not correlate significantly with the Ixtaca Zone, and Hg and Sb anomalies occur peripherally within altered volcanic rocks. Base metals correlate well with Au-Ag at the Caleva, Azul, and Sol zones to such an extent they are best termed Cu-Zn (Au-Ag) anomalies. Based on the distribution of soil geochemical anomalies and the mapped geology it is apparent that the overlying post mineral volcanics significantly suppress sedimentary and intrusive basement rock geochemical anomalies (Figures 7-2, 9-1). Soil responses are consistent with these zones being prospective for both epithermal and earlier porphyry-skarn mineralization.

9.3 Ground Geophysics

9.3.1 Magnetics

During 2010, Almaden completed an 84 line-km ground magnetic survey over a 4 km by 4.5 km area covering the copper porphyry target area north of the Ixtaca Zone (Figure 9-1). The survey comprised a series of 200 m spaced east-west oriented lines with magnetic readings collected at 12.5 m intervals along each line.

The survey identified a broad poorly defined, approximately 100 nano-Tesla (nT) magnetic high anomaly that corresponds in part with mapped altered quartz-monzonite porphyry rocks. Numerous, 30 to 50 nT short strike length NNW trending linear magnetic high anomalies parallel the regional structural grain, and the strike of bedding within Upper Tamaulipas formation calcareous rocks suggesting structural and/or lithologic control of magnetic anomalies.

9.3.2 Induced Polarization / Resistivity

Concurrent with 2010 ground magnetic surveys, Almaden completed 108 line-km of 100 m “a” spacing pole-dipole induced polarization (IP) / resistivity geophysical surveys over the Ixtaca and Cavela zones, and portions of the Azul and Ixtaca East zones (Figure 9-1). The survey employed a series of overlapping east-west and north-south oriented lines spaced at intervals of 100 m.

The survey defines a 1,000 x 200 m north-northwest trending 20 to 30 mV/V chargeability anomaly coincident with mapped calc-silicate skarn mineralization and the Caleva Zone soil geochemical anomaly (Figure 9-1). While poorly constrained by a single north-south oriented survey line, the anomaly extends a further 1 km north over the porphyry copper anomaly area. Partial survey coverage of the Ixtaca East Zone multi-element soil geochemical anomaly defines a 700 x 500 m elliptical 7 to 15 mV/V chargeability anomaly along its western margin.

Resistivity anomalies appear to be controlled in part by topographic lows that down-cut through overlying tuff rocks and expose more resistive basement lithologies. Resistivity low (conductive) anomalies are common along local topographic high ridges and plateaus where significant thicknesses of more conductive tuff rocks remain.

9.3.3 CSAMT / CSIP

During 2011 Zonge International Inc. behalf of Almaden completed a Controlled Source Audio-frequency Magnetotelluric (CSAMT) and Controlled Source Induce Polarization (CSIP) geophysical survey at the Tuligtic Property over a 6 by 4 km area (Figure 9-1).

The survey totalled 48.5 line-km, including six lines oriented N-S (N16E azimuth, CSAMT and CSIP), and 8 perpendicular E-W oriented lines (N104E azimuth, CSAMT only). Survey line spacing varied from 170 to 550 m utilizing an array of six 25 m dipoles.

2-D (N-S Line) smooth-model resistivity data defines a NW trending resistivity anomaly west of the Ixtaca Main Zone, and an E-W trending resistivity anomaly through the Ixtaca Zone. The NW trending anomaly passes through drill sections 10+200E to 10+400E, and may reflect limestone rocks on the west limb of an east-verging antiform. A similar NW trending conductive anomaly immediately to the east may represent calcareous shale rocks within the core of the antiform. The significance of the E-W trending anomaly is not known given the context of the current geologic model.

2-D (E-W Line) smooth-model resistivity data shows a strong resistivity anomaly associated with the core of the Ixtaca Main Zone, and surface outcropping limestone. To the northeast, a resistivity anomaly coincident with the Chemalaco Zone may reflect complex structural geology patterns and the relatively resistive limestone and Chemalaco Dyke lithologies.

CSIP data does not appear to have identified significant anomalies.

10 Drilling

10.1 Introduction

The purpose of this Report is to provide a technical summary and updated mineral resource estimate with respect to the Ixtaca Deposit in relation to diamond drilling completed subsequent to the November 13, 2012 cut-off date of the maiden mineral resource estimate (Raffle et al., 2013). Since 2010, a total of 423 diamond drill holes have been drilled at the Tuligtic Property, totalling 137,438 m (Figure 10-1). Drilling progress since 2010 is summarized below (Table 10-1).

The Main Ixtaca Zone of mineralization has been defined as a sub-vertical body trending northeast over a 650 m strike length (Figure 10-1). The Ixtaca North Zone has been further defined over a 400 m strike length as two discrete parallel sub-zones having a true-thickness of 5 to 35 m, and spaced 20 to 70 m apart (Figure 10-3). The Chemalaco Zone (Figures 10-1, 10-4) is moderately to steeply WSW dipping that has been defined over a 450 m strike length with high-grade mineralization intersected to a vertical depth of 600 m or approximately 700 m down-dip.

Table 10-1. Tuligtic Project Drilling Summary 2010 – 2013

Year	Holes Drilled (total m)	Main Ixtaca Zone	Ixtaca North Zone	Chemalaco Zone
2010	14 (6,465m)	- Discovered as sub-vertical body trending NE defined over 400 m strike		
2011	85 (30,644m)	- Defined over 600 m strike	- Discovered as parallel sub-vertical zone to Ixtaca Main	
2012	126 (44,862m)	- Defined over 650 m strike - High-grade mineralization intersected to 300 m	- Defined over 400 m strike - High-grade mineralization intersected to 300 m	- Discovered as a WSW moderate-steeply dipping body, defined over 350 m strike, trending approximately N-S - High-grade mineralization intersected to 550 m (600 m down-dip)
2013	198 (55,467m)	- Tested over 1,000 m strike - High-grade mineralization intersected to 300 m	- Delineated as two distinct parallel zones - High-grade mineralization intersected to 325 m	- Defined over 450 m strike as splayed body dipping 55 degrees WSW with overall down-dip 700 m - Splayed subzone dips 25-50 degrees, defined over 250m strike, 400 m down-dip

In July 2010 Almaden initiated a preliminary diamond drilling program to test epithermal alteration within the Tuligtic Property, resulting in the discovery of the Main Ixtaca Zone. The first hole, TU-10-001 intersected 302.42 m of 1.01 g/t Au and 48 g/t Ag and multiple high grade intervals including 1.67 m of 60.7 g/t Au and 2,122 g/t Ag. Almaden drilled 14 holes totalling 6,465 m during 2010, defined the Main Ixtaca Zone over a 400 m strike length, and initiated drilling along 50 m NNW oriented sections. During 2011, Almaden drilled an additional 85 holes totalling 30,644 m, which resulted in the discovery of the Ixtaca North Zone and testing of the Main Ixtaca Zone over a 600 m strike length on 50 m sections. Almaden discovered the Chemalaco Zone in early 2012 and continued drilling of the Ixtaca North and Main Ixtaca zones. Almaden drilled 126 holes totalling 44,862 m on the Property from the beginning of 2012 until the November 13, 2012 maiden mineral resource estimate cut-off, for a total of 81,971 m in 225 drill holes.

During 2013 and subsequent to the November 13, 2012 cut-off of the maiden mineral resource estimate, Almaden drilled 198 holes totalling 55,467 m. A total of 79 holes were drilled at the Main Ixtaca Zone, 40 holes at the Ixtaca North Zone and 79 holes at the Chemalaco Zone. Drilling during 2013 focused on expanding the deposit and upgrading resources previously categorized as inferred to higher confidence measured and indicated categories.

Of the 423 holes to date, approximately 189 holes have been completed on the Main Ixtaca Zone, 112 at the Ixtaca North Zone, and 122 at the Chemalaco Zone (Figure 10-1). The diamond drill holes range from a minimum length of 60 m to a maximum of 701 m, and average 325 m. All drilling completed at the Ixtaca Zone has been diamond core of NQ2 size (5.08 cm diameter). Drilling was performed using four diamond drills owned and operated by Almaden via its wholly owned operating subsidiary Minera

Gavilán, S.A. de C.V. The 2010 through 2013 diamond drill programs were completed under the supervision of Almaden personnel. Drill hole collars were spotted using a handheld GPS and compass, and subsequently were surveyed using a differentially corrected GPS. Each of the holes is marked with a small cement cairn inscribed with the drill hole number and drilling direction.

Drill holes were surveyed down hole using Reflex EZ-Shot or EX-Trac instruments following completion of each hole. Down hole survey measurements were spaced at 100 m intervals during 2010 drilling and were decreased to 50 m intervals in 2011. During 2012 and 2013, select drill holes within all three mineralized zones were surveyed at 15 m intervals. A total of 4,672 drill hole orientation measurements (excluding 423 collar surveys) were collected for an average down hole spacing of 27 m. A total of 35 drill holes (10,354 m), apart from the collar survey, were not surveyed downhole; and a total of 5 drill holes (1,672 m) were surveyed at the end of hole only. Drill holes having no down hole survey were assumed to have the orientation of the collar. Drill hole data was plotted in the field and was inspected. Down hole data returning unrealistic hole orientations were flagged and removed from the database. Down hole survey summary statistics are provided in Table 10-2, below.

At the rig, drill core was placed in plastic core boxes labeled with the drill hole number, box number, and an arrow to mark the start of the tray and the down hole direction. Wooden core blocks were placed at the end of each core run (usually 3 m, or less in broken ground). Throughout the day and at the end of each shift drill core is transported to Almaden's Santa Maria core logging, sampling and warehouse facility.

Table 10-2. Tuligtic Project Down Hole Survey Statistics

	Number of Drill Holes	Metres
Number of Down Hole Surveys	4,672	137,438
Average Survey Spacing (not including casing)	423	27
Drill Holes (No Down Hole Survey)	35 (8%)	10,354
Drill Holes (End Of Hole Survey Only)	5 (1%)	1,672
Drill Holes (15 m Survey Spacing)	220 (52%)	67,276
Drill Holes (50m Survey Spacing)	139 (33%)	49,047
Drill Holes (100 m Survey Spacing)	24 (6%)	9,089

Geotechnical logging comprised measurements of total core recovery per-run, RQD (the total length of pieces of core greater than twice the core width divided by the length of the interval, times 100), core photography (before and after cutting), hardness testing and measurements of bulk density using the weight in air-weight in water method.

Drill core was logged based on lithology, and the presence of epithermal alteration and mineralization. All strongly altered or epithermal-mineralized intervals of core were sampled. Almaden employed a maximum sample length of 2 to 3 m in unmineralized lithologies, and a maximum sample length of 1 m in mineralized lithologies (50 cm minimum sample length). Geological changes in the core such as major alteration or mineralization intensity (including large discrete veins), or lithology were used as sample breaks.

The Upper Tamaulipas formation, the dykes that crosscut it and the upper Coyoltepec volcanic subunit are the main host rocks to the epithermal vein system at Ixtaca. In the Main and Ixtaca North zones veining strikes dominantly ENE-WNW (060 degrees) parallel to a major dyke trend and at a very high angle to the N to NNW bedding and fold structures within the limestones. The veins of the Chemalaco Zone are hosted by the shaley carbonate units and strike to the NNW, dipping to the SSW. In the footwall to Chemalaco Zone a parallel dyke has been identified which is altered and mineralized. The Chemalaco Zone and the dyke are interpreted to strike parallel to bedding and to core an antiform comprised of shale.

10.2 Main Ixtaca and Ixtaca North Zones

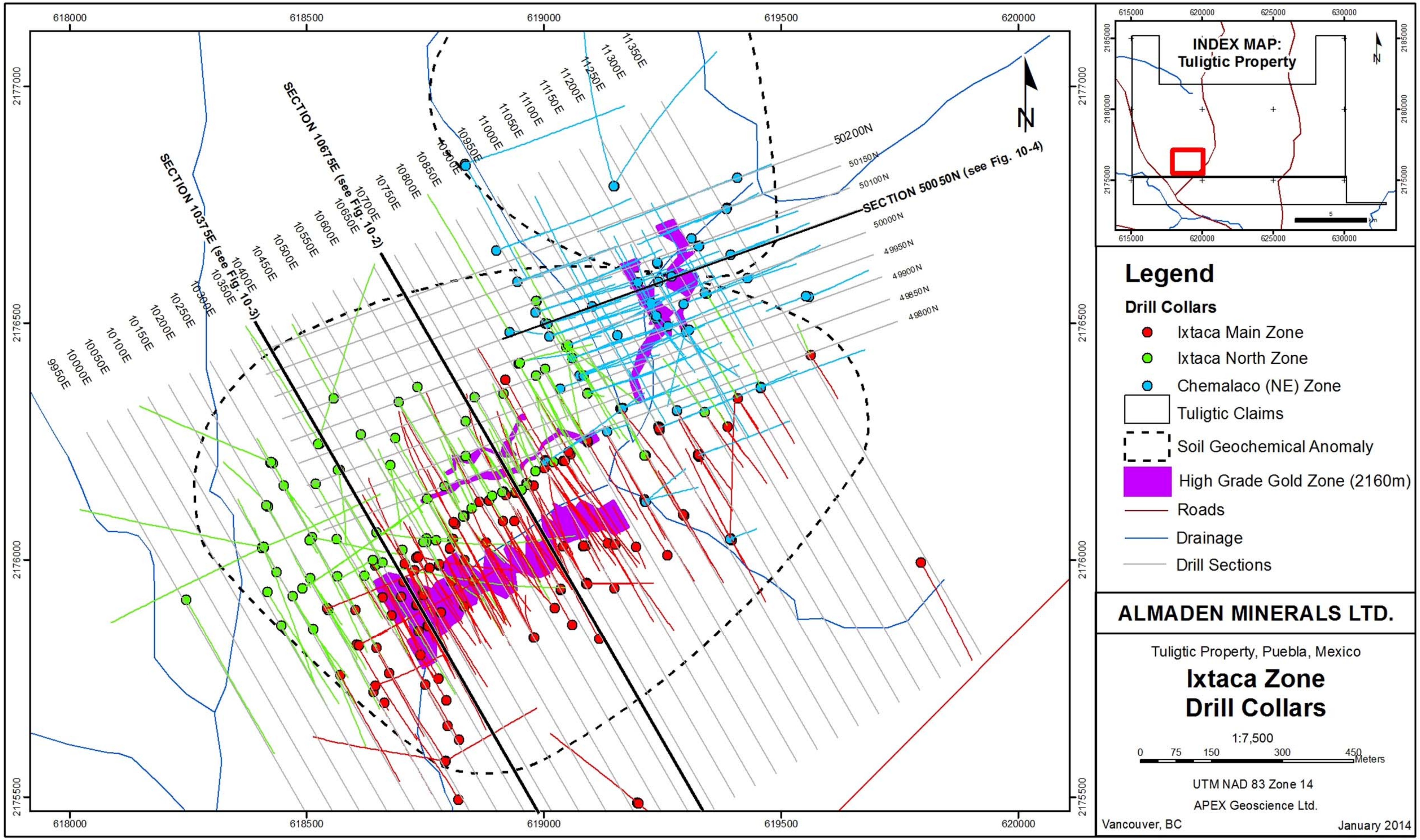
The Main Ixtaca and Ixtaca North zones have a strike length of approximately 650 m and have been drilled at 25 and 50 m section spacing. The vast majority of holes were drilled at an azimuth of 150 or 330 degrees and at dips between 45 and 60 degrees from horizontal. Infill drilling at 25 m sections has also been completed over the majority of the Ixtaca North Zone and in the central area of the Main Ixtaca Zone. Diamond drilling has intersected high-grade mineralization within the Main Ixtaca and Ixtaca North zones to depths of 200 to 300 m vertically from surface. High-grade zones occur within a broader zone of mineralization extending laterally (NNW-SSE) over 1000 m and to a vertical depth of 600 m below surface (Table 10-3 and Figure 10-2).

The epithermal vein system at the Main Ixtaca and Ixtaca North zones is roughly associated with two parallel ENE (060 degrees) trending, subvertical to steeply north dipping dyke zones. The dykes predate mineralization and trend and at a high angle to the N to NNW bedding and fold structures within calcareous sediments of the Upper Tamaulipas formation.

At the Main Ixtaca Zone, a series of dykes ranging from less than 2 m to over 20 m true width occur within an approximately 100 m wide zone (Figures 10-2, 10-3). Wider dykes often correlate within individual drill sections, where they are inferred to pinch or splay. The boarder dyke zone itself is correlatable between sections, although individual dykes are typically not continuous between sections. The dyke zone hosting the Ixtaca North Zone is narrower, comprising a steeply north-dipping zone of two or three discrete dykes ranging from 5 to 20 m in width. Epithermal vein mineralization occurs both within the dykes and sedimentary host rocks, with the highest grades often occurring within or proximal to the dykes. Vein density decreases outward to the north and south from the dyke zones resulting in the formation of two high-grade zones that lack sharp geologic boundaries. The dykes are often intensely altered and are interpreted to control the distribution of epithermal vein system at Ixtaca to the extent that they provided a conduit for ascending hydrothermal fluids, and an important rheological contrast resulting in vein formation within and along the margins individual dykes, and laterally within the adjacent limestone. On surface, the Main Ixtaca and Ixtaca North zones are separated by a steep sided ENE trending valley (Figures 10-2, 10-3).

The lateral (WSW-ENE) extent of the epithermal vein system is controlled by N to NNW bedding and fold structures in basement rocks of the Upper Tamaulipas formation. Drilling indicates Main Ixtaca and Ixtaca North zone mineralization is bound within an ENE-verging asymmetric synform. The synform is cored by a structurally thickened sequence of argillaceous limestone that grades laterally and at depth through calcareous siltstone and grainstone transition units, into dark grey to laminated calcareous shale at depth. Based on increased vein density, including the presence of broad alteration zones and networks of intersecting epithermal veins, the relatively brittle limestone is a preferential host to Main Ixtaca and Ixtaca North zone mineralization.

Figure 10-1. Drill Hole Locations



APEX Geoscience Ltd.

Table 10-3. Section 10+675E Significant Drill intercepts (Main Ixtaca and Ixtaca North Zones)

Hole ID	From (m)	To (m)	Interval (m)	Gold (g/t)	Silver (g/t)	AuEq* (g/t)
TU-12-120	260.90	290.90	30.00	0.74	96.7	2.6
including	260.90	266.10	5.20	2.78	437.0	11.3
TU-12-124	116.50	301.50	185.00	1.00	60.5	2.2
including	167.50	181.40	13.90	6.04	179.7	9.5
TU-12-127	155.95	186.00	30.05	0.70	56.7	1.8
including	174.00	186.00	12.00	1.05	105.7	3.1
TU-12-127	210.00	233.50	23.50	1.02	20.2	1.4
including	213.90	218.30	4.40	3.92	86.0	5.6
TU-12-127	243.00	285.60	42.60	0.57	10.8	0.8
TU-12-127	297.00	314.00	17.00	0.38	8.7	0.5
TU-12-132	64.50	204.20	139.70	0.22	18.0	0.6
including	137.00	166.60	29.60	0.35	27.8	0.9
including	148.25	153.30	5.05	1.16	79.0	2.7
including	174.40	204.20	29.80	0.33	34.1	1.0
TU-12-136	63.10	123.60	60.50	0.84	48.9	1.8
including	82.20	93.00	10.80	1.10	85.2	2.8
including	98.00	110.50	12.50	1.84	98.5	3.8
TU-12-138	43.50	87.27	43.77	0.59	4.3	0.7
including	61.00	71.50	10.50	0.88	4.9	1.0
including	84.00	87.27	3.27	2.07	10.5	2.3
TU-12-138	135.50	184.25	48.75	0.22	16.7	0.5
including	179.95	182.50	2.55	2.98	216.4	7.2
TU-12-138	202.00	359.50	157.50	0.36	41.4	1.2
including	264.30	359.50	95.20	0.54	61.1	1.7
including	292.50	302.00	9.50	1.27	234.3	5.8
including	304.00	307.00	3.00	3.87	439.9	12.4
TU-12-144	45.50	92.60	47.10	0.52	3.7	0.6
TU-12-144	210.00	258.00	48.00	0.52	32.0	1.1
including	227.40	235.80	8.40	1.68	59.3	2.8
TU-13-324	32.92	62.00	29.08	1.31	16.5	1.6
including	42.50	57.75	15.25	2.10	23.7	2.6
including	43.00	45.25	2.25	1.71	72.0	3.1
TU-13-324	113.50	128.00	14.50	0.25	47.0	1.2
including	120.00	121.00	1.00	0.59	117.5	2.9
including	125.00	128.00	3.00	0.79	155.0	3.8
TU-13-324	154.00	174.00	20.00	0.08	29.1	0.6
including	160.00	161.00	1.00	0.42	167.0	3.7
including	167.50	172.00	4.50	0.07	53.4	1.1
TU-13-325	128.50	136.50	8.00	0.58	132.2	3.2
TU-13-325	190.00	236.50	46.50	1.06	53.1	2.1
including	193.40	216.00	22.60	1.72	97.2	3.6
including	194.00	195.20	1.20	2.05	147.0	4.9
including	203.90	205.00	1.10	3.97	175.0	7.4
including	210.50	216.00	5.50	4.40	240.8	9.1
TU-13-388	199.00	229.50	30.50	0.67	23.9	1.1

TU-13-388	337.50	346.50	9.00	1.35	287.5	**6.9**
including	339.25	340.35	1.10	6.54	1982.7	**45.2**
TU-13-388	363.50	416.00	52.50	0.58	50.3	**1.6**
including	363.50	378.40	14.90	0.74	87.0	**2.4**
including	372.00	378.40	6.40	1.19	138.9	**3.9**
including	390.00	403.90	13.90	1.11	82.9	**2.7**
including	398.60	401.10	2.50	1.78	173.0	**5.1**

Table 10-4. Section 10+375E Significant Drill intercepts (Main Ixtaca Zone)

Hole ID	From (m)	To (m)	Interval (m)	Gold (g/t)	Silver (g/t)	AuEq* (g/t)
TU-11-065	26.00	126.80	100.80	0.58	46.2	1.5
including	26.00	74.78	48.78	0.95	77.0	2.5
including	43.60	68.00	24.40	1.67	134.4	4.4
including	49.80	59.80	10.00	3.05	198.8	7.0
TU-11-067	24.30	145.00	120.70	1.02	72.6	2.5
including	36.50	136.80	100.30	1.20	85.0	2.9
including	54.90	96.30	41.40	1.91	144.1	4.8
including	63.55	85.50	21.95	2.75	210.1	7.0
including	65.60	80.85	15.25	3.26	253.4	8.3
including	107.20	116.95	9.75	2.54	112.6	4.8
including	125.55	127.43	1.88	2.51	242.2	7.3
TU-12-202	26.50	66.50	40.00	0.35	1.4	0.4
including	26.50	38.00	11.50	0.78	0.5	0.8
TU-12-202	137.10	172.50	35.40	0.62	12.3	0.9
including	139.10	145.10	6.00	2.57	35.4	3.3
TU-12-202	249.30	260.80	11.50	0.10	16.7	0.4
TU-12-211	31.20	187.85	156.65	0.59	28.6	1.2
including	70.70	84.50	13.80	0.97	82.9	2.6
including	97.80	105.65	7.85	1.07	59.4	2.3
including	129.85	142.40	12.55	1.38	53.3	2.4
including	172.85	183.85	11.00	0.91	56.7	2.0
TU-13-389	21.34	95.50	74.16	1.02	50.9	2.0
including	47.00	71.00	24.00	1.52	60.6	2.7
including	51.50	69.00	17.50	1.92	64.4	3.2
including	88.60	95.50	6.90	2.54	139.9	5.3
TU-13-389	104.00	106.80	2.80	2.86	169.3	6.2
TU-13-391	16.00	126.00	110.00	0.62	42.0	1.5
including	48.16	89.50	41.34	1.16	76.2	2.7
including	48.16	59.30	11.14	1.79	110.9	4.0
including	71.80	84.50	12.70	1.40	106.4	3.5
including	71.80	74.50	2.70	3.06	230.3	7.7
TU-13-393	27.43	141.80	114.37	0.92	53.7	2.0
including	54.50	81.50	27.00	1.03	76.0	2.6
including	56.00	62.20	6.20	2.21	150.5	5.2
including	89.95	124.70	34.75	1.67	70.4	3.1
including	100.30	104.00	3.70	2.08	89.0	3.9
including	110.40	118.30	7.90	4.42	158.7	7.6

*Gold Equivalent based on a three-year trailing average price of $1,540/ounce gold and $30/ounce silver

The Limestone sequence thins to the west in response to a rising ENE-verging antiform. The Main Ixtaca and Ixtaca North veins systems and the dykes transect the antiform sub-perpendicular to the strike of the fold axis. Vein density decreases within the shale units that core the antiform and mineralization is confined near the axis of the antiform within a west dipping tabular zone of low-grade mineralization having a true thickness ranging from 150 to 200 m (Table 10-4 and Figure 10-3).

Mineralized limestone, shale and the cross-cutting dykes are unconformably overlain by bedded crystal tuff, which is also mineralized. Mineralization within tuff rocks overlying the Ixtaca Zone occurs as broad zones of alteration and disseminated sulphides having relatively few veins. High-grade zones of mineralization are locally present within the tuff vertically above the Main Ixtaca and Ixtaca North vein systems and dykes. The high-grade zones transition laterally into low grade mineralization, which together form a broad tabular zone of mineralization at the base of the tuff unit.

10.3 Chemalaco Zone

The Chemalaco Zone (also known as the Northeast Extension) of the Ixtaca deposit has an approximate strike length of 450 m oriented roughly north-south (340 azimuth) and has been drilled via a series of ENE (070 degrees) oriented sections spaced at intervals of 25 to 50 m, and near-surface oblique NNW-SSE oriented drill holes (Figure 10-1). The Chemalaco Zone dips moderately-steeply at 55 degrees WSW. High grade mineralization having a true-width ranging from less than 30 and up to 60 m has been intersected beneath approximately 30 m of tuff to a vertical depth of 550 m, or approximately 700 m down-dip. An additional sub-parallel zone has been defined underneath the Chemalaco having a true-width ranging from 5 to 40 m and dipping 25 to 50 degrees to the WSW, resulting in a splayed zone extending from near-surface to a vertical depth of 250 m. The sub-parallel zone has an approximate down-dip length up to 400 m over a 250 m strike length (Table 10-5, Figure 10-4).

The Chemalaco Zone vein lies northeast of the Main Ixtaca Zone and occurs within the hinge zone of a shale cored antiform. Near surface, along the axis of the antiform, a zone of structurally thinned, brecciated, and mineralized limestone is unconformably overlain by mineralized tuff rocks (Figure 10-4). At a vertical depth of 80 m below surface, high-grade shale-hosted mineralization dips moderately-steeply at 25 to 55 degrees WSW sub-parallel to the interpreted axial plane of the antiform. The footwall of the high-grade zone is marked by a distinct 20 to 30 m true-thickness felsic porphyry dyke (Chemalaco Dyke), which is also mineralized. The Chemalaco Dyke has been interested in multiple drill holes ranging from 250 to 550 m vertically below surface, and its lower contact currently marks the base of marks the base of Chemalaco Zone mineralization.

Table 10-5. Section 50+050N Significant Drill intercepts (Chemalaco Zone)

Hole ID	From (m)	To (m)	Interval (m)	Gold (g/t)	Silver (g/t)	AuEq* (g/t)
TU-12-190	85.00	89.00	4.00	0.25	0.5	0.3
TU-12-190	100.00	112.00	12.00	0.17	1.9	0.2
TU-12-190	259.00	272.90	13.90	0.17	12.3	0.4
TU-12-190	278.85	321.00	42.15	1.06	47.4	2.0
including	293.50	300.50	7.00	1.34	72.0	2.7
including	306.00	317.80	11.80	1.67	71.7	3.1
including	310.00	314.00	4.00	2.45	116.4	4.7
TU-12-190	377.90	386.00	8.10	0.24	2.8	0.3
TU-12-194	83.50	87.50	4.00	0.46	2.8	0.5
TU-12-194	112.60	124.00	11.40	0.22	4.4	0.3
TU-12-194	272.50	279.50	7.00	0.15	40.9	0.9
TU-12-194	294.50	300.00	5.50	0.14	81.1	1.7
TU-12-194	313.00	371.80	58.80	1.04	19.4	1.4
including	317.60	347.00	29.40	1.63	23.9	2.1
TU-12-199	66.00	70.00	4.00	0.26	2.4	0.3
TU-12-199	91.00	93.80	2.80	0.19	3.0	0.2
TU-12-199	344.20	424.00	79.80	0.84	20.6	1.2
including	365.70	385.70	20.00	1.19	25.6	1.7
including	396.50	402.50	6.00	1.43	16.0	1.7
including	408.30	423.40	15.10	1.48	37.6	2.2
including	414.30	416.10	1.80	4.90	175.5	8.3
TU-12-205	81.00	132.00	51.00	0.51	6.0	0.6
including	101.50	106.00	4.50	3.41	6.1	3.5
TU-12-205	254.50	293.50	39.00	0.61	88.8	2.3
including	255.50	281.20	25.70	0.86	127.8	3.3
including	256.00	272.40	16.40	1.08	164.8	4.3
including	256.00	265.00	9.00	1.57	244.5	6.3
TU-12-205	312.00	319.00	7.00	0.19	207.2	4.2
TU-13-265	488.40	531.80	43.40	0.50	9.2	0.7
including	500.60	507.20	6.60	2.15	11.6	2.4
including	504.20	507.20	3.00	3.36	17.1	3.7
TU-13-265	539.00	545.00	6.00	0.07	22.2	0.5
TU-13-265	550.30	558.00	7.70	0.07	28.1	0.6
TU-13-268	41.30	56.25	14.95	0.05	11.5	0.3
TU-13-268	61.25	120.50	59.25	0.11	41.1	0.9
including	74.90	79.75	4.85	0.25	126.9	2.7
including	103.00	106.00	3.00	0.23	81.2	1.8
TU-13-268	133.00	138.00	5.00	0.03	22.3	0.5
TU-13-268	151.50	208.00	56.50	0.36	42.0	1.2
including	166.00	178.50	12.50	0.56	91.4	2.3
including	166.00	167.50	1.50	0.74	223.7	5.1
including	192.00	199.50	7.50	0.75	51.6	1.8
TU-13-268	222.75	239.00	16.25	0.08	14.6	0.4
TU-13-272	48.00	138.50	90.50	0.20	31.4	0.8

including	66.05	70.20	4.15	0.44	49.5	**1.4**
including	77.50	84.80	7.30	0.29	71.1	**1.7**
including	112.75	119.75	7.00	0.43	40.1	**1.2**
including	129.00	138.50	9.50	0.41	114.0	**2.6**
TU-13-272	146.00	161.00	15.00	0.22	47.1	**1.1**
including	147.00	148.50	1.50	0.65	252.7	**5.6**
TU-13-272	187.00	193.50	6.50	0.11	11.5	**0.3**
TU-13-272	220.00	231.00	11.00	0.14	9.5	**0.3**
TU-13-275	68.50	84.00	15.50	0.15	10.6	**0.4**
TU-13-275	105.00	112.00	7.00	0.11	15.8	**0.4**
TU-13-275	120.00	134.50	14.50	0.18	6.2	**0.3**
TU-13-275	149.00	227.00	78.00	0.39	23.8	**0.9**
including	164.50	193.50	29.00	0.43	43.3	**1.3**
TU-13-275	254.00	258.00	4.00	0.01	13.5	**0.3**
TU-13-287	106.00	131.00	25.00	0.11	15.2	**0.4**
including	122.00	125.00	3.00	0.30	50.3	**1.3**
TU-13-287	156.50	182.00	25.50	0.66	102.3	**2.7**
including	168.00	170.08	2.08	4.35	975.0	**23.3**
TU-13-289	134.00	153.00	19.00	0.22	48.4	**1.2**
including	144.50	151.80	7.30	0.40	82.8	**2.0**
TU-13-289	160.00	188.00	28.00	0.21	10.8	**0.4**

*Gold Equivalent based on a three-year trailing average price of $1,540/ounce gold and $30/ounce silver

Figure 10-2. Section 10+675E through the Ixtaca Main and North Zones

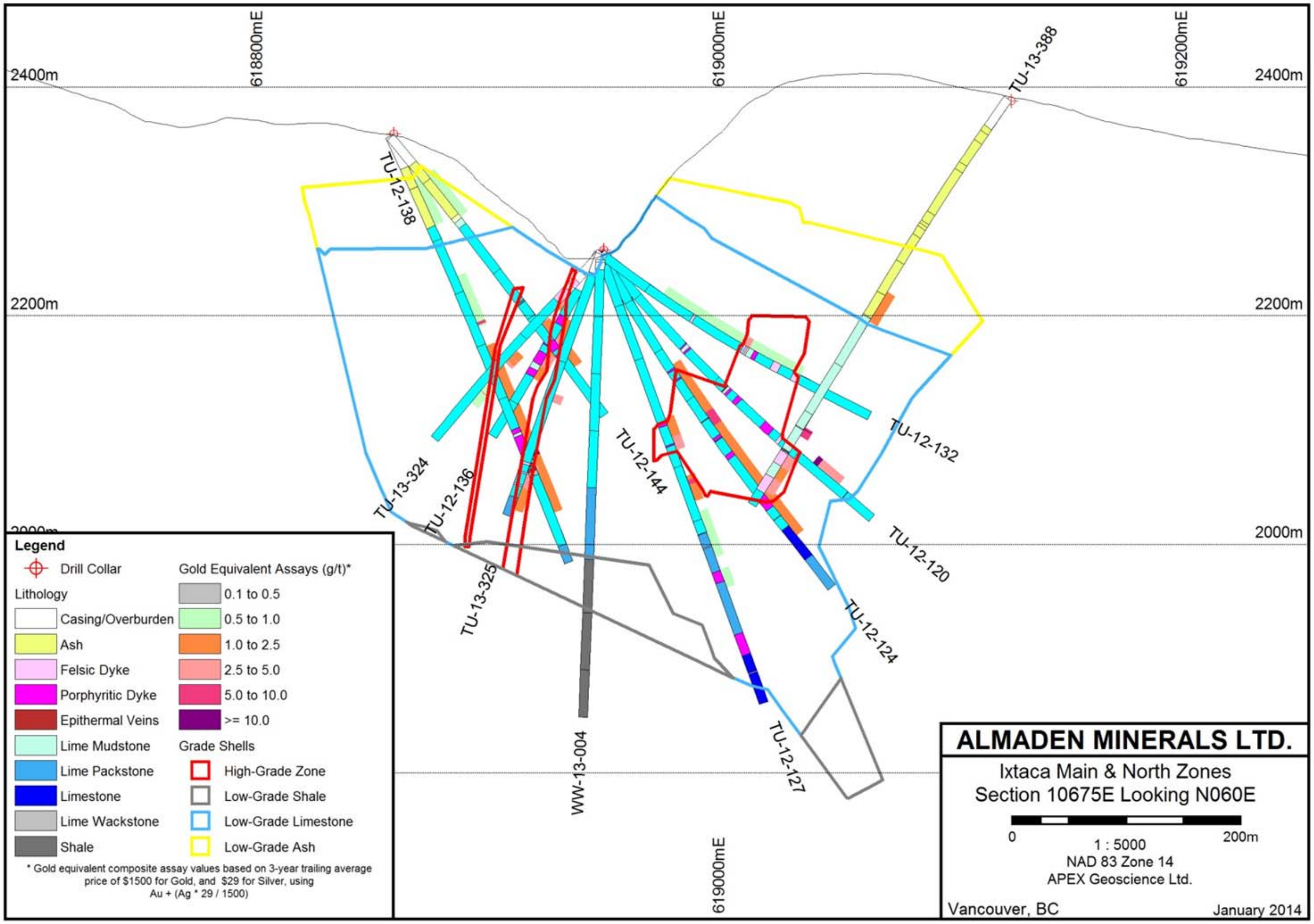


Figure 10-3. Section 10+375E through the Ixtaca Main Zone

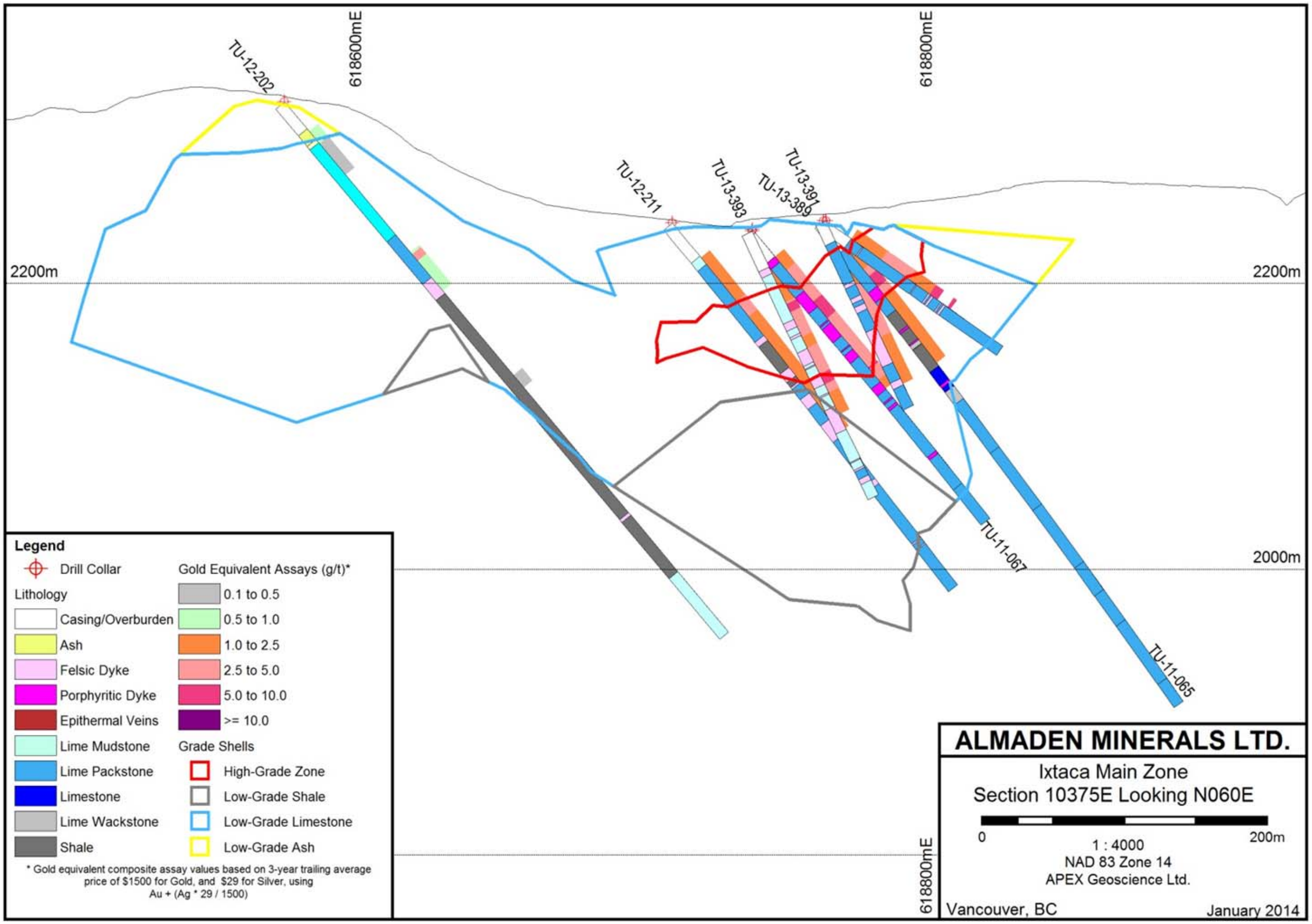
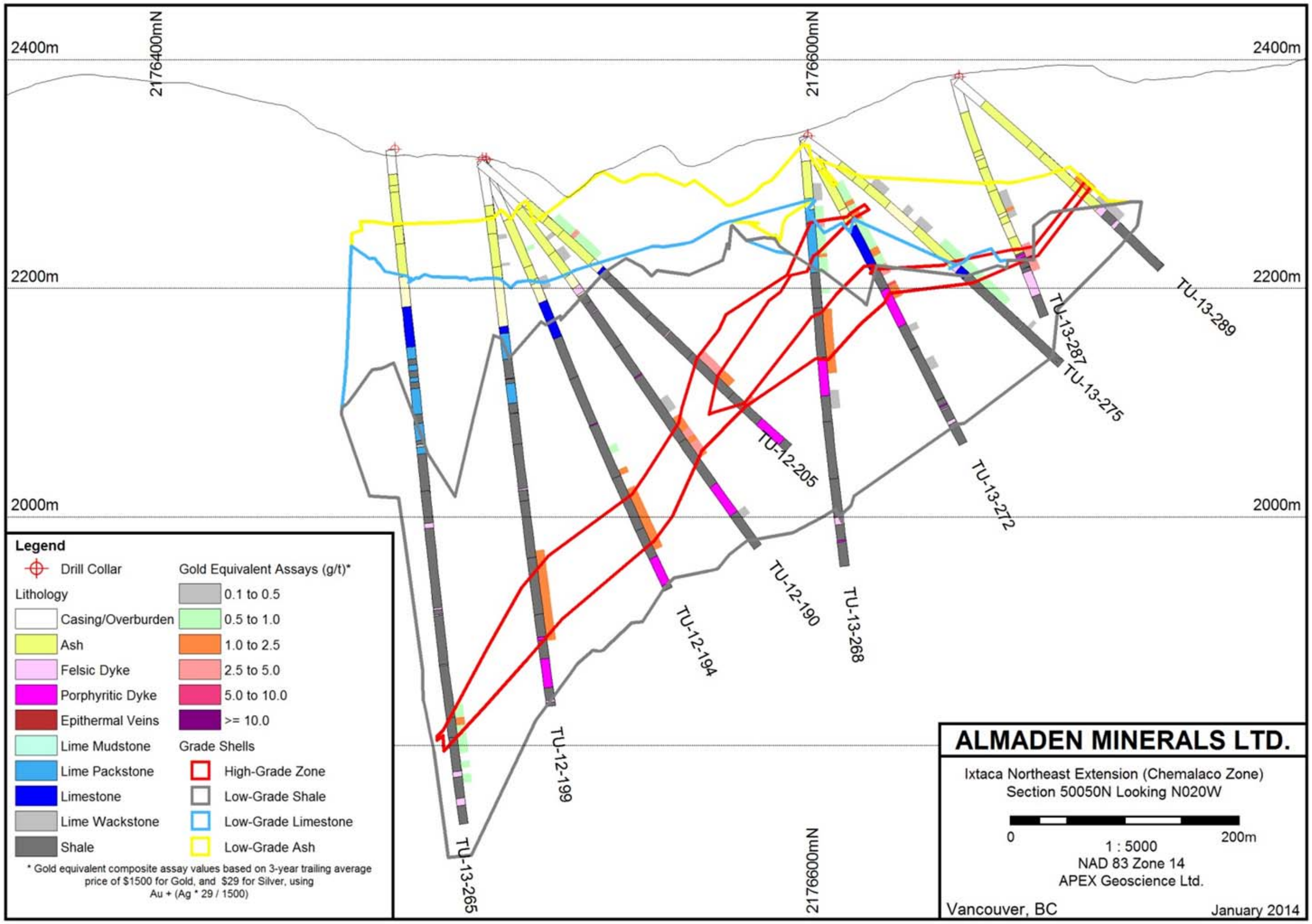


Figure 10-4. Section 50+050N through the Chemalaco Zone



11 Sample Preparation, Analyses and Security

11.1 Sample Preparation and Analyses

11.1.1 Rock Grab and Soil Geochemical Samples

Rock grab and soil geochemical samples were transported by Almaden field personnel to the Santa Maria core facility where they were placed into plastic twine (rice) sacks, sealed using single plastic cable ties. Custody of samples is handed over to ALS Minerals (ALS) at the Santa Maria core facility. ALS sends its own trucks to the Project to transport samples to its sample preparation facility in Guadalajara or Zacatecas, Mexico. Prepared sample pulps were then forwarded by ALS personnel to the ALS North Vancouver, British Columbia laboratory for analysis.

ALS is an International Standards Organization (ISO) 9001:2008 and ISO 17025-2005 certified geochemical analysis and assaying laboratory. ALS is independent of Almaden and the authors.

ALS reported nothing unusual with respect to the shipments, once received and the author has no reason to believe that the security of the samples was compromised.

At the ALS Zacatecas and Guadalajara sample preparation facilities, rock grab samples were dried prior to preparation and then crushed to 10 mesh (70% minimum pass) using a jaw crusher. The samples were then split using a riffle splitter, and sample splits were further crushed to pass 200 mesh (85% minimum pass) using a ring mill pulverizer (ALS PREP-31 procedure). Soil samples were dried and sieved to 80 mesh.

Rock grab samples were subject to gold determination via a 50 gram (g) fire-assay (FA) fusion utilizing atomic absorption spectroscopy (AA) finish with a lower detection limit of 0.005 ppm Au (5 ppb) and upper limit of 10 ppm Au (ALS method Au-AA24). A 50 gram (g) prepared sample is fused with a mixture of lead oxide, sodium carbonate, borax, silica and other reagents as required, inquarted with 6 mg of gold-free silver and then cupelled to yield a precious metal bead. The bead is digested in 0.5 mL dilute nitric acid and 0.5 mL concentrated hydrochloric acid. The digested solution is cooled, diluted to a total volume of 4 mL with de-mineralized water, and analyzed by atomic absorption spectroscopy against matrix-matched standards.

Soil samples were subject to gold determination via is digestion of a 50 g prepared sample in a mixture of 3 parts hydrochloric acid and 1 part nitric acid (aqua regia). Dissolved gold is then determined by ICP-MS.

Silver, base metal and pathfinder elements for rock and soil samples were analyzed by 33-element inductively coupled plasma atomic emission spectroscopy (ICP-AES), with a 4-acid digestion (ALS method ME-ICP61). A 0.25 g prepared sample is digested with perchloric, nitric, hydrofluoric and hydrochloric acids. The residue is topped up with dilute hydrochloric acid and the resulting solution is analyzed by ICP-AES. For rock samples only, following this analysis, the results are reviewed for high concentrations of bismuth, mercury, molybdenum, silver and tungsten and diluted accordingly. Samples meeting this criterion are then analyzed by inductively coupled plasma mass spectrometry (ICP-MS, ALS method ME-MS61). Results are corrected for spectral inter-element interferences. Four acid digestions are able to dissolve most minerals; however, depending on the sample matrix, not all elements are quantitatively extracted.

11.1.2 Almaden Drill Core

All strongly altered or epithermal-mineralized intervals of core were sampled. Almaden employed a maximum sample length of 2 to 3 m in unmineralized lithologies, and a maximum sample length of 1 m in mineralized lithologies (50 cm minimum sample length). Sampling always began at least 5 samples above the start of mineralization. Geological changes in the core such as major alteration or mineralization intensity (including large discrete veins), or lithology were used as sample breaks.

Drill core was half-sawn using industry standard gasoline engine-powered diamond core saws, with fresh water cooled blades and “core cradles” to ensure a straight cut. For each sample, the core logging geologist marks a cut line down the centre of the core designed to produce two halves of equal proportions of mineralization. This is accomplished by marking the cut line down the long axis of ellipses described by the intersection of the veins with the core circumference.

Areas of very soft rock (e.g. fault gouge), are cut with a machete using the side of the core channel to ensure a straight cut. Areas of very broken core (pieces <1 cm) were sampled using spoons. In all cases, the right hand side of the core (looking down the hole) was sampled. After cutting, half the core was placed in a new plastic sample bag and half was placed back in the core box. Between each sample, the core saw and sampling areas were washed to ensure no contamination between samples. Field duplicate, blank and analytical standards were added into the sample sequence as they were being cut.

Sample numbers were written on the outside of the sample bags twice and the numbered tag from the ALS sample book was placed inside the bag with the half core. Sample bags were sealed using single plastic cable ties. Sample numbers were checked against the numbers on the core box and the sample book.

Drill core samples collected by the Almaden were placed into plastic twine (rice) sacks, sealed using single plastic cable ties. ALS sends its own trucks to the Project to take custody of the samples at the Santa Maria core facility and transport them to its sample preparation facility in Guadalajara or Zacatecas, Mexico. Prepared sample pulps were then forwarded by ALS personnel to the ALS North Vancouver, British Columbia laboratory for analysis.

Drill core samples were subject to gold determination via a 50 gram (g) AA finish FA fusion with a lower detection limit of 0.005 ppm Au (5 ppb) and upper limit of 10 ppm Au (ALS method Au-AA24). A 50 g prepared sample is fused with a flux mixture, inquarted with 6 mg of gold-free silver and then cupelled to yield a precious metal bead. The bead is digested in 0.5 mL dilute nitric acid and 0.5 mL concentrated hydrochloric acid.

The digested solution is cooled, diluted to a total volume of 4 mL with de-mineralized water, and analyzed by atomic absorption spectroscopy against matrix-matched standards.

Over limit gold values (>10 ppm Au) were subject to gravimetric analysis, whereby a 50 g prepared sample is fused with a mixture of lead oxide, sodium carbonate, borax, silica and other reagents in order to produce a lead button. The lead button containing the precious metals is cupelled to remove the lead. The remaining gold and silver bead is parted in dilute nitric acid, annealed and weighed as gold (ALS method Au-GRA22).

Silver, base metal and pathfinder elements for drill core samples were analyzed by 33-element ICP-AES, with a 4-acid digestion, a lower detection limit of 0.5 ppm Ag and upper detection limit of 100 ppm Ag (ALS method ME-ICP61). A 0.25 g prepared sample is digested with perchloric, nitric, hydrofluoric and hydrochloric acids. The residue is topped up with dilute hydrochloric acid and the resulting solution is analyzed by ICP-AES (ALS method ME-ICP61). Four acid digestions are able to dissolve most minerals; however, depending on the sample matrix, not all elements are quantitatively extracted.

Over limit silver values (>100 ppm Ag) were subject to 4-acid digestion ICP-AES analysis with an upper limit of 1,500 ppm Ag (ALS method ME-OG62). A prepared sample is digested with nitric, perchloric, hydrofluoric, and hydrochloric acids, and then evaporated to incipient dryness. Hydrochloric acid and de-ionized water is added for further digestion, and the sample is heated for an additional allotted time. The sample is cooled and transferred to a 100 mL volumetric flask. The resulting solution is diluted to volume with de-ionized water, homogenized and the solution is analyzed by ICP-AES. Ultra-high grade silver values (>1,500 ppm Ag) were subject to gravimetric analysis with an upper detection limit of 10,000 ppm Ag (Ag-GRA22).

11.1.3 Author's Drill Core

Drill core samples collected by Kristopher J. Raffle, P.Geo., were placed into sealed plastic bags and transported by the author to ALS North Vancouver, British Columbia laboratory for gold FA and ICP-MS analysis. The author did not have control over the samples at all times during transport; however the author has no reason to believe that the security of the samples was compromised.

The samples were dried prior to preparation and then crushed to 10 mesh (70% minimum pass) using a jaw crusher. The samples were then split using a riffle splitter, and sample splits were further crushed to pass 200 mesh (85% minimum pass) using a ring mill pulverizer (ALS PREP-31 procedure).

Drill core samples collected by the author were subject to gold determination via a 50 gram (g) AA finish FA fusion with a lower detection limit of 0.005 ppm Au (5 ppb) and upper limit of 10 ppm Au (ALS method Au-AA24). A 50 g prepared sample is fused with a flux mixture, inquarted with 6 mg of gold-free silver and then cupelled to yield a precious metal bead. The bead is digested in 0.5 mL dilute nitric acid and 0.5 mL concentrated hydrochloric acid. The digested solution is cooled, diluted to a total volume of 4 mL with de-mineralized water, and analyzed by atomic absorption spectroscopy against matrix-matched standards.

Silver, base metal and pathfinder elements for rock and soil samples were analyzed by 33-element inductively coupled plasma atomic emission spectroscopy (ICP-AES), with a 4-acid digestion. A 0.25 g prepared sample is digested with perchloric, nitric, hydrofluoric and hydrochloric acids. The residue is topped up with dilute hydrochloric acid and the resulting solution is analyzed by ICP-AES. Following this analysis, the results are reviewed for high concentrations of bismuth, mercury, molybdenum, silver and tungsten and diluted accordingly. Samples meeting this criterion are then analyzed by inductively coupled plasma mass spectrometry (ICP-MS, ALS method ME-MS61). Results are corrected for spectral inter-element interferences. Four acid digestions are able to dissolve most minerals; however, depending on the sample matrix, not all elements are quantitatively extracted.

Over limit silver values (>100 ppm Ag) were subject to 4-acid digestion, ICP-AES analysis with an upper limit of 1,500 ppm Ag (ALS method ME-OG62). A prepared sample is digested with nitric, perchloric, hydrofluoric, and hydrochloric acids, and then evaporated to incipient dryness. Hydrochloric acid and de-ionized water is added for further digestion, and the sample is heated for an additional allotted time. The sample is cooled and transferred to a 100 mL volumetric flask. The resulting solution is diluted to volume with de-ionized water, homogenized and the solution is analyzed by ICP-AES.

11.2 Quality Assurance / Quality Control Procedures

For the Tuligtic rock grab sample and soil geochemical programs Almaden relied on external quality assurance and quality control (QA/QC) measures employed by ALS. QA/QC measures at ALS include routine screen tests to verify crushing efficiency, sample preparation duplicates (every 50 samples), and analytical quality controls (blanks, standards, and duplicates). QC samples are inserted with each analytical run, with the minimum number of QC samples dependant on the rack size specific to the chosen analytical method. Results for quality control samples that fall beyond the established limits are automatically red-flagged for serious failures and yellow-flagged for borderline results. Every batch of samples is subject to a dual approval and review process, both by the individual analyst and the Department Manager, before final approval and certification. The author has no reason to believe that there are any issues or problems with the preparation or analyzing procedures utilized by ALS.

Drill core samples are subject to Almaden's internal QA/QC program that includes the insertion of analytical standard, blank and duplicate samples into the sample stream. A total of 15 QA/QC samples are present in every 100 samples sent to the laboratory. QA/QC sample results are reviewed following receipt of each analytical batch. QA/QC samples falling outside established limits are flagged and subject to review and possibly re-analysis, along with the 10 preceding and succeeding samples (prior to August 7, 2012, a total of 5 samples preceding and 5 samples succeeding the reviewable QA/QC sample were re-analyzed). Where the re-analyses fall within acceptable QA/QC limits the values are added to the drill core assay database. Summary results of Almaden's internal QA/QC procedures are presented below.

In the author's opinion, Almaden's QA/QC procedures are reasonable for this type of deposit and the current level of exploration. A total of 12,873 QA/QC analytical standard and blank samples were submitted for analysis. Based on the results of the QA/QC sampling summarized below, the analytical data is considered to be accurate; the analytical sampling is considered to be representative of the drill sample, and the analytical data to be free from contamination. The analytical data is suitable for inclusion into a mineral resource estimate.

11.2.1 Analytical Standards

A total of 17 different analytical standards have been used on the project. Since November 13, 2012 and drill hole TU-12-221 (the end of the Maiden resource estimate cut-off), 7 different analytical standards have been used and are the basis for the section herein. Please refer to the 2013 Almaden NI 43-101 (Raffle et al. 2013) report for a detailed discussion of the previously used standards.

Each standard has an accepted gold and silver concentration as well as known "between laboratory" standard deviations, or expected variability, associated with each standard. The standards included 7 multi-element gold-silver standards with accepted values ranging from 0.564 to 3.88 g/t Au, and 14.4 to 103.0 g/t Ag. One analytical standard for every 20 samples (5%) was inserted into the sample stream at the '05', '25', '45', '65' and '85' positions. QA/QC summary charts showing gold and silver values for each analytical standard in addition to the accepted value, the second, and third "between laboratory" standard deviation are shown in Figure 11-1 below.

Between 2010 and 2013 Almaden employed two separate criteria by which standards were assigned "pass" or "reviewable" status.

Up to drill hole TU-12-130 a reviewable standard was defined as any standard occurring within a reported mineralized interval returning greater than three (3) standard deviations (>3SD) above the accepted value for gold or silver. Beginning with drill hole TU-12-154, standards returning *less than* three (3) standard deviations (<3SD) below the accepted value for gold or silver were also flagged for review. Failed standards occurring outside of reported mineralized intercepts were not flagged as reviewable. Beginning with drill hole TU-12-131, a reviewable standard was defined as any standard occurring anywhere in a drill hole returning >3SD above the accepted value for gold or silver. In addition, two standards analyzed consecutively returning values ranging from >2SD to <3SD above the accepted value for at least one element were classified as reviewable (gold or silver, both must be above the accepted value).

All standard samples returning gold or silver values outside the established criteria were reviewed. A decision to conduct reanalysis of samples surrounding the reviewable standard was based on whether the standard returned a value above or below the accepted value (low, or slightly high >3SD values were allowed after data review) or if it occurred within a reported interval (>3SD values were allowed outside of reported intervals) Prior to August 7, 2012, when a reviewable standard was recognized the 5 preceding and 5 succeeding samples, in addition to the standard were subject to review and possibly re-analysis. After August 7, 2012 when a reviewable standard was recognized, the 10 preceding and 10 succeeding samples, in addition to the standard were subject to review and possibly re-analysis. The results of re-analysis were then compared to the original analysis. Provided that no significant systematic increase or decrease in gold and silver values is noted and the re-analyzed standard returned values within the expected limits, the QA/QC concern was considered resolved and the re-analyzed standard value was added to the drill hole database.

A total of 6,438 analytical standards were inserted into the sample stream of 109,570 assays for gold and silver for the 423 drill holes. Of the 6,438 standards, a total of 2,356 were subject to review criteria in place up to drill hole TU-12-130. Of the remaining 4,082 samples subject to the current review criteria (TU-12-131 and later), 1,708 samples were included in the maiden mineral resource estimate up to hole TU-12-221 (Raffle et al., 2013). QA/QC results with respect to the remaining 2,374 standards are reported herein (TU-12-222 and later).

Of the 2,374 QA/QC samples inserted into the sample stream since November 13, 2012, a total of 162 (6.8%) were initially reviewable as a result of two consecutive standards returning >2SD from the accepted value, or a single standard returning >3SD from the accepted value for gold or silver. These standards were re-analysed and all but four passed the repeat analysis (Figure 11-1). Of the four (4) re-analysis failures, one (1) was outside the reported mineralized interval, and the remaining three (3) assayed within the accepted value for Au but failed the accepted value for Ag. Of these three re-analysis failures, two were consecutive standards that returned >2SD from the accepted Ag value and one re-assayed >3SD for the accepted Ag value.

Figure 11-1. QA/QC Analytical Standards

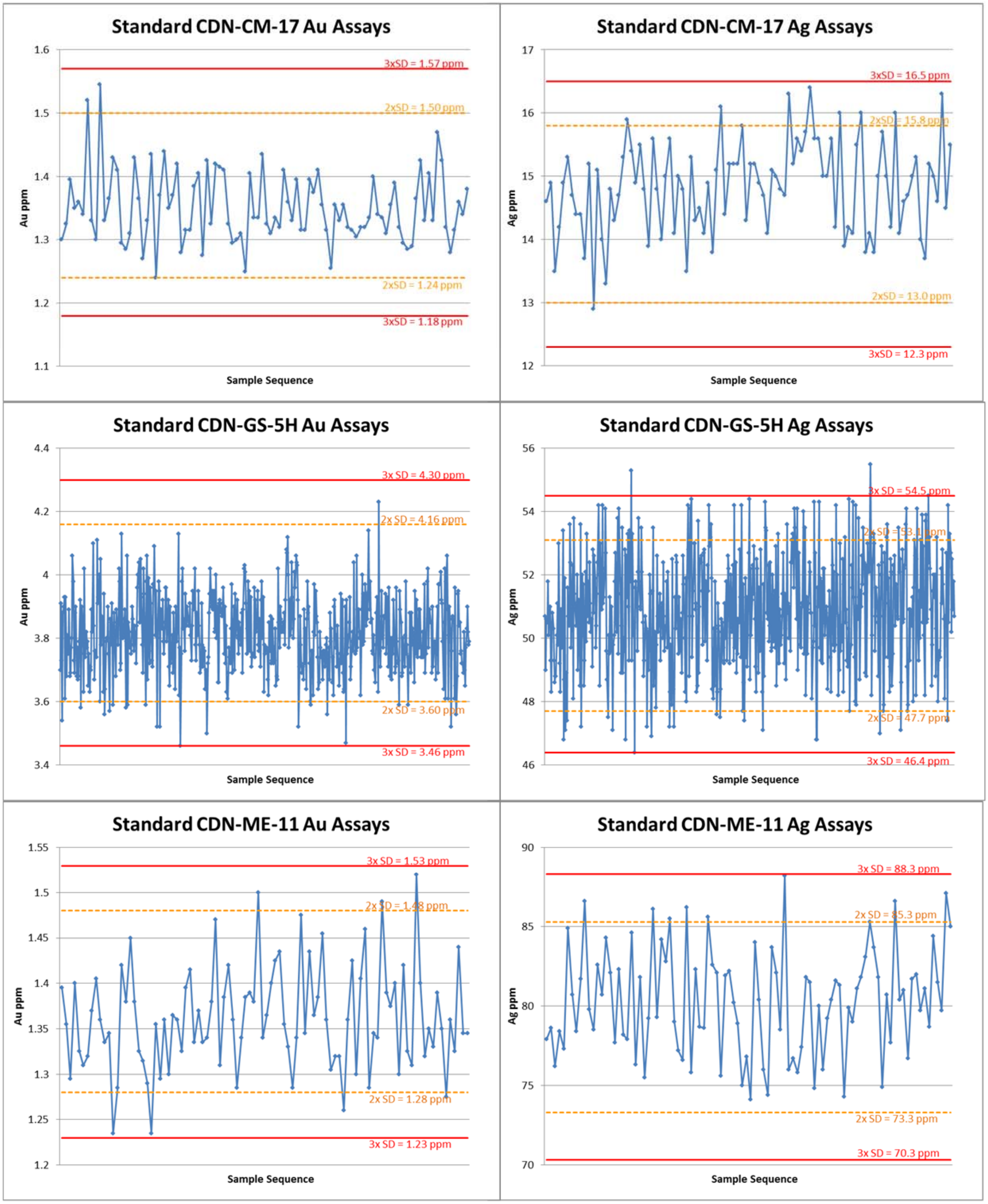


Figure 11-1 (con'd). QA/QC Analytical Standards

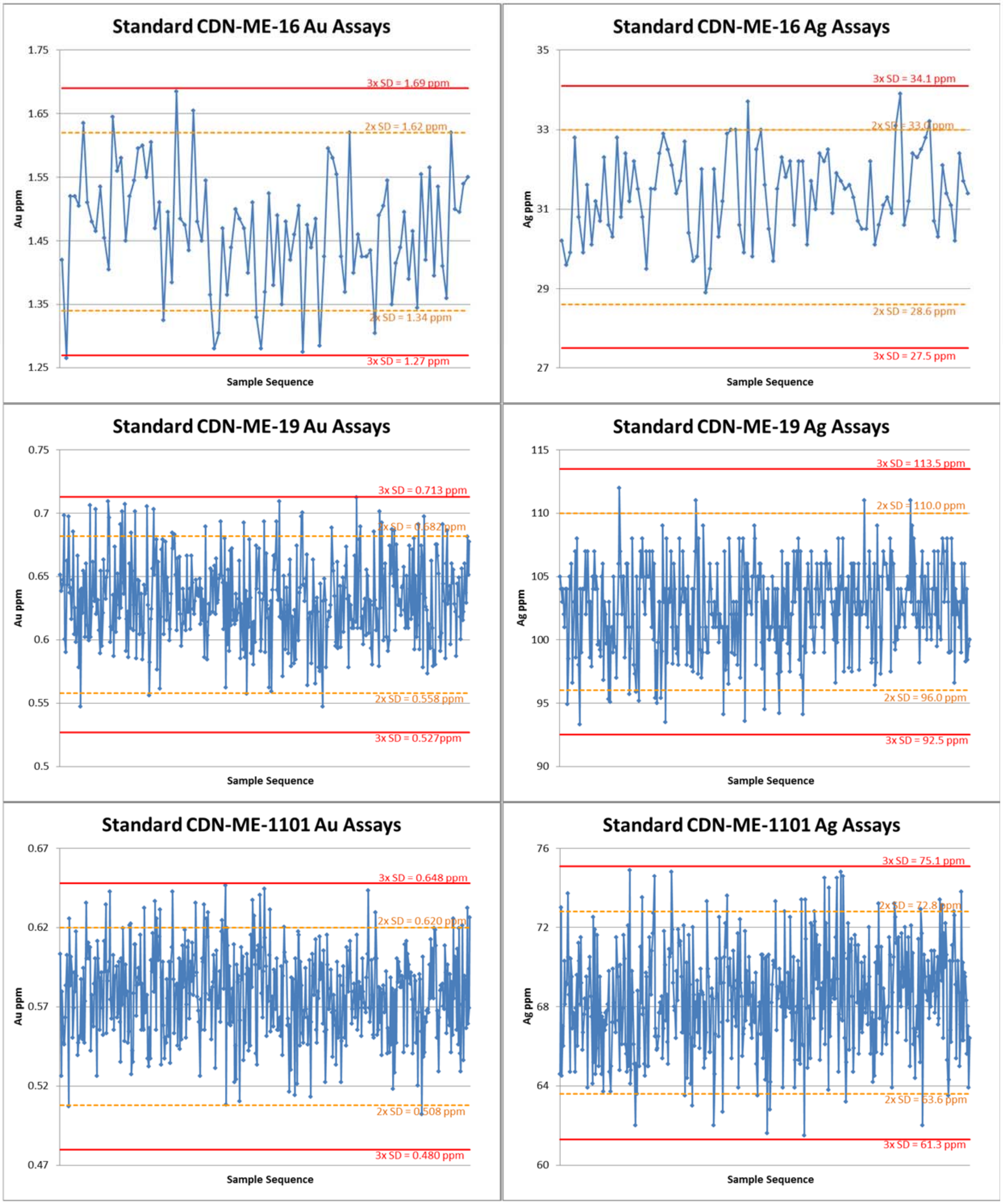
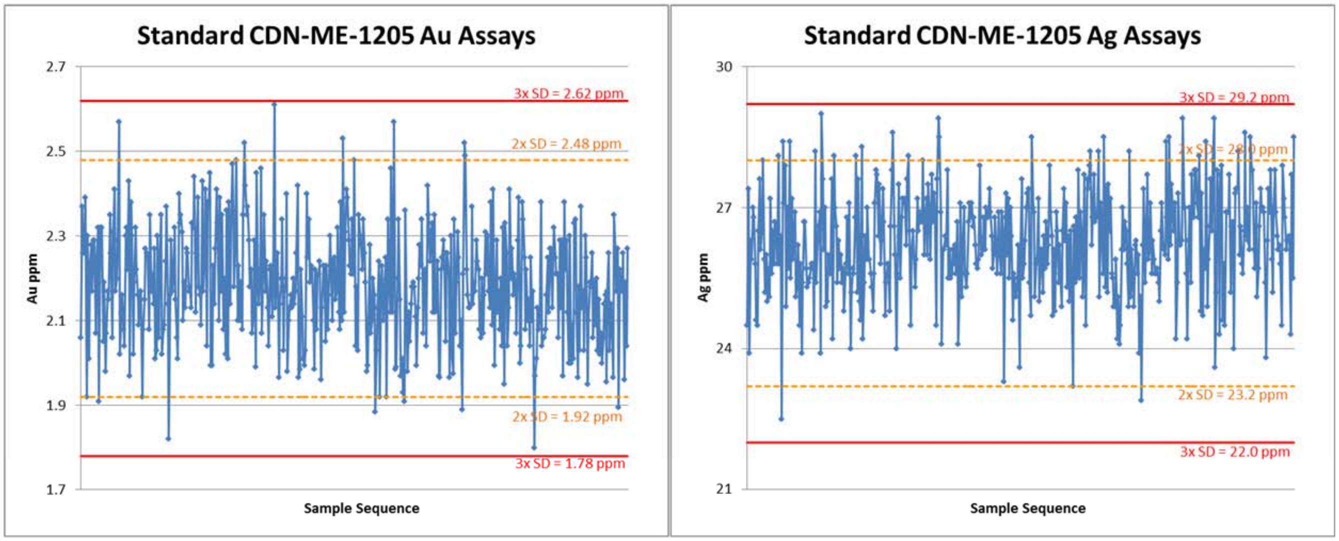


Figure 11-1 (con'd). QA/QC Analytical Standards



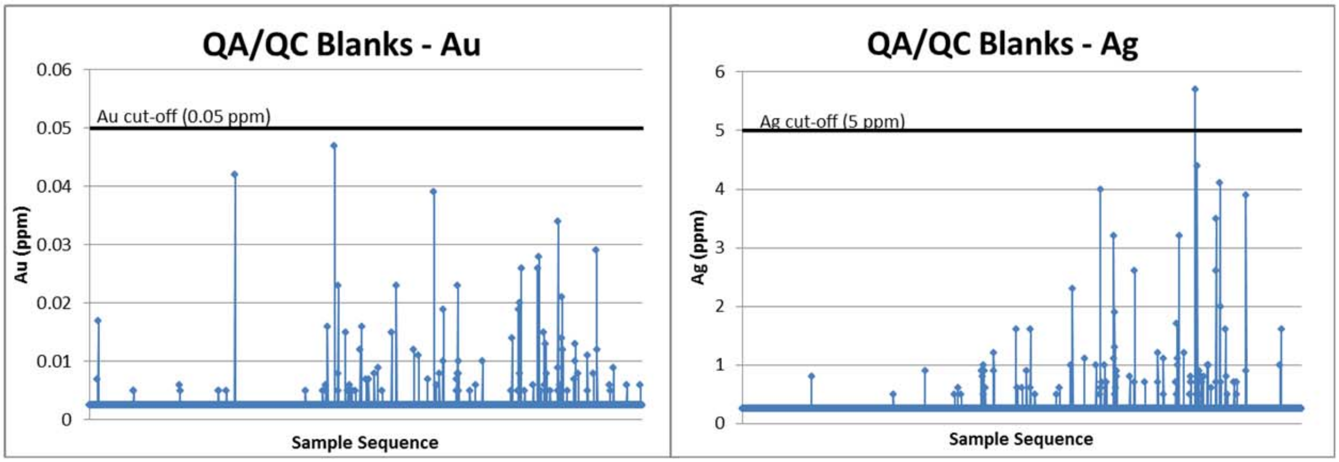
11.2.2 Blanks

Local limestone gravel was used for coarse "blank" samples to monitor potential contamination during the sample preparation procedure. One blank for every 20 samples (5%) was inserted into the sample stream at the '10', '30', '50', '70', and '90' positions. Blank samples returning values of greater than 50 ppb Au and/or 5 ppm Ag were flagged for review.

Reviewable blank samples occurring outside a reported mineralized intercept were not subject to re-analysis. In the event that a blank returned values above the accepted limits for gold or silver (prior to August 7, 2012), the blank and 5 samples on either side were re-analyzed. To provide additional confidence, on August 7, 2012, Almaden increased the number of samples re-analyzed to 10 samples on either side of the blank in question. The results of re-analysis were then compared to the original analysis. Provided that no significant systematic increase or decrease in gold and silver values is noted and the re-analyzed blank did not return values above the accepted limits; the QA/QC concern was considered resolved and the re-analyzed blank value was added to the drill hole database.

Of the 2,374 blank samples analyzed subsequent to since November 13, 2012, a total of 9 blanks returned assays greater than the accepted values of 50 ppb Au and 5 ppm Ag. Of these, 8 blanks returned greater than 50 ppb Au, and 7 blanks returned greater than 5 ppm Ag. These blanks occurred within mineralized intervals, and as such were re-assayed. When re-assayed, all blanks except one sample returned values below the accepted values for Au and Ag (Figure 11-2). The single remaining failed blank sample immediately follows a high grade sample that returned an assay of 5,310 ppm Ag and in this case it is reasonable that a certain amount of carryover occurred.

Figure 11-2. QA/QC Blanks



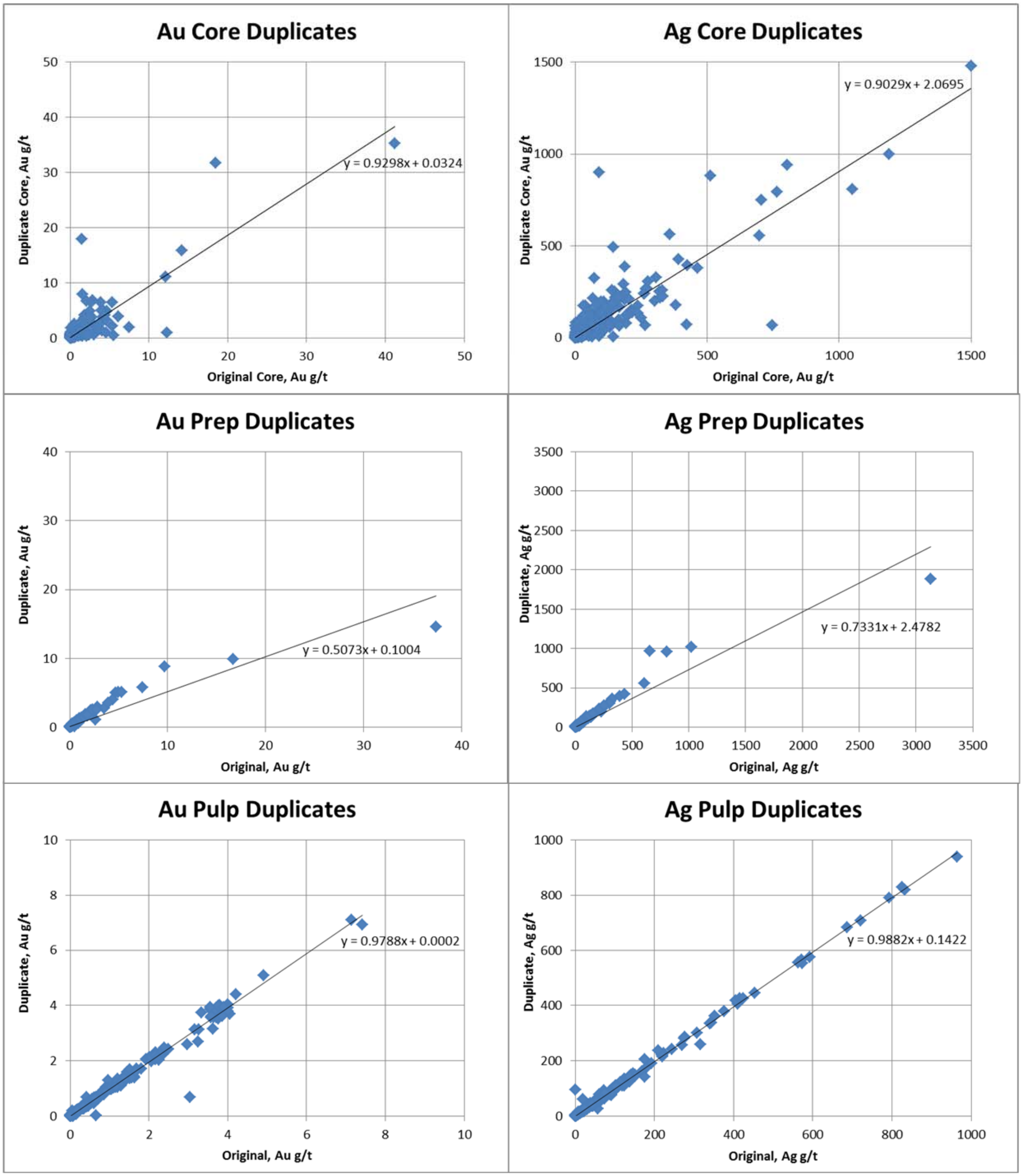
11.2.3 Duplicates

Quartered-core duplicate samples were collected to assess the overall repeatability of individual analytical values. One core duplicate for every 20 samples (5%) was inserted into the sample stream at the ‘15’, ‘35’, ‘55’, ‘75’, and ‘95’ positions. A total of 2,369 quarter-core duplicates were inserted into the sample stream beginning with drill hole TU-12-222.

As part of their internal QA/QC program, ALS completed routine re-analysis of prep (coarse reject) and pulp duplicates to monitor precision. ALS analyzed a total of 772 prep duplicates for gold, and 798 for silver. A total of 1,836 pulp duplicates were analyzed for gold and 1,459 for silver.

Charts showing original versus duplicate quarter-core, prep and pulp duplicate values for gold and silver show a significant and progressive increase in sample repeatability (Figure 11-3). Increased repeatability is expected as the level of duplicate sample homogenization increases from low (quarter-core) to moderate (prep) and high (pulp). The data indicates a high level of repeatability for both prep (coarse reject) and pulp duplicates. This is interpreted to indicate a low “nugget” effect with respect to Ixtaca gold and silver analyses. Excluding primary geologic heterogeneity (quarter-core), the data show a homogenous distribution of gold and silver values within Ixtaca drill core.

Figure 11-3. QA/QC Duplicates



11.3 Independent Audit of Almaden Drill Hole Database

Between August 23 and September 26, 2012 and subsequently January 2 and January 21, 2014 APEX personnel, under the direct supervision of Kristopher J. Raffle, P.Geo., conducted an independent audit of Almaden's drill hole database. The audit included systematic checks of database values for drill collar coordinate, downhole survey, and drill core, analytical standard, duplicate, and blank sample assays against the original field survey files and laboratory certificates. In addition, APEX conducted a review of the Almaden QA/QC database, summary results of which is presented within section 11.2 above.

11.3.1 Collar Coordinate and Downhole Survey Databases

A total of 22 diamond drill hole collar locations were confirmed by Kristopher J. Raffle, P.Geo. following site visits to the Tuligtic Project on October 18, 2011, September 23, 2012 and November 20, 2013. The drill locations were compared with the Almaden database used in the mineral resource estimate and are deemed to be accurate. In addition, Almaden provided APEX with copies of all original down hole survey field records. Original field records for a total of 42 drill holes were checked against database values used for the mineral resource estimate. No discrepancies were found.

11.3.2 Drill Core Assay Database

A total of 109,570 drill core samples exist within the drill database (423 drill holes in total). The database audit consisted of checking 10,885 database gold and silver values against the original ALS analytical certificates. The audit specifically focused on assays within reported mineralized intercepts. No discrepancies were identified between the original ALS analytical certificates and Almaden's drill hole database values.

12 Data Verification

The author first conducted a reconnaissance of the Tuligtic Property from October 17 to October 20, 2011 to verify the reported exploration results. The author completed a traverse of the Ixtaca Zone, observed the progress of ongoing diamond drilling operations and recorded the location of select drill collars consistent with those reported by Almaden. Additionally, Almaden's complete drill core library was made available and the author reviewed mineralized intercepts in drill core from a series of holes across the Ixtaca Zone. The author personally collected quartered drill core samples as 'replicate' samples from select reported mineralized intercepts.

Additional visits to the Tuligtic Property were carried out by the author on September 23, 2012 and November 20, 2013 to observe current operations, review additional mineralized intercepts in drill core, and collect quarter drill core samples from the recently completed drill holes. A comparison of the results of the authors 'replicate' sampling versus original Almaden reported values for gold and silver are presented in Table 12-1.

Table 12-1. Authors Independent Drill Core Sample Assays

Authors Sample	Almaden Sample	Drill Hole	From (m)	To (m)	Interval (m)	Authors Au (ppm)	Authors Ag (ppm)	Almaden Au (ppm)	Almaden Ag (ppm)
11KRP201	51662	TU-11-036	82.97	83.5	0.53	7.85	525	5.59	504
11KRP202	4596	TU-10-006	332.62	333.66	1.04	3.00	164	2.79	191
11KRP203	45073	TU-11-020	190.57	190.87	0.30	5.49	271	5.19	285
11KRP204	56217	TU-11-051	91.70	92.20	0.50	1.98	229	4.04	349
11KRP205	46586	TU-11-034	140.16	140.50	0.34	32.40	691	29.9	712
11KRP206	45347	TU-11-021	168.67	169.16	0.49	17.60	1130	15.55	1460
12KRP601	086459	TU-12-138	299.50	300.00	0.50	1.745	307	1.545	229
12KRP602	094696	TU-12-164	188.00	188.50	0.50	0.819	126	1.745	134
12KRP603	N298311	TU-12-123	228.60	229.10	0.50	3.45	86.6	4.39	92.5
12KRP604	N296249	TU-12-124	174.80	175.30	0.50	1.165	100	2.01	155
12KRP605	098391	TU-12-166	356.40	357.00	0.60	3.94	13.2	3.64	14.5
12KRP606	071443	TU-12-103	273.50	274.00	0.50	5.20	118	4.36	136
13KRP201	126912	TU-13-238	216.00	216.50	0.50	3.78	92	2.69	63.4
13KRP202	142029	TU-13-287	166.98	168.00	1.02	0.668	48	0.775	87.7
13KRP203	141281	TU-13-308	375.50	376.00	0.50	2.36	19	2.41	33.2
13KRP204	143281	TU-13-309	195.00	195.50	0.50	11.35	756	14.4	1000

Based on the results of the traverses, drill core review, and 'replicate' sampling the author has no reason to doubt the reported exploration results. Slight variation in assays is expected due to variable distribution of ore minerals within a core section but the analytical data is considered to be representative of the drill samples and suitable for inclusion in the resource estimate.

13 Mineral Processing and Metallurgical Testing

13.1 Overview

Preliminary metallurgical work has been undertaken at Almaden's Ixtaca gold-silver deposit in Mexico in support of the maiden and updated mineral resource estimate and a potential preliminary economic assessment to be completed in 2014. Detailed metallurgical results can be found in Raffle et al (2013).

Metallurgical test work on Ixtaca was undertaken between September 2012 and January 2013 at Blue Coast Research Ltd. (Blue Coast), Parksville, British Columbia. Test work commenced with the treatment of a range of composite samples, comprising half drill core intersections from each of the main geologic domains: limestone, limestone/dyke high grade (HG), shale (Chemalaco Zone) and volcanic tuff material. Each composite was made up of five sub composites, each of which was taken from a separate drill hole, representing a different part of the respective geologic domain. Samples were shipped from Ixtaca in late August 2012 and inspected at the Blue Coast laboratory in early September 2012 prior to processing.

The following work was undertaken on each of four domain samples, Dyke, Limestone, Shale and Tuff:

- Head Assays for each sample
- Bond Ball Work Index

- E- GRG (Gravity Recoverable Gold) test
- Rougher flotation tests

A high grade blend of limestone and dyke material ('High Grade') was also tested. Results of the test work were used to develop a preliminary process strategy and model expected metal recoveries for the purposes of establishing inferred and indicated resources within the deposit. Samples were generally comprised of coarse assay rejects although some samples were received in the form of half and quarter drill core. Metallurgical composites prepared from drill samples received were tested. Average results from characterization work on head samples are shown in Table 13-1.

Table 13-1. Metallurgical Composite Head Assay

Sample	Pb (%)	Zn (%)	Fe (%)	Au (g/t)	Ag (g/t)	C (%)	S (%)
Dyke	0.02	0.04	3.86	0.71	40.0	1.45	3.64
Limestone	0.01	0.02	0.98	0.58	41.0	7.69	0.77
Limestone/Dyke HG	0.04	0.06	2.28	2.24	127.0	5.03	2.42
Shale	0.23	0.43	3.20	0.98	45.0	3.68	3.38
Tuff (volcanic)	0.01	0.02	2.53	0.86	9.0	1.04	1.95

Initial excellent results for GRG testing as well as flotation on the HG samples indicated good potential for these process routes. Gravity recovery results were factored in to the bulk flotation recovery numbers to obtain expected metal recoveries by this route to develop metallurgical recovery parameters for the establishment of a resource. Modelled recoveries are presented in Table 13-2. Combinations of gravity and flotation indicate excellent potential for gold and silver recovery from the resource.

Table 13-2. Overall and Modelled Recovery Parameters for the Ixtaca Deposit

Sample	Head		Flotation only		Gravity	Combined Float + GRG	
	Au (g/t)	Ag (g/t)	Au (Wt%)	Ag (Wt%)	Au (Wt%)	Au (Wt%)	Ag (Wt%)
Dyke	0.73	45.6	94.4	87.0	48.4	98.8	87.0
Limestone	0.76	49.3	85.7	79.9	58.7	90.5	79.9
Limestone/Dyke HG	2.01	123.5	92.0	88.8	58.7	96.8	88.8
Shale	0.93	46.4	93.2	83.5	54.9	97.9	83.5
Tuff (volcanic)	0.8	13.0	52.3	63.2	15.1	55.2	63.2

Initial process results indicate that treatment of Ixtaca material by a combination of grinding to a p_{80} of 100-150µm plus gravity recovery on the cyclone underflow, with recovery of gold and silver by means of bulk flotation, is a viable process route for the Ixtaca resource.

Further metallurgical work, including mineralogical work, process optimization of flotation, and investigation of alternate reagent combinations on existing and fresh domain samples is planned for 2014.

14 Mineral Resource Estimate

At the request of Morgan Poliquin, President of Almaden Minerals Ltd. (“AML”), Giroux Consultants Ltd. was retained to produce an updated resource estimate on the Ixtaca Main Zone, Tuligtic Project located in Puebla State, Mexico. There have been 198 additional diamond drill holes completed on the Tuligtic Project by Almaden since the last 43-101 resource estimate (K. Raffle, et.al. March 4, 2013) bringing the total number of drill holes on the property to 423. The effective date for this estimate is January 8, 2014, the date the data was received.

G.H. Giroux is the qualified person responsible for the resource estimate. Mr. Giroux is a qualified person by virtue of education, experience and membership in a professional association. He is independent of the company applying all of the tests in section 1.5 of National Instrument 43-101. Mr. Giroux has not visited the property.

14.1 Data Analysis

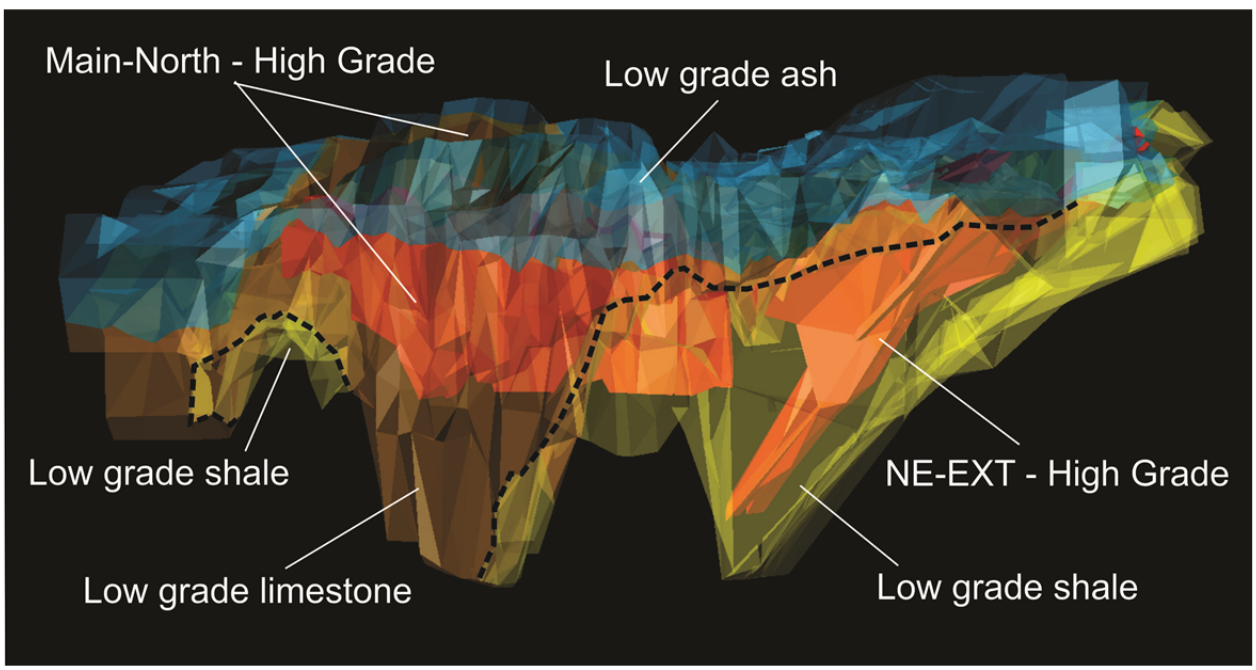
Almaden supplied a total of 423 drill holes with 5,095 down hole surveys and 109,570 assays for gold and silver. Of these drill holes, 400 totalling 129,734 m outline the Ixtaca Main zone and NE Extension which are estimated in this resource. All drill holes are included in Appendix 1 with the holes used in this resource highlighted. A total of 704 gaps were found in the from – to record and in these gaps values of 0.001 g/t Au and 0.01 g/t Ag were inserted. Included in these gaps were 422 intervals at the start or end of holes that were not sampled due to broken rock which was cased or ends of holes that were not considered mineralized. Two gold and silver assays reported as blank were set to 0.001 g/t and 0.01 g/t respectively.

Almaden also supplied a series of geologic solids for the Ixtaca zone, which outlined the following mineralized domains:

Code	Description
ASH	A clay altered tuff overlying the mineralized carbonate rocks
MHG	The Main Ixtaca High Grade Mineralized Zone comprised of varying density of carbonate-quartz epithermal veining
NEHG	A North east trending extension of High Grade carbonate-quartz epithermal veining
LGLS	A lower grade envelope within the Main Zone Limestone unit
LGSH	A lower grade envelope within the Main Zone Shale unit
NELGSH	A lower grade envelope of Shale surrounding the NEHG zone

From this list, 3 dimensional solids, for each domain, were created in Gemcom software by Almaden geologists, to constrain the estimation. Figure 14-1 shows the various mineralized domains.

Figure 14-1: Isometric view looking N showing the geologic solids



Drill holes were then compared to the solids and each assay was tagged with a code (Table 14-1). The statistics for gold and silver are tabulated below sorted by mineralized zone. Assays outside the mineralized solids were tagged as waste.

Table 14-1: Assay statistics for gold and silver sorted by mineralized zone

Domain	Variable	Number of Assays	Mean Grade	Standard Deviation	Minimum Value	Maximum Value	Coefficient Of Variation
ASH	Au (g/t)	13,778	0.422	4.647	0.001	470.00	11.00
	Ag (g/t)	13,778	8.68	58.80	0.01	4340.00	6.78
MHG	Au (g/t)	11,643	1.247	5.080	0.001	336.00	4.08
	Ag (g/t)	11,643	82.51	236.21	0.01	9660.00	2.86
LGLM	Au (g/t)	38,382	0.261	1.784	0.001	167.00	6.83
	Ag (g/t)	38,382	17.40	95.07	0.01	5310.00	5.46
LGSH	Au (g/t)	3,376	0.186	0.992	0.001	38.00	5.34
	Ag (g/t)	3,376	11.58	60.44	0.01	2370.00	5.22
NELGSH	Au (g/t)	20,705	0.118	1.059	0.001	94.00	8.98
	Ag (g/t)	20,705	9.49	41.80	0.01	1490.00	4.41
NEHG	Au (g/t)	3,858	0.791	2.584	0.003	96.40	3.27
	Ag (g/t)	3,858	50.15	118.69	0.25	3140.00	2.37
WASTE	Au (g/t)	18,532	0.012	0.070	0.001	5.44	5.61
	Ag (g/t)	18,532	0.72	6.62	0.01	646.00	9.23

To determine if each of these geologic domains were unique the lognormal cumulative frequency plots for gold and silver were examined. The two high grade units are significantly different from the low grade units so these subdivisions should be honoured. While the low grade units in the Ash and Limestone are reasonably similar they do occur in different geographic areas so they should be modelled separately. The two shale units are also very similar but occur on different ends of the deposit.

Figure 14-2: Lognormal Cumulative Frequency Plot for Au as a Function of Domain

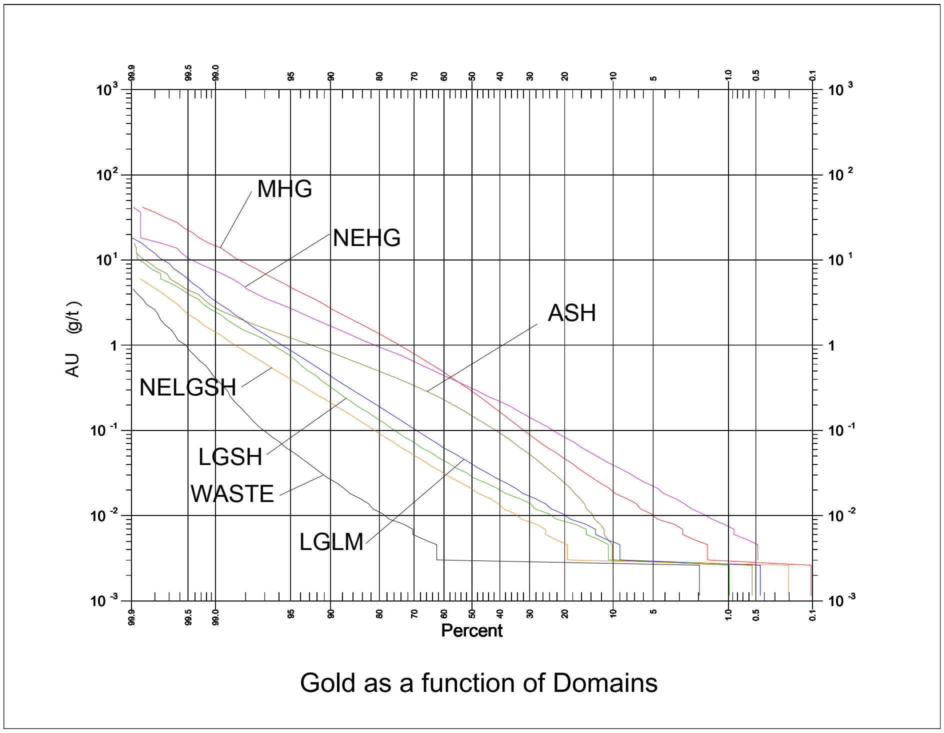
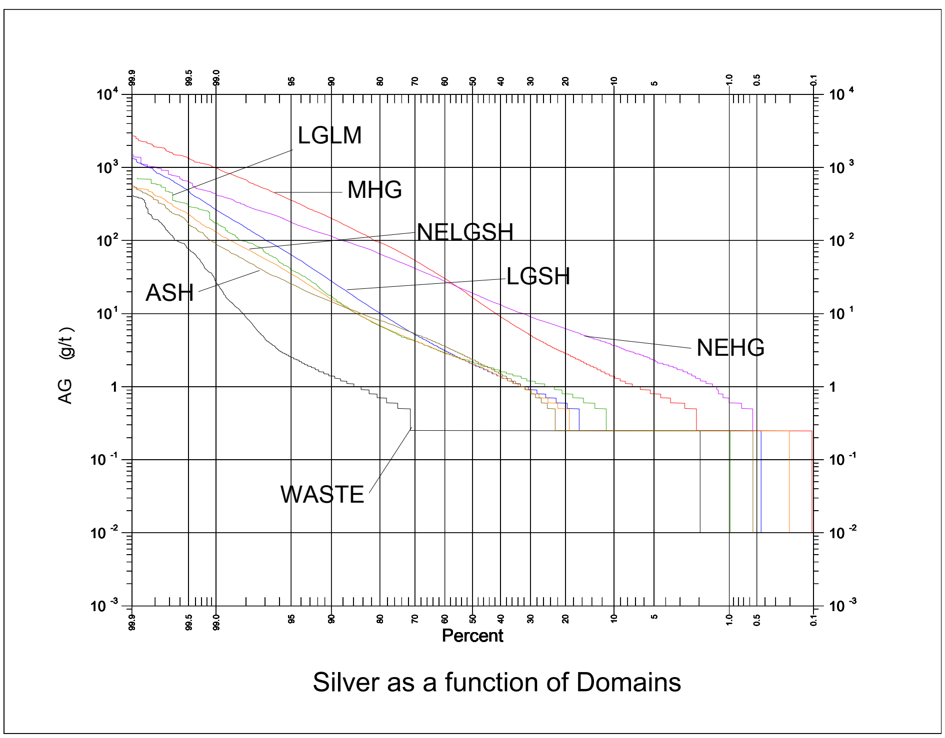


Figure 14-3: Lognormal Cumulative Frequency Plot for Ag as a Function of Domain



The grade distributions for gold and silver, within each mineralized domain, were examined to determine if capping was required and if so at what levels (Table 14-2). Both elements showed skewed distributions in all domains and were converted to lognormal cumulative frequency plots. Each variable was examined within each domain with thresholds selected for capping if required.

Table 14-2: Cap Levels for Gold and Silver

Domain	Variable	Cap Level (g/t)	Number of Assays capped
MHG	Au	56.0 g/t	6
	Ag	2150.0 g/t	18
ASH	Au	20.0 g/t	10
	Ag	500.0 g/t	16
LGLM	Au	41.0 g/t	11
	Ag	2200 g/t	10
LGSH	Au	6.0 g/t	8
	Ag	360.0 g/t	11
NELGSH	Au	13.0 g/t	5
	Ag	1100.0 g/t	4
NEHG	Au	17.0 g/t	5
	Ag	960.0 g/t	9
WASTE	Au	0.5 g/t	32
	Ag	50.0 g/t	14

The effects of capping are shown in the following Table 14-3 with minor reductions in mean grade but significant reductions in standard deviations and coefficients of variation.

Table 14-3: Capped Assay statistics for gold and silver sorted by domain

Domain	Variable	Number of Assays	Mean Grade	Standard Deviation	Minimum Value	Maximum Value	Coefficient Of Variation
ASH	Au (g/t)	13,778	0.358	0.887	0.001	20.00	2.48
	Ag (g/t)	13,778	7.82	27.85	0.01	500.00	3.56
MHG	Au (g/t)	11,643	1.195	3.298	0.001	56.00	2.76
	Ag (g/t)	11,643	80.10	190.56	0.01	2150.00	2.38
LGLM	Au (g/t)	38,382	0.251	1.315	0.001	40.00	5.23
	Ag (g/t)	38,382	17.09	84.75	0.01	2200.00	4.96
LGSH	Au (g/t)	3,376	0.163	0.513	0.001	6.00	3.16
	Ag (g/t)	3,376	10.15	34.15	0.01	360.00	3.37
NELGSH	Au (g/t)	20,705	0.108	0.455	0.001	13.00	4.22
	Ag (g/t)	20,705	9.44	40.35	0.01	1100.00	4.27
NEHG	Au (g/t)	3,858	0.736	1.470	0.003	17.00	2.00
	Ag (g/t)	3,858	48.37	89.16	0.25	960.00	1.84
WASTE	Au (g/t)	18,532	0.011	0.034	0.001	0.50	2.98
	Ag (g/t)	18,532	0.64	2.12	0.01	50.00	3.32

14.2 Composites

Of the 110,274 assays, within the 7 domains, 109,003 or 99% were less than or equal to 3 m in length. As a result a 3 m composite length was selected. Down hole composites

3 m in length were formed to honour the domain boundaries. Composite intervals at the domain boundaries that were less than 1.5 m in length were combined with adjoining samples while those greater than or equal to 1.5 m were left alone. As a result the composites formed a uniform support of 3±1.5 m. Material outside the 6 mineralized solids was considered waste.

Table 14-4: 3 m Composite statistics for gold and silver sorted by mineralized zone

Domain	Variable	Number of Assays	Mean Grade	Standard Deviation	Minimum Value	Maximum Value	Coefficient Of Variation
ASH	Au (g/t)	6,699	0.270	0.519	0.001	12.20	1.92
	Ag (g/t)	6,699	5.77	15.34	0.01	355.15	2.66
MHG	Au (g/t)	2,824	0.880	1.454	0.001	20.67	1.65
	Ag (g/t)	2,824	58.85	86.99	0.01	1287.43	1.48
LGLM	Au (g/t)	13,568	0.158	0.478	0.001	11.72	3.03
	Ag (g/t)	13,568	9.94	31.45	0.01	1050.01	3.16
LGSH	Au (g/t)	1,153	0.114	0.263	0.001	3.06	2.31
	Ag (g/t)	1,153	7.12	18.50	0.01	223.96	2.60
NELGSH	Au (g/t)	7,253	0.073	0.230	0.001	8.33	3.13
	Ag (g/t)	7,253	6.40	19.15	0.01	660.60	2.99
NEHG	Au (g/t)	910	0.626	0.835	0.003	7.36	1.34
	Ag (g/t)	910	42.74	53.21	0.25	487.60	1.24
WASTE	Au (g/t)	11,061	0.008	0.021	0.001	0.46	2.70
	Ag (g/t)	11,061	0.40	1.07	0.01	56.70	2.68

To determine if hard or soft boundaries would be required between the geologic domains a series of Contact Plots were produced. These plots examine the contact area between two geologic domains and compare the average grade for the variable being examined as a function of distance away from this contact. Where large differences appear at the contact a Hard Boundary should be used with samples from one side of the contact not allowed to influence blocks on the other side. If, on the other hand, the differences are minimal or gradational then a Soft Boundary could be set up with samples allowed to influence block grades from both sides of a contact.

The results are shown in Appendix 2. The grades for Au across the contacts are sufficiently different for the LGLM-ASH, LGLM-NELGSH, ASH-NELGSH, MHG-LGLM and NEHG-NELGSH boundaries to make these all Hard Boundaries. In the case of the LGLM-LGSH contact the grades are sufficiently similar, for Au across the contact, to make this a Soft Boundary.

The grades for Ag across the contacts are sufficiently different for the ASH-NELGSH, MHG-LGLM and NEHG-NELGSH contacts to make these all Hard Boundaries.

For silver along the LGLM-ASH, LGLM-LGSH and LGLM-NELGSH contacts the grades are sufficiently similar to make these Soft Boundaries.

14.3 Variography

Pairwise relative semivariograms were produced for gold and silver within the each of the geologic domains. In all cases except for waste, a geometric anisotropy was observed and nested spherical models were fit to the three principal directions. Due to the high correlation between Au and Ag in each of the domains, gold and silver showed similar directions of anisotropy.

Table 14-5: Pearson Correlation Coefficients for Au – Ag in Geologic Domains

Au:Ag Correlation Coef.	ASH	MHG	LGLS	LGSH	NEHG	NELGSH	WASTE
	0.7740	0.8781	0.8330	0.8336	0.5684	0.8013	0.7743

Within the Ash zone both gold and silver were modelled with anisotropic models with longest range along azimuth 155° dip 0° and down dip along azimuth 245° dip -45°.

Within the Main High Grade zone the longest direction of continuity for both Au and Ag was along azimuth 60° with the second longest range dipping -35° along azimuth 150°. A similar direction of anisotropy was observed within the low grade limestone unit that surrounds the Main High Grade Zones.

For the north east extension mineralization, the longest horizontal ranges in both the high grade core and low grade shale that surrounds it, were found along azimuth 347°.

For all of these models nested anisotropic spherical models were applied.

Within waste, both gold and silver showed isotropic nested structures.

The semivariogram parameters are tabulated below and the models for gold are shown in Appendix 3.

Table 14-6: Semivariogram Parameters for Gold and Silver

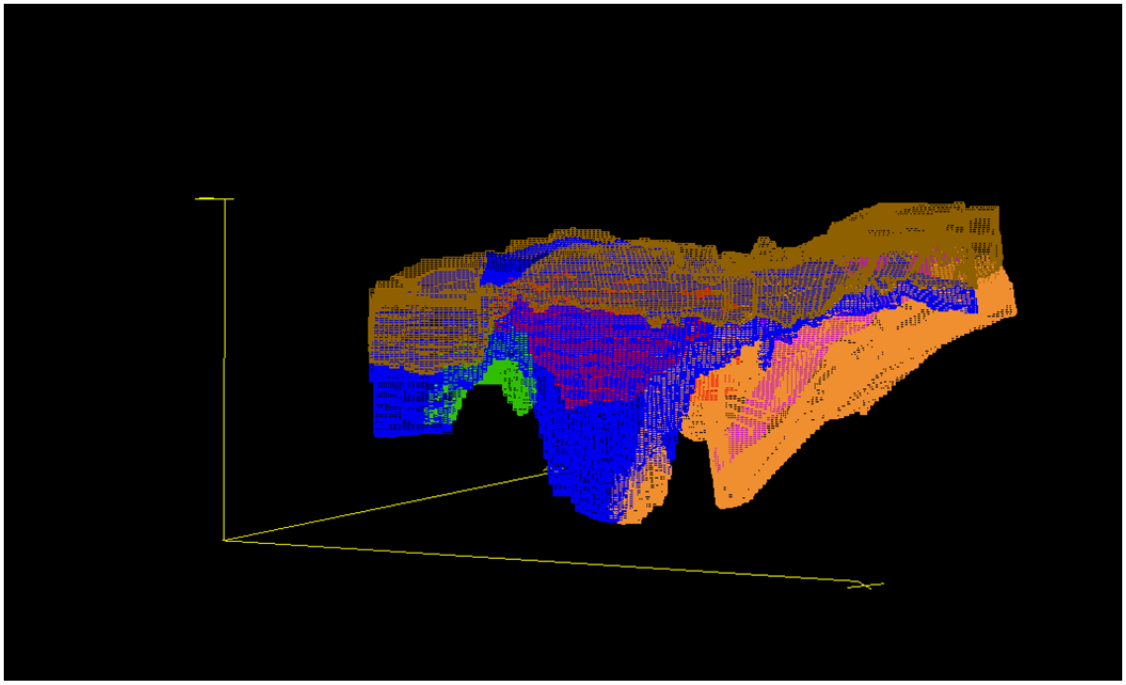
Domain	Variable	Az/Dip	C_0	C_1	C_2	Short Range (m)	Long Range (m)
MHG	Au	60° / 0°	0.35	0.38	0.20	10.0	120.0
		330° / -55°				12.0	100.0
		150° / -35°				12.0	120.0
	Ag	60° / 0°	0.45	0.30	0.18	12.0	140.0
		330° / -55°				15.0	70.0
		150° / -35°				15.0	100.0
ASH	Au	155° / 0°	0.20	0.18	0.70	10.0	120.0
		65° / -45°				15.0	50.0
		245° / -45°				20.0	90.0
	Ag	155° / 0°	0.20	0.20	0.60	10.0	120.0
		65° / -45°				15.0	50.0
		245° / -45°				15.0	90.0
LGLM	Au	60° / 0°	0.30	0.35	0.27	12.0	120.0
		330° / -55°				18.0	80.0
		150° / -35°				18.0	100.0
	Ag	60° / 0°	0.35	0.42	0.20	12.0	120.0
		330° / -55°				24.0	100.0
		150° / -35°				25.0	100.0
LGSH	Au	60° / 0°	0.20	0.30	0.37	15.0	30.0
		330° / -55°				10.0	50.0
		150° / -35°				15.0	60.0
	Ag	60° / 0°	0.20	0.40	0.27	20.0	50.0
		330° / -55°				10.0	50.0
		150° / -35°				30.0	80.0
NELGSH	Au	347° / 0°	0.20	0.25	0.35	40.0	140.0
		257° / -55°				12.0	210.0
		77° / -35°				15.0	100.0
	Ag	347° / 0°	0.20	0.35	0.15	28.0	90.0
		257° / -55°				15.0	210.0
		77° / -35°				20.0	60.0
NEHG	Au	347° / 0°	0.30	0.10	0.40	12.0	120.0
		257° / -55°				10.0	36.0
		77° / -35°				10.0	40.0
	Ag	347° / 0°	0.30	0.15	0.33	12.0	80.0
		257° / -55°				10.0	18.0
		77° / -35°				15.0	48.0
WASTE	Au	Omni Directional	0.08	0.30	0.06	36.0	110.0
	Ag	Omni Directional	0.05	0.45	0.12	36.0	110.0

14.4 Block Model

A rotated block model with blocks 10 m NE-SW, 10 m NW-SE and 5 m high was superimposed over the mineralized solids. The model was rotated 30° counter clockwise to line up with drill sections and line up with the mineralized structures. Within each block the percentage below surface topography and the percentage inside each mineralized solid were recorded. These percentages were checked to assure there was no overlap. The block model origin was as follows:

Lower Left Corner		
618578 E	Column size = 10 m	167 columns
2175235 N	Row size = 10 m	128 rows
Top of Model		
2490 Elevation	Level size = 5 m	180 levels
Rotation 30° counter clockwise		

Figure 14-4: Isometric view looking NW showing blocks with ASH in brown, MHG in red, LGLM in blue, LGSH in green, NEHG in purple and NELGSH in orange



14.5 Bulk Density

A total of 425 specific gravity determinations were collected on a routine basis across the Ixtaca mineralized zone on cross sections 250 E (western border of Ixtaca), 550 E (central part of zone) and 1150 E (eastern section of zone).

- Section 250E: Drill Holes TU-11-030, TU-11-033, TU-11-040, TU-11-045, TU-11-074 and TU-11-075.
- Section 550E: Drill Holes TU-10-011, TU-10-013, TU-11-016, TU-11-019, TU-11-059, TU-11-066 and TU-11-078.
- Section 1150E: Drill Holes TU-11-041, TU-11-046, CA-11-002 and CA-11-003.

The measurements were made on drill core samples using the Archimedes (weight in air-weight in water) method. The relative number of analysis is shown below:

Table 14-7: Specific Gravity Determinations sorted by Cross Section

Cross Section	Number of Samples	Minimum SG	Maximum SG	Average SG
550 E	223	1.33	3.28	2.57
250 E	88	1.42	2.69	2.41
1150 E	114	1.43	3.21	2.60
Total	**425**	**1.33**	**3.28**	**2.55**

The data can also be sorted by lithology.

Table 14-8: Specific Gravity Determinations sorted by Lithology

Lithology Code	Lithology	Number of Samples	Average SG
Ash	Ash unit	33	1.67
Bx/Lm	Breccia / Limestone	3	2.45
Df	Felsic Dyke	71	2.46
Dm	Mafic Dyke	7	2.70
Dp	Porphyritic Dyke	25	2.59
Lch	Limestone/chert	58	2.65
Lg	Lime < 10% mud	10	2.67
Lm	Lime Mudstone	72	2.67
Lp	Lime Packstone	37	2.59
Ls	Limestone undifferentiated	2	2.65
Lw	Lime wackestone	2	2.58
Min	Mineralized qtz. veining	7	2.96
Pp	Principal Porphyry	2	2.58
ShB	Black Shale	56	2.61
ShG	Green Shale	3	2.44
Skn	Skarn	20	2.89
Slt	Siltstone	17	2.71

Table 14.8 summarizes specific gravity values for all lithologies studied in all three sections. Values in the table have been averaged for each lithology. Values from these lithologies were then averaged within the various geologic domains to produce the following specific gravities for converting volumes to tonnes.

- The ash domain had an average specific gravity of 1.67
- The low grade limestone (LGLM) domain had an average specific gravity of 2.66
- The main high grade (MHG) domain had an average specific gravity of 2.63 (This unit contains about 20% Felsic Dyke)
- The main high grade zone (MHGN) North limb had an average specific gravity of 2.60 (This north limb contains about 40% Felsic Dyke and 40% Mafic Dyke)
- The low grade shale (LGSH) domain had an average specific gravity of 2.61
- The North East extension high grade (NEHG) domain had an average specific gravity of 2.65

14.6 Grade Interpolation

Grades for gold and silver were interpolated into the blocks by Ordinary Kriging. Each domain was treated separately with hard boundaries used, except for the LGLM, LGSH and NELGSH domains where contact plots showed a soft boundary was appropriate. For example, blocks with some percentage of MHG present were kriged for Au and Ag using only composites from within the MHG domain while blocks with some percentage of LGLM could see composites within both the LGLM and LGSH domains. Blocks containing more than one domain were estimated for each domain and a weighted average was then produced.

Each kriging run was completed in a series of passes with the search ellipse orientation and dimension a function of the semivariogram for the domain and variable being estimated. The first pass used search dimensions equal to ¼ the semivariogram range in the three principal directions. A minimum of 4 composites were required to estimate a block with a maximum of 3 from any given drill hole. In this manner all blocks were estimated with a minimum of 2 drill holes. For blocks not estimated in pass 1 a second pass using ½ the semivariogram range was completed. A third pass using the full range and a fourth pass using twice the range followed. Finally because there were many blocks containing multiple domains a fifth pass was often required to ensure all domains were estimated. In all passes the maximum number of composites used was 12 and if more were found in any search the closest 12 were used.

Once all domains were completed, estimated blocks containing some percentage outside the mineralized domains were estimated in a similar manner using composites from outside the mineralized domains (waste).

Finally for all blocks along the contacts, containing multiple domains, a weighted average grade for gold and silver was produced. The search parameters for gold within each domain and the number of blocks estimated in each pass are tabulated below.

Table 14-9: Kriging Parameters for Gold in each Domain

Domain	Pass	Number Estimated	Az /Dip	Dist. (m)	Az /Dip	Dist. (m)	Az /Dip	Dist. (m)
MHG	1	14,220	60 / 0	30.0	330 / -55	25.0	150 / -35	30.0
	2	8,773	60 / 0	60.0	330 / -55	50.0	150 / -35	60.0
	3	792	60 / 0	120.0	330 / -55	100.0	150 / -35	120.0
NEHG	1	508	347 / 0	30.0	257 / -55	9.0	77 / -35	10.0
	2	4,916	347 / 0	60.0	257 / -55	18.0	77 / -35	20.0
	3	7,714	347 / 0	120.0	257 / -55	36.0	77 / -35	40.0
	4	1,578	347 / 0	240.0	257 / -55	72.0	77 / -35	80.0
LGLM	1	47,121	60 / 0	30.0	330 / -55	20.0	150 / -35	25.0
	2	106,984	60 / 0	60.0	330 / -55	40.0	150 / -35	50.0
	3	58,743	60 / 0	120.0	330 / -55	80.0	150 / -35	100.0
	4	11,282	60 / 0	240.0	330 / -55	160.0	150 / -35	200.0
NELGSH	1	65,307	347 / 0	35.0	257 / -55	52.5	77 / -35	25.0
	2	82,293	347 / 0	70.0	257 / -55	105.0	77 / -35	50.0
	3	27,998	347 / 0	140.0	257 / -55	210.0	77 / -35	100.0
	4	472	347 / 0	280.0	257 / -55	420.0	77 / -35	200.0
ASH	1	13,923	155 / 0	30.0	65 / -45	12.5	245 / -45	22.5
	2	51,013	155 / 0	60.0	65 / -45	25.0	245 / -45	45.0
	3	50,819	155 / 0	120.0	65 / -45	50.0	245 / -45	90.0
	4	12,622	155 / 0	240.0	65 / -45	100.0	245 / -45	180.0
LGSH	1	198	60 / 0	7.5	330 / -55	12.5	150 / -35	15.0
	2	2,402	60 / 0	15.0	330 / -55	25.0	150 / -35	30.0
	3	8,287	60 / 0	30.0	330 / -55	50.0	150 / -35	60.0
	4	7,123	60 / 0	60.0	330 / -55	100.0	150 / -35	120.0
WASTE	1	7,138	Omni Directional			27.5		
	2	28,078	Omni Directional			55.0		
	3	49,245	Omni Directional			110.0		
	4	19,292	Omni Directional			220.0		

14.6 Classification

Based on the study herein reported, delineated mineralization of Ixtaca is classified as a resource according to the following definitions from National Instrument 43-101 and from CIM (2005):

“In this Instrument, the terms "mineral resource", "inferred mineral resource", "indicated mineral resource" and "measured mineral resource" have the meanings ascribed to those terms by the Canadian Institute of Mining, Metallurgy and Petroleum, as the CIM Definition Standards on Mineral Resources and Mineral Reserves adopted by CIM Council, as those definitions may be amended.”

The terms Measured, Indicated and Inferred are defined by CIM (2005) as follows:

“A Mineral Resource is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal and industrial minerals in or on the Earth’s crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a

Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge."

"The term Mineral Resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling and within which Mineral Reserves may subsequently be defined by the consideration and application of technical, economic, legal, environmental, socio-economic and governmental factors. The phrase 'reasonable prospects for economic extraction' implies a judgement by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. A Mineral Resource is an inventory of mineralization that under realistically assumed and justifiable technical and economic conditions might become economically extractable. These assumptions must be presented explicitly in both public and technical reports."

Inferred Mineral Resource

"*An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, workings and drill holes."*

"Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies."

Indicated Mineral Resource

"An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed."

"Mineralization may be classified as an Indicated Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such as to allow confident interpretation of the geological framework and to reasonably assume the continuity of mineralization. The Qualified Person must recognize the importance of the Indicated Mineral Resource category to the advancement of the feasibility of the project. An Indicated Mineral Resource estimate is of sufficient quality to support a Preliminary Feasibility Study which can serve as the basis for major development decisions."

Measured Mineral Resource

"A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity."

"Mineralization or other natural material of economic interest may be classified as a Measured Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such that the tonnage and grade of the mineralization can be estimated to within close limits and that variation from the estimate would not significantly affect potential economic viability. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit."

At Ixtaca the geologic continuity has been established through surface mapping and drill hole interpretation. This has resulted in a multi domain interpretation that has been used to constrain the resource estimate. The grade continuity within each domain has been quantified by semivariogram analysis. The semivariograms were used to determine the search directions and distances for each pass in the kriging procedure. Using the semivariogram range to estimate blocks would allow classification as follows:

- Blocks estimated in Pass 1 for both Au and Ag using ¼ of the semivariogram range are considered Measured.
- Blocks estimated in Pass 2 or less for Au or Ag using ½ of the semivariogram range are considered Indicated
- All other blocks would be classified as Inferred.

The results are presented in two sets of tables. The first set (14-10 to 14-13) assumes one could mine to the limits of the mineralized solids and no edge dilution in included. The second set of tables (14-14 and 14-17) assumes one would mine a total 10 x 10 x 5 m block and as a result includes edge dilution around the outer limit of the mineralized solids. Reality is somewhere between these two extremes as one could never mine exactly to the limits of the mineralized solids but with proper grade control one should never have to take all the edge dilution included in this size of block. In both tables, a cut-off of 0.50 g/t Au has been highlighted as a possible cut-off for open pit mining. At this time, however, no economic studies have been completed and the economic cut-off is unknown.

Table 14-10: Measured Resource for Mineralized Portion of Blocks

Au Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off		Contained Metal	
		Au (g/t)	Ag (g/t)	Au (ozs)	Ag (ozs)
0.10	50,190,000	0.45	25.74	718,000	41,540,000
0.20	32,430,000	0.61	33.42	637,000	34,850,000
0.25	27,270,000	0.69	36.69	601,000	32,170,000
0.30	23,380,000	0.75	39.63	566,000	29,790,000
0.40	17,620,000	0.89	45.63	502,000	25,850,000
0.50	**13,730,000**	**1.01**	**51.14**	**446,000**	**22,580,000**
0.60	10,960,000	1.13	56.01	397,000	19,740,000
0.70	8,860,000	1.24	60.17	354,000	17,140,000
0.80	7,260,000	1.35	63.85	315,000	14,900,000
1.00	5,010,000	1.56	69.49	251,000	11,190,000
2.00	860,000	2.53	90.52	70,000	2,500,000

Table 14-11: Indicated Resource for Mineralized Portion of Blocks

Au Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off		Contained Metal	
		Au (g/t)	Ag (g/t)	Au (ozs)	Ag (ozs)
0.10	134,590,000	0.35	15.93	1,493,000	68,930,000
0.20	77,570,000	0.49	20.46	1,232,000	51,030,000
0.25	60,690,000	0.57	22.61	1,112,000	44,120,000
0.30	48,520,000	0.64	24.66	1,005,000	38,470,000
0.40	32,560,000	0.79	28.43	827,000	29,760,000
0.50	**23,030,000**	**0.93**	**31.91**	**691,000**	**23,630,000**
0.60	17,140,000	1.07	34.96	587,000	19,270,000
0.70	13,160,000	1.19	37.18	505,000	15,730,000
0.80	10,340,000	1.32	39.56	437,000	13,150,000
1.00	6,660,000	1.55	43.37	332,000	9,290,000
2.00	1,150,000	2.57	55.02	95,000	2,030,000

Table 14-12: Inferred Resource for Mineralized Portion of Blocks

Au Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off		Contained Metal	
		Au (g/t)	Ag (g/t)	Au (ozs)	Ag (ozs)
0.10	65,630,000	0.29	11.64	616,000	24,560,000
0.20	32,620,000	0.44	15.94	465,000	16,720,000
0.25	24,070,000	0.52	18.18	403,000	14,070,000
0.30	18,680,000	0.59	19.96	356,000	11,990,000
0.40	11,870,000	0.73	23.20	280,000	8,850,000
0.50	**8,240,000**	**0.86**	**25.94**	**228,000**	**6,870,000**
0.60	6,070,000	0.98	26.96	190,000	5,260,000
0.70	4,530,000	1.09	26.40	158,000	3,850,000
0.80	3,440,000	1.20	25.65	132,000	2,840,000
1.00	2,160,000	1.38	22.26	96,000	1,550,000
2.00	150,000	2.53	18.67	12,000	90,000

Table 14-13: M + I Resource for Mineralized Portion of Blocks

Au Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off		Contained Metal	
		Au (g/t)	Ag (g/t)	Au (ozs)	Ag (ozs)
0.10	184,760,000	0.37	18.59	2,216,000	110,430,000
0.20	109,990,000	0.53	24.28	1,871,000	85,860,000
0.25	87,960,000	0.61	26.97	1,711,000	76,270,000
0.30	71,900,000	0.68	29.53	1,570,000	68,260,000
0.40	50,170,000	0.82	34.46	1,329,000	55,580,000
0.50	**36,760,000**	**0.96**	**39.09**	**1,137,000**	**46,200,000**
0.60	28,100,000	1.09	43.17	986,000	39,000,000
0.70	22,020,000	1.21	46.43	859,000	32,870,000
0.80	17,610,000	1.33	49.58	753,000	28,070,000
1.00	11,670,000	1.55	54.58	583,000	20,480,000
2.00	2,010,000	2.55	70.22	165,000	4,540,000

Where Mineralized Portion of Blocks means one could mine to the boundaries of the mineralized domains.

Table 14-14: Measured Resource for Total Blocks

Au Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off		Contained Metal	
		Au (g/t)	Ag (g/t)	Au (ozs)	Ag (ozs)
0.10	50,170,000	0.45	25.74	718,000	41,520,000
0.20	32,400,000	0.61	33.44	636,000	34,830,000
0.25	27,240,000	0.69	36.70	600,000	32,140,000
0.30	23,370,000	0.75	39.65	566,000	29,790,000
0.40	17,610,000	0.89	45.64	502,000	25,840,000
0.50	**13,720,000**	**1.01**	**51.15**	**446,000**	**22,560,000**
0.60	10,950,000	1.13	56.03	397,000	19,730,000
0.70	8,860,000	1.24	60.18	354,000	17,140,000
0.80	7,260,000	1.35	63.85	315,000	14,900,000
1.00	5,000,000	1.56	69.52	250,000	11,180,000
2.00	860,000	2.54	90.68	70,000	2,510,000

Table 14-15: Indicated Resource for Total Blocks

Au Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off		Contained Metal	
		Au (g/t)	Ag (g/t)	Au (ozs)	Ag (ozs)
0.10	134,360,000	0.35	15.90	1,490,000	68,690,000
0.20	77,180,000	0.49	20.48	1,226,000	50,820,000
0.25	60,370,000	0.57	22.64	1,104,000	43,940,000
0.30	48,260,000	0.64	24.69	999,000	38,310,000
0.40	32,400,000	0.79	28.46	823,000	29,650,000
0.50	**22,910,000**	**0.93**	**31.95**	**687,000**	**23,530,000**
0.60	17,040,000	1.07	35.00	584,000	19,170,000
0.70	13,080,000	1.19	37.25	502,000	15,670,000
0.80	10,270,000	1.32	39.66	434,000	13,100,000
1.00	6,620,000	1.55	43.52	330,000	9,260,000
2.00	1,140,000	2.57	55.23	94,000	2,020,000

Table 14-16: Inferred Resource for Total Blocks

Au Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off		Contained Metal	
		Au (g/t)	Ag (g/t)	Au (ozs)	Ag (ozs)
0.10	65,310,000	0.29	11.56	607,000	24,270,000
0.20	31,880,000	0.44	16.03	455,000	16,430,000
0.25	23,470,000	0.52	18.32	395,000	13,820,000
0.30	18,150,000	0.60	20.20	348,000	11,790,000
0.40	11,570,000	0.74	23.47	275,000	8,730,000
0.50	**8,100,000**	**0.87**	**26.18**	**226,000**	**6,820,000**
0.60	6,010,000	0.98	27.10	189,000	5,240,000
0.70	4,490,000	1.09	26.50	157,000	3,830,000
0.80	3,410,000	1.20	25.76	131,000	2,820,000
1.00	2,140,000	1.38	22.32	95,000	1,540,000
2.00	150,000	2.53	18.67	12,000	90,000

Table 14-17: M +I Resource for Total Blocks

Au Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off		Contained Metal	
		Au (g/t)	Ag (g/t)	Au (ozs)	Ag (ozs)
0.10	184,520,000	0.37	18.58	2,207,000	110,230,000
0.20	109,570,000	0.53	24.31	1,864,000	85,640,000
0.25	87,610,000	0.61	27.01	1,704,000	76,080,000
0.30	71,630,000	0.68	29.57	1,564,000	68,100,000
0.40	50,010,000	0.82	34.50	1,325,000	55,470,000
0.50	**36,630,000**	**0.96**	**39.14**	**1,133,000**	**46,100,000**
0.60	27,990,000	1.09	43.23	981,000	38,900,000
0.70	21,940,000	1.21	46.51	856,000	32,810,000
0.80	17,540,000	1.33	49.68	750,000	28,020,000
1.00	11,620,000	1.55	54.72	580,000	20,440,000
2.00	2,000,000	2.56	70.46	164,000	4,530,000

Where Total Blocks means one would mine complete 10 x 10 x 5 m blocks taking in dilution around the edges of the mineralized solids.

These same tables are shown below using gold equivalent cut-offs where:

Gold – 3 yr. trailing average price of $1540
Silver – 3 yr. trailing average price of $30

Preliminary metallurgy has shown roughly equivalent metal recoveries for Au and Ag so for now the Au Equivalent equation is:

$$AuEq = Au + (Ag * 30 / 1540)$$

Table 14-18: Measured Resource for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	76,450,000	0.31	19.77	0.70	767	48,590	1,713
0.20	56,390,000	0.40	25.36	0.89	725	45,980	1,621
0.25	49,780,000	0.44	27.91	0.98	704	44,670	1,573
0.30	44,590,000	0.48	30.27	1.07	682	43,400	1,528
0.40	36,490,000	0.55	34.89	1.23	641	40,930	1,438
0.50	**30,440,000**	**0.61**	**39.44**	**1.38**	**599**	**38,600**	**1,351**
0.60	25,880,000	0.67	43.81	1.53	561	36,450	1,271
0.70	22,320,000	0.73	48.00	1.67	525	34,450	1,196
0.80	19,430,000	0.79	52.07	1.80	494	32,530	1,127
1.00	15,620,000	0.88	58.66	2.03	444	29,460	1,018
2.00	6,000,000	1.33	86.51	3.01	256	16,690	581

Table 14-19: Indicated Resource for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	207,050,000	0.25	13.16	0.50	1,631	87,600	3,342
0.20	146,240,000	0.32	17.08	0.65	1,490	80,310	3,056
0.25	126,310,000	0.35	18.88	0.72	1,421	76,670	2,912
0.30	109,150,000	0.38	20.76	0.79	1,344	72,850	2,762
0.40	81,850,000	0.45	24.76	0.93	1,189	65,160	2,458
0.50	**62,610,000**	**0.52**	**28.88**	**1.08**	**1,049**	**58,140**	**2,182**
0.60	48,940,000	0.59	33.11	1.23	927	52,100	1,942
0.70	39,520,000	0.65	37.09	1.37	828	47,130	1,746
0.80	32,950,000	0.71	40.60	1.50	750	43,010	1,588
1.00	23,850,000	0.81	47.06	1.73	624	36,090	1,327
2.00	5,910,000	1.39	72.81	2.81	265	13,830	534

Table 14-20: Inferred Resource for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	100,440,000	0.21	9.81	0.40	685	31,680	1,301
0.20	62,950,000	0.29	13.75	0.56	587	27,830	1,127
0.25	51,760,000	0.32	15.66	0.63	539	26,060	1,048
0.30	43,410,000	0.36	17.52	0.70	498	24,450	974
0.40	31,040,000	0.43	21.22	0.84	424	21,180	836
0.50	**22,700,000**	**0.50**	**24.99**	**0.98**	**362**	**18,240**	**717**
0.60	17,290,000	0.57	28.41	1.12	314	15,790	622
0.70	13,630,000	0.63	31.56	1.25	277	13,830	546
0.80	10,960,000	0.70	34.51	1.37	245	12,160	482
1.00	7,700,000	0.79	39.81	1.57	197	9,860	389
2.00	1,200,000	1.18	73.69	2.61	45	2,840	101

Table 14-21: Measured + Indicated Resource for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	283,480,000	0.26	14.94	0.55	2,397	136,170	5,049
0.20	202,620,000	0.34	19.39	0.72	2,215	126,320	4,677
0.25	176,090,000	0.38	21.43	0.79	2,123	121,330	4,490
0.30	153,740,000	0.41	23.52	0.87	2,027	116,260	4,290
0.40	118,330,000	0.48	27.88	1.02	1,830	106,070	3,896
0.50	**93,050,000**	**0.55**	**32.34**	**1.18**	**1,648**	**96,750**	**3,533**
0.60	74,820,000	0.62	36.81	1.34	1,487	88,550	3,211
0.70	61,840,000	0.68	41.03	1.48	1,354	81,580	2,943
0.80	52,390,000	0.74	44.85	1.61	1,243	75,550	2,715
1.00	39,480,000	0.84	51.65	1.85	1,069	65,560	2,346
2.00	11,910,000	1.36	79.72	2.91	520	30,530	1,115

Where Mineralized Portion of Blocks means one could mine to the boundaries of the mineralized domains.

Table 14-22: Measured Resource for Total Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	76,600,000	0.31	19.72	0.70	768	48,570	1,714
0.20	56,340,000	0.40	25.36	0.89	725	45,940	1,619
0.25	49,730,000	0.44	27.92	0.98	704	44,640	1,573
0.30	44,550,000	0.48	30.28	1.07	682	43,370	1,527
0.40	36,460,000	0.55	34.89	1.23	640	40,900	1,437
0.50	**30,420,000**	**0.61**	**39.44**	**1.38**	**599**	**38,570**	**1,350**
0.60	25,860,000	0.67	43.82	1.53	560	36,430	1,270
0.70	22,300,000	0.73	48.02	1.67	526	34,430	1,196
0.80	19,420,000	0.79	52.08	1.80	493	32,520	1,126
1.00	15,620,000	0.88	58.66	2.03	444	29,460	1,017
2.00	6,000,000	1.33	86.54	3.01	256	16,690	581

Table 14-23: Indicated Resource for Total Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	208,220,000	0.24	13.06	0.50	1,627	87,430	3,334
0.20	145,640,000	0.32	17.08	0.65	1,484	79,980	3,044
0.25	125,610,000	0.35	18.90	0.72	1,413	76,330	2,900
0.30	108,520,000	0.38	20.78	0.79	1,336	72,500	2,749
0.40	81,460,000	0.45	24.78	0.93	1,184	64,900	2,446
0.50	**62,250,000**	**0.52**	**28.92**	**1.09**	**1,043**	**57,880**	**2,172**
0.60	48,710,000	0.59	33.15	1.23	921	51,920	1,933
0.70	39,350,000	0.65	37.12	1.37	824	46,960	1,738
0.80	32,810,000	0.71	40.64	1.50	747	42,870	1,581
1.00	23,750,000	0.81	47.12	1.73	621	35,980	1,322
2.00	5,880,000	1.39	72.89	2.81	263	13,780	532

Table 14-24: Inferred Resource for Total Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	101,730,000	0.21	9.63	0.40	677	31,500	1,292
0.20	62,210,000	0.29	13.71	0.56	576	27,420	1,110
0.25	50,850,000	0.32	15.68	0.63	530	25,640	1,030
0.30	42,490,000	0.36	17.58	0.70	488	24,020	956
0.40	30,250,000	0.43	21.35	0.84	415	20,760	820
0.50	**22,150,000**	**0.50**	**25.14**	**0.99**	**355**	**17,900**	**704**
0.60	16,940,000	0.57	28.55	1.12	309	15,550	612
0.70	13,400,000	0.63	31.66	1.25	273	13,640	539
0.80	10,810,000	0.70	34.57	1.37	242	12,010	476
1.00	7,620,000	0.80	39.85	1.57	195	9,760	385
2.00	1,200,000	1.18	73.69	2.61	45	2,840	101

Table 14-25: Measured + Indicated Resource for Total Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	284,800,000	0.26	14.85	0.55	2,399	135,980	5,045
0.20	201,980,000	0.34	19.39	0.72	2,208	125,920	4,663
0.25	175,330,000	0.38	21.46	0.79	2,114	120,970	4,470
0.30	153,070,000	0.41	23.55	0.87	2,018	115,900	4,277
0.40	117,910,000	0.48	27.90	1.02	1,823	105,770	3,882
0.50	**92,680,000**	**0.55**	**32.38**	**1.18**	**1,642**	**96,490**	**3,522**
0.60	74,570,000	0.62	36.85	1.34	1,482	88,350	3,203
0.70	61,640,000	0.68	41.06	1.48	1,350	81,370	2,933
0.80	52,230,000	0.74	44.89	1.61	1,239	75,380	2,709
1.00	39,370,000	0.84	51.70	1.85	1,065	65,440	2,339
2.00	11,880,000	1.36	79.78	2.91	519	30,470	1,113

Where Total Blocks means one would mine complete 10 x 10 x 5 m blocks taking in dilution around the edges of the mineralized solids.

14.7 Block Model Verification

To check the results level plans were produced on 50 m intervals through the deposit. Estimated block grades were checked against composite grades above and below the bench level. The results matched reasonably well with no bias indicated. Example bench levels are show in Figures 14-5 to 14-9 for bench levels 2250 down to 2050.

Another check on the results was completed by comparing the average composite grade for each domain with the average kriged grades for that domain.

Table 14-26: Comparison of Composite Mean Au Grade to Block Mean Au Grade

Domain	Variable	Number of Assays	Mean Grade Composites	Number of Blocks	Mean Grade Blocks
ASH	Au (g/t)	6,699	0.27	128,377	0.23
	Ag (g/t)	6,699	5.77	128,377	5.75
MHG	Au (g/t)	2,824	0.88	23,785	0.88
	Ag (g/t)	2,824	58.85	23,785	59.94
LGLM	Au (g/t)	13,568	0.16	224,130	0.14
	Ag (g/t)	13,568	9.94	224,130	7.92
LGSH	Au (g/t)	1,153	0.11	18,010	0.15
	Ag (g/t)	1,153	7.12	18,010	7.54
NEHG	Au (g/t)	910	0.63	14,716	0.70
	Ag (g/t)	910	42.74	14,716	44.65
NELGSH	Au (g/t)	7,253	0.07	176,070	0.09
	Ag (g/t)	7,253	6.40	176,070	6.33
WASTE	Au (g/t)	11,061	0.008	103,753	0.016
	Ag (g/t)	11,061	0.40	103,753	0.84

Figure 14-5: IXTACA 2250 Level Plan showing estimated gold in blocks

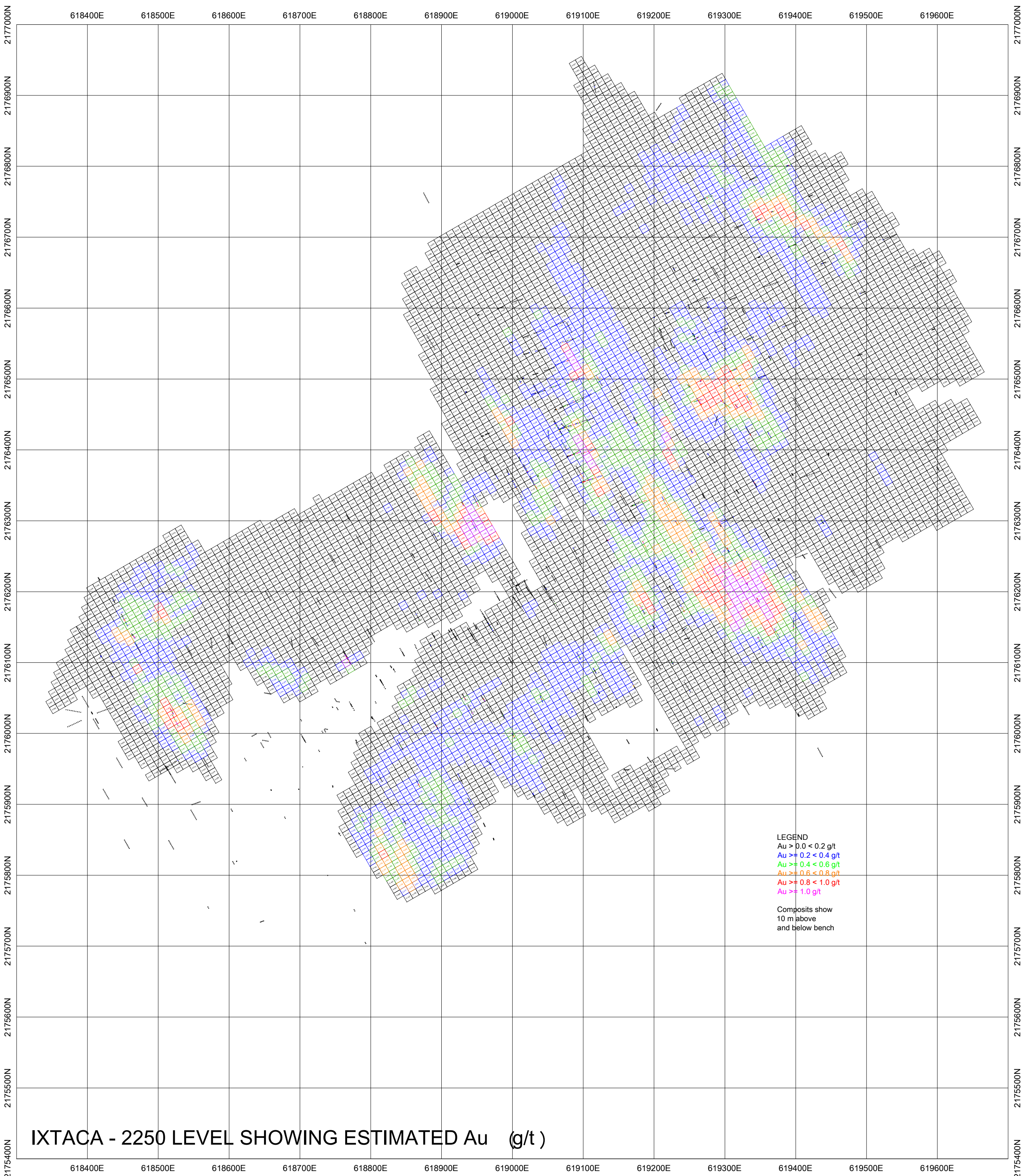
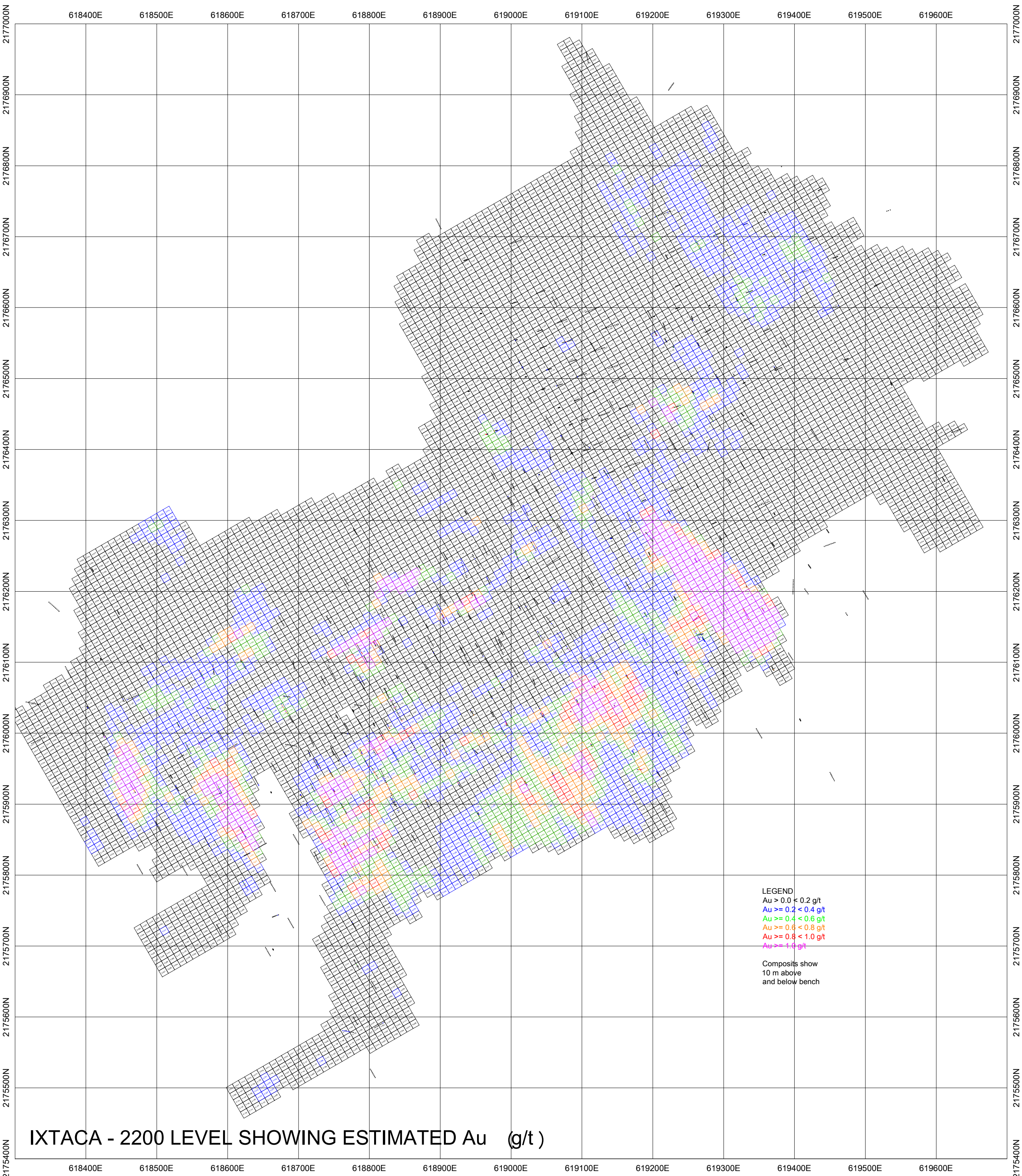


Figure 14-6: IXTACA 2200 Level Plan showing estimated gold in blocks



APEX Geoscience Ltd.

Figure 14-7: IXTACA 2150 Level Plan showing estimated gold in blocks

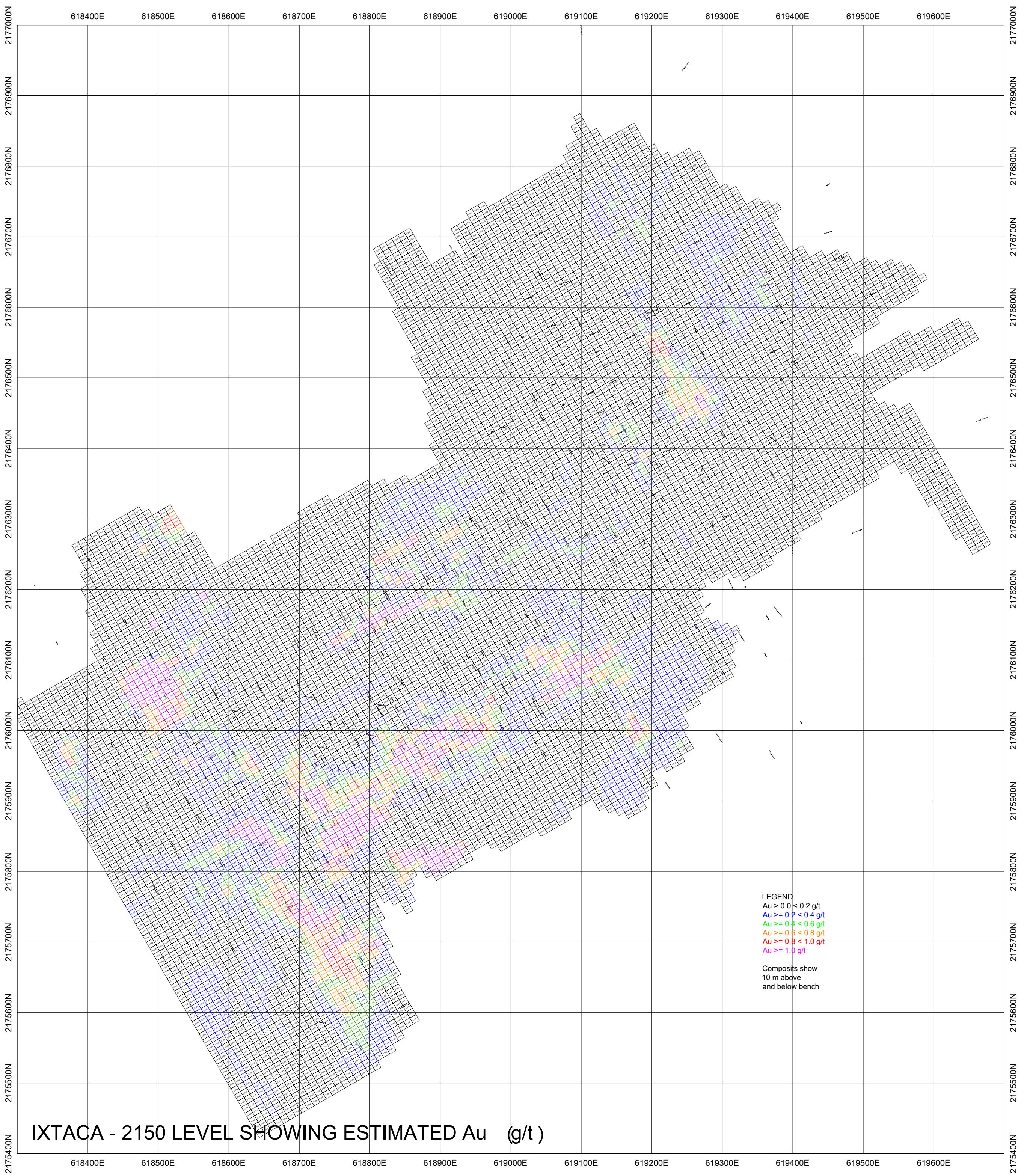


Figure 14-8: IXTACA 2100 Level Plan showing estimated gold in blocks

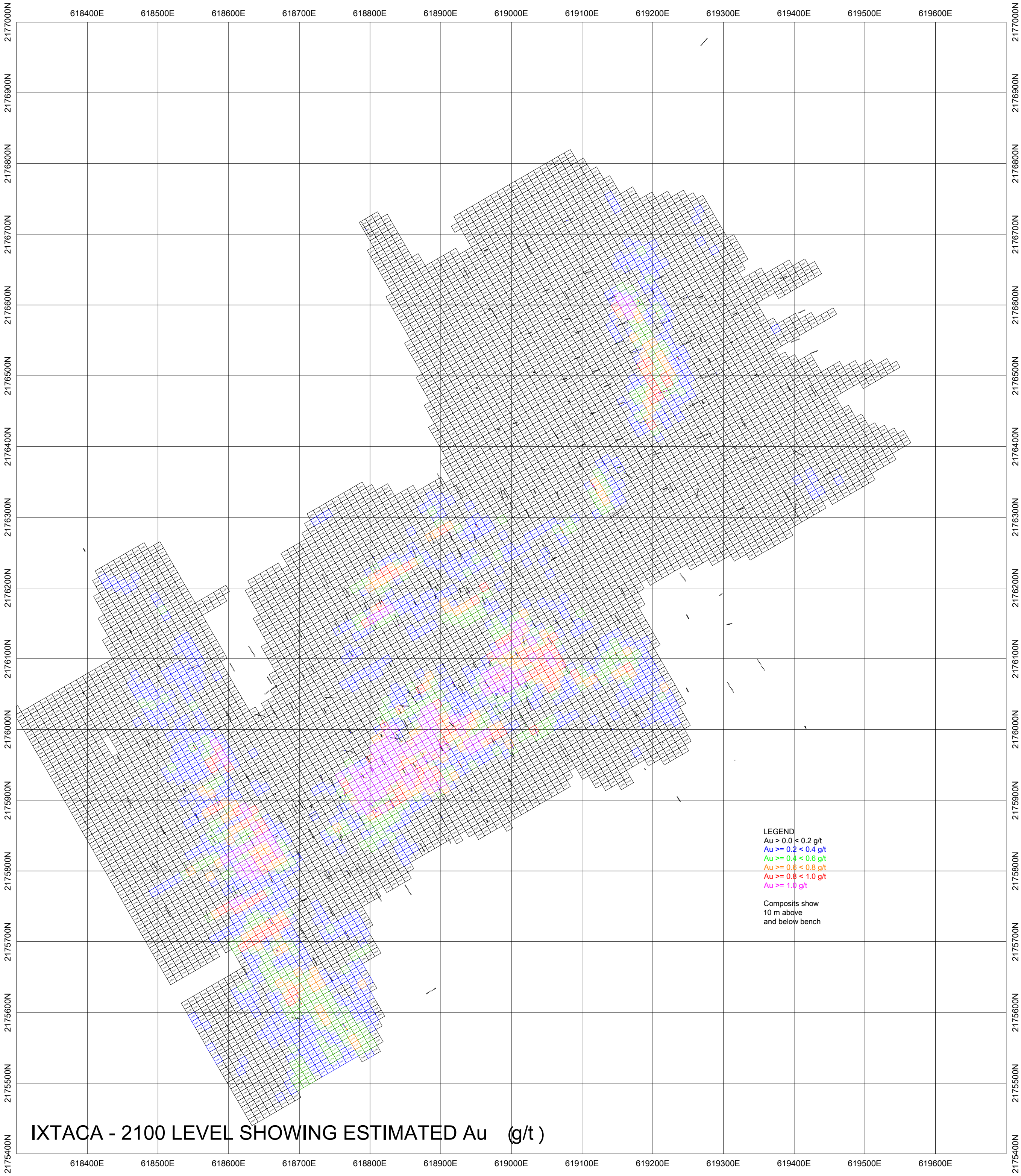
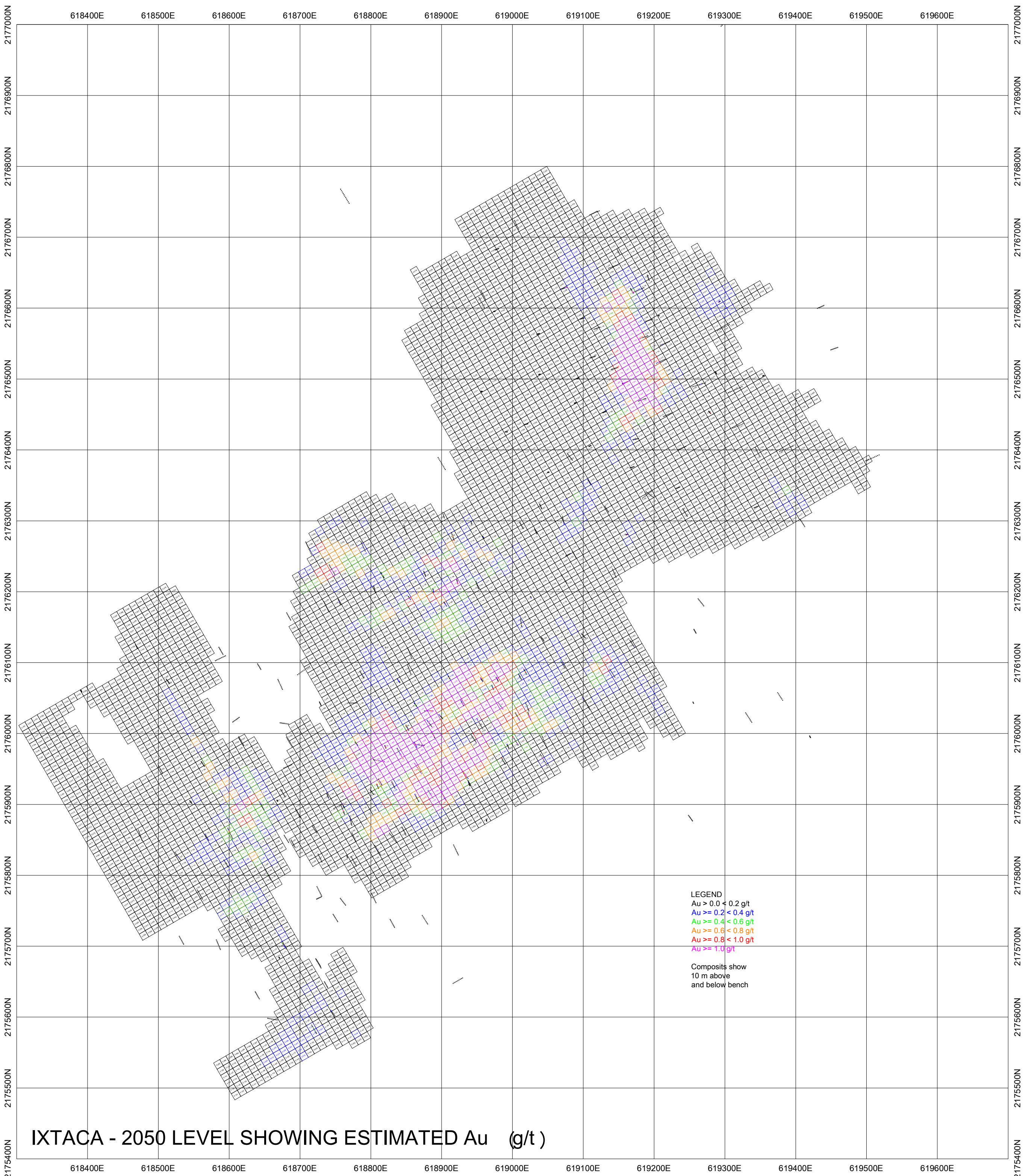


Figure 14-9: IXTACA 2050 Level Plan showing estimated gold in blocks



15 Adjacent Properties

15.1 Santa Fe Metals Corp. Cuyoaco Property

The Cuyoaco property is 100% owned by Santa Fe Metals Corp. It is located approximately 4 km south east of the Tuligitic property (Figure 4-2) and it covers 643 hectares over two mineralized targets: the Pau copper-silver-gold skarn, and the Santa Anita gold project.

15.1.1 Pau Skarn Project

The Pau Project is a copper-silver-gold skarn in Santa Fe Metals' Pau claims and in the western part of its Santa Anita claims. The claims cover an area of approximately 3 square kilometers of epidote-garnet skarn mineralization around a large granodioritic pluton.

In total there are 16 documented, historical workings on the Pau project, many of which are believed to be as old as 16th century. The largest workings include the 170 m x 200 m 'El Magistral' open pit, 3 levels of underground workings at 'California' as well as 'Lincon' (two 50 m adits), 'La Juanita' (two adits), 'La Verdiosa' and 'El Toro'.

Geology on the Pau Project is characterized by garnet-actinolite-quartz-hematite skarn style mineralization associated with two copper, silver, gold rich zones along the western and eastern margins of the granodioritic pluton. Skarn mineralization is exposed at surface in several locations and in the historical workings. Secondary (oxidized) enrichment extends for at least 10 m below surface and is characterized by malachite, azurite and chalcocite but most likely does not form the bulk of the mineralization.

Soil and rock sampling in 2008 by Oremex Silver Inc. returned high-grades of copper, silver, gold, lead and zinc from the exposed rock within workings, and mapping in 2011 found that many of the adits ended in mineralization. Soil and Rock sampling by Santa Fe Metals in 2011 focused on further exploration of the northern part of the Pau Claim and mapping skarn mineralization between known adits. Highlights include a 7.21 g/t Au, 27.7 g/t Ag skarn sample in the El Magistral zone. Low grade gold (0.32 g/t Au) was found within the granodiorite itself, and a previously unknown skarn showing was discovered in the north of the property, a further 1 km north of the La Juanita adits.

15.1.2 Santa Anita Project

Santa Anita is a historic dyke and sill hosted gold rich deposit found in the east of the Cuyoaco property. It is characterized by a zone of parallel gold rich dykes and sills approximately 1 km along and 800 meters wide. In 2011 a parallel dyke and sill system 200 m wide and 600 m in length was discovered to the north east.

The Santa Anita gold project covers a series of parallel, gold-rich dykes and sills that have intruded and altered a sedimentary sequence of limestone and mudstones. The dykes and sills are between 1 m and 10 m wide and form a 1 km by 800 m NW-SE trending zone. The dykes and sills are porphyritic dacites that contain varying amounts of feldspar and hornblende phenocrysts and in places up to 10% fine grained disseminated pyrite.

An extensive surface geochemical mapping program in 2008 delineated a large gold rich envelope called the Santa Anita zone. Mineralization was found to be coarse free metallic gold and electrum in calcite stringers associated to narrow dacitic dikes hosted in a skarn-hornfels-limestone sequence. A limited chip sampling program of the underground workings returned an average grade of 3 g/t. Fifty-eight samples were collected in total.

Drilling of five shallow drill holes (607 metres in total) in 2005/2006 intersected gold mineralization; one hole intersected 12 metres of 2.45 g/t Au and another hole intersected 4 metres of 2.54 g/t Au.

Rock and channel samples collected by Santa Fe Metals in 2011 outline a large low grade gold anomaly that extends beyond the historical boundary of the Santa Anita gold deposit and indicates that the zone of gold rich mineralization is considerably larger than previously thought. The parallel dyke system, named 'Santa Anita Nuevo', has a (surface) width of 200 meters and a strike length of 600 meters. To date, Santa Fe Metals has collected 29 channel samples from dykes to the north of the property that have returned values greater than 0.1 g/t.

15.2 Minera Frisco S.A. de C.V. Espejeras

The Espejeras property is 100% owned by Minera Frisco S.A. de C.V. It is located roughly 7 km north of the Tuligtic property (Figure 4-2) and it covers a surface of 8.75 hectares. Information on the exploration work carried out in the area to date is very limited. The area is considered prospective for gold and silver and Minera Frisco's 2011 Annual Report lists the Espejeras project among feasibility studies and implementation projects. Minera Frisco is looking to obtain environmental permits to implement an extensive diamond drilling program on the property in the near future.

16 Other Relevant Data and Information

The author is not aware of any other relevant information with respect to the Tuligtic Project that is not disclosed in the Technical Report.

17 Interpretation and Conclusions

Almaden acquired the Cerro Grande claims of the Tuligtic Project in 2001 following the identification of surficial clay deposits that were interpreted to represent high-level epithermal alteration. Subsequent geologic mapping, rock, stream silt, soil sampling and induced polarization (IP) geophysical surveys identified porphyry copper and epithermal gold targets within an approximately 5 x 5 km area of intensely altered rock. In July 2010 Almaden initiated a diamond drilling program to test epithermal alteration within the Tuligtic Property, resulting in the discovery of the Ixtaca Zone. The first hole, TU-10-001 intersected 302.42 metres of 1.01 g/t Au and 48 g/t Ag and multiple high grade intervals including 1.67 metres of 60.7 g/t Au and 2122 g/t Ag.

Within the Tuligtic Project, argillaceous limestone of the Late Jurassic to Early Cretaceous Upper Tamaulipas formation is underlain by transitional calcareous clastic rocks including siltstone, grainstone, mudstone, and shale. During the Laramide orogeny the carbonate package was intensely deformed into a series of thrust-related east verging anticlines. Calcareous shale units appear to occupy the cores of the anticlines while the thick bedded limestone/mudstone units occupy the cores of major synclines at the Ixtaca Zone. Limestone basement units are crosscut by intensely altered intermediate composition dykes. The deformed Mesozoic sedimentary sequence is discordantly overlain by epithermal altered Cenozoic bedded crystal tuff of the upper Coyoltepec subunit.

Between 2001 and 2013, Almaden's exploration at the Tuligtic Property included rock and soil geochemical sampling, ground magnetics, IP and resistivity, Controlled Source Audio-frequency Magnetotelluric (CSAMT), and Controlled Source Induced Polarization (CSIP) geophysical surveys resulting in the identification of five anomalous zones: the Ixtaca, Ixtaca East, Caleva, Azul, and Sol zones. Since 2010, a total of 423 diamond drill holes have been drilled at the Tuligtic Gold-Silver Project, totalling 137,438 m.

The previous maiden NI 43-101 compliant mineral resource estimate for the Ixtaca Deposit was derived from the drilling of 225 diamond drill holes between July, 2010 and November 13, 2012. The maiden resource for the Ixtaca deposit was announced on January 31, 2013 and consisted of an indicated mineral resource of 56.99 million-tonnes, comprising 2.02 million-ounces AuEq at an average grade of 1.10 g/t AuEq; and an inferred mineral resource of 41.53 million-tonnes, comprising 1.55 million-ounces AuEq at an average grade of 1.16 g/t AuEq, each using a cut-off grade of 0.5 g/t AuEq. Ixtaca Deposit mineralization has been upgraded and classified as a Measured, Indicated and inferred mineral resource according to the definitions from NI 43-101 and from CIM (2005). A cut-off of 0.50 g/t AuEq has been highlighted as a possible cut-off for open pit mining (Tables 17-2 to 17-5). At this time, however, no economic studies have been completed and the economic cut-off is unknown.

The 225 holes drilled between July, 2010 and November 13, 2012 totalled 81,971 m and identified the Main Ixtaca, Ixtaca North and Chemalaco zones. Diamond drilling at 25 to 50 m section spacing defined the Main Ixtaca and Ixtaca North as NE-oriented sub-vertical zones and a strike length of approximately 650 m. High-grade mineralization was intersected to depths of 200 to 300 m vertically from surface. The Chemalaco zone was identified as dipping moderately-steeply over a strike length of 350 m along a series of five ENE (070 degrees) oriented sections spaced at intervals of 50 to 100 m. High grade mineralization having a true-width ranging from less than 30 and up to 60 m was intersected beneath approximately 30 m of tuff to a vertical depth of 550 m, or approximately 600 m down-dip.

During 2013 and subsequent to the November 13, 2012 cut-off of the maiden mineral resource estimate, Almaden drilled 198 holes totalling 55,467 m. A total of 79 holes were drilled at the Main Ixtaca Zone, 40 holes at the Ixtaca North Zone and 79 holes at the Chemalaco Zone. Drilling during 2013 focused on expanding the deposit and upgrading resources previously categorized as inferred to higher confidence measured and indicated categories.

The Main and North zones have been defined over 650 m and tested over 1000 m strike length with high-grade mineralization intersected to depths up to 350 m vertically from surface. The strike length of the Chemalaco Zone has been extended to 450 m with high-grade mineralization intersected to a vertical depth of 550 m, or approximately 700 m down-dip. An additional sub-parallel zone has been defined underneath the Chemalaco Zone dipping 25 to 50 degrees to the WSW, intersected to a vertical depth of 250 m, approximately 400 m down-dip over a 250 m strike length.

The epithermal vein system at the Main Ixtaca and Ixtaca North zones is associated with two subparallel ENE (060 degrees) trending, subvertical to steeply north dipping dyke zones. A series of 2 m to over 20 m true width dykes occur within an approximately 100 m wide zone. The Ixtaca North dyke zone is narrower and comprises a steeply north-dipping zone of two or three discrete dykes ranging from 5 to 20 m in width. Epithermal vein mineralization occurs both within the dykes and sedimentary host rocks, with the highest grades often occurring within or marginal to the dykes. Vein density decreases outward to the north and south from the dyke zones resulting in the formation of two high-grade zones that lack sharp geologic boundaries. On surface, the Main Ixtaca and Ixtaca North zones are separated by a steep sided ENE trending valley.

The bulk of Main Ixtaca and Ixtaca North zone mineralization is bound within an ENE-verging asymmetric synform. The synform is cored by a structurally thickened sequence of argillaceous limestone that grades laterally and at depth through transition units, into calcareous shale at depth. The Limestone sequence thins to the west along the rising limb of an ENE-verging antiform. The Main Ixtaca and Ixtaca North vein systems and the dykes transect the antiform sub-perpendicular to the strike of the fold axis. Vein density decreases within shale units coring the antiform, and mineralization is confined near the axis of the antiform within a west dipping tabular zone of low-grade mineralization having a true thickness ranging from 150 to 200 m. Mineralized basement rocks are unconformably overlain by crystal tuff, which is also mineralized. High-grade zones of mineralization are present within the tuff vertically above the Main Ixtaca and Ixtaca North vein systems. The high-grade zones transition laterally into low grade mineralization, which together form a broad tabular zone of mineralization at the base of the tuff unit.

The Chemalaco Zone has a strike length of approximately 450 m as defined by drilling along a series of ENE (070 degrees) oriented sections spaced at intervals of 25 to 50 m, and near-surface oblique NNW-SSE oriented drill holes. The Chemalaco Zone dips moderately-steeply at approximately 55 degrees to the WSW. Chemalaco Zone mineralization is interpreted to occur within the hinge zone of a shale cored antiform. Near surface along the axis of the antiform a narrow zone of structurally thinned, brecciated, and mineralized limestone is unconformably overlain by mineralized tuff rocks. At a vertical depth of approximately 50 m below surface, high-grade shale-hosted mineralization dips moderately-steeply WSW sub-parallel to the interpreted axial plane of the antiform. The footwall of the high-grade zone is marked by a distinct 20 to 30 m true-thickness felsic porphyry dyke (Chemalaco Dyke), which is also mineralized. The Chemalaco Dyke has been interested in multiple drill holes ranging from 250 to 550 m vertically below surface, and its lower contact currently marks the base of Chemalaco Zone mineralization.

Metallurgical testwork was completed on each of the Ixtaca Zone geologic domains: limestone, limestone/dyke high grade (HG), shale (Chemalaco Zone) and volcanic tuff material. Modelling shows that a combination of grinding to a p_{80} of 100-150µm plus gravity recovery on the cyclone underflow, with recovery of gold and silver by means of bulk flotation, is a viable process route for the Ixtaca resource. A summary of metallurgical parameters for the main zones tested for this process route is presented in Table 17-1. While an acceptable economic baseline has been established, further opportunities exist for optimising the gold and silver recoveries from the resource. Further metallurgical work, including mineralogical work, process optimization of flotation, and investigation of alternate reagent combinations on existing and fresh domain samples is planned for 2014.

Table 17-1. Overall and Modelled Recovery Parameters for the Ixtaca Deposit

Sample	Head		Flotation only		Gravity	Combined Float + GRG	
	Au (g/t)	Ag (g/t)	Au (Wt%)	Ag (Wt%)	Au (Wt%)	Au (Wt%)	Ag (Wt%)
Dyke	0.73	45.6	94.4	87.0	48.4	98.8	87.0
Limestone	0.76	49.3	85.7	79.9	58.7	90.5	79.9
Limestone/Dyke HG	2.01	123.5	92.0	88.8	58.7	96.8	88.8
Shale	0.93	46.4	93.2	83.5	54.9	97.9	83.5
Tuff (volcanic)	0.8	13.0	52.3	63.2	15.1	55.2	63.2

Giroux Consultants Ltd. prepared and updated mineral resource estimate for the Ixtaca Deposit based on the results of diamond drilling completed by Almaden during 2013 and subsequent to the November 13, 2012 maiden mineral resource estimate cut-off. Preliminary metallurgy has shown roughly equivalent metal recoveries for Au and Ag, therefore the mineral resource Estimate is presented at a series of AuEq cut-offs based on a three years trailing average price of $1,540 per-ounce Au, and $30 per-ounce Ag, and assuming one could mine to the limits of the mineralized solids and no edge dilution is included. Ixtaca Deposit mineralization has been upgraded and classified as a measured, indicated and inferred mineral resource according to the definitions from NI 43-101 and from CIM (2005). A cut-off of 0.50 g/t AuEq has been highlighted as a possible cut-off for open pit mining (Tables 17-2 to 17-5). At this time, however, no economic studies have been completed and the economic cut-off is unknown.

Table 17-2: Measured Resource for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	76,450,000	0.31	19.77	0.70	767	48,590	1,713
0.20	56,390,000	0.40	25.36	0.89	725	45,980	1,621
0.25	49,780,000	0.44	27.91	0.98	704	44,670	1,573
0.30	44,590,000	0.48	30.27	1.07	682	43,400	1,528
0.40	36,490,000	0.55	34.89	1.23	641	40,930	1,438
0.50	**30,440,000**	**0.61**	**39.44**	**1.38**	**599**	**38,600**	**1,351**
0.60	25,880,000	0.67	43.81	1.53	561	36,450	1,271
0.70	22,320,000	0.73	48.00	1.67	525	34,450	1,196
0.80	19,430,000	0.79	52.07	1.80	494	32,530	1,127
1.00	15,620,000	0.88	58.66	2.03	444	29,460	1,018
2.00	6,000,000	1.33	86.51	3.01	256	16,690	581

Table 17-3: Indicated Resource for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	207,050,000	0.25	13.16	0.50	1,631	87,600	3,342
0.20	146,240,000	0.32	17.08	0.65	1,490	80,310	3,056
0.25	126,310,000	0.35	18.88	0.72	1,421	76,670	2,912
0.30	109,150,000	0.38	20.76	0.79	1,344	72,850	2,762
0.40	81,850,000	0.45	24.76	0.93	1,189	65,160	2,458
0.50	**62,610,000**	**0.52**	**28.88**	**1.08**	**1,049**	**58,140**	**2,182**
0.60	48,940,000	0.59	33.11	1.23	927	52,100	1,942
0.70	39,520,000	0.65	37.09	1.37	828	47,130	1,746
0.80	32,950,000	0.71	40.60	1.50	750	43,010	1,588
1.00	23,850,000	0.81	47.06	1.73	624	36,090	1,327
2.00	5,910,000	1.39	72.81	2.81	265	13,830	534

Table 17-4: Inferred Resource for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	100,440,000	0.21	9.81	0.40	685	31,680	1,301
0.20	62,950,000	0.29	13.75	0.56	587	27,830	1,127
0.25	51,760,000	0.32	15.66	0.63	539	26,060	1,048
0.30	43,410,000	0.36	17.52	0.70	498	24,450	974
0.40	31,040,000	0.43	21.22	0.84	424	21,180	836
0.50	**22,700,000**	**0.50**	**24.99**	**0.98**	**362**	**18,240**	**717**
0.60	17,290,000	0.57	28.41	1.12	314	15,790	622
0.70	13,630,000	0.63	31.56	1.25	277	13,830	546
0.80	10,960,000	0.70	34.51	1.37	245	12,160	482
1.00	7,700,000	0.79	39.81	1.57	197	9,860	389
2.00	1,200,000	1.18	73.69	2.61	45	2,840	101

Table 17-5: Measured + Indicated Resource for Mineralized Portion of Blocks

AuEq Cut-off (g/t)	Tonnes > Cut-off (tonnes)	Grade>Cut-off			Contained Metal x1000		
		Au (g/t)	Ag (g/t)	AuEq (g/t)	Au (ozs)	Ag (ozs)	AuEQ (ozs)
0.10	283,480,000	0.26	14.94	0.55	2,397	136,170	5,049
0.20	202,620,000	0.34	19.39	0.72	2,215	126,320	4,677
0.25	176,090,000	0.38	21.43	0.79	2,123	121,330	4,490
0.30	153,740,000	0.41	23.52	0.87	2,027	116,260	4,290
0.40	118,330,000	0.48	27.88	1.02	1,830	106,070	3,896
0.50	**93,050,000**	**0.55**	**32.34**	**1.18**	**1,648**	**96,750**	**3,533**
0.60	74,820,000	0.62	36.81	1.34	1,487	88,550	3,211
0.70	61,840,000	0.68	41.03	1.48	1,354	81,580	2,943
0.80	52,390,000	0.74	44.85	1.61	1,243	75,550	2,715
1.00	39,480,000	0.84	51.65	1.85	1,069	65,560	2,346
2.00	11,910,000	1.36	79.72	2.91	520	30,530	1,115

Where Mineralized Portion of Blocks means one could mine to the boundaries of the mineralized domains.

Diamond drilling by Almaden has resulted in the identification of a measured mineral resource of 30.44 million-tonnes, comprising 1.35 million-ounces AuEq at an average grade of 1.38 g/t AuEq; an indicated mineral resource of 62.61 million-tonnes, comprising 2.18 million-ounces AuEq at an average grade of 1.08 g/t AuEq; and an inferred mineral resource of 22.70 million-tonnes, comprising 0.72 million-ounces AuEq at an average grade of 0.98 g/t AuEq, each using a cut-off grade of 0.5 g/t AuEq.

18 Recommendations

Based on the results of diamond drilling and the updated mineral resource estimate, limited additional drilling may be warranted to upgrade the Inferred and Indicated part of the Ixtaca Deposit mineral resource.

Additional diamond drilling may include up to 10,000 metres to upgrade the Ixtaca Deposit mineral resource. The estimated cost to complete additional diamond drilling is $1,100,000 (Phase 1). Baseline environmental, hydro-geological and open pit optimization engineering studies should be ongoing in order to work towards the completion of a preliminary economic assessment (PEA). The estimated cost to complete engineering studies is $500,000 (Phase 2).

Table 18-1. Budget for Proposed 2014 Exploration, Tuligtic Project

Budget Item	**Estimated Cost**
Additional Diamond Drilling to Upgrade the Ixtaca Deposit Resource PHASE 1: Diamond Drilling 10,000 m (@ $110/metre all-up)	**$1,100,000.00**
TOTAL PHASE 1:	**$1,100,000.00**
Completion of Baseline Environmental, Hydro-geological and Open Pit Optimization PHASE 2: Baseline Environmental and Hydro-geological Engineering Study Open Pit Optimization Engineering Study	 **$250,000.00** **$250,000.00**
TOTAL PHASE 2:	**$500,000.00**
Total Project Costs, Excluding GST	**$1,600,000.00**

19 Date and Signature Page

This Technical Report was prepared to NI 43-101 standards by the following Qualified Persons. The effective date of this report is January 29, 2013.

Kristopher J. Raffle, B.Sc., P.Geo.
APEX Geoscience Ltd.
Vancouver, British Columbia, Canada
February 12, 2014

(signed) *Gary H. Giroux*

Gary H. Giroux, P.Eng., MASc.
Giroux Consultants Ltd.
Vancouver, British Columbia, Canada
January 29, 2014

20 Certificate of Author

20.1 K.J. Raffle Certificate of Author

I, Kristopher J. Raffle, residing in Vancouver British Columbia, do hereby certify that:

1. I am a principal of APEX Geoscience Ltd. ("APEX"), 200, 9797 – 45 Avenue, Edmonton, Alberta, Canada.

2. I am the author and responsible for all sections, except sections 13 and 14, of this Technical Report entitled: **"Technical Report on the Tuligtic Project, Puebla State, Mexico"**, and dated February 12, 2014 (the "Technical Report").

3. I am a graduate of The University of British Columbia, Vancouver, British Columbia with a B.Sc. in Geology (2000) and have practiced my profession continuously since 2000. I have supervised numerous exploration programs specific to low sulphidation epithermal gold-silver deposits having similar geologic characteristics to the Tuligtic Project throughout British Columbia, Canada; and Jalisco, Nayarit and Puebla States, Mexico. I am a Professional Geologist registered with APEGGA (Association of Professional Engineers, Geologists and Geophysicists of Alberta), and APEGBC (Association of Professional Engineers and Geoscientists of British Columbia) and I am a 'Qualified Person' in relation to the subject matter of this Technical Report.

4. I visited the Property that is the subject of this Report on October 17th, 2011, September 23rd, 2012 and November 20, 2013. I have no prior involvement with the Property.

5. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101. I have not received, nor do I expect to receive, any interest, directly or indirectly, in Almaden Minerals. I am not aware of any other information or circumstance that could interfere with my judgment regarding the preparation of the Technical Report.

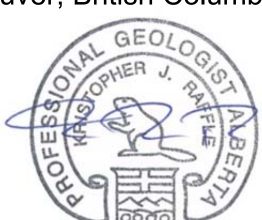
7. I have read and understand National Instrument 43-101 and Form 43-101 F1 and the Report has been prepared in compliance with the instrument.

8. To the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

9. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this February 12, 2014

Vancouver, British Columbia, Canada



Kristopher J. Raffle, B.Sc., P.Geo.

20.2 G.H. Giroux Certificate of Author

I, G.H. Giroux, of 982 Broadview Drive, North Vancouver, British Columbia, do hereby certify that:

1. I am a consulting geological engineer with an office at #1215 - 675 West Hastings Street, Vancouver, British Columbia.

2. I am a graduate of the University of British Columbia in 1970 with a B.A. Sc. and in 1984 with a M.A. Sc., both in Geological Engineering.

3. I am a member in good standing of the Association of Professional Engineers and Geoscientists of the Province of British Columbia.

4. I have practiced my profession continuously since 1970. I have had over 30 years' experience calculating mineral resources. I have previously completed resource estimations on a wide variety of precious metal deposits both in B.C. and around the world, many similar to the Ixtaca project.

5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, past relevant work experience and affiliation with a professional association (as defined in NI 43-101), I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the preparation of Section 14 "Mineral Resource Estimate" of the technical report titled **"Technical Report on the Tuligtic Project, Puebla State, Mexico"**, and dated February 12, 2014 (the "Technical Report"). I have not visited the property.

7. I have not had prior involvement with the property that is the subject of the Technical Report.

8. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the portions of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the Technical Report for which I am responsible not misleading.

9. I am independent of the issuer applying all of the tests in section 1.5 of NI 43-101.

10. I have read NI 43-101, and the portions of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101.

Dated this February 12, 2014

Vancouver, British Columbia, Canada

(signed) *G. H. Giroux* [Sealed]

G. H. Giroux, P.Eng., MASc.

21 References

Almaden Minerals Ltd. (2004): United States Securities Exchange Commission Form 20-F. Annual Report for the Fiscal Year Ended December 31, 2004, 178 p.

Almaden Minerals Ltd. (2005): United States Securities Exchange Commission Form 20-F. Annual Report for the Fiscal Year Ended December 31, 2005, 338 p.

Almaden Minerals Ltd. (2006): United States Securities Exchange Commission Form 20-F. Annual Report for the Fiscal Year Ended December 31, 2006, 156 p.

Almaden Minerals Ltd. (2007): United States Securities Exchange Commission Form 20-F. Annual Report for the Fiscal Year Ended December 31, 2007, 218 p.

Almaden Minerals Ltd. (2008): United States Securities Exchange Commission Form 20-F. Annual Report for the Fiscal Year Ended December 31, 2008, 180 p.

Almaden Minerals Ltd. (2004): United States Securities Exchange Commission Form 20-F. Annual Report for the Fiscal Year Ended December 31, 2004, 178 p.

Almaden Minerals Ltd. (2009): United States Securities Exchange Commission Form 20-F. Annual Report for the Fiscal Year Ended December 31, 2009, 180 p.

Almaden Minerals Ltd. (2011): United States Securities Exchange Commission Form 20-F. Annual Report for the Fiscal Year Ended December 31, 2011, 140 p.

Bentzen, A., and Sinclair, A.J. (1993): P-RES – A Computer Program to Aid in the Investigation of Polymetallic Ore Reserves. Technical Report MT-9 Mineral Deposit Reach Unit, Dept. of Geological Sciences U.B.C., 55 p.

Carrasco-Nunez G., Gomez-Tuena A., Lozano L. (1997): Geologic Map of Cerro Grande Volcano and surrounding areas, Central Mexico. Geological Society of America, Map and Charts Series, map MCH081F, 10 p.

Canadian Institute of Mining, Metallurgy and Petroleum (CIM). (2005). CIM Definition Standards – For Mineral Resources and Mineral Reserves. 10 p.

Coller, D. (2011): Structure and Tectonics of the Ixtaca Epithermal Gold-Silver Vein System, Puebla, Mexico, A Preliminary Field Based Assessment, 15 p.

Ferrari L., Orozco-Esquivel T., Manea V., Manea M. (2011): The dynamic history of the Trans-Mexican Volcanic Belt and the Mexico Subduction Zone. Tectonophysics, V 522-523, p. 122-149.

Fuentes-Peralta T., and Calderon M. C. (2008): Geological Monography of the State of Puebla, Mexico (in Spanish). Servicio Geologico Mexicano (SGM), 257 p.

Garcia-Palomo A., Macias J.L., Arce J.L., Capra L., Garduno V.H., Espindola J.M. (2002): Geology of the Nevado de Toluca Volcano and surrounding areas, central Mexico. Geological Society of America, Maps and Charts Series, map MCH089X, 26 p.

Hedenquist J.W., and Henley R.W. (1995): The Importance of Co2 on Freezing Point Measurements of Fluid Inclusions: Evidence from Active Geothermal Systems and Implications for Epithermal Ore Deposition. Economic Geology, v. 80, 28 p.

Herrington R. (2011): Ixtaca Core Samples: Preliminary SEM Analyses, 20 p.

Leitch, C. (2011): Petrographic Report on 22 Samples. Prepared for Almaden Minerals Ltd., p. 1-28.

Morales-Ramirez J.M. (2002): Geology and metallogeny of the Au-Ag-kaolin deposit of Ixtacamaxtitlan (Puebla State, Mexico) (in Spanish). Honors Thesis, Faculty of Engineering, National University of Mexico, 153 p.

Panteleyev, A. (1995): Porphyry Cu-Au alkali (L03); in Selected British Columbia Mineral Deposit Profiles Volume 1 – Metallics and Coal, Lefebure, D.V. and Ray, G.E., editors, *B.C. Ministry of Energy and Mines*, Paper 1995-20, p. 83-86.

Raffle, K.J., Giroux, G.H., Bamber, A. (2013): Technical Report on the Tuligtic Project, Puebla State, Mexico, 131 p.

Ray, G.E. (1995): Pb-Zn Skarns, in Selected British Columbia Mineral Deposit Profiles, Volume 1 – Metallics and Coal, Lefebure, D.V. and Ray, G.E., Editors, British Columbia Ministry of Employment and Investment, Open File 1995-20, pages 61-62.

Reyes-Cortes M. (1997): Geology of the Oriental basin, States of Puebla, Veracruz, and Texcala (in Spanish). SEP/INAH scientific collection, v. 71, 62 p.

Sinclair, A.J. (1974): Applications of Probability Graphs in Mineral Exploration. Spec. V. Association of Exploration Geochemists, 95 p.

Staffurth N. (2012): Mineralogy and Ore Fluid Properties of the Ixtaca Epithermal Deposits, Puebla State, Mexico: What is the Cause of Gold-Rich Versus Silver-Rich Veins? Masters Thesis, Faculty of Geology, Imperial College London, 35 p.

Taylor, B.E. (2007): Epithermal Gold Deposits, *Mineral Deposits of Canada: A Synthesis of Major Deposit-Types, Distric Metallogeny, The Evolution of Geological Provinces, and Exploration Methods: Geological Association of Canada, Mineral Deposits Division,* Special Publication No. 5, p. 113-139.

Tritlla J, Camprubi A., Morales-Ramirez J.M., Iriondo A., Corona-Esquivel R., Gonzalez-Partida E., Levresse G., and Carrillo-Chavez A. (2004): The Ixtacamaxtitlan kaolinite deposit and sinter (Puebla State, Mexico): a magmatic –hydrothermal system telescoped by a shallow paleoaquifer. Geofluids v. 4, 12 p.

White N.C., and Hedenquist J.W. (1990): Epithermal Environments and Styles of Mineralization: Variations and Their Causes, and Guidelines for Exploration, 29 p.

White N.C., and Hedenquist J.W. (1995): Epithermal Gold Deposits: Styles, Characteristics and Exploration. Society of Economic Geologists (SEG), Number 23, 6 p.

APPENDIX 1: List of Drill Holes on the Tuligtic Project

Holes outlining the Ixtaca Main and NE Zones are highlighted

HOLE	EASTING	NORTHING	ELEVATION	HOLE LENGTH (m)
CA-11-001	619100.90	2176535.30	2302.30	410.87
CA-11-002	619148.11	2176789.80	2402.17	597.77
CA-11-003	619147.74	2176790.16	2403.33	575.46
CA-11-004	619154.90	2176474.60	2298.50	276.76
TU-10-001	618734.70	2176006.60	2247.50	349.91
TU-10-002	618751.50	2176045.20	2248.40	377.34
TU-10-003	618726.10	2175977.20	2244.40	391.67
TU-10-004	618753.70	2176128.70	2278.70	446.60
TU-10-005	618753.70	2176128.70	2278.70	490.12
TU-10-006	618834.80	2176219.10	2323.70	529.74
TU-10-007	618777.90	2175748.90	2245.40	442.54
TU-10-008	618644.40	2175987.60	2252.10	559.61
TU-10-009	618646.40	2176057.90	2264.60	341.90
TU-10-010	618646.60	2175990.60	2252.60	611.43
TU-10-011	618790.20	2176155.60	2277.70	458.72
TU-10-012	618751.50	2176045.20	2248.40	544.98
TU-10-013	618790.20	2176155.60	2277.70	559.07
TU-10-014	618751.50	2176037.40	2246.44	361.49
TU-11-015	618916.80	2176140.30	2252.20	291.39
TU-11-016	618978.70	2175835.20	2375.70	480.36
TU-11-017	618916.80	2176140.30	2252.20	468.78
TU-11-018	618964.10	2176158.20	2253.50	302.97
TU-11-019	618978.70	2175835.20	2375.70	455.98
TU-11-020	618964.10	2176158.20	2253.50	356.86
TU-11-021	619004.50	2176206.60	2255.00	319.43
TU-11-022	619004.50	2176206.60	2255.00	392.58
TU-11-023	618793.40	2175702.98	2243.80	465.12
TU-11-024	619002.30	2176209.90	2255.10	389.53
TU-11-025	619260.60	2176009.30	2382.10	438.42
TU-11-026	619055.30	2176223.60	2253.30	319.43
TU-11-027	619092.80	2176248.00	2255.20	340.46
TU-11-028	618659.20	2175993.80	2250.50	282.24
TU-11-029	618863.25	2176122.30	2244.04	324.31
TU-11-030	618602.40	2175894.08	2246.20	230.43
TU-11-031	618806.97	2176043.89	2242.90	344.12
TU-11-032	619154.90	2176474.60	2298.50	356.01
TU-11-033	618509.50	2176044.90	2285.40	406.60
TU-11-034	618779.10	2175987.80	2243.30	316.38

TU-11-035	618700.72	2176020.35	2245.20	401.12
TU-11-036	618745.96	2175925.12	2242.21	166.73
TU-11-037	618512.46	2175852.96	2263.82	437.69
TU-11-038	618739.65	2175798.95	2241.21	285.90
TU-11-039	618962.37	2176161.65	2252.40	263.04
TU-11-040	618450.56	2176157.40	2298.56	198.12
TU-11-041	619241.11	2176587.53	2327.99	569.37
TU-11-042	618244.68	2175915.65	2269.83	639.26
TU-11-043	619311.04	2176678.66	2374.59	407.82
TU-11-044	619100.90	2176535.30	2302.30	276.76
TU-11-045	618791.29	2175575.38	2231.13	480.36
TU-11-046	619241.11	2176587.53	2327.99	301.14
TU-11-047	619161.37	2176320.10	2262.40	243.23
TU-11-048	618916.80	2176140.30	2252.20	365.15
TU-11-049	619091.07	2175947.99	2410.11	465.12
TU-11-050	619164.04	2176319.31	2263.80	304.19
TU-11-051	618914.70	2176144.40	2250.88	316.38
TU-11-052	619091.27	2176252.37	2253.45	167.03
TU-11-053	618863.70	2176122.61	2244.04	410.87
TU-11-054	619040.03	2176028.18	2392.35	471.22
TU-11-055	619052.21	2176227.51	2251.21	231.04
TU-11-056	618829.90	2176092.90	2243.06	392.58
TU-11-057	618806.97	2176043.89	2242.90	480.97
TU-11-058	619082.10	2176028.70	2385.65	187.76
TU-11-059	618979.23	2175834.90	2371.00	701.34
TU-11-060	618758.23	2175983.00	2237.90	176.17
TU-11-061	618743.77	2175929.00	2239.70	420.01
TU-11-062	618758.23	2175983.00	2237.90	292.00
TU-11-063	618795.80	2175650.00	2232.90	432.21
TU-11-064	618782.92	2175888.24	2260.66	285.90
TU-11-065	618754.18	2175860.52	2243.76	420.01
TU-11-066	618979.23	2175834.90	2371.00	630.02
TU-11-067	618730.44	2175904.32	2237.56	261.52
TU-11-068	618803.94	2175953.38	2269.96	234.09
TU-11-069	618749.80	2175736.77	2237.57	465.73
TU-11-070	618832.54	2175999.74	2271.01	319.43
TU-11-071	618820.40	2175620.41	2236.10	255.42
TU-11-072	619022.54	2175897.56	2403.24	486.46
TU-11-073	618832.51	2175901.98	2300.06	219.15
TU-11-074	618819.30	2175495.40	2234.40	288.95
TU-11-075	618792.10	2175575.61	2227.00	477.93
TU-11-076	618851.70	2175955.88	2294.90	238.66

TU-11-077	618795.50	2175440.40	2236.30	453.54
TU-11-078	618877.90	2176036.30	2312.20	309.68
TU-11-079	619035.90	2175935.80	2409.90	359.66
TU-11-080	619795.60	2175994.20	2393.60	432.21
TU-11-081	618913.60	2176081.90	2320.80	325.53
TU-11-082	619035.70	2175937.80	2408.90	462.08
TU-11-083	618831.60	2176091.70	2247.08	365.15
TU-11-084	619302.70	2176484.90	2331.90	429.16
TU-11-085	619089.90	2175950.80	2413.90	532.18
TU-11-086	618913.60	2176081.90	2320.80	288.95
TU-11-087	619301.40	2176485.60	2330.70	298.09
TU-11-088	618831.80	2176091.40	2246.50	517.55
TU-11-089	619088.50	2175950.10	2413.10	221.28
TU-11-090	619240.50	2176626.30	2321.00	243.23
TU-11-091	618937.70	2176081.90	2322.50	274.76
TU-11-092	619091.20	2175948.70	2413.70	239.57
TU-11-093	619238.90	2176628.90	2320.70	209.70
TU-11-094	619198.10	2176586.50	2309.80	246.28
TU-11-095	618937.70	2176081.90	2322.50	224.94
TU-12-096	618883.70	2176125.60	2251.52	401.73
TU-12-097	618977.90	2176157.10	2250.00	413.92
TU-12-098	619235.90	2176510.50	2326.96	404.77
TU-12-099	619151.20	2176032.30	2396.50	474.27
TU-12-100	619235.90	2176510.50	2326.96	267.61
TU-12-101	618883.70	2176125.60	2251.52	538.89
TU-12-102	618964.10	2176158.20	2253.50	292.00
TU-12-103	619232.80	2176513.50	2325.50	401.73
TU-12-104	618964.10	2176158.20	2253.50	264.57
TU-12-105	618791.30	2175575.40	2231.13	346.25
TU-12-106	619235.90	2176510.50	2326.40	343.20
TU-12-107	618919.10	2176136.80	2254.90	465.73
TU-12-108	619040.90	2176208.50	2258.70	325.53
TU-12-109	619235.90	2176510.50	2326.40	368.20
TU-12-110	618450.80	2176157.50	2305.00	331.01
TU-12-111	619044.60	2176208.50	2254.10	295.05
TU-12-112	619000.50	2176193.30	2253.20	413.92
TU-12-113	619237.70	2176515.40	2333.40	325.53
TU-12-114	618510.00	2176047.30	2288.90	425.50
TU-12-115	619044.60	2176208.50	2254.10	365.15
TU-12-116	619299.20	2176482.80	2330.80	197.51
TU-12-117	619000.50	2176193.30	2253.20	307.24
TU-12-118	618510.00	2176047.30	2288.90	321.87

TU-12-119	618685.90	2176257.90	2374.10	615.09
TU-12-120	618940.60	2176142.30	2257.40	331.62
TU-12-121	619000.50	2176193.30	2253.20	267.61
TU-12-122	618506.50	2175961.00	2283.00	395.02
TU-12-123	618813.10	2176076.20	2247.10	356.01
TU-12-124	618940.60	2176142.30	2257.40	356.01
TU-12-125	618693.04	2176334.10	2376.90	404.77
TU-12-126	618813.10	2176076.20	2247.10	393.19
TU-12-127	618940.60	2176142.30	2257.40	420.01
TU-12-128	618506.50	2175961.00	2283.00	425.50
TU-12-129	618732.40	2176365.60	2377.80	444.40
TU-12-130	618813.10	2176076.20	2247.10	288.95
TU-12-131	618506.50	2175961.00	2283.00	431.60
TU-12-132	618940.60	2176142.30	2257.40	273.71
TU-12-133	618813.10	2176076.20	2247.10	261.52
TU-12-134	618732.40	2176365.60	2377.80	438.30
TU-12-135	618813.10	2176076.20	2247.10	438.30
TU-12-136	618939.90	2176143.10	2252.90	185.32
TU-12-137	618621.50	2175965.70	2247.90	331.01
TU-12-138	618834.20	2176293.00	2358.80	404.77
TU-12-139	618705.70	2175991.60	2247.70	349.30
TU-12-140	619082.70	2176389.60	2274.40	218.85
TU-12-141	618544.70	2175894.40	2263.20	362.10
TU-12-142	618705.70	2175991.60	2247.70	443.79
TU-12-143	619082.70	2176389.60	2274.40	200.56
TU-12-144	618834.20	2176293.00	2358.80	307.24
TU-12-145	619051.20	2176453.70	2295.50	441.35
TU-12-146	618705.70	2175991.60	2247.70	248.72
TU-12-147	618564.10	2175964.80	2256.90	296.57
TU-12-148	618705.70	2175991.60	2247.70	312.72
TU-12-149	618853.10	2176343.20	2353.70	340.77
TU-12-150	618677.90	2175882.90	2245.30	294.44
TU-12-151	619051.20	2176453.70	2295.50	392.58
TU-12-152	618563.20	2176043.90	2268.10	319.43
TU-12-153	618613.80	2176265.30	2348.10	334.67
TU-12-154	618646.60	2175813.20	2239.60	259.38
TU-12-155	619051.20	2176453.70	2295.50	380.39
TU-12-156	618673.20	2175759.90	2238.70	270.05
TU-12-157	618518.50	2176161.10	2312.30	423.06
TU-12-158	618639.10	2175999.90	2252.50	145.69
TU-12-159	619051.20	2176453.20	2295.50	371.25
TU-12-160	618640.40	2175720.50	2239.40	382.83

TU-12-161	618914.70	2176351.30	2330.00	282.85
TU-12-162	619051.20	2176453.20	2295.50	395.63
TU-12-163	618469.30	2175923.20	2277.70	432.21
TU-12-164	618730.70	2176004.10	2244.50	327.96
TU-12-165	618914.70	2176351.30	2330.00	407.82
TU-12-166	619051.20	2176453.20	2295.50	453.54
TU-12-167	618405.00	2176026.00	2267.90	487.07
TU-12-168	618734.10	2176005.90	2246.50	373.68
TU-12-169	618946.40	2176414.40	2308.50	413.92
TU-12-170	618984.30	2176547.10	2323.60	392.58
TU-12-171	618435.90	2175974.50	2272.00	444.40
TU-12-172	618745.60	2176037.90	2246.00	571.80
TU-12-173	618946.40	2176414.40	2308.50	416.97
TU-12-174	618984.30	2176547.10	2323.60	407.82
TU-12-175	619001.70	2176403.90	2299.00	313.33
TU-12-176	618407.50	2176026.90	2272.60	535.84
TU-12-177	618604.70	2175820.10	2247.40	416.36
TU-12-178	618984.30	2176547.10	2323.60	426.11
TU-12-179	619001.70	2176403.90	2299.00	349.91
TU-12-180	618984.30	2176547.10	2323.60	420.01
TU-12-181	619001.70	2176403.90	2299.00	224.94
TU-12-182	618569.60	2175756.10	2245.50	446.84
TU-12-183	618408.31	2176025.50	2272.60	264.57
TU-12-184	618982.70	2176546.50	2323.60	434.04
TU-12-185	618408.31	2176025.50	2272.60	167.03
TU-12-186	619166.30	2176320.60	2262.00	352.96
TU-12-187	618408.00	2176026.90	2272.60	200.56
TU-12-188	618416.10	2175932.00	2273.80	443.79
TU-12-189	618404.50	2176024.40	2270.90	490.12
TU-12-190	619006.00	2176498.30	2312.40	413.92
TU-12-191	619165.40	2176319.80	2265.30	395.63
TU-12-192	618446.00	2175860.50	2273.00	316.38
TU-12-193	618427.70	2176204.10	2302.30	130.45
TU-12-194	619006.00	2176498.30	2312.30	407.82
TU-12-195	618427.70	2176204.10	2302.30	325.53
TU-12-196	619074.90	2176389.50	2271.00	383.44
TU-12-197	618423.40	2176205.70	2302.30	215.80
TU-12-198	618417.50	2176112.00	2286.90	316.38
TU-12-199	619006.00	2176498.30	2312.30	480.97
TU-12-200	618417.50	2176112.00	2286.90	160.93
TU-12-201	619074.90	2176389.50	2271.00	413.92
TU-12-202	618568.40	2176189.60	2327.10	484.02

TU-12-203	618414.40	2176115.20	2286.90	182.27
TU-12-204	619074.90	2176389.50	2271.00	453.54
TU-12-205	619002.20	2176499.80	2312.80	368.20
TU-12-206	618675.70	2176200.30	2361.70	205.13
TU-12-207	618565.40	2176189.80	2326.70	263.96
TU-12-208	619083.80	2176389.60	2271.00	368.20
TU-12-209	618675.70	2176200.30	2361.70	258.47
TU-12-210	619049.20	2176453.30	2291.60	319.43
TU-12-211	618703.40	2175953.70	2242.50	322.48
TU-12-212	618808.70	2176079.40	2244.90	313.33
TU-12-213	619214.50	2176220.80	2298.40	304.19
TU-12-214	619046.70	2176450.80	2292.50	337.72
TU-12-215	618948.30	2176416.70	2307.90	605.94
TU-12-216	619214.50	2176220.80	2298.40	404.77
TU-12-217	618808.70	2176079.40	2244.90	235.61
TU-12-218	619050.70	2176453.90	2287.90	295.05
TU-12-219	619211.60	2176220.30	2301.80	203.61
TU-12-220	619211.60	2176220.30	2301.80	282.85
TU-12-221	618948.30	2176416.70	2307.90	548.03
TU-12-222	619243.40	2176274.20	2302.10	200.56
TU-12-223	618943.70	2176588.20	2337.80	377.34
TU-12-224	619243.40	2176274.20	2302.10	371.25
TU-12-225	619240.90	2176281.30	2300.90	176.17
TU-12-226	619033.90	2176362.00	2282.70	590.70
TU-12-227	619240.90	2176281.30	2300.90	197.51
TU-12-228	618943.70	2176588.20	2337.80	398.68
TU-12-229	619243.70	2176279.70	2305.70	420.01
TU-12-230	618943.70	2176588.20	2337.80	477.93
TU-12-231	619295.40	2176093.20	2334.60	209.70
TU-12-232	619243.70	2176279.70	2305.70	416.97
TU-12-233	619295.40	2176093.20	2334.60	264.57
TU-12-234	619280.10	2176314.40	2316.20	154.84
TU-12-235	618899.10	2176653.80	2346.00	499.26
TU-12-236	619393.90	2176045.20	2346.45	252.37
TU-12-237	619280.10	2176314.40	2316.20	279.81
TU-12-238	619393.90	2176045.20	2346.45	313.33
TU-12-239	619280.10	2176314.40	2316.20	145.69
TU-12-240	619395.80	2176041.50	2346.45	316.38
TU-12-241	619280.10	2176314.40	2316.20	203.61
TU-12-242	619395.80	2176041.50	2346.45	237.13
TU-12-243	619280.00	2176316.30	2346.40	218.85
TU-12-244	618899.10	2176653.80	2346.00	413.92

TU-12-245	619293.60	2176095.80	2329.40	221.89
TU-12-246	619132.90	2176271.90	2258.70	325.53
TU-12-247	619293.60	2176095.80	2329.40	148.74
TU-13-248	618609.90	2175819.30	2242.60	508.41
TU-13-249	619005.20	2176207.80	2255.70	343.81
TU-13-250	619343.10	2176562.90	2356.70	267.61
TU-13-251	619005.20	2176207.80	2255.70	392.58
TU-13-252	619343.10	2176562.90	2356.70	319.43
TU-13-253	618609.90	2175819.30	2242.60	159.41
TU-13-254	619092.50	2176352.10	2271.30	413.92
TU-13-255	619343.10	2176562.90	2356.70	237.13
TU-13-256	618490.60	2175939.60	2279.20	441.35
TU-13-257	619092.50	2176352.10	2271.30	383.44
TU-13-258	619338.60	2176565.00	2356.70	325.53
TU-13-259	619092.50	2176352.10	2271.30	426.11
TU-13-260	618490.60	2175939.60	2279.30	468.78
TU-13-261	619294.10	2176541.10	2330.00	257.56
TU-13-262	618927.30	2176480.60	2321.60	444.40
TU-13-263	619294.10	2176541.10	2330.00	334.98
TU-13-264	619393.90	2176045.20	2346.45	425.20
TU-13-265	618927.30	2176480.60	2321.60	593.75
TU-13-266	619294.10	2176541.10	2330.00	322.48
TU-13-267	619212.10	2176127.50	2324.90	234.09
TU-13-268	619269.80	2176598.90	2333.00	377.34
TU-13-269	619213.20	2176122.60	2322.10	261.52
TU-13-270	619429.30	2176595.30	2380.80	288.95
TU-13-271	619213.10	2176122.60	2322.10	285.90
TU-13-272	619269.80	2176598.90	2333.00	301.14
TU-13-273	619213.20	2176122.60	2322.10	292.00
TU-13-274	619429.30	2176595.30	2380.80	218.85
TU-13-275	619269.80	2176598.90	2333.00	298.09
TU-13-276	619327.80	2176664.30	2373.50	200.70
TU-13-277	619392.20	2176044.40	2341.30	87.78
TU-13-278	619306.40	2176485.60	2334.30	292.00
TU-13-279	619327.80	2176664.30	2373.50	282.85
TU-13-280	619306.40	2176485.60	2334.30	340.77
TU-13-281	619306.40	2176485.60	2334.30	209.70
TU-13-282	619327.80	2176664.30	2373.50	279.81
TU-13-283	619558.60	2176556.30	2404.40	209.70
TU-13-284	619327.00	2176663.10	2384.20	215.80
TU-13-285	619558.60	2176556.30	2404.40	193.85
TU-13-286	619552.60	2176557.30	2404.40	231.04

TU-13-287	619393.70	2176645.40	2384.60	221.89
TU-13-288	618555.60	2176341.20	2339.00	292.00
TU-13-289	619393.70	2176645.40	2384.60	243.23
TU-13-290	618526.50	2176246.50	2333.90	401.73
TU-13-291	619386.30	2176743.80	2358.60	227.99
TU-13-292	618523.80	2176244.30	2333.90	499.26
TU-13-293	619386.30	2176743.80	2358.60	139.60
TU-13-294	619384.80	2176741.50	2358.60	167.03
TU-13-295	619384.80	2176741.50	2358.60	290.78
TU-13-296	619384.80	2176741.50	2358.60	200.56
TU-13-297	618423.50	2176206.60	2299.30	474.88
TU-13-298	619384.80	2176741.50	2358.60	282.85
TU-13-299	619407.10	2176807.40	2358.50	154.84
TU-13-300MET	618505.90	2176041.03	2284.70	75.59
TU-13-301MET	619242.70	2176277.30	2309.03	145.69
TU-13-302	619407.10	2176807.40	2358.50	170.08
TU-13-303MET	618808.30	2176044.00	2243.60	264.57
TU-13-304	619407.10	2176807.40	2358.50	96.93
TU-13-305	619407.10	2176807.40	2358.50	118.26
TU-13-306	618890.30	2176135.40	2249.50	200.56
TU-13-307	619407.10	2176807.40	2358.50	398.68
TU-13-308	619010.90	2176472.30	2308.80	441.35
TU-13-309	618890.30	2176135.40	2249.50	337.72
TU-13-310	619324.70	2176223.30	2361.50	240.18
TU-13-311	619010.90	2176472.00	2308.80	420.01
TU-13-312	619328.00	2176218.20	2350.00	221.89
TU-13-313	618847.70	2176108.90	2252.00	212.75
TU-13-314	619328.00	2176218.20	2350.00	246.28
TU-13-315	619010.90	2176472.30	2308.80	383.44
TU-13-316	618847.70	2176108.90	2252.00	267.61
TU-13-317	619325.20	2176220.90	2346.30	307.24
TU-13-318	618829.70	2176092.00	2247.30	197.51
TU-13-319	619010.90	2176472.00	2308.80	334.67
TU-13-320	619328.00	2176218.00	2350.00	206.65
TU-13-321	618911.97	2176142.43	2253.00	227.99
TU-13-322	619338.50	2176311.50	2353.40	191.41
TU-13-323MET	619006.80	2176499.40	2313.30	377.34
TU-13-324	618950.00	2176147.00	2253.00	218.85
TU-13-325	618950.00	2176147.00	2253.00	243.23
TU-13-326	619338.50	2176311.50	2353.40	209.70
TU-13-327	619338.50	2176311.50	2353.40	185.32
TU-13-328	618982.60	2176522.90	2321.80	374.29

TU-13-329	619338.50	2176311.50	2353.40	209.70
TU-13-330	618982.30	2176187.20	2253.20	234.09
TU-13-331	619387.90	2176281.00	2383.60	197.51
TU-13-332	618982.60	2176522.90	2321.80	356.01
TU-13-333	618982.30	2176187.20	2253.20	267.61
TU-13-334	619387.90	2176281.00	2383.60	224.94
TU-13-335	619387.90	2176281.00	2383.60	231.04
TU-13-336	618982.60	2176522.90	2321.80	368.20
TU-13-337	619019.90	2176205.90	2254.00	200.56
TU-13-338	619387.90	2176281.00	2383.60	234.09
TU-13-339	619019.90	2176205.90	2254.00	246.28
TU-13-340MET	619325.20	2176220.90	2346.30	60.35
TU-13-341MET	619326.60	2176221.50	2361.50	151.79
TU-13-342	619059.40	2176426.30	2282.00	371.25
TU-13-343	619019.90	2176205.90	2254.00	231.04
TU-13-344	619088.30	2176029.40	2399.60	243.23
TU-13-345	619408.90	2176341.60	2409.10	206.65
TU-13-346	619019.90	2176205.90	2254.00	227.99
TU-13-347	619059.40	2176426.30	2282.00	365.15
TU-13-348	619408.90	2176341.60	2409.10	215.80
TU-13-349	619134.70	2176035.00	2393.90	259.69
TU-13-350	619408.90	2176341.60	2409.10	276.76
TU-13-351	618771.70	2176041.40	2243.70	279.81
TU-13-352	619059.40	2176426.30	2282.00	346.86
TU-13-353	619134.70	2176035.00	2393.90	199.64
TU-13-354	618771.70	2176041.40	2243.70	313.33
TU-13-355	619059.40	2176426.30	2282.00	349.00
TU-13-356	619408.90	2176341.60	2409.10	255.42
TU-13-357	619134.70	2176035.00	2393.90	310.29
TU-13-358	619408.90	2176341.60	2409.10	313.37
TU-13-359	618771.70	2176041.40	2243.70	200.56
TU-13-360	618982.90	2176389.60	2299.10	279.81
TU-13-361	619134.70	2176035.00	2393.90	298.09
TU-13-362	618771.70	2176041.40	2243.70	246.28
TU-13-363	619456.80	2176366.00	2417.80	212.75
TU-13-364	618982.90	2176389.60	2299.10	252.37
TU-13-365	619457.90	2176362.50	2416.90	243.23
TU-13-366	618771.70	2176041.40	2243.70	157.58
TU-13-367	618982.90	2176389.60	2299.10	322.48
TU-13-368	619194.10	2176027.40	2388.40	322.48
TU-13-369	619457.90	2176364.30	2417.40	362.10
TU-13-370	618801.10	2176022.90	2247.70	342.29

TU-13-371	618918.70	2176381.20	2322.30	346.86
TU-13-372	619194.10	2176027.40	2388.40	288.95
TU-13-373MET	618801.00	2176024.30	2247.70	319.43
TU-13-374	619562.90	2176432.70	2443.30	270.66
TU-13-375	618964.10	2176158.20	2253.50	258.47
TU-13-376	619059.20	2175862.20	2395.50	447.45
TU-13-377	619562.90	2176432.70	2443.30	316.38
TU-13-378	618801.00	2176024.30	2247.70	212.75
TU-13-379	618964.10	2176158.20	2253.50	151.79
TU-13-380	618758.60	2175982.50	2234.50	234.09
TU-13-381	618698.00	2175921.90	2243.20	182.27
TU-13-382	619261.40	2176493.20	2319.20	170.08
TU-13-383	618698.00	2175921.90	2243.20	151.79
TU-13-384	618758.60	2175982.50	2234.50	151.79
TU-13-385	619261.40	2176493.20	2329.20	285.90
TU-13-386	618735.40	2175849.70	2238.70	163.98
TU-13-387	618778.70	2175991.00	2246.60	298.09
TU-13-388	619116.80	2175832.30	2387.80	420.01
TU-13-389	618755.40	2175859.30	2243.80	151.79
TU-13-390	619226.40	2176543.40	2327.40	252.37
TU-13-391	618755.40	2175859.30	2243.80	142.65
TU-13-392	618778.70	2175991.00	2246.60	188.37
TU-13-393	618731.20	2175905.00	2236.50	204.52
TU-13-394	619226.40	2176543.30	2327.40	234.09
TU-13-395	618746.10	2175926.10	2245.90	234.09
TU-13-396MET	619226.40	2176543.30	2327.40	206.65
TU-13-397	618643.50	2175733.70	2254.70	386.49
TU-13-398	618542.10	2175897.50	2266.20	383.44
TU-13-399	619148.90	2175939.50	2420.80	261.52
TU-13-400	619198.10	2176586.10	2311.00	240.18
TU-13-401	619198.10	2176586.10	2311.00	243.23
TU-13-402	618409.10	2176027.30	2265.00	401.73
TU-13-403	618833.60	2176836.90	2360.44	608.99
TU-13-404	619198.20	2176586.20	2311.00	270.66
TU-13-405	619214.15	2176123.00	2324.80	252.37
TU-13-406	619149.20	2176033.00	2392.00	197.51
TU-13-407	619196.60	2175488.90	2310.50	369.72
TU-13-408	618834.70	2176833.20	2361.50	426.11
TU-13-409	619149.20	2176033.00	2392.00	246.80
TU-13-410	619214.15	2176123.00	2324.80	288.95
TU-13-411	619084.10	2176030.50	2390.70	224.94
TU-13-412	619199.10	2175486.90	2310.50	325.53

WW-13-001	618662.40	2175698.20	2241.20	215.80
WW-13-002	618659.10	2175920.60	2252.70	407.82
WW-13-003	619091.80	2176350.90	2270.30	401.73
WW-13-004	618952.20	2176147.90	2248.90	401.73
WW-13-005	618432.80	2174984.20	2219.30	352.96
WW-13-006	618549.80	2175398.30	2231.10	151.18
WW-13-007	618614.10	2175210.60	2223.40	221.89

APPENDIX 2: Contact Plots

Ash (ASH) – Low Grade Limestone (LGLM) - Au

Ash (ASH) – Low Grade Limestone (LGLM) - Ag

Low Grade Shale (LGSH) – Low Grade Limestone (LGLM) – Au

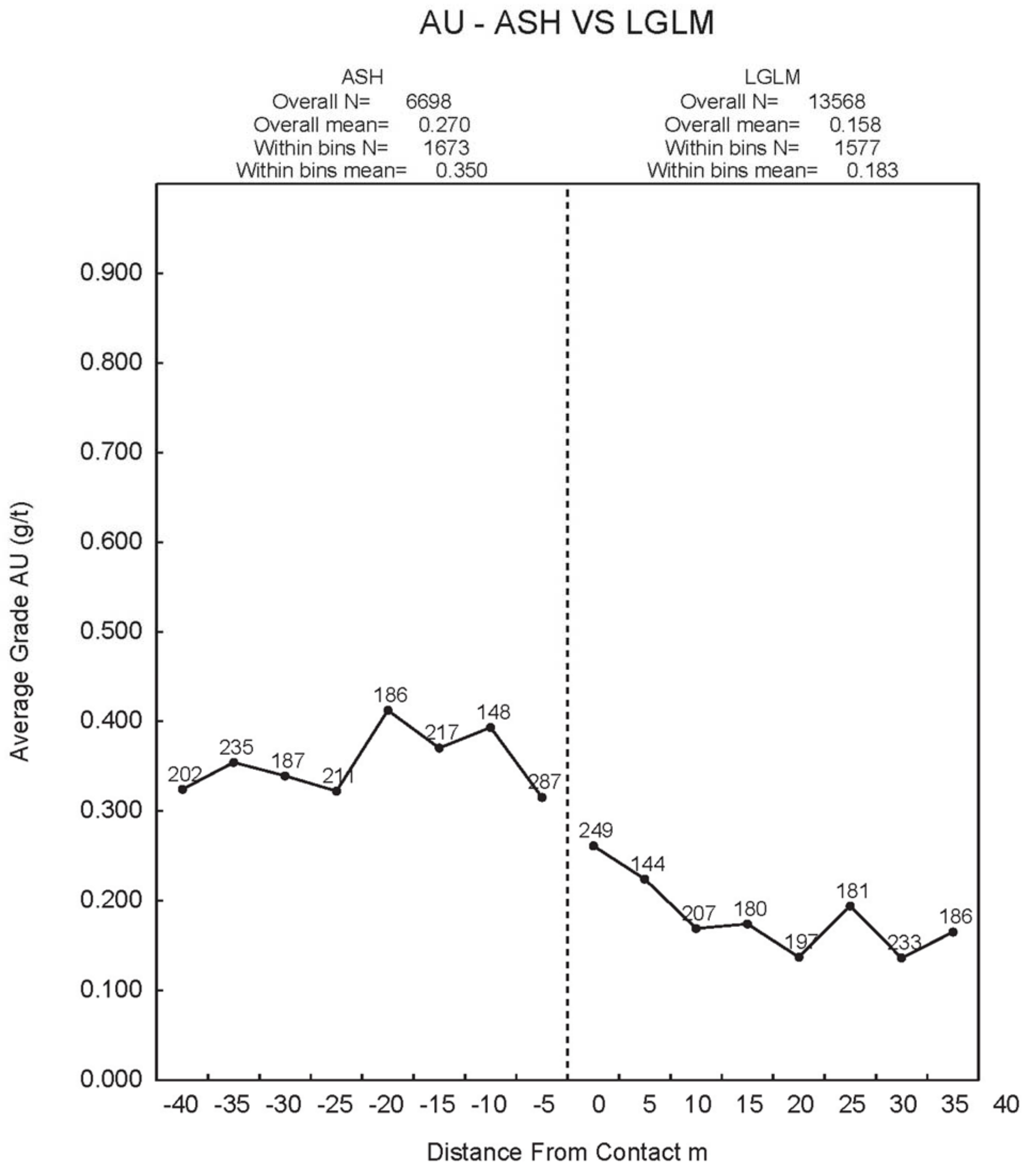
Low Grade Shale (LGSH) – Low Grade Limestone (LGLM) – Ag

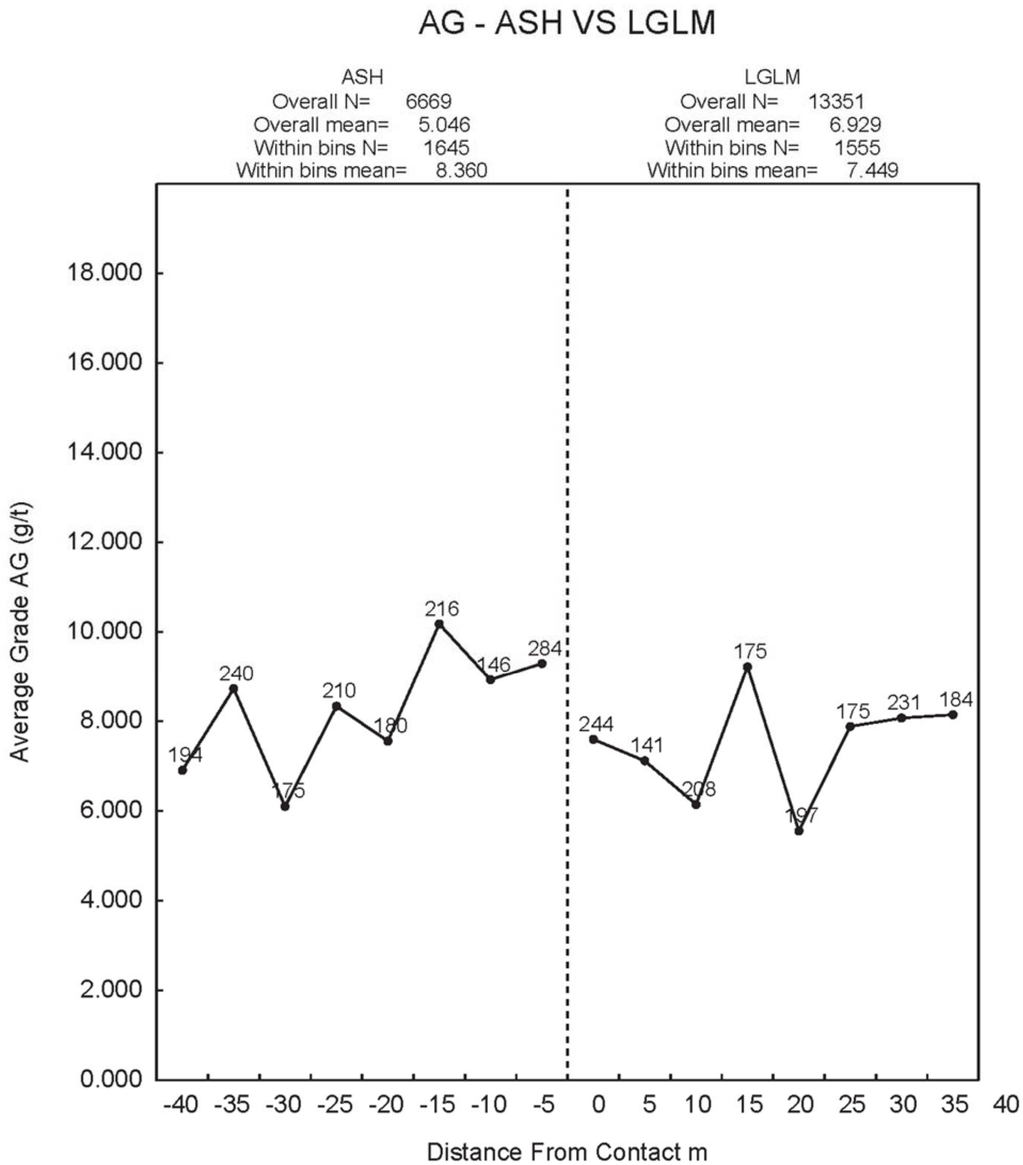
Low Grade Limestone (LGLM) – North East Low Grade Shale (NELGSH) – Au

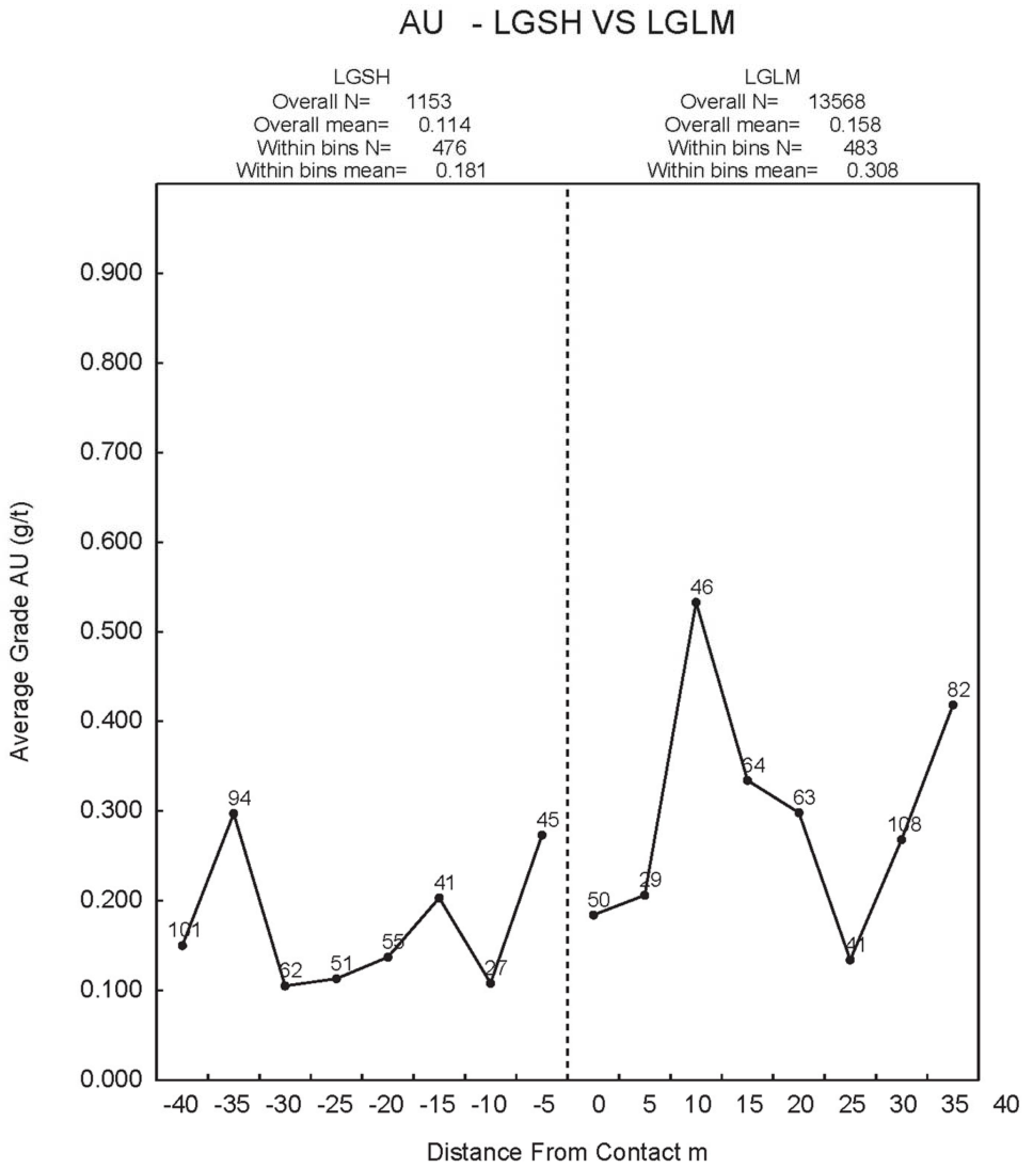
Low Grade Limestone (LGLM) – North East Low Grade Shale (NELGSH) – Ag

Ash (ASH) – North East Low Grade Shale (NELGSH) – Au

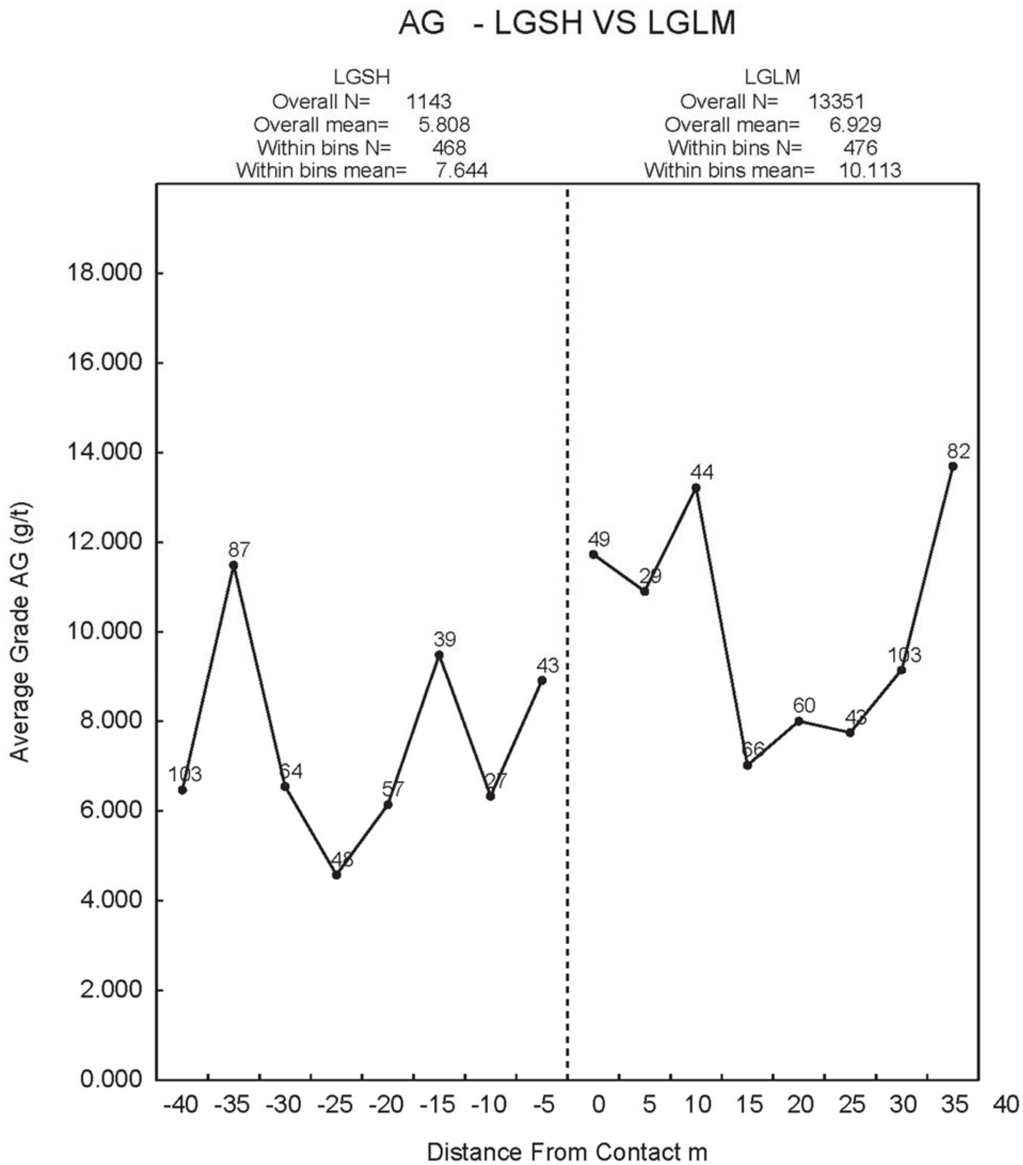
Ash (ASH) – North East Low Grade Shale (NELGSH) – Ag

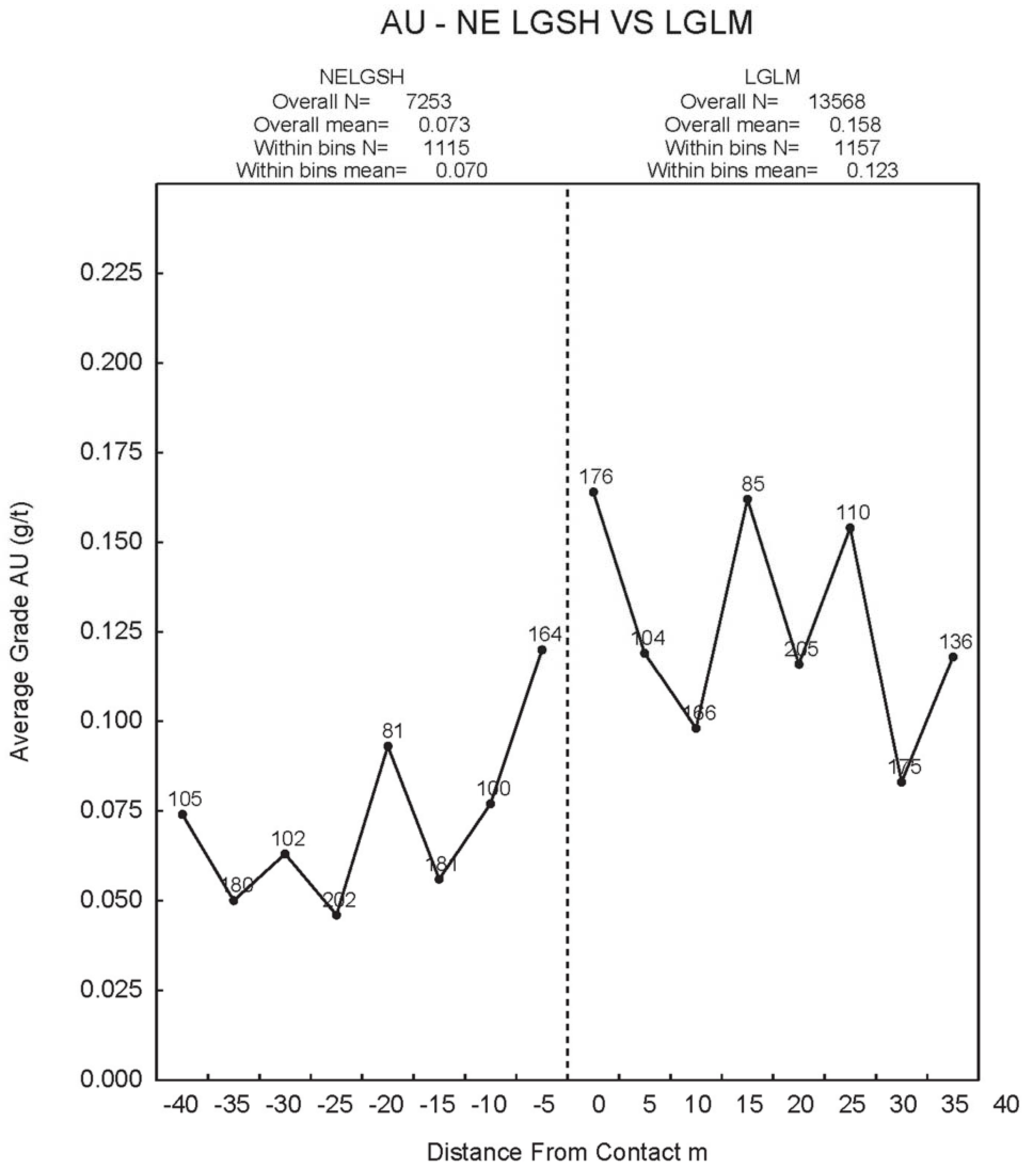

AU - ASH VS LGLM
ASH
Overall N= 6698
Overall mean= 0.270
Within bins N= 1673
Within bins mean= 0.350
LGLM
Overall N= 13568
Overall mean= 0.158
Within bins N= 1577
Within bins mean= 0.183
Average Grade AU (g/t)
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
0.800
0.900
202
235
187
211
186
217
148
287
249
144
207
180
197
181
233
186
-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40
Distance From Contact m

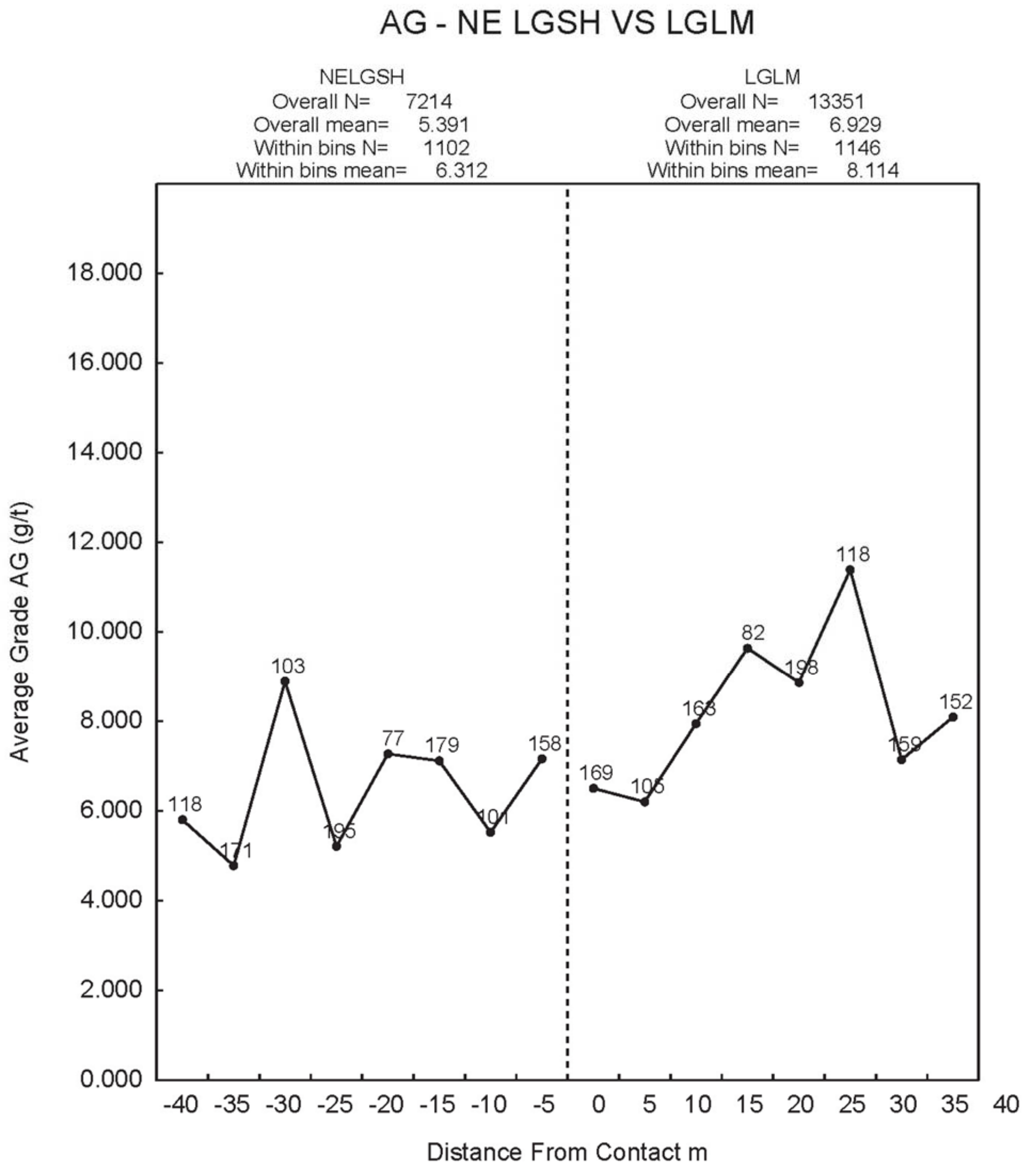

AG - ASH VS LGLM
ASH
Overall N= 6669
Overall mean= 5.046
Within bins N= 1645
Within bins mean= 8.360
LGLM
Overall N= 13351
Overall mean= 6.929
Within bins N= 1555
Within bins mean= 7.449
Average Grade AG (g/t)
18.000
16.000
14.000
12.000
10.000
8.000
6.000
4.000
2.000
0.000
194
240
175
210
180
216
146
284
244
141
208
175
197
175
231
184
-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40
Distance From Contact m

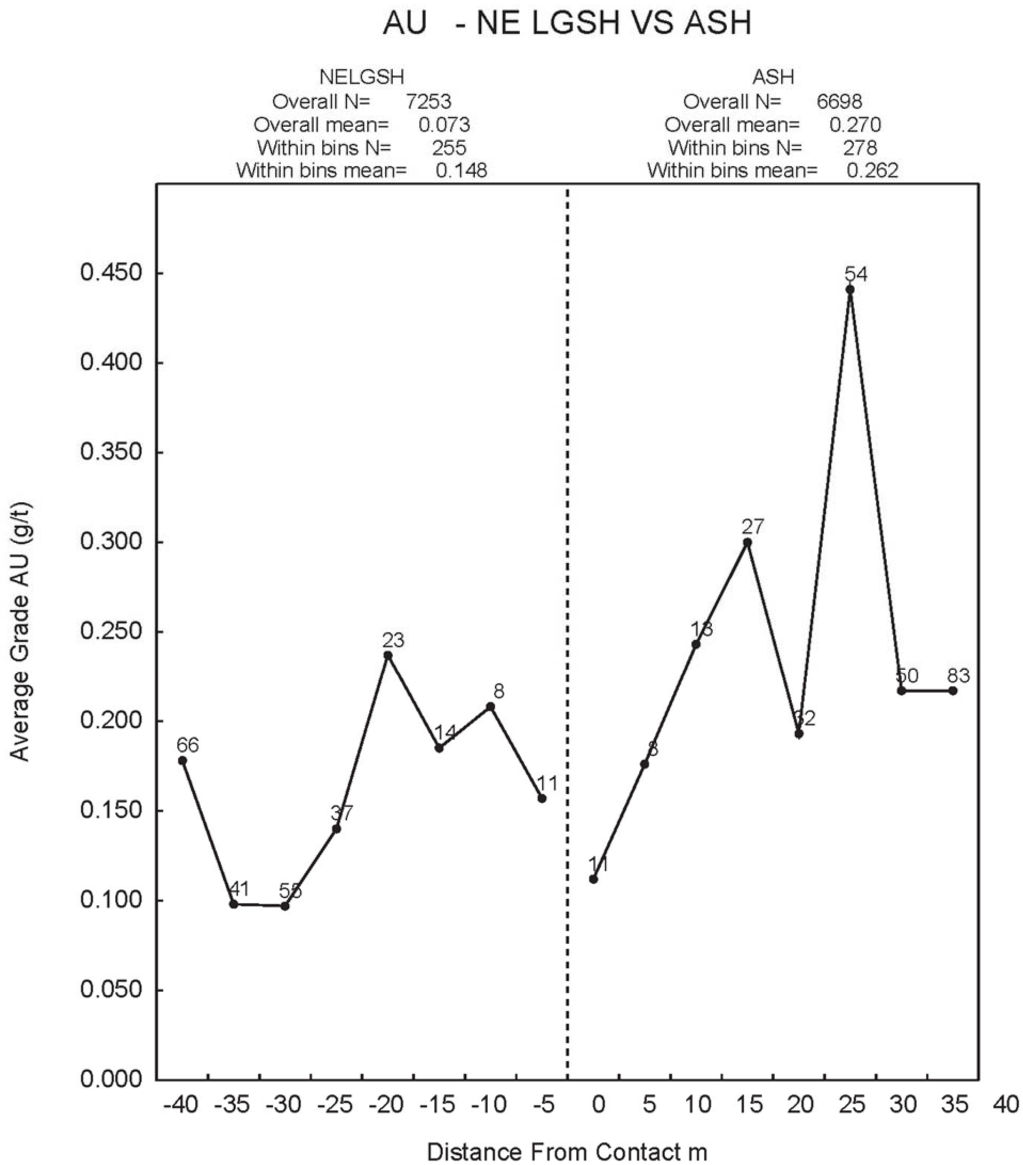


AU - LGSH VS LGLM
LGSH
Overall N= 1153
Overall mean= 0.114
Within bins N= 476
Within bins mean= 0.181
LGLM
Overall N= 13568
Overall mean= 0.158
Within bins N= 483
Within bins mean= 0.308
Average Grade AU (g/t)
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
0.800
0.900
101
94
62
51
55
41
27
45
50
29
46
64
63
41
108
82
-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40
Distance From Contact m

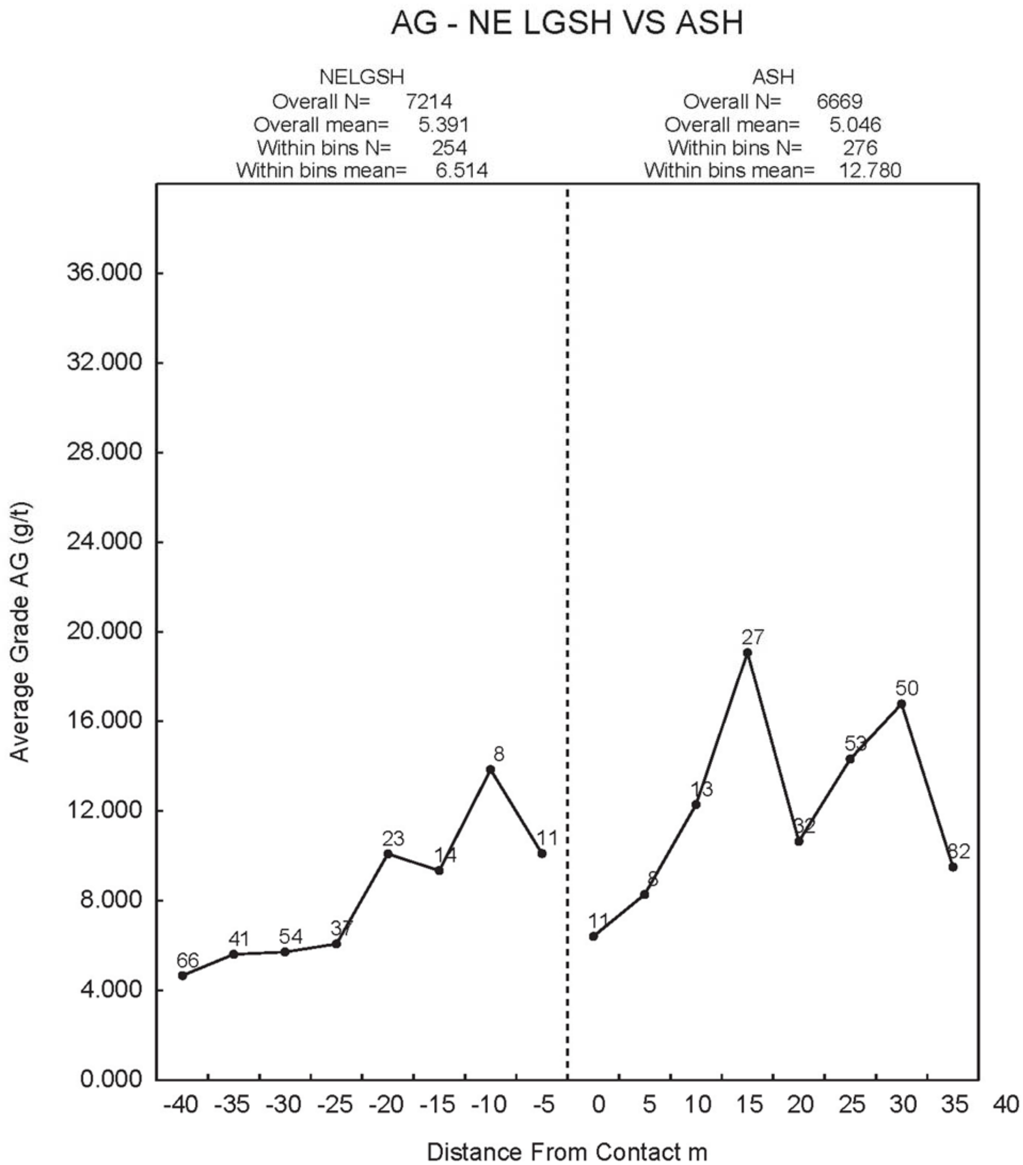

AG - LGSH VS LGLM
LGSH
Overall N= 1143
Overall mean= 5.808
Within bins N= 468
Within bins mean= 7.644
LGLM
Overall N= 13351
Overall mean= 6.929
Within bins N= 476
Within bins mean= 10.113
Average Grade AG (g/t)
18.000
16.000
14.000
12.000
10.000
8.000
6.000
4.000
2.000
0.000
103
87
64
48
57
39
27
43
49
29
44
66
60
43
103
82
-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40
Distance From Contact m


AU - NE LGSH VS LGLM
NELGSH
Overall N= 7253
Overall mean= 0.073
Within bins N= 1115
Within bins mean= 0.070
LGLM
Overall N= 13568
Overall mean= 0.158
Within bins N= 1157
Within bins mean= 0.123
Average Grade AU (g/t)
Distance From Contact m
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
0.225
-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40
105
180
102
202
81
181
100
164
176
104
166
85
205
110
175
136


AG - NE LGSH VS LGLM
NELGSH
Overall N= 7214
Overall mean= 5.391
Within bins N= 1102
Within bins mean= 6.312
LGLM
Overall N= 13351
Overall mean= 6.929
Within bins N= 1146
Within bins mean= 8.114
Average Grade AG (g/t)
Distance From Contact m

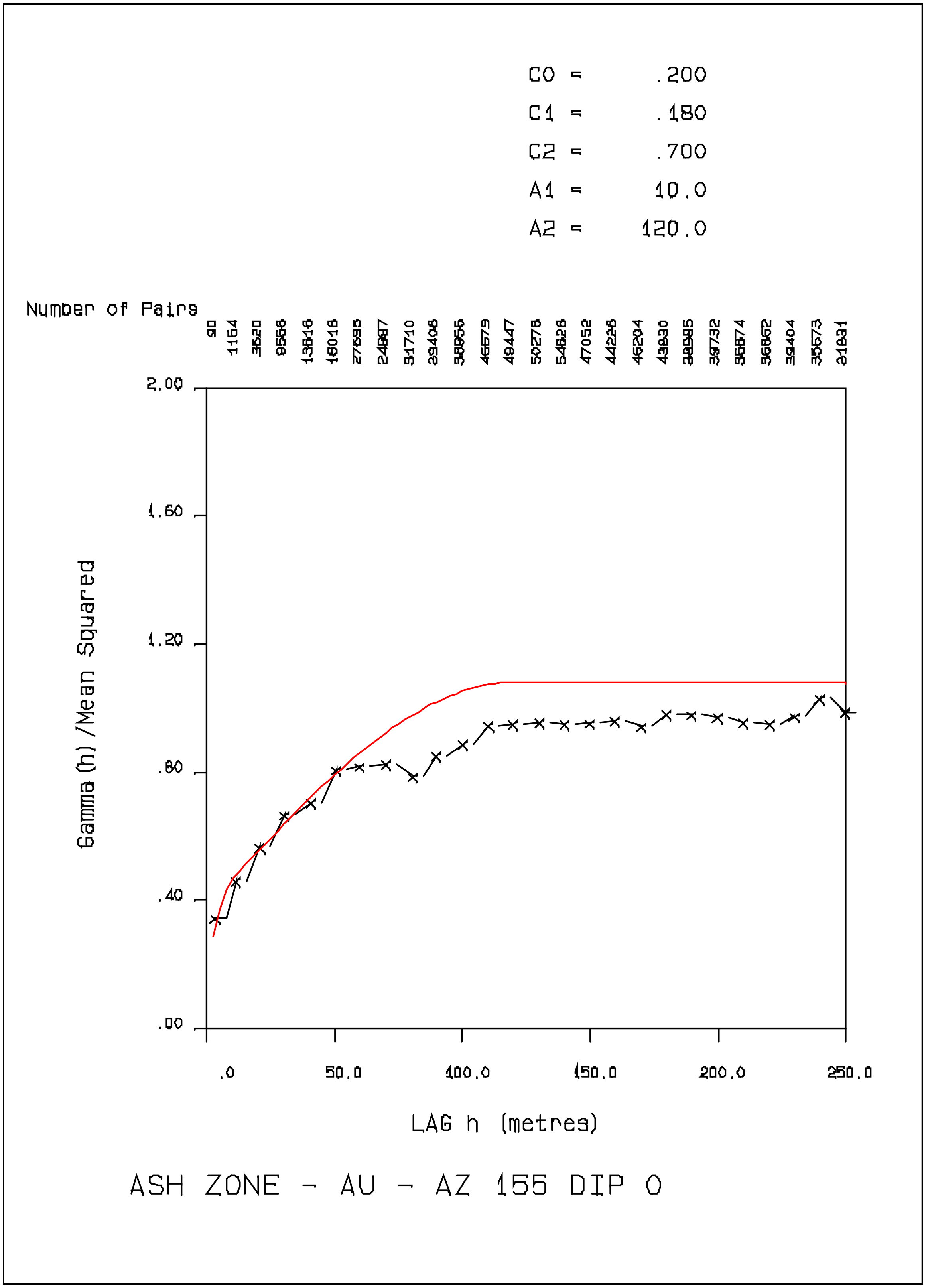


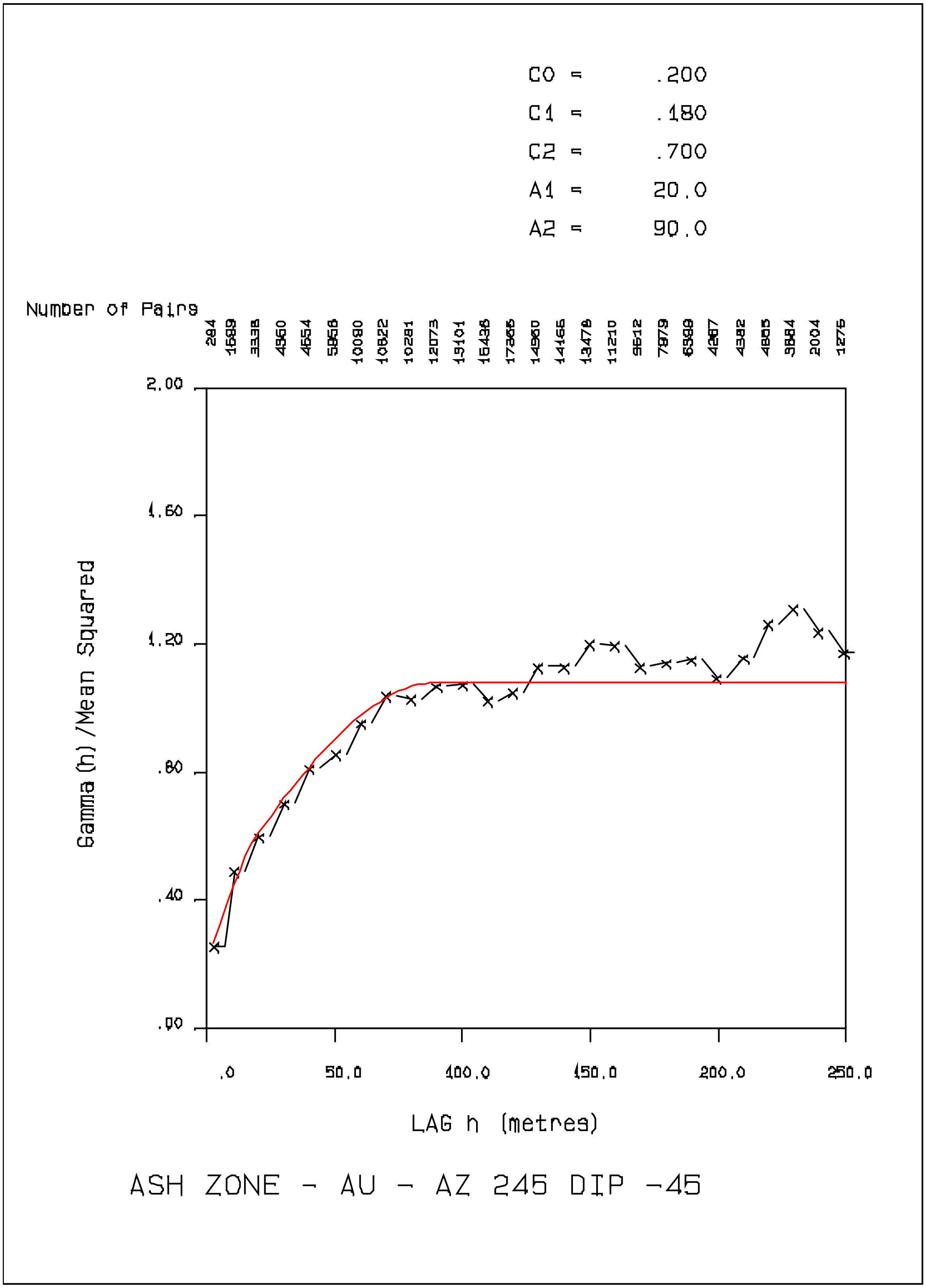
APEX Geoscience Ltd.



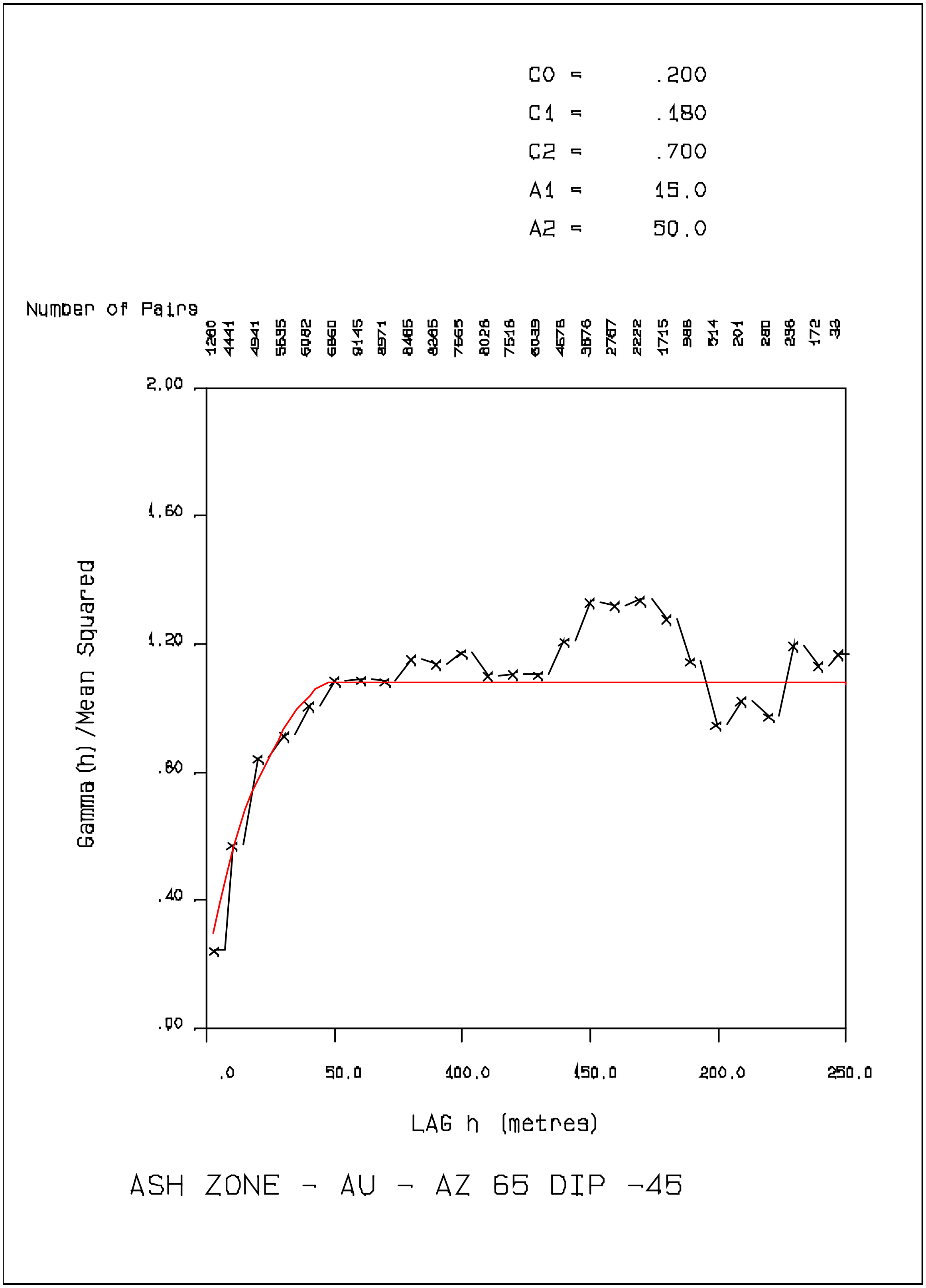
APEX Geoscience Ltd.

APPENDIX 3: Semivariogram Models for Gold in Each Domain

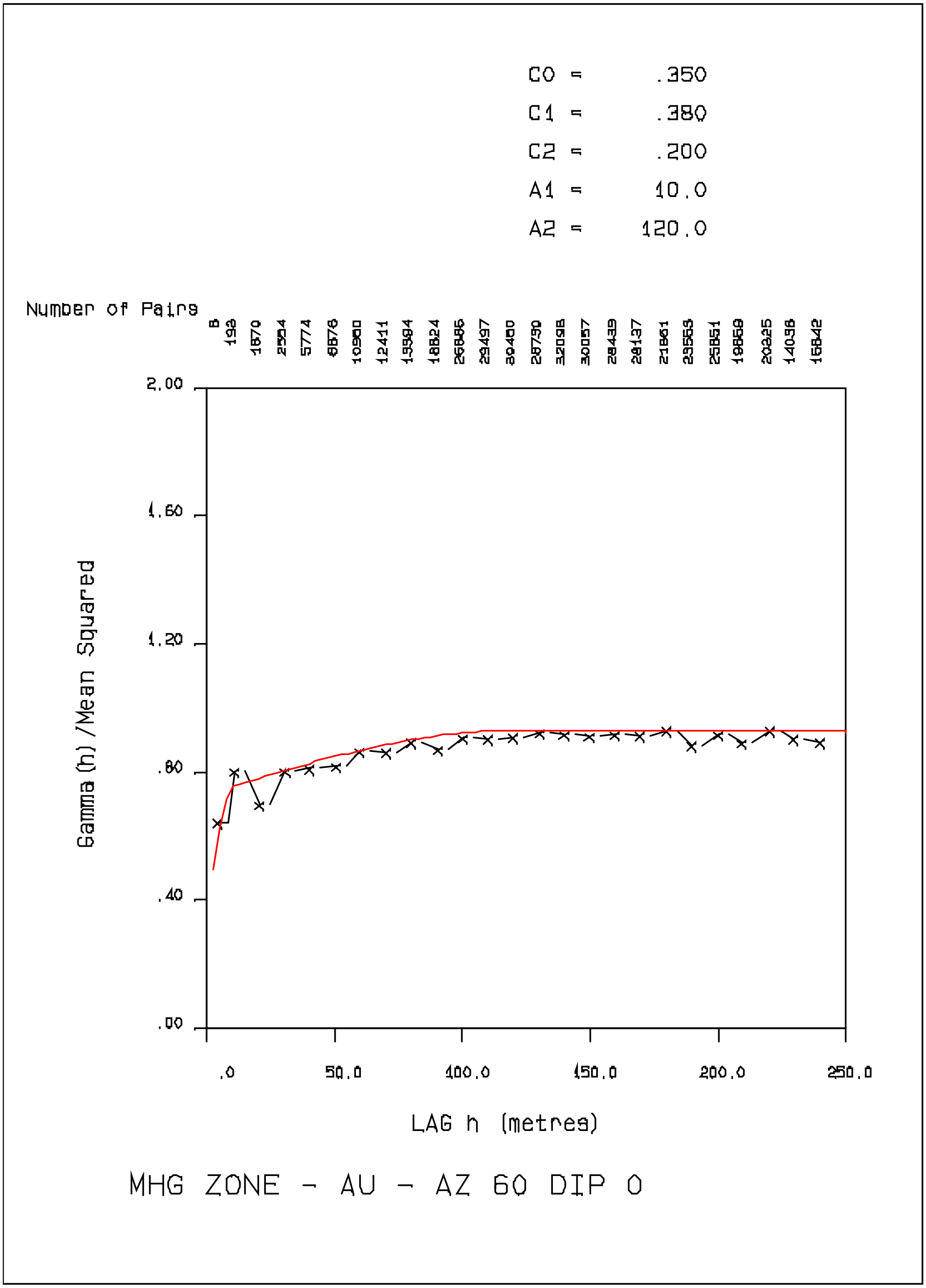

C0 = .200
C1 = .180
C2 = .700
A1 = 10.0
A2 = 120.0
Number of Pairs
Gamma (h) /Mean Squared
2.00
1.60
1.20
.80
.40
.00
.0
50.0
100.0
150.0
200.0
250.0
LAG h (metres)
ASH ZONE - AU - AZ 155 DIP 0

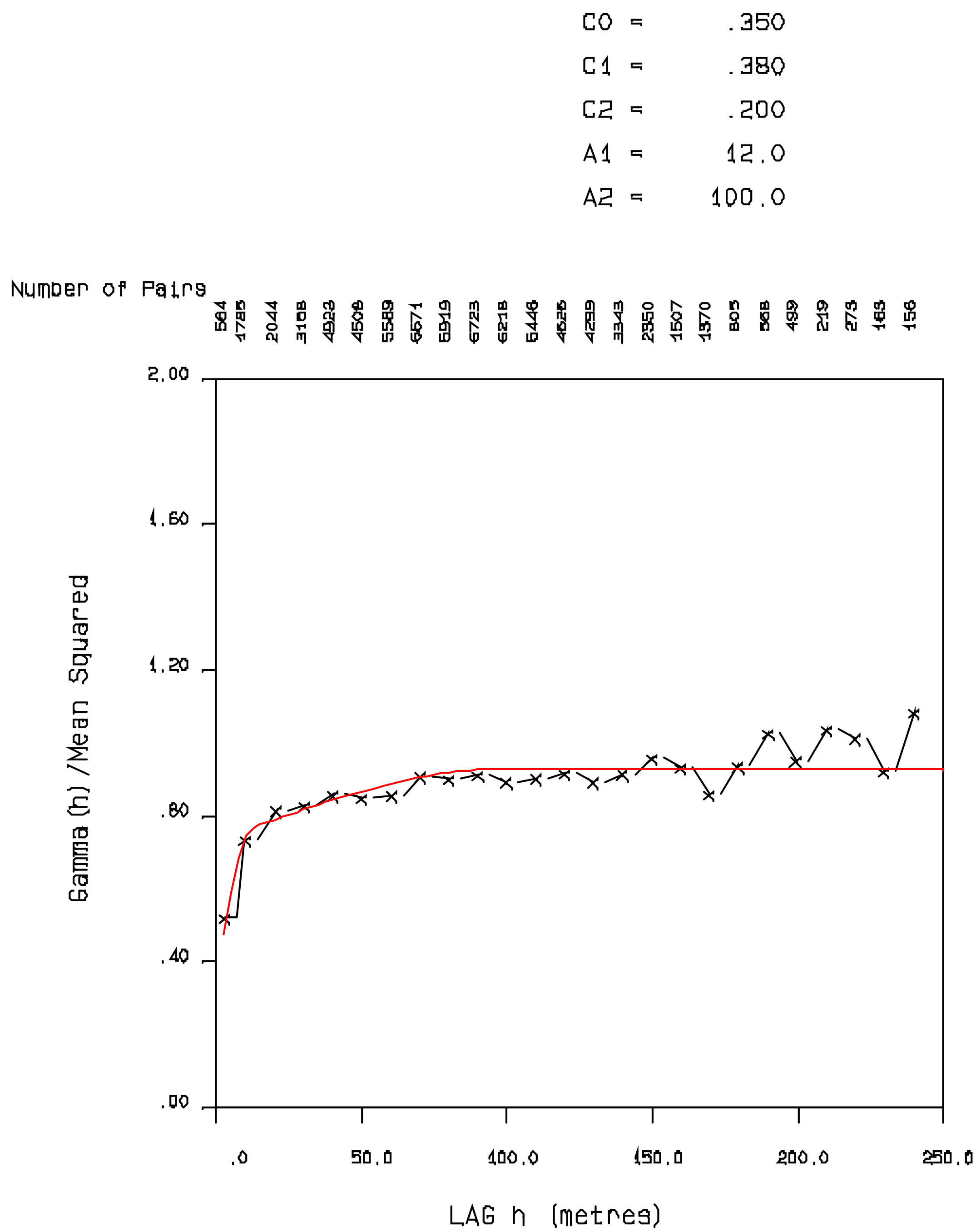


APEX Geoscience Ltd.

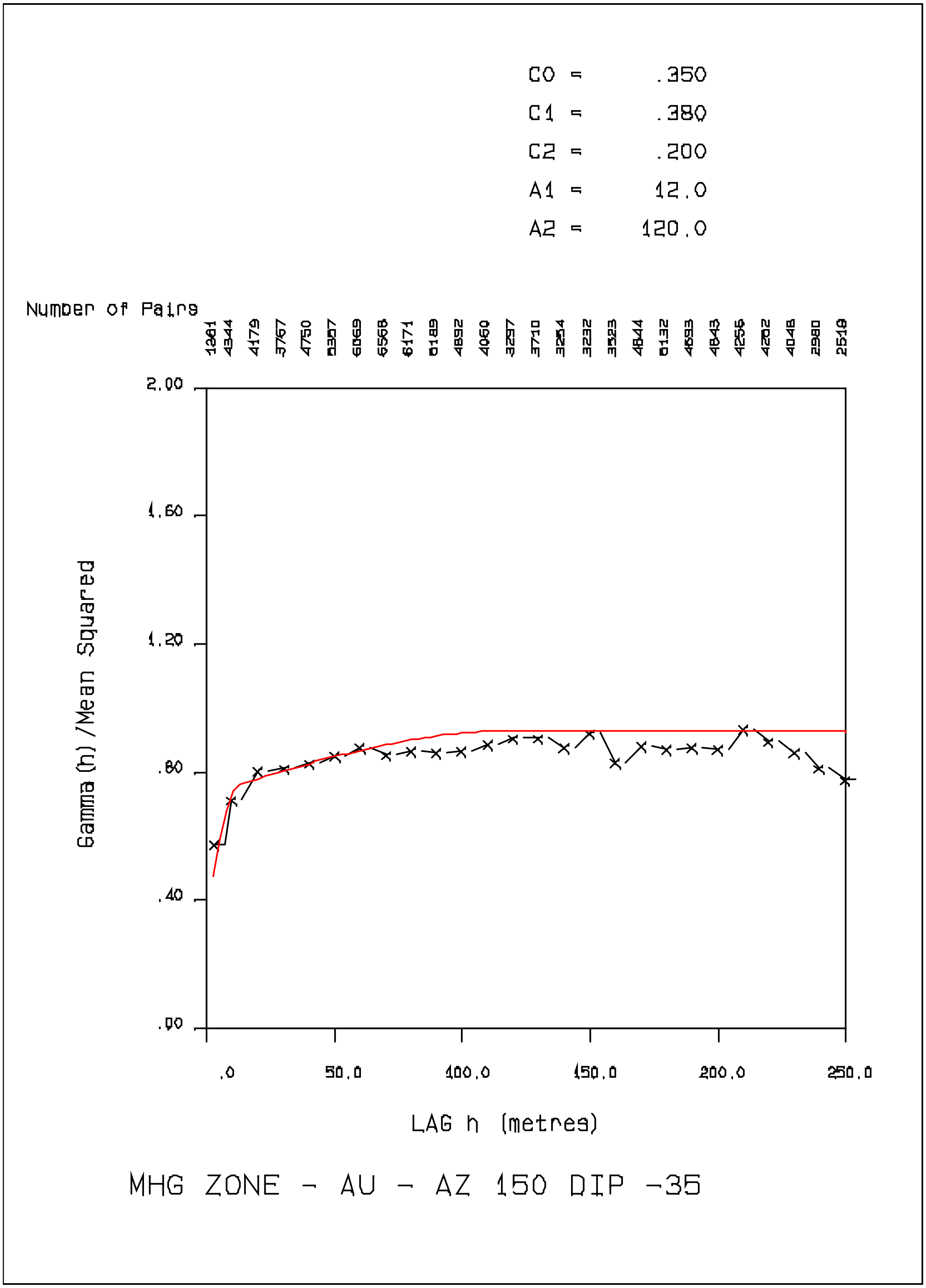


APEX Geoscience Ltd.

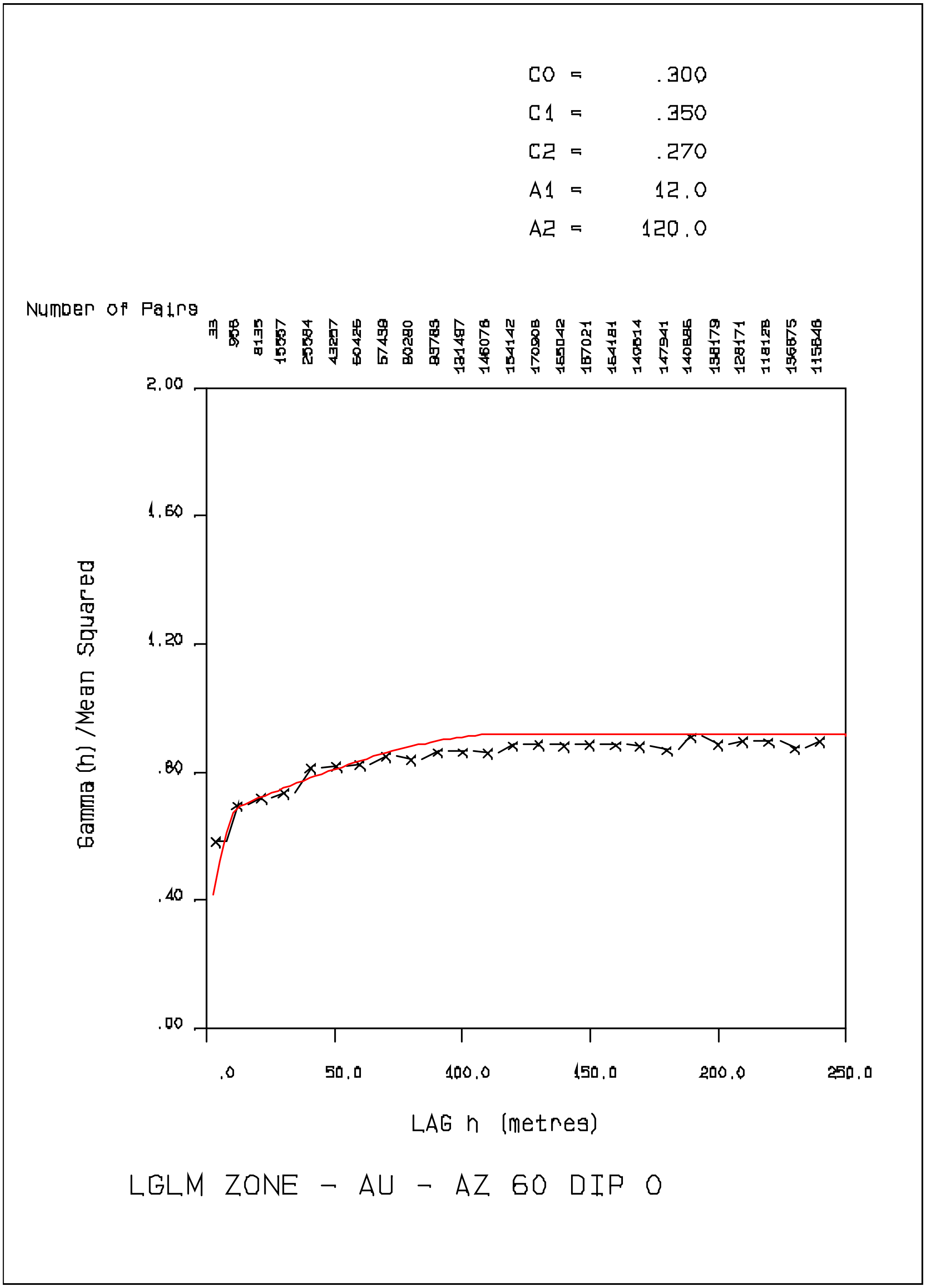

C0 = .350
C1 = .380
C2 = .200
A1 = 10.0
A2 = 120.0
Number of Pairs
Gamma (h) /Mean Squared
2.00
1.60
1.20
.80
.40
.00
.0
50.0
100.0
150.0
200.0
250.0
LAG h (metres)
MHG ZONE - AU - AZ 60 DIP 0

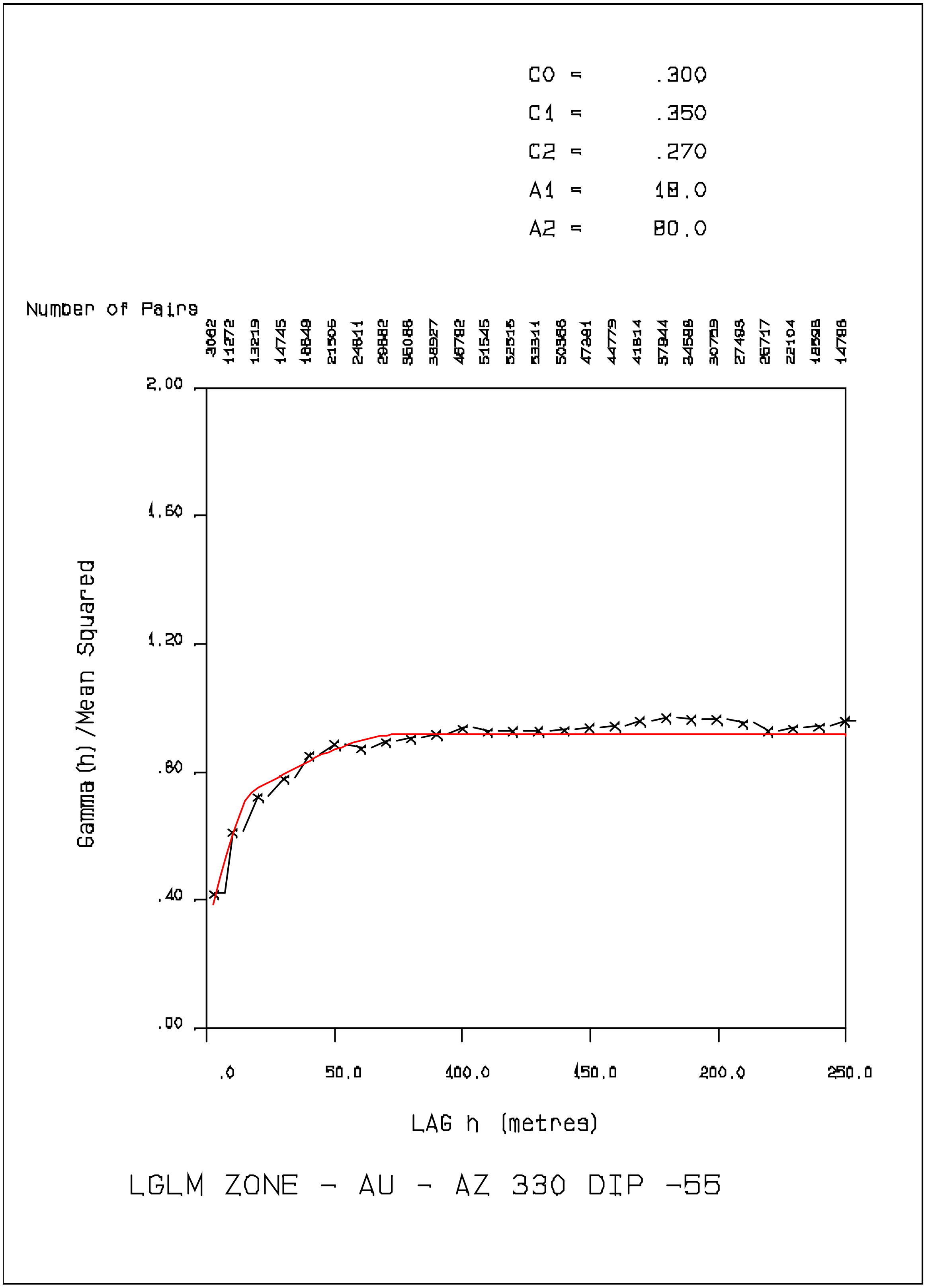


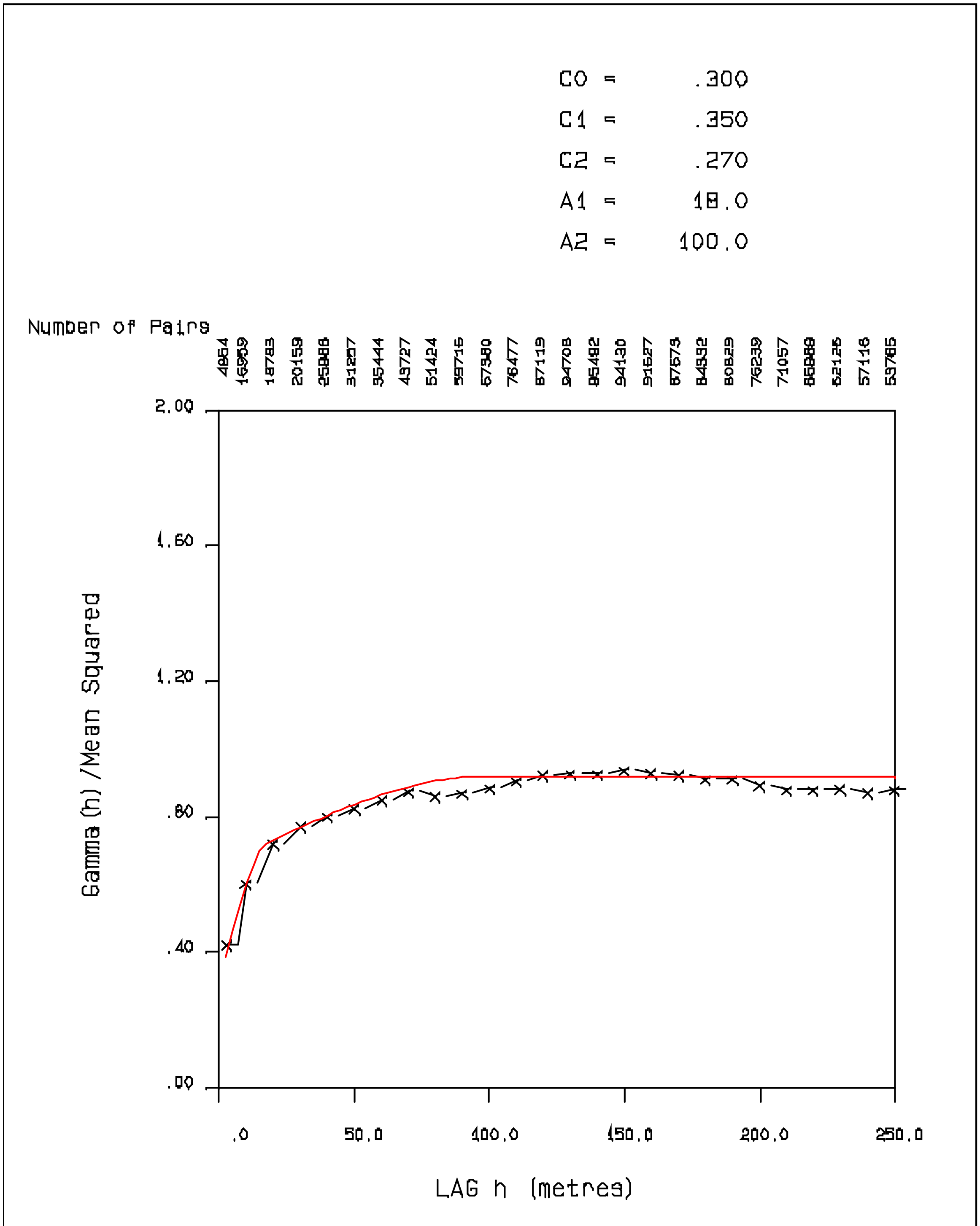
MHG ZONE - AU - AZ 330 DIP -55



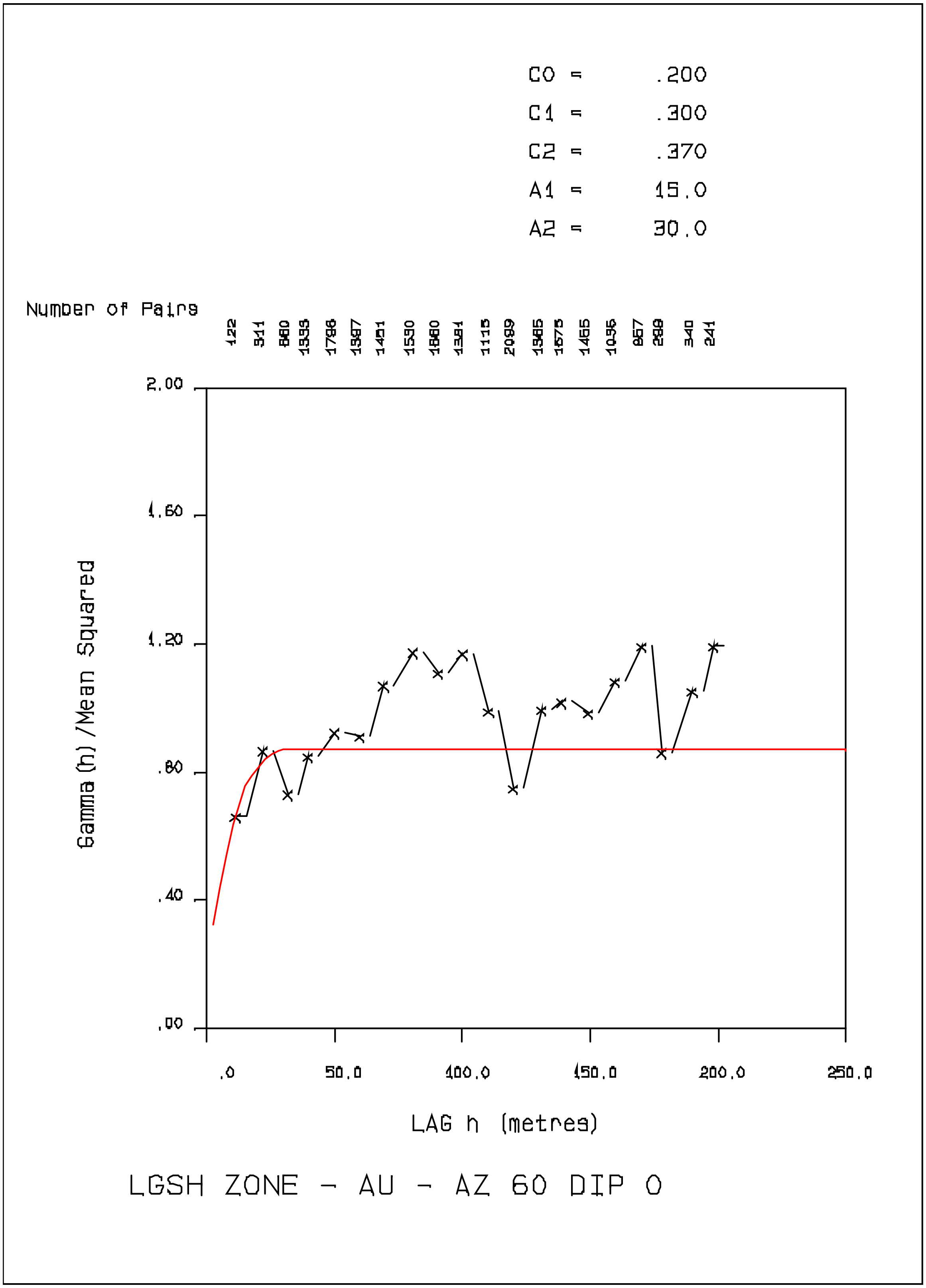
APEX Geoscience Ltd.


C0 = .300
C1 = .350
C2 = .270
A1 = 12.0
A2 = 120.0
Number of Pairs
33
958
8135
15557
25584
43257
50425
57438
80280
85783
131487
146078
154142
170908
165042
167021
164181
140514
147941
140885
158179
128171
118128
136875
115848
2.00
1.60
1.20
.80
.40
.00
Gamma (h) /Mean Squared
.0
50.0
100.0
150.0
200.0
250.0
LAG h (metres)
LGLM ZONE - AU - AZ 60 DIP 0

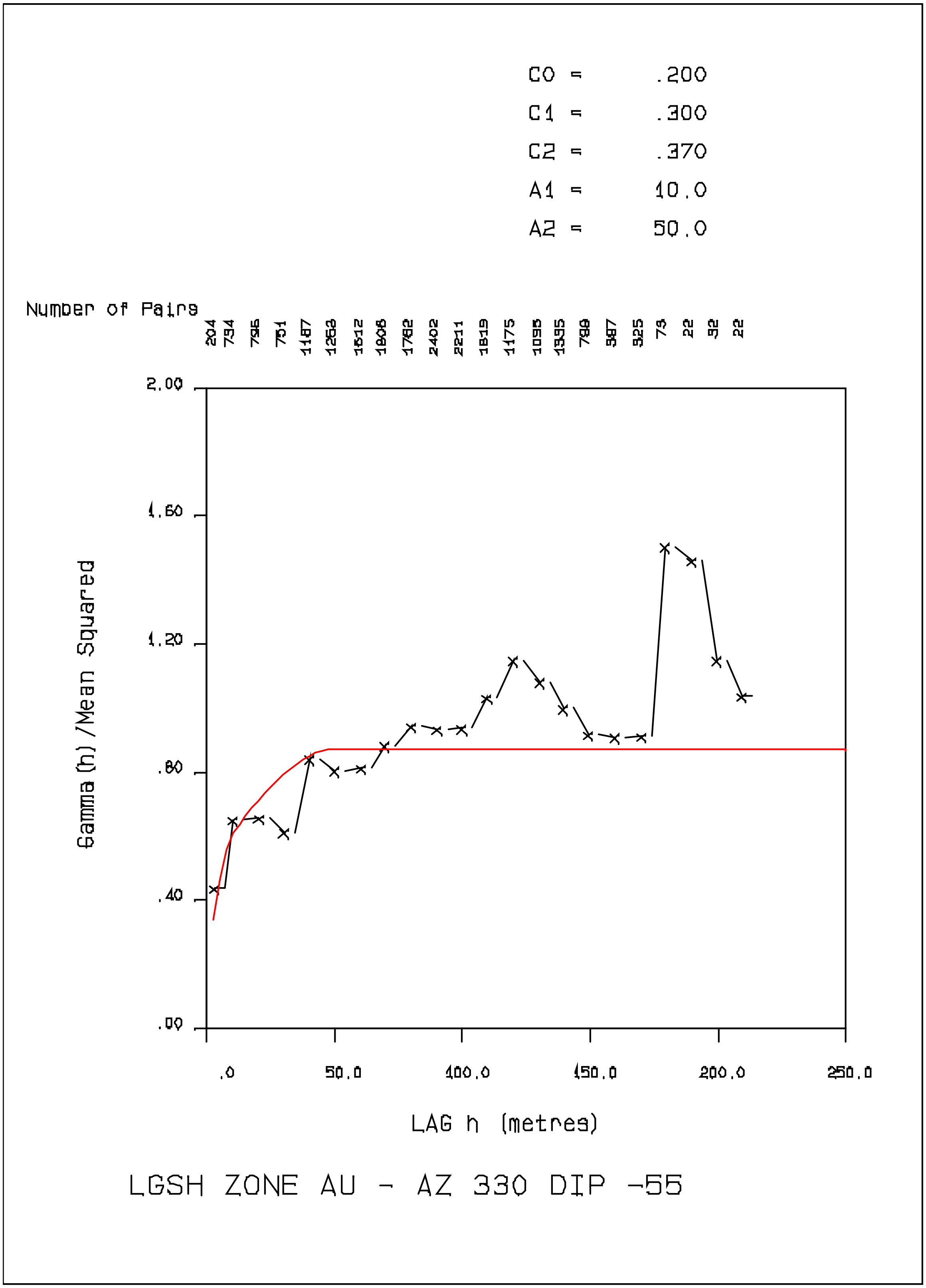

C0 = .300
C1 = .350
C2 = .270
A1 = 18.0
A2 = 80.0
Number of Pairs
2.00
1.60
1.20
.80
.40
.00
Gamma (h) /Mean Squared
.0
50.0
100.0
150.0
200.0
250.0
LAG h (metres)
LGLM ZONE - AU - AZ 330 DIP -55

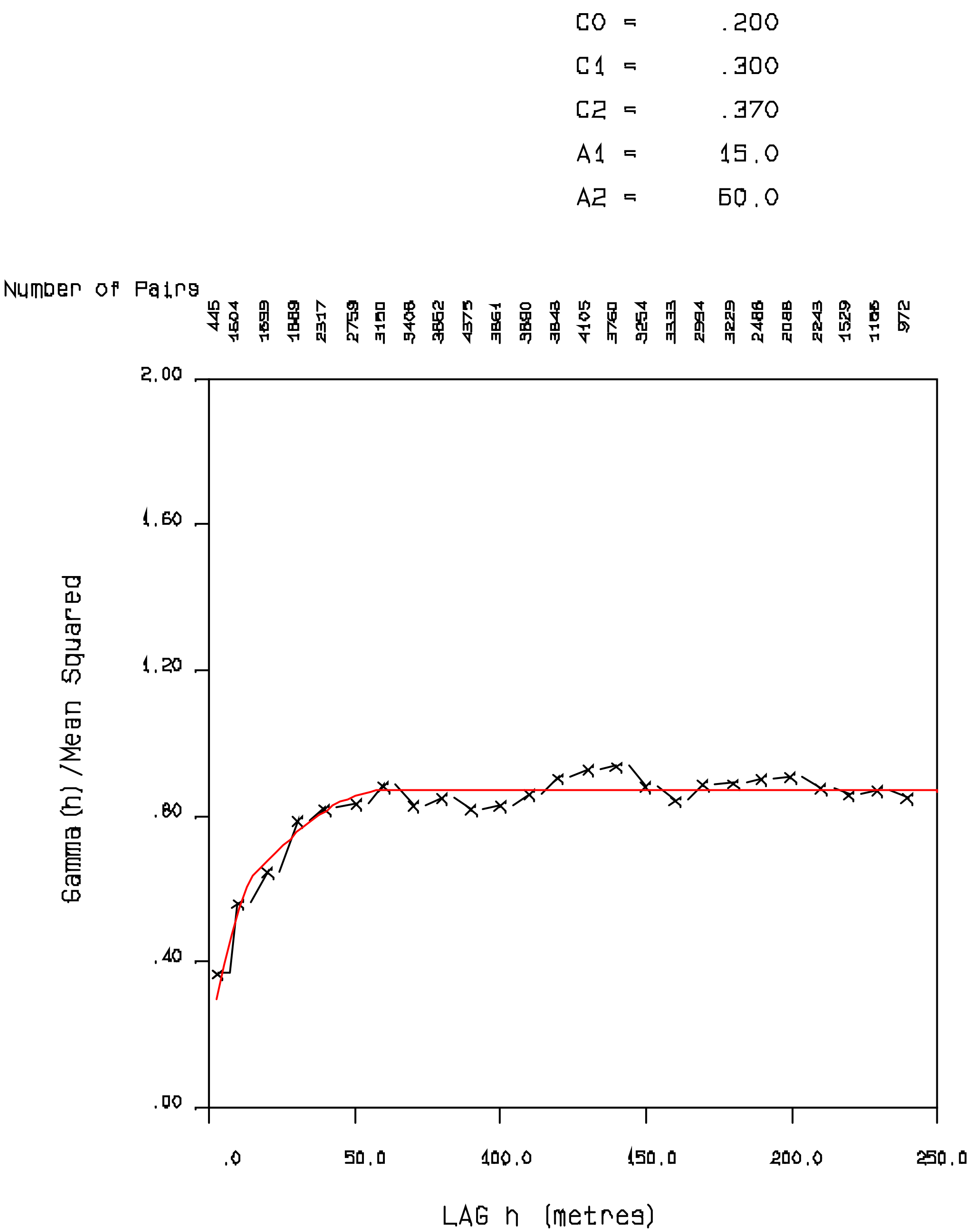


LGLM ZONE - AU - AZ 150 DIP -35

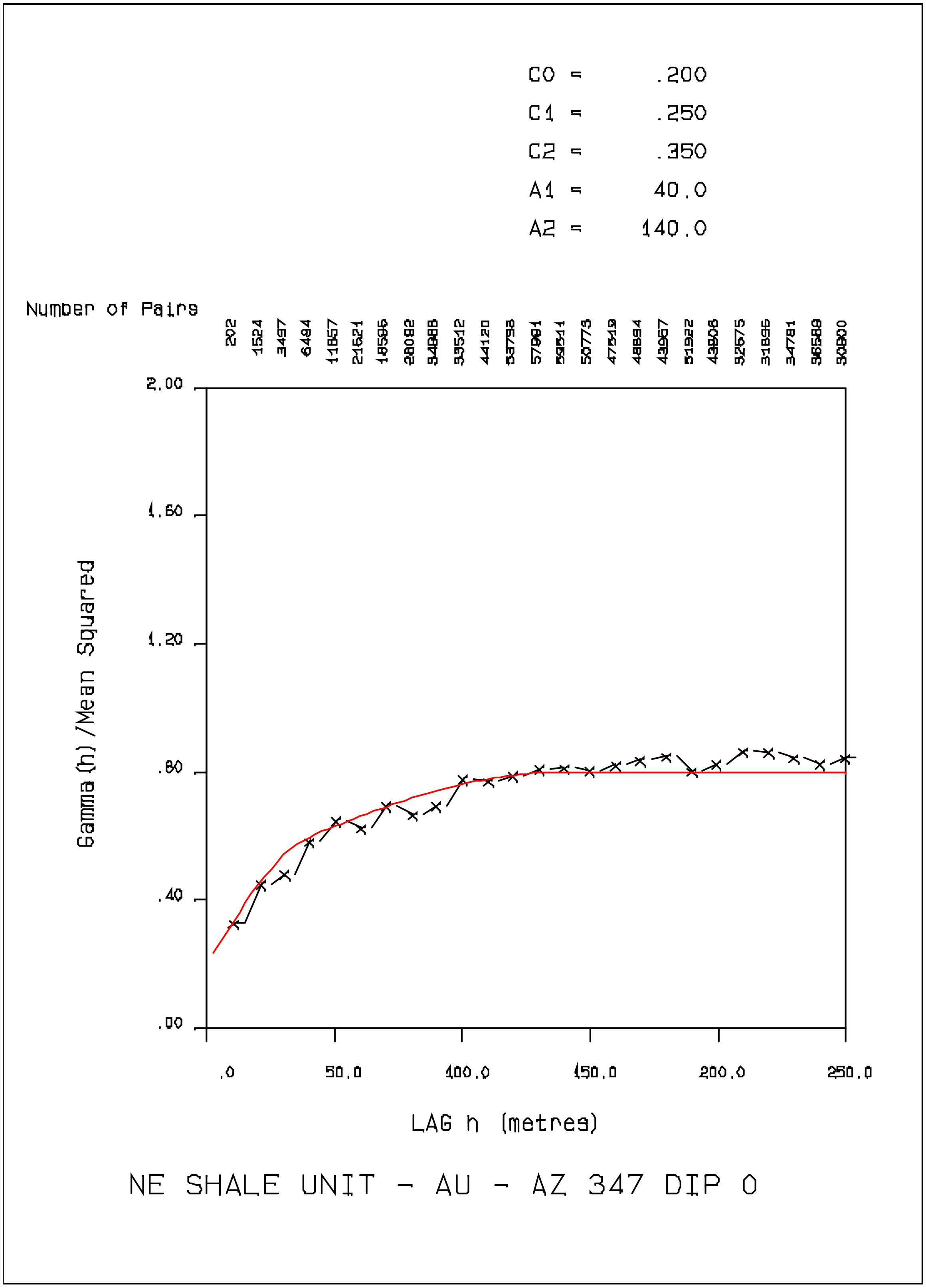


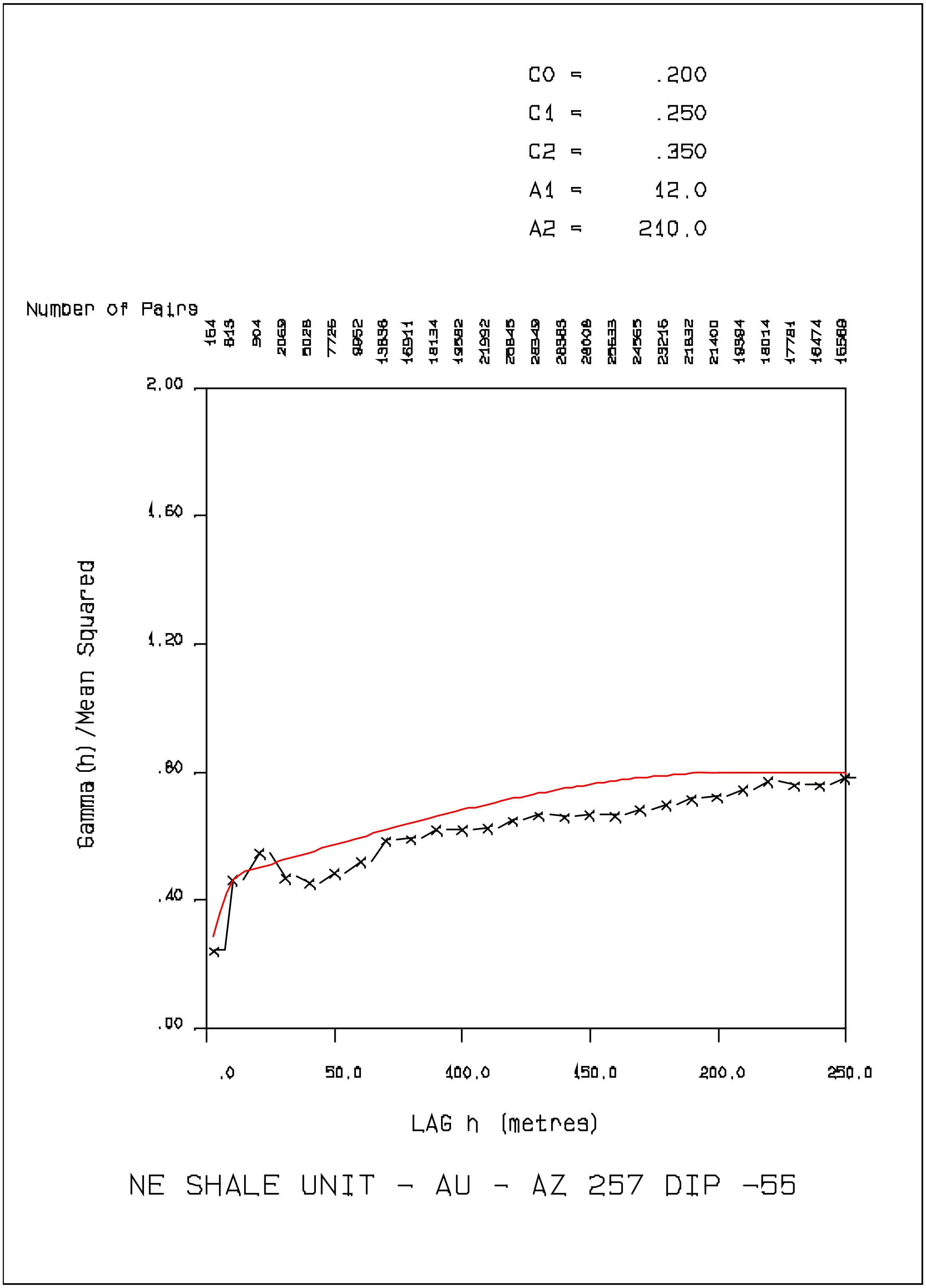
APEX Geoscience Ltd.

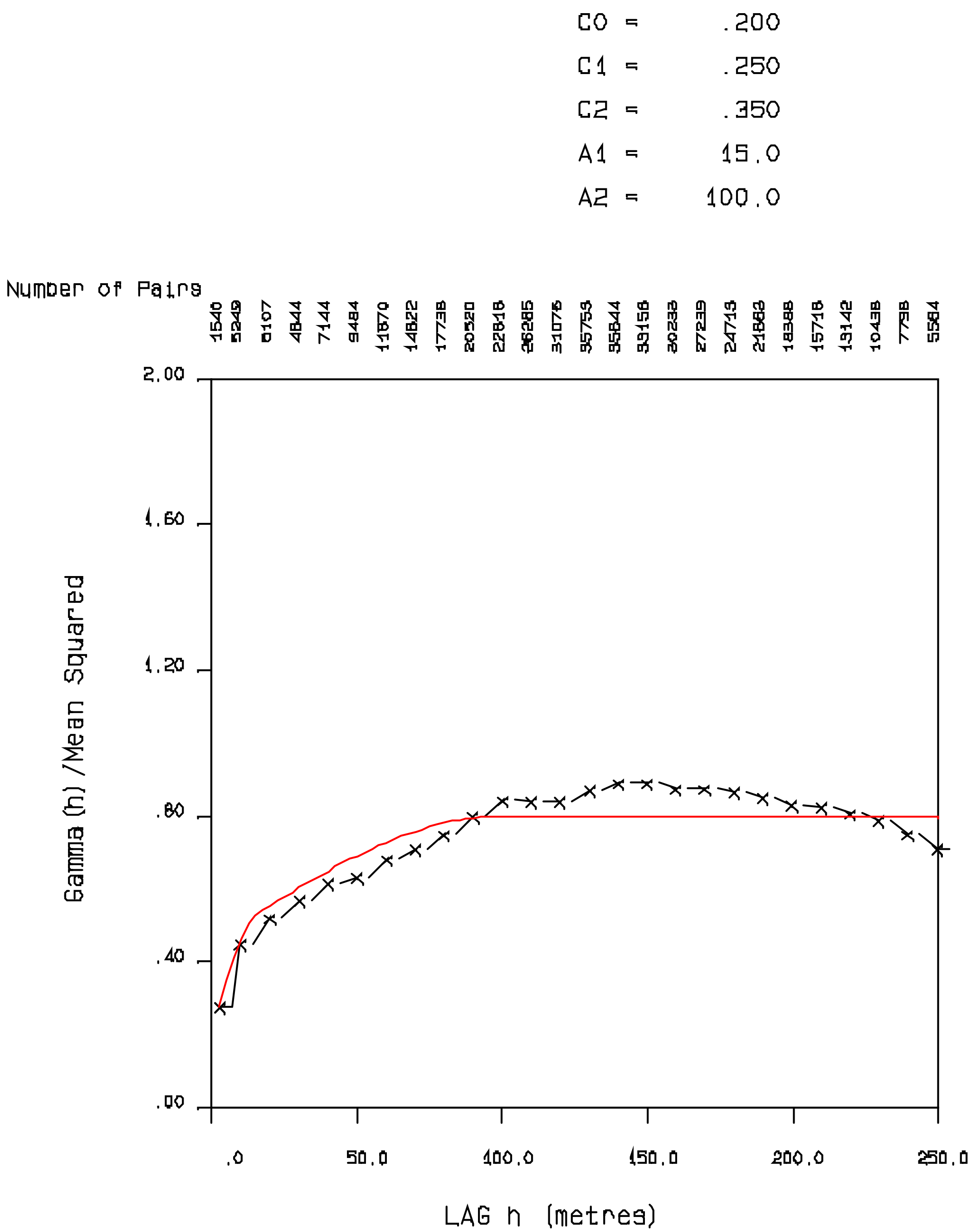

C0 = .200
C1 = .300
C2 = .370
A1 = 10.0
A2 = 50.0
Number of Pairs
204
734
796
751
1187
1263
1512
1808
1782
2402
2211
1819
1175
1095
1335
789
387
325
73
22
32
22
2.00
1.60
1.20
.80
.40
.00
Gamma (h) /Mean Squared
.0
50.0
100.0
150.0
200.0
250.0
LAG h (metres)
LGSH ZONE AU - AZ 330 DIP -55



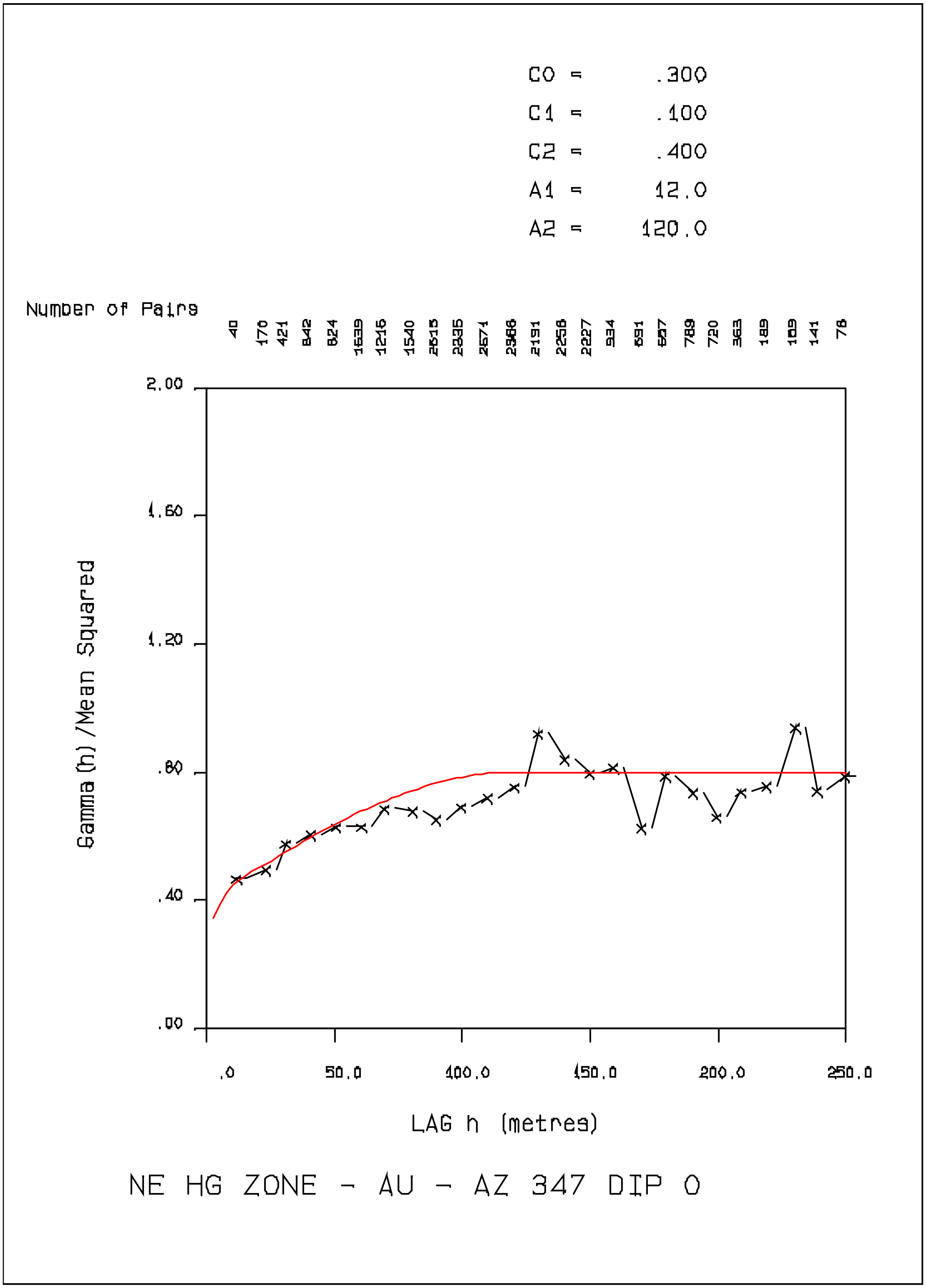
LGSH ZONE - AU - AZ 150 DIP -35

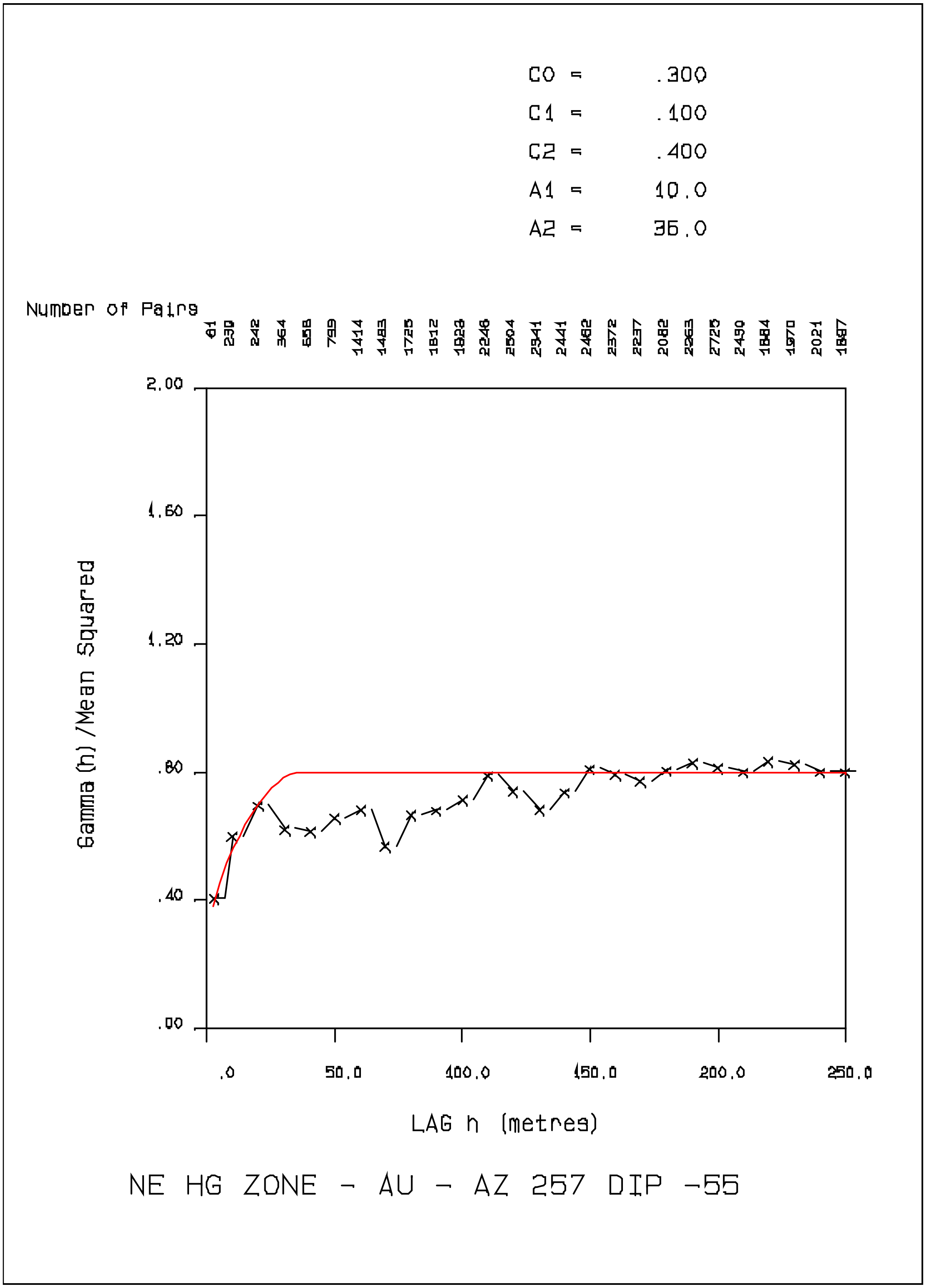

C0 = .200
C1 = .250
C2 = .350
A1 = 40.0
A2 = 140.0
Number of Pairs
202
1524
3497
11857
21621
44120
50773
48894
51922
32575
31896
34781
2.00
1.60
1.20
.80
.40
.00
Gamma (h) /Mean Squared
.0
50.0
100.0
150.0
200.0
250.0
LAG h (metres)
NE SHALE UNIT - AU - AZ 347 DIP 0


C0 = .200
C1 = .250
C2 = .350
A1 = 12.0
A2 = 210.0
Number of Pairs
Gamma (h) /Mean Squared
2.00
1.60
1.20
.80
.40
.00
.0
50.0
100.0
150.0
200.0
250.0
LAG h (metres)
NE SHALE UNIT - AU - AZ 257 DIP -55

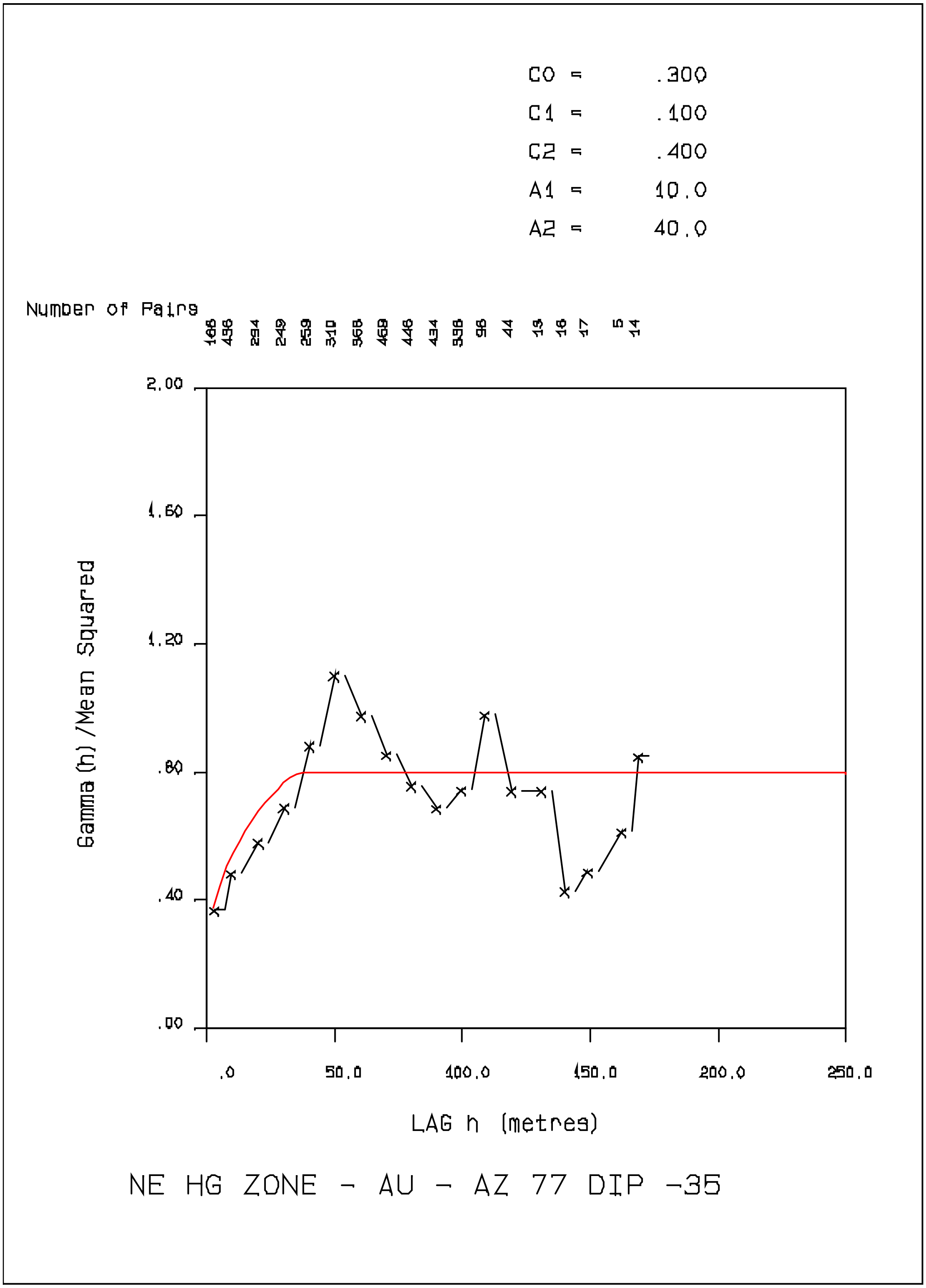


NE SHALE UNIT - AU - AZ 77 DIP -35

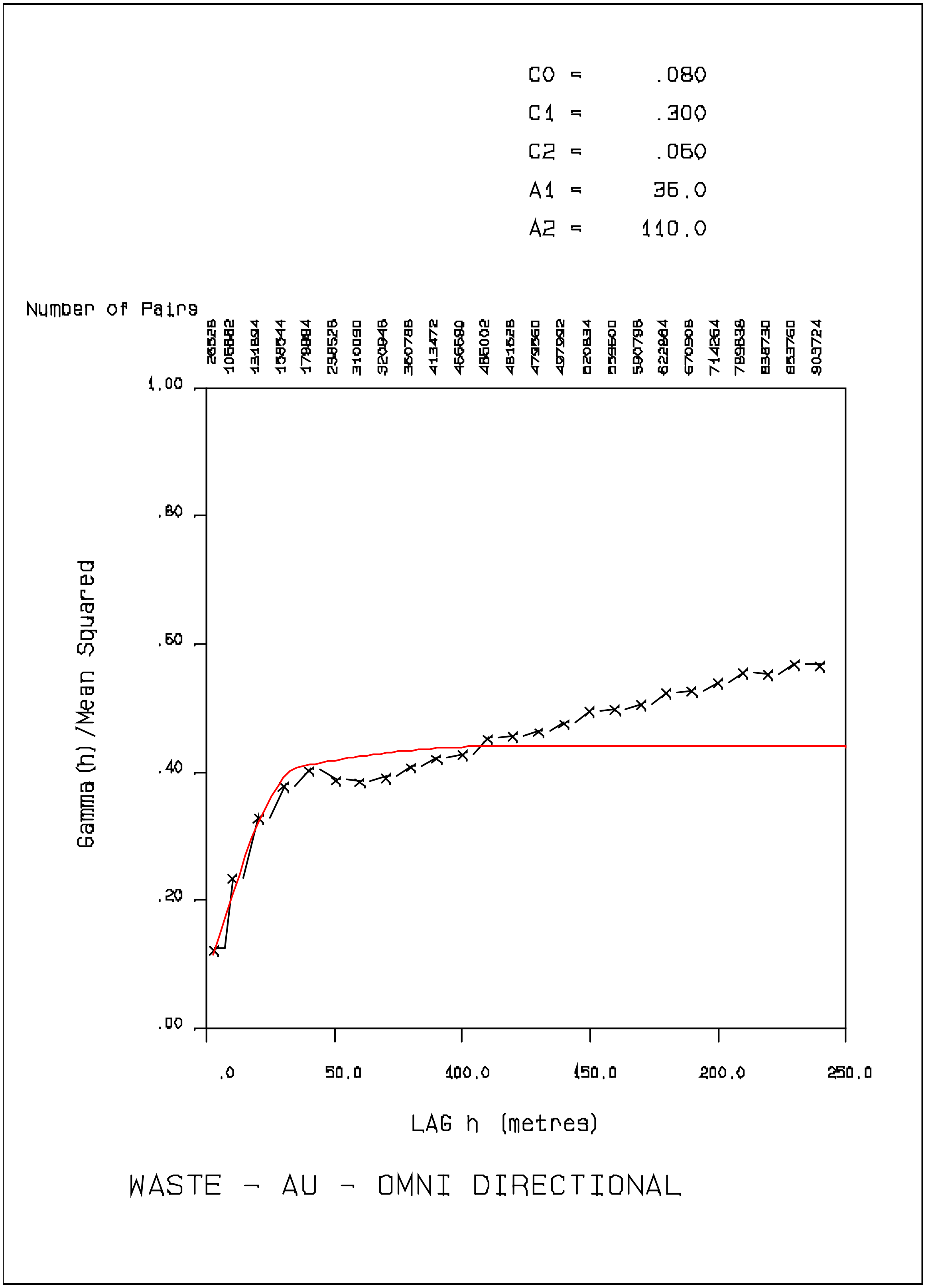

C0 = .300
C1 = .100
C2 = .400
A1 = 12.0
A2 = 120.0
Number of Pairs
40
170
421
842
824
1639
1216
1540
2615
2335
2671
2366
2191
2258
2227
934
691
627
789
720
363
189
169
141
76
2.00
1.60
1.20
.80
.40
.00
Gamma (h) /Mean Squared
.0
50.0
100.0
150.0
200.0
250.0
LAG h (metres)
NE HG ZONE - AU - AZ 347 DIP 0



APEX Geoscience Ltd.



C0 = .300
C1 = .100
C2 = .400
A1 = 10.0
A2 = 40.0
Number of Pairs
2.00
1.60
1.20
.80
.40
.00
Gamma (h) /Mean Squared
.0
50.0
100.0
150.0
200.0
250.0
LAG h (metres)
NE HG ZONE - AU - AZ 77 DIP -35


C0 = .080
C1 = .300
C2 = .060
A1 = 35.0
A2 = 110.0
Number of Pairs
Gamma (h) /Mean Squared
1.00
.80
.60
.40
.20
.00
.0
50.0
100.0
150.0
200.0
250.0
LAG h (metres)
WASTE - AU - OMNI DIRECTIONAL