NI 43-101 TECHNICAL REPORT AND PRELIMINARY ASSESSMENT ON THE COLUMBIA PROJECT
Lewis and Clark County, Montana

PREPARED FOR

ATNA RESOURCES LTD.

June 2, 2010

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TABLE OF CONTENTS

SECTION	TITLE	PAGE NO.
1.	**SUMMARY**	**1**
1.1	PROJECT HISTORY	1
1.2	MINERAL RESOURCES	1
1.3	GEOLOGY	2
1.4	METALLURGICAL TESTING	3
1.5	INFRASTRUCTURE AND POWER	3
1.6	MINE PLANNING	4
1.6.1	*Open Pit Mining*	*4*
1.7	PRODUCTION SCHEDULE	4
1.8	MINERAL PROCESSING	4
1.9	ENVIRONMENTAL CONSIDERATIONS	5
1.10	CAPITAL COST ESTIMATE	5
1.11	OPERATING COSTS	5
1.12	ECONOMIC EVALUATION	6
1.13	OPPORTUNITIES AND RECOMMENDATIONS	6
2.	**INTRODUCTION**	**9**
2.1	TERMS OF REFERENCE	9
2.2	EFFECTIVE DATE	9
2.3	PURPOSE AND BASIS OF REPORT	9
2.4	PERSONAL INSPECTION	10
2.5	UNITS	10
2.6	ACKNOWLEDGEMENTS	10
3.	**RELIANCE ON OTHER EXPERTS**	**11**
4.	**PROPERTY LOCATION AND DESCRIPTION**	**12**
4.1	LOCATION	12
4.2	OWNERSHIP	13
4.3	AGREEMENTS AND ROYALTIES	19
4.4	ENVIRONMENTAL LIABILITIES, PERMITS AND BONDING	20
5.	**ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY**	**22**
5.1	ACCESS	22
5.2	CLIMATE	24
5.3	LOCAL RESOURCES AND INFRASTRUCTURE	24
5.4	PHYSIOGRAPHY	24
6.	**HISTORY**	**25**
6.1	PROPERTY HISTORY	25
6.2	EXPLORATION HISTORY	25
6.3	RESOURCE HISTORY	26
7.	**GEOLOGICAL SETTING**	**28**
7.1	REGIONAL SETTING	28
7.2	LOCAL GEOLOGY AND STRUCTURE	30
7.2.1	*Lithology*	*32*
7.2.2	*Structure*	*32*
8.	**DEPOSIT TYPE**	**33**

8.1 OXIDATION 33
9. MINERALIZATION 34
9.1 COLUMBIA VEIN 35
9.2 ROVER VEIN 35
9.3 SEVEN UP AND DONNELY VEINS 36
9.4 NORTH COLUMBIA STRUCTURES 38
10. EXPLORATION 39
11. DRILLING 40
11.1 REVERSE CIRCULATION DRILLING AND LOGGING 40
11.2 CORE DRILLING AND LOGGING 40
12. SAMPLING METHOD AND APPROACH 41
12.1 SUMMARY 41
12.2 REVERSE CIRCULATION SAMPLING 41
12.3 CORE SAMPLING 41
13. SAMPLE PREPARATION, ANALYSES, AND SECURITY 42
13.1 SUMMARY 42
13.2 SAMPLE SECURITY 42
13.3 DRILL SAMPLE PREPARATION AND ANALYSIS 43
13.3.1 Western Energy and Addwest Sample Procedures 43
13.3.2 Phelps Dodge Sample Procedures 45
13.4 ANALYTICAL QUALITY CONTROL 46
14. DATA VERIFICATION 47
14.1 VERIFICATION OF THE QUALITY CONTROL PROGRAM 47
15. ADJACENT PROPERTIES 50
15.1 ADJACENT PROPERTIES 50
16. MINERAL PROCESSING AND METALLURGICAL TESTING 51
16.1 GRAVITY TEST WORK 51
16.2 FLOTATION TEST WORK 51
16.3 MINERAL PROCESSING 52
17. MINERAL RESOURCE ESTIMATES 53
17.1 INTRODUCTION 53
17.2 DATABASE FOR RESOURCE ESTIMATION 53
17.2.1 Assay Database 55
17.3 MODELING 55
17.3.1 Lithology Modeling 55
17.3.2 Mineral Domains / Grade Shells 55
17.3.3 Compositing 56
17.3.4 Statistical Analysis 56
17.3.5 Variography 58
17.3.6 Silver 60
17.4 BLOCK MODEL 60
17.4.1 Block Model Parameters 60
17.4.2 Topography 60
17.4.3 Acid Rock Drainage Classification 60
17.4.4 Metallurgical Recovery Model 61
17.4.5 Structures 61
17.4.6 Grade Model 61

17.4.6.1 Estimation Plan 61
17.4.7 Bulk Density *62*
17.5 MODEL CHECKS 63
17.5.1 Visual Inspection of Models *63*
17.6 RESOURCE CLASSIFICATION AND SEARCH 65
17.7 MINERAL RESOURCE STATEMENT 65
17.8 CUTOFF GRADE ANALYSIS 66

18. OTHER RELEVANT DATA AND INFORMATION 67

18.1 SUMMARY OF PHELPS DODGE MINING COMPANY 1991 FEASIBILITY STUDY 67

19. ADDITIONAL REQUIREMENTS FOR DEVELOPMENT PROPERTIES AND PRODUCTION PROPERTIES 68

19.1 PIT DESIGN AND POTENTIALLY MINEABLE RESOURCE 68
19.1.1 Open Pit Design *74*
19.1.2 Open Pit Sequencing *77*
19.1.3 Production Schedule *77*
19.2 PROCESSING 82
19.3 CAPITAL AND OPERATING COST ESTIMATES 83
19.3.1 Capital Cost *83*
19.3.2 Operating Cost *84*
19.4 ECONOMIC ANALYSIS 85
19.4.1 Base Case *85*
19.4.2 ATS Concentrate Leach Alternative *88*

20. INTERPRETATION AND CONCLUSIONS 90

21. RECOMMENDATIONS 91

22. REFERENCES/BIBLIOGRAPHY 92

23. DATE AND SIGNATURE PAGES 94

24. CONSENTS OF AUTHORS 100

25. APPENDICES 104

LIST OF FIGURES

FIGURE **PAGE**

FIGURE 1-1 COLUMBIA PROJECT AREA 8
FIGURE 4-1 COLUMBIA PROJECT LOCATION MAP 12
FIGURE 4-2 COLUMBIA MINING CLAIM MAP....18
FIGURE 5-1 COLUMBIA PROJECT ACCESS 22
FIGURE 5-2 COLUMBIA PROJECT AREA 23
FIGURE 7-1 REGIONAL GEOLOGY MAP....29
FIGURE 7-2 COLUMBIA PROPERTY GEOLOGY....31
FIGURE 9-1 CROSS SECTION SHOWING ROVER AND IBEX VEINS 36
FIGURE 9-2 CROSS SECTION SHOWING COLUMBIA AND DONNELY VEINS....37
FIGURE 9-3 CROSS SECTION SHOWING SEVEN-UP VEIN....38
FIGURE 13-1 SAMPLE PREPARATION & ANALYTICAL PROTOCOL WESTERN ENERGY CO. AND ADDWEST GOLD, INC..44
FIGURE 13-2 PHELPS DODGE SAMPLE PREPARATION AND ANALYTICAL PROTOCOL 45
FIGURE 13-3 MODIFIED PHELPS DODGE SAMPLE PREPARATION AND ANALYTICAL PROTOCOL 46
FIGURE 14-1 CHECK FIRE ASSAY COMPARISON....48
FIGURE 14-2 SCREEN FIRE ASSAY COMPARISON....49
FIGURE 17-1 COLUMBIA DRILLING 54
FIGURE 17-2 CUMULATIVE PROBABILITY PLOTS FOR COLUMBIA AND DONNELY 57
FIGURE 17-3 COLUMBIA MAIN ZONE AVERAGE GOLD VARIOGRAM 59
FIGURE 17-4 BLOCK MODEL CROSS-SECTION COLUMBIA-DONNELY AREA 64
FIGURE 17-5 BLOCK MODEL CROSS-SECTION COLUMBIA-DONNELY-COLUMBIA NE 64
FIGURE 17-6 CROSS SECTION OF RESOURCE CLASSIFICATION 65
FIGURE 19-1 PROJECTED PIT LIMIT FOR MI RESOURCES AT $810....71
FIGURE 19-2 PROJECTED PIT LIMIT FOR MI+I RESOURCES AT $810 72
FIGURE 19-3 PIT SHELL SENSITIVITY MEASURED, INDICATED AND INFERRED RESOURCE....73
FIGURE 19-4 FINAL PIT LIMIT 75
FIGURE 19-5 PIT DEVELOPMENT PHASE I....78
FIGURE 19-6 PIT DEVELOPMENT PHASE II 79
FIGURE 19-7 PIT DEVELOPMENT PHASE III 80
FIGURE 19-8 PIT DEVELOPMENT PHASE III WEST, IV & V 81
FIGURE 19-9 COLUMBIA PROCESSING BLOCK FLOW DIAGRAM 82
FIGURE 19-10 COLUMBIA ATS CONCEPTUAL FLOW SHEET....89

LIST OF TABLES

TABLE **PAGE**

TABLE 1-1 ESTIMATED MINERAL RESOURCE 2
TABLE 1-2 PIT LIMIT ANALYSIS COSTS 4
TABLE 1-3 CAPITAL COST ESTIMATE 5
TABLE 1-4 MINING OPERATING COSTS 6
TABLE 1-5 PROCESSING OPERATING COSTS 6
TABLE 4-1 PATENTED CLAIM OWNERSHIP 13
TABLE 4-2 UNPATENTED FEDERAL MINING CLAIMS 14
TABLE 4-3 MINERAL PRODUCTION ROYALTIES 19
TABLE 6-1 1991 PRELIMINARY FEASIBILITY STUDY - HISTORIC RESOURCE ESTIMATE 26
TABLE 6-2 1992 HISTORIC RESOURCE ESTIMATE - 0.02 OPT AU CUTOFF 27
TABLE 10-1 COLUMBIA PROJECT EXPLORATION SUMMARY 39
TABLE 10-2 COLUMBIA PROJECT EXPLORATION SUMMARY BY COMPANY 39
TABLE 14-1 COLUMBIA PROJECT GOLD ASSAY TOTALS 47
TABLE 16-1 METALLURGICAL RECOVERY OF GOLD AND SILVER IN COLUMBIA ORE 52
TABLE 17-1 COLUMBIA PROJECT SUMMARY GOLD COMPOSITE STATISTICS 56
TABLE 17-2 COLUMBIA PROJECT SUMMARY SILVER COMPOSITE STATISTICS 57
TABLE 17-3 PRINCIPAL MINERALIZED ZONE VARIOGRAM MODELS 59
TABLE 17-4 BLOCK MODEL DEFINITION 60
TABLE 17-5 COLUMBIA PROJECT ESTIMATION PARAMETERS 62
TABLE 17-6 ROCK DENSITY BY ALTERATION 63
TABLE 17-7 ESTIMATED MINERAL RESOURCE 66
TABLE 19-1 PIT LIMIT ANALYSIS COSTS 68
TABLE 19-2 MAXIMUM VALUE PIT LIMIT SUMMARY* 69
TABLE 19-3 MINABLE RESOURCE SUMMARY 76
TABLE 19-4 MINE PRODUCTION SUMMARY 77
TABLE 19-5 MINING EQUIPMENT CAPITAL COST 83
TABLE 19-6 PROCESSING CAPITAL COSTS 83
TABLE 19-7 MINING OPERATING COSTS 84
TABLE 19-8 PROCESSING OPERATING COSTS 85
TABLE 19-9 COST CONTINGENCY ALLOWANCES 86
TABLE 19-10 COLUMBIA PROJECT PRELIMINARY ASSESSMENT BASE CASE ECONOMIC MODEL 87
TABLE 19-11 ATS ECONOMIC INPUT AND RESULTS 88

LIST OF APPENDICES

A – DRILL HOLE LIST
B – COMPOSITE STATISTICS BY ZONE
C – VARIOGRAPHY FOR PRINCIPAL ZONES
D – BLOCK MODEL CROSS SECTIONS
E – MINE PRODUCTION SCHEDULE

1. SUMMARY

Gustavson Associates, LLC (Gustavson) was commissioned by Atna Resources Ltd. to prepare a Canadian National Instrument 43-101 (NI 43-101) compliant Independent Technical Report and Preliminary Assessment for the Columbia Project in Lewis and Clark County, Montana, USA.

1.1 Project History

The Columbia site has been the focus of several exploration efforts in recent years. AMAX drilled a single deep core hole near the historic Last Chance adit in the 1970's looking for a Climax-type molybdenum deposit with negative results. In 1983-84, the Anaconda Company examined the property as part of a district-wide mapping and sampling program in the Stemple Pass and Swede Gulch areas. In 1985, the Amazon Mining Company purchased Anaconda's interest in some of the patented mining claims and initiated a limited trenching and core drilling program on the Columbia and Last Chance veins. Western Energy Company (WECo) optioned Amazon's interest in the property in 1987 and initiated a program consisting of exploration drilling, mapping, and sampling. WECo also consolidated the land position by acquiring exploration leases for most of the remaining patented mining claims. WECo's program was successful in discovering a significant gold resource at Columbia, which led to scoping studies, metallurgical test work, and feasibility studies. In 1989, Addwest Gold, Inc. entered into a purchase option with WECo for the Columbia property. Addwest initiated additional reverse circulation drilling and trenching on the property, expanding the resource.

In 1989, Phelps Dodge Mining Company entered a purchase option with Addwest for 50 percent of the project and became the operator of the Seven Up Pete Joint Venture ("SPJV"). Canyon Resources purchased Addwest's interest in 1990 and became a non-operating partner in the SPJV. Based upon encouraging results from continuing reverse circulation drilling and engineering studies, the SPJV exercised the option to purchase the property from WECo. Later in 1990, Canyon's interest in the property was diminished to 27.6 percent due to disproportionate funding of the SPJV by Phelps Dodge which retained 72.4 percent. CR Montana Corporation, a wholly owned subsidiary of Canyon Resources Corporation and now Atna (Canyon Resources merged with Atna Resources in 2008), purchased Phelps Dodge's interest in 1997. In 2009 the entire property was brought under Atna's ownership, at which time the SPJV was dissolved.

1.2 Mineral Resources

In 1991, Phelps Dodge Mining Company and Independent Mining Consultants, Inc. (IMC) conducted further geostatistical analyses of the Columbia property forming the basis for a Preliminary Level Feasibility Study. Based upon this internal study, Phelps Dodge indentified a non-NI 43-101 compliant resource estimate, using a nearest neighbor computer generated model, of 13.9 million tons with an average grade of 0.061 ounce per ton gold (opt Au) at a cut off of 0.020 opt Au.

A total of 312 historical reverse circulation holes plus 24 core holes are included in this new NI 43-101 compliant study of the Columbia Project's mineral resources. The drilling footage totals 139,065 feet and 7,809 feet, respectively. The central portion of the deposit encompasses most of the Columbia Flat area and has been drilled on a 50-by-100 foot pattern along the strike of mineralization. Drilling on the northern and southern portions of the deposit has been completed on approximately a 200-by-200 foot pattern along the strike of mineralization and 200-by-400 foot pattern in areas peripheral to the core zone of mineralization. Gustavson has estimated a resource of over 970,000 ounces in the measured and indicated categories at a 0.010 opt Au cutoff grade. Additionally, over 600,000 ounces are estimated within the inferred category. Table 1-1 summarizes Gustavson's Columbia Project Resource at several cutoff grades:

Table 1-1 Estimated Mineral Resource

Classification	Cutoff Grade (Au opt)	tons	Au grade (opt)	oz Au	Ag grade (opt)	oz Ag
Measured	0.01	10,438,629	0.0313	326,720	0.1162	1,213,350
Indicated		22,400,641	0.0288	644,555	0.0926	2,074,115
M+I		32,839,270	0.0296	971,275	0.1001	3,287,465
Inferred		22,971,429	0.0273	627,887	0.0827	1,898,632
Measured	0.02	5,370,167	0.0474	254,446	0.1548	831,099
Indicated		11,294,459	0.0431	487,227	0.1155	1,304,384
M+I		16,664,626	0.0445	741,673	0.1281	2,135,483
Inferred		10,705,234	0.0424	453,571	0.0968	1,035,787
Measured	0.05	1,442,964	0.0934	134,748	0.2492	359,544
Indicated		2,488,828	0.0888	220,983	0.1751	435,878
M+I		3,931,793	0.0905	355,730	0.2023	795,422
Inferred		2,235,930	0.0856	191,443	0.1171	261,737

Note: Estimation method for the summary in Table 1-1 is inverse distance to the 2.5 power. Numbers in the table may not precisely total due to rounding errors

1.3 Geology

The Columbia deposit is hosted within a series of middle Tertiary volcanic and hypabyssal rocks variously known as the Lincoln Volcanic Field or the Crater Mountain Volcanics. The volcanic rocks consist mainly of felsic to intermediate flows, flow breccias, welded ash flows, and ash-flow tuffs that reach a maximum thickness of approximately 1,500 feet. The volcanic rocks unconformably overlie a thick sequence of middle Proterozoic marine sedimentary rocks known as the Belt Supergroup. The sedimentary and volcanic rocks have been intruded by pre- and post-volcanic intrusives of gabbroic to granodioritic composition. A veneer of Quaternary glacial deposits has covered much of the sequence on the lower hills and valleys.

The regional geologic structure in the Columbia area is complex and poorly understood. At least four episodes of deformation are evident in the area: 1) gentle regional Precambrian tilting; 2) Laramide folding and faulting; 3) late Cretaceous folding and faulting associated with intrusion of granitic stocks related to the Boulder Batholith; and 4) faulting related to Eocene/Oligocene

volcanism. The dominant features are a series of west and northwest-striking faults and broad, open folds related to the Lewis and Clark line, a major structural lineament that traverses northern Idaho and west-central Montana.

The geologic setting of the Columbia deposit is typical of structurally controlled volcanic-hosted, epithermal, quartz-sericite-adularia vein systems. Districts hosting these gold silver deposit types typically have strike lengths on the order of two to three miles and individual veins are typically mineralized over vertical extents of 500 to 1,000 feet. These systems may be zoned vertically with precious metals occurring in the nearer surface environment with increasing base metals at depth. Geochemically, the Columbia precious metals system has a normal suite of trace elements including elevated mercury, antimony, and arsenic and low concentration base metals.

Gold and silver mineralization is associated with quartz, quartz-chalcedony, or quartz-adularia veining, silica flooded breccias and pyrite. Silicification and silica veining is concentrated along the main structures, cross faults, as stockworks adjacent to the main structures, and in flooded breccias zones. Columbia appears to be the lower-most portion of an epithermal vein system and may represent a root zone to a partially eroded system similar to the much larger, McDonald Hot spring gold deposit located a few miles to the north of Columbia.

1.4 Metallurgical Testing

In 2006, Resource Development Inc. (Lakewood, Colorado), was commissioned to conduct a series of gravity and flotation tests on a bulk metallurgical sample obtained from a trench excavated on the Columbia Vein. The results of these tests indicated that gravity concentration recovered up to 54 percent of the gold and 15 percent of the silver in the bulk sample. Flotation of the gravity tailing increased gold recovery to 96 percent, while silver recovery increased to 77 percent. Recovery utilizing flotation, without gravity concentration, resulted in gold and silver recoveries of 92 percent and 70 percent, respectively. These results, combined with previous scoping-level tests, indicate that flotation, possibly combined with gravity, are potentially viable recovery processes for Columbia material. Further test work will be required to optimize these recovery concepts for the various types of mineralization.

1.5 Infrastructure and Power

The nearest population center to the Columbia Project is the small-unincorporated town of Lincoln, which lies approximately eight miles west. Lincoln has limited medical, fire protection, and law enforcement services, which are supplemented as required by Lewis and Clark County services based in Helena. An existing 24.9 kV power line services several homes in the Hogum Creek area. This line would have to be upgraded from the existing Landers Fork substation, and extended approximately three miles to serve the Columbia Project. Water for the Project would be provided via wells under existing water rights owned by Atna.

1.6 Mine Planning

1.6.1 Open Pit Mining

An economic pit limit was developed using costs provided by Atna and developed by Gustavson. Gold and silver prices were based on historic prices.

Table 1-2 Pit Limit Analysis Costs

Operating Parameters	Value	Units
Mining cost **	$ 1.26	$/ton rock
Milling cost	$ 6.70	$/ton ore
Conc. transport @ 5:1 ratio Est ~200mi@0.14/t.mi	$ 6.00	$/ton ore
Tailings	$ 0.30	$/ton ore
General & Administration	$ 1.30	$/ton ore
Gold Price *	$ 850.00	$/troy oz Au
Silver Price	$ 13.50	$/troy oz Ag
Deducts on Gold		
Treatment Charges and Refining Charges	$ 62.00	$/oz Au
Royalty		
% Payable by Refiner	98%	
Gold Recovery	92%	
Silver Recovery	70%	

**** Estimated costs provided by Atna**

*** Gold price is 3 year trailing average as of February 2010. The silver price is based on the historic gold to silver ratio of 60:1.**

A preliminary design based on this analysis includes 14.89 million tons of ore with an average grade of 0.047opt Au and 0.145opt Ag. The pit includes 42.58 million tons of waste giving a stripping ratio of 2.93.

1.7 Production Schedule

The pit was sequenced from north to south with the objective of back filling waste into the north end of the pit during the latter part of the mine life, reducing surface effects of the mine. This opens the possibility of co-placement of filtered process tailings with the waste.

1.8 Mineral Processing

Processing involves conventional crushing, grinding, classification, gravity concentration, flotation and tailings discharge. The flotation concentrate will be processed off site with cyanide since it is not permissible to use cyanide at the Columbia site. Gold from the gravity circuit, approximately 50 percent of the total recoverable, will be upgraded and smelted at the mine site

into a salable doré product. Figure 19-9 presents the processing block flow diagram for processing the Columbia material.

The ammonia thiosulfate (ATS) offers an alternative onsite treatment, however this process route is conceptual in nature and relies upon metallurgical work completed over a period of years by Canyon Resources. As part of the processing review, consideration was given to creating a flotation concentrate, and treating the flotation concentrate with ATS in an attempt to improve the project economics. Based upon this very preliminary assessment the production of a concentrate that is treated off-site indicates better economics than the alternatives.

1.9 Environmental Considerations

Current Montana law prohibits the use of cyanide in a new milling facility. Though it appears that production of a flotation concentrate from a gravity tail produces an economically positive result. It may be noteworthy that no surface gold mine has been permitted since implementation of this legislation.

1.10 Capital Cost Estimate

Required mine equipment was based upon detailed mine production schedules which included equipment productivity and utilization. Capital costs represent current market prices for similar equipment with verification with the InfoMine mine costing system. Processing capital costs were developed using the InfoMine cost modeling system. The facility was based upon costing of a single product flotation mill with the addition of a gravity circuit.

Table 1-3 Capital Cost Estimate

Estimated Capital	Amount (million $)	Contingency Percent	Total (million $)
Mining Equipment	15.35	10%	16.89
Process Plant	41.93	20%	50.31
Other	5.00		5.00
Total	62.28		72.20

1.11 Operating Costs

Mine operating costs are based upon information provided by Atna from the Briggs operation. A detailed mine production schedule was developed and equipment productivities were calculated based on the phase design and a schedule developed including required mine equipment, labor and consumables. The mining costs for ore and waste are presented in the following table.

Table 1-4 Mining Operating Costs

Category	Cost per ton
Ore	$1.61
Waste 2.9:1	$1.39
Total per ore ton	**$5.64**

Estimated process operating costs were derived from the costing models within the InfoMine mine costing service. The process flow sheet as presented in Section 19.2 is the basis for the costs.

Table 1-5 Processing Operating Costs

Process	Unit Cost	Per Ore Ton
Crushing, Grinding & Gravity	$6.80 per ton	$6.80
Flotation	$2.00 per ton	$2.00
Concentrate treatment	$50.00 per ton	$5.00
Refining	$1.50 per ounce	$0.07
Concentrate transportation	$22.50 per ton	$2.25
G&A	$1.50 per ton	$1.50
Contingency 15%	$2.64 per ton	$2.64
TOTAL		**$20.26**

1.12 Economic Evaluation

The Base case economic model uses a gold price of $850 per oz and a silver price of $13.50 per oz. (a 60:1 Au/Ag ratio). The mineral resource exploited in this Preliminary Assessment is 14.1 million tons at a gold grade of 0.050 opt and a silver grade of 0.153 opt. The Base Case Internal Rate of Return (IRR) is 11 percent and the Net Present Value (NPV) at a 5 percent discount rate is $27.3 million, with a payback of 5.5+ years. Using increased metal prices of $950/oz Au and $15/oz Ag, the IRR increases to 20 percent and the NPV at 5 percent is $75.3 million. Payback at these prices decreases to slightly greater than 4 years.

This report contains a Preliminary Assessment of the Columbia Project, and as such, the economic analysis is based on a resource that includes Inferred Mineral Resources, as well as Measured and Indicated Mineral Resources.

1.13 Opportunities and Recommendations

A Preliminary Assessment of the Columbia Project as an open pit with concentrator appears economically favorable. The key points which require confirmation are:

- Additional metallurgical testing to adequately represent the various parts of the deposit, and sufficient to refine the process flow and complete a plant design.
- Additional drilling to confirm the resource and upgrade the classification of the Donnely South area.
- A thorough investigation of the legal and political risks of permitting and operating an open pit gold mine in Montana.

Figure 1-1 Columbia Project Area

2. INTRODUCTION

Gustavson Associates, LLC ("Gustavson") was commissioned by Atna Resources LTD. ("Atna") to prepare a Canadian National Instrument 43-101 (NI 43-101) compliant Independent Technical Report and Preliminary Assessment of the Columbia project (the "Project") in Lewis and Clark County, Montana, USA.

2.1 Terms of Reference

This report has been prepared in accordance with the guidelines provided in NI 43-101, Standards of Disclosure for Mineral Projects, dated December 31, 2005. The Qualified Persons responsible for this report are:

Donald E. Hulse, P.E., Principal Mining Engineer, Gustavson Associates
William J. Crowl, R.G., Vice President, Mining Sector, Gustavson Associates
Richard D. Moritz, Principal Mining Engineer, Gustavson Associates

This estimation of mineral resources and accompanying NI 43-101 compliant report are part of an ongoing effort by Atna, to develop the Columbia Project.

2.2 Effective Date

The effective date for this report is June 2, 2010

2.3 Purpose and Basis of Report

This NI 43-101 report documents the work completed and reported on in a Technical Report filed on SEDAR on October 21, 2009, as well as the results of a Preliminary Assessment of a proposed development plan for the Columbia project. Gustavson has prepared this report for Atna (the report has been prepared for Atna, the general public, and regulatory compliance under NI 43-101), and for the general public accessing information about Atna's property holdings. The information presented, opinions, conclusions, and estimates made are based on the following:

- Information provided by Atna;
- Assumptions, conditions, and qualifications as set forth in the report; and
- Data, reports, and opinions from other consulting organizations and from the previous property owners.

Gustavson has relied upon Atna regarding technical information; this information appears to be of sound quality. Gustavson has relied upon Atna for information on land ownership and tenure and has not independently verified the status of these items. Gustavson has used data and reports prepared by other consultants, including Resource Development Inc. ("RDi"). Gustavson is unaware of any other material technical data other than that presented by Atna.

This report contains a Preliminary Assessment of the Columbia Project, and as such the economic analysis is based on a resource that includes Inferred Mineral Resources, as well as Measured and Indicated Mineral Resources. Therefore, conclusions drawn in this report must be viewed only for planning purposes and not as an absolute quantification of the resource or economics. Caution should be used by a reviewer of this document as all results, interpretations, and conclusions are of a preliminary nature subject to refinement as more information becomes available.

2.4 Personal Inspection

Mr. Hulse, qualified person, visited the site on August 4, 2009 in company with Atna personnel. Mr. Hulse inspected the core storage facility near Lincoln Montana, and reviewed assay records stored at the Kendall Operation near Lewistown, Montana.

2.5 Units

All measurements used in the Columbia project are in Imperial units, with the exception that the mineral resource will be stated in both Imperial and SI (metric) units.

2.6 Acknowledgements

Gustavson wishes to thank the staff of Atna for their hospitality during the site visit and for their cooperation providing requested information and preparing this report.

3. RELIANCE ON OTHER EXPERTS

The information, conclusions, and recommendations contained in this report are based largely upon review and analysis of digital and hard copy data and information supplied to Gustavson by Atna. Information was also obtained during discussions with Atna personnel familiar with the property. Several Atna personnel, listed below, contributed substantially to this report. Each has well over 15 years of experience in their area of expertise.

William R. Stanley, V.P. Exploration
James E. Volberding, Manager, Montana Operations

Other technical experts have been retained by Atna to analyze metallurgical, processing, geotechnical, and environmental aspects of the project. Gustavson has utilized a recently completed report by Resource Development, Inc. of Wheat Ridge, Colorado, regarding some metallurgical characteristics of the ore.

4. PROPERTY LOCATION AND DESCRIPTION

4.1 Location

The Columbia Mine Property is located in Lewis and Clark County, Montana about 90 miles northwest of Helena, Montana and 8 miles southeast of Lincoln, Montana on Highway 200. The approximate center of the Property is located about 46°59'14.65" North latitude and 112°08'34.43" West longitude. Figure 4-1 shows the location of the Columbia Project.

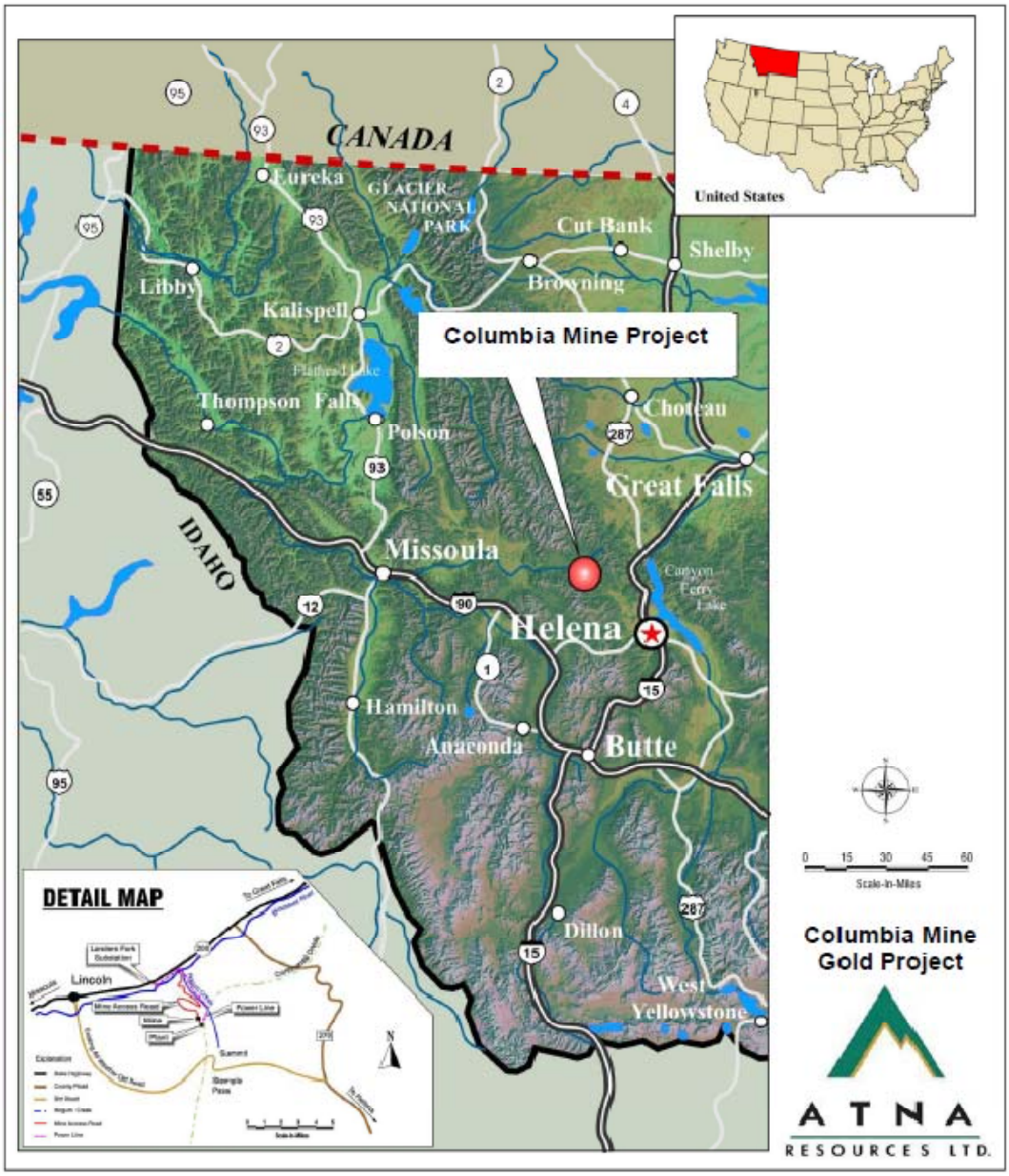

Figure 4-1 Columbia Project Location Map

4.2 Ownership

The Columbia Mine Property is held by CR Montana Corporation, a subsidiary of Canyon Resources Corporation, which in turn is a subsidiary of Atna Resources Ltd. (collectively, "Atna"). The Property consists of 15 patented claims owned 100 percent by Atna, 6 patented claims in which Atna holds a fractional interest and leases the outstanding interests and 3 patented claims owned 100 percent by a Lessor. See Table 4-1 for details of the Patented Claim ownership. In addition, Atna controls 68 unpatented federal lode mining claims surrounding the patented claim package. See Table 4-2 for details on the unpatented mining claims. The Property covers 1,280 acres in Sections 19, 20, 21, 28 and 29, Township 14 North, Range 7 West, Montana Principal Meridian, Lewis and Clark County, Montana. See Figure 4-2.

Table 4-1 Patented Claim Ownership

Patented Claims Owned by CR Montana Corporation				
Name	**MS #**	**Acreage**	**Owners**	**Percent**
Columbia	2161	17.4	CR Montana	100.00
Winthrop	2162	20.64	CR Montana	100.00
Railsback	2240	2.79	CR Montana	100.00
Stanley	9003	17.042	CR Montana	100.00
Lockey	10798	11.02	CR Montana	100.00
Key West	10798	19.6	CR Montana	100.00
Golden Gate	10798	23.53	CR Montana	100.00
Beatrice	10798	19.4	CR Montana	100.00
Combination	10798	20.6	CR Montana	100.00
Great Western #1	10798	23.54	CR Montana	100.00
Red Bird	10798	19.6	CR Montana	100.00
Blue Bird	10798	20.6	CR Montana	100.00
Signe	10798	15.1	CR Montana	100.00
Monroe	8644	19	CR Montana	100.00
Reliable	8645	20.6	CR Montana	100.00
Patented Claims with Fractional Interests held by CR Montana and Lessors				
Name	**MS #**	**Acreage**	**Owners**	**Percent**
Kimberly	9002	11.954	CR Montana	78.30
			Hoskins/Hoskins/Hoskins	21.70
Alton	9004	12.052	CR Montana	78.30
			Hoskins/Hoskins/Hoskins	21.70
Bangor	9003	20.017	CR Montana	35.00
			Palaoro	43.30
			Lovely	21.70
Enterprise	9003	19.48	CR Montana	35.00
			Palaoro	43.30
			Lovely	21.70

Patented Claims owned by Lessors and held by CR Montana by Lease				
Name	**MS #**	**Acreage**	**Owners**	**percent**
Ibex	2159	18.37	Canfield/Canfield/Flynn	56.25
			Muir/Muir/Hunter	43.75
Rover	2160	16.73	Canfield/Canfield/Flynn	56.25
			Muir/Muir/Hunter	43.75
Last Chance	9188	19.23	Barneson	100.00
First Chance	9188	17.22	Barneson	100.00
Golden Fleece	9188	20.66	Barneson	100.00
Total Acreage		426.175		

Table 4-2 Unpatented Federal Mining Claims

BLM MMC	Claim Name	Twnshp	Rng	Sec	1/4 Sec	Lewis & Clark	
						Bk/Pg	Location Date
184672	PD 2	14N	7W	20	SW	M11/7528	2/18/1991
184673	PD 5	14N	7W	29	NW	M11/7529	2/18/1991
184720	JV 48	14N	7W	29	NE/NW	M11/7577	2/18/1991
184721	JV 49	14N	7W	29	NE/NW	M11/7578	2/18/1991
184732	JV 60	14N	7W	29	ALL	M11/7589	2/18/1991
184738	JV 70	14N	7W	29	NE/SW	M11/7595	2/18/1991
215832	JV 1	14N	7W	20	NW	M35/5013	10/5/2006
				19	NE		
215833	JV 2	14N	7W	20	NW	M35/5014	10/5/2006
					Amended	M36/137	
215834	JV 3	14N	7W	20	NW	M35/4015	10/5/2006
				19	NE		
215835	JV 4	14N	7W	20	NW	M35/5016	10/5/2006
215836	JV 5	14N	7W	20	NW	M35/5017	10/5/2006
				19	NE		
215837	JV 6	14N	7W	20	NW	M35/5018	10/5/2006
215838	JV 7	14N	7W	20	NW/SW	M35/5019	10/5/2006
				19	NE/SE		
215839	JV 8	14N	7W	20	NW/SW	M35/5020	10/5/2006
				19	NE/SE		
					Amended	M36/138	

BLM MMC	Claim Name	Twnshp	Rng	Sec	1/4 Sec	Lewis & Clark	
						Bk/Pg	Location Date
215840	JV 9	14N	7W	20	NW/SW	M35/5021	10/5/2006
215841	JV 10	14N	7W	20	NW/SW	M35/5022	10/5/2006
215842	JV 11	14N	7W	20	NW/SW	M35/5023	10/3/2006
215843	JV 12	14N	7W	20	SW	M35/5024	10/3/2006
				19	SE		
215844	JV 13	14N	7W	20	SW	M35/5025	10/3/2006
				19	SE		
215845	JV 14	14N	7W	20	SW	M35/5026	10/3/2006
				19	SE		
215846	JV 15	14N	7W	20	SW	M35/5027	10/3/2006
				29	NW		
				19	SE		
				30	NE		
					Amended	M36/139	
215847	JV 16	14N	7W	29	NW	M35/5028	10/3/2006
				30	NE		
215848	JV 17	14N	7W	29	NW	M35/5029	10/3/2006
				30	NE		
215849	JV 18	14N	7W	29	NW	M35/5030	10/3/2006
215850	JV 19	14N	7W	29	NW	M35/5031	10/3/2006
215851	JV 20	14N	7W	29	NW	M35/5032	10/4/2006
				30	NE		
215852	JV 21	14N	7W	29	NW	M35/5033	10/4/2006
215853	JV 22	14N	7W	29	SW	M35/5034	10/4/2006
				30	SE		
					Amended	M36/140	
215854	JV 23	14N	7W	29	SW	M35/5035	10/4/2006
					Amended	M36/141	
215855	JV 24	14N	7W	29	SW	M35/5036	10/4/2006
				30	SE		
					Amended	M36/142	
215856	JV 25	14N	7W	29	SW	M35/5037	10/4/2006
215857	JV 26	14N	7W	29	SW	M35/5038	10/4/2006
				30	SE		
					Amended	M36/143	
215858	JV 27	14N	7W	29	SW	M35/5039	10/4/2006
215859	JV 28	14N	7W	29	SW	M35/5040	10/4/2006
				30	SE		

BLM MMC	Claim Name	Twnshp	Rng	Sec	1/4 Sec	Lewis & Clark	
						Bk/Pg	Location Date
215860	JV 29	14N	7W	29	SW	M35/5041	10/4/2006
215861	JV 30	14N	7W	20	NW/NE	M35/5042	10/4/2006
215862	JV 31	14N	7W	20	NE	M35/5043	10/4/2006
215863	JV 32	14N	7W	20	NW/NE	M35/5044	10/4/2006
215864	JV 33	14N	7W	20	NE	M35/5045	10/4/2006
215865	JV 34	14N	7W	20	NW/NE	M35/5046	10/4/2006
215866	JV 35	14N	7W	20	NE	M35/5047	10/4/2006
215867	JV 36	14N	7W	20	NE	M35/5048	10/4/2006
					Amended	M36/144	
215868	JV 37	14N	7W	20	NE/SE	M35/5049	10/4/2006
					Amended	M36/125	
215869	JV 38	14N	7W	20	NE	M35/5050	10/4/2006
215870	JV 39	14N	7W	20	NE/SE	M35/5051	10/4/2006
					Amended	M36/126	
215871	JV 40	14N	7W	20	SE	M35/5052	10/4/2006
215872	JV 41	14N	7W	20	SE	M35/5053	10/4/2006
215873	JV 42	14N	7W	20	SE	M35/5054	10/4/2006
215874	JV 43	14N	7W	20	SE	M35/5055	10/4/2006
				29	NE		
215875	JV 44	14N	7W	29	NE	M35/5056	10/4/2006
215876	JV 45	14N	7W	29	NE	M35/5057	10/4/2006
					Amended	M36/127	
215877	JV 46	14N	7W	29	NE	M35/5058	10/4/2006
					Amended	M36/128	
215878	JV 47	14N	7W	29	NE/SE	M35/5059	10/4/2006
					Amended	M36/129	
215881	JV 50	14N	7W	29	SE/SW	M35/5062	10/4/2006
					Amended	M36/130	
215882	JV 51	14N	7W	29	NE/SE	M35/5063	10/4/2006
					Amended	M36/131	
215883	JV 52	14N	7W	29	SE/SW	M35/5064	10/4/2006
215884	JV 53	14N	7W	29	SE	M35/5065	10/4/2006
					Amended	M36/132	
215885	JV 54	14N	7W	29	SE/SW	M35/5066	10/4/2006
215886	JV 55	14N	7W	29	SE	M35/5067	10/4/2006
					Amended	M36/133	
215887	JV 56	14N	7W	29	SE/SW	M35/5068	10/4/2006
215888	JV 57	14N	7W	29	SE	M35/5069	10/4/2006

BLM MMC	Claim Name	Twnshp	Rng	Sec	1/4 Sec	Lewis & Clark	
						Bk/Pg	Location Date
				28	SW		
215889	JV 58	14N	7W	29	NE/SE	M35/5070	10/4/2006
				28	SW/NW		
					Amended	M36/134	
215890	JV 59	14N	7W	29	NE	M35/5071	10/4/2006
				28	NW		
					Amended	M36/135	
215892	JV 62	14N	7W	20	SE	M35/5073	10/4/2006
215893	JV 63	14N	7W	20	NE/SE	M35/5074	10/4/2006
				21	NW/SW		
					Amended	M36/136	
215894	JV 64	14N	7W	20	NE/SE	M35/5075	10/4/2006
				21	NW/SW		
					Amended	M36/123	
215895	JV 69	14N	7W	20	NW	M35/5076	10/5/2006
				19	NE		
215897	JV 71	14N	7W	30	SE	M35/5078	10/4/2006
				29	SW		
					Amended	M36/124	
68 claims							

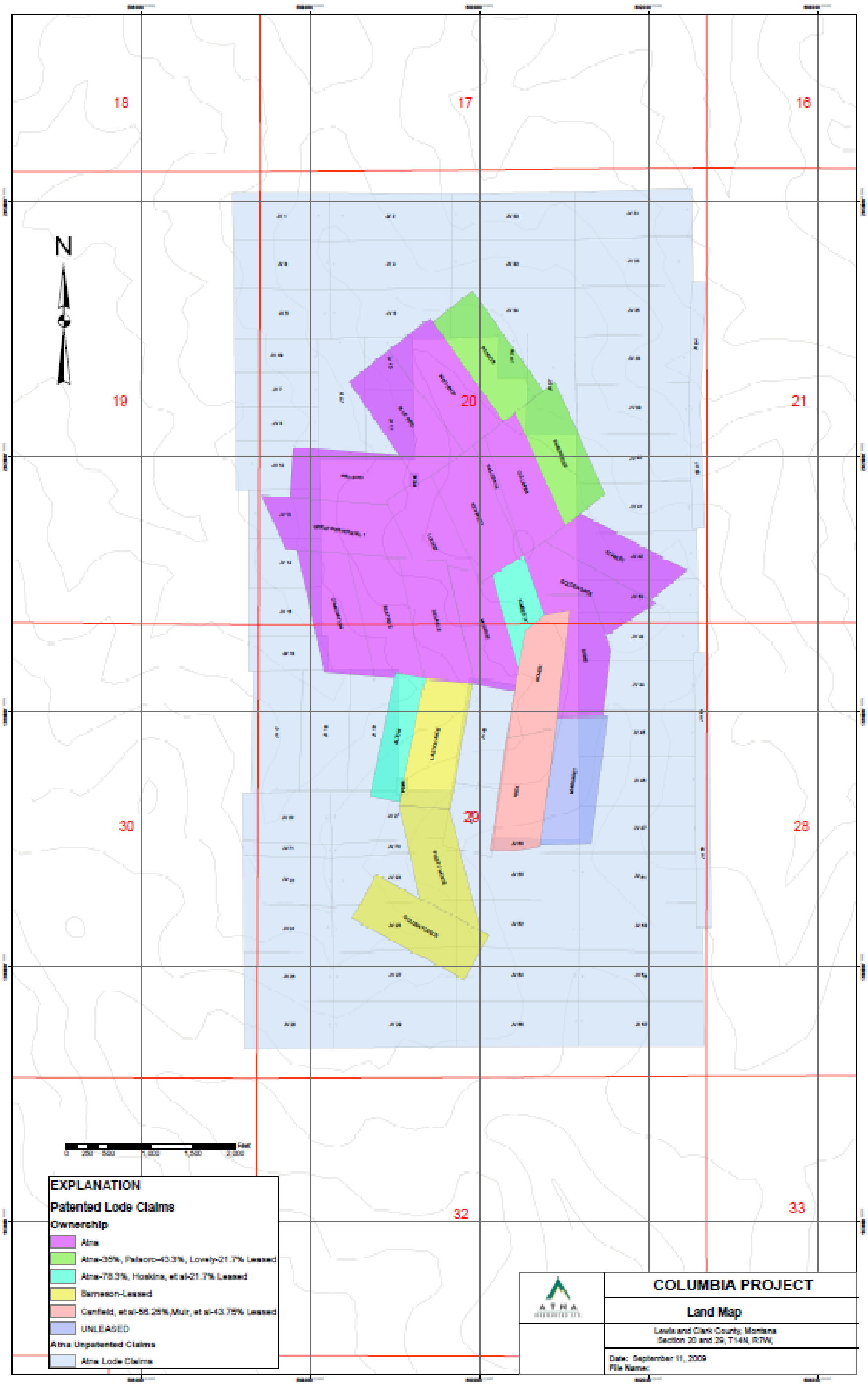

Figure 4-2 Columbia Mining Claim Map

4.3 Agreements and Royalties

The fractional interests in the patented claims are held by five mining leases. The entire interest of three of the patented claims is also subject to a sixth mining lease. The termination dates for these leases range from 2013 to 2029. The royalty burden on the individual claims varies from a net royalty of 2.1745 percent to 6 percent. Table 4-3 lists each royalty owner, the percent interest that the owner has in the patented claim and the NSR royalty owned by any given claimant. The final column lists the Net Royalty Burden for each patented claim.

Table 4-3 Mineral Production Royalties

Royalties on Patented Claims Owned by CR Montana Corporation						
Name	**MS #**	**Acreage**	**Owner**	**Percent Interest**	**NSR Royalty**	**Net Royalty**
Columbia	2161	17.4	Amazon	100.0%	1.0%	2.1745%
			Bielenberg	52.62%	1.5%	
			Tobin et al	47.38%	1.5%	
Winthrop	2162	20.64	Amazon	100.0%	1.0%	2.1745%
			Bielenberg	52.62%	1.5%	
			Tobin et al	47.38%	1.5%	
Railsback	2240	2.79	Amazon	100.0%	1.0%	2.1745%
			Bielenberg	52.62%	1.5%	
			Tobin et al	47.38%	1.5%	
Stanley	9003	17.042	Amazon	100.0%	1.0%	2.1745%
			Bielenberg	56.62%	1.5%	
			Tobin et al	21.68%	1.5%	
Lockey	10798	11.02	Thor/Mason	100.00%	4.0%	4.0%
Key West	10798	19.6	Thor/Mason	100.00%	4.0%	4.0%
Golden Gate	10798	23.53	Thor/Mason	100.00%	4.0%	4.0%
Beatrice	10798	19.4	Thor/Mason	100.00%	4.0%	4.0%
Combination	10798	20.6	Thor/Mason	100.00%	4.0%	4.0%
Great Western #1	10798	23.54	Thor/Mason	100.00%	4.0%	4.0%
Red Bird	10798	19.6	Thor/Mason	100.00%	4.0%	4.0%
Blue Bird	10798	20.6	Thor/Mason	100.00%	4.0%	4.0%
Signe	10798	15.1	Thor/Mason	100.00%	4.0%	4.0%
Monroe	8644	19	Thor/Mason	50.00%	4.0%	2.0%
Reliable	8645	20.6	Thor/Mason	50.00%	4.0%	2.0%

Royalties on Patented Claims with Fractional Interests held by CR Montana and Lessors						
Name	**MS #**	**Acreage**	**Owner**	**Percent Interest**	**NSR Royalty**	**Net Royalty**
Kimberly	9002	11.954	Amazon	100%	1.0%	2.825%
			Bielenberg	56.62%	1.5%	
			Tobin et al	21.68%	1.5%	
			Hoskins/Hoskins/ Hoskins	21.70%	3.0%	
Alton	9004	12.052	Amazon	100%	1.0%	2.825%
			Bielenberg	56.62%	1.5%	
			Tobin et al	21.68%	1.5%	
			Hoskins/Hoskins/ Hoskins	21.70%	3.0%	
Bangor	9003	20.017	Amazon	100%	1.00%	3.258%
			Tobin et al	35.00%	1.5%	
			Palaoro	43.30%	3.0%	
			Lovely	21.70%	2.0%	
Enterprise	9003	19.48	Amazon	100%	1.00%	3.258%
			Tobin et al	35.00%	1.5%	
			Palaoro	43.30%	3.0%	
			Lovely	21.70%	2.0%	
Patented Claims owned by Lessors and held by CR Montana by Lease						
Name	**MS #**	**Acreage**	**Owner**	**Percent Interest**	**NSR Royalty**	**Net Royalty**
Ibex	2159	18.37	Canfield/Canfield/ Flynn	56.25%	5.0%	6.0%
			Muir/Muir/Hunter	43.75%	5.0%	
			Amazon	100%	1.0%	
Rover	2160	16.73	Canfield/Canfield/ Flynn	56.25%	5.0%	6.0%
			Muir/Muir/Hunter	43.75%	5.0%	
			Amazon	100%	1.0%	
Last Chance	9188	19.23	Barneson	100%	5.00%	6.0%
			Amazon	100%	1.0%	
First Chance	9188	17.22	Barneson	100%	5.00%	6.0%
			Amazon	100%	1.0%	
Golden Fleece	9188	20.66	Barneson	100%	5.00%	6.0%
			Amazon	100%	1.0%	

4.4 Environmental Liabilities, Permits and Bonding

Environmental liabilities at the Columbia site consist of minor reclamation obligations for surface disturbances associated with previous exploration efforts. Exploration and development

work on the property has been, and will continue to be conducted under Exploration License #00497 issued and administered by the Montana Department of Environmental Quality (MDEQ), Environmental Management Bureau, Hard Rock and Placer Exploration Section. The license is renewable annually and remains in effect as long as exploration activity is active or contemplated. The Columbia exploration license is in good standing as of the writing of this technical report.

Most of the exploration disturbances at the site have been successfully reclaimed, and reclamation bonding released; however, a small amount of disturbance has not been reclaimed and is bonded via a cash bond (B126-30-00) held in an interest-bearing account by MDEQ. The obligated amount of the cash bond as of January 2009 is $44,705.

Storm water discharges from the Columbia site are regulated under Authorization Number MTR300085 associated with the General Permit for Discharges Associated with Mining and Oil and Gas Activities. This permit, issued and administered by the Montana Department of Environmental Quality, Water Protection Bureau, is renewable every five years and remains in effect as long as exploration and development activity is occurring at the site. The storm water discharge permit is in good standing at the time of the writing of this technical report.

5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Access

The Columbia Project is located 40 miles northwest of Helena, Montana and eight miles east of Lincoln, Montana in western Lewis and Clark County. Access to the property from State Highway 200 is via approximately four miles of improved gravel road, known as the Hogum Creek Road and West Hogum Creek Road (#1841), managed by the U.S. Forest Service. Alternate access may also be obtained from the Stemple Pass Road via the Crater Mountain Road (#1825), also managed by the U.S. Forest Service. Access to the property is currently limited to the period from May 15th to October 15th under the terms of a Special Use Permit issued by the USFS (#LIN1). Figure 5-1 displays the project access roads. Figure 5-2 provides an oblique aerial view of the Columbia Property and surrounding area.

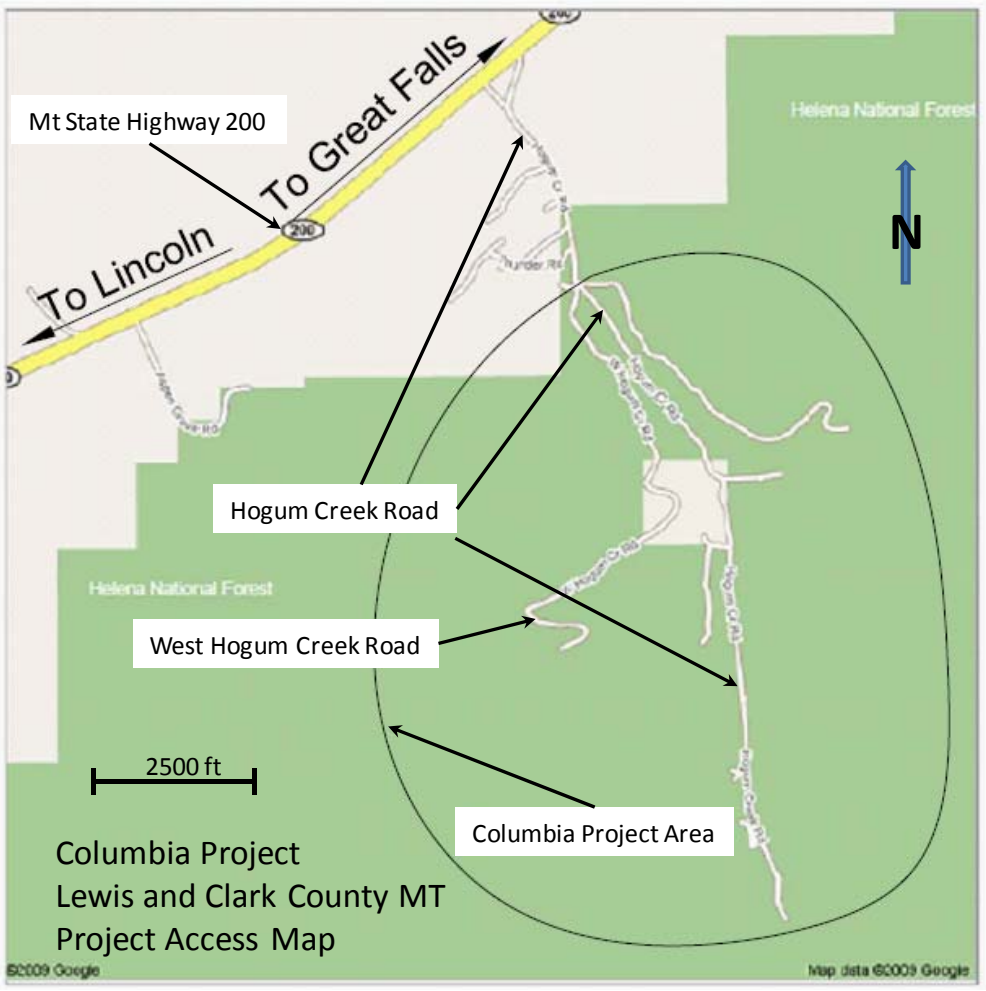

Figure 5-1 Columbia Project Access

Figure 5-2 Columbia Project Area

5.2 Climate

The climate of the Columbia area is considered to be a modified north pacific coast type compared to the more continental climate of eastern Montana. Average monthly temperatures are generally cooler than Helena or areas east of the Continental Divide, ranging from 20ºF in January to 60ºF in July. Also, precipitation is more evenly distributed than areas east of the divide. Precipitation varies considerably with elevation and ranges from over 40 inches per year on the Continental Divide south of the property to less than 20 inches in the Blackfoot River valley to the north. Annual precipitation at the project site is estimated to be 26 inches with approximately 50 percent of it occurring in the form of snow. May is typically the wettest month of the year with an average precipitation of over three inches. Annual pan evaporation is approximately 28.8 inches. The Columbia area has fairly moderate wind speeds, averaging 17.6 miles per hour. The most common wind direction is from the west, and wind persistence averages 73 percent. Air quality, as measured by a PM-10 monitoring station located three miles north of the Columbia Project, is considered excellent, averaging 7 $\mu g/m^3$.

5.3 Local Resources and Infrastructure

The nearest population center to the Columbia Project is the small unincorporated town of Lincoln which lies approximately eight miles west. State Highway 200 serves as Lincoln's main street running east-west through the Blackfoot River valley. Highway 279 intersects Highway 200 twelve miles east of Lincoln, crosses Flesher Pass and connects the town of Lincoln with Helena, the nearest rail head. Lincoln has limited medical, fire protection, and law enforcement services which are supplemented as required by Lewis and Clark County services based in Helena. An existing 24.9 kV power line services several homes in the Hogum Creek area. This line would have to be upgraded from the existing Landers Fork substation, and extended approximately three miles to serve the Columbia Project. Water for the Project would be provided via wells under existing water rights owned by Atna.

5.4 Physiography

The Columbia Project lies within the Northern Rocky Mountain Physiographic Province and is within the Montana Overthrust Belt. The terrain in the area is typically steep and deeply dissected. The Project lies along a long $N40^0W$ trending ridge that is flanked on the east and west by Hogum Creek and Seven Up Pete Creek, respectively. Crater Mountain and the Continental Divide to the south, and the Blackfoot River valley to the north form distinct physiographic boundaries and prominent landmarks in the project area. Elevations in the area range from 4,800 feet in the Blackfoot River Valley to 7,128 feet at Crater Mountain. The average elevation of the ridge top in the project area is approximately 6,200 feet. With the exception of the ridge tops, the project area is densely timbered, though recent insect infestation has resulted in significant tree mortality. Logging operations have recently been initiated to remove affected trees.

6. HISTORY

The Columbia Property has a long history of mine production and mineral exploration dating back over 100 years.

6.1 Property History

The Columbia Project is located within the historic Seven Up Pete Mining District and has been the focus of exploration and development interest for over 100 years. The first recorded activity in the area was in 1886 when William Howe discovered the Last Chance lode deposit. A small stamp mill was constructed in 1913 to process lower grade ores which could not be directly shipped to smelters in the Helena and Rimini areas. There are remnants of this historic mill on the property. Through 1926, Howe and others developed approximately 3,000 feet of underground workings. Though little production data is available, a 1933 report mentioned that ore shipped to the smelter ranged from 1.00 to 5.83 opt Au and from 13 to 232 opt silver. Higher grade ores were apparently mined from small shoots and pods and hand sorted prior to shipping.

6.2 Exploration History

The Columbia site has been the focus of several exploration programs over the last 40 years. AMAX drilled a single deep core hole near the historic Last Chance adit in the 1970's looking for a Climax-type molybdenum deposit with negative results. In 1983-84, the Anaconda Company examined the property as part of a district-wide mapping and sampling program in the Stemple Pass and Swede Gulch areas. In 1985, the Amazon Mining Company purchased Anaconda's interest in some of the patented mining claims and initiated a limited trenching and core drilling program on the Columbia and Last Chance veins. Western Energy Company ("WECo") optioned Amazon's interest in the property in 1987 and initiated a program consisting of reverse circulation and diamond core drilling, trench excavation, and surface mapping and sampling. WECo also consolidated the land position by acquiring exploration leases for most of the remaining patented mining claims. WECo's program was successful in discovering a significant gold resource at Columbia which led to scoping studies, metallurgical test work, and feasibility studies. In 1989, Addwest Gold, Inc. entered into a purchase option with WECo for the Columbia property. Addwest initiated additional reverse circulation drilling and trenching on the property expanding the resource.

In 1989, Phelps Dodge Mining Company entered a purchase option with Addwest for 50 percent of the project and became the operator of the Seven Up Pete Joint Venture (SPJV). Canyon Resources purchased Addwest's interest in 1990 and became a non-operating partner in the SPJV. Based upon encouraging results from continuing reverse circulation drilling and engineering studies, the SPJV exercised the option to purchase the property from WECo. Later in 1990, Canyon's interest in the property was diminished to 27.6 percent due to disproportionate funding of the SPJV by Phelps Dodge which retained 72.4 percent. CR Montana Corporation, a

wholly-owned subsidiary of Canyon Resources Corporation and now Atna (Canyon Resources merged with Atna Resources in 2008), purchased Phelps Dodge's interest in 1997. In 2009 the entire property was brought under Atna's ownership, at which time the SPJV was dissolved.

6.3 Resource History

Several estimates of the Columbia mineral resource have been conducted in the last 25 years using modern geostatistical techniques. The first resource estimate was conducted by Western Energy Company in 1988 using indicator kriging to interpolate gold grades within 100 foot x 10 foot x 10 foot blocks oriented along the strike of the major vein structures. The estimate was confined to a 1,000 foot x 1,000 foot region known as the Columbia Flat area. Columbia Flat was the only area of the property thought to have adequate drill hole coverage at the time to provide a reasonably accurate resource estimate. This study resulted in a resource of 3.33 million tons at 0.047 opt Au at a cutoff grade of 0.01 opt Au.

In 1991, Phelps Dodge Mining Company and Independent Mining Consultants, Inc. (IMC) conducted further geostatistical analysis and resource estimation of the Columbia property which formed the basis for a Preliminary Feasibility Study. This estimate utilized drilling data from across the Columbia property and included all major known mineralized structures. Phelps Dodge and IMC also completed both a manually derived estimate, based upon cross sections produced by Phelps Dodge geologists, and a nearest neighbor computer model. The projection of mineralization was confined by digitized envelopes and variography. The results of these resource estimates are shown in Table 6-1:

Table 6-1 1991 Preliminary Feasibility Study - Historic Resource Estimate

Technique	Resource Tons (000)	Grade (opt Au)	Contained Au Oz (000)	Cutoff Grade (opt Au)
Cross Sectional	13,741	0.060	824	0.020
Nearest Neighbor	13,924	0.061	849	0.020
Difference	+183	+0.001	+25	

In 1992, Phelps Dodge refined the geologic resource model for Columbia utilizing additional drill hole and trench data. The resource was estimated using several geostatistical techniques including nearest neighbor, ordinary kriging, mix-population kriging, and indicator kriging. The results from this work are presented within Table 6-2 below.

Table 6-2 1992 Historic Resource Estimate - 0.02 opt Au Cutoff

Technique	Resource Tons (000)	Grade (opt Au)	Contained Au Oz (000)
Nearest Neighbor	12,801	0.056	717
Ordinary Kriging	20,140	0.041	826
Mix-Pop. Kriging	11,109	0.042	467
Indicator Kriging	21,890	0.035	766

Even though the 1992 resource estimates contained additional exploration data, Phelps Dodge geologists and geostatisticians concluded that the estimates were low in both mineralized tons and gold grade due to overly constricted mineral envelopes. These 1992 resource estimates are the last completed prior to the current resource estimate contained within this Technical Report.

Gustavson completed the first NI 43-101 compliant mineral resource estimate in September 2009 (filed on SEDAR in October 2009). This work and resource estimate is reiterated with in this Technical Report and serves at the basis for the Preliminary Economic Assessment of the project contained herein.

7. GEOLOGICAL SETTING

7.1 Regional Setting

The Columbia deposit is hosted within a series of middle Tertiary (Late Eocene-Early Oligocene) volcanic and hypabyssal rocks variously known as the Lincoln Volcanic Field or the Crater Mountain Volcanics. The volcanic rocks consist mainly of felsic to intermediate flows, flow breccias, welded ash flows, and ash-flow tuffs that attain a maximum thickness of approximately 1,500 feet. The volcanic rocks unconformably overlie a thick sequence of middle Proterozoic marine sedimentary rocks known as the Belt Supergroup. The sedimentary and volcanic rocks have been intruded by pre- and post-volcanic intrusive of gabbroic to granodioritic composition. A veneer of Quaternary glacial deposits has covered much of the sequence on the lower hills and valleys.

The Belt Supergroup in the area consists of, in ascending order, siltstones and mudstones of the Spokane Formation (5,000 feet), dolomitic siltstones and argillites of the Empire Formation (1,000 feet), and impure carbonates of the Helena Formation (5,000 to 7,000 feet). The contact between the Belt sediments and the overlying volcanic rocks is exposed north of the Columbia property in the Hogum Creek drainage where bleached, hornfelsed Helena dolomite crops out in road cuts.

The volcanic rocks of the Lincoln Volcanic Field consist of two distinct suites that are spatially separated and have unclear temporal relationships. The rocks in the Columbia area are characterized by a series of aphanitic to finely porphyritic lava flows, mudflow, and agglomerates of andesitic to dacitic composition. Further south near Crater Mountain, more felsic rocks occur, primarily rhyolite flows and tuffs. Figure 7-1 displays the regional geologic setting of the Columbia Project.

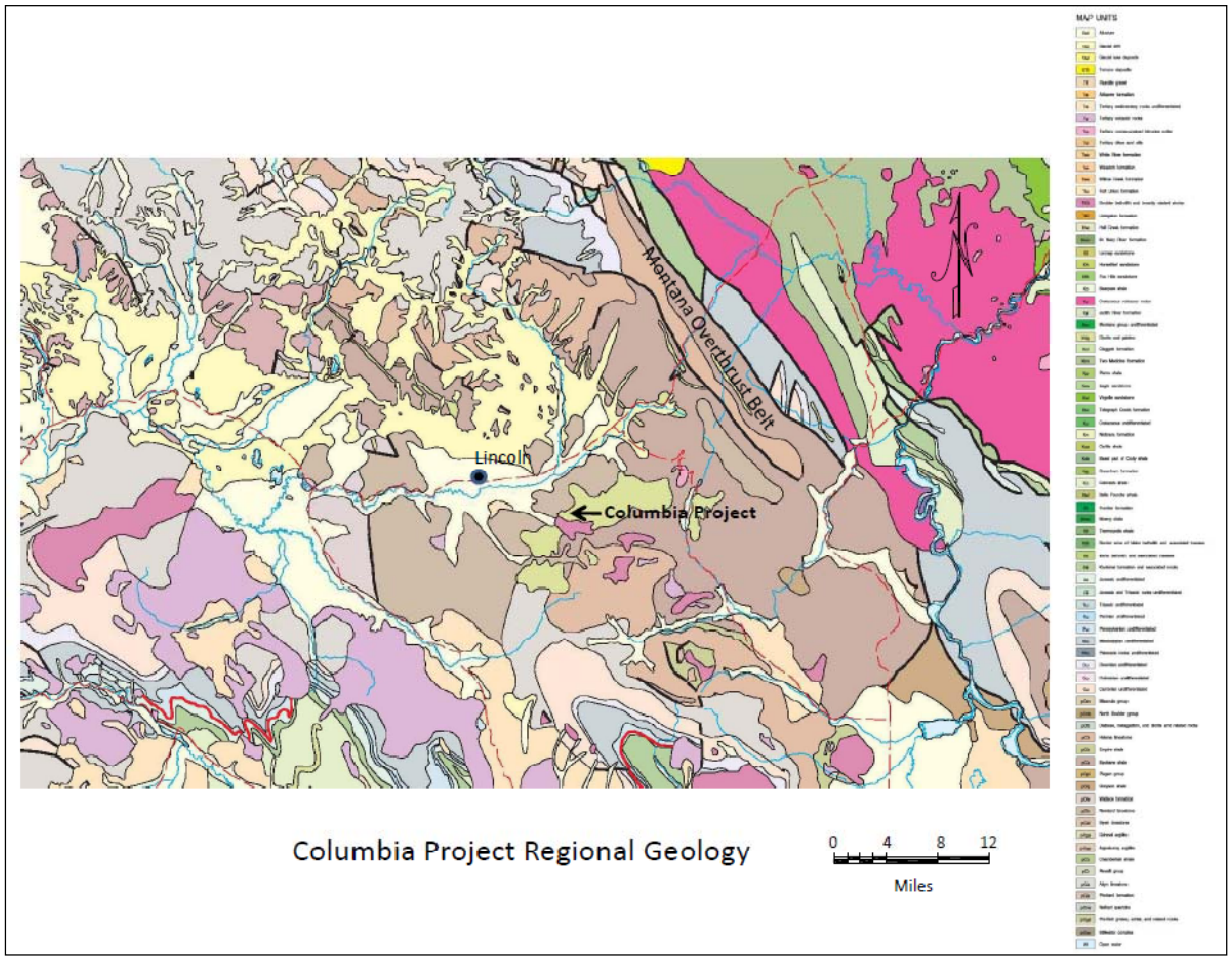

Figure 7-1 Regional Geology Map

The regional geologic structure in the Columbia area is complex and poorly understood. At least four episodes of deformation are evident in the area: 1) gentle regional Precambrian tilting; 2) Laramide folding and faulting; 3) late Cretaceous folding and faulting associated with intrusion of granitic stocks related to the Boulder Batholith; and 4) faulting related to Eocene/Oligocene volcanism. The dominant features are a series of west- and northwest-striking strike-slip, dip-slip, and oblique-slip faults and broad, open folds related to the Lewis and Clark line, a major structural lineament that traverses northern Idaho and west-central Montana. To the east of the project are north- and northwest-striking imbricate thrust faults of the Montana Overthrust Belt.

The Lincoln Volcanic Field exhibits a marked elongation along a northwest-southeast axis. It is possible that the emplacement of the volcanic was influenced by the structural relationships of the Lewis and Clark line and the Montana Overthrust Belt and were preserved in a volcano-tectonic depression.

The mineral deposits in the Columbia area were formed after Laramide folding, and are potentially genetically related to emplacement of pre- and post-volcanic granitic intrusions and middle Tertiary volcanism. At least two episodes of mineralization have been identified: 1) high temperature vein and replacement deposits within the stocks and their inner contact metamorphic aureoles; and, 2) epithermal gold and silver veins associated with extrusion of middle Tertiary volcanics. The Columbia deposit is representative of the latter style of mineralization.

7.2 Local Geology and Structure

The geologic setting of the Columbia deposit is typical of structurally controlled volcanic-hosted, epithermal, quartz-sericite-adularia vein systems. Districts hosting these gold-silver deposit types typically have strike lengths on the order of two to three miles and individual veins are mineralized over vertical extents of 500 to 1,000 feet. These systems may be zoned vertically with precious metals occurring in the nearer surface environment with increasing base metals at depth. Geochemically, the Columbia precious metals system has a normal suite of trace elements including elevated mercury, antimony, and arsenic and low concentration base metals. Figure 7-2 displays the property geology.

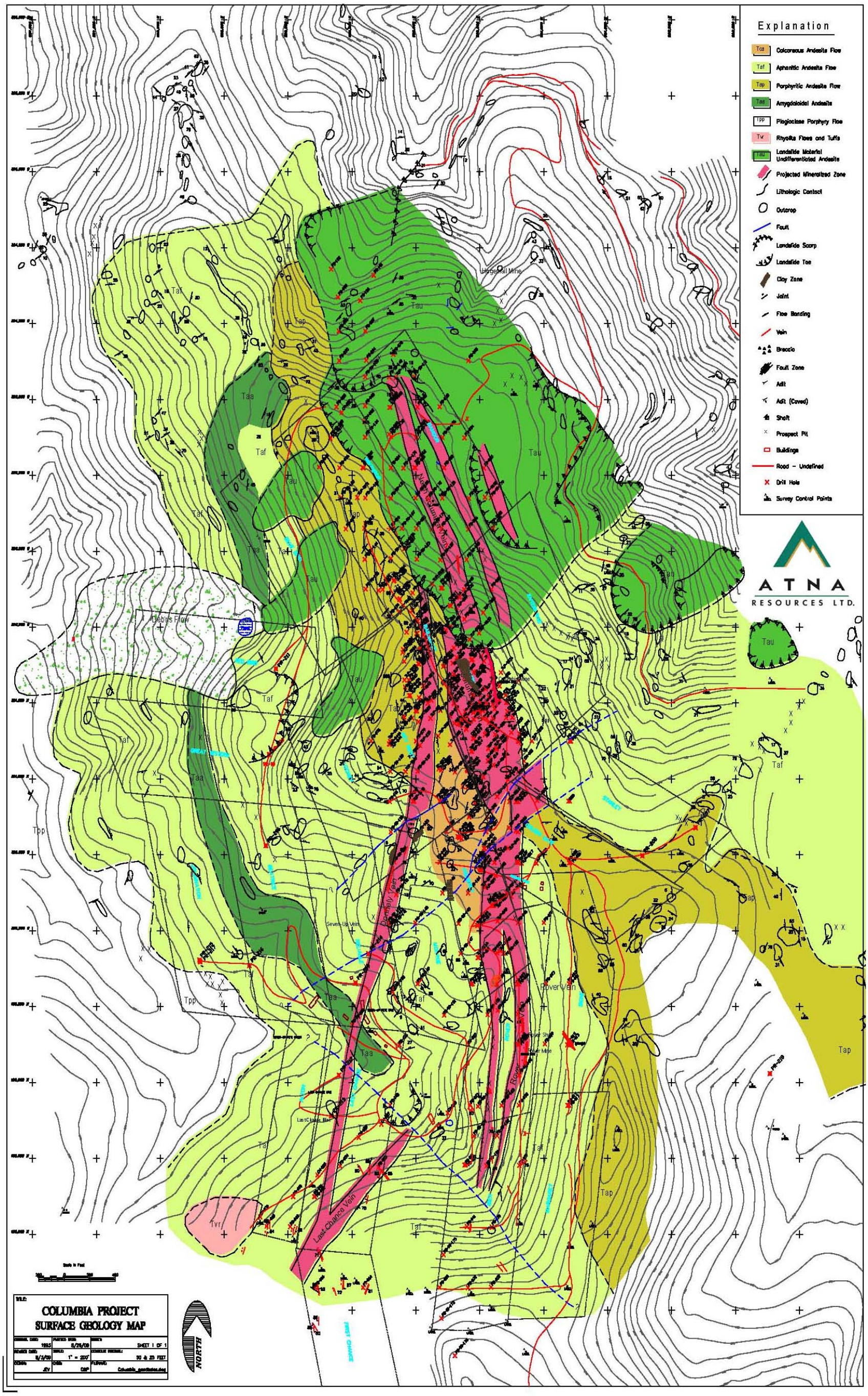

Figure 7-2 Columbia Property Geology

7.2.1 Lithology

The volcanic rocks in the Columbia area consist primarily of dark grey to dark reddish-grey andesite or latite flows, flow breccias, and welded tuffs. In general, the rocks are aphanitic to finely porphyritic with plagioclase, hornblende, and biotite being the dominant phenocrysts. Locally, the rocks may be magnetic. The volcanic rocks exhibit wide-spread deuteric alteration and are locally vesiculated with euhedral calcite crystals commonly filling the vesicles. A well-developed platy structure is commonly present in the volcanic flows at Columbia. Generally, the platy structure is nearly perpendicular or at high angles to the flow contacts and is probably formed by stresses developed during cooling. Flow tops are marked by the development of red, iron oxide rich clays that are thought to be paleosoil horizons.

More felsic volcanic rocks occur at the southern end of the Columbia property near Crater Mountain and are dominated by intensely welded rhyolitic ash flow tuff. Several rhyolitic domes are associated with the ash flow tuffs and may represent eruptive centers. One of these domes is well exposed south of the Last Chance adit and consists of strongly flow banded, spherulitic rhyolite. A thin, hydrothermally altered zone and coarse, possibly intrusive, pyroclastic body occur between the dome and the adjacent ash flow sheets and rhyolite flows.

The geometry of the volcanic rocks at Columbia is complex. The flows are lenticular, limited in aerial extent, and appear to follow irregular paleotopography. This complexity, combined with an alteration overprint, has made hole-to-hole geologic correlation of the volcanic rocks formidable without detailed petrographic examination. This complexity does not appear to have any significant influence on the focus or distribution of gold-silver mineralization at Columbia.

7.2.2 Structure

Due to the complex geometry of the volcanic rocks hosting the Columbia deposit, structural relationships are difficult to ascertain; however, some general observations may be drawn. First, the mineralization at Columbia is strongly structurally controlled, with veins hosted within several north-trending fissures which may be related to stress fractures accompanying emplacement of Late Tertiary plutons. Second, these mineralized fissures have been offset by northeast trending faults. Lastly, the mineralization in the North Columbia area has been displaced by a series of shallow Quaternary landslides and debris flows. At the local level, north- and northeast-striking joints and fissures appear to be mineralized to a greater degree than those at other orientations. These mineralized structures are commonly offset by small-scale, northwest-striking joint sets.

8. DEPOSIT TYPE

The Columbia Project is an epithermal, quartz-sericite-adularia precious metal vein system hosted within intermediate volcanic and hypabyssal rocks. Deposits such as these typically have variable strike lengths which may reach two to three miles on a district scale and are mineralized with gold and silver over vertical extents of 500 to 1,000 feet. Mineralization is associated with quartz or quartz-chalcedony veining, silica flooded breccias and pyrite. Silicification and silica veining is concentrated along the main structures, cross faults, as stockworks adjacent to the main structures, and in flooded breccias zones. Columbia appears to be the lower-most portion of an epithermal vein system and may represent a root zone to a partially eroded system similar to the much larger, McDonald Hot spring gold deposit located a few miles to the north of Columbia.

8.1 Oxidation

Sampling studies conducted at Columbia indicate that oxidation is widespread and pervasive. Oxidation affects over 80 percent of all samples which assay 0.015 opt Au or greater. Samples of mineralization having two percent or greater sulfide comprise less than 6 percent of the mineralized population.

9. MINERALIZATION

The mineralization at Columbia is strongly structurally controlled. Epithermal gold and silver mineralization is hosted within north, northwest, and northeast-striking, high-angle fissure veins and stockwork zones that may be traced for distances up to 6,000 feet along strike and at least 700 feet down dip. Gold mineralization is directly related to vein abundance with high grades associated with vein abundances greater than 10 percent by volume. Quartz-adularia veins, though comprising only eight percent of the vein type population, are almost double the average grade of the resource.

The mineralogy of the veins at Columbia is simple. Gold occurs as electrum (Au 54 to 63 percent) within pyrite and oxidized pseudomorphs after pyrite as well as free gold and electrum in quartz gangue with lesser adularia, calcite, and rarely barite. Associated secondary minerals include goethite, hematite, and much rarer jarosite and hissingerite (hydrous iron silicate). Primary sulfide minerals include acanthite, chalcopyrite, covellite, pyrite, sphalerite, and uytenbogaartite (Au-Ag sulfide). Gold mineralization typically weakens at depth giving way to more base metal dominated mineral assemblages; however, overall base metal content is low in the lower portion of the gold system.

Sampling studies of Columbia mineralization indicate that, on average, quartz veins are 38 times more mineralized in gold than the adjacent altered wall rocks. Furthermore, gold mineralization is more strongly associated with high-angle, north-striking veins than those with other orientations.

Gold mineralization is strongly associated with argillic and silicic alteration; however, the presence of alteration is not a direct guide to gold mineralization as evidenced by broad zones of altered wall rock with no gold mineralization. The clay content of the mineralized zones is variable, ranging from traces of clay coating more competent rock fragments to samples that are essentially entirely clay. Approximately 20 percent of mineralized samples above 0.015 opt Au fall into this latter category.

The lithology of the host rock does not control gold mineralization to any significant degree. An exception to this statement is a calcareous andesite flow that appears to have been extruded after the mineralizing event and forms a cap on the deposit at the Columbia Flat area as discussed below.

Gold mineralization at Columbia is largely associated with four major vein systems: 1) the Columbia Vein; 2) the Rover Vein; 3) the Seven Up and Donnely Veins; and, 4) the North Columbia Veins. The vein systems are shown projected to surface in plan-view on Figure 7-2 and in cross sectional views on Figure 9-1, Figure 9-2, and Figure 9-3 and are described below.

9.1 Columbia Vein

The Columbia Vein is better described as a veined zone 5 to 20 feet wide consisting of a myriad of narrow quartz-adularia veins that occasionally coalesce into a single quartz rib. The strike of the Columbia is north to N12W and the dip varies from 65 to 70 degrees west. The veins range in size from hairline fracture fillings to five-feet wide and consist dominantly of quartz with lesser adularia and rare calcite. Most of the quartz veins are drusy with euhedral quartz crystals projecting inward from the vein walls into central, open cavities. Pyrite and oxidized pseudomorphs after pyrite are common on fracture surfaces and in the quartz matrix and locally make up to five percent of the vein by volume (before meteoric oxidation).

The hanging wall of the Columbia Vein is generally well mineralized with sheeted zones of subparallel stockwork quartz-adularia veins ranging in size from hairline up to one foot wide and more localized flooded breccias zones. Broad zones of bleached, clay-altered and fractured andesite hosting brecciated quartz veins and iron-stained clay veins are characteristic of Columbia hanging wall mineralization. The clay alteration is dominantly sericite with lesser kaolinite and quartz. The width of the Columbia hanging wall mineralization varies from over 200 feet at Columbia Flat, to less than 50 feet near the transition with the Rover Vein to the south.

The alteration contact on the footwall side of the Columbia Vein is typically abrupt, commonly grading from argillic and silicic alteration to propylitic alteration in as little as five feet. The contact is particularly abrupt where the Columbia Vein occurs as a discreet rib.

Overlying the Columbia Vein in the area of Columbia Flat is a calcareous andesite flow that appears to be post-mineralization and truncates gold mineralization. This unit is approximately 50 feet thick at its thickest point and is lenticular, thinning rapidly to the north, south, east and west.

9.2 Rover Vein

The geology of the Rover Vein is very similar to that of the Columbia Vein and is very likely the southern extension of the latter. The Rover is five to 15 feet wide and, like the Columbia, consists of numerous quartz-adularia veins that occasionally coalesce into a dense quartz rib. The general strike of the Rover is north to N70E and the dip is 65 to 80 degrees west. The Rover Vein is composed of drusy quartz veins with lesser adularia, pyrite, and oxidized pseudomorphs after pyrite. Partially oxidized and unoxidized pyrite, both in veins and in the host rock, is more common at the Rover than the Columbia, although all rocks exhibit some degree of oxidation. Unlike the Columbia, intense wallrock alteration and quartz veining extend up to 50 feet into the footwall of the Rover Vein as well as into the hanging wall. This is likely due to the fact that the Rover changes in strike in the vicinity of the Rover Mine shaft creating a broad zone of mineralized tension fractures.

The gold mineralization in the Rover occurs in shoots that occupy the near-surface portion of the structure. Gold grade decreases markedly approximately 250 feet down dip on the Rover structure.

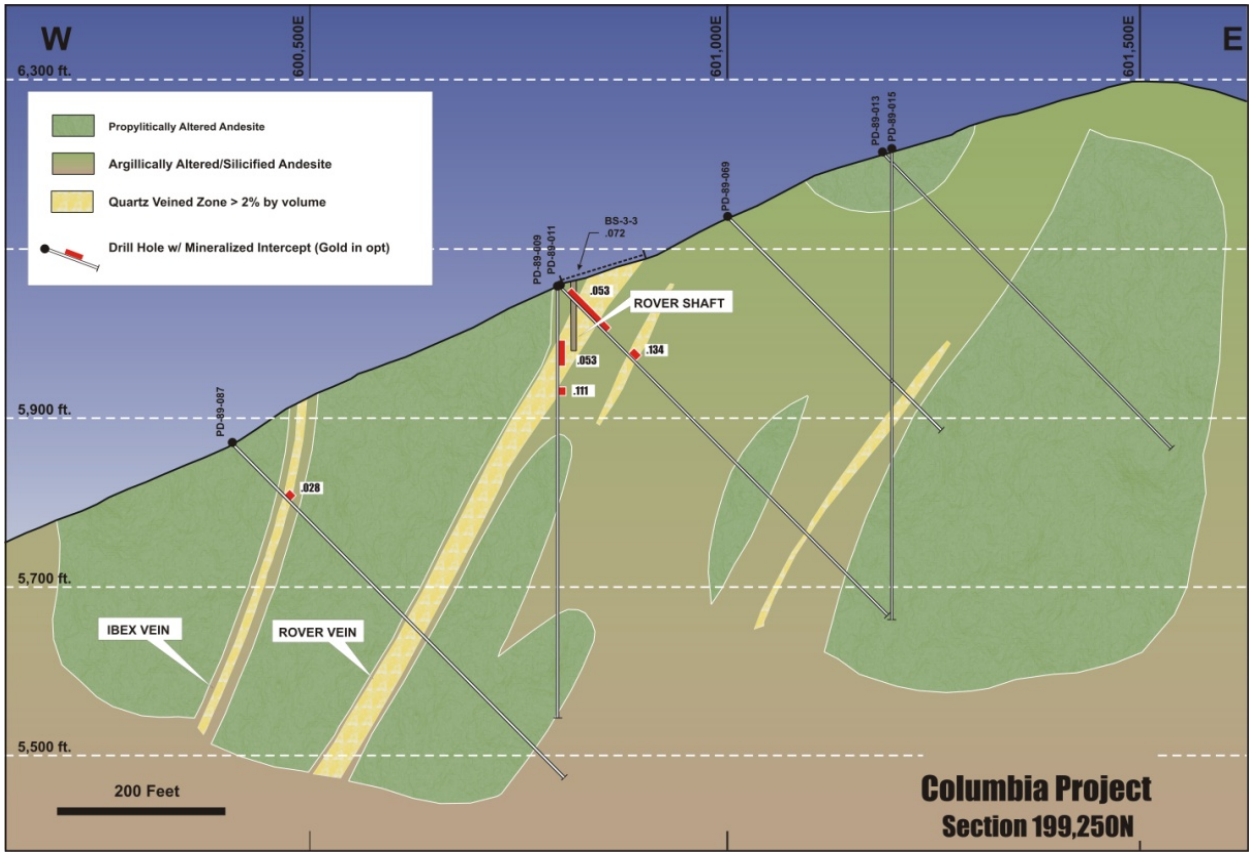

Figure 9-1 Cross Section Showing Rover and Ibex Veins

9.3 Seven Up and Donnely Veins

The Seven Up and Donnely Veins, in contrast to the Columbia and Rover structures, are discrete systems in that the veins and associated wallrock alteration occur in well-defined envelopes five to 60 feet wide. The Seven Up Vein strikes N12E from the Seven Up Mine portals to approximately 200,850 North and dips vertically to 85 degrees east. The Donnely Vein strikes North from 200,850 North to 202,000 North, where the vein thins to less than one foot. The dip of the Donnely is near vertical.

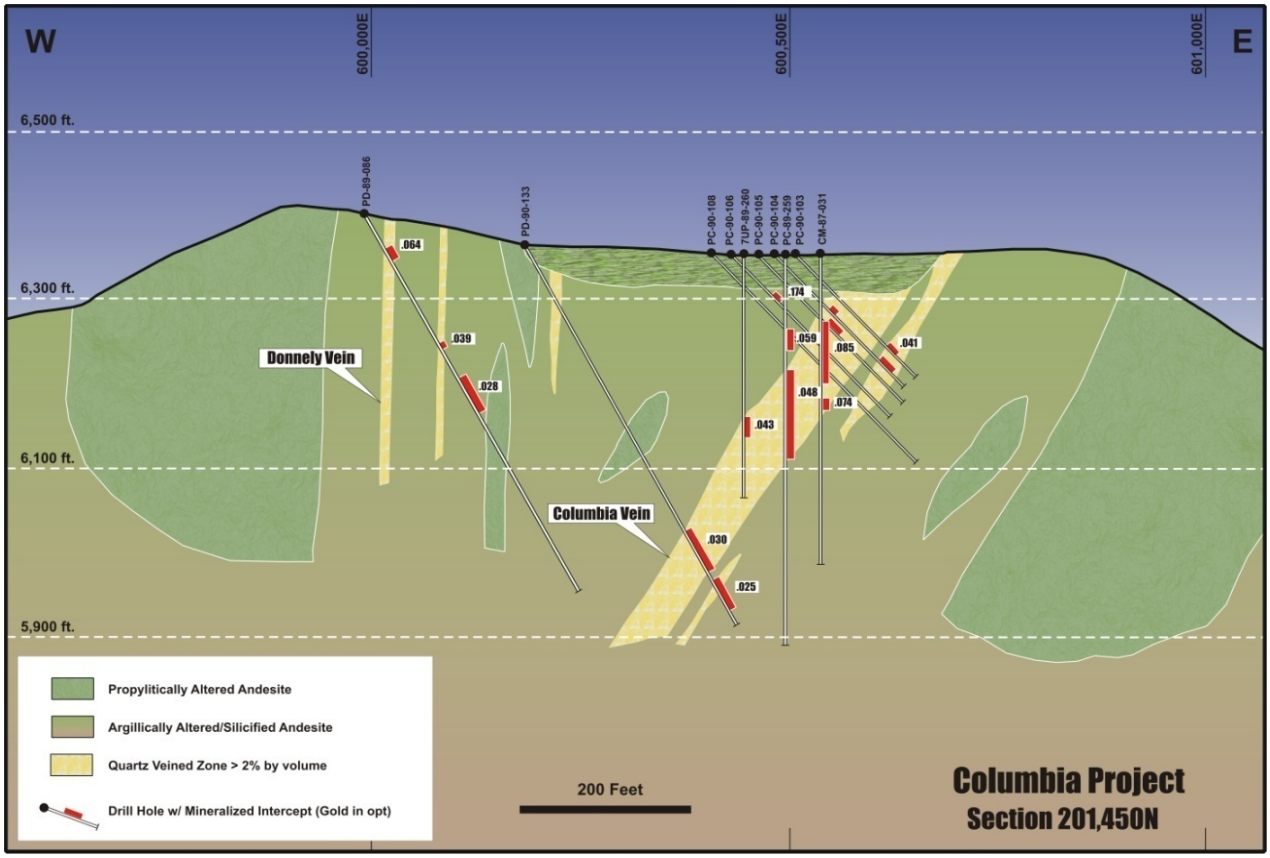

Figure 9-2 Cross Section Showing Columbia and Donnely Veins

The Seven Up and Donnely Veins consist of numerous drusy quartz–sericite-adularia veins with lesser pyrite and oxidized pseudomorphs after pyrite in argillically altered and silicified andesite. The veins contain breccias composed of aggregates of wallrock fragments probably derived from local collapse of portions of the vein walls. This may have occurred during the opening of tension fractures and/or hydrothermal brecciation.

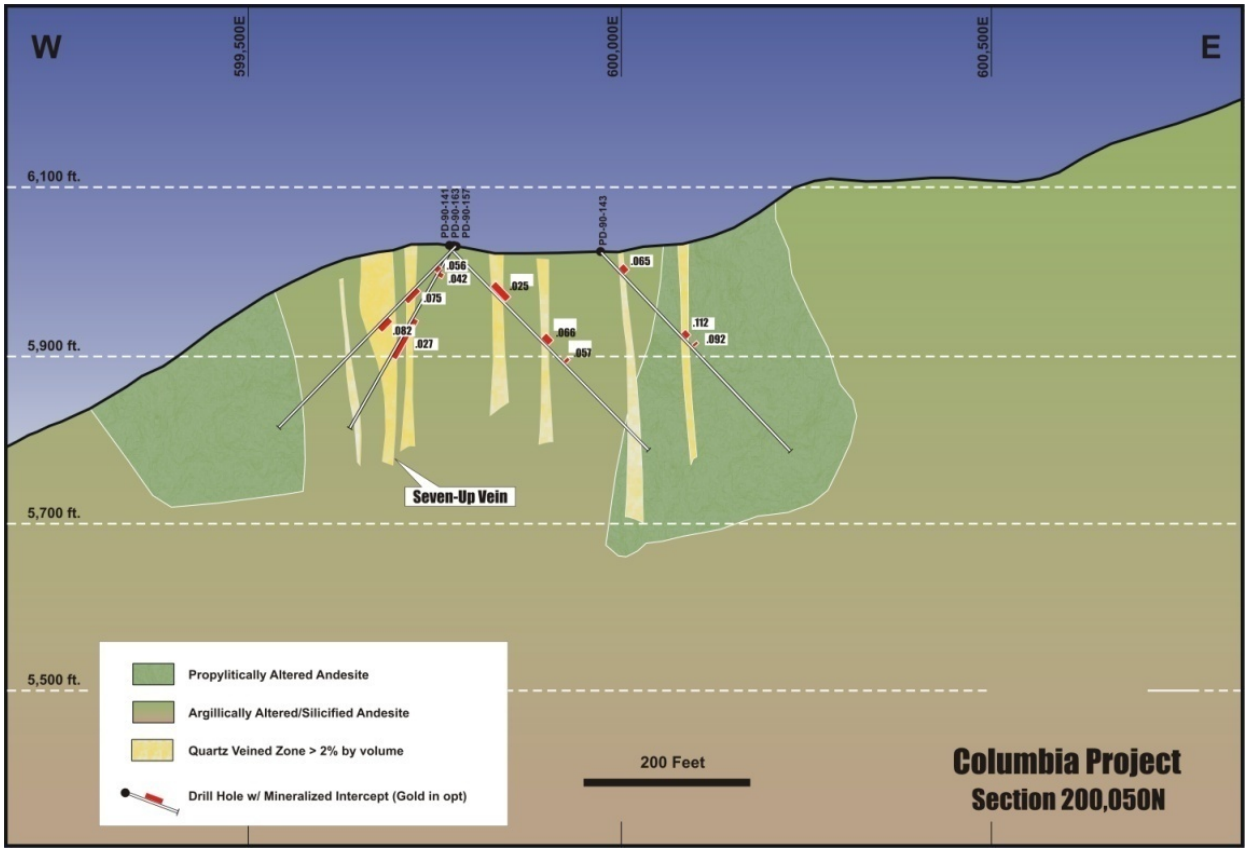

Figure 9-3 Cross Section Showing Seven-Up Vein

9.4 North Columbia Structures

The North Columbia area has been modified by a series of Quaternary landslides that have displaced the Columbia and Donnely Veins to the east and northeast in large, coherent blocks. The near-surface structure of the North Columbia area is chaotic with soil and organic matter incorporated into the slide to a depth between 50 and 100 feet deep. Below this depth, mineralized zones remain coherent, though still obviously displaced. Mineralization in this area is strongly oxidized, clay rich, and commonly lacking obvious signs of quartz veining. Though mineralized zones in the North Columbia area have been displaced, the location of mineralization is reasonably predictable due to the displaced blocks being rather large and coherent masses.

10. EXPLORATION

The Columbia Project has been explored in modern times by a variety of methods including surface geologic mapping and sampling, geochemistry, geophysics, trenching and extensive drilling. But by far, the greatest amount of exploration information has been obtained via trench mapping and sampling, diamond core drilling, and reverse circulation drilling (RVC), which is summarized in Table 10-1 and Table 10-2.

Table 10-1 Columbia Project Exploration Summary

Technique	Number	Total Feet
RVC Drilling	312	139,065
Core Drilling	24	7,809
Trenches	79	12,638

Table 10-2 Columbia Project Exploration Summary by Company

Company	RVC Drilling		Core Drilling		Trenching	
	Holes	Feet	Holes	Feet	Number	Feet
Western Energy Co.	72	36,010	17	6,113	19	2,002
Addwest Gold, Inc.	60	24,970	0	0	9	1725
Phelps Dodge Mining Co.	180	78,085	7	1,696	51	8,911

Not included in this exploration summary are 12 early core holes drilled by Amazon Mining Company and 20 RVC holes drilled late in the exploration work by Phelps Dodge Mining Company. Assay certificates and collar survey data from the Amazon holes were not available, and collar survey information from the Phelps Dodge holes were not available and therefore these holes have not been included in the current study. It should be noted that the 20 Phelps Dodge holes excluded from this study were drilled for geotechnical and/or condemnation purposes and are not located near the Columbia mineralized zones and would not have any influence on the mineral resources developed in this Technical Report.

11. DRILLING

A total of 312 reverse circulation and 24 core holes have been drilled and are included in this study of the Columbia Project's mineral resources totaling 139,065 feet and 7,809 feet, respectively. The central portion of the deposit encompassing most of the Columbia Flat area has been drilled on a 50-by-100 foot pattern along the strike of mineralization. Drilling on the northern and southern portions of the deposit has been completed on approximately a 200-by-200 foot pattern along the strike of mineralization and 200-by-400 foot patterns in area peripheral to mineralization.

11.1 Reverse Circulation Drilling and Logging

Reverse circulation drilling at Columbia was conducted using drill rigs capable of drilling angle holes to intercept dipping vein structures as close to a normal angle as possible. Typically, angle drill holes were drilled at 45 and 60 degrees from the same location. Drilling was conducted using 5 ½ inch diameter down-hole hammer bits or 5 ¼ inch tri-cone bits. All drilling was completed by reputable contractors using three man crews consisting of a driller, driller's helper, and sampler.

Geologic logging of each RVC sample interval was conducted by a trained geologist at the drill rig, and chip sample trays of each drilled interval were prepared simultaneously. The geologic logging format varied by company; however, all holes were logged by Phelps Dodge geologists to conform to a numerical logging format as well as to provide consistency in geologic interpretation. The numerical geologic log entries were then transferred into a computer database by a technician under supervision of a geologist

11.2 Core Drilling and Logging

Core drilling at Columbia was predominantly HQ size (2.5 inch diameter), though some PQ size (3.3 inch diameter) core was collected for metallurgical and geotechnical purposes. Some early core drilling conducted by Amazon Mining Company was NC size (1.7 inch diameter), though none of this drilling is included in the resource database due to its small sample size and uncertain collar locations.

All core holes were logged at an indoor facility by experienced geologists. Core logging formats varied by company, though all core was relogged by Phelps Dodge geologists to conform to a numerical logging format as well as to provide consistent geologic interpretation. All core was photographed to provide a visual record. In addition to collecting geologic data, geologists collected geotechnical information including RQD, description of fracture surfaces, and uniaxial compressive strength through point load tests.

12. SAMPLING METHOD AND APPROACH

12.1 Summary

The sampling protocol at Columbia throughout its exploration history was completed consistent with industry standards. During the Phelps Dodge work, special attention was given to sample size, sample preparation, and analytical techniques to address the possibility of coarse gold occurring within the mineralized zones. Consequently, a conservative sampling and analytical protocol was implemented and periodically checked to assure data quality and to minimize sample bias. The sampling protocol was developed by Pierre Gy and Francis Pitard Sampling Consultants and is based upon statistical analysis of gold grain size distribution in Columbia drill samples.

12.2 Reverse Circulation Sampling

Sampling of reverse circulation drill holes was conducted on five-foot intervals. Dry samples were split through a riffle-type splitter at the drill rig and collected in Tyvek bags. The drill hole number and sample interval were written on the bag labels and on the bag itself with indelible ink markers. Wet samples were collected in plastic five gallon buckets nested within larger 30 gallon plastic tubs. As the inner bucket filled, it was allowed to overflow into the larger outer tub where fines were allowed to settle out. At the end of a five-foot interval, the sample collected in the outer tub was combined with that in the inner bucket, the bucket was capped with a locking lid, and the lid was marked with the hole number and sample interval with an indelible ink marker. For both wet and dry samples, the sampling apparatus was set to obtain approximately 15 pounds of the sampled interval. Both wet and dry samples were transported to an enclosed central holding facility at least once per day where they were inventoried and prepared for shipment to the assay laboratory.

12.3 Core Sampling

Sampling of diamond core was conducted in a manner so as to conform to geologic features, though no sample interval exceeded five feet in length. Sample intervals were selected by geologists as the core was logged. The core was then split in half by a geologist or technician under a geologist's supervision using a hydraulic core splitter or diamond saw. The samples were bagged in a Tyvek or cotton canvas bag, and the drill hole numbers and sample intervals were written on the bag labels and on the bags themselves with an indelible ink marker. These bagged samples were retained in a central facility until transported to the assay laboratory. After sampling, the retained portion of the core was reboxed, and the boxes were stored in a secure facility. Some retained portions of the core were consumed in subsequent metallurgical testing.

13. SAMPLE PREPARATION, ANALYSES, AND SECURITY

13.1 Summary

All sample collection during modern exploration of the Columbia property adhered to accepted industry protocols. With the exception of the initial split at the drill rig, or in the case of core, the initial split of the core after logging the sample preparation and analysis was conducted by qualified, third-party contractors. Sample preparation and assay labs utilized during the various phases of Columbia exploration are listed below:

Bondar-Clegg
12980 West Cedar Drive
Lakewood, CO 80228

Silver Valley Laboratories
P.O. Box 929, One Gov't Gulch
Kellogg, ID 83837

American Assay Laboratories, Inc.
1500 Glendale Ave.
Sparks, NV 89431

Chem Assay Lab
4955 Iris Street
Wheat Ridge, CO 80033

Barringer Laboratories, Inc.
15000 West 6th Avenue, Suite 300
Golden, CO 80401

Blue Range Engineering
56 East Mercury Street
Butte, MT 59701

Precision Assay Laboratory, Inc.
210 South Division
Whitehall, MT 59759

13.2 Sample Security

Prior to shipping to the assay laboratory, all Columbia samples were stored at a controlled central facility with limited access. When project personnel were not present, the facility was kept locked, and distribution of keys to the facility was kept to a minimum. Keys to the facility were stamped "Do Not Duplicate" in order to prevent unauthorized copies being made. If personnel

left the project for any reason, they were required to return all issued keys as part of a check-out procedure.

All excess sample material, including assay pulps and coarse reject materials, were returned to the Project and are stored in boxes labeled with the hole numbers, assay certificate numbers, and sample intervals. These boxes were returned to the locked storage facility.

13.3 Drill Sample Preparation and Analysis

13.3.1 Western Energy and Addwest Sample Procedures

Assay labs employed by Western Energy Company and Addwest Gold, Inc., utilized a standard sample preparation and analytical protocol as shown in Figure 13-1

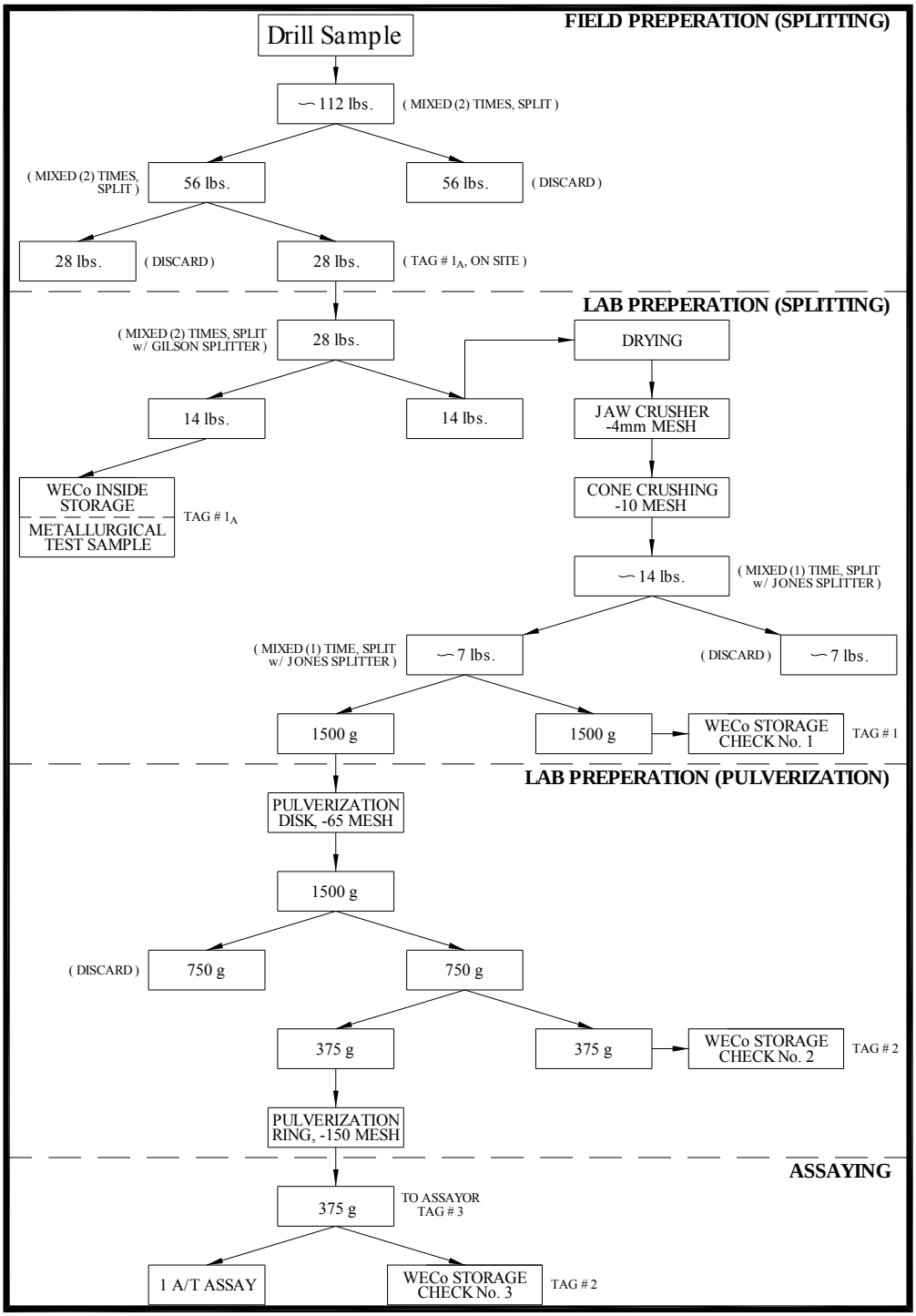

Figure 13-1 Sample Preparation & Analytical Protocol Western Energy Co. and Addwest Gold, Inc.

Western Energy and Addwest analyzed for gold and silver using conventional one assay ton fire assay method.

13.3.2 Phelps Dodge Sample Procedures

Early on, Phelps Dodge was concerned that the presence of fine particulate gold in the Columbia deposit may create an analytical bias if standard assay protocols were utilized. As a result, Phelps Dodge, through Bondar Clegg, implemented a program whereby an additional pulverization step was added in the preparation of assay pulps to minimize errors from splitting. Additionally, those samples with initial gold assays greater than or equal to 0.010 opt Au were re-assayed by standard 1 assay-ton fire assay methods several times using additional pulp splits and/or using screen-fire assay procedures. The sample preparation and analytical protocol used is shown in Figure 13-2.

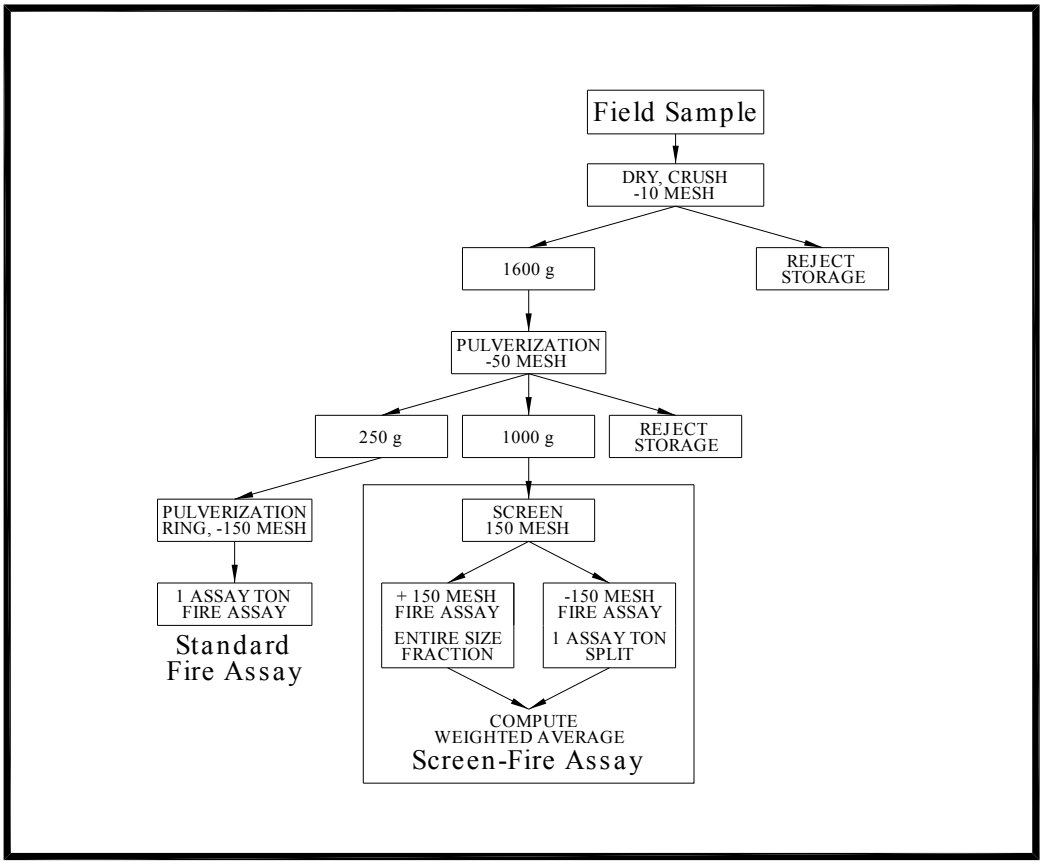

Figure 13-2 Phelps Dodge Sample Preparation and Analytical Protocol

In 1992, as a result of an analysis which showed the difference between conventional fire assays and screen-fire assays was negligible (0.0007 opt Au relative difference, or 1.4 percent), the sample preparation and analytical protocol was modified as displayed in Figure 13-3:

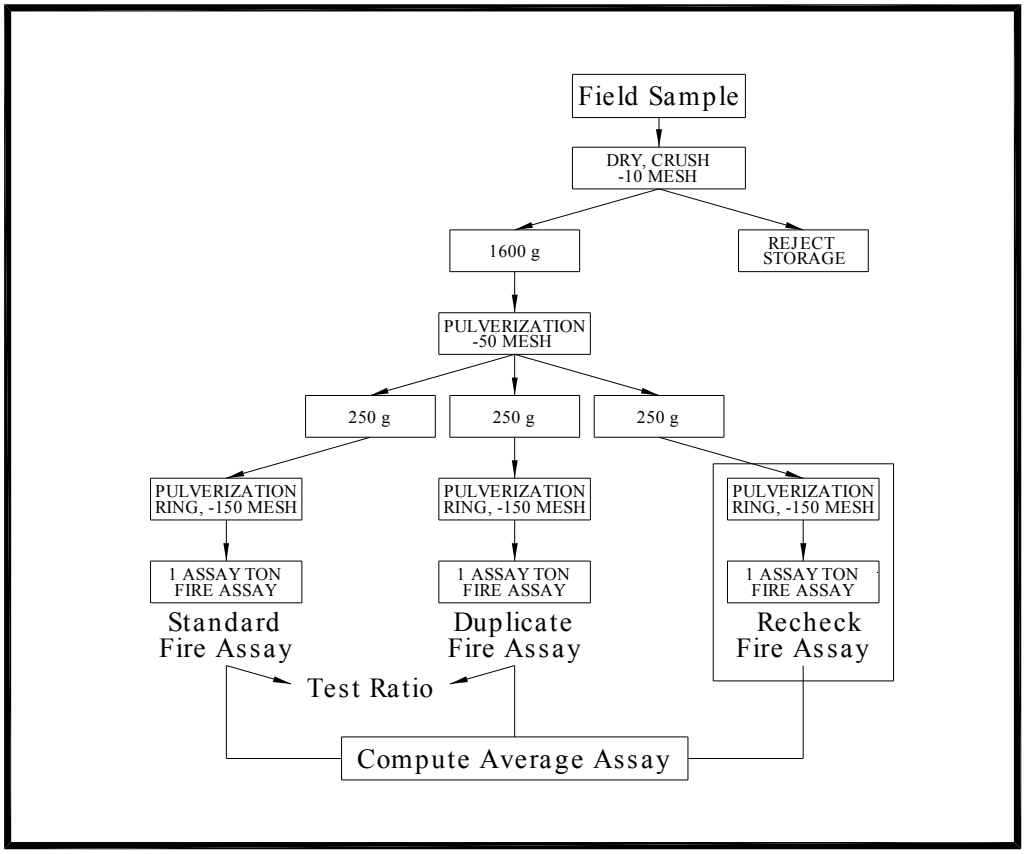

Figure 13-3 Modified Phelps Dodge Sample Preparation and Analytical Protocol

13.4 Analytical Quality Control

All previous exploration programs at Columbia routinely performed check assays on approximately 10 percent of all samples. Analysis of the check assay program indicated that the analyses correlated satisfactorily, with approximately 0.0007 opt Au relative error or approximately +/- 1.4 percent. Preparation of analytical standards from the project's host material was not possible due to the presence of occasional fine and coarse gold (up to 700 microns). Excess assay pulps from previous drilling and trenching programs are stored at a secure location and are available for further analysis should the need arise.

14. DATA VERIFICATION

The validated drill hole database for the Columbia project contains more than 33,600 individual sample intervals, with 30,800 gold assay values. More than 2,900 check assays have been performed for gold. In some cases there were as many as 3 repeat assays for a sample. Over 800 screen fire assays test for coarse gold.

Table 14-1 Columbia Project Gold Assay Totals

Assay	Number
Total Sample Intervals	33,633
Gold Assays	30,808
Gold Assays > 0.001 opt	29,232
Fire Assay Check 1	1,940
Fire Assay Check 2	139
Fire Assay Check 3	22
Screen Fire Assay	851
Silver Fire Assays	28302
Silver Check Assays	1678

There are more than 28,000 silver assays with over 1,600 check assays.

14.1 Verification of the Quality Control Program

Table 14-1 shows the relationship between the original assay and the first check assay. The graph is plotted on a logarithmic scale to highlight the differences at lower grades. This is significant because lab accuracy is typically near 0.001 opt Au, thus the lower grade samples segregate into rounded values. The comparison statistics of the original assay (shown on the horizontal axis) and the check show a difference of 0.002 opt Au in the average grade with identical standard deviations (Figure 14-1). The correlation coefficient of 0.955 shows exceptionally good reproducibility.

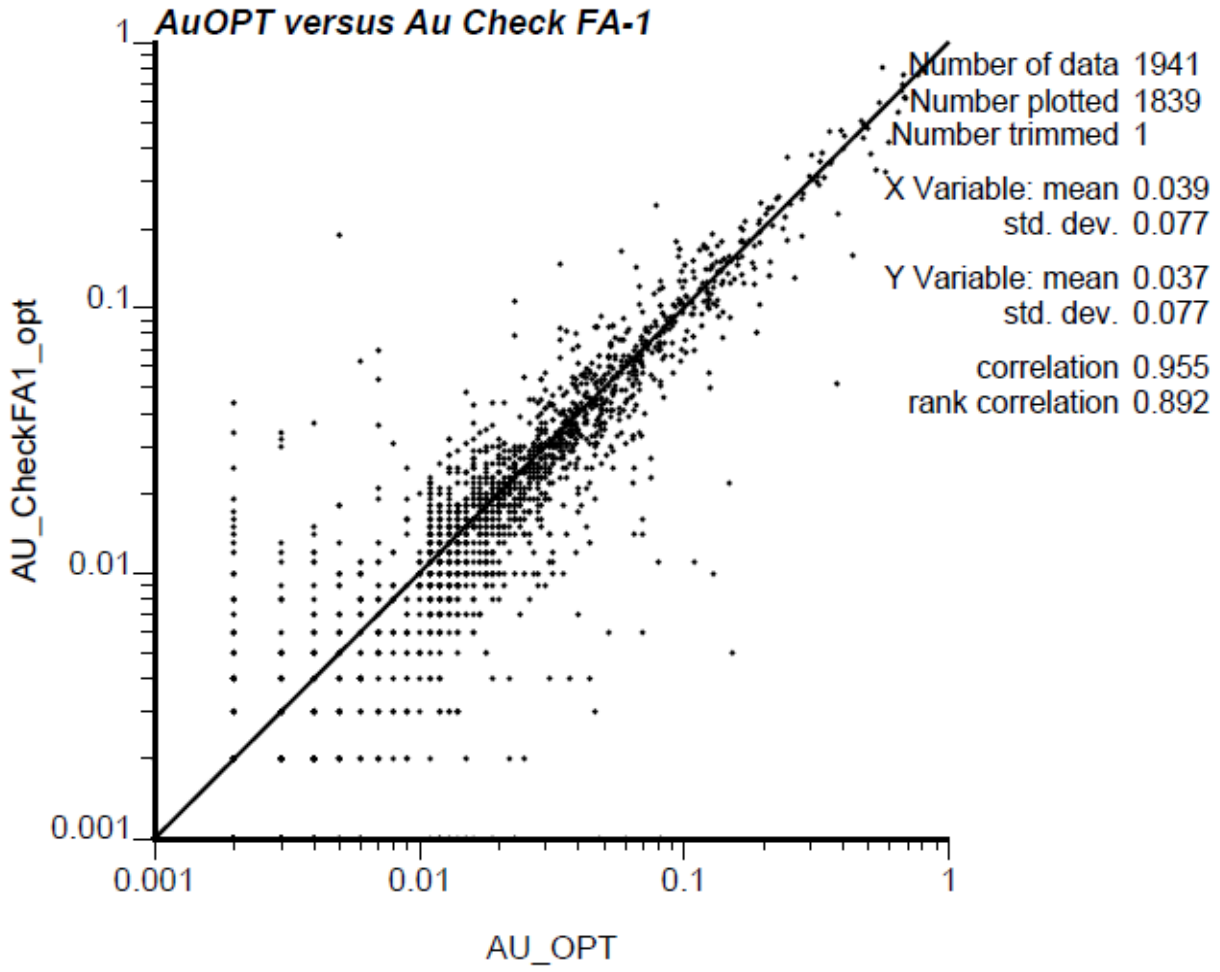

Figure 14-1 Check Fire Assay Comparison

Figure 14-2 shows the comparison of the original assay with screen fire assays. The mean and standard deviation of these samples are also very close. The slightly lower standard deviation of the screen fires may be due to the larger sample volume used for this assay although the effect is subtle. Again a correlation of 0.98 is exceptionally good.

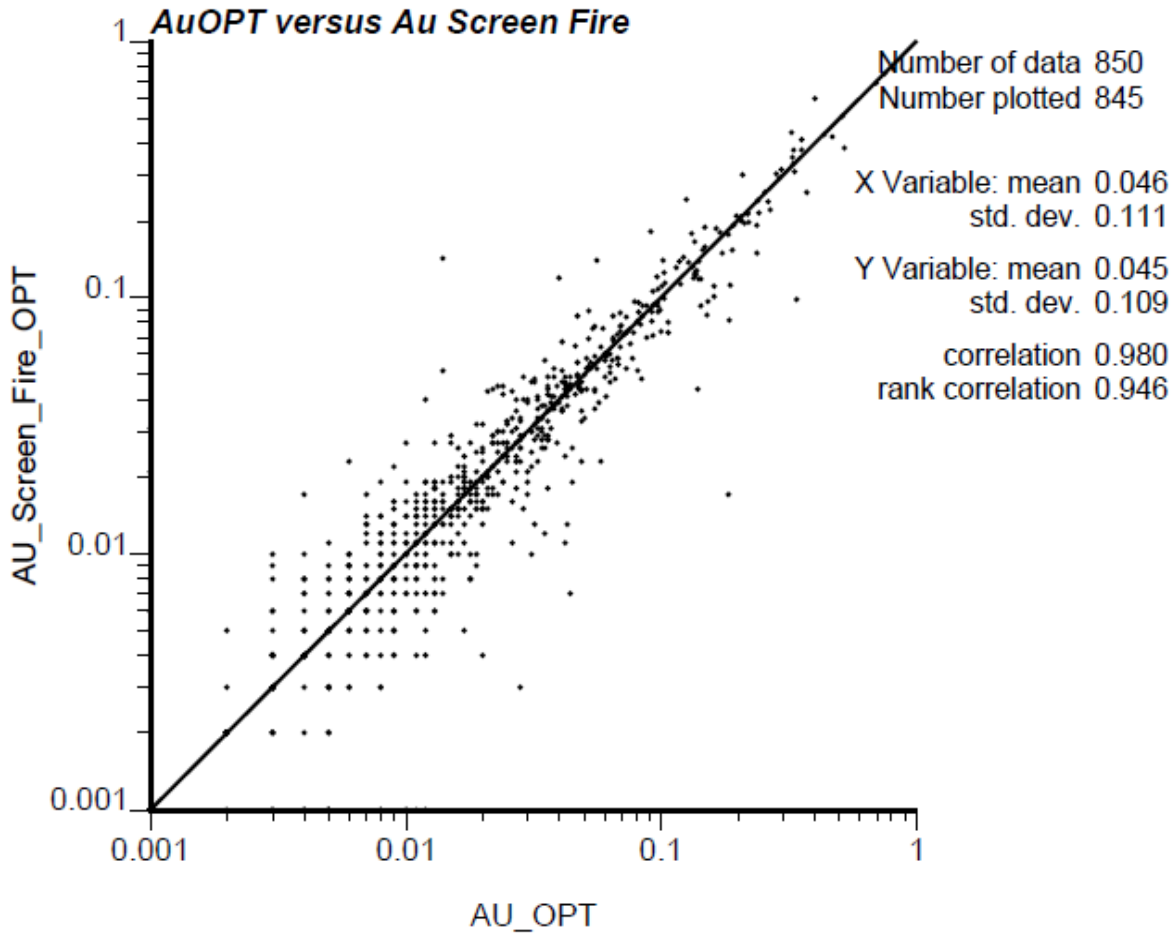

Figure 14-2 Screen Fire Assay Comparison

Based on the high correlation results, original assay values have been used in this study. This eliminates the possibility of any preferential bias by performing check assays on higher grades, which can increase the probability that the check assay is less than the original.

15. ADJACENT PROPERTIES

15.1 Adjacent Properties

The McDonald Gold Project is approximately five miles north of the Columbia Project and may be spatially and temporally related to the Columbia mineralization. The McDonald deposit rests on a thick sequence of Precambrian sedimentary rocks in approximately 1,200 feet of Eocene to Oligocene andesite and felsic ash-flow volcanic rocks that unconformably overlie the Precambrian sediments and host high-level, epithermal gold mineralization. The deposit geometry is controlled by a combination of lithic- and pumice-rich layers in volcanic tuffs and steeply dipping, intersecting stockworks of quartz-adularia veins of very similar mineralogical composition to those seen at Columbia. The timing and spatial distribution of the mineralization at McDonald, as at Columbia, is closely related to the volcanic history of the Lincoln area. Mineralization likely occurred between 39.0 and 37.0 Ma based upon whole-rock K-Ar dates of adularia-altered tuff and biotite K-Ar dates obtained from a post-mineral rhyolite tuff found north of the McDonald area. At depth, steeply dipping, quartz-adularia veins hosted within andesite of similar composition to that hosting the mineralization at Columbia occur along a northerly axis in line with the Columbia structures to the south. The McDonald deposit may represent a preserved remnant of a much more laterally extensive ash-flow sheet. At the Columbia site, this ash-flow sheet has been eroded away leaving only the deep, quartz-adularia vein system intact.

Several non-NI 43-101 compliant resource estimates have been conducted at McDonald, the latest of which was prepared by Canyon Resources in 1998 and is approximately 450 million tons at 0.019 opt Au. Though permit applications to develop McDonald as an open pit, gold and silver mine were submitted in 1994, development of the property has been stymied by political developments in Montana, which in 1998, banned the use of cyanide, effectively banning the processing scheme. Future development of the McDonald property remains uncertain.

16. MINERAL PROCESSING AND METALLURGICAL TESTING

Previous mineral processing and metallurgical test work conducted on Columbia Project materials were focused on cyanide-based processing technology. In 1998, the State of Montana banned the use of cyanide processing associated with new open-pit gold and silver mines, thus eliminating the cyanidization option at Columbia. Subsequent test work has focused on the use of alternative methods for the recovery of gold and silver. Processing evaluation for this study has been to consider conventional means, including gravity concentration combined with flotation concentration with on or off-site treatment of the concentrate. In addition, alternative lixiviants were considered as developed within the August 2000 study, "Economic and Technical Analysis of Alternative Technologies for Mining and Processing of Gold / Silver Ores of the McDonald and Seven-Up Pete Deposits".

16.1 Gravity Test Work

Western Energy Company performed a series of tests on three bulk metallurgical samples obtained from trenches at their in-house metallurgical test facility. The matrix of tests generally indicated that finer grinding increased gravity recovery of gold and silver. The three test sizes evaluated were -100 mesh, -65 mesh, and -48 mesh. Gold recoveries ranged from 65 to 85 percent, whereas silver recoveries ranged from 17 to 79 percent.

Resource Development Inc (RDi) of Wheat Ridge, Colorado completed a metallurgical test program during March 2006. The objective of the program was to evaluate the potential of recovery gold from Columbia material by gravity, flotation or a combination of the two processes. Gravity results indicated a gold recovery of 48 percent to 56 percent from a grind size of P_{80} 65 and 100 Mesh respectively. Silver recovery ranged from 16 percent to 18 percent from the same grind sizes.

16.2 Flotation Test Work

Phelps Dodge Mining Company conducted two scoping-level bulk flotation tests on drill hole composites in 1989 which yielded gold and silver recoveries of 81 and 35 percent, respectively. Phelps Dodge followed up with six additional scoping-level bulk flotation tests. At least one test on each composite resulted in gold recovery in excess of 90 percent, while silver recoveries ranged from 60 to 85 percent. This test work was completed at Phelps Dodge's in-house metallurgical test facility.

RDi completed a series of flotation tests in conjunction with gravity to evaluate the potential for a combined circuit. Initial flotation tests resulted in gold recoveries from 76 percent to 93 percent. Grind sizes ranged from P_{80} 65 to 150 Mesh. Silver recoveries ranged from 48 percent to 72 percent with the same grind sizes. Flotation following gravity using a grind size of P_{80} 65 and

100 Mesh resulted in 84 percent to 93 percent gold recovery and 66 percent to 73 percent silver recovery.

16.3 Mineral Processing

In 2006, Resource Development, Inc. conducted a series of gravity and flotation tests on a bulk metallurgical sample obtained from a trench excavated on the Columbia Vein. The results of these tests indicated that gravity concentration recovered up to 56 percent of the gold and 18 percent of the silver in the bulk sample. Flotation of the gravity tailing increased gold recovery to 93 to 96 percent, and silver recovery increased to73 to 77 percent. These results, combined with previous scoping-level tests, indicate that gravity concentrations, combined with flotation, are viable recovery processes for Columbia material. Off-site cyanide treatment of the flotation concentrate has been estimated at 90 percent recovery for gold and 40 percent recovery for silver based on the work completed in June of 2000 by Hazen Research.

Table 16-1 Metallurgical Recovery of Gold and Silver in Columbia Ore

Process	Gold	Silver
Gravity	52%	17%
Flotation	85%	70%
Flotation net addition to recovery	41%	58%
Offsite Cyanide treatment	90%	40%
Total Recovery	**89%**	**40%**

Further test work will be required to optimize these recovery concepts.

As an alternative to off-site cyanide treatment of the flotation concentrate it would be possible to treat the concentrate using ammonium thiosulfate (ATS). Within the August 2006 study previously mentioned, it was determined that a gold recovery of 65 percent could be obtained with ATS treatment of Columbia flotation concentrate. This route would eliminate offsite treatment of concentrates and the associated cost but would reduce the overall gold recovery to approximately 79 percent, an estimated 10 percent reduction.

Geologic characterization of Columbia mineralization indicates that ore will contain up to 30 percent clay with some samples being entirely clay. Selection of processing techniques will be optimized to minimize materials handling and comminution issues which may arise due to the presence of this clay. Crushing and grinding power requirements were estimated by Boliden Allis by testing representative Columbia samples. Impact Work Indices varied from 8.7 to 11.3 kWh/ton, while Ball Mill Work Indices (150 Mesh) varied from 11.1 to 15.2 kWh/ton. Abrasion indices varied from 0.0198 lb/kWh to 0.3998 lb/kWh.

17. MINERAL RESOURCE ESTIMATES

17.1 Introduction

Gustavson has developed a three dimensional block model and mineral resource estimate for the Columbia Project. The previous resource model was built by Phelps Dodge Mining in 1992 and the reports written at that time do not conform to the requirements of NI 43-101.

17.2 Database for Resource Estimation

Gustavson was provided with the drill hole database in a series of text files. Files provided included:

- Drill Collar Locations
- Downhole Survey Measurements
- Gold Assays
- Silver Assays
- Mineral Zone Codes

Other geologic parameters were logged and recorded in the database; however limited correlation between these parameters and gold and silver grades were seen. More important was a spatial correlation developed by Atna geologists which resulted in seven structural zones with similar grades and spatial orientations.

Sampling and sample preparation methods were well documented as described in Section 13.3. The original assay certificates were reviewed by Atna and assay values, duplicate assays, and fire screen assays were re-entered into the database. Gustavson has spot checked approximately 10 percent of the assay certificates and the data entry.

Figure 17-1 shows the drill hole locations and the general outline of the mineralized zones. The seven zone outlines were developed by Atna geologists based on grade shells developed at an 0.01 opt Au cutoff. In some cases, such as the Columbia Main Zone, the zone consists of a principal structure with associated mineralized fractures and stockworks. In other areas, especially the Donnely Main Zone, the zone consists of a number of smaller less defined structures connected by fractures and stockworks.

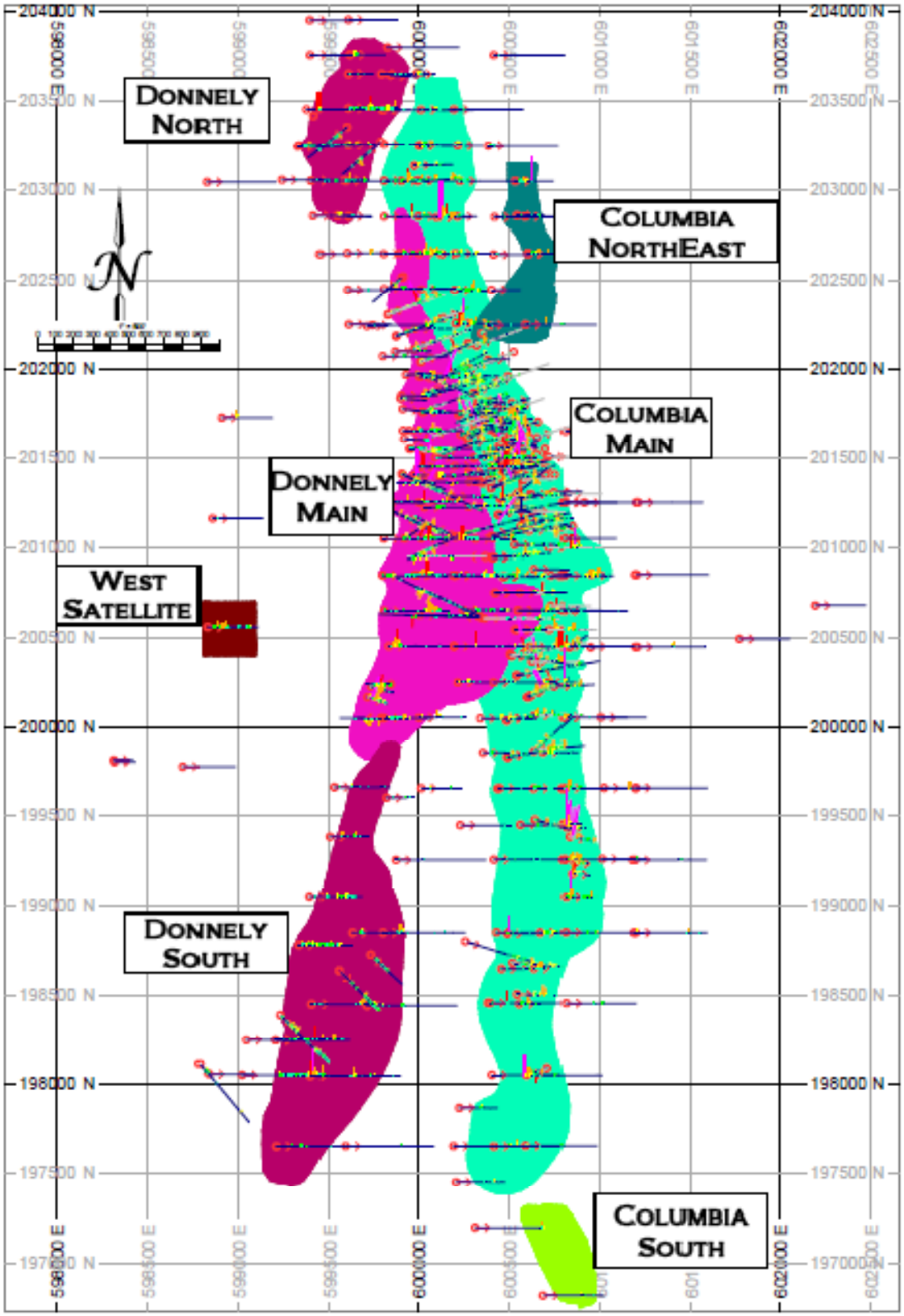

Figure 17-1 Columbia Drilling

17.2.1 Assay Database

Gold values at Columbia were subject to careful analysis as described in Sections 13 and 14. The rigorous sampling protocols used by each of the companies historically involved in the project have resulted in a very good assay database from which the resource can be estimated.

Based on a statistical evaluation of composite data and discussions with Atna geologists, a composite length of 10 feet was used for the geo-statistical analysis and resource modeling.

17.3 Modeling

To constrain the grade estimation, Gustavson created a block model that incorporated the grade shells and zones modeled by Atna, limiting the estimation of gold and silver to those shapes.

17.3.1 Lithology Modeling

The mineralization at Columbia appears to be controlled more by structure than lithology. The rock densities are not sufficiently variable for different lithologies to require inclusion of lithology in the resource model. For these reasons, lithology was not included in the resource model. It may be important to add lithology if future work indicates the pit slope angle is dependent on rock type.

17.3.2 Mineral Domains / Grade Shells

The analysis of mineralized domains that comprise data with similar characteristics is an important aspect of the modeling process. The data within a domain behave as a single statistical population, allowing better geostatistical models that produce better estimates of grade.

To create the mineral domains, Atna constructed grade shells by digitizing shapes drawn on 50-foot to 200-foot spaced cross sections, plotted on paper. The mineralized grade shells were interpreted at 0.05 opt Au and 0.01 opt Au cutoffs, also incorporating geology and structure, creating polygons that were digitized. The digitized sectional grade polygons were then brought into Surpac Vision 6.1© to create a three dimensional interpretation of the grade shell. In a second step, new grade polygons were constructed the computer screen on 50-foot to 100-foot intervals along east-west cross sections utilizing a nominal 0.010 opt Au cutoff. Zones of mineralization were carefully constructed to follow mineralized structural trends as outlined in the paper cross sectional interpretation. Mineralized envelopes were limited to one half (½) the distance to the next drill hole or 150 feet down dip and along strike from the last drill hole – whichever was less.

These screen generated sectional polygons were then triangulated to form 3D solids for each of the major mineralized zones (Columbia, Donnely, etc.) and the smaller satellite mineral zones. These three dimensional zones were then sliced horizontally on 40-foot bench levels and re-interpreted utilizing geology, drill hole assays, and structural information to create the final

shells utilized for development of the mineral resource estimate. Any overlap of shells was eliminated prior to completion of the mineral resource estimate. The grade shells were truncated to topography and to the post-mineral volcanic flow that cover a portion of the central Columbia area. This was done to insure that the post mineral volcanic flow represents a hard un-mineralized boundary in the mineral estimate and that no grade shells extended above the topographic surface.

17.3.3 Compositing

Down the hole composites were created from the drillhole database. Each interval of the drillholes had been previously coded as being located within (or not within) the mineralized group of lithologies. Down-the-hole length composites were nominally 10 feet in length starting from the hole collar. All statistics and variography analysis was length weighted to account for any variable composite lengths.

17.3.4 Statistical Analysis

Summary statistics for the seven modeled zones are shown in Table 17-1 and Table 17-2.

Table 17-1 Columbia Project Summary Gold Composite Statistics

Zone	Number Samples	Au (opt) Average	Au (opt) Std Dev	Au (opt) Variance	Au (opt) Max
Columbia Main	4226	0.0270	0.0764	0.0058	3.100
Columbia North East	79	0.0207	0.0454	0.0021	0.383
Donnely Main	1529	0.0201	0.0415	0.0017	0.619
Donnely North	215	0.0183	0.0313	0.0010	0.278
Donnely South	342	0.0216	0.0350	0.0012	0.416
West Satellite	31	0.0292	0.0353	0.0012	0.126
South Columbia	13	0.0258	0.0280	0.0008	0.101
Grand Total	6435	0.0247	0.0662	0.0044	3.100

Table 17-2 Columbia Project Summary Silver Composite Statistics

Zone	Number Samples	Ag(opt) Average	Ag (opt) Std Dev	Ag (opt) Variance	Ag (opt) Max
Columbia Main	3542	0.1089	0.2557	0.0654	5.460
Columbia North East	74	0.0563	0.0614	0.0038	0.435
Donnely Main	1488	0.0935	0.2641	0.0698	0.175
Donnely North	214	0.0671	0.0512	0.0026	6.300
Donnely South	360	0.0923	0.1181	0.0140	0.345
West Satellite	31	0.1065	0.1151	0.0133	1.405
South Columbia	13	0.0715	0.0477	0.0023	0.530
Grand Total	5722	0.10151	0.24437	0.05971	6.300

Two representative cumulative probability plots are shown for gold in the Columbia Main and Donnely Main mineralized zones in Figure 17-2 below. A complete set of the graphs is in Appendix B

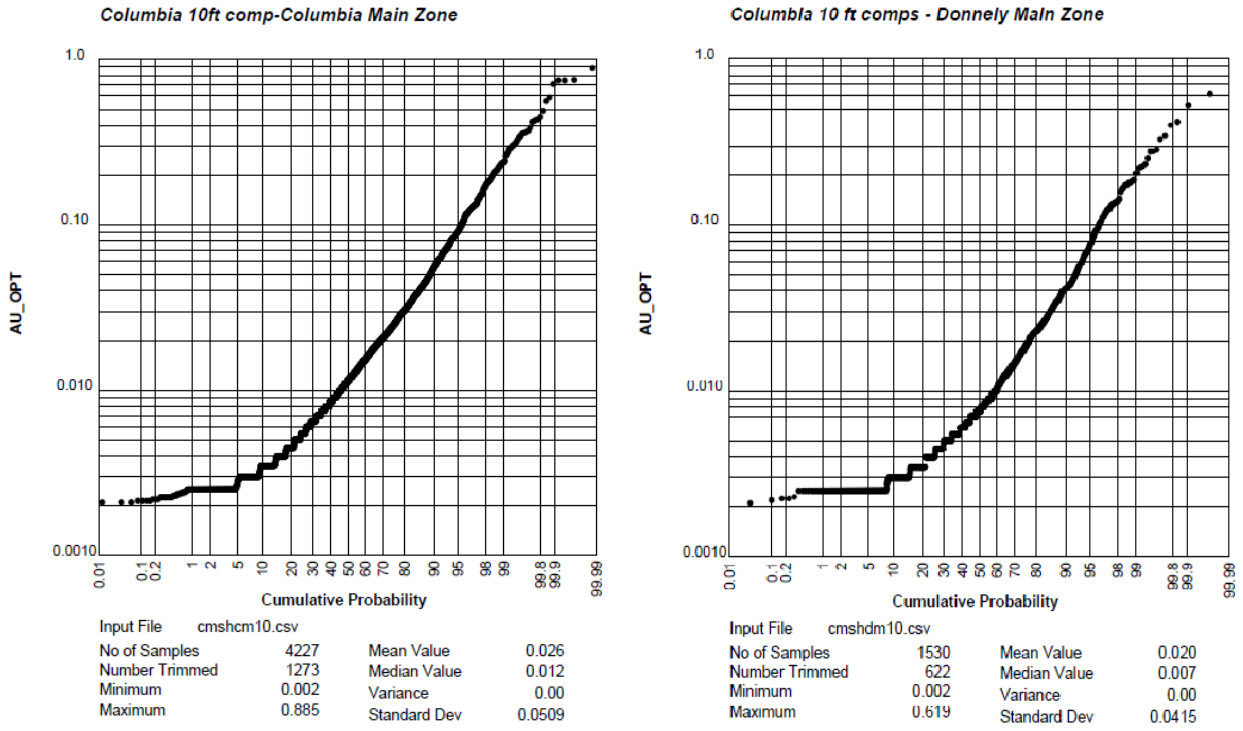

Figure 17-2 Cumulative Probability Plots for Columbia and Donnely

The distribution of gold grades within the Columbia and Donnely zones are nearly lognormal with two outlier values greater than 1.0 opt Au which were then capped to 1.0 opt Au. The other zones exhibit similar behavior.

17.3.5 Variography

Semivariograms, often noted simply as variograms, are a summary of a direct representation of the spatial continuity between data points. Variograms for most gold deposits are complex and often exhibit poor structure.

Pairwise Relative Semivariograms were analyzed for both gold and silver. Relative Semivariograms smooth an experimental semivariogram by scaling $\gamma(h)$ using the mean squared of each pair of points. This smoothes the graph, making interpretation easier. The Columbia and Donnely Zones have good data distribution and the variography is relatively well behaved. The other zones have considerably less data and the variograms for these smaller zones were very difficult to interpret. Due to the geometric similarity of the smaller zones to the bigger Columbia Main and Donnely Main zones, variogram parameters for the Columbia Main and Donnely main zones were adjusted and used for the sub-parallel adjacent zones.

Indicator variograms were also calculated and modeled for cutoffs at 0.01 and 0.1 opt Au to examine the behavior at those grades. The first cutoff at 0.01 opt Au was selected because it is near but below the envisioned economic cutoff of the deposit, and the 0.10 opt Au cutoff because it is near the 95th percentile of the data.

The Columbia Main Zone exhibits the best behavior. It appears to consist of one main vein structure and minor sub-parallel satellite zones. An example of the variogram for the Columbia Main Zone is shown in Figure 17-3. All directional variograms are in Appendix C.

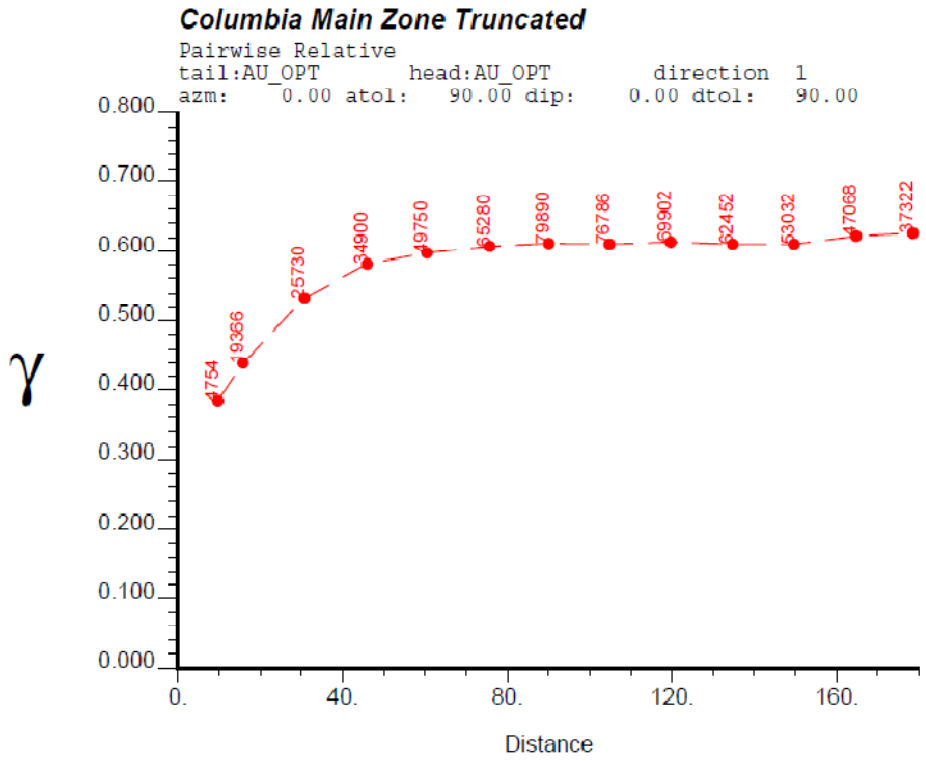

Figure 17-3 Columbia Main Zone Average Gold Variogram

Modeling (the fitting of a model to the experimental variogram) of these variograms was performed in close cooperation with Atna personnel.

For the gold grade variograms, the nugget effects vary between approximately one third and one half of the total variance. This implies underlying short range variability in the gold grades and will lead to local smoothing of the grade estimate. This small scale variability can be seen in the drill hole data although the ore zone is quite persistent between drill holes and cross sections.

Table 17-3 Principal Mineralized Zone Variogram Models

Zone	Azimuth Major Axis	Dip Inter Axis	Nugget	Major Range	Inter Range	Minor Range	Sill
Columbia Main	340°	80°W	0.30	100	100	30	0.60
Donnely Main	315°	40°W	0.41	200	160	100	0.38
Silver	0°	85°W	0.20	60	60	40	0.50

17.3.6 Silver

Silver mineralization appears to be more variable than gold. The variogram ranges are much shorter than for gold, and silver contributes much less to the value of the project. Silver variograms were only modeled for Columbia Main, and these parameters were used for silver grade estimation in all zones.

17.4 Block Model

A block model covering the Columbia project area was built in the Montana State Plane coordinate system in feet, NAD83, Vertical system is based upon 1927 datum. The model was built and grades estimated using Datamine© software.

17.4.1 Block Model Parameters

The block model was defined to include all drilling and known deposits. The model space is defined as follows in Table 17-4.

Table 17-4 Block Model Definition

	East	North	Elevation
Block size (ft)	20.0	20.0	20.0
Start	598400.0	196400.0	5200.0
Number	160	400	75

The vertical block model size is commonly defined by the mining equipment expected to be used to mine the deposit. The horizontal dimensions of the blocks are commonly defined as one fourth to one third of the nominal drill hole spacing of the exploration program. Although the deposit is drilled with variable density, the spacing of holes within the mineralized zones is between 50 and 100 ft both along and across strike. In the principal mineralized zones, spacing is close to 50 by 50 ft. thus the 20 foot square block is supported by the data, while being adequately representative of bulk mining methods.

17.4.2 Topography

Topography was based on aerial photo work circa 1990. Data were provided by Atna as both 3 dimensional contour lines and as a triangular mesh or wireframe. This wireframe was used to truncate the vertical extent of the model.

17.4.3 Acid Rock Drainage Classification

Although there are sulfides (principally pyrite) within the rocks at the Columbia project, there is buffering capacity from the propylitic alteration of the andesites. Existing waste dumps and adits are not generating acidic drainage. Gustavson did not address sulfur or potential for acid rock

drainage. Static acid base analysis (ABA) testing should be included as part of future drilling campaigns.

17.4.4 Metallurgical Recovery Model

Preliminary work performed by Resource Development Incorporated ("RDI") of Wheat Ridge Colorado indicates that it is possible to process the Columbia ore through a mill producing a gravity concentrate and a flotation concentrate with a combined gold recovery of between 93 percent and 96 percent, and a combined silver recovery of between 72 percent and 77 percent.

The concentrate could be either processed on site, or shipped off site to another Atna operation or to a custom refiner for final gold production, avoiding the use of cyanide at the mine and mill site.

17.4.5 Structures

Seven mineralized zones or grade shells were developed by Atna geologists. The outlines of the zones were developed on cross-sections and "wireframed" to create 3 dimensional shapes that have been included in the block model. The block model was coded based on these shapes. The code was used to control grade estimation, using similarly coded composites in the estimate.

17.4.6 Grade Model

Gold grades were estimated using a variety of methods. Six estimates were made for statistical and graphical comparison to the drill data. These methods are:

- Nearest neighbor
- Inverse distance to the 2nd power
- Inverse Distance to the 2.5 power
- Inverse Distance to the 3rd power
- Ordinary Kriging
- Mixed Kriging. This separated the grades into 3 subsets using two indicators, one at 0.01 opt Au and one at 0.10 opt Au. Sub grade material (below 0.01 opt) was not included and high grade was added as a proportion at a fixed grade to avoid overextending high grade samples.

17.4.6.1 Estimation Plan

The gold grade was estimated with two search passes. The first pass used 110 percent of the variogram range and required 2 independent drill holes to define measured and indicated resources. The distinction between measured and indicated was made based on a cutoff of estimation variance from the ordinary kriging estimate. Each mineralized zone was estimated independently using the samples from the zone and altering the search anisotropy to best match the orientation of the mineralization.

Silver was estimated in all zones using an average variogram model and search parameters.

Inferred resources for both gold and silver were estimated in a single pass where measured resources were not estimated. The silver estimate doubled the search distance and only required one drill hole to make an estimate. Inferred gold grades used 150 percent of the measured and indicated distance and only required one drill hole.

Table 17-5 Columbia Project Estimation Parameters

Zone	Azimuth Major Axis	Dip Inter Axis	Major Range (ft)	Inter Range (ft)	Minor Range (ft)	Min No. Samples	Max No. Samples
Columbia Main	340°	65°W	120	120	40	5	12
Columbia North East	340°	65°W	120	120	40	5	12
Donnely Main	350°	70°W	140	140	50	5	12
Donnely North	20°	54°E	140	140	50	5	12
Donnely South	14°	72°W	140	140	50	5	12
West Satellite	0°	90°	140	140	50	5	12
South Columbia	340°	85°W	120	120	40	5	12
Au Inferred	350°	85°W	180	180	60	3	12
Silver	0°	85°W	70	95	50	5	12
Silver Inferred	0°	85°W	140	190	100	3	12

17.4.7 Bulk Density

An average in-place density was assigned to all blocks below topography. The densities are based on a study completed in 1990, and are referenced to earlier work.

Table 17-6 Rock Density by Alteration

Alteration	Density (specific gravity)	Tonnage Factor (ft^3/ton)	Percent of Deposit
Silicified	2.52	12.70	46.90
Argillic	2.29	14.00	43.10
Propyllitic	2.45	13.10	10.00
Average Used	2.39	13.40	

17.5 Model Checks

Gustavson performed a thorough check of the models created, using several methods. This included using the variogram parameters to calculate the expected variance of the deposit based on the point to block variance.

Based on the cross sectional comparison of the model with the drill holes and on the variance of the estimated grades within the model, the inverse distance 2.5 model was selected as the best overall representation of the data at this time.

17.5.1 Visual Inspection of Models

The model was plotted on plan and in section to compare estimated grade to the drill hole location and grades. Examples of the cross sections are shown in Figure 17-4 and Figure 17-5, and a complete set of cross sections is in Appendix D.

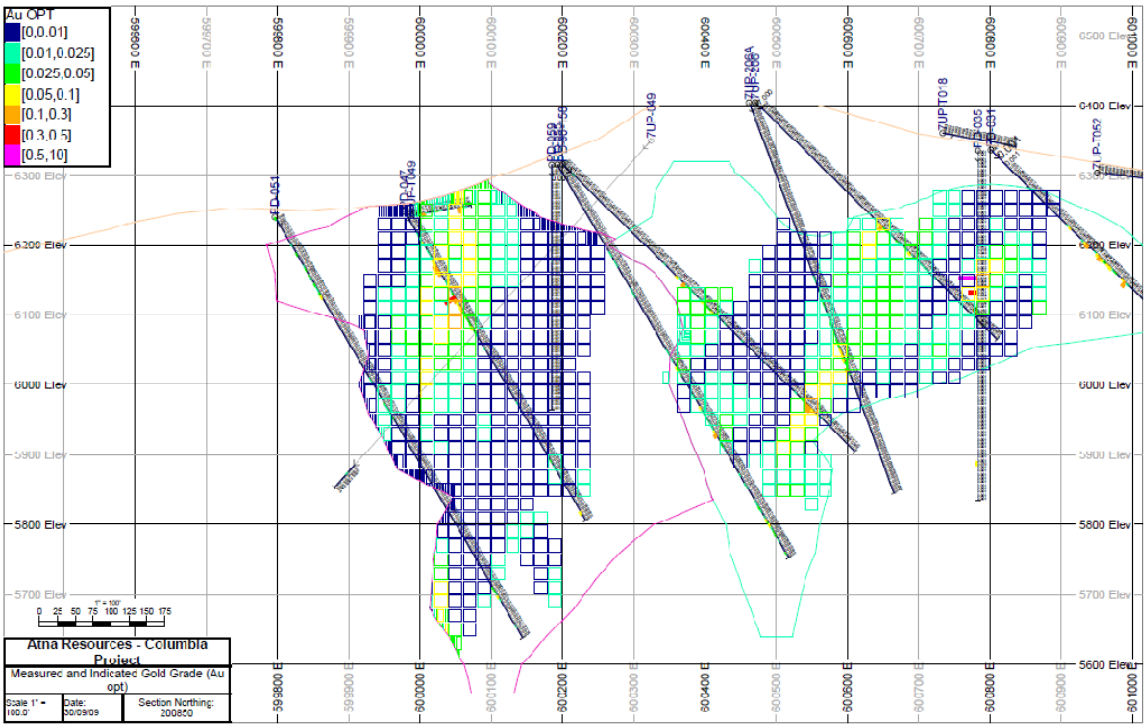

Figure 17-4 Block Model Cross-Section Columbia-Donnely Area

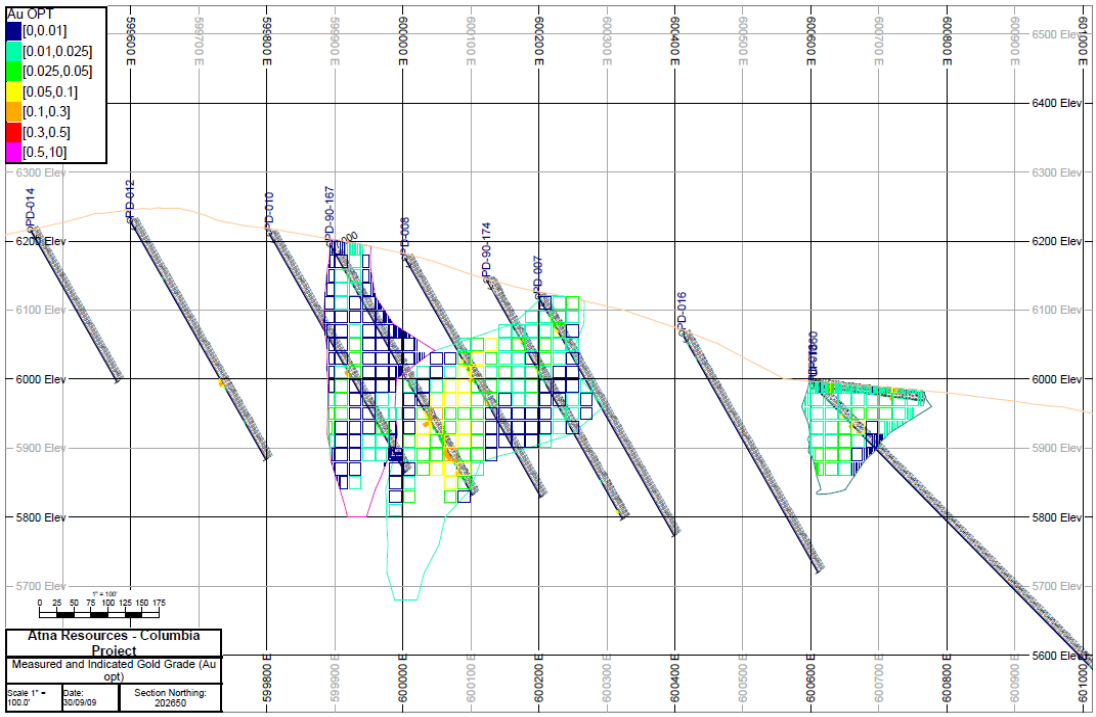

Figure 17-5 Block Model Cross-Section Columbia-Donnely-Columbia NE

17.6 Resource Classification and Search

The mineral resource was placed into categories based on the search criteria presented in Table 17-5. The differentiation of measured and indicated categories is based on an estimation variance cutoff of 0.30 opt Au. This was confirmed by visual inspection of the cross sections, plotting the estimation variance and proximity to drill holes. Figure 17-6 shows the classification compared to the proximity to drill holes.

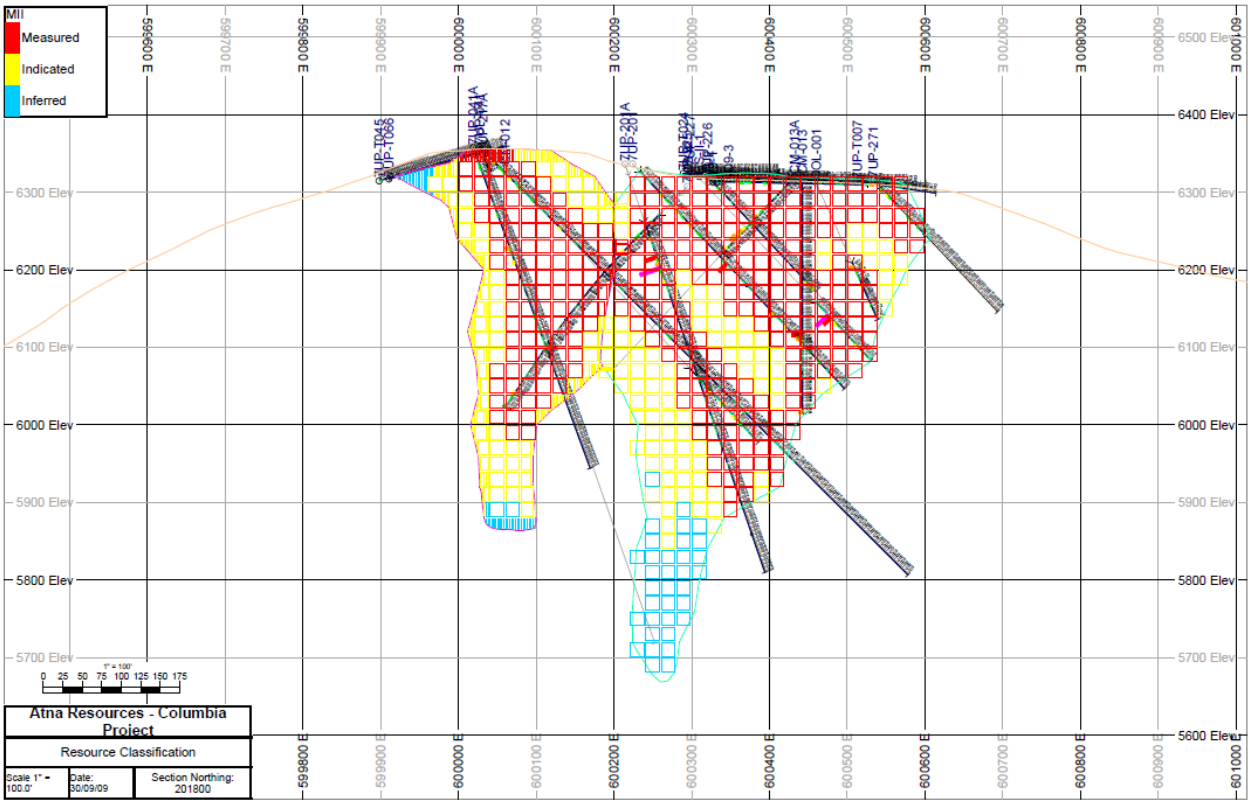

Figure 17-6 Cross Section of Resource Classification

17.7 Mineral Resource Statement

Using inverse distance to the 2.5 power (IDP) weighting algorithm, Gustavson estimates a mineral resource of over 970,000 ounces of gold in the measured and indicated categories at a 0.010 opt Au cutoff grade. Additionally, there are over 600,000 ounces of gold estimated in the inferred category. Table 17-7 summarizes Gustavson's Columbia Project Resource at several cutoff grades.

Table 17-7 Estimated Mineral Resource

Classification	Cutoff Grade (Au opt)	tons	Au grade (opt)	oz Au	Ag grade (opt)	oz Ag
Measured	0.01	10,438,629	0.0313	326,720	0.1162	1,213,350
Indicated		22,400,641	0.0288	644,555	0.0926	2,074,115
M+I		32,839,270	0.0296	971,275	0.1001	3,287,465
Inferred		22,971,429	0.0273	627,887	0.0827	1,898,632
Measured	0.02	5,370,167	0.0474	254,446	0.1548	831,099
Indicated		11,294,459	0.0431	487,227	0.1155	1,304,384
M+I		16,664,626	0.0445	741,673	0.1281	2,135,483
Inferred		10,705,234	0.0424	453,571	0.0968	1,035,787
Measured	0.05	1,442,964	0.0934	134,748	0.2492	359,544
Indicated		2,488,828	0.0888	220,983	0.1751	435,878
M+I		3,931,793	0.0905	355,730	0.2023	795,422
Inferred		2,235,930	0.0856	191,443	0.1171	261,737

Note: The estimation method for Table 17-7 is inverse distance to the 2.5 power. Numbers in the table may not precisely total due to rounding errors

17.8 Cutoff Grade Analysis

The cutoff grades used in this study are the same as grades used in previous estimates for easy, direct comparison. The expected cutoff grade is between 0.010 and 0.020 opt Au equivalent. Additional metallurgical test work and economic analysis may change the cutoff grade. Project economics may be optimized by evaluating the impact of alternate cutoff grades in the economic model. Costs and cutoff grade calculations for the open pit design are shown in Table 19-1.

18. OTHER RELEVANT DATA AND INFORMATION

18.1 Summary of Phelps Dodge Mining Company 1991 Feasibility Study

In 1991, Phelps Dodge Mining Company completed a Feasibility Study assessing the viability of developing Columbia (then-named Seven-Up Pete) Property as a 1.353 million-ton per year, open-pit mine and milling operation. The deposit, modeled prior to the existence of NI 43-101 contained a mineralized inventory of 13.924 million tons at 0.061 opt Au or approximately 849,000 ounces of gold. The potential minable resource was estimated at 9.483 million tons at 0.060 opt Au at a 2.9:1 waste-to-ore ratio. Gold recovery was estimated at 92 percent yielding approximately 521,000 ounces of gold recovered. The 4,400 ton per day milling operation as envisioned would require an average production of 13,500 tons of ore and waste mined over an estimated 7.7 year mine life. Ore processing assumed crushing, grinding, and carbon-in-pulp adsorption followed by subaerial tailings deposition. Gold and silver were to be recovered from strip solution via conventional electrowinning and smelted to produce doré bullion.

The Base Case economics evaluation in the Phelps Dodge study assumed gold and silver prices of $350/oz and $4/oz, respectively. Total capital costs were estimated to be $52.3 million, while operating costs were estimated to be $11.8 per ton of ore including $1.71 for mining, $6.55/ton for processing, and $1.00 per ton for G&A. The economic evaluation of the project yielded an IRR of 0.97 percent and a negative NPV of $26.2 million at a 15 percent discount rate. Sensitivity analyses performed in the study indicated that the project required a gold price exceeding $450/oz to produce an IRR above 15 percent.

While the 1991 Feasibility Study showed the project to be marginally economic, Phelps Dodge continued its development work in an effort to increase the size of the resource, improve mining methods to reduce dilution, and lower costs overall. The Columbia Project was placed on hold after discovery of the much larger McDonald deposit to the north. Columbia was viewed as a potential satellite operation to McDonald. All development activities ceased after passage of the State of Montana's regulations barring the use of cyanide at any new open pit metal mines in the state.

The Phelps Dodge Feasibility Study discussed above is not compliant with NI 43-101 standards and was carried out by internally by Phelps Dodge Mining Company in 1991. This study has no bearing on the potential economic viability of the mineral resources reported in this technical report and is included for historical background information. The mineral resources reported in this Technical Report do not have any feasibility study level work completed, and are not minable reserves. The mineral resources (or a portion there of) within this report may or may not be minable.

19. ADDITIONAL REQUIREMENTS FOR DEVELOPMENT PROPERTIES AND PRODUCTION PROPERTIES

19.1 Pit Design and Potentially Mineable Resource

In September, 2009 Gustavson Associates completed an update of the Columbia Project mineral resource estimate.

A preliminary economic pit limit analysis on the mineral resource model was performed. The economic parameters, provided by Atna during the development of the resource estimate, are shown in Table 19-1.

Gustavson used a three year trailing average (February 2010) gold price of $US850 per troy oz for the base case, and a silver price of $US 13.50 per troy oz, which is a gold to silver price ratio of 60:1. The calculated break even gold equivalent cutoff grade using these parameters is 0.02 opt Au.

Table 19-1 Pit Limit Analysis Costs

Operating Parameters	Value	Units
Mining cost **	$ 1.26	$/ton rock
Milling cost	$ 6.70	$/ton ore
Conc. transport @ 5:1 ratio Est ~200mi@0.14/t.mi	$ 6.00	$/ton ore
Tailings	$ 0.30	$/ton ore
General & Administration	$ 1.30	$/ton ore
Gold Price *	$ 850.00	$/troy oz Au
Silver Price	$ 13.50	$/troy oz Ag
Deducts on Gold		
Treatment Charges and Refining Charges	$ 62.00	$/oz Au
Royalty		
% Payable by Refiner	98%	
Gold Recovery	92%	
Silver Recovery	70%	
Cutoff Au Equivalent	0.020	Au opt

**** Estimated costs provided by Atna**

*** Gold price is 3 year trailing average as of February 2010. Silver is historic gold to silver ratio of 60:1.**

An initial pit limit analysis was run in October 2009 for a suite of gold prices of $600, $700, $900, $1,000 and $1,200 in addition to the $810 base case. The silver price was maintained at a 60:1 ratio to the gold price.

The pit limits were developed on the measured and indicated resource; and again on the total measured, indicated and inferred resource. For purposes of the Preliminary Assessment, it is acceptable to utilize inferred resource in the evaluation. An average pit slope of 45° was used for each case. Earlier reports reference a Golder study with inter-ramp angles of 50° and 62°, but with the relatively low highwall due to the mining the ridge top, a single road width changes the average overall slope of 40° to 50°. The pit designs thus include an allowance for roads, but do not include haul roads. The ultimate pit undiscounted economic values are summarized in Table 19-2 for each case, and more detailed tables are included at the end of the report.

Table 19-2 Maximum Value Pit Limit Summary*

Measured and Indicated

	Total Tons	Profit $	ORE Tons	Meas. Au oz	Ag oz	Rec. oz Au	Rec. oz Ag
$600	17,306,976	83,963,087	5,670,859	364,834	1,041,714	335,647	729,200
$700	22,533,256	121,783,423	7,753,057	429,244	1,269,277	394,904	888,494
$810	30,625,009	174,274,274	10,764,298	509,047	1,563,028	468,323	1,094,120
$900	32,639,759	216,026,143	12,135,798	537,591	1,687,343	494,583	1,181,140
$1,000	34,317,683	268,972,115	13,831,436	567,827	1,847,352	522,401	1,293,147
$1,200	37,658,886	382,575,202	16,946,167	615,912	2,087,133	566,639	1,460,993
$810 No Transport Cost	36,129,585	254,311,768	18,370,357	630,620	2,199,687	580,171	1,539,781

Measured Indicated and Inferred

	Total Tons	Profit $	ORE Tons	Meas. Au oz	Inf . Au oz	Ag oz	Rec. oz Au	Rec. oz Ag
$600	26,003,122	115,448,796	8,207,556	381,585	134,865	1,422,640	351,058	124,076
$700	33,624,290	169,067,161	11,370,366	452,700	160,052	1,759,000	416,484	147,248
$810	44,740,741	239,332,939	15,317,091	528,840	189,906	2,129,993	486,533	174,714
$900	48,203,875	303,512,183	17,898,803	564,419	207,984	2,353,331	519,266	191,345
$1,000	52,025,069	379,989,690	20,692,561	595,560	228,901	2,568,173	547,915	210,589
$1,200	59,344,594	547,358,319	26,334,775	645,899	268,218	2,976,824	594,227	246,761
$810 No Transport Cost	59,662,038	415,344,423	31,178,401	682,134	287,983	3,317,238	853,703	2,322,067

***These Tables were originally produced in September of 2009 when the trailing average gold price was $810.00/oz Au. They were not re-performed in February 2010 as the range of data has not changed. $850.00/oz Au was used for the design.**

All pits dug similar quantities of measured and indicated gold ounces in both the MI and MI+I cases (less than 10 percent additional M&I ounces). The difference in total contained ounces between the two cases is mostly due to the additional inferred resource in the analysis. Nearly all M&I ounces are mined in the M&I pit analysis. Figure 19-1 and Figure 19-2 show projections of the pit limits for the $810 Au pit limit for the MI and MI+I resource case respectively. The color coding shows the incrementally larger pit shells dug by the Lerchs Grossman miner, as a

percentage of the maximum. Blue areas are the most economically robust and red the most economically marginal. Comparing the two figures shows that the greatest change occurs in the Donnely South Area with smaller changes around the edges of the other mineralized zones. This indicates that conversion of inferred to M&I with additional drilling offers potential to increase the resource as well as the potentially minable resource.

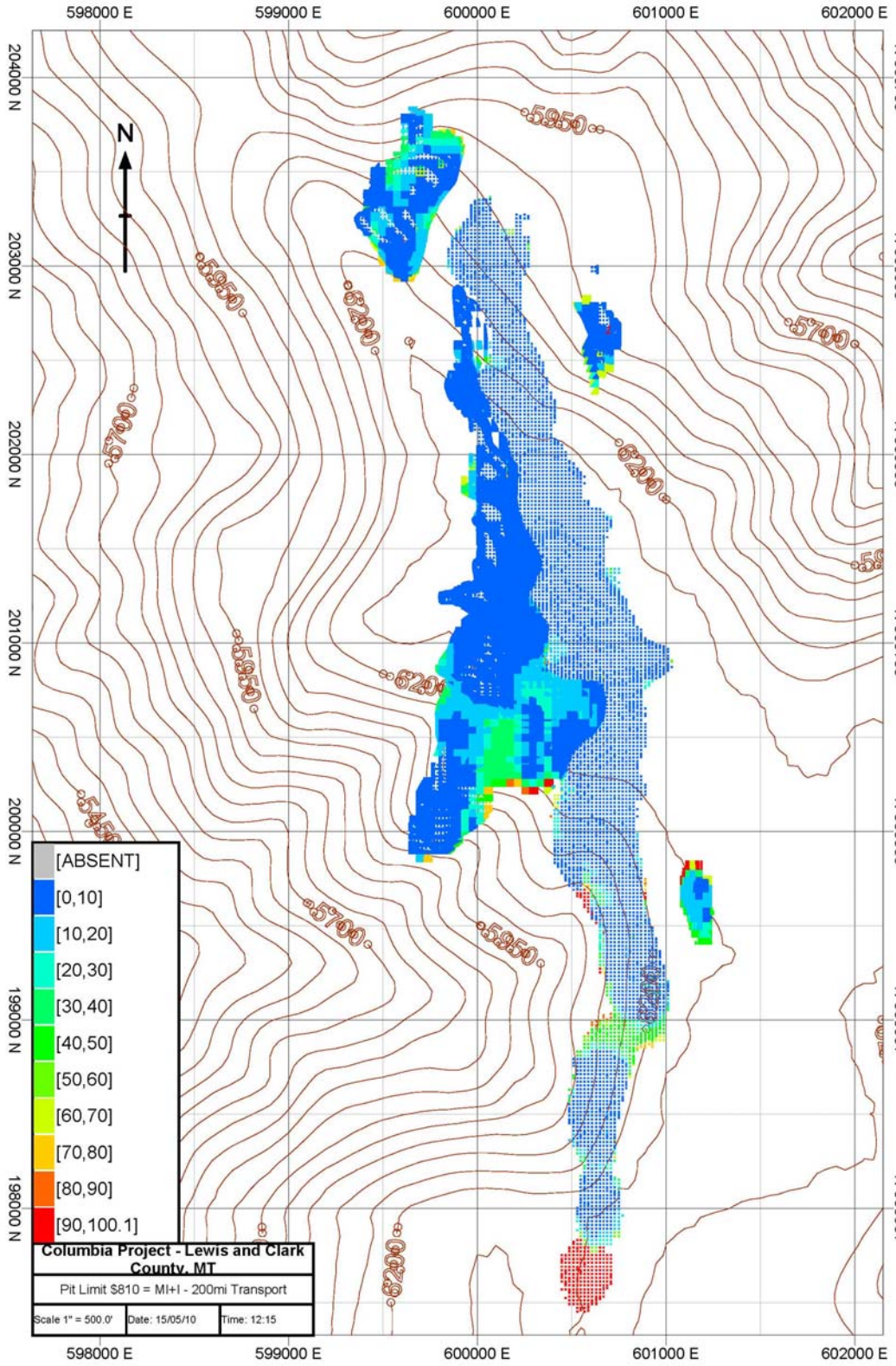

Figure 19-1 Projected Pit Limit for MI Resources at $810

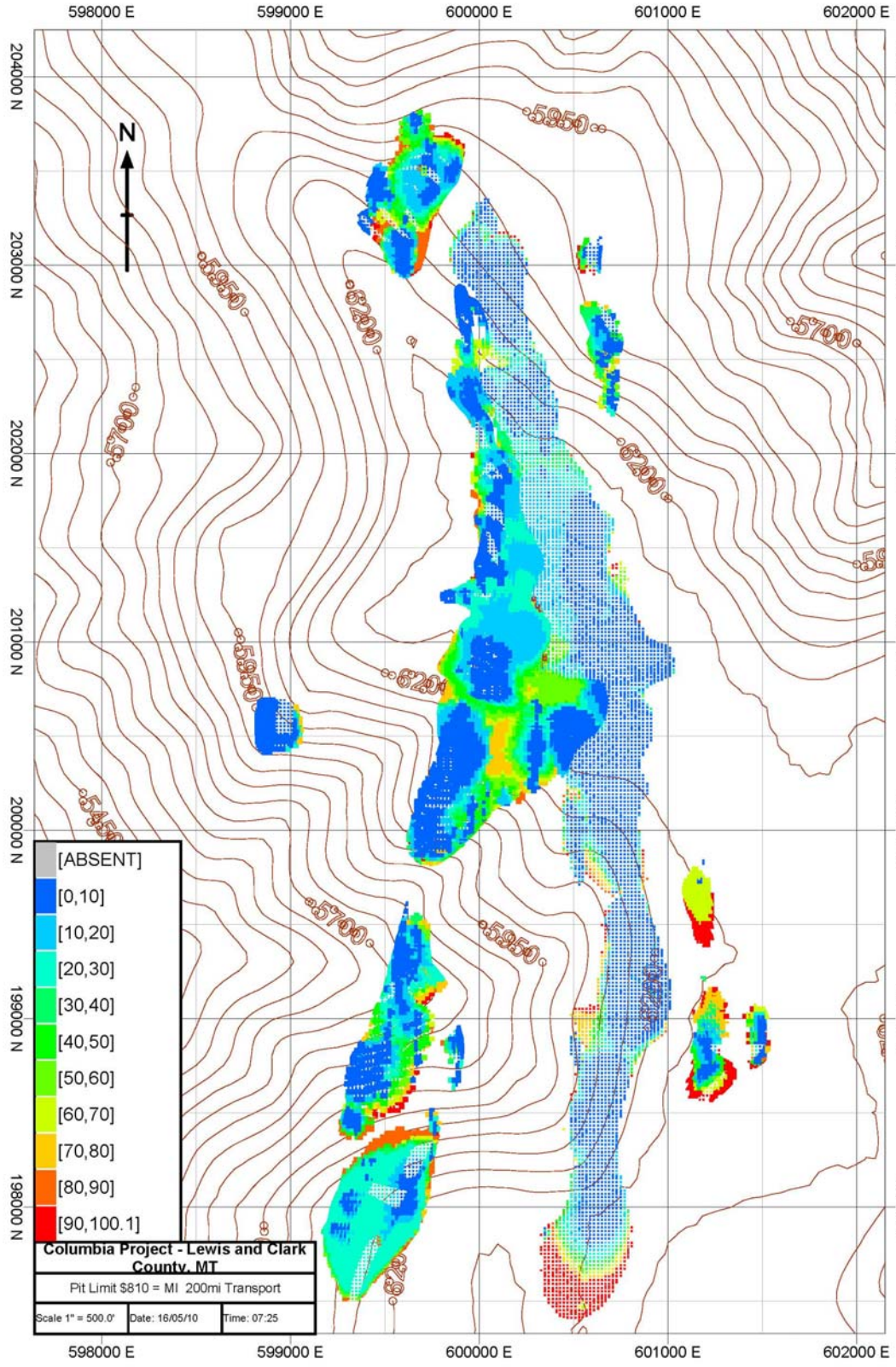

Figure 19-2 Projected Pit Limit for MI+I Resources at $810

Gustavson formalized this study in February 2010. Between October 2009 and February 2010, the trailing average gold price rose from $810.00/oz to $850.00/oz Au. This offered very subtle changes in the pit limits. A series of "pit shells" was produced to analyze the shell to use for a pit design. The best pit shell to use for final design and mine production is often not the "maximum value - ultimate pit", but a slightly smaller pit that does not mine the final very high strip ratio ore tons.

To determine the best pit shell for final design, Gustavson examined the curves of profit, tons and ounces of gold produced in successive pit shells. As the pit shells approach the maximum pit, the consecutive shells become more marginal, i.e. more tons moved per ounce produced, thus the profitablity of those ounces has a higher economic risk both in terms of the cost of production and the time that is required to produce the ounces. Figure 19-3 shows a large increase in tons without a corresponding increase in ounces or profit near pit 64.

There is an opportunity to mine only 67 percent of the total tons and earn over 90 percent of the possible profit. This pit is similar in size to the previously analyzed $810/oz gold pit.

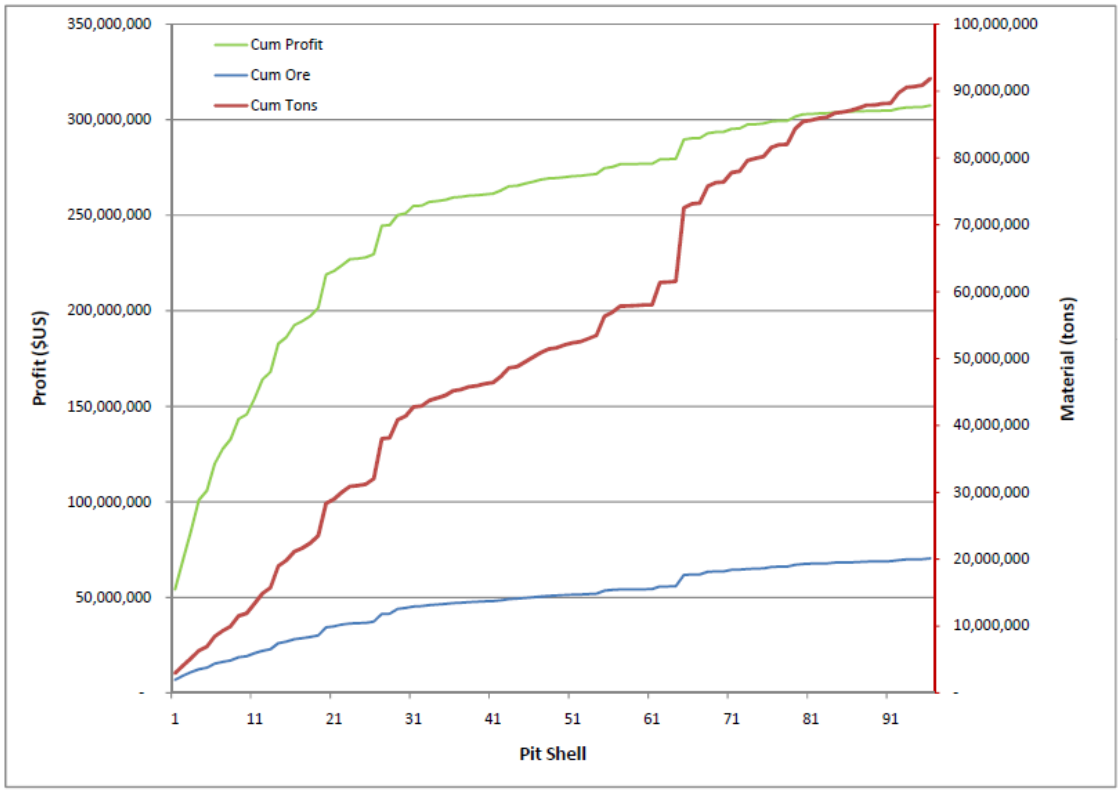

Figure 19-3 Pit Shell Sensitivity Measured, Indicated and Inferred Resource

19.1.1 Open Pit Design

As a preliminary assessment, the pit has been developed without roads and with assumed waste dump locations. Figure 19-4 shows the final pit limit and Table 19-3 shows the potentially minable resource. Approximate haulage profiles have been developed to account for mine productivity.

No detailed geotechnical data exists at this time, so the design slope is 45 degrees. The slightly steeper pit slopes which will probably be achievable will be offset by the addition of haul roads, although as there is side hill access to many of the benches, this can be minimized.

Equipment is assumed to be 100 ton rear drive trucks and front end loaders. Roads have been assumed at 10 percent grade.

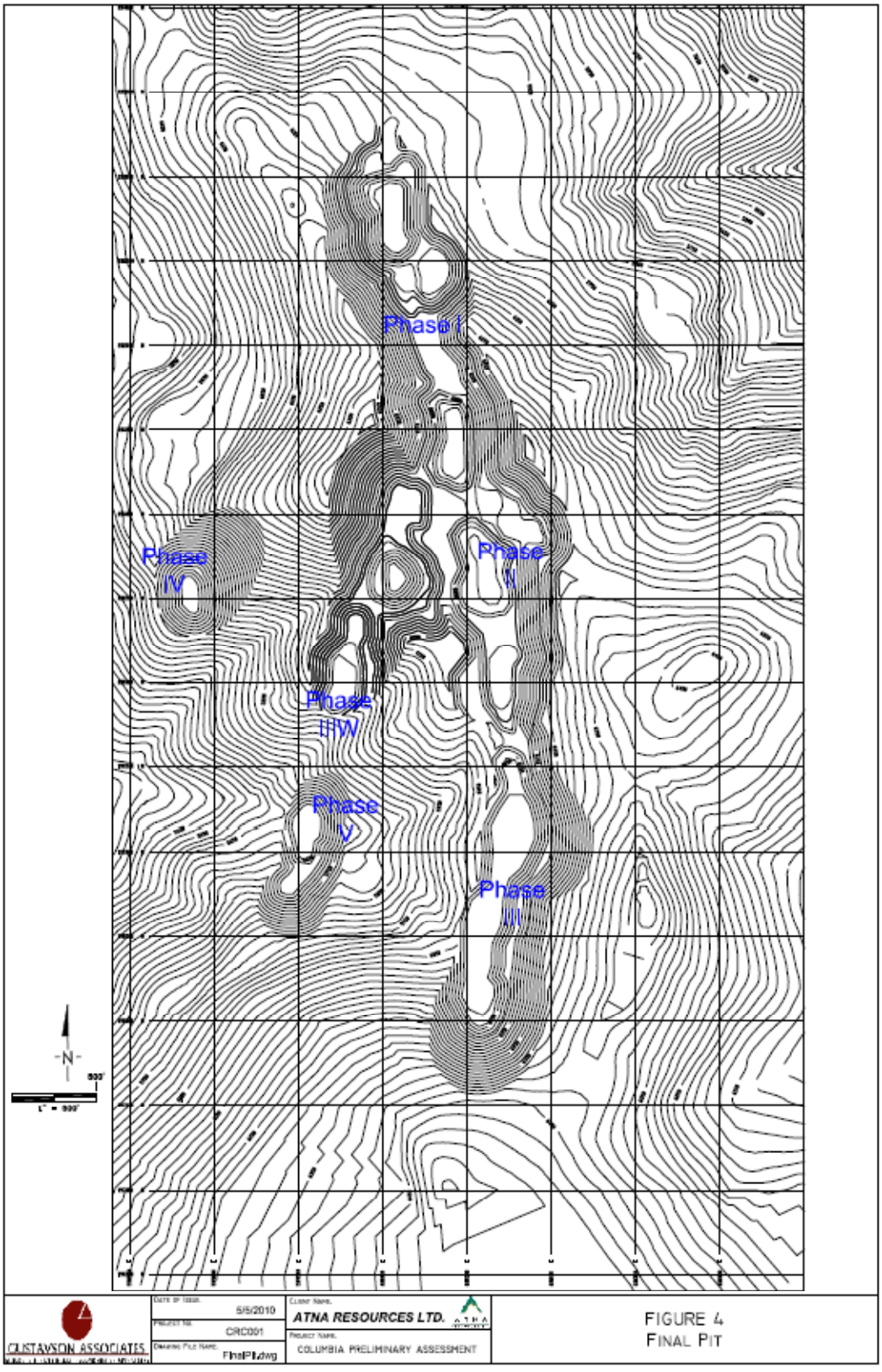

Figure 19-4 Final Pit Limit

Table 19-3 Minable Resource Summary

Columbia Potentially Minable Open Pit Resource

Bench	Ore Tonnage k-tons	Ore1 Au opt	Ore1 Ag opt	Waste Tonnage k-tons	Total Tonnage k-tons	Strip Ratio
6420	-	0	0	2.46	2.46	99.99
6400	-	0	0	27.49	27.49	99.99
6380	7.9	0.07	1.011	360	367.89	45.6
6360	36.51	0.059	0.377	728.03	764.54	19.94
6340	63.39	0.04	0.177	1,240.47	1,303.86	19.57
6320	90.9	0.036	0.128	1,676.76	1,767.66	18.45
6300	172.49	0.041	0.136	1,999.98	2,172.47	11.59
6280	244.71	0.044	0.153	2,261.04	2,505.75	9.24
6260	345.01	0.044	0.15	2,374.31	2,719.32	6.88
6240	431.81	0.045	0.155	2,466.24	2,898.05	5.71
6220	558.78	0.044	0.152	2,492.34	3,051.12	4.46
6200	675.88	0.043	0.162	2,526.85	3,202.73	3.74
6180	791.13	0.044	0.161	2,533.02	3,324.15	3.2
6160	928.51	0.046	0.16	2,481.07	3,409.58	2.67
6140	1,042.47	0.051	0.171	2,413.41	3,455.88	2.32
6120	1,109.88	0.053	0.168	2,366.19	3,476.07	2.13
6100	1,125.20	0.052	0.162	2,336.23	3,461.43	2.08
6080	1,065.71	0.051	0.153	2,201.71	3,267.42	2.07
6060	1,006.16	0.05	0.135	1,893.68	2,899.84	1.88
6040	957.19	0.046	0.128	1,665.48	2,622.67	1.74
6020	815.17	0.044	0.121	1,432.44	2,247.61	1.76
6000	629.82	0.047	0.117	1,188.78	1,818.61	1.89
5980	514.86	0.049	0.118	914.18	1,429.04	1.78
5960	334.66	0.048	0.109	641.55	976.21	1.92
5940	270.75	0.049	0.105	455.23	725.98	1.68
5920	237.2	0.047	0.093	355.86	593.06	1.5
5900	212.89	0.048	0.094	298.44	511.33	1.4
5880	134.56	0.045	0.094	251.31	385.87	1.87
5860	116.71	0.046	0.106	234.87	351.58	2.01
5840	70.35	0.045	0.128	222.79	293.14	3.17
5820	79.98	0.044	0.148	222.43	302.41	2.78
5800	88.37	0.044	0.147	196.63	285	2.22
5780	97.79	0.044	0.158	174.04	271.84	1.78
5760	104.18	0.044	0.157	154.68	258.86	1.48
5740	99.97	0.043	0.146	148.08	248.05	1.48
5720	92.21	0.043	0.135	146.59	238.8	1.59
5700	96.61	0.042	0.131	123.27	219.88	1.28
5680	84.68	0.039	0.098	113.07	197.75	1.34
5660	59.26	0.032	0.096	102.46	161.72	1.73
5640	40.51	0.033	0.108	74.02	114.53	1.83
5620	34.39	0.033	0.115	52.18	86.57	1.52
5600	25.5	0.034	0.116	33.01	58.51	1.29
TOTAL	14,894.06	0.047	0.145	43,582.61	58,476.67	2.93
					Ore Cutoff	0.019

19.1.2 Open Pit Sequencing

The pit was phased from north to south. This maximizes the opportunity to backfill waste as well as dry tailings into the mined-out pit. The following figures show the development of the pit from north to south. Though roads have not been designed or optimized, the relative distances between the pits and approximate dump locations based on previous studies have allowed the consideration of the equipment productivities and material sequencing.

19.1.3 Production Schedule

The mine production schedule was based on 5000 tpd ore delivered to a crushing plant which feeds the mill. Production starts with a one year development and prestripping schedule. Following that, the plant is scheduled to process 5000 short tons per day of ore. After prestripping, the stripping ratios begin at 3:1 and drop gradually to 1.5:1. Figure 19-5 through Figure 19-8 show the development of the phases. The mine production schedule phase by phase is attached in Appendix E.

Table 19-4 Mine Production Summary

		Ore			Total	Total					
			Gold	Silver	Waste	MIned	Strip	Contained Ounces		Recoverable Ounces	
Period	Days	Tons	Grade	Grade	Tons	Tons	Ratio	Gold	Silver	Gold	Silver
2011	350.0	800,592	0.044	0.183	6,200,770	7,001,362	7.75	35,175	146,256	32,713	102,379
2012	350.0	1,750,066	0.040	0.133	5,263,570	7,013,636	3.01	69,858	232,530	64,968	162,771
2013	350.0	1,849,364	0.042	0.103	5,534,223	7,383,587	2.99	78,350	190,717	72,866	133,502
2014	350.0	1,750,625	0.053	0.174	5,325,073	7,075,697	3.04	91,959	304,949	85,522	213,464
2015	350.0	1,750,345	0.052	0.176	5,287,817	7,038,162	3.02	90,452	308,530	84,120	215,971
2016	350.0	1,750,929	0.049	0.161	4,486,197	6,237,126	2.56	86,085	281,848	80,059	197,293
2017	350.0	1,750,096	0.053	0.170	4,393,743	6,143,839	2.51	93,131	297,940	86,612	208,558
2018	350.0	1,750,019	0.051	0.116	4,531,351	6,281,370	2.59	89,707	203,262	83,428	142,283
2019	350.0	1,742,021	0.041	0.111	2,557,414	4,299,436	1.47	71,794	192,807	66,769	134,965
2020	350.0	0	-	-	0	0	0.00	0	0	0	0
	10065.0	14,894,056	0.047	0.145	43,580,158	58,474,214	2.93	706,512	2,158,838	657,056	1,511,186

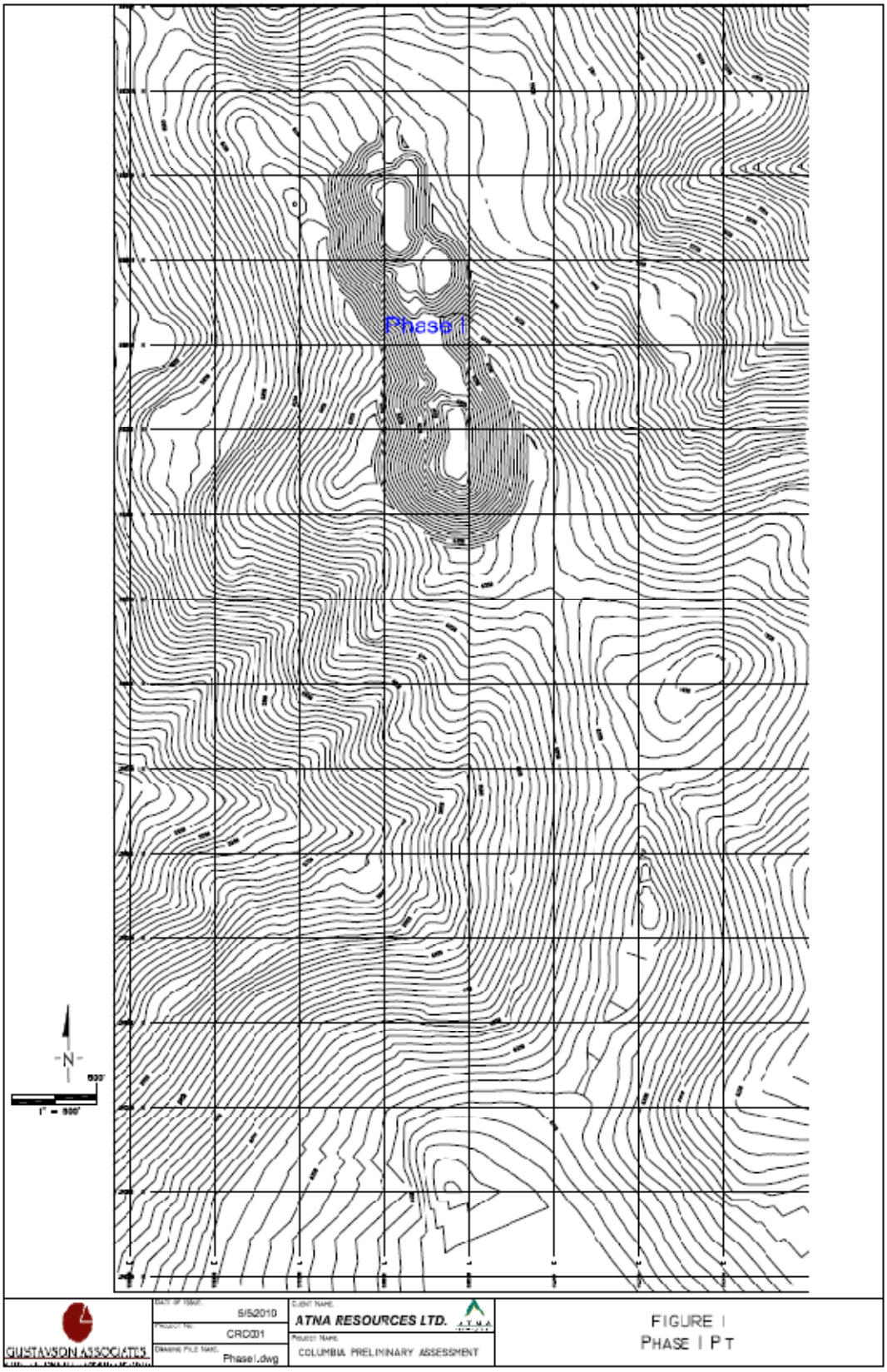

Figure 19-5 Pit Development Phase I

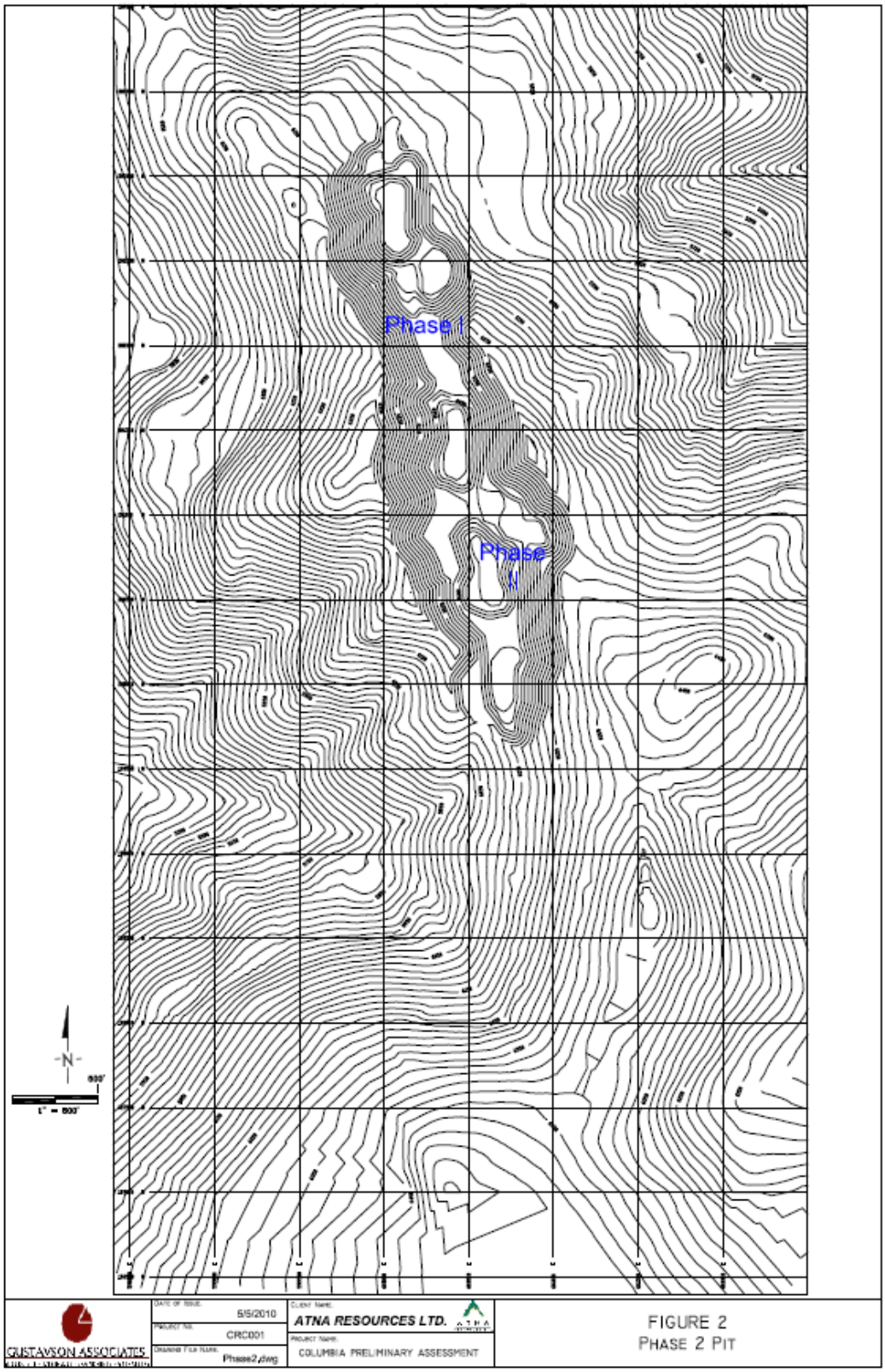

Figure 19-6 Pit Development Phase II

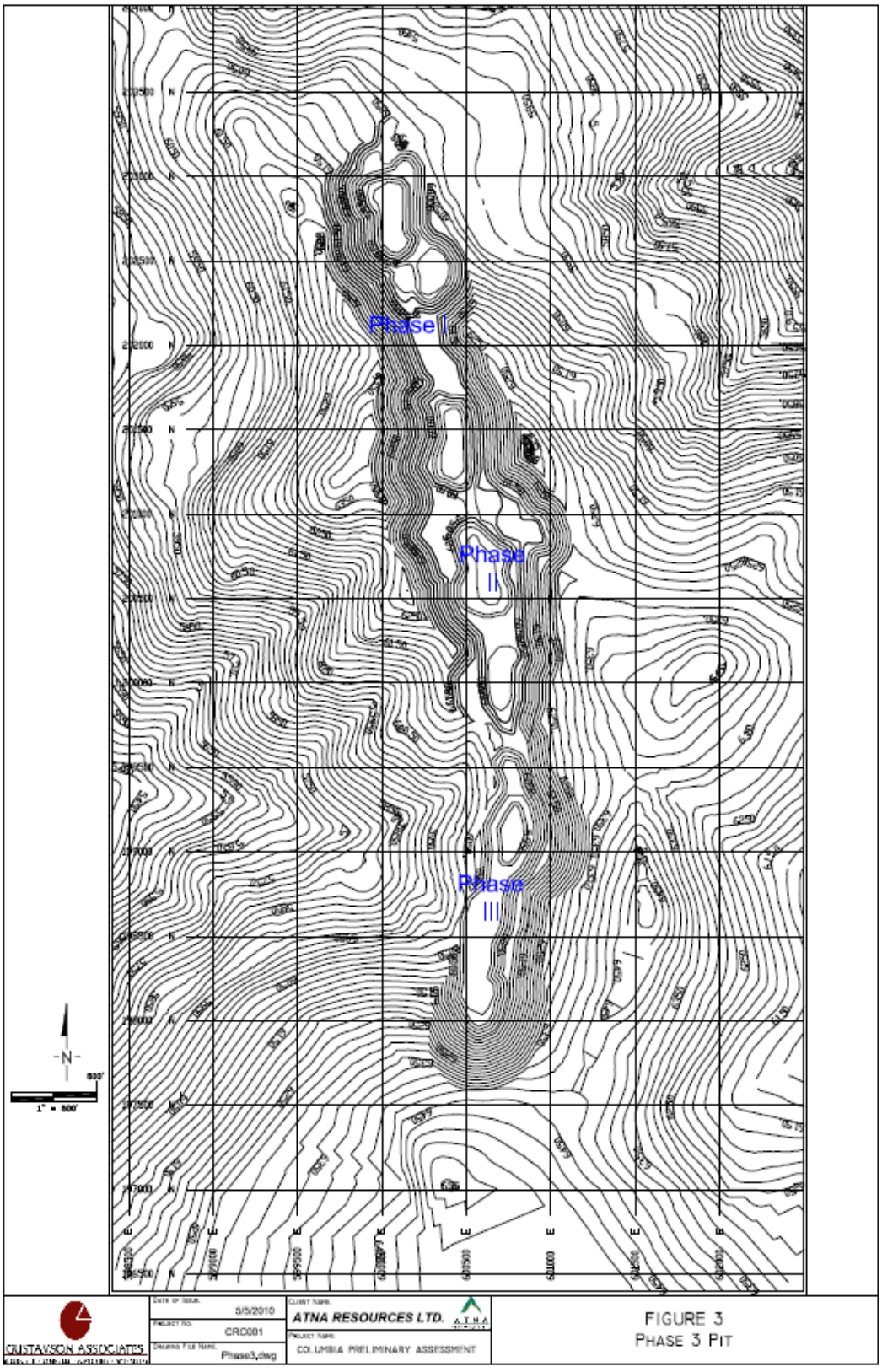

Figure 19-7 Pit Development Phase III

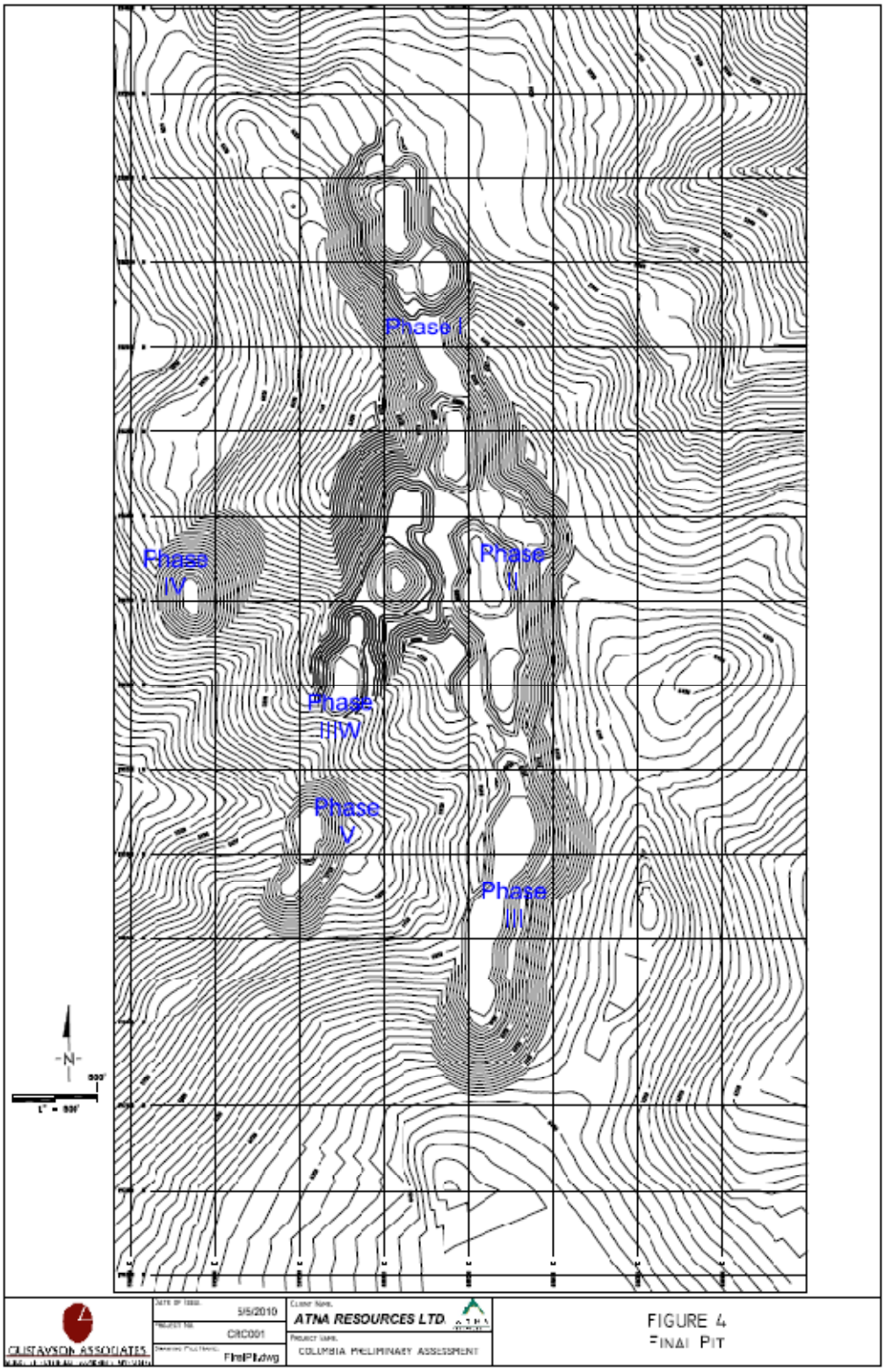

Figure 19-8 Pit Development Phase III West, IV & V

19.2 Processing

Processing involves conventional crushing, grinding, classification, gravity concentration, flotation and tailings discharge. The flotation concentrate will be processed off site with cyanide since it is not permissible to use cyanide at the Columbia site. Gold from the gravity circuit, approximately 50 percent of the total recoverable, will be upgraded and smelted at the mine site into a salable doré product. Figure 19-9 presents the processing block flow diagram for processing the Columbia material.

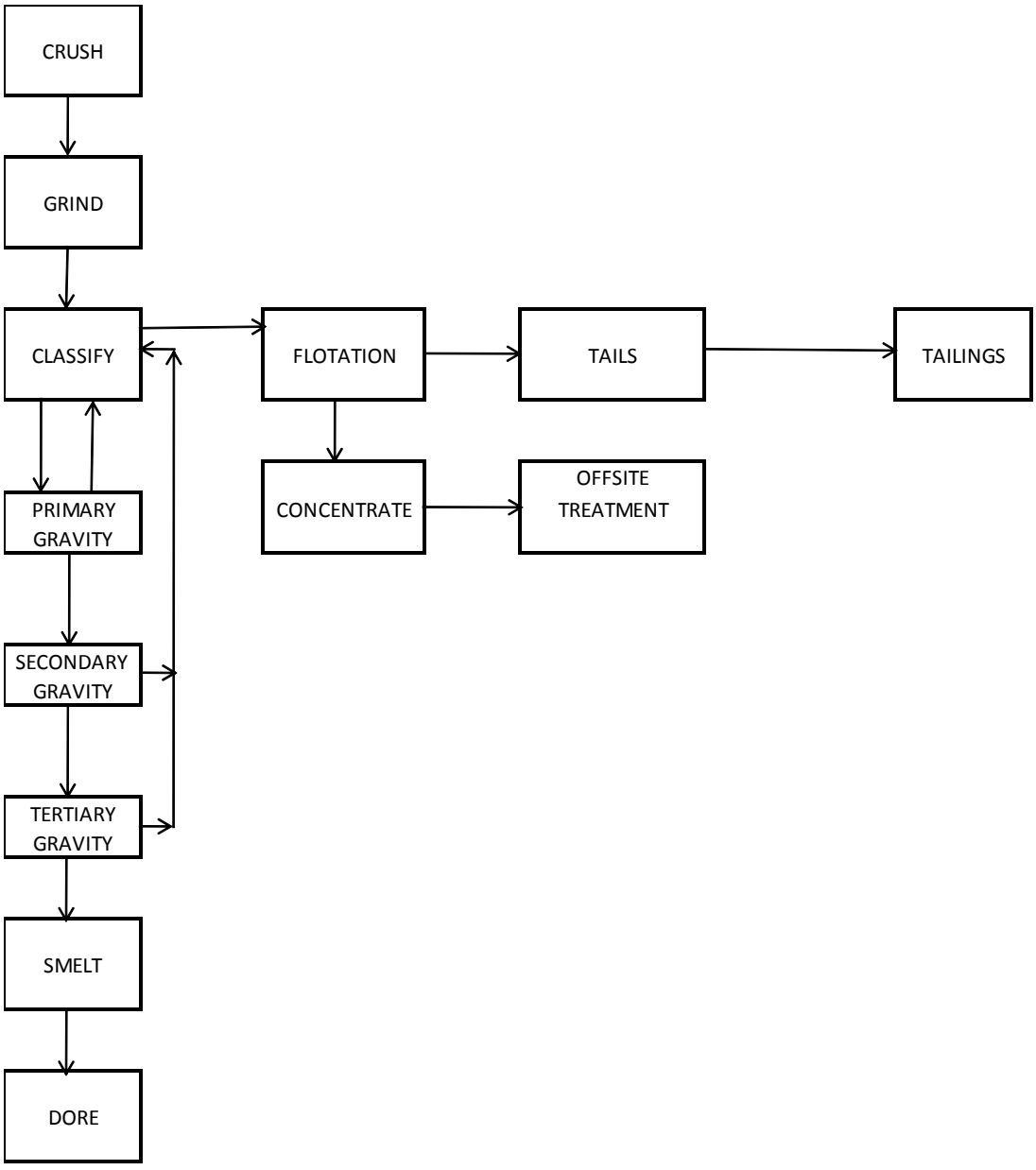

Figure 19-9 Columbia Processing Block Flow Diagram

19.3 Capital and Operating Cost Estimates

19.3.1 Capital Cost

Required mine equipment was based upon detailed mine production schedules which included equipment productivity and utilization. Capital costs represent current market prices for similar equipment with verification with the InfoMine mine costing system. The following table presents the capital costs including a 10 percent contingency.

Table 19-5 Mining Equipment Capital Cost

Equipment Description	Units	Unit Cost	Total Cost
Haul truck	5	$1,100,000	$5,500,000
Loader	2	$1,450,000	$2,900,000
Drill	2	$650,000	$1,300,000
Dozer D8	1	$750,000	$750,000
Dozer D10	2	$1,300,000	$2,600,000
RT Dozer	1	$600,000	$600,000
Grader	1	$500,000	$500,000
Water truck	1	$950,000	$950,000
Misc. service	1	$250,000	$250,000
Sub Total			**$15,350,000**
Contingency 10%			$1,535,000
TOTAL			**$16,885,000**

Processing capital costs were developed using the InfoMine cost modeling system to support the block flow diagram as shown in section 19.3. The facility was based upon costing of a single product flotation mill with the addition of a gravity circuit. The following table presents these costs including a 20 percent contingency.

Table 19-6 Processing Capital Costs

Processing Area	Capital Cost
Crushing, Grinding, Classification and Gravity	$25,578,315
Flotation, concentrate handling and tailings	$16,348,877
Sub Total	$41,927,192
Contingency 20%	$8,385,438
TOTAL	**$50,312,630**

19.3.2 Operating Cost

Mine operating costs are based upon information provided by Atna from the Briggs operation, and compared to information from the InfoMine mine costing service with a very close correlation. A detailed mine production schedule was developed using previous layouts for the locations of waste dumps and process facilities. Equipment productivities were calculated based on the phase design and a schedule developed including required mine equipment, labor and consumables. Maintenance costs, equipment availability, and utilization were included with the operating costs estimates. The mining costs for ore and waste are presented in the following table.

Table 19-7 Mining Operating Costs

Category	Cost per Ton
Ore	$1.61
Waste 2.9:1	$1.39
Total per ore ton	**$5.64**

Estimated process operating costs were derived from the costing models within the InfoMine mine costing service. The process flow sheet as presented in Section 19.2 is the basis for the costs. The costs presented in the following table include:

- All crushing, grinding, classification, screens, feeders, conveyors, pumps, and cyclones necessary to operate the mill
- Concentrate filtering and handling
- Tailings disposal
- 40 percent burden on labor
- All necessary reagents, wear materials and grinding media
- Electrical power at $0.115 / kWh

Table 19-8 Processing Operating Costs

	Unit Cost	Per Ore Ton
Crushing, Grinding & Gravity	$6.80 per ton	$6.80
Flotation	$2.00 per ton	$2.00
Concentrate Treatment	$50.00 per ton	$5.00
Refining	$1.50 per ounce	$0.07
Concentrate Transportation	$22.50 per ton	$2.25
G&A	$1.50 per ton	$1.50
Contingency 15%	$2.64 per ton	$2.64
TOTAL		**$20.26**

19.4 Economic Analysis

A cash flow model was created, using inputs from the mine development scenario described above and a 5,000 tpd gravity and flotation plant (Figure 19-9).

19.4.1 Base Case

The Base case economic model uses a gold price of $850 per oz and a silver price of $13.50 per oz. (a 60:1 Au/Ag ratio). The mineral resource exploited in this Preliminary Assessment is 14.1 million tons at a gold grade of 0.050 opt and a silver grade of 0.153 opt. The Base Case model is presented in Table 19-10.

The Base Case Internal Rate of Return (IRR) is 11 percent and the Net Present Value (NPV) at a 5 percent discount rate is $27.3 million, with a payback of 5.5+ years. Using increased metal prices of $950/oz Au and $15/oz Ag, the IRR increases to 20 percent and the NPV at 5 percent is $75.3 million. Payback at these prices decreases to slightly greater than 4 years.

This report contains a Preliminary Assessment of the Columbia Project, and as such, the economic analysis is based on a resource that includes Inferred Mineral Resources, as well as Measured and Indicated Mineral Resources. Therefore, conclusions drawn in this report must be viewed only for planning purposes and not as an absolute quantification of the resource or economics. Caution should be used by a reviewer of this document as all results, interpretations, and conclusions are of a preliminary nature subject to refinement as more information becomes available.

Contingency allowances were added to the cost estimates at variable rates as shown in Table 19-9. The lower value for mine capital reflects that Atna is achieving similar pricing on mine equipment. A 15 percent contingency on operating cost reflects that the final designs have not been completed thus final productivities may vary, although the hourly operating costs are well

known. The higher contingency for the plant is due to the preliminary nature of the process flow sheets and lack of detail adequate to better define the costs.

Table 19-9 Cost Contingency Allowances

	Contingency Percent
Mine Capital Cost	10%
Mine Operating Cost	15%
Plant Capital Cost	20%

Table 19-10 Columbia Project Preliminary Assessment Base Case Economic Model

COLUMBIA PROJECT	GRAVITY CONC. OPTION												
							5000 tpd plant						
	BASIS	UNITS											
	5,000	tpd											
	350	days per year	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	Total
PRODUCTION	ore	tons		800,592	1,750,066	1,849,364	1,750,625	1,750,345	1,750,929	1,750,096	1,750,019	1,742,021	14,093,464
	grade	opt, Au		0.044	0.040	0.042	0.053	0.052	0.049	0.053	0.051	0.041	0.050
	grade	opt, Ag		0.183	0.133	0.103	0.174	0.176	0.161	0.170	0.116	0.111	0.153
	waste	tons		6,200,770	5,263,570	5,534,223	5,325,073	5,287,817	4,486,197	4,393,743	4,531,351	2,557,414	43,580,158
	total material			7,001,362	7,013,636	7,383,587	7,075,697	7,038,162	6,237,126	6,143,839	6,281,370	4,299,436	58,474,214
5 day/wk, 52 weeks/yr	tons per day	260		26,928	26,976	28,398	27,214	27,070	23,989	23,630	24,159	16,536	
	Strip Ratio			*7.7*	*3.0*	*3.0*	*3.0*	*3.0*	*2.6*	*2.5*	*2.6*	*1.5*	*3.1*
	Contained Gold			*35,175*	*69,858*	*78,350*	*91,959*	*90,452*	*86,085*	*93,131*	*89,707*	*71,794*	*706,512*
	Contained Silver			*146,256*	*232,530*	*190,717*	*304,949*	*308,530*	*281,848*	*297,940*	*203,262*	*192,807*	*2,158,838*
	Recovered Gold			*31,207*	*61,978*	*69,512*	*81,586*	*80,249*	*76,375*	*82,626*	*79,588*	*63,696*	*626,817*
	Recovered Silver			*58,853*	*93,570*	*76,744*	*122,711*	*124,152*	*113,416*	*119,891*	*81,793*	*77,586*	*868,716*
REVENUE													
Gold	$850	89%		$26,526,218	$52,681,232	$59,085,531	$69,348,013	$68,211,753	$64,918,420	$70,231,973	$67,650,088	$54,141,558	$ 532,794,786
Silver	$13.50	40%		$794,519	$1,263,195	$1,036,049	$1,656,602	$1,676,058	$1,531,110	$1,618,532	$1,104,199	$1,047,406	$ 11,727,670
Total Revenue				$27,320,737	$53,944,427	$60,121,580	$71,004,616	$69,887,811	$66,449,530	$71,850,505	$68,754,287	$55,188,964	$ 544,522,456
CASH PRODUCTION COSTS													
Mining													
Ore	$1.61	$/ton		$1,220,758	$2,666,559	$2,744,761	$2,560,969	$2,477,650	$2,625,099	$2,664,862	$2,780,857	$2,925,743	$ 22,667,259
Waste	$1.39	$/ton		$8,518,494	$7,210,696	$7,357,520	$7,160,419	$7,144,025	$6,536,383	$6,433,322	$6,618,763	$3,742,078	$ 60,721,699
Processing													
Gravity circuit	$6.80	$/ton		$5,446,114	$11,905,017	$12,580,502	$11,908,817	$11,906,915	$11,910,888	$11,905,219	$11,904,698	$11,850,291	$ 101,318,462
Flotation circuit	$2.00	$/ton		$1,601,183	$3,500,132	$3,698,728	$3,501,249	$3,500,690	$3,501,858	$3,500,191	$3,500,038	$3,484,042	$ 29,788,112
Offsite treatment of conc.	$5.00	$/ton		$4,002,959	$8,750,330	$9,246,820	$8,753,123	$8,751,725	$8,754,645	$8,750,478	$8,750,096	$8,710,106	$ 74,470,280
Refining Cost	$1.30	$/oz Au		$40,570	$80,571	$90,366	$106,062	$104,324	$99,287	$107,414	$103,465	$82,805	$ 814,863
Transportation	150	miles											
Transportation cost	$0.15	$/ton mile		$1,801,331	$3,937,649	$4,161,069	$3,938,905	$3,938,276	$3,939,590	$3,937,715	$3,937,543	$3,919,547	$ 33,511,626
General & Administrative	$1.50	$/ton		$1,200,888	$2,625,099	$2,774,046	$2,625,937	$2,625,518	$2,626,394	$2,625,143	$2,625,029	$2,613,032	$ 22,341,084
PRODUCTION COSTS				$23,832,296	$40,676,053	$42,653,811	$40,555,480	$40,449,123	$39,994,144	$39,924,345	$40,220,488	$37,327,643	$ 345,633,384
OTHER PRODUCTION COSTS													
Royalties	NSR	3%		$644,276	$1,235,276	$1,398,700	$1,746,196	$1,712,805	$1,609,680	$1,771,647	$1,678,896	$1,274,295	$ 13,071,771
TOTAL PRODUCTION COSTS				$24,476,573	$41,911,330	$44,052,511	$42,301,675	$42,161,928	$41,603,824	$41,695,992	$41,899,384	$38,601,938	$ 358,705,155
Contingency		15%		$3,671,486	$6,286,699	$6,607,877	$6,345,251	$6,324,289	$6,240,574	$6,254,399	$6,284,908	$5,790,291	$ 53,805,773
TOTAL PRODUCTION COSTS W/ CONT.				$28,148,059	$48,198,029	$50,660,388	$48,646,927	$48,486,217	$47,844,397	$47,950,391	$48,184,292	$44,392,229	$ 412,510,928
CAPITAL	Contingency												
Mine	10%		$15,350,000										$ 15,350,000
Processing	20%		$41,927,192										$ 41,927,192
Other	0		$5,000,000										$ 5,000,000
Contingency			$9,920,438										$ 9,920,438
TOTAL CAPITAL			$72,197,630										$ 72,197,630
NET INCOME BEFORE CAPITAL				-$827,322	$5,746,398	$9,461,192	$22,357,689	$21,401,594	$18,605,133	$23,900,114	$20,569,996	$10,796,735	$ 132,011,528
Less: capital			($72,197,630)										$ (72,197,630)
NET CASH FLOW			($72,197,630)	($827,322)	$5,746,398	$9,461,192	$22,357,689	$21,401,594	$18,605,133	$23,900,114	$20,569,996	$10,796,735	$ 132,011,528
NPV	5%	$27,313,020											
IRR	11%												
CUMULATIVE CASH FLOW			($72,197,630)	($73,024,952)	($67,278,555)	($57,817,363)	($35,459,674)	($14,058,079)	$4,547,053	$28,447,167	$49,017,163	$59,813,898	
CASH COSTS													
	C1			$ 551	$ 430	$ 405	$ 320	$ 324	$ 336	$ 309	$ 331	$ 370	$ 359
	C2			$ 877	$ 757	$ 714	$ 576	$ 583	$ 606	$ 561	$ 592	$ 680	$ 639
	C3			$ 3,190	$ 757	$ 714	$ 576	$ 583	$ 606	$ 561	$ 592	$ 680	$ 755

19.4.2 ATS Concentrate Leach Alternative

The ammonia thiosulfate (ATS) process route is conceptual in nature and relies upon metallurgical work completed over a period of years by Canyon Resources. In some test work, the samples utilized were grab samples and may or may not truly represent the metallurgical and mineralogical characteristics of the deposit. Numerous alternative lixiviates were tested after cyanide was banned for mineral processing in the State of Montana.

As part of the processing review, consideration was given to creating a flotation concentrate, as in the base case. The alternative of treating the flotation concentrate with ATS was reviewed with the view of improving the project economics. Based upon this very preliminary assessment the production of a concentrate that is treated off-site indicates better economics for the assumptions within this study.

For the ATS option, a conceptual flow sheet was developed which included crushing, grinding, gravity recovery and treatment, gravity tail flotation, flotation concentrate treatment with ammonium thiosulfate and precipitation of precious metals onto copper chips. Precious metals were removed from the copper chips prior to smelting.

Hazen completed work on the Columbia material using ATS with reasonable results. Other alternative lixiviates were tested but have not been considered since most are unproven and/or carcinogenic. This is not to imply ATS has demonstrated commercial viability, although there has been some commercial success at Newmont's operation at Carlin, Nevada. To elevate the project to a pre-feasibility level would require significant metallurgical testing and process development. A review of patents and / or licenses associated with ATS processing would also be necessary.

The economic outcome of treating the concentrate with ATS is not as attractive as treating the concentrate off-site with cyanide. This could change depending upon the ability to transport concentrate and the potential cost for third party treatment.

Table 19-11 ATS Economic Input and Results

PROCESSING	Capital cost	$54.6 Million
	Operating cost	$12.36 per ton
BASE CASE	Gold $850 per ounce	
	Silver $13.50 per ounce	
	Gold recovery 79%	
	Silver recovery 40%	
ECONOMICS	NPV @ 5%	$17.5 Million
	IRR	9%

The following block flow diagram presents the conceptual process route:

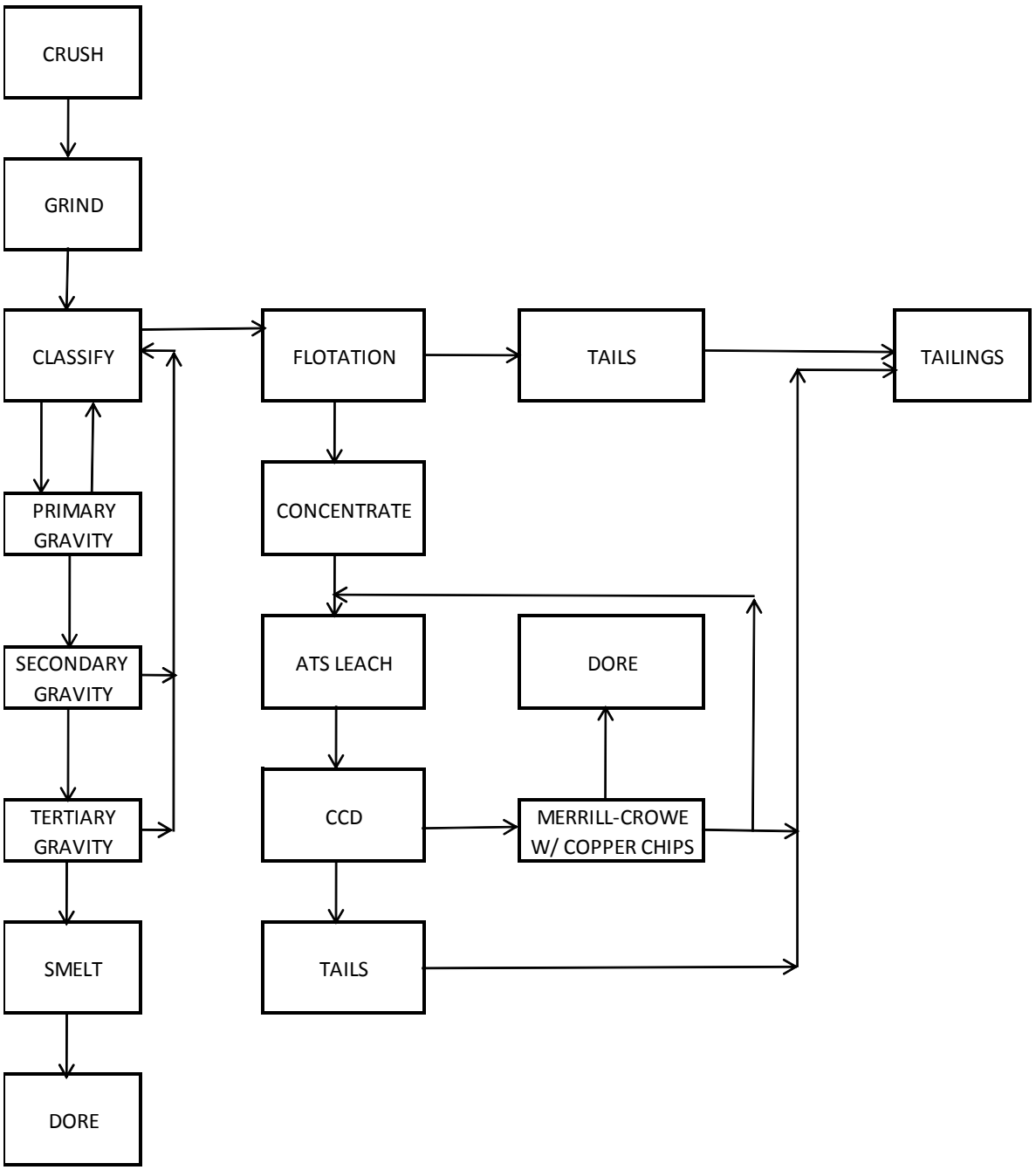

Figure 19-10 Columbia ATS Conceptual Flow Sheet

20. INTERPRETATION AND CONCLUSIONS

The Columbia Project has a measured and indicated resource at potentially minable grades containing nearly 970 thousand ounces of gold and over 2 million ounces of silver (0.010 opt Au cut off). Further exploration drilling has the potential to increase this total between and peripheral to the defined mineralized zones. At this size, the Columbia project has the potential to be economically viable as an open pit operation with conventional milling.

The Preliminary Assessment indicates that 14 million tons of ore in the measured, indicated and inferred resource categories can be mined producing 700 thousand ounces of gold and 2 million ounces of silver, at a Gold Institute cost (C1) of US$357/oz and cost (C3) of US$756/ounce Au.

The assumed processing method is milling with gravity and flotation concentration, shipping to an already permitted mill within the state. The current regulatory status in Montana may complicate this arrangement. Leaching whole ore by ammonium thiosulfate may be potentially feasible, though possibly less attractive, and the commercial application of the technology has not been well proven.

To make the transition to development, the following items will need to be considered:

- Metallurgical testing of samples from various parts of the deposit will be required to confirm the overall metal recoveries and to design the gold recovery circuit. This will require some large diameter core holes to produce a sufficient quantity of ore for the testing.
- Law prohibits the use of cyanide in a new milling facility within the State of Montana. Production of a flotation concentrate from the gravity tail gives the best overall recovery for the materials tested. Subsequent review of the project should entail a detailed review of the best economic option for the treatment of the flotation concentrate. Currently there are two options; cyanide or ATS leaching of the concentrate.
- Additional drilling is needed. This will including twinning some of the reverse circulation holes with core holes to confirm the grade and character of the mineralization, as well as infill and offset holes to complete the exploration of the deposit.
- Prior geotechnical studies must be reviewed and updated as necessary. This will allow definition of the acceptable pit slopes as well as the stability of slide blocks on the hill slopes surrounding the main deposit. This must be defined as some of these slide blocks contain parts of the ore body and others may underlie waste dumps. Coordinated with this will be a geo-hydrologic study of the site to complete both mine dewatering and permitting/water treatment designs.
- A thorough review of the permitting needs of the project is needed to assure the project can be brought into production.

21. RECOMMENDATIONS

To move this project toward production Gustavson recommends that work be initiated toward a pre-feasibility study of the proposed operation. This work will require the following tasks to be completed.

- Identify the permit requirements for a project of this type in the current regulatory environment and commence preliminary permitting efforts.
- Acquisition of adequate metallurgical samples which may require drilling up to 8 large holes (PQ diameter) at an estimated average depth of 400 feet. Estimated cost $300,000.
- Exploration core drilling (NX diameter) of up to 20 holes at an average depth of 600 feet. Estimate cost $900,000.
- Metallurgical test work of at least 4 composite samples. Estimated cost $250,000.
- Geotechnical studies of the pit, dump, and plant areas.
- Geo-hydrologic study of the area.
- Initiate environmental baseline work as this will fall on the critical path toward advancing the project.
- Evaluate and initiate discussions with other mills that might receive concentrates from Columbia.
- Pre-feasibility study including pit design, preliminary plant design, capital and operating cost estimates, and adequate to report a minable 76. Estimated cost $250,000.
- The shipping of a gold bearing concentrate to a permitted facility within the State of Montana requires legal review.

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23. DATE AND SIGNATURE PAGES

William J Crowl

Vice President, Mining
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Email: wcrowl@gustavson.com

CERTIFICATE of AUTHOR

I, William J. Crowl do hereby certify that:

1. I am currently employed as Vice President, Mining by Gustavson Associates, LLC at:

   274 Union Boulevard
   Suite 450
   Lakewood, Colorado 80228

2. I am a graduate of the University of Southern California with a Bachelor of Arts in Earth Science (1968), and a MSc. in Economic Geology from the University of Arizona in 1979, and have practiced my profession continuously since 1973.
3. I am a registered Professional Geologist in the State of Oregon (G573) and am a member in good standing of the Australian Institute of Mining and Metallurgy and the Society of Economic Geologists.
4. I have worked as a geologist for a total of 37 years since my graduation from university; as a graduate student, as an employee of a major mining company, a major engineering company, and as a consulting geologist.
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, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the preparation of the technical report titled "NI 43-101 Technical Report and Preliminary Assessment on the Columbia Project Lewis and Clark County, Montana," dated June 2, 2010 (the "Technical Report"). No personal visit to the subject property was conducted by me.
7. I have personally completed an independent review and analysis of the data and written information contained in this Technical Report.
8. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.

9. I do not hold, nor do I expect to receive, any securities or any other interest in any corporate entity, private or public, with interests in the properties that are the subject of this report or in the properties themselves, nor do I have any business relationship with any such entity apart from a professional consulting relationship with the issuer, nor to the best of my knowledge do I have any interest in any securities of any corporate entity with property within a two (2) kilometer distance of any of the subject properties.
10. I am independent of Atna Resources Ltd. in accordance with Section 1.4 of NI 43-101.
11. I have read National Instrument 43-101 and Form 43-101, and the Technical Report has been prepared in compliance with that instrument and form.
12. I consent to the filing of the Technical Report with any stock exchanges or other regulatory authority and any publication by them, including electronic publication in the public company files on the websites accessible by the public, of the Technical Report.

Dated this 2nd day of June, 2010

/s/ William J. Crowl
Signature of Qualified Person

"William J. Crowl"
Print name of Qualified Person

Donald E. Hulse

Principal Mining Engineer
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CERTIFICATE of AUTHOR

I, Donald E. Hulse do hereby certify that:

1. I am currently employed as Vice President, Mining by Gustavson Associates, LLC at:

   274 Union Boulevard
   Suite 450
   Lakewood, Colorado 80228

2. I am a graduate of the Colorado School of Mines with a Master of Science in Mining Engineering (1982), and have practiced my profession continuously since 1983.
3. I am a registered Professional Engineer in the State of Colorado (35269).
4. I have worked as a mining engineer for a total of 28 years since my graduation from university; as an employee of a major mining company, a major engineering company and as a consulting engineer.
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, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the preparation of the technical report titled "NI 43-101 Technical Report and Preliminary Assessment on the Columbia Project Lewis and Clark County, Montana," dated June 2, 2010 (the "Technical Report"). A personal visit of the subject property was conducted in August, 2009.
7. I have personally completed an independent review and analysis of the data and written information contained in this Technical Report.
8. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
9. I do not hold, nor do I expect to receive, any securities or any other interest in any corporate entity, private or public, with interests in the properties that are the subject of this report or in the properties themselves, nor do I have any business relationship with any such entity apart from a professional consulting relationship with the issuer, nor to the best of my knowledge do I have any interest in any securities of any corporate entity with property within a two (2) kilometer distance of any of the subject properties.

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

Dated this 2nd day of June, 2010

/s/ Donald E. Hulse
Signature of Qualified Person

"Donald E. Hulse"
Print name of Qualified Person

RICHARD D. MORITZ

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CERTIFICATE of AUTHOR

I, Richard D. Moritz do hereby certify that:

1. I am currently employed as Associate Principal Mining Engineer by Gustavson Associates, LLC at:

   274 Union Boulevard
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   Lakewood, Colorado 80228

2. I am a graduate of the Mackay School of Mines with a Bachelor of Science in Mining Engineering (1979), and have practiced my profession continuously since 1980.
3. I am a member in good standing of the Mining and Metallurgy Society of America.
4. I have worked as a mining engineer for a total of 30 years since my graduation from university; as an employee of several mining companies, an engineering company, and as a consulting engineer.
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, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
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8. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
9. I do not hold, nor do I expect to receive, any securities or any other interest in any corporate entity, private or public, with interests in the properties that are the subject of this report or in the properties themselves, nor do I have any business relationship with any such entity apart from a professional consulting relationship with the issuer, nor to the best of my knowledge do I have any interest in any securities of any corporate entity with property within a two (2) kilometer distance of any of the subject properties.

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11. I have read National Instrument 43-101 and Form 43-101, and the Technical Report has been prepared in compliance with that instrument and form.
12. I consent to the filing of the Technical Report with any stock exchanges or other regulatory authority and any publication by them, including electronic publication in the public company files on the websites accessible by the public, of the Technical Report.

Dated this 2nd day of June, 2010

/s/ Richard D. Moritz
Signature of Qualified Person

"Richard D. Moritz"
Print name of Qualified Person

24. CONSENTS OF AUTHORS

GUSTAVSON ASSOCIATES
GEOLOGISTS · ENGINEERS · ECONOMISTS · APPRAISERS

2 June, 2010

British Columbia Securities Commission

SUBJECT: Atna Resources Ltd.: Consent of William J. Crowl, regarding "NI 43-101 Technical Report and Preliminary Assessment on The Columbia Project Lewis and Clark County, Montana", and references thereto.

Dear Sirs/Mesdames:

RE: Atna Resources Ltd.: Consent of William J. Crowl, regarding "Technical Report for the Columbia Project", and references thereto.

I, William J. Crowl, do hereby consent to the public filing of the subject data reviewed in the Technical Report entitled "NI 43-101 Technical Report and Preliminary Assessment on the Columbia Project, Lewis and Clark County, Montana" dated 2 June, 2010 and posted on SEDAR, and extracts from or a summary of the Technical Report, and I consent to the use of the Technical Report in the ongoing exploration, development and financing of the Columbia Project.

I have read the written disclosure being filed and agree that it fairly and accurately represents the information in the Technical Report that supports the disclosure.

Dated this 2nd day of June, 2010

William J. Crowl

Signature of Qualified Person
William J. Crowl, Professional Geologist

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GEOLOGISTS · ENGINEERS · ECONOMISTS · APPRAISERS

2 June, 2010

British Columbia Securities Commission

Dear Sirs/Mesdames:

SUBJECT: Atna Resources Ltd.: Consent of Donald E. Hulse, regarding "NI 43-101 Technical Report and Preliminary Assessment on The Columbia Project Lewis and Clark County, Montana", and references thereto.

I, Donald E. Hulse do hereby consent to the public filing of the subject data reviewed in the Technical Report entitled "NI 43-101 Technical Report and Preliminary Assessment on the Columbia Project, Lewis and Clark County, Montana" dated 2 June, 2010 and posted on SEDAR, and extracts from or a summary of the Technical Report, and I consent to the use of the Technical Report in the ongoing exploration, development and financing of the Columbia Project.

I have read the written disclosure being filed and agree that it fairly and accurately represents the information in the Technical Report that supports the disclosure.

Dated this 2nd day of June, 2010

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2 June, 2010

British Columbia Securities Commission

Dear Sirs/Mesdames:

SUBJECT: Atna Resources Ltd.: Consent of Richard D. Moritz, regarding "NI 43-101 Technical Report and Preliminary Assessment on The Columbia Project Lewis and Clark County, Montana", and references thereto.

I, Richard D. Moritz, do hereby consent to the public filing of the subject data reviewed in the Technical Report entitled "NI 43-101 Technical Report and Preliminary Assessment on the Columbia Project, Lewis and Clark County, Montana" dated 2 June, 2010 and posted on SEDAR, and extracts from or a summary of the Technical Report, and I consent to the use of the Technical Report in the ongoing exploration, development and financing of the Columbia Project.

I have read the written disclosure being filed and agree that it fairly and accurately represents the information in the Technical Report that supports the disclosure.

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25. APPENDICES

APPENDIX A

Drill Hole List

DH_ID	DH_Type	Target_Area
PD-90-188	RC	
PD-90-176	RC	
PD-90-173	RC	
PD-072	RC	
PD-066	RC	Donnely
PD-064	RC	
PD-050	RC	
PD-052	RC	
PD-90-175	RC	
PD-068	RC	Donnely
PD-070	RC	
PD-041	RC	
PD-062	RC	Donnely
PD-060	RC	
7UP-T079	Trench	
CM-030	RC	
PD-090	RC	Donnely
PD-091	RC	Donnely
PD-092	RC	Donnely
CM-029	RC	Donnely
PD-058	RC	Donnely
PD-054	RC	Donnely
PD-90-181	RC	
PD-037	RC	
PD-061	RC	
PD-057	RC	
7UP-T080	Trench	
CM-028	RC	Donnely
PD-90-184	RC	
PD-90-182	RC	
7UP-T078	Trench	
CM-027	RC	Donnely
PR-92-213	RC	Donnely
CM-025	RC	
PD-90-185	RC	
PR-92-214	RC	Donnely
PD-90-183	RC	
PD-019	RC	
PD-048	RC	Donnely

DH_ID	DH_Type	Target_Area
PD-017	RC	
PD-033	RC	
PD-023	RC	
PD-90-168	RC	
PR-92-212	RC	Donnely
PR-92-218	RC	
BS-III-4	Trench	Columbia
BS-III-3	Trench	Columbia
PD-056	RC	
PD-015	RC	
PD-013	RC	
PD-087	RC	
PD-009	RC	
PD-011	RC	
PD-069	RC	
BS-III-2	Trench	Columbia
PD-90-205	RC	Donnely
BS-III-1	Trench	Columbia
PD-90-151	RC	
PD-90-155	RC	
PD-90-166	RC	
CM-024	RC	
PD-90-153	RC	
PD-002	RC	
PD-90-171	RC	
PD-005	RC	
PD-004	RC	
PD-006	RC	
PD-001	RC	
PD-90-149	RC	
PD-003	RC	
PD-073	RC	
PR-92-209	RC	Donnely
PR-92-216	RC	
PR-92-217	RC	
PR-92-215	RC	
7UP-211A	Core	
7UP-211	RC	
PD-90-147	RC	
PD-90-152	RC	

DH_ID	DH_Type	Target_Area
CM-023	Core	
7UP-T042	Trench	
7UP-210A	RC	
7UP-210	RC	
PD-90-145	RC	
PD-90-157	RC	Donnely
PD-90-163	RC	Donnely
PD-90-141	RC	
PD-90-143	RC	Donnely
PD-045	RC	
PD-077	RC	
7UP-249	RC	
7UP-022A	RC	
BS-IV-2	Trench	Columbia
CM-022	Core	
DC-010	Core	
7UP-T027	Trench	
BS-IV-1	Trench	Columbia
7UP-T041	Trench	
PD-90-161	RC	Donnely
PD-90-164	RC	
PD-90-146	RC	Donnely
PD-90-148	RC	
7UP-209A	RC	
7UP-209	RC	
7UP-248	RC	
7UP-247A	RC	
7UP-247	RC	
7UP-208	RC	
7UP-208A	RC	
7UP-T053	Trench	
7UP-T017	Trench	
PD-025	RC	
PD-021	RC	
PD-90-162	RC	
PD-029	RC	
PD-027	RC	
PD-049	RC	Donnely
PD-053	RC	Donnely
PD-90-154	RC	Donnely

DH_ID	DH_Type	Target_Area
PR-92-208	RC	
7UP-245	RC	
7UP-245A	RC	
7UP-246	RC	
PR-92-206	RC	
7UP-244	RC	Donnely
7UP-049A	RC	Donnely
7UP-049B	RC	Donnely
7UP-049	RC	Donnely
PD-90-165	RC	Donnely
PD-088	RC	
PD-90-150	RC	Donnely
7UP-207	RC	
7UP-207A	RC	
PD-098	RC	Donnely
7UP-T026	Trench	
7UP-243	RC	
PR-92-207	RC	
7UP-241	RC	
7UP-241A	RC	
7UP-242	RC	
7UP-206	RC	
7UP-206A	RC	
PD-035	RC	
PD-031	RC	
PD-051	RC	Donnely
7UP-T018	Trench	
PD-90-158	RC	Donnely
PD-059	RC	Donnely
PD-055	RC	Donnely
PD-047	RC	Donnely
7UP-T049	Trench	Donnely
PD-039	RC	
PD-043	RC	
7UP-T052	Trench	
7UP-240	RC	
7UP-239A	RC	
7UP-239	RC	
7UP-238	RC	Donnely
7UP-275	RC	

DH_ID	DH_Type	Target_Area
7UP-237	RC	
PD-90-135	RC	
7UP-T048	Trench	Donnely
PD-90-139	RC	Donnely
PD-089	RC	
PD-90-137	RC	Donnely
7UP-204A	RC	
7UP-204	RC	
7UP-205	RC	Donnely
7UP-205A	RC	Donnely
DC-007	Core	
DC-003	Core	Donnely
7UP-T040	Trench	
CM-020	Core	
7UP-216	Core	
DC-004	Core	
7UP-T025	Trench	Donnely
PR-92-210	RC	
7UP-214A	Core	
7UP-214	Core	
7UP-T020	Trench	
7UP-T039	Trench	
7UP-T030	Trench	
7UP-235	RC	Donnely
7UP-236	RC	
7UP-044	RC	Donnely
7UP-044A	RC	Donnely
PD-067	RC	
PD-063	RC	
7UP-T047	Trench	Donnely
PD-071	RC	
PD-075	RC	
PD-079	RC	Donnely
7UP-T051	Trench	
PD-076	RC	Donnely
CM-019A	Core	
CM-019	Core	
7UP-233	RC	
7UP-T019	Trench	
7UP-234	RC	

DH_ID	DH_Type	Target_Area
7UP-274	RC	
DC-009	Core	
7UP-T038	Trench	
7UP-219	Core	
COL-006	Core	
7UP-203	RC	
7UP-215	Core	Donnely
7UP-215A	Core	
7UP-263	RC	Donnely
7UP-T037	Trench	
7UP-T029	Trench	Donnely
7UP-262	RC	
7UP-264	RC	
7UP-265	RC	
7UP-231	RC	Donnely
7UP-232	RC	
7UP-266	RC	
PC-90-107	Core	Donnely
7UP-267	RC	
7UP-268	RC	
7UP-043	RC	Donnely
7UP-043A	RC	Donnely
7UP-261	RC	
CM-026	RC	
7UP-T021	Trench	
7UP-260	RC	
CM-017	Core	
7UP-T046	Trench	Donnely
PD-086	RC	Donnely
PC-90-104	Core	
PC-90-105	Core	
PC-90-103	Core	
PC-90-108	Core	
PC-90-106	Core	
COL-003	Core	
PD-90-133	RC	Donnely
7UP-259	RC	
CM-031	RC	
7UP-T016	Trench	
7UP-255	RC	

DH_ID	DH_Type	Target_Area
CM-015	Core	
7UP-015A	RC	
PC-90-109	Core	
7UP-230	RC	
7UP-254	RC	
7UP-258	RC	
7UP-253	RC	
7UP-273	RC	
BS-II-8	Trench	Columbia
7UP-256	RC	
7UP-229	RC	Donnely
7UP-T043	Trench	Donnely
7UP-T028	Trench	
WALL	Trench	Columbia
DC-001	Core	
7UP-042A	RC	Donnely
7UP-042	RC	Donnely
7UP-257	RC	
7UP-T022	Trench	
DC-008	Core	
D9-9	Trench	Columbia
COL-004	Core	
D9-8	Trench	Columbia
7UP-T015	Trench	
BS-II-3	Trench	Columbia
7UP-T065	Trench	Donnely
7UP-202A	RC	
7UP-202	RC	
7UP-228	RC	Donnely
7UP-272	RC	
DC-002	Core	
COL-005	Core	
D9-7B	Trench	Columbia
BS-II-7	Trench	Columbia
PD-046	RC	
D9-7	Trench	Columbia
PD-083	RC	Donnely
7UP-T056	Trench	Donnely
7UP-T023	Trench	
D9-6	Trench	Columbia

DH_ID	DH_Type	Target_Area
D9-5	Trench	Columbia
7UP-227	RC	
7UP-T036	Trench	
COL-002	Core	
BS-II-2	Trench	Columbia
COL-001	Core	
PR-92-211	RC	
7UP-201A	RC	
7UP-201	RC	
D9-3	Trench	Columbia
D9-4	Trench	Columbia
7UP-041	RC	Donnely
7UP-041A	RC	Donnely
7UP-T024	Trench	
BS-II-1	Trench	Columbia
7UP-T066	Trench	Donnely
7UP-271	RC	
CM-013A	Core	Donnely
CM-013	Core	
7UP-226	RC	
7UP-T007	Trench	
D9-2	Trench	Columbia
D9-1	Trench	Columbia
7UP-T045	Trench	Donnely
7UP-217A	Core	Donnely
7UP-217	Core	Donnely
PD-084	RC	Donnely
7UP-225	RC	Donnely
DC-005	Core	Donnely
7UP-224	RC	
7UP-270	RC	
DC-006	Core	Donnely
7UP-200	RC	Donnely
DC-006A	Core	Donnely
CM-012	Core	Donnely
7UP-040A	RC	Donnely
7UP-040	RC	Donnely
7UP-T035	Trench	
7UP-T067	Trench	Donnely
7UP-223	RC	

DH_ID	DH_Type	Target_Area
RD-001	RC	
7UP-222A	RC	Donnely
7UP-222	RC	Donnely
PD-90-160	RC	
PD-074	RC	Donnely
7UP-T033	Trench	
7UP-T068	Trench	Donnely
7UP-221A	RC	Donnely
7UP-221	RC	Donnely
7UP-269	RC	
CM-011A	Core	
CM-011	Core	
7UP-039A	RC	Donnely
7UP-039	RC	Donnely
7UP-T032	Trench	
PD-90-159	RC	Donnely
7UP-T044	Trench	
PD-040	RC	
PD-90-125	RC	
PD-038	RC	
PD-90-156	RC	
PD-085	RC	
PD-081	RC	
7UP-T031	Trench	
7UP-220A	RC	
7UP-220	RC	Donnely
PD-90-127	RC	
PD-90-142	RC	
PD-90-144	RC	
PD-90-123	RC	
PD-90-121	RC	Donnely
CM-007A	Core	Donnely
CM-007	Core	Donnely
PD-016	RC	
PD-90-174	RC	
PD-014	RC	
PD-018	RC	
PD-010	RC	Donnely
PD-008	RC	
PD-007	RC	

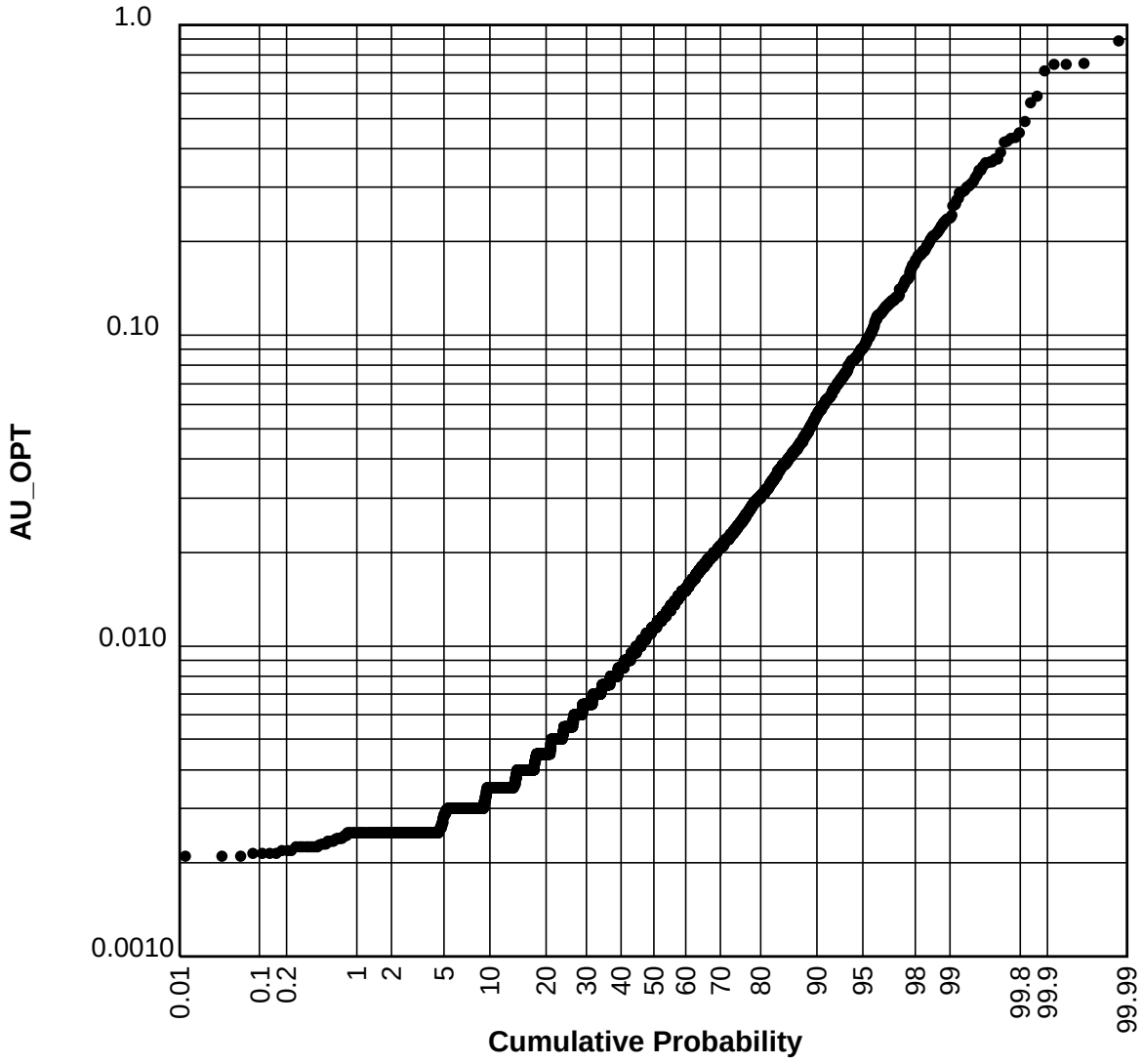
DH_ID	DH_Type	Target_Area
7UP-T060	Trench	
PD-90-167	RC	Donnely
PD-012	RC	
PD-90-172	RC	
PD-044	RC	
PD-90-126	RC	Donnely
PD-90-130	RC	
PD-90-124	RC	
PD-90-128	RC	
PD-90-179	RC	
PD-90-122	RC	Donnely
7UP-T071	Trench	
7UP-T072	Trench	
PD-90-169	RC	
PD-065	RC	
PD-90-170	RC	
PD-022	RC	
PD-026	RC	Donnely
PD-020	RC	
PD-024	RC	
PD-036	RC	Donnely
7UP-T062	Trench	
7UP-T061	Trench	
PD-042	RC	Donnely
BS-I-1	Trench	Columbia
7UP-T073	Trench	Donnely
PD-034	RC	
7UP-T070	Trench	
PD-90-136	RC	
PD-90-129	RC	Donnely
PD-90-120	RC	
PD-90-134	RC	Donnely
PD-90-132	RC	
CM-005	Core	Donnely
CM-002	Core	Donnely
CM-001	Core	
7UP-T063	Trench	
PD-030	RC	Donnely
PD-080	RC	
PD-028	RC	Donnely

DH_ID	DH_Type	Target_Area
PD-032	RC	
PD-082	RC	Donnely
7UP-T074	Trench	
PD-90-131	RC	
PD-90-140	RC	Donnely
PD-90-138	RC	
PD-093	RC	
PD-095	RC	
PD-094	RC	
PD-078	RC	
PD-096	RC	
PD-097	RC	
PD-100	RC	
PD-099	RC	
PD-101	RC	
PD-102	RC	

APPENDIX B

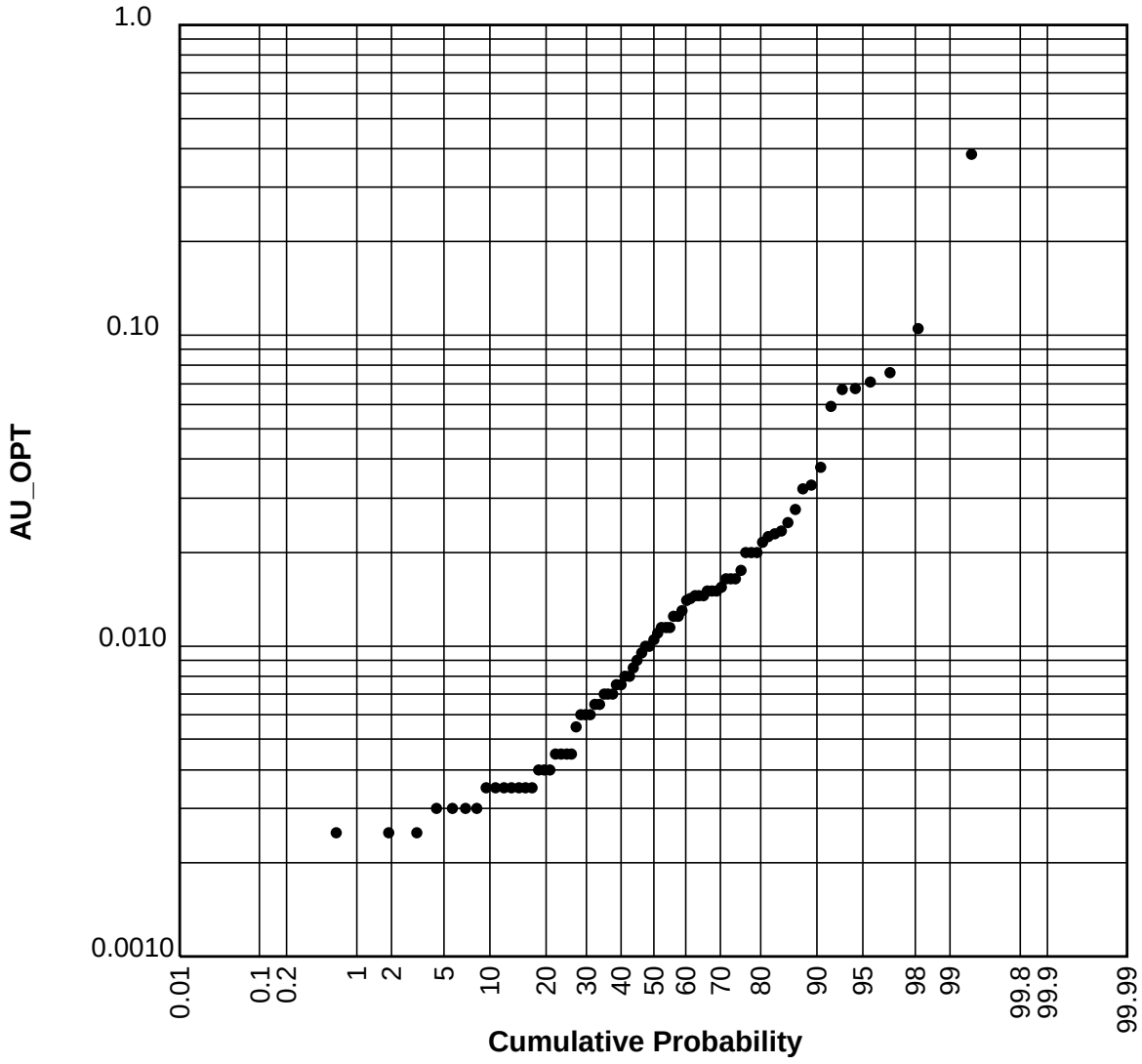
Composite Statistics by Zone

Columbia 10ft comp-Columbia Main Zone



Input File	cmshcm10.csv		
No of Samples	4227	Mean Value	0.026
Number Trimmed	1273	Median Value	0.012
Minimum	0.002	Variance	0.00
Maximum	0.885	Standard Dev	0.0509

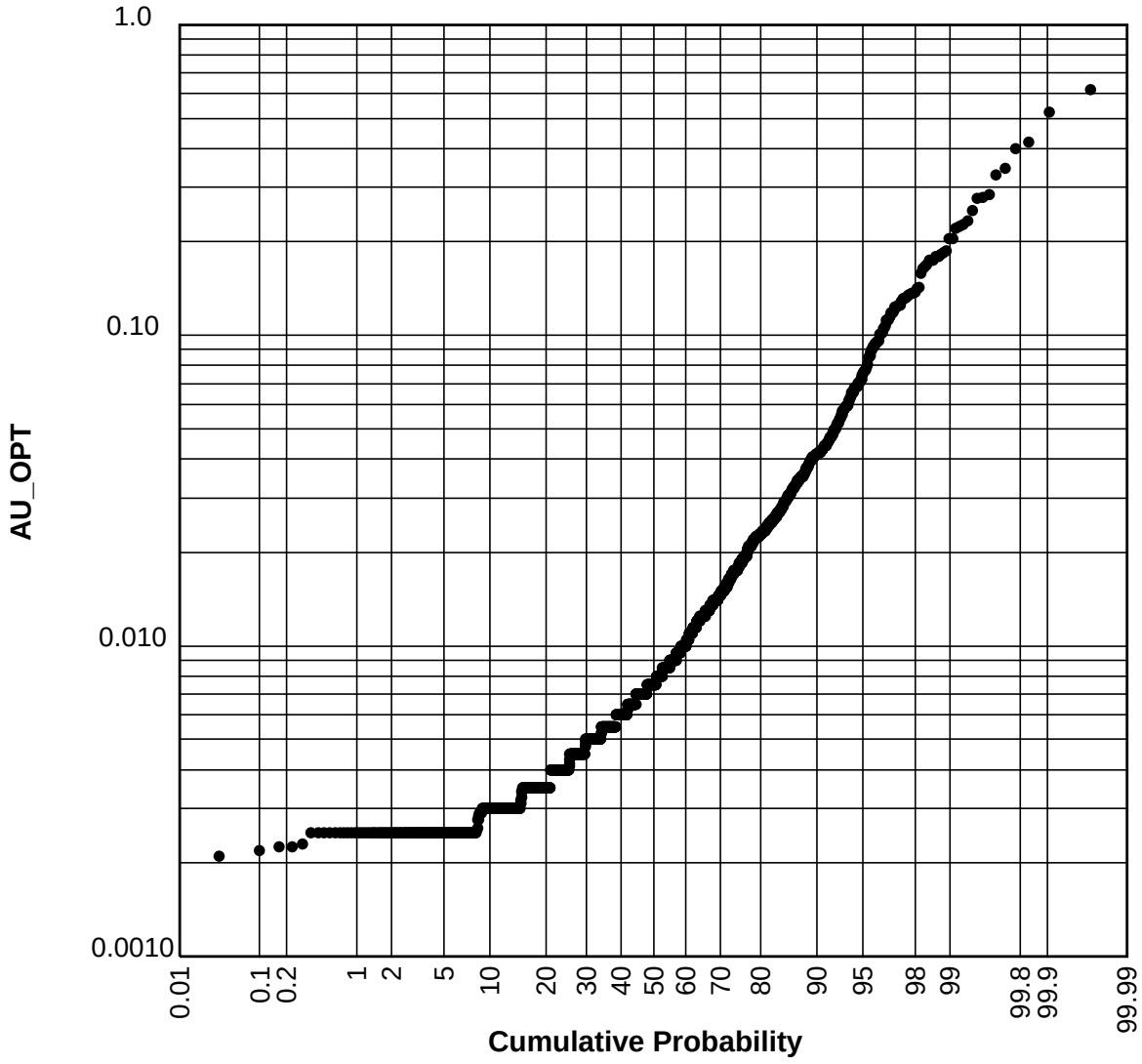
Columbia 10 ft comps - Columbia NE Zone



Input File cmshcn10.csv

No of Samples	79	Mean Value	0.021
Number Trimmed	38	Median Value	0.010
Minimum	0.002	Variance	0.00
Maximum	0.383	Standard Dev	0.0451

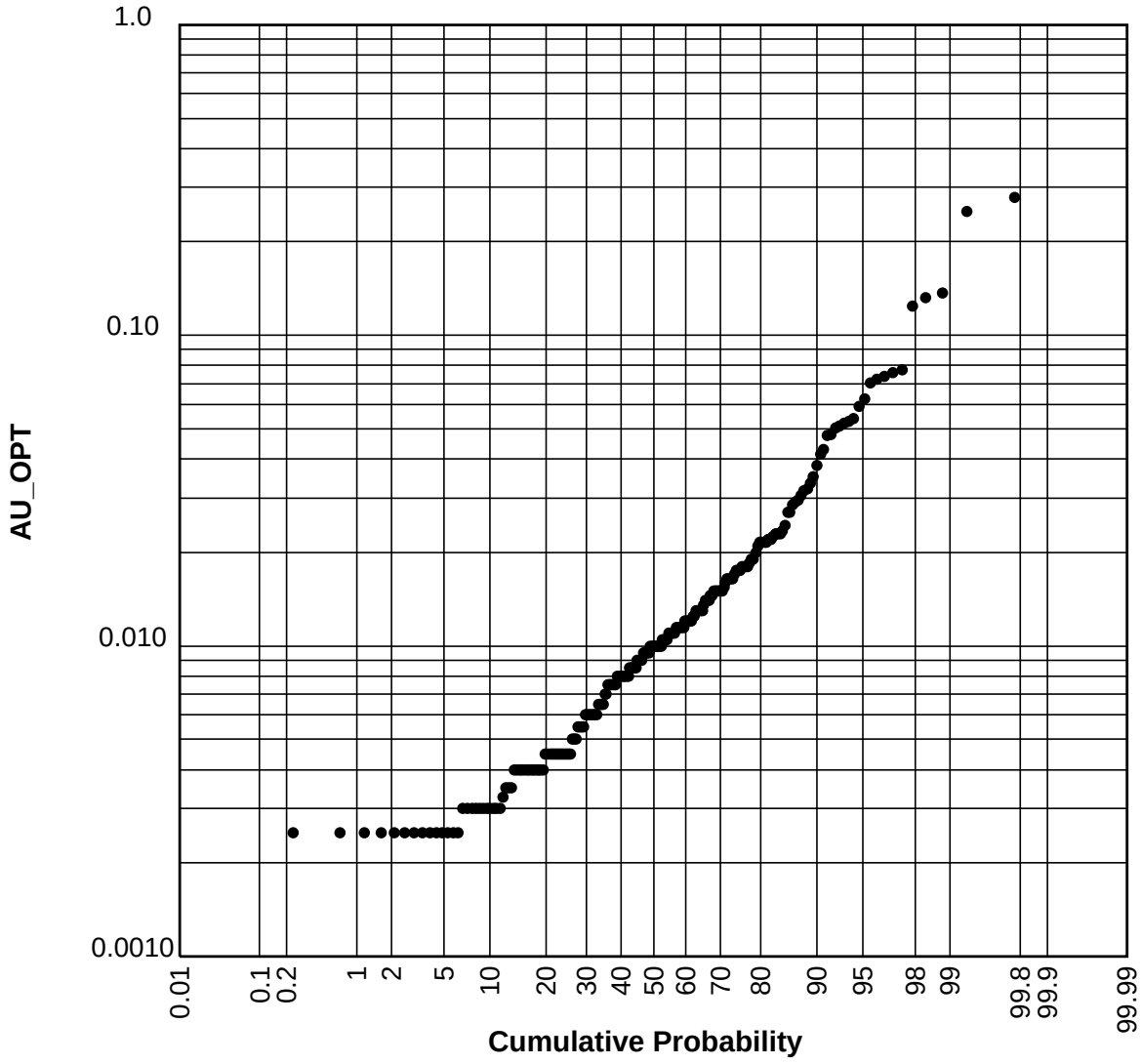
Columbia 10 ft comps - Donnely Main Zone



Input File cmshdm10.csv

No of Samples	1530	Mean Value	0.020
Number Trimmed	622	Median Value	0.007
Minimum	0.002	Variance	0.00
Maximum	0.619	Standard Dev	0.0415

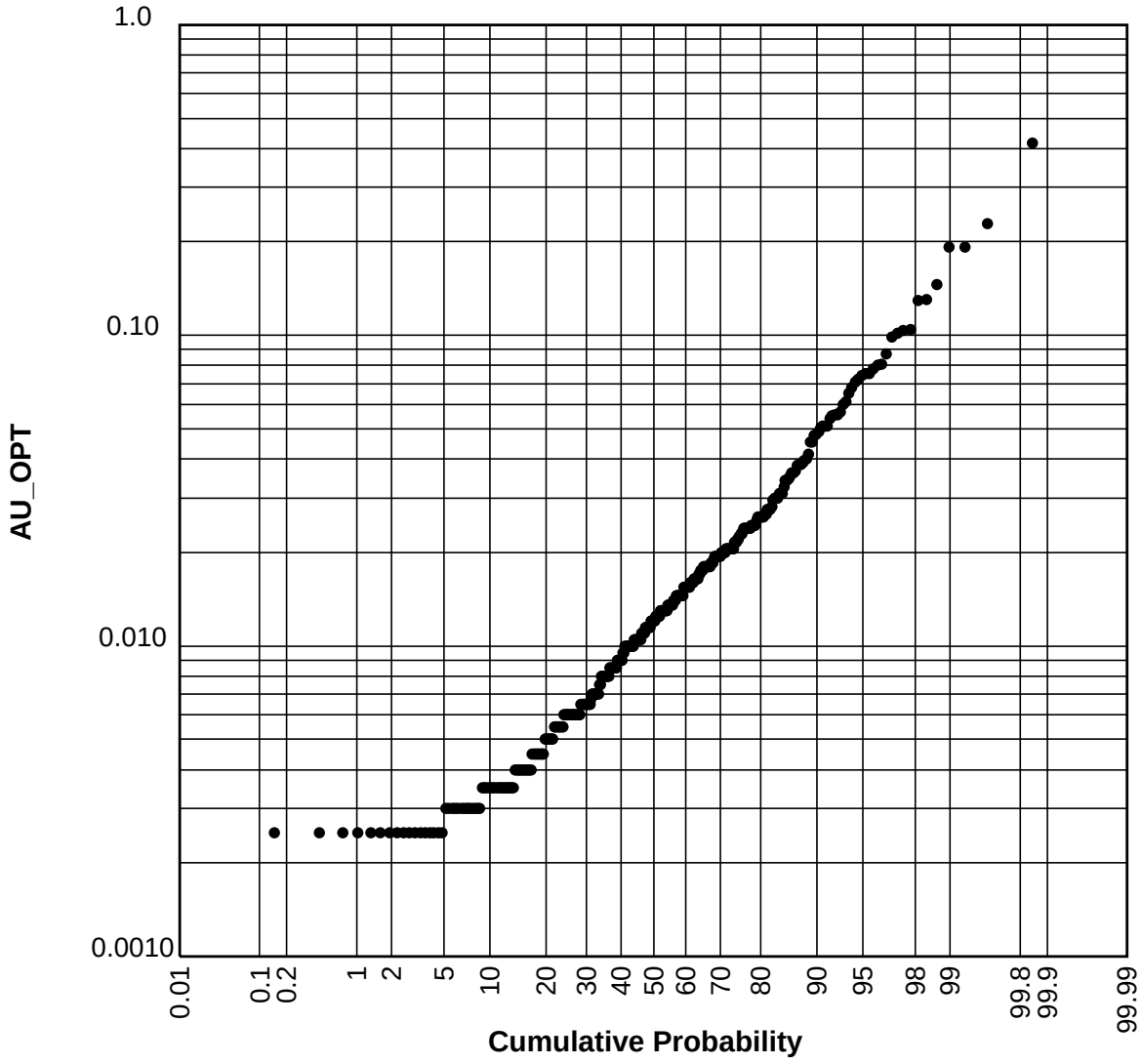
Columbia 10 ft comps - Donnely North Zone



Input File cmshdn10.csv

No of Samples	215	Mean Value	0.018
Number Trimmed	115	Median Value	0.010
Minimum	0.002	Variance	0.00
Maximum	0.278	Standard Dev	0.0312

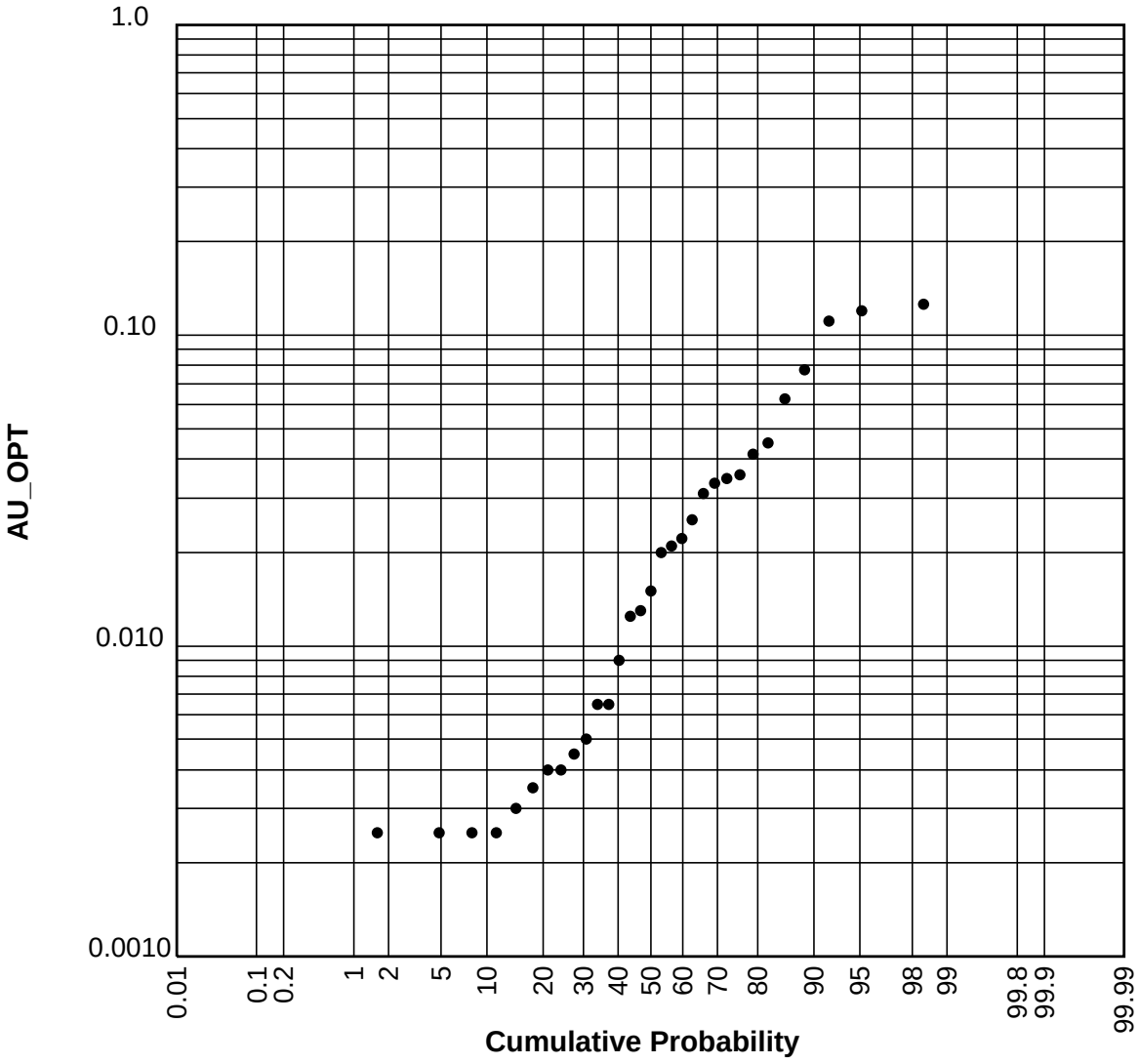
Columbia 10 ft comp - Donnely South Zone



Input File cmshds10.csv

No of Samples	342	Mean Value	0.022
Number Trimmed	145	Median Value	0.012
Minimum	0.002	Variance	0.00
Maximum	0.416	Standard Dev	0.0350

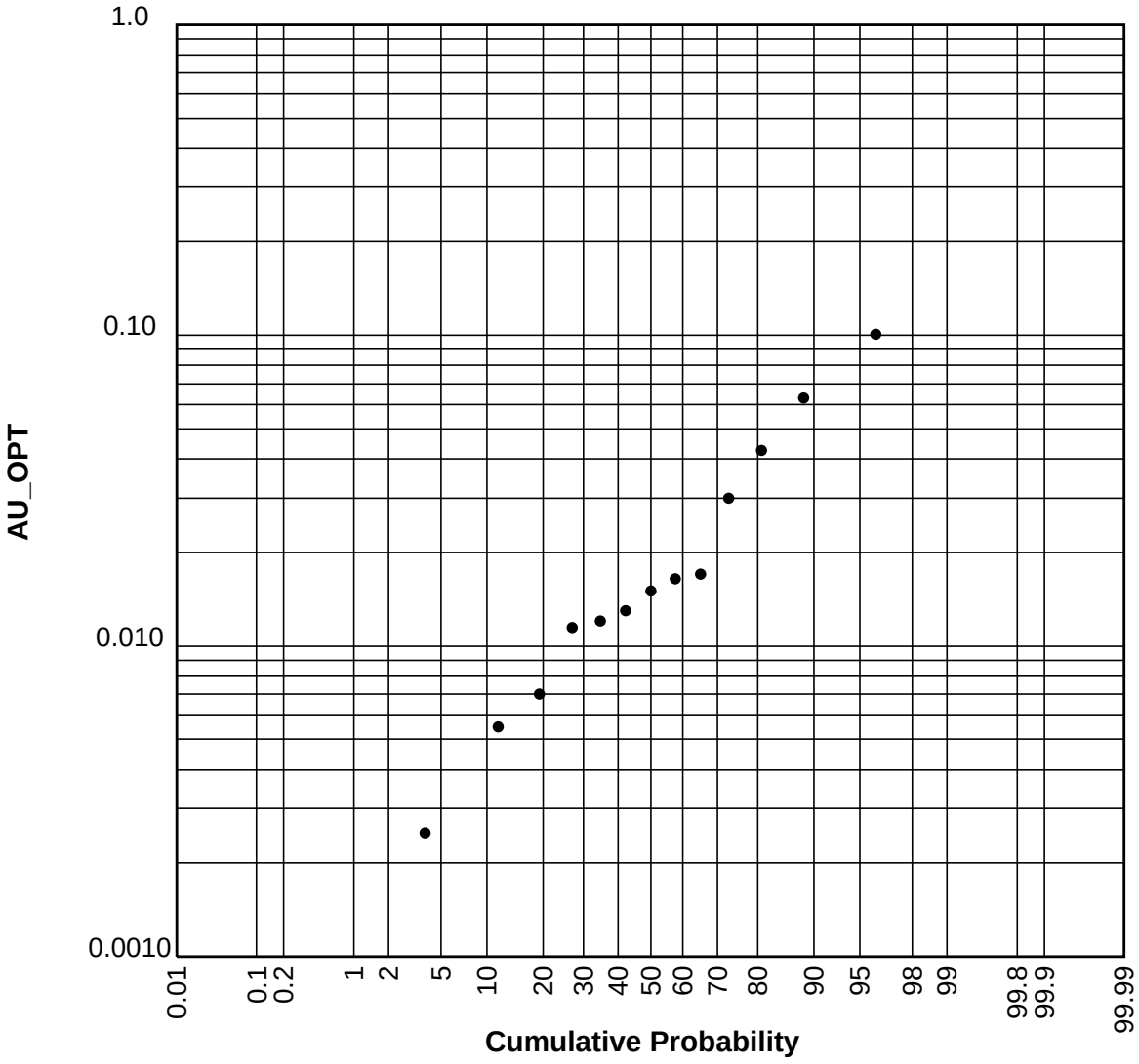
Columbia 10 ft comp-Satellite West Zone



Input File cmshst10.csv

No of Samples	31	Mean Value	0.029
Number Trimmed	2	Median Value	0.015
Minimum	0.002	Variance	0.00
Maximum	0.126	Standard Dev	0.0347

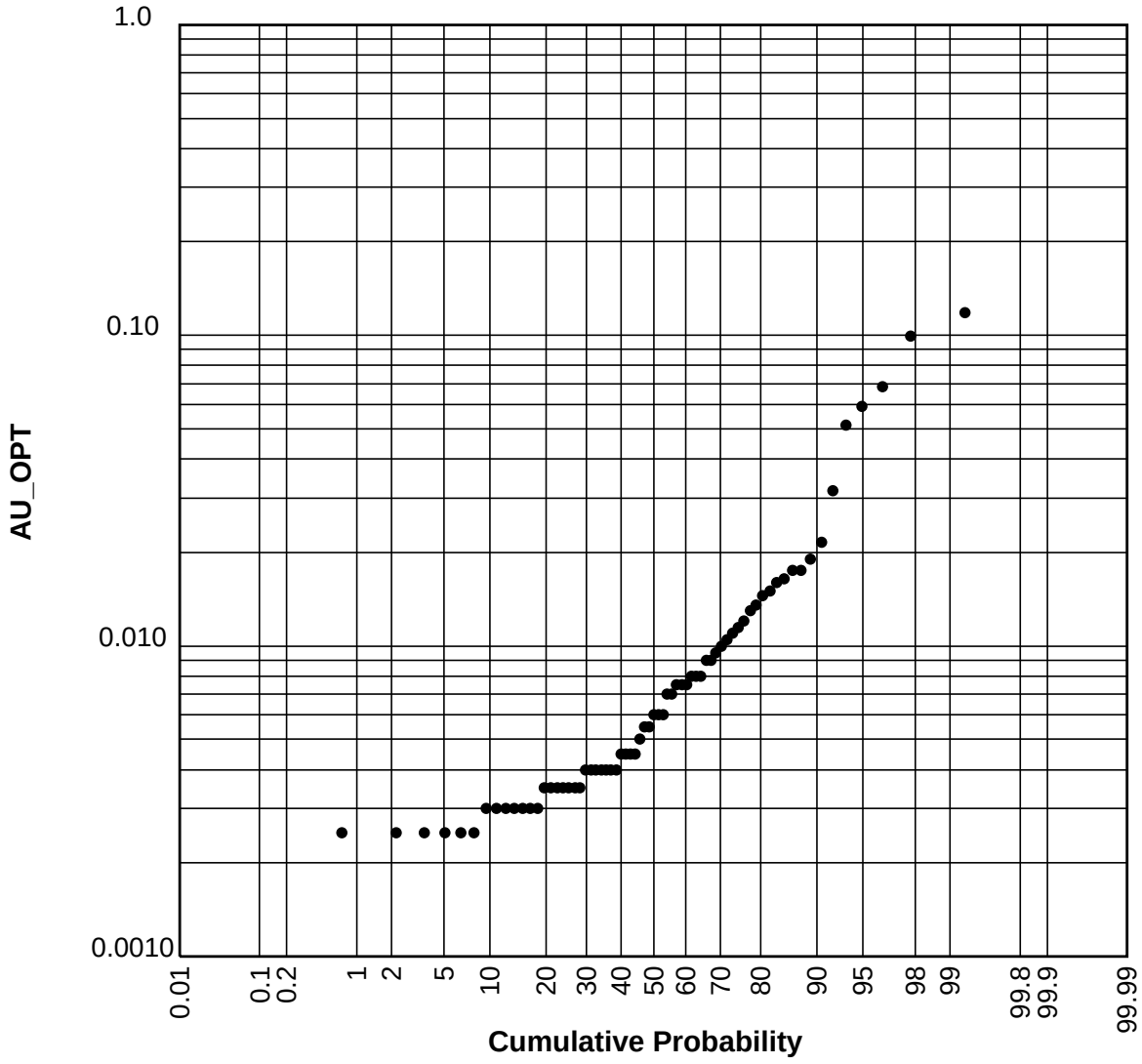
Columbia 10 ft comp-South Columbia Zone



Input File cmshsc10.csv

No of Samples	13	Mean Value	0.026
Number Trimmed	4	Median Value	0.015
Minimum	0.002	Variance	0.00
Maximum	0.101	Standard Dev	0.0269

Columbia 10 ft comps - Columbia SE Zone



Input File cmshcs10.csv

No of Samples	69	Mean Value	0.013
Number Trimmed	145	Median Value	0.006
Minimum	0.002	Variance	0.00
Maximum	0.119	Standard Dev	0.0206

APPENDIX C

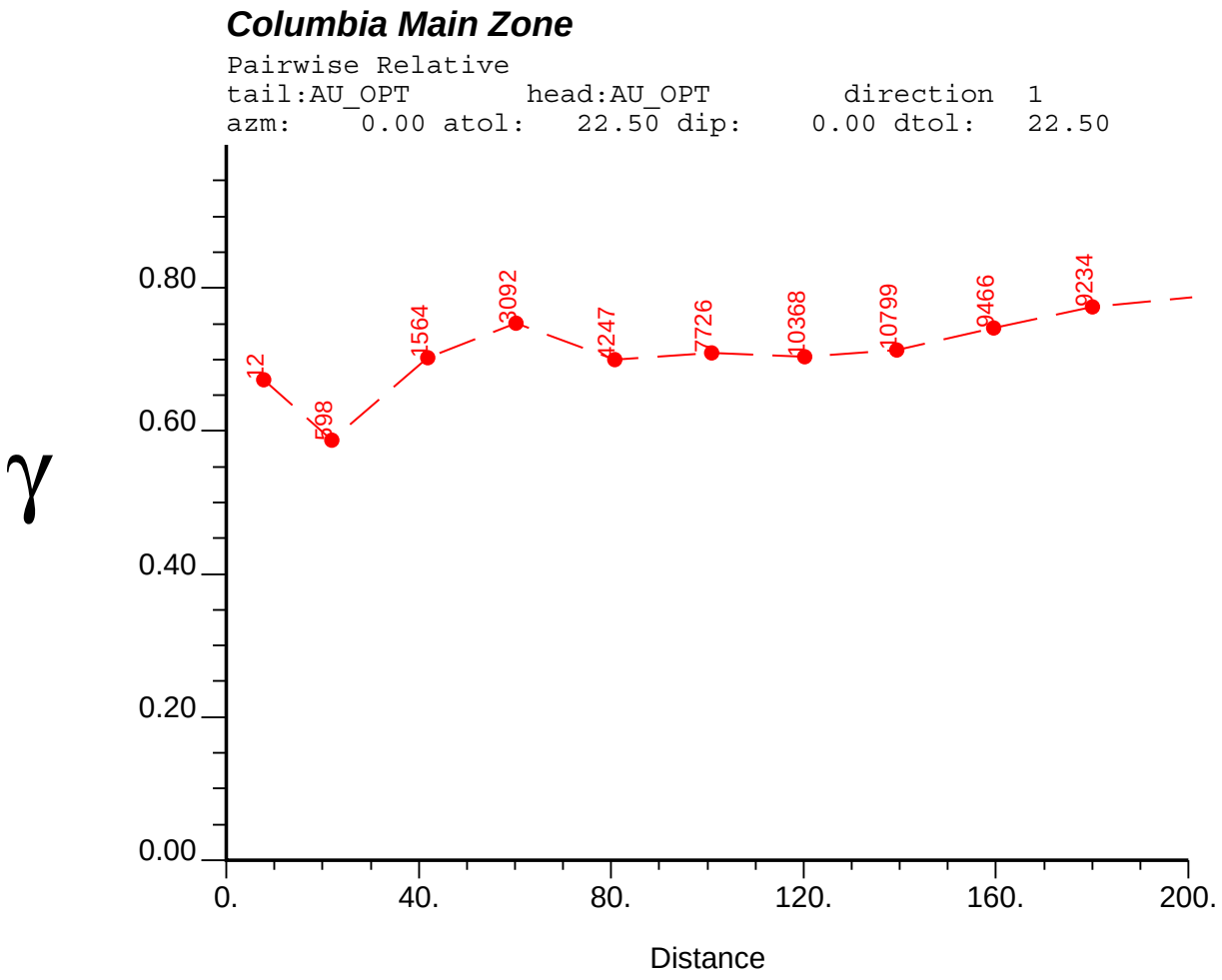
Variography for Principal Zones

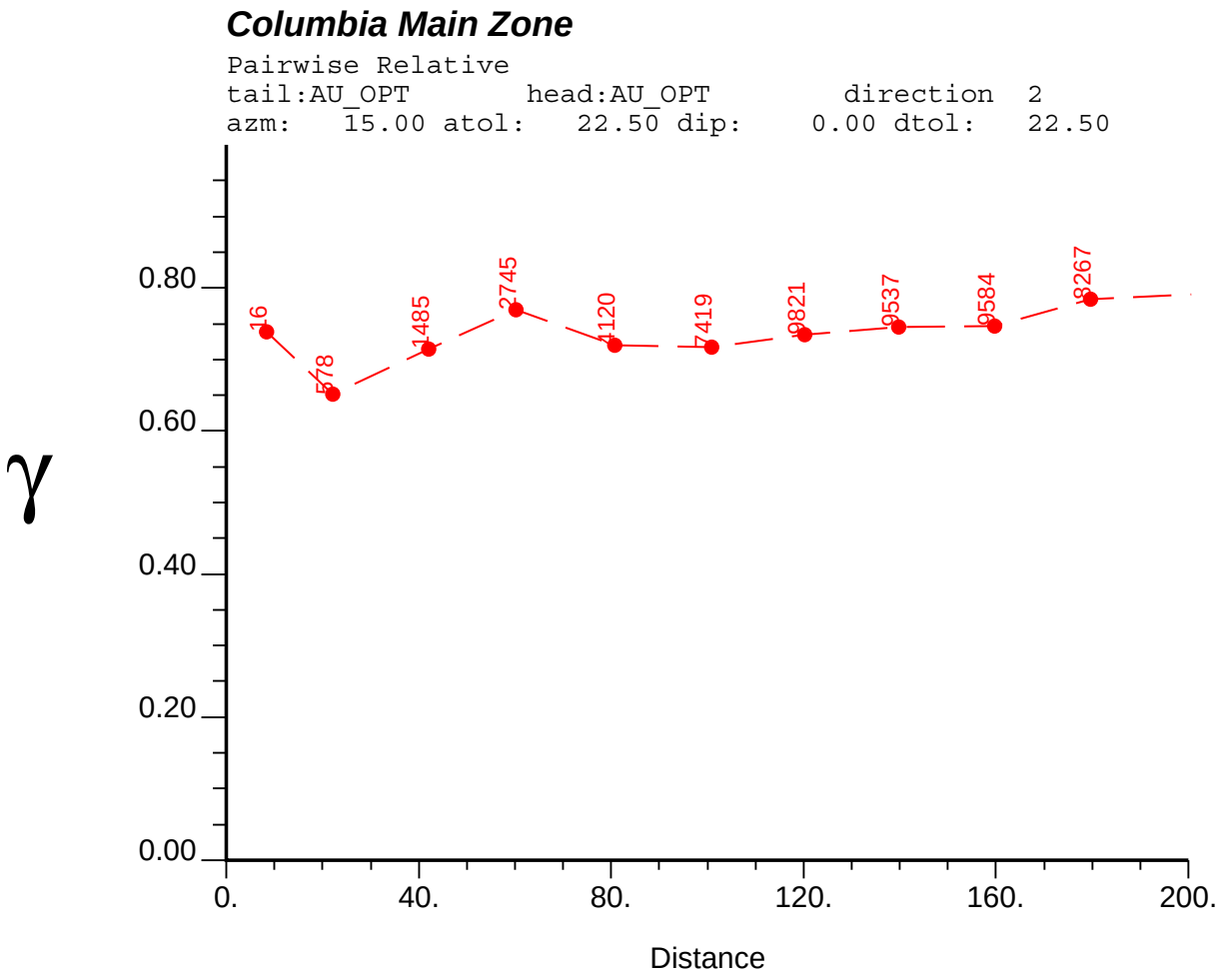
APPENDIX C

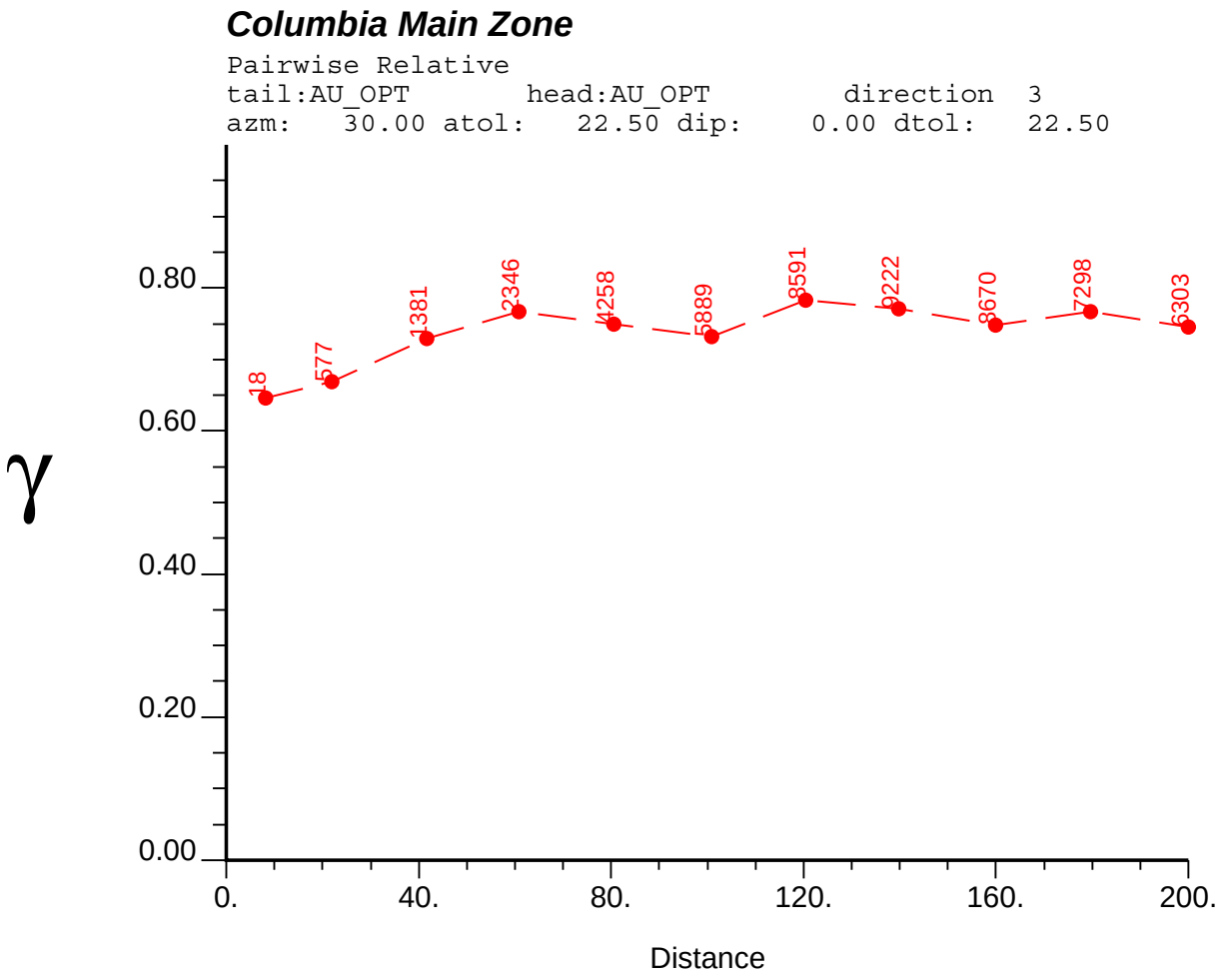
Part 1

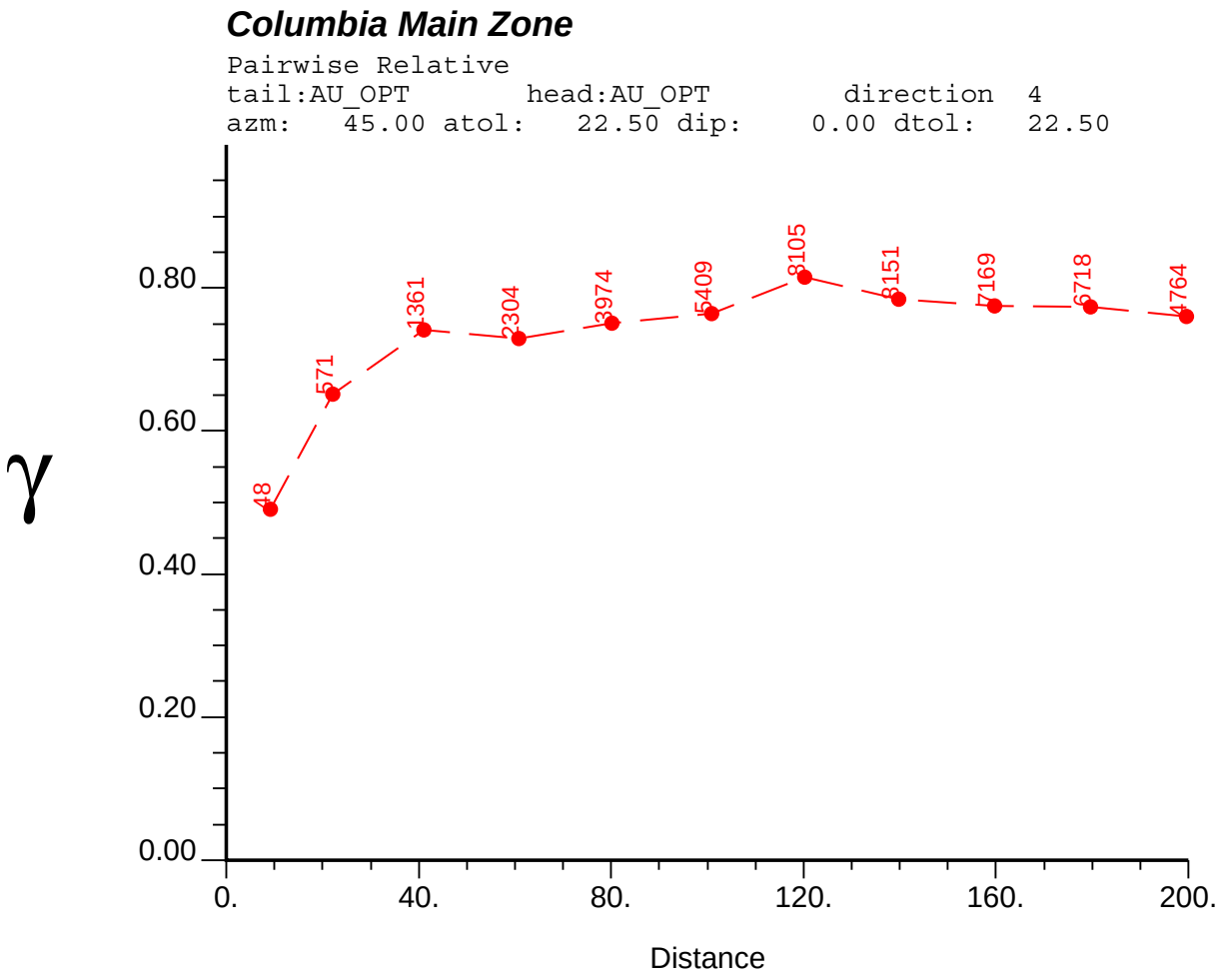
Columbia Main Zone

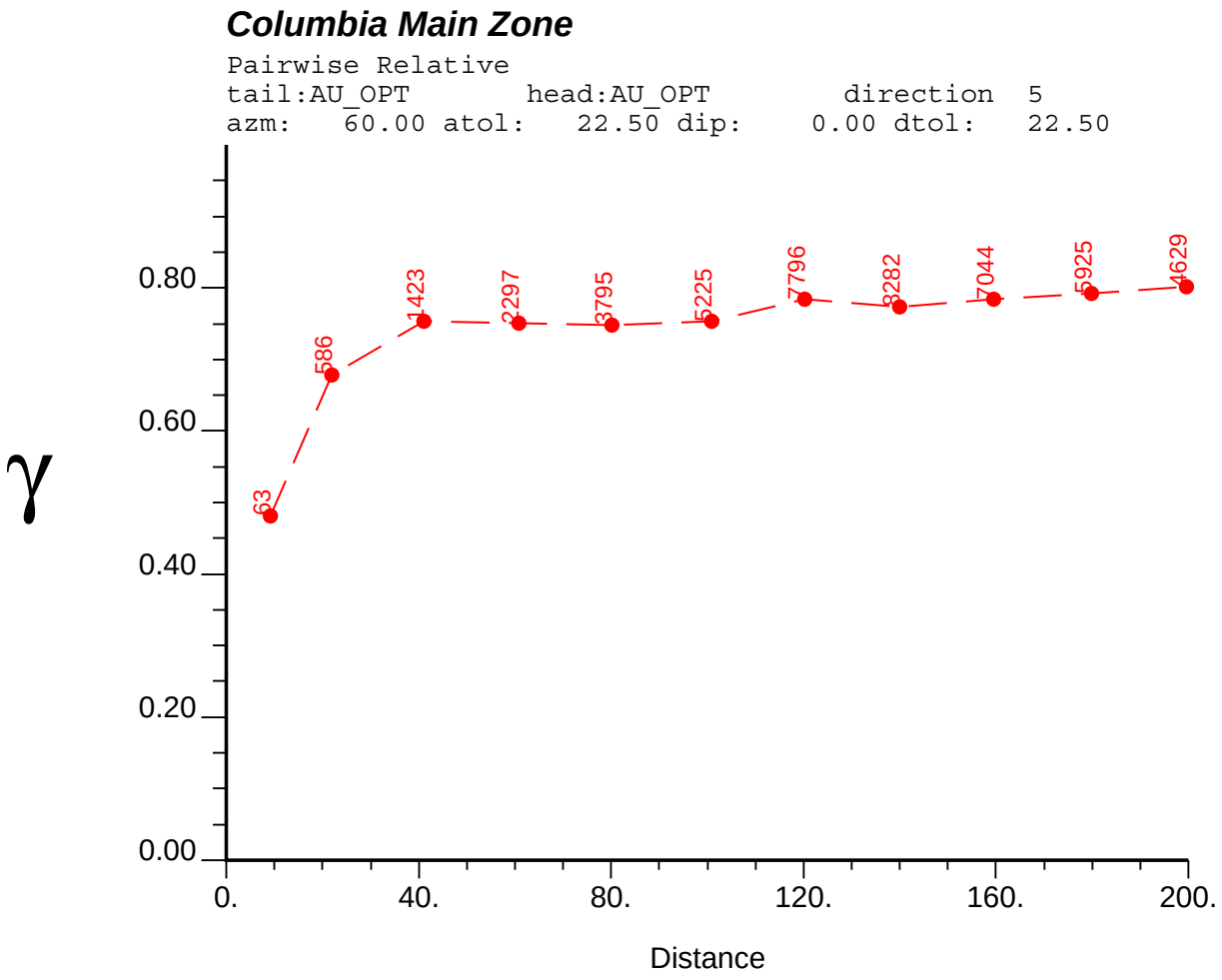
Variogram Models

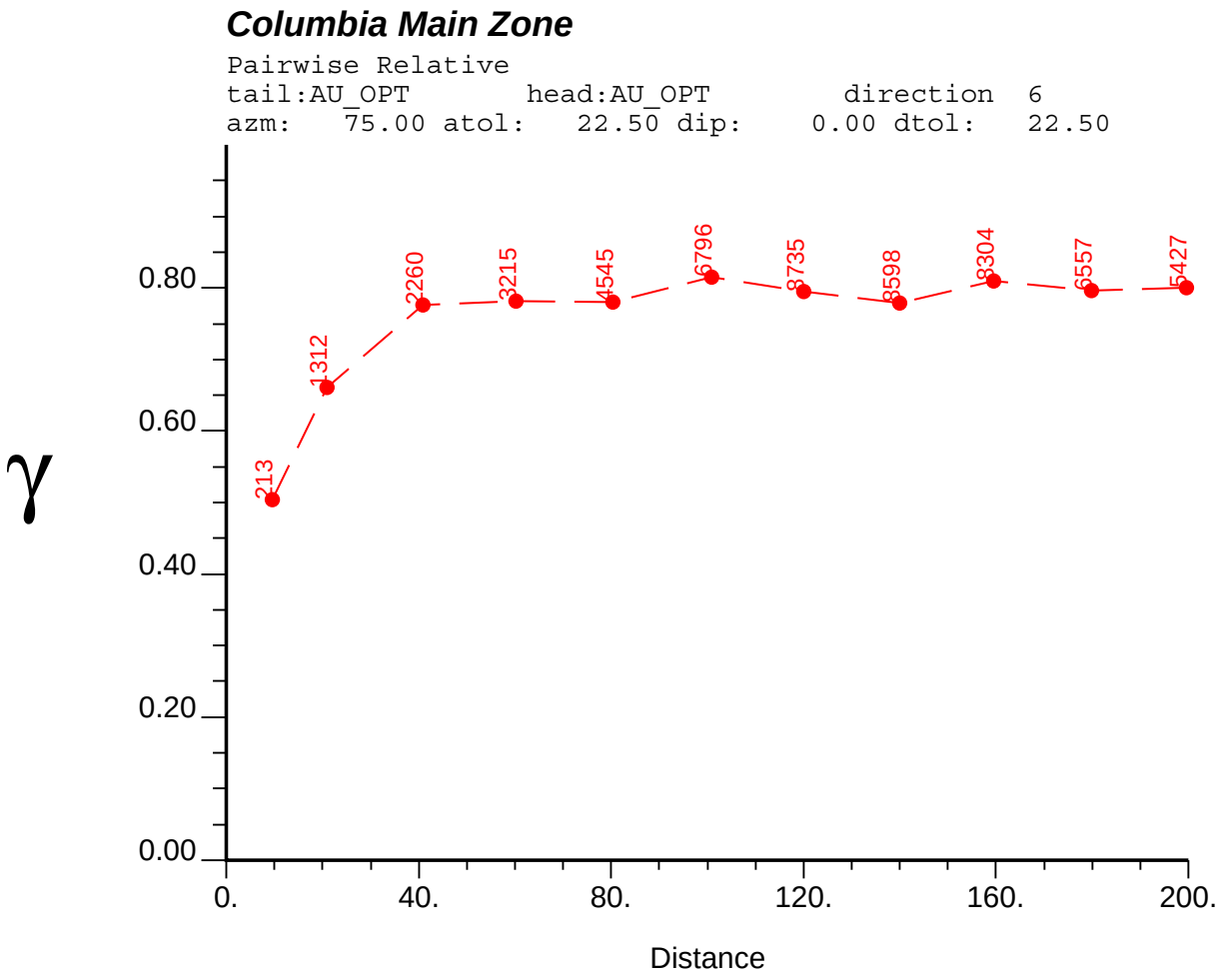

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 1
azm: 0.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
12
598
1564
3092
4247
7726
10368
10799
9466
9234
0.
40.
80.
120.
160.
200.
Distance

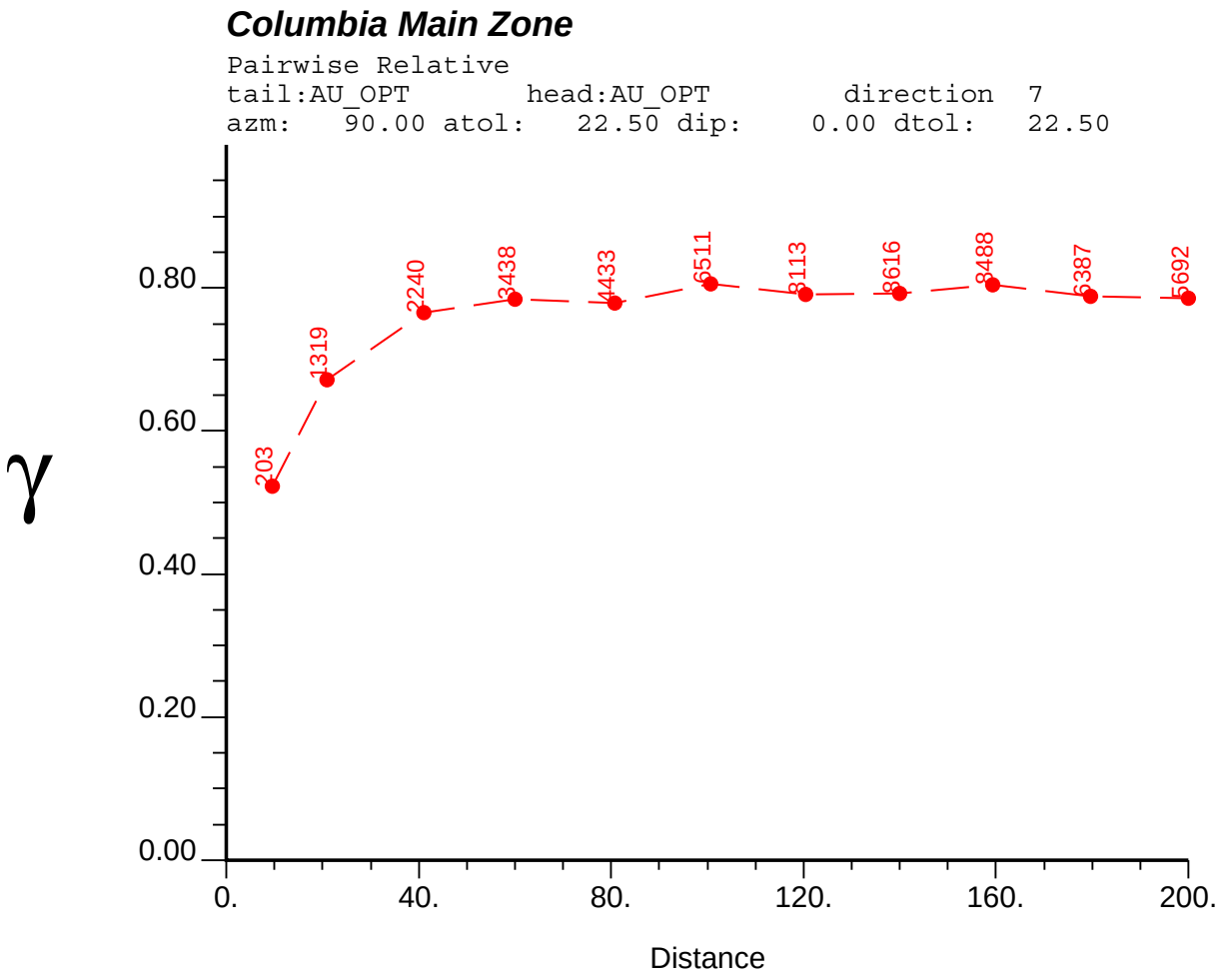

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 2
azm: 15.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
16
578
1485
2745
4120
7419
9821
9537
9584
9267
0.
40.
80.
120.
160.
200.
Distance

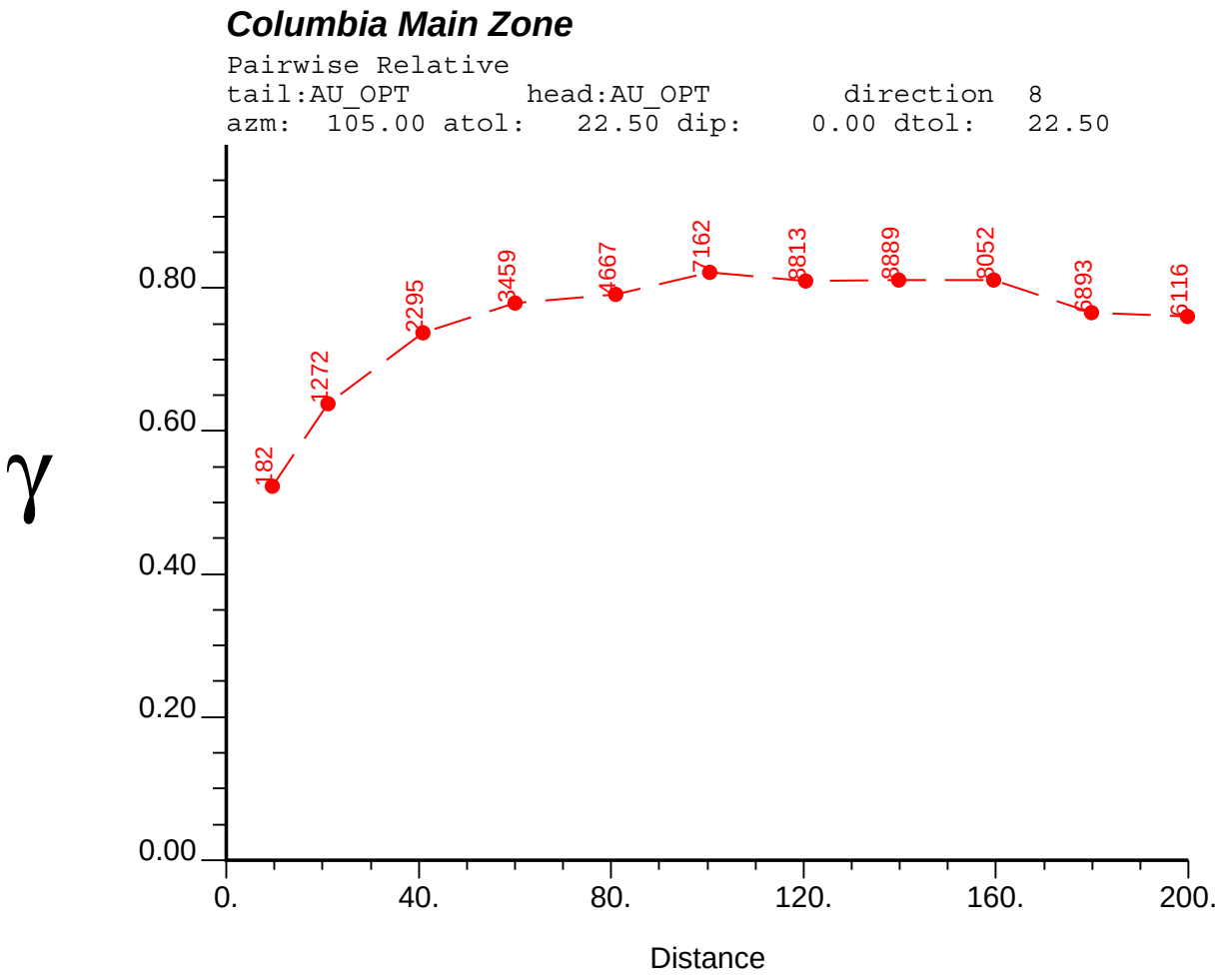

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 3
azm: 30.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
18
577
1381
2346
4258
5889
8591
9222
8670
7298
6303

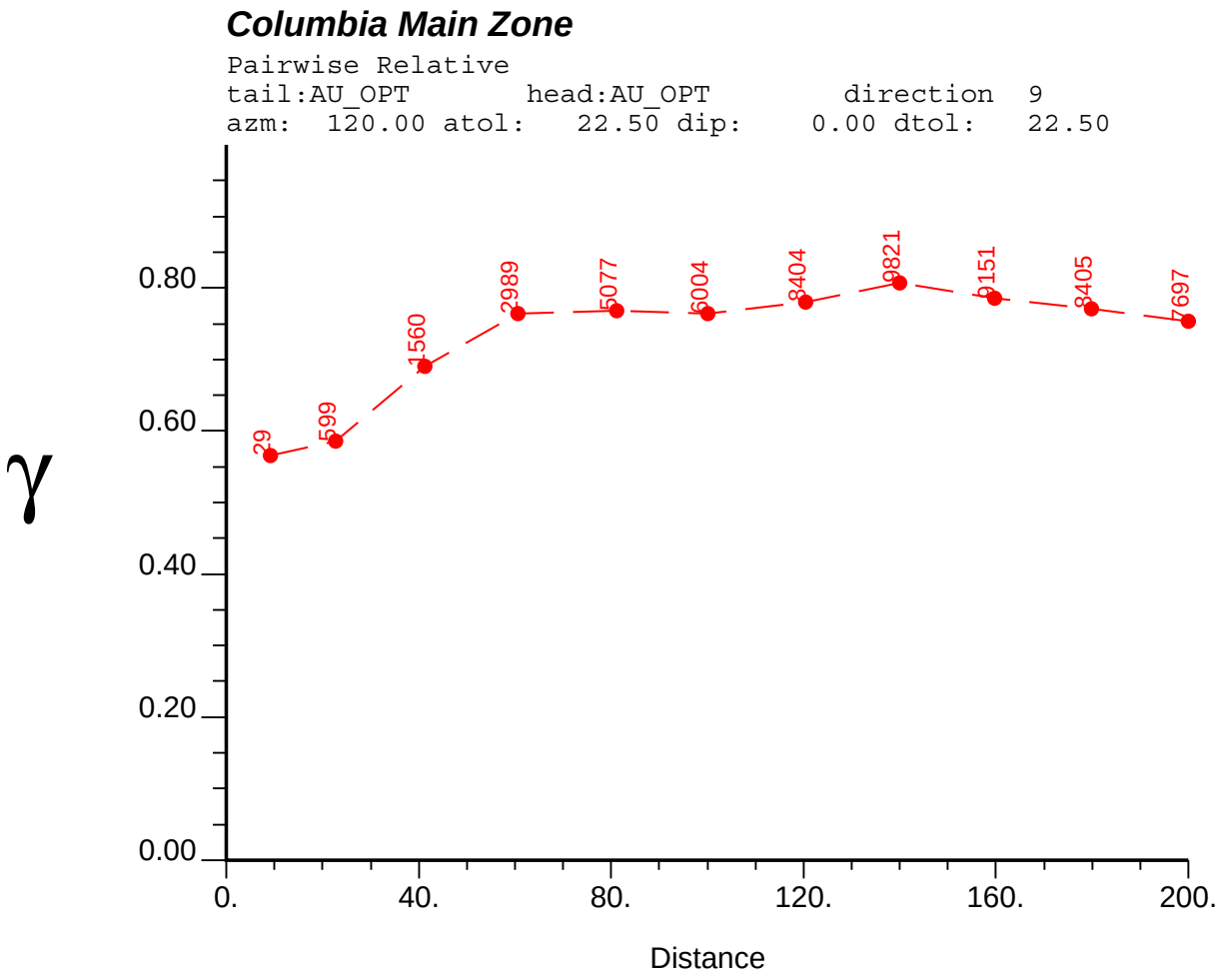

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 4
azm: 45.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
48
571
1361
2304
3974
5409
8105
8151
7169
6718
4764

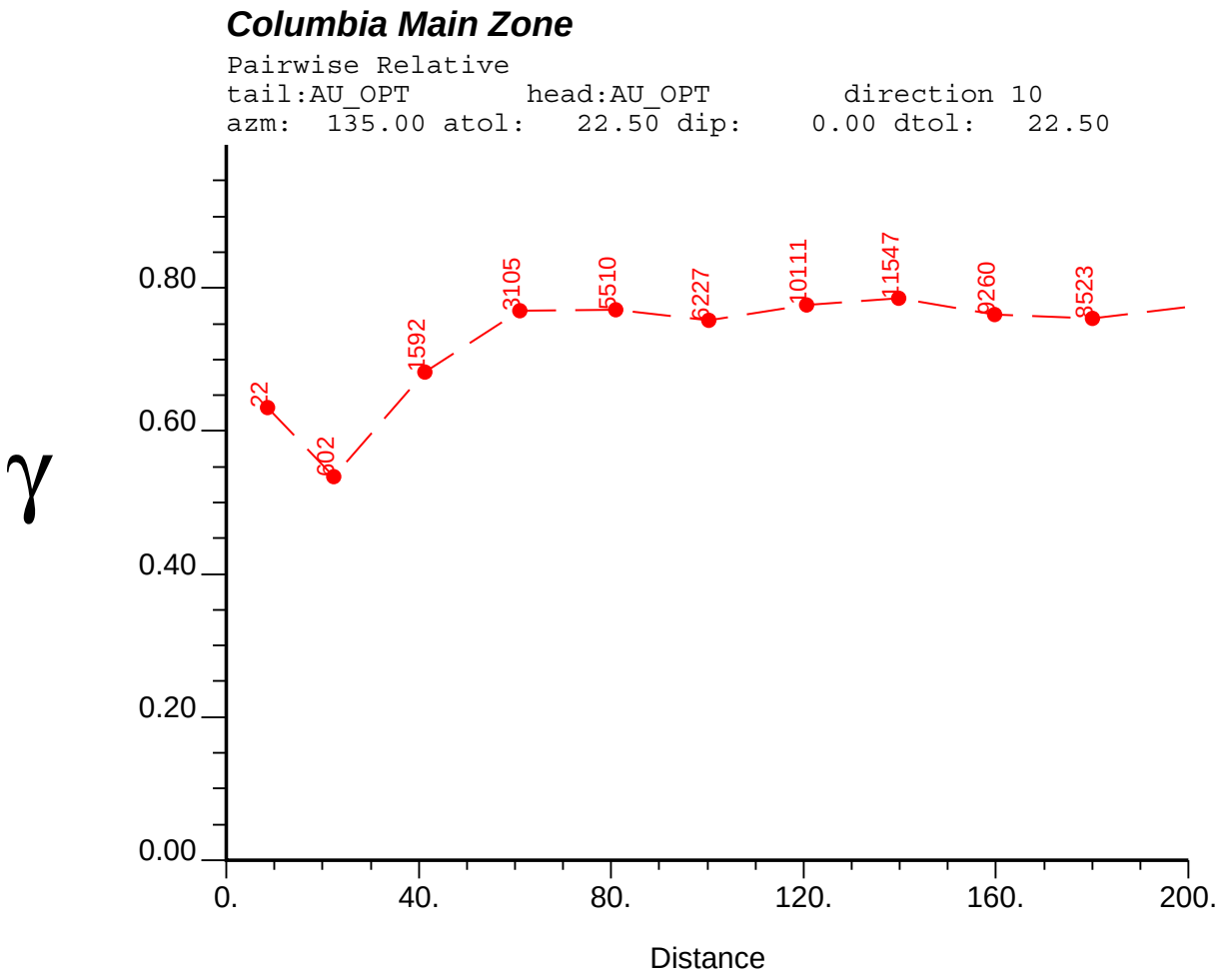

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 5
azm: 60.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
63
586
1423
2297
3795
5225
7796
8282
7044
5925
4629
0.
40.
80.
120.
160.
200.
Distance

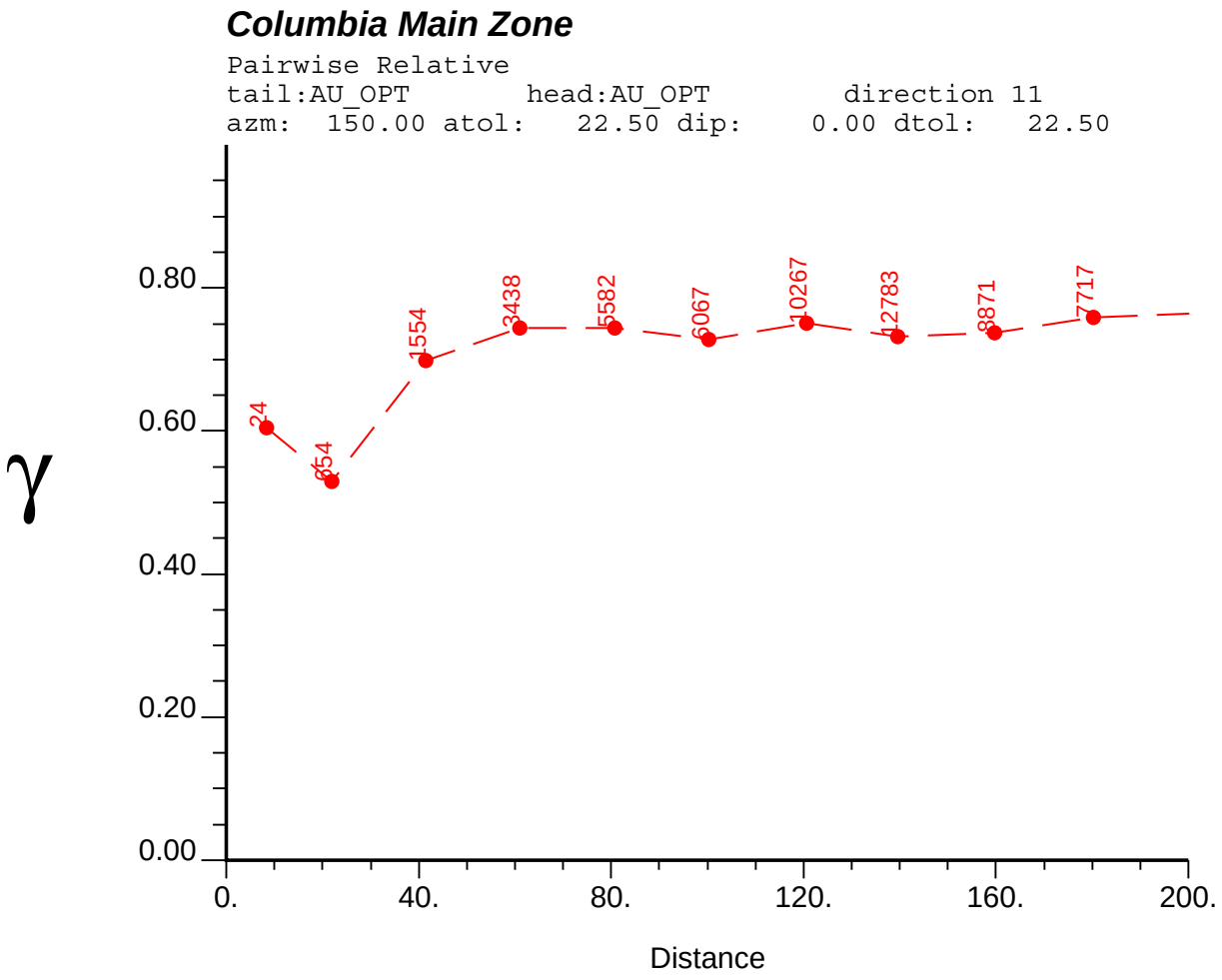

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 6
azm: 75.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.00
0.20
0.40
0.60
0.80
213
1312
2260
3215
4545
6796
8735
8598
8304
6557
5427
0.
40.
80.
120.
160.
200.
Distance

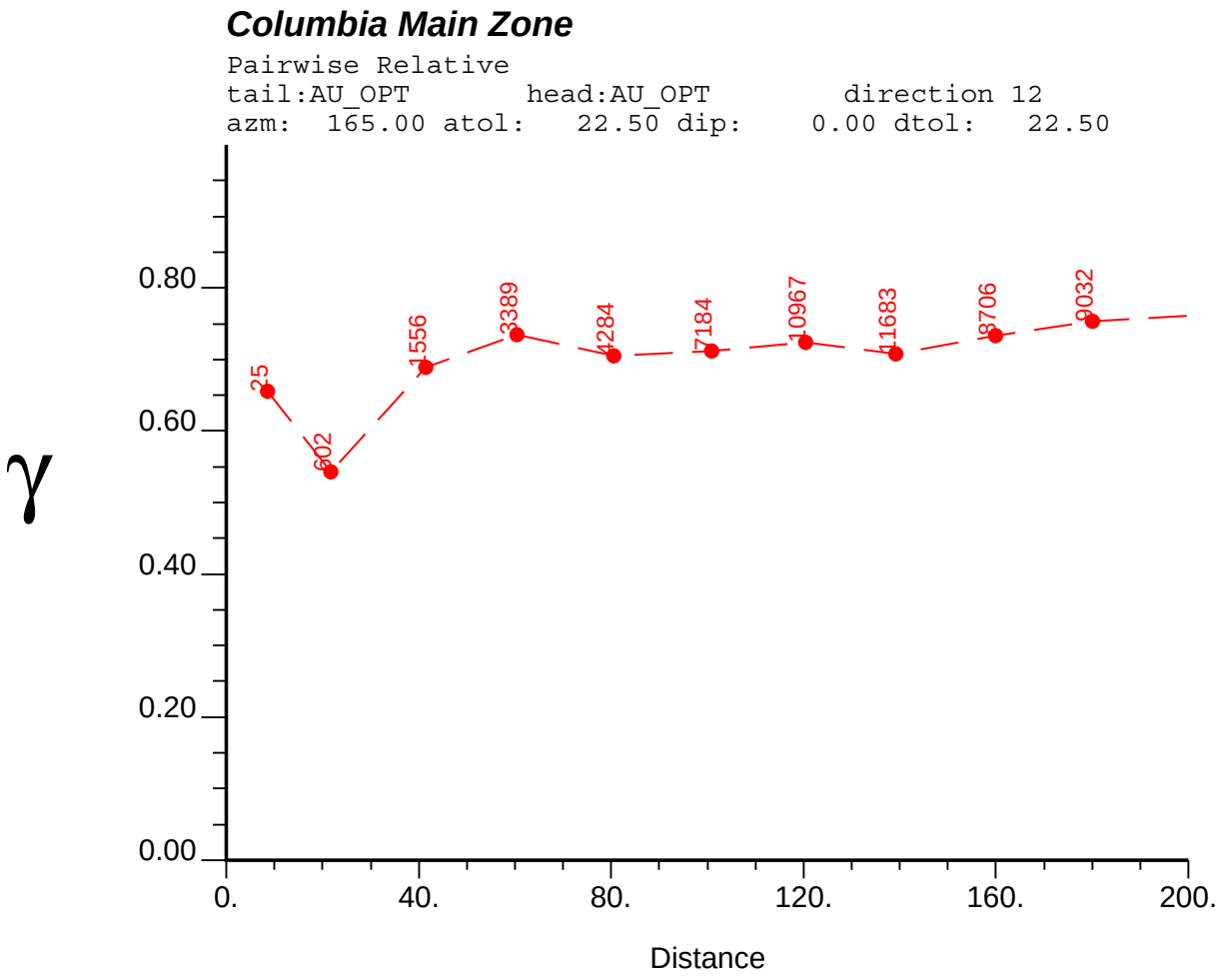

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 7
azm: 90.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
203
1319
2240
3438
4433
6511
8113
8616
8488
6387
5692
0.
40.
80.
120.
160.
200.
Distance

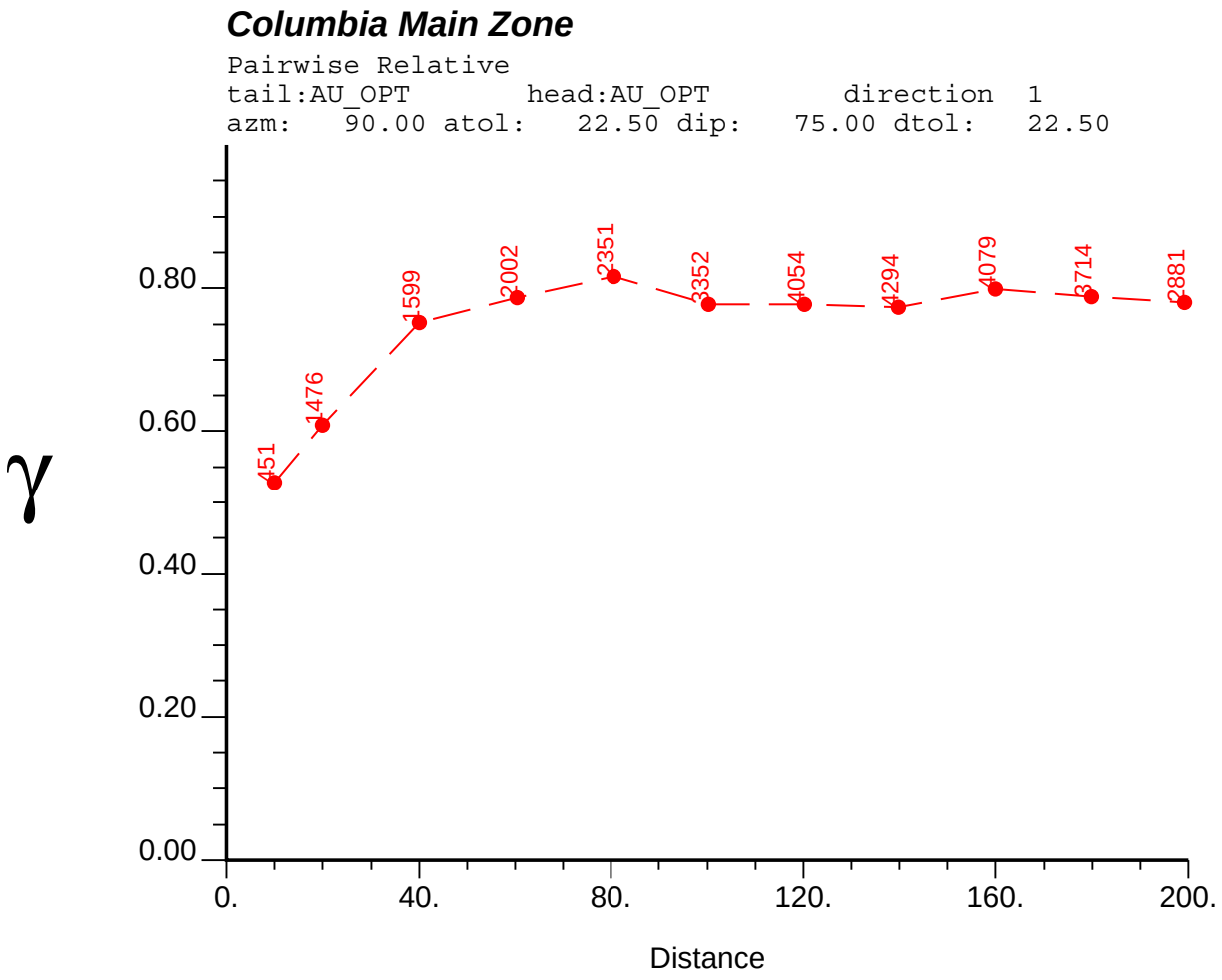

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 8
azm: 105.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
182
1272
2295
3459
4667
7162
8813
8889
8052
6893
6116

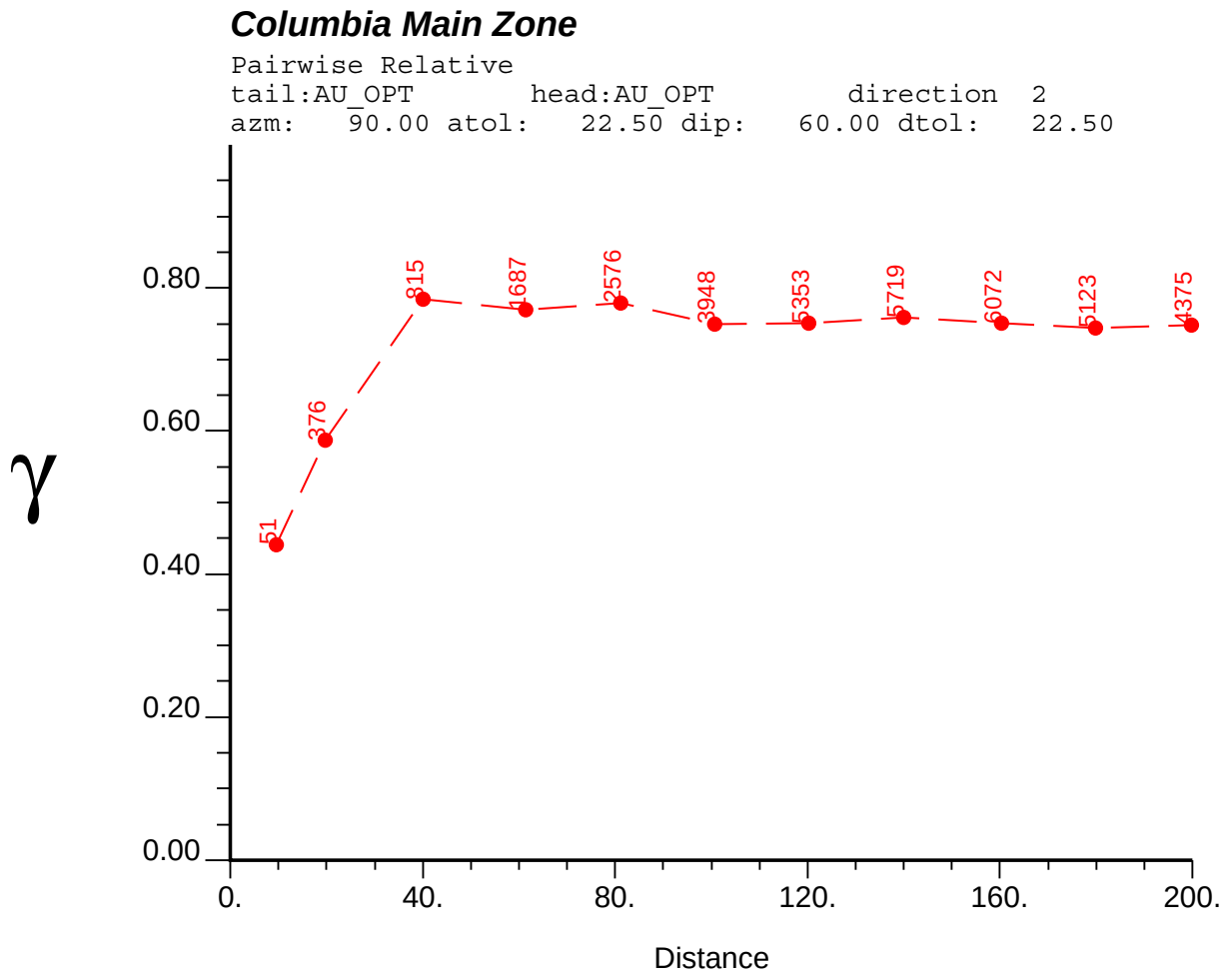

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 9
azm: 120.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
29
599
1560
2989
5077
6004
8404
9821
9151
8405
7697

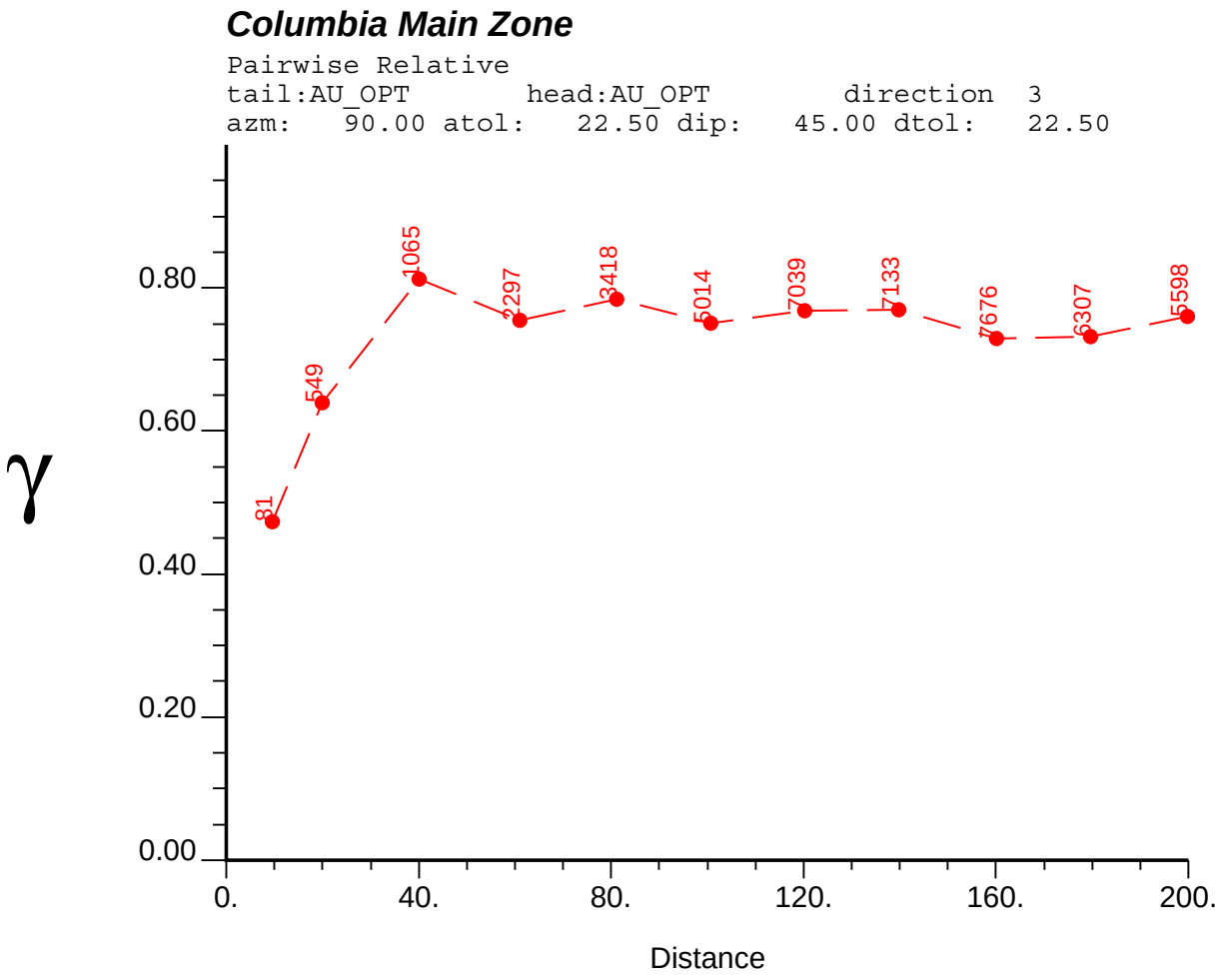

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 10
azm: 135.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
22
602
1592
3105
5510
6227
10111
11547
9260
8523

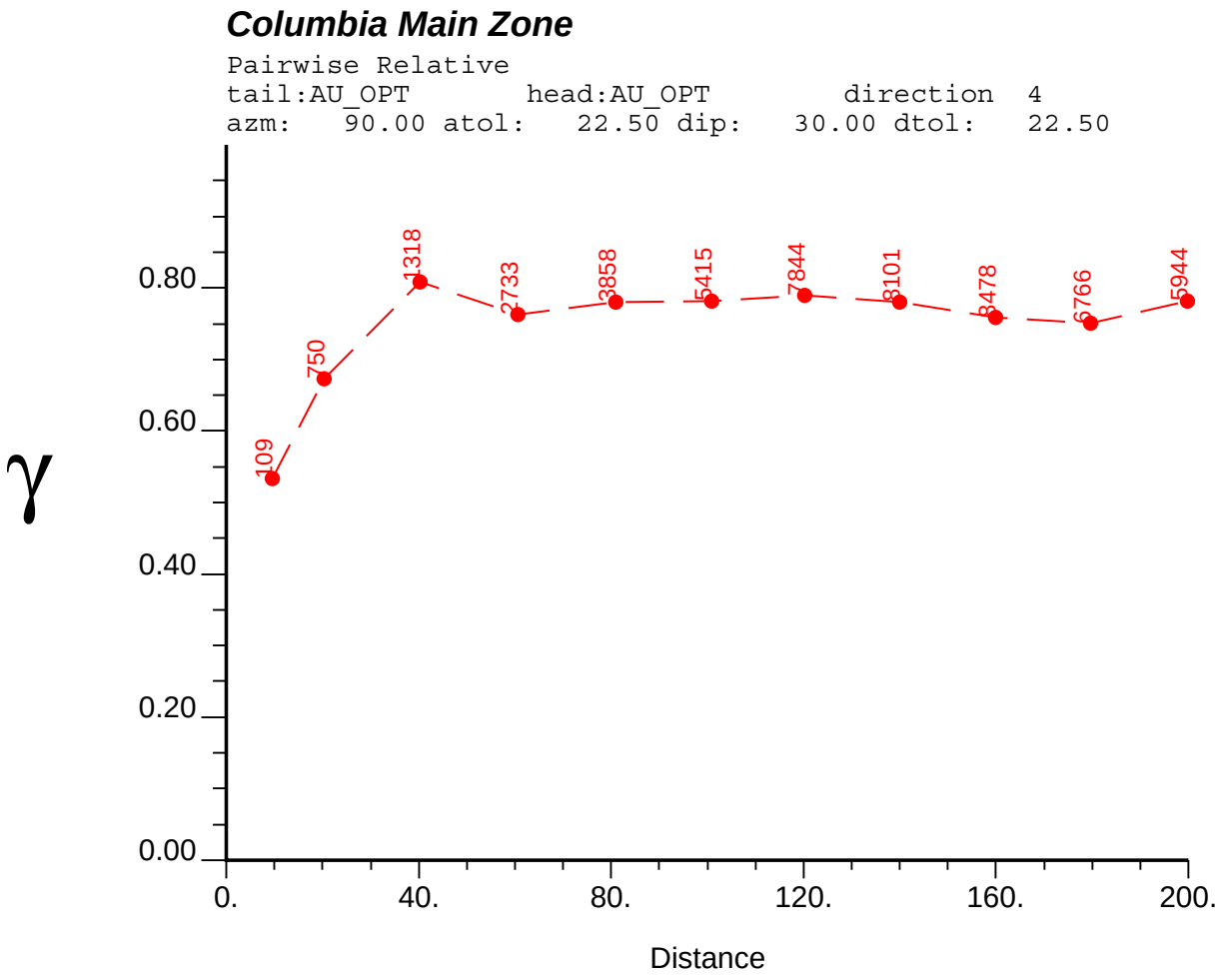

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 11
azm: 150.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
24
654
1554
3438
5582
6067
10267
12783
8871
7717

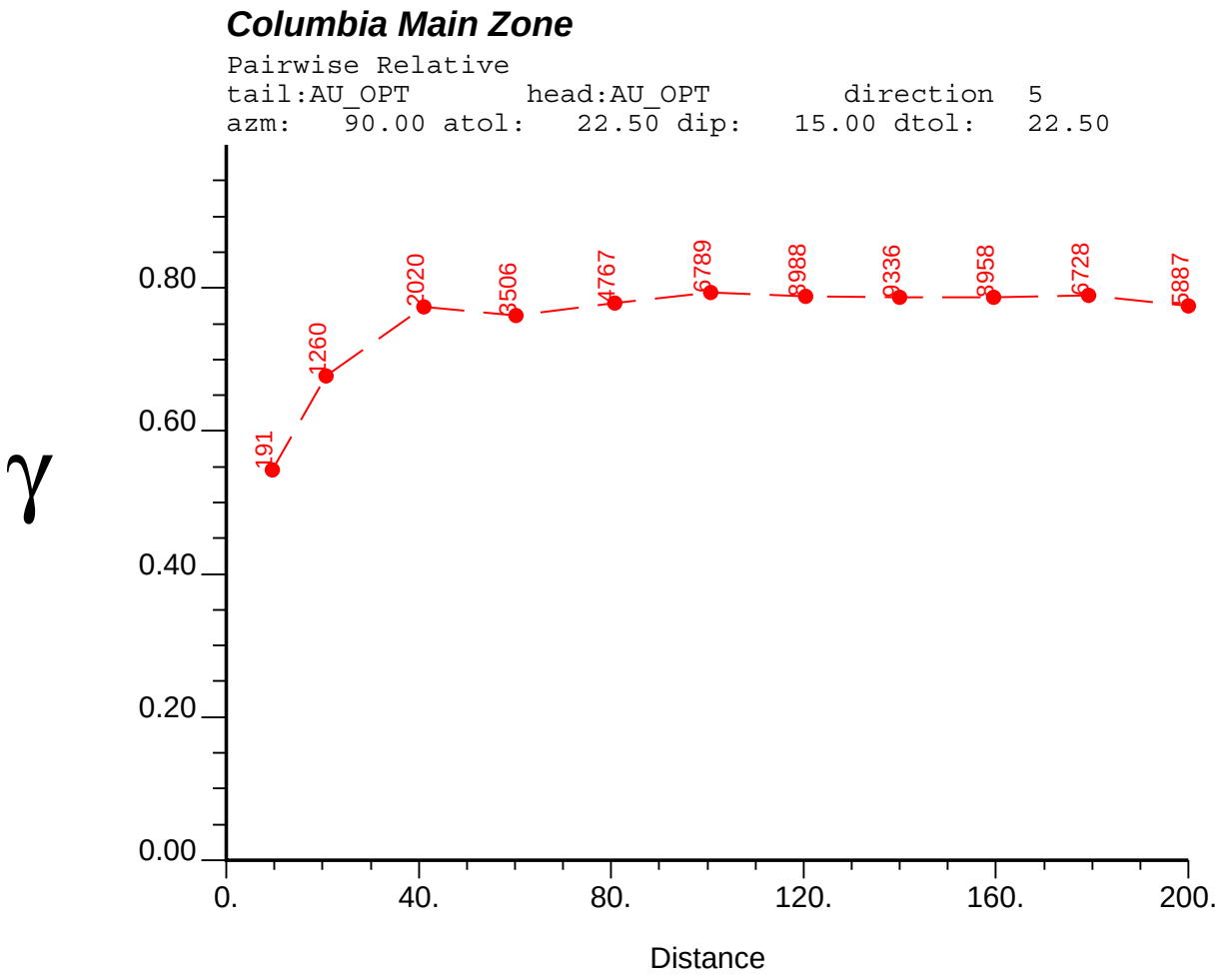

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 12
azm: 165.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
25
602
1556
3389
4284
7184
10967
11683
8706
9032

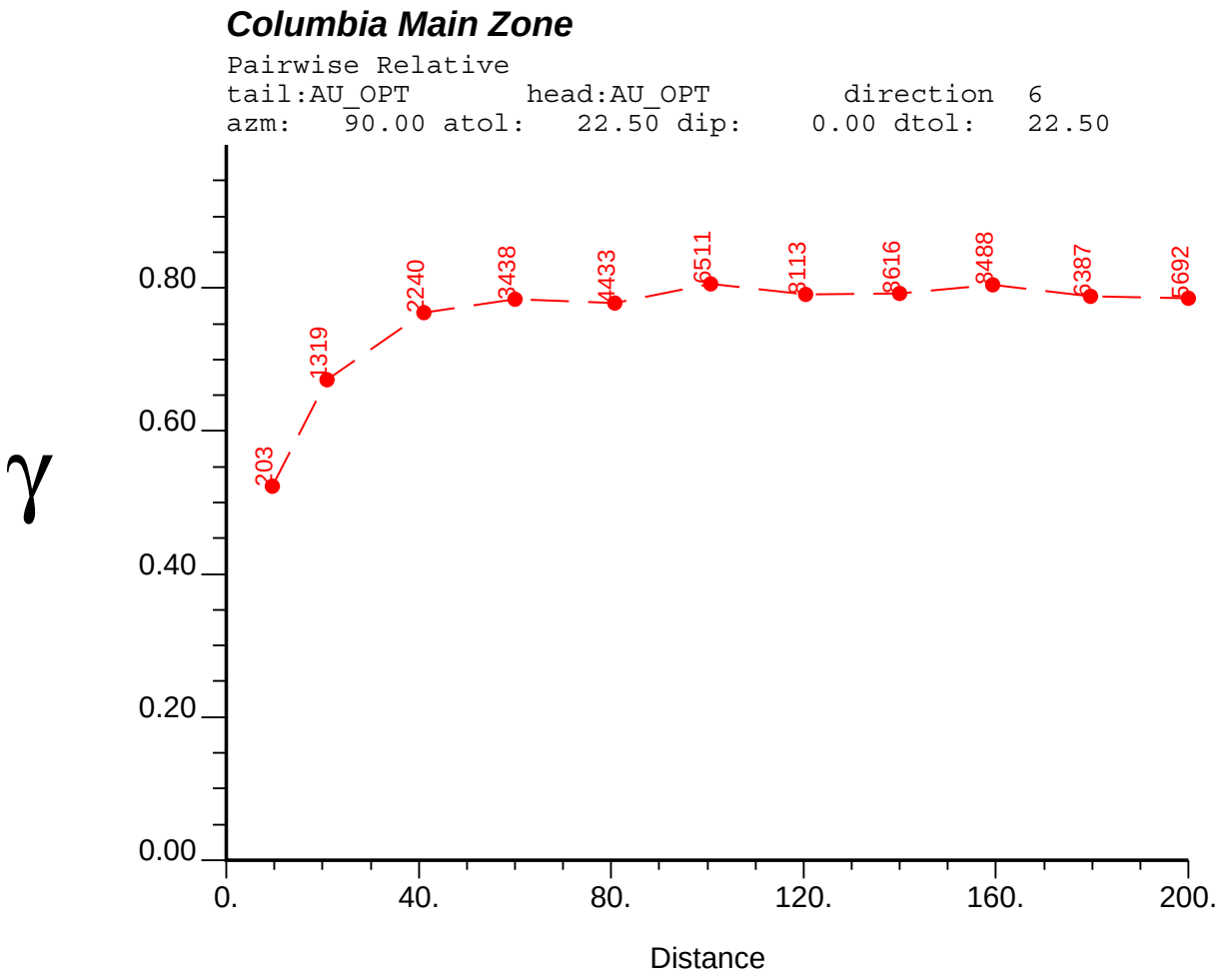

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 1
azm: 90.00 atol: 22.50 dip: 75.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
451
1476
1599
2002
2351
3352
4054
4294
4079
3714
2881
0.
40.
80.
120.
160.
200.
Distance

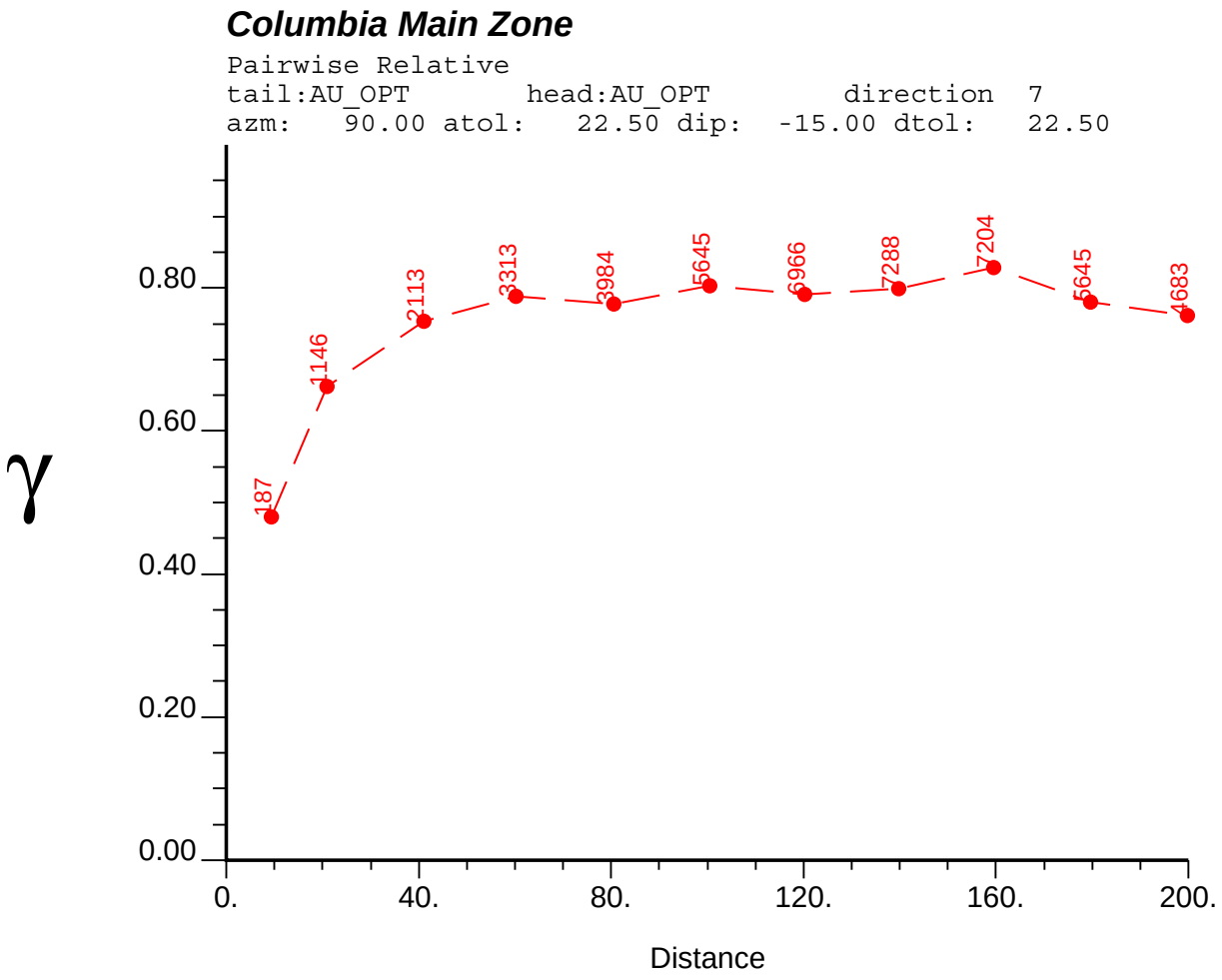

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 2
azm: 90.00 atol: 22.50 dip: 60.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
51
376
815
1687
2576
3948
5353
5719
6072
5123
4375

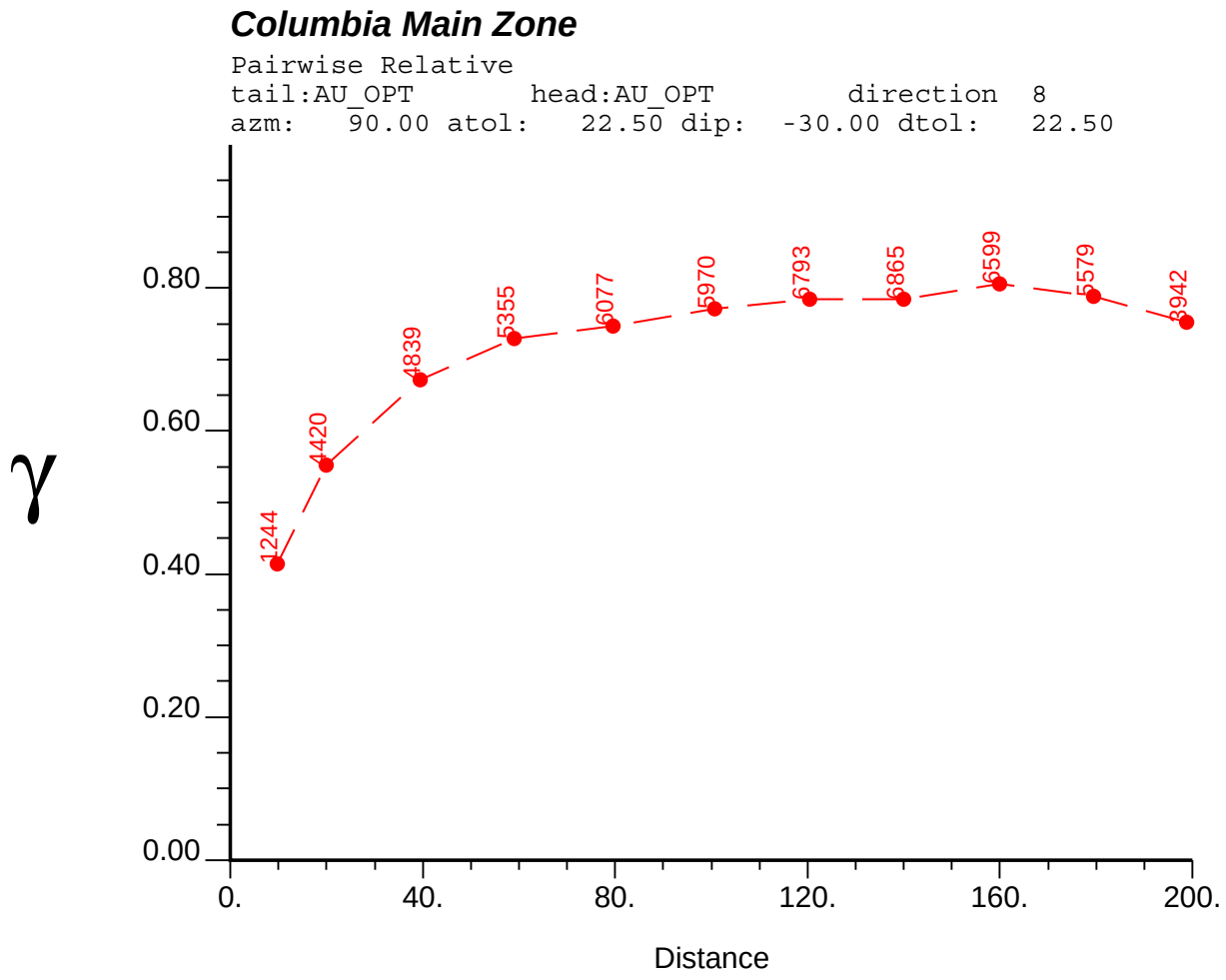

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 3
azm: 90.00 atol: 22.50 dip: 45.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
81
549
1065
2297
3418
5014
7039
7133
7676
6307
5598

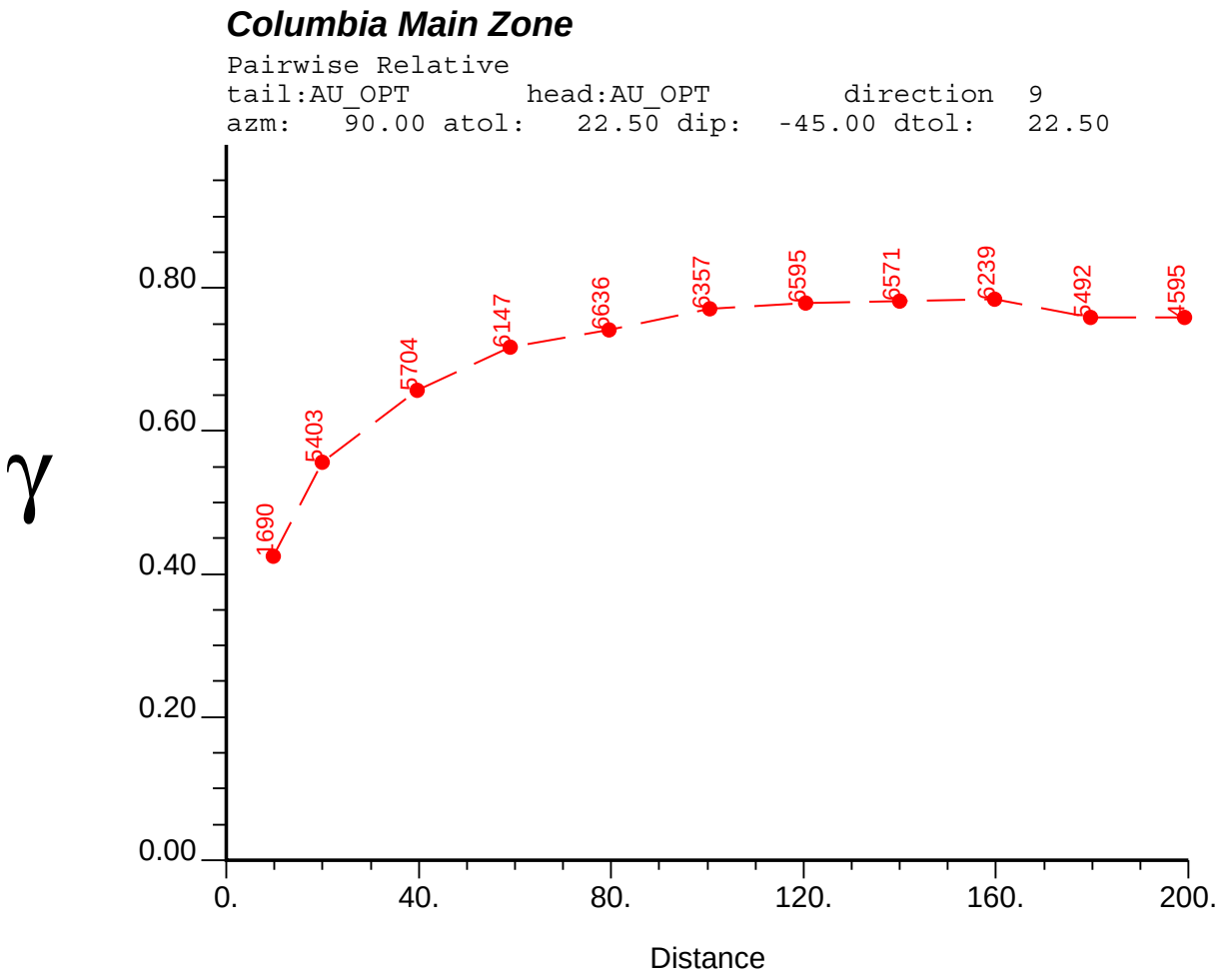

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 4
azm: 90.00 atol: 22.50 dip: 30.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
109
750
1318
2733
3858
5415
7844
8101
8478
6766
5944

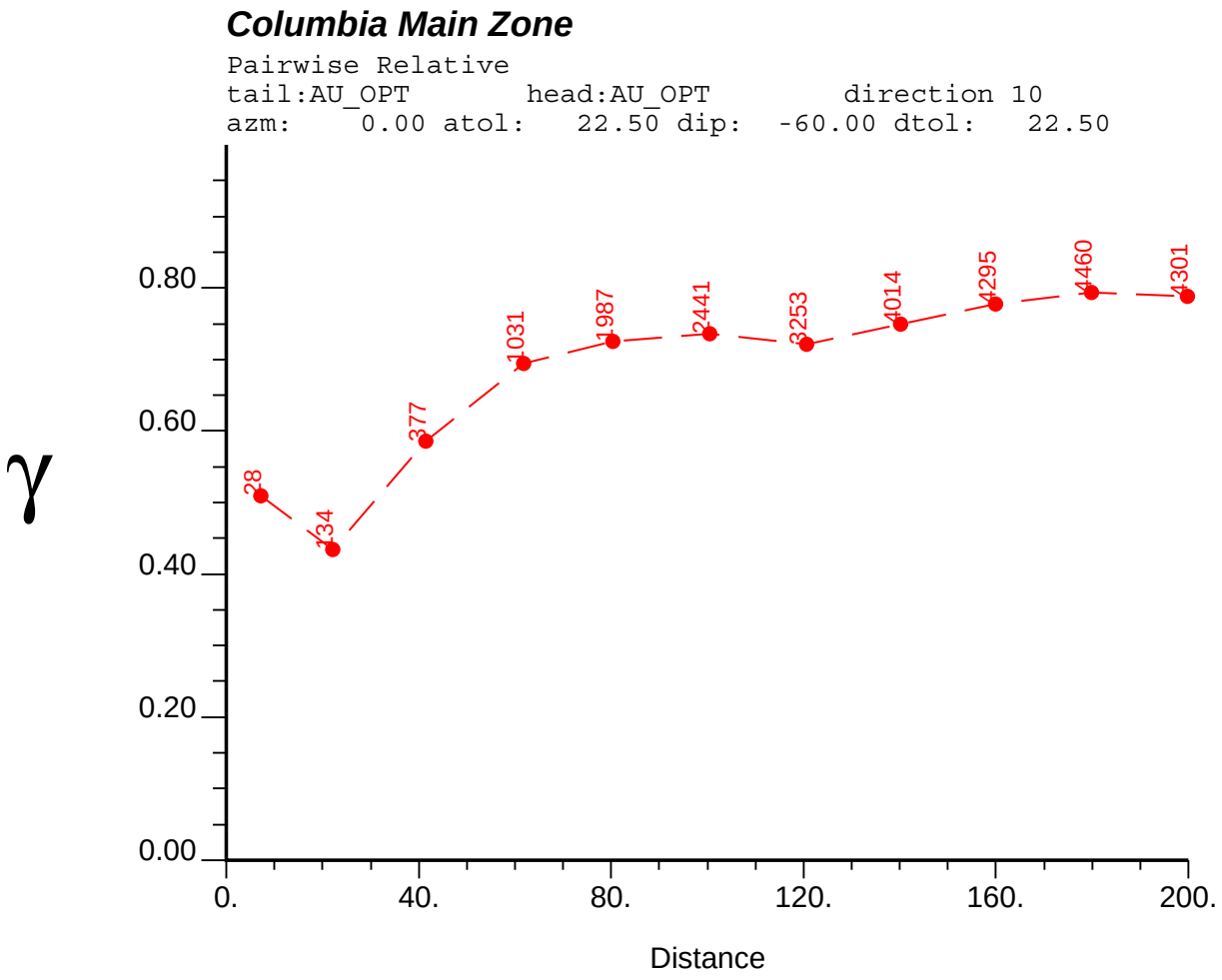

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 5
azm: 90.00 atol: 22.50 dip: 15.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
191
1260
2020
3506
4767
6789
8988
9336
8958
6728
5887

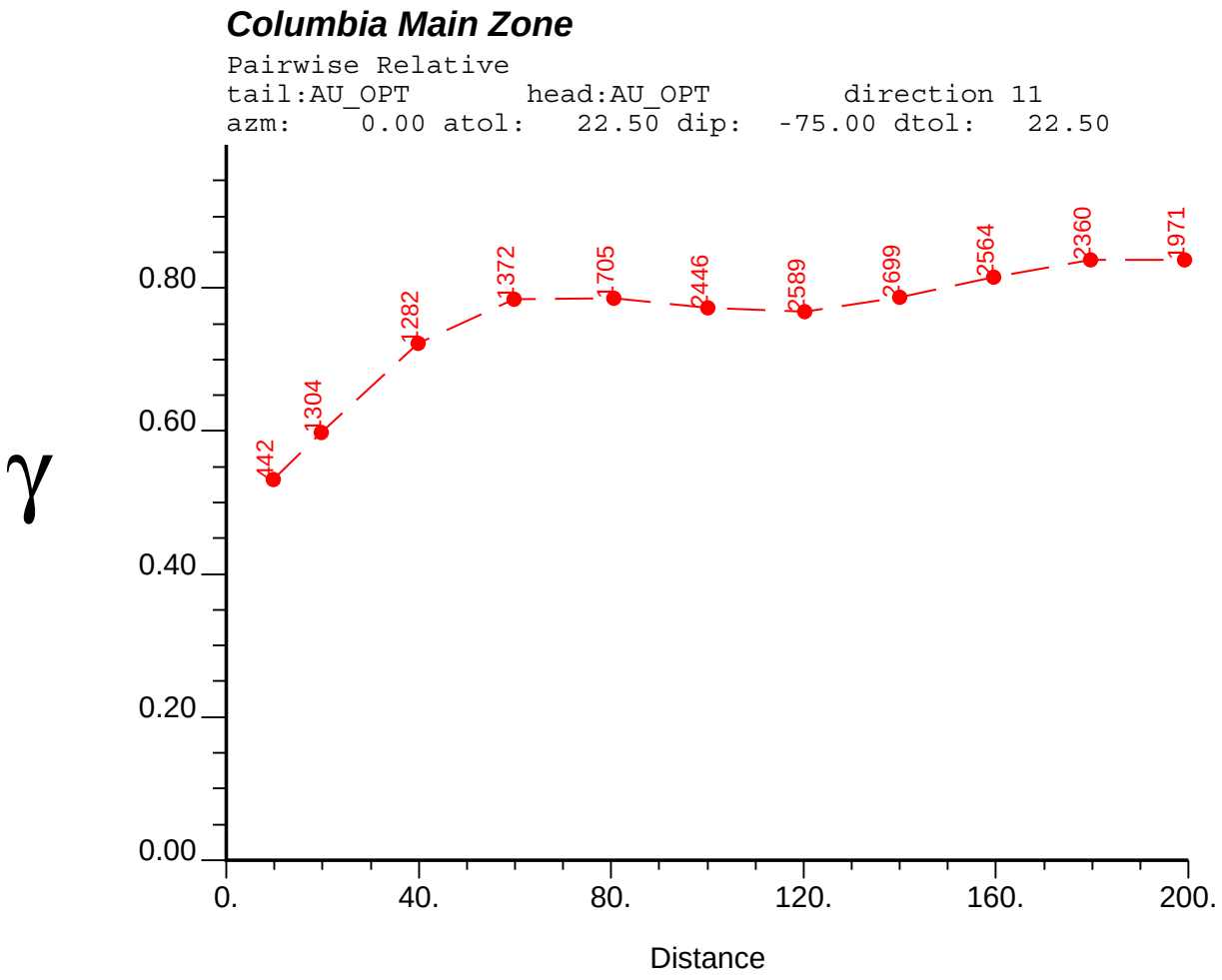

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 6
azm: 90.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
203
1319
2240
3438
4433
6511
8113
8616
8488
6387
5692
0.
40.
80.
120.
160.
200.
Distance

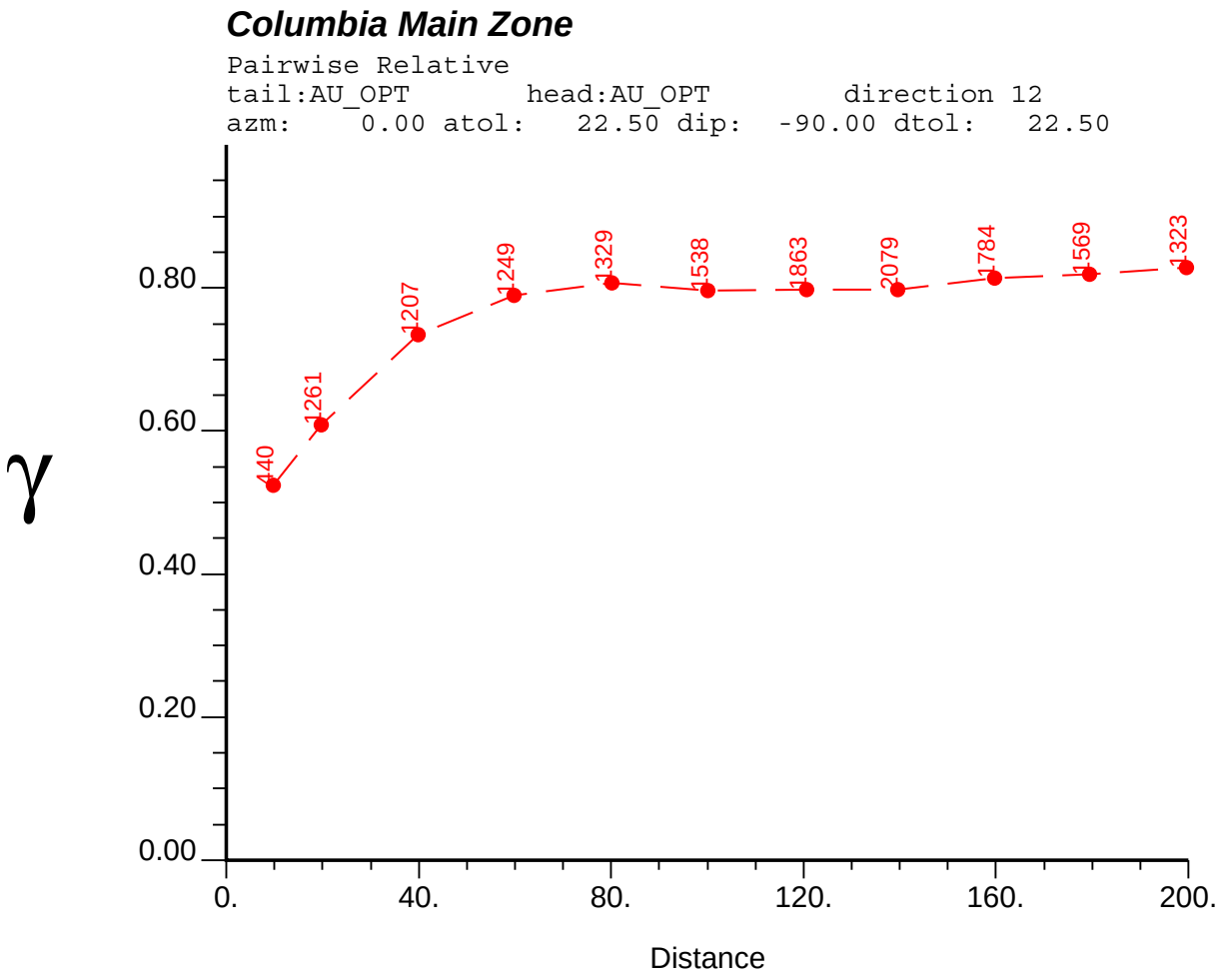

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 7
azm: 90.00 atol: 22.50 dip: -15.00 dtol: 22.50
γ
0.00
0.20
0.40
0.60
0.80
0.
40.
80.
120.
160.
200.
Distance
187
1146
2113
3313
3984
5645
6966
7288
7204
5645
4683

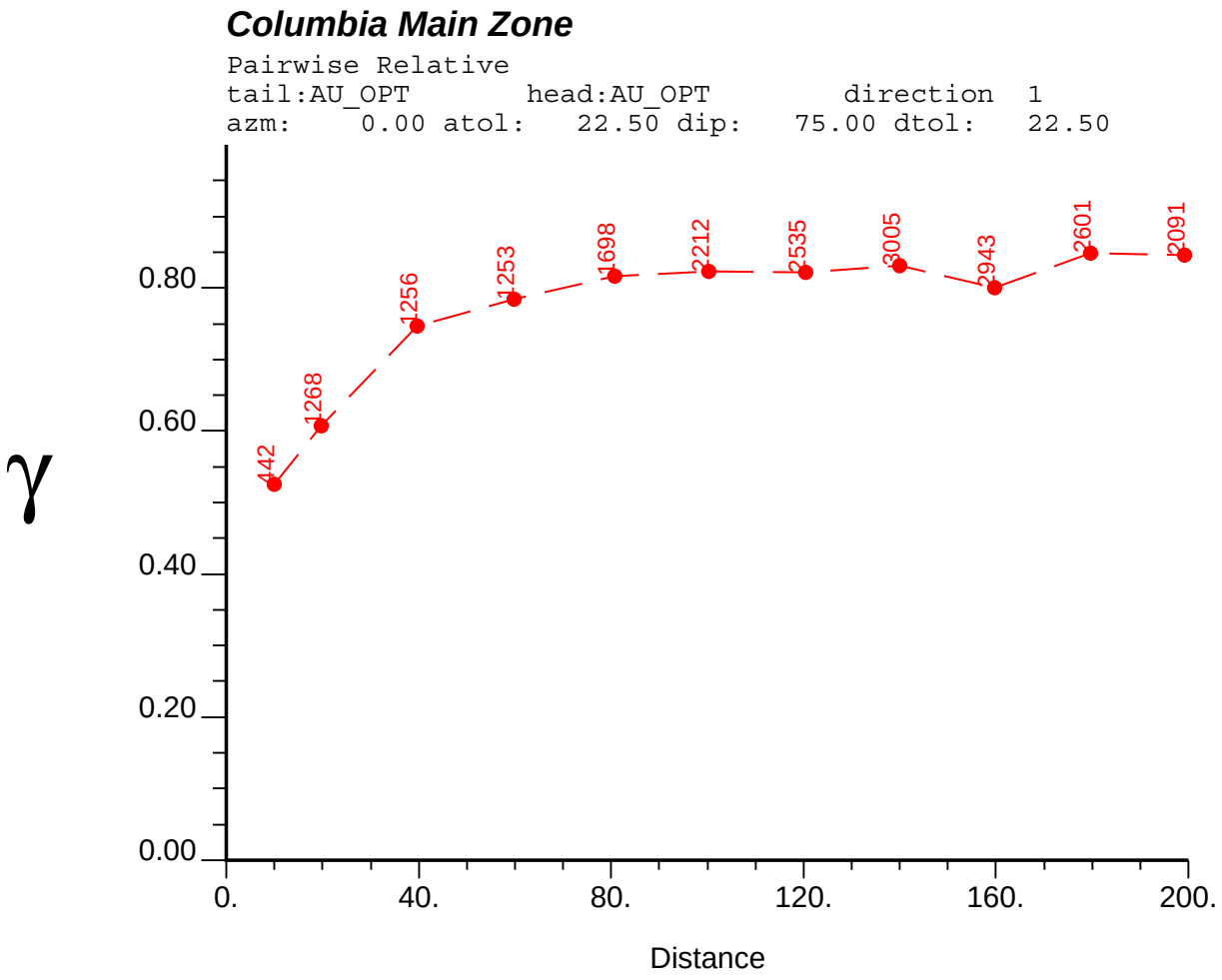

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 8
azm: 90.00 atol: 22.50 dip: -30.00 dtol: 22.50
γ
0.00
0.20
0.40
0.60
0.80
0.
40.
80.
120.
160.
200.
Distance
1244
4420
4839
5355
6077
5970
6793
6865
6599
5579
3942

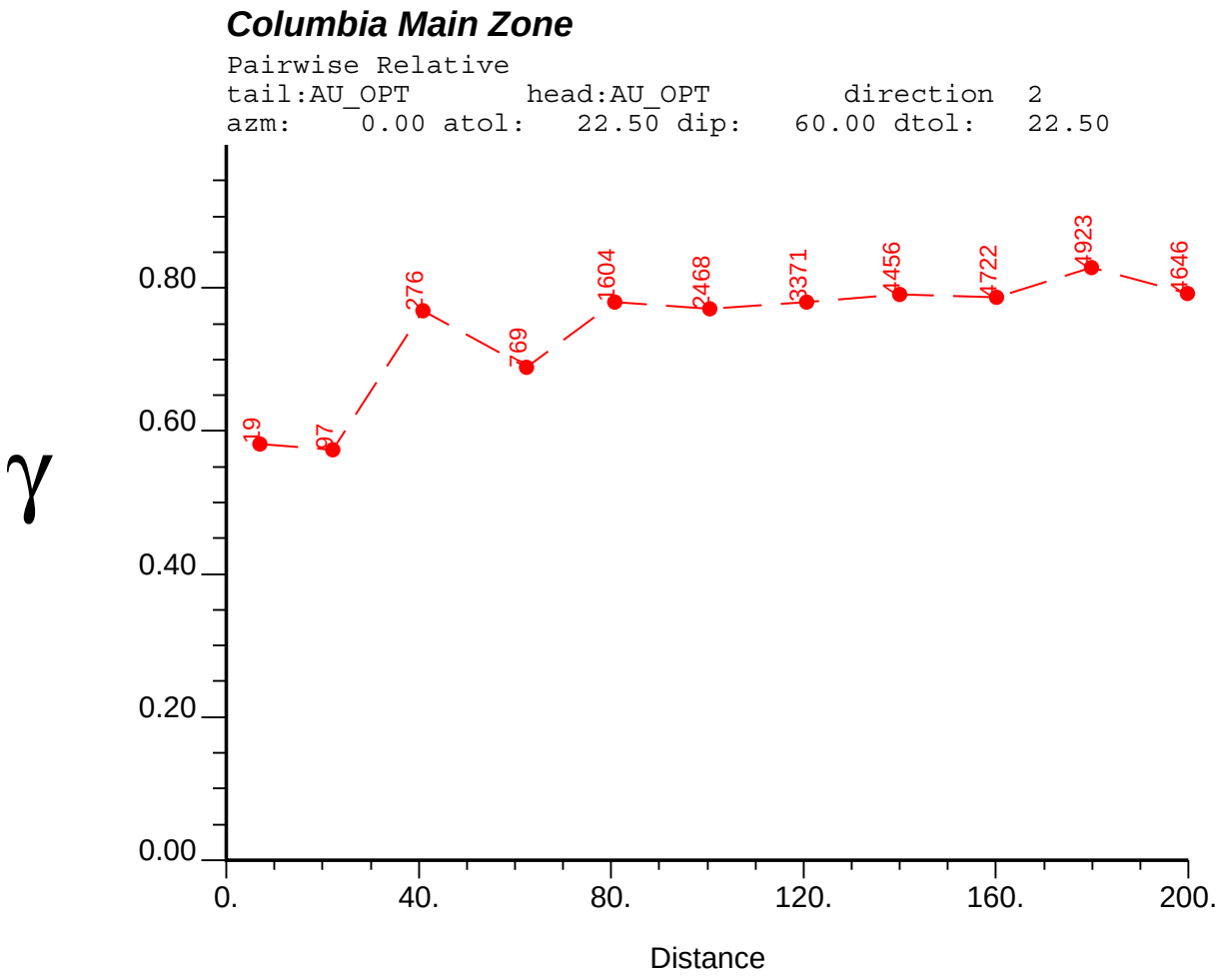

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 9
azm: 90.00 atol: 22.50 dip: -45.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
1690
5403
5704
6147
6636
6357
6595
6571
6239
5492
4595

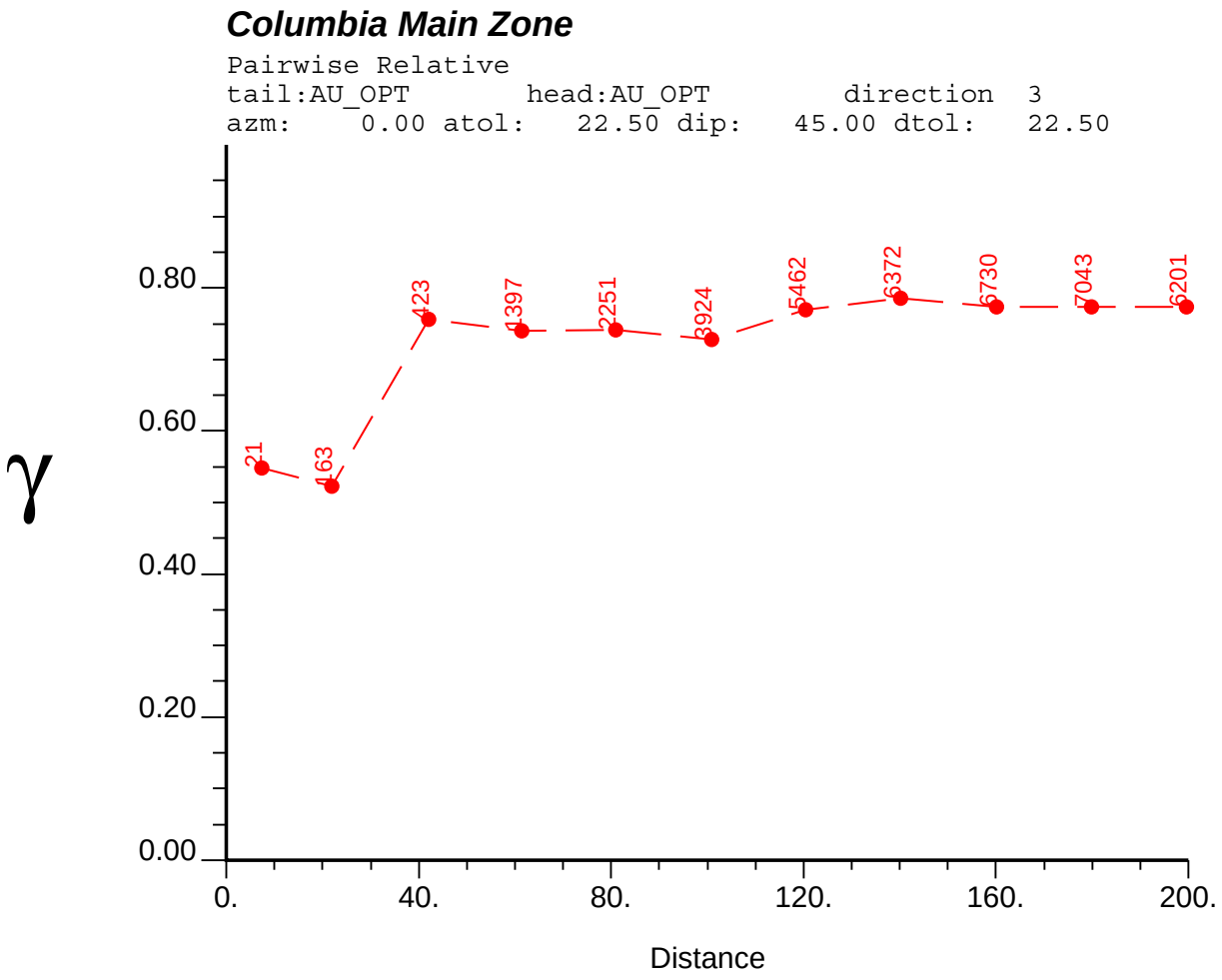

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 10
azm: 0.00 atol: 22.50 dip: -60.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
28
134
377
1031
1987
2441
3253
4014
4295
4460
4301

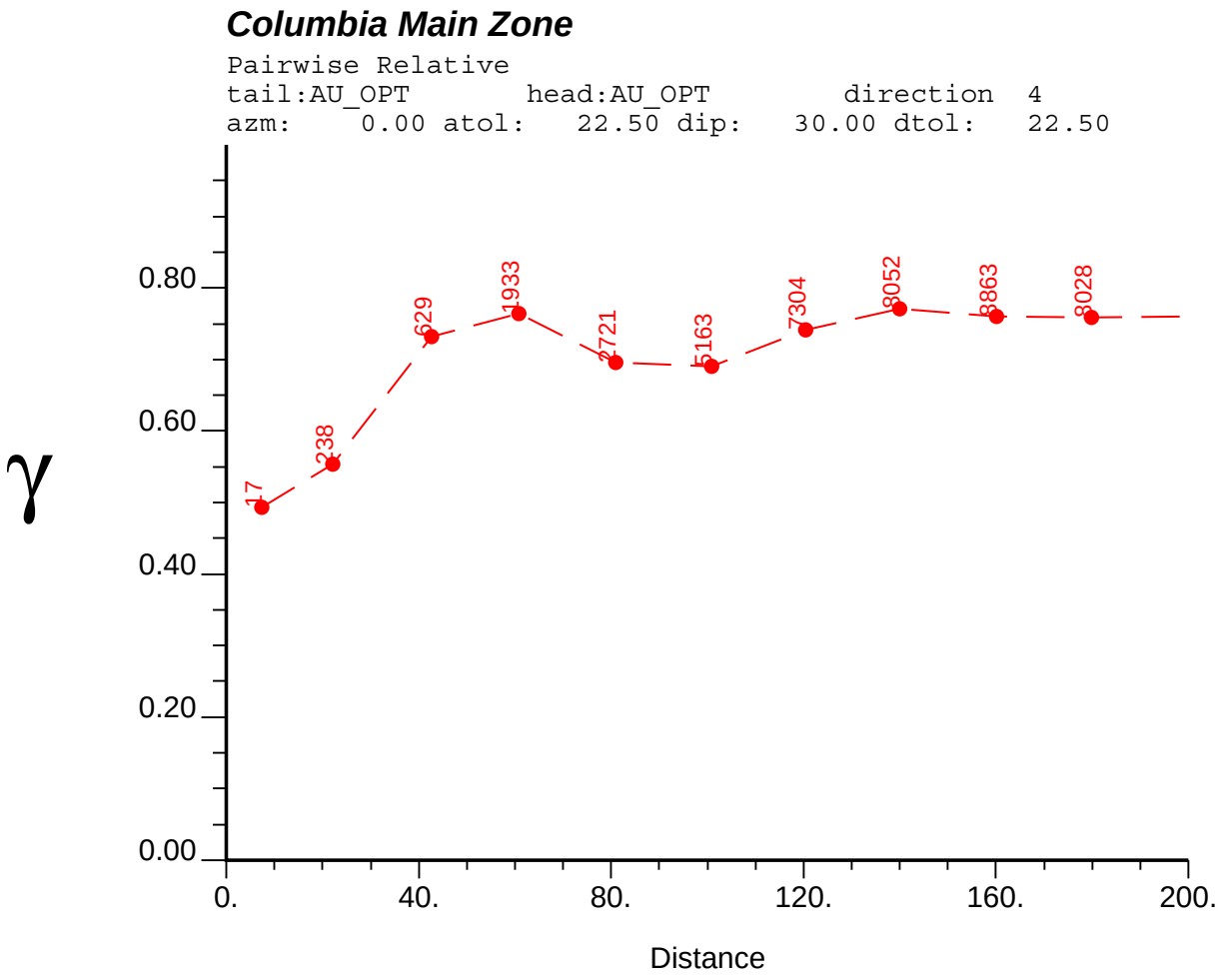

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 11
azm: 0.00 atol: 22.50 dip: -75.00 dtol: 22.50
γ
0.00
0.20
0.40
0.60
0.80
0.
40.
80.
120.
160.
200.
Distance
442
1304
1282
1372
1705
2446
2589
2699
2564
2360
1971

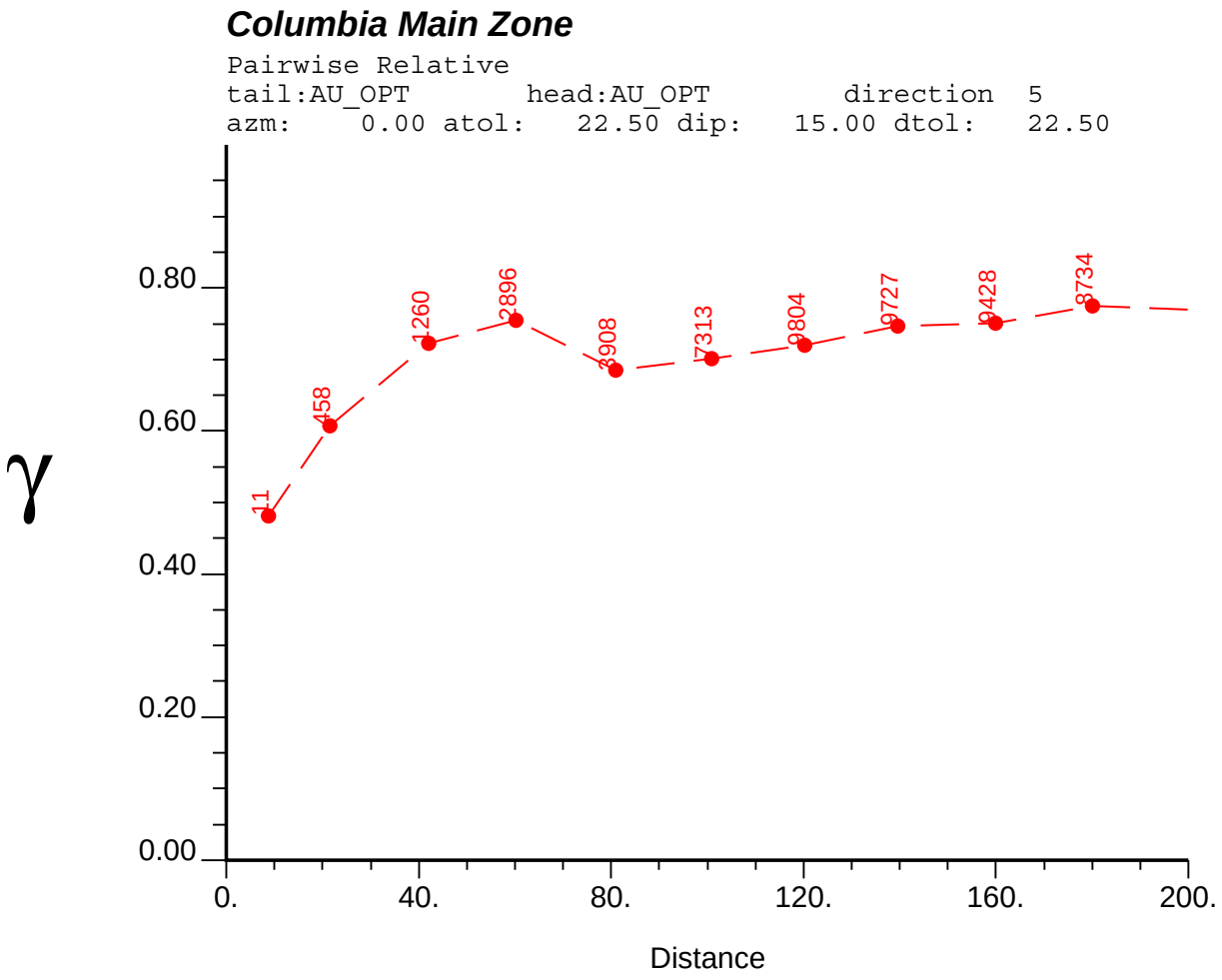

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 12
azm: 0.00 atol: 22.50 dip: -90.00 dtol: 22.50
γ
0.00
0.20
0.40
0.60
0.80
0.
40.
80.
120.
160.
200.
Distance
140
1261
1207
1249
1329
1538
1863
2079
1784
1569
1323

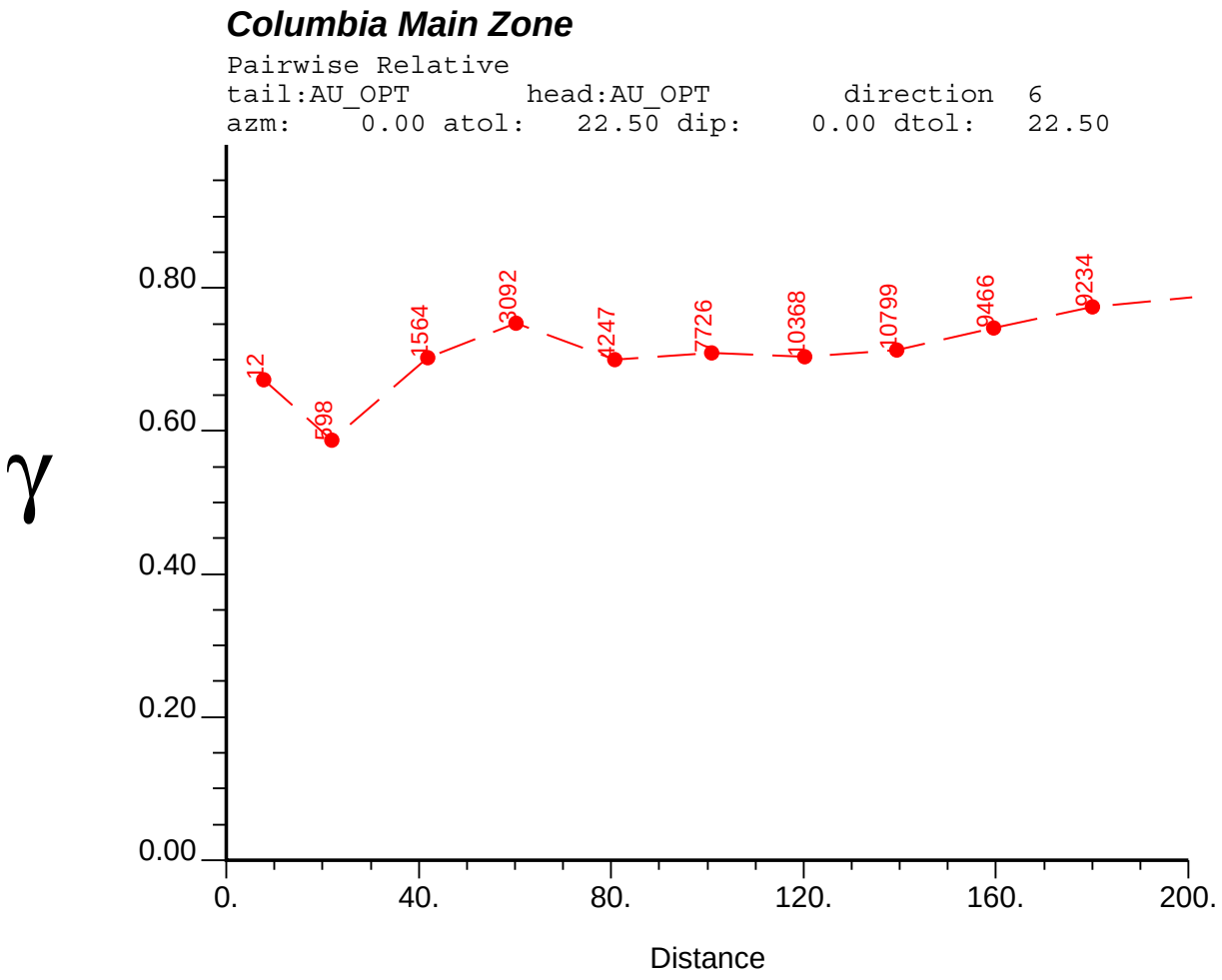

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 1
azm: 0.00 atol: 22.50 dip: 75.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
442
1268
1256
1253
1698
2212
2535
3005
2943
2601
2091
0.
40.
80.
120.
160.
200.
Distance

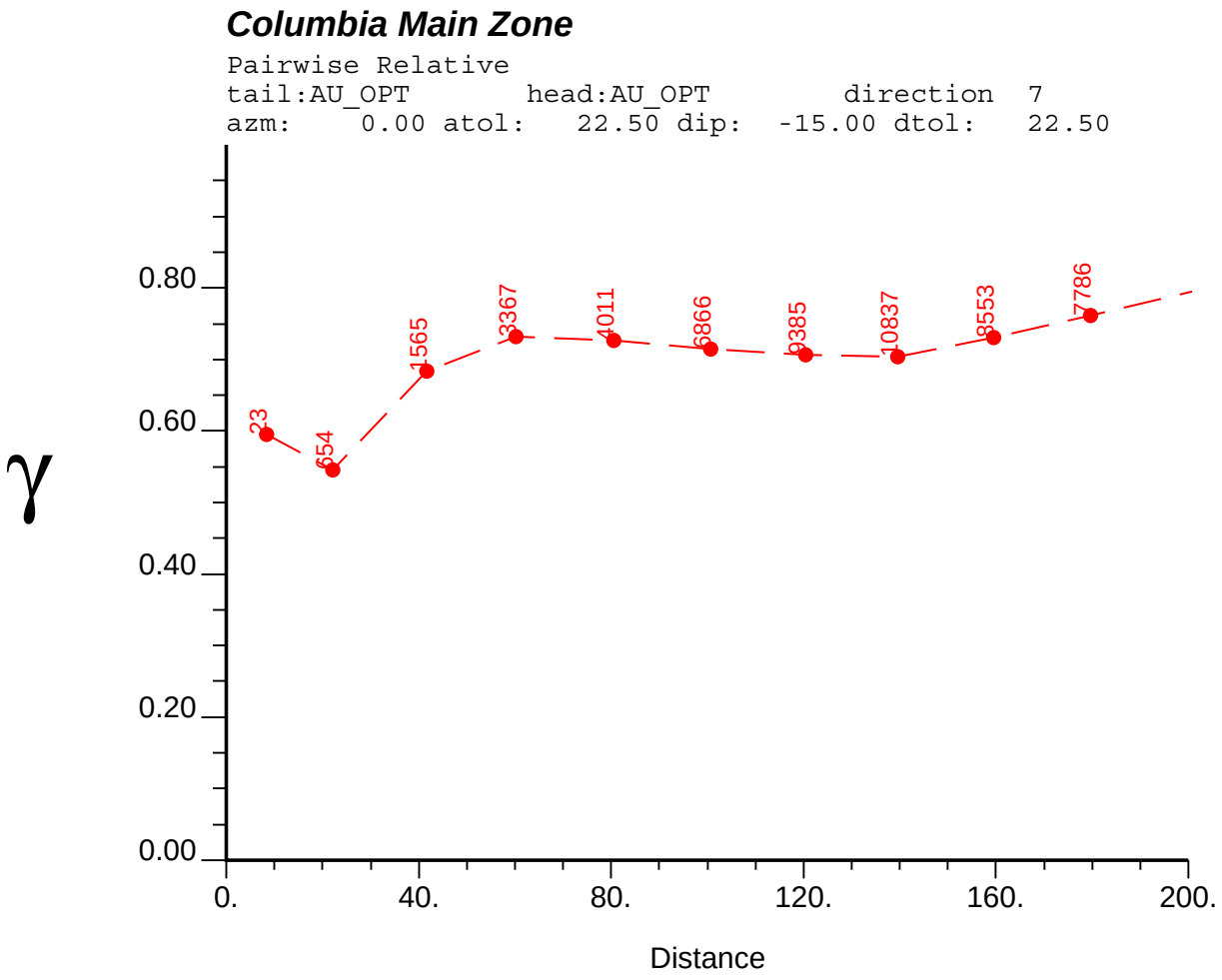

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 2
azm: 0.00 atol: 22.50 dip: 60.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
19
97
276
769
1604
2468
3371
4456
4722
4923
4646

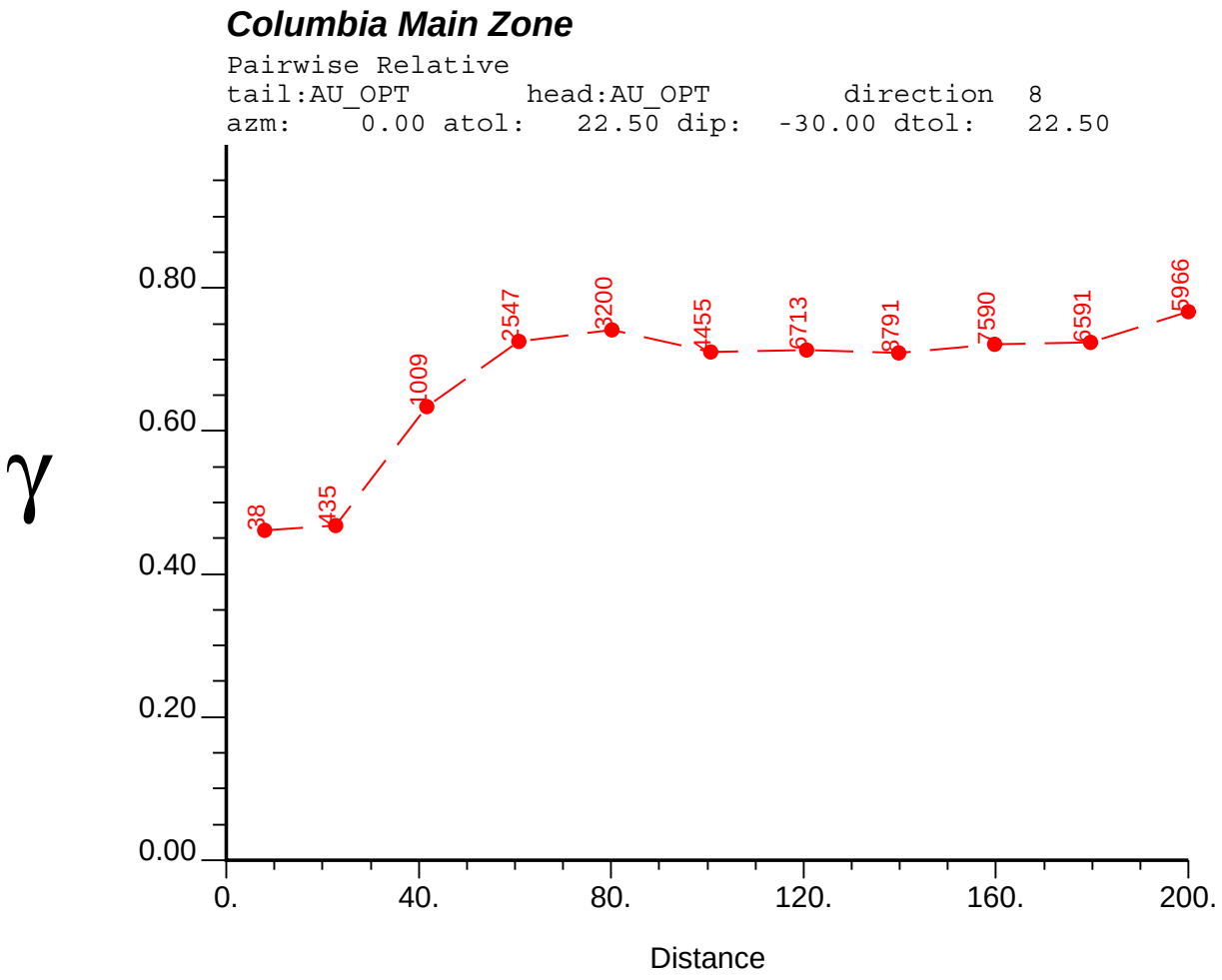

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 3
azm: 0.00 atol: 22.50 dip: 45.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
21
163
423
1397
2251
3924
5462
6372
6730
7043
6201

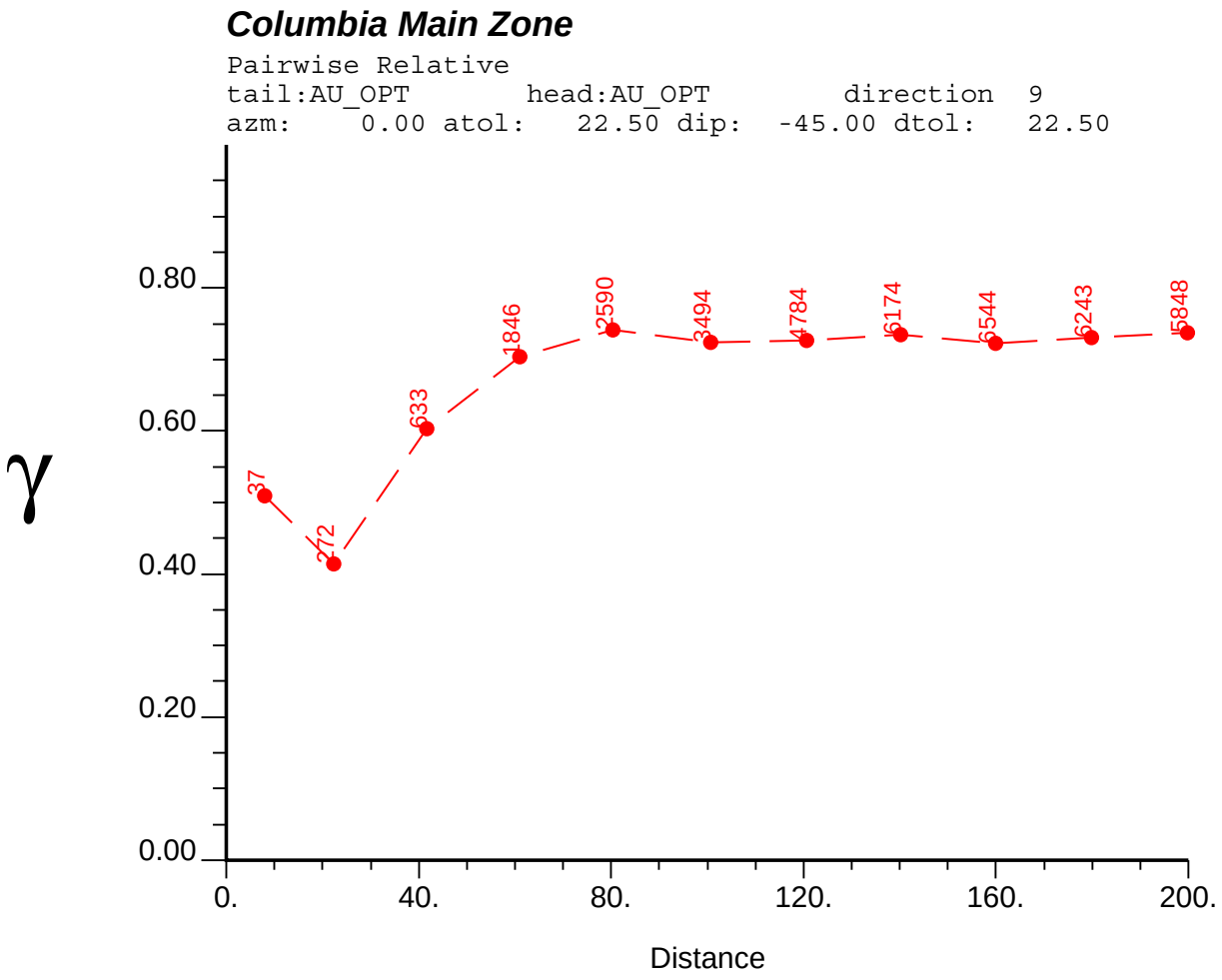

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 4
azm: 0.00 atol: 22.50 dip: 30.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
17
238
629
1933
2721
5163
7304
8052
8863
9028

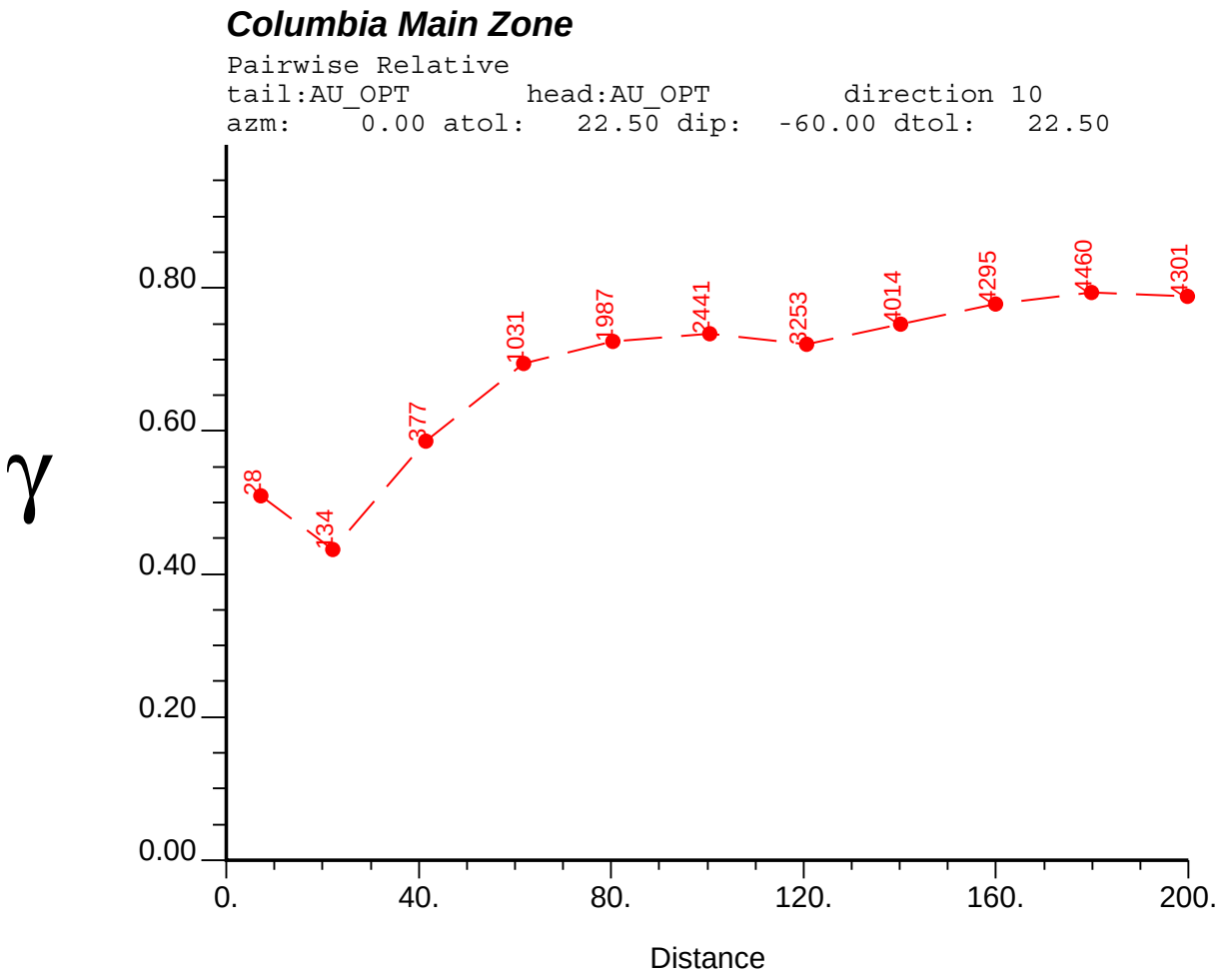

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 5
azm: 0.00 atol: 22.50 dip: 15.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
11
458
1260
2896
3908
7313
9804
9727
9428
8734

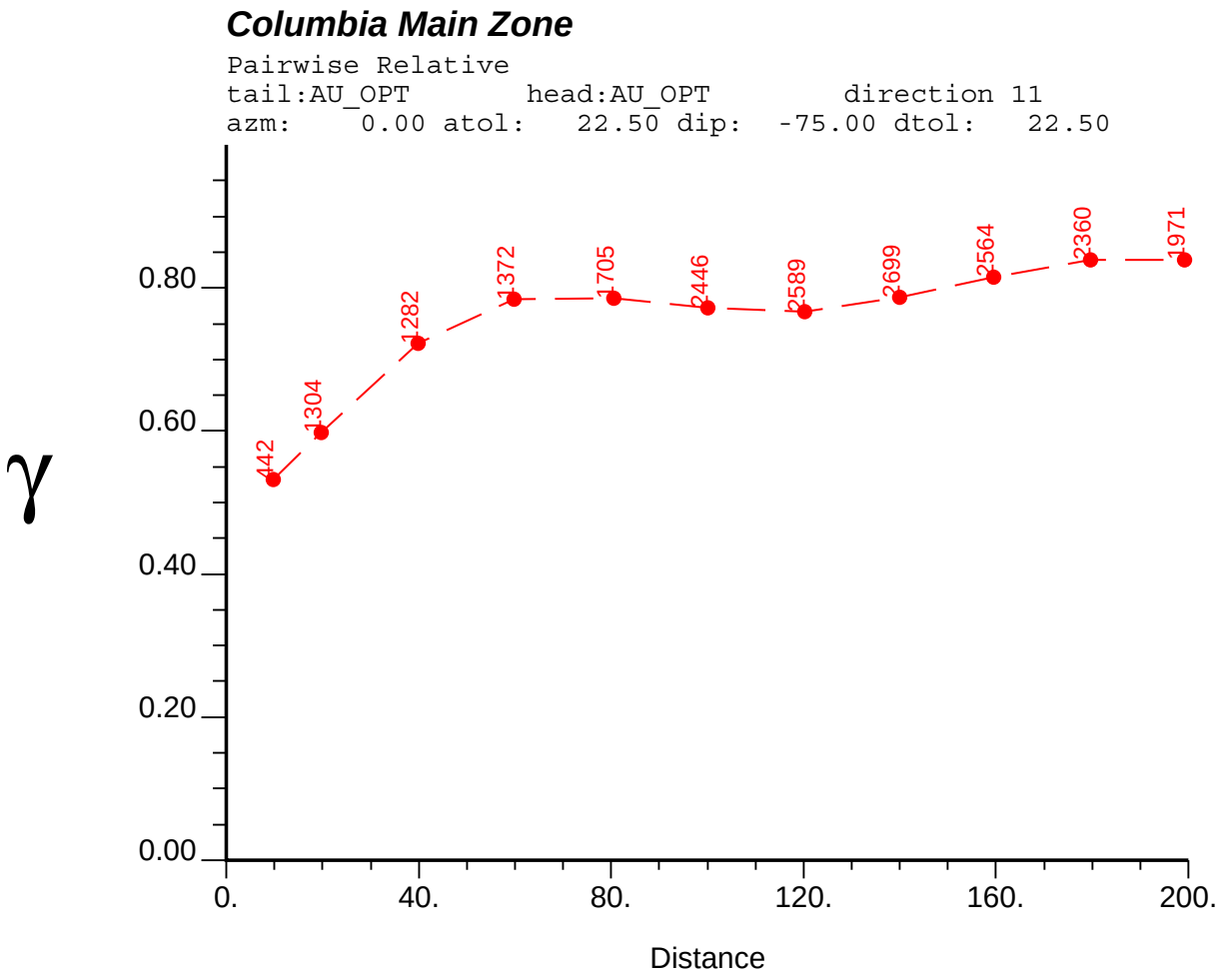

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 6
azm: 0.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
12
598
1564
3092
4247
7726
10368
10799
9466
9234

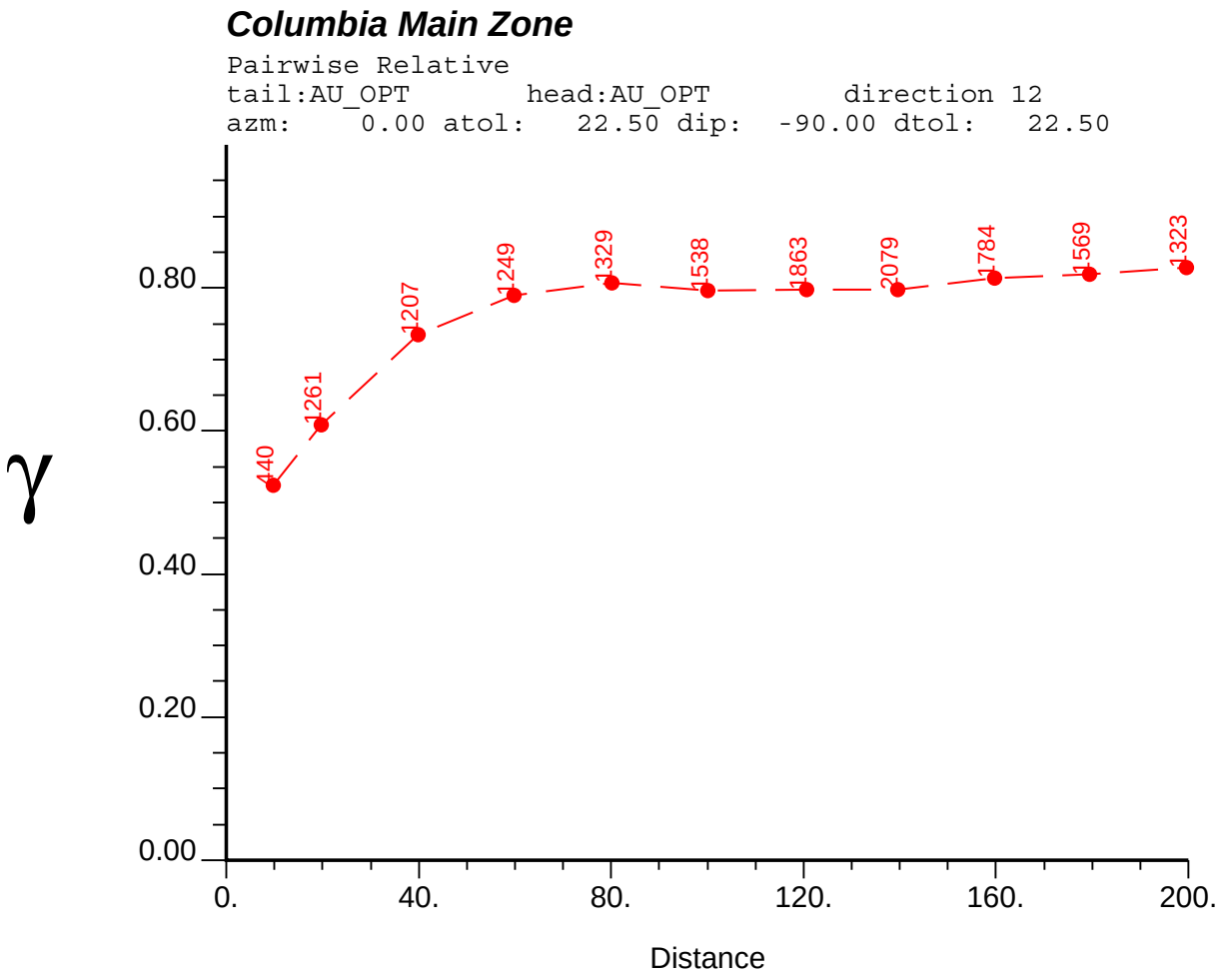

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 7
azm: 0.00 atol: 22.50 dip: -15.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
23
654
1565
3367
4011
6866
9385
10837
8553
7786


Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 8
azm: 0.00 atol: 22.50 dip: -30.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
38
435
1009
2547
3200
4455
6713
8791
7590
6591
5966


Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 9
azm: 0.00 atol: 22.50 dip: -45.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
37
272
633
1846
2590
3494
4784
6174
6544
6243
5848


Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 10
azm: 0.00 atol: 22.50 dip: -60.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
28
134
377
1031
1987
2441
3253
4014
4295
4460
4301


Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 11
azm: 0.00 atol: 22.50 dip: -75.00 dtol: 22.50
γ
0.00
0.20
0.40
0.60
0.80
0.
40.
80.
120.
160.
200.
Distance
442
1304
1282
1372
1705
2446
2589
2699
2564
2360
1971

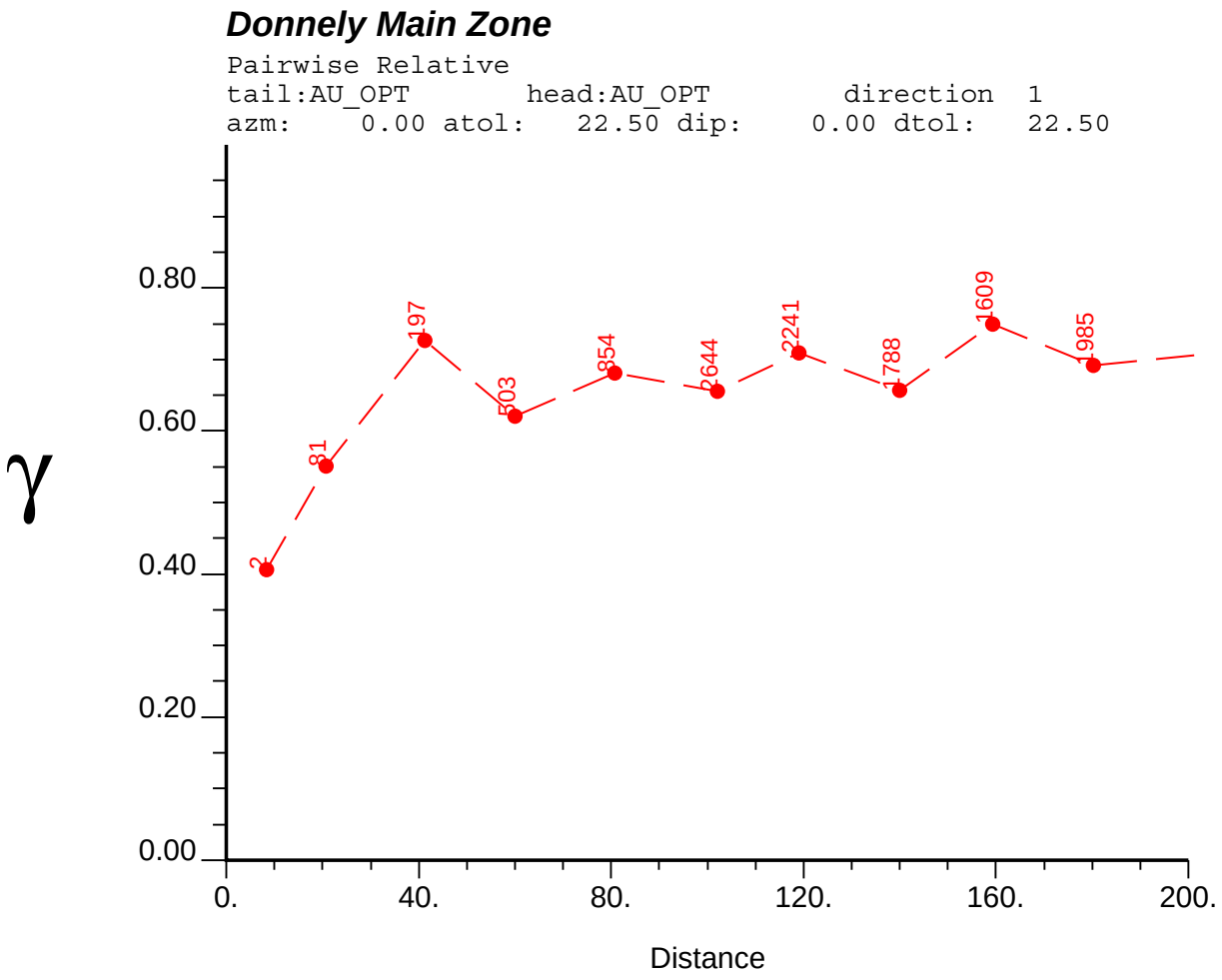

Columbia Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 12
azm: 0.00 atol: 22.50 dip: -90.00 dtol: 22.50
γ
0.00
0.20
0.40
0.60
0.80
0.
40.
80.
120.
160.
200.
Distance
140
1261
1207
1249
1329
1538
1863
2079
1784
1569
1323

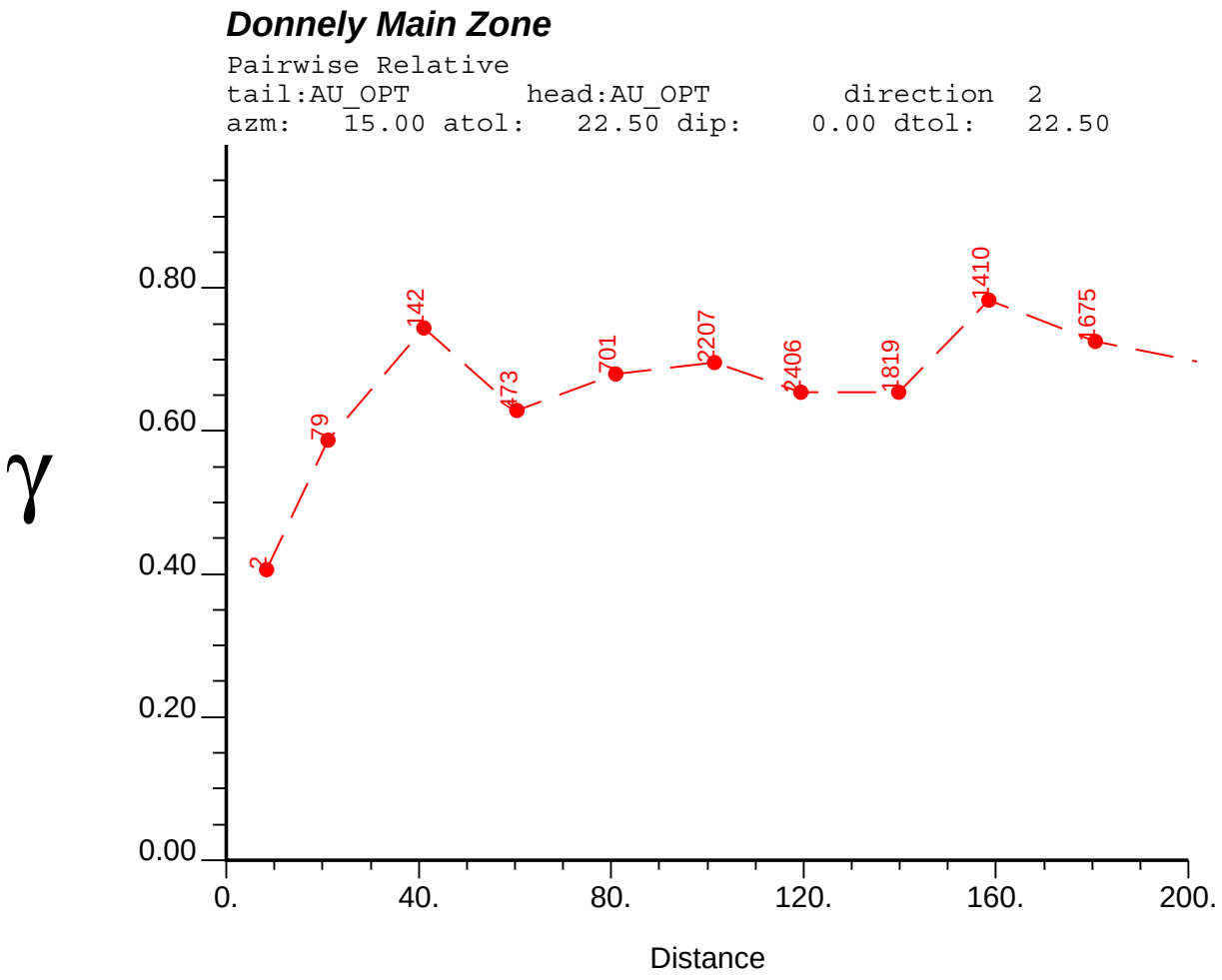
APPENDIX C

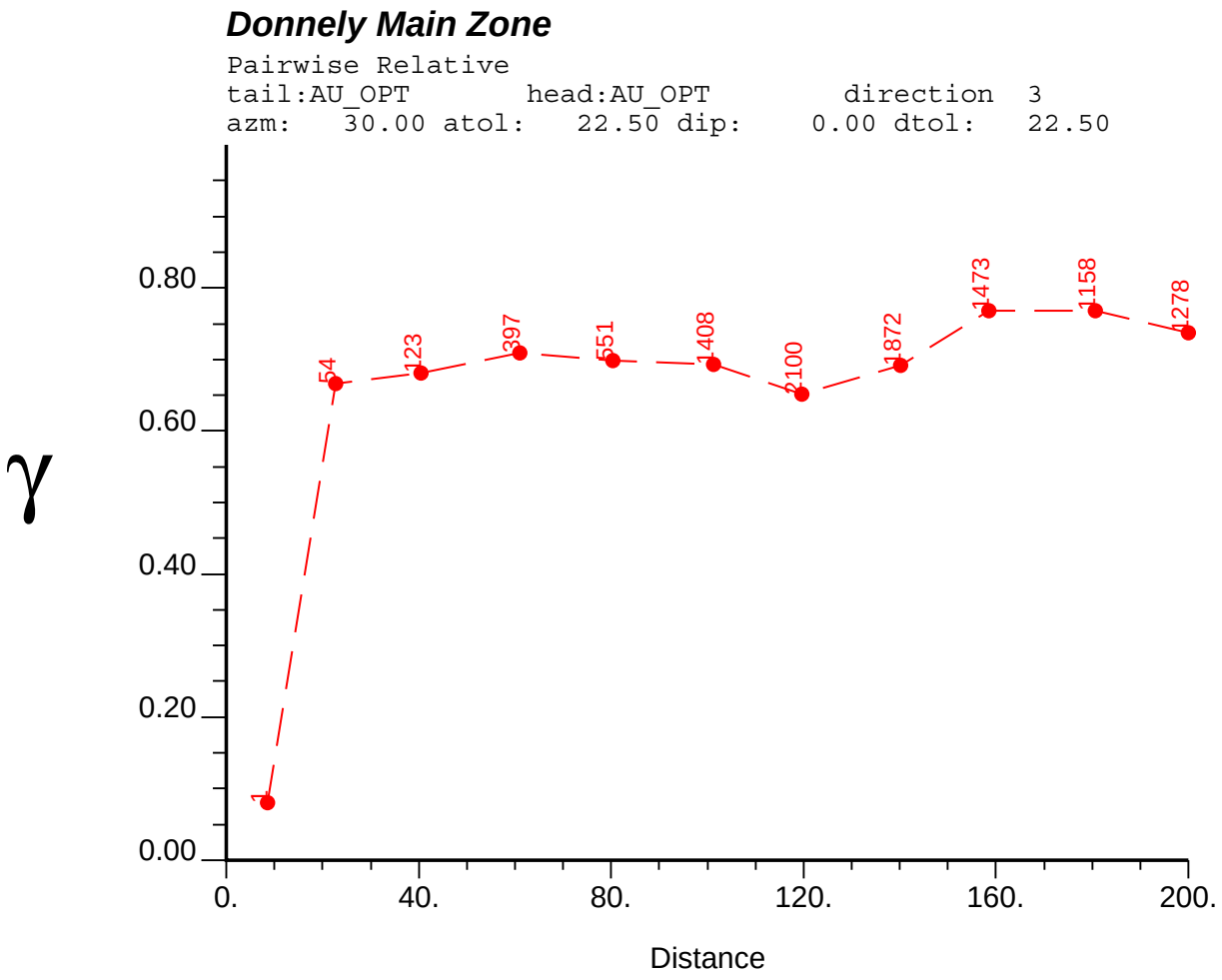
Part 2

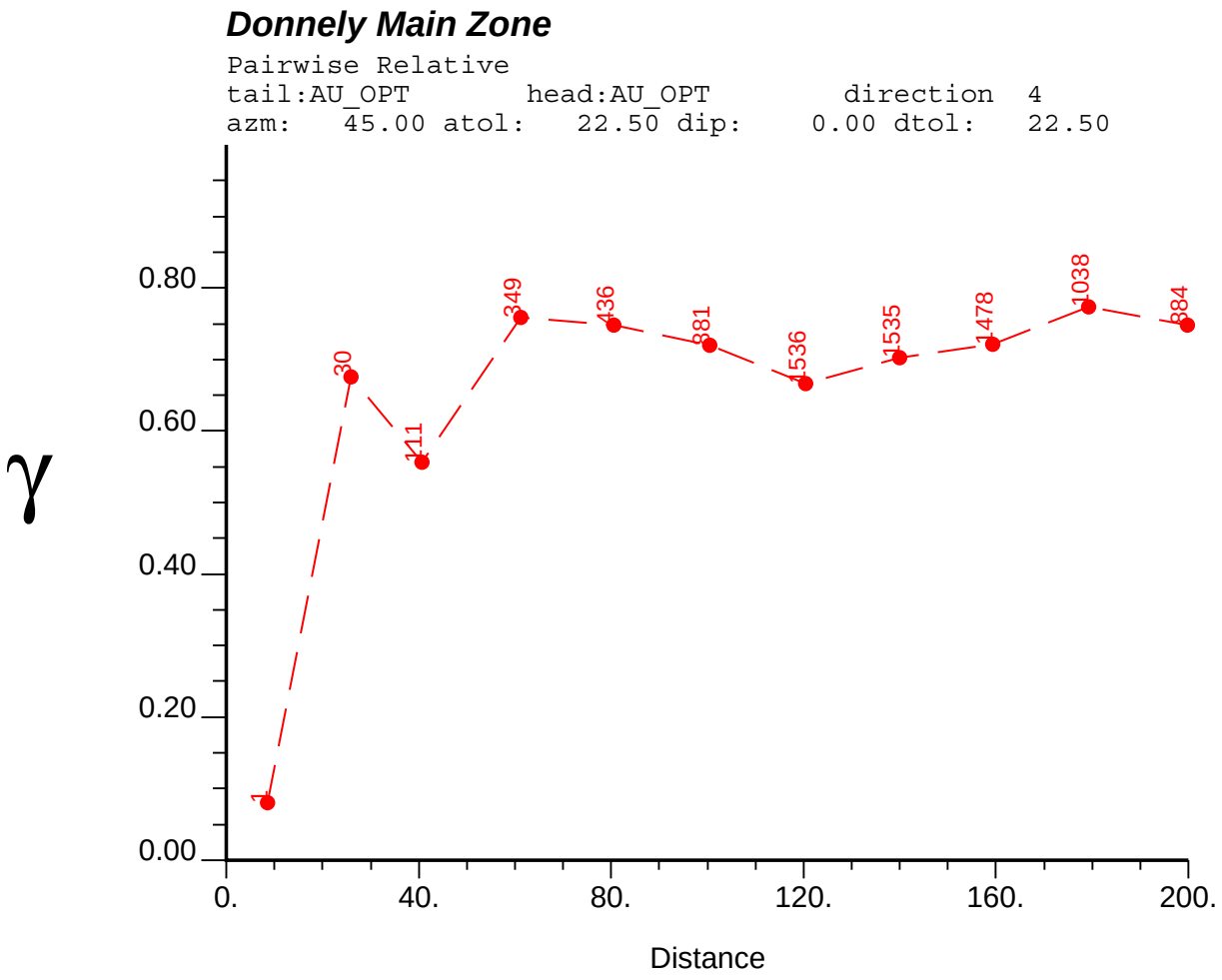
Donnely Main Zone

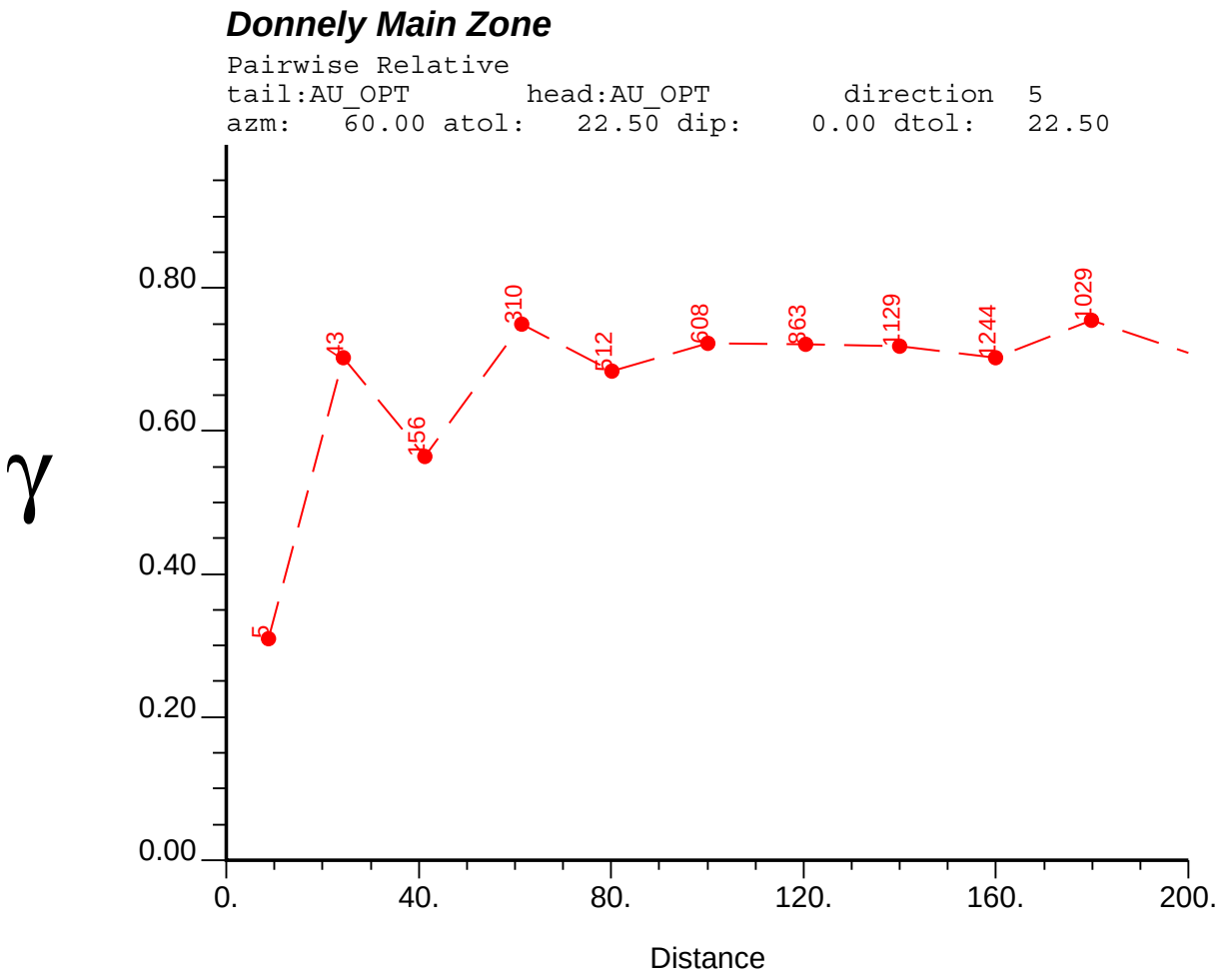
Variogram Models

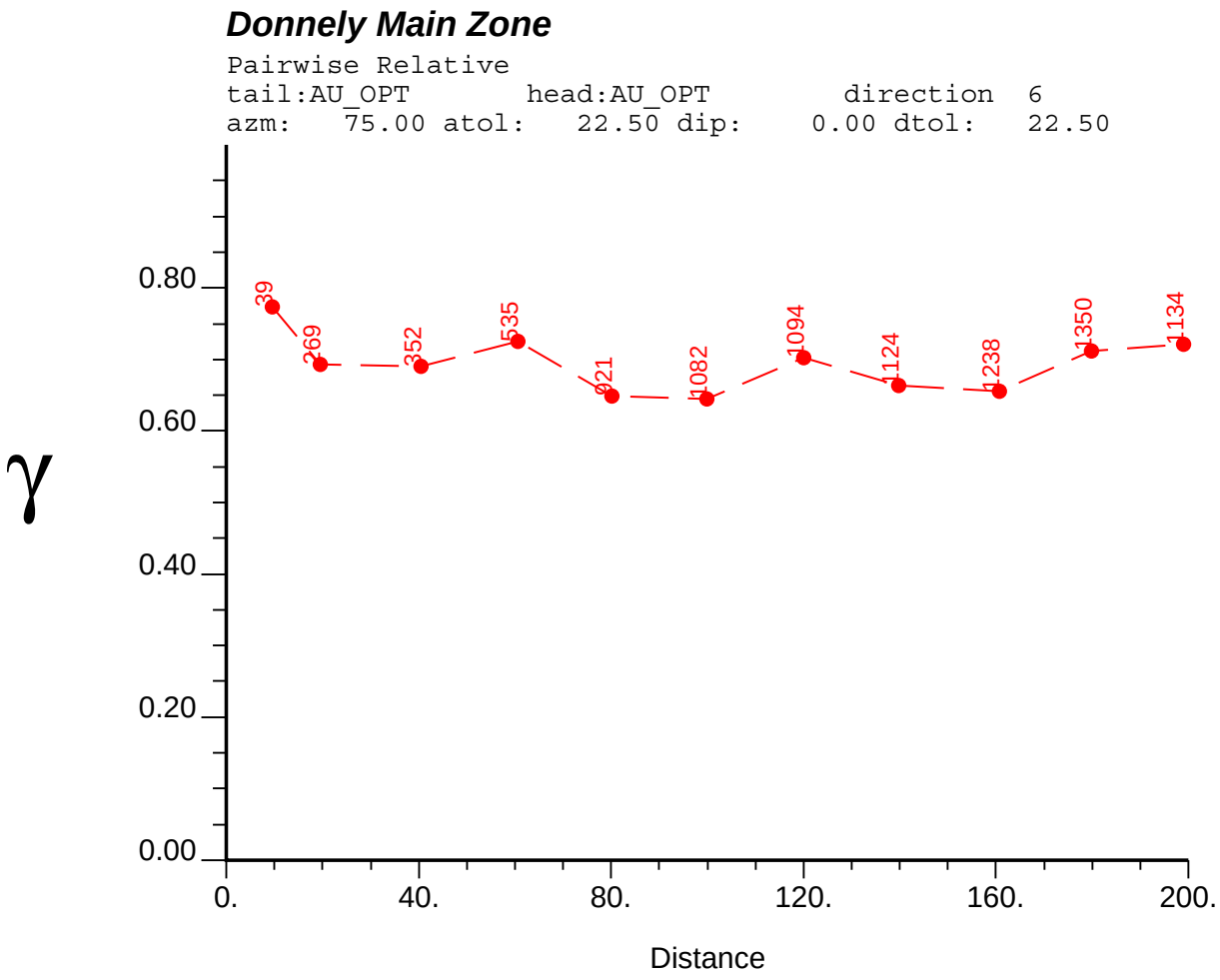

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 1
azm: 0.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
2
81
197
503
854
2644
2241
1788
1609
1985

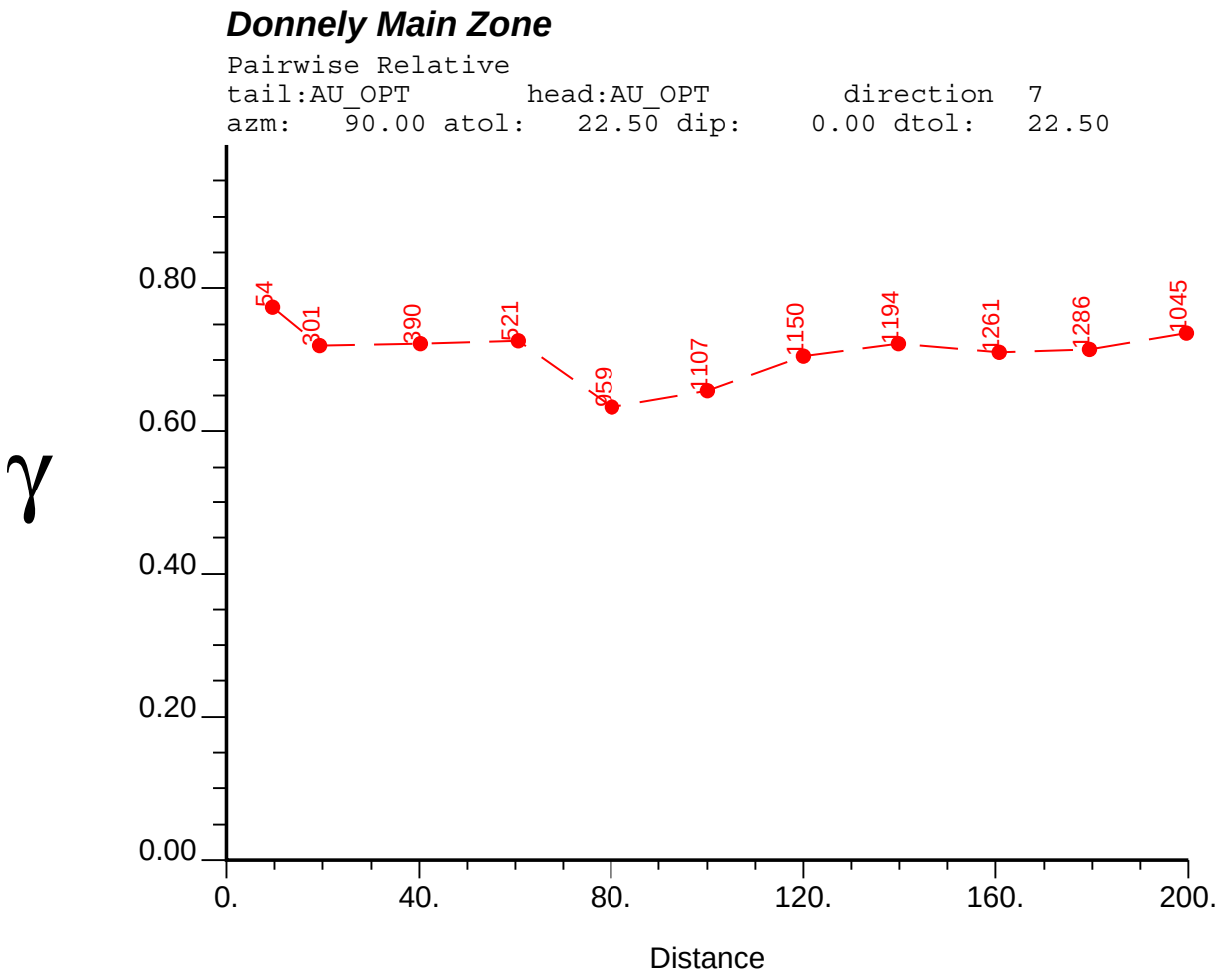

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 2
azm: 15.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
2
79
142
473
701
2207
2406
1819
1410
1675

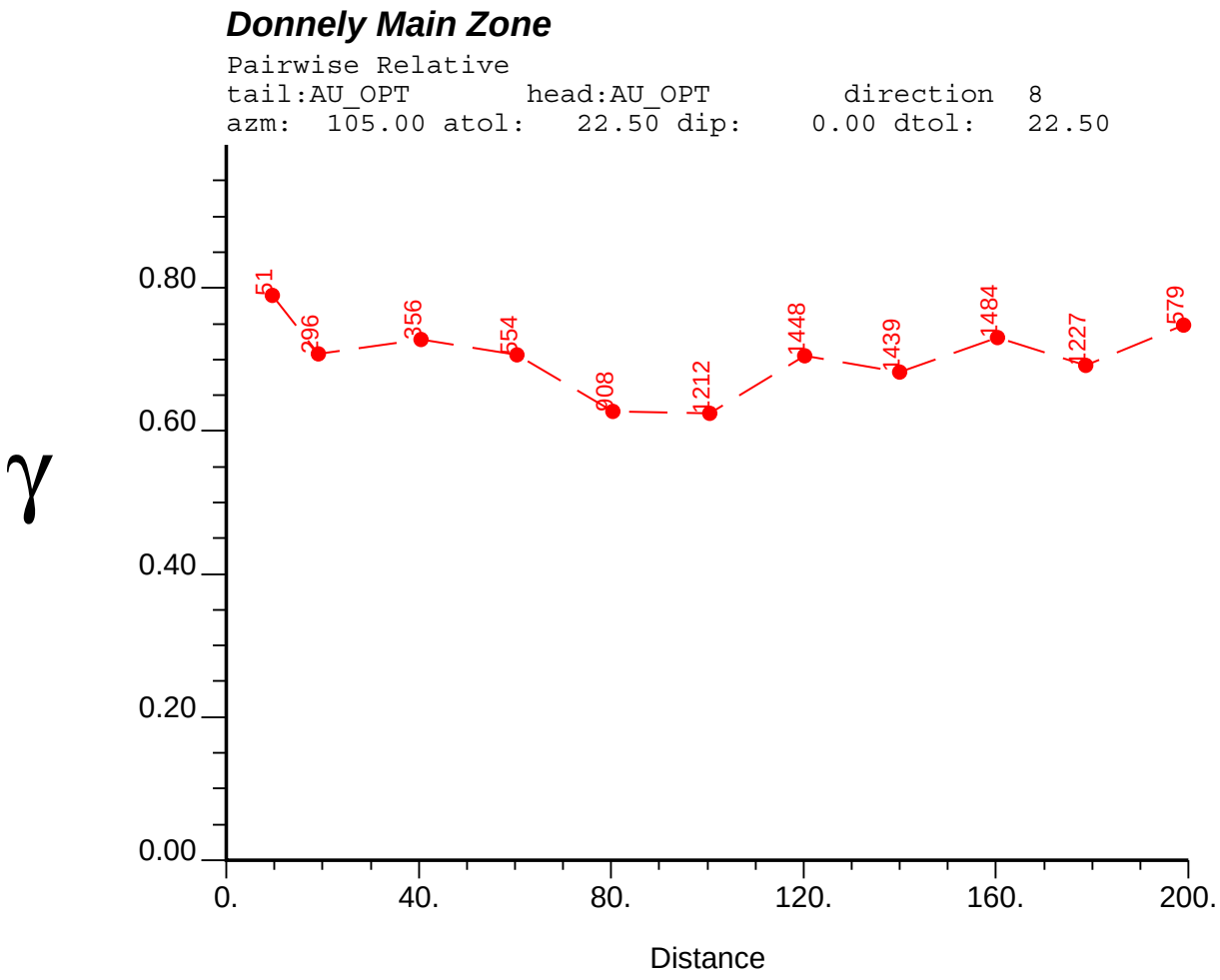

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 3
azm: 30.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
1
54
123
397
551
1408
2100
1872
1473
1158
1278

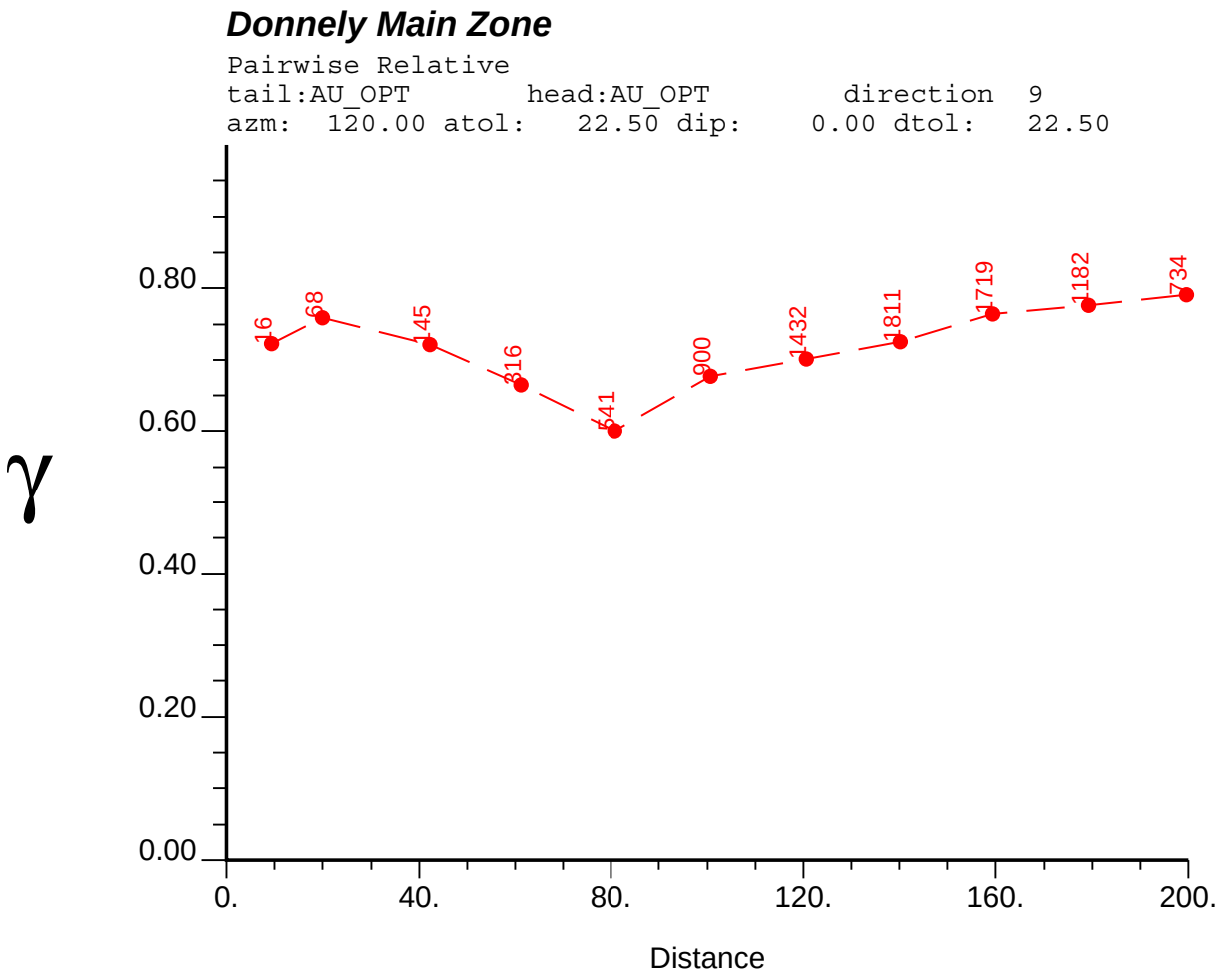

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 4
azm: 45.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
1
30
111
349
436
681
1536
1535
1478
1038
884

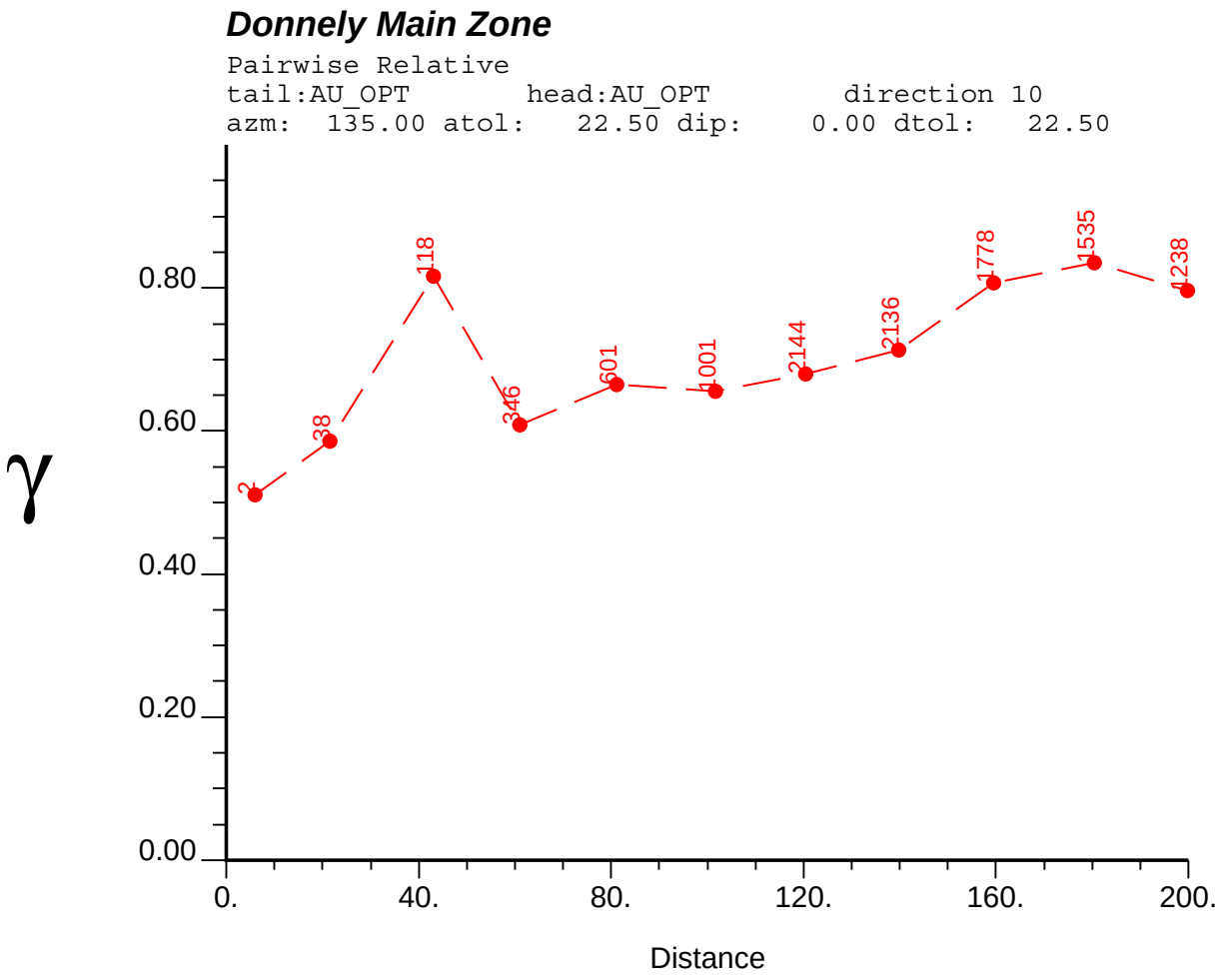

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 5
azm: 60.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
5
43
156
310
512
608
863
1129
1244
1029

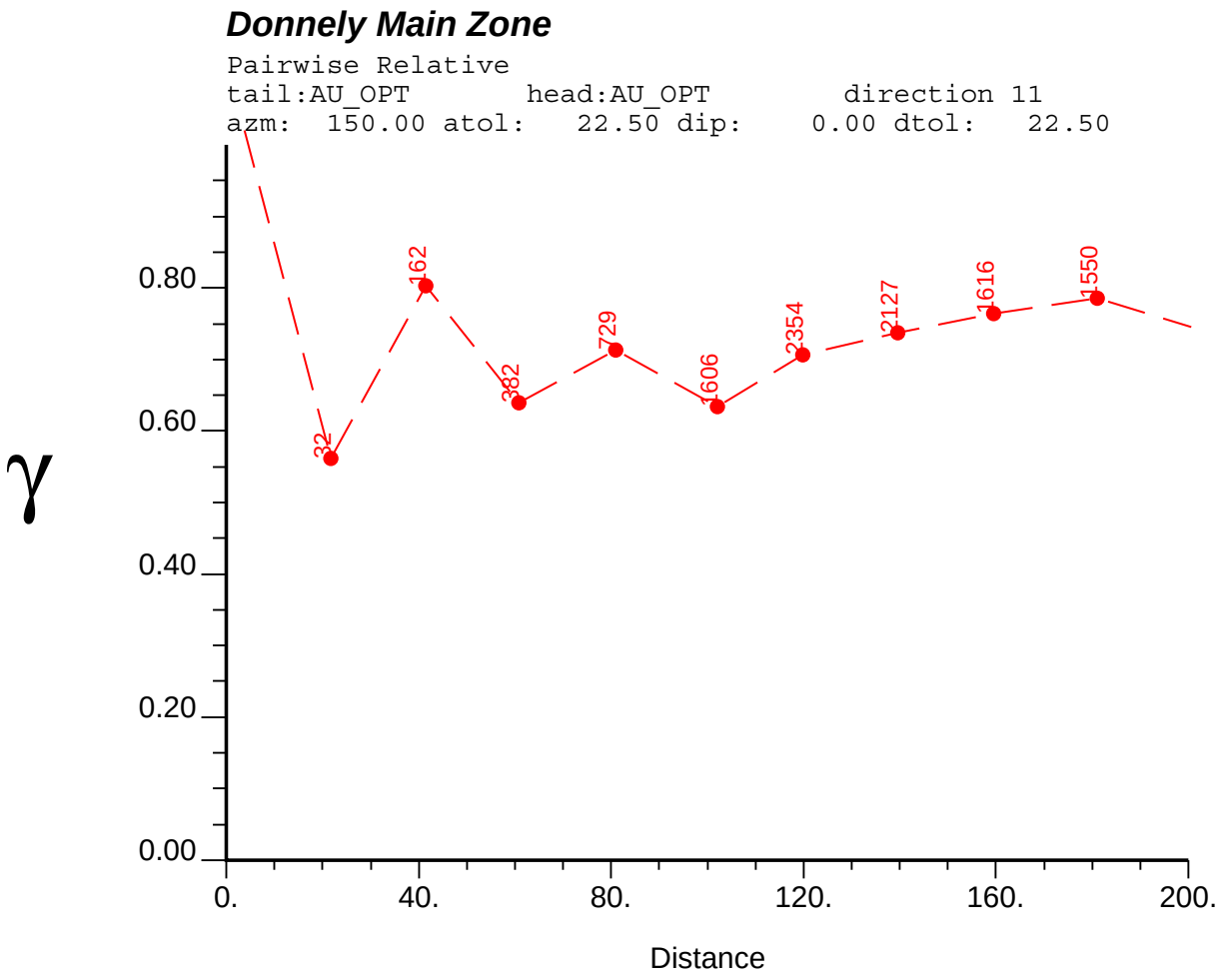

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 6
azm: 75.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
39
269
352
535
921
1082
1094
1124
1238
1350
1134

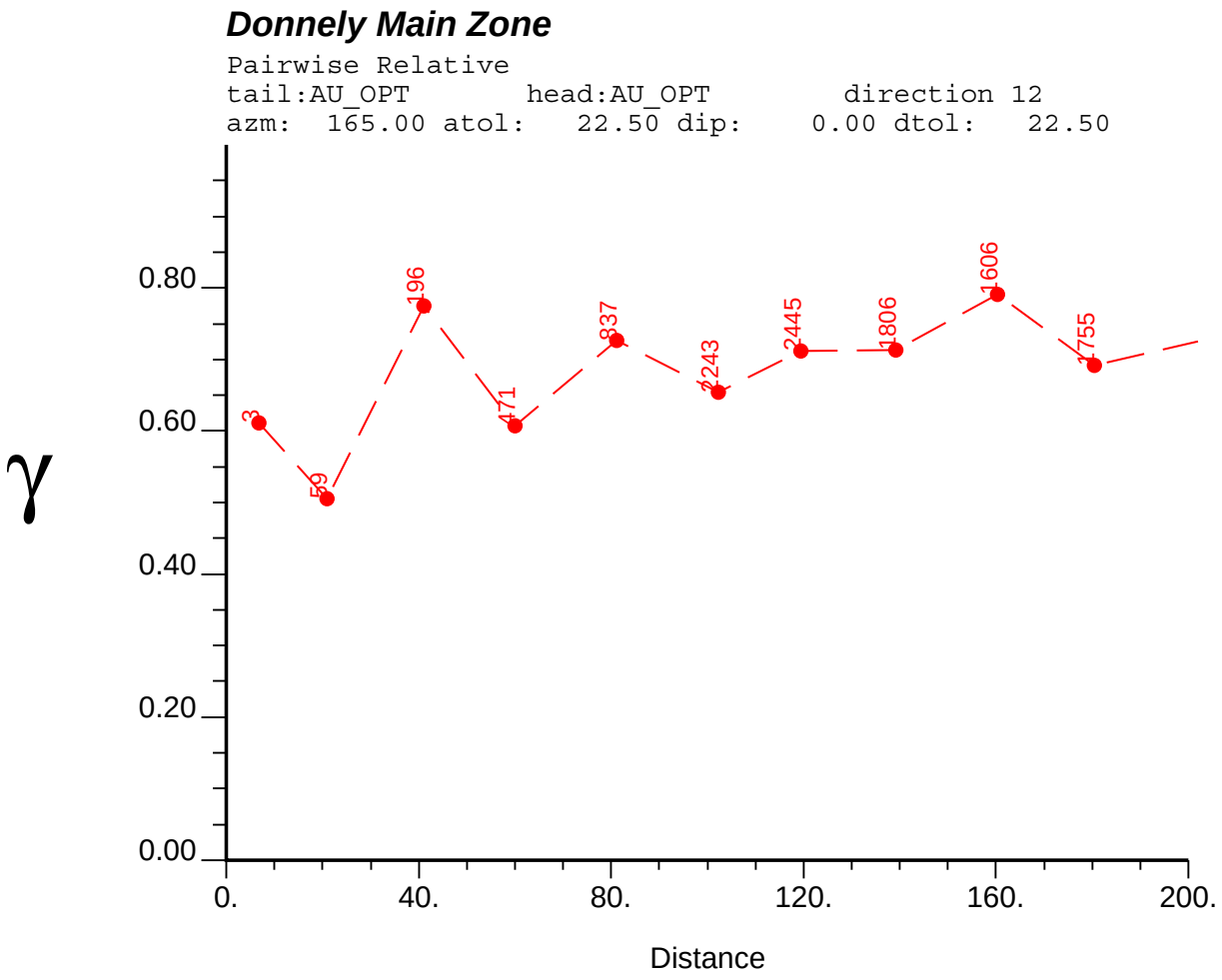

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 7
azm: 90.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
54
301
390
521
959
1107
1150
1194
1261
1286
1045
0.
40.
80.
120.
160.
200.
Distance

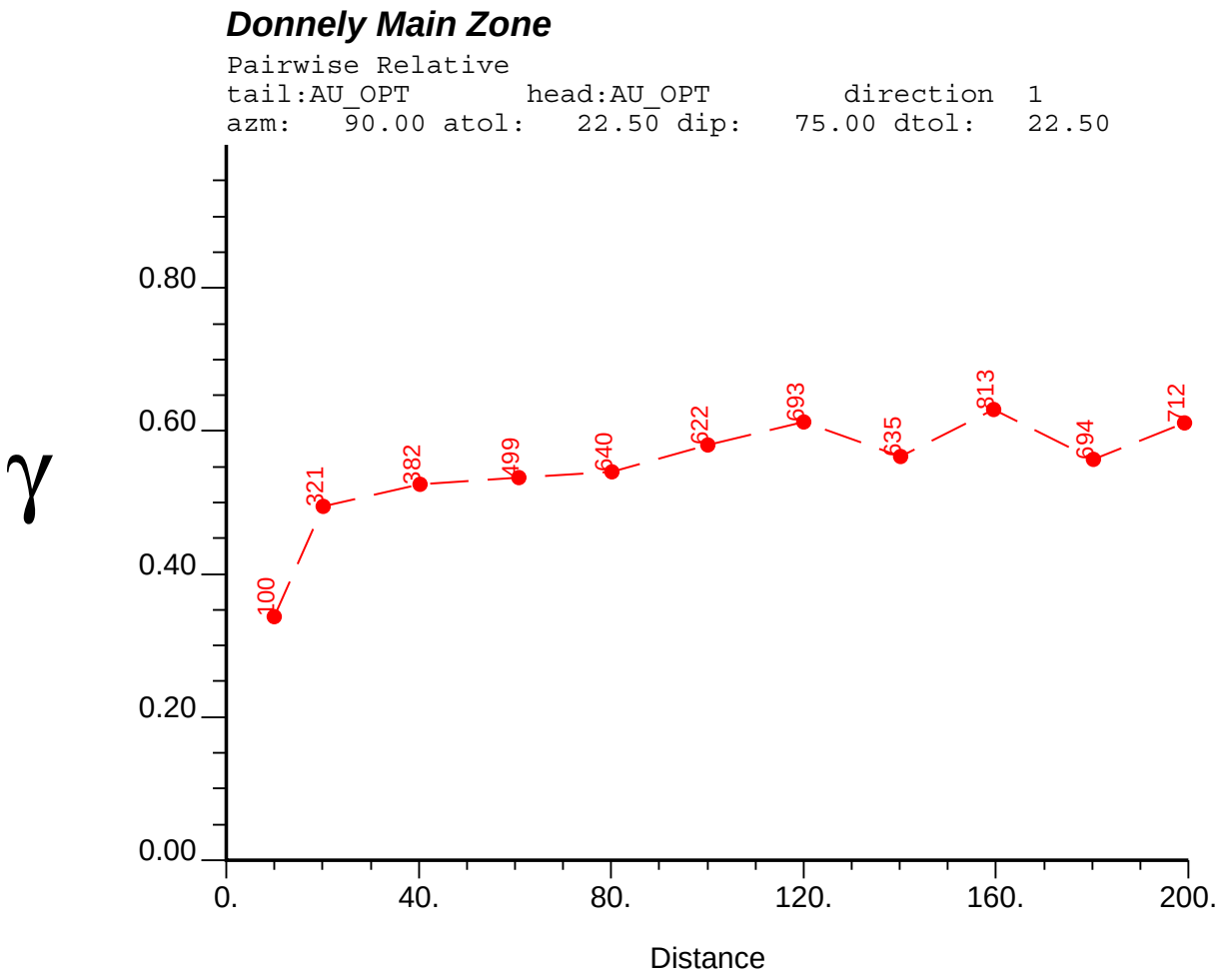

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 8
azm: 105.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
51
296
356
554
908
1212
1448
1439
1484
1227
579
0.
40.
80.
120.
160.
200.
Distance

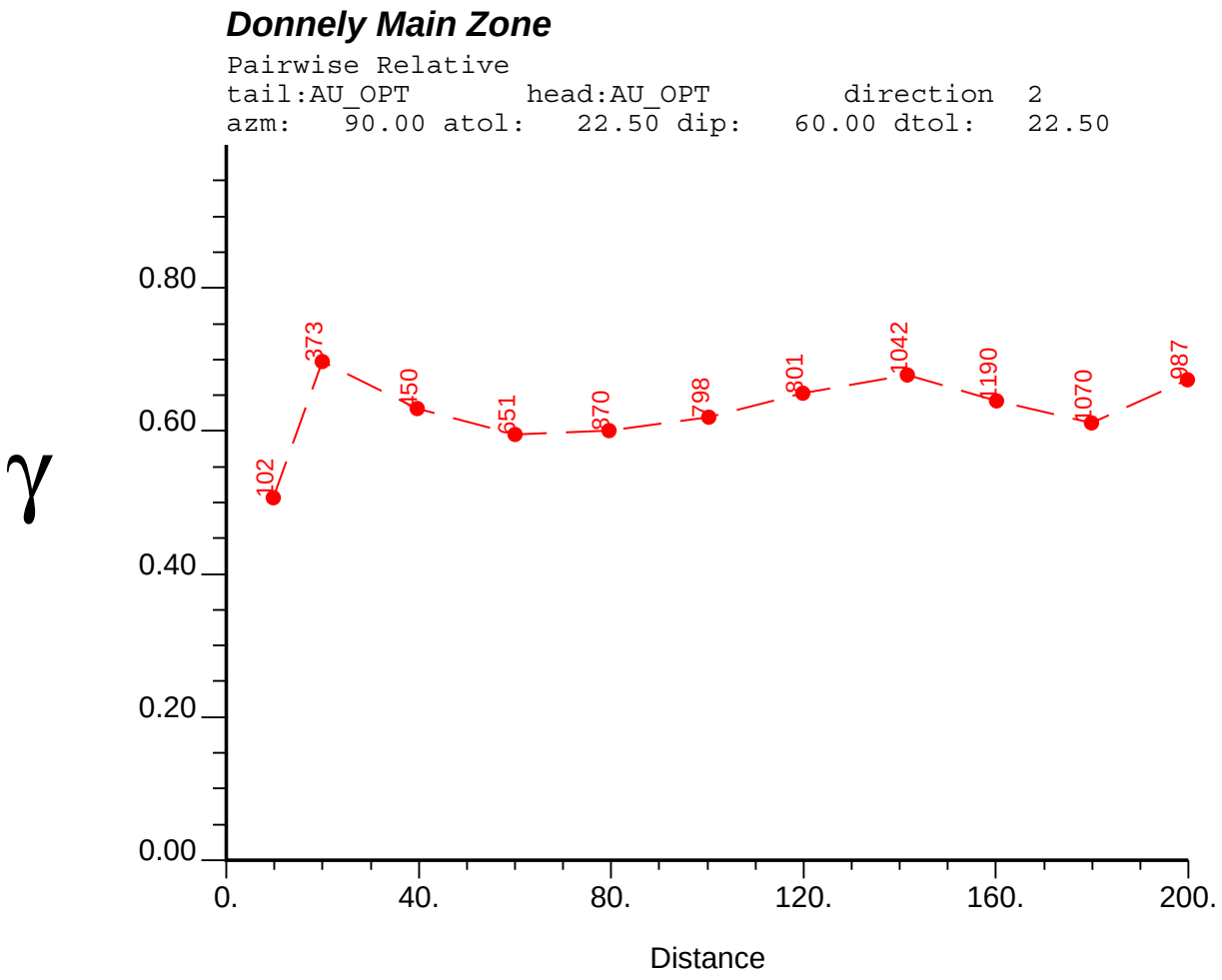

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 9
azm: 120.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
16
68
145
316
541
900
1432
1811
1719
1182
734

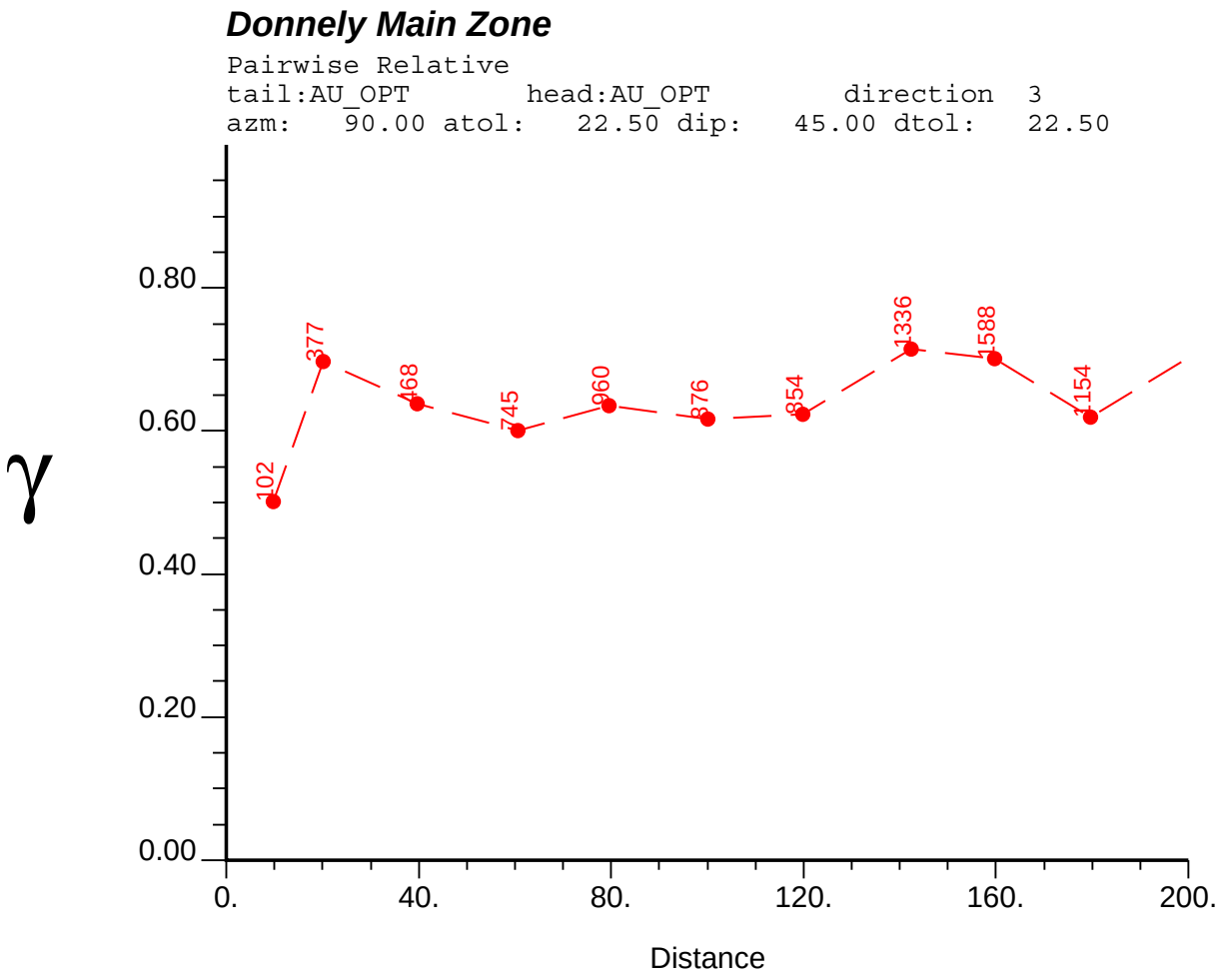

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 10
azm: 135.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.00
0.20
0.40
0.60
0.80
0.
40.
80.
120.
160.
200.
Distance
2
38
118
346
601
1001
2144
2136
1778
1535
1238

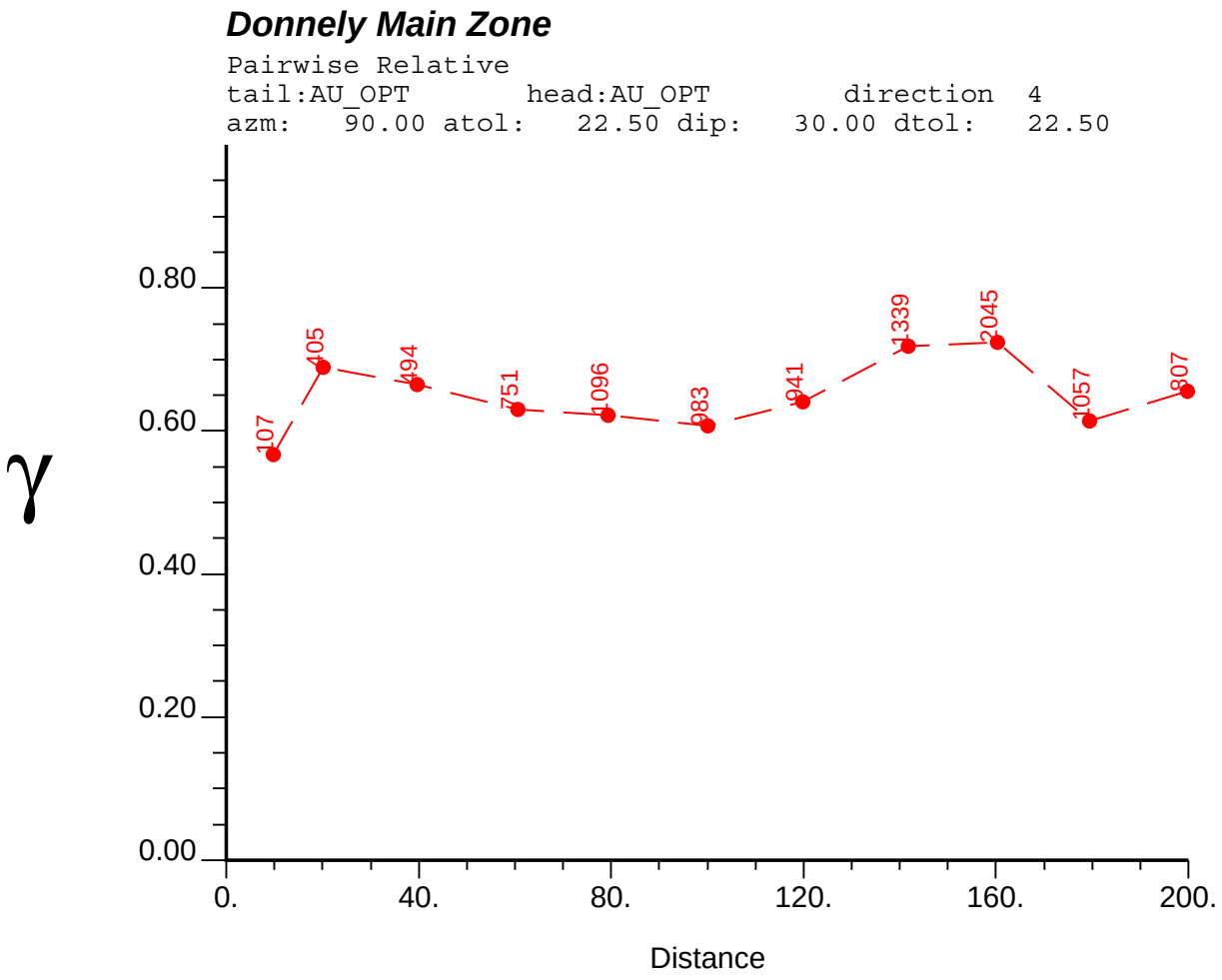

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 11
azm: 150.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.00
0.20
0.40
0.60
0.80
0.
40.
80.
120.
160.
200.
Distance
32
162
382
729
1606
2354
2127
1616
1550

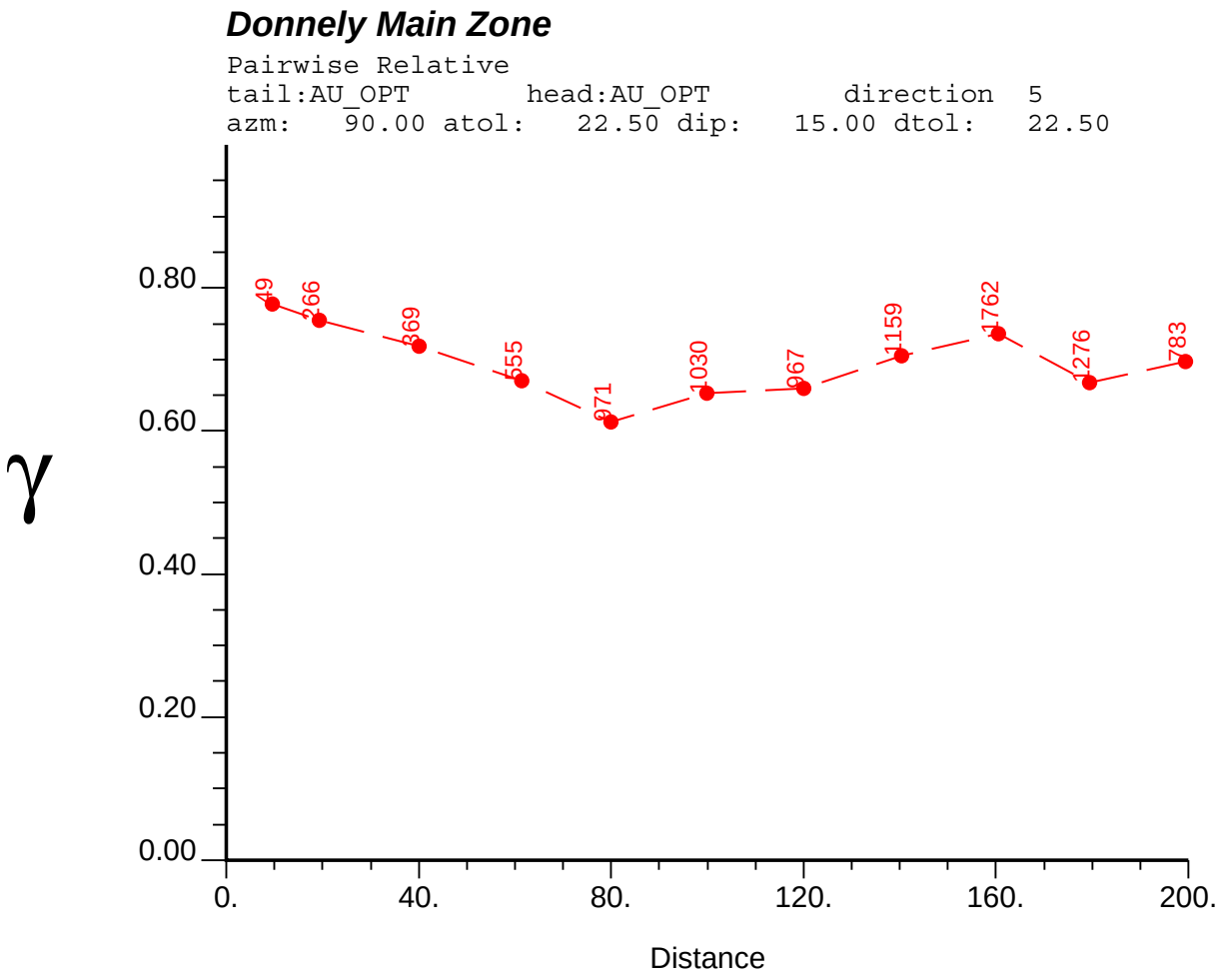

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 12
azm: 165.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
3
59
196
471
837
1243
2445
1806
1606
1755

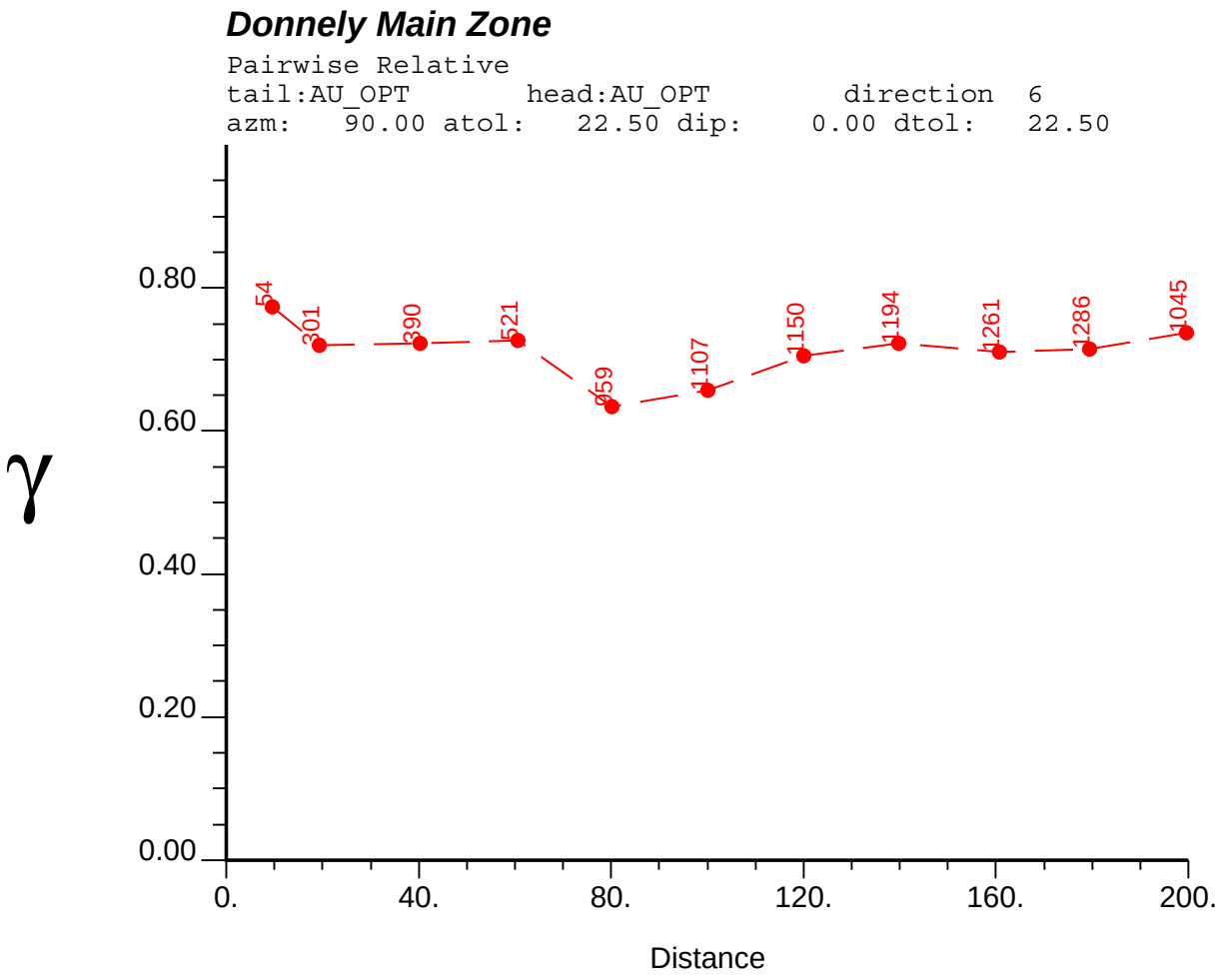

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 1
azm: 90.00 atol: 22.50 dip: 75.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
100
321
382
499
640
622
693
635
813
694
712

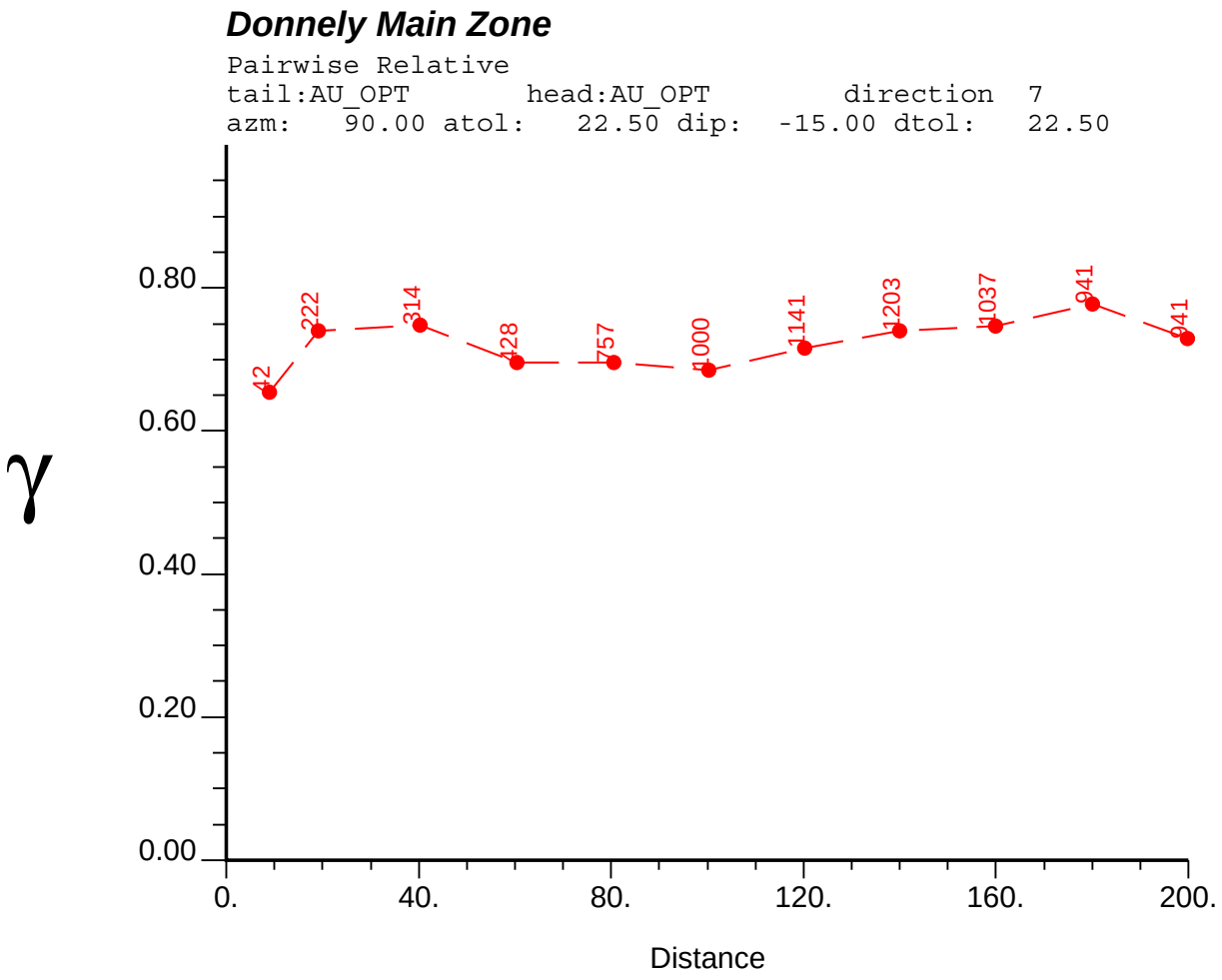

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 2
azm: 90.00 atol: 22.50 dip: 60.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
102
373
450
651
870
798
801
1042
1190
1070
987
0.
40.
80.
120.
160.
200.
Distance

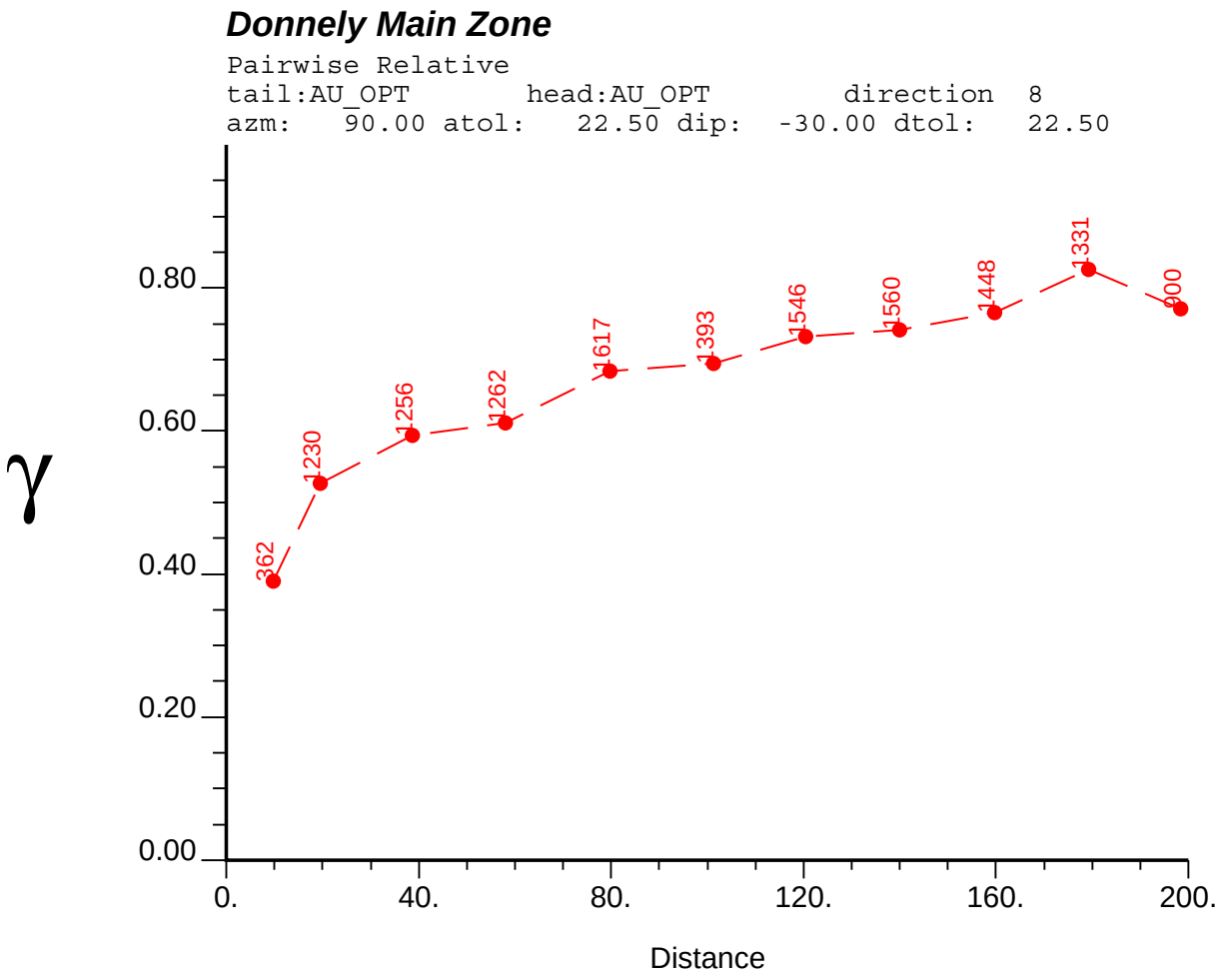

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 3
azm: 90.00 atol: 22.50 dip: 45.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
102
377
468
745
960
876
854
1336
1588
1154

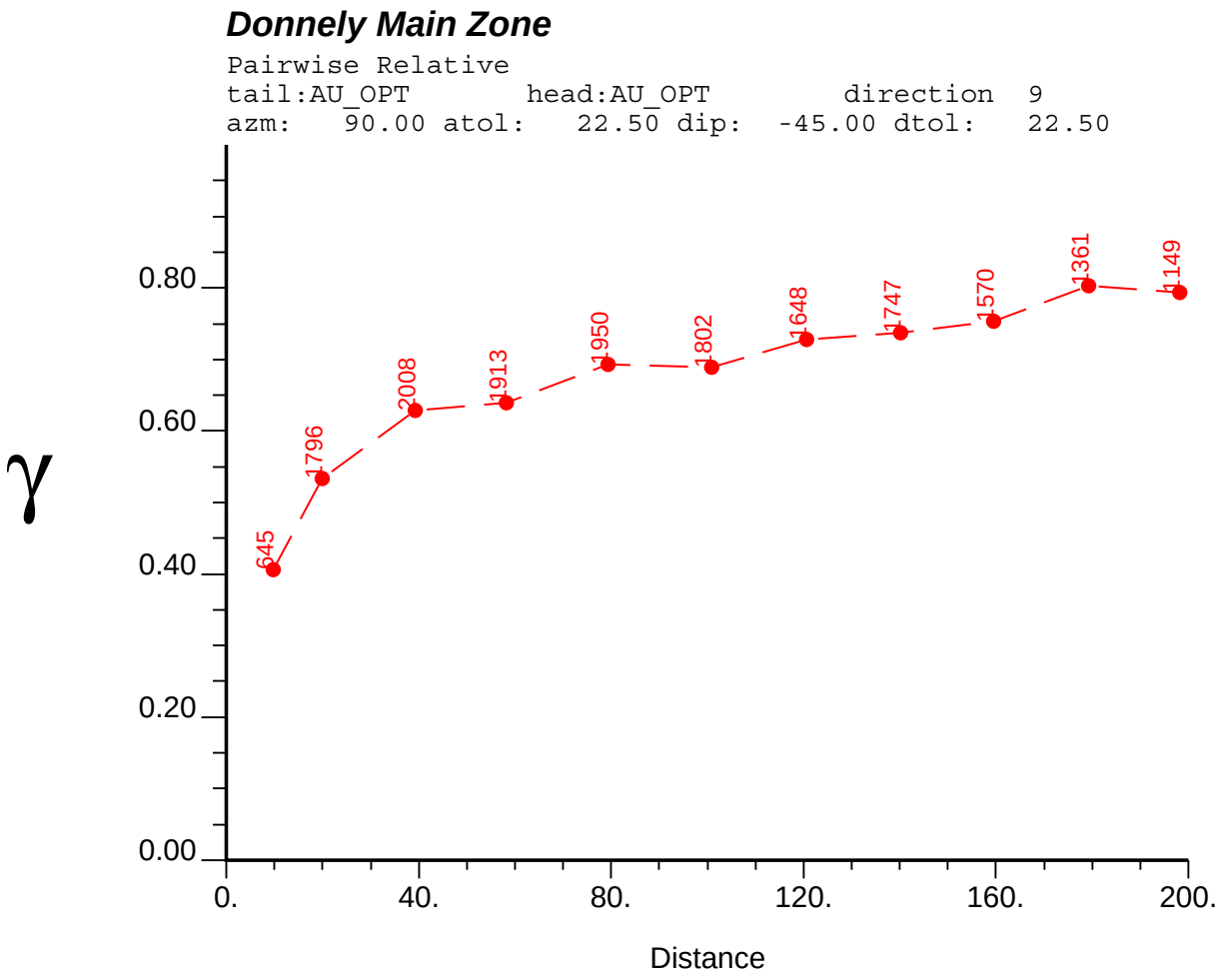

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 4
azm: 90.00 atol: 22.50 dip: 30.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
107
405
494
751
1096
983
941
1339
2045
1057
807

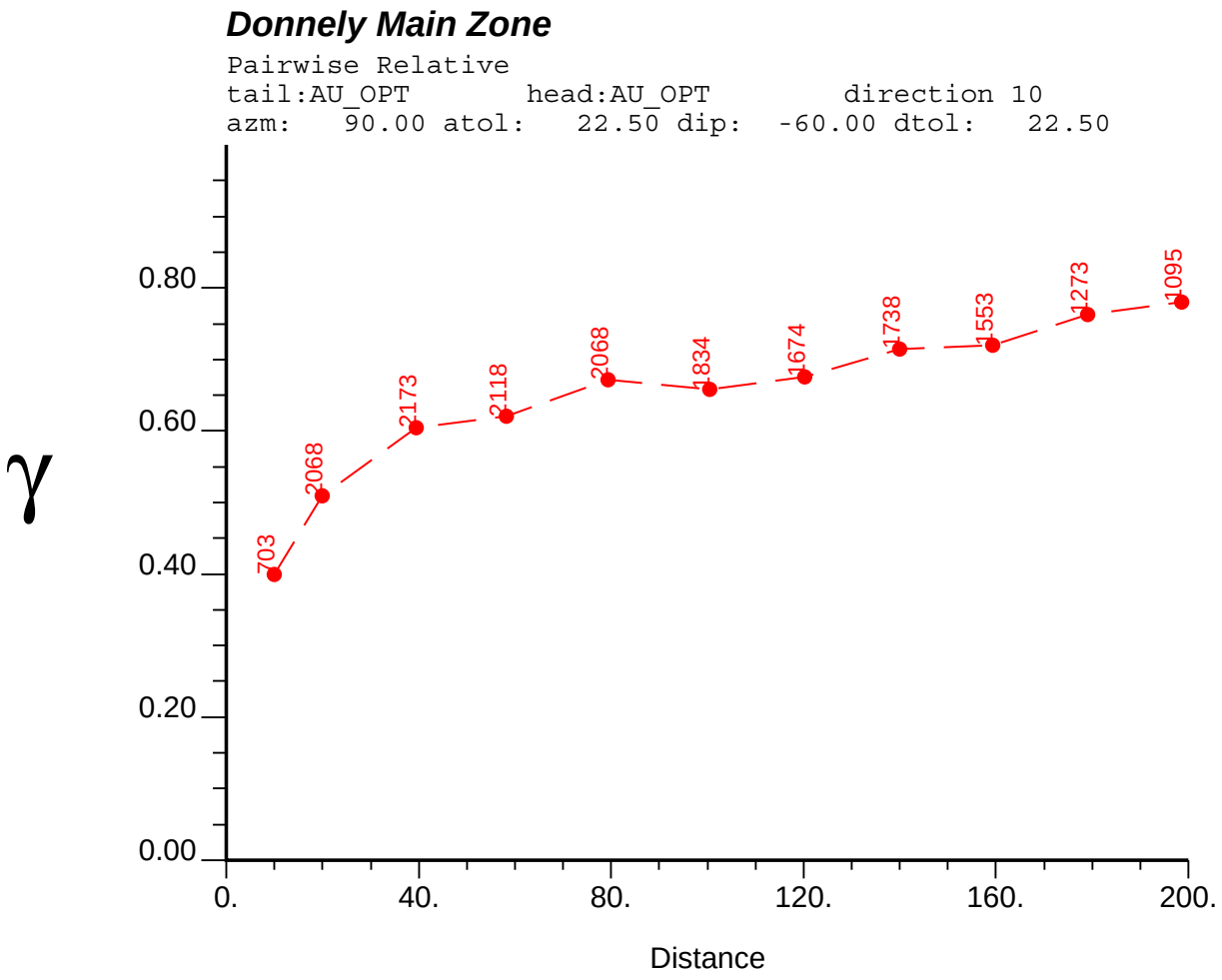

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 5
azm: 90.00 atol: 22.50 dip: 15.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
49
266
369
555
971
1030
967
1159
1762
1276
783
0.
40.
80.
120.
160.
200.
Distance

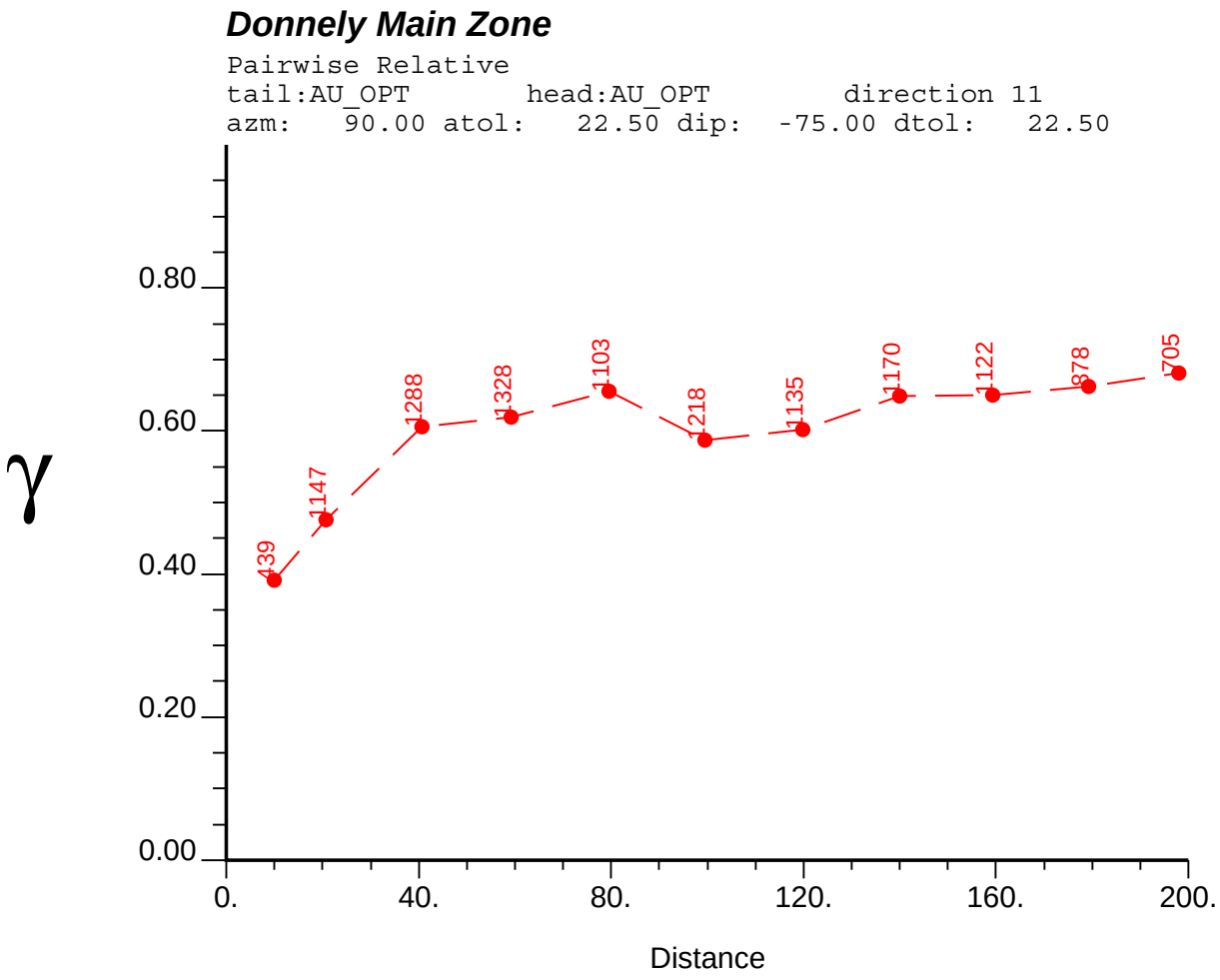

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 6
azm: 90.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
54
301
390
521
959
1107
1150
1194
1261
1286
1045

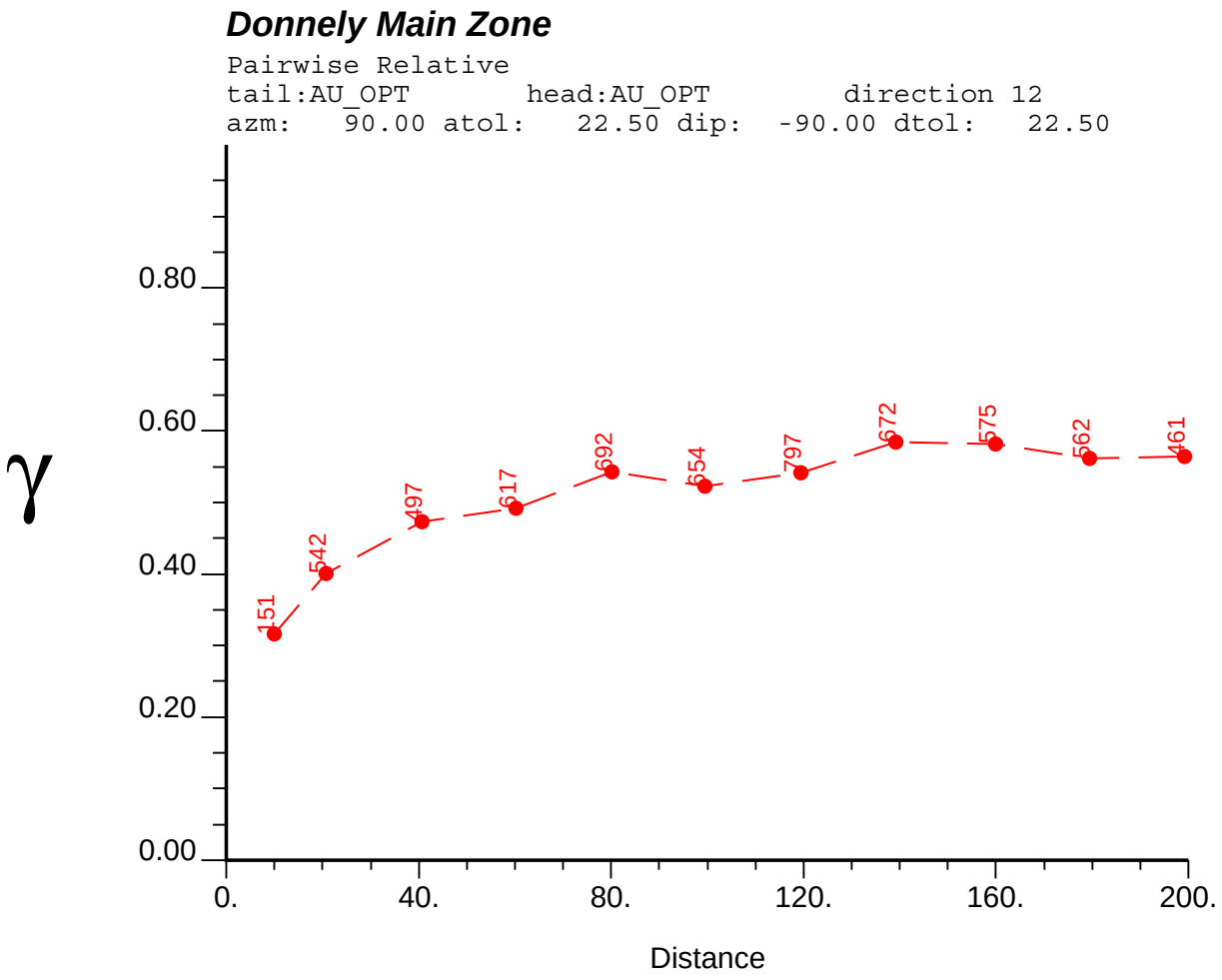

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 7
azm: 90.00 atol: 22.50 dip: -15.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
42
222
314
428
757
1000
1141
1203
1037
941
941
0.
40.
80.
120.
160.
200.
Distance

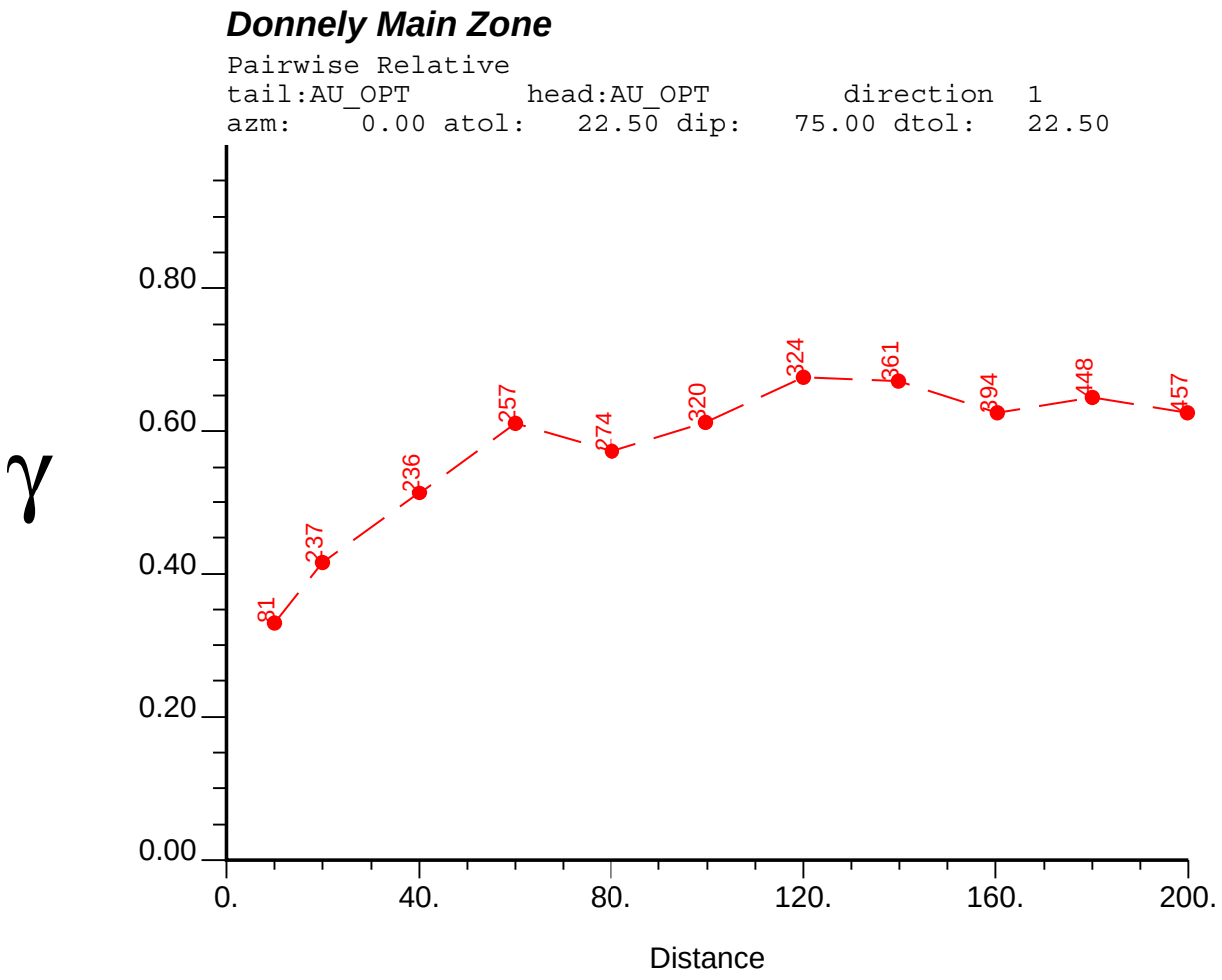

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 8
azm: 90.00 atol: 22.50 dip: -30.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
362
1230
1256
1262
1617
1393
1546
1560
1448
1331
900

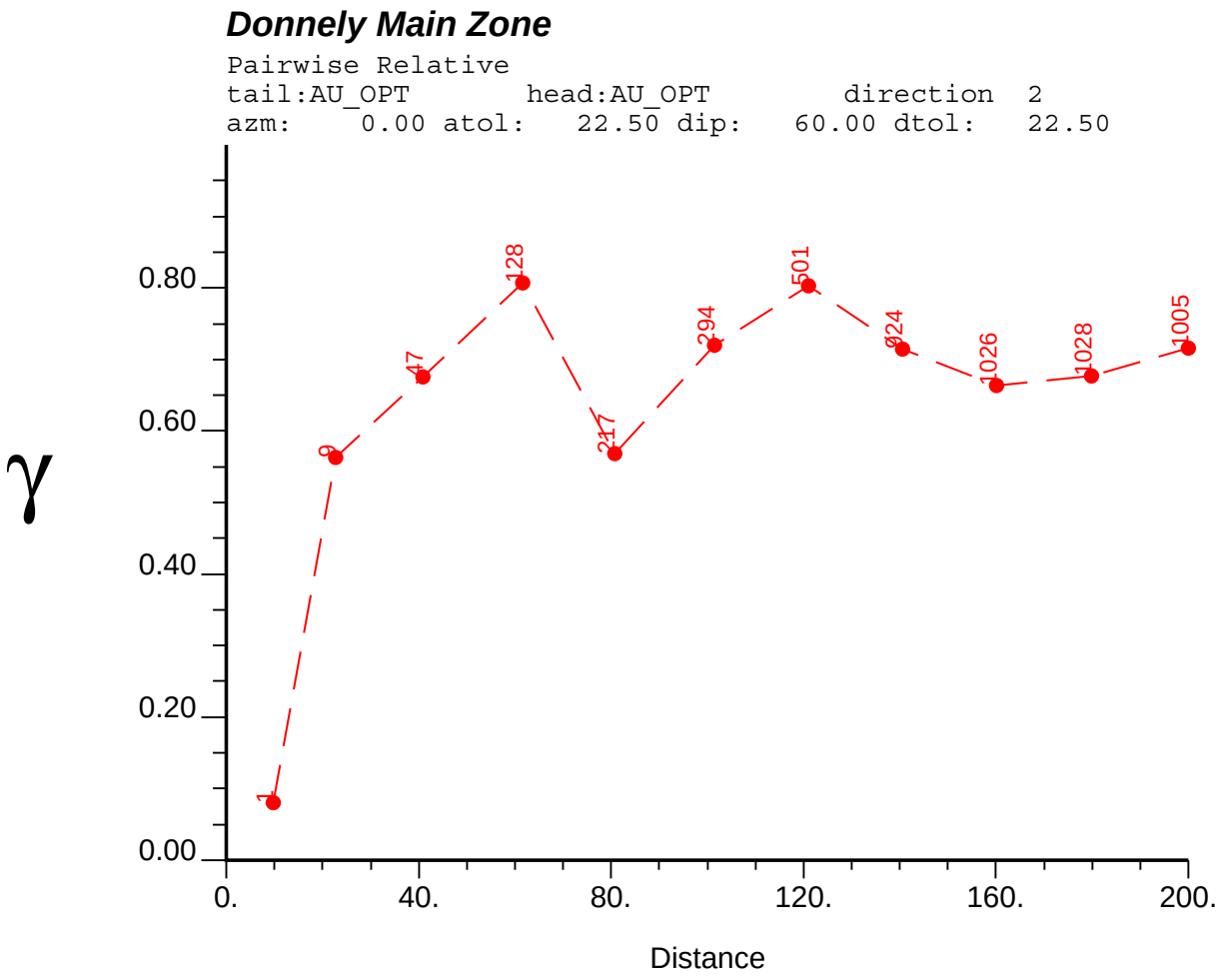

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 9
azm: 90.00 atol: 22.50 dip: -45.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
645
1796
2008
1913
1950
1802
1648
1747
1570
1361
1149

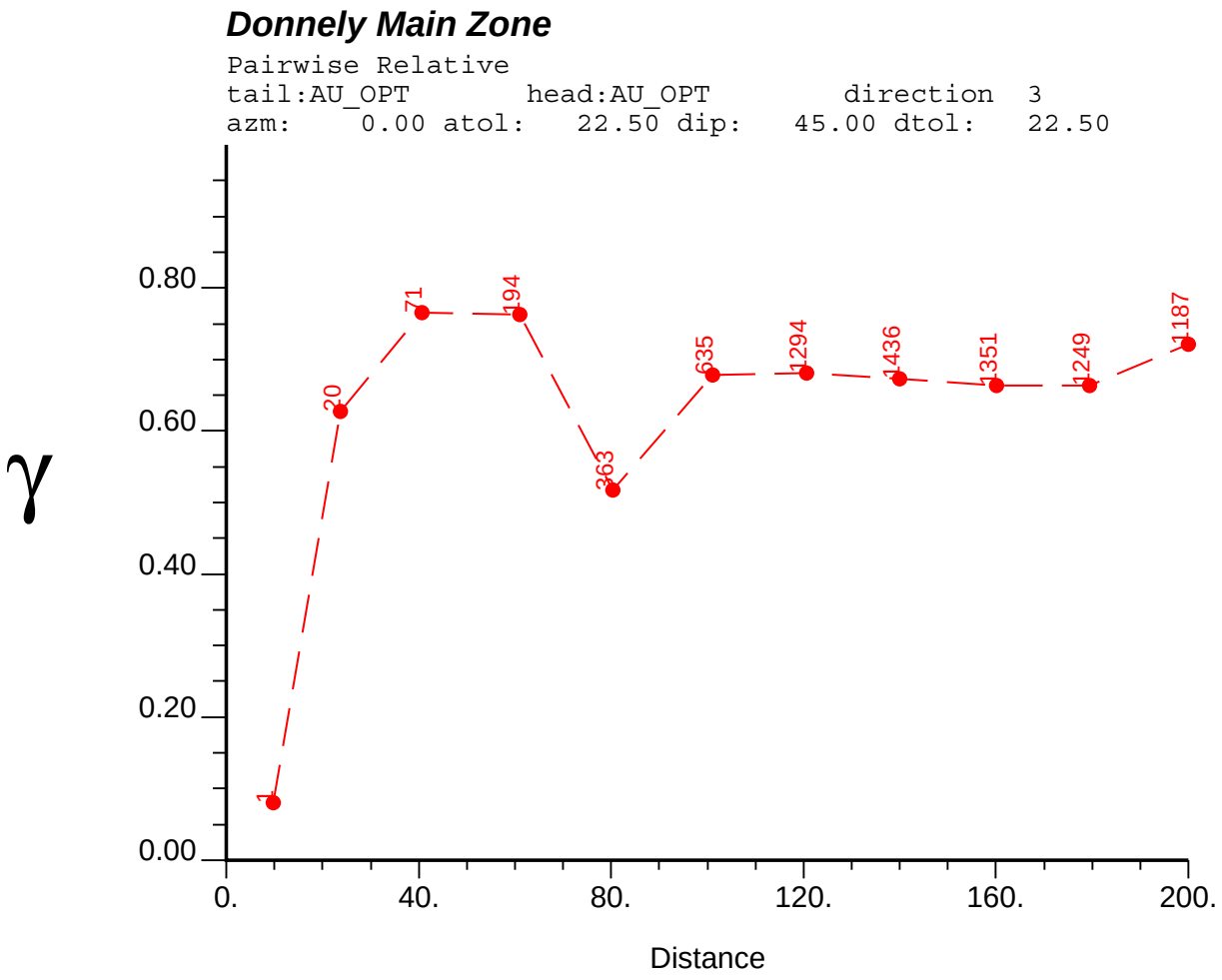

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 10
azm: 90.00 atol: 22.50 dip: -60.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
703
2068
2173
2118
2068
1834
1674
1738
1553
1273
1095

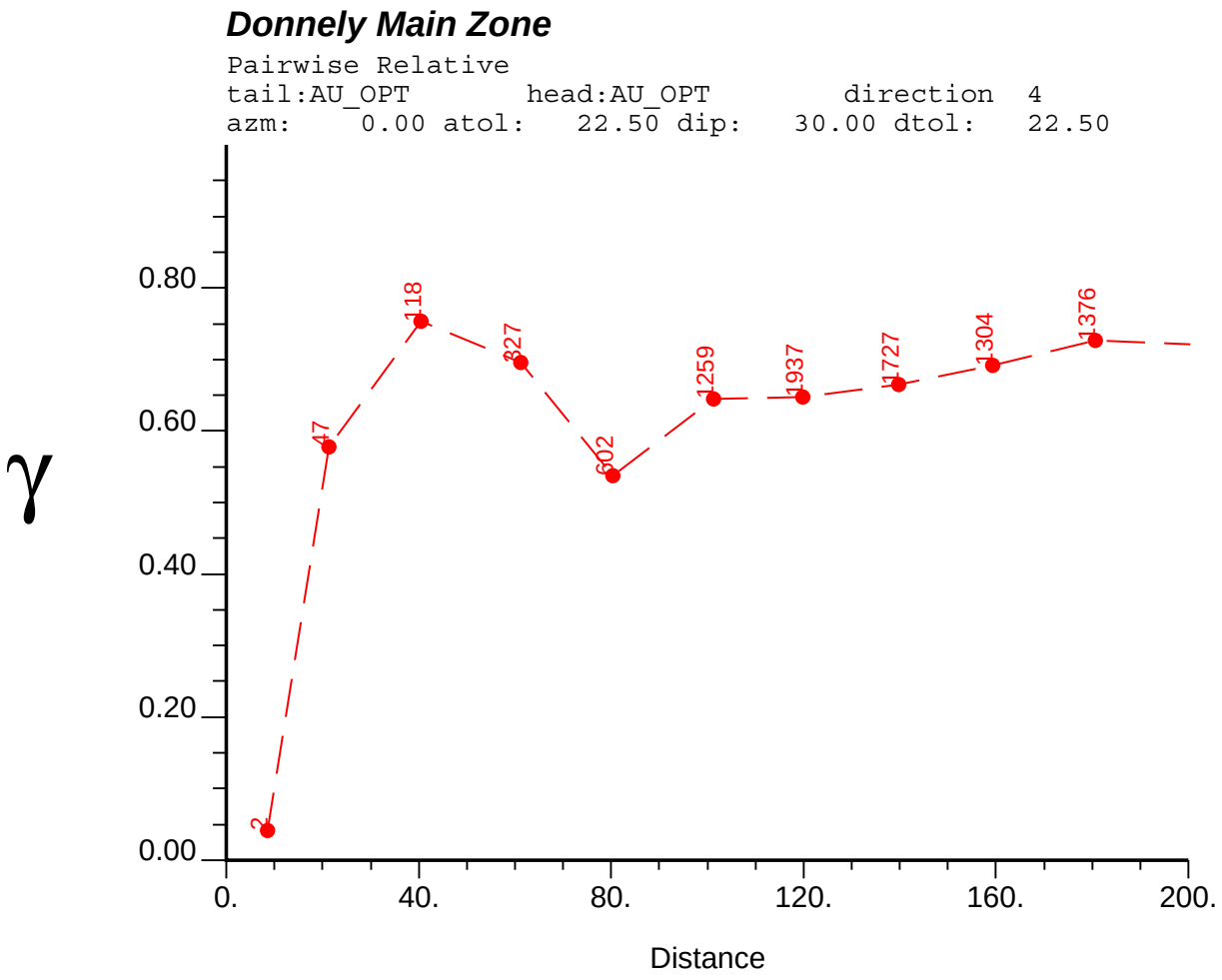

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 11
azm: 90.00 atol: 22.50 dip: -75.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
439
1147
1288
1328
1103
1218
1135
1170
1122
878
705

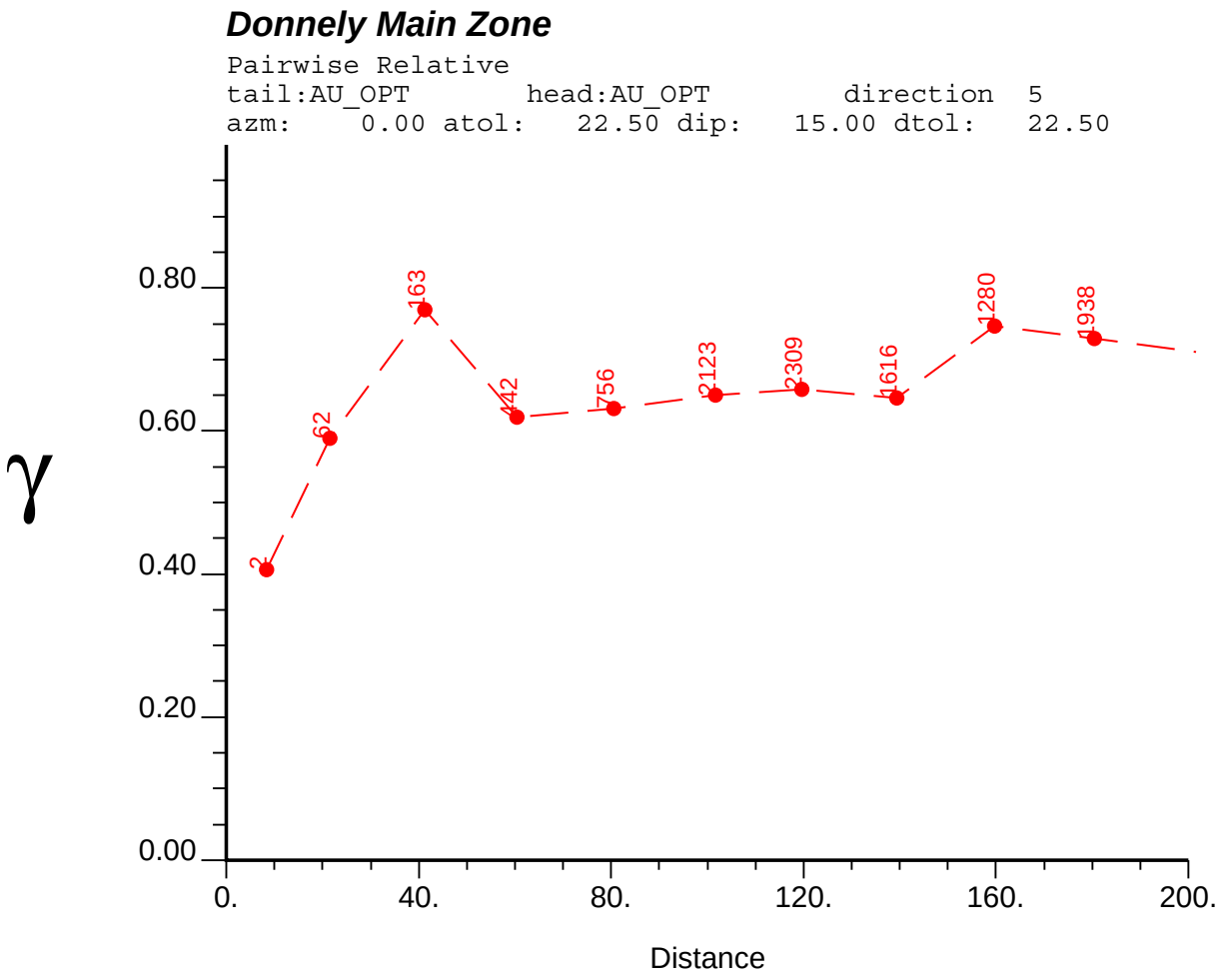

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 12
azm: 90.00 atol: 22.50 dip: -90.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
151
542
497
617
692
654
797
672
575
562
461

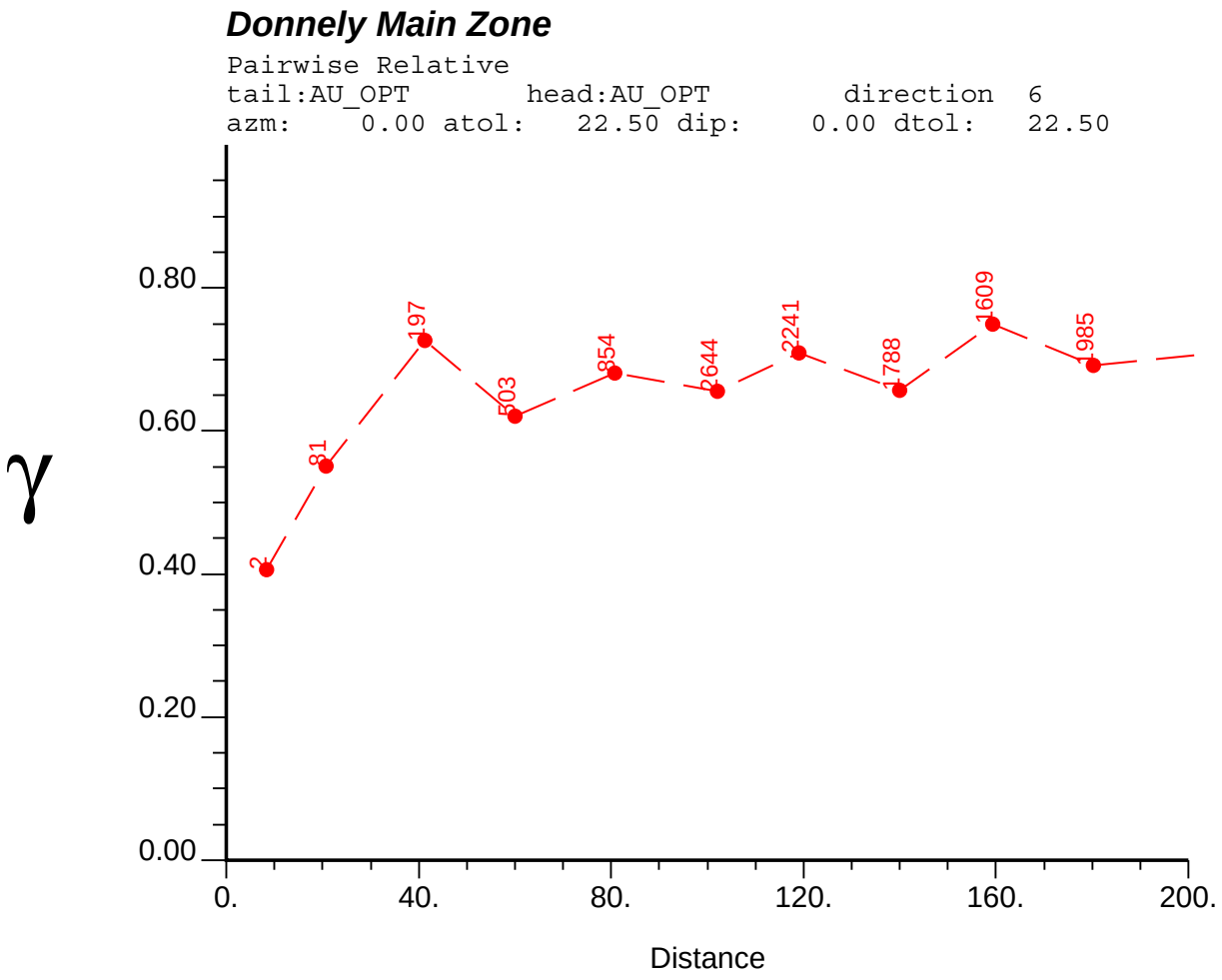

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 1
azm: 0.00 atol: 22.50 dip: 75.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
81
237
236
257
274
320
324
361
394
448
457

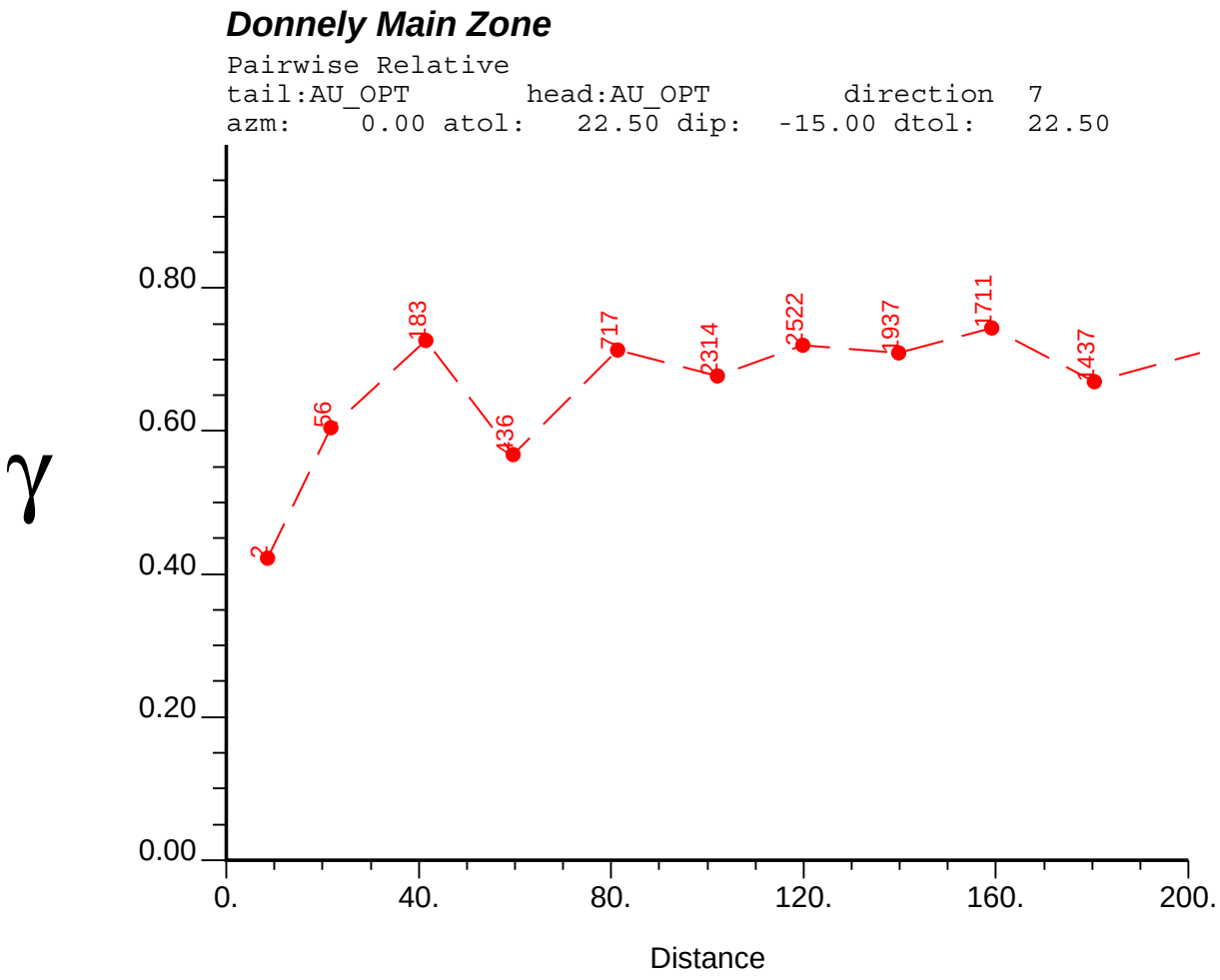

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 2
azm: 0.00 atol: 22.50 dip: 60.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
1
9
47
128
217
294
501
924
1026
1028
1005

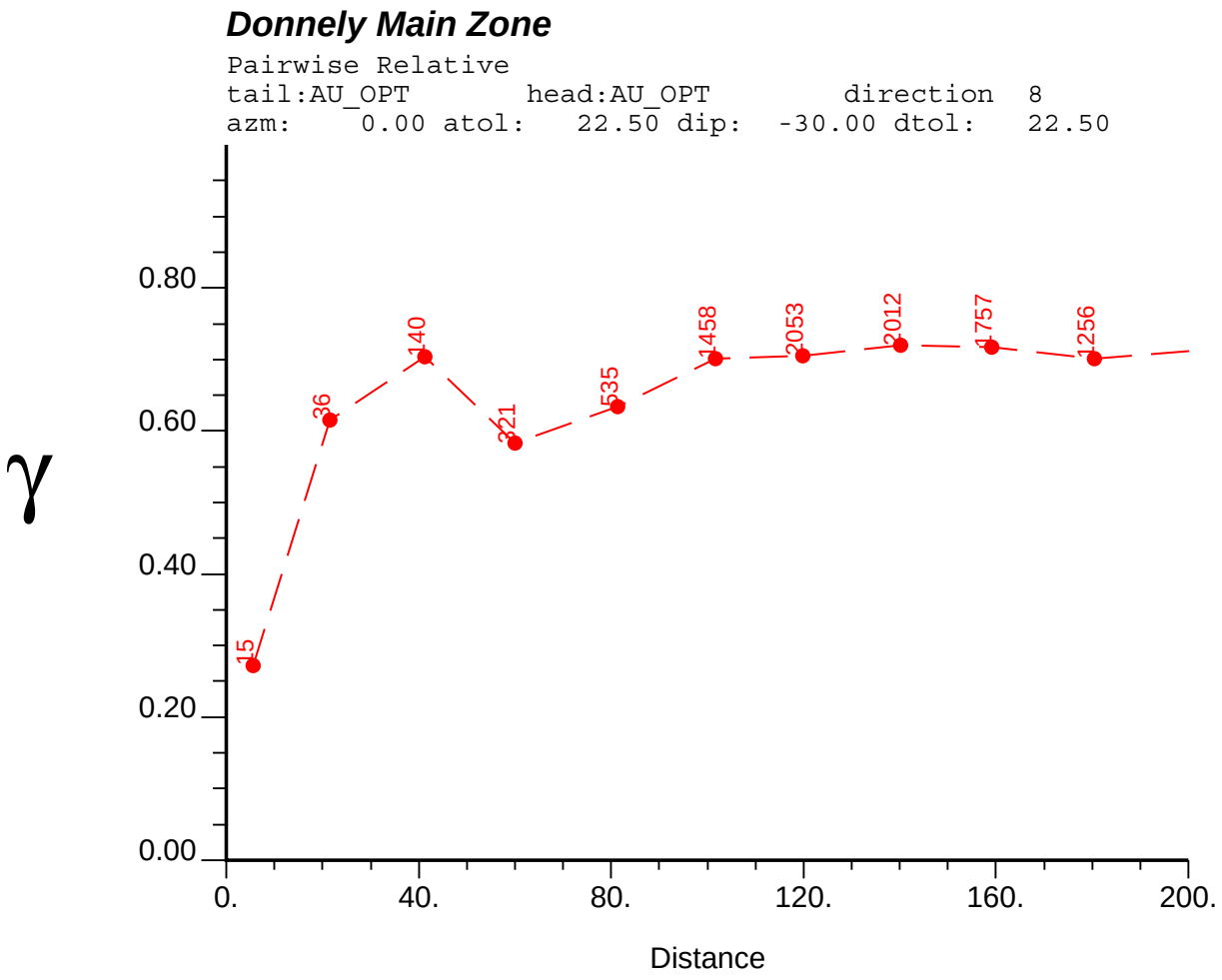

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 3
azm: 0.00 atol: 22.50 dip: 45.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
1
20
71
194
363
635
1294
1436
1351
1249
1187

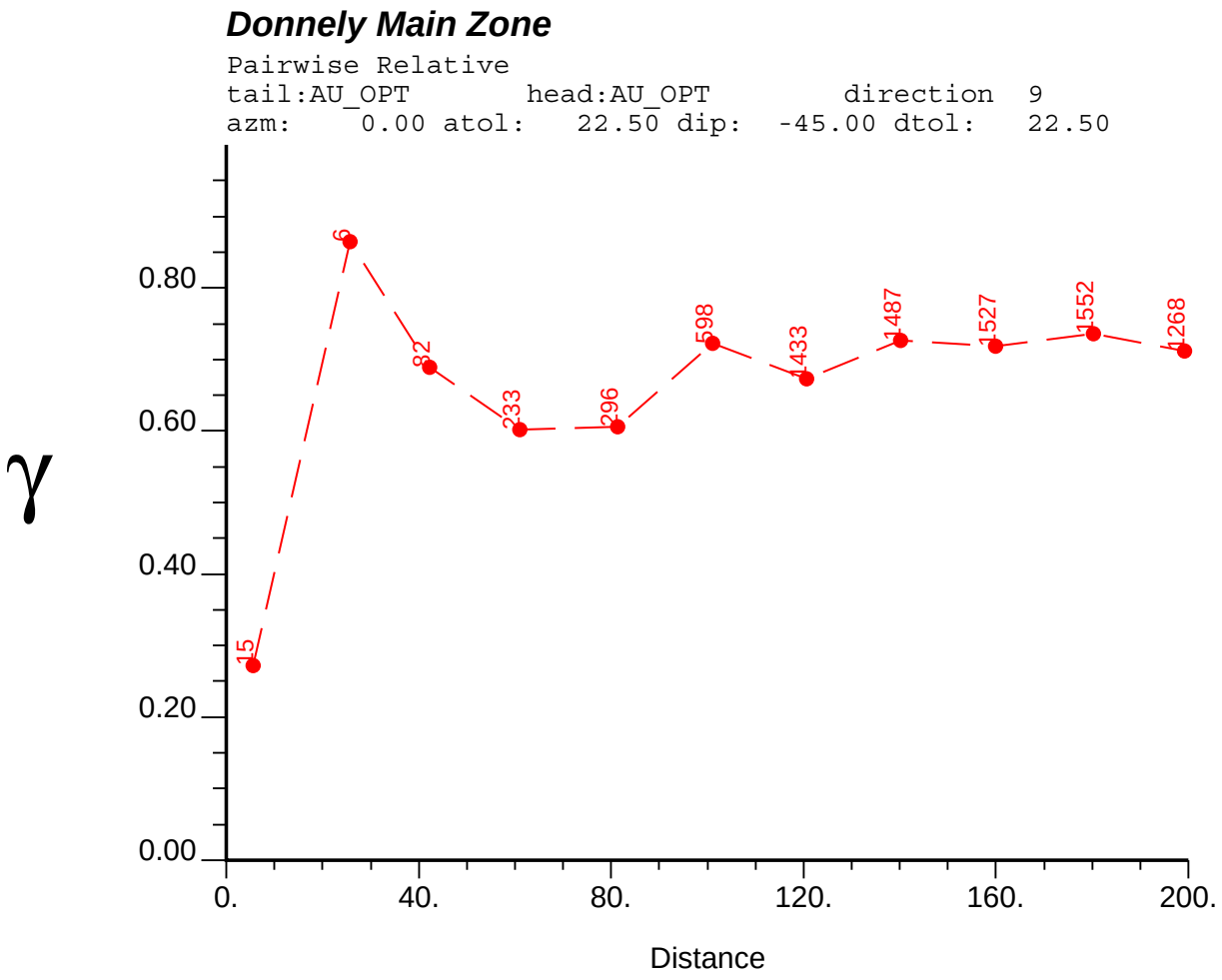

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 4
azm: 0.00 atol: 22.50 dip: 30.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
2
47
118
327
602
1259
1937
1727
1304
1376

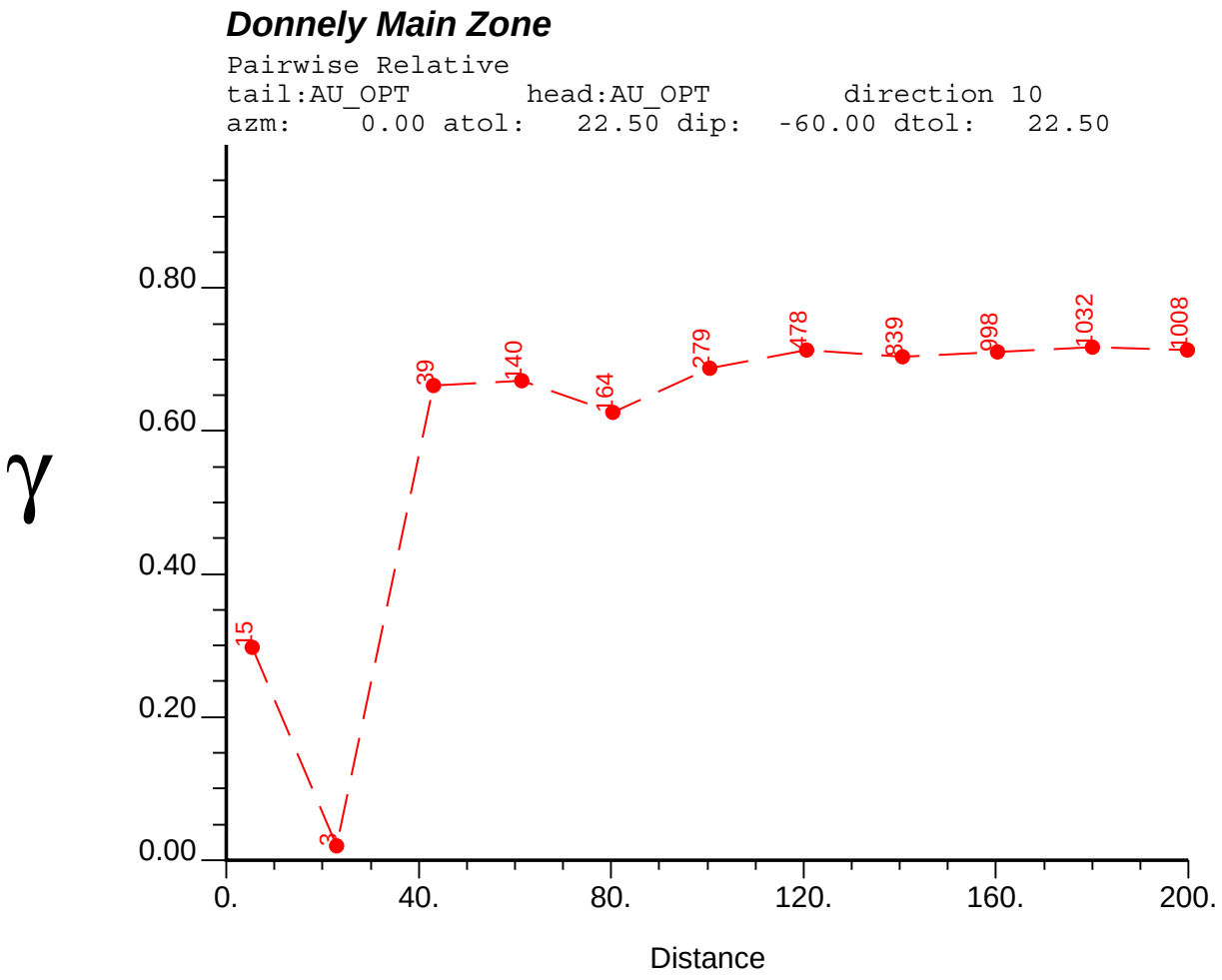

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 5
azm: 0.00 atol: 22.50 dip: 15.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
2
62
163
442
756
2123
2309
1616
1280
1938

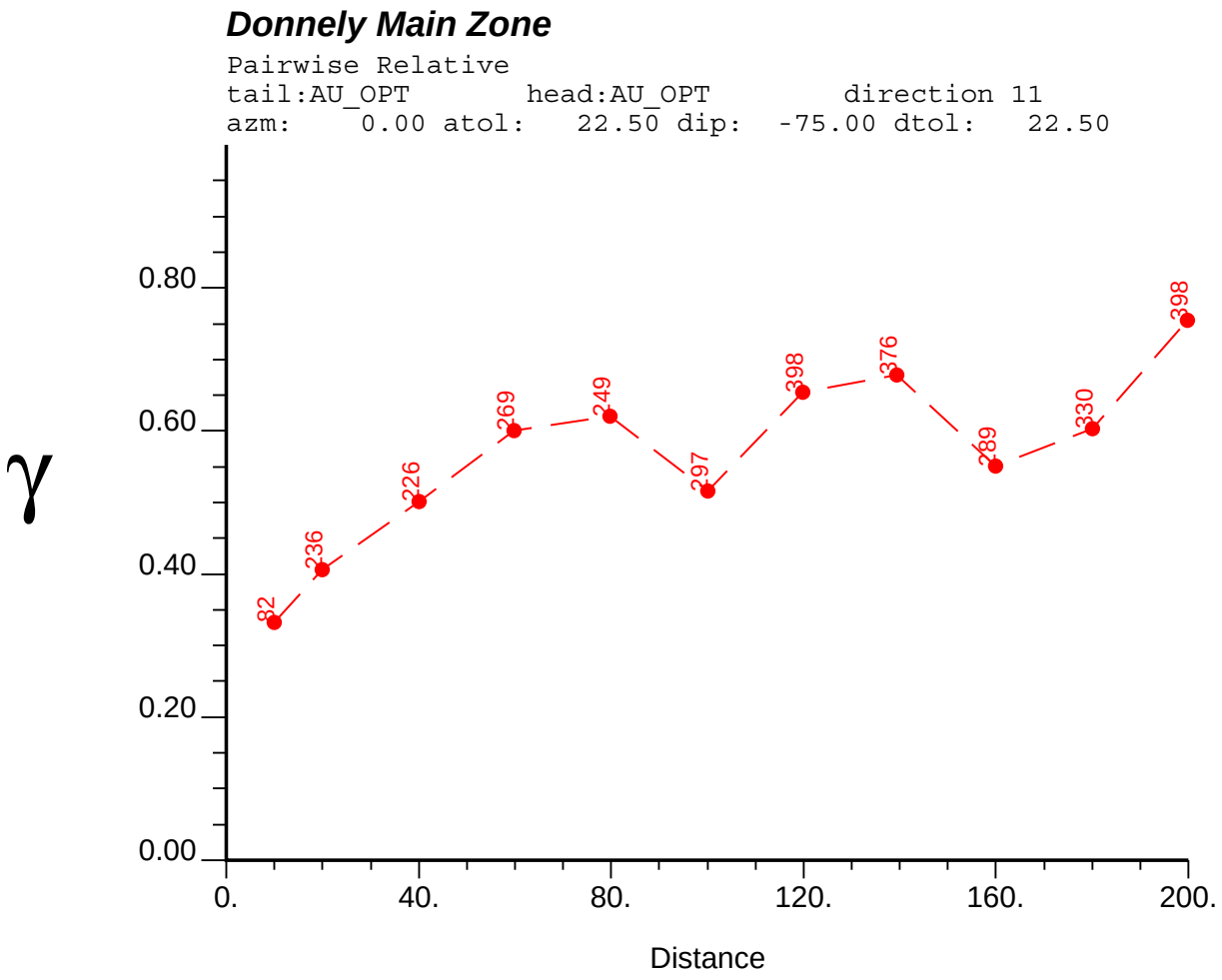

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 6
azm: 0.00 atol: 22.50 dip: 0.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
2
81
197
503
854
2644
2241
1788
1609
1985

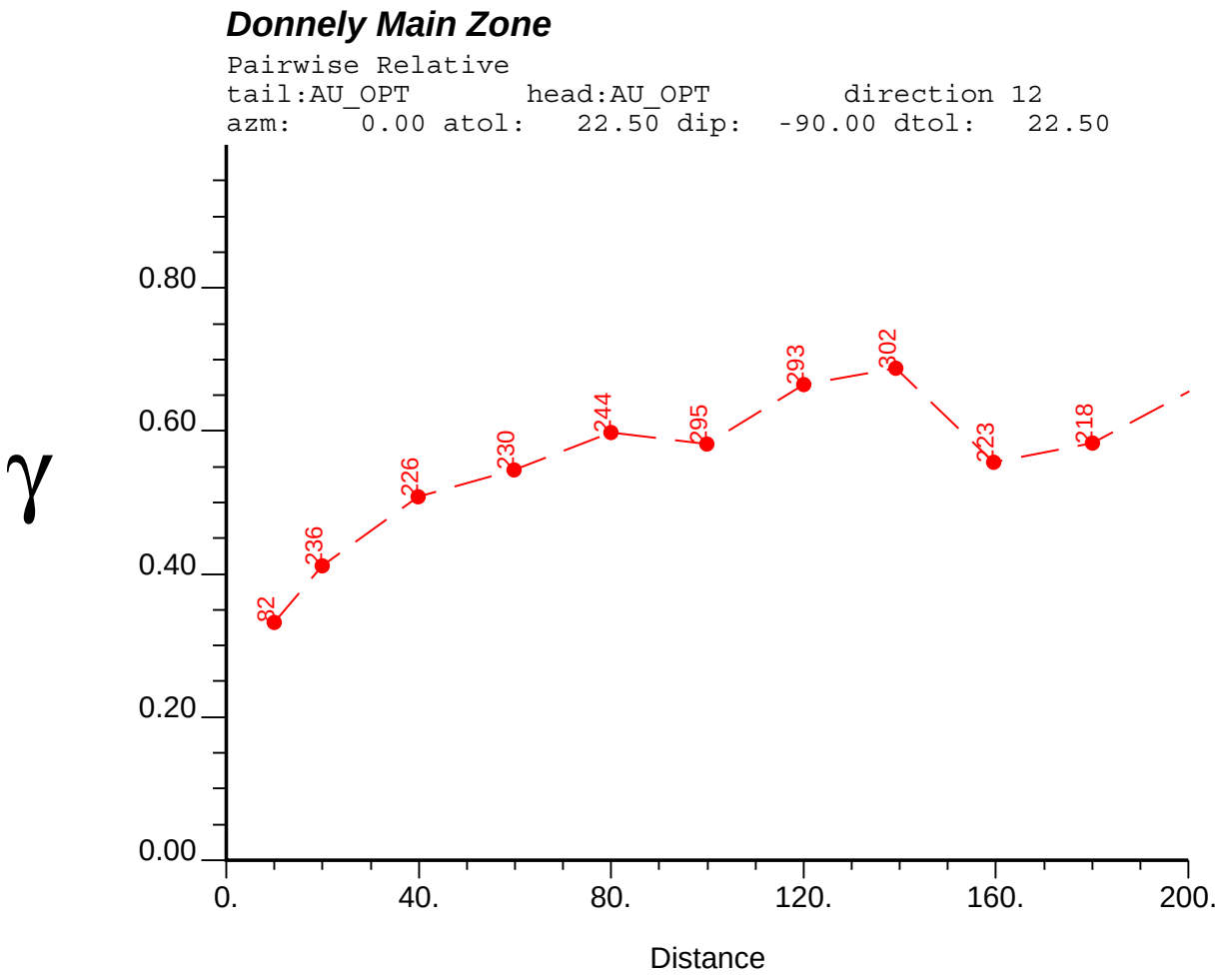

Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 7
azm: 0.00 atol: 22.50 dip: -15.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
2
56
183
436
717
2314
2522
1937
1711
1437


Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 8
azm: 0.00 atol: 22.50 dip: -30.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
15
36
140
321
535
1458
2053
2012
1757
1256


Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 9
azm: 0.00 atol: 22.50 dip: -45.00 dtol: 22.50
γ
0.00
0.20
0.40
0.60
0.80
0.
40.
80.
120.
160.
200.
Distance
15
6
82
233
296
598
1433
1487
1527
1552
1268


Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 10
azm: 0.00 atol: 22.50 dip: -60.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
15
3
39
140
164
279
478
839
998
1032
1008


Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 11
azm: 0.00 atol: 22.50 dip: -75.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
82
236
226
269
249
297
398
376
289
330
398


Donnely Main Zone
Pairwise Relative
tail:AU_OPT head:AU_OPT direction 12
azm: 0.00 atol: 22.50 dip: -90.00 dtol: 22.50
γ
0.80
0.60
0.40
0.20
0.00
0.
40.
80.
120.
160.
200.
Distance
82
236
226
230
244
295
293
302
223
218

APPENDIX D

Block Model Cross Sections

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

QPD-90-138
QPD-90-140
UP-T074
QPD-90-131

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 203600

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev
5300 Elev

QPD-028
QPD-082
7UP-T063
QPD-032

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 203500

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

CM-001
CM-002
PD-030
PD-063
PD-080

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 203400

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

7UP-T073
GM-002
PD-90-134
CM-005
PD-90-132
PD-90-120

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 203300

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

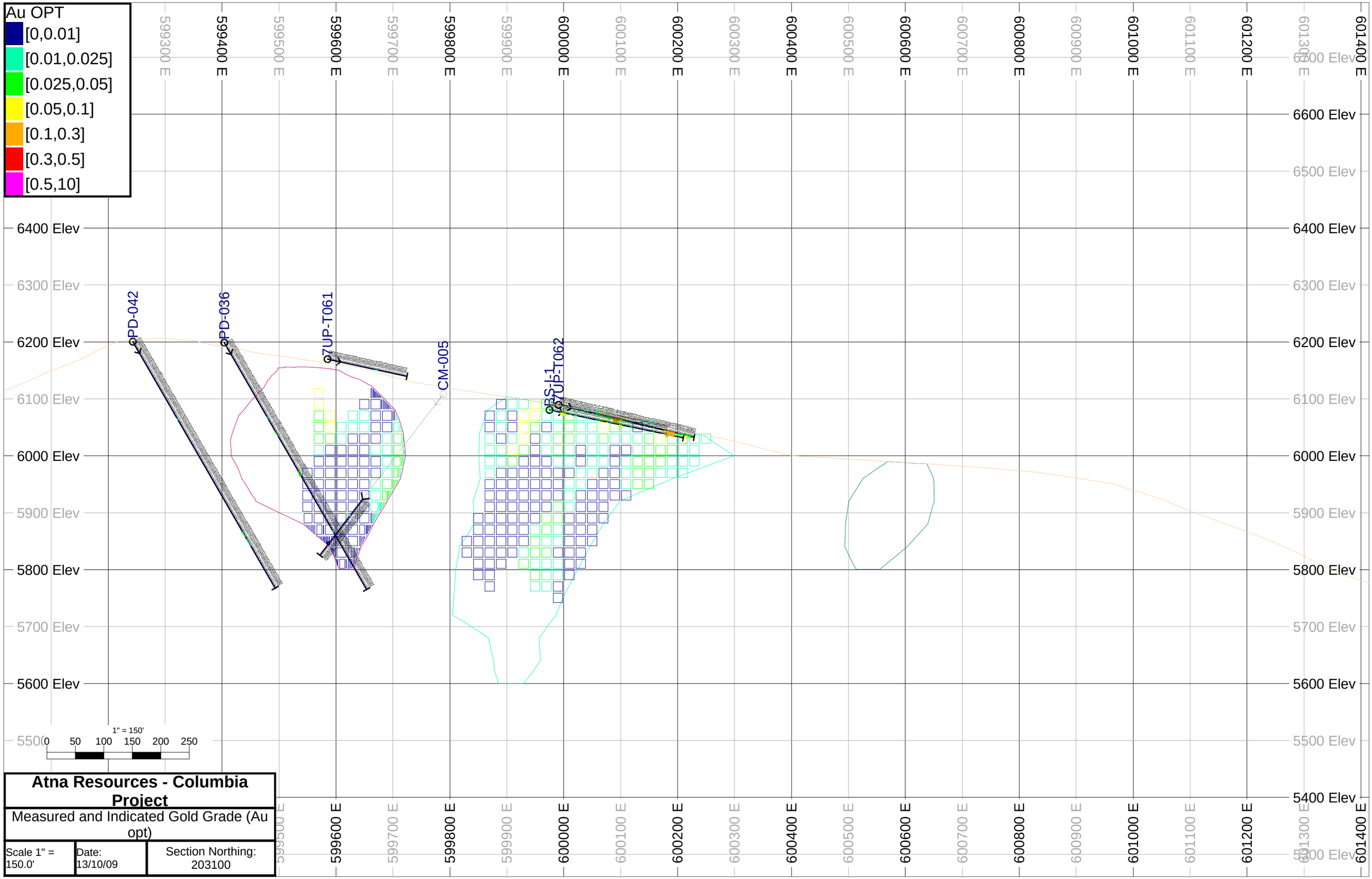
ZUP-T070
CM-002
CM-005
ZUP-T070
GPD-90-136
GPD-034

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 203200



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 203100

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

OPD-026
OPD-024
OPD-90-170
OPD-020
OPD-022
OPD-065

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 203000

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

OPD-90-122
7UP-T071
OPD-90-124
OPD-90-128
7UP-T072
OPD-90-179

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 202900

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

7UP-T071
PD-90-126
PD-90-172
PD-90-130
PD-044

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 202800

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

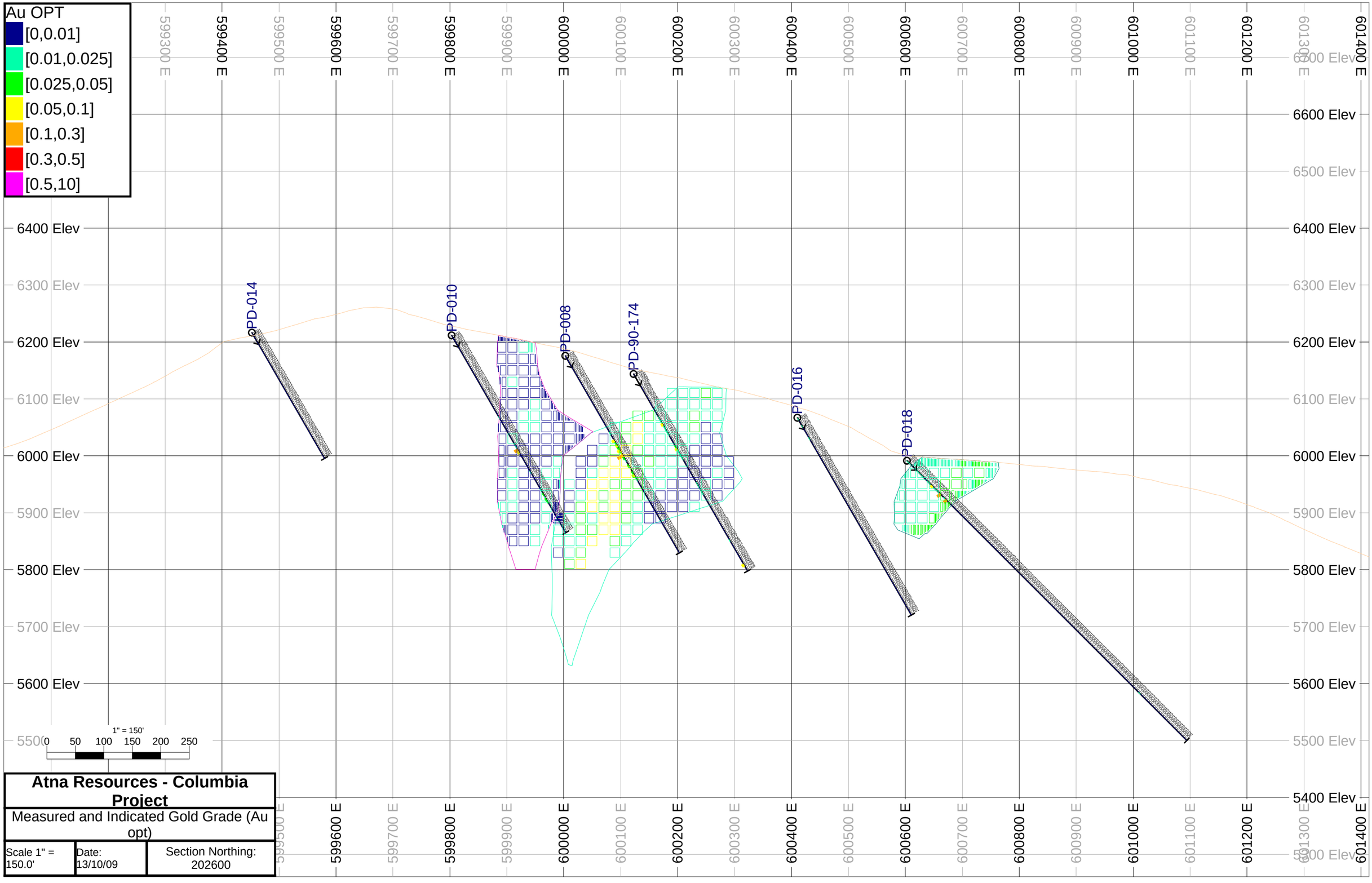
QPD-012
QPD-90-167
QPD-007
QUP-T060

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

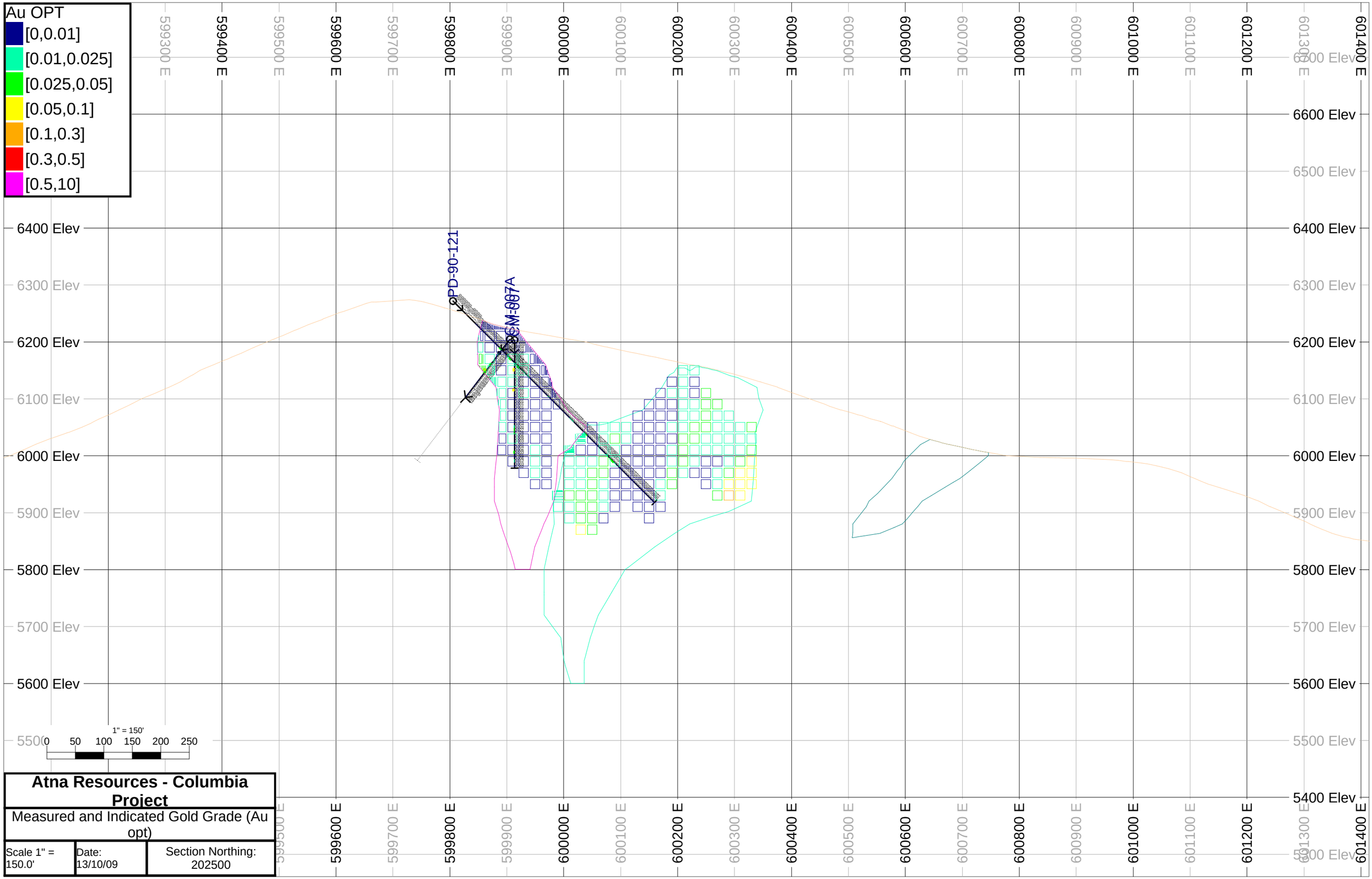
Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 202700



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 202600



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 202500

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

QPD-90-144
7UP-220A
CM-007A
QPD-90-123
17.000
QPD-90-127
QPD-90-142

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 202400

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

7UP-220A
7UP-230A
OPD-90-156
7UP-T031
OPD-085
OPD-081
7UP-T032

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 202300

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

7UP-T044
PD-90-125
7UP-030A
7UP-222
7UP-269
7UP-T032
PD-040
PD-038

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 202200

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

PD-074
7UP-T068
7UP-221A
7UP-222A
7UP-200
7UP-T034A
7UP-223
CM-011A
7UP-269
PD-90-160
7UP-T033

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 202100

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

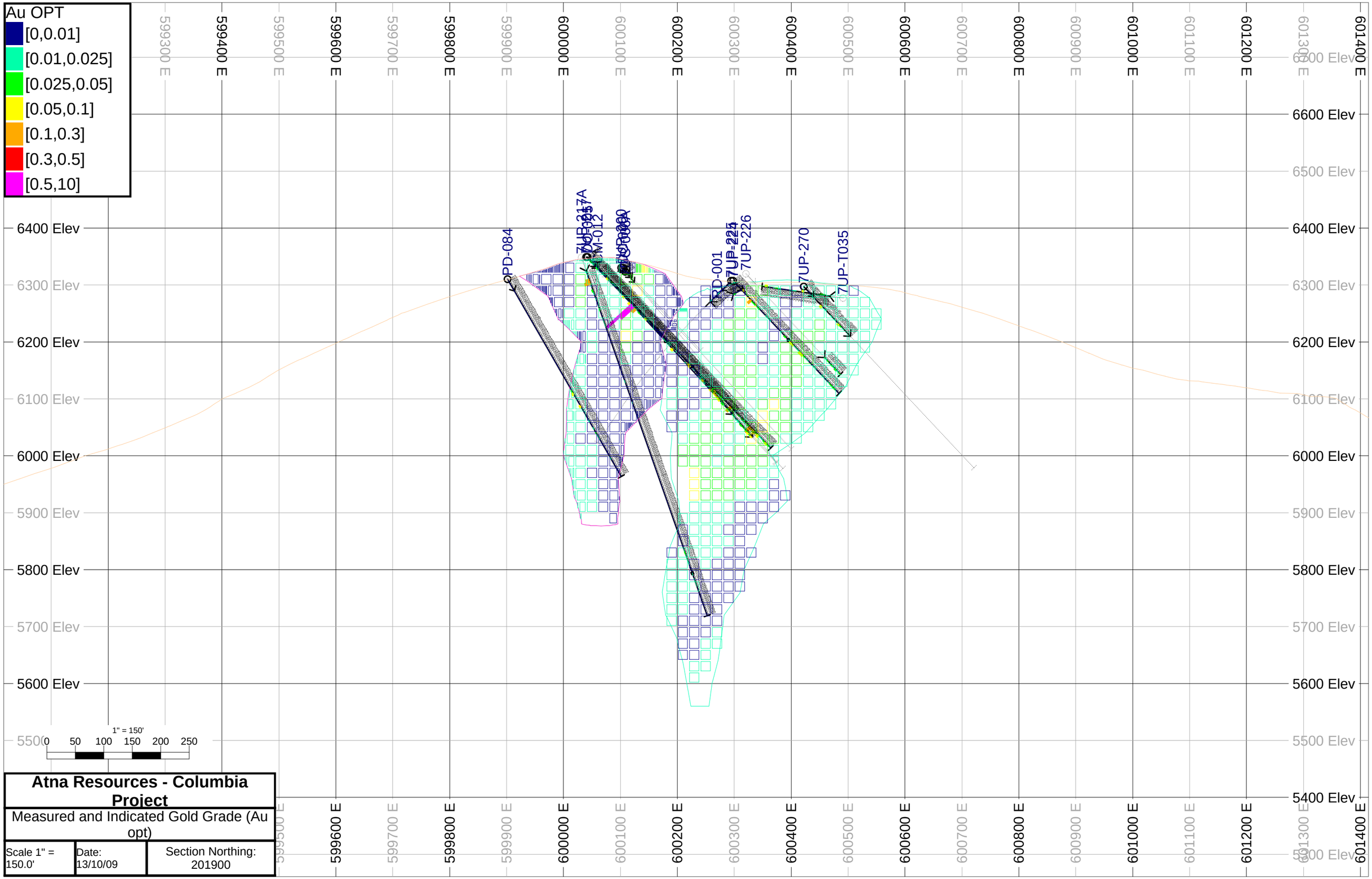
7UP-T067
7UP-223
7UP-270
7UP-T035
7UP-T033
DC-005
CM-012
RD-001
D-037

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

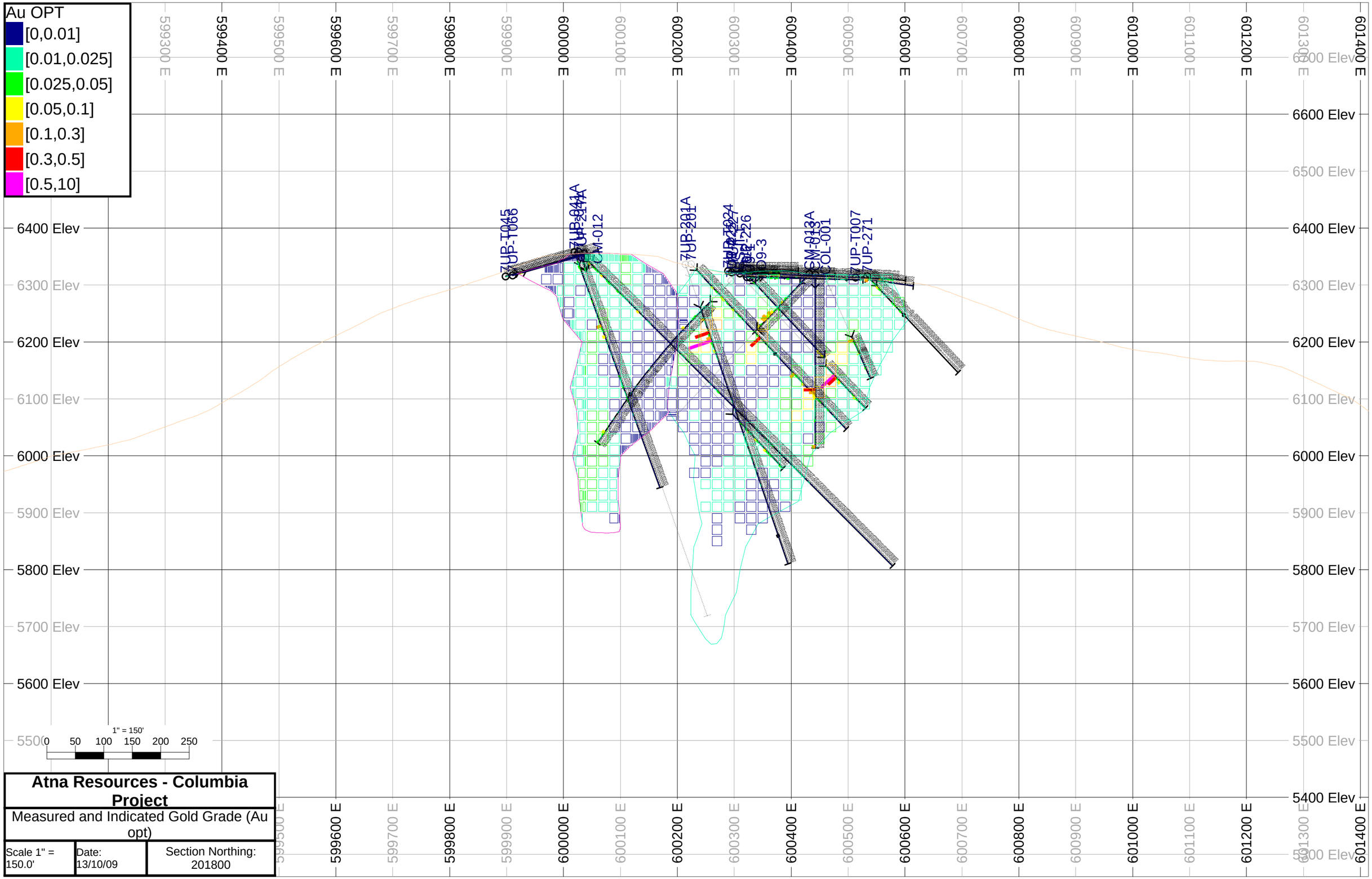
Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 202000



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 201900



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 201800

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

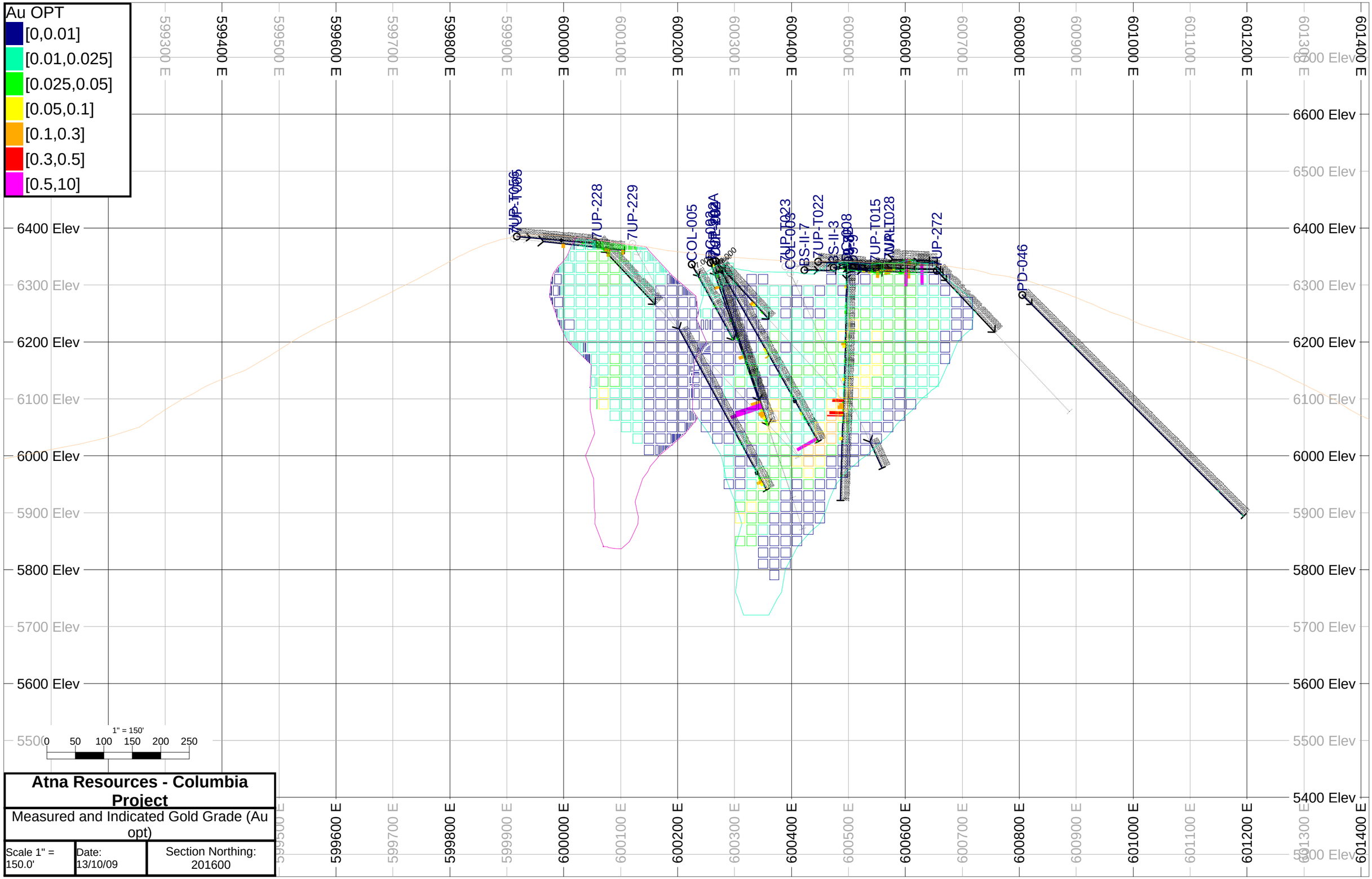
7UP-T056
PD-083
7UP-228
7UP-227
7UP-T023
7UP-T036

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

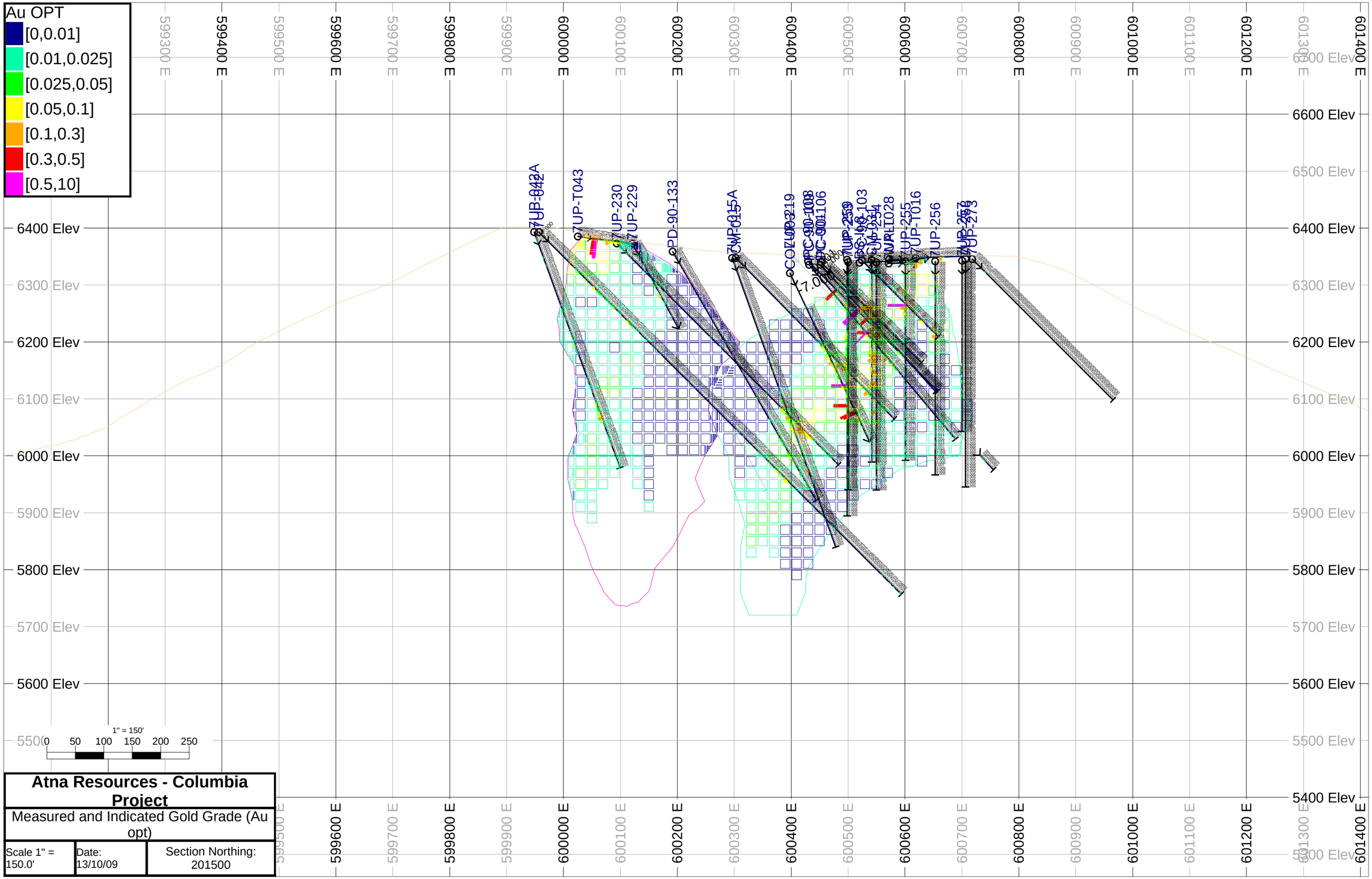
Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 201700



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 201600



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 201500

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

7UP-043A
PC-90-107
RD-086
7UP-T029
7UP-231
CM-026
7UP-263
7UP-215A
7UP-262
7UP-264
PC-90-105
7UP-232
7UP-265
7UP-T037
7UP-266
CM-017
7UP-267
7UP-268

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 201400

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

7UP-043A
7UP-T029
7UP-233
7UP-T030
7UP-234
CM-017
7UP-T038
7UP-274

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 201300

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev
5300 Elev

PD-076
7UP-044A
7UP-043
7UP-T025
PD-079
7UP-235
DC-003
7UP-205A
7UP-236
DC-007
7UP-214A
7UP-206
DC-004
7UP-T039
PD-063
7UP-T051
PD-075
DC-001

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 201200

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

7UP-044A
7UP-T048
7UP-T025
PD-90-137
DC-003
7UP-205A
7UP-204
7UP-216
DC-004
7UP-T040
CM-020

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 201100

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

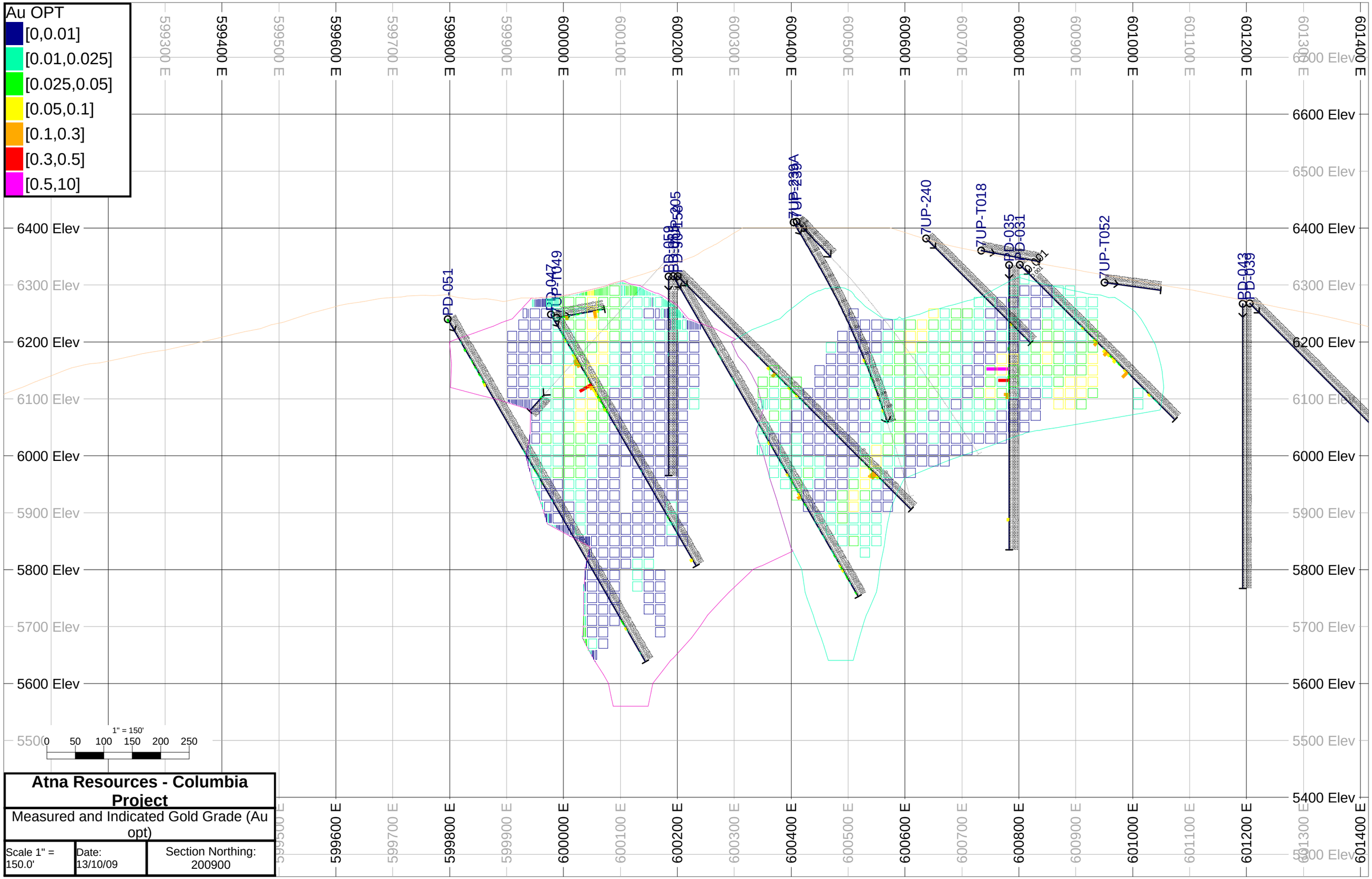
PD-90-139
7UP-T048
7UP-205
PD-90-135
7UP-238
7UP-239
7UP-239A
7UP-237
7UP-275
PD-089

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

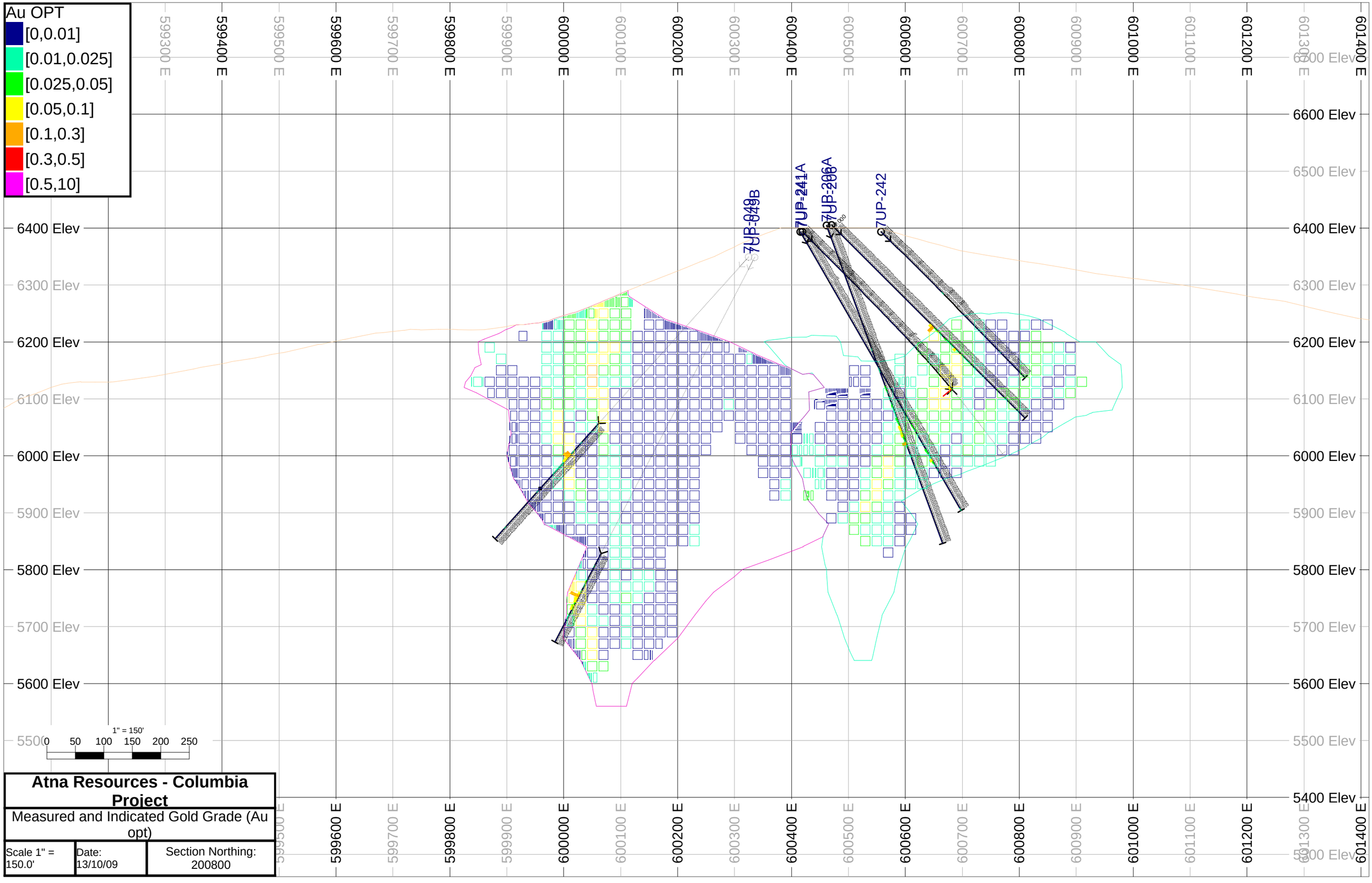
Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 201000



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 200900



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 200800

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

PD-90-150
PD-098
7UP-049B
7UP-241
7UP-207A
7UP-243
7UP-T026
PD-088

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 200700

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

7UP-244
7UP-T026
PD-90-165

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 200600

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev
5300 Elev

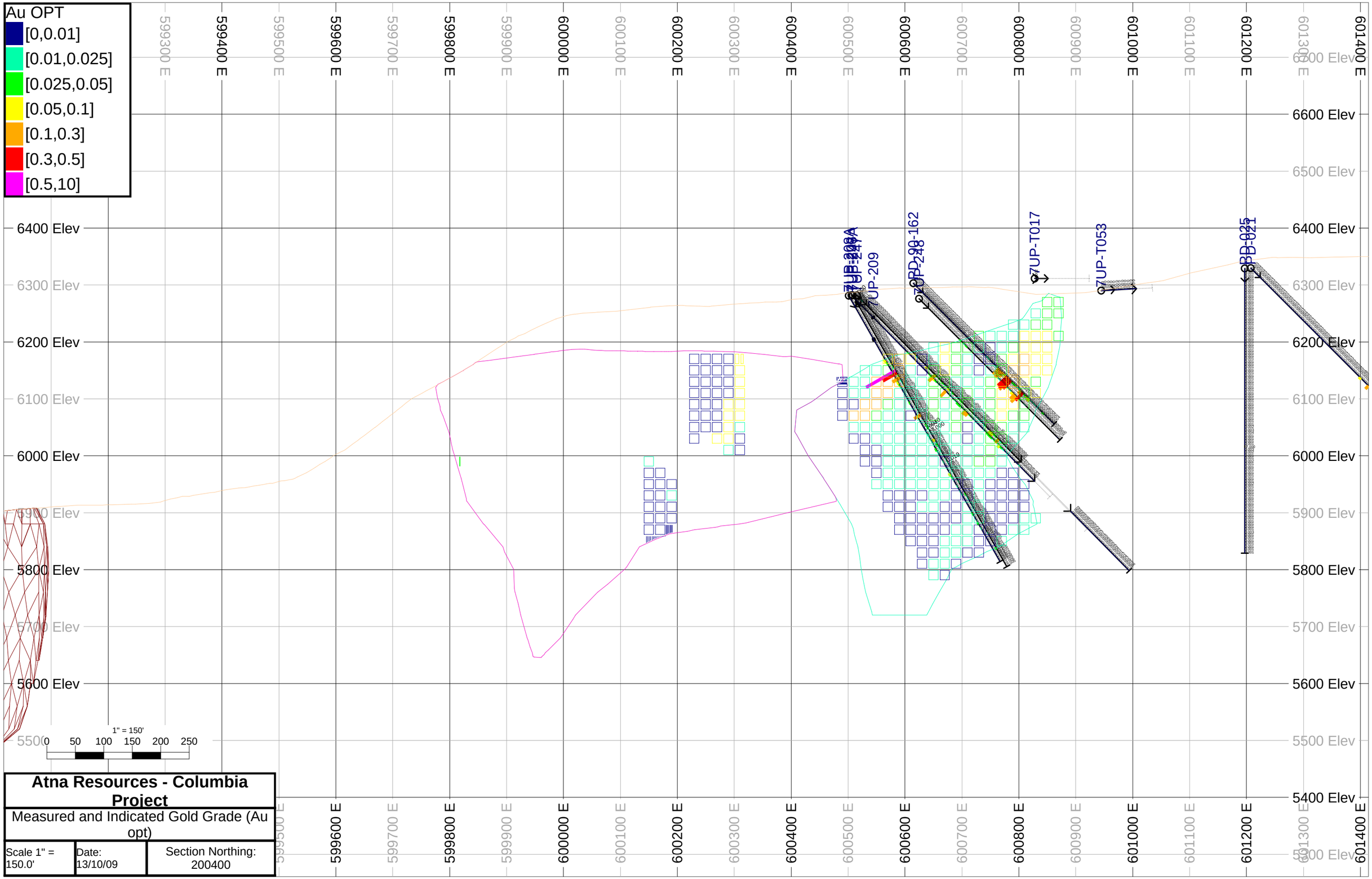
QPD-90-154
QPD-043
7UP-247
7UP-245A
7UP-246
QPD-029
QPD-027
7UP-T017
7UP-T053

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 200500



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 200400

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

7UP-208
7UP-209
7UP-209A
DC-010

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 200300

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

DPD-90-161
BS-IV-2
BS-IV-1
DPD-90-146
DPD-90-164
DPD-90-148
7UP-T041

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 200200

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

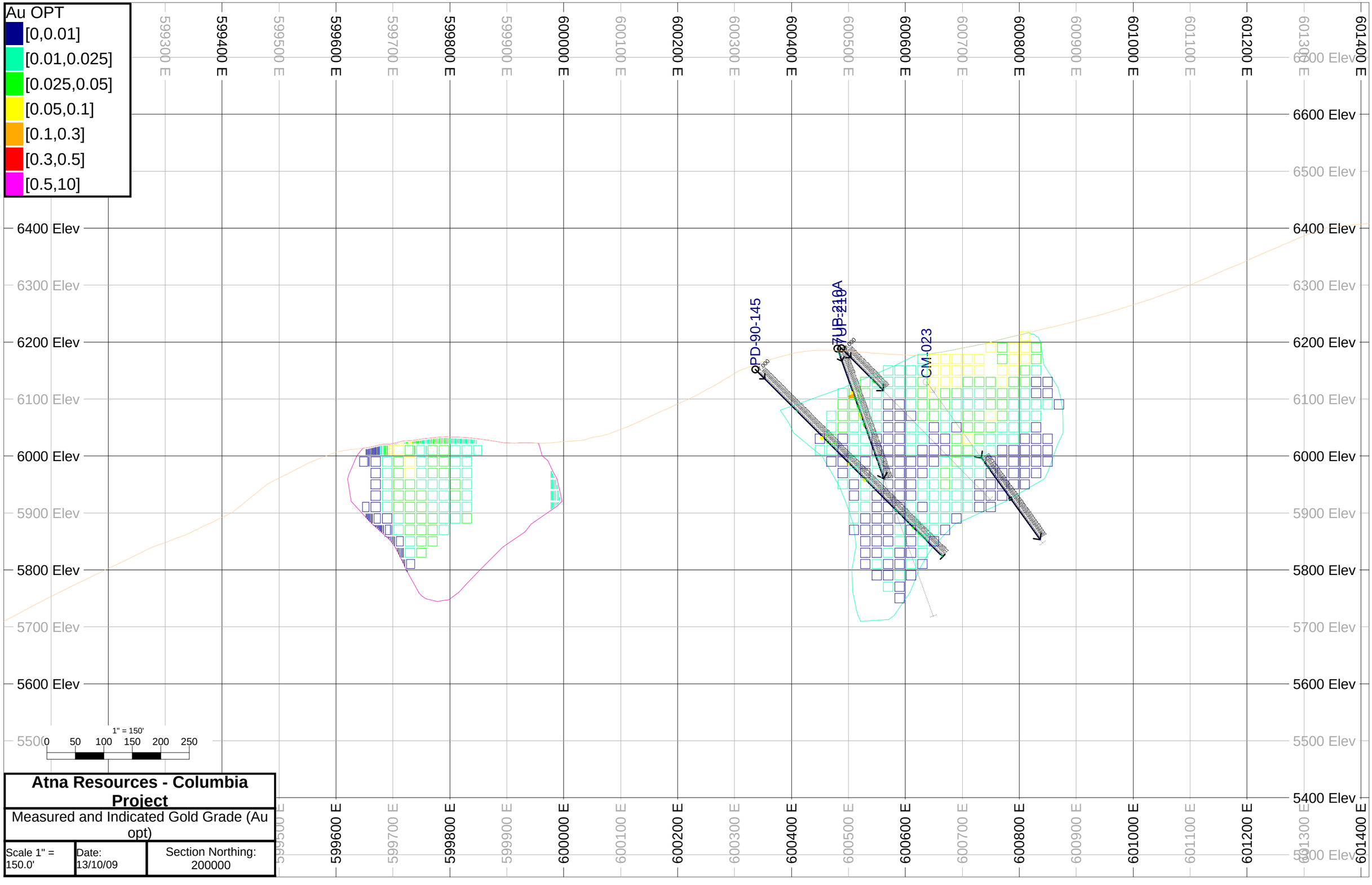
BS-IV-2
PD-90-143
TUB-210A
CM-078
IP-249
PD-045
PD-077

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 200100



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 200000

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

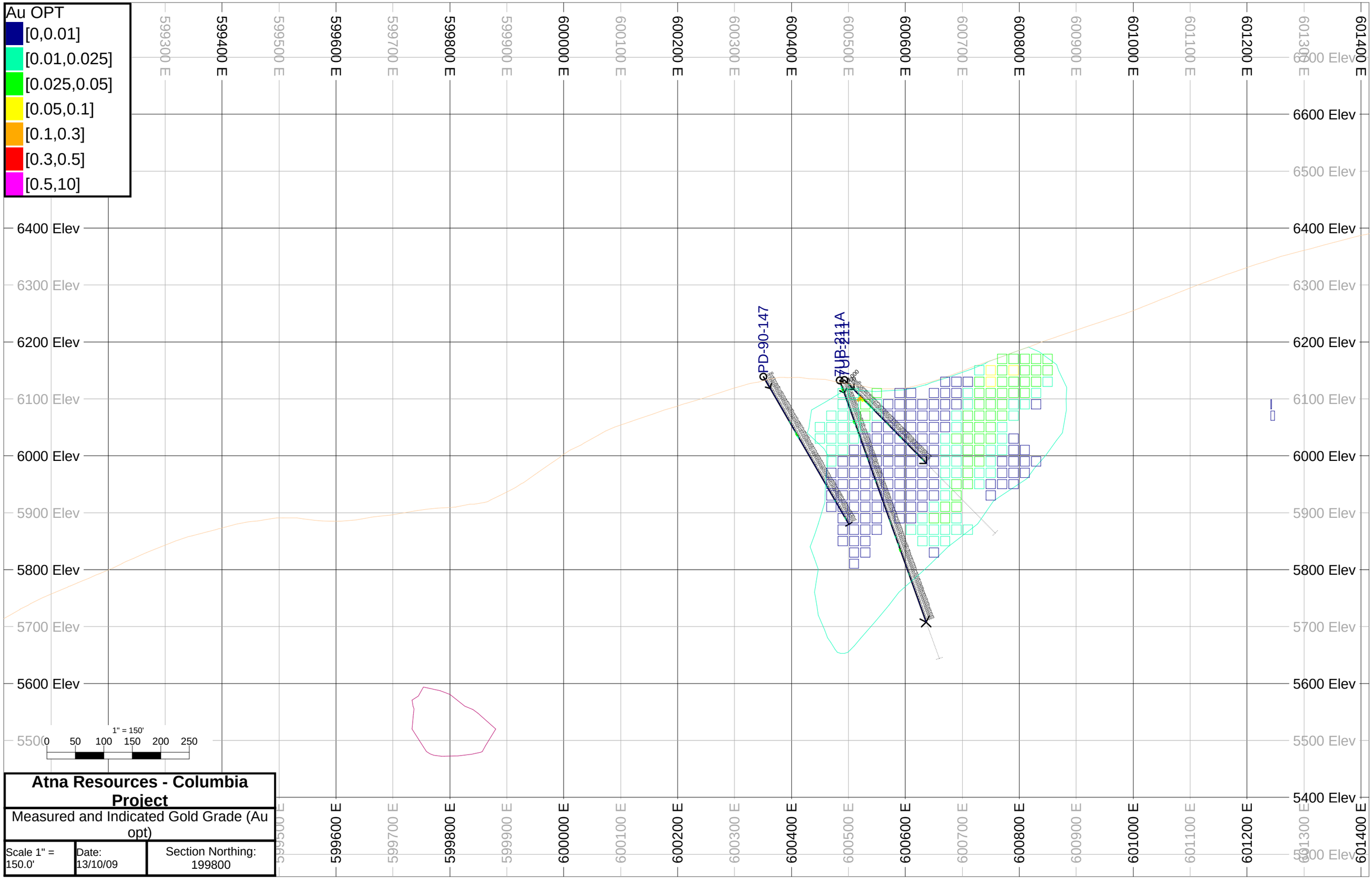
PD-90-147
7UP-211A
CM-023
7UP-T042
D-90-152

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

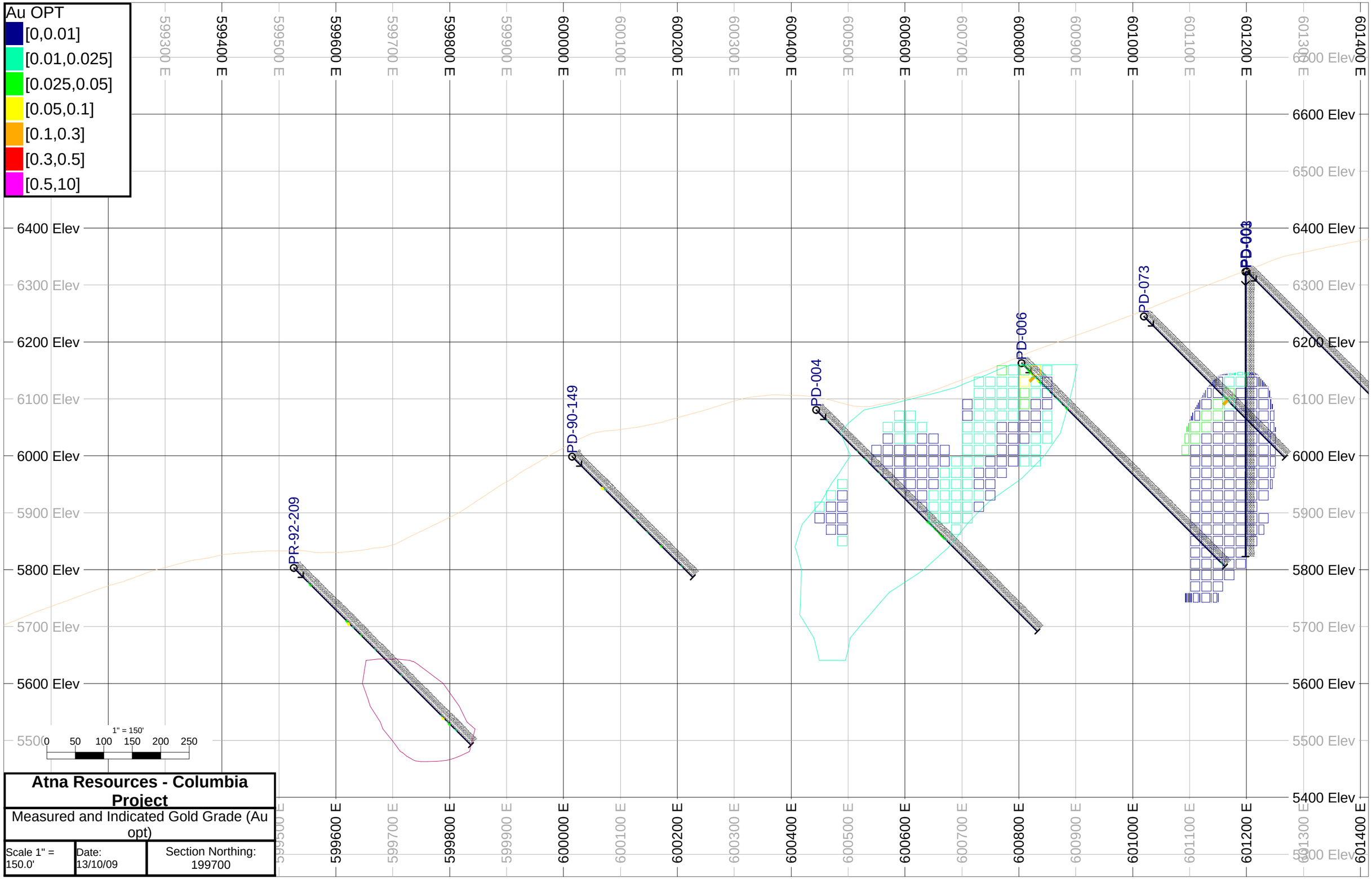
Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 199900



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 199800



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 199700

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

OPD-90-153
OPD-002
OPD-90-171
OPD-005

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 199600

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

PD-90-166
CM-024

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 199500

Au OPT
[0,0.01]
[0.01,0.025]
[0.025,0.05]
[0.05,0.1]
[0.1,0.3]
[0.3,0.5]
[0.5,10]

599300 E 599400 E 599500 E 599600 E 599700 E 599800 E 599900 E 600000 E 600100 E 600200 E 600300 E 600400 E 600500 E 600600 E 600700 E 600800 E 600900 E 601000 E 601100 E 601200 E 601300 E 601400 E

6600 Elev
6500 Elev
6400 Elev
6300 Elev
6200 Elev
6100 Elev
6000 Elev
5900 Elev
5800 Elev
5700 Elev
5600 Elev
5500 Elev
5400 Elev

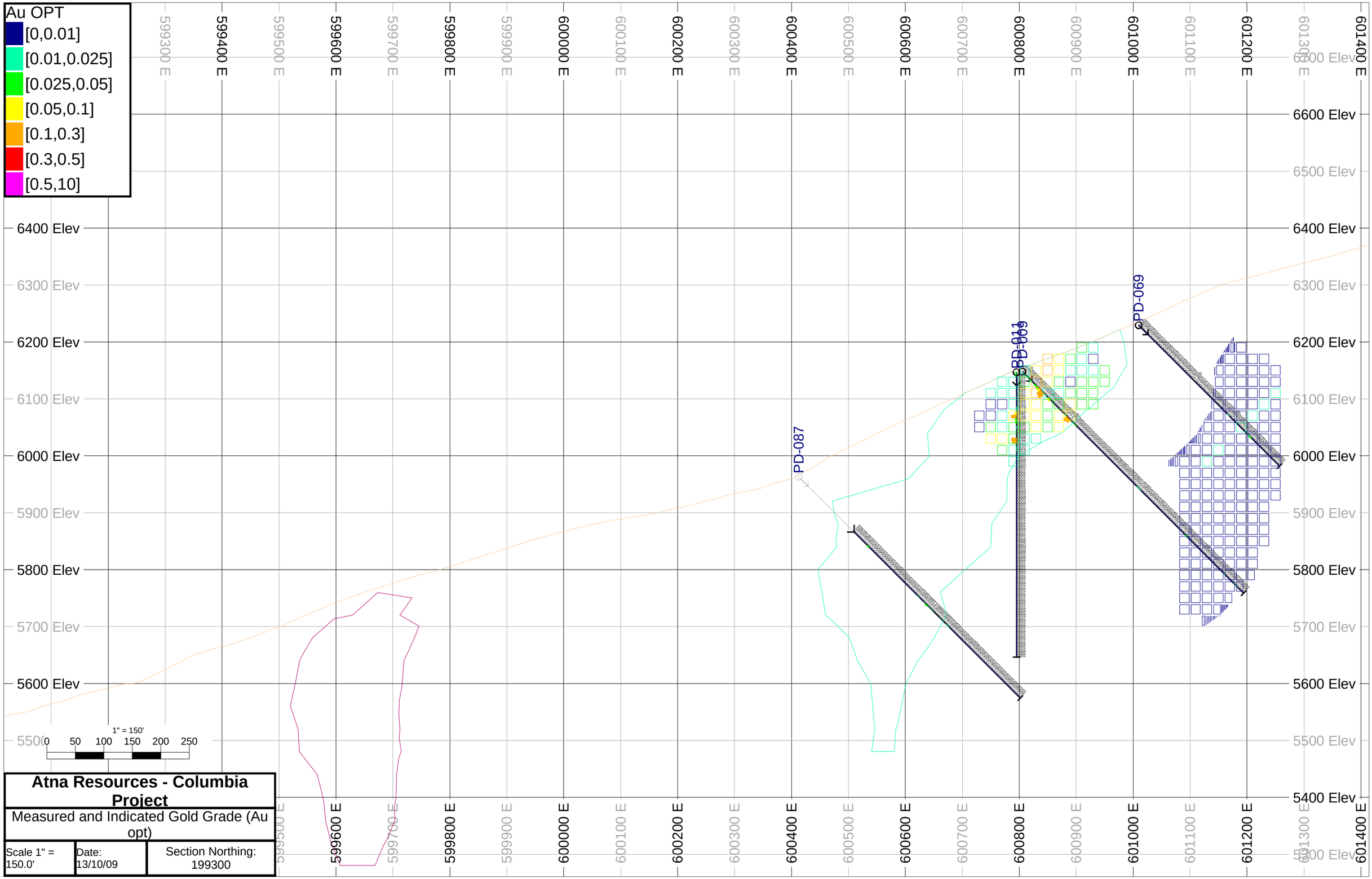
QPD-90-205
QPD-90-151
QPD-90-155
CM-024
BS-III-1
BS-III-2

1" = 150'
0 50 100 150 200 250

Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

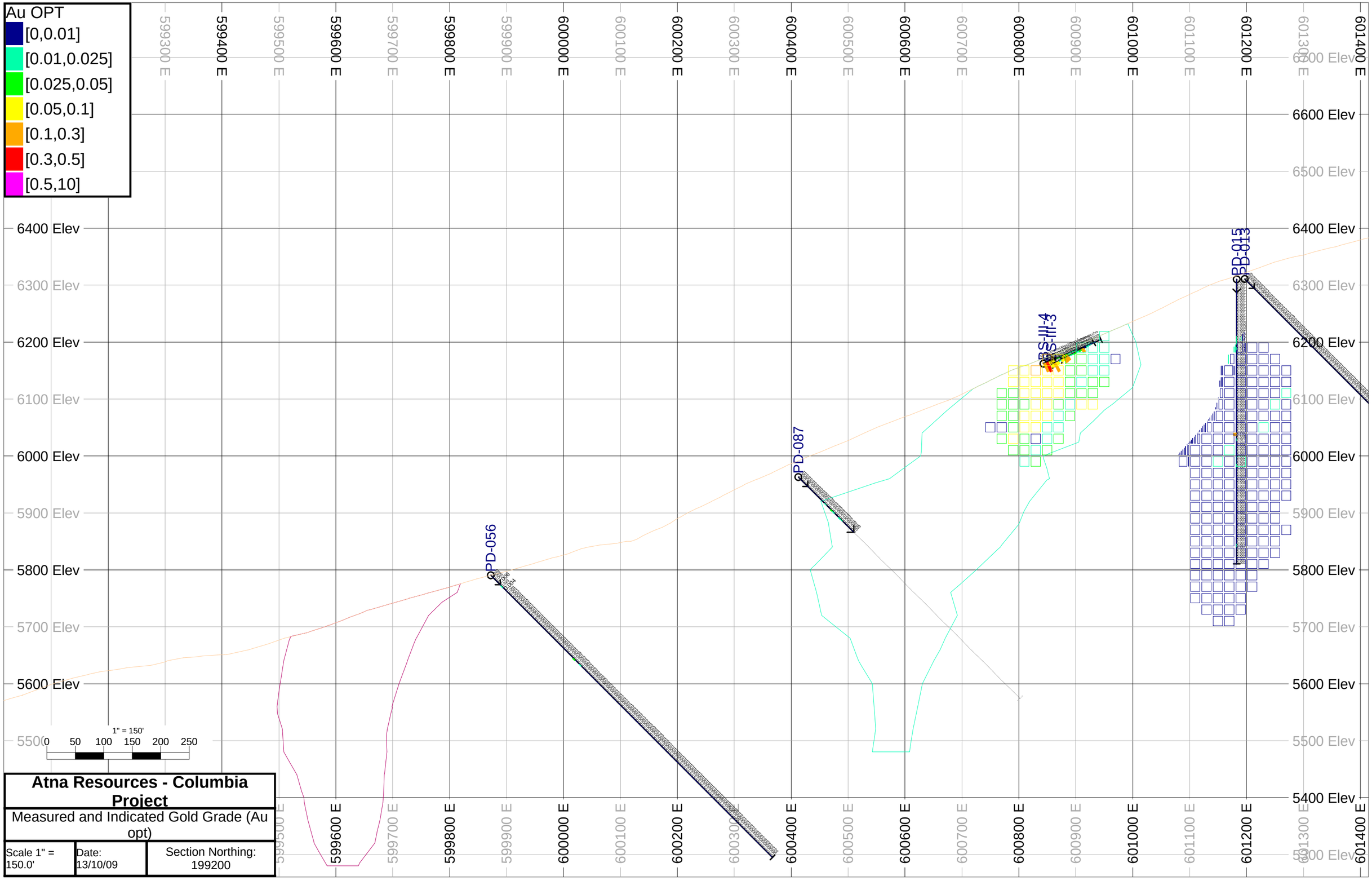
Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 199400



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 199300



Atna Resources - Columbia Project

Measured and Indicated Gold Grade (Au opt)

Scale 1" = 150.0'	Date: 13/10/09	Section Northing: 199200

APPENDIX E

Mine Production Schedule

Columbia
Mine Production Schedule

		Period	2011	7.75	2012	3.01	2013	2.99	2014	3.04	2015	3.02	2016	2.56	2017	2.51	2018	2.59	2019	1.47
		Sum	800,592	6,200,770	1,750,066	5,263,570	1,849,364	5,534,223	1,750,625	5,325,073	1,750,345	5,287,817	1,750,929	4,486,197	1,750,096	4,393,743	1,750,019	4,531,351	1,742,021	2,557,414
			Ore	Waste	Ore	Waste	Ore	Waste	Ore	Waste	Ore	Waste	Ore	Waste	Ore	Waste	Ore	Waste	Ore	Waste
	Phase	Toe																		
	Ph I	6380	6,584	228,868																
		6360	31,401	469,437																
		6340	55,498	784,699																
		6320	78,607	927,154																
		6300	145,136	957,848																
		6280	181,147	978,251																
		6260	224,219	954,513																
		6240	78,000	900,000	185,478	12,344														
		6220			289,940	865,042														
		6200			308,477	838,963														
		6180			316,969	822,613														
		6160			319,788	804,877														
		6140			311,414	780,873														
		6120			18,000	600,000	273,149	180,518												
		6100					280,279	769,734												
		6080					281,166	748,042												
		6060					279,817	613,991												
		6040					307,210	522,108												
		6020					291,752	429,968												
		6000							227,945	340,413										
		5980							189,050	233,637										
		5960							131,014	145,404										
		5940							89,395	70,008										
		5920							76,183	45,011										
		5900							58,402	22,792										
	Ph II	6380				26,253														
		6360				88,849														
		6340				223,755	0													
		6320				200,000	1,229	243,714												
		6300					10,666	675,261												
		6280					40,582	850,887												
		6260					83,513	500,000		403,665										
		6240							116,526	933,692										
		6220							166,205	933,474										
		6200							230,452	892,992										
		6180							322,453	803,984										
		6160							143,000	500,000	250,311	224,991								
		6140									419,249	673,295								
		6120									419,570	615,522								
		6100									400,063	558,298								
		6080										200,000	318,921	233,915						
		6060											260,797	278,905						
		6040											198,517	223,573						
		6020											117,405	164,386						
		6000											63,177	106,973						
		5980											56,523	69,447						
		5960											29,254	35,821						
	Ph III	6400									0	27,493								
		6380									0	49,099								
		6360									0	73,194								
		6340									0	104,449								
		6320									0	155,887								
		6300									0	202,862								
		6280									0	245,149								
		6260									0	285,525								
		6240									0	327,813								
		6220									36,577	344,125								
		6200									58,541	377,204								
		6180									78,034	410,866								
		6160									88,000	412,045	36,574	0						
		6140											197,451	393,661						
		6120											252,125	384,312						
		6100											66,055	200,000	217,028	186,364				
		6080													285,081	373,801				
		6060													268,361	367,980				
		6040													258,713	302,495				
		6020													209,219	262,359				
		6000													9,000	193,216	145,247	0		
		5980															134,047	128,640		
		5960															41,447	33,180		
		5940															24,478	24,478		
	Ph IIIW	6380											1,312	55,777						
		6360											5,110	96,545						
		6340											7,889	127,565						
		6320											11,063	150,002						
		6300											16,689	164,004						
		6280											22,983	186,754						
		6260											37,279	230,604						
		6240											51,806	292,390						
		6220													66,055	349,702				
		6200													78,410	417,355				
		6180													73,675	491,281				
		6160													90,838	523,706				
		6140														250,000	114,355	286,945		
		6120															147,033	539,309		
		6100															161,775	556,760		
		6080															180,539	561,988		
		6060															197,184	533,187		
		6040															192,753	502,839		
		6020															196,795	447,574		
		6000																200,000	184,454	207,978
		5980																	135,236	328,337
		5960																	132,949	255,304
		5940																	129,591	199,919
		5920																	121,366	142,510
		5900																	105,606	96,024
		5880																	81,732	50,806
		5860																	56,476	21,136
	Ph IV	6200												332						
		6180												4,272						
		6160												15,447						
		6140												28,638						
		6120												46,531						
		6100												65,069						
		6080												83,966						
		6060												99,617						
		6040												114,465						
		6020												128,150						
		6000												140,204						
		5980												154,123						
		5960												171,840						
		5940													27,287	160,377				
		5920													39,653	164,673				
		5900													48,885	168,875				
		5880															52,593	176,452		
		5860															54,249	181,706		
		5840															55,065	182,557		
		5820															52,460	175,736	3,080	0
		5800																	56,433	134,015
		5780																	56,612	98,612
		5760																	56,240	65,551
		5740																	51,007	40,933
		5720																	42,810	23,459
		5700																	35,483	8,696
		5680																	22,090	4,179
	Ph V	5940												453						
		5920												3,661						
		5900												10,748						
		5880												24,049	236	0				
		5860													5,987	32,024				
		5840													15,283	40,235				
		5820													24,442	46,689				
		5800													31,942	62,611				
		5780																	41,183	75,430
		5760																	47,937	89,132
		5740																	48,963	107,144
		5720																	49,398	123,129
		5700																	61,126	114,570
		5680																	62,591	108,889
		5660																	59,262	102,458
		5640																	40,510	74,017
		5620																	34,388	52,179
		5600																	25,500	33,008