NI 43-101 TECHNICAL REPORT AND PRELIMINARY ECONOMIC ASSESSMENT FOR THE THUNDER BAY NORTH PROJECT, THUNDER BAY, ONTARIO

PREPARED FOR: CLEAN AIR METALS INC.

REPORT DATE: JANUARY 12, 2022

REPORT EFFECTIVE DATE: DECEMBER 1, 2021

PREPARED BY:

Nordmin Engineering Ltd.

QUALIFIED PERSONS:

Glen Kuntz, P. Geo.
Brian Wissent, P.Eng.
Kurt Boyko, P.Eng.
Harold Harkonen, P.Eng.
Lyn Jones, P.Eng.
Wilson Muir, P.Eng.
Brian Buss, P.Eng.
Ben Peacock, P. Eng.

NI 43-101 TECHNICAL REPORT
AND
PRELIMINARY ECONOMIC ASSESSMENT

THUNDER BAY NORTH PROJECT
THUNDER BAY, ONTARIO

Prepared for:

Clean Air Metals Inc.

Project # 21015-01

Issue Date: January 12, 2022

Technical Report Effective Date: December 1, 2021

Mineral Resource Effective Date: November 1, 2021

Prepared by:

160 Logan Ave., Thunder Bay, ON P7A 6R1

Phone: +1 807-683-1730 | Fax: +1 807-683-1744

www.nordmin.com

SIGNATURES

Report Issue Date: January 12, 2022

Report Effective Date: December 1, 2021

Mineral Resource Effective Date: November 1, 2021

PREPARED AND SIGNED BY

The undersigned prepared this Technical Report, titled NI 43-101 Technical Report and Preliminary Economic Assessment, Thunder Bay North Project, Thunder Bay, Ontario, with an effective date of December 1, 2021. The format and content of this technical report conforms to National Instrument 43-101 of the Canadian Securities Administrators.

Nordmin Engineering Ltd.

Original Signed

Glen Kuntz, P.Geo.
Consulting Specialist – Geology/Mining

Original Signed

Brian Wissent, P.Eng.
Senior Mining Engineer

Original Signed

Harold Harkonen, P.Eng.
Consulting Specialist – Power Systems

Original Signed

Kurt Boyko, P.Eng.
Consulting Specialist – Mechanical

Knight Piésold Ltd.

Original Signed

Wilson Muir, P.Eng.
Senior Engineer

Original Signed

Ben Peacock, P.Eng.
Senior Engineer

Blue Coast Metallurgy & Research

Original Signed

Lyn Jones, P.Eng.
Manager, Process Engineering

BWB Consulting Services Inc.

Original Signed

Brian Buss, P.Eng.
President

REVISION HISTORY

REV. NO	ISSUE DATE	PREPARED BY	REVIEWED BY	APPROVED BY	DESCRIPTION OF REVISION
3.1	December 23, 2021	Nordmin	Client/QPs		DRAFT REVIEW
4.4	January 8, 2022	Nordmin	QPs		FINAL REVIEW
4.8	January 10, 2022	Nordmin	QPs		FINAL

FORWARD-LOOKING STATEMENT

This document includes certain “forward-looking” information and "forward-looking statements" within the meaning of applicable securities legislation, together, forward-looking statements. All statements, other than statements of historical facts constitute forward-looking statements. Forward-looking statements estimates and statements that describe the Company's future plans, objectives or goals, including words to the effect that the Company or management expects a stated condition or result to occur. Forward-looking statements may be identified by such terms as "believes", "anticipates", "expects", "estimates", "may", "will", "could", "would", "if", "yet", "potential", "undetermined", "objective", "plan" or similar expressions. Since forward-looking statements are based on assumptions and estimates and address future events and conditions, by their very nature, they involve inherent risk, and uncertainties. Although these statements are based on information currently available to the authors of this Technical Report and the Company, the authors provide no assurance that actual results will meet the expectations set forth herein. Risks, uncertainties, and other factors, known and unknown, involved with forward-looking statements could cause actual events, results, performance, prospects, and opportunities to differ materially from those expressed or implied by such forward-looking statements. Forward-looking statements in this Technical Report include, but are not limited to, the Company's objectives, goals, future plans, statements, exploration results, potential mineralization, estimation of Mineral Resources, exploration, and mine development plans, the timing of the commencement of operations and estimates of market conditions. Furthermore, forward-looking statements include disclosure regarding the economics and project parameters presented in the PEA, including, without limitation, IRR, all-in sustaining costs, NPV and other costs and economic information, possible events, conditions or financial performance that is based on assumptions about future economic conditions and courses of action; the timing and costs of future development and exploration activities on the Company's projects; success of development and exploration activities; permitting time lines and requirements; time lines for further studies; planned exploration and development of properties and the results thereof; and planned expenditures and budgets and the execution thereof. Factors that could cause actual results to differ materially from such forward-looking statements include, but are not limited to the failure to identify Mineral Resources, failure to convert estimated Mineral Resources to reserves, the inability to complete a feasibility study which recommends a production decision, the preliminary nature of the PEA and the metallurgical test results, geotechnical challenges, delays in obtaining or failures to obtain required governmental, environmental, or other project approvals, political risks, inability to fulfill the duty to accommodate First Nations and other Indigenous Peoples, uncertainties relating to epidemics, pandemics and other public health crises, including COVID-19 or similar such viruses, uncertainties relating to the availability and costs of financing needed in the future, changes in equity markets, inflation, changes in foreign currency exchange rates, fluctuations in commodity prices, delays in the development of projects, capital and operating costs varying significantly from estimates and the other risks involved in the mineral exploration and development industry, and those risks set out in the Company's public documents filed on the System for Electronic Document Analysis and Retrieval ("SEDAR"). Although the authors believes that the assumptions and factors used in preparing the forward-looking statements in this Technical Report are reasonable, undue reliance should not be placed on such forward-looking statements, which only apply as of the date of this Technical Report, and no assurance can be given that such events will occur in the disclosed time frames or at all. The authors disclaim any intention or obligation to update or revise any forward-looking statements, whether as a result of new information, future events, or otherwise, other than as required by applicable law.

CAUTIONARY NOTE TO U.S. READERS REGARDING ESTIMATES OF MEASURED, INDICATED AND INFERRED RESOURCES

This Technical Report uses the terms "Measured" and "Indicated" Mineral Resources and "Inferred" Mineral Resources. The Company advises U.S. investors that, while these terms are recognized by the U.S. Securities and Exchange Commission (SEC) under Regulation S-K subpart 1300, there are differences between the definitions ascribed to such terms under Regulation S-K subpart 1300 and the Canadian Institute of Mining (CIM) Standards.

The estimation of "Measured" and "Indicated" Mineral Resources involves greater uncertainty as to their existence and economic feasibility than the estimation of proven and probable reserves. The estimation of "Inferred" resources involves far greater uncertainty as to their existence and economic viability than the estimation of other categories of resources. It cannot be assumed that all or any part of a "Measured," "Indicated," or "Inferred" Mineral Resource will ever be upgraded to a higher category.

Under Canadian rules, estimates of "Inferred Mineral Resources" may not form the basis of feasibility studies, prefeasibility studies, or other economic studies, except in prescribed cases, such as in a preliminary economic assessment under certain circumstances. Under SEC rules, estimates of "Inferred Mineral Resources" may not be considered when assessing the economic viability of a mining project, and may not be converted to a Mineral Reserve. Under U.S. standards, mineralization may not be classified as a "Mineral Reserve" unless the determination has been made that the mineralization could be economically and legally produced or extracted at the time the reserve determination is made. U.S. investors are cautioned not to assume that any part or all of a "Measured," "Indicated," or "Inferred" Mineral Resource exists or is economically or legally mineable. Information concerning descriptions of mineralization and resources contained herein may not be comparable to information made public by U.S. companies subject to the reporting and disclosure requirements under the SEC's Regulation S-K subpart 1300.

Contents

1. SUMMARY 26
1.1 Terms of Reference 26
1.2 Principal Outcomes 26
1.2.1 Economic Analysis 26
1.2.2 Mineral Resource Estimate 28
1.2.2.1 Input Parameters for Mineral Resource Calculation 32
1.3 Project Description, Location, and Access 32
1.4 History 33
1.5 Geological Setting, Mineralization, and Deposit Types 34
1.6 Exploration, Drilling, and Analytical Data Collection in Support of Mineral Resource Estimation 35
1.7 Data Verifcation 35
1.8 Mineral Processing and Metallurgical Testing 36
1.8.1 Mineral Processing 36
1.9 Mining Methods 37
1.10 Infrastructure 39
1.10.1 Waste Storage Facility 40
1.11 Enviromental Studies, Permitting and Social Impact 41
1.12 Capital and Operating Costs 42
1.13 Risks and Uncertainties 42
1.14 Interpretations and Conclusions 43
1.15 Recommendations 43
1.15.1 Phase 1 Recommendations – PEA Augmentation 43
1.15.2 Phase 2 Recommendations – PFS 43
2. INTRODUCTION 44
2.1 Terms of Reference 44
2.2 Qualified Persons 44
2.3 Effective Dates 46
2.4 Information Sources and References 46
2.5 Previous Reporting 46
2.5.1 Previous Mineral Resource Estimates 46
2.5.2 Previous Mineral Reserve Estimates 47
2.6 Acknowledgements 47
2.7 Units of Measure 48

3. RELIANCE ON OTHER EXPERTS ... 49
3.1 Mineral Tenure, Surface Rights, Property Agreements, and Royalties ... 49
3.2 Environmental, Permitting, and Liability Issues ... 49
4. PROPERTY DESCRIPTION AND LOCATION ... 50
4.1 Property Land Tenure ... 50
4.1.1 Current Property ... 50
4.1.2 Escape Property ... 50
4.2 Underlying Agreements ... 51
4.2.1 The Rio Tinto Option Agreement – Escape Claims ... 51
4.2.2 The Panoramic Share Purchase Agreement – Current Deposit and Surrounding Claims ... 52
4.2.3 The Benton Option Agreement ... 52
4.2.4 Project Royalties – Escape Property and Current Property ... 53
4.2.5 Permits and Authorization ... 53
4.2.6 Environmental Considerations ... 54
4.2.7 Mining Rights in Ontario ... 54
5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY ... 55
5.1 Accessibility ... 55
5.2 Local Resources and Infrastructure ... 55
5.3 Climate ... 56
5.4 Vegetation and Wildlife ... 56
5.5 Physiography ... 56
6. HISTORY ... 57
6.1 Historical Exploration ... 57
6.2 Previous Mineral Resource Estimates ... 65
6.2.1 September 29, 2009 SRK Consulting Ltd. Resource Estimate ... 66
6.2.2 February 2012, Magma Metals (Canada) Limited Mineral Resource Estimate (Beaver East Only) ... 67
6.2.3 March 17, 2011, AMEC Resource Estimate ... 68
6.2.4 January 18, 2021, Nordmin NI 43-101 Technical Report and Mineral Resource Estimate ... 72
6.3 Historical Mineral Reserve Estimate ... 74
6.4 Past Production ... 74
7. GEOLOGICAL SETTING AND MINERALIZATION ... 75
7.1 Regional Geology ... 75
7.2 Thunder Bay North Project Geology ... 77
7.3 Property Mineralization ... 80

7.3.1 Current Deposit 80
7.3.1.1 Upper Current/Current Zone 81
7.3.1.2 Bridge Zone 81
7.3.1.3 Cloud Zone 81
7.3.1.4 Beaver Zone 82
7.3.1.5 437/SEA Zone 83
7.3.2 Escape Deposit 83
7.3.2.1 Steepledge North 83
7.3.2.2 Steepledge South 83
7.3.2.3 Escape South 84
7.3.3 Satellite Occurrences 84
7.3.3.1 Lone Island South Intrusion 84
7.3.3.2 025 Intrusion 84
8. DEPOSIT TYPES 86
8.1 Orthomagmatic Sulphide Deposits 86
8.1.1 Cu-Ni-(PGE) Dominant Orthomagmatic Sulphide Deposits 86
8.1.2 PGE-Dominant Orthomagmatic Sulphide Deposits 87
9. EXPLORATION 88
9.1 Borehole Orientation and Collar Location Surveys (2020) 88
9.2 Diamond Drilling (2020-2021) 88
9.2.1 Escape Property Drilling 88
9.2.1.1 High Grade Zone 89
9.2.1.2 Step-Out Drilling 90
9.2.1.3 Magnetotelluric (MT) Anomaly Follow-up 92
9.2.2 Current Property Drilling 92
9.2.2.1 Large Diameter Metallurgical Holes 93
9.3 Geochemistry and Metallurgy (2020) 94
9.3.1 Current Property 94
9.3.2 Escape Property 94
9.4 Borehole Geophysics (2020-2021) 94
9.5 Linecutting and Ground Geophysics (2020) 94
9.6 Petrography (2020) 95
9.7 Preliminary Synchrotron Cluster Results (2020) 95
9.7.1 Mineralogical Analysis 96
9.7.1.1 Mineral Cluster Analysis Dendogram 98

10. DRILLING 100
10.1 Current Deposit Drilling 100
10.1.1 Escape Deposit Drilling 100
10.2 Core Logging 101
10.3 Thunder Bay North Project SG Measurements 101
10.4 Comments on Section 10 104
11. SAMPLE PREPARATION, ANALYSES, AND SECURITY 105
11.1 Assay Sample Preparation and Analysis 105
11.1.1 Clean Air Metals Inc. Core Sample Preparation and Analysis (2020-2021) 105
11.1.2 Historic Core Assay Sample Preparation and Analysis 107
11.1.2.1 Accurassay Laboratories 107
11.1.2.2 ALS Chemex 107
11.2 Specific Gravity Sampling 108
11.2.1 Current Deposit 108
11.2.2 Escape Deposit 108
11.3 Quality Assurance/Quality Control Programs 108
11.3.1 Current Deposit 109
11.3.1.1 Standards 109
11.3.1.2 Blanks 115
11.3.1.3 Field and Laboratory Duplicates 123
11.3.2 Escape Deposit 131
11.3.2.1 Standards 131
11.3.2.2 Blanks 136
11.3.2.3 Field and Laboratory Duplicates 141
11.3.2.4 Lab Inserted Standards With No Accepted Values or Certificates 149
11.4 Security and Storage 149
11.5 Qualified Person's Opinion on the Adequacy of Sample Preparation, Security, and Analytical Procedures. 150
12. DATA VERIFICATION 151
12.1 Nordmin Site Visit 2020 151
12.1.1 Field Collar Validation 152
12.1.2 Core Logging, Sampling, and Storage Facilities 157
12.1.3 Independent Sampling 158
12.2 Database Validation 169
12.3 Review of the Company's QA/QC 169

12.4 QP's Opinion ... 169
13. MINERAL PROCESSING AND METALLURGICAL TESTING ... 170
13.1 Introduction ... 170
13.2 Historical Testwork ... 170
13.2.1 Sample Preparation and Characterization ... 170
13.2.2 Grindability ... 171
13.2.3 Flotation Development ... 172
13.2.4 Variability Testing ... 173
13.3 2020 Test Program: Blue Coast Phase 1 ... 174
13.3.1 Sample Selection and Characterization ... 174
13.3.2 Mineralogy ... 175
13.3.3 Metallurgical Testwork ... 175
13.4 2021 Test Program: Blue Coast Phase 2 ... 181
13.4.1 Sample Selection and Characterization ... 181
13.4.1.1 Mineralogy ... 185
13.4.1.2 Grindability ... 186
13.4.2 Metallurgical Testwork ... 187
13.4.2.1 Cu/Bulk Flowsheet ... 187
13.4.2.2 Bulk Circuit Only Flowsheet ... 189
13.5 Metallurgical Projection ... 189
13.5.1 Deleterious Elements ... 191
14. MINERAL RESOURCE ESTIMATE ... 192
14.1 Drill Hole Database ... 192
14.2 Domaining ... 193
14.2.1 Geological Domaining ... 193
14.2.2 Grade Domaining ... 196
14.3 Exploratory Data Analysis ... 199
14.4 Data Preparation ... 203
14.4.1 Non-Assayed Assay Intervals ... 203
14.4.2 Outlier Analysis and Capping ... 203
14.4.3 Compositing ... 206
14.4.4 Specific Gravity ... 207
14.4.5 Block Model Strategy and Analysis ... 207
14.4.6 Assessment of Spatial Grade Continuity ... 208
14.4.7 Block Model Definition ... 210

14.4.8 Interpolation Method 211
14.4.9 Search Strategy 211
14.5 Block Model Validation 213
14.5.1 Visual Comparison 213
14.5.2 Swath Plots 221
14.5.3 Interpolation Comparison 224
14.6 Equivalency 226
14.7 Mineral Resource Classification 227
14.8 Reasonable Prospects of Eventual Economic Extraction 231
14.8.1 Input Parameters for Resource Calculation 232
14.9 Mineral Resource Estimate 233
14.9.1 Current Deposit by Geological Domain 236
14.9.2 Escape Deposit by Geological Domain 238
14.10 Cautionary Statement Regarding Mineral Resource Estimates 239
14.11 Mineral Resource Sensitivity to Reporting Cutoff 239
14.12 Comparison with the Previous Resource Estimate 241
14.13 Factors That May Affect the Mineral Resources 243
14.14 Comments on Section 14 243
15. MINERAL RESERVE ESTIMATE 244
16. MINING METHODS 245
16.1 Introduction 245
16.2 Summary 245
16.3 Geomechanical Evaluation 249
16.3.1 General 249
16.3.2 Rock Mass Characterization 250
16.3.3 Stope Dimensions 253
16.3.4 Crown Pillar Dimensions 253
16.3.5 Ground Support 253
16.3.6 Escape Deposit 254
16.4 Underground Evaluation 254
16.4.1 Mining Method Selection 255
16.4.2 Cutoff Grades and NSR 258
16.4.3 Stope Optimization, Dilution and Recovery 260
16.4.4 Stope Design 263
16.4.5 Mine Access and Development 268

16.4.6 Production 268
16.4.7 Productivity 270
16.4.8 Sequencing 271
16.4.9 Development & Production Schedule 272
16.5 Mine Infrastructure and Services 277
16.5.1 Ventilation 277
16.5.2 Dewatering 279
16.5.3 Maintenance Shops 279
16.5.4 Explosives Storage 279
16.5.5 Health and Safety 279
16.5.6 Mine Service Distribution System 280
16.5.7 Underground Workforce 280
16.5.8 Mobile Equipment 283
17. RECOVERY METHODS 284
17.1 Summary 284
17.2 Process Description 284
17.3 Primary Crushing 288
17.3.1 Purpose 288
17.3.2 Description 288
17.4 Coarse Ore Stockpile 288
17.4.1 Purpose 288
17.4.2 Description 288
17.5 Comminution 289
17.5.1 Purpose 289
17.5.2 Description 289
17.6 Flotation Circuit 289
17.6.1 Purpose 289
17.6.2 Copper Concentrate Circuit 289
17.6.3 Bulk Concentrate Circuit 290
17.7 Concentrate Thickening, Filtration, and Loadout 290
17.7.1 Purpose 290
17.7.2 Copper Concentrate Circuit 290
17.7.3 Bulk Concentrate Circuit 290
17.8 Tailings 291
17.8.1 Purpose 291

17.8.2 Description 291
17.9 Reagents 291
17.10 Assay and Metallurgical Laboratory 291
18. PROJECT INFRASTRUCTURE 292
18.1 Introduction 292
18.2 Onsite Infrastructure 292
18.3 Project Logistics 292
18.4 Buildings and Facilities 294
18.5 Existing Infrastructure 294
18.6 Power Supply and Distribution 294
18.7 Waste and Water Management Plan 296
18.7.1 Design Criteria 296
18.7.2 Geotechnical Conditions 299
18.7.3 Tailings Characteristics 300
18.7.4 WSF Concept Summary 300
18.7.4.1 Stage 1 Construction 302
18.7.4.2 Stage 2 Construction 302
18.7.4.3 Waste Management 303
18.7.4.4 Water Management 303
18.7.4.5 Instrumentation 304
18.7.4.6 Reclamation and Closure 304
18.8 Surface Infrastructure for Underground Mine 304
18.8.1 Compressed Air 304
18.8.2 Mine Air Ventilation and Heating 305
19. MARKET STUDIES AND CONTRACTS 306
19.1 Market Studies 306
19.2 Contracts 309
20. ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL, OR COMMUNITY IMPACT 311
20.1 Environmental Setting 311
20.1.1 Biophysical Setting 311
20.1.2 Meteorology 311
20.1.2.1 Geochemistry 312
20.1.2.2 Hydrogeology 313
20.1.2.3 Surface Water Quality 313
20.1.2.4 Sediment Quality 313

20.1.2.5 Noise ... 313
20.1.2.6 Streamflow ... 314
20.1.2.7 Vegetation and Ecological Communities ... 314
20.1.2.8 Wildlife and Wildlife Habitat ... 315
20.2 Project Permitting Requirements ... 316
20.3 Social and Community Setting ... 316
20.4 Mine Closure ... 316
21. CAPITAL AND OPERATING COSTS ... 318
21.1 Basis of Estimate ... 318
21.2 Labour Assumptions ... 320
21.3 Material Costs ... 320
21.4 Contingency ... 320
21.5 Capital Costs ... 320
21.5.1 Initial Capital Costs ... 321
21.5.2 Ongoing and Closure Capital Costs ... 326
21.6 Operating Costs ... 331
21.6.1 Underground Mining Operating Costs ... 331
21.6.2 Process Plant Operating Costs ... 333
21.6.3 WSF and Water Management & Treatment Operating Costs ... 333
21.6.4 General and Administrative Operating Costs ... 334
21.6.5 Royalties and Transportation Operating Costs ... 335
22. ECONOMIC ANALYSIS ... 336
22.1 Introduction ... 336
22.2 Cautionary Statement ... 338
22.3 Principal Parameters and Assumptions ... 338
22.4 Taxes ... 339
22.5 Economic Results ... 339
22.6 Sensitivity Analysis ... 343
23. ADJACENT PROPERTIES ... 348
24. OTHER RELEVANT DATA AND INFORMATION ... 348
25. INTERPRETATION AND CONCLUSIONS ... 349
25.1 Introduction ... 349
25.2 Mineral Tenure, Surface Rights, Royalties, and Agreements ... 349
25.3 Geology ... 349
25.4 Exploration, Drilling, and Analytical Data Collection in Support of Mineral Resource Estimation ... 350

25.5 Metallurgical Testing 350
25.6 Mineral Resource Estimate 351
25.7 Mineral Processing 352
25.8 Mining Methods 353
25.9 Infrastructure 353
25.10 Enviromental Studies, Permitting and Social Impact 354
25.11 Capital and Operating Costs 354
25.12 Economic Analysis 355
25.13 Risks and Uncertainties 355
25.14 Conclusions 356
26. RECOMMENDATIONS 357
26.1 Phase 1 Recommendations – PEA Augmentation 357
26.1.1 Geology and Mining Recommendations 357
26.1.2 Recommended Metallurgical Work 358
26.1.3 WSF Recommendations 358
26.1.4 Environmental Recommendations 358
26.2 Phase 2 Recommendations – PFS 359
27. REFERENCES 360
28. GLOSSARY 363
28.1 Mineral Resource 363
28.2 Mineral Reserve 363
28.3 Definition of Terms 364
28.4 Abbreviations & Symbols 365

Appendices

Appendix A: QP Certificates of Authors
Appendix B: Claims List
Appendix C: QA/QC Charts for the Standards and Blanks
Appendix D: Grade Distribution Swath Plots
Appendix E: Geomechanical Characterization
Appendix F: Mine Ventilation and Design

List of Figures

Figure 1-1: Proposed site plan with mineable Current and Escape deposits 37
Figure 1-2: Current deposit long section (facing South-West) 38
Figure 1-3: Escape deposit long section (facing South-West) 38
Figure 4-1: Project location map 50
Figure 4-2: Thunder Bay North Project, comprised of the Current Property and the Escape Property 51
Figure 4-3: Project tenure, claims, NSR, and operational alienations 53
Figure 7-1: Regional geology (after Stott et al. 2007) 75
Figure 7-2: Thunder Bay North Project geology map 78
Figure 7-3: Intrusions contributing to the Thunder Bay North Intrusive Complex outlined in orange. Project property claim outline shown on satellite imagery background (Microsoft Bing). 80
Figure 7-4: Plan View of Escape and Current Deposits with block models of mineralized zones 81
Figure 9-1: Escape Property drill hole location map. 89
Figure 9-2: Longitudinal section through the HGZ showing assay grades, drill hole traces, and the mineralized zone generated by implicit modelling; view of the section is toward 2500 azimuth. 90
Figure 9-3: Current Property 2020 metallurgical drill hole location map 93
Figure 9-4: Magnetotelluric survey pseudo-sections for the six lines surveyed in the Escape Lake and Current Lake areas in August 2020 95
Figure 9-5: Dendogram display of diffractogram cluster analysis for the Current deposit and Escape South HGZ samples 99
Figure 11-1: Purpose-designed Vancon diamond-bladed core saw with pre-marked sample bags 106
Figure 11-2: Current deposit Standard AMIS008 Pt (g/t) 111
Figure 11-3: Current deposit Standard AMIS0008 Pd (g/t) 111
Figure 11-4: Current deposit Standard AMIS0073 Cu (g/t) 112
Figure 11-5: Current deposit Standard AMIS0073 Ni (g/t) 112
Figure 11-6: Current deposit Standard Oreas 19a Au (g/t) 114
Figure 11-7: Current deposit Standard Oreas-15 g Au (g/t) 114
Figure 11-8: Current deposit Standard Oreas 682 Rh (g/t) 115
Figure 11-9: ALS Pt (g/t) results for the Current deposit marble coarse blanks 116
Figure 11-10: ALS Pd (g/t) results for the Current deposit marble coarse blanks 116
Figure 11-11: ALS Cu (g/t) results for the Current deposit marble coarse blanks 117
Figure 11-12: ALS Ni (g/t) results for the Current deposit marble coarse blanks 117
Figure 11-13: ALS Co (g/t) results for the Current deposit marble coarse blanks 118
Figure 11-14: ALS Ag (g/t) results for the Current deposit marble coarse blanks 118
Figure 11-15: ALS Au (g/t) results for the Current deposit marble coarse blanks 119
Figure 11-16: ALS Pt (g/t) results for the Current deposit silica coarse blanks 119
Figure 11-17: ALS Pd (g/t) results for the Current deposit silica coarse blanks 120

Figure 11-18: ALS Cu (g/t) results for the Current deposit silica coarse blanks 120
Figure 11-19: ALS Ni (g/t) results for the Current deposit silica coarse blanks 121
Figure 11-20: ALS Co (g/t) results for the Current deposit silica coarse blanks 121
Figure 11-21: ALS Ag (g/t) results for the Current deposit silica coarse blanks 122
Figure 11-22: ALS Au (g/t) results for the Current deposit silica coarse blanks 122
Figure 11-23: Current deposit field duplicates for Pt (g/t) 123
Figure 11-24: Current deposit field duplicates for Pd (g/t) 124
Figure 11-25: Current deposit field duplicates for Cu (g/t) 124
Figure 11-26: Current deposit field duplicates for Ni (g/t) 125
Figure 11-27: Current deposit field duplicates for Co (g/t) 125
Figure 11-28: Current deposit field duplicates for Ag (g/t) 126
Figure 11-29: Current deposit field duplicates for Au (g/t) 126
Figure 11-30: Current deposit lab duplicates for Pt (g/t) 127
Figure 11-31: Current deposit lab duplicates for Pd (g/t) 127
Figure 11-32: Current deposit lab duplicates for Cu (g/t) 128
Figure 11-33: Current deposit lab duplicates for Ni (g/t) 128
Figure 11-34: Current deposit lab duplicates for Co (g/t) 129
Figure 11-35: Current deposit lab duplicates for Ag (g/t) 129
Figure 11-36 Current deposit lab duplicates for Au (g/t) 130
Figure 11-37: Current deposit lab duplicates for Rh (g/t) 130
Figure 11-38: Escape deposit Standard AMIS0073 Cu (g/t) 133
Figure 11-39: Escape deposit Standard AMIS0073 Ni (g/t) 133
Figure 11-40: Escape deposit Standard Oreas 684 Pt (g/t) 135
Figure 11-41: Escape deposit Standard Oreas 684 Pd (g/t) 135
Figure 11-42: Escape deposit Standard Oreas 684 Rh (g/t) 136
Figure 11-43: ALS Pt (g/t) results for the Escape deposit gabbro coarse blanks 137
Figure 11-44: ALS Pd (g/t) results for the Escape deposit gabbro coarse blanks 137
Figure 11-45: ALS Cu (g/t) results for the Escape deposit gabbro coarse blanks 138
Figure 11-46: ALS Ni (g/t) results for the Escape deposit gabbro coarse blanks 138
Figure 11-47: ALS Co (g/t) results for the Escape deposit gabbro coarse blanks 139
Figure 11-48: ALS Ag (g/t) results for the Escape deposit gabbro coarse blanks 139
Figure 11-49: ALS Au (g/t) results for the Escape deposit gabbro coarse blanks 140
Figure 11-50: ALS Cu (g/t) results for the Escape deposit marble coarse blanks 140
Figure 11-51: Escape deposit field duplicates for Pd (g/t) 142
Figure 11-52: Escape deposit field duplicates for Cu (g/t) 142
Figure 11-53: Escape deposit field duplicates for Ni (g/t) 143
Figure 11-54: Escape deposit field duplicates for Co (g/t) 143

Figure 11-55: Escape deposit field duplicates for Ag (g/t) 144
Figure 11-56: Escape deposit field duplicates for Au (g/t) 144
Figure 11-57: Escape deposit lab duplicates for Pt (g/t) 145
Figure 11-58: Escape deposit lab duplicates for Pd (g/t) 145
Figure 11-59: Escape deposit lab duplicates for Cu (g/t) 146
Figure 11-60: Escape deposit lab duplicates for Ni (g/t) 146
Figure 11-61: Escape deposit lab duplicates for Co (g/t) 147
Figure 11-62: Escape deposit lab duplicates for Ag (g/t) 147
Figure 11-63: Escape deposit lab duplicates for Au (g/t) 148
Figure 11-64: Secure core yard storage........ 150
Figure 12-1: DDH BL-09-159 collar 152
Figure 12-2: Validated drill hole collars versus all drill holes 153
Figure 12-3: Current deposit validated drill holes versus all drill holes 155
Figure 12-4: Escape deposit validated drill holes versus all drill holes 156
Figure 12-5: Escape deposit scatter plot comparison of Ag (g/t) verification samples........ 156
Figure 12-6: The Company core logging facility 157
Figure 12-7: The Company core cutting facility........ 157
Figure 12-8: Core cutter bringing samples outside to be shipped 159
Figure 12-9: Current Deposit scatter plot comparison of Pt (ppm) verification samples 162
Figure 12-10: Current Deposit scatter plot comparison of Pd (ppm) verification samples 162
Figure 12-11: Current Deposit scatter plot comparison of Ni (%) verification samples........ 163
Figure 12-12: Current Deposit scatter plot comparison of Cu (%) verification samples........ 163
Figure 12-13: Current Deposit scatter plot comparison of Au (ppm) verification samples 164
Figure 12-14:Current deposit scatter plot comparison of Ag (ppm) verification samples........ 164
Figure 12-15: Escape deposit scatter plot comparison of Pt (ppm) verification samples........ 166
Figure 12-16: Escape deposit scatter plot comparison of Pd (ppm) verification samples........ 166
Figure 12-17: Escape deposit scatter plot comparison of Ni (%) verification samples 167
Figure 12-18: Escape deposit scatter plot comparison of Cu (%) verification samples 167
Figure 12-19: Escape deposit scatter plot comparison of Au (ppm) verification samples........ 168
Figure 12-20: Escape deposit scatter plot comparison of Ag (ppm) verification samples........ 168
Figure 13-1: Kinetic curves for copper and nickel recovery for the rougher flotation tests........ 176
Figure 13-2: Pt/Pd recovery vs. sulphur recovery for rougher flotation tests F1 to F4. 177
Figure 13-3: Flowsheet used for open-circuit batch flotation testing........ 177
Figure 13-4: Grade/recovery curves for copper and nickel in the cleaner tests on the MC composite 178
Figure 13-5: Pt/Pd grade/recovery curves for test F-13........ 179
Figure 13-6: Cu and Ni grade/recovery curves for the cleaner tests on the Var1 composite........ 179
Figure 13-7: Ni circuit Pt/Pd grade/recovery curves for the cleaner tests on the Var1 composite......... 180

Figure 13-8: Hole locations and spatial distribution of the nine Current deposit variability samples 182
Figure 13-9: Hole locations and spatial distribution of the three Escape deposit variability samples 184
Figure 13-10: Distribution of sulphide minerals in the variability composites 186
Figure 13-11: Cu and Ni Grade/Recovery curves for the variability composites 187
Figure 13-12: Pd and Pt Grade/Recovery curves for the bulk circuit of the Cu/Bulk flotation tests 188
Figure 13-13: Pt/Pd Grade/Recovery curves for the Bulk Only flowsheet option 189
Figure 13-14: Head grade vs. recovery to concentrate relationships for Pt and Pd in the copper and bulk circuits... 190
Figure 14-1: Plan view of Escape and Current deposits 192
Figure 14-2: Geological domains 193
Figure 14-3: Structural details 194
Figure 14-4: Plan view showing the Current deposit and Escape deposit including geological domains............ 195
Figure 14-5: Current deposit long section showing geological domains and Pt Eq grade distribution 195
Figure 14-6: Escape deposit long section showing geological domains and Pt Eq grade distribution................. 195
Figure 14-7: Plan view of the mineralogical domains for Escape deposit and Current deposit 197
Figure 14-8: Plan view of the mineralogical domains for Current deposit 198
Figure 14-9: Long Section View of the mineralogical domains for Current deposit 198
Figure 14-10: Plan view of the mineralogical domains for Escape deposit... 199
Figure 14-11: Log probability plot and histogram Pd/Pt (g/t), BG domain Current deposit............................... 201
Figure 14-12: Log probability plot and histogram Pd/Pt (g/t), LG domain Current deposit 201
Figure 14-13: Log probability plot and histogram Pd/Pt (g/t), BG domain Escape deposit 202
Figure 14-14: Log probability plot and histogram Pt/Pd (g/t), LG domain Escape deposit................................. 202
Figure 14-15: Current deposit cross section Pt (g/t) 214
Figure 14-16: Current deposit cross section Pd (g/t) 215
Figure 14-17: Current deposit cross section Cu (%) 215
Figure 14-18: Current deposit cross section Ni (%) 216
Figure 14-19: Current deposit cross section Rh (g/t) 216
Figure 14-20: Current deposit cross section Co (g/t) 217
Figure 14-21: Escape deposit cross section Pt (g/t) 217
Figure 14-22: Escape deposit cross section Pd (g/t)... 218
Figure 14-23: Escape deposit cross section Pd (g/t)... 218
Figure 14-24: Escape deposit cross section Cu (%) 219
Figure 14-25: Escape deposit cross section Ni (%) 219
Figure 14-26: Escape deposit cross section Rh (g/t)... 220
Figure 14-27: Escape deposit cross section Co (g/t)... 220
Figure 14-28: Swath plots in X, Y, Z direction, Current deposit, Pt 222
Figure 14-29: Swath plots in X, Y, Z direction, Escape deposit, Pt... 222
Figure 14-30: Swath plots in X, Y, Z direction, Current deposit, Pd... 223

Figure 14-31: Swath plots in X, Y, Z direction, Escape deposit, Pd 223
Figure 14-32: Cross section of the Current deposit, Pt KV 228
Figure 14-33: Cross section of the Escape deposit, Pt KV 228
Figure 14-34: Plan section showing the Current deposit categorizations........ 229
Figure 14-35: Cross section showing the Current deposit categorizations........ 229
Figure 14-36: Plan view showing Escape deposit categorizations 230
Figure 14-37: Cross section showing Escape deposit categorization........ 231
Figure 16-1: Proposed site plan with mineable Current and Escape deposits........ 246
Figure 16-2: Current deposit long section (facing South-West)........ 247
Figure 16-3: Escape deposit long section (facing South-West) 247
Figure 16-4: LOM production (kt) by year 248
Figure 16-5: Stereonet plot of joints and foliation........ 251
Figure 16-6: RQD long section 252
Figure 16-7: Proposed site plan with mineable Current and Escape deposits........ 254
Figure 16-8: Current mining area LHOS mining method 256
Figure 16-9: Transverse primary/secondary LHOS mining method 257
Figure 16-10: LHOS MSO shape example downhole and uphole stoping........ 261
Figure 16-11: LHOS MSO shape example validation sections 262
Figure 16-12: Uphole and downhole LHOS scenarios 264
Figure 16-13: LHOS downhole drill pattern section 265
Figure 16-14: LHOS uphole drill pattern section 266
Figure 16-15: LHOS uphole drill pattern cross section........ 267
Figure 16-16: DAF mining method 268
Figure 16-17: Current deposit production mining method........ 269
Figure 16-18: Current deposit production mining method........ 269
Figure 16-19: Transverse primary/secondary LHOS mining method plan section........ 272
Figure 16-20: Transverse primary/secondary LHOS mining method cross section 272
Figure 16-21: Current deposit production schedule 275
Figure 16-22: Escape deposit production schedule 276
Figure 16-23: Current deposit steady state ventilation model 278
Figure 16-24: Escape deposit steady state ventilation model 278
Figure 17-1: Simplified overall process flow diagram 286
Figure 17-2: Surface infrastructure layout 287
Figure 18-1: Site plan with deposits........ 292
Figure 18-2: Surface infrastructure layout 293
Figure 18-3: Offsite infrastructure........ 295
Figure 18-4: WSF plan and section 301

Figure 19-1: Global copper demand 2000 - 2040 307
Figure 19-2: Global nickel in chemical production by country (Source: Wood Mackenzie) 307
Figure 19-3: Global platinum, palladium, gold, ruthenium, indium and rhodium prices (Source: Edison Investment Research, Refinitiv) 308
Figure 20-1: 2006 – 2011 Mean monthly temperatures (adapted from DST 2012b) 311
Figure 20-2: Monthly precipitation (adapted from DST 2012b) 312
Figure 20-3: Study area hydrograph (adapted from DST, 2014) 314
Figure 22-1: Cashflow model results 341
Figure 22-2: Post-tax revenue NPV sensitivity 345
Figure 22-3: Post-tax costs NPV sensitivity 346

List of Tables

Table 1-1: Key Financial and Project Metrics 27
Table 1-2: Key Financials 28
Table 1-3: Thunder Bay North Project Mineral Resource Estimate, Grade and Tonnage 30
Table 1-4: Thunder Bay North Project Mineral Resource Estimate, Contained Metal 30
Table 1-5: Mineral Resource Estimate Cutoff Grade Calculation Parameters 32
Table 1-6: Underground Design Parameters 39
Table 1-7: Underground MSO Cutoff 39
Table 2-1: QP Section Responsibility 45
Table 6-1: Project Exploration 1976 to 2005 57
Table 6-2: Previous Project Exploration by Magma/Panoramic/RTEC 2006 to 2018 58
Table 6-3: Consolidated Mineral Resource Statement*, SRK Consulting, September 7, 2009 66
Table 6-4: East Beaver Lake Mineral Resources 67
Table 6-5: March 17, 2011, AMEC Open Pit Mineral Resource Statement 70
Table 6-6: March 17, 2011, AMEC Underground Mineral Resource Statement 71
Table 6-7: Commodity Prices Used in the Resource Calculations 72
Table 6-8: January 20, 2021, Nordmin Mineral Resource Estimate for Current and Escape Deposits 73
Table 6-9: January 20, 2021, Nordmin Mineral Resource Estimate for Current and Escape Deposits, Contained Metal 73
Table 9-1: Selected Grade-Thickness Assay Intervals on the Escape Property - 2020 Diamond Drilling Program . 91
Table 9-2: Current Deposit 2020 Metallurgical Drill Hole Summary 92
Table 10-1: Current Deposit Drill Hole Summary 100
Table 10-2: Escape Deposit Drill Hole Summary 100
Table 10-3: Current Deposit SG Measurements 101
Table 10-4: Escape Deposit SG Measurements 102

Table 11-1: ICP-AES Method Detection Limit Elements and Ranges in ppm for ME-ICP61 106
Table 11-2: Current Deposit CRM Result Summary from Geologist Inserted CRMs 110
Table 11-3: Current Deposit CRM Result Summary from Lab Inserted CRMs... 113
Table 11-4: Escape Deposit CRM Result Summary from the Company 132
Table 11-5: Escape Deposit CRM Result Summary from the Lab 134
Table 11-6: Lab Inserted Standards with no Accepted Values or Certificates 149
Table 12-1: Current Deposit Drill Hole Collar Comparison.. 154
Table 12-2: Escape Deposit Drill Hole Collar Comparison 155
Table 12-3: Current Deposit Drill Intervals Selected for Verification Sampling 158
Table 12-4: Escape Deposit Drill Intervals Selected for Verification Sampling 159
Table 12-5: Current Deposit Quarter Core Sampling Conducted by Nordmin, October 2020............................ 161
Table 12-6: Escape Deposit Quarter Core Sampling Conducted by Nordmin, October 2020 165
Table 13-1: Main Composite Head Analysis 171
Table 13-2: Summary of Grindability Results 171
Table 13-3: Locked Cycle Flotation Test Results, Test #23 172
Table 13-4: Bulk Concentrate Minor Element Analysis, Test #23 173
Table 13-5: Head Assays for the Variability Composites 174
Table 13-6: Head Assays for the Blue Coast Phase I Composites 174
Table 13-7: Modal Analysis For Three Size Fractions of the Master Composite 175
Table 13-8: Minor Element Assays for Cu 1st Cleaner Conc and Ni 3rd Cleaner Conc for Test F-24. 180
Table 13-9: Head Assays for the Phase 2 Metallurgical Composites.. 183
Table 13-10: Modal Analysis for the Current Deposit Variability Samples 185
Table 13-11: Test Results for the Phase 2 Grindability Comp 186
Table 13-12: Open-Circuit Concentrate Grades and Recoveries for the Cu/Bulk Flowsheet.............................. 188
Table 13-13: Projected Grade and Recovery to Final Concentrate 190
Table 13-14: Minor Element Assays for Cu/Bulk Flotation Concentrates 191
Table 14-1: Drill Hole Count Summary 192
Table 14-2: Mineral Resource Estimate Number of Assays by Deposit 193
Table 14-3: Current Deposit and Escape Deposit Geological Domains 194
Table 14-4: Current Deposit and Escape Deposit Assay Counts by Grade Domain 200
Table 14-5: Summary of the Assay Database for the Current and Escape Deposits... 203
Table 14-6: Assays at Minimum Detection Limits 203
Table 14-7: Current Deposit Capping Analysis 204
Table 14-8: Escape Deposit Capping Analysis 205
Table 14-9: Composite Analysis... 206
Table 14-10: Specific Gravity 207
Table 14-11: Current Deposit Variography Parameters 209

Table 14-12: Escape Deposit Variography Parameters 210
Table 14-13: Current Deposit Block Model Definition Parameters 210
Table 14-14: Escape Deposit Block Model Definition Parameters 211
Table 14-15: Search Parameters 213
Table 14-16: Current Deposit Interpolation Comparison 224
Table 14-17: Escape Deposit Interpolation Comparison 225
Table 14-18: Commodity Prices Used in the Resource Calculation 232
Table 14-19: Mineral Resource Estimate Cutoff Grade Calculation Parameters 233
Table 14-20: Thunder Bay North Project Mineral Resource Estimate, Grade and Tonnage 234
Table 14-21: Thunder Bay North Project Mineral Resource Estimate, Contained Metal 235
Table 14-22: Current Deposit Mineral Resource Estimate, Grade and Tonnage Summary by Geological Domain 236
Table 14-23: Current Deposit Mineral Resource Estimate, Contained Metal by Geological Domain 237
Table 14-24: Escape Deposit Mineral Resource Estimate, Grade and Tonnage Summary by Geological Domain 238
Table 14-25: Escape Deposit Mineral Resource Estimate, Contained Metal by Geological Domain 238
Table 14-26: Mineral Resource Sensitivity to Reporting Cutoff, Indicated 240
Table 14-27: Mineral Resource Sensitivity to Reporting Cutoff, Inferred 240
Table 14-28: 2021 Underground Mineral Resource Estimate Compared to the November 2021 Mineral Resource Estimate for the Current Deposit 242
Table 14-29: March 2021 Underground Mineral Resource Estimate Compared to the November 2021 Underground Mineral Resource Estimate for Escape Deposit 242
Table 16-1: LOM Production Plan (kt) 248
Table 16-2: Underground Design Parameters 249
Table 16-3: Underground MSO Cutoff 249
Table 16-4: NSR Cutoff Grade Parameters 258
Table 16-5: 2-Year Trailing Price Deck 259
Table 16-6: NSR Block Model Factors 259
Table 16-7: Process Plant Copper Concentrate Recovery and Mass 259
Table 16-8: Process Plant Bulk Concentrate Recovery and Mass 259
Table 16-9: Smelter Payable % and Deductions 260
Table 16-10: Smelter Treatment Charges (TC)/Refining Charges (RC) 260
Table 16-11: LHOS External Dilution 262
Table 16-12: Mineralized Material Dilution and Recovery 263
Table 16-13: LHOS Maximum Size 265
Table 16-14: Resource Category by Mining Area (kt) 270
Table 16-15: Mucking Cycle Times 270
Table 16-16: Haulage Cycle Times 270
Table 16-17: Shift Productivity Rates 271

Table 16-18: Production Limits by Mining Area 271
Table 16-19: LHOS Average Stope Cycle Time 273
Table 16-20: LOM Production Plan by Mining Area (kt) 274
Table 16-21: Yearly Workforce Count by Type 280
Table 16-22: Yearly Management and Technical Staff Workforce Count 281
Table 16-23: Yearly Maintenance Hourly Workforce Count 282
Table 16-24: Yearly Development Hourly Workforce Count 282
Table 16-25: Yearly Production Hourly Workforce Count 282
Table 16-26: Underground Mobile Equipment Required by Year 283
Table 17-1: Key Process Design Criteria Used for Plant Design 285
Table 17-2: Required Reagents 291
Table 18-1: Key Design Criteria - Development Year and the First Two Years of Operations 296
Table 18-2: Key Design Criteria - Over Development Year and all Ten Years of Operations 298
Table 19-1: 2-Year Trailing Price Deck 309
Table 19-2: Smelter Payable % and Deductions 309
Table 19-3: Smelter TC/RC 310
Table 21-1: Summary of Capital Costs 321
Table 21-2: Process Plant Initial Capital Costs 322
Table 21-3: WSF/WMT Initial Capital Costs 322
Table 21-4: Other Surface Site Initial Capital Costs 323
Table 21-5: Offsite Infrastructure Initial Capital Costs 324
Table 21-6: Underground Major Infrastructure Initial Capital Costs 324
Table 21-7: Underground Mobile Equipment Initial Capital Costs 325
Table 21-8: Underground Pre-production Development Capital Costs 326
Table 21-9: Owners Construction Support/Technical Capital Costs 326
Table 21-10: WSF/WMT Ongoing Capital Costs 328
Table 21-11: Surface Site Infrastructure Ongoing Capital Costs 328
Table 21-12: Offsite Infrastructure Ongoing Capital Costs 328
Table 21-13: Underground Major Infrastructure Ongoing Capital Costs 330
Table 21-14: Underground Mobile Equipment Ongoing Capital Costs 330
Table 21-15: Underground Waste Development Ongoing Capital Costs 330
Table 21-16: Sustaining Capital Costs 331
Table 21-17: Summary of Operating Costs 332
Table 21-18: LOM Operating Costs per Tonne of Mill Feed 332
Table 21-19: Underground Mining Operating Costs 332
Table 21-20: LOM Underground Mining Operating Costs per Tonne of Mill Feed 332
Table 21-21: Process Plant Operating Costs 333

Table 21-22: Process Plant Operating Costs per Tonne of Mill Feed ... 333
Table 21-23: WSF/WMT Operating Costs ... 334
Table 21-24: WSF/WMT Operating Costs per Tonne of Mill Feed ... 334
Table 21-25: G&A Operating Costs ... 334
Table 21-26: G&A Operating Costs per Tonne of Mill Feed ... 335
Table 21-27: Royalties and Transportation Operating Costs ... 335
Table 22-1: Summary of Economic Analysis Results ... 337
Table 22-2: Summary of Initial Capital Costs ... 340
Table 22-3: Summary of Ongoing Capital Costs ... 340
Table 22-4: Summary of Operating Costs ... 341
Table 22-5: Cashflow Model ... 342
Table 22-6: Economic Indicators ... 343
Table 22-7: Discount Rate Post-Tax NPV Sensitivity ... 343
Table 22-8: Post-Tax NPV Sensitivity Analysis ... 344
Table 22-9: Post-Tax IRR Sensitivity Analysis ... 347
Table 26-1: Phase 1 Recommended PEA Augmentation Budget ... 357
Table 26-2: Phase 2 Recommended Current Deposit PFS Budget ... 359
Table 28-1: Definition of Terms ... 364
Table 28-2: Abbreviations and Symbols Used in this Technical Report ... 365

1. SUMMARY

Nordmin Engineering Ltd. (Nordmin) was retained by Clean Air Metals Inc. (Clean Air or "the Company") to prepare a Canadian National Instrument 43-101 (NI 43-101) Technical Report (Technical Report) and Preliminary Economic Assessment (PEA) for the Thunder Bay North Project ("the Project"), situated approximately 50 kilometres (km) northeast of the city of Thunder Bay, Ontario, Canada.

The Company retained Nordmin for the geology, underground mining, processing, surface infrastructure studies, Knight Piésold Ltd. (Knight Piésold) for the waste management and underground geotechnical studies, DST, a division of Englobe Corp. (DST) for the site water management and environmental studies, and Blue Coast Research and Metallurgy (Blue Coast) for the metallurgical studies, and BWB Consulting Services Inc. for the tax calculation (collectively referred to as "the Consultants"), to support the preparation of the PEA.

1.1 Terms of Reference

This Technical Report supports the disclosures in the Company news release of December 1, 2021, entitled "Clean Air Metals Announces a PEA of the Current and Escape PGE-Cu-Ni Deposits of the Thunder Bay North Project, with post-tax NPV5 of C$293 million, Internal Rate of Return (IRR) 25.2%." All measurement units used in this Technical Report are metric unless otherwise noted. Currency is expressed in Canadian (CAD) dollars (C$). The Technical Report uses Canadian English.

Mineral Resources are reported in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (May 2014; the 2014 CIM Definition Standards) and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (November 2019; 2019 CIM Best Practice Guidelines).

The effective date of this Technical Report is December 1, 2021. The effective date of the Mineral Resource Estimate for the Project is November 1, 2021 (Current deposit is November 1, 2021, and the Escape deposit is January 18, 2021).

1.2 Principal Outcomes

1.2.1 Economic Analysis

A life of mine (LOM) cashflow model was constructed based on the LOM production schedule for the deposits including an assessment of the sensitivities to certain economic parameters. The economic results of this report are based upon the services performed by:

- Nordmin for Underground mining surface infrastructure and processing.
- Knight Piésold for Waste Storage Facility (WSF) and underground geotechnical parameters.
- Blue Coast for Metallurgy.
- DST for environmental and permitting.
- BWB Consulting Services Inc. for taxation calculations.

The Company provided the inputs and related calculations with respect to the impact of taxation on the economic model. This included the calculation of applicable federal (Canadian) and provincial (Ontario) corporate income taxes and provincial (Ontario) mining taxes. Allowable deductions were based primarily on available capital cost pools for corporate income taxes. Application of deductions specifically available for Ontario mining taxes were also calculated. These included processing allowances and the application of the "New Mine" exemption for the Project.

Opening balances (costs carried forward from previous years) including non-capital (operating) losses and balances for various capital asset categories were included as per information provided by the Company.

The Project includes an underground mine and associated infrastructure, surface infrastructure to support the mine operations (i.e., maintenance and office facilities), water management features, Run of mine (ROM) stockpiling area, processing facility and WSF.

The economic model for the Project indicates a pre-tax free cashflow of $651.6 million over a 10 year mine life, a pre-tax Net Present Value (NPV) 5% of $425.0 million and a pre-tax IRR of 31.1%. On an after-tax basis, the Project could generate free cashflow of $467.4 million, and after-tax NPV (5%) of $293.0 million and an after-tax IRR of 25.2%. The Project is most sensitive to commodity prices, metallurgical recoveries and smelter payables/deductions.

As the metal prices outline in Table 19-1, the conclusions are as follows:

- The capital payback is 2.6 years from start of production.
- Revenue’s average $239.8 million per year from sale of PGE and Copper mineral concentrates.
- Total mined metal production over a 10-year mine life based on the present resource base is expected to be 629 k oz platinum (Pt), 618 k oz Palladium (Pd), 111 M pounds Copper (Cu), 57 M pounds Nickel (Ni), 38 k oz Gold (Au), 850 k oz Silver (Ag), or 2,886 k oz Pt Eq1.
- 65.2% of total mineral production occurs in the first 5 years.
- Operating margin of 59% in the first 5 years and LOM Operating margin of 53%.

Table 1-1 summarizes the Project economics for the described base case.

Table 1-1: Key Financial and Project Metrics

Project Metric	Units	Value
Pre-tax NPV @ 5%	$M	$425.04
After-tax NPV @ 5%	$M	$293.00
Pre-tax IRR	% (real)	31.1
After-tax IRR	% (real)	25.2
Payback Period from start of production	Years	2.6
Initial Capital Expenditure (CapEx)	$M	$367.17
Initial EPCM / Indirects (incl. in CapEx)	$M	$41.16
Initial Contingency (incl. in CapEx)	$M	$60.20
Maximum Production Rate	Mtpa	1.3
Mine Life	Years	10
Ramp-Up Years	Years	1
Long Hole Open Stoping (LHOS) Mill Feed	kt	10,338
Drift and Fill Mill Feed	kt	1,946
Total Mill Feed	kt	12,284
LOM Mill Feed Grade	EqPt (g/t)	7.3
Total Revenue	$M	$2,245

Project Metric	Units	Value
Total Operating Costs	$M	$1,057
Pre-tax Operating Cashflow	$M	$1,188
Net Smelter Return (NSR)	$/tonne mill feed	$178.02
Operating Margin	%	53%
Operating Costs		
Underground Mine Operating Costs	$/t mill feed	$47.37
Processing Plant / WSF	$/t mill feed	$25.03
General and Administrative (G&A) Costs	$/t mill feed	$6.87
Royalties	$/t mill feed	$2.63
Transportation to Smelter	$/t mill feed	$4.71
Total Unit Operating Costs	**$/t mill feed**	**$86.61**

A simple tax model was constructed and applied using standard tables for depreciation of capital cost pools.

Opportunities exist to optimize the Project economics through application of specific strategies to reduce taxation burdens.

Table 1-2 summarizes the estimated total LOM cashflows. The column at the right is the NPV (cost) of those cashflows.

Table 1-2: Key Financials

Cashflow	Units	LOM
Total Revenue	$M	$2,245
Total Operating Costs	$M	$1,057
Pre-tax Operating Cashflow	$M	$1,188
Total Capital	$M	$536
Pre-Tax Accumulated Cashflow	$M	$652
Pre-Tax NPV @ 5% Discount	$M	$425
Pre-Tax IRR	%	31.1%
Taxes	$M	$184
Post-Tax Accumulated Cashflow	$M	$467
Post-Tax NPV @ 5% Discount	$M	$293
Post-Tax IRR	%	25.2%

1.2.2 Mineral Resource Estimate

The Mineral Resource Estimate for the Project conforms to industry best practices and is reported using the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves and 2019 CIM Best Practice Guidelines and has an effective date of November 1, 2021.

Mineral Resources were classified into Measured, Indicated, and Inferred Resource categories based on geological and grade continuity, drill hole spacing, and reviewing kriging variance. The Mineral

Resource Estimate has been defined based on an applied Pd Eq cutoff grade to reflect processing methodology and assumed revenue streams from Pt, Pd, Au, Ag, Cu, Ni, Co, and Rh.

The Mineral Resource Estimate (Mineral Resource Estimate) is predominately based on an unchanged geological model and methodologies utilized to calculate the 2021 Mineral Resource Estimate. The differences in the Current deposit relate to the incorporation of approximately 7,200 m of infill drilling within the Lower Bridge/Upper Beaver area and the corresponding reinterpretation of the infill drilling and incorporating updated metal prices metallurgical and smelter recoveries.

The effective date of the Mineral Resource Estimate for the Project is November 1, 2021. Within the Project, the Current deposit contains an Indicated Mineral Resource of 10,388,964 tonnes at US$93/tonne contained value and an Inferred Mineral Resource of 5,274,798 tonnes at US$93/tonne contained value and has an effective date of November 1, 2021. The Escape deposit contains an Indicated Mineral Resource of 4,164,360 tonnes at US$100/tonne contained value and an Inferred Mineral Resource of 2,802,798 tonnes at US$100/tonne contained value (Table 1-3 and Table 1-4) and has an effective date of January 18, 2021.

Table 1-3: Thunder Bay North Project Mineral Resource Estimate, Grade and Tonnage

Category	Tonnes	Pt (g/t)	Pd (g/t)	Au (g/t)	Ag (g/t)	Rh (g/t)	Co (g/t)	Cu (%)	Ni (%)	Pt Eq (g/t)	Pd Eq (g/t)	4PGE[1] (g/t)
Indicated Current Deposit	10,388,964	1.67	1.84	0.09	2.23	0.05	150	0.38	0.21	8.32	3.64	3.65
Indicated Escape Deposit	4,164,360	1.20	0.94	0.12	2.47	0.06	209	0.52	0.28	7.61	3.33	2.33
TOTAL INDICATED RESOURCE	**14,553,324**	**1.54**	**1.58**	**0.10**	**2.30**	**0.05**	**167**	**0.42**	**0.23**	**8.12**	**3.55**	**3.27**
Inferred Current Deposit	5,274,798	0.62	0.65	0.07	1.05	0.01	118	0.32	0.14	3.83	1.68	1.35
Indicated Escape Deposit	2,802,798	0.81	0.70	0.07	1.10	0.00	176	0.34	0.17	4.52	1.98	1.59
TOTAL INFERRED RESOURCE	**8,077,595**	**0.69**	**0.67**	**0.07**	**1.07**	**0.01**	**138**	**0.33**	**0.15**	**4.07**	**1.78**	**1.43**

[1]4PGE (g/t) = Pd (g/t) + Pt (g/t) + Au (g/t) + Rh (g/t)

Table 1-4: Thunder Bay North Project Mineral Resource Estimate, Contained Metal

Category	Tonnes	Pt (oz)	Pd (oz)	Au (oz)	Ag (oz)	Rh (oz)	Co (Tonnes)	Cu (Tonnes)	Ni (Tonnes)	Pt Eq (oz)	Pd Eq (oz)	4PGE[1] (oz)
Indicated Current Deposit	10,388,964	558,288	615,331	30,860	744,401	15,248	1,563	39,385	21,405	2,780,251	1,216,830	1,219,727
Indicated Escape Deposit	4,164,360	161,229	126,095	16,462	330,980	8,264	873	21,742	11,726	1,018,330	445,692	312,050
TOTAL INDICATED RESOURCE	**14,553,324**	**719,518**	**741,426**	**47,322**	**1,075,381**	**23,511**	**2,435**	**61,126**	**33,131**	**3,798,581**	**1,662,522**	**1,531,777**
Inferred Current Deposit	5,274,798	105,882	110,695	11,106	177,307	1,654	625	16,914	7,124	650,277	284,606	229,337
Inferred Escape Deposit	2,802,798	73,248	63,134	6,403	99,395	70	494	9,414	4,885	407,369	178,293	142,855
TOTAL INFERRED RESOURCE	**8,077,595**	**179,130**	**173,829**	**17,508**	**276,702**	**1,724**	**1,119**	**26,329**	**12,009**	**1,057,646**	**462,899**	**372,191**

[1]4PGE (oz) = Pd (oz) + Pt (oz) + Au (oz) + Rh (oz)

Mineral Resource Estimate Notes

Underground Mineral Resources were prepared in accordance with NI 43-101 and the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014) and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (2019). Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. This estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

- Underground Mineral Resources are based on a 2-year trailing price deck as of September 30, 2021.
- Resource excludes all material immediately below Current Lake, above a minimum crown pillar thickness of 20 m which is assumed to be not recoverable by underground methods.
- Minor variations may occur during the addition of rounded numbers.
- Calculations used metric units metres (m), tonnes (t) and grams/tonne (g/t).
- Assays were variably capped on a domain by domain basis.
- Specific gravity was applied using Ordinary Kriging (OK) estimation.
- Mineral Resource effective date November 1, 2021.
- All figures are rounded to reflect the relative accuracy of the estimates and totals may not add correctly.
- Reported from within a mineralization envelope accounting for mineral continuity.

The Mineral Resource Estimate is based on underground mining methods and milling and flotation/cyanidation concentration processing method. Areas of uncertainty that may materially impact the Mineral Resource Estimate include:

- Changes to long-term metal price assumptions.
- Changes to the input values for mining, processing, and G&A costs to constrain the estimate.
- Changes to local interpretations of mineralization geometry and continuity of mineralized zones.
- Changes to the density values applied to the mineralized zones.
- Changes to metallurgical recovery assumptions.
- Changes in assumptions of marketability of the final product.
- Variations in geotechnical, hydrogeological, and mining assumptions.
- Changes to assumptions with an existing agreement or new agreements.
- Changes to environmental, permitting, and social licence assumptions.
- Logistics of securing and moving adequate services, labour, and supplies could be affected by epidemics, pandemics and other public health crises, including COVID-19, or similar such viruses.

There is potential for an increase in the Mineral Resource Estimate if mineralization that is currently classified as Inferred can be upgraded to higher-confidence Mineral Resource categories and if any categorized mineralization within the various deposits can be expanded.

1.2.2.1 Input Parameters for Mineral Resource Calculation

The cutoff value used for the Mineral Resource for Current deposit is US$93/tonne (C$121/tonne) insitu contained value and the Escape deposit is US$100/tonne (C$130/tonne) insitu contained value. The cutoff value is calculated based on estimations as follows: direct mining operating cost, onsite milling operating cost, tailings management facility operating cost, indirect operating cost, G&A cost, onsite milling metal recoveries, offsite smelting metal recoveries, and smelter metal payable percentages.

Estimated operating costs, onsite estimated mill metal recoveries, offsite estimated smelting metal recoveries and estimated smelter payable percentages used for Mineral Resource cutoff grade calculations are summarized in Table 1-5. For resource cutoff calculation purposes, a mining recovery of 100.0% and 0.0% mining dilution were applied.

Table 1-5: Mineral Resource Estimate Cutoff Grade Calculation Parameters

Parameter	Unit	Value Current Deposit	Value Escape Deposit
Currency Used for Evaluation	$	CAD	CAD
Mill Daily Throughput / Mining Rate	tonnes per day (t/d)	3600	3600
Long hole Open Stoping Component	%	75	75
Drift and Fill Component	%	25	25
Direct Mining Cost	$/t mill feed	30	31
Milling / WSF Cost	$/t mill feed	21	21
Indirect / G&A Cost	$/t mill feed	10	10
Transportation to Refinery Charges	$/t mill feed	5	4
Royalties	%	1.3	1.5
Milling Recovery	%	77	77
Smelter Recovery and Payables	%	73	68
Insitu Contained Value Cutoff (C$)	$/t mill feed	121	130
Insitu Contained Value Cutoff (US$)	$/t mill feed	93	100

Source: Nordmin 2021

1.3 Project Description, Location, and Access

The Project is situated approximately 50 km northeast of the city of Thunder Bay, within the Thunder Bay Mining Division, Ontario, Canada. The Project centroids are approximately latitude 48º45' N, and longitude 88º56'W and is comprised of the Current Property and the Escape Property.

The Project consists of 344 unpatented, single cell, multicell, and partial cell border claims (1456 cell units) covering an aggregate area of approximately 29,725 ha. All claims and underlying agreements are in good standing.

The Company's exploration activities are located on lands which Fort William First Nation, Red Rock Indian Band and the Biinjitiwaabik Zaaging Anishinaabek (collectively the "Cooperating Participants") assert are part of their traditional territory and in which the Participating First Nations assert their members hold and exercise Aboriginal and/or Treaty rights (the "Rights"). The Company and the Cooperating Participants signed a Memorandum of Agreement (MOA) effective as of January 9, 2021.

The Project is accessible using a series of intermittently maintained logging roads branching from Armstrong Highway 527, which in turn branches from the Trans-Canada Highway 11-17 a short distance east of the city of Thunder Bay.

The climate is continental with a temperate marine influence from the close proximity of Lake Superior. Temperatures generally range from winter lows of about -35°C to summer highs of about 35°C. Average winter temperatures are in the range of -15°C to -20°C, and average summer temperatures are in the range of 20°C to 25°C.

Annual rainfall is approximately 70 cm with 55 cm to 60 cm of rain and 200 cm to 300 cm of snow annually. Average winter snow depths in the region are about 100 cm to 150 cm.

The area is characterized by low relief (less than 20 m) with a mixture of muskeg and mature spruce forests. The claims are covered by typical northern boreal forest comprising spruce and jack pine. Local fauna includes moose, wolf, black bear, marten, hare, and several species of birds.

Project elevations vary by about 40 m, from 470 metres above sea level (masl) to about 510 masl, averaging approximately 485 masl.

Outcrop is locally rare. Glacial overburden depth is generally shallow, rarely exceeds 20 m, and primarily consists of ablation till, minor basal till, and moderate expanses of outwash sand and gravel.

Exploration activities can be curtailed by snowmelt conditions. It is expected that any future mining operations will be able to be conducted year-round.

At present, there is no significant infrastructure in the area. A 230 kW powerline is in the process of being built between Thunder Bay and Wawa, ON. This powerline will cross the southeast corner of the Project where, at the point of closest approach, it is located approximately 6 km southeast from the centre of the Current deposit.

The land holdings are sufficient to allow for exploration and development. The potential surface rights holdings, that can be triggered when the claims go to lease, are sufficient for development of infrastructure to sustain a mining operation.

Sufficient skilled mining labour is present in Thunder Bay and surrounding communities.

1.4 History

Initial exploration in the general region was for uranium and was concentrated in the area of the Christianson uranium showing, discovered in 1949, and located about 5 km east of Current Lake near the western shoreline of Greenwich Lake. Drilling was first performed on the property in 1976.

The Current Lake area was explored for diamonds by Dr. Graham Wilson and Dr. Gerald Harper et al between 1993 to 2000. This led to the discovery of mineralized ultramafic (peridotite) boulders containing elevated grades of Pt-Pd-Cu-Ni along the western shoreline of Current Lake.

Magma Metals (Canada) Limited optioned the Current Lake property in 2005. Kennecott staked the Escape Lake claim (a single 15-unit claim) in 2006. Magma Metals (Canada) Limited was taken over by Panoramic Resources Limited in June 2012. Since the acquisition of Kennecott by Rio Tinto in 2015, there has been extensive exploration activities by the various operators through to the current operator (Clean Air) (Section 6).

The first Mineral Resource calculation on the Current deposit, with an effective date of September 7, 2009, was completed by SRK. Further estimates were completed by AMEC in 2011 and Magma Metals on Beaver East in 2012 (internal).

1.5 Geological Setting, Mineralization, and Deposit Types

Mineralization discovered on the Project to date is considered to be somewhat atypical of orthomagmatic Ni-Cu sulphide deposits, in particular part of the sub-class of deposits associated with rift and flood basalts and their associated magmatic conduits (Noril'sk type) (Naldrett 2004).

The Current deposit Mineral Resource Estimate benefits from approximately 171,465 m of diamond drilling in 767 drill holes spanning from 2006 until 2021. The Escape deposit Mineral Resource Estimate benefits from approximately 40,855 m of diamond drilling in 129 drill holes spanning from 2008 until 2020. Collectively this drilling by the Company and its predecessors has led to the delineation of the Current and Escape Mineral Resource Estimates.

The Project is hosted within the Quetico Terrane of the Superior Province of the Canadian Precambrian Shield. The Quetico Terrane is a fore-arc accretionary prism about 70 km wide and is comprised of metamorphosed and deformed clastic metasedimentary rocks.

Mineralization within the Current deposit and the Escape deposit is hosted within magmatic conduits comprised of melanocratic gabbro and ultramafic peridotites. Mineralization is strongly associated with sulphide abundance with the exception of the Cloud Zone within the Current deposit.

Nordmin examined and modelled the grade distributions for each of the elements. Grade distribution wireframes were created for Pd, Pt, Au, Ag, Cu, Ni, Co, and Rh. The analysis confirmed that the changes in mineralization and corresponding grade within the various conduits appear to be caused by preferential magma/fluid mixing. The higher-grade mineralization is largely settled near the lower portions of the conduits due to the high sulphide content associated with the different metals. The settling created a scenario in which the high grade mineralization is "pod"-like in nature and relatively equally spaced along the lower contact of each conduit. The material between the higher-grade pods is mineralized but with lower grades. Therefore, the higher-grade pods are connected within a lower grade matrix. As such, Nordmin created wireframe grade shells for each of the eight commodities to reflect the lithological and geochemical differences, along with sulphide abundance for the purpose of grade concentration and isolation of composites.

Mineralization wireframes were created on 10 m to 20 m vertical and plan sections and were adjusted between various views to edit and smooth each wireframe where required. The wireframes were encouraged and permitted to follow lithological boundaries and trends where applicable. When not cutoff by drilling, the wireframes terminate at the contact of the conduit or where a lack of drilling or significant change in grade distribution terminates them, whichever was most appropriate. No wireframe overlapping exists within a given grade domain, but wireframes were allowed to overlap across domains. The mineralization domain wireframes were modelled for eight grade elements, including Pt, Pd, Au, Ag, Cu, Ni, Co, and Rh. Structural and mineralization trends were used in the interpretation and selection of block modelling parameters. A final block model was created by estimating and combining block models for each domain; this block model has been fully validated with no material bias identified.

Explicit modelling was employed to allow for mineralization in context with the deposit geology and associated geochemistry to be considered.

The geological understanding of the setting (lithologies and structural) and alteration controls on mineralization is sufficient to support the estimation of Mineral Resources.

1.6 Exploration, Drilling, and Analytical Data Collection in Support of Mineral Resource Estimation

The exploration programs completed by the Company and previous operators are appropriate for the deposit style. The programs have delineated the Current and Escape deposits, as well as a number of exploration targets. Geophysical interpretations and regional surface exploration indicate the potential to discover further targets that warrant further investigation.

The quantity and quality of the lithological, collar and downhole survey data collected in the various exploration programs by various operators are sufficient to support the Mineral Resource Estimate. The collected sampling is representative of the Pt, Pd, Au, Ag, Cu, Ni, Co, and Rh grades in the deposit, reflecting areas of higher, and lower grades. The analytical laboratories used for legacy and current assaying are well known in the industry, produce reliable data, are properly accredited, and widely used within the industry.

Nordmin is not aware of any drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results. In Nordmin's opinion, the drilling, core handling, logging, and sampling procedures meet, or exceed industry standards, and are adequate for the purpose of Mineral Resource Estimation.

Nordmin considers the quality assurance (QA)/quality control (QC) protocols in place for the Project to be acceptable and in line with standard industry practice. Based on the data validation and the results of the standard, blank, and duplicate analyses, Nordmin is of the opinion that the assay and bulk density databases are of sufficient quality for Mineral Resource Estimation for the Project.

1.7 Data Verifcation

Nordmin completed several data validation checks throughout the duration of the 2021 Mineral Resource Estimate. The verification process included a two-day site visit to the Project by the Qualified Persons (QP) to review surface geology, drill core geology, geological procedures, chain of custody of drill core and for the collection of independent samples for metal verification. The data verification included:

- a survey spot check of drill collars;
- a spot check comparison of assays from the drill hole database against original assay records (lab certificates);
- a spot check of drill core lithologies recorded in the database versus the core located in the core farm; and
- a review of the QA/QC performance of the drill programs.

Nordmin has also completed additional data analysis and validation, as outlined in Section 11.

The QP completed a spot check verification of the following drill holes:

- Current deposit – 52 (6%) of the lithologies, 3,184 (5%) of the geotechnical measurements, 3,992 (11%) of the assays.
- Escape deposit - 12 (10%) of the lithologies, 1,930 (15%) of the assays.

The geology was validated for lithological units from the Company's OCRIS logger. The geological contacts and lithology aligned with the core contacts and lithology and are acceptable for use.

1.8 Mineral Processing and Metallurgical Testing

Mineralogical characterization of composite samples from the Current and Escape deposits indicate that copper is contained primarily as chalcopyrite and approximately two-thirds of the nickel is in sulphide form, primarily as pentlandite. The remaining nickel is mostly hosted by magnesium-silicate minerals, mainly serpentine, and olivine. The platinum, palladium, and gold mineralization are very fine-grained; however, they are closely associated with all sulphide minerals, including pyrite and pyrrhotite, and recovery of the sulphides will therefore bring along most of the precious metal values. Gangue silicates consist of serpentine, amphibole, chlorite, mica, and feldspar. Copper and nickel sulphide material liberation indicate a moderately fine grind is required for good recovery of the sulphides.

Hardness testing by the standardized Bond Ball Work Index (BBWi) method indicated that samples from the deposits are moderately hard, with an index of ~19 kWh/t at a closing size of 150 mesh. Conversely, Abrasion Index testing revealed that the composite was only mildly abrasive.

A flotation development program was completed on one master composite (MC) and ten variability composites from the Current deposit and three variability composites from the Escape deposit. Flowsheet options considered include separate copper and nickel concentrates, separate copper and bulk concentrates, and a single bulk concentrate. A flowsheet was developed, consisting of primary grinding to a P_{80} (80% passing) of 65 microns (µm), sequential flotation of copper bearing minerals, followed by nickel, or bulk sulphide flotation. Regrinding of the copper rougher concentrate to a P_{80} of ~25 µm followed by two stages of cleaning achieved concentrate grades of ~25% copper. Nickel concentrate grades up to 11% nickel were achieved with fine regrinding to a P_{80} < 20 µm but resulted in low nickel and PGE recoveries to a selective nickel concentrate. Replacing the nickel concentrate with a bulk concentrate eliminates the nickel circuit regrind and improves overall metal recovery. High recoveries of the precious metals are possible if all the sulphides are floated, however the rejection of any of the sulphide minerals leads to an attendant drop in PGE and gold recovery.

1.8.1 Mineral Processing

The conceptional process plant has been designed as a conventional milling operation with a capacity of 3,600 t/d. ROM mineralized material will be reduced to P_{80} of 300 mm by a single jaw crusher. Crusher discharge would be transferred to a surface stockpile, from which material would be reclaimed by two active apron feeders. A front-end loader would be utilized on occasion to minimize size segregation and to motivate the pile during the winter period.

A conventional semi autogenous grinding (SAG) and ball mill grinding circuit is proposed. The conceptual design targets a grind size P_{80} of 65µm, utilizing a SAG size of 6.7 m diameter by 2.8 m (effective grinding length [EGL]) long and a ball mill size of 4.5 m by 7 m (EGL) long. The SAG mill is closed-in with a pebble circuit where pebbles are crushed prior to being recycled to the SAG feed. The ball mill will be closed-in with hydrocyclones, with cyclone overflow reporting to the copper rougher circuit.

The flotation circuit will produce two separate marketable concentrates. A copper-PGE concentrate will be the primary float, utilizing a regrind stage of the rougher float product prior to two subsequent stages of cleaning. Cu-PGE concentrate will be thickened and dewatered via a filter press prior to being stored in a covered stockpile prior to shipment.

Copper rougher tails will be pumped to a bulk concentrate flotation circuit which consists of rougher stage, and four subsequent cleaning stages. The bulk concentrate product will be thickened and dewatered via a filter press prior to being stored in a covered stockpile prior to shipment.

Copper-PGE concentrate is anticipated to amount to approximately 53 t/d dry metric tonnes (dmt), with an assumed target moisture content of 8% which amounts to an annual concentrate production of 20,650 wet metric tonnes (wmt). The remaining bulk concentrate production will be approximately 119 t/d (dmt), with an assumed target moisture content of 8% which translates to an annual concentrate production of 46,500 wmt.

It is anticipated that the two separate concentrate products will be shipped by truck to separate regional smelters suited to handle the separate marketable concentrate products.

1.9 Mining Methods

The proposed Thunder Bay North operation involves underground mining at a rate of 3,600 t/d with an accompanying process plant with a matching 3,600 t/d capacity. Shown in Figure 1-1 is the proposed site plan with the mineable Current and Escape deposits.

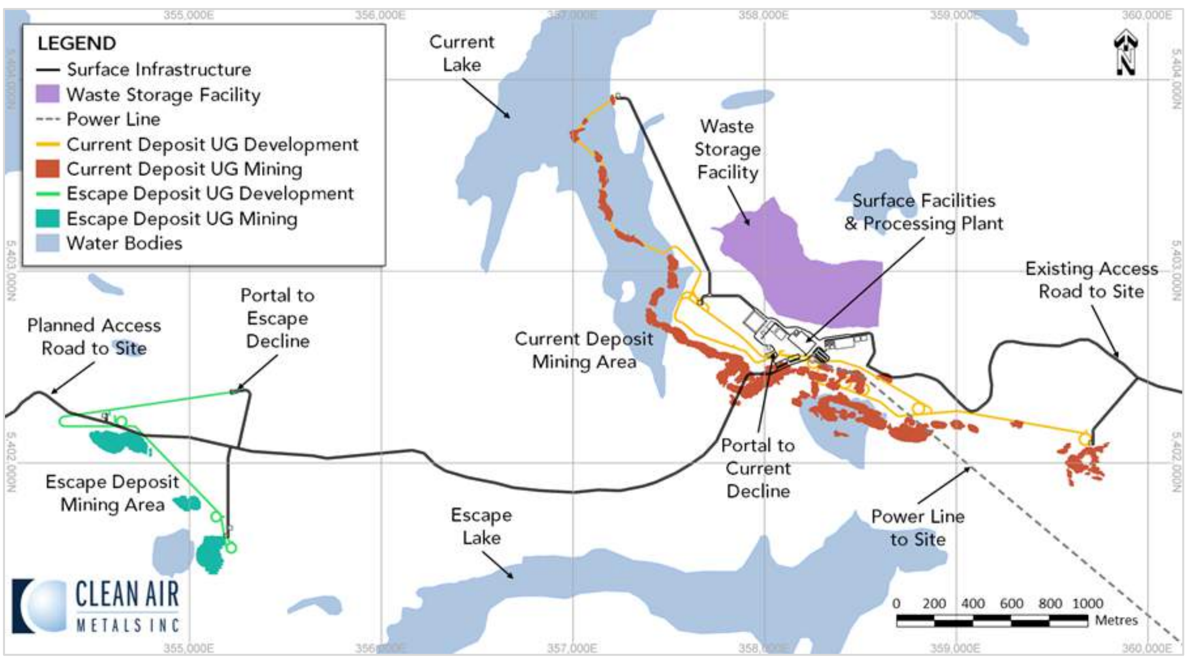


Figure 1-1: Proposed site plan with mineable Current and Escape deposits

The Current deposit is accessed via a portal from surface and has a 12-month pre-production development period, which allows for the Current deposit main decline system to connect to the Current main fresh air raise and provide secondary egress for the mine. Contractor decline development is assumed for the 12-month pre-production period as well as the following 2 years.

The Escape deposit is accessed via a separate portal from surface. The main decline development begins 12 months after the Current deposit decline begins and continues for 3 years, until the decline connects with the Escape main fresh air raise. Contractor decline development is assumed for the Escape deposit.

The Current deposit pre-production development period is followed by a production ramp-up period and achieves full production (3,600 t/d) in the first quarter of Year 1. The Current deposit production commences in the Current and Bridge mining zones and continues in these areas for the first 3 years.

In Year 4, the Escape deposit begins production in the High Grade Zone (HGZ) at 1,800 t/d and the Current deposit production rate is reduced to 1,800 t/d. Figure 1-2 and Figure 1-3 show long sections of the proposed Current deposit and Escape deposit.

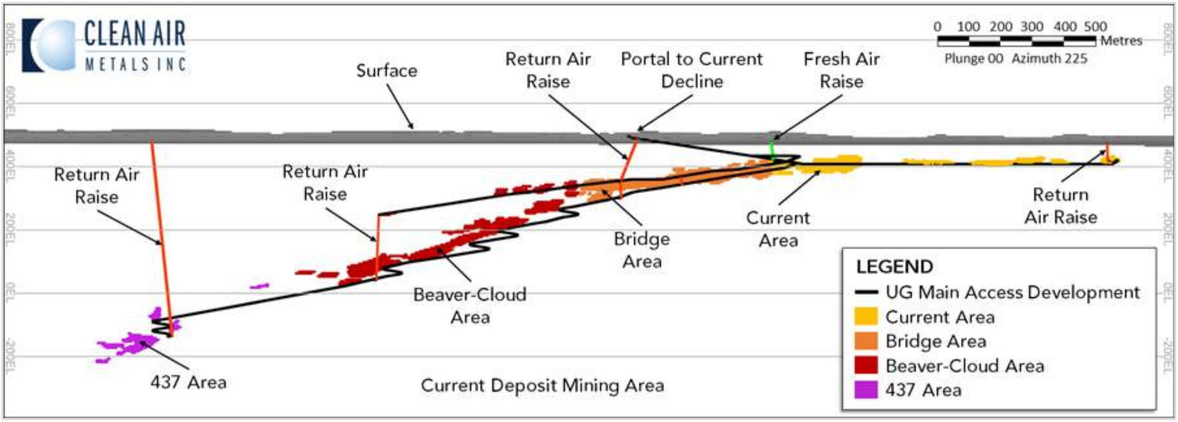


Figure 1-2: Current deposit long section (facing South-West)

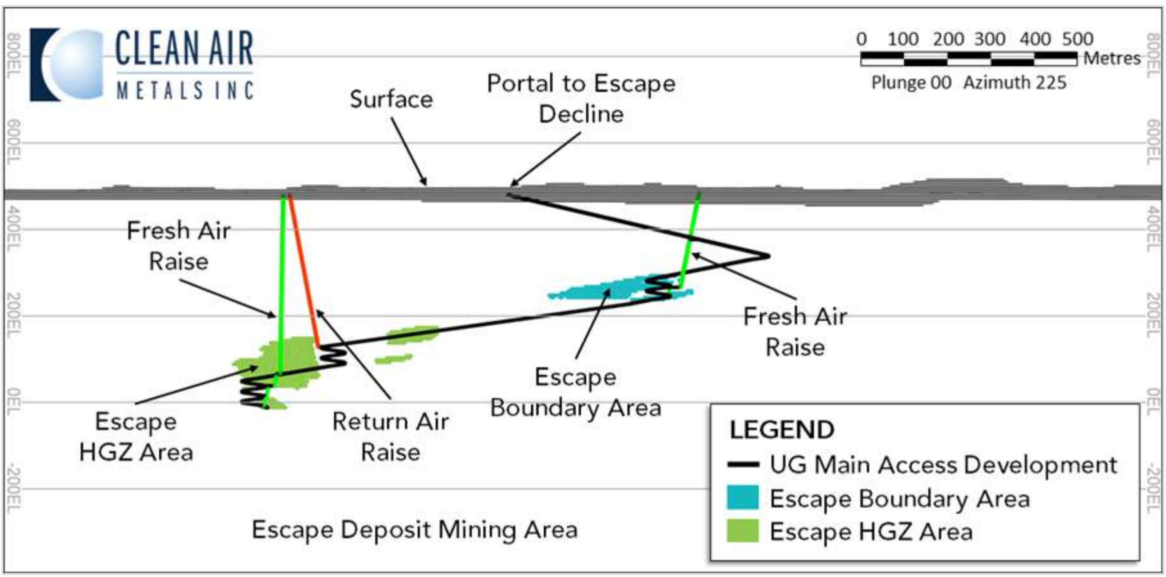


Figure 1-3: Escape deposit long section (facing South-West)

The underground production was scheduled based on 3,600 t/d mill feed and 850 t/d waste, excavated using a fleet of 10-tonne load-haul-dump loaders (LHD), and hauled with 40-tonne trucks, using the Current, and Escape declines to haul material to surface.

The underground mining inventory was determined using Deswik's Mineable Shape Optimizer (MSO) software tool. The MSO uses the geological block model to generate shapes (e.g., stopes) based on economic and geometric parameters as listed in Table 3. The mining underground inventory is a combination of the four mining areas (Current, Bridge, Beaver-Cloud, and 437) within the Current deposit and the two mining areas (HGZ and Boundary) within the Escape deposit. The underground inventory spans along a strike length of 3.3 km and to a depth of 700 m within the Current deposit and spans along a strike length of 1 km and to a depth of 500 m within the Escape deposit. The underground stope inventory is constrained by a crown pillar, extending 30 m below the unconsolidated sentiments below Current Lake.

The Current and Escape deposits will be mined via a combination of conventional underground long hole open stope and drift & fill mining methods, backfilled with a combination of cemented paste back fill (CPB), cemented rock fill (CRF) and unconsolidated rock fill (URF). Stopes are designed to be accessed and excavated via overcut and undercut development cross-cut drifts, which connect to the main declines. The main declines provide ventilation, haulage to surface, and mine access.

Table 1-6 shows the underground design parameters and Table 1-7 shows the underground MSO cutoff.

Table 1-6: Underground Design Parameters

Parameter	Value
Long hole Open Stoping Size	
Length (Maximum)	20 m
Height (Maximum)	25 m
Width (Range)	5 m to 15 m
Drift and Fill Stoping Dimensions	
Height	5 m
Width	5 m
Development Drift Dimensions	
Ramp	5 m (height) x 5 m (width)
Cross-cut	4.5 m (height) x 5 m (width)
Mining Dilution and Recovery	
Underground (UG) Mining Dilution	9.6%
UG Mining Recovery	95%
Resources Used for MSO and UG Design	Measured + Indicated + Inferred

Table 1-7: Underground MSO Cutoff

Parameter	Unit	Current	Bridge	Beaver - Cloud	Boundary	HGZ
Direct Mining Cost LHOS	$/t mill feed	$34.7	$28.5	$30.8	$32.0	$34.5
Direct Mining Cost (DAF)	$/t mill feed	$44.0	$43.8	$46.5	$47.7	$52.9
Milling / WSF Cost	$/t mill feed	$23.0	$23.0	$23.0	$23.0	$23.0
Indirect / G&A Cost	$/t mill feed	$10.0	$10.0	$10.0	$10.0	$10.0
NSR Cutoff (LHOS)	**$/t mill feed**	**$67.7**	**$61.5**	**$63.8**	**$65.0**	**$67.5**
NSR Cutoff (DAF)	**$/t mill feed**	**$77.0**	**$76.8**	**$79.5**	**$80.7**	**$85.9**

Note: NSR calculation includes mining dilution and recovery, milling recoveries, smelter payables and deductions, royalties, and transportation.

1.10 Infrastructure

The Project is located in the Tartan and Greenwich Lake Areas approximately 50 km north of the city of Thunder Bay, Ontario, Canada. The site is paved highway accessible from Thunder Bay on Trans-Canada Highway 11-17 and then north on Highway 527 to the Escape Lake Road network. Access to the mine site is in discussion with a major forestry company via a combination of upgrades to existing logging roads and construction of new roads, totalling 10.5 km, connecting to Highway 527 to the West.

The main project components include the mine, process plant supporting infrastructure, WSF, external and internal access roads, power supply and distribution, and freshwater supply and distribution.

Power is anticipated to be supplied via a new 230 kV East-West Tie Line running to the south east of the project site (expected completion date of 2022) that is accessed by construction of approximately 6 km of new 13.8 kV power lines. The proximity of the mine site plan to power (230 kV East-West Tie Line) and transportation infrastructure (paved Highway 527) within the Company's mining claims is felt to offer a competitive advantage.

1.10.1 Waste Storage Facility

Potentially Acid Generating (PAG) filtered tailings and PAG waste rock will be stored in the WSF, which will be located to the north of the plant site with sufficient offsets from local waterbodies. The WSF will contain a maximum of 6.0 million tonnes of PAG filtered tailings and 1.3 million tonnes of PAG waste rock over 10 years of mining. The WSF will be constructed in two stages, with the initial WSF designed to contain 1.3 million tonnes of filtered tailings and 0.4 million tonnes of waste rock to support the first two years of mining. The WSF footprint will be expanded during Year 2 of operations after which the entire WSF footprint will be used to place the waste, raise the facility by encapsulating the tailings within a rockfill shell zone, and establish a paddock.

The foundation materials in the area typically consist of a veneer of silty sand with varying gravel content overlying competent bedrock. The limited overburden will be removed from the WSF footprint to expose the bedrock. It is anticipated that a portion of the bedrock foundation will be treated with dental concrete to cover any identified faults, or other weak zones to help establish a low permeability foundation over the footprint. The overburden from the foundation preparation work will be placed in the Overburden Stockpile.

Drains will be strategically installed directly on the exposed bedrock to route any collected seepage to perimeter water collection ponds (WCPs). A starter perimeter berm consisting of potentially non-acid generating (NPAG) waste rock from underground mine development, locally quarried rockfill, and locally processed filter zone material from the Overburden Stockpile will then be placed to prepare the WSF for waste management operations. The filtered tailings will be transported to the WSF using conveyors and the material will be placed and compacted with a dozer and compactor. The PAG waste rock will be hauled to the WSF and strategically co-disposed with the tailings. Waste and the perimeter berm materials will be placed in generally level lifts across the entire WSF footprint to raise the facility. This approach will prevent ponding of water on the WSF surface and allow any runoff to shed from the WSF. During the winter months, snow will be removed from the interim surfaces as the material is placed.

Water management for the WSF will include a series of water collection ditches and ponds along the toe of the WSF. The collected water will be pumped to a central Water Management Pond (WMP), which will also be used to collect contact water from the plant site and other site infrastructure. The WMP will provide temporary storage of contact water during normal operations. A floating pump and pipeline will be installed at the WMP to convey the contact water to the mill for re-use in the process or to a water treatment facility. It is expected that the site will operate under a hydrological surplus and contact water will need to be treated, as required, and discharged over a portion of each year. The WMP will also temporarily store runoff from the Environmental Design Flood (EDF) and safely pass runoff flows resulting from the Inflow Design Flood (IDF) via a spillway.

Instrumentation, including vibrating wire piezometers and surface movement monuments, will be installed at the WSF to monitor the performance of the facility. A total of six groundwater monitoring wells will also be installed downstream of the WSF, WMP, and overburden stockpile. The wells will be installed into the bedrock foundation to monitor the groundwater quality. The monitoring wells will be sized to be upgraded to pumpback wells if the water quality does not meet the established criteria and groundwater seepage collection is warranted.

The WSF will be progressively reclaimed during operations by placing overburden from the Overburden Stockpile on the perimeter berm slopes and establishing vegetation. A soil cover will be placed on the final WSF surface and vegetation will be established on the cover at closure. It is assumed that monitoring of the WSF will continue for a period of 20 years following cessation of operations

1.11 Enviromental Studies, Permitting and Social Impact

Clean Air Metals acknowledges that the project is within the Robinson-Superior Treaty territory and that the land on which the project lies is the traditional territory of the Fort William First Nation, Red Rock Indian Band and Biinjitiwaabik Zaaging Anishinaabek. Clean Air Metals has signed a MOA (January 9, 2021) with each of the three proximate First Nation communities (the Participating Communities).

Clean Air Metals, as well as previous owners, have engaged environmental consulting firms to complete a variety of environmental baseline studies across the project, resulting in a robust historical data set obtained between 2007 and 2013 and 2020 to present. In general, the water quality across the site is representative of natural, background conditions typical within the boreal forest in this region. Lakes are typically mesotrophic with some yellow perch, walleye, sucker, northern pike, and cyprinid species present. The Current River flows from the project area and has excellent water quality. Terrestrial bird and mammal species, including but not limited to moose, wolves, lynx, black bears, and fox, are abundant throughout the study area. Some species at risk (bat species and several bird species) have been identified within the project area; however, these are not likely to present any major impediments to project development. Much of the project area has been harvested by forestry operations in the past and is highly disturbed, as shown by the Forest Resource Inventory and vegetation assessments. No provincially significant wetlands are known to be present within the project area.

Hydrological studies have been completed within several project area watersheds. The Current Lake Outlet, tributaries into Current Lake, Escape Lake Outlet and the Current River at Highway 527 have been monitored for flow at various times between 2008 and present. Further monitoring and data correlation is required to strengthen the hydrological model for the project area.

Hydrogeological testing completed to date has shown marginal to moderate permeability within the peridotite and metasediment rocks. Further assessment of the subsurface hydrogeological characteristics, particularly within the sediment/breccia rock types, and within the Escape resource are planned for future studies.

Geochemical testing consisting of metal leaching (ML) and acid rock drainage (ARD) assessment work completed to date has focused on the Current resource. Elevated levels of some metals such as arsenic, barium, boron, copper, molybdenum, nickel, selenium, uranium, and zinc are anticipated to leach from onsite waste rock. High neutralization potential exists within the rock; however, some ARD is anticipated in the future. Further testing for planning and modelling purposes is required to expand upon these findings.

Two minor archaeological sites have been identified within the local study area for the project. Further work in the form of a Stage 3 assessment is required to assess the extent of the sites;

however, they are outside and well away from any proposed mine infrastructure and are thought to be relatively minor.

Baseline data collection will continue for physical environment studies (hydrology, surface water, sediment, hydrogeology, metals leaching and acid rock drainage, meteorology, and noise), biological environment studies (fish and fish habitat, mammals, birds, species at risk, vegetation, and wetlands) and archaeological studies.

1.12 Capital and Operating Costs

Details of the initial and sustaining capital estimate are shown in Table 1-1.

The estimate of initial capital costs is $367.2 million including amounts for working capital, indirect and contingency assumptions, as outlined in Table 21-1 (note that columns may not sum exactly due to rounding). A contingency of $60.0 million has been included in the estimate of initial capital costs, which amounts to approximately 20% of direct initial capital costs. The duration of the detailed design and construction phase of the project is estimated at 24 months.

The sustaining capital, including rehabilitation and closure costs, and the reversal of upfront working capital, is estimated at $169.0 million over the LOM.

Total operating costs have an estimated average of 86.6/t ore processed at 1.3 Mtpa (3,600 t/d) during LOM production. The total operating cost per tonne ore processed is comprised of $47.4/t underground direct operating costs, $25.0/t process plant, WSF and water management and treatment (WMT) costs, $6.9/t G&A costs, $2.6/t royalties, and $4.7/t transportation to the smelter. Over LOM operating costs total $1,056.7 million and represent 12.3 Mt of mill feed processed.

1.13 Risks and Uncertainties

There are some risks that are inherent to a mining project such as:

- The PEA is preliminary in nature and includes an economic analysis that is based, in part, on Inferred Mineral Resources. Inferred Mineral Resources are considered too speculative geologically for the application of economic considerations that would enable them to be categorized as Mineral Reserves. There is no certainty that the PEA will result in an operating mine. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Areas of uncertainty that may materially impact the PEA and Mineral Resource Estimate include:

- Changes to long-term metal price assumptions.
- Changes to the input values for mining, processing, and G&A costs to constrain the estimate.
- Changes to local interpretations of mineralization geometry and continuity of mineralized zones.
- Changes to the density values applied to the mineralized zones.
- Changes to metallurgical recovery assumptions.
- Changes in assumptions of marketability of the final product.
- Variations in geotechnical, hydrogeological, and mining assumptions.
- Changes to assumptions with an existing agreement or new agreements.
- Changes to environmental, permitting, and social licence assumptions.
- Environmental Assessments (EA) timing, requirements and supporting documentation.

- The assumption that the electric power line will be available on time for the construction of the project.
- Discussions with various First Nation communities.
- Logistics of securing and moving adequate services, labour and supplies could be affected by epidemics, pandemics and other public health crises, including COVID-19 or similar such viruses.

1.14 Interpretations and Conclusions

The results of the PEA for the Company indicate that the Project has technical and financial merit using the base case assumptions. Throughout 2022, the Company will continue with ongoing exploration work, including geotechnical drilling, metallurgical/comminution studies and infill drilling. If a production decision is made, the Company will then commence the next phase of planning for underground mining.

The Company believes there is further potential to significantly expand the Mineral Resource and the geophysical survey will assist in identifying strike continuity and expanding mineralization potential.

The Company expects to complete a Mineral Resource update in 2022 on the greater than 35,000 m of step-out and delineation drilling that has been completed on the Escape deposit since the January 20, 2021 resource statement. Much of the Inferred material in the present PEA mine plan has been a focus of infill drilling activity as previously disclosed and is expected to convert to indicated mineral inventory. Continuity of mineralization has been also demonstrated geophysically (using the Magnetometric Resistivity (MMR) technique). The additional drilling is expected to support the use of the MSO algorithm in a PFS.

1.15 Recommendations

1.15.1 Phase 1 Recommendations – PEA Augmentation

The Phase 1 recommendations are focused on infill/expansion drilling, environmental baseline studies and technical trade-off studies. The Phase 1 PEA augmentation recommendations which are anticipated to require a budget of C$3,190,000.

1.15.2 Phase 2 Recommendations – PFS

The Phase 2 recommendations are contingent upon the completion of the Phase 1 recommendations and subject to minimum NAV and IRR outcomes from the Phase 1 program and Company approval.

Phase 2 recommends a PFS on the Current deposit that is predicated on additional infill drilling to finalize an Indicated Mineral Resource, metallurgical test work, mine planning and related trade-off studies and a discounted cashflow model.

The contingent Phase 2 PFS recommendations which are anticipated to require a budget of C$3,124,000.

2. INTRODUCTION

2.1 Terms of Reference

This Technical Report was prepared as a NI 43-101 Technical Report and Mineral Resource Estimate for the Company by Nordmin for the Project situated approximately 50 km northeast of the city of Thunder Bay, ON, Canada.

The Mineral Resources are considered effective as of November 1, 2021. This Technical Report supersedes all prior technical reports, Mineral Resource Estimates, and PEAs prepared for the Project. As of the date of this report, the Company anticipates using these Mineral Resources for future drill targeting and Mineral Resource upgrades.

The Company is a junior mineral exploration company listed on the TSX Venture Exchange (TSXV: AIR) with their head office located at:

217 Queen St. West (c/o Irwin Lowy)
Toronto, ON M5V-0R2

The quality of information, conclusions, and recommendations contained herein are consistent with the level of effort involved in Nordmin's services, based on i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications outlined in this Technical Report.

The user of this document should ensure that this is the most recent Technical Report for the Project, as it is not valid if a new Technical Report has been issued.

This Technical Report provides a Mineral Resource Estimate and a classification of the Mineral Resource prepared in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Standards on Mineral Resources and Reserves: Definitions and Guidelines, May 10, 2014 (CIM, 2014) and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (November 2019; 2019 CIM Best Practice Guidelines).

Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

2.2 Qualified Persons

The Consultants preparing this Technical Report are specialists in the fields of geology, exploration, mineral processing, metallurgical testing, mining methods, Mineral Resource Estimation, and classification.

Nordmin nor any associates employed in the preparation of this Technical Report are insiders, associates, affiliates, or has any beneficial interest in the Company. The results of this Technical Report are not dependent upon any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings between the Company and Nordmin. Nordmin is being paid a fee for the work in accordance with reasonable professional consulting practices.

This Technical Report was prepared by the QPs listed in Table 2-1, and their responsibilities for each section are indicated. These individuals, by virtue of their education, experience and professional association, are considered a QP as defined in the NI 43-101 standard, for this Technical Report, and are a member in good standing of a relevant professional institution. QP Certificates of the Authors are provided in Appendix A of this Technical Report.

Table 2-1: QP Section Responsibility

Section and Title	Qualified Person	Company
1: Summary	Various QPs	Various
2: Introduction	Glen Kuntz, P.Geo.	Nordmin
3: Reliance on Other Experts	Glen Kuntz, P.Geo.	Nordmin
4: Property Description and Location	Glen Kuntz, P.Geo.	Nordmin
5: Accessibility, Climate, Local Resources, Infrastructure, and Physiography	Glen Kuntz, P.Geo.	Nordmin
6: History	Glen Kuntz, P.Geo.	Nordmin
7: Geological Setting and Mineralization	Glen Kuntz, P.Geo..	Nordmin
8: Deposit Types	Glen Kuntz, P.Geo	Nordmin
9: Exploration	Glen Kuntz, P.Geo.	Nordmin
10: Drilling	Glen Kuntz, P.Geo.	Nordmin
11: Sample Preparation, Analyses, and Security	Glen Kuntz, P.Geo.	Nordmin
12: Data Verification	Glen Kuntz, P.Geo.	Nordmin
13: Mineral Processing and Metallurgical Testing	Lyn Jones, P. Eng.	Blue Coast
14: Mineral Resource Estimate	Glen Kuntz, P.Geo.	Nordmin
15: Mineral Reserve Estimate	N/A	N/A
16: Mining Methods	Brian Wissent, P. Eng. Ben Peacock, P. Eng.	Nordmin Knight Piésold
17: Recovery Methods	Kurt Boyko, P. Eng.	Nordmin
18: Project Infrastructure	Brian Wissent, P. Eng., Harold Harkonen, P.Eng., Wilson Muir, P. Eng.	Nordmin Knight Piésold
19: Market Studies and Contracts	Kurt Boyko, P. Eng.	Nordmin
20: Environmental Studies, Permitting, and Social, or Community Impact	Glen Kuntz, P.Geo.	Nordmin
21: Capital and Operating Costs	Brian Wissent, P. Eng.	Nordmin
22: Economic Analysis	Brian Wissent, P. Eng. & Brian Buss P.Eng	Nordmin/BWB Consulting Services Inc.

Section and Title	Qualified Person	Company
23: Adjacent Properties	Glen Kuntz, P.Geo	Nordmin
24: Other Relevant Data and Information	Glen Kuntz, P.Geo	Nordmin
25: Interpretation and Conclusions	Various QPs	Various
26: Recommendations	Various QPs	Various
27: References	Glen Kuntz, P.Geo	Nordmin
28: Glossary	Glen Kuntz, P.Geo	Nordmin

The following summarizes the dates of the QP site visit to the Project:

- Glen Kuntz, P.Geo., completed one site visit between October 20 and October 21, 2020.
- Ben Peacock, P.Eng., completed one site visit between October 20 and October 21, 2020.

2.3 Effective Dates

The effective date of the Mineral Resource Estimate is November 1, 2021. The effective date of the Technical Report is December 1, 2021.

2.4 Information Sources and References

This Technical Report has been prepared by independent consultants who are QP's under NI 43-101 and prepared in accordance with NI 43-101, Form 43-101F1, and Companion Policy 43-101CP. Subject to the conditions and limitations set forth herein, the independent consultants believe that the qualifications, assumptions, and the information used by them is reliable, and efforts have been made to confirm this to the extent practicable. However, none of the Consultants involved in this study can guarantee the accuracy of all information in this Technical Report.

This Technical Report is based, in part, on internal company technical reports and maps, published government reports, company letters and memoranda, and public information as listed in Section 27. Several sections from reports authored by other consultants have been directly quoted or summarized in this Technical Report and are so indicated where appropriate.

A draft copy of this Technical Report has been reviewed for factual errors by the Company regarding the Company, history of the Project, and the Mineral Resource Estimate prepared by Nordmin.

Nordmin has relied on the Company's historical and current knowledge of the Project and work performed thereon. Any statements and opinions expressed in this document are given in good faith and in the belief that such statements and opinions are not false and misleading at the date of this Technical Report.

2.5 Previous Reporting

2.5.1 Previous Mineral Resource Estimates

The Mineral Resource Estimate (effective date of November 1, 2021) discussed herein (Section 14.9) supersedes historical and past Mineral Resource Estimates presented in this section.

The following historical information is relevant to provide context but is not current and should not be relied upon. The QPs responsible for the preparation of this Technical Report have not done sufficient work to classify the historical estimate as current Mineral Resources or Mineral Reserves, and the Company is not treating any historical estimates as Mineral Resource Estimates.

- Cole, G., and El-Rassi, D., 2009: Mineral Resource Evaluation, Thunder Bay North Polymetallic Project, Ontario, Canada: Technical Report prepared by SRK Consulting Ltd. for Magma Metals (Canada) Ltd., effective date 7 September 2009.
- Thomas, D.G., Melnyk, J., Gormely, L., Searston, S., Kulia, G. 2011: Magma Metals Limited, Thunder Bay North Polymetallic Project Ontario, Canada, NI 43-101 Technical Report. Project No. 164115. Effective Date: 6 October 2010.
- Searston, S., 2011: Magma Metals Limited, Preliminary Assessment Report Thunder Bay Project, Ontario, Canada. Project No. 164115 [unpublished]. Internal report dated February 2011.
- Thomas, D.G., Melnyk, J., Gormely, L., Searston, S., Kulia, G. 2011: Magma Metals Limited, Thunder Bay North Polymetallic Project Ontario, Canada, NI 43-101 Technical Report on Preliminary Assessment. Project No. 164115. Effective Date: 17 March 2011 in support of a press release dated 7 February 2011, entitled "Positive Scoping Study for Thunder Bay North Project: Considerable upside potential to further enhance the economics of the project."
- Leon, G., MacTavish, A., Heggie, G., Magma Metals Limited 2012: Mineral Resource Estimate for the East Beaver Lake Zone Extension [unpublished]. Internal report.
- Kuntz, G.: NI 43-101 Technical Report and Mineral Resource Estimate for the Thunder Bay North Project, Thunder Bay, Ontario. Report issued March 3, 2021.

2.5.2 Previous Mineral Reserve Estimates

There are no historical Mineral Reserve estimates calculated for the Project.

2.6 Acknowledgements

Nordmin would like to thank and acknowledge the following people who have contributed to the preparation of this report and the underlying studies under the supervision of the QPs:

Nordmin Personnel

Christian Ballard, Senior Geologist, Brian Wissent, Senior Mine Engineer, Brett Stewart, Technical Design Specialist, Annika Van Kessel, G.I.T., Sirena Jacobsen, Geological Technician, Harold Harkonen, and Kurt Boyko, P.Eng., Consulting Specialist – Mechanical Systems.

Clean Air Employees and Consultants

Abraham Drost, CEO & Director, Jim Gallagher, Executive Chairman, Allan MacTavish, Vice President Project Manager (retired), Geoff Heggie, Exploration Manager, Andrey Zagoskin, Database/GIS Geologist, Dr. Derek Wilton, Senior Geological Advisor, Carson Phillips, VP Corporate Development, Kris Tuuttila, Regional Manager, Senior Associate with DST Consulting Engineers Inc., Nichola McKay, Geometallurgy Manager and, Lyn Jones, Manager, Process Engineering with Blue Coast Metallurgy & Research, Brian Buss P.Eng, President, BWB Consulting Services Inc., and Wilson Muir, Senior Engineer with Knight Piésold Ltd.

2.7 Units of Measure

Unless otherwise noted, the following measurement units, formats, and systems are used throughout this Technical Report.

- Measurement Units: all references to measurement units use the International System of Units (SI, or metric) for measurement. The primary linear distance unit, unless otherwise noted, are metres (m).
- General Orientation: unless otherwise stated, all references to orientation, and coordinates in this Technical Report are presented as Universal Transverse Mercator (UTM) in metres.
- Currencies outlined in the Technical Report are stated in Canadian dollars (C$) unless otherwise noted.

The symbols and abbreviations used in this Technical Report are outlined in Section 28.4.

3. RELIANCE ON OTHER EXPERTS

Nordmin's opinion contained herein is based on information provided to Nordmin by the Company throughout the course of Nordmin's investigations. Nordmin has relied upon the work of other consultants for the Project in support of this Technical Report.

In each case, the QP hereby disclaims responsibility for such information to the extent of their reliance on such reports, opinions, or statements.

Nordmin used their experience to determine if the information from previous reports was suitable for inclusion in this Technical Report and adjusted information that required amending. This Report includes technical information, which required subsequent calculations to derive subtotals, totals, and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, Nordmin does not consider them to be material.

These items have not been independently reviewed by Nordmin and Nordmin did not seek an independent legal opinion of these items.

3.1 Mineral Tenure, Surface Rights, Property Agreements, and Royalties

Copies of the tenure documents, operating licences, permits, and work contracts were reviewed by Nordmin; an independent verification of land title and tenure reported in Section 4, was not performed. Nordmin did not independently verify the legality of any underlying agreement(s) that may exist concerning the licenses or other agreement(s) between third parties but has instead relied on the Company to have conducted the proper legal due diligence.

3.2 Environmental, Permitting, and Liability Issues

The QP has fully relied upon on the Company and their consultant, Kris Tuuttila, A.Sc.T., P.Geo. (Limited), Regional Manager, Senior Associate of DST Consulting Engineers Inc., concerning the Project environmental, socioeconomic, and permitting matters relevant to the Technical Report.

4. PROPERTY DESCRIPTION AND LOCATION

The Project is situated approximately 50 km northeast of the city of Thunder Bay, within the Thunder Bay Mining Division, Ontario, Canada (Figure 4-1). The Project centroids are approximately latitude 48º45’ N, and longitude 88º56’W.

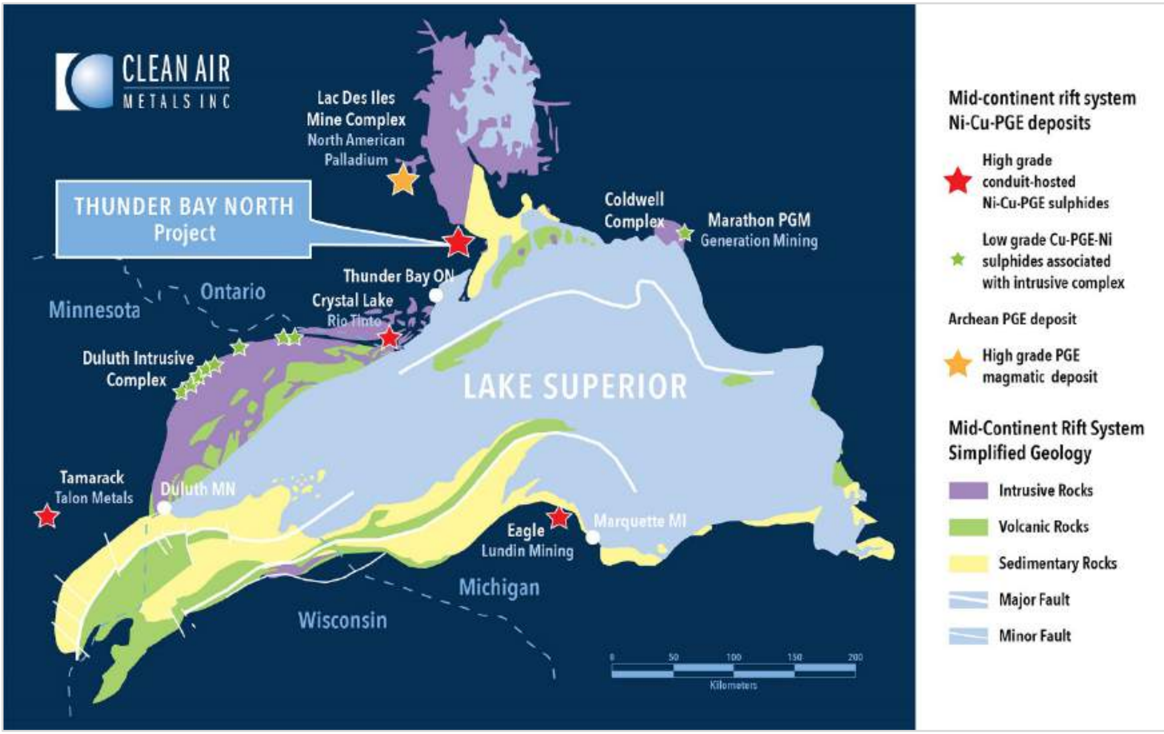


Figure 4-1: Project location map

4.1 Property Land Tenure

The Project is comprised of the Current Property and the Escape Property (Figure 4-2).

4.1.1 Current Property

The Current Property hosts the Current deposit and is comprised of:

- Upper Current Zone/Current Zone,
- Bridge Zone,
- Beaver Lake West Zone,
- Beaver Lake Zone,
- Cloud Zone,
- 437/ South East Anomaly (SEA), and
- two satellite occurrences know as the Lone Island Lake South Intrusion Occurrence and the 025 Intrusion Occurrence.

4.1.2 Escape Property

The Escape Property hosts the Escape deposit and is comprised of:

- Steepledge North,

- Steepledge South,
- Ribbon Zone, and
- Escape South HGZ/Escape South Perimeter.

The Project consists of 344 unpatented, single cell, multicell, and partial cell border claims (1456 cell units) covering an aggregate area of approximately 29,725 ha (Figure 4-2, Appendix B).

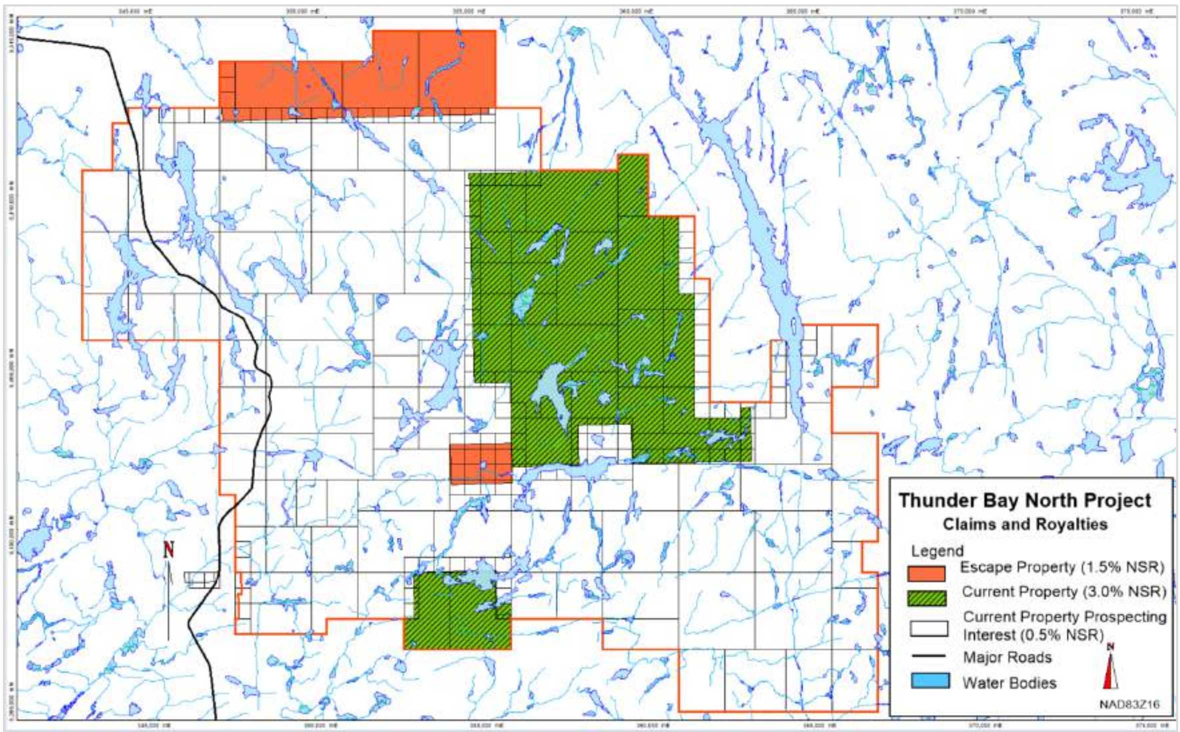


Figure 4-2: Thunder Bay North Project, comprised of the Current Property and the Escape Property

The claims have not been legally surveyed. The government of Ontario requires expenditures of $400 per year per unit, prior to expiry, to keep the claims in good standing for the following year. All claims are currently in good standing with ample credits to keep them in good standing for many years.

The Company's exploration activities are located on lands which the Cooperating Participants assert are part of their traditional territory and in which the Participating First Nations assert their members hold and exercise Rights. The Company and the Cooperating Participants signed a MOA effective as of January 9, 2021.

4.2 Underlying Agreements

4.2.1 The Rio Tinto Option Agreement – Escape Claims

Prior to entering into an agreement with Clean Air through its predecessor Regency Gold Corp. (Regency), Benton Resources Inc. (TSXV: BEX; "Benton") entered into a 3-year, C$6 million option agreement with RTEC for the Escape and Escape North properties (the "RTEC option"). RTEC will retain a 1% NSR Royalty on the properties optioned to Benton (and ultimately optioned to Clean Air) (Figure 4-3).

Benton paid RTEC C$3 million on signing of the option agreement on October 9, 2019 and is obligated to pay an additional C$3 million in equal installments each October 8 of 2020, 2021, and 2022, or as a lump sum remaining balance at any time. Clean Air assumed Benton's financial obligation under the RTEC option agreement by entering into a subsequent option agreement with Benton (the "Benton option") which closed on May 14, 2020.

Clean Air Metals made the first anniversary payment of $1M to RTEC on or about October 1, 2020. The second anniversary payment of $1M to RTEC was completed on October 12, 2021. Clean Air Metals opted for an accelerated payment option and completed the third and final $1M installment to RTEC on November 10, 2021.

4.2.2 The Panoramic Share Purchase Agreement – Current Deposit and Surrounding Claims

Through the Benton option agreement, Regency also entered directly into a formal binding share purchase agreement with Panoramic Resources Inc. dated January 6, 2020 ("Pan Agreement"). Under the Pan Agreement, Clean Air acquired a 100% ownership interest in the Panoramic subsidiary, Panoramic PGMs (Canada) Limited (Panoramic), that holds certain mining claims that protect the Current deposit area of the Thunder Bay North Project, subject to a registered security interest by Panoramic (Figure 4-3).

Terms of the purchase include an aggregate payment of C$9 million to Panoramic Resources Inc. over a three-year period, including a C$4.5 million down payment on closing which was completed May 14, 2020. Clean Air is obligated to pay an additional C$4.5 million in equal installments by each May 13 of 2021, 2022, and 2023, or as a lump sum remaining balance at any time. Clean Air Metals completed the first $1.5M payment installment to Panoramic Resources Inc. on May 11, 2021, with a balance of $3m remaining. Completion of the payments to Panoramic is an accompanying condition of the Benton option. Panoramic Resources Inc. retains no royalty on the Project.

4.2.3 The Benton Option Agreement

Regency, the public company shell and predecessor to Clean Air, entered into the Benton option on January 6, 2020 (the "Benton option"), pursuant to which Benton assigned its option agreement obligations with RTEC to Regency, with RTEC's permission. Subject to the satisfaction of certain conditions precedent mainly involving the completion of all payments on Benton's behalf to fully exercise the underlying RTEC option and Panoramic Resources Inc. share purchase agreements, Regency, (now Clean Air) would fully acquire 100% right, title and interest in the Escape and Escape North Properties (now Escape Property) and Current claims and accompanying release of the Panoramic Resources Inc. security interest (Figure 4-3).

Regency Gold Corp. formally changed its name to Clean Air Metals Inc. in February 2020 after the reverse takeover of the Regency Board of Directors by the Clean Air management team. The Benton option agreement closed concurrently on May 14, 2020, prior to the resumption of trading of Clean Air (now TSXV: AIR) on May 22, 2020. Escape claims will continue to be listed in the name of Benton Resources Inc. authorizing Clean Air as Agent, until the full vesting of the Benton option, when the claims will be transferred to Clean Air.

Regency issued 24,615,884 common shares of the company to Benton, which are now shares of Clean Air on a 1:1 basis. Clean Air is obligated make the payments to fulfill the terms of the RTEC option between Benton and RTEC and the Pan Agreement in order to fully exercise the Benton option.

4.2.4 Project Royalties – Escape Property and Current Property

In addition to the RTEC 1% NSR on the Escape Property optioned to Benton, Benton Resources Inc. will retain a 0.5% NSR on all Escape claims as well as a 0.5% NSR on the previous Panoramic claims which do not already have a pre-existing royalty encumbrance (Figure 4-3).

A portion of the Panoramic claims protecting the Current deposit have an existing 3% NSR to Drs. Graham Wilson and Gerald Harper, the prospectors that discovered the original PGE-Cu-Ni boulder occurrence at the north end of Current Lake. The 3% NSR occurs on the northeast portion of the Property and includes the Current Zone as well as another block at the southern extent of the Property. The royalty includes a prepayment (advance royalty) totalling $50,000 paid annually and divided equally between the prospectors. Under the terms of the original option agreement with the prospectors and Magma Metals (Canada) Limited (predecessor to Panoramic Resources and Clean Air) Clean Air may reduce the royalty to a 2% NSR on payment of C$1 million at any time. Clean Air also enjoys a Right of First Refusal period of 60 days to match any commercial offer to purchase and retire the remaining royalty.

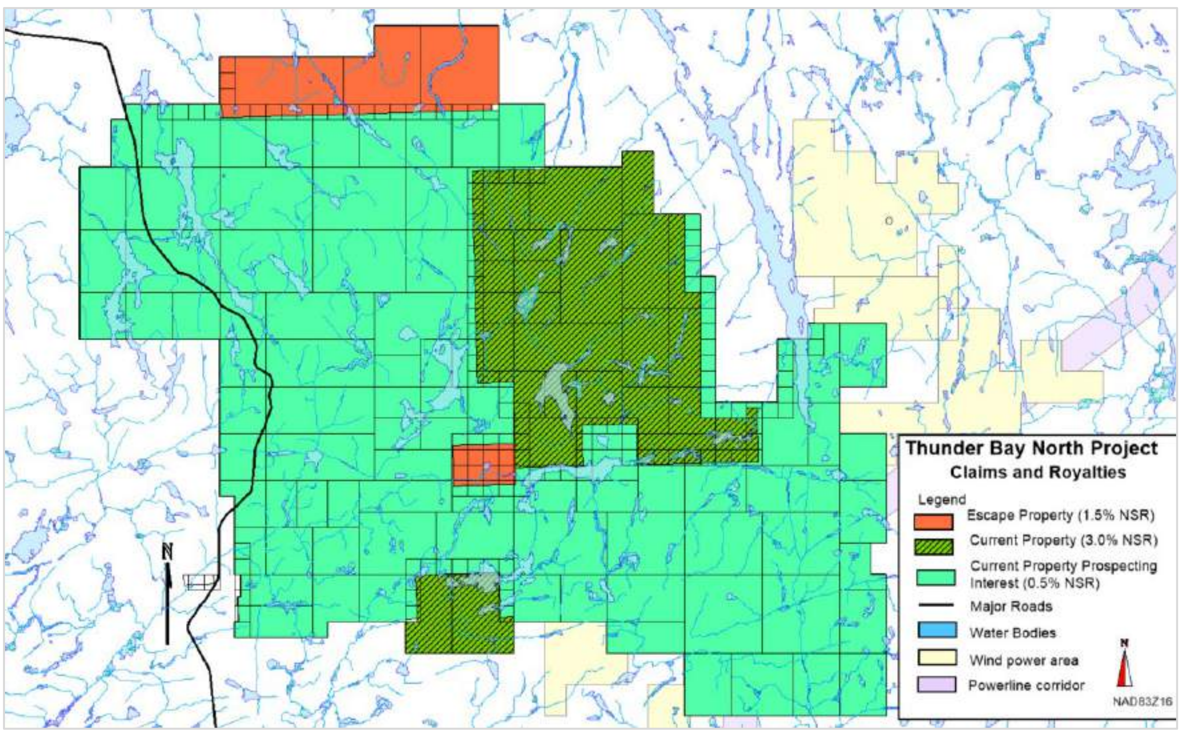


Figure 4-3: Project tenure, claims, NSR, and operational alienations

4.2.5 Permits and Authorization

There are valid Ministry of Natural Resources and Forestry Land Use permits on the Project authorizing an exploration camp and septic system. The Company, under its subsidiary Panoramic also holds a crushed aggregate quarry permit to take crushed rock to use as aggregate from a pit on the Property. The Project does not hold the surface rights on the properties.

The Ontario Mining Act requires Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF) issued Exploration Permits or Plans for exploration on Crown Lands. The nominal processing periods are 50 days for a permit and 30 days for a plan while the documents are reviewed by MNDMNRF and presented to the Indigenous communities whose traditional lands will be impacted by the work. The Company discussed the exploration plans with both the MNDMNRF and local communities and has obtained the required three-year Exploration Permits for the Project.

4.2.6 Environmental Considerations

There are no known environmental liabilities associated with the Property. Permits are required if, during the course of exploration, waterways are affected. No other significant factors or risks exist which may affect access, title, or the right, or ability to perform work on the Property.

4.2.7 Mining Rights in Ontario

The Project is located in the province of Ontario, a jurisdiction that has a well-established permitting process. This process is coordinated between the municipal, provincial, and federal regulatory agencies. As is the case for similar mine developments in Canada, the Project is subject to federal and provincial Environmental Assessment process. Due to the complexity and size of such projects, various federal, and provincial agencies have jurisdiction to provide authorizations or permits that enable Project construction to proceed.

Federal agencies that have significant regulatory involvement include the Canadian Environmental Assessment Agency, Environment, and Climate Change Canada, Natural Resources Canada, and Fisheries, and Oceans Canada.

On the Ontario provincial agency side, the MNDMNRF, Ministry of Environment, and Climate Change, and the Ministry of Transportation each have key project development permit responsibilities.

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

5.1 Accessibility

The Project is accessible using a series of intermittently maintained forest access roads branching from Armstrong Highway 527, which in turn branches from the Trans-Canada Highway 11-17 a short distance east of the city of Thunder Bay.

Access to the Current Property from Thunder Bay is as follows:

- 10 km east of Thunder Bay along Highway 11/17 to Highway 527;
- 22.7 km north on Highway 527 to the Escape Lake forest access road;
- 17.2 km east on the Escape Lake road to the Shallownest East forest access road;
- 5.3 km north on the Shallownest East road to the Steepledge forest access road that branches to the west;
- 3.5 km west along the Steepledge road to a road junction; and
- 0.65 km south to the immediate vicinity of the Current deposit (immediately above the Beaver Lake West/Bridge Zone).

Access to the Escape deposit from the junction of Highway 527 and the Escape Lake Road is as follows:

- 1.8 km east along the Escape Lake road to the Finn road;
- 16.9 km north along the Finn road to the Shark road;
- 2.4 km south along the Shark road to a recent drill access trail leading approximately 500 m west to the vicinity of the Escape South HGZ.

The Escape Lake, Finn, and Shallownest East forest access roads are intermittently maintained by local logging contractors if they have active logging activities in the area.

5.2 Local Resources and Infrastructure

The Company's exploration activities are located on lands which the Cooperating Participants assert are part of their traditional territory and in which the Participating First Nations assert their members hold and exercise Rights.

The Company and the Cooperating Participants signed a MOA effective as of January 9, 2021. The MOA confirms a framework for a mutually beneficial relationship between the Cooperating Participants regarding the Project, based on the relationship set out in a November 2011 Memorandum of Agreement and Communication Protocol among the Cooperating Participants, which remains in effect. The MOA establishes a foundation for collaborative and respectful communications between the Cooperating Participants to facilitate the Company's consultation with the Participating First Nations to identify:

- potential impacts of the Project on the Participating First Nations interests and Rights;
- the appropriate measures to mitigate and avoid any adverse effects; and
- opportunities to enhance positive impacts and benefits.

At present, there is no significant infrastructure in the area. A 230 kW powerline is in the process of being built between Thunder Bay and Wawa, ON. This powerline will cross the southeast corner of the Project where, at the point of closest approach, it is located approximately 6 km southeast from the centre of the Current deposit.

The land holdings are sufficient to allow for exploration and development. The potential surface rights holdings, that can be triggered when the claims go to lease, are sufficient for development of infrastructure to sustain a mining operation.

Sufficient skilled mining labour is present in Thunder Bay and surrounding communities.

5.3 Climate

The climate is continental with a temperate marine influence from the close proximity of Lake Superior. Temperatures generally range from winter lows of about -35°C to summer highs of about 35°C. Average winter temperatures are in the range of -15°C to -20°C, and average summer temperatures are in the range of 20°C to 25°C.

Annual rainfall is approximately 70 cm with 55 cm to 60 cm of rain and 200 cm to 300 cm of snow annually. Average winter snow depths in the region are about 100 cm to 150 cm.

Exploration activities can be curtailed by snowmelt conditions. It is expected that any future mining operations will be able to be conducted year-round.

5.4 Vegetation and Wildlife

Swamps, marshes, small streams, and small to moderate-size lakes are common. Drainage is provided by the numerous, usually unnamed streams that lead to the Current and MacKenzie rivers, located to the northwest, and the southeast, respectively. Both rivers drain directly into Lake Superior, which is situated about 25 km to the south of the centre of the Project.

Primary vegetation comprises boreal forest of black spruce, jack pine, trembling aspen, and white birch. Large swathes of the Project have been clear-cut logged and are re-generating after tree re-planting programs performed by the logging companies.

The forest around the Project currently provides habitat for wildlife species that are common to mixed boreal forests in Ontario.

The area is characterized by low relief (less than 20 m) with a mixture of muskeg and mature spruce forests. The claims are covered by typical northern boreal forest comprising spruce and jack pine. Local fauna includes moose, wolf, black bear, marten, hare, and several species of birds.

5.5 Physiography

Project elevations vary by about 40 m, from 470 metres above sea level (masl) to about 510 masl, averaging approximately 485 masl.

Outcrop is locally rare. Glacial overburden depth is generally shallow, rarely exceeds 20 m, and primarily consists of ablation till, minor basal till, and moderate expanses of outwash sand and gravel.

6. HISTORY

The extensive history of exploration activities on the Project has been described in detail in two previous reports prepared by AMEC, February 2011, and Clark Exploration Consulting, January 2020. Excerpts of this Information are provided in this Section.

Initial exploration in the general region was for uranium and was concentrated in the area of the Christianson uranium showing, discovered in 1949, and located about 5 km east of Current Lake near the western shoreline of Greenwich Lake. A forerunner of RTEC acquired the area that contained the Christianson uranium showing in 1976.

The area was explored for diamonds by Dr. Graham Wilson and Dr. Gerald Harper et al between 1993 and 2000. This led to the discovery of mineralized ultramafic (peridotite) boulders containing elevated grades of Pt-Pd-Cu-Ni along the western shoreline of Current Lake. Pacific North West Capital Corporation optioned the property in 2001; however, they did not conclude the option.

Magma Metals (Canada) Limited then optioned for the claims comprising the Current Property in 2005. At that stage the Project comprised 26 contiguous mining claims. In 2006, the three Beaver Lake claims were optioned, and in 2007 an additional option on the CasRon property was acquired.

Kennecott staked the Escape claim (a single, pre-2018 15 unit claim) in 2006.

Magma Metals (Canada) Limited was taken over by Panoramic Resources Limited in June 2012 and the Current claims were transferred to Panoramic PGMs (Canada) Limited.

An Earn-In to Joint Venture Agreement was signed between RTEC and Panoramic in mid-2014. RTEC acquired all assets of Kennecott in 2015 including the 15-unit Escape claim.

Benton signed the Benton option on the Escape Property with RTEC on October 9, 2019.

Regency, the public company shell and predecessor to Clean Air, completed a reverse takeover of the Board of Regency on February 12, 2020, and formally changed its name to Clean Air Metals Inc. at the onset of trading on May 22, 2020, under symbol AIR: TSXV.

Benton, with RTEC's permission, assigned its interest in the Escape Property claims to Clean Air in the Benton option agreement dated May 14, 2020. Under additional terms of the same Benton option, Clean Air also acquired a 100% interest in the Panoramic PGMs (Canada) Limited by a share purchase agreement, subject to a security interest.

6.1 Historical Exploration

The 2020 report prepared by Clark Exploration Consulting presented the exploration work completed from 1976 – 2005) within Table 6-1.

Table 6-1: Project Exploration 1976 to 2005

Activity	Operator
1976	
Field mapping and core drilling	RTEC
1991	
Airborne magnetic and electromagnetic geophysical surveys	Ontario Geological Survey
1993 to 2000	

Activity	Operator
Rock chip sampling, prospecting, and petrographic, and geochemical research within the Onion Lake, Tartan Lake, and Greenwich Lake areas. In 1999–2000, prospecting, lithogeochemistry, soil sampling, and ground magnetic surveys were conducted in the Current Lake vicinity.	Original prospectors and discoverers, Dr. Gerald Harper, Dr. Graham Wilson, and Francis Mann
2001	
Discovery of mineralized ultramafic (peridotite) boulders along the western shoreline of Current Lake that contained elevated Pt-Pd-Cu-Ni grades.	Dr. Graham Wilson
2001 to 2002	
Ground magnetic and electromagnetic surveys and a six-hole core drill program, totalling 813.5 m; no mineralized ultramafic rocks were encountered.	Pacific North West Capital Corporation
2002 to 2005	
No known work was done until mid-2005 when the then Thunder Bay North claims (centred on Current Lake) were optioned to Magma Metals Limited of Perth, Western Australia.	Dr. Gerald Harper, Dr. Graham Wilson

The internal 2011 AMEC PEA prepared for Magma Metals (Canada) Limited presented the exploration work completed by Magma Metals (Canada) Limited and Panoramic (2006 – 2018) within Table 6-2. Exploration activities from 2019 through 2020 are summarized in Section 9.

Table 6-2: Previous Project Exploration by Magma/Panoramic/RTEC 2006 to 2018

Activity	Duration Date	Performed By
2006		
Prospecting, Geological Mapping, Petrography	14/05/2006–17/05/2006	Turnstone Geological Consulting
Helicopter-borne Magnetic/Radiometric Survey	07/07/2006–11/07/2006	McPhar Geosurveys
Phase 1 Current Lake Diamond Drilling (Diamond Drilling), 6 holes (1,590.5 m)	08/12/2006–04/04/2006	Turnstone Geological Consulting
2007		
Helicopter-borne vertical time domain electromagnetic (VTEM) Survey	27/02/2007–03/03/2007	Geotech Limited
Induced Polarization (IP)/Resistivity Survey	09/03/2007–18/03/2007	Abitibi Geophysique
Phase 2 Current Lake Diamond Drilling, 28 holes (3,078.3 m)	16/04/2007–21/10/2007	Magma Metals (Canada) Limited
Phase 1 Beaver Lake Diamond Drilling, 1 core hole, (500 m)	04/09/2007–21/09/2007	Magma Metals (Canada) Limited
Boat Magnetic Surveys	05/07/2007–06/07/2007	Mtec Geophysics
Phase 2 Beaver Lake Diamond Drilling, 6 holes (2,014.5 m)	22/11/2007–14/12/2007	Magma Metals (Canada) Limited

Activity	Duration Date	Performed By
Lone Island Lake Diamond Drilling, 1 hole (387 m)	22/11/2007–14/12/2007	Magma Metals (Canada) Limited
Borehole Pulse Electromagnetic (EM) Survey	10/12/2007–21/12/2007	Crone Geophysics & Exploration Ltd.
2008		
Drill Core Physical Property Tests	12/01/2008–13/01/2008	Southern Geoscience Consultants
Borehole Pulse EM Survey	22/01/2008–02/02/2008	Crone Geophysics & Exploration Ltd.
Phase 3 Current Lake Ice Diamond Drilling, 23 holes (1,834 m)	21/02/2008–16/03/2008	Magma Metals (Canada) Limited
Resistivity/IP Survey	21/02/2008–13/03/2008	Abitibi Geophysique
Phase 3 Beaver Lake Diamond Drilling, 26 holes (8,008.5 m)	11/02/2008–26/06/2008	Magma Metals (Canada) Limited
RTEC Phase I Escape Lake Drilling, 1 hole (500 m)	01/03/2008-08/03/2008	RTEC
TBNP Airborne Magnetic Survey	03/03/2008–05/03/2008	Aeroquest Limited
Petrography and Mineralogy	09/03/2008–12/03/2008	Magma Metals (Canada) Limited
Regional Airborne Magnetic Survey	07/05/2008–15/05/2008	Aeroquest Limited
Phase 4 Current Lake Barge Diamond Drilling, 67 holes (5,571.5 m)	23/06/2008–08/11/2008	Magma Metals (Canada) Limited
Phase 4 Beaver Lake Diamond Drilling, 40 holes (13,089.7 m)	29/06/2008–19/12/2008	Magma Metals (Canada) Limited
Boat Magnetic Surveys, Current, and Steepledge Lakes	08/08/2008–09/08/2009	Mtec Geophysics
Petrography and Mineralogy	06/09/2008–10/09/2008	Turnstone Geological Consulting
Petrology and Lithogeochemistry	15/09/2009–19/09/2008	R. Sproule, GeoDiscovery Group
Geological Mapping	12/10/2008–27/10/2009	Turnstone Geological Consulting
Reconnaissance Diamond Drilling, 7 holes (2,765 m); completed at SEA, Steepledge, and Lone Island Lake areas	17/10/2008–13/12/2008	Magma Metals (Canada) Limited
Structural Study	10/11/2008–13/11/2008	SRK Consulting Ltd. (SRK)
2009		
Phase 5 Current Lake Ice Diamond Drilling, 86 holes, (6,726 m)	23/01/2009–24/03/2009	Magma Metals (Canada) Limited
Lake Ice Magnetic Survey, Steepledge Lake	25/02/2009–26/02/2009	Mtec Geophysics
Helicopter-borne VTEM Survey	15/02/2009–23/02/2009	Geotech Limited
Helicopter-borne Follow-up VTEM Survey	28/03/2009	Geotech Limited

Activity	Duration Date	Performed By
Fixed Loop transient electromagentic (TEM) Survey, Current Lake	05/03/2009–17/03/2009	Crone Geophysics & Exploration Ltd.
HT SQUID Fixed Loop TEM Survey	10/03/2009–21/03/2009	Crone Geophysics & Exploration Ltd.
Phase 5 Beaver Lake Diamond Drilling, 38 holes, (7,989.5 m)	24/03/2009–20/06/2009	Magma Metals (Canada) Limited
Borehole Pulse EM Survey	22/03/2009–09/04/2009	Crone Geophysics & Exploration Ltd.
Triple Parameter Probe Survey	06/2009	Crone Geophysics & Exploration Ltd.
Magnetometric Resistivity (MMR) Downhole Test Survey	21/05/2009-31/05/2009	Crone Geophysics & Exploration Ltd.
Geological Mapping	26/05/2009–26/10/2009	Magma Metals (Canada) Limited
Phase 6 Beaver Lake Diamond Drilling, 45 holes (12,460.8 m)	21/06/2009–31/10/2009	Magma Metals (Canada) Limited
Borehole Pulse EM Surveys	03/06/2009–23/06/2009	Crone Geophysics & Exploration Ltd.
Phase 1 Steepledge Lake Barge Diamond Drilling, 32 holes, (6,212 m)	24/06/2009–07/10/2009	Magma Metals (Canada) Limited
Borehole MMR Test Surveys	24/05/2009–30/06/2009	Crone Geophysics & Exploration Ltd.
Borehole Pulse EM Surveys	25/07/2009–08/08/2009	Crone Geophysics & Exploration Ltd.
Borehole Pulse EM Surveys	25/08/2009–02/09/2009	Crone Geophysics & Exploration Ltd.
Test Heavy Mineral Concentrate (HMC) Geochemistry Survey	20/09/2009–28/09/2009	Magma Metals (Canada) Limited
Test Lake Sediment Geochemistry Survey	07/10/2009–19/10/2009	Magma Metals (Canada) Limited
Phase 2 Steepledge Lake Helicopter Diamond Drilling, 7 core holes, (2,217 m)	15/10/2009–10/12/2009	Magma Metals (Canada) Limited
Geophysical Data Review	20/10/2009–13/11/2009	W. Hughes, WHEM Consulting
Borehole Pulse EM Surveys	25/10/2009–04/11/2009	Crone Geophysics & Exploration Ltd.
Airborne Light Detection and Ranging (LIDAR) Survey (DTM)	16/11/2009-17/11/2009	Terrapoint Aerial Services
Structural Study	01/11/2009-05/11/2009	Taloumba Inc.
Phase 7 Beaver Lake Diamond Drilling, 22 holes, (4,195.5 m)	01/11/2009–17/12/2009	Magma Metals (Canada) Limited
2010		

Activity	Duration Date	Performed By
Lithogeochemistry Study	12/01/2010–02/07/2010	Taloumba Inc.
Phase 8 Beaver Lake Diamond Drilling, 128 holes, (30,519.5 m)	16/01/2010–27/04/2010	Magma Metals (Canada) Limited
Borehole Pulse EM Surveys	19/01/2010–17/02/2010	Crone Geophysics & Exploration Ltd.
RTEC Phase II Escape Lake Drilling, 3 holes (1599 m)	11/02/2010-01/03/2010	RTEC
Phase 3 Steepledge Lake Diamond Drilling, 14 holes, (2,242.0 m)	14/02/2010–14/03/2010	Magma Metals (Canada) Limited
Borehole MMR Survey	18/02/2010–26/03/2010	Crone Geophysics & Exploration Ltd.
Physical Properties and North Seeking Gyro Survey	02/2010-03/2010	DGI Geoscience Inc.
Moving Loop/Fixed Loop Ground EM Surveys	23/03/2010–10/05/2010	Crone Geophysics & Exploration Ltd.
Cesium Vapour Ground Magnetic Survey	27/03/2010–18/04/2010	Crone Geophysics & Exploration Ltd.
Borehole Physical Rock Properties Survey	20/02/2010–03/03/2010	DGI Geoscience Inc.
Borehole Pulse EM Surveys	11/05/2010–08/06/2010	Crone Geophysics & Exploration Ltd.
Gravity Ground Test Survey	12/05/2010–21/05/2010	Eastern Geophysics Ltd.
Current Lake Follow-up Diamond Drilling, 4 holes, (661 m)	28/04/2010–13/06/2010	Magma Metals (Canada) Limited
Reconnaissance Mapping and Sampling Program, Hicks Lake Area	17/05/2010-08/07/2010	Magma Metals (Canada) Limited
Phase 3 Lone Island Lake Reconnaissance Diamond Drilling, 12 holes (4,249.5 m)	06/05/2010–21/07/2010	Magma Metals (Canada) Limited
Phase 9 Beaver Lake Diamond Drilling, 28 holes, (5,843.9 m)	07/05/2010–21/07/2010	Magma Metals (Canada) Limited
Phase 2 SEA Diamond Drilling, 5 holes, (1,429 m)	06/06/2010–29/07/2010	Magma Metals (Canada) Limited
Cesium Vapour Ground Magnetic Survey	09/06/2010–14/07/2010	Crone Geophysics & Exploration Ltd.
Gravity Ground Survey	03/07/2010–18/07/2010	Eastern Geophysics Limited
HMC Geochemistry Survey	17/06/2010-02/09/2010	Magma Metals (Canada) Limited
Lake Sediment Geochemistry Survey	03/08/2010-05/10/2010	Magma Metals (Canada) Limited
Falcon Airborne Gravity Gradiometer Survey	14/08/2010–27/08/2010	Fugro Airborne Surveys
Borehole Pulse EM and 3-axis Magnetic Survey	23/08/2010–03/09/2010	Crone Geophysics & Exploration Ltd.
Gravity Anomaly Follow-up Diamond Drilling, 2 holes (2229.0 m)	09/09/2010-21/11/2010	Magma Metals (Canada) Limited

Activity	Duration Date	Performed By
Phase 10 Beaver Lake Diamond Drilling, 37 holes (8853.0 m)	08/09/2010-13/12/2010	Magma Metals (Canada) Limited
Surface MMR test survey (15 holes, Beaver Lake area)	04/2010-062010	Crone Geophysics & Exploration Ltd.
UTEM Inductive Source Resistivity (ISR) Test Survey (Beaver Lake and SEA Areas)	01/10/2010-10/10/2010	Lamontagne Geophysics Ltd.
Sulphide Fractionation Study	01/10/2010-12/11/2010	Dr. A.E. Beswick
2011		
Borehole Pulse EM and 3-axis Magnetic Survey (Beaver Lake and SEA Series Diamond Drilling holes)	09/01/2011–27/03/2011	Crone Geophysics & Exploration Ltd.
Cesium vapour ground magnetic survey, Shallownest Lake Grid	01/02/2011-06/02/2011	Crone Geophysics & Exploration Ltd.
RTEC Phase III Escape Lake Drilling, 4 holes (2443.26 m)	15/01/2011-05/03/2011	RTEC
Phase 4 SEA Diamond Drilling, 5 holes (555.0 m)	20/01/2011-03/02/2011	Magma Metals (Canada) Limited
Phase 4 Lone Island Lake Recon, 2 holes (333.0 m)	01/02/2011-05/02/2011	Magma Metals (Canada) Limited
Cesium vapour ground magnetic survey, Escape Lake Grid	08/02/2011-19/02/2011	Crone Geophysics & Exploration Ltd.
Escape Lake Diamond Drilling, 3 holes (601.3 m)	09/02/2011-17/02/2011	Magma Metals (Canada) Limited
Phase 7 Current Lake Diamond Drilling, 25 holes (2380 m)	03/02/2011-12/03/2011	Magma Metals (Canada) Limited
Phase 11 Beaver Lake Diamond Drilling, 10 holes (2943.0 m)	04/02/2011-27/03/2011	Magma Metals (Canada) Limited
Ground Gravity Survey, Escape, and Beaver Lake grids	10/02/2011-12/03/2011	Eastern Geophysics Ltd.
Phase 4 Steepledge Winter Recon Diamond Drilling, 9 holes (3296.5 m)	27/02/2011-09/05/2011	Magma Metals (Canada) Limited
Cesium vapour ground magnetic survey, northern Current Lake	07/03/2011-12/03/2011	Crone Geophysics & Exploration Ltd.
Borehole Pulse EM and 3-axis Magnetic Survey, Steepledge Lake	28/03/2011–12/04/2011	Crone Geophysics & Exploration Ltd.
Z-TEM Airborne Survey (629 line-km oriented at 060^0, Current, Steepledge, and Lone Island lakes, and SEA areas)	24/05/2011-05/06/2011	GeoTech Limited
Phase 12 Beaver Lake Diamond Drilling, 37 holes (14,475.0 m)	11/05/2011-11/08/2011	Magma Metals (Canada) Limited
Dynamic Textures, Fabrics, and Geochemistry Study	13/06/2011-31/10/2011	R.J.F. Scoates, Magma Metals (Canada) Limited

Activity	Duration Date	Performed By
Borehole Pulse EM and 3-axis Magnetic Survey, Beaver Lake, and SEA areas	25/06/2011–31/07/2011	Crone Geophysics & Exploration Ltd.
Reconnaissance Mapping and Sampling, Hicks Lake Area	06/09/2011-12/09/2011	Magma Metals (Canada) Limited
Reconnaissance geological mapping, Lone Island Lake Area	13/09/2011-17/09/2011	Magma Metals (Canada) Limited
Phase 13 Beaver Lake Diamond Drilling, 17 holes (10,866.0 m)	06/09/2011-17/12/2011	Magma Metals (Canada) Limited
Borehole Pulse EM and 3-axis Magnetic Survey, Beaver Lake	21/10/2011–13/11/2011	Crone Geophysics & Exploration Ltd.
3D Downhole IP Test Survey	15/11/2011-16/12/2011	JVX Geophysics
Borehole Pulse EM and 3-axis Magnetic Survey, Beaver Lake	15/12/2011–22/12/2011	Crone Geophysics & Exploration Ltd.
2012		
Borehole Pulse EM and 3-axis Magnetic Survey	03/01/2012–25/01/2012	Crone Geophysics & Exploration Ltd.
RTEC Phase IV Escape Lake Drilling, 4 holes (2370 m)	07/02/2012-15/03/2012	RTEC
Phase 5 Lone Island Lake South Recon, 2 holes (519.0 m)	25/02/2012-24/03/2012	Magma Metals (Canada) Limited
Deep ZTEM Diamond Drilling, 1 hole (1122.0 m)	04/03/2012-07/04/2012	Magma Metals (Canada) Limited
Borehole Pulse EM and 3-axis Magnetic Survey	29/05/2012–07/06/2012	Crone Geophysics & Exploration Ltd.
Phase 5 Steepledge Winter Diamond Drilling, 2 holes (450.0 m)	27/04/2012-07/05/2012	Magma Metals (Canada) Limited
Early Mid-continent Rift (MCR) Corridor Reconnaissance Lakeshore Mapping and Sampling Program (Central and Northern Thunder Bay North Project)	30/05/2012-14/07/2012	Panoramic
Soil Gas Hydrocarbon Test Survey over Bridge Zone Mineralization	11/08/2012-14/08/2012	Ontario Geological Survey
Ray Lake Diamond Drilling, 1 core hole (351.0 m)	11/04/2012-19/05/2012	Panoramic
Phase 14 Beaver Lake Diamond Drilling, 15 holes (12,220.0 m)	20/08/2012-04/12/2012	Panoramic
Airborne Magnetic Anomaly Field Check of marginal Thunder Bay North Claims	25/08/2012-16/11/2012	Panoramic
Borehole Pulse EM and 3-axis Magnetic Survey, SEA Area	31/10/2012–12/12/2012	Crone Geophysics & Exploration Ltd.
2013		
Reconnaissance geological mapping, Steepledge Lake, Lone Island Lake, Current Lake, and Hicks Lake areas	04/06/2013-09/10/2013	Panoramic

Activity	Duration Date	Performed By
Synoptic and Infill geological mapping, various locations in central part of property	04/06/2013-13/08/2013	Panoramic
Soil Gas Hydrocarbon Geochemical Survey, Beaver Lake East, and SEA Intrusion Grid	04/06/2013-14/06/2013	Panoramic
Soil Gas Hydrocarbon Geochemical Survey, Steepledge South Grid	17/06/2013-24/06/2013	Panoramic
Soil Gas Hydrocarbon Geochemical Survey, Lone Island Lake South Grid	25/06/2013-28/06/2013	Panoramic
2014		
Cesium vapour ground magnetic survey, Steepledge South Grid	19/02/2014-24/02/2014	Panoramic
Cesium vapour ground magnetic survey, 025 Intrusion area	25/03/2014-28/03/2014	Panoramic
Thunder Bay North Reconnaissance Geological Mapping Program	04/06/2014-24/10/2014	Panoramic
Thunder Bay North South Reconnaissance and Synoptic Geological Mapping Program	06/06/2014-30/07/2014	Panoramic
Prospecting of Late Magnetic Granitoid Stocks, Southeastern Thunder Bay North	21/07/2014-25/07/2014	Panoramic
2015		
Thunder Bay North West Reconnaissance Geological Mapping Program	23/06/2015-11/11/2015	Panoramic
Thunder Bay North Reconnaissance Geological Mapping Program, southeast Thunder Bay North, 025 Intrusion area	24/06/2015-10/09/2014	Panoramic
RTEC Phase V Escape Lake/Thunder Bay North Drilling, 5 holes (2738.16 m)	25/07/2015-25/11/2015	RTEC
2016		
RTEC Phase VI Escape Lake/Thunder Bay North Drilling, 11 holes (4287.88 m)	17/01/2016-12/03/2016	RTEC
Thunder Bay North Reconnaissance Geological Mapping, southeast Thunder Bay North, 025 Intrusion area	11/05/2015-25/07/2014	Panoramic
RTEC Gravity Survey, 025 Intrusion	21/09/2016-27/09/2016	Discovery International Geophysics
RTEC Semi Airborne HeliSAM Survey, Thunder Bay North/Escape Lake	19/09/2016-12/10/2016	Discovery International Geophysics
2017		
Thunder Bay North Reconnaissance Geological Mapping, Hilltop, and 025 Intrusion areas	17/05/2017-08/06/2017	Panoramic

Activity	Duration Date	Performed By
2018		
Thunder Bay North Reconnaissance Geological Mapping, 025 Intrusion area	05/06/2017	Panoramic
2020		
Escape deposit Phase I diamond drilling. 25 drill holes with cumulative 11345 m.	08/05/2020-06/12/2020	Clean Air Metals
Escape deposit Phase II diamond drilling. 15 drill holes with cumulative 6994 m.	30/06/2020-20/10/2020	Clean Air Metals
Current deposit metallurgical sample diamond drilling. 4 drill holes with cumulative 795 m.	06/12/2020-22/12/2020	Clean Air Metals
Current deposit MT-anomaly testing: 1 drill hole with final depth of 770 m	27/10/2020-06/12/2020	Clean Air Metals
Bore hole EM was completed on 11 drill holes in the Escape deposit		Crone Geophysics
Bore hole MMR was completed on nine drill holes in the Escape deposit.	25/07/2020- 01/10/2020	Crone Geophysics
Magnetotelluric survey Phase I: Current and Escape deposits totalling 110 stations	04/08/2020-02/09/2020	Quantec Geoscience
2021		
Escape deposit Phase III diamond drilling. 82 drill holes with cumulative 35364 m.	21/01/2021-30/11/2021	Clean Air Metals
Current deposit MT-anomaly testing: 2 drill holes with cumulative depth of 985 m	12/06/2021-14/07/2021	Clean Air Metals
Current deposit continuity drill testing: 33 drill holes with cumulative depth of 6838 m	13/07/2021-18/10/2021	Clean Air Metals
Bore hole EM was completed on 25 drill holes in the Escape deposit		Crone Geophysics
Magnetotelluric survey Phase II: Current and Escape deposits totalling 202 stations	14/01/2021-23/02/2021	Quantec Geoscience
Magnetotelluric survey Phase IIb: Current and Escape deposits totalling 104 stations	18/11/2021-07/12/2021	Quantec Geoscience
Surface pulse EM survey was completed over the northern portion of the Escape chonolith.	18/10/2021-30/11/2021	Crone Geophysics

6.2 Previous Mineral Resource Estimates

The following historical information is relevant to provide context but is not current and should not be relied upon. The QPs responsible for the preparation of this Technical Report have not done sufficient work to classify the historical estimate as current Mineral Resources or Mineral Reserves, and the Company is not treating any historical estimates as Mineral Resource Estimates.

Three previous, historic Mineral Resource Estimates were calculated for the Current deposit. The first two and were documented by NI43-101 Technical Reports, the third was reported in a Magma Metals (Canada) Limited February 23, 2012, Press Release that was issued after a takeover bid was made for Magma Metals Limited (and its Canadian subsidiary) by Panoramic Resources Limited.

A single Mineral Resource Estimate was completed for Escape deposit effective January 18th, 2021.

6.2.1 September 29, 2009 SRK Consulting Ltd. Resource Estimate

The September 29, 2009, SRK estimate comprised the first resource calculation for the Current deposit and considered 333 holes (50,416 m) drilled by Magma Metals (Canada) Limited between 2007 and 2009. It was also the first Mineral Resource calculated within the Project boundaries. The effective date of this Mineral Resource Estimate was September 7, 2009.

The database used at the time included downhole survey records for 3,810 intervals, 3,940 stratigraphic intervals and 19,518 sample intervals with assay results for Au (ppm), Pt (ppm), Pd (ppm) and Ag g/t and multi-element inductively coupled plasma scans (ICP), for which only Cu (ppm), Ni (ppm) and Co (ppm) were considered for resource estimation. The resource database also included 559 specific gravity (SG) measurements performed by pycnometry and 469 specific gravity measurements on drill core collected by the water displacement method. Only the core SG data were considered for resource estimation. A linear regression established between core SG data and Ni assays was used to assign a SG value to resource blocks.

SRK constructed a series of 3D wireframes for various lithologies and the polymetallic sulphide mineralization (using a platinum equivalent threshold). The interpretation of final shape and extent of the sulphide mineralization was a collaborative effort between Magma Metals (Canada) Limited and SRK staff.

After review SRK composited all assay data to one metre lengths and subdivided the sulphide mineralization into six grade sub-domains for geostatistical analysis and grade estimation and seven sub-domains for variography. Appropriate top cuts were selected after review of log normal distributions. Multivariate variography was conducted for each of the seven metals in each sub-domain, considering the excellent correlation existing between the metals. Variography was completed on raw composited data to produce single structure multivariate omni-directional downhole semi variograms. Pt, Pd, Ni, Au, Cu, Ag, and Co grades were estimated in each of the domains separately using ordinary kriging and estimation parameters derived from variography. Two estimation passes were used for assigning grades to each domain, considering appropriate estimation parameters, and search neighbourhood sizing.

Two block models, aligned with the local UTM grid, were created for each of the mineralized zones within the Current deposit. Block size was set at ten by ten by five metres based primarily on density of sampling. The block model (percentage model) was populated with percentages from the wireframe intersection, grades, slope of regression, standard deviation, the number of informing points, block variance, SG, and the domain codes.

The open pit Mineral Resources are reported at a cutoff grade of 1.0 g/t platinum equivalency (Pt Eq), whereas underground Mineral Resources are reported at a cutoff grade of 2.0 g/t Pt Eq. The Mineral Resource Statement is summarized in Table 6-3.

Table 6-3: Consolidated Mineral Resource Statement*, SRK Consulting, September 7, 2009

	Quantity	Grade	Contained Metal

	Tonnage	Pt	Pd	Au	Ag	Cu	Ni	Co	Pt Eq	Pt	Pd	Au	Ag	Pt Eq	Cu	Ni	Co
Class	[000't]	[g/t]				[%]	[%]	[ppm]	[g/t]	[000'oz]					[tonnes]		
Open Pit Resources†																	
Indicated	4,295	1.33	1.26	0.08	1.88	0.32	0.21	149	2.83	184	173	12	259	391	13,633	9,081	639
Inferred	3,033	0.99	0.94	0.06	1.54	0.25	0.19	147	2.16	97	91	6	151	210	7,632	5,623	446
Underground Resources†																	
Indicated	286	1.66	1.52	0.10	2.42	0.42	0.28	182	3.67	15	14	1	22	34	1,193	798	52
Inferred	563	1.44	1.35	0.09	2.02	0.32	0.23	167	3.02	26	24	2	37	55	1,790	1,296	94
Combined Open Pit & Underground																	
Indicated	4,581	1.35	1.27	0.08	1.91	0.32	0.22	151	2.88	199	187	13	281	425	14,826	9,879	691
Inferred	3,596	1.06	1.00	0.07	1.62	0.26	0.19	150	2.29	123	115	8	188	265	9,422	6,919	540

* Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates. The cutoff grades are based on metal price assumptions of US$1,200 per troy ounce platinum, US$250 per troy ounce palladium, US$930 per troy ounce gold, US$13 per troy ounce silver, and US$2.30 per pound copper, US$7.00 per pound nickel and US$15.00 per pound cobalt. Mineral Resources are reported at two platinum equivalent cutoff grades considering conceptual metallurgical recoveries of 75% for platinum and palladium, 50% for gold, 65% for silver, and 90% for copper, nickel, and cobalt sulphides.

† Open pit Mineral Resources are reported at a cutoff grade or of 1.0 gram of platinum equivalent per tonne, whereas underground Mineral Resources are reported at a cutoff of 2.0 of platinum equivalent per tonne.

\# Current Lake includes the "Bridge Zone."

6.2.2 February 2012, Magma Metals (Canada) Limited Mineral Resource Estimate (Beaver East Only)

An internal geostatistical Mineral Resource Estimate (Leon, G., et. al, 2012) was compiled from drilling information over a 450 m strike length of the Current Intrusion immediately east of, and in addition to, the underground Mineral Resources estimated by AMEC in 2010.

The Mineral Resource Estimate was based on 43 diamond drill holes (16,898 m), the majority of which were completed between May and August 2011. These holes were mostly drilled on 100 m spaced sections with holes spaced 50 m apart along each section.

The internal Mineral Resource Estimate of the East Beaver Zone was constrained by the same technical and financial parameters as the previous AMEC estimates, including cutoff grades, and metal prices. The Mineral Resource Estimate for this area is summarized in Table 6-4.

The mineralization in the resource extension is mainly located at or near the base of the intrusion at depths ranging from 390 m in the western part to 450 m in the eastern part. At the time, the underground Mineral Resource was open to the east.

Table 6-4: East Beaver Lake Mineral Resources

	Tonnage (000's t)	Grade								
		Pt Eq	Pt	Pd	Rh	Au	Ag	Cu	Ni	Co
		(g/t)						(%)		

Indicated	339	4.25	1.71	1.64	0.08	0.11	3.3	0.55	0.26	0.011
Inferred	260	2.95	1.26	1.22	0.06	0.09	2.2	0.38	0.15	0.007
		Contained Metal								
		Pt Eq	**Pt**	**Pd**	**Rh**	**Au**	**Ag**	**Cu**	**Ni**	**Co**
		Ounces (000's)						**Tonnes (000's)**		
Indicated		46	19	18	1	1	36	2	1	-
Inferred		25	11	10	-	1	19	1	-	-

6.2.3 March 17, 2011, AMEC Resource Estimate

The AMEC March 17, 2011, Resource Estimate was based on 528 drill holes (97,676 m) and 22,698 core samples (Table 6-5 and Table 6-6). AMEC created two block models for the Current deposit comprising one for potential open pit mineralization and one for potential underground mineralization. The block models produced were regular models without sub-blocks or percent models. Wireframe models representing topographical, geological, and grade shell boundaries were generated in GEOVIA GEMS™ (GEMS) and MineSight software from available drill hole data and digitized geological cross section interpretations provided by Magma Metals (Canada) Limited staff. The topographic surface was modelled as a wireframe in GEMS from a 2009 LIDAR digital elevation model provided by Magma Metals.

The original drill core samples were composited to 1 m standard lengths for outlier analysis and grade capping studies. The 1 m composites were subsequently composited to 2 m for exploratory data analysis, continuity analysis (variography), and interpolation.

AMEC conducted outlier studies on the composited grade data for nine grade elements and compounds: Ag, Au, Co, Cu, magnesium oxide (MgO), Ni, Pd, Pt, and sulphur (S). High grade outliers in the low grade shell were capped; no additional special treatment or restrictions were accorded to the capped 2 m composites during interpolation in the low grade shells. The high grade outliers in the high grade shell were not capped; instead, a restricted interpolation search strategy was used to reduce the predicted metal indicated by the capping study targets. Outlier restriction for 2 m composites in the high grade shell plus near-massive to massive sulphides was implemented during grade interpolation by limiting the search distance to a specified maximum for composites with grades above a selected threshold. Beyond the maximum distance, the composites above the threshold were not used for grade interpolation.

Variography was performed to establish continuity ranges. Unit sill variograms (correlograms) were calculated and modelled for Pt, Pd, Cu, Ni, and MgO.

To account for a portion of the Ni and Co occurring as silicate minerals, Ni, and Co in sulphide were estimated by linear regression of MgO to total Ni and total Co, respectively. The portion of metal occurring in silicates is unrecoverable and therefore, must be accounted for. In ultramafic rocks where the dominant silicate minerals are olivine and orthopyroxene, the amount of MgO provides an indication of the amount of unrecoverable Ni and Co.

AMEC also reviewed the potential for deriving a regression equation to estimate rhodium (Rh) content. AMEC cautions that the Rh regression should only be considered to be appropriate to provide order-of-magnitude results that cannot be relied upon for mine planning or detailed revenue estimates.

SG (density) was estimated by linear regression of the estimated gram per tonne Pt + Pd grades in the open pit and underground block models.

Ordinary kriging (OK) and inverse-distance weighting to the first power (IDW) were used for grade interpolation for the Mineral Resource Estimate. Ordinary kriging was used as the estimator for Cu, MgO, Ni, Pd, and Pt. Inverse-distance weighting to the first power was used for Ag, Au, Co, and S. A nearest neighbour (NN) interpolated block model was used as a means of creating declustered statistics for block model estimation validation.

Estimates were verified by a combination of model volume checks, verification of global statistics, Herco, and swath plots. No errors were noted with the estimations.

Classification of Mineral Resources was based on a combination of grade and geological continuity, and distances to the nearest drill hole.

Table 6-5: March 17, 2011, AMEC Open Pit Mineral Resource Statement

Category	Quantity Tonnage (t x 1,000)	Grade									Contained Metal								
		Pt (g/t)	Pd (g/t)	Rh (g/t)	Au (g/t)	Ag (g/t)	Cu (%)	Ni (%)	Co (g/t)	Pt Eq (g/t)	Pt (oz x 1,000)	Pd (oz x 1,000)	Rh (oz x 1,000)	Au (oz x 1,000)	Ag (oz x 1,000)	Cu (t x 1,000)	Ni (t x 1,000)	Co (t x 1,000)	Pt Eq (oz x 1,000)
Indicated	8,460	1.04	0.98	0.04	0.07	1.5	0.25	0.18	140	2.13	282	266	12	18	411	21	15	1	580
Inferred	53	0.96	0.89	0.04	0.07	1.6	0.22	0.18	142	2.00	2	2	—	—	3	—	—	—	3

Notes to Accompany Open Pit Mineral Resource Table

1. The Mineral Resource categories under Joint Ore Reserves Committee (JORC) Code (2004) are the same as the equivalent categories under CIM Definition Standards for Mineral Resources and Mineral Reserves (2010).
2. The portion of the Mineral Resource underlying Current Lake is assumed to be accessible and that necessary permission and permitting will be acquired.
3. Strip ratio (waste to ore) of 9:1.
4. The open pit Mineral Resource is reported at a cutoff grade of 0.59 g/t Pt Eq within a Lerchs-Grossman resource pit shell optimized on Pt Eq.
5. The contained metal figures shown are in situ.
6. No assurance can be given that the estimated quantities will be produced.
7. The Pt Eq formula is based on assumed metal prices and overall recoveries.
8. All figures have been rounded; summations within the tables may not agree due to rounding. Tonnages and contained metal values are rounded to the nearest 1,000 tonnes, grades are rounded to two decimal places;
9. Tonnage and grade measurements are in metric units. Contained ounces are reported as troy ounces.

Table 6-6: March 17, 2011, AMEC Underground Mineral Resource Statement

Category	Quantity Tonnage (t x 1,000)	Grade									Contained Metal								
		Pt (g/t)	Pd (g/t)	Rh (g/t)	Au (g/t)	Ag (g/t)	Cu (%)	Ni (%)	Co (g/t)	Pt Eq (g/t)	Pt (oz x 1,000)	Pd (oz x 1,000)	Rh (oz x 1,000)	Au (oz x 1,000)	Ag (oz x 1,000)	Cu (t x 1,000)	Ni (t x 1,000)	Co (t x 1,000)	Pt Eq (oz x 1,000)
Indicated	1,030	1.63	1.51	0.08	0.11	2.4	0.39	0.24	172	3.48	54	50	2	4	80	4	3	—	115
Inferred	212	1.40	1.29	0.06	0.09	1.9	0.34	0.23	158	3.00	10	9	—	1	13	1	—	—	20

Notes to Accompany Underground Mineral Resource Table

1. Mineral Resources are reported to commodity prices of US$875/oz Au, US$14.30/oz Ag, US$13/lb Co, US$2.10/lb Cu, US$7.30/lb Ni, US$400/oz Pd, US$1,470/oz Pt and US$4,000/oz Rh;
2. Mineral Resources are defined within mineable underground shapes;
3. Underground Mineral Resources are reported to a Pt Eq value of 1.94 g/t;
4. Tonnages and contained metal values are rounded to the nearest 1,000 tonnes, grades are rounded to two decimal places;
5. Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content;
6. Tonnage and grade measurements are in metric units. Ounces are reported as troy ounces.

6.2.4 January 18, 2021, Nordmin NI 43-101 Technical Report and Mineral Resource Estimate

The January 18, 2021, Mineral Resource Estimate prepared by Nordmin contained two elements. The first was a maiden resource for the Escape deposit and the secondly an update to the Current deposit utilizing updated metal pricing. Metal pricing was based on a three-year trailing average for all elements except Co which used a 2-year trailing average as summarized in Table 6-7. The Escape deposit resource was based on 122 drill holes (40,855 m) of diamond drilling from 2008 to 2020 constituting approximately 13,000 multi-element analysis, whereas the Current deposit was defined by approximately 730 drill holes for a cumulate total of approximately 162,997 m completed between 2006 to 2020 which constitute approximately 35,000 multi-element analysis.

Nordmin modelled the grade distribution for each element (Pt, Pd, Ni, Cu, Co, Ag, Au, Rh) separately and generated wireframe grade shells (high, medium, low grade and background) for each with considerations of lithology and geochemical differences along with sulphide abundance. Grade capping was carried out for select elements followed by compositing assays to 1 m intervals. Mineralization wireframes were generated on 10 m to 20 m sections and plans and adjusted between different perspectives to smooth the connecting wireframes. Block models with 5 m x 5 m x 5 m dimensions were generated by estimating and combining blocks for each domain using an ordinary kriging interpolant.

Table 6-7: Commodity Prices Used in the Resource Calculations

Commodity	Units	Assumption (US$)
Pd	per oz	$ 1,516.82
Pt	per oz	$ 902.38
Ag	per oz	$ 17.35
Au	per oz	$ 1,469.60
Cu	per lbs	$ 2.87
Ni	per lbs	$ 6.15
Cobalt (Co)	per tonne	$ 34,839.16
Rh	per oz	$ 4,910.67

The Mineral Resource Estimate was defined on a Pd Eq cutoff grade to reflect processing methodology and assumed revenue streams from Pt, Pd, Au, Ag, Cu, Ni, Co and Rh. The mineral estimate was based on underground mining methods and milling with flotation/cyanidation concentration processing method. The cutoff utilized was US$77/tonne (C$101/tonne) insitu contained value, 1.58 g/t Pd Eq or 2.65 g/t Pt Eq. Results of the resource estimation are summarized in Table 6-8 as grade and tonnes and Table 6-9 as contained metal.

Table 6-8: January 20, 2021, Nordmin Mineral Resource Estimate for Current and Escape Deposits

Category	Tonnes	Pt (g/t)	Pd (g/t)	Au (g/t)	Ag (g/t)	Rh (g/t)	Co (g/t)	Cu (%)	Ni (%)	Pt Eq (g/t)	Pd Eq (g/t)
Indicated Current Deposit	11,999,177	1.48	1.40	0.07	1.32	0.04	137	0.28	0.17	5.79	3.44
Indicated Escape Deposit	4,286,220	0.92	1.18	0.12	2.45	0.06	209	0.52	0.28	6.16	3.67
Total Indicated Resource	**16,285,397**	**1.33**	**1.34**	**0.08**	**1.62**	**0.05**	**156**	**0.34**	**0.20**	**5.89**	**3.50**
Inferred Current Deposit	6,406,960	0.68	0.65	0.06	0.95	0.01	123	0.30	0.14	3.40	2.02
Inferred Escape Deposit	3,445,179	0.64	0.73	0.07	1.13	0.00	173	0.33	0.18	3.75	2.23
Total Inferred Resource	**9,852,138**	**0.67**	**0.68**	**0.07**	**1.01**	**0.01**	**140**	**0.31**	**0.15**	**3.52**	**2.10**

Table 6-9: January 20, 2021, Nordmin Mineral Resource Estimate for Current and Escape Deposits, Contained Metal

Category	Tonnes	Pt (oz)	Pd (oz)	Au (oz)	Ag (oz)	Rh (oz)	Co (tonnes)	Cu (tonnes)	Ni (tonnes)	Pt Eq (oz)	Pd Eq (oz)
Indicated Current Deposit	11,999,177	569,176	538,181	26,121	508,434	16,998	1,649	33,751	20,969	2,233,575	1,328,789
Indicated Escape Deposit	4,286,220	127,090	162,337	16,928	337,946	8,009	896	22,390	12,016	849,481	505,369
Total Indicated Resource	**16,285,397**	**696,266**	**700,517**	**43,050**	**846,380**	**25,008**	**2,544**	**56,141**	**32,985**	**3,083,056**	**1,834,158**
Inferred Current Deposit	6,406,960	140,400	133,333	12,888	195,484	18,360	785	19,155	9,113	700,621	416,810
Inferred Escape Deposit	3,445,179	70,520	80,989	7,754	124,809	71	595	11,293	6,046	414,932	246,850
Total Inferred Resource	**9,852,139**	**210,919**	**214,322**	**20,642**	**320,293**	**1,907**	**1,380**	**30,449**	**15,159**	**1,115,553**	**663,660**

6.3 Historical Mineral Reserve Estimate

There are no historical Mineral Reserve estimates calculated for the Project.

6.4 Past Production

There is no past production of the Project.

7. GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The Project is hosted within the Quetico Terrane (Subprovince) of the Superior Province of the Canadian Precambrian Shield (Figure 7-1). The Quetico Terrane is interpreted as a fore-arc accretionary prism deposited during and after peak volcanic activity within the adjacent Wawa, Wabigoon, and Abitibi Terranes between 2,698 and 2,688 million years ago. The terrane is about 70 km wide and forms a linear strip of moderately to strongly metamorphosed and deformed clastic metasedimentary rocks and their melt equivalents.

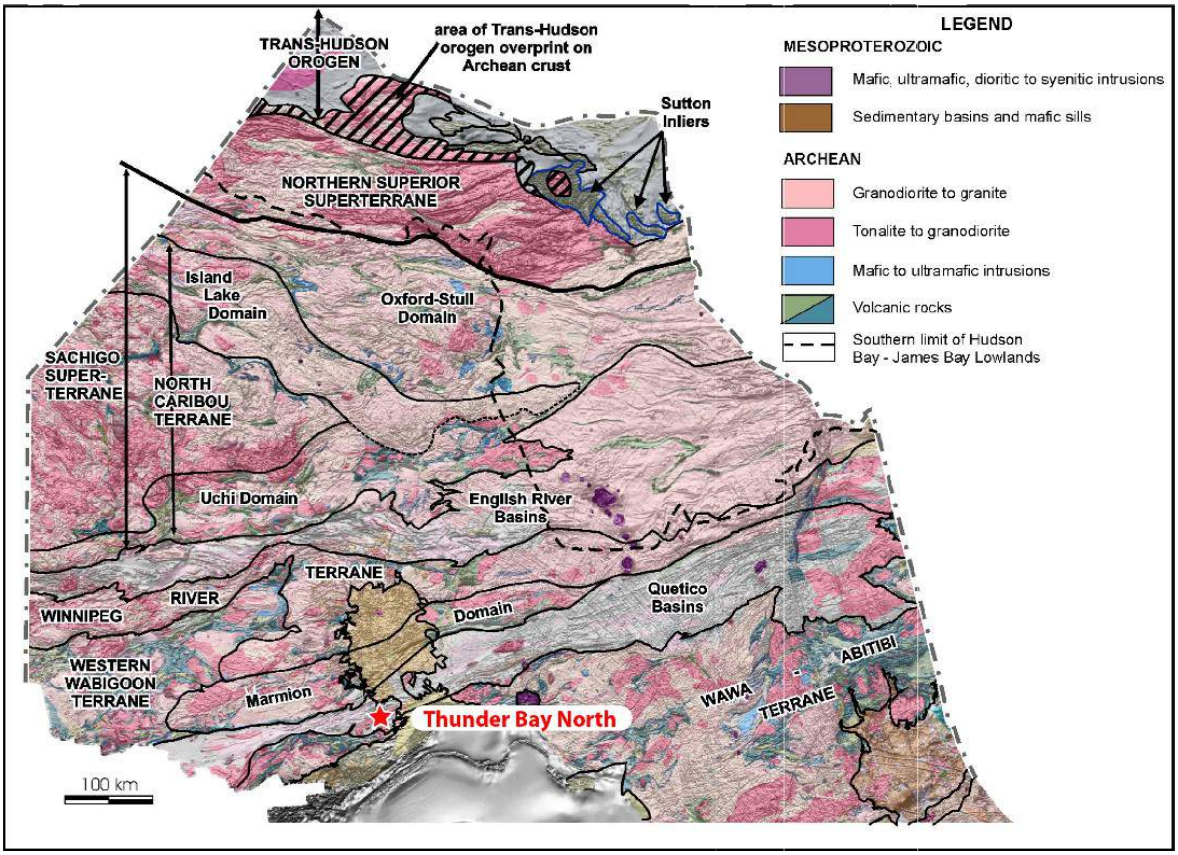


Figure 7-1: Regional geology (after Stott et al. 2007)

Sedimentary rocks that have been identified include turbiditic greywacke and siltstone with rare iron formation, pelite (mudstone), and conglomerate, which were deposited within a large, laterally extensive, submarine basin. Volcanic rocks are extremely rare; however, intrusive rocks are common. These comprise biotite–hornblende–magnetite granitoid bodies of mixed felsic and mafic composition with volumetrically minor ultramafic units; and one- and two-mica granitoids. The igneous activity is interpreted to have occurred some five million years to 20 million years after the accumulation of the sedimentary pile.

Overlying the Quetico Terrane rocks in the Lake Superior region are sediments of the 1,860 mega annum (Ma), Paleoproterozoic Animikie Group. These rocks, in the Thunder Bay area, rest unconformably upon Archaean basement and form a homoclinal sedimentary sequence consisting of Gunflint Formation chemical sediments and argillites overlain by Rove Formation shales and greywackes.

At about 1,590 Ma, the Mesoproterozoic Badwater Intrusion was emplaced, followed, at about 1,537 Ma, by the intrusion of the English Bay igneous complex.

Sediments of the Sibley Group unconformably overlie the Animikie Group south of Lake Nipigon, and consist of quartz arenite, argillaceous dolomite, and mudstones. These have an age date range of 1,670 Ma to 1,450 Ma.

The final Proterozoic event was deposition of the Mesoproterozoic (1,140 Ma to 1,090 Ma) Keweenawan Supergroup, comprising a thick edifice of subaerial lava flows, local concentrations of intrusive rocks, and an upper sequence of sedimentary rocks that were deposited within normal, fault-bounded, and asymmetric grabens, developed within and marginal to the Mid-Continent (Keweenawan) Rift.

The rift, now largely beneath Lake Superior, contains as much as 30 km of fill, with volcanic rocks comprising about two-thirds of the total (Miller, 2007). Geophysical data also suggest that a volume of magma nearly equivalent to that filling the rift underplated the crust (Miller, 2007). Considering the rift fill, the volume of underplated material, and the unknown amount of eroded material, the MCR is one of the world's largest Large Igneous Provinces and is an important emerging Cu-Ni–PGE province.

Mafic to ultramafic intrusive rocks in Ontario and Minnesota, related to the formation of the Keweenawan Supergroup, include:

- Voluminous, laterally extensive diabase sills and associated dykes (Nipigon, Logan, and Pigeon River Sills)
- Moderate to very large-size composite and layered mafic intrusions (Duluth Complex, Crystal Lake Gabbro)
- Layered and differentiated ultramafic intrusions (Seagull, Hele, Kitto, and Disraeli Intrusions)
- Volumetrically minor, ultramafic, conduit-like intrusive complexes (Thunder Bay North Intrusive Complex)

The layered and differentiated Seagull, Hele, Kitto, and Disraeli ultramafic intrusions that are hosted within and adjacent to the Nipigon Basin (one arm of the failed MCR valley extended north to Lake Nipigon in Ontario, forming the Nipigon Embayment or Basin) are recognized as hosting disseminated Ni, Cu, and platinum group element (PGE) sulphide mineralization. The intrusions appear to be primarily sill-like with the exception of the Seagull Intrusion, which has a distinct lopolithic form. Intrusion emplacement appears to have been fault controlled, but no distinct magma feeder zones to the intrusions have been identified.

The Duluth Complex and Crystal Lake gabbro also host low grade Cu-Ni-PGE mineralization. The Duluth Complex consists of a large composite intrusion of primarily anorthosite, troctolite, and gabbro derived from periodic tapping of an evolving magma source. The complex formed from up to 40 separate sheet-like and cone-shaped sub-intrusions. Low–medium-grade Cu-Ni sulphide mineralization that locally contains anomalous PGE concentrations were identified in the basal zones of the Partridge River and South Kawishiwi intrusions near the northwestern contact of the Complex. At least nine deposits have been delineated in the basal 100 m to 300 m of both intrusions. At Crystal Lake, PGE-bearing sulphide Ni mineralization is associated with taxitic textures in a medium- to coarse-grained gabbro.

The conduit-like intrusion hosting PGE-rich Cu and Ni, sulphide mineralization at the Current deposit is the first of that type recognized in the province. The Current deposit is just one of at least five intrusions, or groups of intrusions comprising the Thunder Bay North Intrusive Complex and is part of a network of magma conduits or chonoliths formed in association with the Keweenawan-age MCR. The Current deposit has been precisely dated by the Geological Survey of Canada at 1106.6 ± 1.6 MY using the U-Pb zircon dating method (Bleeker, 2020).

7.2 Thunder Bay North Project Geology

Within the Project area the main rock types are Archean-age granitoid and metasedimentary rocks of the Quetico Terrane, and Mesoproterozoic-age Keweenawan Supergroup mafic to ultramafic intrusive rocks and related intermediate to mafic hybrid intrusive rocks of the MCR. The MCR-related intrusive rocks exhibit PGE-Cu-Ni mineralization to some extent (Figure 7-2). The Current, Escape, and Lone Island Lake North and South intrusions appear to be connected by the diffuse East West Complex which consists of a series of moderately-dipping hybrid sills and dykes that are confined to the Escape Lake Fault Zone which comprises the southernmost part of the Quetico Fault system. The Lone Island Lake South Intrusion is locally mineralized, whereas the Lone Island Lake North Intrusion is not. The 025 Intrusion is located 3 km north-northwest of Current Lake and is the only mineralized intrusion within the Thunder Bay North Complex that is not directly associated with the Quetico Fault Zone and is the only intrusion within the complex where peridotite is exposed in outcrop. To date significant quantities of mineralization have only been identified within the Current and Escape intrusions. The Current deposit is hosted within the Current Intrusion and the Escape HGZ, Ribbon, and Steepledge North, and Steepledge South mineralized zones are hosted by the Escape Intrusion.

Rock types present within the Project consist of (from oldest to youngest):

- Voluminous, laterally extensive diabase sills and associated dykes (Nipigon, Logan, and Pigeon River Sills);
- A variety of variably deformed Archean-age felsic to intermediate granitoid rocks including granodiorite, diorite, tonalite, and pegmatitic leucogranite;
- Strongly deformed and metamorphosed Archean-age clastic metasedimentary rocks identified as wacke, siltstone, rarely pelite (mudstone), and paragneiss;
- Relatively undeformed discrete, late, Archean-age intrusions composed of magnetic granodiorite, monzonite, and rarely granite; and
- Mesoproterozoic diabase dykes, and occasionally sills of several swarms, mainly the Nipigon swarm.
- Relatively undeformed, practically unmetamorphosed mafic to ultramafic intrusive rocks of the various intrusions comprising the Thunder Bay North Intrusive Complex including varitextured and layered gabbro, olivine melagabbro, feldspathic lherzolite, and lherzolite; these rocks are closely associated with a variety of earlier, genetically related, hybridized, intermediate to mafic intrusive rocks that comprise the initial (preparatory) intrusive phases for the complex.

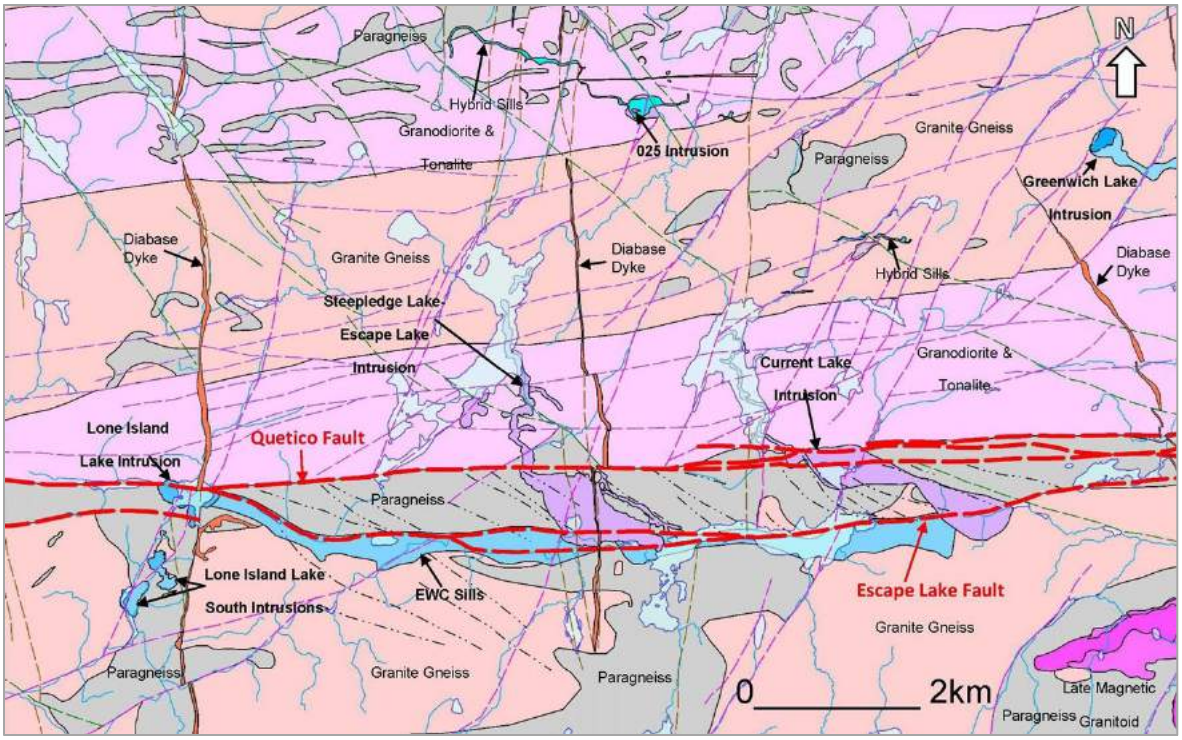


Figure 7-2: Thunder Bay North Project geology map

Most of the presently known mineralization is hosted in both the Current and Escape intrusions, which are just two of at least five Keweenawan (Mesoproterozoic) age magmatic conduits that formed within the Project boundaries along the failed continental margin rift that comprises the MCR system. This group of related intrusions were collectively referred to as the Thunder Bay North Intrusive Complex. There are several distinct, but genetically related rock-type phases present within the various intrusions comprising the complex.

The initial, preparatory phase of the both the Current and Escape intrusions is the lithologically complex and hybridized sequence called hybridized mafic intrusions (the "Hybrid") that contain large quantities of incorporated country rock. Within the Current Intrusion, the composition of the Hybrid in close proximity to the Current deposit, where it is relatively thin, is a variable mixture of leucogabbro, leucotroctolite, and monzonite. The Hybrid begins to thicken over the Beaver Lake East Zone of the Current deposit and continues to thicken to the southeast where it forms a saucer-shaped, well-fractionated mafic to intermediate intrusion composed of monzonite, diorite, leucogabbro, gabbro, ferro-gabbro, and oxide gabbro. The Hybrid was forcefully intruded along flat-lying structures and up-dip along the faulted east-trending granitoid– metasedimentary rock contact. It consists of red (hematized, upper) and grey (non-hematized, lower) varieties that usually contain amygdules (infilled gas bubbles) or ocellae (immiscible liquids drops) of calcium carbonate. The red hybrid often contains subround to subangular xenoliths of silica which may represent remnants of assimilated country rock. Locally the hybrid phases form intrusion breccias containing fragments of the local country rocks. This fractionated, often complex sequence of rocks occurs stratigraphically above the mineralized olivine-bearing to olivine-rich phases and is never mineralized. Thicker intervals of the Hybrid are obviously fractionated and appear to have been primarily static after emplacement with little to no evidence identifiable evidence of sustained flow.

The contact between mafic to intermediate Hybrid phases and ultramafic olivine melagabbro to lherzolite phases, is typically sharp, but locally can be gradational over one to two metres. The olivine melagabbro-lherzolite body forms the shallowly southeast plunging mineralized magmatic conduit hosting the Current, Bridge, Beaver West, Beaver, Beaver East, and 437 Zones within the Current Intrusion. The ultramafic portion of the Current conduit does not vary much along its traced strike length of over 5 km. The rocks usually exhibit a magmatic foliation defined by elongated olivines; however, there are no internal contacts within the olivine melagabbro-lherzolite, and the only change noted is an inward decrease of plagioclase from the contacts to the centre of the intrusion. There is localized evidence within the Current Zone that there were once two active conduits, one above the other, that eventually merged together. However, to the southeast within the same Current Intrusion, there is no evidence for two conduits.

The Escape Intrusion exhibits a shallow, south- to southeast plunge, is larger and more lithologically complex than the Current Intrusion, and changes dramatically from north to south. The northern portion of the intrusion is a tall hourglass- shaped tube (chonolith) exhibiting ample evidence of the presence of two, possibly three merged conduits and is primarily ultramafic in composition (olivine melagabbro to peridotite). Disseminated mineralization can occur anywhere within the northern ultramafic part of the body. South of the Quetico Fault the intrusion begins to change from a multi-level tube to a tabular body with a fluted top and bottom. Unlike the Current Intrusion, the Escape Intrusion, particularly within the Escape Property has lithologically distinct upper and lower portions and locally contains gabbroic autoliths. The lower part of the intrusion is similar to Current Intrusion with magmatically foliated olivine melagabbro in contact with a peridotite inward and with depth with an olivine pyroxenite occurring at the base of the body as well as locally at the contact with the upper half of the intrusion. The upper part of the intrusion is a locally vari-textured, locally rhythmically layered gabbro, and olivine gabbro. Mineralization occurs mainly within the upper gabbroic portion in the north, but in the south mineralization generally occurs within the ultramafic portion.

The mineralized portion of both the Current Intrusion and the Escape Intrusion comprise active conduits where there was long-term magma flow and primarily consist of olivine-bearing to olivine-rich mafic to ultramafic intrusive rocks that physically and stratigraphically underlie the hybrid phases and are in sharp contact with it.

- Within the Current Intrusion, the mineralized rocks consist of olivine-bearing to olivine-rich, fine-grained plagioclase-rich two-pyroxene peridotite (at the margins of the intrusion) that grades into plagioclase-bearing to plagioclase-poor (feldspathic), two-pyroxene peridotite (lherzolite containing both clinopyroxene and orthopyroxene) at the core of the intrusion. This plagioclase-rich rock is referred to in Magma Metals (Canada) Limited/Panoramic drill logs as olivine melagabbro and the term, even though describing a rock that is essentially a feldspar-rich lherzolite, has been retained for continuity. All contacts between these two olivine-rich rocks within the intrusion are gradational over metres to tens of metres.
- Within the Escape Intrusion the olivine-bearing to olivine-rich phases are texturally different and are arranged in a more complex manner than similar phases within the Current Intrusion. The upper portion of the olivine-bearing phases consist of a fine-grained olivine gabbro to olivine melagabbro which directly overlies, and is in sharp contact with, a medium-grained feldspathic peridotite which preliminary petrographic work suggests is a wehrlite (a peridotite containing only clinopyroxene and no orthopyroxene). As is observed in the Current Intrusion only the olivine-bearing phases contain mineralization. Fine-grained olivine gabbro to melagabbro often underlies the medium-grained peridotitic phase.

7.3 Property Mineralization

Mineralization discovered within the Property to date is considered to be somewhat atypical of orthomagmatic Cu-Ni sulphide deposits, in particular part of the sub-class of deposits associated with rift and flood basalts and their associated magmatic conduits (Noril'sk type: Naldrett 2004). What makes the conduit-hosted mineralization identified to date within the Property atypical is the PGE- and Cu-rich nature and lack of large Ni-rich massive sulphide accumulations such as those observed at Voisey's Bay and Noril'sk. There still remains the potential for large massive sulphide bodies within both the Current and Escape intrusions.

Most of the presently known mineralization is hosted within the Current and Escape intrusions, although disseminated Pt-Pd-Cu-Ni mineralization has also been observed within the Lone Island and 025 intrusions. These intrusions comprise four of the at least five Keweenawan (Mesoproterozoic) age magmatic conduits present along the northwestern edge of the MCR system within the Project boundaries. This group of related intrusions have been collectively termed the Thunder Bay North Intrusive Complex (Figure 7-3).

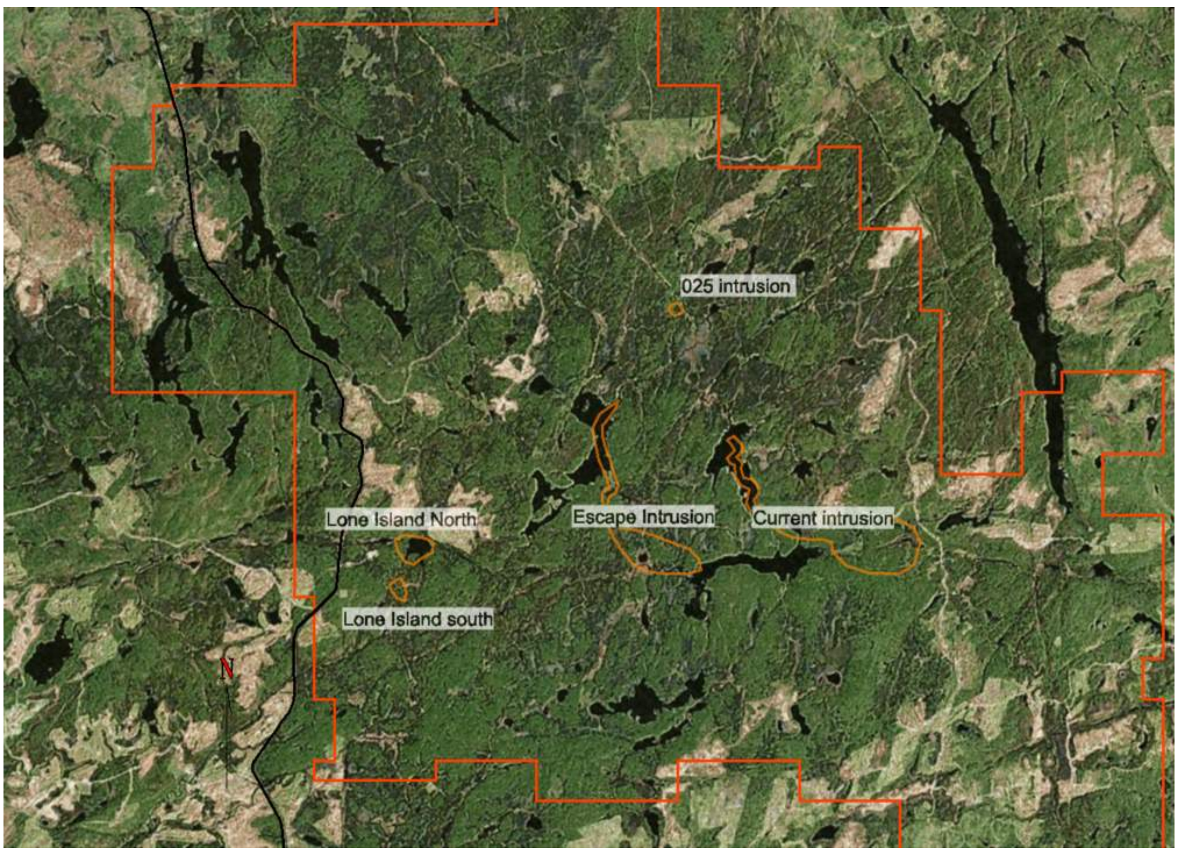


Figure 7-3: Intrusions contributing to the Thunder Bay North Intrusive Complex outlined in orange. Project property claim outline shown on satellite imagery background (Microsoft Bing).

7.3.1 Current Deposit

The Current deposit has six well defined zones of mineralization that are contiguous along the plunge of the intrusion. Escape deposit has three well defined zones of mineralization that were used within the current Mineral Resource Estimate.

In almost all cases, mineralization within both deposits, and corresponding zones are hosted by variably felspathic lherzolite and olivine melagabbro. The drill-defined length of the Current deposit is approximately 4.0 km, and the drill-defined strike length of the Escape deposit is approximately 3.6 km (Figure 7-4).

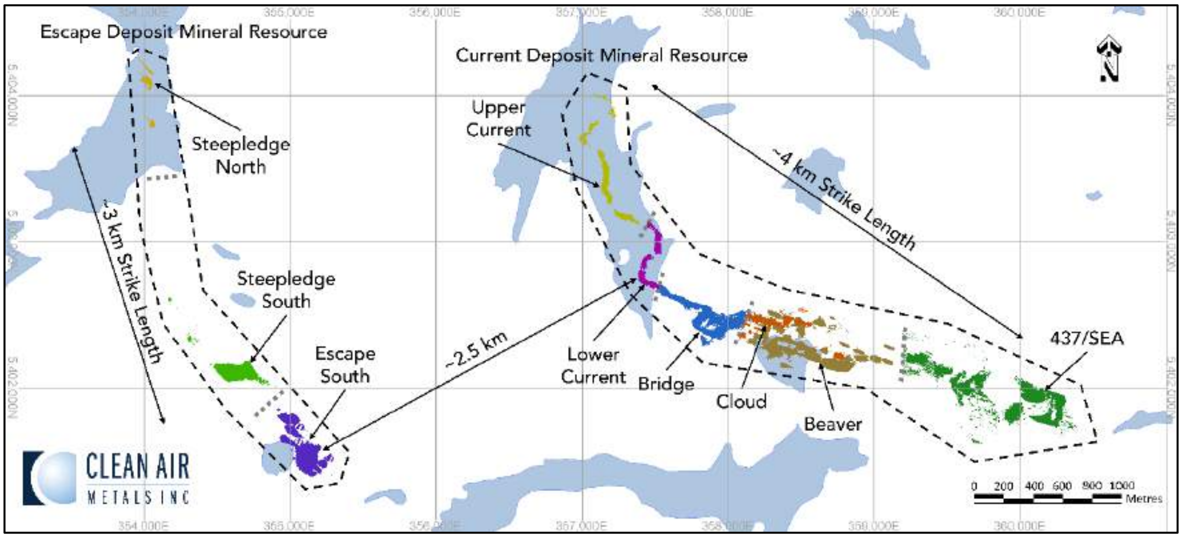


Figure 7-4: Plan View of Escape and Current Deposits with block models of mineralized zones

Other zones do exist within both of the intrusions and are discussed in this Section; however, they are not part of the current Mineral Resource Estimate.

7.3.1.1 Upper Current/Current Zone

The Current Zone, discovered in late 2006 by Magma Metals, is hosted within a sub-horizontal to gently south-southeast plunging, narrow, oval to bell-shaped magmatic conduit (or chonolith), which is part of the Current Lake Intrusion. The zone ranges from 30 m to 50 m in width and up to 70 m in height, mainly underlying Current Lake. The Current Zone is hosted within medium- to coarse-grained S-type granitoid rocks of Archean (Quetico) age. The olivine melagabbro to feldspathic lherzolite comprising the conduit contains sulphide mineralization consisting of a few percent to locally greater than 25%, predominantly finely disseminated pyrrhotite, pentlandite, chalcopyrite, pyrite, and rare cubanite, and violarite that are interstitial to the silicate gangue.

7.3.1.2 Bridge Zone

The Bridge Zone comprises the eastern portion of the Current Zone before the tube-like conduit begins to transition into a tabular body within the Beaver West Zone. Mineralization is generally similar to that observed within the Current Zone; however, there are several small, elongated, limited strike-extent net-textured to massive sulphide pools present locally. This zone becomes increasingly bottom-loaded to the east where it joins with the Beaver West Zone.

7.3.1.3 Cloud Zone

The Cloud Zone was discovered in 2008 and is a distinct low sulphide, high-tenor zone that occurs near the roof of the Beaver Zone of the Current Intrusion and transitions to the west into the upper part of the Beaver West Zone. It comprises a diffuse, irregular cloud of <1% very finely disseminated chalcopyrite and some pyrrhotite that is often very difficult to see visually. This zone is often so subtle that the sulphides comprising it cannot be distinguished in hand specimen until they tarnish after several weeks exposure to the air. The Cloud Zone may continue to the east and southeast from where it has been presently defined, but it has not been drilled off enough to confirm this supposition.

7.3.1.4 Beaver Zone

The Beaver Zone was also discovered in late 2007 by Magma Metals (Canada) Limited and occurs within the larger, tabular, Beaver portion of the intrusion. It exhibits a shallow east–southeasterly plunge and increases from a width of 100 m and a thickness of 15 m to a width of 550 m and a thickness of 150 m to 175 m in the east. Mineralization is primarily developed in the basal portions of the intrusion (bottom-loaded) within variably feldspathic lherzolite. The sulphide mineralogy is similar to that of the Current Zone and includes pyrrhotite, pentlandite, chalcopyrite, pyrite, and rare cubanite. Sulphide mineralization is primarily finely disseminated to locally finely net-textured, ranging from a few percent to >25% sulphides, and is also interstitial to the silicate gangue. Rarely, small massive sulphide pods of limited strike-extent or thickness occur locally.

7.3.1.4.1 Beaver West Zone

The Beaver West Zone, discovered in late 2007 by Magma Metals, is the eastern part of what AMEC Americas called the Bridge Zone in their 2010 and 2011 Reports. This zone has been kept as a separate zone because it contains several different mineralization trends (at least 2, possibly 3) with directions differing greatly from the mineralized trends observed within other parts of the Current chonolith system. When examined closely the mineralization within the Beaver West Zone forms an interlocking mesh partially contained within depressions within the floor of the intrusion. The azimuths of the two main trends are 110° to 120° and 045° to 055°. A possible third trend is at 030° to 040°. This part of the Current deposit is mostly contained within the Quetico-age metasedimentary rocks located immediately south of the Quetico Fault. It is roughly triangular in shape and forms the transition zone between the Bridge and Beaver zones. It is characterized by a narrow southeast entrance and an even narrower northwest exit and is located immediately east of where the Bridge Zone tube transitions into a tabular body as it crosses over the Quetico Fault. The thickness of the intrusion hosting the Beaver West Zone is quite variable with an irregular floor hosting several thermally-eroded depressions that sometimes host small, linear massive sulphide pools overlain by variable thicknesses of net-textured sulphides (greater than 25%) grading upward into finely disseminated sulphides. Sulphide mineralogy is similar to that of the Current and Bridge Zones and includes pyrrhotite, pentlandite, chalcopyrite, pyrite, and rare cubanite. The Beaver West Zone is probably the best mineralized portion of the mineralized Current intrusive system and is host to the greatest proportion of the massive sulphide concentrations intersected during drilling by Magma Metals.

7.3.1.4.2 Beaver East Zone

The Beaver East Zone comprises the southeasterly extension of the Beaver Zone past that portion of the system that was included within the 2010 AMEC historic Mineral Resource Estimate, and it is essentially continuous with the Beaver Zone. The intrusion in this area is up to 200 m thick and about 550 m in width. This zone exhibits the same shallow plunge and extends the Beaver mineralization a further 630 m to the east-southeast. Mineralization is finely disseminated, ranging from a few percent to >25% sulphides, is interstitial to the gangue, and primarily occurs within linear, thermally-eroded depressions within the base of the Beaver portion of the Current Intrusion.

7.3.1.5 437/SEA Zone

The relatively deep (approximately 650 m below surface), poorly defined 437 Zone was discovered in late 2011 and comprises a separate mineralized zone located approximately 300 m southeast of the Beaver East Zone. It occurs within the eastern part of the Current Intrusion where the intrusion morphology transitions from a steep-sided trough to a more open basal feature merging into the SEA portion of the Current Intrusion. Mineralization ranging from a few percent to about 25% disseminated is identified within at least one channelized setting within a homogenous peridotite.

7.3.2 Escape Deposit

The Escape Intrusion was tested by 121 holes drilled between 2008 and 2020 and is much less well defined compared to the Current deposit (708 holes). This intrusion has a drill and magnetically-defined strike length of approximately 4.6 km. There are presently three mineralized zones defined within the Escape Intrusion, which are from north to south: Steepledge North; Steepledge South; and the Escape HGZ. A fourth zone is the variably disseminated mineralization intersected between the Steepledge South and the Escape South HGZ by drill holes from both RTEC and Clean Air. This diffuse, relatively narrow, sub-horizontal band of disseminated variable-grade mineralization is hereby termed the Ribbon Zone.

7.3.2.1 Steepledge North

The Steepledge North was discovered by Magma Metals (Canada) Limited in late 2008 and consists of a poorly defined, approximately 200 m long, weakly to locally moderately mineralized zone located beneath the central and southern portions of Steepledge Lake. In this area the mineralization and the conduit are similar to that observed within the Current Zone 3 km to the east; however, the grades are much lower, and the conduit is wider and thicker (50 m to 75 m wide and up to 100 m in height). Mineralization is finely disseminated, ranging from a few percent to <5% sulphides (pyrrhotite and chalcopyrite), and is interstitial to gangue minerals.

7.3.2.2 Steepledge South

The Steepledge South was discovered in 2010 and comprises a roughly approximately 300 m long, poorly drill-defined, irregular zone that is located within a geologically complex portion of the conduit where it transitions from an elongated, hourglass-shaped tube into complex tabular body. Where drill density allows, it is evident that the intrusion in this area consists of at least two, possibly more, separate conduits that have merged together. Mineralization is observed in multiple levels within the merged conduit. Mineralization is finely disseminated to locally finely stringered pyrrhotite and chalcopyrite, ranging from a few percent to 10 to 15% sulphides, and is interstitial to gangue minerals.

7.3.2.2.1 Ribbon Zone

The Ribbon Zone was discovered by RTEC in early 2008 and presently comprises a roughly approximately 350 m long, poorly drill-defined, elongate, relatively narrow, sub-horizontal, band of disseminated mineralization, similar to the more diffuse portions of the Beaver Zone within the Current deposit. Several RTEC and Clean Air holes have tested this zone; however, its actual shape and dimensions are not yet known. This zone most probably connects the Steepledge South and the Escape HGZ. Mineralization mainly consists of finely disseminated chalcopyrite and pyrrhotite ranging from a few percent to approximately 10% and occurs interstitial to gangue minerals.

7.3.2.3 Escape South

The Escape South Zone is a very well-mineralized, relatively flat-lying (sub-horizontal), elongated disk-like zone exhibiting an overlying and connected central sail and an underlying, discontinuous central keel. This mineralization overlies a localized, deep, steep-sided, thermally-eroded depression within the floor of the intrusion. The Escape South Zone was initially discovered by RTEC in 2011 who, by the end of 2012, had drilled seven holes into the central part of the zone. Drilling by the Company during 2020 showed that the zone consists of two distinct sub-zones:

1. Escape South HGZ; and
2. Escape South Perimeter Zone (Perimeter).

7.3.2.3.1 Escape South HGZ

The Escape South HGZ comprises a 200 m long, 100 m wide, and 10 m to 90 m thick heavily disseminated to net-textured zone that is located within a geologically complex portion of the southern Escape Intrusion. It is a tabular, sub-horizontal, relatively high grade sulphide body with an upper “fin” shape (sail) and a discontinuous lower "keel” shape that is always situated over, but not at the base of, a pronounced, localized, steep-sided, thermally-eroded depression in the floor of the intrusion. This zone represents the furthest south zone of identified mineralization in the Escape Intrusion and is situated proximal and to the north of the east-trending Escape Lake Fault Zone, which forms the southern margin of the regional, crustal-scale Quetico Fault Zone. The HGZ contains moderate to high grade Pt-Pd-Cu-Ni mineralization and is hosted within a medium-grained peridotite unit (variety wehrlite) which is usually in sharp contact with an overlying fine-grained olivine melagabbro and in sharp contact in places with an underlying fine-grained olivine melagabbro. The host peridotite is coarser-grained and more texturally variable than the fine-grained, relatively homogeneous lherzolite hosting the mainly disseminated mineralization in the Current Lake area. Mineralization mainly consists of heavily disseminated to net-textured pyrrhotite and chalcopyrite ranging from 15% at the margins of the zone up to about approximately 40% within the bulk of the zone.

7.3.2.3.2 Escape South Perimeter

The Escape South Perimeter Zone consists of finely disseminated, sub-horizontal wings of mineralization that extend outward in all directions from the Escape South HGZ Zone. This zone is thinner (generally between 5 m to 15 m thick) and contains 3% to 15%, finely disseminated sulphides (pyrrhotite and chalcopyrite) when compared to the usually net-textured HGZ that it encloses.

7.3.3 Satellite Occurrences

7.3.3.1 Lone Island South Intrusion

There is localized, finely disseminated pyrrhotite and chalcopyrite mineralization that is contact-proximal and is exposed at surface at the Lone Island South Intrusion. However, no distinct mineralized zones have been identified by surface sampling or limited diamond drilling. The lack of olivine-bearing phases and the general S-undersaturated nature of the rocks comprising the intrusion suggest that this intrusion is not prospective.

7.3.3.2 025 Intrusion

The 025 Intrusion is the only location within the Project where peridotite/olivine cumulate rocks are exposed in outcrop at surface. The fine-grained peridotite comprising most of the multi-outcrop exposure is very similar in appearance to that observed in boulders and drill core at Current Intrusion. The first of the three holes drilled the vicinity of the exposed conduit by RTEC in 2015 targeted the centre of the exposure with a vertical hole and intersected low grade mineralization. This mineralization consisted of approximately 1% finely disseminated pyrrhotite and chalcopyrite within fine-grained peridotite. The low percentage of sulphides present within an interval that contained up to 0.617 g/t Pd, 0.533 g/t Pt, 2130 ppm Cu, and 2110 ppm Ni suggests that the tenor of the sulphides was relatively high. Therefore, it remains an exploration target.

8. DEPOSIT TYPES

The descriptions provided within Section 8.1 and its subsections was summarized from several technical publications including Naldrett (2004) and Eckstrand et. al. (2007), and observations made by Allan MacTavish of Clean Air (and historical operators; Magma Metals (Canada) Limited and Panoramic).

8.1 Orthomagmatic Sulphide Deposits

Orthomagmatic sulphide deposits are sulphide mineral concentrations derived from immiscible sulphide liquids contained within mafic and ultramafic igneous rocks. When formed the immiscible sulphide liquid droplets move and eventually settle gravitationally through less dense silicate magma with the sulphide liquid acting as a "collector" for Co, Cu, Ni, PGE, and to a lesser degree iron (Fe). Due to the greater abundance of Fe most immiscible sulphide liquid is Fe-rich.

Orthomagmatic deposits occur in predominantly mafic to ultramafic igneous rocks in many different geological settings, including deformed greenstone belts, and calc- alkaline batholiths associated with convergent plate margins; ophiolite complexes that formed at constructive plate margins; intraplate magmatic provinces associated with flood basalt type magmatism; and passively rifted continental margins. Occasionally significant mineralization will occur below the host intrusion within diverse footwall country rocks comprising a wide variety of compositions.

Cu-Ni–PGE deposits can occur as individual sulphide bodies or as groups of sulphide bodies associated with one or more related mafic-ultramafic magmatic bodies in areas or belts up to tens, even hundreds, of kilometres in length.

Orthomagmatic sulphide deposits as a group are typically associated with:

- Major lithological changes; reversals or changes in crystallization order; discontinuities in mineral fractionation patterns and cyclic units; and abrupt changes in host intrusion morphology (i.e., sharp bends or widening in a conduit or channelized ultramafic flow);
- Within structurally low areas at the base of intrusions or flows;
- Rocks near the lower contact of an intrusion that may contain country rock xenoliths and may be characterized by irregular variations in grain size, mineralogy, and texture;
- Rocks near the base of an ultramafic volcanic flow that are down-flow from a sulphide source; and
- Pegmatoids and rocks enriched in minerals that crystallize late from silicate magmas.

The location of sulphide concentrations in conduits at Noril'sk-Talnakh and Voisey's Bay, and within, or near channelized flows in many komatiitic deposits, suggests that sulphides accumulated where the flow rate of magma was reduced, and the entrained sulphides were able to settle gravitationally to form rich basal concentrations.

There two main subsets of orthomagmatic sulphide deposits are:

8.1.1 Cu-Ni-(PGE) Dominant Orthomagmatic Sulphide Deposits

Cu-Ni-dominant sulphide deposits are generally high sulphide percentage deposits with Ni and Cu usually as the main economic metals. Ni usually constitutes the main economic commodity with Cu as either a co-product or by-product, and with Co, the PGE, and Au as common by-products. The magma containing sulphides that collect to form deposits entered the host intrusion already saturated in sulphide droplets that formed outside of the host intrusion and were then brought into the intrusion. This deposit subset can be subdivided into four subtypes:

- A meteorite-impact mafic melt sheet containing massive basal sulphide deposits (Sudbury, Ontario is the only known example).
- Rift and continental flood basalt-associated mafic sills, dyke-like bodies, and chonoliths (Noril'sk–Talnakh, Russia; Jinchuan, China; Duluth Complex, Minnesota; Eagle, Michigan; Voisey's Bay, Labrador; Current Lake, Ontario).
- Komatiite (magnesium-rich) ultramafic volcanic flows and related sill-like intrusions (Thompson, Manitoba; Raglan, Quebec; Kambalda and Agnew, Australia).
- Other mafic/ultramafic intrusions (Kotalahti, Finland; Råna, Norway; and Selebi-Phikwe, Botswana).

The Current deposit and the mineralization hosted within the various mafic-ultramafic intrusions comprising the Thunder Bay North Intrusive Complex are considered to be examples of this subset, in particular the subtype associated with magmatic conduits (chonoliths) in close association with continental rifts and flood basalts (Noril'sk- Talnakh, Voisey's Bay, Expo-Ungava and Eagle deposits).

8.1.2 PGE-Dominant Orthomagmatic Sulphide Deposits

PGE-dominant, low sulphide deposits, with the PGE's associated with low percentages of disseminated Cu-Ni-Fe sulphides (<3%), usually occur within very large to medium- sized, mafic/ultramafic layered intrusions. Within this subset the magma entering the host intrusion is undersaturated in sulphides (i.e., the sulphur used to form sulphide droplets was still in solution within the magma). The sulphur exsolved out of solution to form sulphide droplets after exsolution was triggered by one or more of: magma fractionation; magma contamination by assimilation of silicate-rich or sulphide-rich wall-rocks; or magma mixing with a new pulse of magma entering the chamber. The sulphide droplets then settle through the magma to a level where they collect, usually well-up in the stratigraphy of the host intrusion.

There are two main subtypes of PGE-dominant magmatic sulphide deposits associated with mafic/ultramafic intrusions:

- Reef-type Stratiform PGE deposits which occur within well-layered mafic/ ultramafic intrusions (i.e., Bushveld Complex, South Africa; Stillwater Complex, Montana)
- Magmatic breccia/contact type deposits that occur in stock-like or layered mafic/ultramafic intrusions (Platreef in South Africa; Lac des Iles and River Valley, Ontario).

The Lac des Iles Deposit in Northwestern Ontario does not appear fit into either of the main subtypes described above and may form its own subtype since it is not a reef and even though one of its zones was a breccia it does not appear to fit into the magmatic breccia/contact type.

Cu-Ni dominant (generally massive) and PGE-dominant (sulphide-poor) deposits rarely occur within the same mafic/ultramafic intrusion. Channelized komatiitic flows occasionally host low sulphide percentage, disseminated Ni±Cu deposits (i.e., Mount Keith in Western Australia) that do not form like PGE-dominant deposits, but are a rare subset of Cu-Ni dominant deposit type.

9. EXPLORATION

The Company commenced exploration of the Property on May 10, 2020. This work was the first exploration by the Company on the Property after the acquisition of Panoramic from Panoramic Resources Limited which closed on May 14, 2020. Exploration was continuous from May 10, 2020, until Nov. 30, 2021, and consisted of diamond drilling, historic drill core, and drill core reject re-analysis, borehole geophysics, line cutting, and ground geophysical surveys. The work was concentrated in the Escape and Current properties of the Project which are located approximately 3 km apart.

9.1 Borehole Orientation and Collar Location Surveys (2020)

Reflex North America (Imdex Limited) was contracted to complete north seeking gyro orientation surveys of all previously-drilled RTEC holes completed between 2008 and 2016 in the Escape Property. This work was completed in late May 2020.

Also, Ontario Land Surveyor J.D. Barnes Limited surveyed the locations of the same Escape RTEC holes on May 14, 2020. Later, in mid-December 2020, J.D. Barnes Limited also surveyed the locations of all holes drilled by the Company in 2020 and part of 2021.

9.2 Diamond Drilling (2020-2021)

A total of 162 diamond drill holes, totalling 63091 m were completed on the Property between May 10, 2020, and November 30, 2021. Most of the holes (122) were drilled on the Escape Property with the balance (40) drilled on the Current Property approximately 3 km to the east.

9.2.1 Escape Property Drilling

A total of 122 Escape Property holes were completed in 2020-2021 (ELR20-001 to 034, ELR21-035 to -103, inclusive). These holes totalled 53703 m drilled and were completed between May 10, 2020, and November 30, 2021, utilizing up to two drills. Initial drilling targeted the Escape HGZ in the southern portion of the intrusion. Drilling progressed to following the mineralized chonolith northward through the Ribbon Zone located just north of the HGZ (Figure 9-1), into Steepledge South zone/boundary zone and connect with the southern most historical drill fence completed by Magma/Panoramic PGMs Ltd.

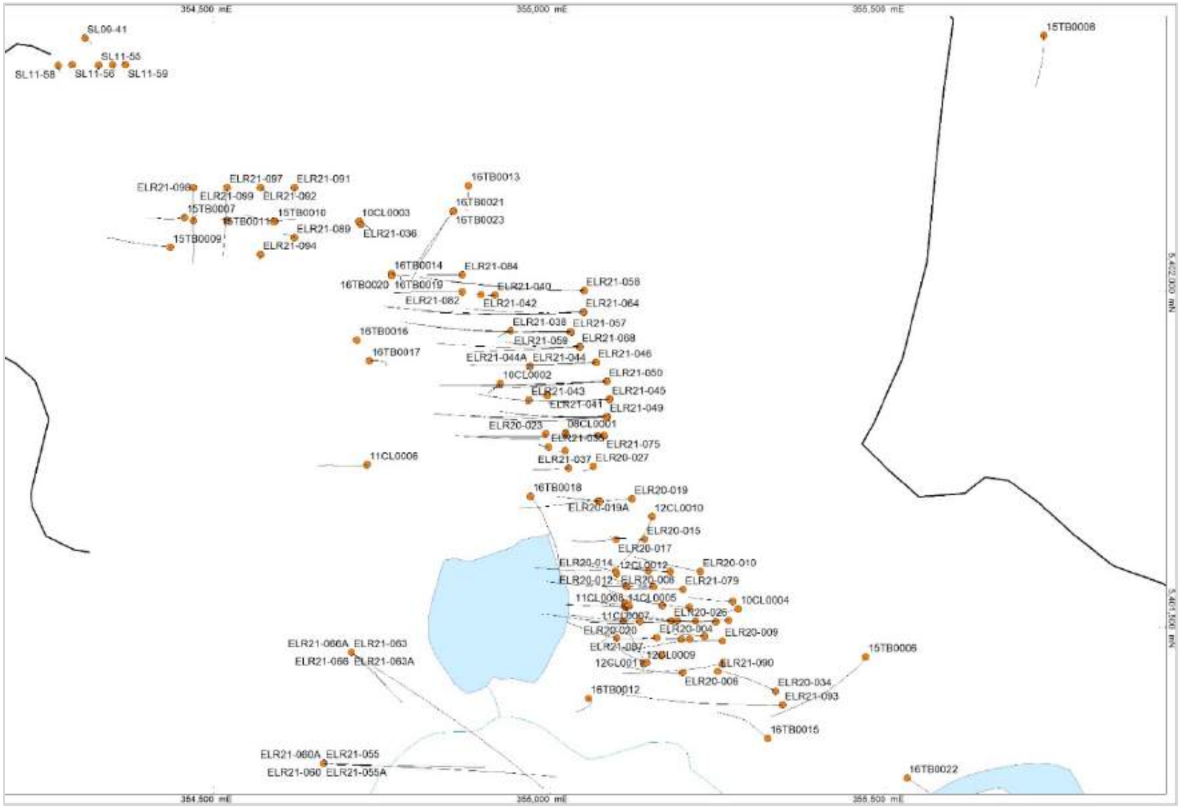


Figure 9-1: Escape Property drill hole location map.

These programs were the first holes drilled in the Escape Property since RTEC completed 11 holes (4287 m) in early 2016. Most of the holes were spaced 50 m apart on 50 m spaced, east west-oriented drill fences. Several infill holes were drilled midway between the 50 m spaced fences in the HGZ to show continuity of mineralization. Localized infill drilling on the main drill fences was completed in a few areas of the HGZ in order to achieve an approximate 25 m spacing within the mineralization at depth. The enclosing Archean country rocks, usually Quetico-age metasedimentary rocks, were often variably fractured and portions of most of the holes drilled had to be cemented to stabilize the holes for later borehole geophysical surveys. This cementing greatly decreased overall production but was essential to completing the holes.

9.2.1.1 High Grade Zone

The HGZ drilling defined the margins and the core of the zone with enough detail to achieve Indicated status within the resource calculation. The drilling showed that the HGZ primarily consists of a sub-horizontal zone of net-textured to heavily disseminated pyrrhotite, chalcopyrite, and pentlandite usually contained within medium-grained feldspathic peridotite. Detailed petrography by Dr. James Miller (Section 9.6) has shown that this peridotite is specifically a feldspathic wehrlite. The HGZ is approximately 215 m long and 125 m in width and is oriented north-northwest (NNW) to south-southeast (SSE). The zone varies greatly in thickness from about 15 m on its margins to up to 98 m in its core (Figure 9-2). The core mineralization forms a prominent NNW-SSE-oriented sail with a less prominent, similarly-oriented keel of an elongated and distorted, sub-horizontal mineralized disc. The rim of the disc is located at about 390 m to 400 m vertical depth below surface. The bulk of the metal within the Escape deposit is presently contained within the HGZ. The HGZ mineralization responds very well to borehole EM surveys and can be detected from a considerable distance away.

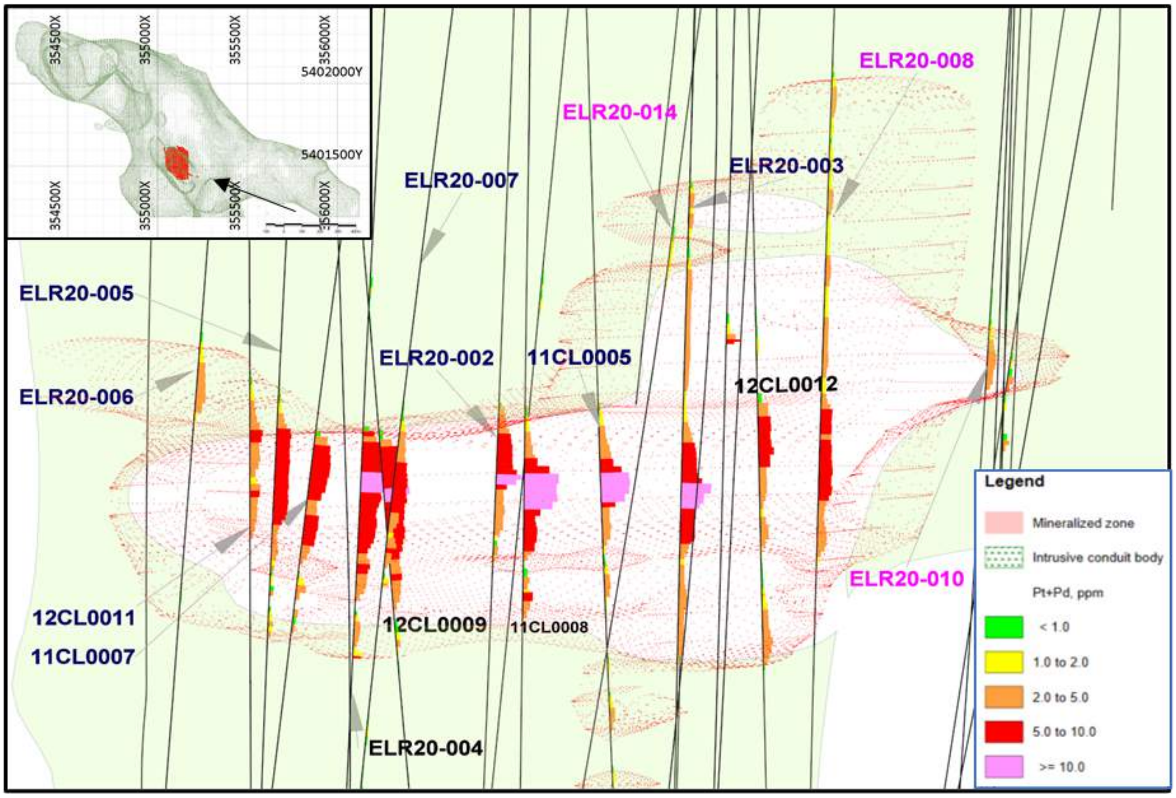


Figure 9-2: Longitudinal section through the HGZ showing assay grades, drill hole traces, and the mineralized zone generated by implicit modelling; view of the section is toward 2500 azimuth.

9.2.1.2 Step-Out Drilling

A further 12 holes were drilled to test the southern portion of the Ribbon Zone immediately to the north of the HGZ (Table 9-1). The mineralization within this area consists of up to three diffuse, sub-horizontal, possibly anastomosing mineralized streams composed of 3% to 10% finely disseminated pyrrhotite and chalcopyrite contained within medium-grained feldspathic peridotite (wehrlite). Presently the width of the zone is difficult to determine and more extensive drilling to the west and sometimes to the east will be required to place definite limits on the width. Existing drilling exposes widths of greater than 35 m in the north and 75 m in the south where the zone is always open to the west and sometimes open to the east. Zone thickness presently varies between 5 m and 45 m and in some sections comprises as many as three closely separated mineralized zones. There is a slight, apparently southerly tilt to the Ribbon Zone with the southern portion of the mineralization apparently continuous with the disseminated margins of the HGZ at a similar stratigraphic level (390 m to 400 m depth). The northern portion of the zone, at the limit of present Company drilling, consists of three mineralized levels occurring at between 300 m and 370 m depth. The zone is very difficult to detect using standard borehole EM techniques and presently seems to be impossible to detect using most surface geophysical techniques. The mineralized zone has been detected as an early-time response using Crone's borehole EM system.

Table 9-1: Selected Grade-Thickness Assay Intervals on the Escape Property - 2020 Diamond Drilling Program

Drill Hole Number	From (m)	To (m)	Total Width (m)	Pt (ppm)	Pd (ppm)	Cu (ppm)	Ni (ppm)	Pt + Pd (ppm)	Pt:Pd Ratio	Cu:Ni Ratio	Grade-Thickness (Pt + Pd) x m
ELR20-025	324.4	423.25	98.85	1.397	1.892	6888	3544	3.289	0.74	1.94	325
including	392.54	411.76	19.22	2.900	4.090	14177	7536	6.990	0.71	1.88	
ELR20-003	359.45	438.37	78.92	1.663	2.174	7960	4068	3.837	0.76	1.96	303
including	395.45	415.45	20.00	3.388	4.670	15417	8356	8.058	0.73	1.85	
including	403.45	408.45	5.00	5.068	6.442	21540	8782	11.510	0.79	2.45	
ELR20-028	350.80	434.10	83.30	1.466	1.912	7263	4092	3.378	0.77	1.77	281
including	398.1	419.8	21.70	3.697	3.488	13974	8907	7.185	1.06	1.57	
ELR20-008	326.84	422.84	96.00	1.220	1.626	6053	3427	2.846	0.75	1.77	273
including	391.84	409.84	18.00	2.294	3.195	11717	7557	5.489	0.72	1.55	
ELR20-004	391.58	424.5	32.92	3.164	4.325	15523	8122	7.489	0.73	1.91	247
including	399.58	403.5	3.92	5.103	7.083	24518	12698	12.186	0.72	1.93	
ELR20-005	386.7	424.7	38.00	1.821	2.457	9249	6281	4.278	0.74	1.47	163
including	391.7	410.7	19.00	2.624	3.684	14011	10009	6.308	0.71	1.40	
ELR20-002	386.15	416.15	30.00	2.070	2.688	9592	4868	4.757	0.77	1.97	143
including	391.15	402.15	11.00	3.227	4.272	15204	7770	7.499	0.76	1.96	
including	399.15	401.15	2.00	5.020	6.155	23400	5915	11.175	0.82	3.96	
ELR20-032	379	414.07	35.07	1.640	2.234	7963	4106	3.874	0.73	1.94	136
including	395.14	405.07	9.93	2.725	3.774	12932	6628	6.499	0.72	1.95	
ELR20-007	388.5	421	32.50	1.691	2.161	7510	3451	3.853	0.78	2.18	125
including	396.5	406.5	10.00	2.618	3.312	10857	4735	5.930	0.79	2.29	
ELR20-022	386.45	410	23.55	2.180	2.824	9559	5011	5.004	0.77	1.91	118
including	392.2	401.75	9.55	3.055	3.932	13089	6659	6.987	0.78	1.97	
ELR20-020	391.74	411.74	20.00	2.021	2.623	8784	4496	4.644	0.77	1.95	93
including	392.74	398.74	6.00	2.645	3.722	12508	8710	6.367	0.71	1.44	
ELR20-011	389.69	414.69	25.00	1.577	1.966	6437	2825	3.542	0.80	2.28	89
including	398.69	400.69	2.00	2.330	3.250	11200	6090	5.580	0.72	1.84	
including	403.69	408.69	5.00	2.356	2.872	9108	2722	5.228	0.82	3.35	

9.2.1.3 Magnetotelluric (MT) Anomaly Follow-up

A series of drill holes proximal to both the Current Intrusion and Escape Intrusion were completed to follow-up on select MT-anomalies generated from the Quantec Geoscience MT survey described in Section 9.5, which was completed between October 27, 2020 and December 6, 2020 (Figure 9-3). MT-Anomaly "E" proximal to Escape Intrusion was targeted as a potential mineralized extension to the Escape intrusion hosted within the Escape Lake fault zone. MT-anomaly-E was tested with a series of drill holes ELR21-055A (572 m), ELR21-060A (458 m) ELR21-063A (524 m) and ELR21-066 (155 m). All drill holes intersected variably sheared Archean metasedimentary rocks of the Quetico subprovince with minor Thunder Bay North intrusive complex sills and dykes identified. The targeted MT resistivity low was not identified. Exploration drilling completed was potentially sub-parallel to the target. A borehole EM survey of the hole unfortunately did not detect any off-hole anomalies.

Follow-up drilling to MT-anomalies (BB-SEA20 and -SEA21) proximal to the Current Intrusion was carried out with two drill holes CL20-001 (770 m) and CL21-002A (950.8 m). These holes were completed proximal to the historical SEA10-06 drill hole (1,965 m) which tested an airborne gravity gradiometer high. Neither of the CL-series holes intersected mafic/ultramafic intrusions. This contrasts with the historical hole SEA10-06 which intersected multiple mafic sills/dykes at multiple stratigraphic levels, with the thickest mafic intrusion occurring at the same depth as the modelled MT-anomalies (BB-SEA20, -SEA21). The differences in mafic intrusions intersected between adjacent drill holes maybe reflecting a strong structural control and dyke emplacement rather then laterally continuous sills.

9.2.2 Current Property Drilling

Drilling at the Current Property consisted of four large diameter metallurgical holes (Table 9-2) to obtain mineralized samples of the Current deposit for metallurgical purposes and 35 drill holes to infill areas within the Current deposit that were identified as having poor continuity in the resource model.

Table 9-2: Current Deposit 2020 Metallurgical Drill Hole Summary

Drill Hole	Start Date	End Date	UTM_E (m)	UTM_N (m)	Azimuth (°0)	Dip (°)	Length (m)
CLM20-001	December 6, 2020	December 13, 2020	358047.0	5402501.0	270	-90	200.0
CLM20-002	December 13, 2020	December 16, 2020	357553.0	5402662.0	270	-90	140.0
CLM20-003	December 14, 2020	December 17, 2020	358372.0	5402430.0	270	-90	269.0
CLM20-004	December 18, 2020	December 22, 2020	357870.0	5402530.0	270	-90	186.0

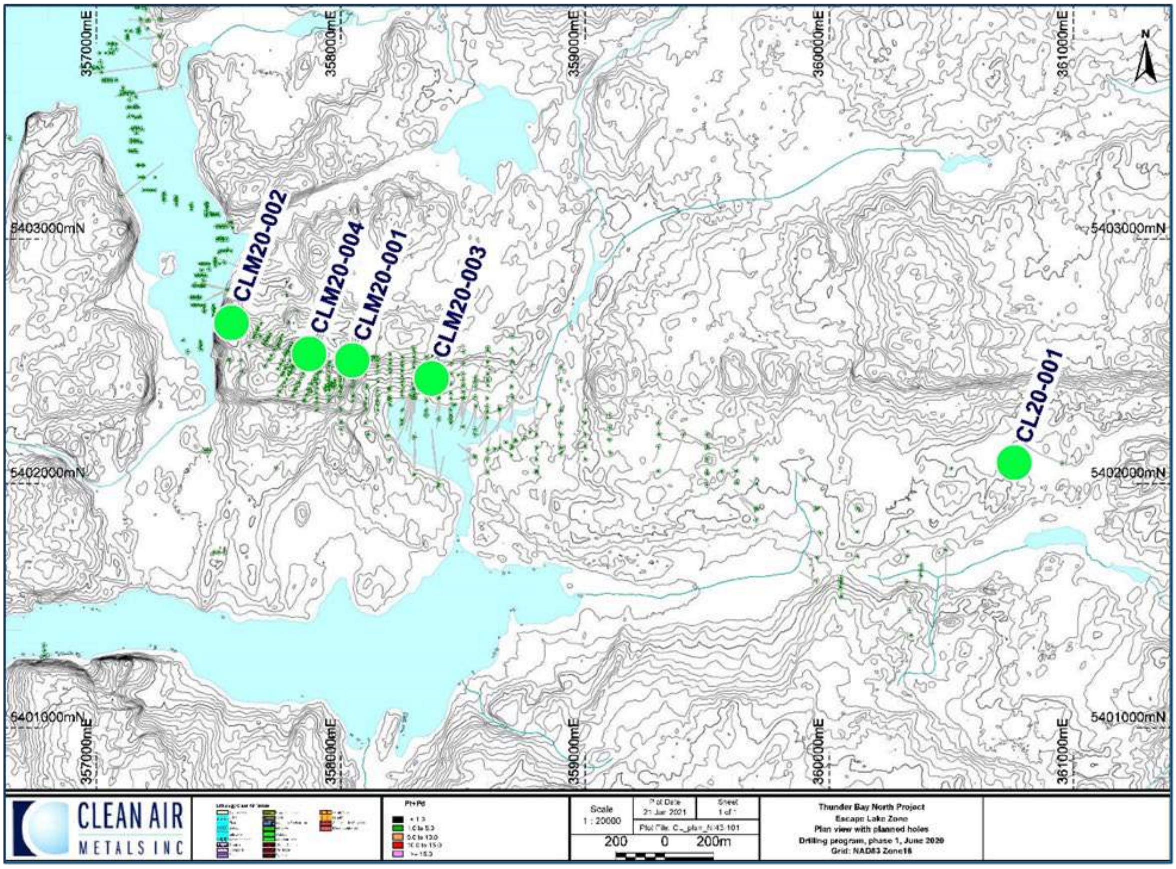


Figure 9-3: Current Property 2020 metallurgical drill hole location map

9.2.2.1 Large Diameter Metallurgical Holes

Four larger diameter (HQ-size) holes, totalling 795 m (CLM20-001 to 004, inclusive) were drilled between December 6, 2020, and December 22, 2020 (Figure 9-3). The placement of these holes was designed to recover additional, unoxidized mineralization for metallurgical studies from the known Current mineralized zones. The drill core recovered was obtained and utilized as per:

1. A 15 cm segment of full core was collected every 3 m from the intrusive rocks of the conduit and a short distance into the country rocks of the hanging wall and footwall. Each of these pieces were cut in half with half retained. From one-half segment a representative polished thin section was prepared with the other half analyzed at ALS Geochemistry [ALS]. The polished thin section will be reviewed by Dr. Derek Wilton at the Memorial University of Newfoundland (MUN) where it will be analyzed using the Scanning Electron Microscopy (SEM) - Mineral Liberation Analysis (MLA) facility at the MUN Core Research Equipment and Instrument Training (CREAIT) Network labs.
2. After the 15 cm samples were taken the bulk of the core was cut in half with one-half wrapped in plastic wrap (to slow oxidation of sulphides) and shipped to Blue Coast Metallurgy and Research in Parksville, BC for metallurgical testing during Q1 of 2021. The remaining half was again cut in half with one-quarter sent to ALS for analysis and the other quarter retained by the Company.

9.3 Geochemistry and Metallurgy (2020)

9.3.1 Current Property

A large number of historic Current deposit coarse drill core sample rejects were pulled from storage and submitted to ALS for re-analysis to determine their Rh content.

Also, mineralized core from numerous historic Current deposit drill holes were re-sampled (1/2 core was quartered) and submitted to Blue Coast, along with stored sample rejects, for metallurgical analysis.

9.3.2 Escape Property

All mineralized pulps from drill core samples taken from holes drilled in the HGZ in 2020 that contained greater than 1 g/t Pt+Pd were re-analyzed for their Rh content. Select mineralized intervals from the step-out drilling were analyzed as initial sample submissions. A more focused program once initial assays are received to re-submit pulps and rejects is currently being utilized.

9.4 Borehole Geophysics (2020-2021)

Bore hole EM was completed on a selection of drill holes that test the Escape Intrusion or tested MT-anomalies. Surveying was done by Crone Geophysics and Exploration using their borehole pulse EM system. All data were reprocessed and then modelled by Consulting Geophysicist Brian Bengert of B-Field Geophysics for follow-up drill targets generation.

9.5 Linecutting and Ground Geophysics (2020)

A 2-phase, 38.75 line-km grid was cut over the Current and Escape intrusions as control for a Quantec Geoscience MT survey.

Cutting of the first 14.40 line-km stage of the grid commenced on August 2, 2020 and was completed on August 22, 2020. The Quantec MT survey commenced on August 7, 2020 (while the grid was being cut) and was completed on August 31, 2020 (Figure 9-4).

The excellent results of the MT survey completed in August prompted an expansion of the survey which required cutting another 24.35 line-km of grid between October 8 and November 20, 2020.

The additional gridlines are now in the process of being surveyed by Quantec Geoscience.

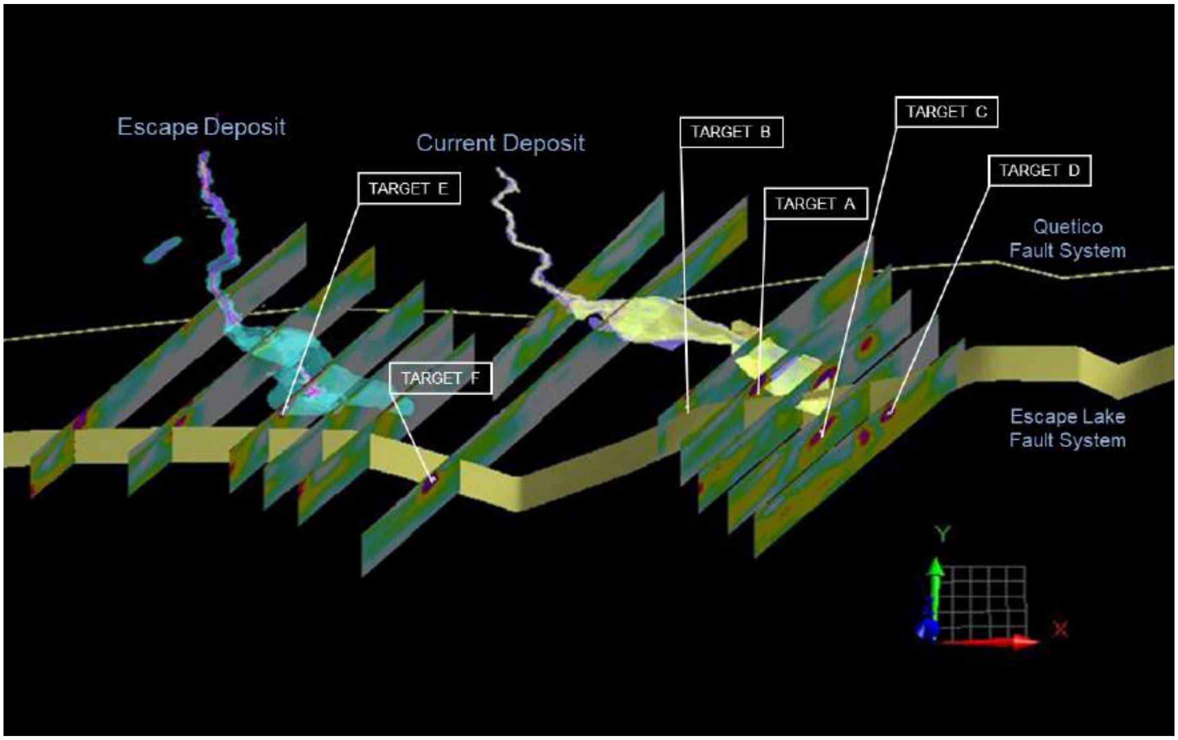


Figure 9-4: Magnetotelluric survey pseudo-sections for the six lines surveyed in the Escape Lake and Current Lake areas in August 2020

9.6 Petrography (2020)

Thin and polished thin sections were prepared from 31 samples systematically taken from the mafic to ultramafic intrusive rocks comprising the Escape Intrusion within drill hole ELR20-004. The samples were collected by, and subsequently examined by, Dr. James Miller, formerly a Professor of Geology at the University of Minnesota in Duluth, MN and now a Consulting Geoscientist and an Adjunct Professor of Geology at Lakehead University, in Thunder Bay, ON. The 31 thin sections were examined in detail during the last half of 2020 and two reports documenting those examinations have been written. The opaque minerals highlighted within the polished thin sections were in the process of being examined at the time of the writing of this report.

Dr. Miller's examination determined that the rocks of the Escape Intrusion differ from those observed within the Current Lake Intrusion (located 3 km to the east) in texture, in overall complexity, and the lack of orthopyroxene within the mafic and ultramafic rock types. The rocks comprising the Escape Intrusion are considerably more complex than those observed within the Current Intrusion. The bulk of the mineralization within both intrusions occurs within feldspathic peridotite (a rock that contains greater than 40% olivine, variable amounts of pyroxene, and up to 20% plagioclase feldspar); however, the peridotite within the Current Intrusion is a fine-grained feldspathic lherzolite containing both orthopyroxene and clinopyroxene, whereas the peridotite at Escape Lake Intrusion is a medium-grained feldspathic wehrlite containing only clinopyroxene as its pyroxene phase.

9.7 Preliminary Synchrotron Cluster Results (2020)

During mid-2020, and on the advice of Nordmin, the Company embarked on a program of Synchrotron Spectroscopy analyses on 94 samples taken from the Current deposit (79) and the

Escape South HGZ (15). This, and subsequent work should strongly aid in the characterization of the various mineralized zones comprising the Current deposit, in particular, and the aid in the preliminary characterization of the Escape HGZ.

This work was completed by Dr. Lisa Van Loon of LISA CAN Analytical Solutions Inc. and Dr. Neil Banerjee of Western University, Ontario in partnership with the Nordmin. Dr. Van Loon and Dr. Banerjee describe synchrotron mineral cluster analysis as a multivariate analysis whose goal is to classify a suite of samples into different groups such that similar subjects are placed in the same group. This work was specifically done without any prior knowledge of the mineralogy or geochemistry of the samples submitted by the Company.

The Current deposit samples consisted of coarse rejects of core samples originally taken by Magma Metals (Canada) Limited/Panoramic between 2007 and 2012. The Escape South HGZ samples consisted of samples pulps of core samples taken during the Company's 2020 diamond drilling program.

9.7.1 Mineralogical Analysis

Synchrotron Spectroscopy analysis was performed on 94 samples and identified eight mineralogical domains. As described in various sections above the Current and Escape deposits are hosted by two separate, but closely-related (lithologically and chemically) intrusions that are of almost identical age, even though separated by a distance of 3 km. They are both part of a distinct intrusive "family" and because of this relationship their samples were not split apart and were analyzed together as a single group. Work on the data obtained is ongoing and the presence of the various mineral species continues to be updated and refined. The mineral species stated were determined from the synchrotron spectra and were not directly observed.

Domain 1

This domain was defined using 18 samples where 11 were from the Current deposit and seven were from the Escape HGZ. Sample L013391 was the most representative.

The Domain 1 samples contained:

- Sulphides: Chalcopyrite pentlandite, troilite, and minor pyrite.
- Silicates: Olivine; both clino- and orthopyroxenes; plagioclase feldspar; the phylosilicates talc, chlorite, and biotite; the serpentine minerals chrysotile and lizardite; and quartz.
- Oxides: Magnetite.

This domain corresponds with high grade mineralization present at the base of the conduit portion of the Current Intrusion and the high grade core of the Escape HGZ.

Domain 2

This domain is the most dominant and physically, and lithologically widespread group, and was defined by 59 samples, where 54 were from the Current deposit and five were from the Escape HGZ. Sample L013386 was the most representative sample.

The Domain 2 samples contained:

- Sulphides: Chalcopyrite, troilite, some pentlandite, and in a few samples some pyrite.
- Silicates: Olivine; both clino- and orthopyroxenes; plagioclase feldspar; the phylosilicates talc, chlorite, and biotite; and in some samples the serpentine minerals chrysotile and lizardite.

- Oxides: Magnetite.
- Carbonates: Calcite.

This domain corresponds with the bulk of the moderate to high grade disseminated portions comprising the Current deposit, including part of the Cloud Zone, and the moderate grade portion of the Escape South HGZ outside of the high grade core. The various silicate minerals identified correspond quite well with visual observations of the domain in drill core.

Domain 3

This domain only consists of two essentially unmineralized samples taken from Escape South HGZ and located stratigraphically above the HGZ.

The Domain 3 samples only contained:

- Silicates: Olivine; clinopyroxene; the phylosilicates talc and chlorite; and some quartz.

Domain 4

Like Domain 3 above this domain consists of only two samples.

Domain 4 samples contained:

- Sulphides: Chalcopyrite, pyrite.
- Silicates: Olivine; plagioclase; the phylosilicates talc and chlorite; and some quartz.
- Oxides: Magnetite.

These samples were obtained from the basal portion of the western Beaver Zone of the Current deposit and are high grade in nature.

Domain 5

This domain was determined using only one sample from the Current deposit.

The Domain 5 sample only contained:

- Sulphides: Chalcopyrite, pyrite.
- Silicates: Plagioclase; the phylosilicate chlorite (alteration of clinopyroxene?); and some quartz.

This sample was obtained from the basal portion of the western Beaver Zone a short distance east of the narrow entrance to the Beaver West sub-chamber. The minerals present strongly suggest that the sample was taken from a grey hybrid sill located below the basal contact of the Current Lake Intrusion.

Domain 6

This domain was determined using 2 samples from the Current deposit.

The Domain 6 samples contained:

- Sulphides: Chalcopyrite, pyrrhotite, and pyrite.
- Silicates: The phylosilicates talc and chlorite.
- Oxides: Magnetite.

These two samples were obtained from within the high grade, possibly net-textured basal mineralization located a short distance inside Beaver West sub-chamber and adjacent to the sub-chamber's northern margin (eastern Bridge Zone). The lack of silicate phases and the high grade nature of the mineralization (approximately 30 g/t Pt+Pd) strongly suggests that sulphides are the dominant phase and there are few silicates present.

Domain 7

This domain was determined using nine samples with eight samples taken from the Current deposit and one sample taken from the Escape HGZ.

The Domain 7 samples contained:

- Sulphides: Pyrite and some chalcopyrite.
- Silicates: Albite and plagioclase feldspar; occasional pyroxene; the phylosilicates chlorite, biotite, muscovite, and talc; and quartz.
- Oxides: Magnetite.
- Carbonates: Calcite.

This domain probably represents the various red and grey hybrid phases that occur both stratigraphically above and sometimes below (grey hybrid only) the active, olivine-bearing portions of both intrusions. The rocks within the hybrid phases are lithologically complex, variably altered, rarely mineralized, and sometimes contain inclusions of mineralized ultramafic intrusive material.

Domain 8

This domain was determined using only one sample from the Current deposit.

The Domain 8 sample contained:

- Sulphides: Chalcopyrite, pyrrhotite, and pyrite.
- Silicates: The phylosilicate chlorite (alteration of clinopyroxene?) and minor quartz.
- Oxides: Magnetite.

The very high grade nature of this sample (>90 g/t Pt+Pd) and the lack of silicate phases strongly suggests that it was taken from one of the massive sulphide pods occurring within the Beaver West sub-chamber (Bridge Zone), possibly the one intersected within drill hole BL09-197.

9.7.1.1 Mineral Cluster Analysis Dendogram

The dendogram display of diffractogram cluster analysis for the eight Current deposit and Escape South HGZ domains are shown in Figure 9-5 with Domain 1 (red), Domain 2 (blue), Domain 3 (green), and Domain 4 (purple), Domain 5 (orange), Domain 6 (cyan), Domain 7 (brown), and Domain 8 (black). It is important to note the following:

- The domains are relative.
- The domains were established post-synchrotron results.
- The dendrogram is a tree diagram in which each terminal is representative of a single sample.
- The samples are joined together by a series of lines.
- The further along the distance axis (x-axis) that the patterns are joined the less similar they are.

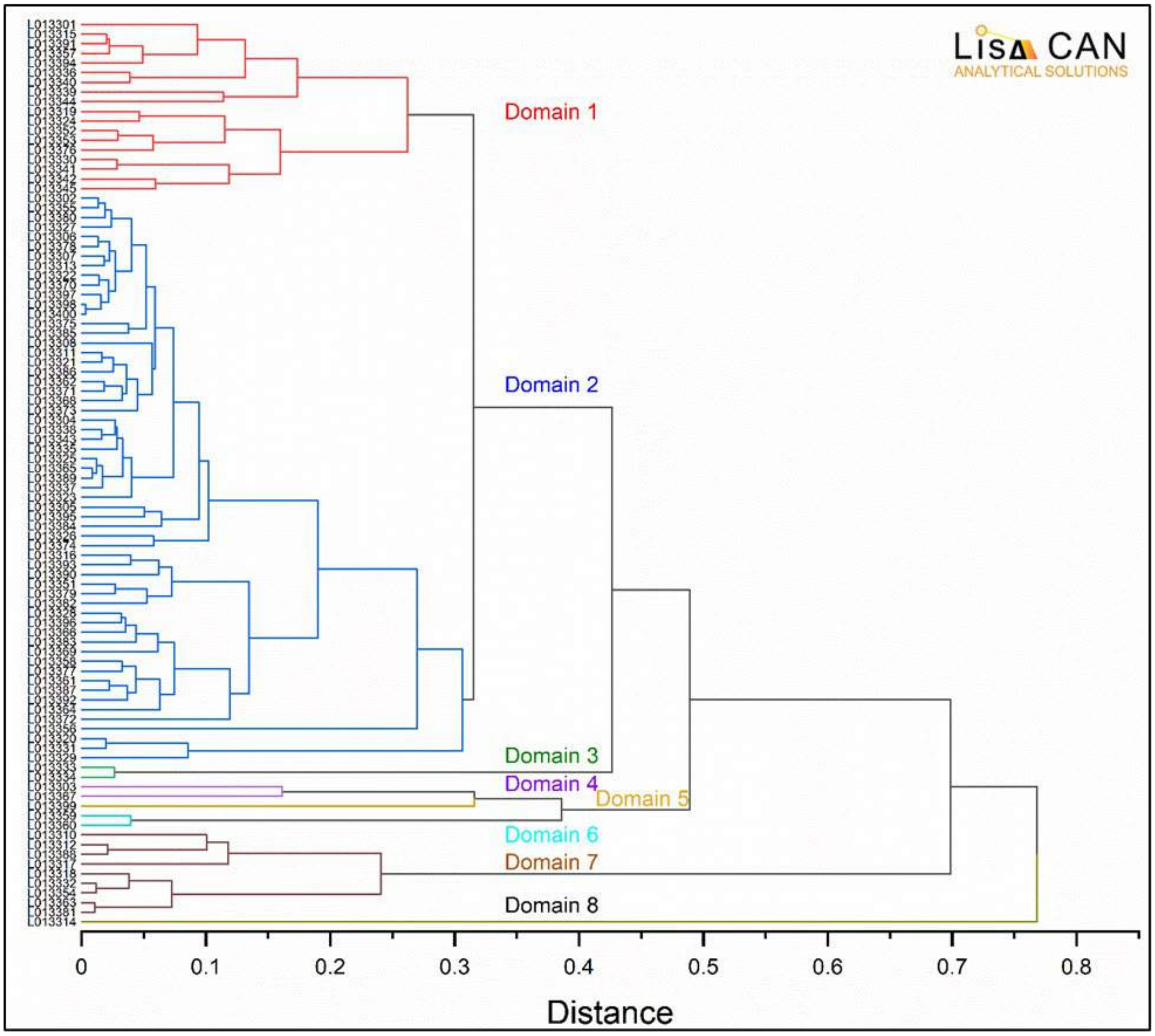


Figure 9-5: Dendogram display of diffractogram cluster analysis for the Current deposit and Escape South HGZ samples

10. DRILLING

10.1 Current Deposit Drilling

The Current deposit diamond drilling consists of 172,130 m of core from NQ drill holes completed between 2006 and 2021. Table 10-1 provides a summary of the drill campaigns by year and operator.

Table 10-1: Current Deposit Drill Hole Summary

Year	Operator	Hole Prefix	Number of Holes	Hole Diameter	Total Length (m)
2006	Magma Metals (Canada) Ltd.	CL	2	NQ	375
2007	Magma Metals (Canada) Ltd.	BL, CL	38	NQ	6805
2008	Magma Metals (Canada) Ltd.	BL, CL, SEA	169	NQ	30777
2009	Magma Metals (Canada) Ltd.	BL, CL	191	NQ	31424
2010	Magma Metals (Canada) Ltd.	BL, CL, SEA	207	NQ	48737
2011	Magma Metals (Canada) Ltd.	BL, CL, SEA	102	NQ	31297
2012	Magma Metals (Canada) Ltd.	BL	19	NQ	13327
2020	Clean Air Metals	CLR	5	HQ/NQ	1565
2021	Clean Air Metals	CLR	35	NQ	7823

All drill holes were sited using a differential global positioning system (DGPS). Drilling is normally perpendicular to the strike of the mineralization. Depending on the dip of the drill hole and the dip of the mineralization, inclined drill intercept widths are typically greater than true widths. For the Current deposit, the drilling has been completed along 50 m spaced section lines with core holes spaced at 10 m intervals on each section. The average drill section and spacing in the Current deposit is 50 m and varies between approximately 30 m and 60 m.

10.1.1 Escape Deposit Drilling

Diamond drilling at the Escape trend consists of 53,703 m of core from NQ drill holes completed between 2008 and 2021. Table 10-2 provides a summary of the drill campaigns by year and operator.

Table 10-2: Escape Deposit Drill Hole Summary

Year	Operator	Hole Prefix	Number of Holes	Hole Diameter	Total Length (m)
2008	Boart Longyear (RTX database), Magma Metals (Canada) Ltd.	ELR, SL	3	NQ	500
2009	Magma Metals (Canada) Ltd	SL	39	NQ	8,405
2010	Boart Longyear (RTX database), Magma Metals (Canada) Ltd.	ELR, SL	17	NQ	3,874
2011	Team Drilling (RTX database), Magma Metals (Canada) Ltd.	ELR, SL	13	NQ	5,737
2012	Downing Drilling (RTX database), Magma Metals (Canada) Ltd.	ELR, SL	5	NQ	2,820

Year	Operator	Hole Prefix	Number of Holes	Hole Diameter	Total Length (m)
2015	Downing Drilling (RTX database)	ELR	11	NQ	4,955
2016	Downing Drilling (RTX database)	ELR	13	NQ	4,851
2020	Clean Air Metals Inc.	ELR	40	NQ	18,339
2021	Clean Air Metals Inc.	ELR	82	NQ	35,364

All drill holes have been sited using a DGPS. The drilling followed the Escape deposit with approximate spacing between 30 m and 60 m.

10.2 Core Logging

The Company's geological logging included recording lithology, alteration, mineralization, structure, and magnetic susceptibility. The current database has 101 unique lithology types with 41 lithological qualifier units, 69 lithological textures, and 61 lithological structures. The alteration database has 20 unique alteration codes. Chlorite, hematite, silica, and serpentine are the most common logged alteration types. There are 33 unique minerals recorded in the current database, including chalcopyrite, pentlandite, and malachite.

10.3 Thunder Bay North Project SG Measurements

The Company has collected 70,236 SG measurements for the Project, of these 57,925 are for the Current deposit (Table 10-3) and 12,311 are for the Escape deposit (Table 10-4). SG was measured using water dispersion method. The samples were weighed in air, and then the uncoated sample was placed in a basket suspended in water and weighed again. All SG's were estimated as all other grades.

Table 10-3: Current Deposit SG Measurements

Lithology	Count of SG	Average of SG
Felsic Rock, Undivided	21	2.626
Granite - Undifferentiated	2408	2.651
Granodiorite	1540	2.629
Alkali Feldspar Granite	162	2.626
Monzonite	17	2.661
Quartz Monzonite	70	2.545
Granite	1424	2.644
Tonalite	317	2.656
Hem Altered and Partial Melt Granitoid	162	2.631
Hybrid Grey	2233	2.839
Hybrid Classic Red	3640	2.708
Mafic Undifferentiated	233	2.865
Diabase	56	2.964
Gabbro	703	3.003

Lithology	Count of SG	Average of SG
Gabbro - Altered	19	2.717
Gabbro - Leucocratic	59	2.852
Gabbro - Melanocratic	5338	2.995
Gabbro - Noritic	19	3.000
Oxide Gabbro	209	3.013
Gabbro - VariTextured	57	2.809
Massive Sulphides	23	3.825
Overburden - Glacial	545	2.968
Overburden - Mud	289	3.052
Overburden - Water	58	2.951
Peridotite	23307	3.010
Pyroxenite	73	3.000
Sedimentary Rocks - Undifferentiated	2302	2.764
Sedimentary Gneiss	85	2.704
Mudstone	10	2.735
Sandstone	650	2.706
Siltstone	6917	2.739
Schist	655	2.775
Sandstone to Siltstone	3536	2.749
Ultramafic - Undifferentiated	47	3.390
Vein	16	3.067
Mixed Intrusion Breccia	495	2.653
Interfingered Mafic/Felsic	230	2.741

Table 10-4: Escape Deposit SG Measurements

Lithology	Count of SG	Average of SG
Breccia	15	2.690
Felsic Rock, Undivided	23	2.626
Granite - Undifferentiated	885	2.651
Granodiorite	313	2.629
Alkali Feldspar Granite	464	2.626
Monzonite	45	2.661
Granite	318	2.644
Tonalite	174	2.656
Hem Altered and Partial Melt Granitoid	54	2.631

Lithology	Count of SG	Average of SG
Felsic Breccia	15	2.719
Gabbro	1229	2.853
Granite	91	2.617
Hybrid Grey	434	2.839
Hybrid Classic Red	424	2.708
BrecciaIntrusive	89	2.665
Mafic Undifferentiated	100	2.865
Diabase	313	2.964
Gabbro	198	3.003
Gabbro - Leucocratic	10	2.852
Oxide Gabbro	89	3.013
Gabbro - VariTextured	16	2.809
Diorite	69	2.877
Overburden	100	2.828
Overburden - Glacial	104	2.968
Overburden - Mud	40	3.052
Overburden - Water	47	2.951
Pyroxenite	9	3.000
Sedimentary Rocks - Undifferentiated	192	2.764
Siltstone	2415	2.753
Sedimentary Gneiss	57	2.704
Mudstone	146	2.735
Sandstone	84	2.706
Siltstone	1042	2.739
Schist	225	2.775
Sandstone to Siltstone	161	2.749
Breccia	80	2.666
Ultramafic - Undifferentiated	62	3.390
Peridotite	2052	2.947
Pyroxenite	91	2.905
Vein	14	3.067
Mixed Intrusion Breccia	22	2.653

10.4 Comments on Section 10

In the opinion of the QP, the quantity, and quality of the lithological, collar, downhole survey, and SG data collected in the exploration programs are sufficient to support the Mineral Resource Estimate.

- Core logging completed by the Company and previous operators meet industry standards for exploration on replacement and porphyry deposits,
- Collar surveys and downhole surveys were performed using industry-standard instrumentation,
- Drill hole orientations are appropriate for the mineralized style, and
- Drill hole intercepts demonstrate that sampling is representative.

No other factors were identified with the data collected from the drill programs that could significantly affect the Mineral Resource Estimate.

11. SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 Assay Sample Preparation and Analysis

Between December 2006 and September 2007 all Magma Metals (Canada) Limited samples were sent to the Accurassay Laboratories facility (Accurassay) located in Thunder Bay, Ontario. At the time Accurassay was a well-established and recognized assay and geochemical analytical services company and was independent of Magma Metals. The Thunder Bay Accurassay analytical facility (since closed) held ISO-17025 registration. Accurassay was also used in 2006 to prepare a limited amount of standard reference material (SRM) based on local boulder material.

Between September 2007 and December 2020 all sample preparation and analysis of Magma Metals (Canada) Limited (September 2007 to June 2012), Panoramic (June 2012 to December 2012), and the Company (after May 2020) were completed at the ALS Chemex (later ALS Geochemistry) preparation facility in Thunder Bay and then shipped to the ALS primary assay laboratory in Vancouver, B.C. for analysis. ALS is a well-established and recognized assay and geochemical analytical services company certified to international standards and is independent of Magma Metals, Panoramic, and the Company. The Thunder Bay laboratory holds ISO-9000 accreditation; the Vancouver facility holds ISO-17025 registration.

11.1.1 Clean Air Metals Inc. Core Sample Preparation and Analysis (2020-2021)

The diamond drill core from the Escape and Current properties, as sampled by the Company in 2020-2021, under the direct supervision of Justin Johnson, P.Geo., May 10 to November 20, 2020, Adam Richardson, P. Geo., November 20 and December 23, 2020, and by Eric Scheel, P.Geo., January 2021 to current date, was cut in half with a purpose-designed Vancon diamond-bladed core saw (Figure 11-1). One-half of the cut core was placed in a pre-marked plastic sample bag, and the other half returned to the core box. Sample bags were sealed with zip ties to ensure sample integrity. All samples were taken directly from the Company core cutting facility to the ALS Thunder Bay Preparation Lab in a Company vehicle driven by a Company employee and given directly to an employee of the ALS lab to ensure and uninterrupted chain of custody.

All samples taken during the 2020-2021 diamond drilling program were prepared at the ALS Preparation Lab in Thunder Bay, Ontario, and then shipped to, and analyzed at the ALS primary laboratory in Vancouver. The samples were crushed and then pulverized at the Thunder Bay lab from split core to prepare a total sample of up to 250 g 85% passing 75 µm. After sample pulp preparation had been completed the pulps were then shipped directly to the ALS primary analytical laboratory in Vancouver, B.C. and analyzed in the following manner:

- All samples were analyzed for Au, Pt, and Pd using fire assay (FA) with an inductively coupled plasma mass spectrometry (ICP-MS) finish (ALS method code: PGM-ICPMS23). Detection limits for this method are Au: 0.001 ppm to 1 ppm; Pt: 0.0005 ppm to 1 ppm; and Pd 0.001 ppm to 1 ppm.
- Au, Pt, and Pd samples with grades above the optimal ICP-MS detection limits (as directly stated above) were re-analyzed using an optical emission spectroscopy method (ICP-OES; method code PGM-ICP27 “ore grade”). Detection limits for this method are Au: 0.03 ppm to 100 ppm; Pt: 0.03 ppm to 100 ppm; and Pd 0.03 ppm to 100 ppm.
- All samples were analyzed for multi-elements and base metals using a multi-element atomic emission spectroscopy (ICP-AES; method code ME-ICP61) technique following four-acid

digest of the sample. This analytical method reports 33 elements, including Ag, chromium (Cr), Cu, Ni, and Co. The detection limits for method code ME-ICP61 are listed in Table 11-1.

- Commencing in late 2020 select core samples were analyzed for Rh using the Rh-MS25 method. Prior to this all samples containing greater than 1 g/t Pt+Pd were re-analyzed for Rh.

Figure 11-1: Purpose-designed Vancon diamond-bladed core saw with pre-marked sample bags

Table 11-1: ICP-AES Method Detection Limit Elements and Ranges in ppm for ME-ICP61

Element	Range	Element	Range	Element	Range	Element	Range
Ag	0.05–100	Co	1–10000	Mo	1–10000	Sr	1–10000
Al	0.01–50%	Cr	1–10000	Na	0.01–10%	Th	20–10000
As	5–10000	Cu	1–10000	Ni	1–10000	Ti	0.01–10%
Ba	10–10000	Fe	0.01–50%	P	10–10000	Tl	10–10000
Be	0.5–1000	Ga	10–10000	Pb	2–10000	U	10–10000
Bi	2–10000	K	0.01–10%	S	0.01–10%	V	1–10000
Ca	0.01–50%	La	10–10000	Sb	5–10000	W	10–10000
Cd	0.5–1000	Mg	0.01–50%	Sc	1–10000	Zn	2–10000
		Mn	5–10000				

11.1.2 Historic Core Assay Sample Preparation and Analysis

Historic diamond drill core samples taken between December 2006 and December 2012 taken from the Current deposit were analyzed at two separate facilities:

11.1.2.1 Accurassay Laboratories

Between December 2006 and September 2007, the Current Property core sample preparation and analysis was completed in Thunder Bay by Accurassay Laboratories on Magma Metals (Canada) Limited Current diamond drill holes TBND001 to TBND034. All samples were dried prior to any sample preparation. Once dry, samples were crushed to 90% -8 mesh, split into 250 g to 500 g sub-samples using a Jones Riffler and then pulverized to 90% -150 mesh using a ring and puck pulverizer. Prior to analysis, samples were homogenized. Silica cleaning was completed between each sample to prevent cross-contamination.

Sample analysis completed by Accurassay comprised:

- Method Code AL4APP: FA with atomic absorption (AA) finish for Au, Pt, Pd with detection limits of 5 ppb, 15 ppb, and 10 ppb, respectively.
- Method Code AL4CNC: Aqua regia digest with AA-finish for Cu, Ni, Co with detection limits of 1 ppm each.

All samples were taken directly from the Magma Metals (Canada) Limited core cutting facility to the ALS Chemex Thunder Bay preparation lab by a Magma Metals (Canada) Limited employee and given directly to an employee of the ALS Chemex lab to ensure uninterrupted chain of custody.

11.1.2.2 ALS Chemex

Between September 2007 to December 2012, all core samples were prepared at the ALS Chemex Preparation Laboratory located in Thunder Bay. All samples were bar coded on arrival at the lab for entry in the ALS Laboratory Information Management System (LIMS). This system provides complete chain of custody records for every stage in the sample preparation and analytical process from the moment that a sample arrives at the laboratory.

On receipt, the samples were weighed, dried at 110°C to 120°C, crushed using a jaw crusher to >50% passing 1 mm, riffle split to generate a 250 g sub-sample, and pulverized to >85 percent less than 75 µm.

Au, Pt and Pd were analyzed using FA with an inductively coupled plasma mass spectrometry (ICP-MS) finish (method code: PGM-ICPMS23). Detection limits were Au: 0.001 ppm to 1 ppm; Pt: 0.0005 ppm to 1 ppm; and Pd 0.001 ppm to 1 ppm. Samples that exhibited grades above the optimal ICP-MS detection limits were analyzed using an optical emission spectroscopy method (ICP-OES; method code PGM-ICP27 "ore grade"). Detection limits for this method are Au: 0.03 ppm to 100 ppm; Pt: 0.03 ppm to 100 ppm; and Pd 0.03 ppm to 100 ppm.

Multi-element and base metals are analyzed using a multi-element atomic emission spectroscopy (ICP-AES; method code ME-ICP61) technique following four-acid digest of the sample. This analytical method reports 33 elements, including Ag, Cr, Cu, Ni, and Co.

All samples were taken directly from the Magma Metals (Canada) Limited core cutting facility to the ALS Chemex Thunder Bay preparation lab by a Magma Metals (Canada) Limited employee and given directly to an employee of the ALS Chemex lab to ensure uninterrupted chain of custody.

11.2 Specific Gravity Sampling

11.2.1 Current Deposit

A total of 10,689 SG measurements for the Current deposit were provided from onsite drill measurements. SG measurements were taken from representative core sample intervals (approximately 0.1 m to 0.2 m long). SG was measured using a water dispersion method. The samples were weighed in air, and then the uncoated sample was placed in a basket suspended in water and weighed again. SG is calculated by using the weight in air versus the weight in water method (Archimedes), by applying the following formula:

$$Specific\ Gravity = \frac{Weight\ in\ Air}{(Weight\ in\ Air - Weight\ in\ Water)}$$

11.2.2 Escape Deposit

A total of 3,169 SG measurements for the Escape deposit were provided from onsite drill measurements. SG measurements were taken from representative core sample intervals (approximately 0.1 m to 0.2 m long). SG was measured using a water dispersion method. The samples were weighed in air, and then the uncoated sample was placed in a basket suspended in water and weighed again. SG is calculated by using the weight in air versus the weight in water method (Archimedes).

Nordmin determined that the required amount and distribution of SG measurements did not exist for direct estimation of the entire block model. All SG's are estimated as all other grades.

11.3 Quality Assurance/Quality Control Programs

QC measures were set in place to ensure the reliability and trustworthiness of exploration data. These measures include written field procedures and independent verifications of aspects such as drilling, surveying, sampling, assaying, data management, and database integrity. Appropriate documentation of QC measures and regular analysis of QC data is essential as a safeguard for Project data and form the basis for the QA program implemented during exploration.

Analytical QC measures typically involve internal and external laboratory procedures implemented to monitor the precision and accuracy of the sample preparation and assay data. These measures are also important to identify potential sample sequencing errors and to monitor for contamination of samples.

Sampling and analytical QA/QC protocols typically involve taking duplicate samples and inserting QC samples (certified reference material [CRM] and blanks) to monitor the assay results' reliability throughout the drill program. Umpire check assays are typically performed to evaluate the primary lab for bias and involve re-assaying a set proportion of sample rejects and pulps at a secondary umpire laboratory.

11.3.1 Current Deposit

11.3.1.1 Standards

The Company submitted seven different CRM as part of its QA/QC process with a total of 10,598 CRM between 2006 and 2021 (Table 11-2). The review of CRM results identified 492 sample swaps or laboratory failures that have been incorrectly identified as members of a different population. AMIS0008 fell within the range of mean +/- two standard deviations for Pt and Pd (Figure 11-2 and Figure 11-3). AMIS0073 shows high variability and has outliers for the mean +/- two standard deviations for Cu and Ni (Figure 11-4 and Figure 11-5).

The lab submitted 16 different CRM as part of its QA/QC process with a total of 16,531 CRM between 2006 and 2021 (Table 11-3). Oreas 19 a largely fell within the range of mean +/- two standard deviations for Au, however there are some outliers for Oreas 15 a (Figure 11-6 and Figure 11-7). Oreas 682 falls within the range of mean +/- two standard deviations for Rh (Figure 11-8). The process performance and moving range charts for all other standards listed in Table 11-2 and Table 11-3 can be found in Appendix C.

Table 11-2: Current Deposit CRM Result Summary from Geologist Inserted CRMs

Standard	Count	Best Value Pt (g/t)	Mean Value Pt (g/t)	Bias (%)	Best Value Pd (g/t)	Mean Value Pd (g/t)	Bias (%)	Best Value Cu (g/t)	Mean Value Cu (g/t)	Bias (%)	Best Value Ni (g/t)	Mean Value Ni (g/t)	Bias (%)	Best Value Co (g/t)	Mean Value Co (g/t)	Bias (%)
AMIS0008	96	8.660	8.980	-0.320	4.360	4.420	-0.060									
AMIS0056	112	0.810	0.820	-0.010	0.880	0.880	0.000									
AMIS0060	2253							3308.000	3413.000	- 105.000	2909.000	3007.000	-98.000			
AMIS0064	4895	1.240	0.650	0.590	0.580	0.140	0.440									
AMIS0073	1162	0.330	0.345	-0.015	0.890	0.906	-0.016	2414.000	2478.73	-64.73	5459.000	5262.550	196.450	277.000	273.000	4.000
AMIS0093	302	0.110	0.107	0.003	0.470	0.466	0.004	2958.000	3010.000	-52.000	2722.000	2629.000	93.000	173.000	163.000	10.000
AMIS0124	1754	0.840	0.842	-0.002	0.870	0.877	-0.007	1324.000	1373.000	-49.000	1917.000	1886.000	31.000			
OREAS 13b	16	0.526	0.526	0.000	0.243	0.243	0.000									
OREAS 681	8	0.197	0.197	0.000	0.131	0.131	0.000									

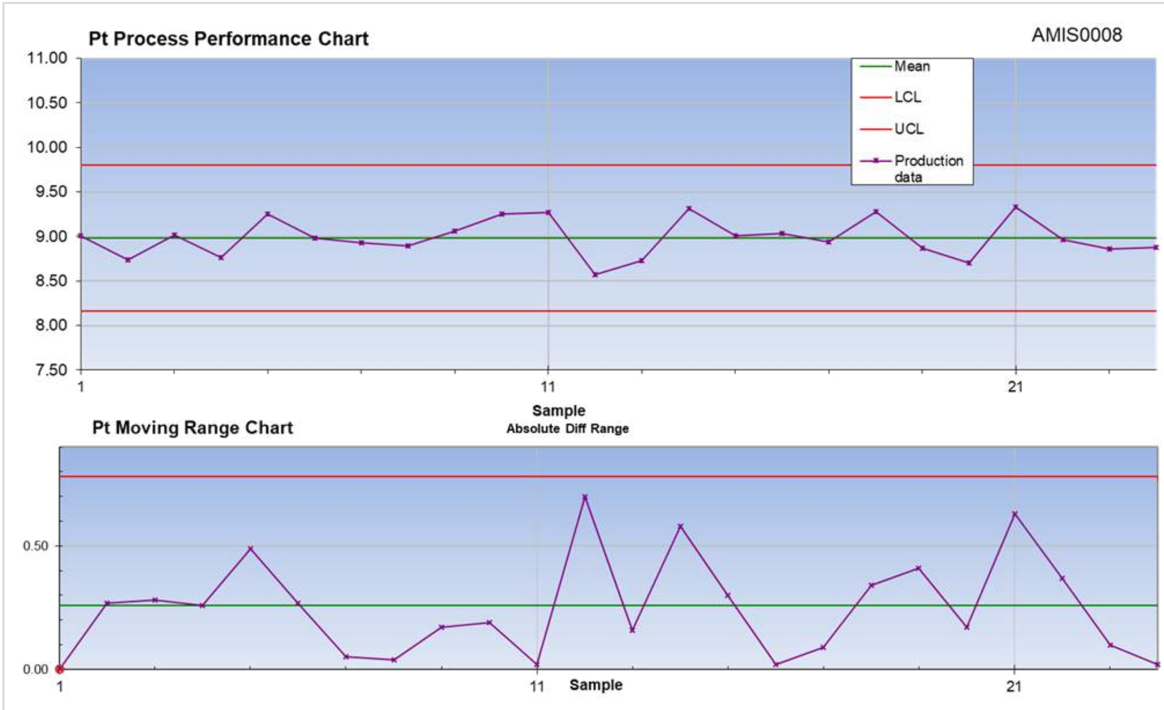


Figure 11-2: Current deposit Standard AMIS008 Pt (g/t)

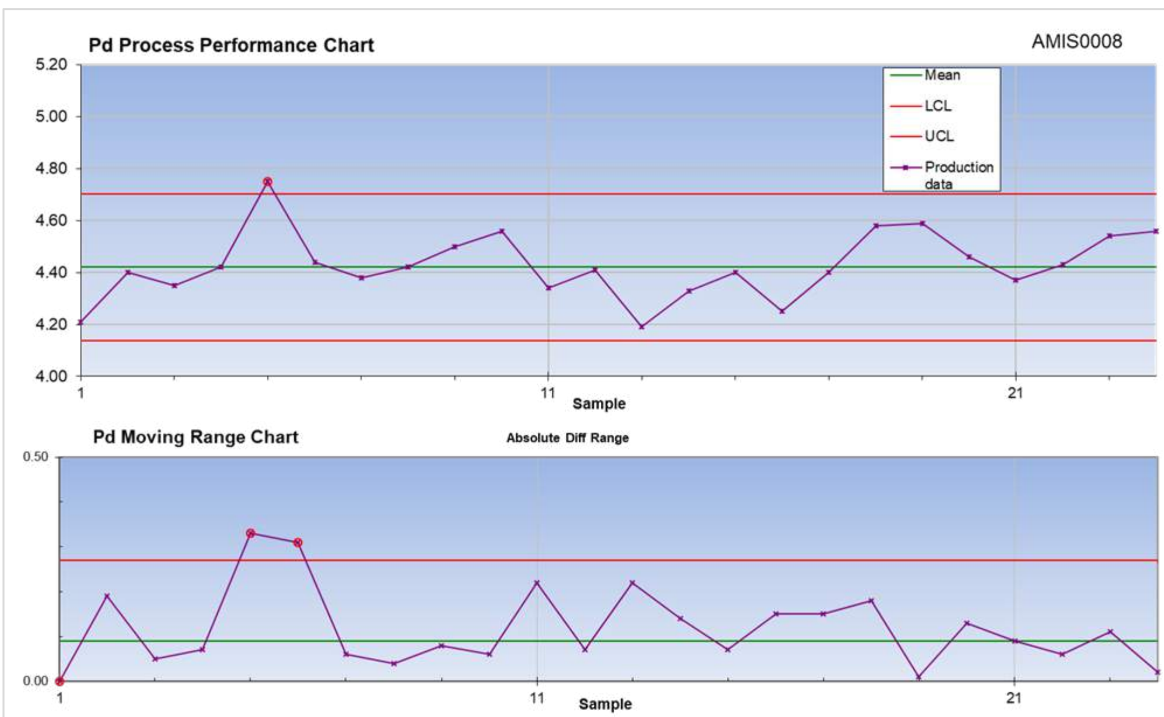


Figure 11-3: Current deposit Standard AMIS0008 Pd (g/t)

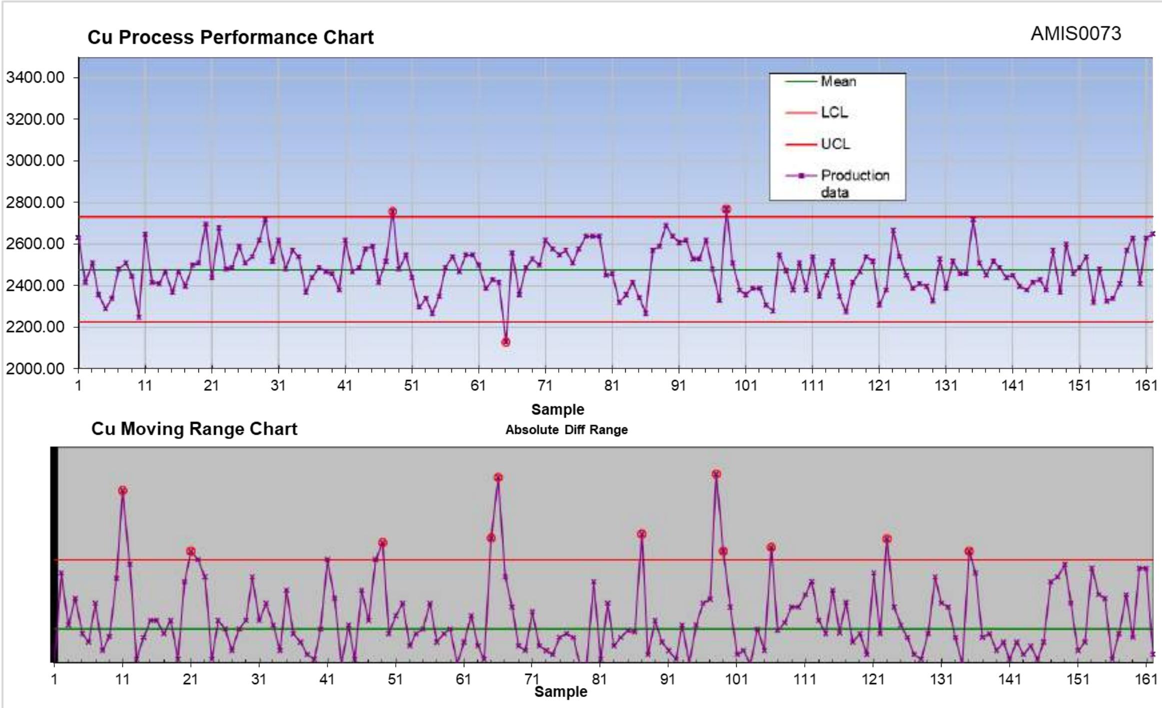


Figure 11-4: Current deposit Standard AMIS0073 Cu (g/t)

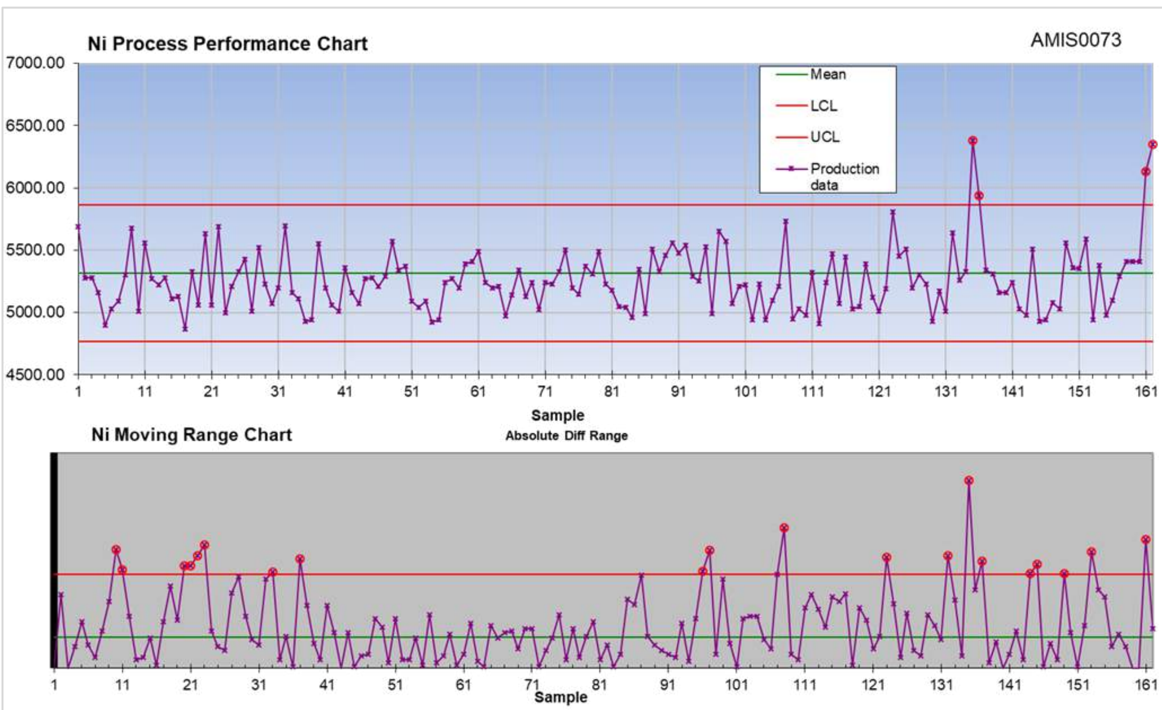


Figure 11-5: Current deposit Standard AMIS0073 Ni (g/t)

Table 11-3: Current Deposit CRM Result Summary from Lab Inserted CRMs

Standard	Count	Best Value Pt (g/t)	Mean Value Pt (g/t)	Bias (%)	Best Value Pd (g/t)	Mean Value Pd (g/t)	Bias (%)	Best Value Cu (g/t)	Mean Value Cu (g/t)	Bias (%)	Best Value Ni (g/t)	Mean Value Ni (g/t)	Bias (%)	Best Value Co (g/t)	Mean Value Co (g/t)	Bias (%)	Best Value Ag (g/t)	Mean Value Ag (g/t)	Bias (%)	Best Value Au (g/t)	Mean Value Au (g/t)	Bias (%)
GBM306-12	76							14902	14820	82	9513	9430	83									
GBM398-4c	284							3891	3709	182	4071	3982	89									
GBM399-5	4463							29424	665	28759	24412	181	24231									
GBM908-10	852							3601	3579	22	2241	2179	62	23	25	2	2.900	2.980	0.080			
OREAS 19 a	57																			5.490	5.420	0.700
Oreas 15 g	147																			0.527	0.512	0.015
Oreas 24P	120							52	52.720	0.720	141	147.700	6.700									
Oreas 45c	1376	0.065	0.064	0.001	0.047	0.046	0.001															
Oreas 45P	8435	0.077	0.075	0.002	0.055	0.054	0.001	749	738	11	385	364	21							0.055	0.072	0.017
Oreas 904	99																			0.045	0.044	0.001
PGMS 9	699	0.710	0.400	0.310	2.600	1.510	1.090													1.040	0.700	0.340
PGMS 13	735	1.250	1.260	0.010	4.510	4.460	0.050													1.410	1.380	0.030
PGMS 14	1830	0.119	0.12	0.001	0.451	0.448	0.003													0.259	0.257	0.002
PGMS 15	1180	0.098	0.101	0.003	0.428	0.429	0.001													0.410	0.400	0.010
PGMS 16	790	1.230	0.799	0.431	4.660	3.710	0.950													1.120	0.710	0.410
PGMS 17	1152	0.998	1.000	0.002	4.300	4.360	0.060													0.927	0.91	0.017
PGMS 19	54	0.108	0.111	0.003	0.476	0.480	0.004													0.230	0.223	0.007
AMIS0160	3							2.060	2.060	0.000				3.160	3.160	0.310						
AMIS0281	3	0.504	0.540	0.060	1.50	1.500	0.080															
CCU-1c	5							25.620	25.620	0.0007												
CCU-1 d	2							23.9	23.9	0.00029												
CCU-1e	9							22.88	22.88	0.00024												

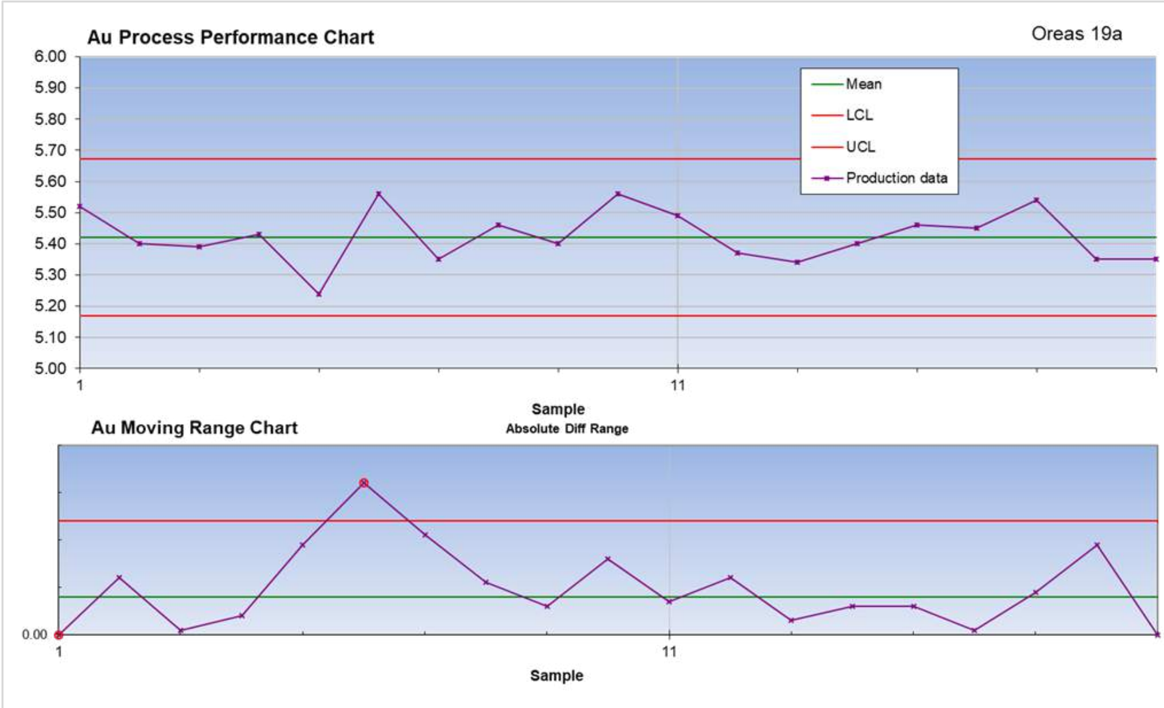


Figure 11-6: Current deposit Standard Oreas 19a Au (g/t)

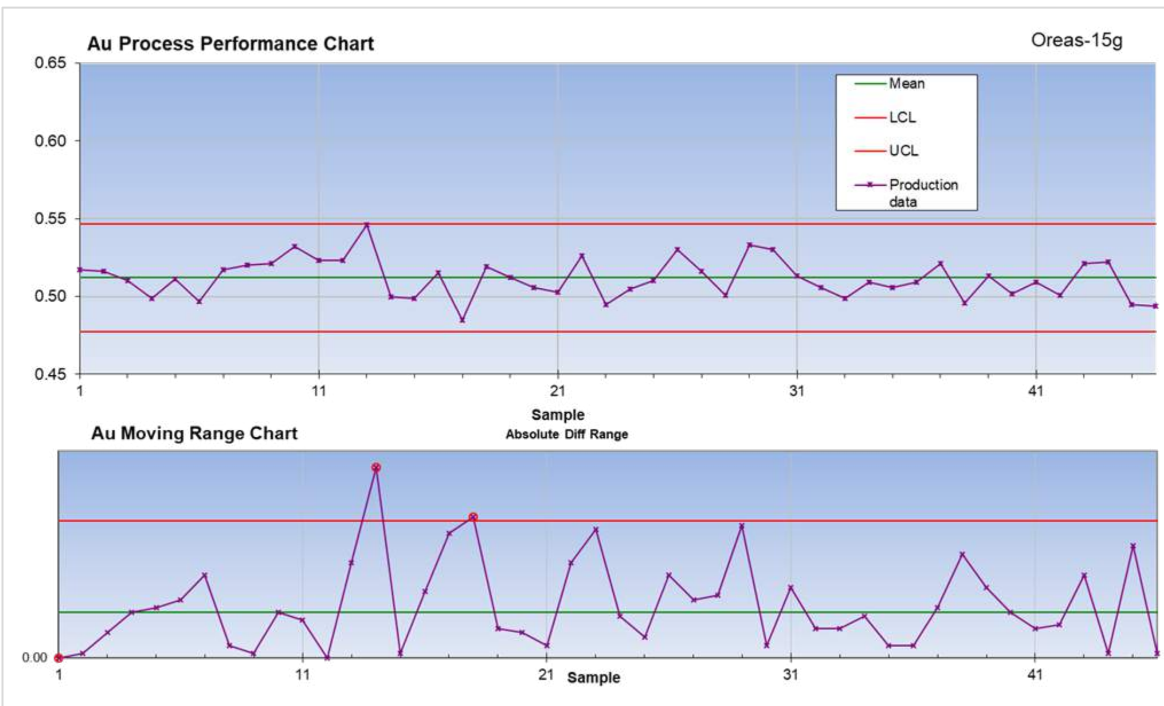


Figure 11-7: Current deposit Standard Oreas-15 g Au (g/t)

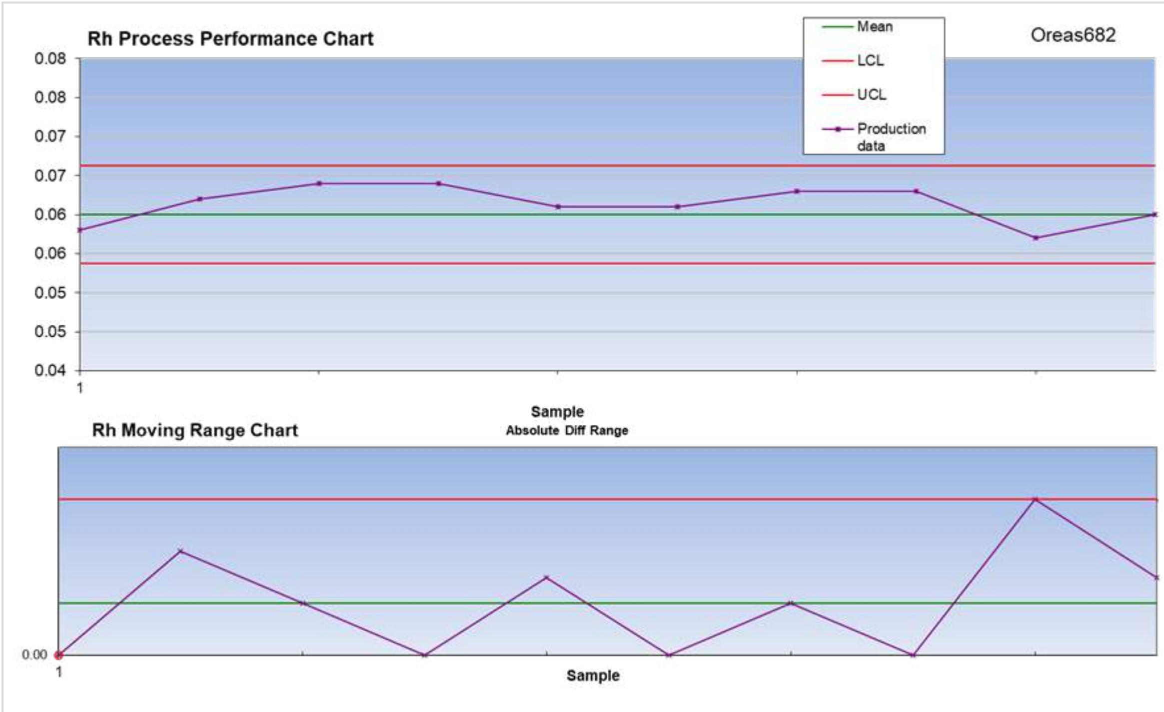


Figure 11-8: Current deposit Standard Oreas 682 Rh (g/t)

11.3.1.2 Blanks

The Company submitted 6,703 coarse blanks between 2006 and 2021 as part of its QA/QC process. Five different blanks were used with the corresponding amount in brackets BL08 (2637), BL09 (1967), BL12 (722), BL114 (40), Marble (1337) (Figure 11-9 through Figure 11-15) and Silica (3546) (Figure 11-16 through Figure 11-22). The lab submitted 24,191 blanks between 2006 and 2021 as part of its QA/QC process. One blank was used labelled as Blank. The charts not presented in this section are available in Appendix C. No significant carryover of elevated metals is evident. This does not impact the Mineral Resource Estimate.

The blanks contain measurable quantities of Pt, Pd, Cu, Ni, Co, Ag, Au, and Rh. There was no obvious correlation between the blank values and those samples immediately preceding.

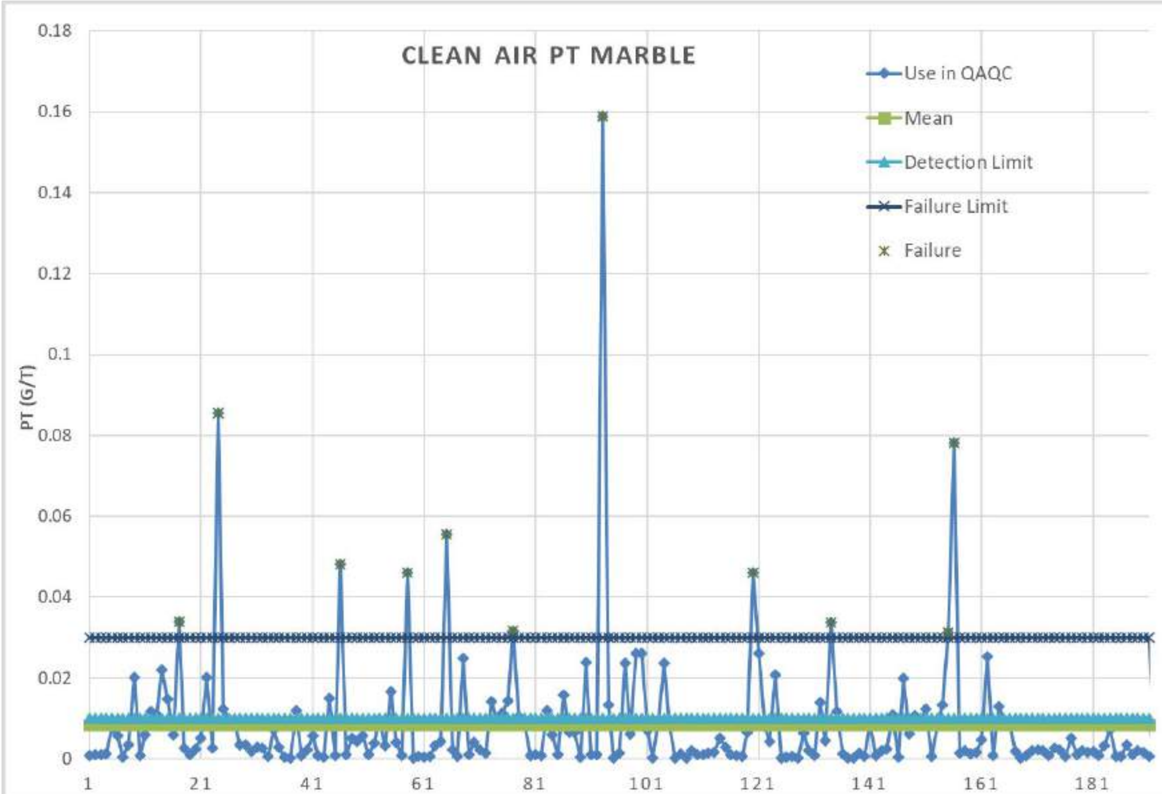


Figure 11-9: ALS Pt (g/t) results for the Current deposit marble coarse blanks

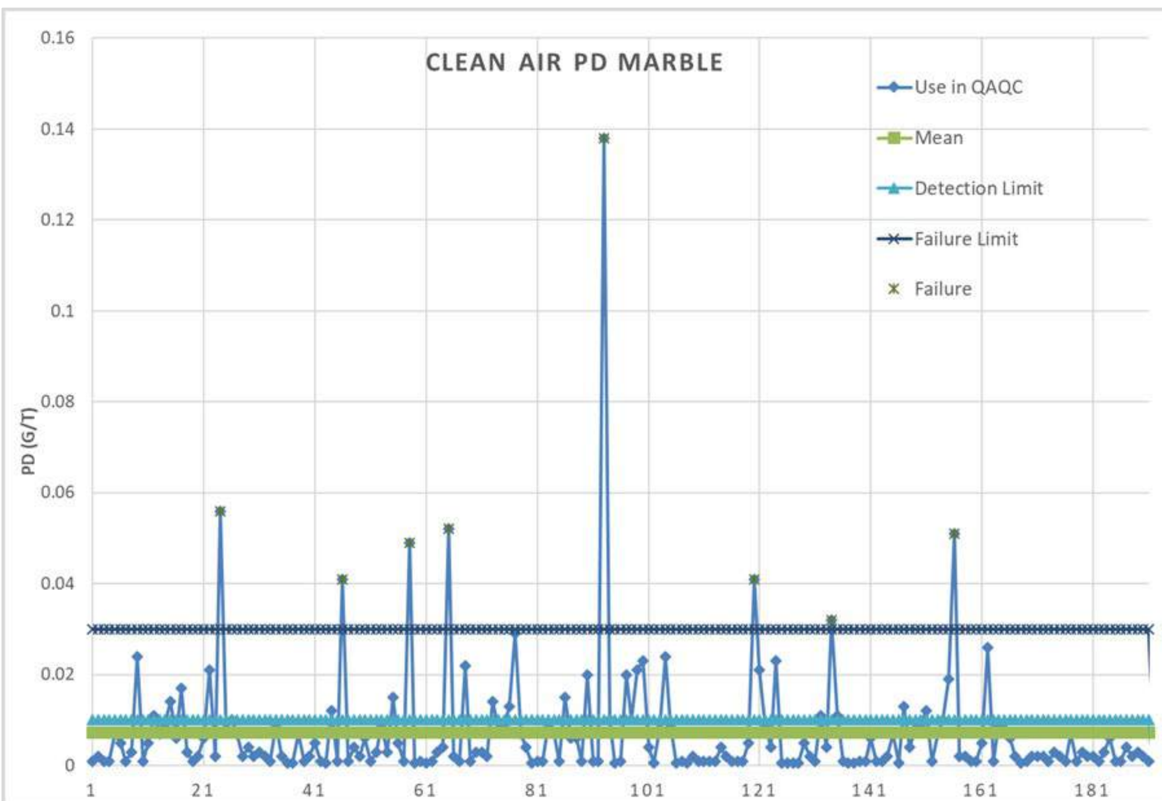


Figure 11-10: ALS Pd (g/t) results for the Current deposit marble coarse blanks

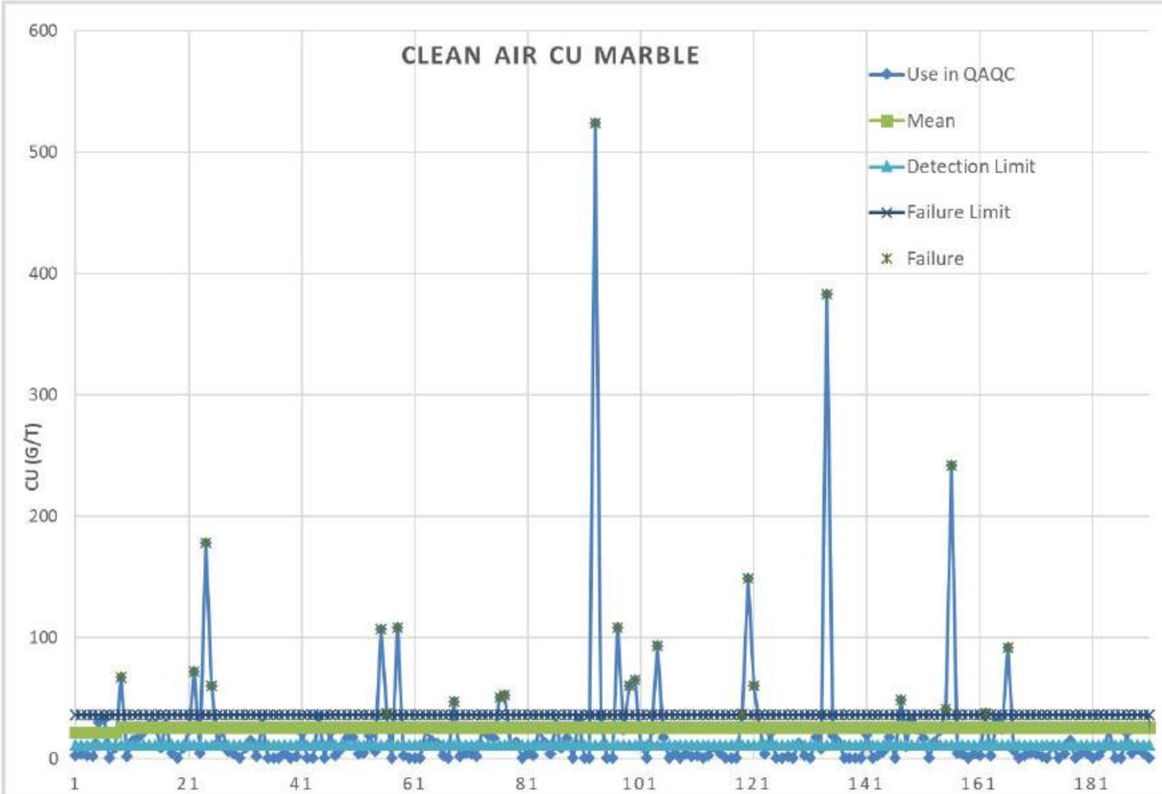


Figure 11-11: ALS Cu (g/t) results for the Current deposit marble coarse blanks

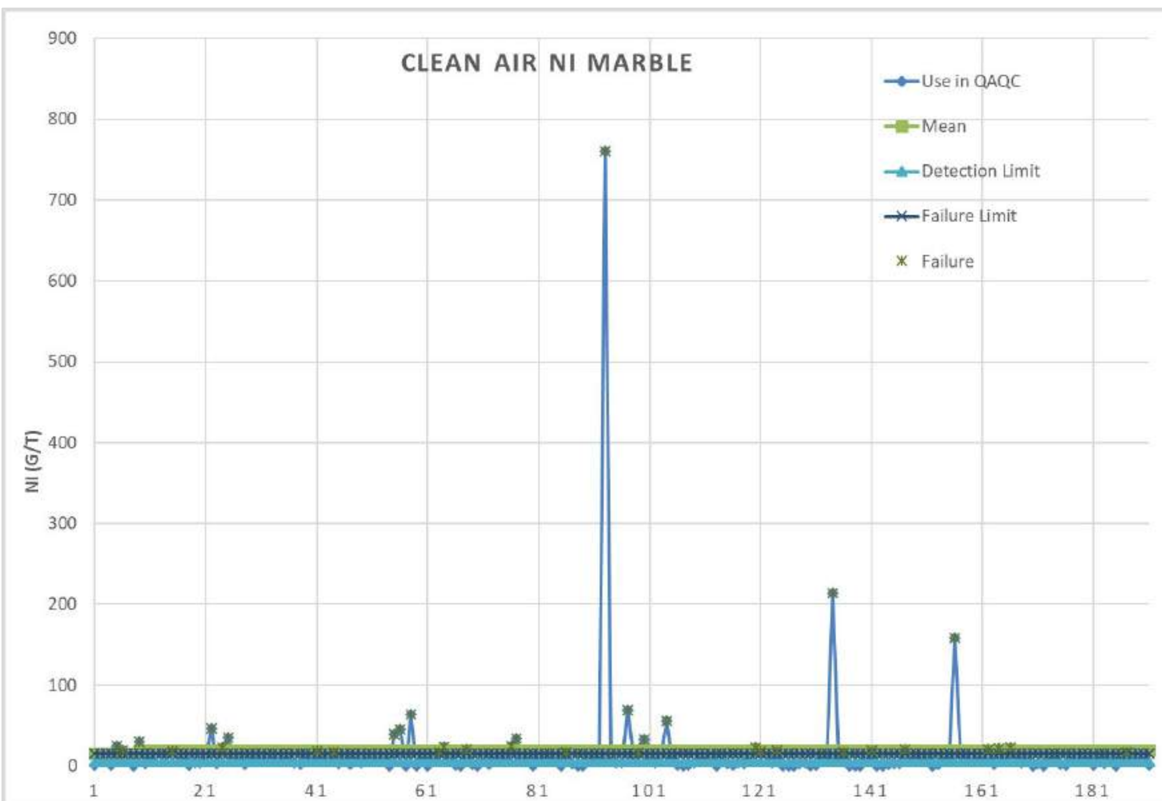


Figure 11-12: ALS Ni (g/t) results for the Current deposit marble coarse blanks

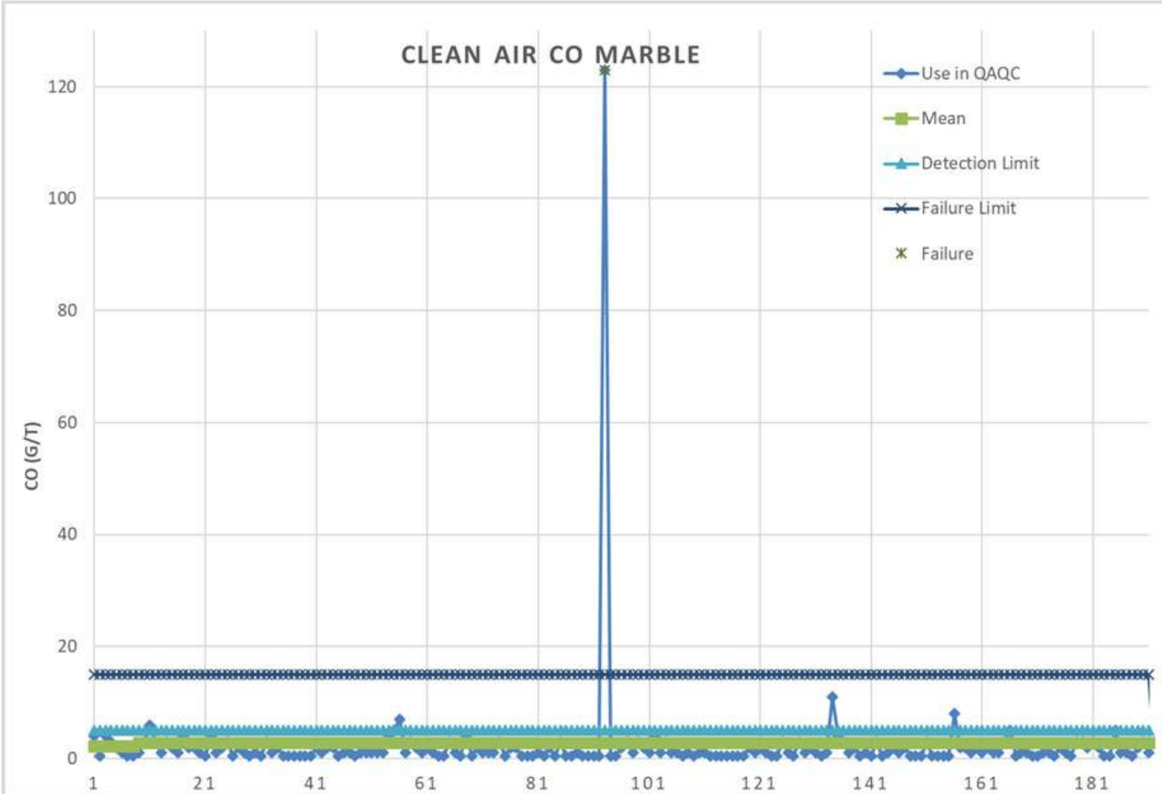


Figure 11-13: ALS Co (g/t) results for the Current deposit marble coarse blanks

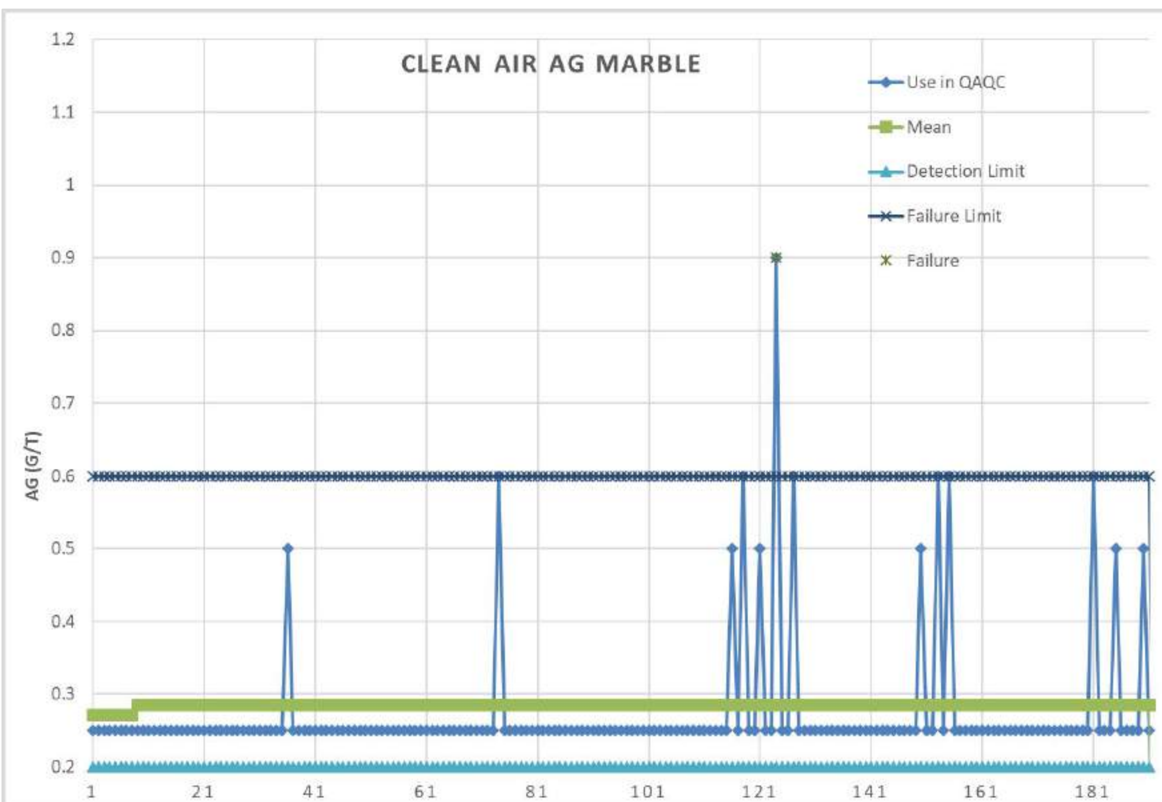


Figure 11-14: ALS Ag (g/t) results for the Current deposit marble coarse blanks

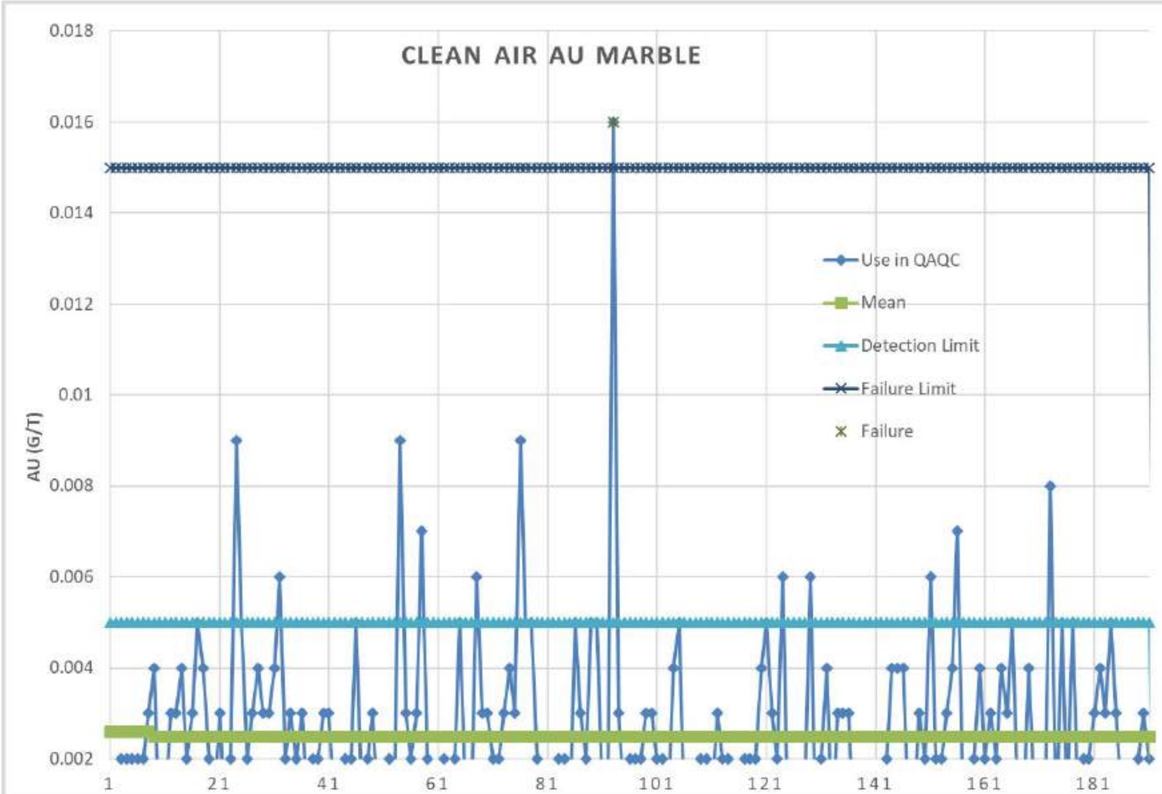


Figure 11-15: ALS Au (g/t) results for the Current deposit marble coarse blanks

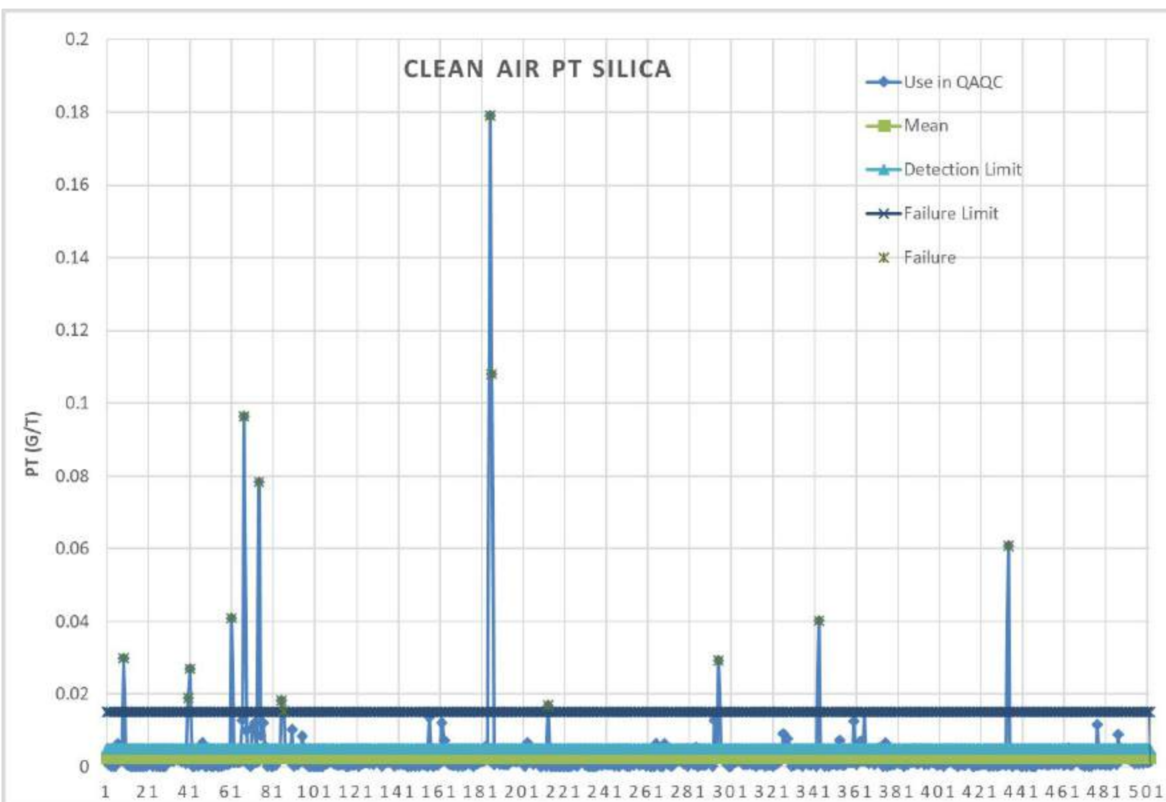


Figure 11-16: ALS Pt (g/t) results for the Current deposit silica coarse blanks

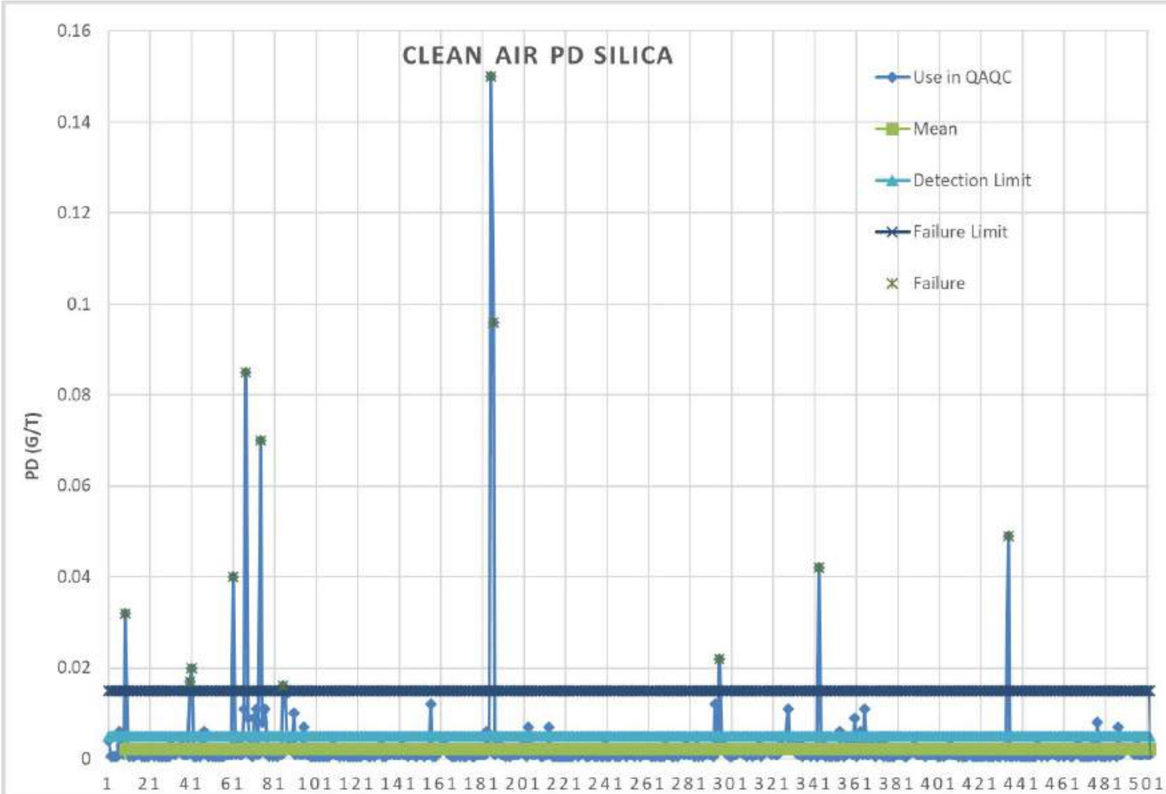


Figure 11-17: ALS Pd (g/t) results for the Current deposit silica coarse blanks

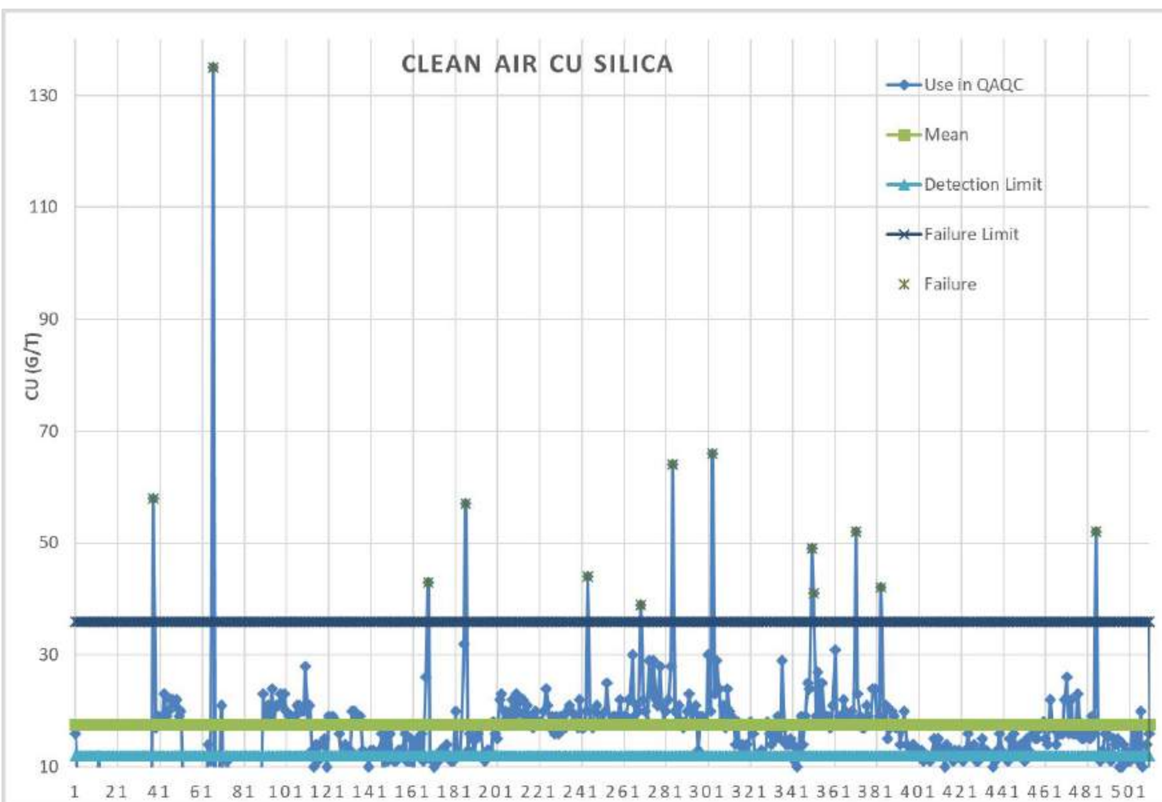


Figure 11-18: ALS Cu (g/t) results for the Current deposit silica coarse blanks

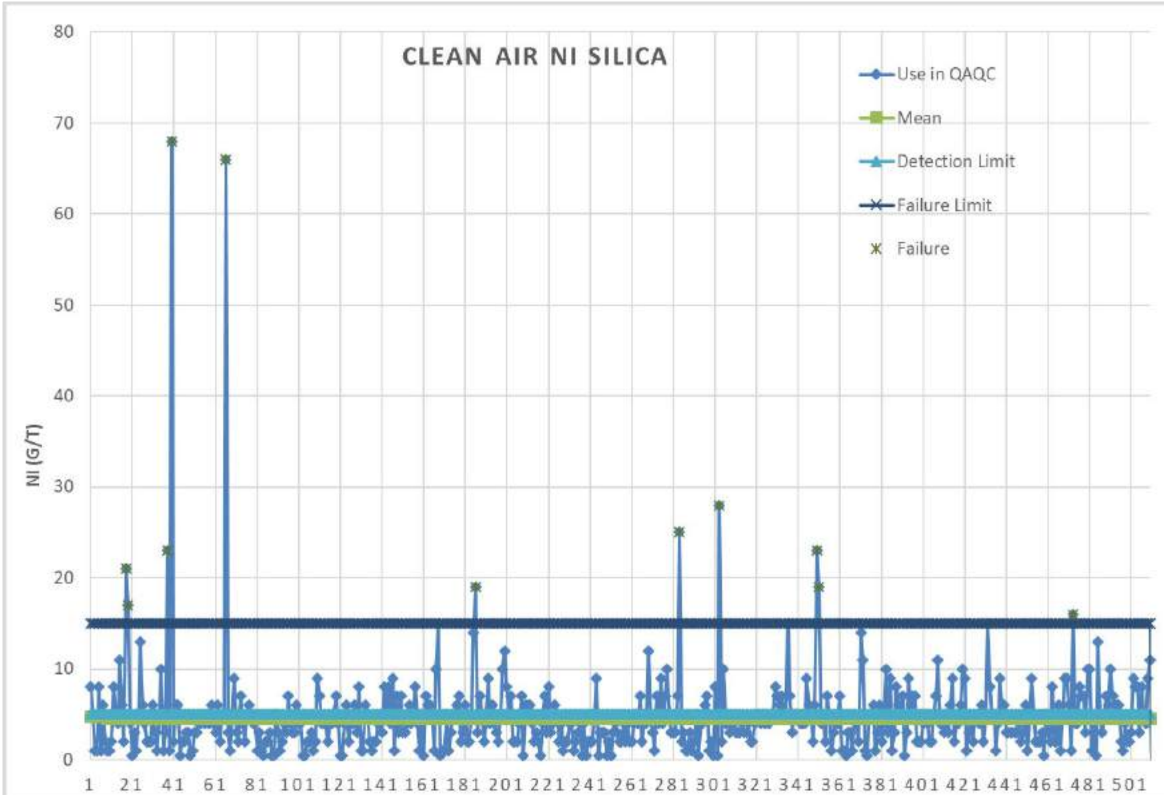


Figure 11-19: ALS Ni (g/t) results for the Current deposit silica coarse blanks

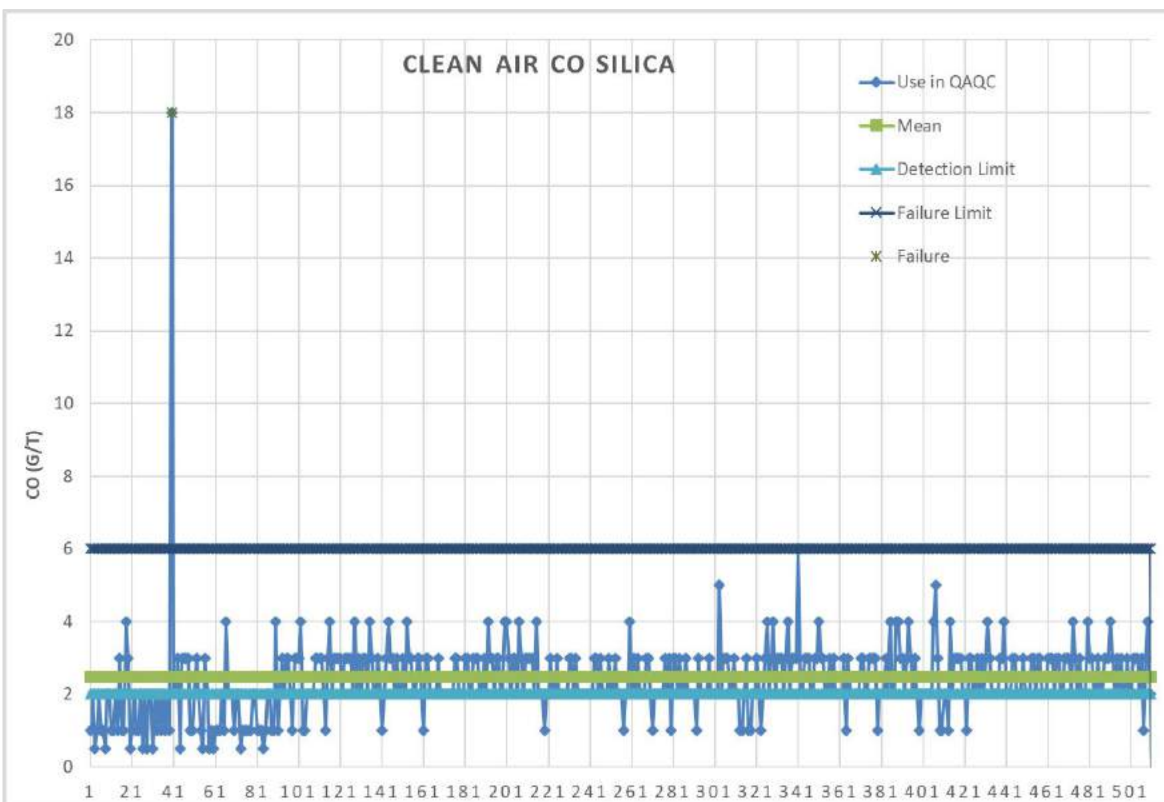


Figure 11-20: ALS Co (g/t) results for the Current deposit silica coarse blanks

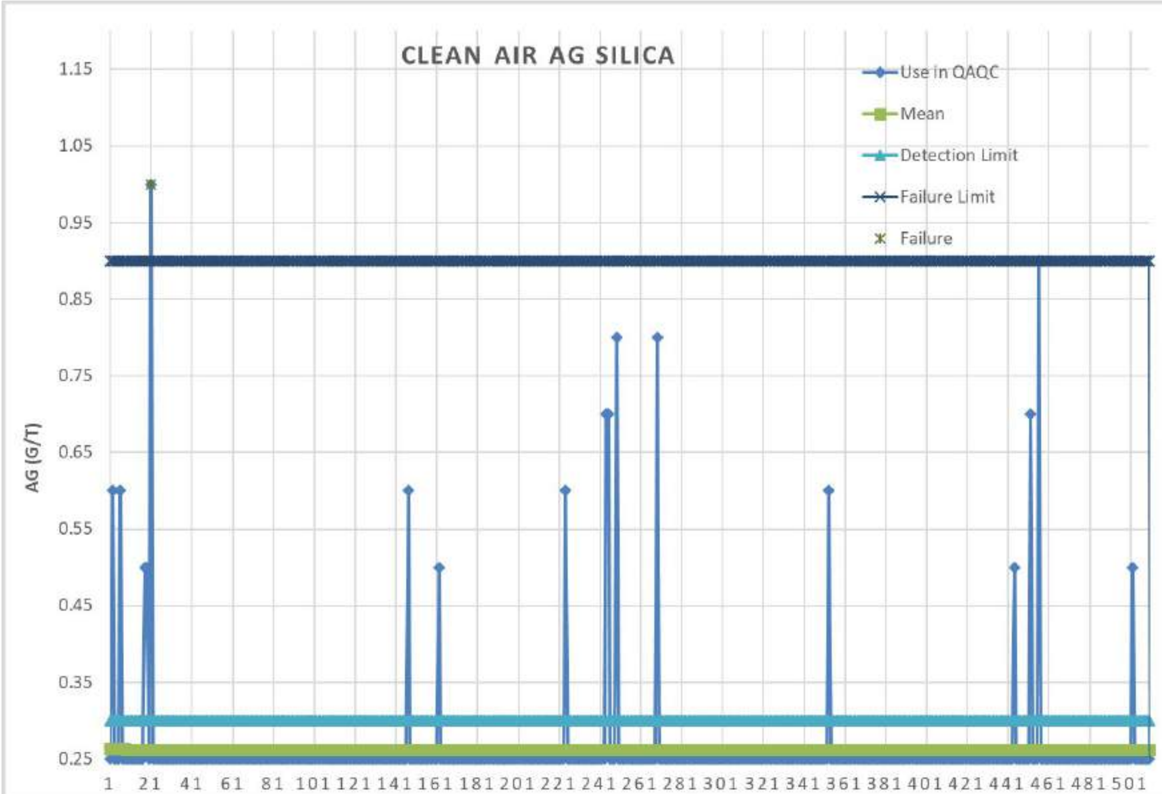


Figure 11-21: ALS Ag (g/t) results for the Current deposit silica coarse blanks

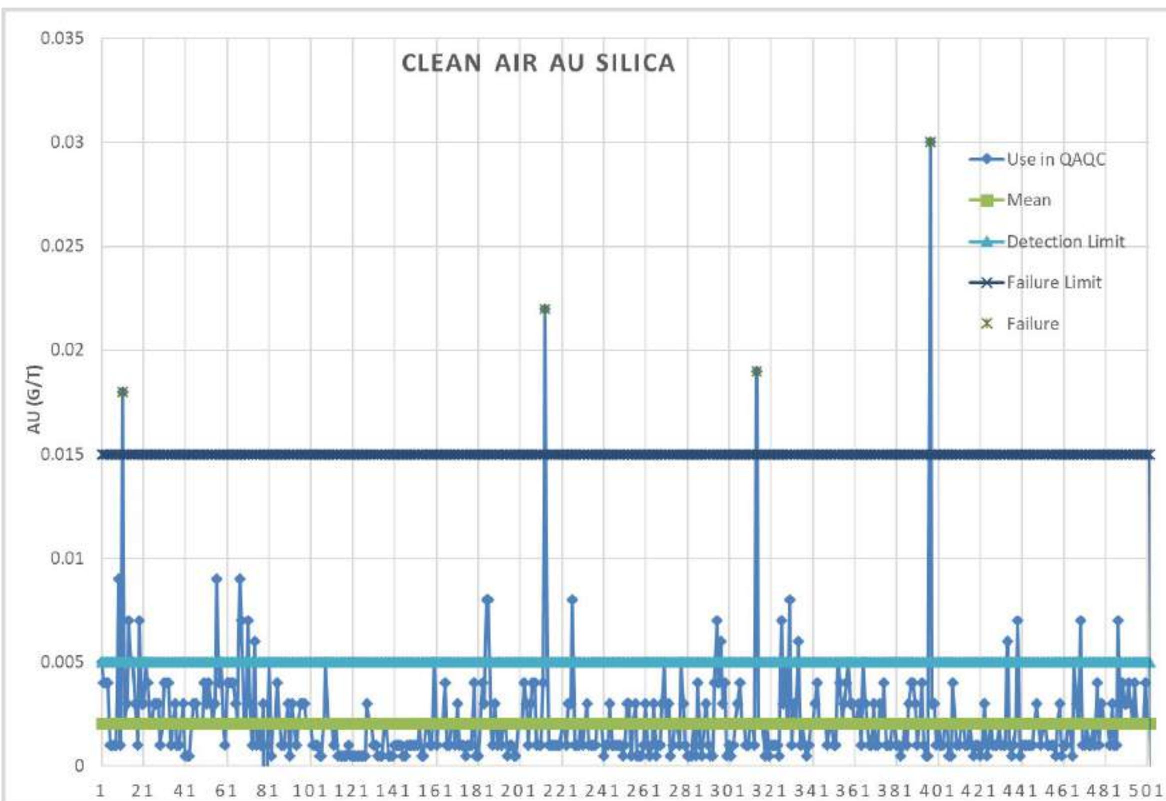


Figure 11-22: ALS Au (g/t) results for the Current deposit silica coarse blanks

11.3.1.3 Field and Laboratory Duplicates

The Company submitted 800 core and pulp duplicates and the lab submitted 22,840 laboratory duplicates as part of their QA/QC process between 2006 and 2021. The Pt, Pd, Cu, Ni, Ag, Au, and Rh field duplicates demonstrate good agreement however Co shows variability (Figure 11-23 and Figure 11-29). The lab duplicates for Pt, Pd, Cu, Ni, Co, Ag, and Rh show good agreement while the Au results show high variability for Au results (Figure 11-30 and Figure 11-37).

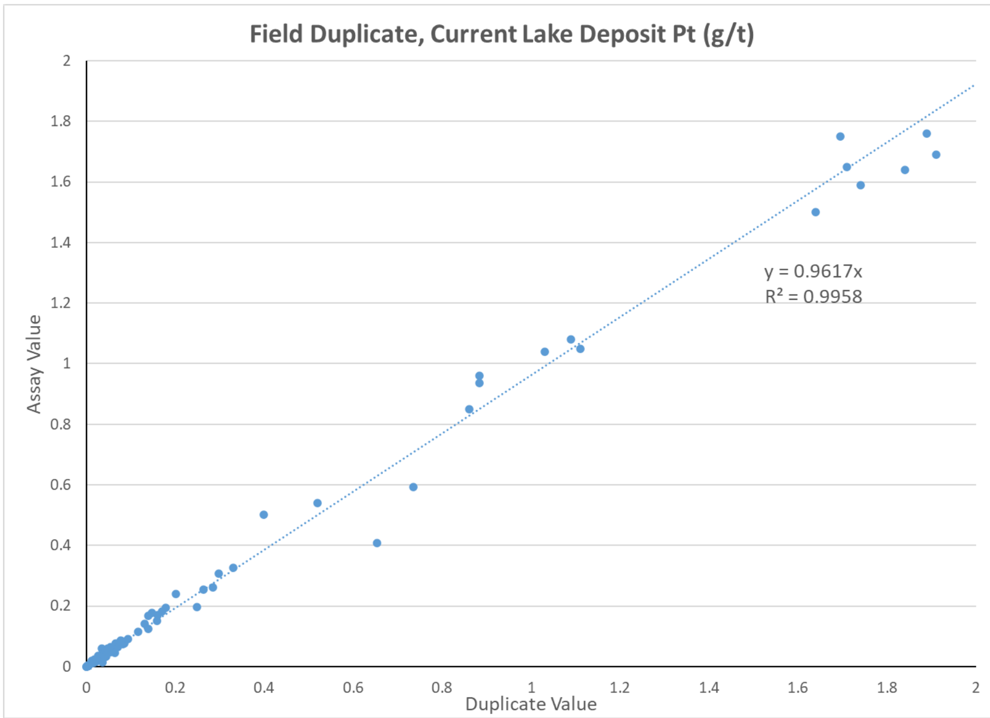


Figure 11-23: Current deposit field duplicates for Pt (g/t)

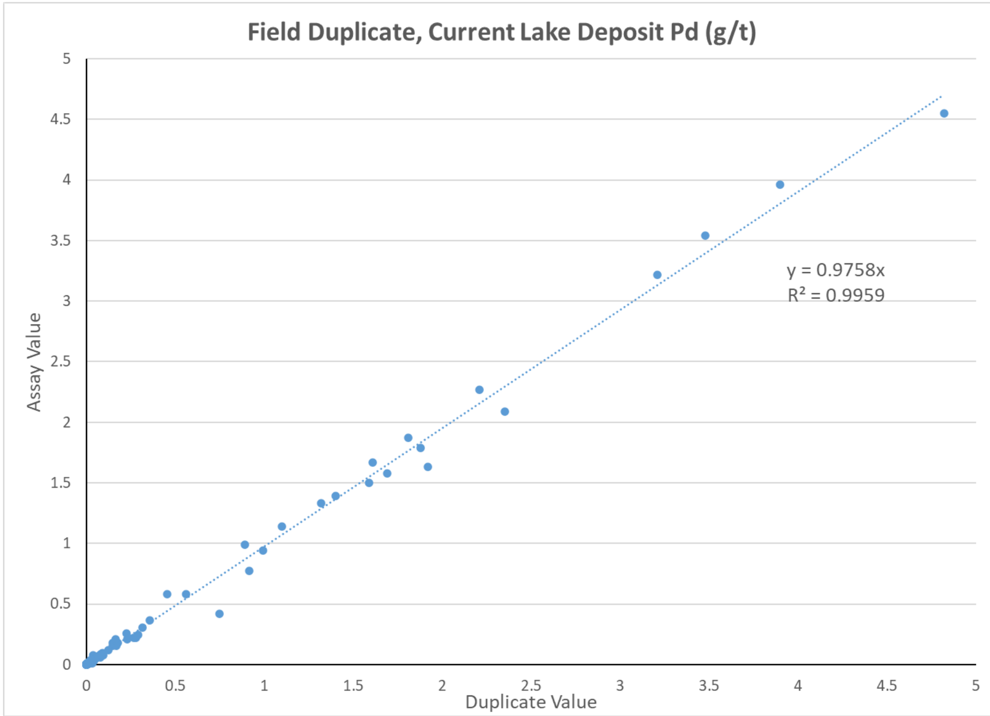


Figure 11-24: Current deposit field duplicates for Pd (g/t)

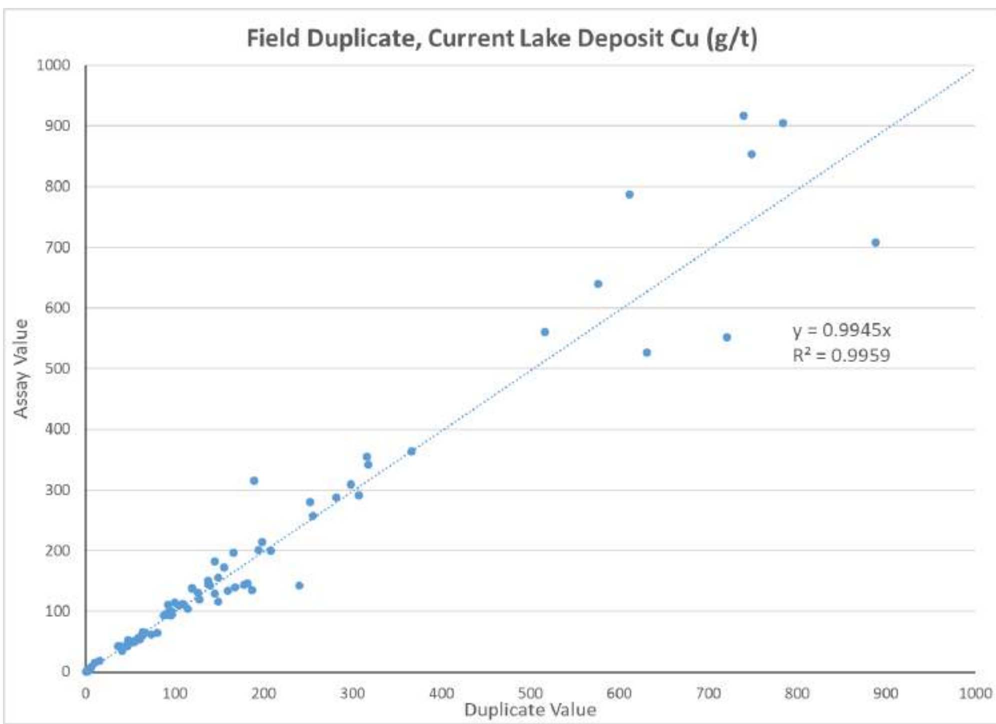


Figure 11-25: Current deposit field duplicates for Cu (g/t)

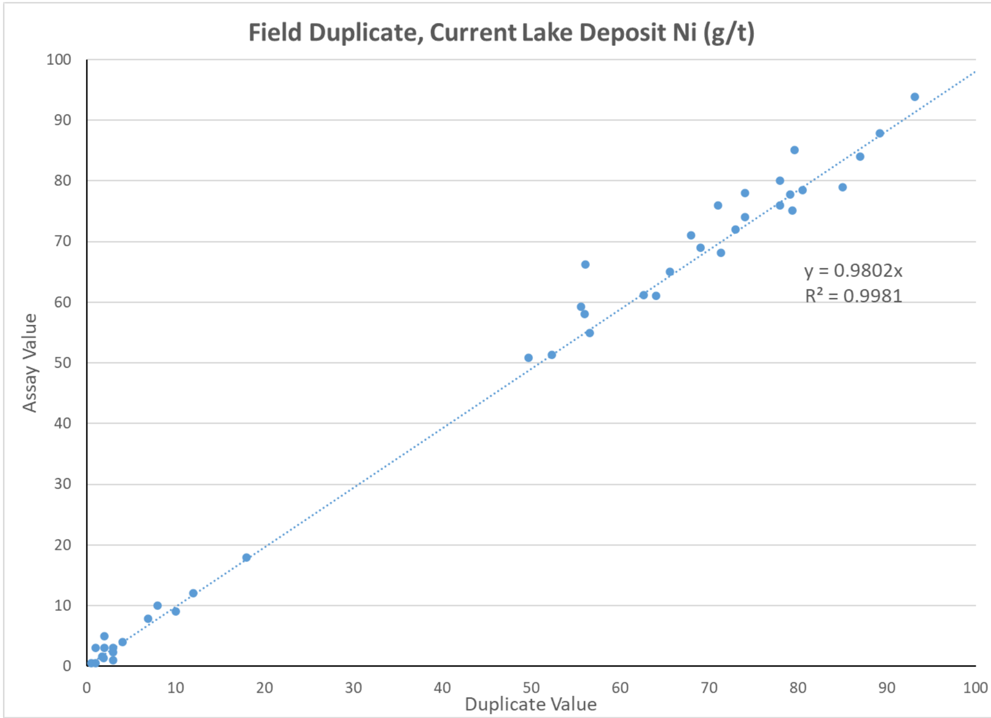


Figure 11-26: Current deposit field duplicates for Ni (g/t)

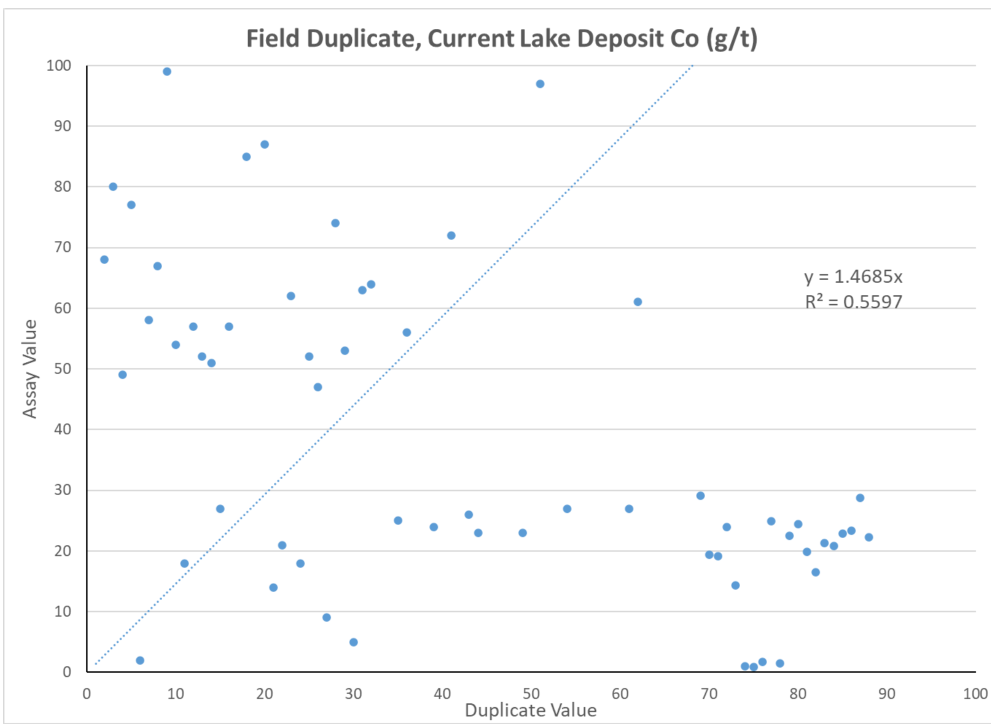


Figure 11-27: Current deposit field duplicates for Co (g/t)

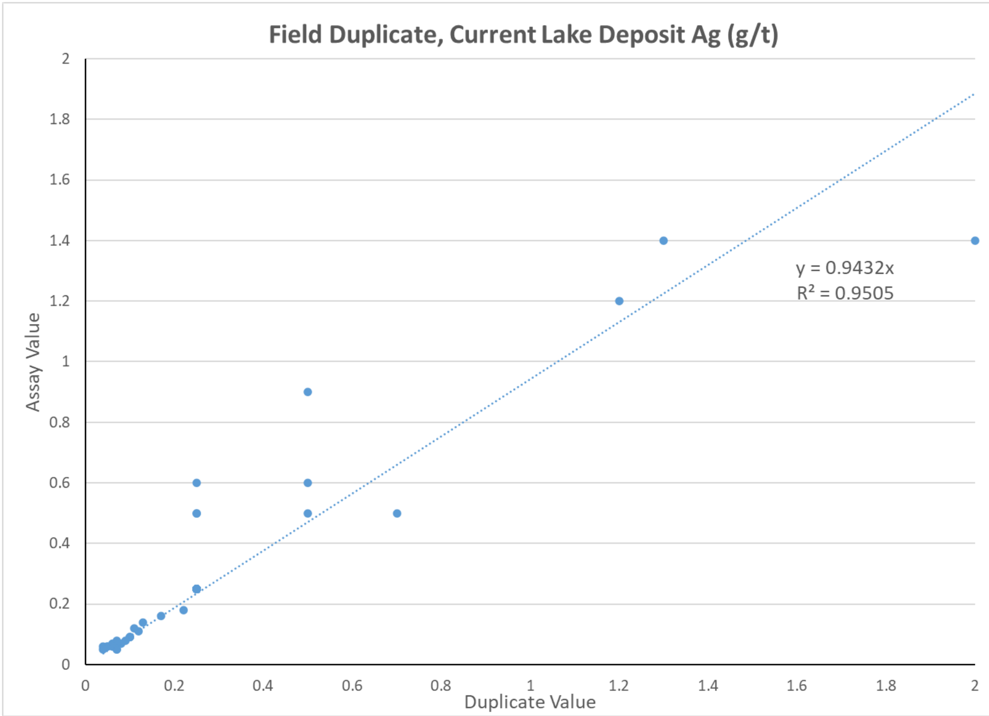


Figure 11-28: Current deposit field duplicates for Ag (g/t)

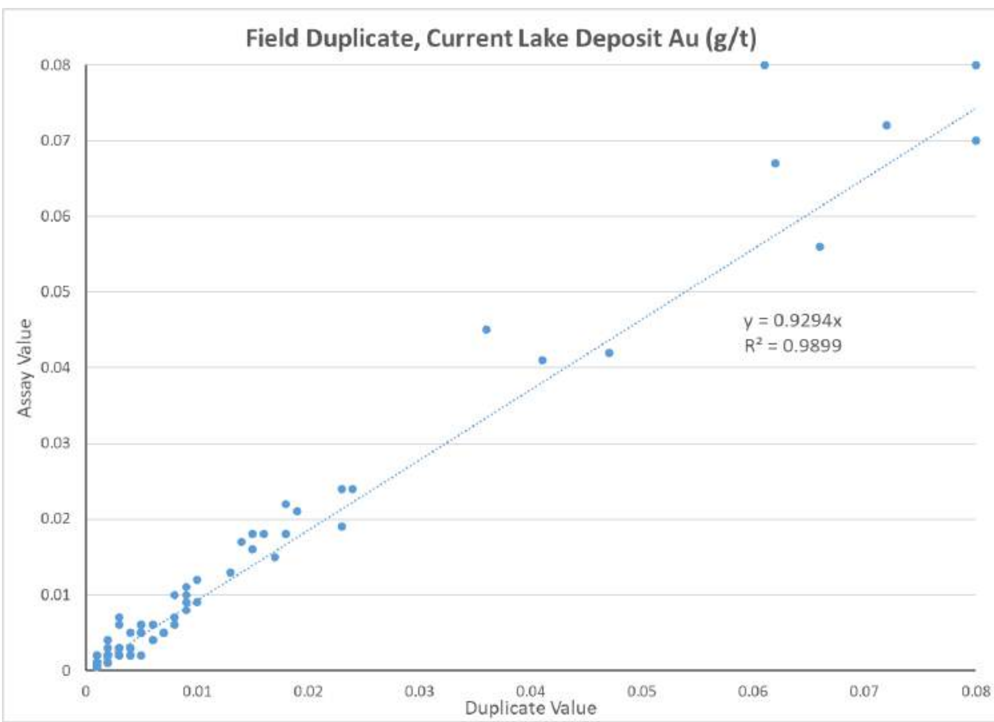


Figure 11-29: Current deposit field duplicates for Au (g/t)

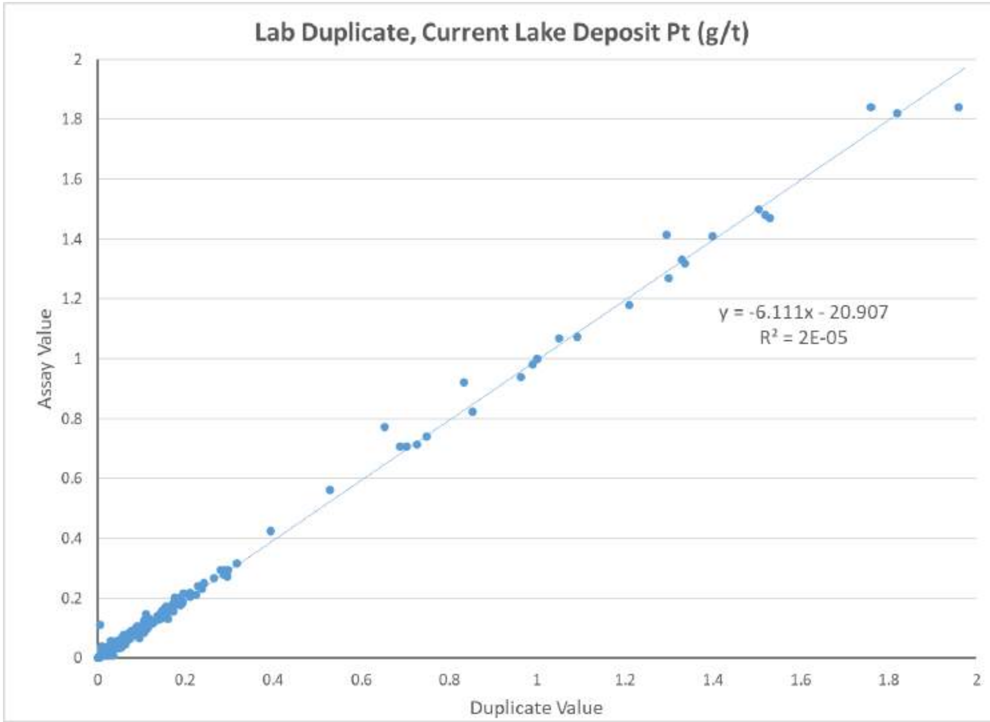


Figure 11-30: Current deposit lab duplicates for Pt (g/t)

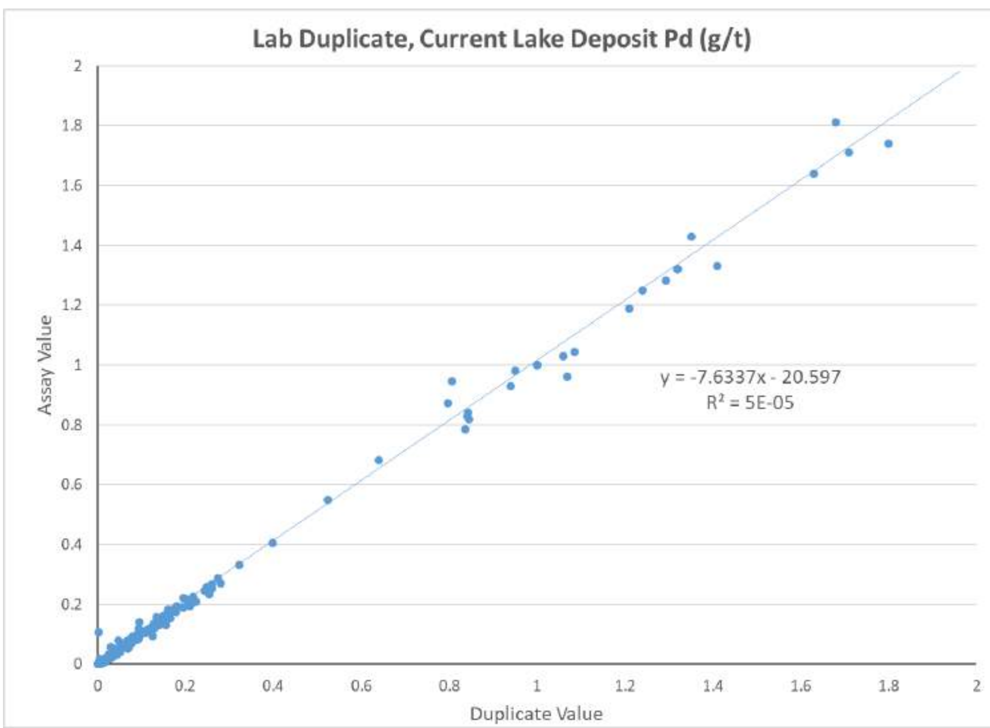


Figure 11-31: Current deposit lab duplicates for Pd (g/t)

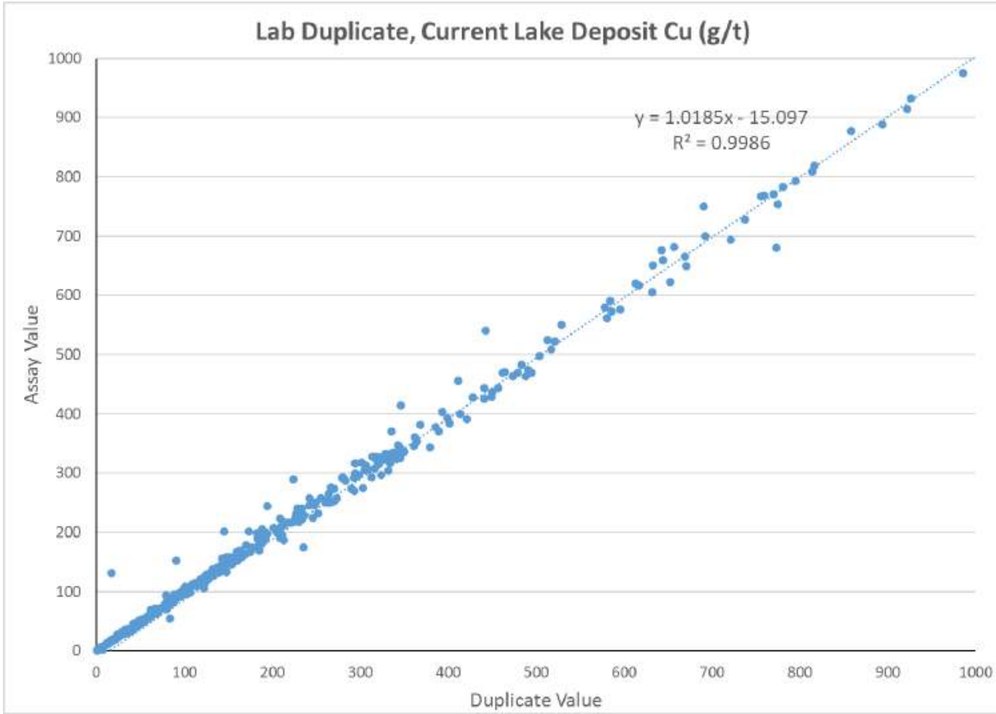


Figure 11-32: Current deposit lab duplicates for Cu (g/t)

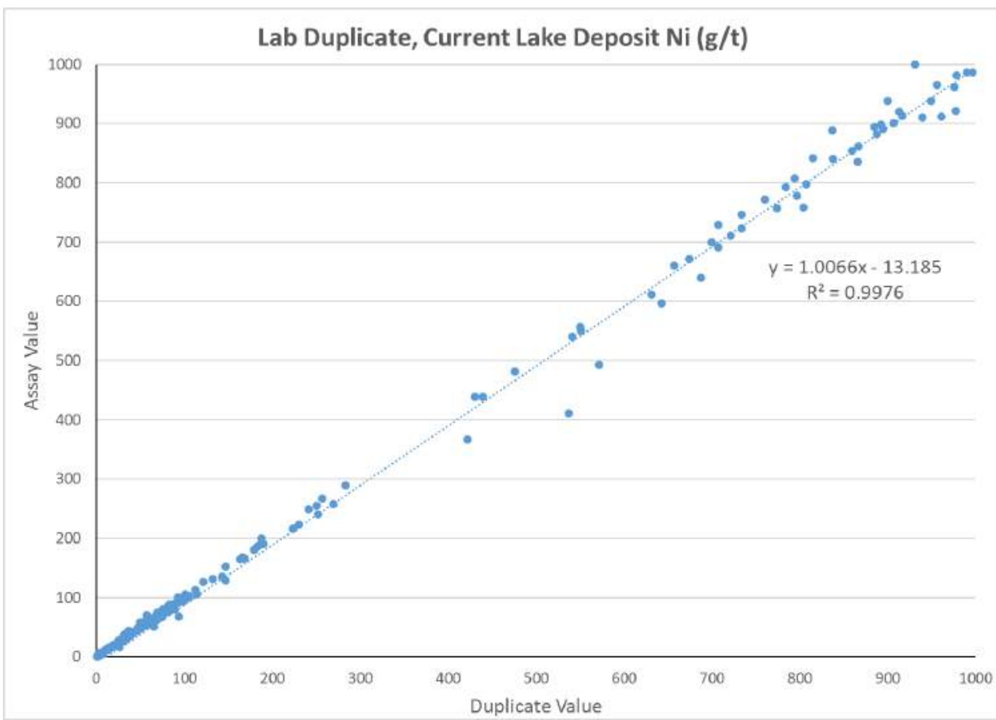


Figure 11-33: Current deposit lab duplicates for Ni (g/t)

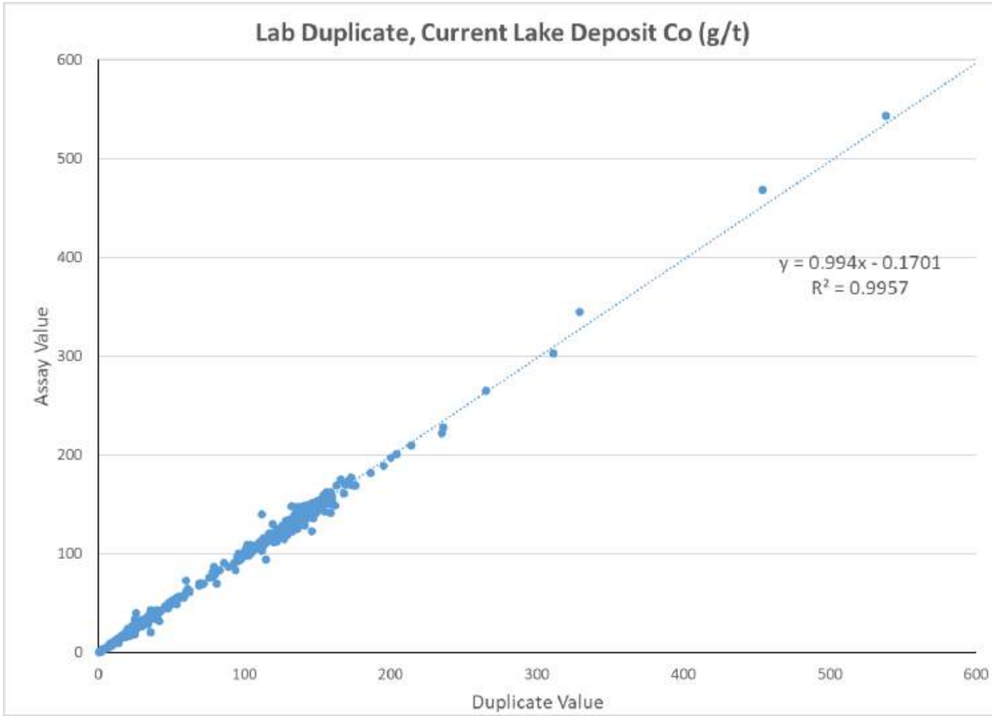


Figure 11-34: Current deposit lab duplicates for Co (g/t)

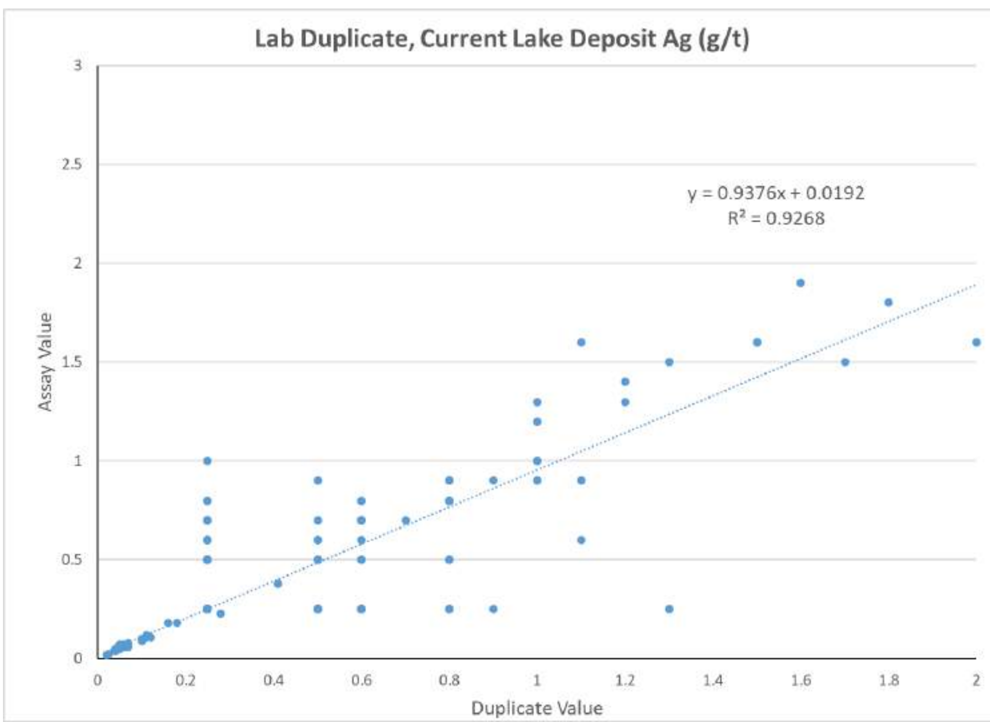


Figure 11-35: Current deposit lab duplicates for Ag (g/t)

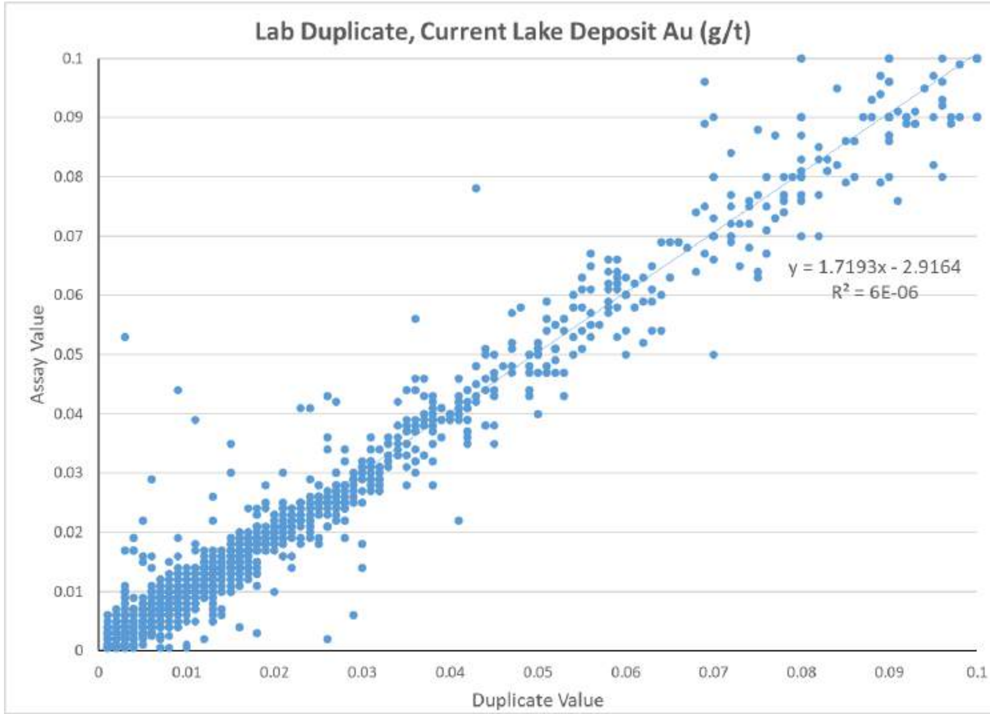


Figure 11-36 Current deposit lab duplicates for Au (g/t)

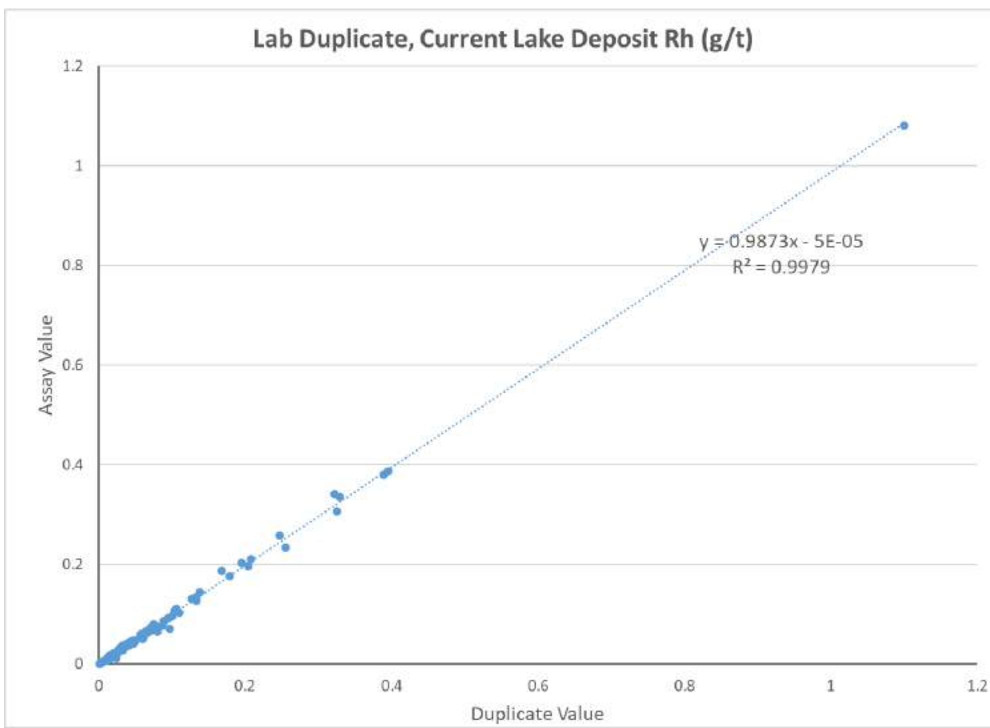


Figure 11-37: Current deposit lab duplicates for Rh (g/t)

11.3.2 Escape Deposit

11.3.2.1 Standards

The Company submitted seven different CRM's as part of its QA/QC process with a total of 976 CRM's (Table 11-4). The review of CRM results identified 21 sample swaps or laboratory failures that have been incorrectly identified as members of a different population. AMIS0073 shows high variability and has outliers for the mean +/- two standard deviations for Cu and Ni (Figure 11-38 and Figure 11-39).

The lab submitted two different CRM's as part of its QA/QC process with a total of 216 CRM's (Table 11-5). Oreas 684 fell within the range of mean +/- two standard deviations for Pt and Pd (Figure 11-40 and Figure 11-41). Oreas 684 fell largely into the range of mean +/- two standard deviations for Rh (Figure 11-42). The process performance and moving range charts for all other standards listed in Table 11-4 and Table 11-5 can be found in Appendix C.

Table 11-4: Escape Deposit CRM Result Summary from the Company

Standard	Count	Best Value Pt (g/t)	Mean Value Pt (g/t)	Bias (%)	Best Value Pd (g/t)	Mean Value Pd (g/t)	Bias (%)	Best Value Cu (g/t)	Mean Value Cu (g/t)	Bias (%)	Best Value Ni (g/t)	Mean Value Ni (g/t)	Bias (%)	Best Value Co (g/t)	Mean Value Co (g/t)	Bias (%)
AMIS0060	196							3308.00	3477.000	-169.000	2909.000	3298.000	-389.000			
AMIS0064	90	1.240	1.240	0.000	0.580	0.560	0.020									
AMIS0073	188	0.330	0.349	-0.019	0.890	0.917	-0.027	2414.000	2487.000	-73.000	5459.000	5776.000	-317.000	277.000	288.000	-11.000
AMIS0093	203	0.11	0.105	0.005	0.470	0.470	0.000	2958.000	3006.000	-48.000	2722.000	2804.000	-82.000	173.000	171.000	2.000
AMIS0499	36	2.16	0.34		2.43	0.19										
Oreas 13b	136	0.526	0.526	0.016	0.243	0.243	0.013									
Oreas 681	87	0.197	0.197	0.000	0.131	0.131	0.000									

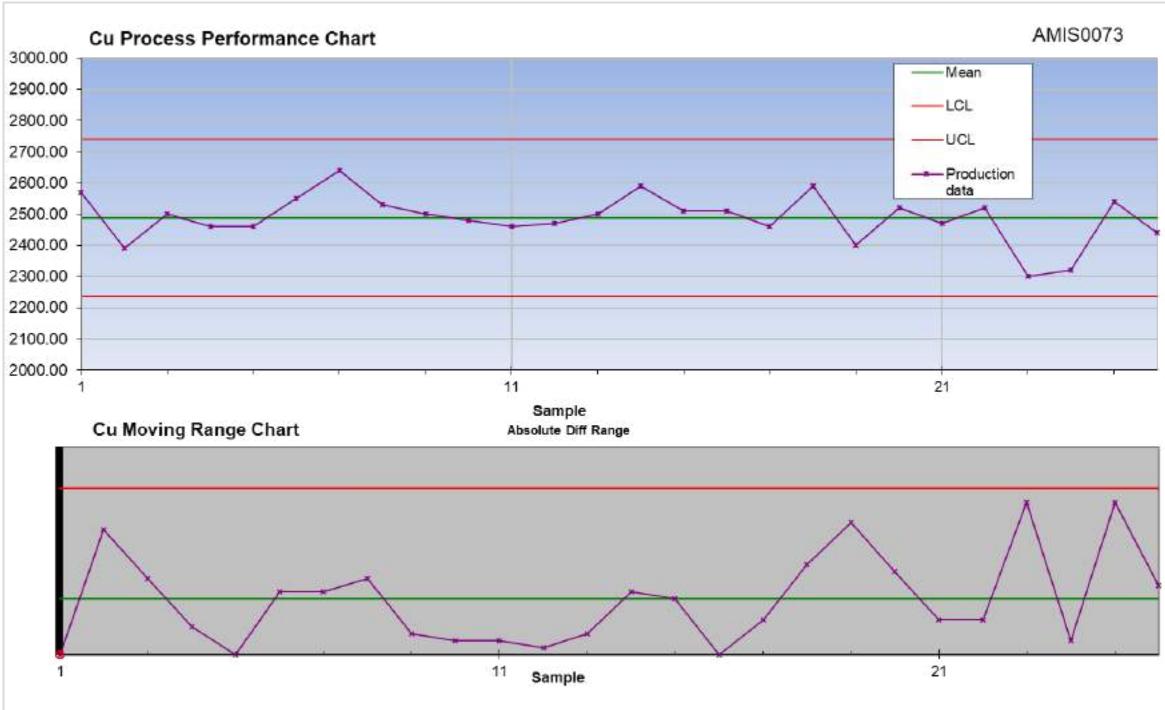


Figure 11-38: Escape deposit Standard AMIS0073 Cu (g/t)

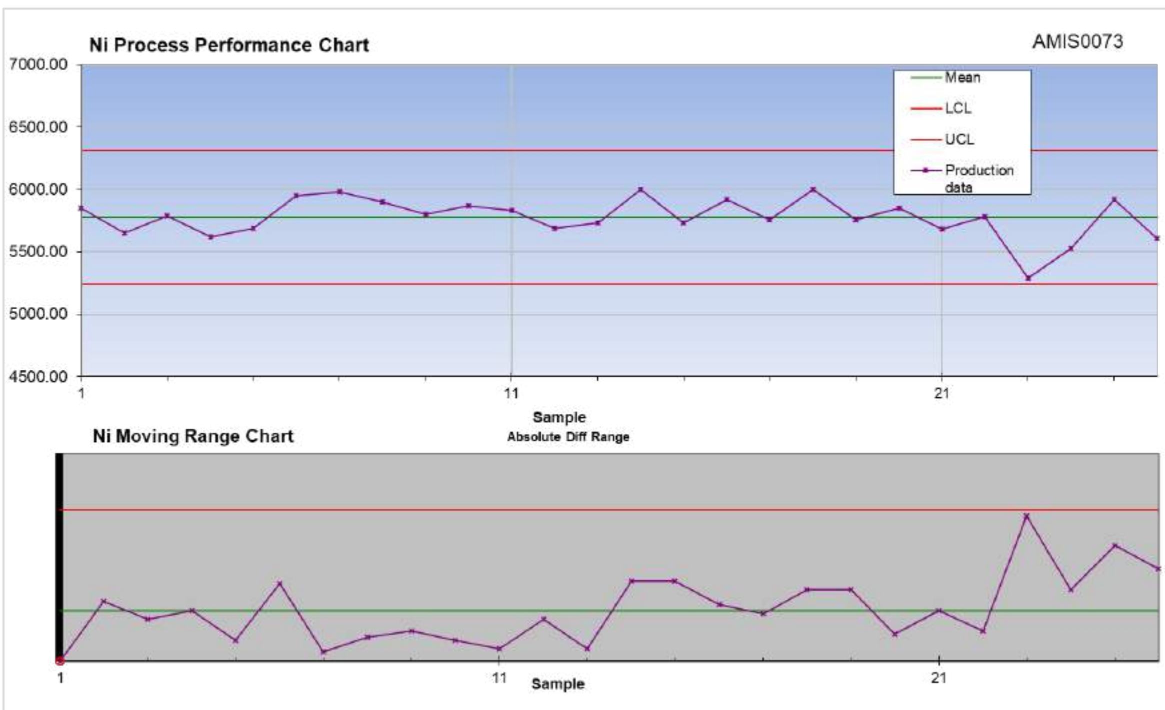


Figure 11-39: Escape deposit Standard AMIS0073 Ni (g/t)

Table 11-5: Escape Deposit CRM Result Summary from the Lab

Standard	Count	Best Value Pt (g/t)	Mean Value Pt (g/t)	Bias (%)	Best Value Pd (g/t)	Mean Value Pd (g/t)	Bias (%)	Best Value Cu (g/t)	Mean Value Cu (g/t)	Bias (%)	Best Value Ni (g/t)	Mean Value Ni (g/t)	Bias (%)	Best Value Co (g/t)	Mean Value Co (g/t)	Bias (%)	Best Value Au (g/t)	Mean Value Au (g/t)	Bias (%)
Oreas 602	108							5170	5152	18	60	62.2	-2.2	9.72	9.88	-0.16			
Oreas 684	108	3.870	3.900	-0.030	1.720	1.740	-0.020										0.248	0.255	-0.007

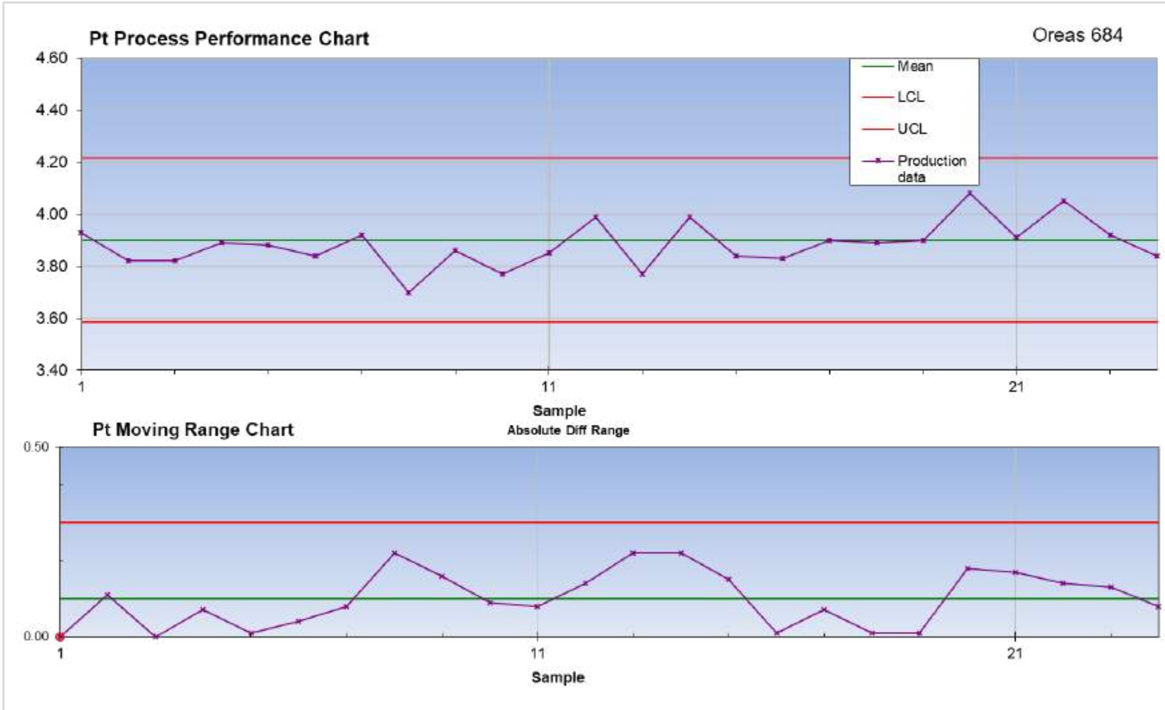


Figure 11-40: Escape deposit Standard Oreas 684 Pt (g/t)

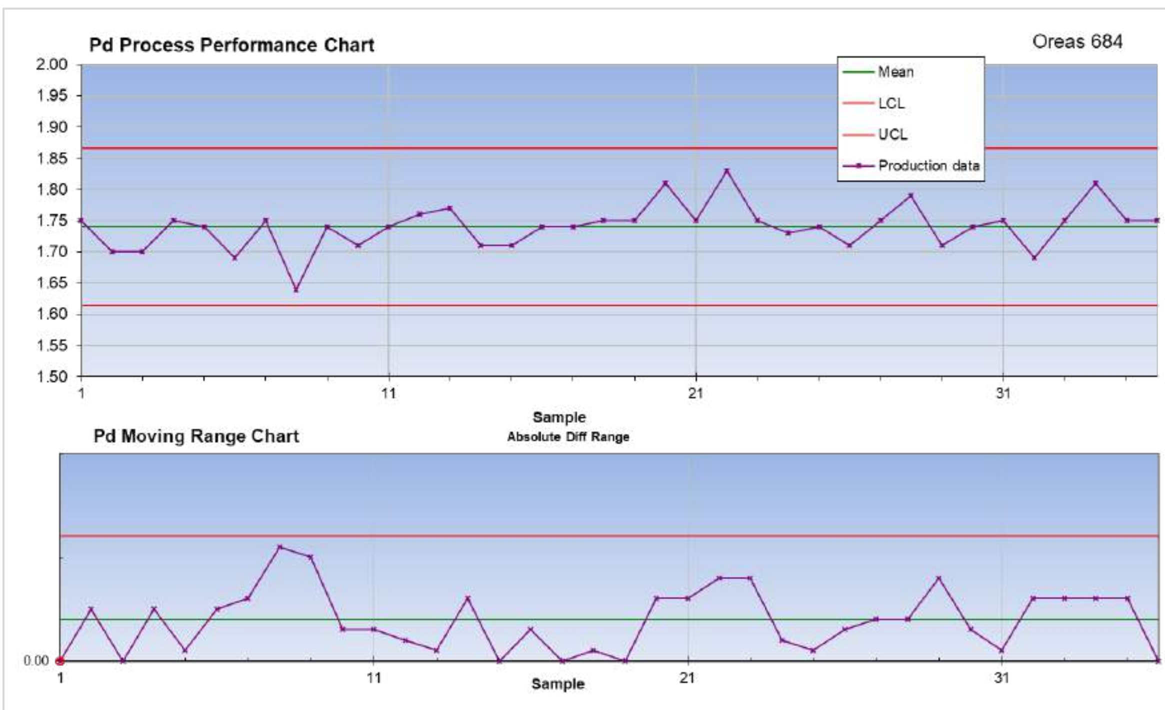


Figure 11-41: Escape deposit Standard Oreas 684 Pd (g/t)

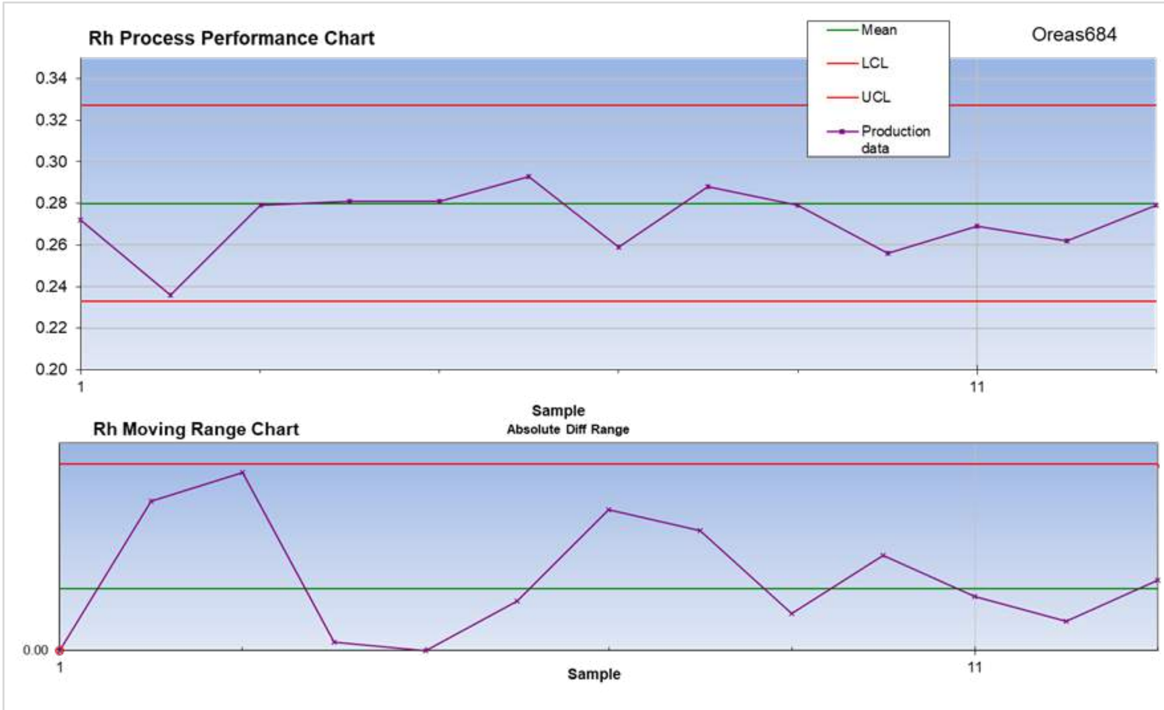


Figure 11-42: Escape deposit Standard Oreas 684 Rh (g/t)

11.3.2.2 Blanks

The Company submitted 1,411 coarse blanks between 2006 and 2021 as part of its QA/QC process. Three different blanks were used with the corresponding amount in brackets BL114 (548), Marble (72) and Gabbro (791) (Figure 11-43 through Figure 11-49). The marble material used for the Cu blank exhibits highly variable/erratic values and should not be used for the purposes of a blank while assaying for Cu (Figure 11-50). The lab submitted 2403 blanks all as one blank labelled as blanks. The charts not presented in this section are available in Appendix C. No significant carryover of elevated metals is evident. This does not impact the Mineral Resource Estimate.

The blanks contain measurable quantities of Pt, Pd, Cu, Ni, Co, Ag, Au, and Rh. There was no obvious correlation between the blank values and those samples immediately preceding.

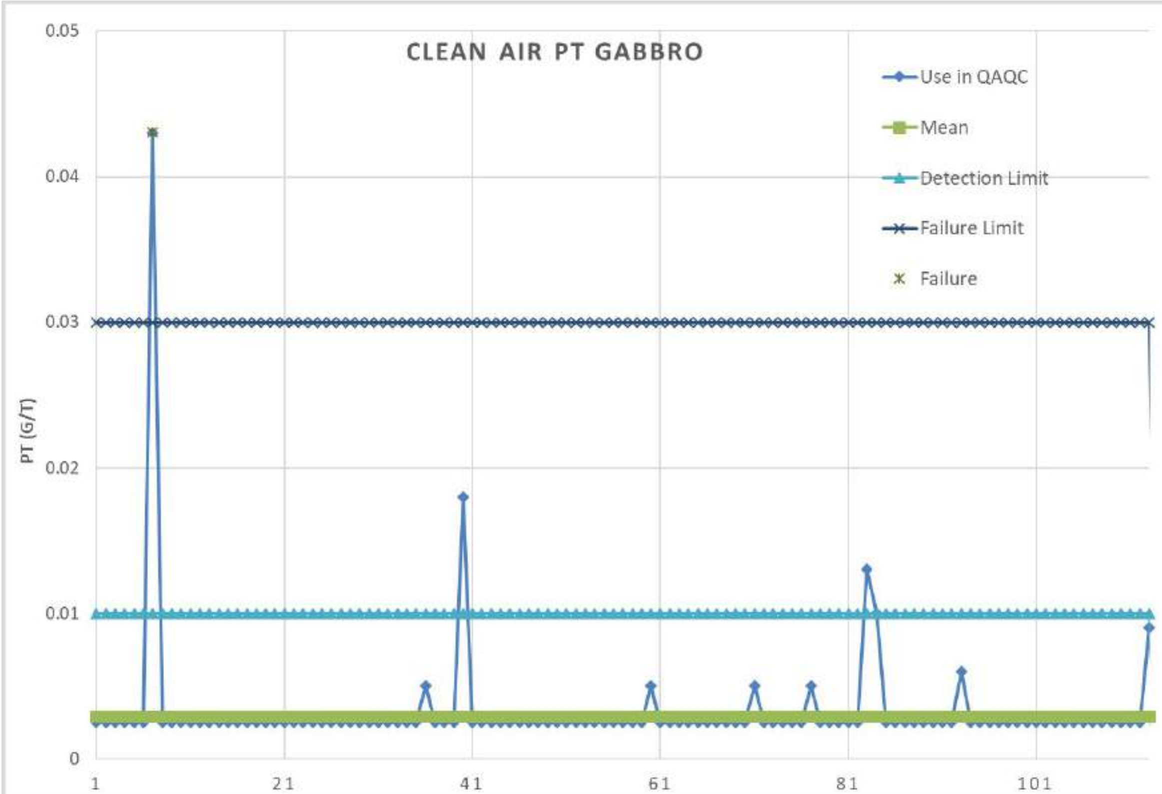


Figure 11-43: ALS Pt (g/t) results for the Escape deposit gabbro coarse blanks

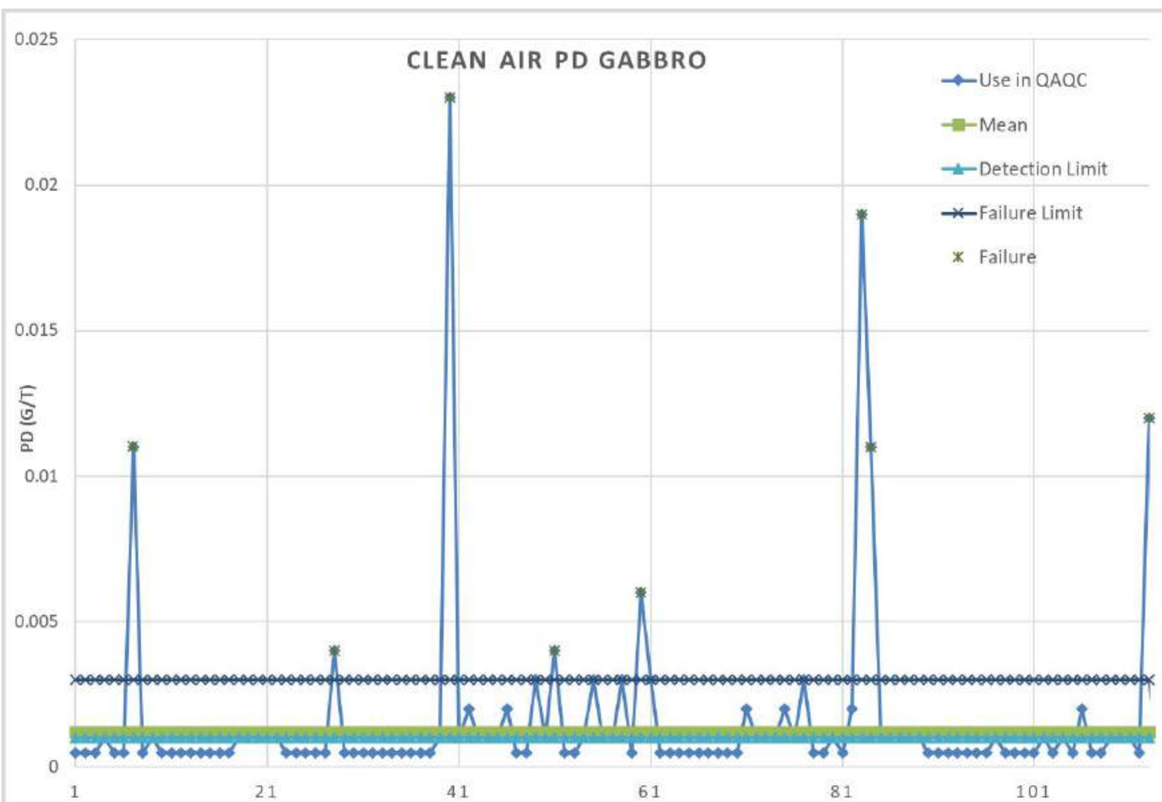


Figure 11-44: ALS Pd (g/t) results for the Escape deposit gabbro coarse blanks

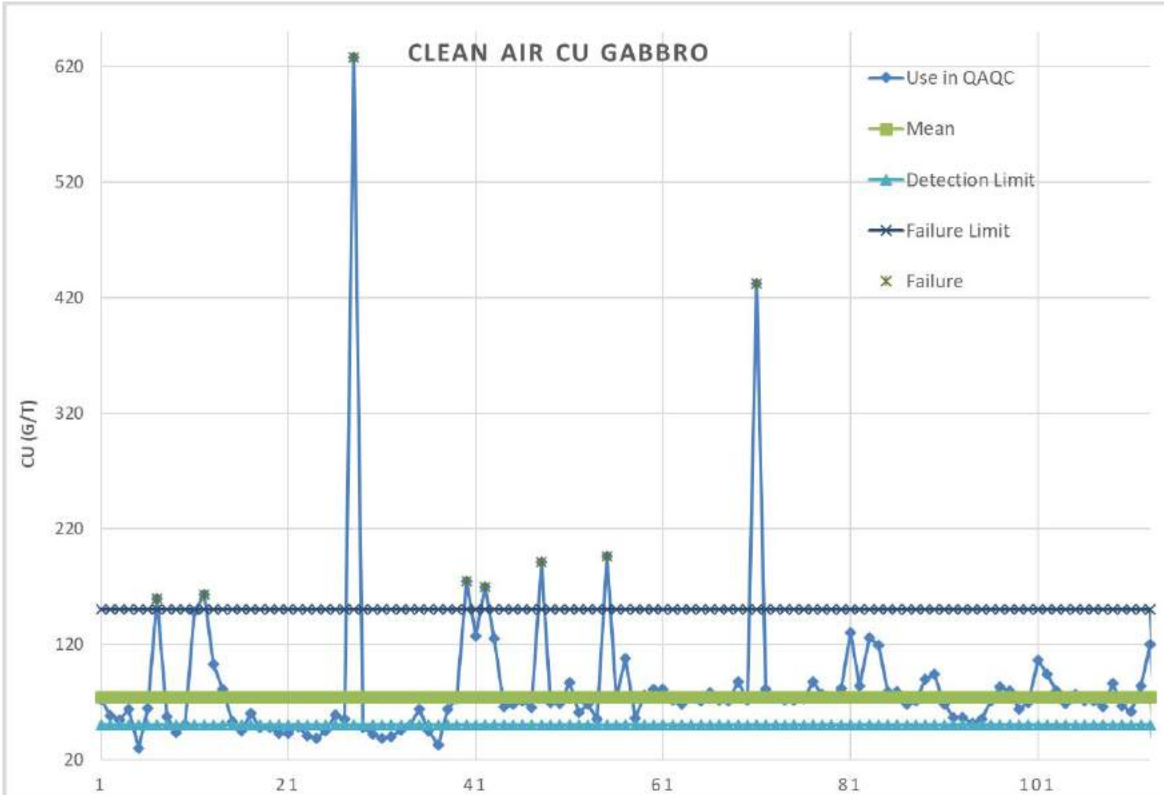


Figure 11-45: ALS Cu (g/t) results for the Escape deposit gabbro coarse blanks

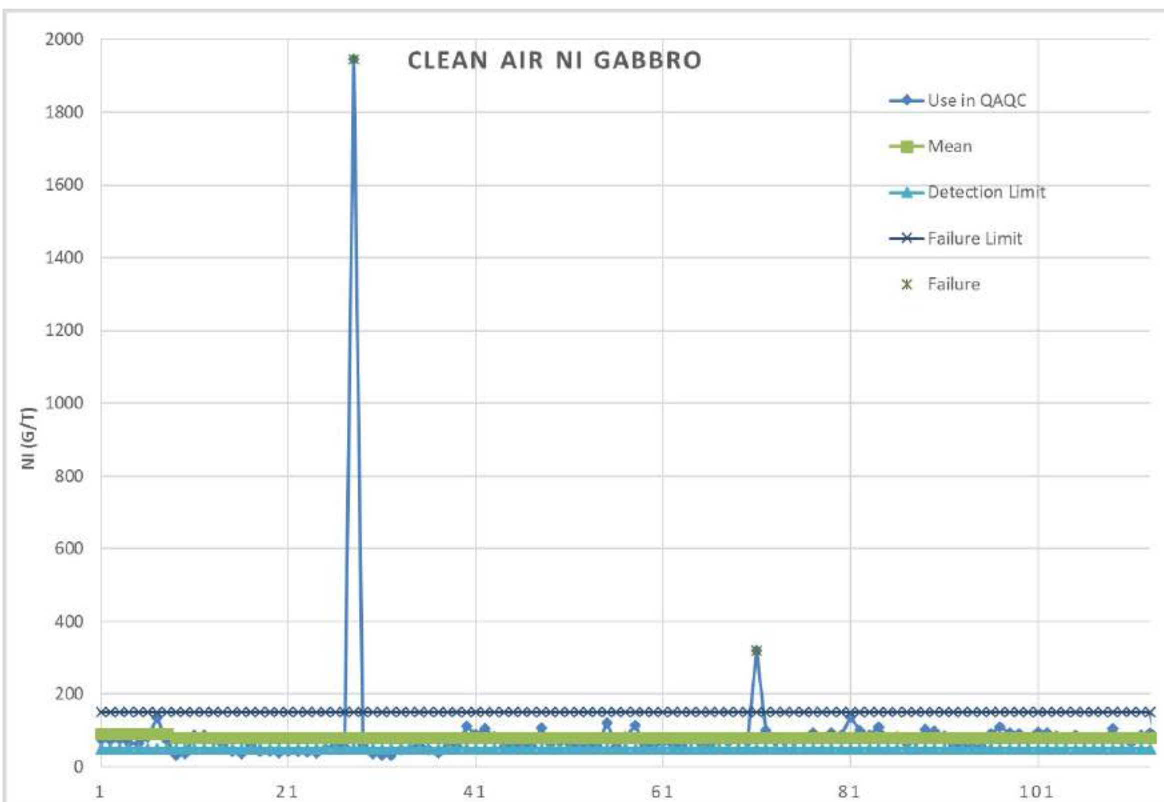


Figure 11-46: ALS Ni (g/t) results for the Escape deposit gabbro coarse blanks

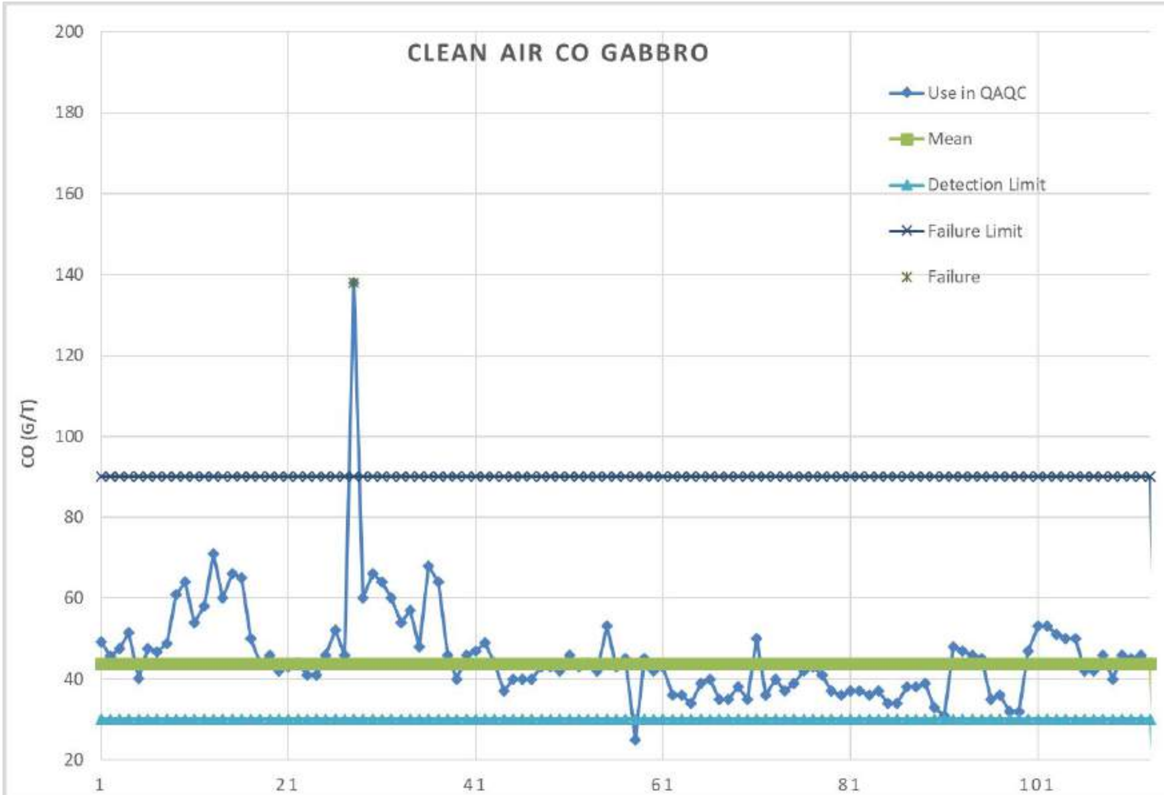


Figure 11-47: ALS Co (g/t) results for the Escape deposit gabbro coarse blanks

Figure 11-48: ALS Ag (g/t) results for the Escape deposit gabbro coarse blanks

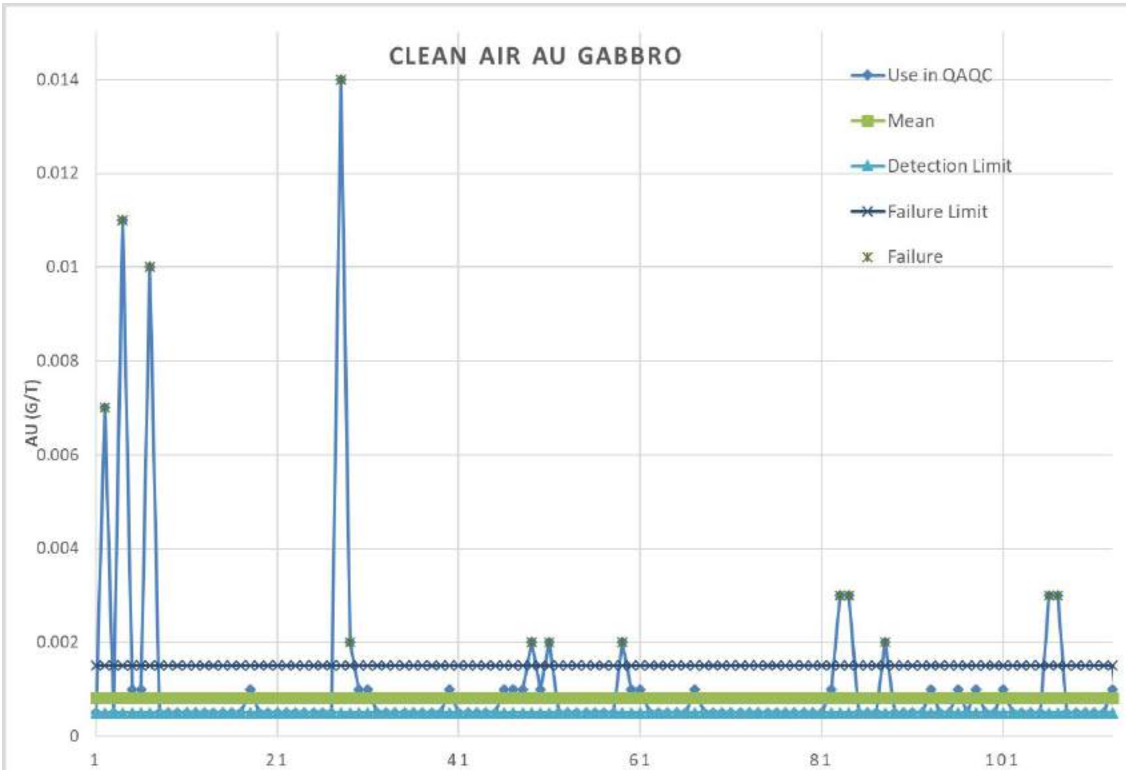


Figure 11-49: ALS Au (g/t) results for the Escape deposit gabbro coarse blanks

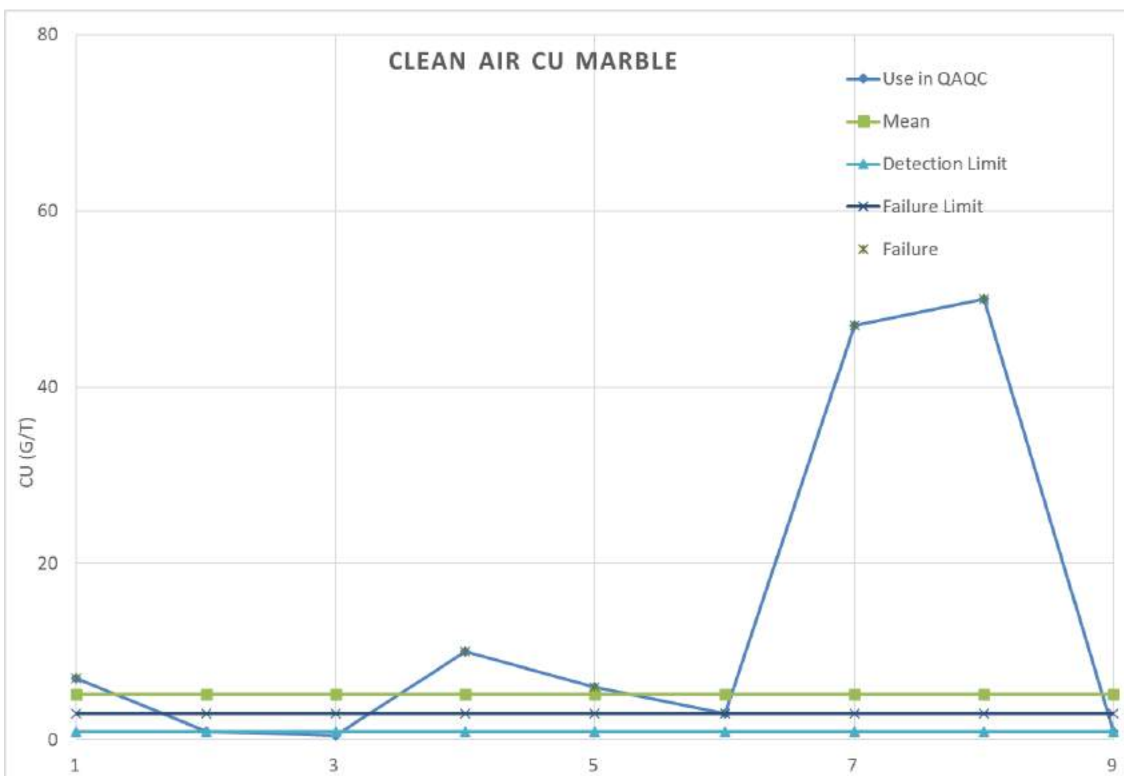


Figure 11-50: ALS Cu (g/t) results for the Escape deposit marble coarse blanks

11.3.2.3 Field and Laboratory Duplicates

The Company submitted 1,298 core and pulp duplicates and the lab submitted 1,562 laboratory duplicates as part of their QA/QC process. The Pt, Pd, Cu, Ni, Co, Ag and Au field duplicates demonstrate good agreement (Figure 11-51 through Figure 11-57). The lab duplicates for Cu, Ni, Co, and Ag, show good agreement while Pt, Pd and Au do not show good agreement (Figure 11-58 through Figure 11-63).

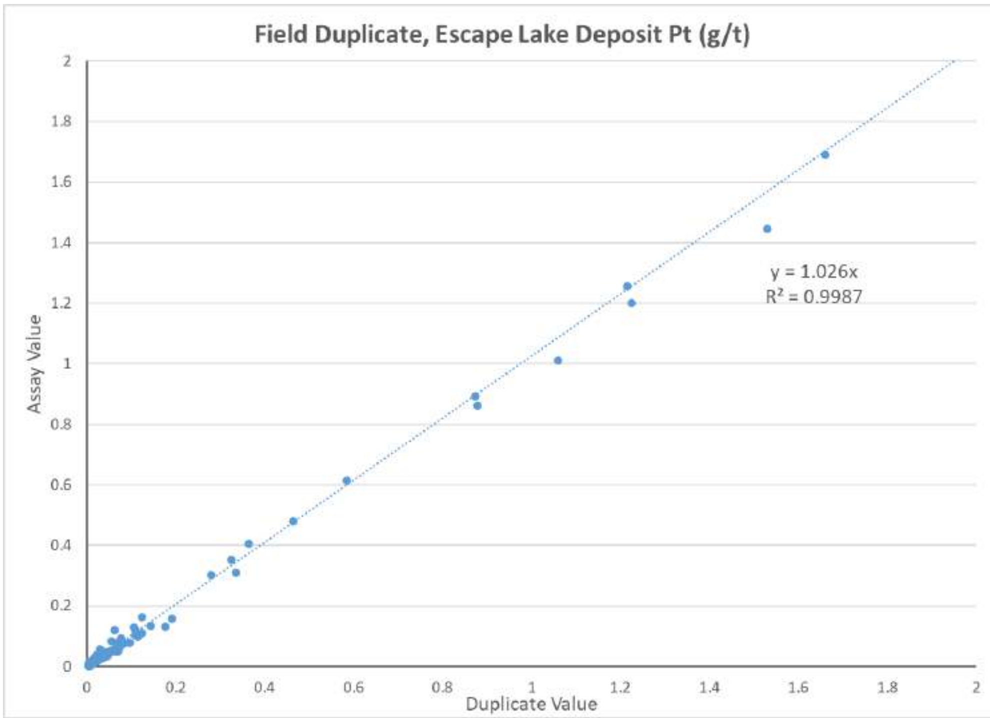


Figure 11-51: Escape deposit field duplicates for Pt (g/t)

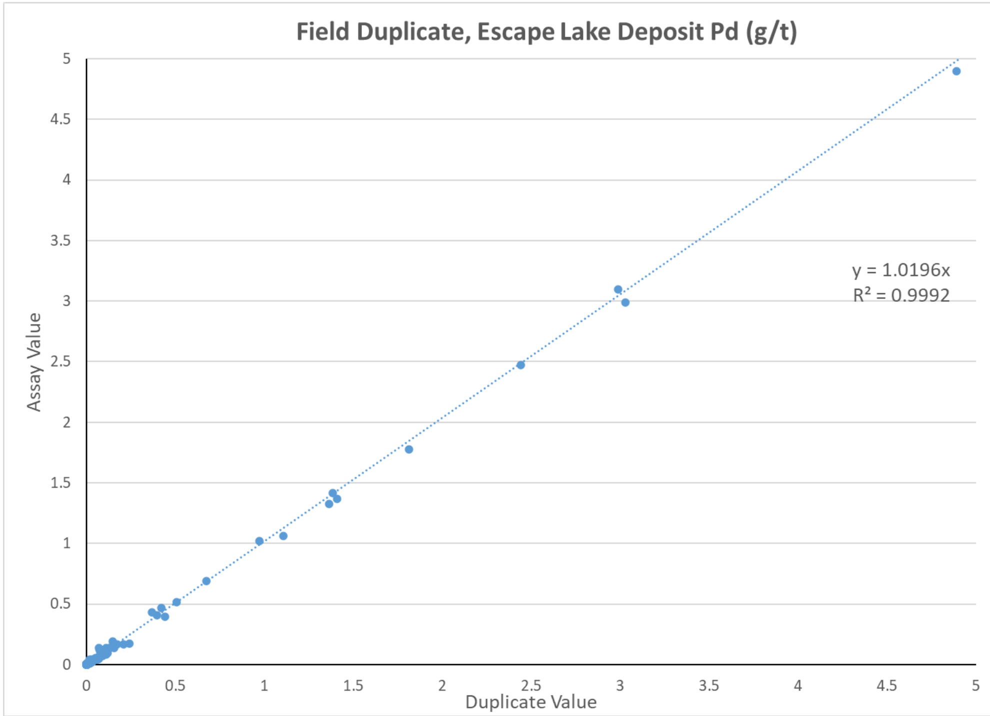


Figure 11-51: Escape deposit field duplicates for Pd (g/t)

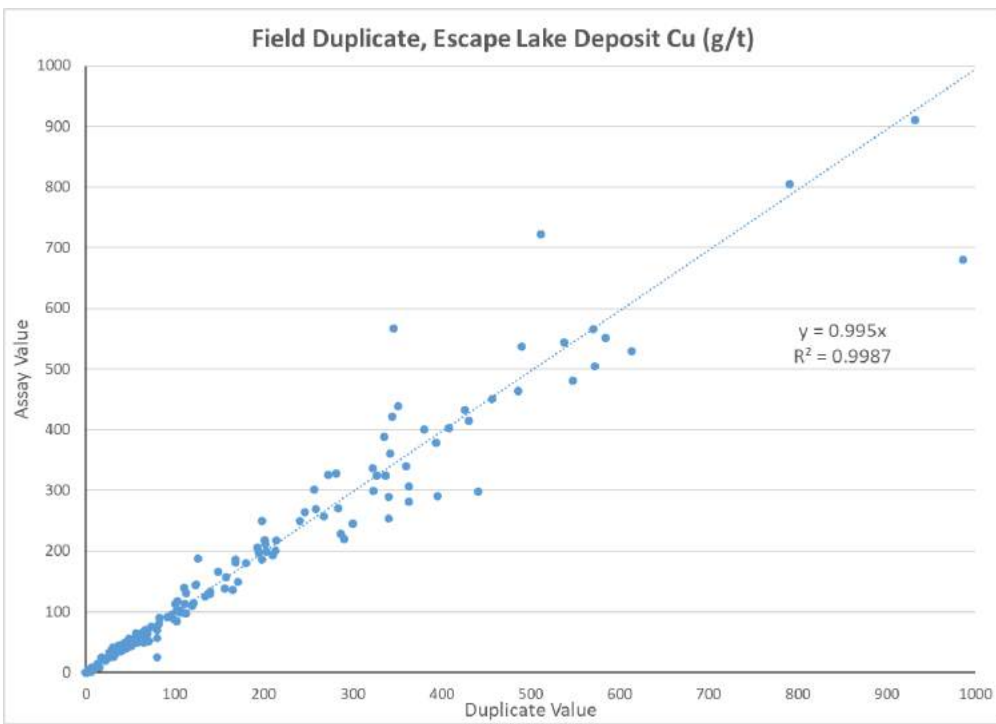


Figure 11-52: Escape deposit field duplicates for Cu (g/t)

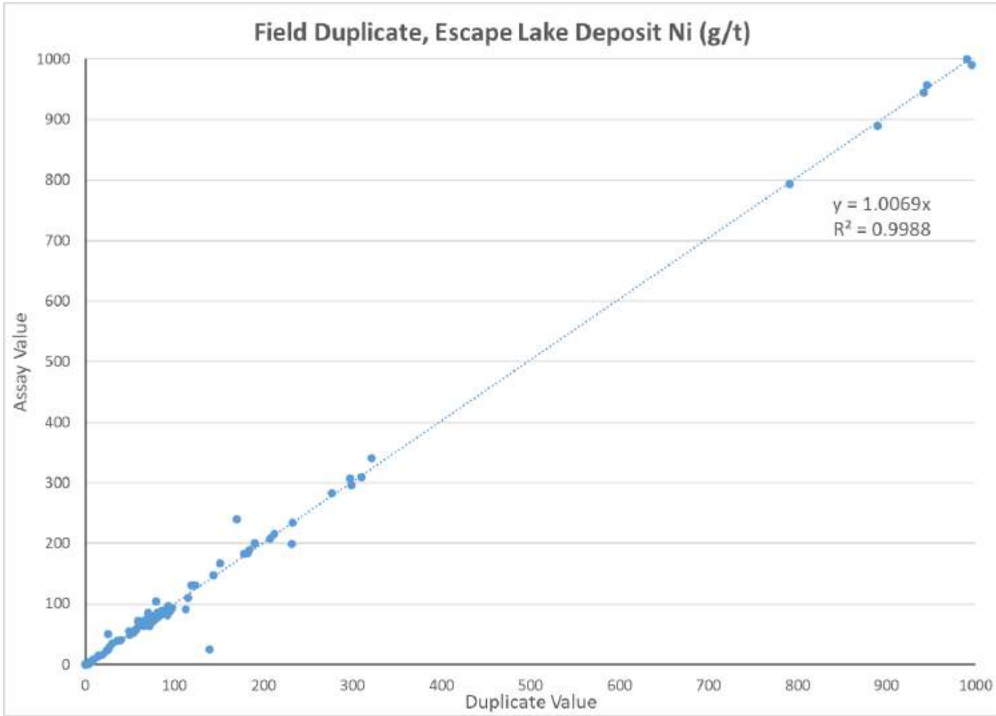


Figure 11-53: Escape deposit field duplicates for Ni (g/t)

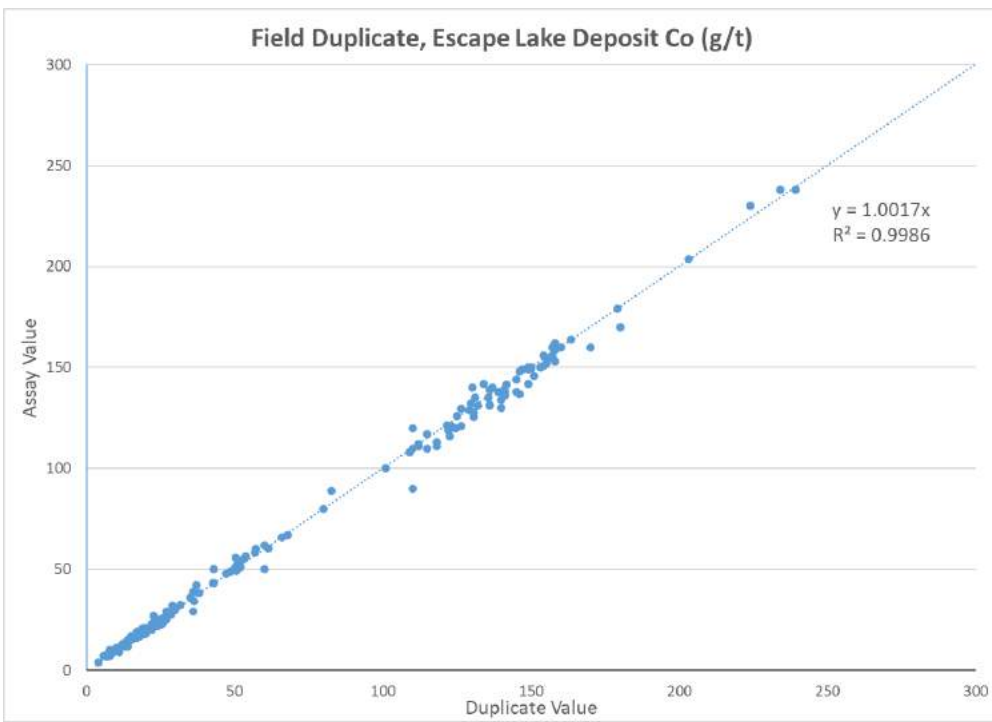


Figure 11-54: Escape deposit field duplicates for Co (g/t)

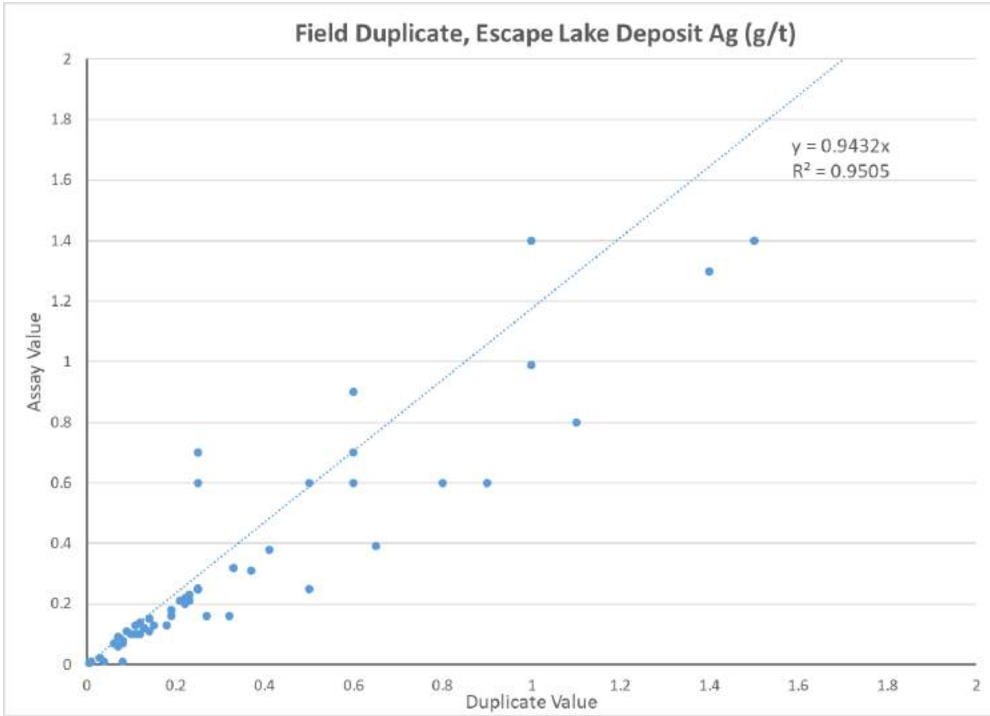


Figure 11-55: Escape deposit field duplicates for Ag (g/t)

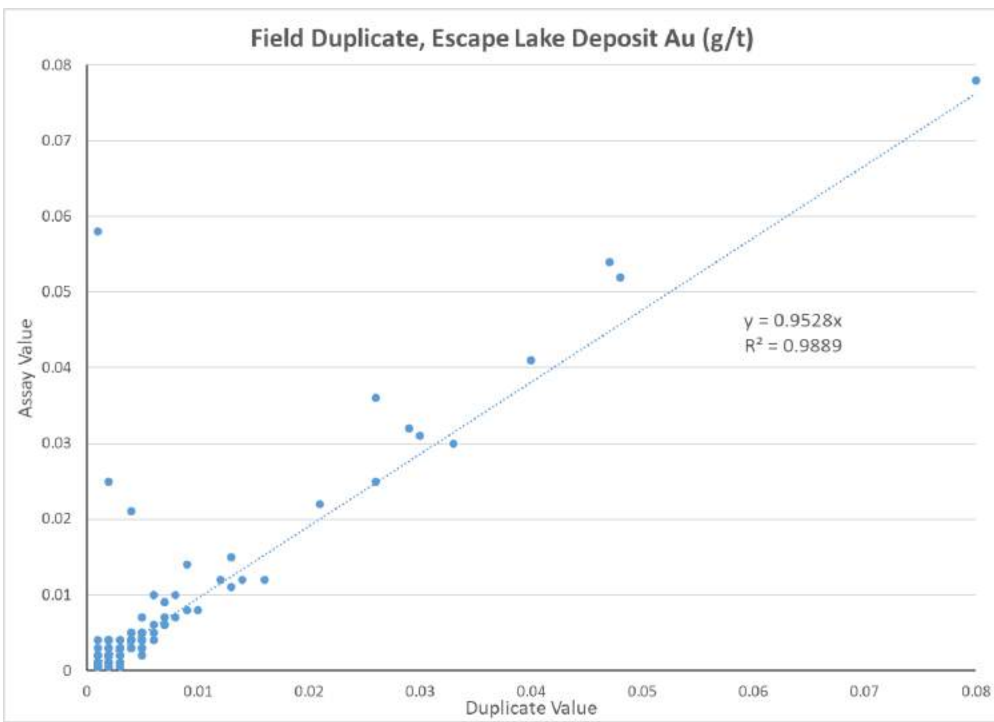


Figure 11-56: Escape deposit field duplicates for Au (g/t)

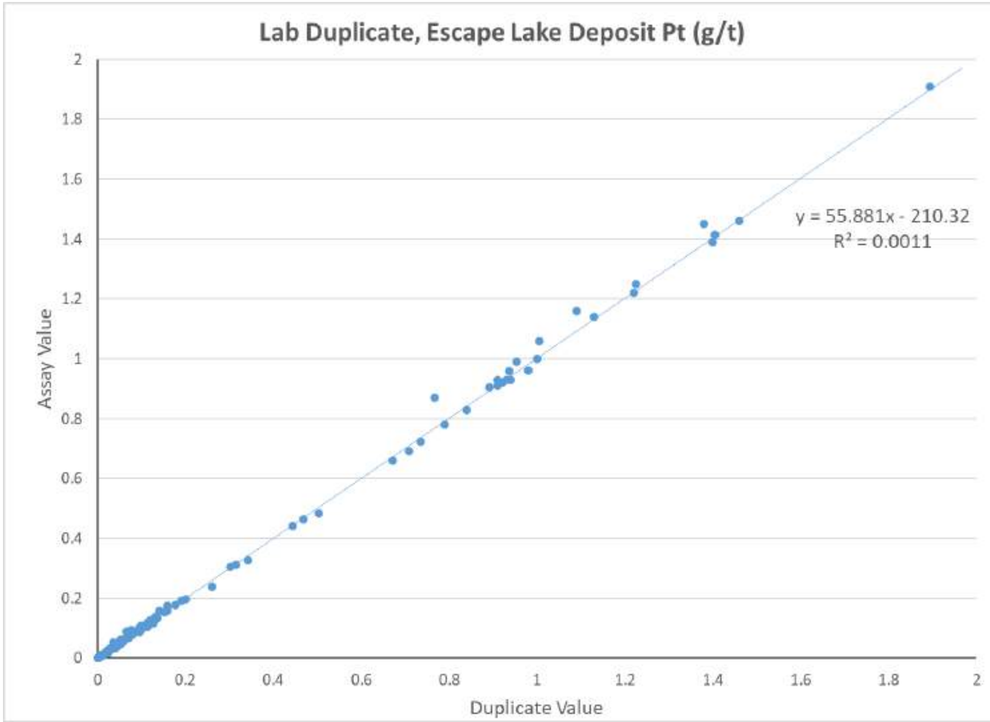


Figure 11-57: Escape deposit lab duplicates for Pt (g/t)

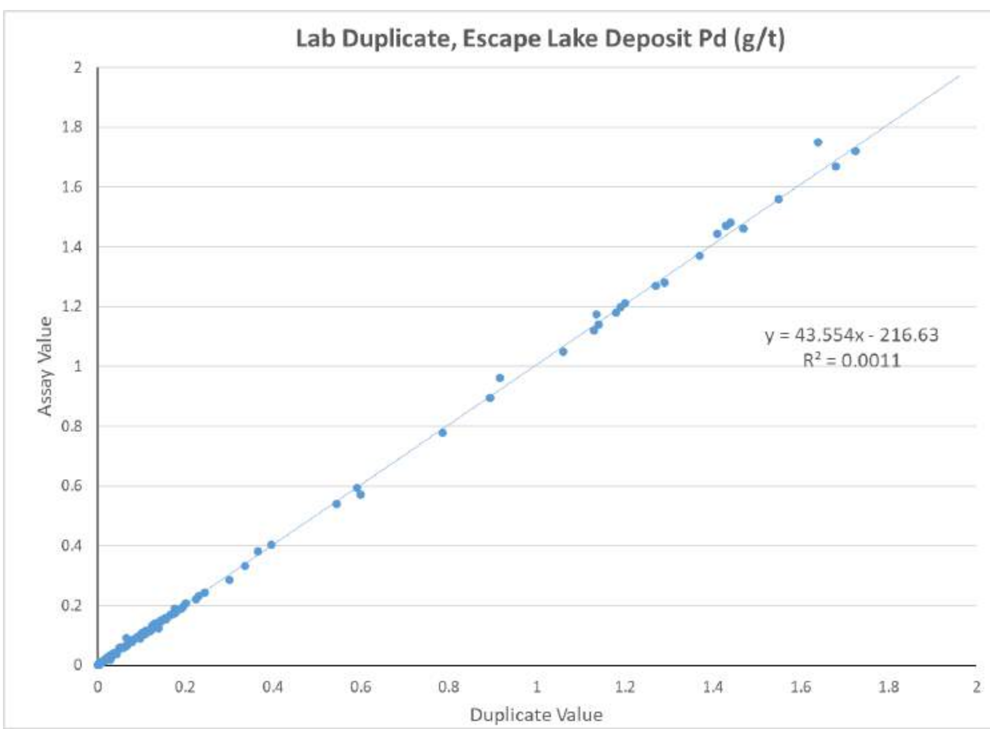


Figure 11-58: Escape deposit lab duplicates for Pd (g/t)

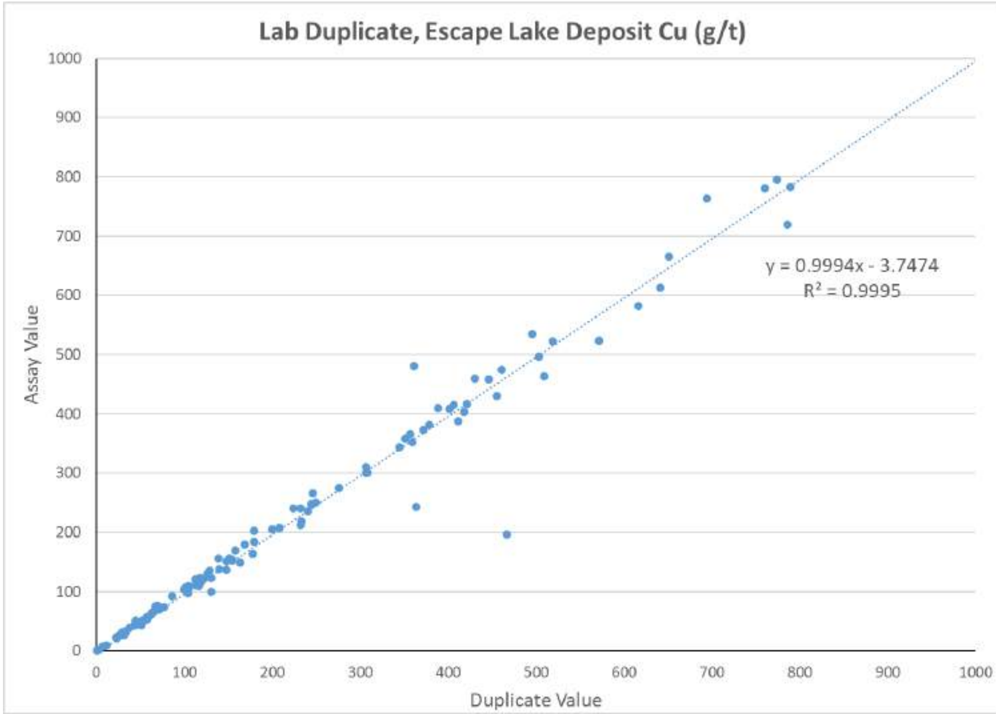


Figure 11-59: Escape deposit lab duplicates for Cu (g/t)

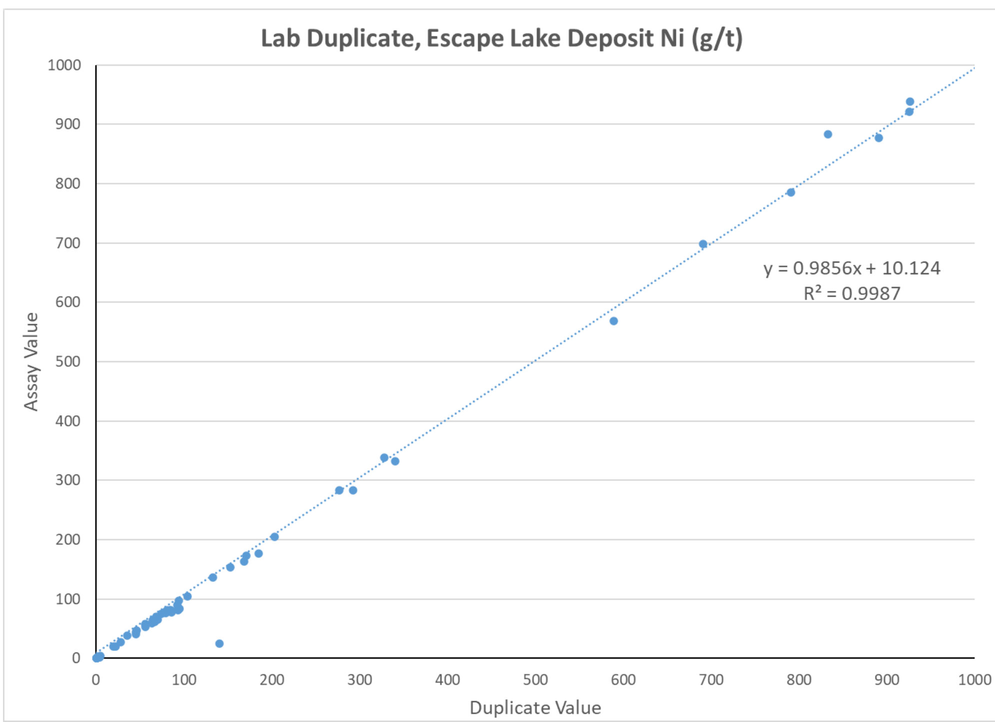


Figure 11-60: Escape deposit lab duplicates for Ni (g/t)

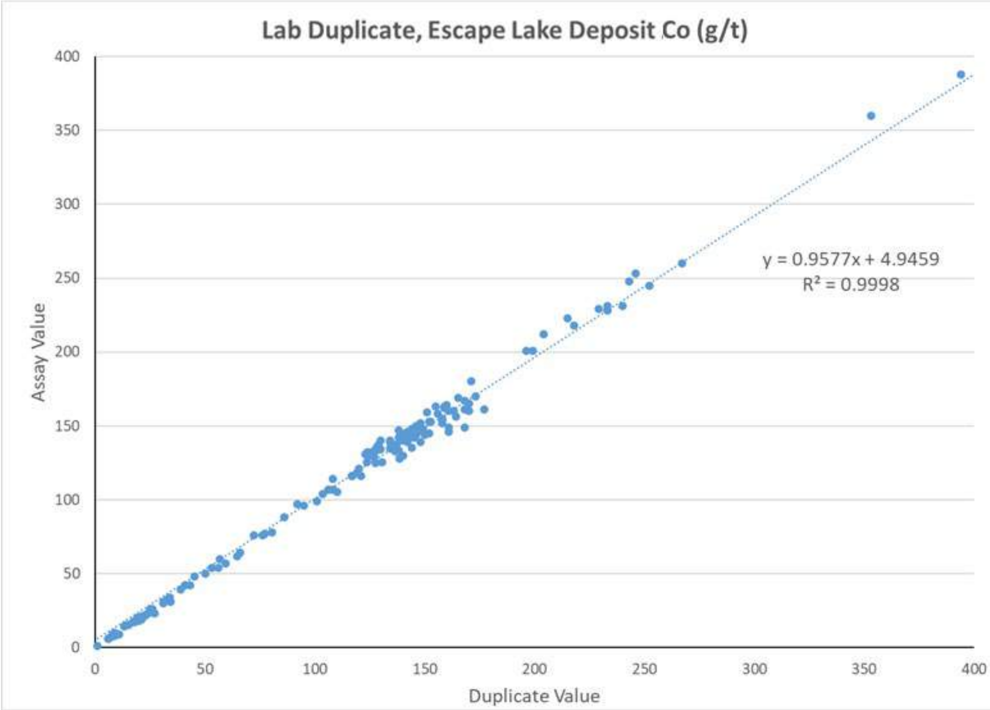


Figure 11-61: Escape deposit lab duplicates for Co (g/t)

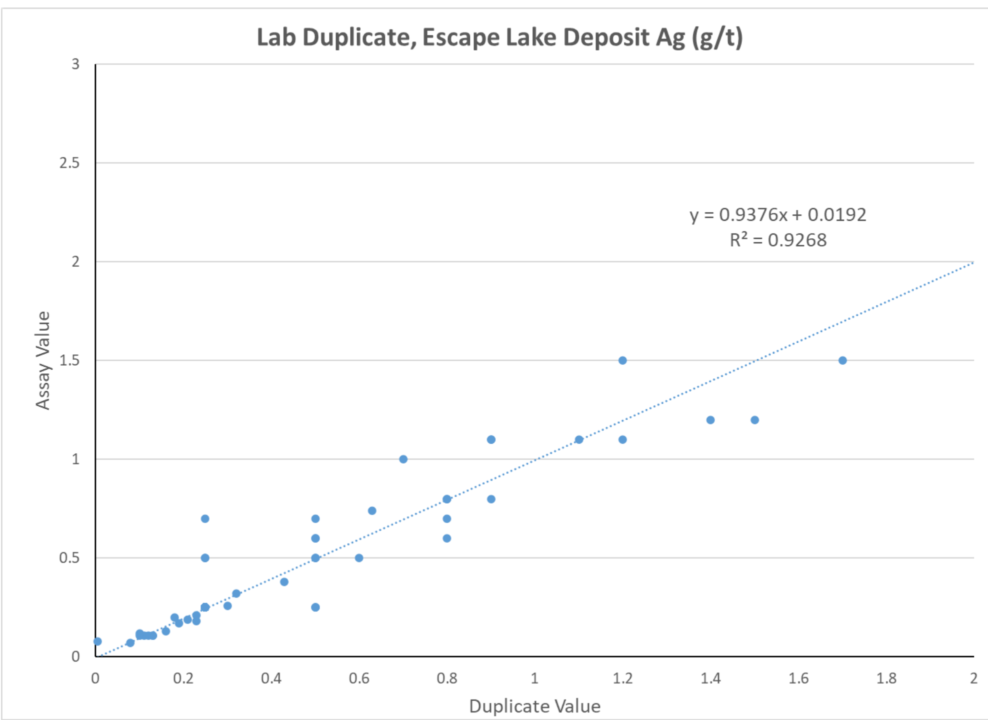


Figure 11-62: Escape deposit lab duplicates for Ag (g/t)

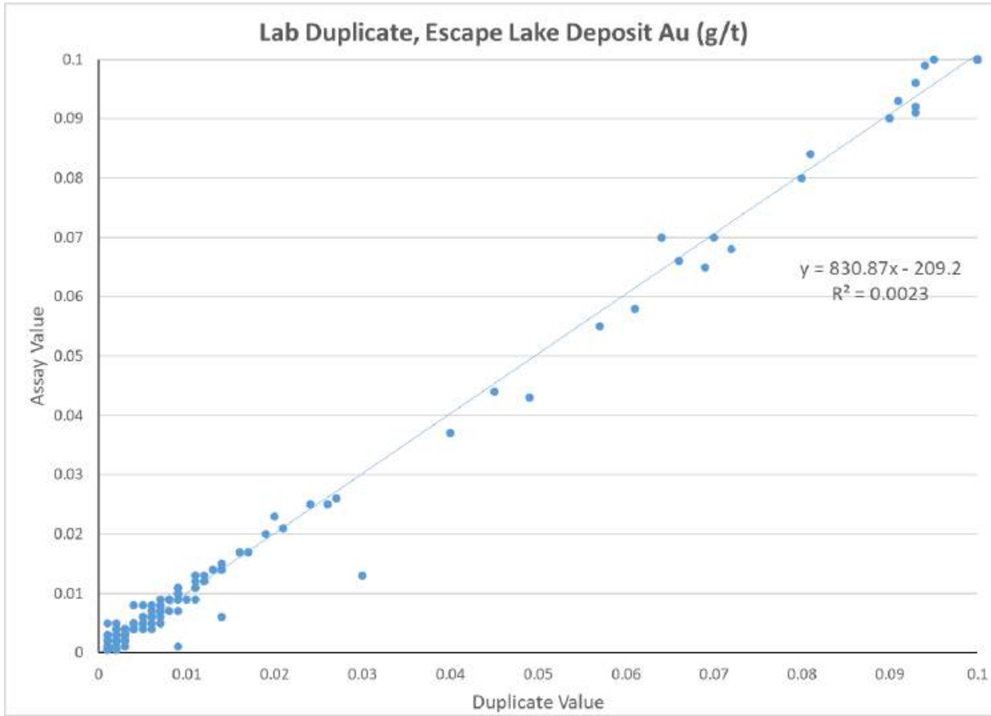


Figure 11-63: Escape deposit lab duplicates for Au (g/t)

11.3.2.4 Lab Inserted Standards With No Accepted Values or Certificates

Two lab standards were inserted that have no accepted values or certificates; they are listed in Table 11-6. In total they comprise 47% of total inserted CRMs and 18% of all samples for both Current and Escape deposits, including QA/QC standard, blanks, and duplicates.

Table 11-6: Lab Inserted Standards with no Accepted Values or Certificates

Standard	Count	Standard	Count	Standard	Count
BP-13	120	GMN-04	1	OxN92	30
BM-197	51	GLG307-4	723	OxP50	2
BM-44	48	GPP-01	619	OGGE008	2516
APG6	1115	GPP-02	6855	PD1	515
CL-HG	21	GPP-*04*	66	PG119	2130
CL-LG	637	GPP-05	18	PG121	156
CL-MG	98	GPP-14	108	PK2	426
D1	534	GXR-1	32	SARM7B	168
D-10	18	GXR-2	32	SJ32	26
D-11	51	GXR-4	32	SJ39	4
D-12	24	GXR-6	32	SRM88B	12
D2	6	LDI-2	1678	ST-252	9
D4	31	LKSD-2	8	ST-327	1
D-5	18	OxA59	12	SU-1b	29
D-6	12	OxA71	168	SY-4	16
DL-1	8	OxA89	3	TAM26	7
DNC-1	28	OXD57	14	TAM27	63
EA-01	172	OXD73	48	TAM28	271
EA-02	32	OxF53	3	TAM29	1029
EA-03	7	OxJ111	120	TRHB	12
EMOG-17	148	OxK95	96	UTS-3	8
ESB-A	260	OXL17	4	WGB-1	29
ESB-B	1474	OxN62	34	WPR-1	55
ESB-C	1725	OxN77	54		

11.4 Security and Storage

The Project core is stored in wooden core boxes and transported to the core logging shack. After being logged the core boxes are stacked outside where they get strapped and tarped onto a flat bed. The flat bed ships the core to a secure core yard on a regular basis for permanent storage (Figure 11-64).

Figure 11-64: Secure core yard storage

11.5 Qualified Person's Opinion on the Adequacy of Sample Preparation, Security, and Analytical Procedures.

Nordmin has been supplied with all raw QA/QC data and has reviewed and completed an independent check of the results for all of the Project sampling programs. It is Nordmin's opinion that the sample preparation, security, and analytical procedures used by all parties are consistent with standard industry practices and that the data is suitable for the 2021 Mineral Resource Estimate. Nordmin identified further recommendations to the Company to ensure the continuation of a robust QA/QC program but has noted that there are no material concerns with the geological or analytical procedures used or the quality of the resulting data.

12. DATA VERIFICATION

Nordmin completed several data validation checks throughout the duration of the 2021 Mineral Resource Estimate. The verification process included a two-day site visit to the Project by the QP to review surface geology, drill core geology, geological procedures, chain of custody of drill core and for the collection of independent samples for metal verification. The data verification included:

- a survey spot check of drill collars;
- a spot check comparison of assays from the drill hole database against original assay records (lab certificates);
- a spot check of drill core lithologies recorded in the database versus the core located in the core farm; and
- a review of the QA/QC performance of the drill programs.

Nordmin has also completed additional data analysis and validation, as outlined in Section 11.

12.1 Nordmin Site Visit 2020

A site visit to the Project was carried out across October 20 and October 21, 2020, by Nordmin personnel; Glen Kuntz, P.Geo., QP for Mineral Resources, Christian Ballard, P.Geo., Annika Van Kessel, GIT, and Sirena Jacobsen, G.Tech. Nordmin was accompanied by the Company's VP Project Manager, Allan MacTavish, P.Geo. who has been involved with the Project for several years and the Project Geologist, Ethan Beardy, GIT who has been involved with the Project since May 2020.

Activities during the site visit included the:

- Review of the geological and geographical setting of the Project.
- Review and inspection of the site geology, mineralization, and structural controls on mineralization.
- Review of the drilling, logging, sampling, analytical and QA/QC procedures.
- Review of the chain of custody of samples from the field to the assay lab.
- Review of the drill logs, drill core, storage facilities, and independent assay verification on selected core samples.
- Confirmation of a variety of drill hole collar locations.
- Review of the structural measurements recorded within the drill logs and how they are utilized within the 3D structural model.
- Validation of a portion of the drill hole database.

The Company geologists completed the geological mapping, core logging, and sampling associated with each drill location. Therefore, Nordmin relied on the Company's database to review the core logging procedures, the collection of samples, and the chain of custody associated with the drilling programs. The Company provided Nordmin with digital and paper copies of the logging and assay reports. All drilling data, including collars, logs, and assay results, were provided to Nordmin prior to the site visit.

No significant issues were identified during the site visit.

The Company employs a rigorous QA/QC protocol, including the routine insertion of field duplicates, blanks, and certified reference standards. Nordmin was provided with an excerpt from the database for review.

The collection and use of the structural information were reliable and representative of the drilled structure features.

The geological data collection procedures and the chain of custody were found to be consistent with industry standards and following the Company's internal procedural documentation; and Nordmin was able to verify the quality of geological and sampling information and develop an interpretation of PGE (Pt/Pd) and precious/base metal (Au, Ag, Cu, Ni, Co, Rh) grade distributions appropriate for the Mineral Resource Estimate.

12.1.1 Field Collar Validation

The QP confirmed the collar locations of 41 Current deposit, eight Escape deposit drill holes used within the Resource Estimate.

The collars were collected using a Garmin handheld GPS unit. Each drill hole was capped and labelled; they were made very visible in the field. The collars taken by Nordmin are very similar if not exact to what the Company had for collar locations.

The validation work is documented in Figure 12-1 through Figure 12-5, Table 12-1 and Table 12-2.

Figure 12-1: DDH BL-09-159 collar

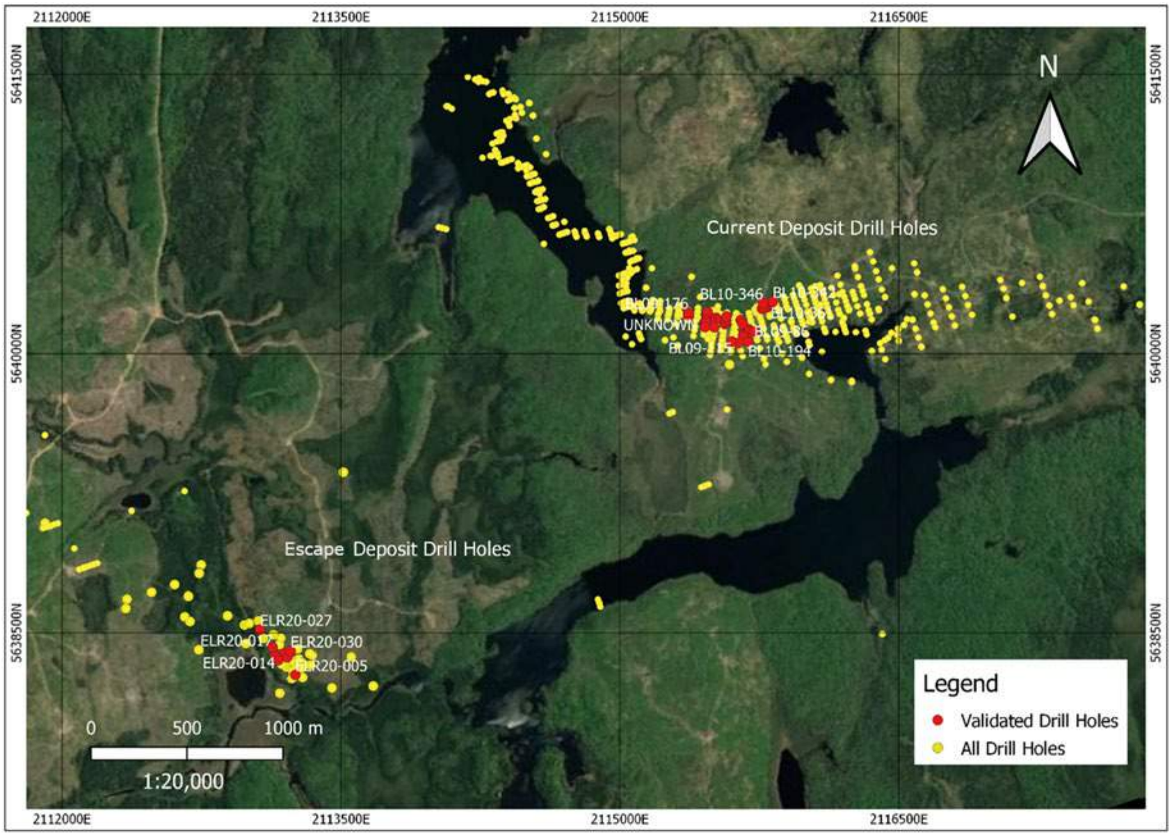


Figure 12-2: Validated drill hole collars versus all drill holes

Table 12-1: Current Deposit Drill Hole Collar Comparison

Hole ID	Nordmin Northing	Nordmin Easting	Nordmin Elevation	Original Northing	Original Easting	Original Elevation	Differences-Northing	Differences-Easting	Differences-Elevation
BL10-377	357937.000	5402400.000	502.231	357938.070	5402400.000	504.933	0.125	0.145	2.702
BL10-279	357950.000	5402408.000	503.182	357950.730	5402407.000	504.55	0.594	1.371	1.368
BL10-198	357950.000	5402420.000	501.404	357951.080	5402419.400	503.834	0.286	0.217	2.430
BL10-369	357963.000	5402416.000	502.122	357963.740	5402413.900	504.351	0.051	2.031	2.229
BL10-373	357974.000	5402421.000	502.499	357975.350	5402421.100	503.673	0.909	0.317	1.174
BL10-363	357974.000	5402410.000	502.708	358088.130	5402528.400	495.288	113.381	118.016	-7.420
BL09-86	357997.000	5402401.000	500.830	357997.640	5402400.900	501.760	0.119	0.493	0.930
BL10-195	357952.000	5402380.000	504.756	357952.420	5402378.600	505.105	0.0467	1.846	0.349
BL10-375	357936.000	5402381.000	506.008	357937.870	5402380.100	505.823	1.523	0.533	0.185
BL10-374	357934.000	5402392.000	504.179	357936.110	5402390.600	505.349	1.432	1.608	1.170
BL10-194	357950.000	5402360.000	504.095	357950.530	5402358.800	504.037	0.358	1.510	0.058
BL10-193	357900.000	5402370.000	503.623	357900.210	5402368.700	504.375	0.121	1.045	0.752
BL09-115	357870.000	5402389.000	505.347	357870.680	5402387.400	506.790	0.056	1.257	1.443
BL09-154	357864.000	5402486.000	507.243	357865.370	5402485.600	508.540	0.683	0.798	1.297
BL10-206	357870.000	5402495.000	507.175	357870.450	5402493.700	508.807	0.410	0.829	1.632
BL09-153	357876.000	5402504.000	508.590	357875.830	5402502.800	510.978	0.395	1.195	2.388
BL10-207	357880.000	5402514.000	509.164	357880.420	5402512.500	511.260	0.101	1.597	2.095
BL09-151	357885.000	5402521.000	509.399	357885.370	5402520.500	511.966	0.197	0.632	2.567
BL09-110	357832.000	5402531.000	506.021	357832.110	5402529.300	508.240	0.254	1.818	2.219
BL09-89	357828.000	5402522.000	506.021	357828.070	5402520.000	507.512	0.674	1.140	1.491
BL09-162	357807.000	5402539.000	508.442	357807.700	5402537.600	508.574	0.006	1.154	0.132
BL09-161	357799.000	5402523.000	509.035	357799.680	5402521.600	509.228	0.185	1.271	0.193
BL09-164	357789.000	5402558.000	506.037	357790.160	5402556.700	506.298	0.443	0.969	0.261
BL10-233	357794.000	5402567.000	505.524	357794.710	5402567.000	505.415	0.710	0.296	0.109
BL09-165	357799.000	5402575.000	504.400	357800.130	5402574.600	504.755	0.769	0.686	0.355
BL09-160	357779.000	5402539.000	505.903	357780.020	5402537.700	506.822	0.542	1.648	0.919
BL10-231	357777.000	5402532.000	507.007	357777.180	5402530.700	506.689	0.105	0.811	0.318
BL09-159	357772.000	5402522.000	507.109	357771.410	5402521.300	507.061	-0.795	1.049	0.048
BL09-158	357762.000	5402504.000	504.991	357761.840	5402502.900	506.376	-0.259	1.040	1.385
BL09-176	357703.000	5402603.000	492.404	357704.990	5402603.000	493.144	1.107	0.163	0.740
BL-10-221	357950.000	5402480.000	501.879	357951.080	5402478.700	501.492	0.233	0.946	0.387
BL10-220	357952.000	5402460.000	501.306	357951.010	5402458.100	501.949	-1.401	2.032	0.643
BL10-360	358073.000	5402501.000	490.183	358075.370	5402499.000	496.041	2.138	1.989	5.858
BL10-349	358087.000	5402499.000	493.743	358087.650	5402498.600	494.764	0.274	0.412	1.021
BL10-303	358100.000	5402509.000	492.350	358100.280	5402510.500	494.38	0.223	1.497	2.030
BL08.49/50	358102.000	5402499.000	492.369	358102.400	5402498.500	493.818	0.164	0.523	1.449
BL10-344	358112.000	5402510.000	492.616	358113.420	5402509.300	493.575	0.753	1.092	0.959
BL10-361	358125.000	5402511.000	493.246	358125.790	5402509.100	493.313	0.170	1.617	0.067
BL10-362	358124.000	5402520.000	494.631	358124.610	5402518.500	493.992	0.016	1.215	0.639
BL10-342	358138.000	5402518.000	496.092	358138.540	5402519.200	493.927	0.383	1.415	2.164
BL10-346	358088.000	5402526.000	497.117	358088.110	5402526.000	495.834	-0.028	0.212	1.283

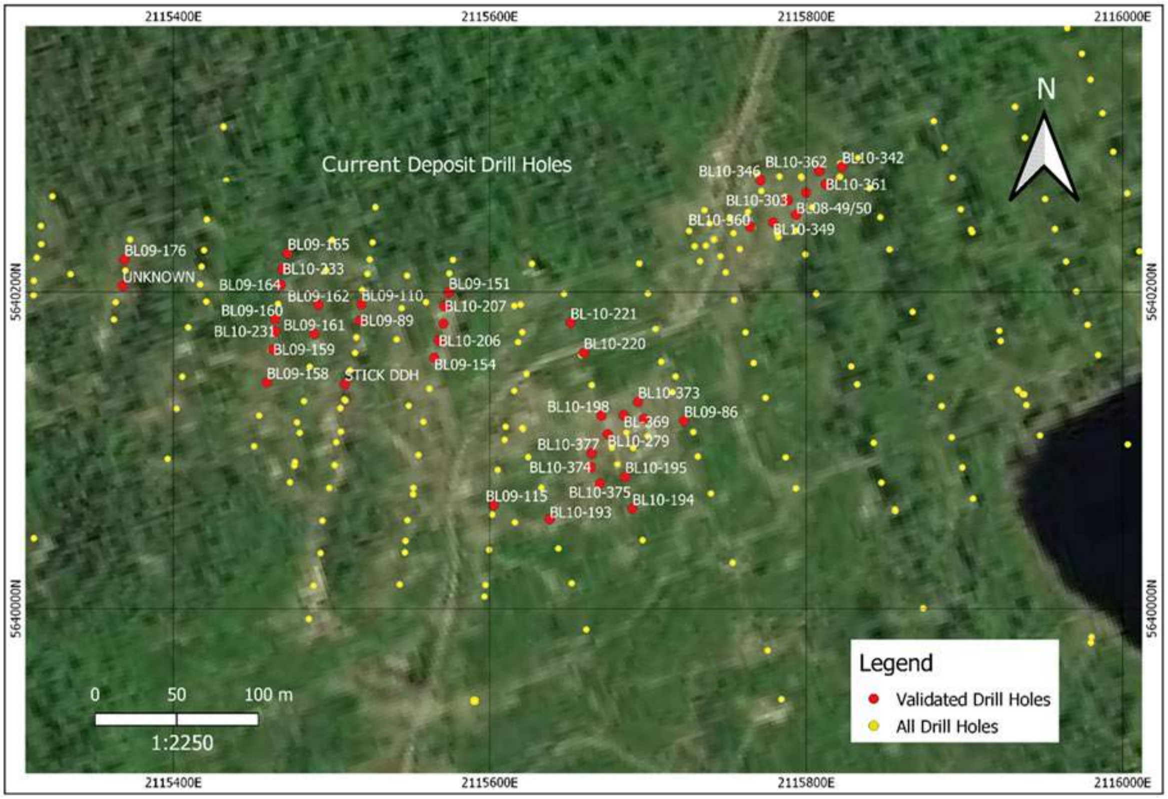


Figure 12-3: Current deposit validated drill holes versus all drill holes

Table 12-2: Escape Deposit Drill Hole Collar Comparison

Hole ID	Nordmin Northing	Nordmin Easting	Nordmin Elevation	Original Northing	Original Easting	Original Elevation	Differences -Northing	Differences -Easting	Differences - Elevation
ELR20-005	355164.000	5401459.000	472.052	355164.500	5401459.250	472.052	0.510	0.246	0.000
ELR20-008	355147.000	5401584.000	473.700	355147.600	5401584.270	473.700	0.582	0.273	0.000
ELR20-014/012	355095.000	5401585.000	471.347	355095.300	5401585.90	474.600	0.300	0.900	3.253
ELR20-017	355097.000	5401632.000	474.002	355097.300	5401632.150	474.002	0.263	0.152	0.000
ELR20-022	355105.000	5401560.000	470.227	355105.200	5401560.240	470.227	0.200	0.240	0.000
ELR20-025	355155.000	5401560.000	470.8426	355155.100	5401560.370	470.843	0.100	0.370	0.000
ELR20-027	355063.000	5401741.000	468.997	355063.700	5401741.270	468.997	0.700	0.270	0.000
ELR20-030	355180.000	540158.000	476.097	355180.200	540158.180	476.097	0.200	0.180	0.000

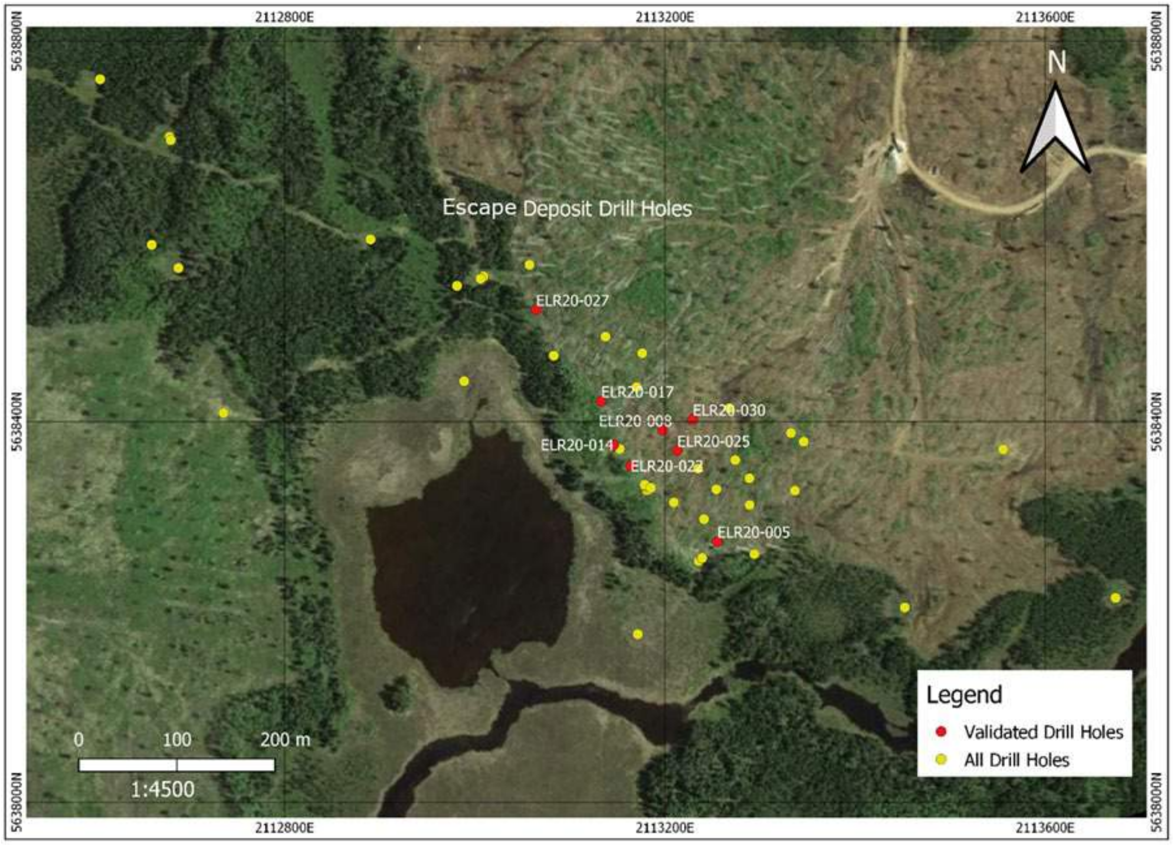


Figure 12-4: Escape deposit validated drill holes versus all drill holes

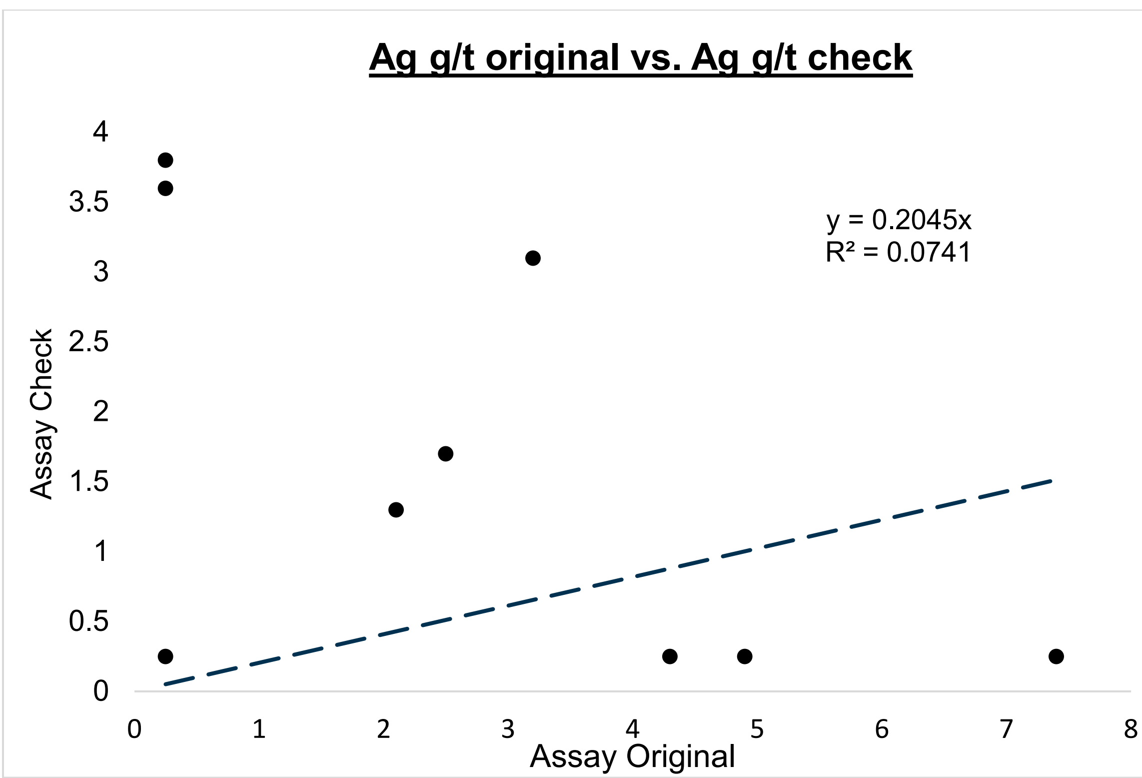


Figure 12-5: Escape deposit scatter plot comparison of Ag (g/t) verification samples

12.1.2 Core Logging, Sampling, and Storage Facilities

The Company drill holes were logged, photographed, and sampled onsite at the core logging facility. Historic core is stored at the core yard, recently drilled core is currently being kept as cross-piles at the core logging facility. The core samples, pulps, and coarse rejects are kept at the core shack in multiple temporary buildings.

Figure 12-6: The Company core logging facility

Figure 12-7: The Company core cutting facility

12.1.3 Independent Sampling

The QP selected intervals from 21 Current deposit holes and ten Escape deposit holes. A total of 31 verification samples were collected (Table 12-3 and Table 12-4). Diamond drill core previously sampled (halved) was re-sampled by quartering within the original sample boundaries and assigned a new sample ID for analysis. The remaining quarter core was returned to the original core box, in sample sequence.

The Company uses unmineralized material, where values of ore minerals are below detection limits, or quartz gravel as sample blanks. Coarse blanks are crushed as normal samples within the sample stream so that contamination during sample preparation can be detected. Blanks are used to assess proper instrument cleaning and instrument detection limits and contaminations within the lab.

Table 12-3: Current Deposit Drill Intervals Selected for Verification Sampling

Drill Hole ID	From (m)	To (m)	Old Sample	New Sample
BL11-399	242.60	243.00	J553935	L013411
BL11-399	310.60	312.00	J556622	L013412
BL11-399	393.20	395.20	J556667	L013413
BL11-401	250.85	252.00	J556772	L013414
TBND065	54.60	55.00	H090444	L013416
TBND065	51.70	52.00	H090438	L013417
TBND065	57.30	58.00	H090448	L013418
BL08-39	152.00	153.00	H087761	L013419
BL08-39	161.00	162.00	H087770	L013420
BL08-39	179.00	180.00	H087792	L013421
TBND134	83.00	84.00	H068169	L013422
TBND134	55.00	56.00	H068138	L013423
TBND134	39.00	40.00	H068126	L013424
BL10-357	149.40	149.90	E190257	L013425
BL10-357	149.90	150.00	E190258	L013426
BL10-357	174.00	174.25	E190276	L013427
BL10-236	127.00	128.00	E191136	L013428
BL10-236	129.00	130.00	E191138	L013429
BL10-236	144.00	144.85	E191153	L013430
BL10-305	182.00	183.00	E190911	L013431
BL10-305	171.00	172.00	E190898	L013432

Table 12-4: Escape Deposit Drill Intervals Selected for Verification Sampling

Drill Hole ID	From (m)	To (m)	Old Sample	New Sample
ELR20-004	435.55	436.05	B605489	L013401
ELR20-004	473.37	474.37	B606531	L013402
ELR20-004	393.58	394.58	B605439	L013403
ELR20-004	347.40	349.40	B605411	L013404
ELR20-004	555.14	557.00	B606601	L013405
ELR20-008	394.84	395.00	B610102	L013406
ELR20-008	416.00	416.84	B610126	L013407
ELR20-008	292.70	293.00	B610001	L013408
ELR20-008	371.84	372.84	B610076	L013409
ELR20-008	323.00	323.84	B610025	L013410

The verification of individual sampling included placing individually cut pieces into a plastic bag where they are packed together in rice bags and sent to ALS Geochemistry in Thunder Bay, ON using the Company's analytical procedures (Figure 12-8).

Figure 12-8: Core cutter bringing samples outside to be shipped

The QP assay results were compared to the Company's database and summarized in the scatter plots for Ag, Au, Cu, Ni Pd, and Pt for Current deposit (Table 12-5 and Figure 12-9 through Figure 12-14) and Escape deposit (Table 12-6 and Figure 12-15 through Figure 12-20). Despite some significant sample variances in a few samples, most assays compared within reasonable tolerances for the deposit type and no material bias was evident.

Table 12-5: Current Deposit Quarter Core Sampling Conducted by Nordmin, October 2020

Drill Hole ID	From (m)	To (m)	Length (m)	Half Core Pd (ppm)	Quarter Core Pd (ppm)	Half Core Pt (ppm)	Quarter Core Pt (ppm)	Half Core Ag (ppm)	Quarter Core Ag (ppm)	Half Core Au (ppm)	Quarter Core Au (ppm)	Half Core Cu (%)	Quarter Core Cu (%)	Half Core Ni (%)	Quarter Core Ni (%)
BL11-399	242.600	243.000	0.400	0.001	>1.000	0.002	>1.000	0.250	5.200	0.001	0.141	0.008	0.011	0.002	0.024
BL11-399	310.600	312.000	1.400	0.232	>1.000	0.238	>1.000	0.250	7.500	0.015	0.216	0.048	0.050	0.145	0.030
BL11-399	393.200	395.200	2.00	0.868	>1.000	0.897	>1.000	1.200	2.900	0.063	0.100	0.279	1.115	0.251	0.035
BL11-401	250.850	252.000	1.150	0.038	0.104	0.045	0.086	0.250	<0.500	0.005	0.007	0.016	0.050	0.098	0.041
TBND065	54.600	55.000	0.400	3.340	0.013	3.570	0.010	5.00	<0.500	0.230	0.002	0.741	0.064	0.392	0.046
TBND065	51.700	52.000	0.300	0.082	>1.000	0.092	>1.000	0.250	2.300	0.008	0.080	0.028	0.050	0.079	0.052
TBND065	57.300	58.000	0.700	0.910	>1.000	0.940	>1.000	1.700	3.700	0.060	0.134	0.285	0.060	0.206	0.057
BL08-39	152.000	153.000	1.000	1.100	0.015	1.200	0.011	1.400	<0.500	0.070	<0.001	0.201	0.127	0.189	0.152
BL08-39	161.000	162.000	1.000	0.705	>1.000	0.758	0.953	0.800	1.800	0.046	0.085	0.144	0.080	0.163	0.161
BL08-39	179.000	180.000	1.000	0.284	0.164	0.317	0.123	0.250	<0.500	0.019	0.010	0.051	0.515	0.138	0.179
TBND134	83.000	84.000	1.000	0.602	0.006	0.676	0.007	0.700	<0.500	0.050	<0.001	0.162	0.136	0.152	0.083
TBND134	55.000	56.000	1.000	1.150	0.242	1.300	0.255	1.700	<0.500	0.090	0.015	0.253	0.554	0.190	0.055
TBND134	39.000	40.000	1.000	0.082	0.909	0.092	0.928	0.250	1.400	0.007	0.059	0.020	0.012	0.075	0.039
BL10-357	149.400	149.900	0.500	1.850	0.452	1.900	0.485	3.600	0.800	0.120	0.031	0.602	0.120	0.258	0.149
BL10-357	149.900	150.000	0.100	1.900	>1.000	1.950	>1.000	3.700	2.300	0.110	0.127	0.606	0.850	0.267	0.150
BL10-357	174.000	174.250	0.250	0.021	0.127	0.016	0.139	0.250	<0.500	0.002	0.010	0.008	0.392	0.010	0.174
BL10-236	127.000	128.000	1.000	1.340	>1.000	1.410	>1.000	1.500	1.400	0.080	0.076	0.323	0.180	0.240	0.127
BL10-236	129.000	130.000	1.000	0.319	>1.000	0.339	>1.000	0.250	0.900	0.021	0.056	0.084	1.900	0.128	0.129
BL10-236	144.000	144.850	0.850	1.650	0.739	1.760	0.789	3.400	0.800	0.150	0.042	0.507	0.760	0.259	0.144
BL10-305	182.000	183.000	1.000	0.761	0.263	0.846	0.316	1.200	<0.500	0.067	0.017	0.256	0.492	0.212	0.182
BL10-305	171.000	172.000	1.000	0.161	0.698	0.160	0.761	0.250	1.100	0.014	0.053	0.044	0.111	0.139	0.171

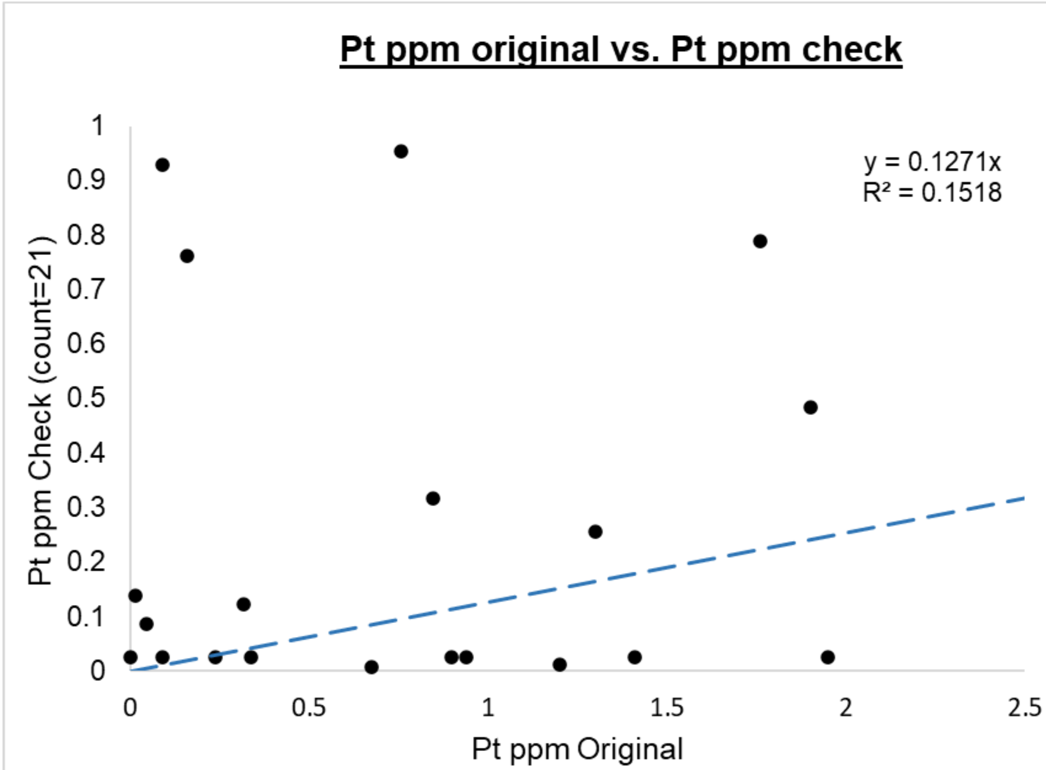


Figure 12-9: Current Deposit scatter plot comparison of Pt (ppm) verification samples

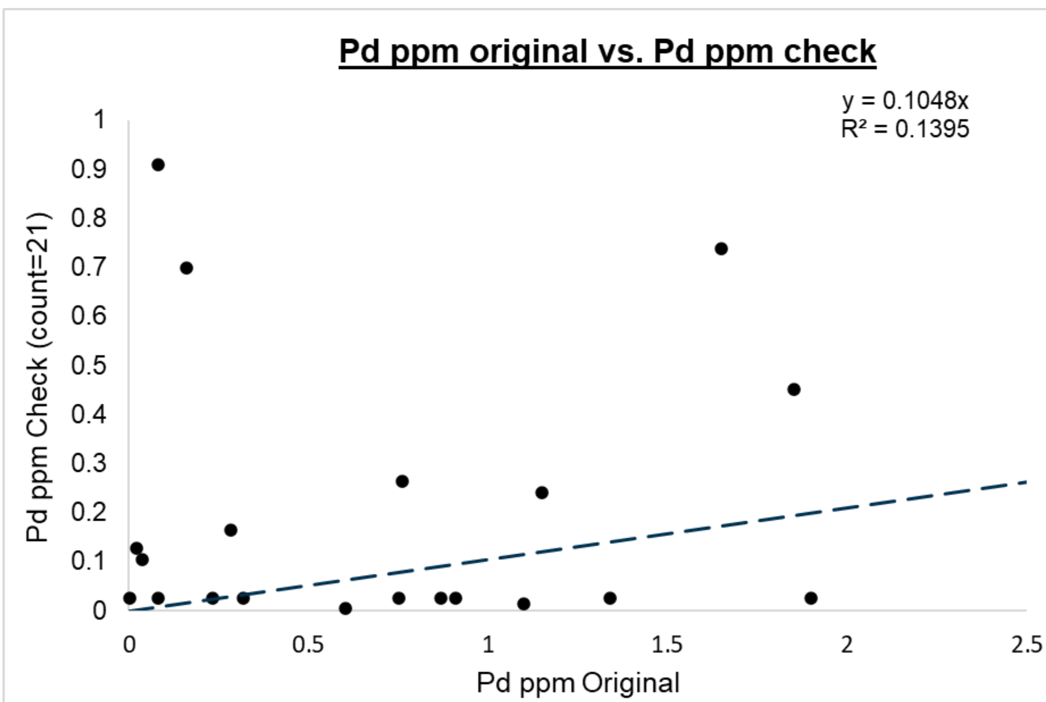


Figure 12-10: Current Deposit scatter plot comparison of Pd (ppm) verification samples

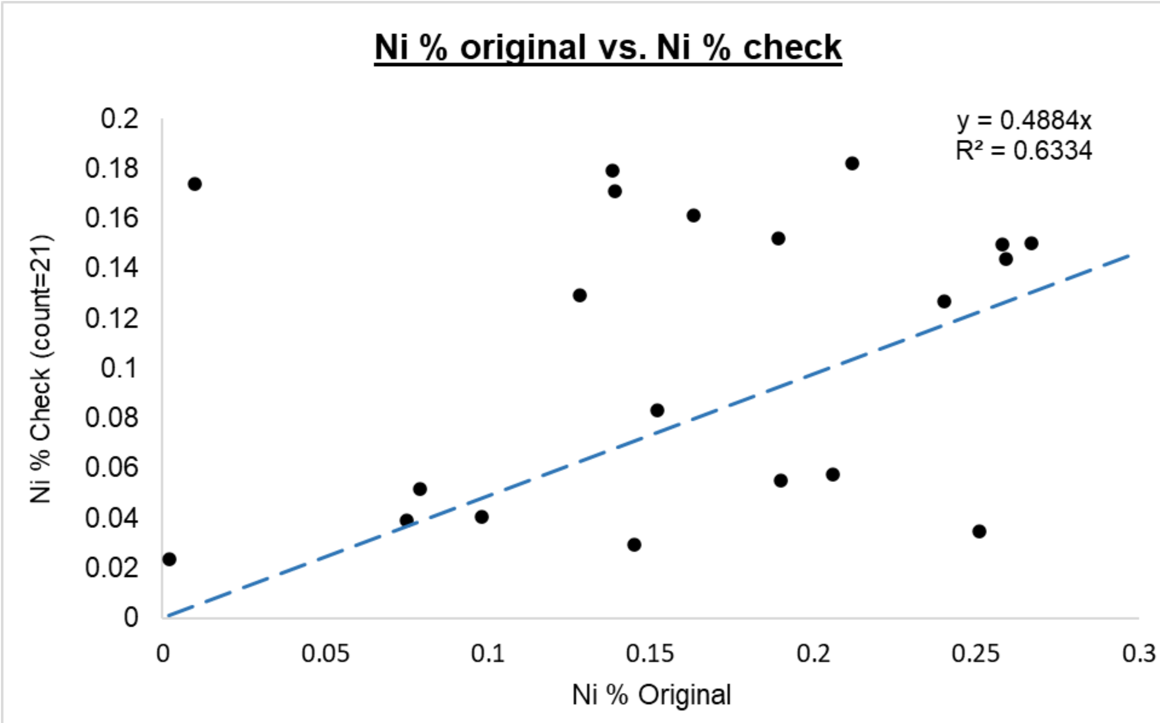


Figure 12-11: Current Deposit scatter plot comparison of Ni (%) verification samples

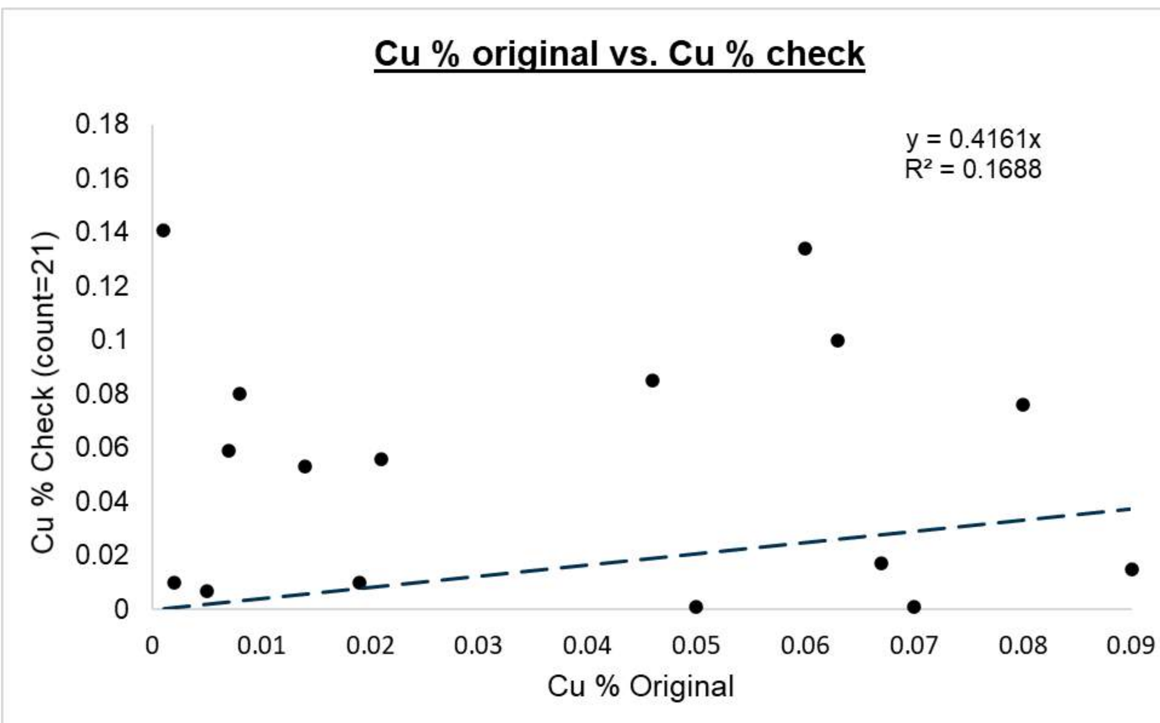


Figure 12-12: Current Deposit scatter plot comparison of Cu (%) verification samples

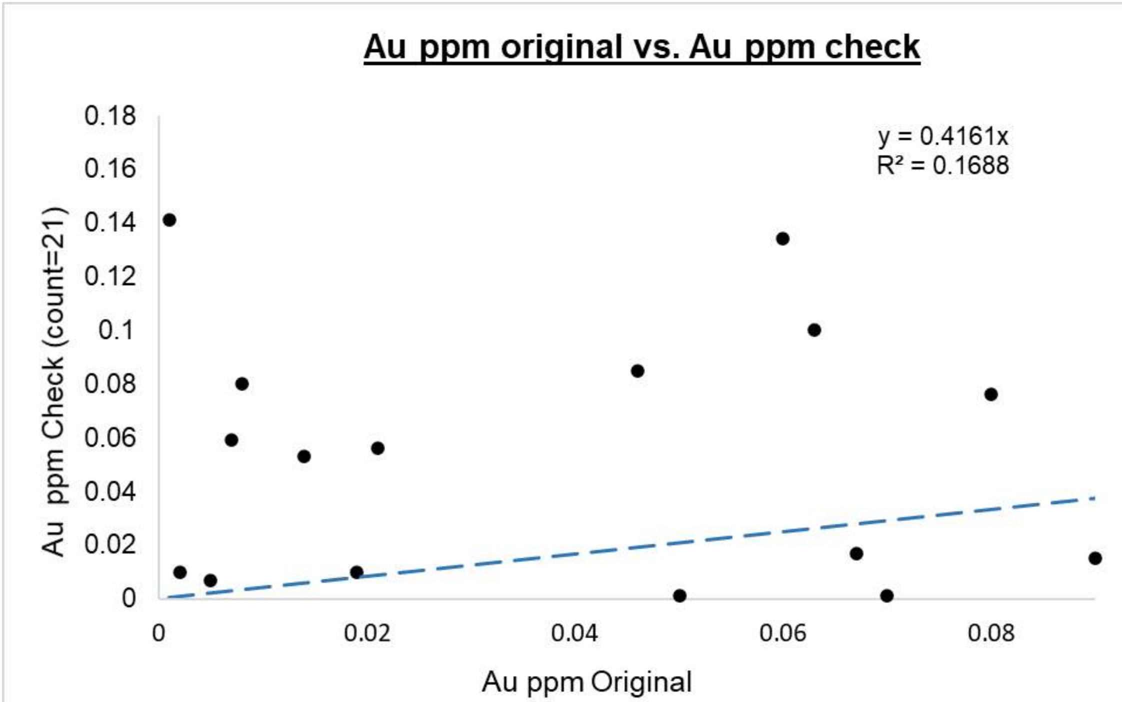


Figure 12-13: Current Deposit scatter plot comparison of Au (ppm) verification samples

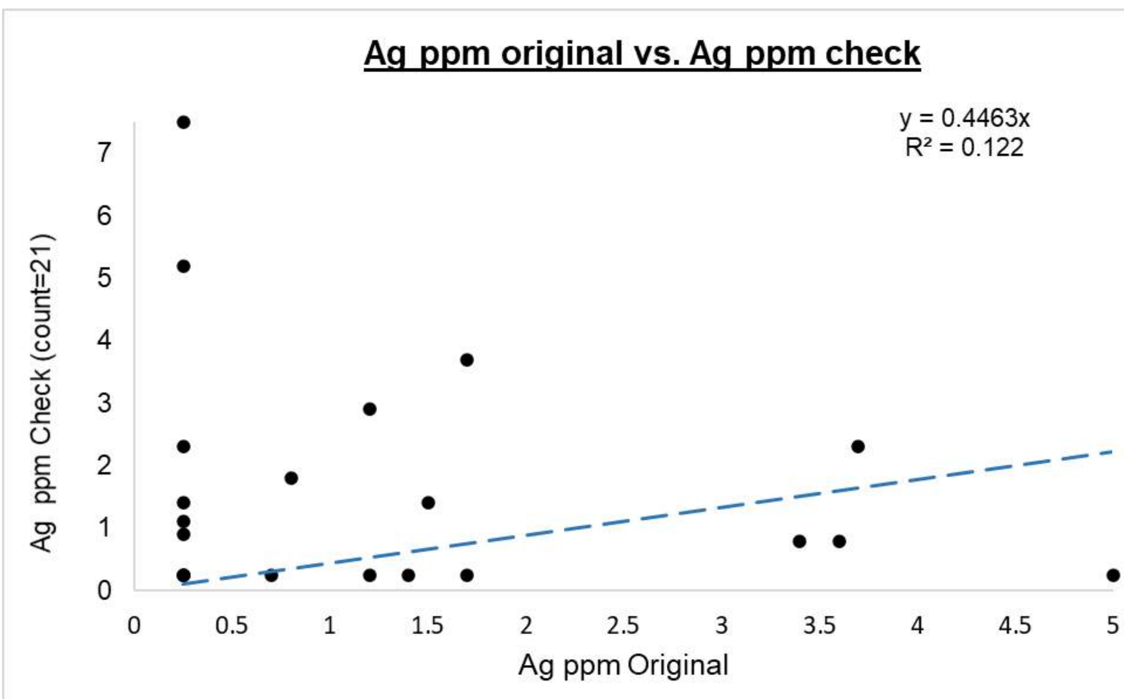


Figure 12-14:Current deposit scatter plot comparison of Ag (ppm) verification samples

Table 12-6: Escape Deposit Quarter Core Sampling Conducted by Nordmin, October 2020

Drill Hole ID	From (m)	To (m)	Length (m)	Half Core Pd (ppm)	Quarter Core Pd (ppm)	Half Core Pt (ppm)	Quarter Core Pt (ppm)	Half Core Ag (ppm)	Quarter Core Ag (ppm)	Half Core Au (ppm)	Quarter Core Au (ppm)	Half Core Cu (%)	Quarter Core Cu (%)	Half Core Ni (%)	Quarter Core Ni (%)
ELR20-004	435.550	436.050	0.500	4.010	0.448	2.800	0.491	4.900	<0.500	0.130	0.033	1.470	1.020	0.989	0.436
ELR20-004	473.370	474.370	1.000	3.330	0.077	2.870	0.083	7.400	<0.500	0.220	0.006	1.570	0.174	0.753	0.473
ELR20-004	393.580	394.580	1.000	4.640	>1.000	3.140	>1.000	3.200	3.100	0.100	0.125	1.740	0.500	1.210	0.393
ELR20-004	347.400	349.400	2.000	0.097	>1.000	0.080	>1.000	0.250	3.600	0.008	0.103	0.033	0.340	0.149	0.347
ELR20-004	555.140	557.000	1.860	0.003	>1.000	0.002	>1.000	0.250	5.000	0.008	0.125	0.005	0.050	0.013	0.555
ELR20-008	394.840	395.000	0.160	3.020	>1.000	1.990	>1.000	2.500	1.700	0.090	0.076	1.190	3.320	0.982	0.394
ELR20-008	416.000	416.840	0.840	2.340	0.313	1.790	0.339	4.300	<0.500	0.140	0.021	0.819	0.854	0.570	0.416
ELR20-008	292.700	293.000	0.300	0.001	>1.000	0.001	>1.000	0.250	3.800	0.005	0.149	0.005	0.270	0.002	0.293
ELR20-008	371.840	372.840	1.000	1.100	0.745	0.830	0.781	2.100	1.300	0.090	0.065	0.420	0.140	0.187	0.372
ELR20-008	323.00	323.840	0.840	0.172	0.082	0.141	0.087	0.250	<0.500	0.012	0.006	0.058	0.288	0.137	0.323

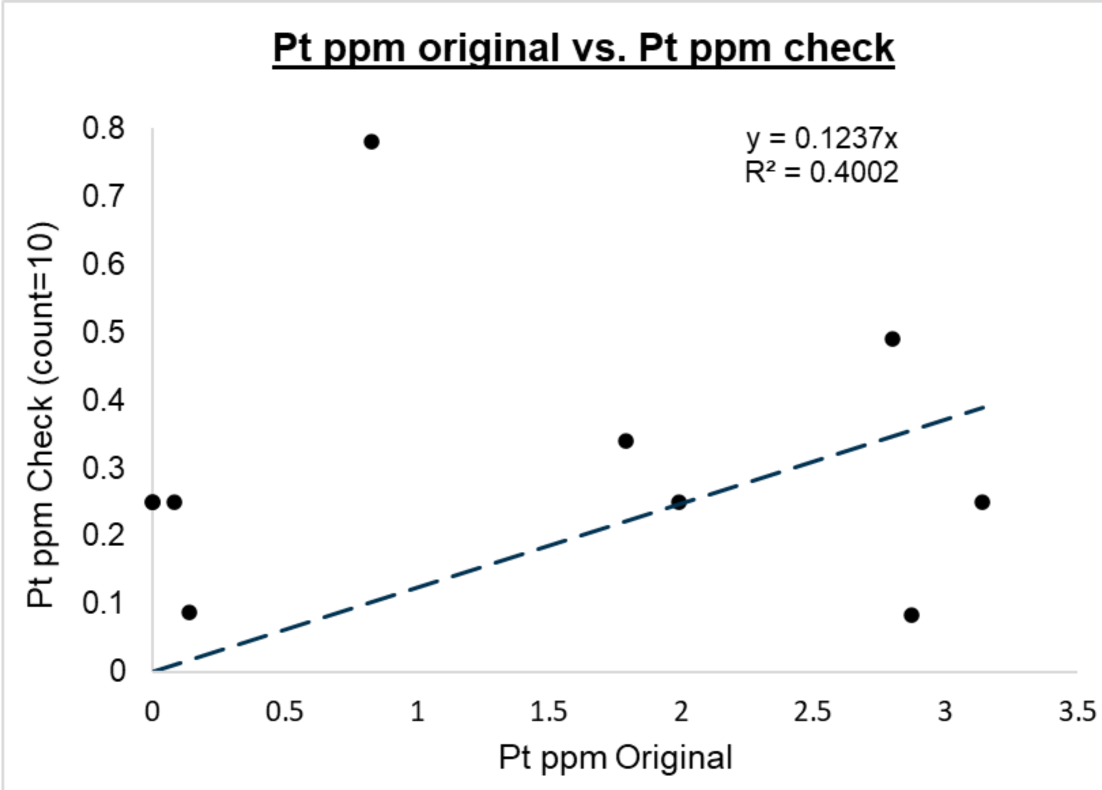


Figure 12-15: Escape deposit scatter plot comparison of Pt (ppm) verification samples

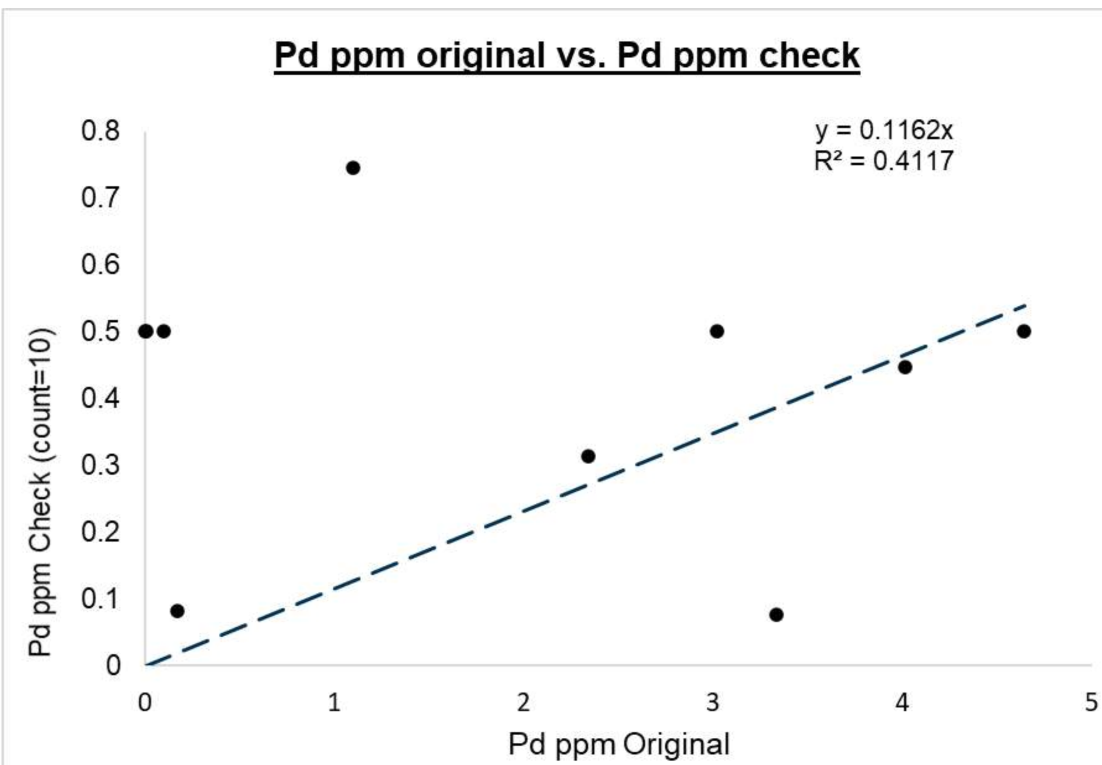


Figure 12-16: Escape deposit scatter plot comparison of Pd (ppm) verification samples

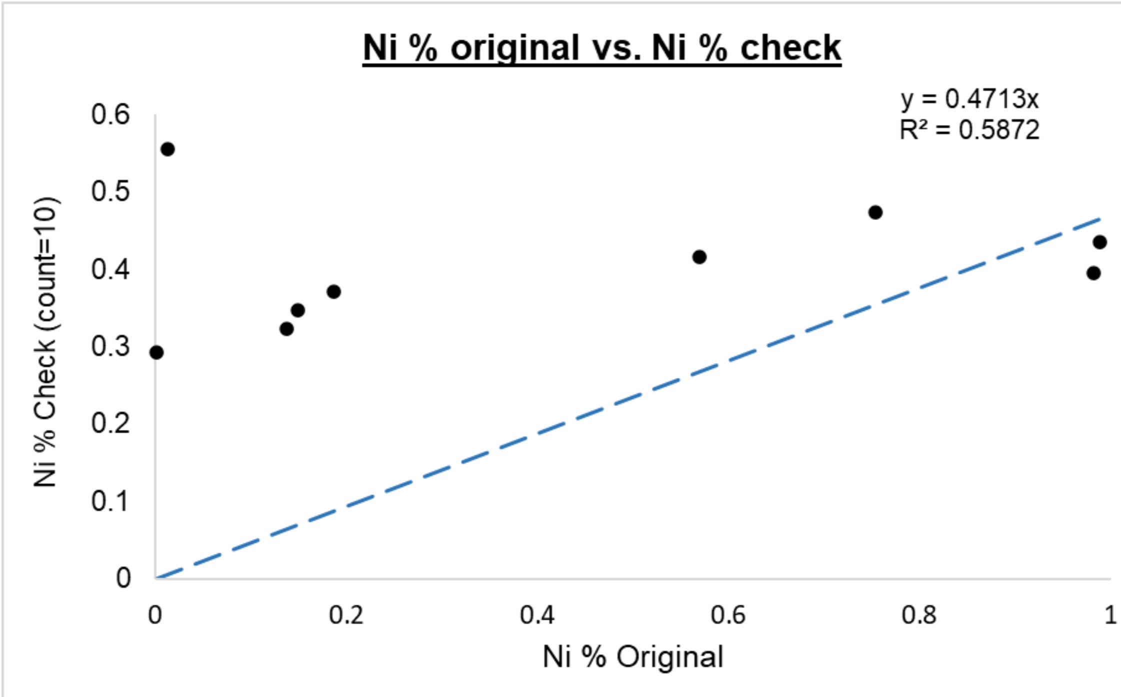


Figure 12-17: Escape deposit scatter plot comparison of Ni (%) verification samples

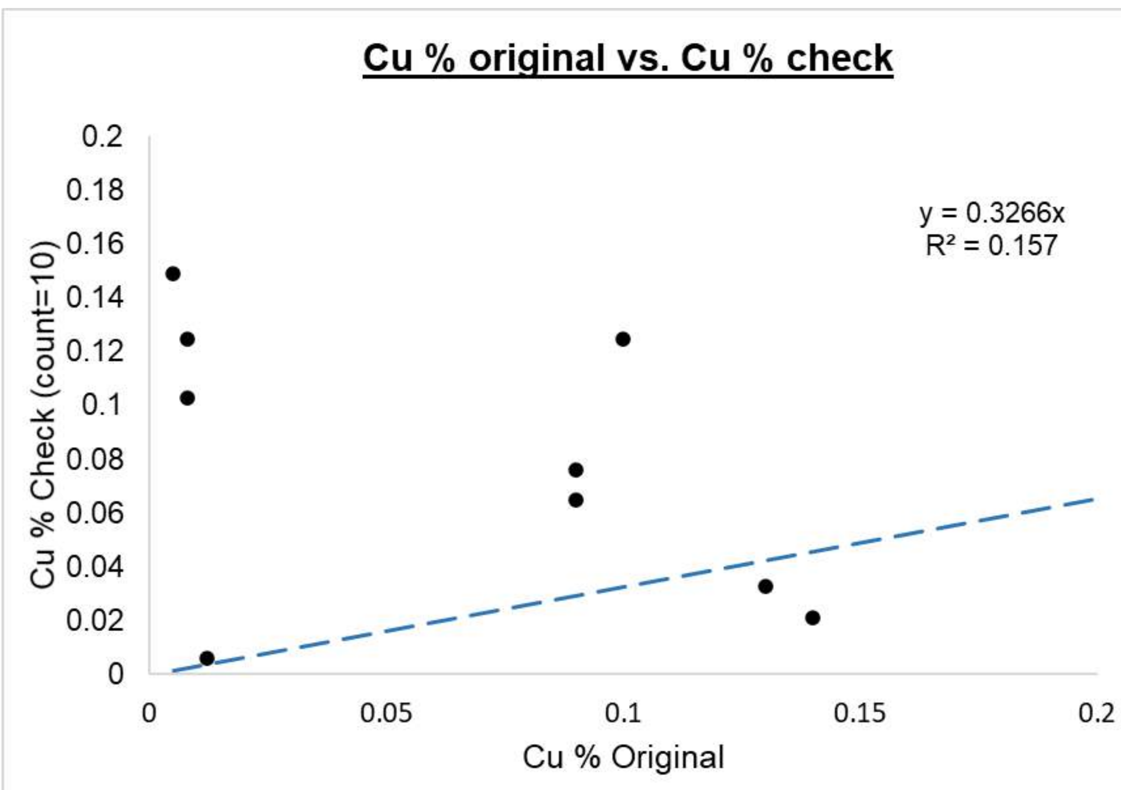


Figure 12-18: Escape deposit scatter plot comparison of Cu (%) verification samples

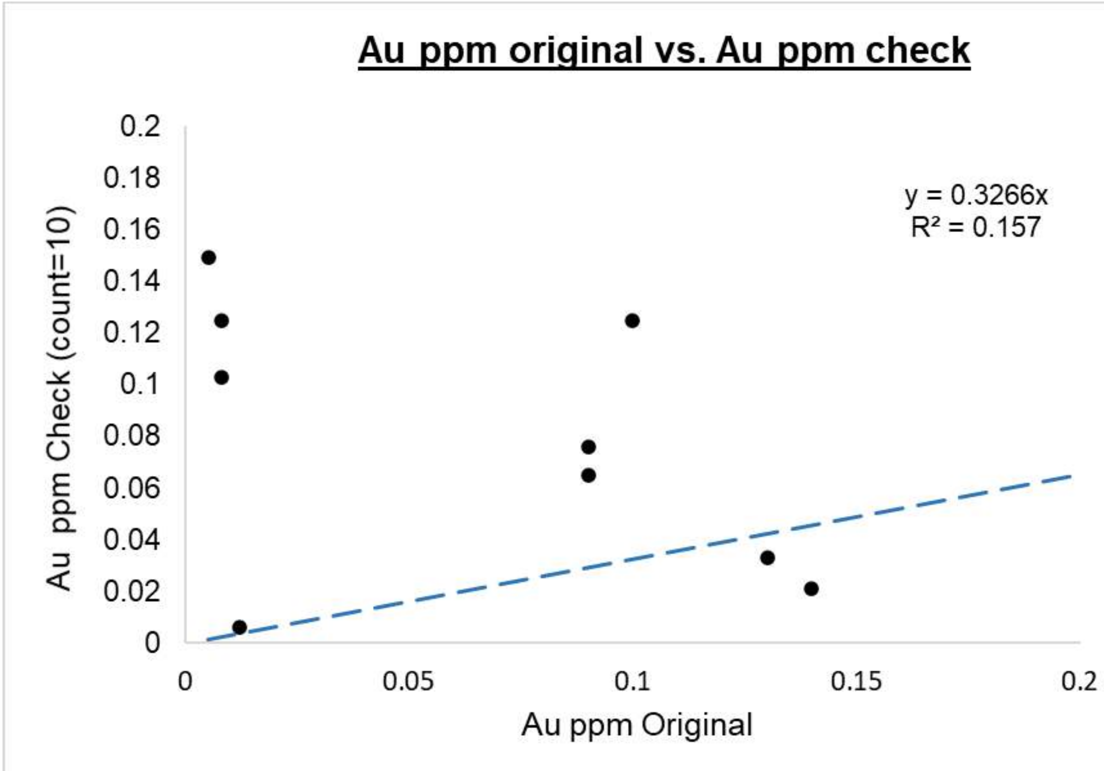


Figure 12-19: Escape deposit scatter plot comparison of Au (ppm) verification samples

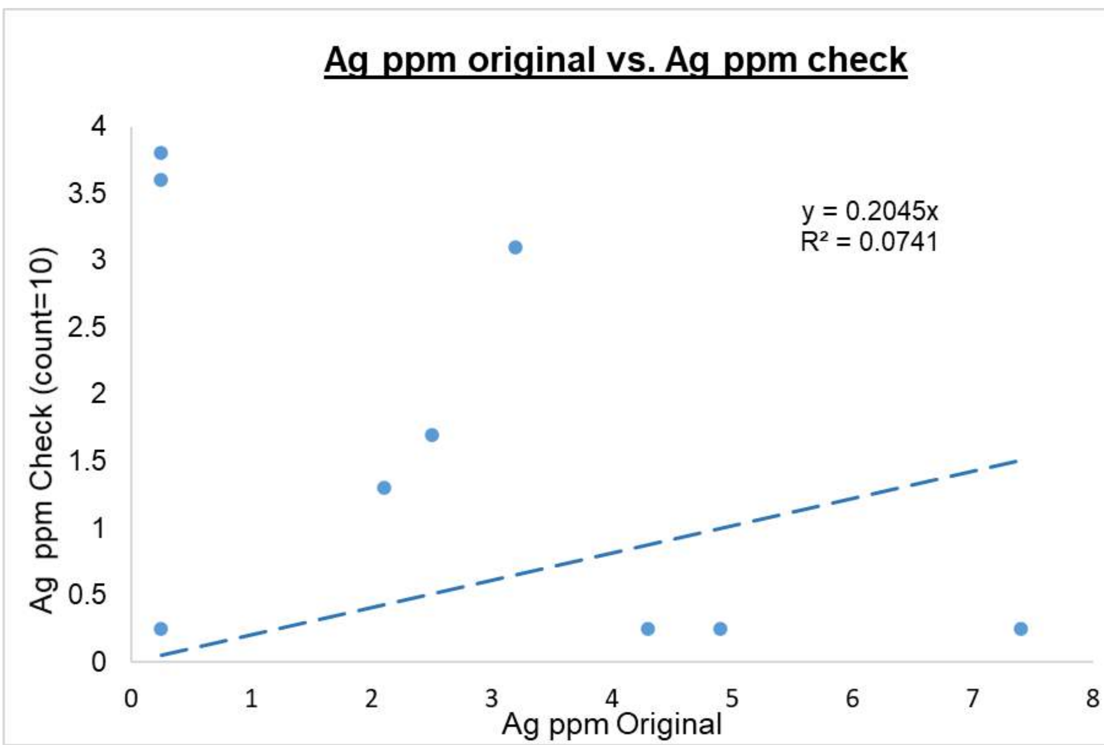


Figure 12-20: Escape deposit scatter plot comparison of Ag (ppm) verification samples

12.2 Database Validation

The QP completed a spot check verification of the following drill holes:

i. Current deposit – 52 (6%) of the lithologies, 3,184 (5%) of the geotechnical measurements, 3,992 (11%) of the assays.

ii. Escape deposit - 12 (10%) of the lithologies, 1,930 (15%) of the assays.

The geology was validated for lithological units from the Company's OCRIS logger. The geological contacts and lithology aligned with the core contacts and lithology and are acceptable for use.

Within the database there are 32 drill holes that did not have a collar associated with them; however, these specific drill holes are not associated with the Project and are negatable.

12.3 Review of the Company's QA/QC

The Company has a robust QA/QC process in place, as previously described in Section 11. The Company geologists actively monitor the assay results throughout the drill programs and summarize the QA/QC results, reporting weekly, and monthly. A number of failures for standard and blank reference materials were documented, resulting in re-assay of entire sample batches. Most of the CRMs performed as expected within tolerances of two to three standard deviations of the mean grade. Nordmin is satisfied that the QA/QC process performs as designed to ensure the assay data quality.

12.4 QP's Opinion

Upon completion of the data verification process, it is the QP's opinion that the geological data collection and QA/QC procedures used by the Company are consistent with standard industry practices and that the geological database is of suitable quality to support the Mineral Resource Estimate.

13. MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Introduction

Historical metallurgical testwork on Current deposit samples obtained during the 2010-2011 work program was conducted at G&T (now ALS) in Kamloops, BC, and at SGS Mineral Services ("SGS") in Lakefield, ON. The main focus of the testwork was the concentration of pay metals by froth flotation, but also considered gravity recovery and magnetic separation, as well as downstream process options including the Platsol process in an effort to optimize the value of the final products.

A new metallurgical test program was initiated at Blue Coast in December 2020. The program used coarse reject samples from previous drilling campaigns as well as split core material recovered from four new drill holes from the 2020 drilling campaign. The objective of the program was to advance the flowsheet development with a focus on optimizing grades and recoveries of final concentrates and providing baseline data for preliminary process engineering. Key elements of the work included:

- Mineralogical characterization of composite samples for bulk modals, sulphide liberation and association.
- Hardness testing to include SAG Mill Comminution (SMC), BBWi, and Abrasion Index (Ai) testing.
- Flotation flowsheet development and optimization.
- Chemical characterization of flotation concentrates.

This section provides a summary of the testwork programs completed on samples from the Current and Escape deposits.

13.2 Historical Testwork

Three reports form the basis of the historical technical information presented here:

- Xstrata Process Support (XPS); Mineralogical Report 5010809.00 for Magma Metals Limited, Qemscan Analysis of One Crushed Composite, June 8, 2010.
- G&T; Metallurgical Assessment of the Thunder Bay North Project, KM2533, Nov. 5, 2010.
- SGS"; Project #12372-001 for Magma Metals Limited, The Grindability Characteristics of Samples from the Thunder Bay North Project, April 30, 2010.

13.2.1 Sample Preparation and Characterization

A sample described as "Main Composite" was one of six different composites prepared by G&T from 281 kg of quartered drill core in March 2010. Head analysis of the Main Composite is presented in Table 13-1.

Table 13-1: Main Composite Head Analysis

Element	Unit	Assay
Palladium	g/t	1.12
Platinum	g/t	0.95
Copper	%	0.31
Nickel	%	0.22
Cobalt	g/t	180
Gold	g/t	0.11
Silver	g/t	2.6
Iron	%	10.9
Sulphur	%	1.73

Source: G&T Report KM2533, Nov. 5, 2010

Electron probe micro-analysis (EMPA) in the XPS study indicated that the Ni grade of serpentines and olivine in the composite is approximately 0.2%, and that non-sulphide Ni represents approximately 42% of the total Ni in the sample. In addition, an additional 6% of the Ni is contained in pyrite and pyrrhotite at grade of approximately 0.45% Ni.

Liberation analysis by MLA carried out at G&T revealed that at a P_{80} (80% passing size) of 86 µm Cu, as chalcopyrite, was found to be sufficiently liberated to achieve separation. At the same grind size pentlandite was not liberated and would be primarily associated with pyrite and pyrrhotite.

13.2.2 Grindability

Hardness testing was conducted at SGS on selected composite samples. Results are summarized in Table 13-2 and indicate that the samples tested are hard compared to other deposits, but only mildly abrasive.

Table 13-2: Summary of Grindability Results

Sample Name	Relative Density	JK Parameters A x b	JK Parameters DWi	SPI® (Min)	CWi (kWh/t)	RWi (kWh/t)	BWi (kWh/t) 150M	BWi (kWh/t) 325M	Ai (g)
Main Sample	2.89	30.9	9.28	135	-	17.0	18.7	23.4	0.052
Boulder Sample	2.97	31.8	9.38	-	15.8	-	17.8	-	-
Variability Sample	2.94	37.4	7.84	-	-	-	17.6	-	-

Source: SGS Report, 2010. Rwi = bond rod mill work index, DWi = Drop Weight Index

13.2.3 Flotation Development

Flotation testwork was carried out at G&T with the objective of developing a flotation process to recover pay metals to a saleable concentrate and reject penalty elements, including talc minerals.

Three main flotation flowsheet options were investigated: bulk concentrate production; recovery of separate Cu-Ni and pyrite (PGM) concentrates, and separate Cu and Ni/PGM concentrates. In addition to flowsheet configuration, low-air flotation, consisting of nitrogen sparged flotation in the early stages of rougher flotation to selectively recover pyrite and pyrrhotite over Cu and Ni minerals was also evaluated. The presence of magnesium bearing minerals was identified in the mineralogical study and methods of control in the testwork included the addition of a talc pre-flotation step as well as the use of starch depressants.

The highest recoveries were achieved with a bulk concentrate flowsheet and locked cycle testing was conducted to evaluate the effect of recycle streams on final concentrate grades and recoveries. Table 13-3 presents the metallurgical projection for the bulk flowsheet including a pre-flotation step to control magnesium. The pre-float concentrate MgO grade was measured at 25.6%, and this stream would report to final tailings.

Table 13-3: Locked Cycle Flotation Test Results, Test #23

Flotation Stream	Wt.	Assay, % (Cu, Ni, Co) g/t (Pt, Pd, Au)						Distribution, %					
	%	Cu	Ni	Co	Pt	Pd	Au	Cu	Ni	Co	Pt	Pd	Au
Feed	100	0.30	0.20	0.02	1.30	1.32	0.08	100	100	100	100	100	100
Pre-float Concentrate	5.7	0.15	0.12	0.01	0.6	0.7	0.06	2.9	3.6	4.0	2.4	3.1	3.9
3rd Cleaner Concentrate	4.6	5.73	1.91	0.09	23.3	22.2	1.12	87.2	44.7	28.4	80.9	77.6	60.8
Tailings	89.7	0.03	0.11	0.01	0.20	0.28	0.03	9.8	51.7	67.7	16.7	19.3	35.3

Source: G&T Report KM2533, Nov. 5, 2010

Minor element analysis of a 3rd cleaner concentrate sample from flotation test #23 is presented in Table 13-4. Despite the pre-flotation step and the use of depressants during flotation the concentrate still has appreciable MgO, 7.8%, which may attract a smelter penalty. No other penalty elements were identified.

Table 13-4: Bulk Concentrate Minor Element Analysis, Test #23

Element	Symbol	Unit	Technique	Assay
Aluminum	Al	%	WR ICP-OES	0.53
Antimony	Sb	g/t	2 Acid ICP-OES	20
Arsenic	As	g/t	2 Acid ICP-OES	98
Bismuth	Bi	g/t	2 Acid ICP-OES	2
Cadmium	Cd	g/t	AR FAAS	10
Calcium	Ca	%	WR ICP-OES	0.87
Cobalt	Co	%	AR FAAS	0.093
Copper	Cu	%	AR FAAS	5.73
Fluorine	F	g/t	Fusion ISE	198
Gold	Au	g/t	FA FAAS	1.12
Iron	Fe	%	AR FAAS	30.7
Lead	Pb	%	AR FAAS	0.011
Magnesium Oxide	MgO	%	WR ICP-OES	7.79
Manganese	Mn	%	WR ICP-OES	0.072
Mercury	Hg	g/t	LeForte rt CV-AAS	<1
Molybdenum	Mo	%	2 Acid FAAS	0.003
Nickel	Ni	%	AR FAAS	1.91
Palladium	Pd	g/t	FA ICP-OES	22.2
Phosphorus	P	g/t	3 Acid ICP-OES	406
Platinum	Pt	g/t	FA ICP-OES	23.3
Selenium	Se	g/t	ESHKA ICP-OES	182
Silicon	Si	%	Fusion ICP-OES	7.25
Sulphur	S	%	2 Acid-ICP-OES	28.9
Silver	Ag	g/t	AR FAAS	26
Zinc	Zn	%	AR FAAS	0.038

Source: G&T Report KM2533, Nov. 5, 2010

Additional testwork evaluated both gravity and magnetic separation as means to reject gangue, and to improve precious metals recovery and overall concentrate grade. Centrifugal gravity recovery using a Knelson concentrator followed by hand panning indicated that approximately 30% of the contained gold could be recovered to a low grade concentrate suitable for combining with the bulk concentrate. No other metals were observed to benefit from gravity concentration. Low intensity magnetic separation at a field strength of 1000 Gauss was investigated as a means to remove pyrrhotite from the bulk concentrate but was not found to achieve an efficient separation.

13.2.4 Variability Testing

Five variability composites were prepared from the split core samples received at G&T. The samples represented discrete zones of varying geographical and geological properties. A summary of the head analysis for the variability samples is presented in Table 13-5. The composites varied widely in mineralization and metal grades. Total sulphur in the composites ranged from 0.8% to 17%, with pay metals varying in proportion to the sulphur.

Table 13-5: Head Assays for the Variability Composites

Sample	Cu	Ni	Co	S	MgO	Pd	Pt	Au	Ag
	%	%	%	%	%	g/t	g/t	g/t	g/t
Cloud	0.3	0.2	0.02	0.7	26.0	1.2	1.0	0.1	2.5
0.7 Diss	0.1	0.1	0.02	0.8	22.9	0.3	0.3	0.2	1.3
1.5 Diss	0.2	0.2	0.02	1.5	22.0	0.4	0.4	0.2	1.7
5 Diss	0.8	0.5	0.03	3.8	24.0	3.1	2.6	0.2	4.6
10 Matrix	1.2	0.6	0.03	3.9	23.1	4.9	4.9	0.3	6.6
20 Matrix	2.7	1.5	0.08	17.4	12.6	11.6	8.4	0.4	9.9

Rougher and cleaner flotation tests were carried out using the optimized conditions developed from the testwork on the Main Composite. Metallurgical response varied widely between composites driven largely by grade and sulphide content. Copper recoveries ranged from 68% to 89%, whereas Ni recovery was more sensitive to head grade, with recoveries ranging from 24% to 70%.

Based on the results of the G&T testwork, a conceptual flowsheet was developed that included pre-flotation of floatable gangue followed the production of a bulk concentrate with the potential for additional recovery in the grinding circuit through gravity concentration.

13.3 2020 Test Program: Blue Coast Phase 1

A new metallurgical testing program on samples from the Bridge, Beaver, and Current zones of the deposit was initiated at Blue Coast in November 2020 (Report PJ5331: Thunder Bay North-Metallurgical Flowsheet Development, May 18, 2021). The objective of the program was to further develop the flowsheet and advance the metallurgy to a PEA level.

13.3.1 Sample Selection and Characterization

Due to limitations on core sample availability, the initial development testwork was conducted on a MC composed of coarse assay reject material from past drilling programs. Later in the program, a second composite, labelled as Var1, was generated using selected core samples from the 2020 drilling campaign. Head assays for both composites are presented in Table 13-6.

Table 13-6: Head Assays for the Blue Coast Phase I Composites

Sample	Cu (%)	Ni (%)	NiS (%)	Pt (g/t)	Pd (g/t)	Rh (ppb)	S (%)
Master Composite	0.30	0.19	0.11	1.01	0.89	57	1.81
Var 1 Composite	0.46	0.21	-	1.05	1.00	-	1.94

13.3.2 Mineralogy

A sample of the MC was ground to a P_{100} of 100 µm, screened at 75 µm and 38 µm, and submitted for bulk modals as well as sulphide association and liberation analysis. A summary of the results of the modal analysis is presented in Table 13-7 and indicates that the main components of the gangue mineralization consist of serpentine and amphibole, and to a lesser extent chlorite and quartz.

Table 13-7: Modal Analysis For Three Size Fractions of the Master Composite

Mineral Abundance (%)	Combined	CAM MC +75	CAM MC -75	CAM MC -38
Chalcopyrite	0.75	0.50	1.09	1.11
Fe Sulphide	2.83	2.16	3.82	2.88
Pyrrhotite	0.23	0.24	0.21	0.16
Millerite	0.03	0.02	0.05	0.05
NiS low Fe (Godlevskite)	0.23	0.21	0.27	0.18
Fe Oxide/Hydroxide	2.55	2.40	2.75	2.73
Hematite low Cr	1.07	0.94	1.33	0.52
Ilmenite	2.40	2.07	2.98	1.39
Quartz	2.25	2.26	2.28	1.94
Feldspar	9.72	10.21	9.46	5.37
Amphibole	15.88	15.61	17.04	8.74
Phlogopite/Biotite	2.69	2.74	2.61	2.86
Muscovite	1.15	1.25	1.05	0.64
Chlorite	8.09	8.02	7.49	14.57
Si-Al Clays	1.64	1.65	1.60	1.91
Serpentine	46.57	47.99	43.87	52.34
Talc	0.33	0.36	0.29	0.20
Calcite	0.55	0.40	0.76	0.69
Dolomite	0.23	0.19	0.26	0.57

Copper is present as chalcopyrite while nickel was identified as the low iron sulphide godlevskite, although this may be result of the aging and oxidation of the sample, i.e., the godlevskite may be an altered form of pentlandite.

Chalcopyrite was found to be moderately liberated, with 54.1% being greater than 80% liberated at a P_{80} of 100 µm. Association of chalcopyrite was primarily with pyrite and serpentine. Nickel sulphide identified as godlevskite was found to be mostly locked, with 63.2% less than 40% liberated, and associations including chalcopyrite and serpentine.

13.3.3 Metallurgical Testwork

A total of nine rougher tests and nine open-circuit cleaner tests were carried out on the MC. The tests sought to optimize the circuit parameters including primary and regrind size, circuit configuration, collector type and addition, and gangue depressants used.

Baseline testing focused on a sequential flowsheet targeting the selective flotation of copper sulphides followed by recovery of the nickel sulphides and remaining PGE's. An initial primary grind size P_{80} of 100 µm was selected, with lime added to achieve a pulp pH of 10.5, triethylenetetramine (TETA) added to depress pyrrhotite, and 3418A added as a copper collector. Rougher flotation of the copper minerals was followed by lowering the pH to 9.0 with sulphuric acid and the addition of sodium isopropyl xanthate (SIPX) for collection of the nickel sulphides.

Figure 13-1 presents the kinetic recovery curves for copper and nickel for each of the rougher tests. Copper circuit performance was consistently good with high copper recovery to the rougher concentrate. In comparison, nickel recovery was much lower averaging ~60% to the combined (Cu+Ni) rougher concentrate under most conditions. At the same time, sulphur recover to the combined concentrate ranged from 80% to 88%, supporting the head assay result in Table 13-6 which indicates that a significant portion of the contained nickel is associated with non-sulphide gangue.

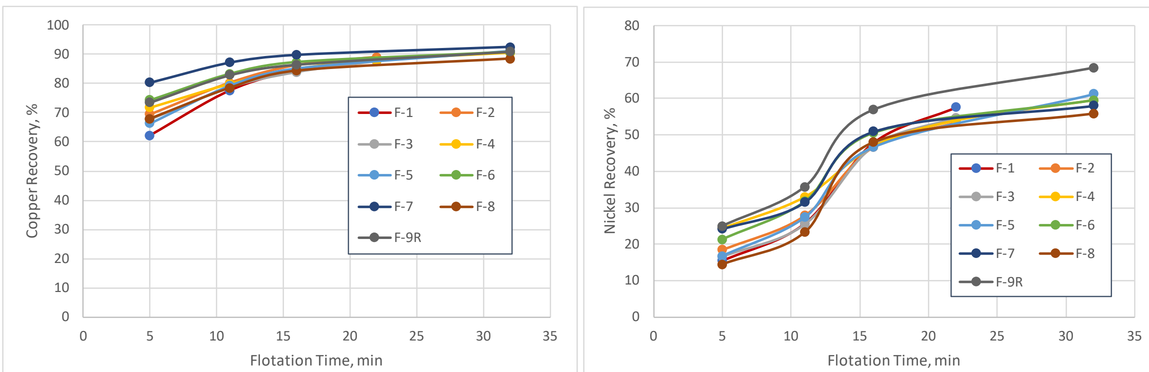


Figure 13-1: Kinetic curves for copper and nickel recovery for the rougher flotation tests

Variations on this flowsheet and reagent scheme over the course of nine rougher kinetic flotation tests provided the following results:

- Optimal primary grind size grind size was identified as a P_{80} of ~65 µm as this provided good liberation of the copper and nickel sulphide minerals.
- 3418A was found to provide selective recovery of the copper sulphides while minimizing the recovery of nickel to the copper rougher concentrate.
- Carboxymethyl cellulose (CMC) was found to be more effective than Calgon as a gangue dispersant/depressant.
- The addition of sodium sulfite was found to improve copper grade in the rougher concentrate, but negatively affected recovery.
- Increasing the collector dosage in the nickel rougher flotation was not found to improve nickel recovery.
- Addition of $CuSO_4$ in the nickel roughers was found to improve nickel recovery.

Platinum and palladium assays on selected products from the rougher kinetic tests indicated that PGE recovery is strongly dependent on sulphur recovery. This is particularly true for platinum, as shown in Figure 13-2. For palladium, the results indicate that the sulphides in the copper circuit concentrate carry more grade than in the nickel circuit. This suggests that a portion of the contained palladium is associated closely with chalcopyrite and would be expected to upgrade in the copper concentrate.

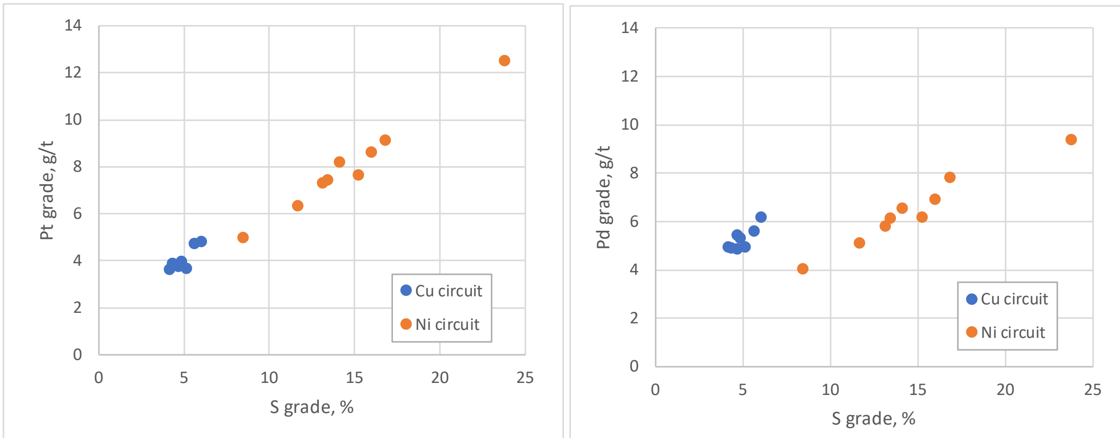
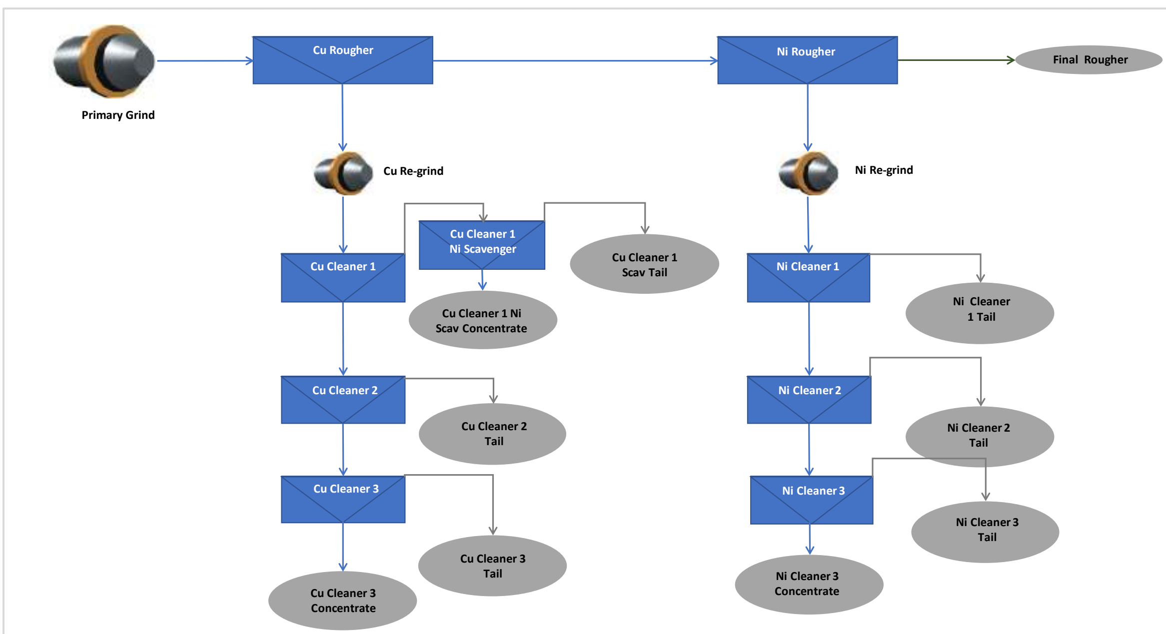


Figure 13-2: Pt/Pd recovery vs. sulphur recovery for rougher flotation tests F1 to F4.

Based on the results of the rougher kinetics tests, a rougher sequential flowsheet was identified as effective at achieving good stage recoveries of the contained pay metals. A further nine open-circuit cleaner flotation tests were carried out on the MC to evaluate the potential final concentrate grades and recoveries. Figure 13-3 presents a schematic of the typical flowsheet used for these tests.



Source: Blue Coast Report PJ5331, May 18, 2021

Figure 13-3: Flowsheet used for open-circuit batch flotation testing.

The initial starting point for the cleaner tests consisted of a primary grind P_{80} of 65 µm, a pH 10.5 in the copper rougher and pH 9 in the nickel rougher, with collectors as 3418A and SIPX. In addition, TETA, diethylenetriamine (DETA), and CMC were used as gangue and iron sulphide depressants, and copper sulphate was added as an activator in the nickel circuit.

The copper rougher concentrate was initially reground to a P_{80} of approximately 35 µm prior to three stages of open-circuit cleaning. Grade recovery curves for copper and nickel in the cleaner flotation tests are presented in Figure 13-4. The copper circuit demonstrated good performance in all tests, achieving final copper grades of >25% under varying conditions, and the steepness of the curves indicate high stage recoveries even in open-circuit.

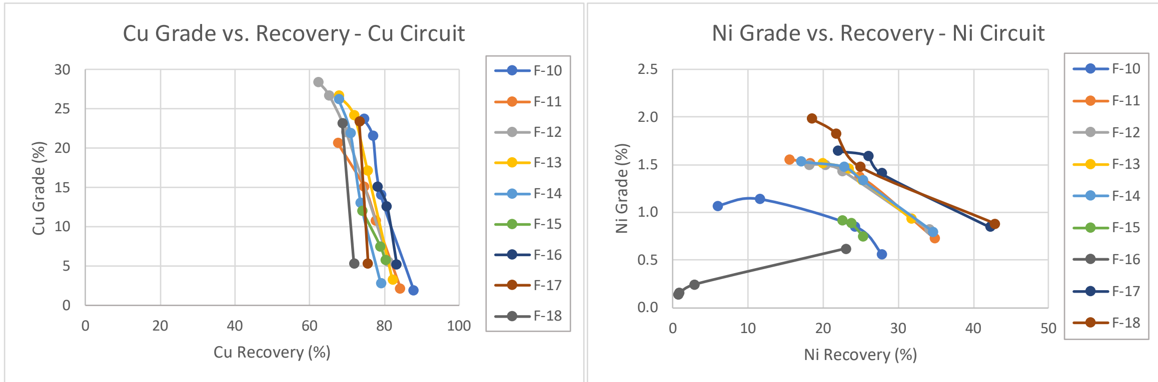


Figure 13-4: Grade/recovery curves for copper and nickel in the cleaner tests on the MC composite

Conversely, the cleaning of the nickel rougher concentrate was found to be much more difficult. Stage recoveries were low, particularly in the first cleaner, and further compounded the low rougher circuit recovery. In addition, the cleaning of the rougher concentrate did not significantly improve the nickel grade of the concentrate reaching a maximum of 1.5% Ni in tests F-10 to F-16. For the last two tests in this series a regrind of the rougher nickel concentrate was included in the flowsheet and this improved the concentrate grade up to 2.0% Ni, but the high nickel losses in the first cleaner remained.

Platinum and palladium grade/recovery curves for test F-13 are presented in Figure 13-5. Higher grades and stage recoveries were achieved in the copper circuit, particularly for palladium due to a close association with chalcopyrite. Nickel circuit performance for PGE's were comparable to that for nickel shown in Figure 13-4, and suggests that pay metals in this stream are associated with both nickel sulphides and iron sulphides. As a result, any attempt to depress the iron sulphides and improve nickel and PGE grade has a detrimental effect on overall metal recovery.

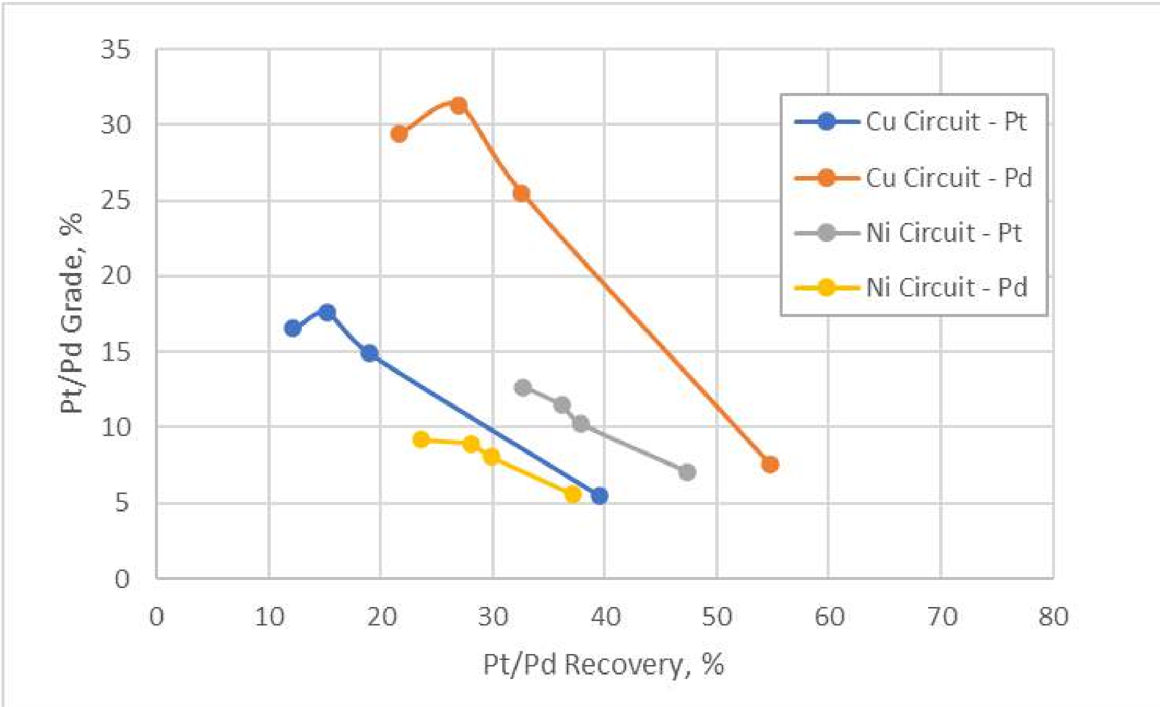


Figure 13-5: Pt/Pd grade/recovery curves for test F-13.

To evaluate the influence of composite sample aging and surface oxidation on the metallurgical performance, a second composite labelled as Var1 was generated. Unlike the MC, which was composed of coarse assay rejects, the Var1 composite was comprised of selected intervals of split core from the 2020 drilling campaign. Head assays presented in Table 13-6 indicate that the composite is similar in grade to the MC, although slightly higher in copper.

Six cleaner flotation tests were conducted on the Var1 composite, with the starting conditions for these tests taken from the F-17 test on the MC. Immediate improvements in metallurgical performance were noted, in particular in terms of final concentrate nickel grade. Higher grades and recoveries were also observed in the copper circuit, as illustrated in Figure 13-6.

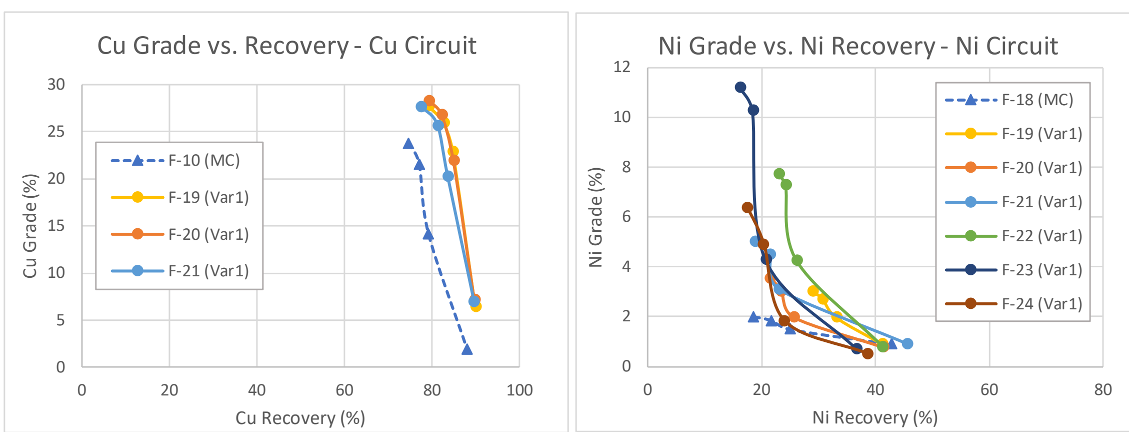


Figure 13-6: Cu and Ni grade/recovery curves for the cleaner tests on the Var1 composite.

Subsequent tests in this series focused on improving grade in the nickel circuit through two flowsheet modifications: 1) replacement of SIPX with the specialized nickel sulphide collector, Solvay NP-12;

and 2) varying the DETA (diethylenetriamine) addition to the nickel circuit regrind to improve depression of the contained iron sulphides. In test F-23, with 125 g/t DETA added to the regrind and 35 g/t NP-12 collector, a final concentrate nickel grade of 11.3% was achieved. However, overall nickel recovery to this stream was still too low at only 16.2%. High stage losses continued to occur during upgrading of the concentrate.

Results for platinum and palladium were similar to those for nickel with improved final concentrate grades, but at unacceptable recoveries. Figure 13-7 provides a comparison of the platinum and palladium results for the Var1 composite compared to those for the MC (F-13).

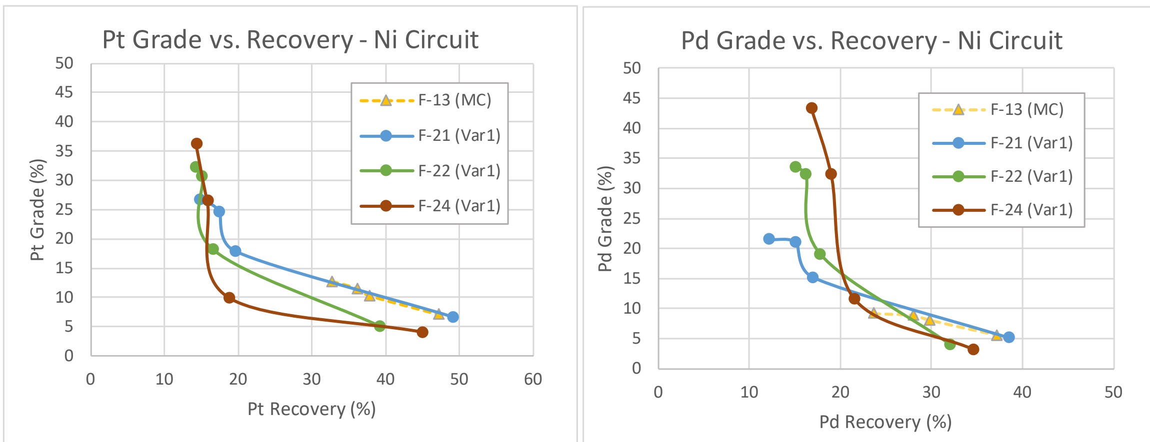


Figure 13-7: Ni circuit Pt/Pd grade/recovery curves for the cleaner tests on the Var1 composite.

The final concentrates from flotation test F-24 were submitted for an ICP scan to measure the contained minor elements. Results are presented in Table 13-8 and indicate that all elements are within reasonable limits. Magnesium in the copper concentrate is slightly elevated, but this can likely be controlled through a second stage of cleaning and/or fine tuning of the CMC addition.

Table 13-8: Minor Element Assays for Cu 1st Cleaner Conc and Ni 3rd Cleaner Conc for Test F-24.

Element/Units		Cu Conc	Ni Conc		Element/Units		Cu Conc	Ni Conc
Ag	**ppm**	83.9	46.2		**Mo**	**ppm**	<1	<1
Al	**%**	0.51	0.20		**Na**	**%**	0.18	0.06
As	**ppm**	19	37		**Nb**	**ppm**	<10	<10
Ba	**ppm**	19	12		**Ni**	**ppm**	6950	OL
Be	**ppm**	<0.2	<0.2		**P**	**%**	<0.002	0.059
Bi	**ppm**	<2	23		**Pb**	**ppm**	75	135
Ca	**%**	0.39	0.15		**Rb**	**ppm**	<20	<20
Cd	**ppm**	11.8	2.7		**Re**	**ppm**	<20	<20
Co	**ppm**	515	3049		**Sb**	**ppm**	5	27
Cr	**ppm**	145	117		**Se**	**ppm**	99	103
Cu	**ppm**	OL	35243		**Sn**	**ppm**	<10	<10
Fe	**%**	27.84	37.71		**Sr**	**ppm**	31	14
Ga	**ppm**	<20	373		**Ta**	**ppm**	13	15
Ge	**ppm**	<20	<20		**Te**	**ppm**	<100	<100

Element/Units		Cu Conc	Ni Conc		Element/Units		Cu Conc	Ni Conc
Hf	**ppm**	<20	<20		**Ti**	**%**	0.08	0.08
In	**ppm**	<20	33		**Tl**	**ppm**	<2	7
K	**%**	0.05	0.02		**V**	**ppm**	19	28
Li	**ppm**	10	2		**W**	**ppm**	30	17
Mg	**%**	2.83	0.80		**Zn**	**ppm**	672	1225
Mn	**ppm**	220	125		**Zr**	**ppm**	43	26

The phase 1 program was concluded based on limitations of available sample and pending a re-evaluation of final product grade objectives.

13.4 2021 Test Program: Blue Coast Phase 2

A second phase of the flowsheet development program was initiated at Blue Coast Research in July 2021 (Report PJ5366: Thunder Bay North Phase 2 Metallurgical Testwork, December 14, 2021). The objective of the program was to identify the optimal conditions for achieving metal recovery to concentrate, and to evaluate the effect of variations in head grade on metal recovery. The program included chemical and mineralogical characterization of 12 variability composites as well as bench scale grindability and flotation testwork.

13.4.1 Sample Selection and Characterization

A total of nine variability composites were generated from three drill holes in the Current deposit, as shown in Figure 13-8. (Selected samples from these holes were also blended to form the Var1 composite that was used in the first phase of testing at Blue Coast.) In Phase 2, each hole was used to generate three composites (A, B, and C) organized spatially, increasing in depth through the mineralized portion of the available core.

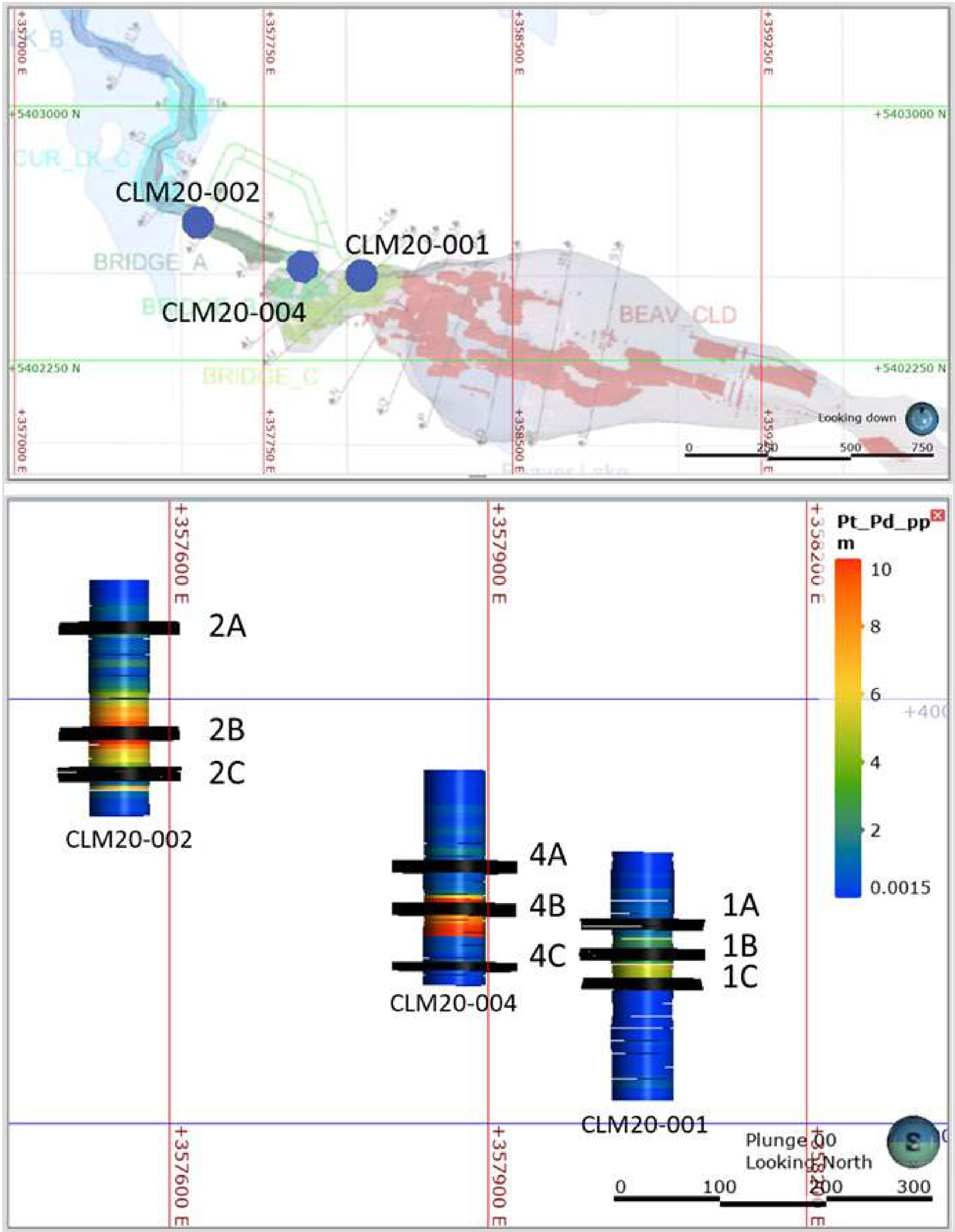


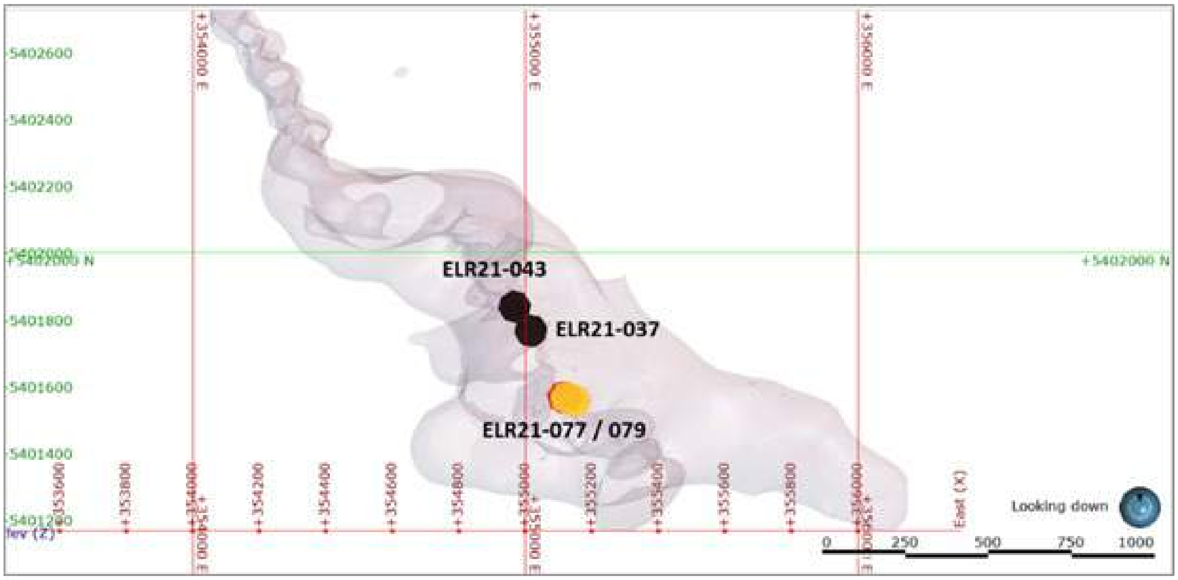
Figure 13-8: Hole locations and spatial distribution of the nine Current deposit variability samples

The head assays for the nine Current deposit variability composites are presented in Table 13-9. The assays indicated a wide range in grade with PGE (Pt +Pd) grades ranging from 1.49 g/t (1A) to 11.2 g/t (4C). In general, higher PGE grades also correspond to higher copper, nickel, and sulphur grades. Assays for rhodium were conducted on the head samples and indicated grades ranging from 0.020 g/t to 0.402 g/t.

Table 13-9: Head Assays for the Phase 2 Metallurgical Composites

Sample	Pt g/t	Pd g/t	Rh, g/t	Cu %	Ni %	S %
Method	**FA-ICP**	**FA-ICP**	**(Actlabs)**	**4AD-AA**	**4AD-AA**	**ELTRA**
Hole 1A	0.77	0.72	0.031	0.23	0.17	1.97
Hole 1B	1.38	1.27	0.027	0.35	0.18	1.22
Hole 1C	5.53	5.13	0.101	1.28	0.42	3.89
Hole 2A	0.81	0.76	0.035	0.21	0.17	1.51
Hole 2B	5.1	5.48	0.402	1.51	1.04	8.53
Hole 2C	2.11	1.9	0.034	0.61	0.29	1.74
Hole 4A	0.67	0.6	0.020	0.16	0.15	0.81
Hole 4B	4.16	4.31	0.322	1.21	0.81	5.41
Hole 4C	5.92	5.31	0.031	1.27	0.42	2.86
HGZ-L	0.96	1.04	0.024	0.28	0.17	1.01
HGZ-H	1.89	2.29	0.110	0.65	0.33	3.01
Steepledge South	0.94	1.01	0.020	0.26	0.18	1.29

Towards the end of the test program, three additional variability composites representing the Escape deposit were generated using assay reject material. Figure 13-9 illustrates the location of these samples, with the head assays presented in Table 13-9.



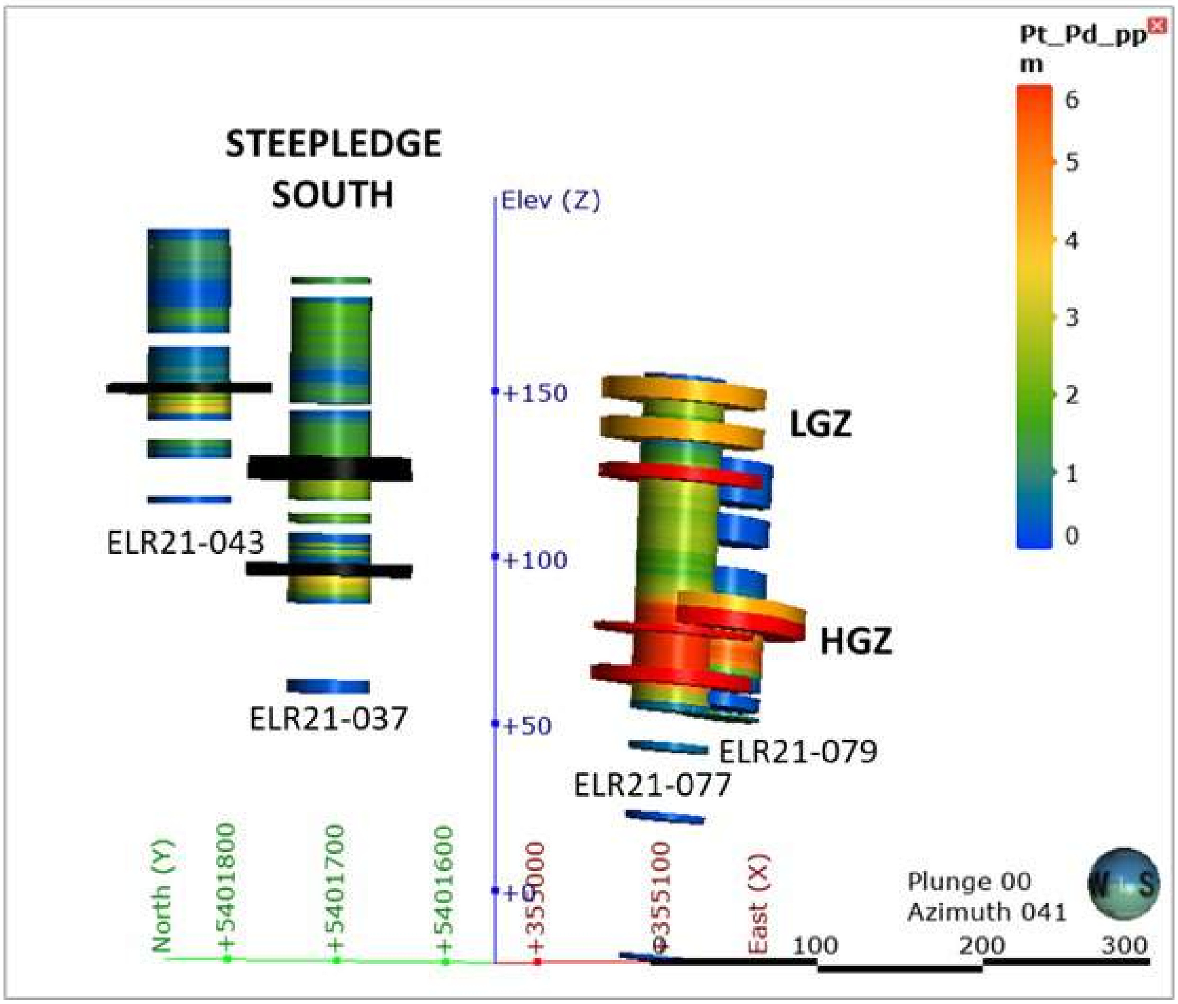


Figure 13-9: Hole locations and spatial distribution of the three Escape deposit variability samples

13.4.1.1 Mineralogy

For each of the variability composites, a head sample ground to a target P_{80} of 65 µm was submitted for bulk modals as well as sulphide association and liberation analysis. A summary of the results of the modal analysis for the variability composites is presented in Table 13-10 and indicates that, comparable to the Phase 1 composites, the main components of the gangue mineralization consist of serpentine and amphibole. The Escape domain composites contain a higher ratio of serpentine to amphibole compared to the Current domain.

Table 13-10: Modal Analysis for the Current Deposit Variability Samples

Composite	1A	1B	1C	2A	2B	2C	4A	4B	4C	HGZ-H	HGZ-L	Stplg. South
Galena	n.d.	n.d.	0.01	n.d.	0	n.d.	n.d.	n.d.	0	n.d.	n.d.	n.d.
Sphalerite	0	0.01	0.01	n.d.	0	0.01	0	0.01	0.01	0.01	0.01	0.01
Chalcopyrite	0.24	0.35	1.44	0.2	1.51	0.74	0.59	4.08	3.75	1.84	0.78	0.64
Fe Sulphide	3.06	1.72	4.64	1.86	5.02	1.73	0.69	3.54	1.38	1.75	0.48	0.84
Pyrrhotite	0.01	0.01	0.76	0.44	10.25	0.75	0.19	3.84	1.11	5.05	1.44	2.19
Millerite	0.25	0.23	0.11	0.09	n.d.	n.d.	0	n.d.	n.d.	n.d.	n.d.	n.d.
NiS low Fe	0.02	0.04	0.6	0.22	1.89	0.38	0.28	1.35	0.62	0.55	0.23	0.25
Pentlandite	0	0	0.03	0.06	0.74	0.08	0.02	0.3	0.14	0.20	0.07	0.15
Barite	n.d.	0	0	0.01	0	0.01	0	n.d.	0.01	n.d.	n.d.	n.d.
Fe Oxi/Hydroxi	2.43	2.78	3.11	1.33	2.14	2.02	1.72	4.33	2.74	2.44	2.84	2.11
Hematite low Cr	0.51	0.49	0.6	0.94	1	1.69	1	0.8	1.37	1.15	0.40	0.91
Ilmenite	1.75	2.05	2.16	1.82	1.04	1.51	2.12	1.36	1.45	0.78	0.91	0.57
Titanite	0.15	0.05	0.02	0.02	0	0.01	0.05	0	0	0.00	0.00	0.00
Quartz	0.14	0.14	0.15	0.14	0.13	0.17	0.12	0.14	0.15	0.16	0.11	0.14
Feldspar	0.94	4.1	8.69	3.44	5.28	9.35	6.27	5.96	8.45	4.37	4.46	5.56
Amphibole	16.5	15.3	13.1	12.8	11.2	10.2	15.3	13.2	9.45	9.93	8.89	9.45
Epidote	0.22	0.06	0.05	0.03	0.02	0.04	0.05	0.02	0.03	0.15	0.26	0.15
Allanite	0.01	0	0	n.d.	n.d.	0	0	0	0	0.00	0.01	0.00
Zircon	0.01	0	0.01	0	n.d.	0.02	n.d.	n.d.	0	0	0	0
Phlogop./Biotite	2.31	3.78	5.26	3.02	1.04	3.5	2.4	2.02	3.59	1.94	1.73	2.39
Muscovite	0.28	1.02	0.28	0.79	0.42	0.26	0.44	0.11	0.09	0.15	0.19	0.16
Chlorite	11.0	10.3	10.5	10.2	7.27	10.5	9.97	7.53	8.89	3.51	3.62	4.29
Si-Al Clays	0.47	0.88	1.72	0.87	1.07	1.5	1.04	1.17	1.35	0.26	0.30	0.41
Serpentine	57.0	54.3	43.4	58.0	43.9	51.7	54.9	45.1	51.2	61.4	69.5	64.8
Talc	0.24	0.13	0.04	0.08	0.01	0.02	0.2	0.07	0.05	0.01	0.00	0.02
Sillimanite	0.01	0.01	0.01	0.01	0.02	0.01	0	0.01	0.01	0.02	0.02	0.03
Apatite	0.3	0.37	0.3	0.24	0.16	0.3	0.27	0.21	0.21	0.18	0.20	0.24
Monazite	n.d.	n.d.	n.d.	0	0	0	0	0	n.d.	0.00	0.00	0.00
Calcite	0.34	0.16	0.2	1.79	0.85	0.84	0.63	0.42	0.31	0.44	0.22	0.71
Dolomite	1.27	1.32	1.47	0.77	1.53	1.79	0.99	1.58	2.15	1.31	1.28	1.60
Ankerite	0	0	0	0.02	0.03	0.02	0.01	0.01	0	0.01	0.01	0.02

Figure 13-10 provides a comparison of sulphide mineral distributions between composites. For the Current deposit, high nickel grades in composites 2B and 4B are accompanied by higher ratios of pyrrhotite to pyrite. Composites 1A and 1B contain nickel primarily as millerite, in contrast to the other composites with more pentlandite or low iron nickel sulphide. Copper is present almost exclusively as chalcopyrite in all composites. The Escape deposit composites are comparable in terms of copper and nickel grade to the Current deposit composites but have a higher ratio of pyrrhotite to pyrite.

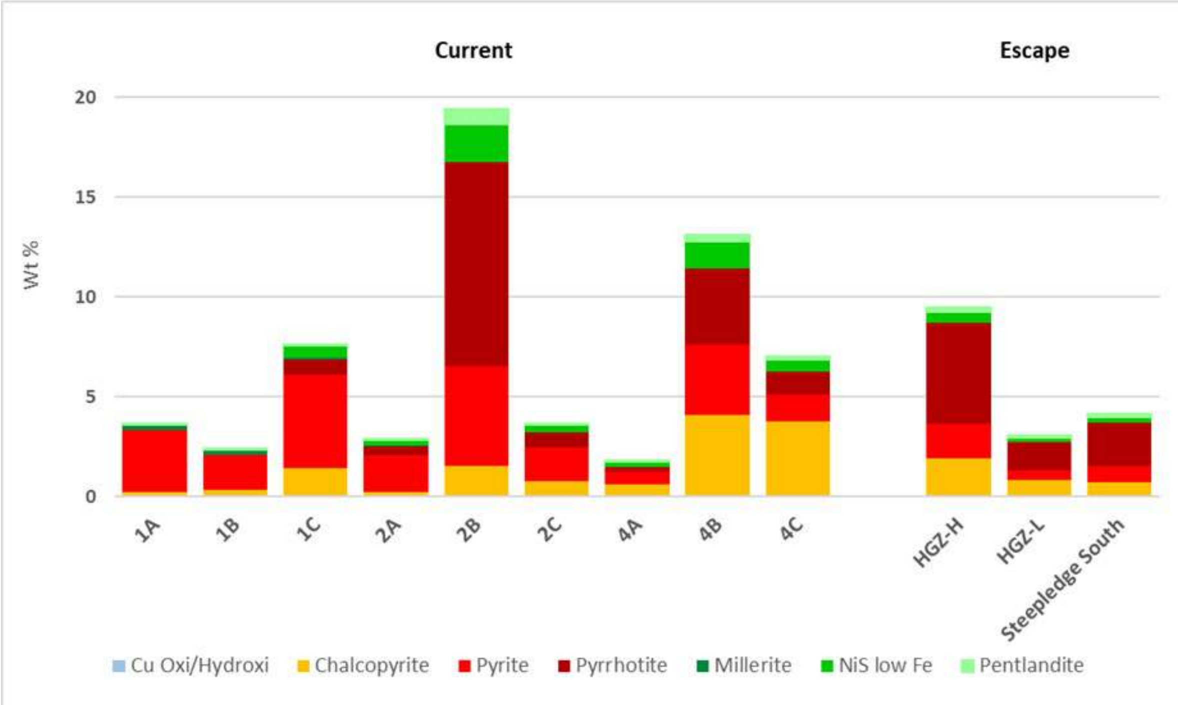


Figure 13-10: Distribution of sulphide minerals in the variability composites

Similar to the results in Phase 1, liberation analysis of the Current deposit composites indicated good liberation of chalcopyrite, whereas the Escape deposit samples indicated moderate liberation of chalcopyrite at the grind size tested. For both deposits poor liberation of the nickel sulphides was observed.

13.4.1.2 Grindability

A single grindability composite was prepared from evenly distributed intervals of the three Current deposit drill holes. Based on the drill hole data, the composite graded 0.88 g/t Pt, 0.85 g/t Pd, 0.22% Cu, 0.17% Ni, and 1.31% S. The composite was submitted for analysis for SMC, BBWi, and Ai testing. Grindability results are presented in Table 13-11 and indicate that the material can be classified as hard and is comparable to the earlier testwork on samples from this deposit summarized in Table 13-11.

Table 13-11: Test Results for the Phase 2 Grindability Comp

Sample	SMC			DWi	BBWi	Ai
	Axb	ta	sg	kWh/t	kWh/t	g
Grindability Comp	38.5	0.34	2.93	7.59	19.5	--

13.4.2 Metallurgical Testwork

The initial series of tests on samples from the Current deposit was composed of baseline testing of each composite using the sequential Cu/Ni flotation flowsheet developed in the Phase 1 program. The test procedure consisted of batch ball mill grinding to a P_{80} of 65 µm with lime and TETA added to the mill. Sequential flotation of copper and nickel concentrates using collectors 3418A and NP12 and the flotation procedure illustrated in Figure 13-3, except that only one stage of copper cleaning was included. CMC was added in the rougher and cleaner circuits to control gangue, in particular magnesium (Mg), in the final concentrate.

Figure 13-11 illustrates the open-circuit grade recovery curves for copper and nickel in their respective circuits. While both graphs indicate variability in the flotation response between samples, this is largely a function of the wide range in head grades, with those composites with comparable grade to the Phase 1 Var1 composite demonstrating very similar metallurgical response. Copper rougher recovery exceeded 80% for all composites with good upgrading to the first cleaner for all except for the two composites with the lowest head grade. (Note that only one stage of copper cleaning was included in the Cu/Ni flowsheet in Phase 2, as the potential for achieving a >25% Cu grade had been clearly demonstrated in earlier testwork.)

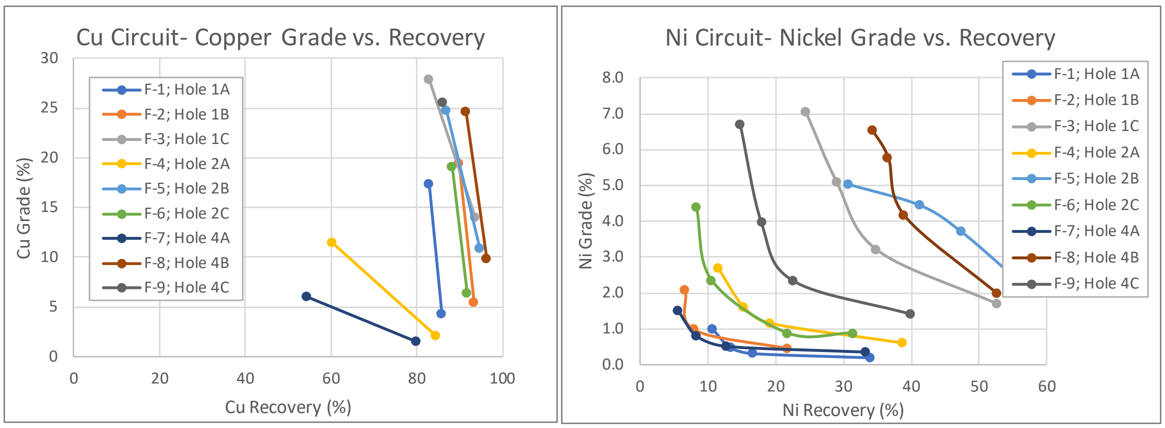


Figure 13-11: Cu and Ni Grade/Recovery curves for the variability composites

Nickel circuit results revealed the same moderate recoveries to rougher concentrate followed by high losses in the first cleaner that were observed in Phase 1. Improved performance was achieved in composites with elevated nickel head grades (2B, 4B, 4C), suggesting that the background level of non-sulphide nickel is relatively constant and therefore less of an influence at higher grades.

13.4.2.1 Cu/Bulk Flowsheet

To improve overall PGE recovery a Cu/Bulk flowsheet was proposed that would change the conditions in the nickel circuit to produce a bulk sulphide concentrate. The additional pyrite and pyrrhotite recovery was expected to increase the recovery of platinum and palladium, and to a lesser extent, nickel as well.

The selective flotation collector NP12 was replaced with SIPX and the regrind of the rougher concentrate was discontinued along with the addition of DETA to depress pyrrhotite. An initial series of tests was run on four blended composites consisting of equal mass of two selected variability composites. The copper and bulk concentrate open-circuit final concentrate grades and recoveries are provided in Table 13-12.

Table 13-12: Open-Circuit Concentrate Grades and Recoveries for the Cu/Bulk Flowsheet

Test #	Comp	Product	Grade					Distribution				
			Pt (g/t)	Pd (g/t)	Cu (%)	Ni (%)	S (%)	Pt (%)	Pd (%)	Cu (%)	Ni (%)	S (%)
F-11	1A	Cu Cln 2 Conc	13.0	44.4	25.6	1.7	30.6	12.7	43.9	81.5	8.6	12.4
		Bulk Cln 3 Conc	14.4	8.9	0.68	1.4	44.4	64.4	40.4	10.0	31.8	82.4
		Calculated Head	*0.79*	*0.78*	*0.24*	*0.15*	*1.9*	*100*	*100*	*100*	*100*	*100*
F-12	1A:2A	Cu Cln 2 Conc	11.3	30.6	25.1	1.6	31.1	9.0	24.6	71.6	6.1	11.5
		Bulk Cln 3 Conc	16.0	13.0	1.1	1.8	41.3	66.0	53.6	16.5	35.9	78.3
		Calculated Head	*0.77*	*0.77*	*0.22*	*0.16*	*1.67*	*100*	*100*	*100*	*100*	*100*
F-13	1B:2C	Cu Cln 2 Conc	24.8	35.9	27.0	1.4	32.6	21.2	31.5	87.5	8.8	34.6
		Bulk Cln 3 Conc	40.7	36.7	1.1	4.5	31.4	49.0	45.3	5.0	41.4	47.1
		Calculated Head	*1.7*	*1.6*	*0.44*	*0.22*	*1.4*	*100*	*100*	*100*	*100*	*100*
F-14	1C:4C	Cu Cln 2 Conc	12.1	18.1	31.1	0.5	33.3	6.1	10.1	79.8	4.0	29.9
		Bulk Cln 3 Conc	77.9	69.7	3.4	4.3	31.8	65.9	65.7	14.7	59.8	47.9
		Calculated Head	*6.1*	*5.5*	*1.2*	*0.38*	*3.4*	*100*	*100*	*100*	*100*	*100*
F-15	2B:4B	Cu Cln 2 Conc	19.0	25.0	25.2	2.4	32.8	19.3	24.0	94.4	14.5	22.4
		Bulk Cln 3 Conc	22.3	24.4	0.30	4.1	33.2	62.3	64.7	3.1	66.9	62.4
		Calculated Head	*4.8*	*5.0*	*1.3*	*0.81*	*7.1*	*100*	*100*	*100*	*100*	*100*

The Cu/Bulk flowsheet was demonstrated to offer improved overall metal recoveries, particularly for platinum and palladium. In addition, the elimination of the regrind improved the 1st cleaner stage recovery possibly through reduced sliming. Subsequent tests looked at increased collector addition and higher mass pull in the nickel circuit to improve metal recovery, with only minimal loss in grade.

A series of six tests were then completed on selected variability composites to confirm the flowsheet. Figure 13-12 presents the grade/recovery curves for palladium and platinum in the bulk circuit. The steepness of the curves indicates good stage recoveries in open-circuit testing and that the concentrates upgraded well with rejection of the non-sulphide gangue minerals. (Note that the calculated recoveries are for the bulk circuit only, and the overall recovery would also include metal recovered in the copper circuit.)

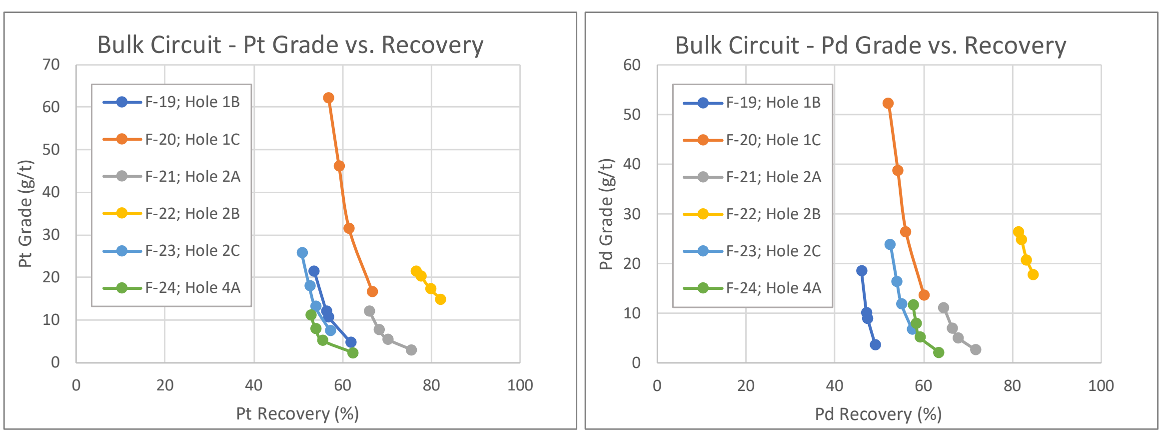


Figure 13-12: Pd and Pt Grade/Recovery curves for the bulk circuit of the Cu/Bulk flotation tests

13.4.2.2 Bulk Circuit Only Flowsheet

The option of producing a single, bulk concentrate containing all of the sulphide minerals, including those reporting to the copper concentrate, was also considered. Six cleaner flotation tests were completed on variability composites. Figure 13-13 presents the grade/recovery curves for platinum and palladium for these tests and illustrates the overall recoveries of PGE to a flotation concentrate.

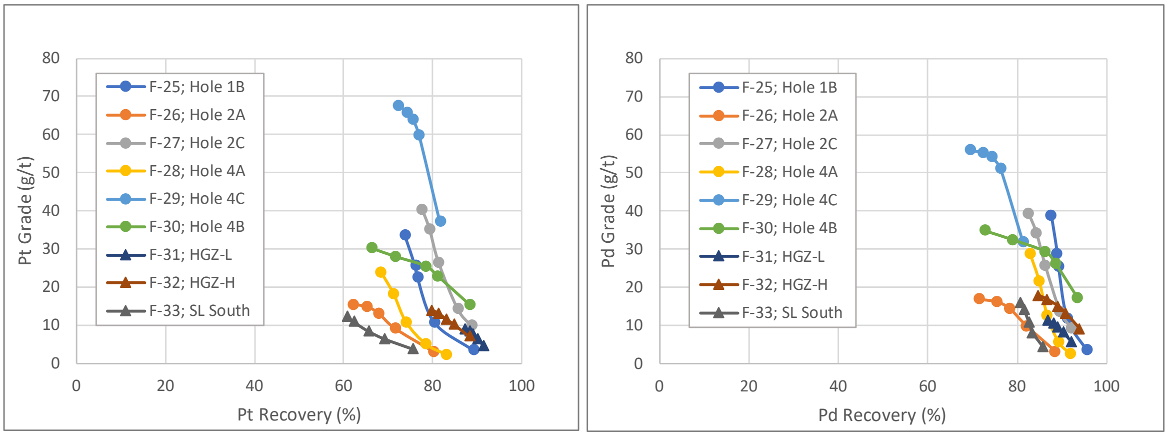


Figure 13-13: Pt/Pd Grade/Recovery curves for the Bulk Only flowsheet option

The work on the bulk only flowsheet also included three tests on composite samples from the Escape deposit. Because these composites were generated from assay reject material rather than fresh core, it was expected that they would show signs of oxidation and yield poor separation performance in a split concentrate flowsheet. The bulk only flowsheet tests were conducted to demonstrate the amenability of the Escape deposit samples to flotation, i.e., the association of pay metals with sulphide minerals. The Escape deposit composites HGZ-L, HGZ-H, and Steepledge South were found to demonstrate comparable metal recoveries to the Current deposit composites.

The bulk only flowsheet produced good recoveries for all metals and offers a simpler process leading to lower expected capital and operating costs. However, the reduced grades of copper and nickel in the combined concentrate was found to negatively impact the overall payable and no further tests on the bulk only flowsheet were conducted.

13.5 Metallurgical Projection

Metallurgical recoveries of metal values to final concentrate were estimated based on the open-circuit flotation testwork results for each of the Current deposit variability composites. The results were plotted against the head grade for the corresponding composite and trendlines were generated for both the copper and bulk circuits of the Cu/Bulk flowsheet. Figure 13-14 presents the results of this analysis for platinum and palladium.

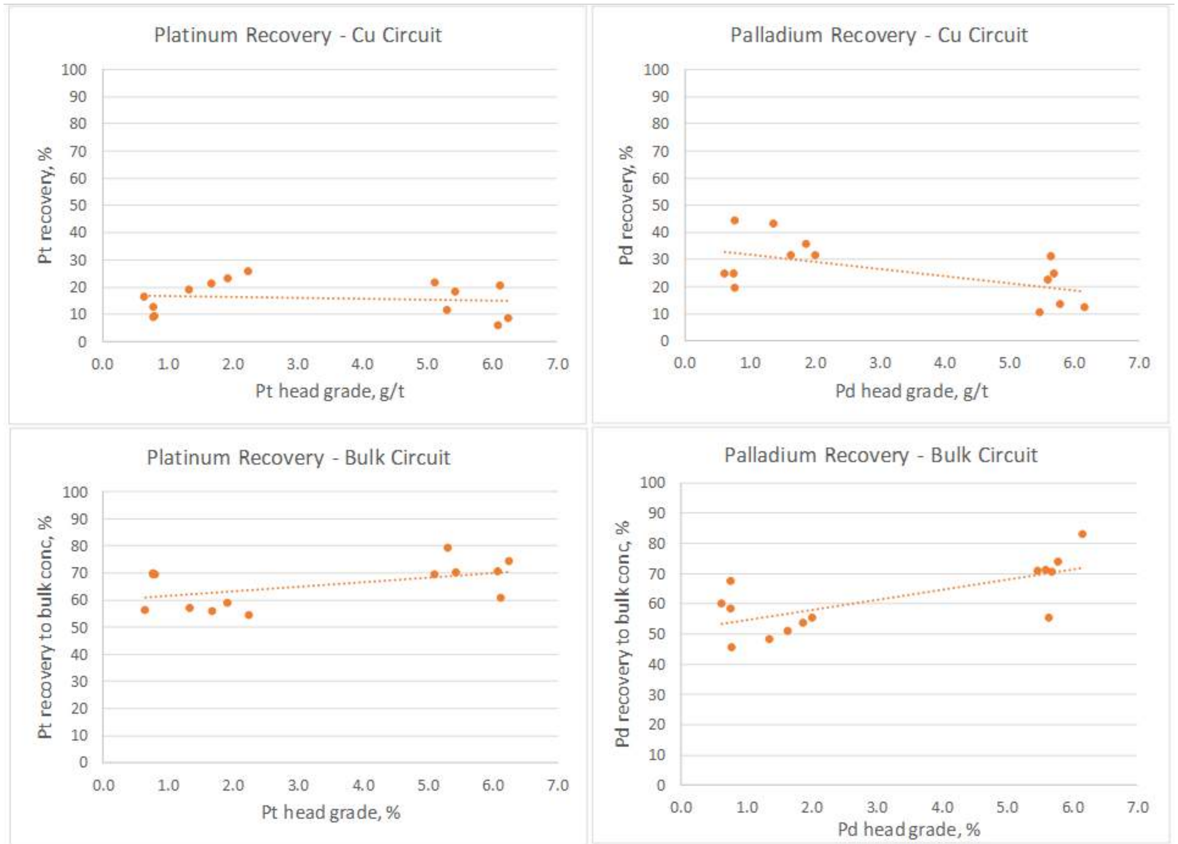


Figure 13-14: Head grade vs. recovery to concentrate relationships for Pt and Pd in the copper and bulk circuits.

Similar curves were prepared for copper, nickel, gold, silver, cobalt, and rhodium. The recovery relationships were used to provide an estimate of metal recovery for the resource model. Table 13-13 provides a summary of the estimated copper and bulk concentrate grade and recovery using the average LOM mill feed grade.

Table 13-13: Projected Grade and Recovery to Final Concentrate

Estimated Grade	**Mass**	**Pt**	**Pd**	**Cu**	**Ni**	**Au**	**Ag**	**Rh**	**Co**
	%	**g/t**	**g/t**	**%**	**%**	**g/t**	**g/t**	**g/t**	**%**
Average Mill Feed	100	1.59	1.56	0.41	0.21	0.097	2.2	0.041	0.015
Cu Concentrate	1.47	17.4	34.6	23.3	0.9	3.3	58	0.3	0.07
Bulk Concentrate	3.25	32.2	25.9	1.6	2.9	0.9	18	0.3	0.21
Estimated Mill Recovery	**Mass**	**Pt**	**Pd**	**Cu**	**Ni**	**Au**	**Ag**	**Rh**	**Co**
	%	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Cu Concentrate	1.47	16.1	32.5	83.1	6.3	50.0	40.0	10.0	6.5
Bulk Concentrate	3.25	65.9	54.0	12.4	45.6	30.0	27.6	27.2	44.6
Combined Recovery	*4.72*	*82.0*	*86.5*	*95.5*	*51.9*	*80.0*	*67.6*	*37.2*	*51.1*

Rhodium assays were conducted on selected flotation tests to evaluate potential concentrate grades and recoveries. Concentrate grades up to 2 ppm Rh were measured but are strongly dependent on the rhodium and sulphur head grades. For the average mill feed grade, rhodium grade in the final concentrates is not expected to exceed 0.5 ppm.

13.5.1 Deleterious Elements

Analysis for minor elements was conducted by ICP on the concentrates from two tests from the Blue Coast Phase 2 test program using the Cu/Bulk flowsheet. Results of the analysis are summarized in Table 13-14. Slightly elevated levels of Mg are observed in both concentrate streams, which is typical of Current deposit samples where head samples range from as 9.5-15.0% Mg. The testwork here has demonstrated that Mg in the final products can be controlled through adjustments to the cleaner flotation conditions including the addition of CMC. Future testwork is expected to include fine tuning of depressant addition to ensure that penalty levels of Mg in the final concentrate are avoided.

Table 13-14: Minor Element Assays for Cu/Bulk Flotation Concentrates

Element	Units	Test F12, Comp 1A:2A		Test F20, Comp 1C	
		Cu Clnr Conc	Bulk Clnr Conc	Cu Clnr Conc	Bulk Clnr Conc
Al	%	0.37	0.72	0.23	0.27
As	ppm	56.7	51.7	3.69	193
Ba	ppm	8.25	39.1	17.5	16.1
Ca	%	0.31	0.50	0.22	0.44
Cd	ppm	7.8	5.6	17.6	0.79
Cr	ppm	86.8	356	132	144
Fe	%	29.0	31.9	25.4	36.9
Ga	ppm	30.2	99.8	46.8	34.4
Hg	ppm	<3	<3	<3	<3
In	ppm	<20	<20	<20	<20
K	%	0.039	0.076	0.039	0.045
Li	ppm	7.41	13.7	4.07	11.31
Mg	%	2.1	3.9	1.5	2.4
Mn	ppm	178	426	174	380
Mo	ppm	<1	<1	<1	<1
Na	%	0.027	0.128	0.069	0.039
P	%	<0.002	<0.002	<0.002	<0.002
Pb	ppm	105	187	209	69
Rb	ppm	<20	<20	<20	<20
Re	ppm	<20	<20	<20	<20
Sb	ppm	14.5	18.2	31.3	8.9
Se	ppm	51.4	102.9	118.3	36.8
Sr	ppm	20.6	47.5	19.3	34.5
Ta	ppm	16.4	22.0	18.1	20.6
Te	ppm	93.4	53.3	45.5	38.9
Ti	%	0.07	0.22	0.11	0.21
Tl	ppm	11.8	11.2	6.0	10.2
V	ppm	31.2	61.5	28.7	73.8
Zn	ppm	1154	677	853	461
Zr	ppm	26.7	46.6	27.3	56.5

14. MINERAL RESOURCE ESTIMATE

14.1 Drill Hole Database

The work on the 2021 Mineral Resource Estimate included a detailed geological and structural re-examination of the Current and Escape deposits.

The Current deposit Mineral Resource Estimate benefits from approximately 171,465 m of diamond drilling in 767 drill holes spanning from 2006 until 2021. The Escape deposit Mineral Resource Estimate benefits from approximately 40,855 m of diamond drilling in 129 drill holes spanning from 2008 until 2020 (Figure 14-1).

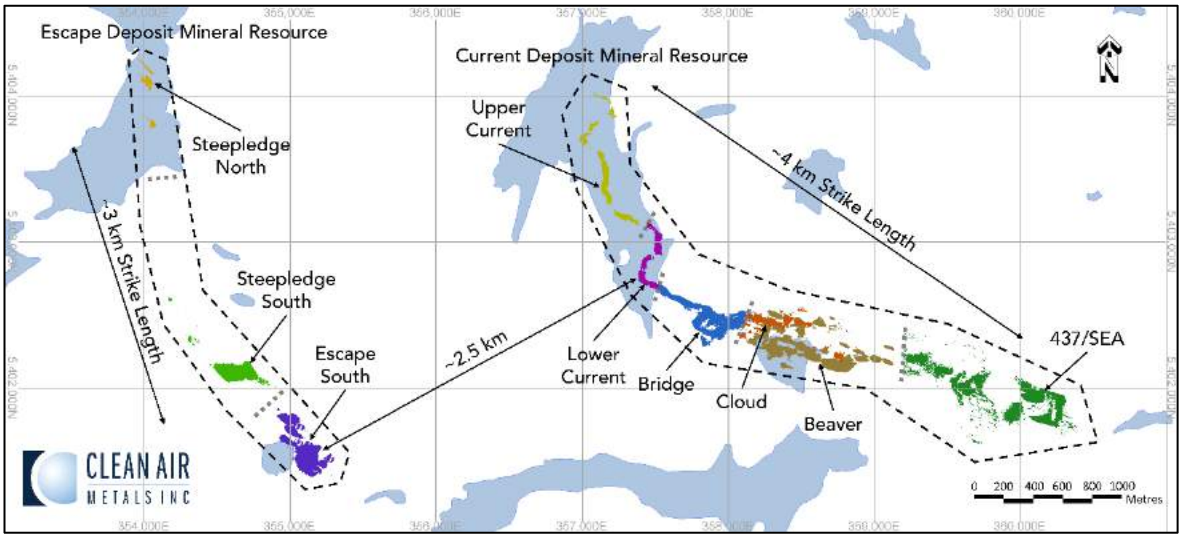


Figure 14-1: Plan view of Escape and Current deposits

Several assay suites were performed on different samples, including ME-XRF-06, ME-ICP06, and 6PGE (NSF01). All assays included in the Mineral Resource Estimate have been reviewed and validated based upon available information. Where sample intervals have been assayed multiple times with different methods, results have been vetted, and clarified through averaging when necessary. Drill hole counts are summarized in Table 14-1.

Table 14-1: Drill Hole Count Summary

Deposit	Total Drill Hole Count	Total Meterage (m)
Current Deposit	767	171,465
Escape Deposit	129	40,855

Table 14-2 summarizes the number of assays used within the Mineral Resource Estimate.

Table 14-2: Mineral Resource Estimate Number of Assays by Deposit

Element	Current Deposit Assays	Escape Deposit Assays
Pd	36,607	14,217
Pt	36,607	14,217
Au	36,607	14,216
Ag	35,707	13,611
Cu	36,607	12,913
Ni	36,607	13,710
Rh	2,523	1,042
Co	36,579	13,715

14.2 Domaining

14.2.1 Geological Domaining

Geological domains were developed within each of the deposit locations. The domains are dependent upon geographical, lithological, and mineralogical characteristics along with incorporating both regional and local structural information. Local Fault zones were created and/or extrapolated from surface mapping and core axis intervals within the drill core (Figure 14-2 and Table 14-3).

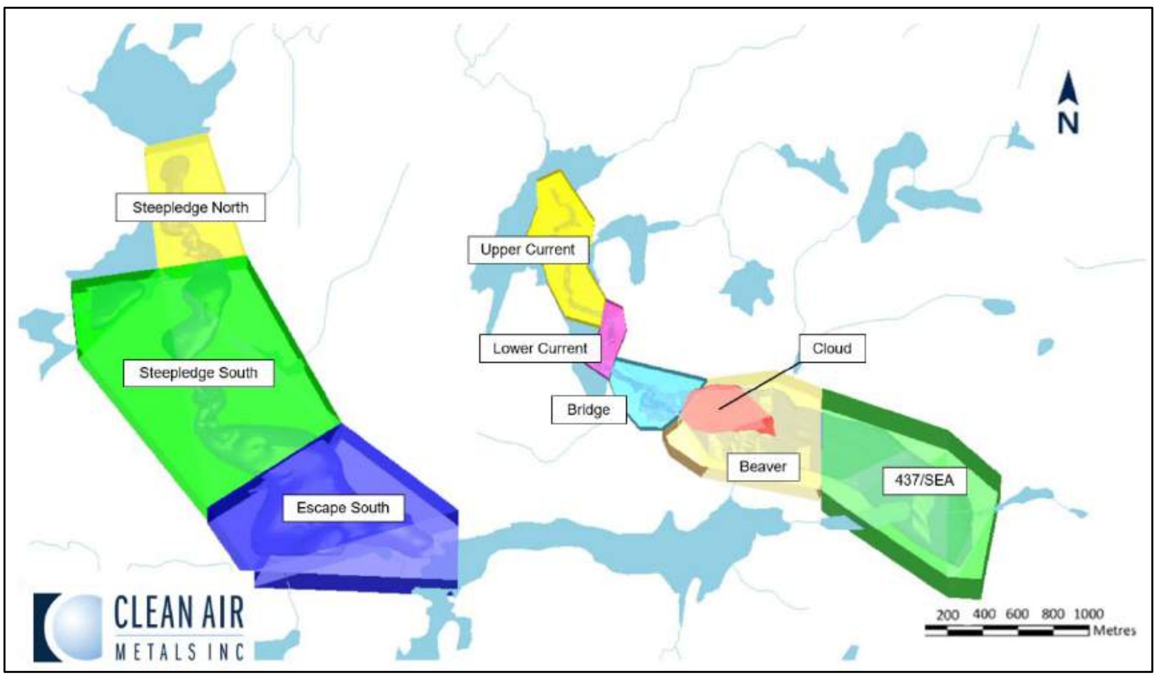


Figure 14-2: Geological domains

Table 14-3: Current Deposit and Escape Deposit Geological Domains

Current Deposit	Escape Deposit
Upper Current	Steepledge North
Lower Current	Steepledge South
Bridge	Escape South
Beaver	
Cloud	
437/SE Anomaly	

The conduit is relatively younger in geological time when compared to its host rocks and therefore most of the local and regional faults do not penetrate the magmatic conduit nor the deposits. Lithology wireframes (sediment, granite, gabbro, ultramafic peridotites, and "hybrids" from the combination of surface mapping and underground drilling) were created for the rocks that host or surround the deposits (Figure 14-3, Figure 14-4, Figure 14-5 and Figure 14-6).

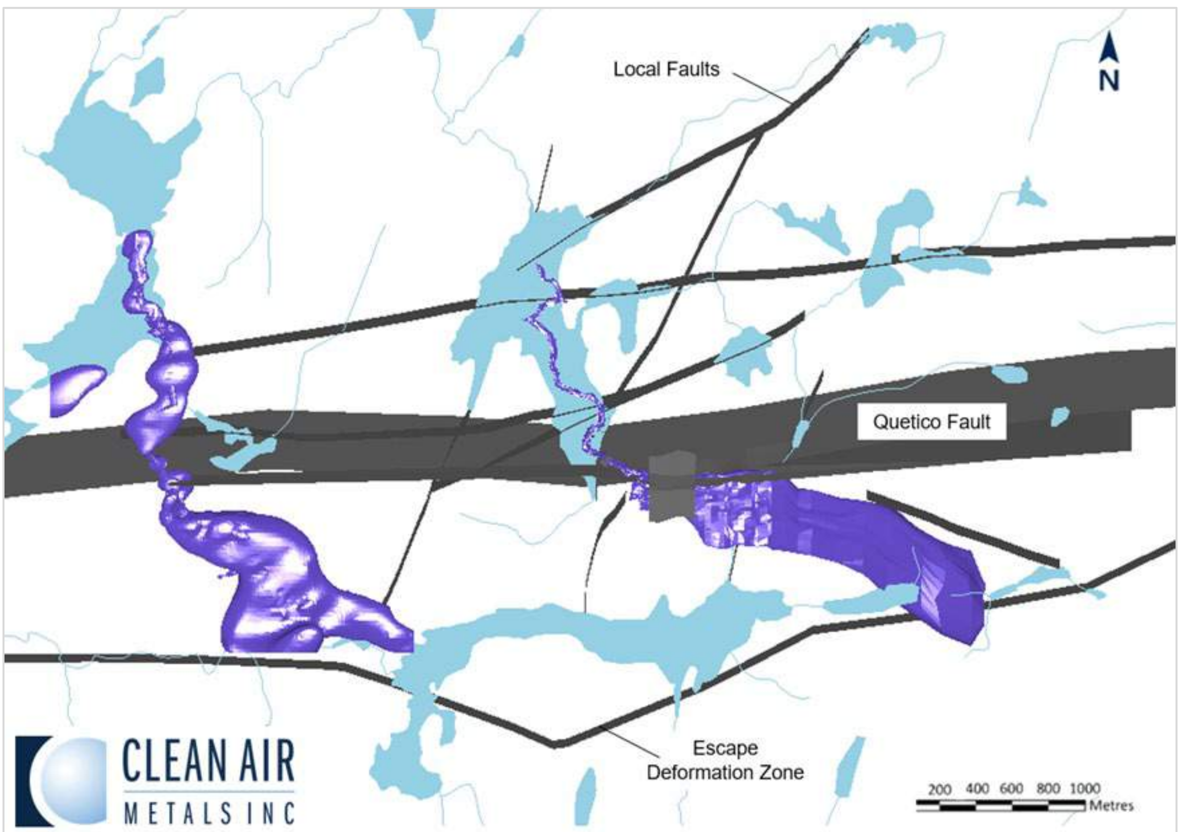


Figure 14-3: Structural details

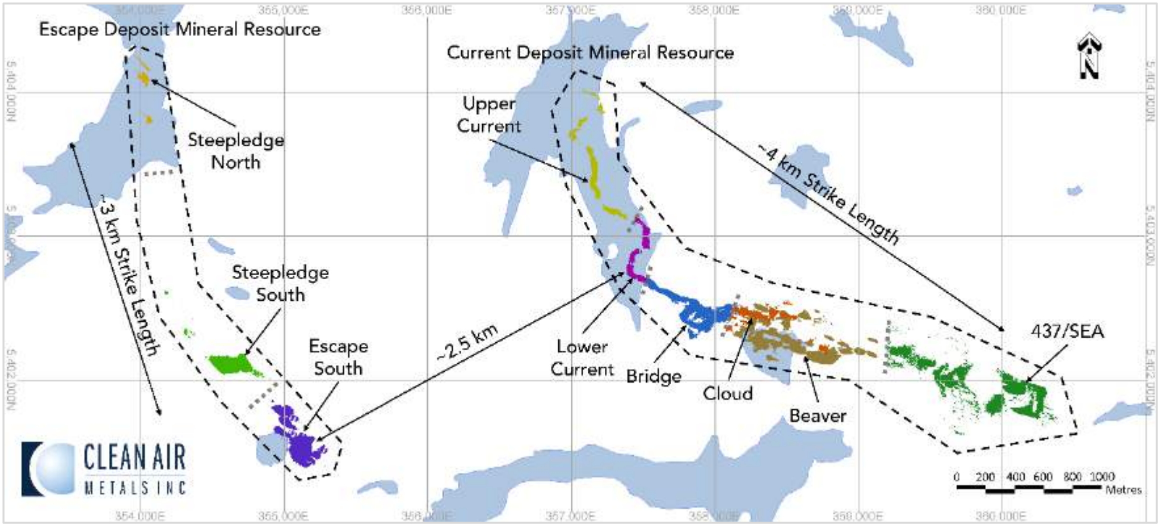


Figure 14-4: Plan view showing the Current deposit and Escape deposit including geological domains

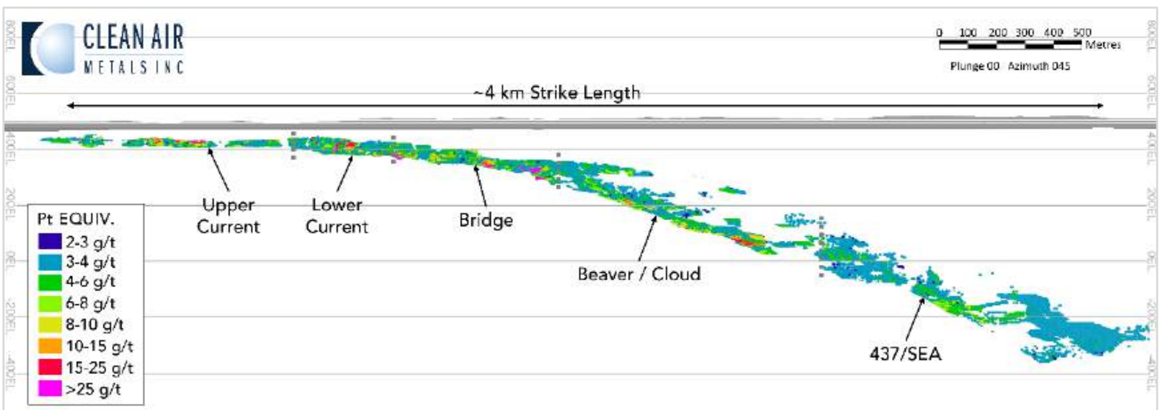


Figure 14-5: Current deposit long section showing geological domains and Pt Eq grade distribution

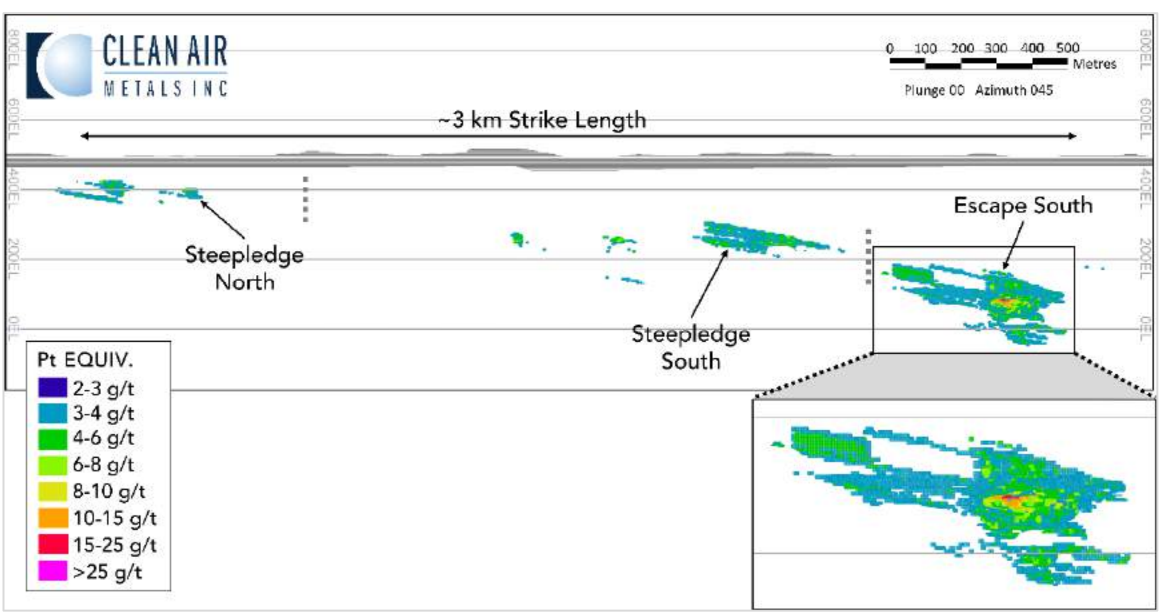


Figure 14-6: Escape deposit long section showing geological domains and Pt Eq grade distribution

14.2.2 Grade Domaining

Mineralization within the Current deposit and Escape deposit are hosted within magmatic conduits comprised of melanocratic gabbro and ultramafic peridotites. Mineralization is strongly associated with sulphide abundance with the exception of the Cloud Zone within the Current deposit.

Nordmin initially examined and modelled the grade distributions for each of the elements. Grade distributions were created for Pd, Pt, Au, Ag, Cu, Ni, Co, and Rh. The analysis confirmed that the changes in mineralization and corresponding grade within the various conduits appear to be caused by preferential magma/fluid mixing. The higher-grade mineralization is largely settled near the lower portions of the conduits due to the high sulphide content associated with the different metals. The settling created a scenario in which the high grade mineralization is “pod”-like in nature and relatively equally spaced along the lower contact of each conduit. The material between the higher-grade pods is mineralized but with lower grades. Therefore, the higher-grade pods are connected within a lower grade matrix. As such, Nordmin created wireframe grade shells for each of the eight commodities to reflect the lithological and geochemical differences, along with sulphide abundance for the purpose of grade concentration and isolation of composites.

Mineralization wireframes were initially created on 10 m to 20 m sections and plans and adjusted between various views to edit and smooth each wireframe where required. The wireframes were permitted to follow lithological boundaries and trends where applicable. When not cutoff by drilling, the wireframes terminate at the contact of the conduit; lack of drilling or a or significant change in grade distribution, whichever was most appropriate. No wireframe overlapping exists within a given grade domain, but wireframes were allowed to overlap across domains. The use of explicit modelling allows for mineralization in context with the deposit geology and associated geochemistry to be considered. It is Nordmin’s opinion that the explicit modelling approach minimizes risks compared to using implicit modelling for this style of mineralization.

Grade domain wireframes were modelled for eight grade elements, including Pt, Pd, Au, Ag, Cu, Ni, Co, and Rh. Each domain is based upon a grade bin using a combination of Background Grade (BG), LG, Medium Grade (MG), and HG. BGs were isolated through applying the overall conduit wireframe.

The criteria used to create each of the grade domains is as follows:

Current Deposit

1. Pt/Pd: Pt and Pt grades were summed, and the resulting total used to model grade domains for both Pt and Pd with the following criteria: BG Pt+Pt < 2.0 g/t, LG Pt+Pt 2.0 to 6.0 g/t, MG Pt+Pd 6.0 to 12.0 g/t, HG Pt+Pd > 12.0 g/t
2. Au: BG Au < 0.25 g/t, HG Au > 0.25 g/t
3. Ag: BG Ag < 5.0 g/t, HG Ag > 5.0 g/t
4. Cu: BG: < 1% Cu, LG 1 to 2% Cu, MG 2 to 4% Cu, HG > 4% Cu
5. Ni BG < 0.25% Ni, LG 0.25 to 0.5% Ni, MG 0.5 to 1% Ni, HG > 1% Ni
6. Co: BG Co < 250 g/t, LG Co 250 to 500 g/t, HG Co > 500 g/t
7. Rh: BG Rh < 0.25 g/t, LG Rh 0.25 to 0.5 g/t, MG Rh 0.5 to 1.0 g/t, HG Rh > 1.0 g/t

Escape Deposit

1. Pt/Pd: Pt and Pt grades were summed and modelled together with the following criteria: BG Pt+Pt < 2.0 g/t, LG Pt+Pt 2.0 to 6.0 g/t, MG Pt+Pd 6.0 to 12.0 g/t, HG Pt+Pd > 12.0 g/t
2. Au: BG Au < 0.25 g/t, HG Au > 0.25 g/t
3. Ag: BG Ag < 2.5 g/t, LG Ag 2.5 to 5 g/t, HG Ag > 5 g/t

4. Cu: BG: < 1% Cu, LG 1 to 2% Cu, HG > 2% Cu
5. Ni BG < 0.25% Ni, LG 0.25 to 0.5% Ni, MG 0.5 to 1% Ni, HG > 1% Ni
6. Co: BG Co < 250 g/t, LG Co 250 to 500 g/t, HG Co > 500 g/t
7. Rh: BG Rh < 0.25 g/t, LG Rh 0.25 to 0.5 g/t, MG Rh 0.5 to 1.0 g/t, HG Rh > 1.0 g/t

Figure 14-7 displays all Pt/Pd mineral wireframes in both the Current and Escape deposits.

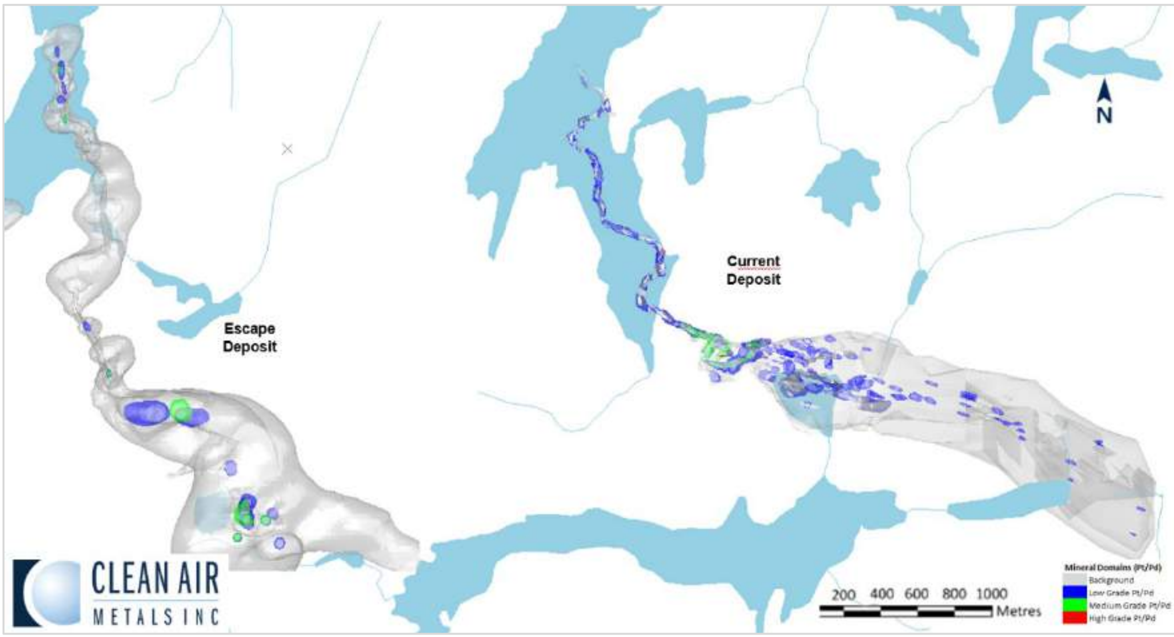


Figure 14-7: Plan view of the mineralogical domains for Escape deposit and Current deposit

Figure 14-8 and Figure 14-9 display the Current deposit Pt/Pd wireframes, and Figure 14-10 displays the Escape deposit Pt/Pd wireframes.

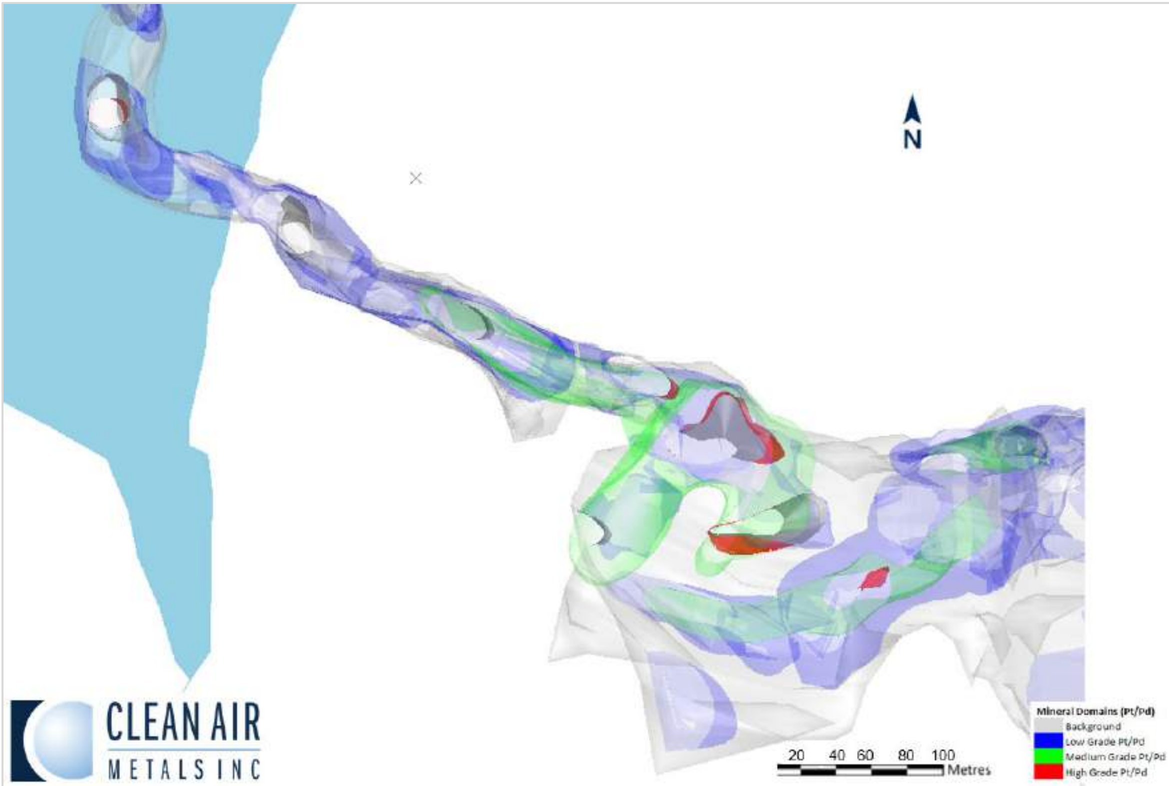


Figure 14-8: Plan view of the mineralogical domains for Current deposit

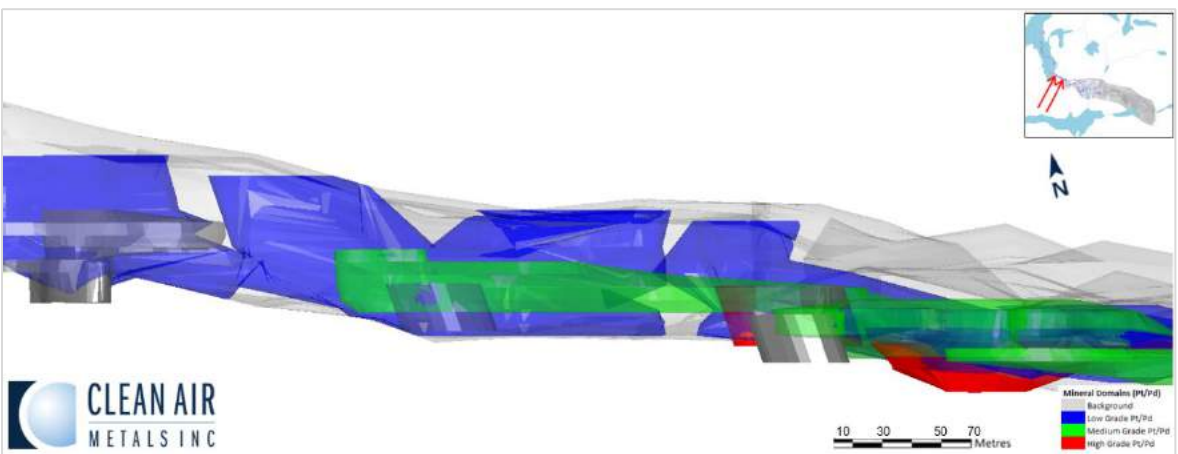


Figure 14-9: Long Section View of the mineralogical domains for Current deposit

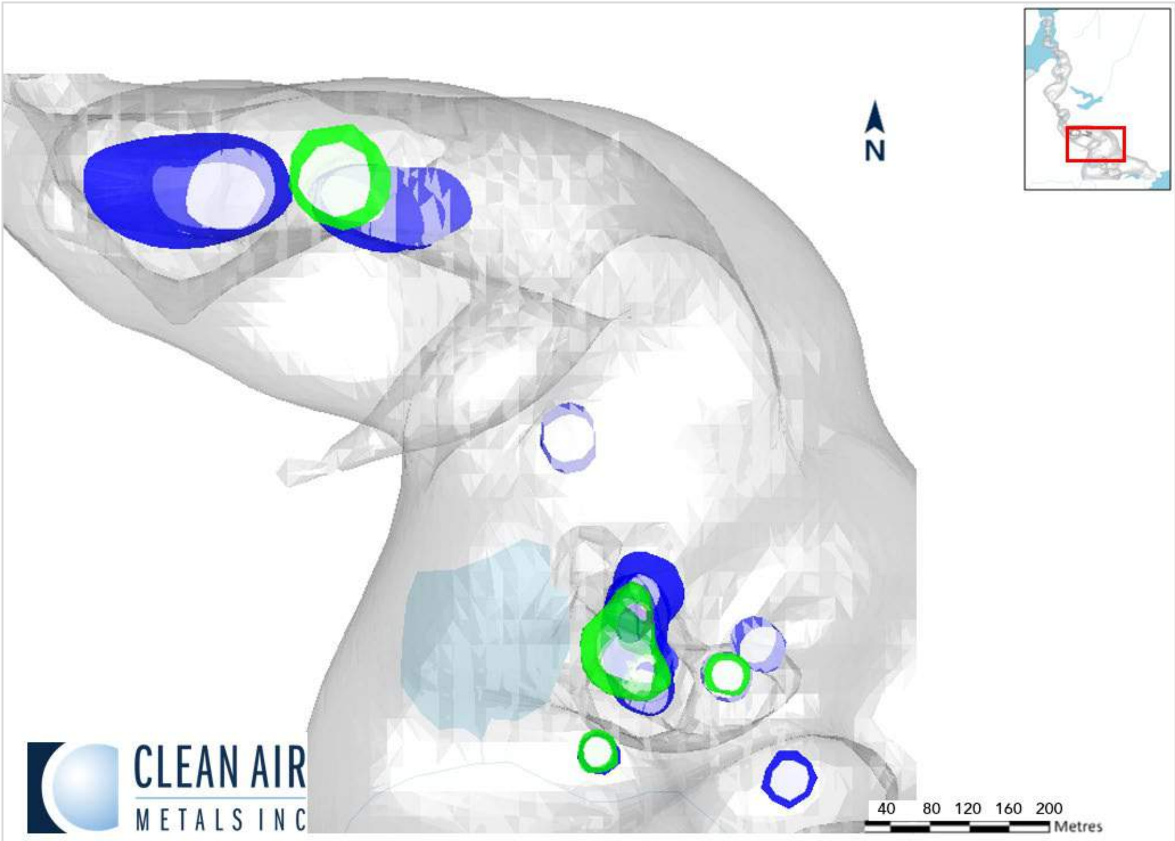


Figure 14-10: Plan view of the mineralogical domains for Escape deposit

14.3 Exploratory Data Analysis

The exploratory data analysis was conducted on raw drill hole data to determine the nature of the element distribution, correlation of grades within individual rock units, and the identification of high grade outlier samples. Nordmin used a combination of descriptive statistics, histograms, probability plots, and XY scatter plots to analyze the grade population data. The findings of the exploratory data analysis were used to help define modelling procedures and parameters used in the Mineral Resource Estimate.

Descriptive statistics were used to analyze the grade distribution of each sample population, determine the presence of outliers, and identify correlations between grade and rock types for each mineral zone. Table 14-4 demonstrates the drill hole sample data by grade domain for Current and Escape deposits.

Table 14-4: Current Deposit and Escape Deposit Assay Counts by Grade Domain

Domain		Current Deposit Assay Count	Escape Deposit Assay Count
Pt/Pd	BG	23,789	5,905
	LG	6,106	1,036
	MG	1,113	353
	HG	397	47
Au	BG	30,848	10,015
	HG	560	300
Ag	BG	27,604	3,859
	MG	n/a	662
	HG	3,443	849
Cu	BG	27,505	6,641
	LG	1,885	446
	MG	597	n/a
	HG	143	38
Ni	BG	25,789	6,383
	LG	2,899	445
	MG	1,783	299
	HG	316	101
Co	BG	29,109	4,791
	LG	597	361
	HG	1,662	165
Rh	BG	1,343	752
	LG	705	232
	MG	45	57
	HG	9	n/a

Figure 14-11 and Figure 14-12 provide the data analysis for the Pd/Pt BG and LG domains of the Current deposit. Multiple inflections exist within the dataset for each domain indicating multiple phases of mineralization are present.

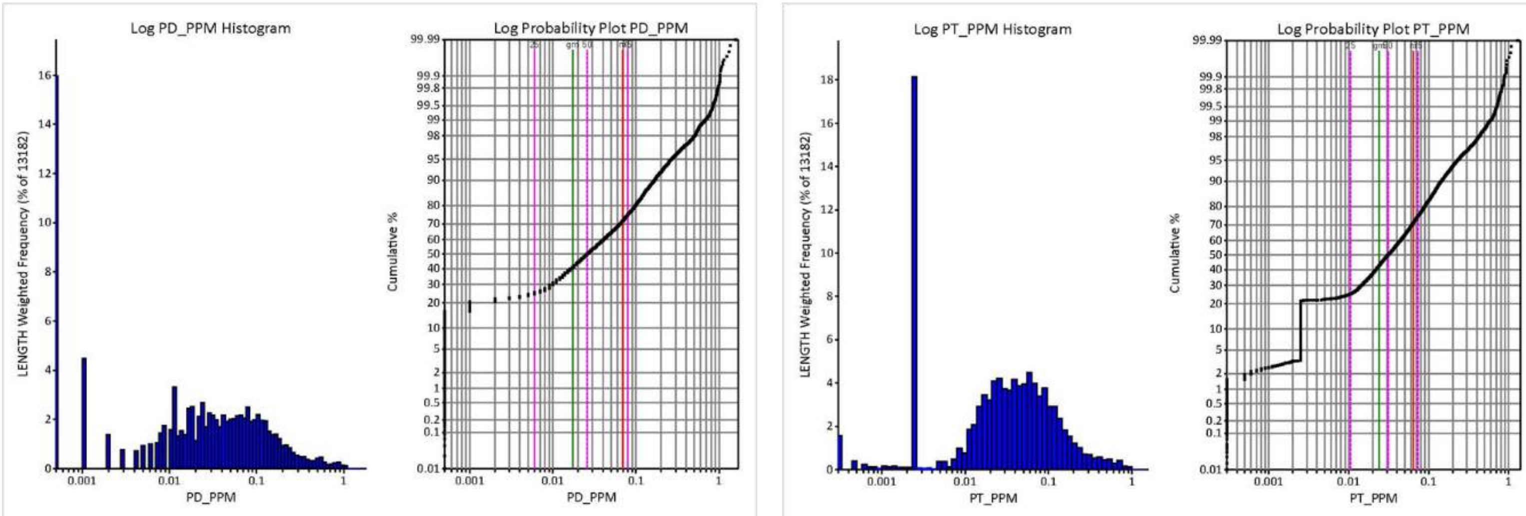


Figure 14-11: Log probability plot and histogram Pd/Pt (g/t), BG domain Current deposit

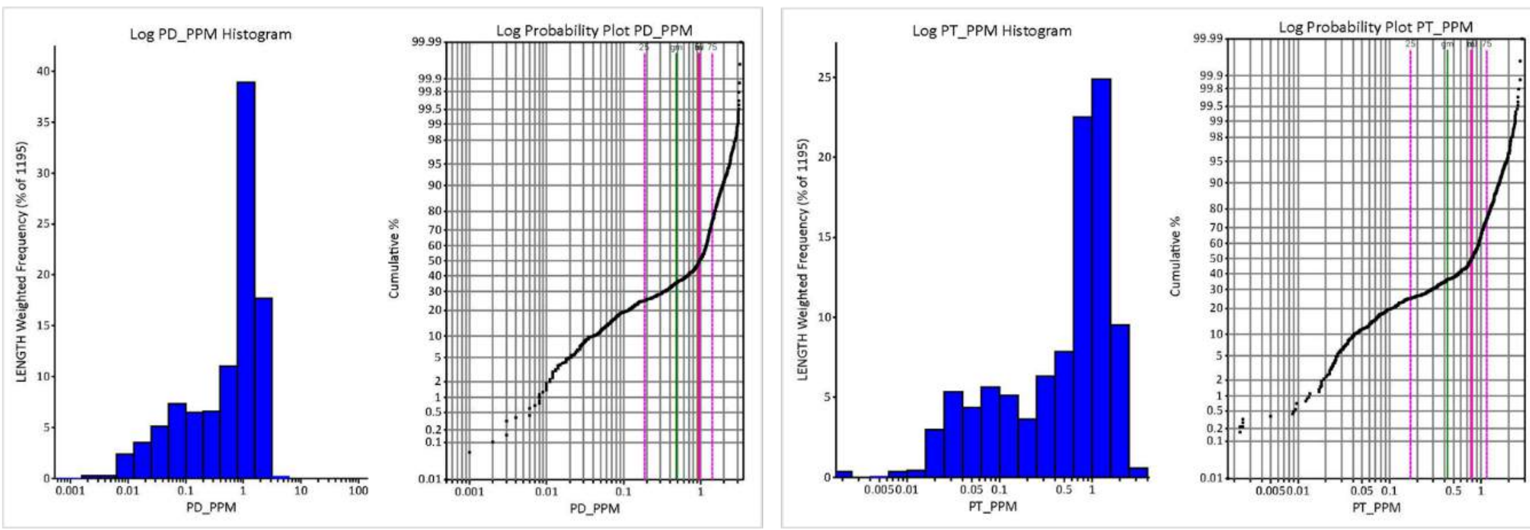


Figure 14-12: Log probability plot and histogram Pd/Pt (g/t), LG domain Current deposit

Figure 14-13 and Figure 14-14 provide the data analysis for the seven grade domains within the Escape deposit. Multiple inflections exist within the dataset for each domain indicating multiple phases of mineralization are present.

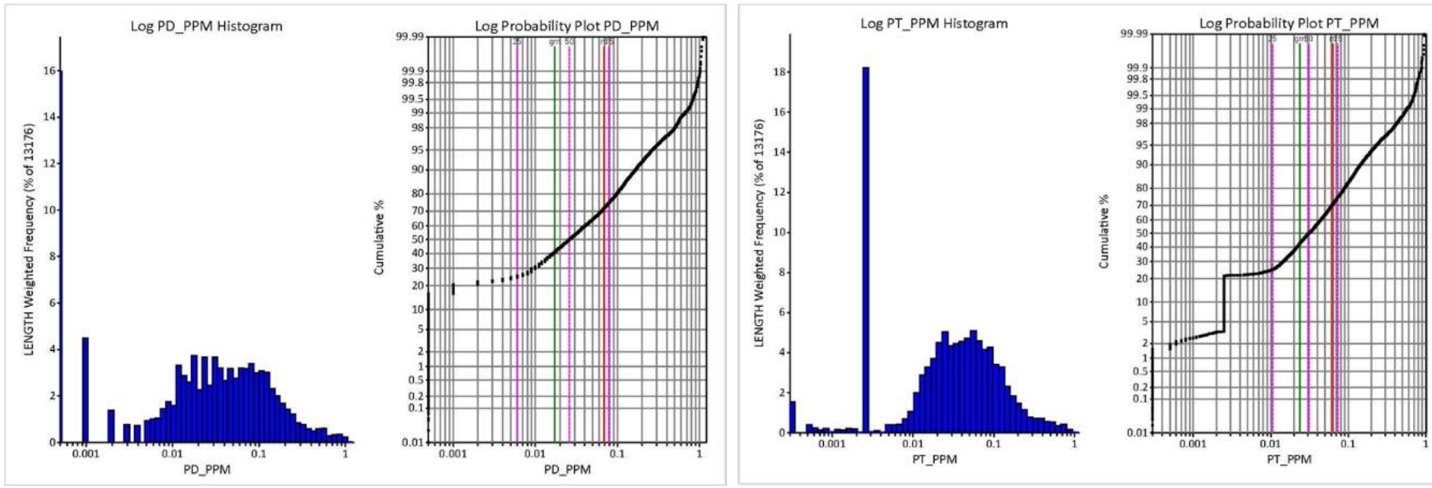


Figure 14-13: Log probability plot and histogram Pd/Pt (g/t), BG domain Escape deposit

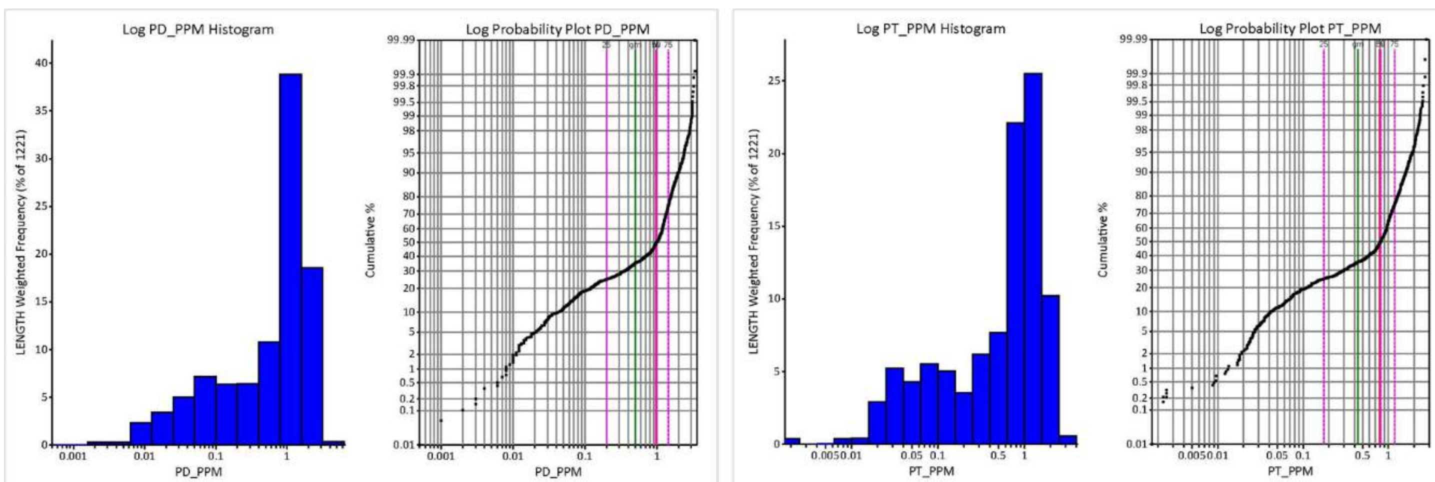


Figure 14-14: Log probability plot and histogram Pt/Pd (g/t), LG domain Escape deposit

14.4 Data Preparation

Prior to grade estimation, the data was prepared in the following matter:

- All drill hole assays that intersected a wireframe within each domain were assigned a set of codes representative of the domain, wireframe number, and mineralization type.
- High grade outlier assays in each domain were reviewed and if needed a top cut was applied.

14.4.1 Non-Assayed Assay Intervals

Table 14-5 summarizes the drill holes used in the resource model. The assay database provided to Nordmin by the Company contained appropriately-substituted minimum detection assay values (Table 14-6).

Table 14-5: Summary of the Assay Database for the Current and Escape Deposits

Type	Current Deposit	Escape Deposit
Number of drill holes	756	150
Number of survey records	19,847	3,106
Number of lithology records	10,540	2,875

Table 14-6: Assays at Minimum Detection Limits

	Current Deposit			Escape Deposit		
Field	Count	Count at Minimum Detection	% at Minimum Detection	Count	Count at Minimum Detection	% at Minimum Detection
Pd	36,607	1,432	3.9%	14,846	1,639	11.0%
Pt	36,607	1,105	3.0%	14,846	321	2.2%
Au	36,607	3,134	8.5%	14,241	10,295	72.3%
Ag	35,707	26,333	73.6%	14,241	4,241	29.8%
Cu	36,607	138	0.3%	14,345	233	1.6%
Ni	36,607	313	0.9%	14,339	394	2.7%
Co	36,579	42	0.1%	14,345	35	0.2%
Rh	2,523	2	0.0%	1,041	78	7.5%

14.4.2 Outlier Analysis and Capping

Grade outliers that are much higher than the general population of assays have the potential to bias (inflate) the quantity of metal estimated in a block model. Geostatistical analysis using XY scatter plots, cumulative probability plots, and decile analysis was used by Nordmin to analyze the raw drill hole assay data for each domain to determine appropriate grade capping. Statistical analysis was performed independently on all domains by the X10 Geo software package.

Table 14-7 and Table 14-8 provide the summary of the results from the capping analysis of each deposit.

Table 14-7: Current Deposit Capping Analysis

Domain		Assay Count	CAPPED Cap	Min	Max	Mean	Assays Capped	% Capped	% Metal Lost	CV	UNCAPPED Min	Max	Mean	CV
Pd g/t	BG	25,216	No cap	0.001	5.61	0.132	0	0	0	1.52	0.001	5.61	0.132	1.52
	LG	7,934	15	0.001	15	0.903	4	0.1	1.5	1.24	0.001	47.8	0.917	1.57
	MG	1,811	No cap	0.001	43.3	2.288	0	0	0	1.16	0.001	43.3	2.288	1.16
	HG	657	No cap	0.001	61.5	4.68	0	0	0	1.22	0.001	61.5	4.68	1.22
Pt g/t	BG	25,216	5	0.0003	5	0.143	5	0.02	0.1	1.47	0.0003	7.17	0.143	1.51
	LG	7,934	20	0.0003	20	0.959	4	0.1	2.1	1.27	0.0003	71	0.98	1.84
	MG	1,811	No cap	0.0028	90	2.45	0	0	0	1.38	0.0028	90	2.45	1.38
	HG	657	No Cap	0.0003	63.5	4.97	0	0	0	1.15	0.0003	63.5	4.97	1.15
Au g/t	BG	34,085	1	0.001	1	0.019	3	0.01	0.4	1.93	0.001	7.5	0.019	2.33
	HG	824	5	0.001	5	0.311	3	0.4	0.8	1.21	0.001	9.28	0.314	1.33
Ag g/t	BG	29,602	10	0.25	10	0.402	4	0.01	0.7	1.11	0.25	90.9	0.405	1.51
	HG	4,863	100	0.25	100	3.053	5	0.1	1	1.69	0.25	139	3.084	1.88
Cu %	BG	29,538	No Cap	0.0005	1.79	0.049	0	0	0	1.6	0.005	1.79	0.049	1.6
	LG	3,633	No Cap	0.001	3.47	0.398	0	0	0	0.97	0.001	3.47	0.398	0.97
	MG	923	No Cap	0.009	14.35	0.576	0	0	0	1.29	0.009	14.35	0.576	1.29
	HG	289	No cap	0.003	20.4	1.03	0	0	0	2.09	0.003	20.4	1.03	2.09
Ni %	BG	27,472	2	0.001	2	0.114	3	0.01	0.01	0.41	0.001	2.61	0.114	0.41
	LG	3,730	No cap	0.001	1.045	0.18	0	0	0	0.54	0.001	1.045	0.18	0.54
	MG	2,546	No cap	0.001	3.76	0.259	0	0	0	0.83	0.001	3.76	0.259	0.83
	HG	478	No cap	0.038	3.82	0.54	0	0	0	0.98	0.038	3.82	0.54	0.98
Co g/t	BG	31,670	700	0.5	700	121	6	0.02	0	0.32	0.5	881	121	0.32
	LG	659	No Cap	23	536	178.5	0	0	0	0.41	23	536	178.5	0.41
	HG	2,544	1600	1	1600	198.6	1	0.04	0.04	0.57	1	1900	198.6	0.58
Rh g/t	BG	1,852	No cap	0.001	2.76	0.04	0	0	0	1.97	0.001	2.76	0.04	1.97
	LG	280	No cap	0.001	1.1	0.1	0	0	0	1.29	0.001	1.1	0.1	1.29
	MG	33	No cap	0.001	0.485	0.03	0	0	0	1.7	0.001	0.485	0.03	1.7
	HG	6	No cap	0.002	0.545	0.234	0	0	0	1.2	0.002	0.545	0.234	1.2

Table 14-8: Escape Deposit Capping Analysis

Domain		Assay Count	CAPPED Cap	Min	Max	Mean	Assays Capped	% Capped	% Metal Lost	CV	UNCAPPED Min	Max	Mean	CV
Pd g/t	BG	9,474	No cap	0.000	1.14	0.069	0	0.00	0.00	1.78	0.0005	1.14	0.069	1.78
	LG	1,080	No cap	0.000	3.38	0.971	0	0.00	0.00	0.79	0.0005	3.38	0.971	0.79
	MG	368	No cap	0.006	6.75	2.752	0	0.00	0.00	0.52	0.0060	6.75	2.752	0.52
	HG	46	No cap	1.920	8.76	5.873	0	0.00	0.00	0.29	1.920	8.76	5.873	0.52
Pt g/t	BG	9,474	No cap	0.000	0.95	0.064	0	0.00	0.00	1.61	0.0003	0.95	0.064	1.61
	LG	1,080	No cap	0.002	2.82	0.793	0	0.00	0.00	0.77	0.0017	2.82	0.793	0.77
	MG	368	No cap	0.003	5.45	2.067	0	0.00	0.00	0.50	0.0025	5.45	2.067	0.50
	HG	46	No cap	1.695	7.43	4.473	0	0.00	0.00	0.33	1.695	7.43	4.473	0.33
Au g/t	BG	10,635	0.3	0.001	0.30	0.013	5	0.05	0.50	2.09	0.001	0.84	0.013	2.14
	HG	306	No cap	0.001	0.82	0.246	0	0.00	0.00	0.52	0.001	0.82	0.246	0.52
Ag g/t	BG	8,439	5.0	0.005	5.00	0.330	9	0.11	1.20	1.01	0.005	34.20	0.330	1.40
	LG	1,586	15.0	0.080	15.00	1.239	2	0.13	0.50	1.23	0.08	20.20	1.244	1.27
	HG	882	20.0	0.250	20.00	3.550	8	0.91	0.80	1.02	0.25	28.00	3.583	1.06
Cu %	BG	9,911	2.0	0.001	2.00	0.059	4	0.04	0.40	2.02	0.0005	3.88	0.059	2.06
	LG	458	No cap	0.006	2.96	0.936	0	0.00	0.00	0.54	0.0055	2.96	0.936	0.54
	HG	38	No cap	0.944	2.80	1.998	0	0.00	0.00	0.21	0.944	2.80	1.998	0.21
Ni %	BG	9,321	No cap	0.001	0.88	0.103	0	0.00	0.00	0.54	0.001	0.88	0.103	0.54
	LG	462	No cap	0.008	0.88	0.227	0	0.00	0.00	0.47	0.008	0.88	0.227	0.47
	MG	302	No cap	0.119	0.99	0.491	0	0.00	0.00	0.52	0.119	0.99	0.491	0.52
	HG	103	No cap	0.038	1.28	0.889	0	0.00	0.00	0.37	0.038	1.28	0.889	0.37
Co g/t	BG	10,415	No cap	0.500	462.00	107.660	0	0.00	0.00	0.45	0.500	462.00	107.660	0.45
	LG	361	No cap	31.000	496.00	253.800	0	0.00	0.00	0.35	31	496.00	253.800	0.35
	HG	165	No cap	61.000	740.00	484.930	0	0.00	0.00	0.26	61.000	740.00	484.930	0.26
Rh g/t	BG	752	No cap	0.001	0.210	0.024	0	0.00	0.00	1.07	0.001	0.210	0.024	1.07
	LG	232	No cap	0.001	0.531	0.127	0	0.00	0.00	0.92	0.001	0.531	0.127	0.92
	MG	57	No cap	0.005	0.731	0.424	0	0.00	0.00	0.47	0.005	0.731	0.424	0.47

14.4.3 Compositing

Compositing of assays is a technique used to give each assay a relatively equal length and therefore reduce the potential for bias due to uneven assay lengths; it prevents the potential loss of assay data and reduces the potential for grade bias due to the possible creation of short and potentially high grade composites that have a tendency to be situated along the zone contacts when using a fixed length.

The raw assay data was found to have a relatively narrow range of assay lengths. Assays captured within all zones were composited to 1.0 m regular intervals based on the observed modal distribution of assay lengths, which supports a 5.0 m x 5.0 m x 5.0 m block model (with sub-blocking). An option to use a slightly variable composite length was chosen to allow for backstitching shorter composites that are located along the edges of the composited interval. All composite assays were generated within each mineral lens with no overlaps along boundaries. The composite assays were validated statistically to ensure there was no loss of data or change to the mean grade of each assay population (Table 14-9).

Table 14-9: Composite Analysis

Domain		Current Composite Count	Escape Composite Count
Pt/Pd	BG	33,601	13,181
	LG	8,360	14,376
	MG	1,541	1,578
	HG	1,541	1,243
Au	BG	41,963	14,468
	HG	525	14,797
Ag	BG	41,660	11,706
	LG		13,621
	HG	3,591	2,927
Cu	BG	40,066	13,130
	LG	2,534	13,622
	MG	2,534	n/a
	HG	141	532
Ni	BG	35,811	12,237
	LG	41,194	12,779
	MG	2,120	875
	HG	2,120	449
Co	BG	39,707	14,141
	LG	2,227	14,522
	HG	2,227	552
Rh	BG	1,035	964
	LG	1,547	1,190
	MG	542	280
	HG	38	n/a

14.4.4 Specific Gravity

A total of 10,630 SG measurements from 557 diamond drill holes exist from the Current deposit, and 2,832 SG measurements from 117 diamond drill holes exist from the Escape deposit. Measurements were calculated using the weight in air versus the weight in water method (Archimedes), by applying the following formula:

$$Specific\ Gravity = \frac{Weight\ in\ Air}{(Weight\ in\ Air - Weight\ in\ Water)}$$

Nordmin determined that the required amount and distribution of SG measurements allowed for direct estimation of SG within the block model. NN, ID2, ID3, and OK estimations were completed, and OK was selected as the estimation the most appropriately representative for each deposit.

An SG summary can be found in Table 14-10.

Table 14-10: Specific Gravity

Deposit	Drill Hole Count	SG Count	Max.	Min.	Mean	Standard Deviation	Standard Error	Covariance
Current	557	10,685	4.447	1.708	2.894	0.144	0.00139	0.0207
Escape	117	2,887	6.736	1.809	2.914	0.237	0.00445	0.0562

14.4.5 Block Model Strategy and Analysis

A series of upfront test modelling was completed to define an estimation methodology to meet the following criteria:

- Representative of the Current and Escape geological and structural models.
- Accounts for the variability of grade, orientation, and continuity of mineralization.
- Controls the smoothing (grade spreading) of grades and the influence of outliers.
- Accounts for most of the mineralization within Current and Escape.
- Is robust and repeatable within the mineral domains.
- Supports multiple domains.

Multiple test scenarios were evaluated to determine the optimum processes and parameters to use to achieve the stated criteria. Each scenario was based on NN, inverse-distance squared (ID2), inverse-distance cubed (ID3), and OK interpolation methods.

All test scenarios were evaluated based on global statistical comparisons, visual comparisons of composite assays versus block grades, and the assessment of overall smoothing. Based on results of the testing, it was determined that the final resource estimation methodology would constrain the mineralization by using hard wireframe boundaries to control the spread of high to grade and low to grade mineralization. OK was selected as the interpolation method best representative of both the Current and Escape deposits.

14.4.6 Assessment of Spatial Grade Continuity

Datamine and Sage 2001 was used to determine the geostatistical relationships of Current and Escape deposits. Independent variography was performed on composite data for each domain. Experimental grade variograms were calculated from the capped/composited assay data for each element to determine the approximate search ellipse dimensions and orientations.

The analyses considered the following for each analysis:

- Downhole variograms were created and modelled to define the nugget effect.
- Experimental pairwise to relative correlogram variograms were calculated to determine directional variograms for the strike and down dip orientations.
- Variograms were modelled using an exponential with practical range.
- Directional variograms were modelled using the nugget defined in the downhole variography, and the ranges for the along strike, perpendicular to strike, and down dip directions.
- Variograms outputs were re-oriented to reflect the orientation of the mineralization.

Search parameters were applied using dynamic anisotropy. Dynamic anisotropy interpolation is an estimation method used in conjunction with “normal” estimation interpolation methods (NN, ID, OK, etc.) which takes into consideration the local variation of the domain orientation in the block estimation. Practically, this involves in a per-block inclusion and modification of the search parameters. This generally results in a lower number of search ellipsoids. Three search estimation passes were performed for all domains except rhodium, where only two were performed.

Two main search ellipsoids were applied to estimation, one specifically for rhodium estimation due to the relatively low numbers of assays and the presence of infill assaying. The variography used for each deposit is provided in Table 14-11 and Table 14-12. The search parameters used for the estimation are provided in Section 14.4.9. Some domains share variography parameters due to behaviour and/or lack of data.

Table 14-11: Current Deposit Variography Parameters

Domain		Rotation Angles 1	Rotation Angles 2	Rotation Angles 3	Axes	Structure 1 Range 1	Structure 1 Range 2	Structure 1 Range 3	Structure 2 Range 1	Structure 2 Range 2	Structure 2 Range 3	Nugget
Pt	BG	-61	-3	16	Z-Y-Z	44	21	17	39	276	158	0.196
	LG	28	-4	-34	Z-Y-Z	17	11	5	140	11	14	0.104
	MG/HG	0	0	-28	Z-Y-Z	2	48	4	20	45	8.5	0.015
Pd	BG	-4	2	-12	Z-Y-Z	50	15	16	45	263	139	0.158
	LG	-16	-6	10	Z-Y-Z	19	9	5	141	10	13	0.129
	MG/HG	-44	1	-18	Z-Y-Z	5	5	3	47	13	8	0.007
Au	BG	6	1	37	Z-Y-Z	46	11	12	675	205	14	0.176
	HG	-1	88	-82	Z-Y-Z	3	5	27	575	133	29	0.000
Ag	BG	-81	88	89	Z-Y-Z	13	50	13	205	257	135	0.226
	HG	26	5	-28	Z-Y-Z	8	33	4	5	56	22	0.001
Cu	BG	-83	-1	93	Z-Y-Z	58	17	13	60	630	145	0.310
	LG/MG/HG	-1	-4	-26	Z-Y-Z	4	9	3	180	425	11	0.000
Ni	BG	-99	89	-3	Z-Y-Z	2	11	30	36	18	8.5	0.146
	LG	6	130	15	Z-Y-Z	5	5	7	4.5	12.5	79	0.000
	MG/HG	1	-1	4	Z-Y-Z	24	16	101	525	860	100	0.100
Co	BG	-143	-5	103	Z-Y-Z	35	1020	52	290	2800	1140	0.030
	LG	-87	-24	88	Z-Y-Z	832	69	34	3850	1650	312	0.050
	HG	-37	-89	96	Z-Y-Z	7	4	4	265	51	19	0.001
Rh	BG	18	-23	-61	Z-Y-Z	2	11	13	13	15	130	0.006
	LG/MG/HG	-81	0	-47	Z-Y-Z	7	4	4	920	200	28	0.300

Table 14-12: Escape Deposit Variography Parameters

		Rotation Angles				Structure 1			Structure 2			Nugget
Domain		1	2	3	Axes	Range 1	Range 2	Range 3	Range 1	Range 2	Range 3	
Pt	BG	-80	-1	-37	Z-Y-Z	5.2	15.6	9.7	74	198	40	0.023
	LG	-76	0	25	Z-Y-Z	28.6	9.4	11	93	797	68	0.000
	MG	18	-8	-26	Z-Y-Z	19.4	26.2	8	16.4	272	389	0.000
	HG	-42	8	72	Z-Y-Z	16	62	10	15	288	670	0.031
Pd	BG	-33	-10	26	Z-Y-Z	5.4	18.9	9.7	73	202	41	0.032
	LG	-73	83	3	Z-Y-Z	13.3	11	24.6	101	694	63	0.021
	MG	-4	-15	-7	Z-Y-Z	21	42.2	10.4	16.8	320	454	0.000
	HG	-11	6	42	Z-Y-Z	16.2	49.9	10.5	16.3	345	935	0.000
Au	BG	-31	-5	23	Z-Y-Z	33.1	8	8.6	109	507	48	0.069
	HG	-17	56	-20	Z-Y-Z	5.1	32.4	5.4	7.3	370	11.2	0.000
Ag	BG	28	-8	-75	Z-Y-Z	86	10.9	16.1	190	21	12	0.156
	LG	-79	-6	-38	Z-Y-Z	27	12.5	7.9	20	506	249	0.003
	HG	-29	3	30	Z-Y-Z	24.3	14.7	5.5	86	517	24	0.061
Cu	BG	-21	20	-9	Z-Y-Z	30.7	5.6	31.8	30.7	5.6	32	0.112
	LG	-96	-2	4	Z-Y-Z	62.8	14.5	17	43.2	872	221	0.001
	HG	-26	-16	10	Z-Y-Z	14.4	22.9	7.3	12.5	108	227	0.000
Ni	BG	14	0	61	Z-Y-Z	207	26	30	1092	407	73	0.096
	LG	-85	88	-1	Z-Y-Z	24.2	24.2	133	696	335	74	0.009
	MG	-19	40	-17	Z-Y-Z	18.2	37.9	19.3	19.2	280	74	0.000
	HG	-18	-81	58	Z-Y-Z	378	27.6	86	29.4	391	1610	0.000
Co	BG	-104	-129	-90	Z-Y-Z	24.1	8.8	20	157	1252	85	0.000
	LG	-86	6	57	Z-Y-Z	23.2	8.2	12.2	155	822	78	0.006
	HG	-10	-22	42	Z-Y-Z	15.3	116	8.7	11.6	103	809	0.000
Rh	BG	-12	65	-21	Z-Y-Z	16	30	40	1700	50	40	0.015
	LG/MG/HG	-39	-87	60	Z-Y-Z	14.4	61	17	18	541	190	0.318

14.4.7 Block Model Definition

Block model shape and size is typically a function of the geometry of the deposit, the density of assay data, drill hole spacing, and the selected mining unit. Taking this into consideration, the block model was defined with parent blocks at 5.0 m x 5.0 m x 5.0 m (N-S x E-W x Elevation). The block model prototype parameters are listed in Table 14-13 and Table 14-14.

Table 14-13: Current Deposit Block Model Definition Parameters

Item	Block Origin (m)	Block Max (m)	Block Dimension (m)	Number of Parent Blocks	Minimum Sub-block (m)
Easting	356,000	362,000	5	1200	0.625
Northing	5,400,000	5,405,000	5	1000	0.625
Elevation	-1,000	700	5	340	Variable

Table 14-14: Escape Deposit Block Model Definition Parameters

Item	Block Origin (m)	Block Max (m)	Block Dimension (m)	Number of Parent Blocks	Minimum Sub-block (m)
Easting	348,000	362,000	5	2800	0.625
Northing	5,399,000	5,408,000	5	1800	0.625
Elevation	-1,000	700	5	340	Variable

All mineral zone volumes were filled with blocks using the parameters described in Table 14-13 and Table 14-14. Block volumes were compared to the mineral zone volumes to confirm there were no significant differences. Block volumes for all zones were found to be within reasonable tolerance limits for all mineral zone volumes. Sub-blocking was allowed to maintain the geological interpretation and accommodate the HG and LG zones (wireframes), the lithological SG, and the category application. Sub-blocking has been allowed to the following minimums:

- 5.0 m x 5.0 m x 5.0 m blocks are sub-blocked threefold to 0.25 m x 0.25 m in the N to S and E to W directions with a variable elevation calculated based on the other sizes.

The block models were not rotated but were clipped to topography. The resource estimation was conducted using Datamine Studio RM^{TM} version 1.7.100.0 within the NAD 83 UTM Zone 16 N projection grid.

14.4.8 Interpolation Method

The Escape deposit and Current deposit block models were estimated using NN, ID2, ID3, and OK interpolation methods for global comparisons and validation purposes. The OK method was used for the Mineral Resource Estimate; it was selected over ID2, ID3, and NN as the OK method was the most representative approach to controlling the smoothing of grades.

14.4.9 Search Strategy

Zonal controls were used to constrain the grade estimates to within each LG and HG wireframes. These controls prevented the assays from individual domain wireframes from influencing the block grades of one another, acting as a “hard boundary” between the zones. For instance, the composites identified within the BG Pt/Pd wireframes were used to estimate the BG Pt/Pd wireframes, and all other composites were ignored during the estimation. There were circumstances where the addition of a “soft boundary” was used if limited composites were available. In these instances, a higher-grade lens was allowed to use composites from the LG lenses to help populate the block model. For example, the MG Pt/Pd wireframes were allowed to estimate with a combination of HG and MG Pt/Pd composites. These soft boundaries are as follows:

- BG: No soft boundary
- LG: Soft boundary with BG composites
- MG: Soft boundary with LG composites
- HG: Soft boundary with MG composites

Search orientations were used for estimation of the block model and were based on the shape of the modelled mineral domains. A total of three nested searches were performed on all zones. The search distances were based upon the variography ranges outlined in Table 14-11 and Table

14-12. The search radius of the first search was based upon the first structure of the variogram, the second search is approximately two times the first search pass and the third search pass is 1.5 times the initial search. Search strategies for each domain used an elliptical search with a minimum and maximum number of composites defined in Table 14-3 and Table 14-4.

Non-estimated blocks were left as absent and not reported in the Mineral Resource Estimate.

Table 14-15: Search Parameters

	Ellipsoid Rotation Angles			Ranges, Search Pass 1			Ranges, Search Pass 2			Ranges, Search Pass 3			Composites, Pass 1		Composites, Pass 2		Composites, Pass 3	
Domain	1(X)	2(Z)	3(Y)	1	2	3	1	2	3	1	2	3	Min	Max	Min	Max	Min	Max
Pt/Pd, Au, Ag, Cu, Ni, Co	30	0	-10	50	20	10	100	40	20	150	60	30	3	8	3	8	2	8
Rh	30	0	-10	25	10	5	43.8	17.5	8.8	n/a	n/a	n/a	3	8	3	8	n/a	n/a

14.5 Block Model Validation

The block model validation process included visual comparisons between block estimates and composite grades in plan and section views, local versus global estimates for NN, ID2, ID3, and OK, and swath plots. Block estimates were visually compared to the drill hole composite data in all domains and corresponding zones to ensure agreement. No material grade bias issues were identified, and the block model grades compared well to the composite data.

14.5.1 Visual Comparison

The validation of the interpolated block model was assessed by using visual assessments and validation plots of block grades versus capped assay grades and composites. The review demonstrated a good comparison between local block estimates and nearby assays, without excessive smoothing in the block model. Figure 14-15 through Figure 14-20 provide the visual comparisons for select element of the Current deposit and Figure 14-21 to Figure 14-27 provide the visual comparisons for selected elements of the Escape deposit.

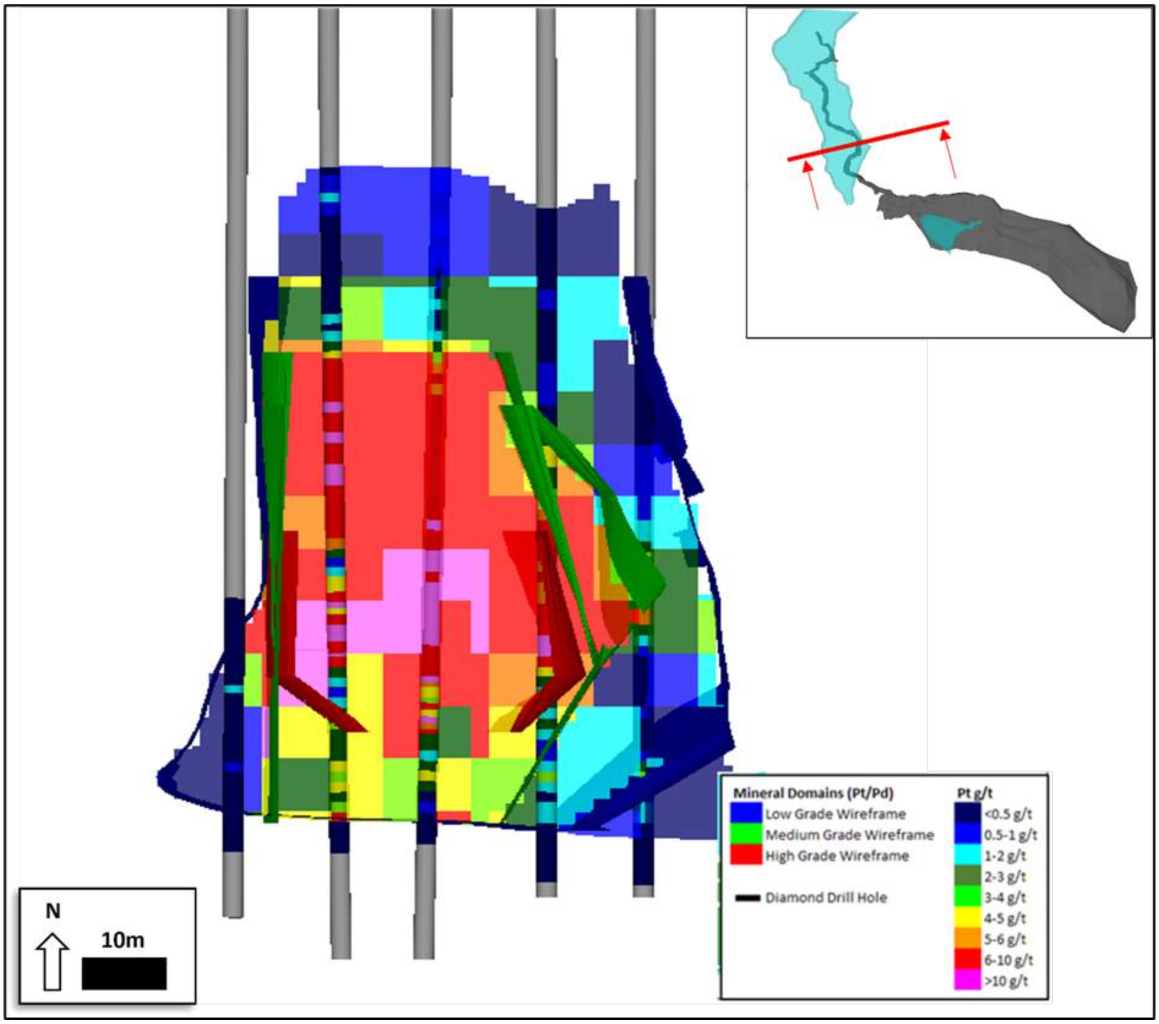


Figure 14-15: Current deposit cross section Pt (g/t)

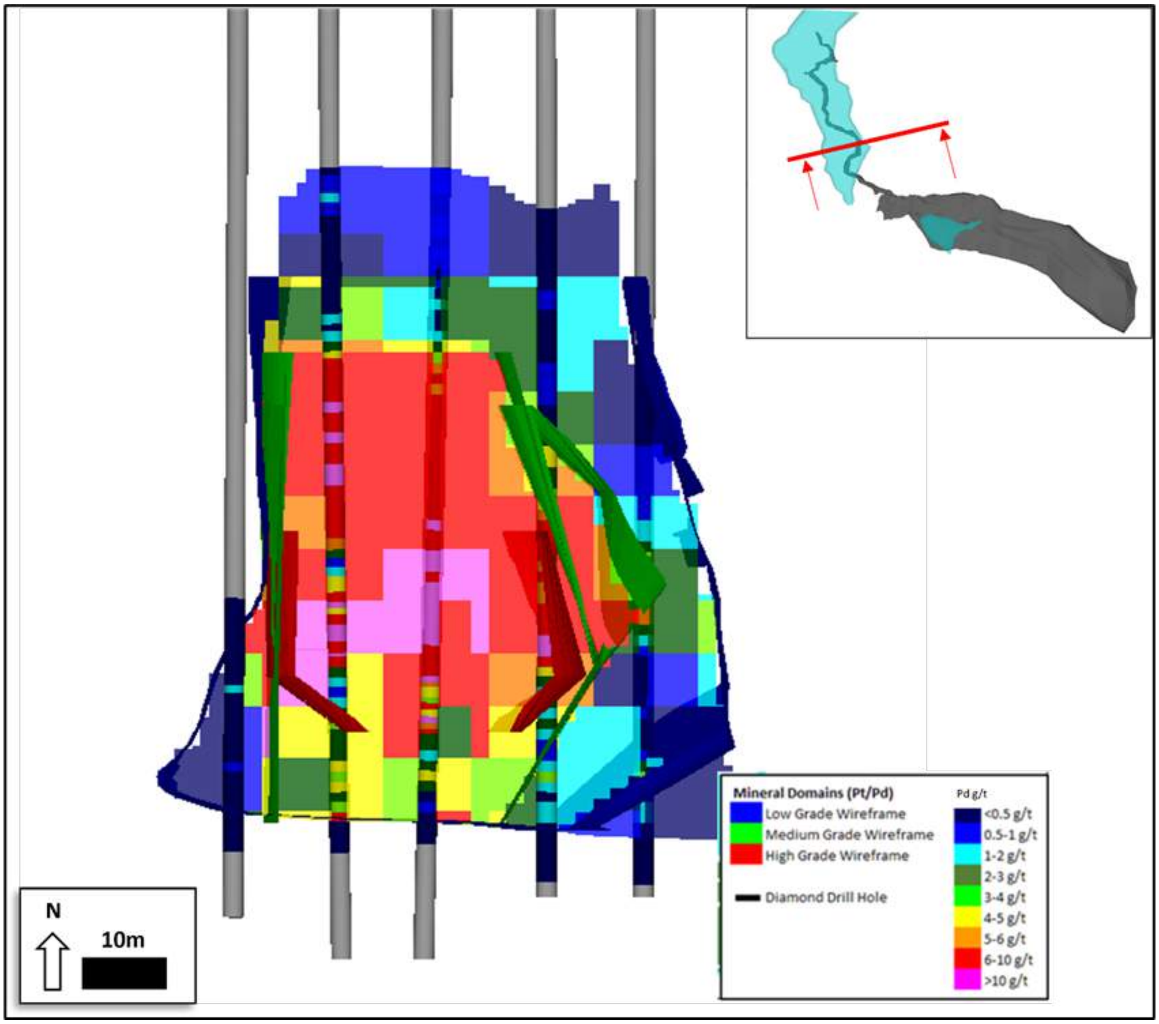


Figure 14-16: Current deposit cross section Pd (g/t)

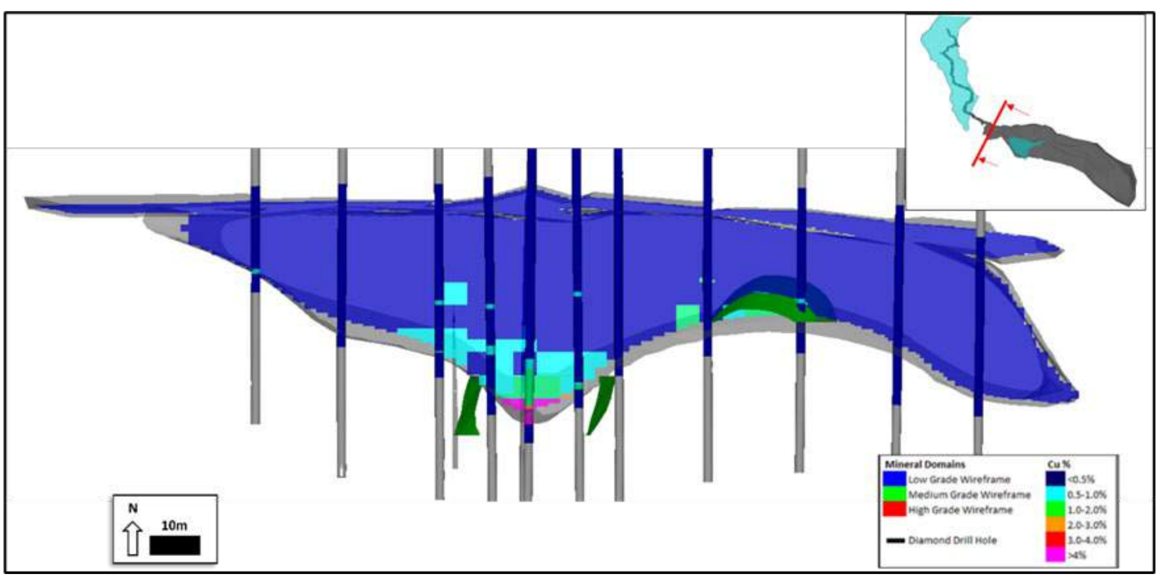


Figure 14-17: Current deposit cross section Cu (%)

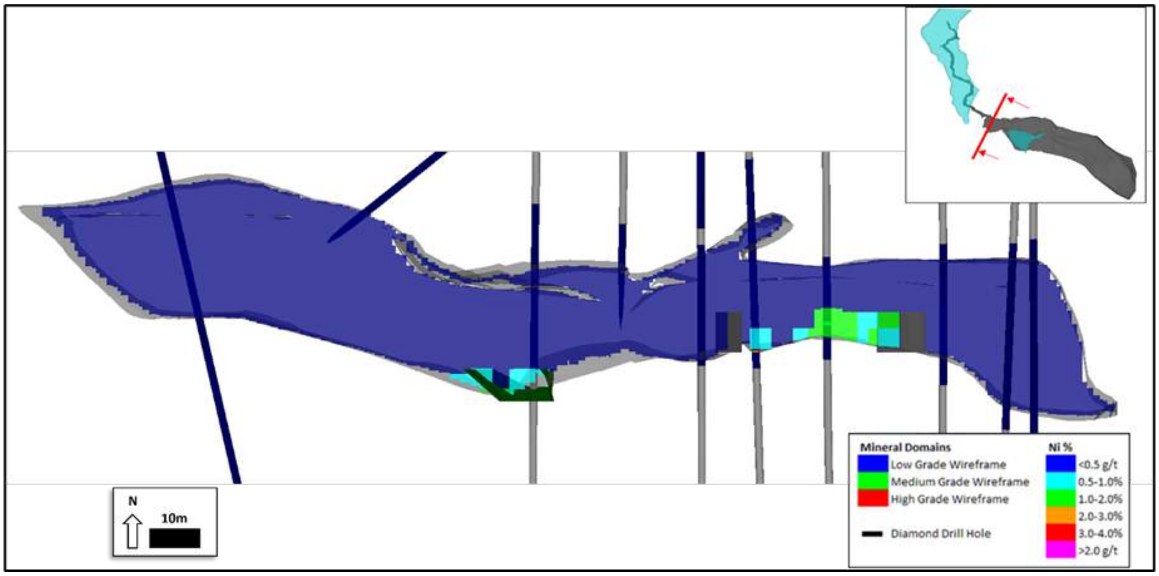


Figure 14-18: Current deposit cross section Ni (%)

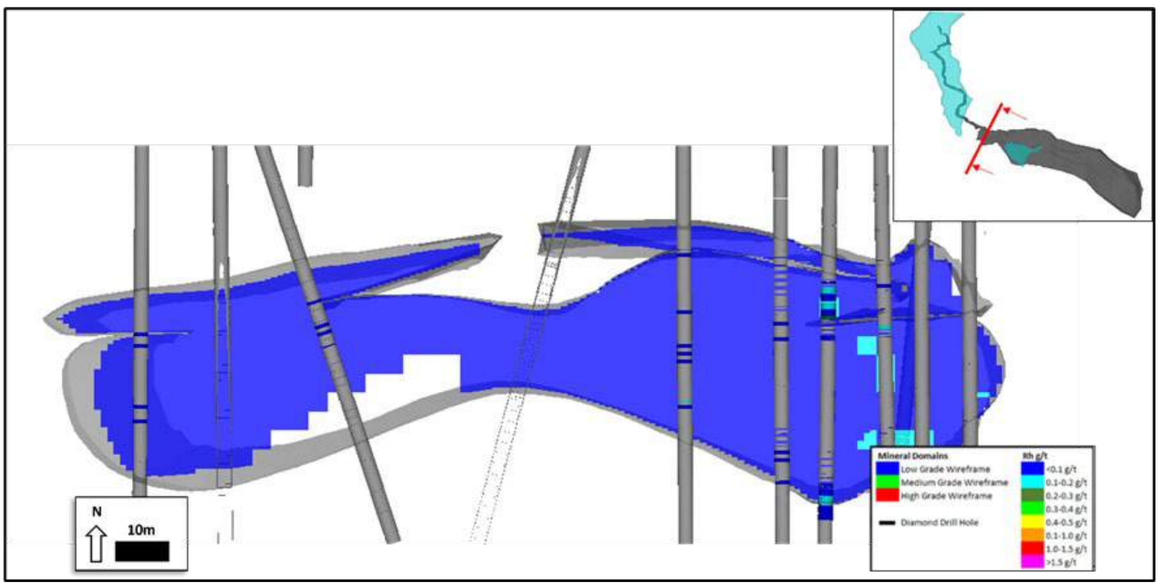


Figure 14-19: Current deposit cross section Rh (g/t)

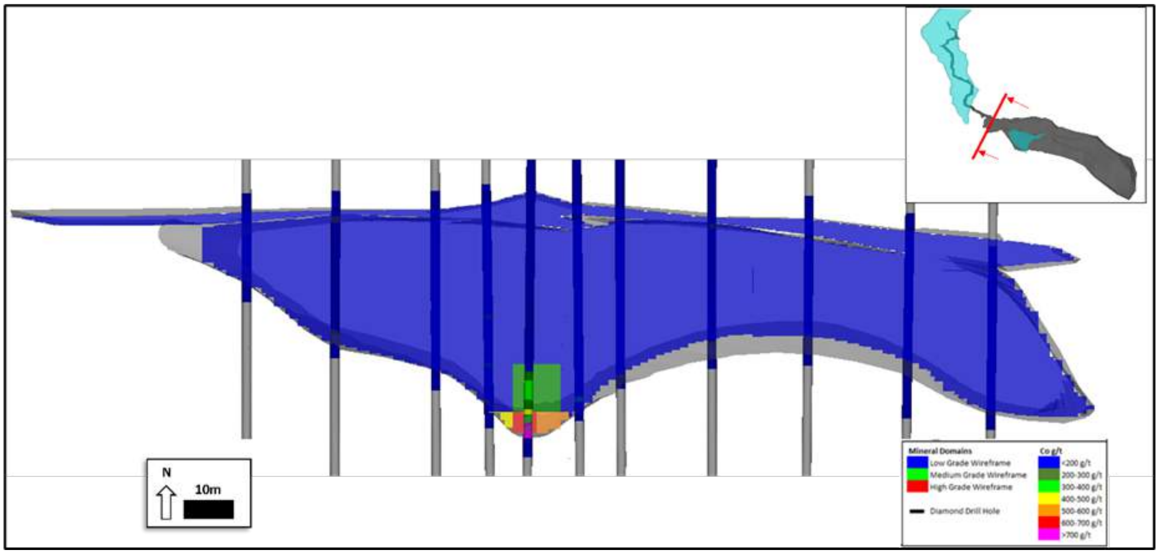


Figure 14-20: Current deposit cross section Co (g/t)

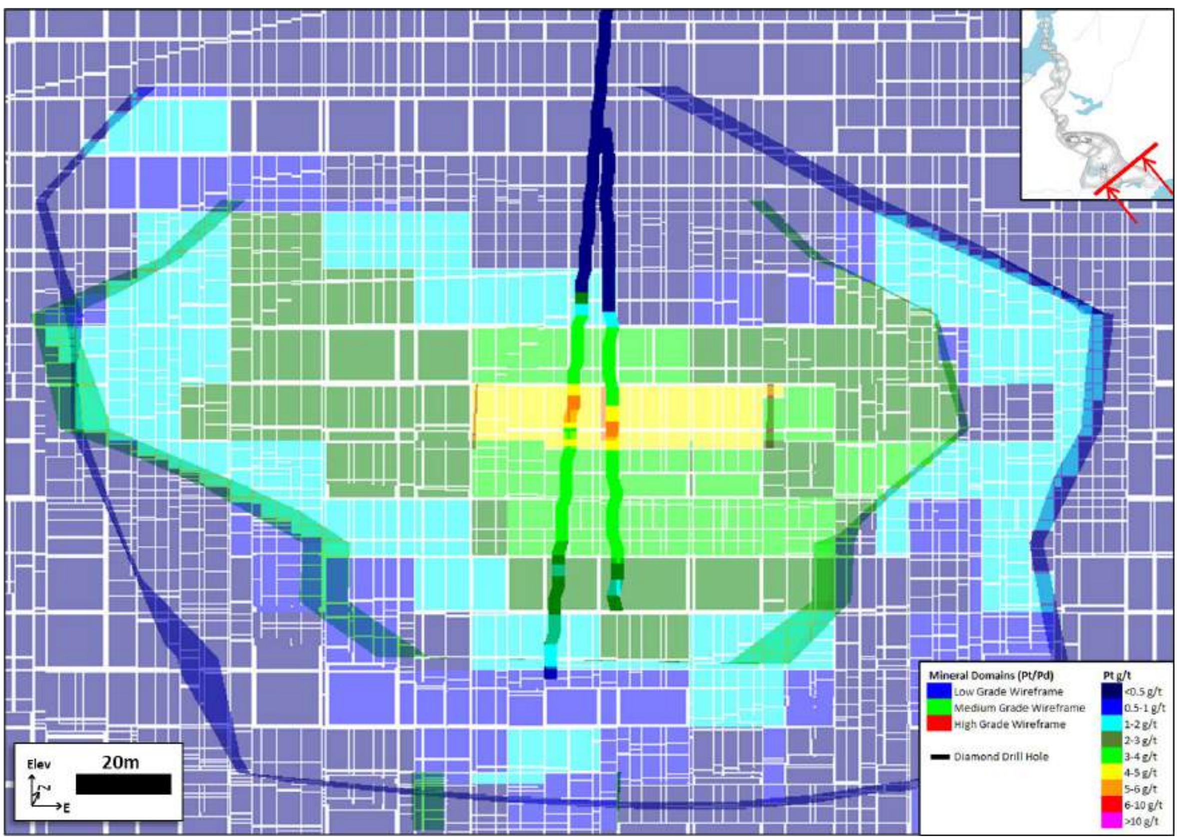


Figure 14-21: Escape deposit cross section Pt (g/t)

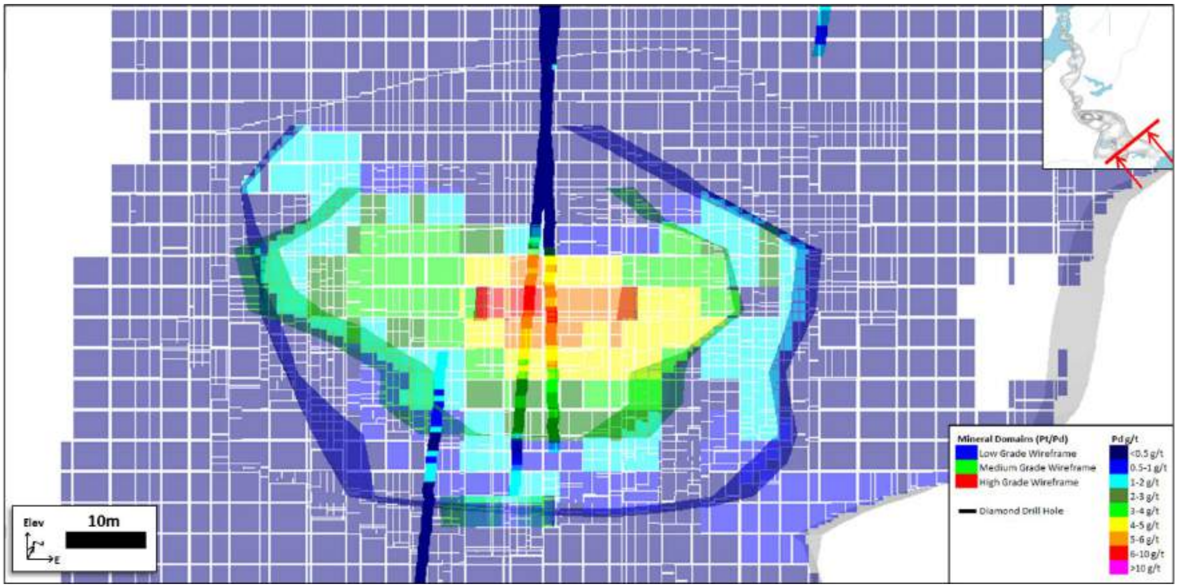


Figure 14-22: Escape deposit cross section Pd (g/t)

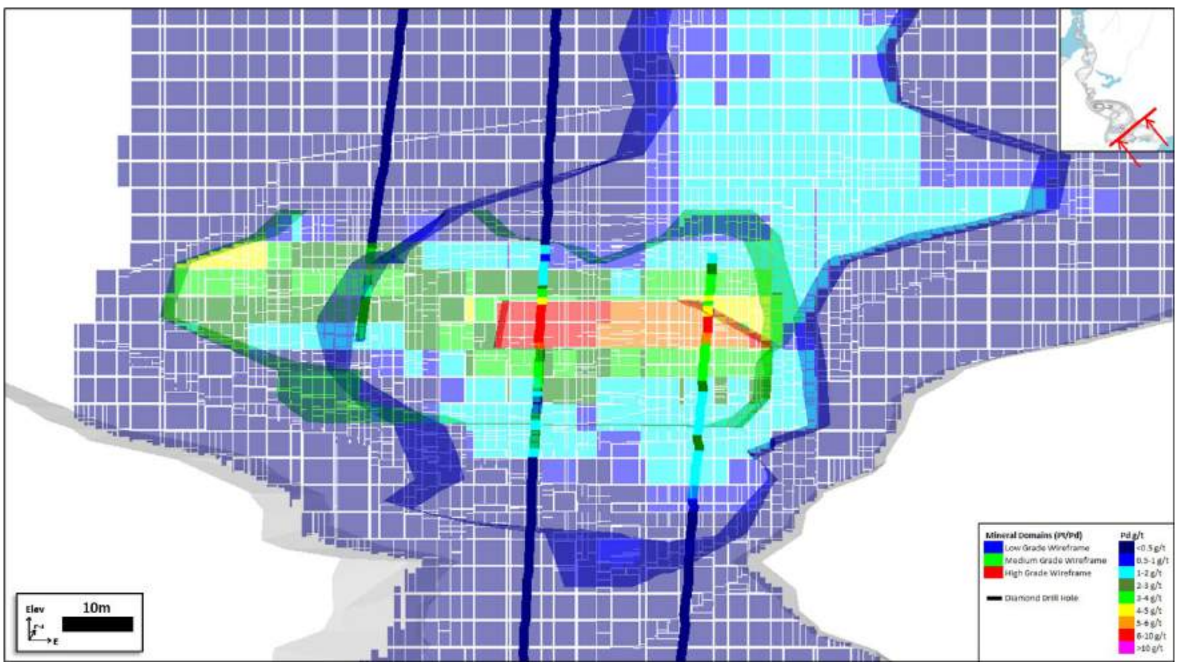


Figure 14-23: Escape deposit cross section Pd (g/t)

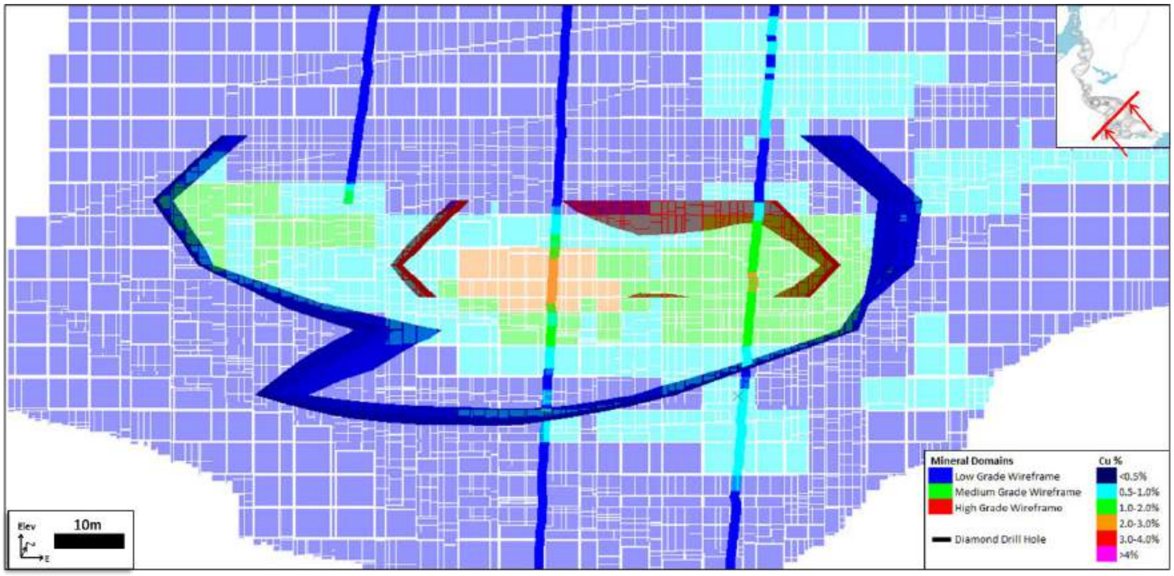


Figure 14-24: Escape deposit cross section Cu (%)

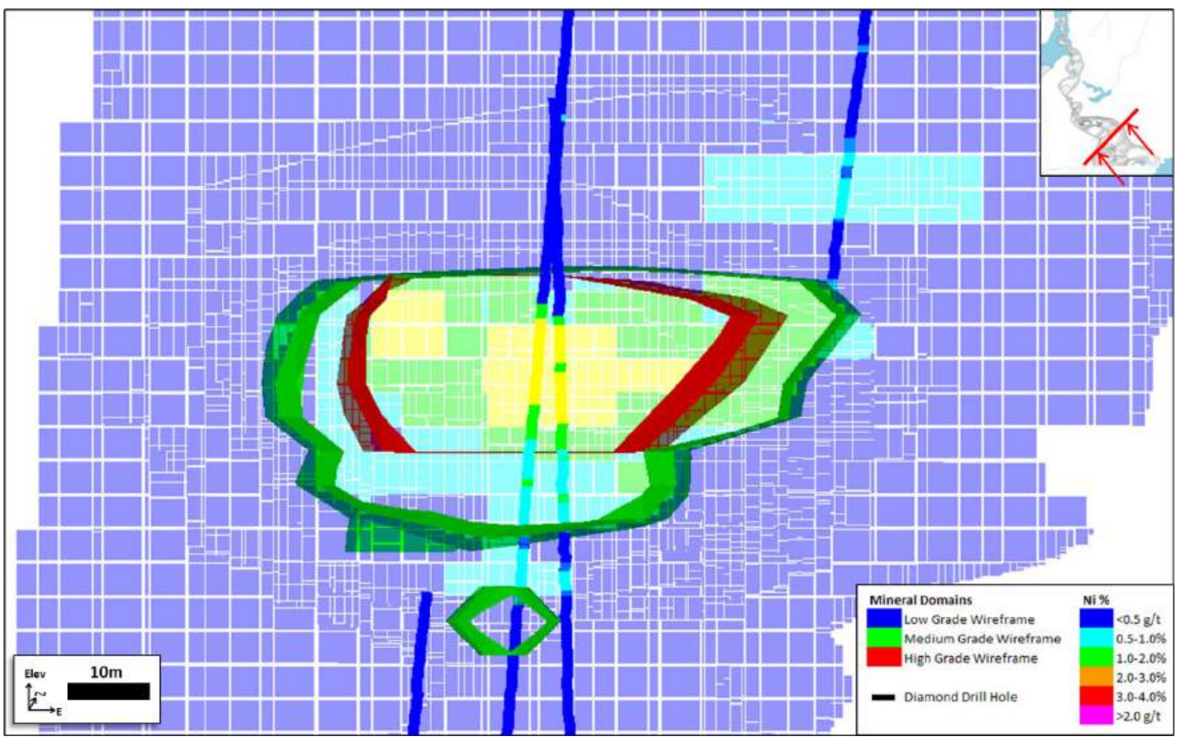


Figure 14-25: Escape deposit cross section Ni (%)

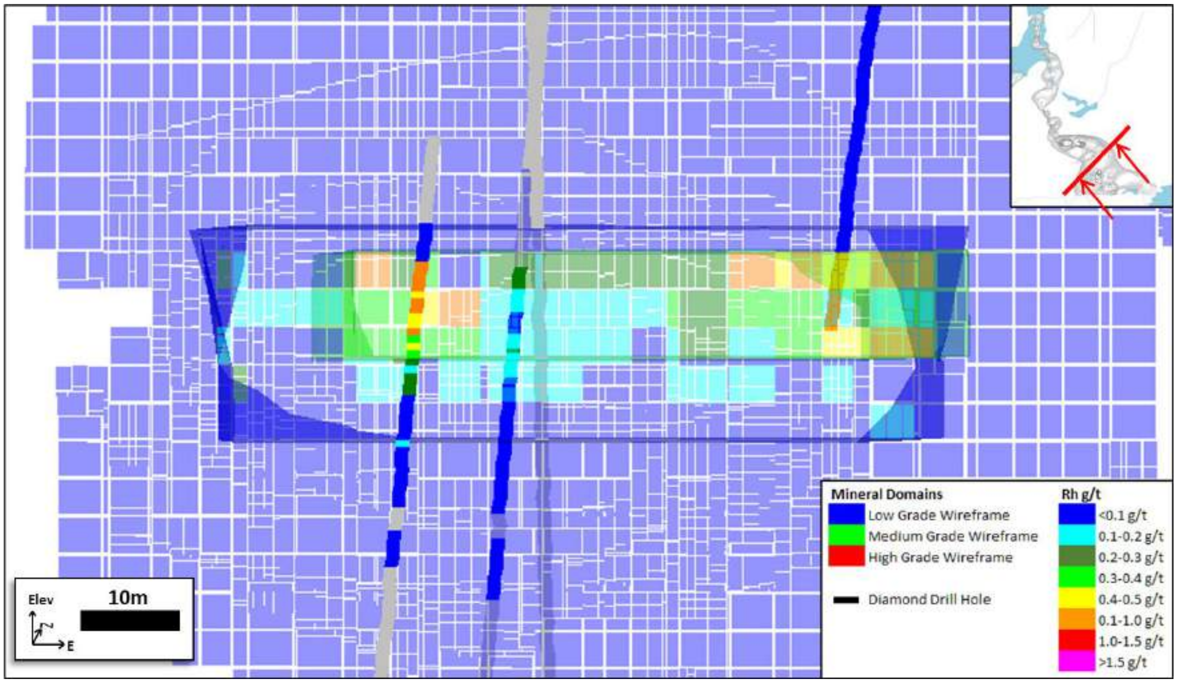


Figure 14-26: Escape deposit cross section Rh (g/t)

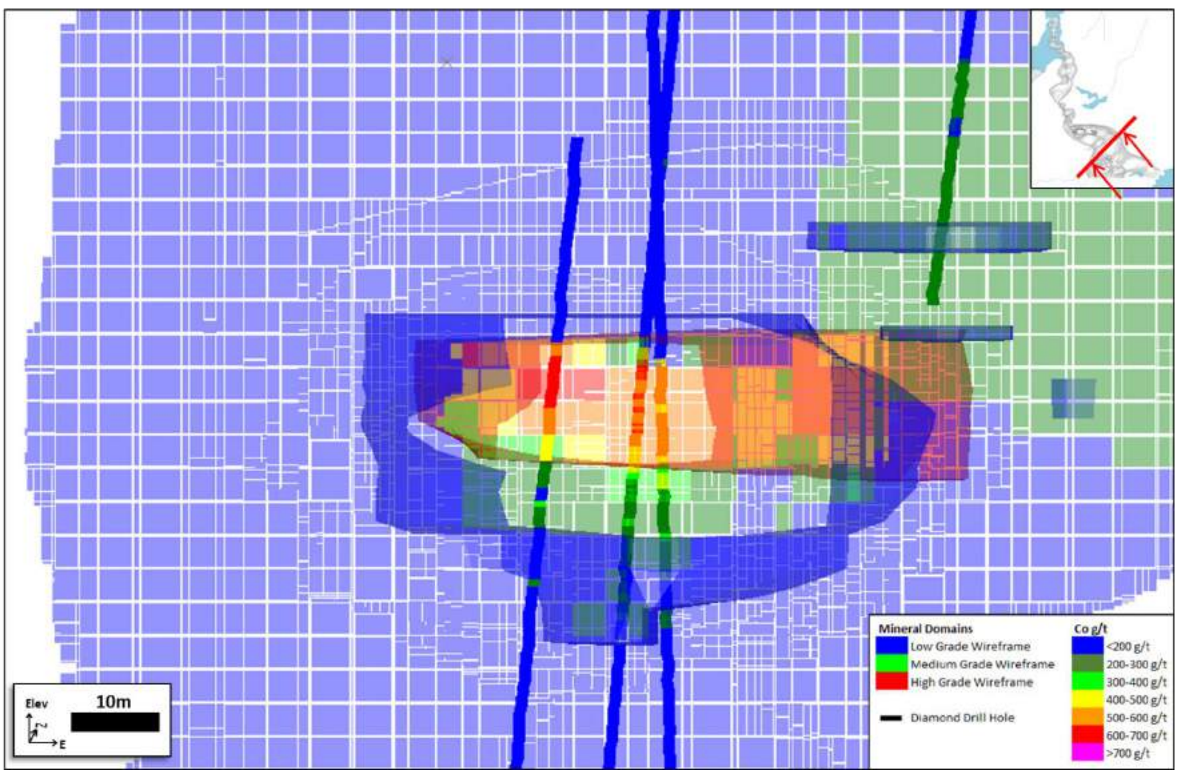


Figure 14-27: Escape deposit cross section Co (g/t)

14.5.2 Swath Plots

A swath plot is a graphical representation of grade distribution derived by a series of sectional "swaths." Swath plots were generated for Au from slices throughout each domain. They compare the block model grades for NN, ID2, ID3, and OK to the drill hole composite grades to evaluate any potential local grade bias. Review of the swath plots did not identify bias in the model that is material to the 2021 Mineral Resource Estimate, as there was a strong overall correlation between the block model OK grade and the capped composites used in the 2021 Mineral Resource Estimate, as demonstrated in Figure 14-28 through Figure 14-31 (additional figures are available in Appendix D). For these figures, the composite grade (S_XXCAP, where XX is the element being analyzed) is compared across swaths with the four estimation types from the block model.

Fields include (all are in g/t):

- M_TONNES: Block model tonnage
- NRECORDS: Number of records
- S_XXCAP: composite capped grade for XX
- M_XXOK: Block model estimated XX grade, OK
- M_XXID2: Block model estimated XX grade, ID2
- M_XXID3: Block model estimated XX grade, ID3
- M_XXNN: Block model estimated XX grade, NN

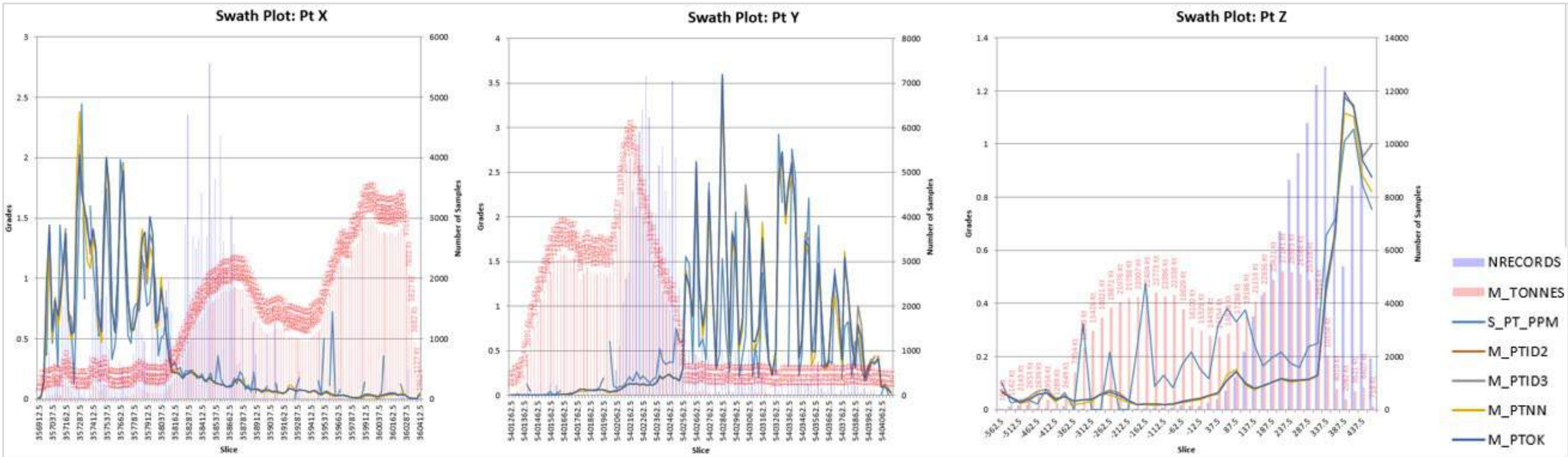


Figure 14-28: Swath plots in X, Y, Z direction, Current deposit, Pt

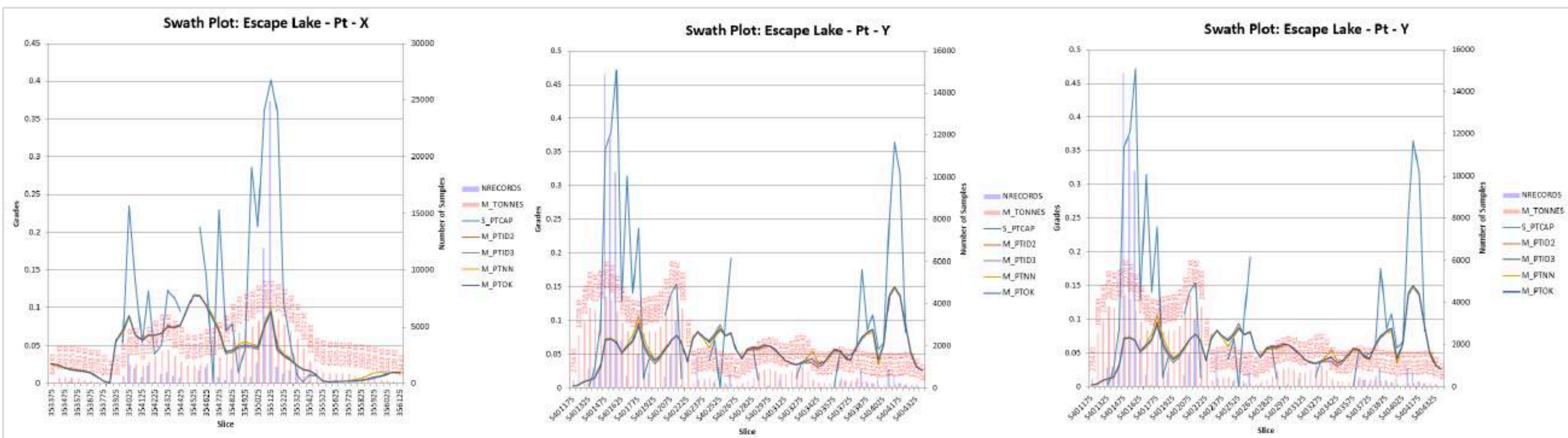


Figure 14-29: Swath plots in X, Y, Z direction, Escape deposit, Pt

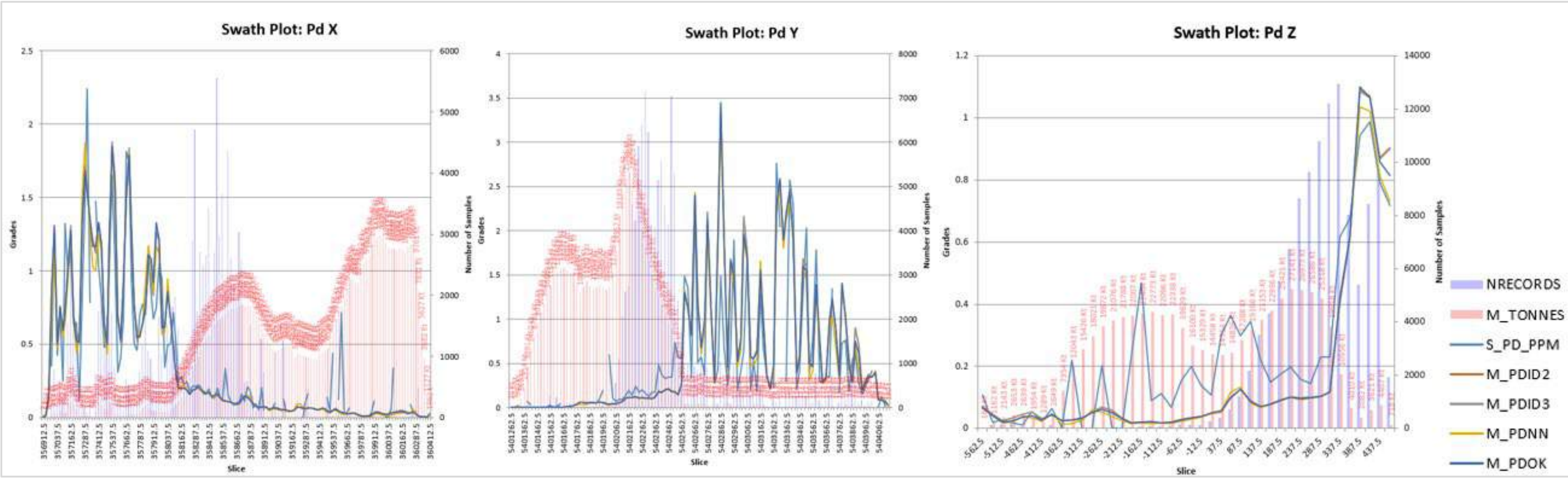


Figure 14-30: Swath plots in X, Y, Z direction, Current deposit, Pd

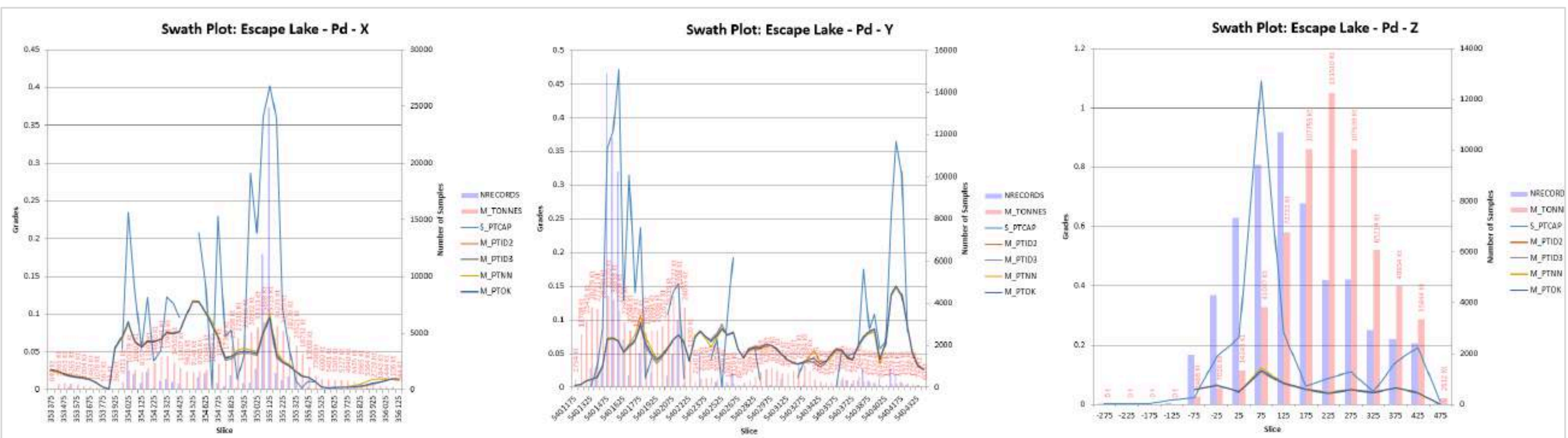


Figure 14-31: Swath plots in X, Y, Z direction, Escape deposit, Pd

14.5.3 Interpolation Comparison

Estimation was completed using NN, ID2, ID3, and OK interpolation methods. The results are presented in Table 14-16 and

Table 14-17. The tonnage column includes all material that has been classified as Measured, Indicated, and Inferred.

Table 14-16: Current Deposit Interpolation Comparison

Current Deposit — *Grades in g/t*

Classification	Domain	Tonnes	Pt NN	Pt ID2	Pt ID3	Pt OK	Pd NN	Pd ID2	Pd ID3	Pd OK	Au NN	Au ID2	Au ID3	Au OK	Ag NN	Ag ID2	Ag ID3	Ag OK
Indicated	Upper Current	1,123,518	1.68	1.67	1.62	1.68	1.67	1.55	1.54	1.54	0.09	0.10	0.10	0.10	2.15	2.30	2.29	2.29
	Current	1,574,152	2.59	2.57	2.38	2.59	2.56	2.39	2.38	2.38	0.12	0.13	0.13	0.13	2.93	3.03	3.02	2.99
	Bridge	3,261,258	2.00	2.00	2.14	2.00	2.14	1.84	1.84	1.90	0.11	0.12	0.12	0.11	2.77	2.77	2.76	2.77
	Beaver	3,592,490	1.54	1.54	1.57	1.54	1.54	1.40	1.40	1.39	0.06	0.07	0.07	0.06	1.56	1.63	1.62	1.61
	Cloud	837,545	0.89	0.89	0.88	0.88	0.84	0.84	0.84	0.83	0.06	0.06	0.06	0.05	1.35	1.30	1.31	1.28
Inferred	Beaver	505,794	0.91	0.91	0.93	0.88	0.86	0.87	0.90	0.84	0.06	0.06	0.06	0.06	1.79	1.67	1.69	1.66
	437/SE	4,769,004	0.60	0.60	0.54	0.63	0.56	0.56	0.52	0.60	0.06	0.07	0.07	0.07	0.91	0.95	0.95	0.98

Current Deposit — *Grades in g/t* (Rh) — *Grades in Percentage* (Cu, Ni) — *Grades in g/t* (Co)

Classification	Domain	Tonnes	Rh NN	Rh ID2	Rh ID3	Rh OK	Cu NN	Cu ID2	Cu ID3	Cu OK	Ni NN	Ni ID2	Ni ID3	Ni OK	Co NN	Co ID2	Co ID3	Co OK
Indicated	Upper Current	1,123,518	0.06	0.07	0.07	0.07	0.39	0.41	0.41	0.41	0.21	0.21	0.21	0.21	156.98	156.28	156.23	155.30
	Current	1,574,152	0.06	0.05	0.05	0.05	0.50	0.51	0.51	0.52	0.23	0.23	0.23	0.23	159.38	160.26	160.22	159.05
	Bridge	3,261,258	0.05	0.05	0.05	0.05	0.45	0.45	0.45	0.47	0.20	0.19	0.19	0.20	150.23	148.57	148.77	148.33
	Beaver	3,592,490	0.04	0.04	0.04	0.03	0.26	0.27	0.27	0.27	0.21	0.20	0.20	0.22	147.90	147.69	147.71	147.57
	Cloud	837,545	0.04	0.05	0.05	0.04	0.21	0.21	0.21	0.21	0.15	0.15	0.15	0.15	150.29	148.94	149.30	147.87
Inferred	Beaver	505,794	0.02	0.02	0.02	0.02	0.29	0.27	0.28	0.27	0.20	0.20	0.20	0.20	155.28	152.83	153.28	151.67
	437/SE	4,769,004	0.01	0.01	0.01	0.01	0.30	0.32	0.32	0.33	0.12	0.13	0.13	0.13	115.26	116.53	116.90	114.94

Table 14-17: Escape Deposit Interpolation Comparison

Escape Deposit *Grades in g/t*

Classification	Domain	Tonnes	Pt NN	Pt ID2	Pt ID3	Pt OK	Pd NN	Pd ID2	Pd ID3	Pd OK	Au NN	Au ID2	Au ID3	Au OK	Ag NN	Ag ID2	Ag ID3	Ag OK
Indicated	Steepledge North	124,611	0.77	0.73	0.74	0.73	0.90	0.86	0.86	0.84	0.06	0.06	0.06	0.06	1.57	1.32	1.33	1.30
	Steepledge South	42,812	0.88	0.90	0.90	0.89	1.03	1.07	1.06	1.05	0.06	0.06	0.06	0.05	1.25	1.17	1.18	1.15
	Escape South	3,996,938	0.99	0.96	0.96	0.95	1.27	1.22	1.23	1.22	0.12	0.13	0.13	0.13	2.58	2.55	2.56	2.52
Inferred	Steepledge North	97,464	0.56	0.49	0.49	0.50	0.66	0.57	0.58	0.59	0.05	0.05	0.05	0.05	0.61	0.59	0.59	0.58
	Steepledge South	1,990,612	0.79	0.81	0.81	0.78	0.90	0.93	0.93	0.90	0.06	0.07	0.07	0.07	1.31	1.28	1.28	1.18
	Escape South	714,722	0.54	0.50	0.50	0.49	0.66	0.63	0.63	0.61	0.08	0.08	0.08	0.08	1.06	0.98	0.98	0.97

Escape Deposit *Grades in g/t* (Rh) — *Grades in Percentage* (Cu, Ni) — *Grades in g/t* (Co)

Classification	Domain	Tonnes	Rh NN	Rh ID2	Rh ID3	Rh OK	Cu NN	Cu ID2	Cu ID3	Cu OK	Ni NN	Ni ID2	Ni ID3	Ni OK	Co NN	Co ID2	Co ID3	Co OK
Indicated	Steepledge North	124,611	0.01	0.01	0.01	0.01	0.31	0.30	0.30	0.29	0.18	0.18	0.18	0.18	152.82	153.50	153.62	157.85
	Steepledge South	42,812	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.28	0.18	0.18	0.18	0.17	144.03	141.95	142.23	142.66
	Escape South	3,996,938	0.07	0.06	0.06	0.06	0.54	0.54	0.54	0.53	0.29	0.29	0.29	0.29	214.53	212.26	212.34	211.89
Inferred	Steepledge North	97,464	0.00	0.00	0.00	0.00	0.27	0.27	0.27	0.27	0.21	0.21	0.21	0.21	149.00	150.26	150.25	149.59
	Steepledge South	1,990,612	0.00	0.00	0.00	0.00	0.31	0.33	0.33	0.33	0.17	0.17	0.17	0.17	170.80	175.35	175.08	177.16
	Escape South	714,722	0.00	0.00	0.00	0.00	0.36	0.36	0.36	0.36	0.20	0.20	0.20	0.19	179.53	178.01	178.33	177.20

14.6 Equivalency

Equivalency formulas were calculated and used for reporting purposes. The derivation of the equivalency formulas is based on accepted industry practices. All equivalencies are reported as in situ grades.

Notes:

- All percentage grades referenced in the formulas for Cu and Ni are numeral percentage rather than decimal percentages (i.e., 2% is 2.0, not 0.02).
- 0.06857 is used for troy ounce and pound conversion.
- 2204 is used for tonne and pound conversion.
- 31.1035 is used for grams and ounces conversion.
- 10,000 is used to convert from numerical percentage to grams.

Platinum equivalency (Pt Eq) and palladium equivalency (Pd Eq) was calculated through the following formulas, using components from Pt, Pd, Au, Ag, Cu, Ni, Co, and Rh.

Platinum Equivalency

- Pt Eq (g/t) = Pt Component + Pd Component + Au Component + Ag Component + Cu Component + Ni Component + Co Component + Rh Component
- Pt Eq g/t = (Pt g/t) + (Pd g/t * Pd Factor) + (Au g/t * Au Factor) + (Ag g/t * Ag Factor) + (Cu % * Cu Factor) + (Ni % * Ni Factor) + (Co g/t * Co Factor) + (Rh g/t * Rh Factor)
- $Pt\ \mathrm{Eq\ g/t} = \mathrm{Pt\ g/t} + \left(\mathrm{Pd\ g/t} \times \frac{Pd\ \$/oz}{Pt\ \$/oz}\right) + \left(\mathrm{Au\ g/t} \times \frac{Au\ \$/oz}{Pt\ \$/oz}\right) + \left(\mathrm{Ag\ g/t} \times \frac{Ag\ \$/oz}{Pt\ \$/oz}\right) + \left(\mathrm{Cu\ \%} \times \frac{Cu\ \$/t \times 10000 \times 0.06857 \div 2204}{Pt\ \$/oz}\right) + \left(\mathrm{Ni\ \%} \times \frac{Ni\ \$/t \times 10000 \times 0.06857 \div 2204}{Pt\ \$/oz}\right) + \left(\mathrm{Co\ g/t} \times \frac{Co\ \$/t \times 0.06857 \div 2204)}{Pt\ \$/oz}\right) + \left(\mathrm{Rh\ g/t} \times \frac{Rh\ \$/oz}{Pt\ \$/oz}\right)$
- $\mathrm{Pt\ Eq\ g/t} = (\mathrm{Pt\ g/t}) + \left(\mathrm{Pd\ g/t} \times \frac{2214}{969}\right) + \left(\mathrm{Au\ g/t} \times \frac{1723}{969}\right) + \left(\mathrm{Ag\ g/t} \times \frac{21.6}{969}\right) + \left(\mathrm{Cu\ \%} \times \frac{6821 \times 10000 \times 0.06857 \div 2204}{969}\right) + \left(\mathrm{Ni\ \%} \times \frac{15125 \times 10000 \times 0.06857 \div 2204}{969}\right) + \left(\mathrm{Co\ g/t} \times \frac{38790.40 \times 0.06857 \div 2204}{969}\right) + \left(\mathrm{Rh\ g/t} \times \frac{13626}{969}\right)$
- $\mathrm{Pt\ Eq\ g/t} = (\mathrm{Pt\ g/t}) + (\mathrm{Pd\ g/t} \times 2.284830) + (\mathrm{Au\ g/t} \times 1.778128) + (\mathrm{Ag\ g/t} \times 0.02229102) + (\mathrm{Cu\ \%} \times 3.049028) + (\mathrm{Ni\ \%} \times 4.856173) + (\mathrm{Co\ g/t} \times 0.00124544) + (\mathrm{Rh\ g/t} \times 14.06192)$

Palladium Equivalency

- Pd Eq g/t = Pd Component + Pt Component + Au Component + Ag Component + Cu Component + Ni Component + Co Component + Rh Component
- Pd Eq g/t = (Pd g/t) + (Pt g/t * Pt Factor) + (Au g/t * Au Factor) + (Ag g/t * Ag Factor) + (Cu % * Cu Factor) + (Ni % * Ni Factor) + (Co g/t * Co Factor) + (Rh g/t * Rh Factor)
- $\text{Pd Eq g/t} = (\text{Pd g/t}) + \left(\text{Pt g/t} \times \frac{902.38}{2214}\right) + \left(\text{Au g/t} \times \frac{1469.60}{2214}\right) + \left(\text{Ag g/t} \times \frac{17.35}{2214}\right) + \left(\text{Cu \%} \times \frac{6325.48 \times 10000 \times 0.06857 \div 2204}{2214}\right) + \left(\text{Ni \%} \times \frac{13543.01 \times 10000 \times 0.06857 \div 2204}{2214}\right) + \left(\text{Co g/t} \times \frac{34839.16 \times 0.06857 \div 2204}{2214}\right) + \left(\text{Rh g/t} \times \frac{4910.67}{2214}\right)$
- $\text{Pd Eq g/t} = (\text{Pd g/t}) + \left(\text{Pt g/t} \times \frac{969}{2214}\right) + \left(\text{Au g/t} \times \frac{1723}{2214}\right) + \left(\text{Ag g/t} \times \frac{21.60}{2214}\right) + \left(\text{Cu \%} \times \frac{6821 \times 10000 \times 0.06857 \div 2204}{2214}\right) + \left(\text{Ni \%} \times \frac{15125 \times 10000 \times 0.06857 \div 2204}{2214}\right) + \left(\text{Co g/t} \times \frac{38790.4 \times 0.06857 \div 2204}{2214}\right) + \left(\text{Rh g/t} \times \frac{13626}{2214}\right)$
- $\text{Pd Eq g/t} = (\text{Pd g/t}) + (\text{Pt g/t} \times 0.4376694) + (\text{Au g/t} \times 0.7782294) + (\text{Ag g/t} \times 0.009756098) + (\text{Cu \%} \times 0.9585019) + (\text{Ni \%} \times 2.1253983) + (\text{Co g/t} \times 0.0005450912) + (\text{Rh g/t} \times 6.1544715)$

14.7 Mineral Resource Classification

The Mineral Resource Estimate was classified in accordance with the 2014 CIM Definition Standards and 2019 CIM Best Practice Guidelines. Mineral Resource classifications were assigned to regions of the block model based on the QPs confidence and judgment related to geological understanding, continuity of mineralization in conjunction with data quality, spatial continuity based on variography, estimation pass, data density, and block model representativeness, specifically drill and chip assay spacing and abundance, kriging variance (KV), and search volume block estimation assignment.

All resources must have "reasonable prospects for eventual economic extraction." A Mineral Resource is an inventory of mineralization that under realistically assumed and justifiable technical and economic conditions might become economically extractable.

Wireframes were manually built for the purpose of classification (Measured, Indicated, and Inferred), which were applied to the block model. Classification wireframes were built based on the following criteria:

- Measured: No material was determined to classify as Measured for either deposit.
- Indicated:
  - Within approximately 20 m of a moderate amount of drill sampling, and,
  - Area search volume block estimation equal to 1 or 2 (estimation occurs within the first or second search pass).
- Inferred: It was deemed appropriate to assign the classification of Inferred to all remaining blocks. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

The KV is a quantitative measure of the smoothness of the kriging estimates where KV=0 indicates zero variance and KV=1 indicates total variance. Figure 14-32 and Figure 14-33 display the Pt KV in cross section.

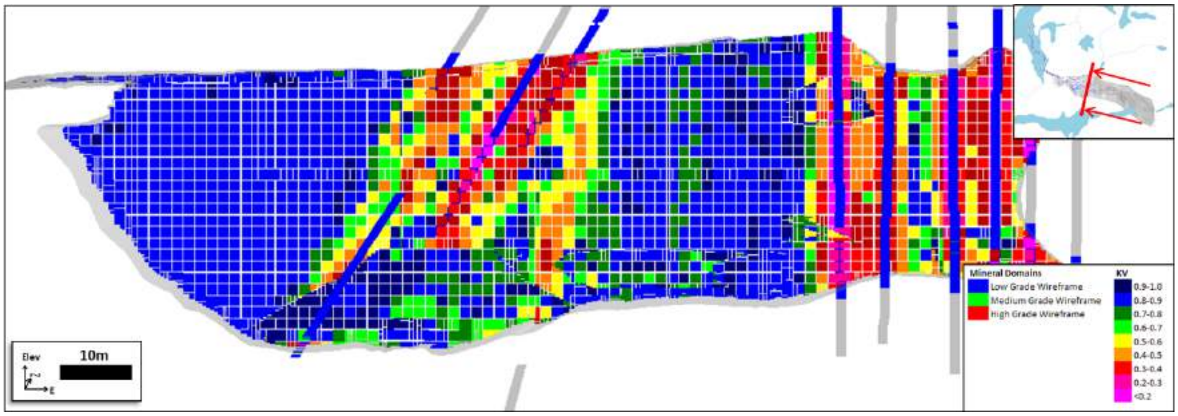


Figure 14-32: Cross section of the Current deposit, Pt KV

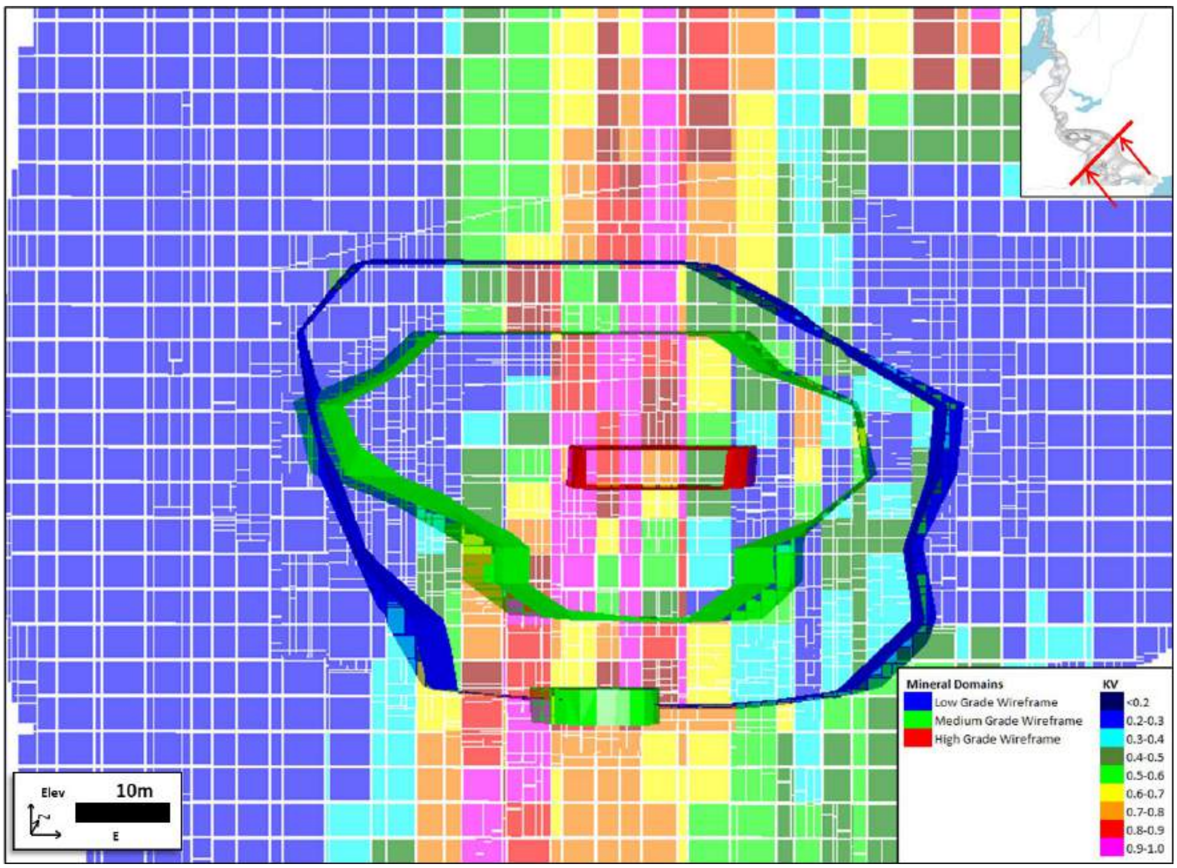


Figure 14-33: Cross section of the Escape deposit, Pt KV

Figure 14-34 and Figure 14-35 demonstrate classification for the Current deposit. Figure 14-36 and Figure 14-37 demonstrate classification for the Escape deposit.

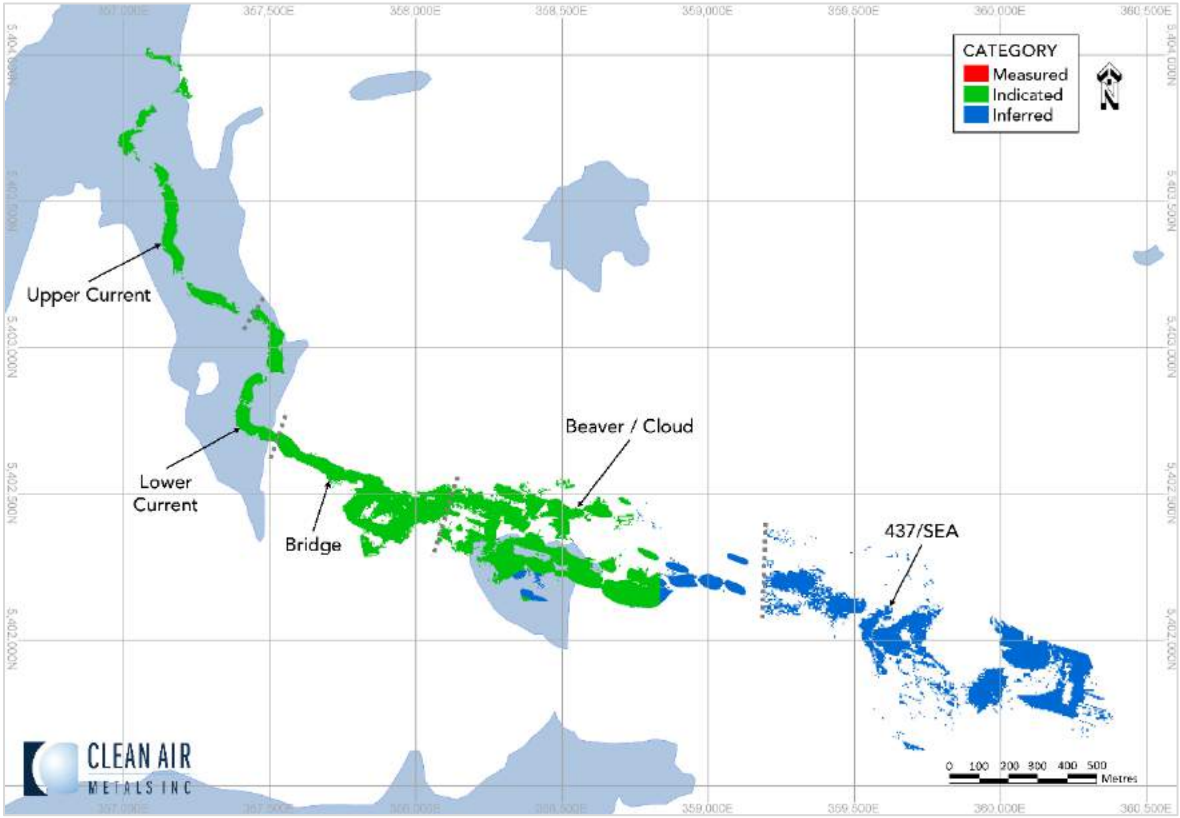


Figure 14-34: Plan section showing the Current deposit categorizations

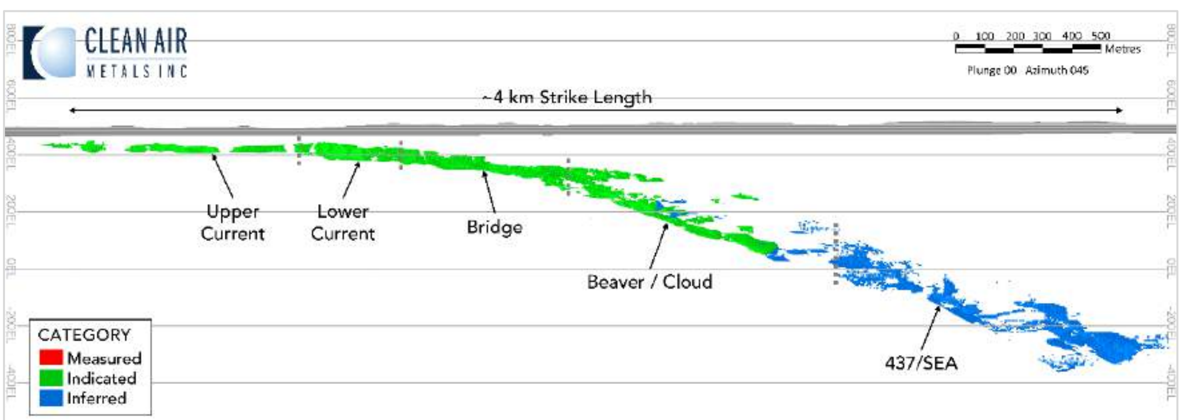


Figure 14-35: Cross section showing the Current deposit categorizations

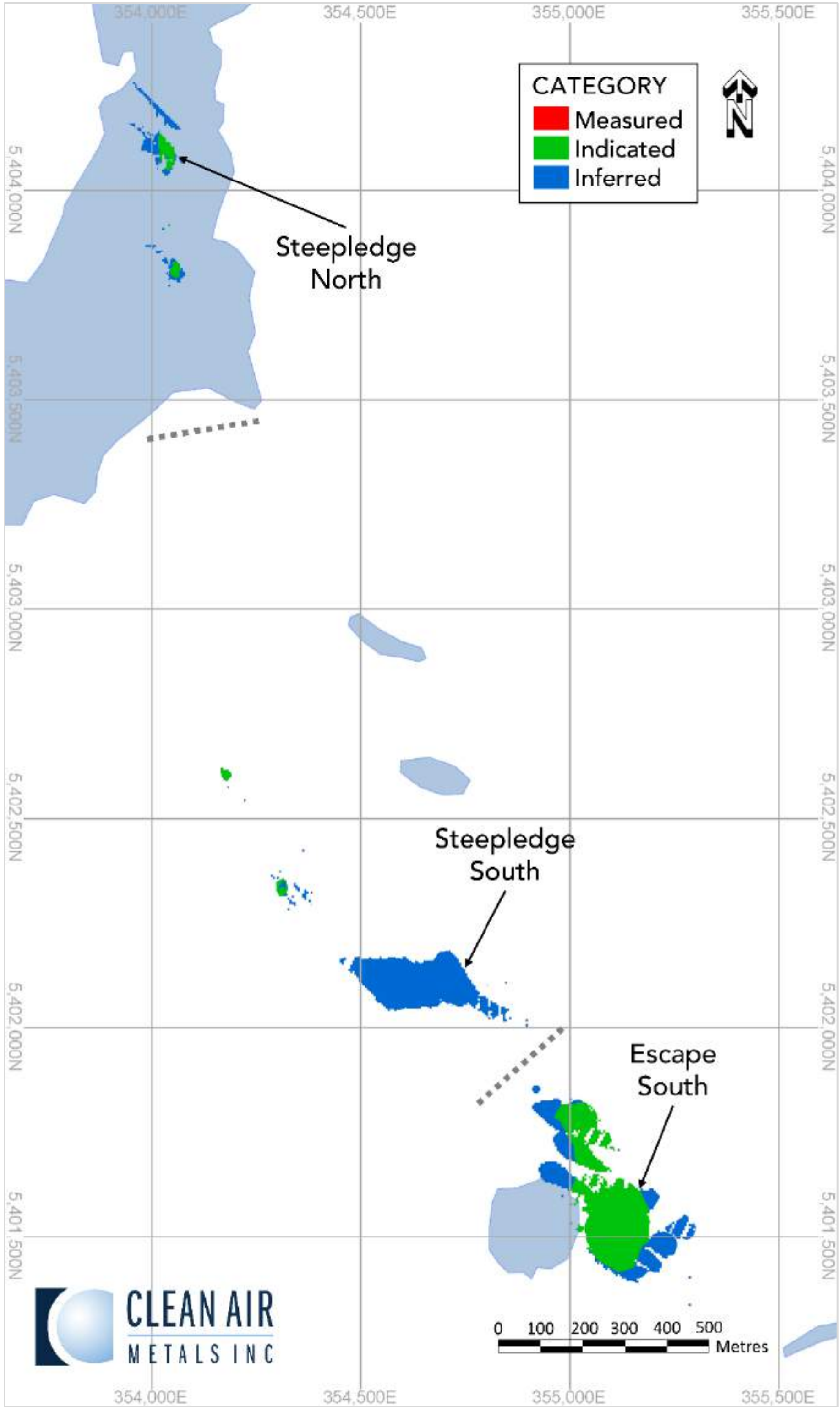


Figure 14-36: Plan view showing Escape deposit categorizations

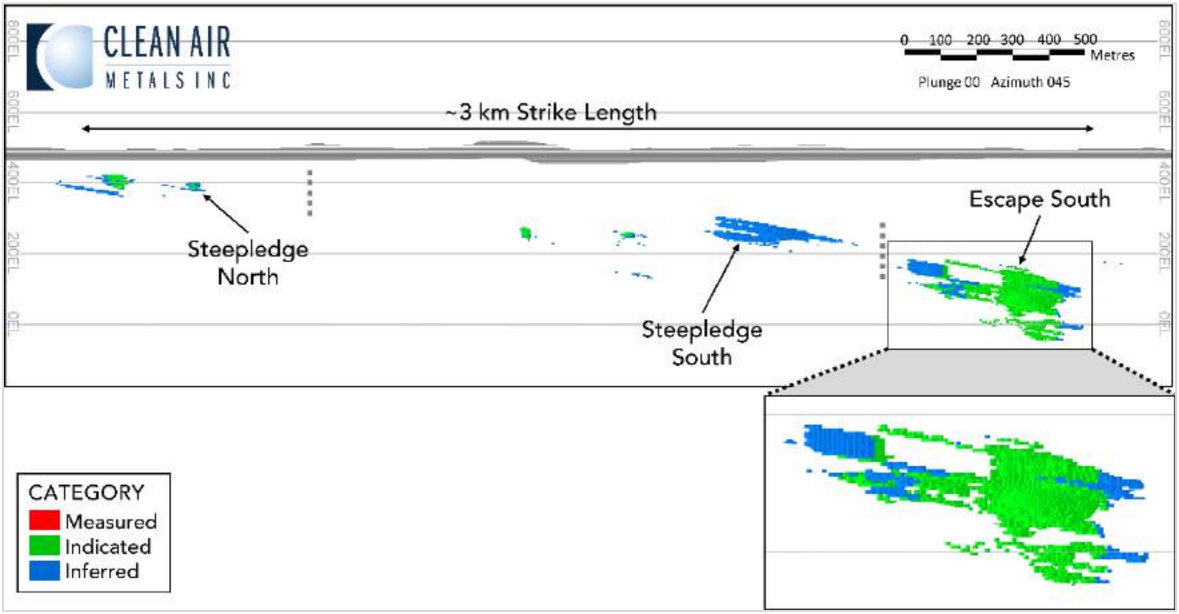


Figure 14-37: Cross section showing Escape deposit categorization

14.8 Reasonable Prospects of Eventual Economic Extraction

Reasonable prospects assumptions include:

- Underground Mineral Resources were prepared in accordance with NI 43-101 and the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014) and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (2019). Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. This estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.
- Underground Mineral Resources are based on a 2-year trailing price deck (Table 14-18) as of September 30, 2021.
- Resource excludes all material immediately below Current Lake, above a minimum crown pillar thickness of 20 m which is assumed to be not recoverable by underground methods.
- Minor variations may occur during the addition of rounded numbers.
- Calculations used metric units metres (m), tonnes (t) and grams/tonne (g/t).
- Assays were variably capped on a domain by domain basis.
- SG was applied using Ordinary Kriging (OK) estimation.
- Mineral Resource effective date November 1, 2021.
- All figures are rounded to reflect the relative accuracy of the estimates; totals may not add correctly.
- Reported from within a mineralization envelope accounting for mineral continuity.

Table 14-18: Commodity Prices Used in the Resource Calculation

Commodity	Units	Assumption (USD$)
Pd	per oz	$2,214.00
Pt	per oz	$969.00
Ag	per oz	$21.60
Au	per oz	$1,723.00
Cu	per lb	$3.094828
Ni	per lb	$6.862523
Co	per tonne	$38,790.40
Rh	per oz	$13,626.00

14.8.1 Input Parameters for Resource Calculation

Mining Cutoff Grade

The cutoff value used for the Current Mineral Resource is US$93/tonne (C$121/tonne) insitu contained value for indicated and inferred resources. The cutoff value used for the Escape Mineral Resource is US$100/tonne (C$130/tonne) insitu contained value for indicated and inferred resources. The cutoff value is calculated based on estimations as follows: direct mining operating cost, onsite milling operating cost, tailings management facility operating cost, indirect operating cost, G&A cost, onsite milling metal recoveries, offsite smelting metal recoveries, and smelter metal payable percentages.

Estimated operating costs, onsite estimated mill metal recoveries, offsite estimated smelting metal recoveries and estimated smelter payable percentages used for Mineral Resource cutoff grade calculations are summarized in Table 14-19. For resource cutoff calculation purposes, a mining recovery of 100.0% and 0.0% mining dilution were applied.

.

Table 14-19: Mineral Resource Estimate Cutoff Grade Calculation Parameters

Parameter	Unit	Value Current Deposit	Value Escape Deposit
Currency Used for Evaluation	$	CAD	CAD
Mill Daily Throughput/Mining Rate	t/d	3600	3600
LHOS Component	%	75	75
Drift and Fill Component	%	25	25
Direct Mining Cost	$/t mill feed	30	31
Milling / WSF Cost	$/t mill feed	21	21
Indirect / G&A Cost	$/t mill feed	10	10
Transportation to Refinery Charges	$/t mill feed	5	4
Royalties	%	1.3	1.5
Milling Recovery	%	77	77
Smelter Recovery and Payables	%	73	68
Insitu Contained Value Cutoff (C$)	$/t mill feed	121	130
Insitu Contained Value Cutoff (US$)	$/t mill feed	93	100

14.9 Mineral Resource Estimate

The Mineral Resources were classified using the 2014 CIM Definition Standards and the 2019 CIM Best Practice Guidelines. The Current deposit contains an Indicated Mineral Resource of 10,388,964 tonnes at US$93/tonne contained value and an Inferred Mineral Resource of 5,274,798 tonnes at US$93/tonne contained value and has an effective date of November 1, 2021. The Escape deposit contains an Indicated Mineral Resource of 4,164,360 tonnes at US$100/tonne contained value and an Inferred Mineral Resource of 2,802,798 tonnes at US$100/tonne contained value (Table 14-20 and Table 14-21) and has an effective date of January 18, 2021.

Table 14-20: Thunder Bay North Project Mineral Resource Estimate, Grade and Tonnage

Category	Tonnes	Pt (g/t)	Pd (g/t)	Au (g/t)	Ag (g/t)	Rh (g/t)	Co (g/t)	Cu (%)	Ni (%)	Pt Eq (g/t)	Pd Eq (g/t)	4PGE[1] (g/t)
Indicated Current Deposit	10,388,964	1.67	1.84	0.09	2.23	0.05	150	0.38	0.21	8.32	3.64	3.65
Indicated Escape Deposit	4,164,360	1.20	0.94	0.12	2.47	0.06	209	0.52	0.28	7.61	3.33	2.33
TOTAL INDICATED RESOURCE	**14,553,324**	**1.54**	**1.58**	**0.10**	**2.30**	**0.05**	**167**	**0.42**	**0.23**	**8.12**	**3.55**	**3.27**
Inferred Current Deposit	5,274,798	0.62	0.65	0.07	1.05	0.01	118	0.32	0.14	3.83	1.68	1.35
Indicated Escape Deposit	2,802,798	0.81	0.70	0.07	1.10	0.00	176	0.34	0.17	4.52	1.98	1.59
TOTAL INFERRED RESOURCE	**8,077,595**	**0.69**	**0.67**	**0.07**	**1.07**	**0.01**	**138**	**0.33**	**0.15**	**4.07**	**1.78**	**1.43**

[1]4PGE (g/t) = Pd (g/t) + Pt (g/t) + Au (g/t) + Rh (g/t)

Table 14-21: Thunder Bay North Project Mineral Resource Estimate, Contained Metal

Category	Tonnes	Pt (oz)	Pd (oz)	Au (oz)	Ag (oz)	Rh (oz)	Co (Tonnes)	Cu (Tonnes)	Ni (Tonnes)	Pt Eq (oz)	Pd Eq (oz)	4PGE[1] (oz)
Indicated Current Deposit	10,388,964	558,288	615,331	30,860	744,401	15,248	1,563	39,385	21,405	2,780,251	1,216,830	1,219,727
Indicated Escape Deposit	4,164,360	161,229	126,095	16,462	330,980	8,264	873	21,742	11,726	1,018,330	445,692	312,050
TOTAL INDICATED RESOURCE	**14,553,324**	**719,518**	**741,426**	**47,322**	**1,075,381**	**23,511**	**2,435**	**61,126**	**33,131**	**3,798,581**	**1,662,522**	**1,531,777**
Inferred Current Deposit	5,274,798	105,882	110,695	11,106	177,307	1,654	625	16,914	7,124	650,277	284,606	229,337
Inferred Escape Deposit	2,802,798	73,248	63,134	6,403	99,395	70	494	9,414	4,885	407,369	178,293	142,855
TOTAL INFERRED RESOURCE	**8,077,595**	**179,130**	**173,829**	**17,508**	**276,702**	**1,724**	**1,119**	**26,329**	**12,009**	**1,057,646**	**462,899**	**372,191**

[1]4PGE (oz) = Pd (oz) + Pt (oz) + Au (oz) + Rh (oz)

Mineral Resource Estimate Notes

1. Underground Mineral Resources were prepared in accordance with NI 43-101 and the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014) and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (2019). Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. This estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.
2. Underground Mineral Resources are based on a 2-year trailing price deck as of September 30, 2021.
3. Resource excludes all material immediately below Current Lake, above a minimum crown pillar thickness of 20 m which is assumed to be not recoverable by underground methods.
4. Minor variations may occur during the addition of rounded numbers.
5. Calculations used metric units metres (m), tonnes (t) and grams/tonne (g/t).
6. Assays were variably capped on a domain by domain basis
7. SG was applied using Ordinary Kriging (OK) estimation
8. Mineral Resource effective date November 1, 2021
9. All figures are rounded to reflect the relative accuracy of the estimates and totals may not add correctly.
10. Reported from within a mineralization envelope accounting for mineral continuity.

14.9.1 Current Deposit by Geological Domain

Table 14-22 and Table 14-23 outline the Mineral Resources for the Current deposit by geological domain.

Table 14-22: Current Deposit Mineral Resource Estimate, Grade and Tonnage Summary by Geological Domain

Category	Geological Domain	Tonnes	Pt (g/t)	Pd (g/t)	Au (g/t)	Ag (g/t)	Rh (g/t)	Co (g/t)	Cu (%)	Ni (%)	Pt Eq (g/t)	Pd Eq (g/t)	4 PGE (g/t)
Indicated Current Deposit	Upper	1,123,518	1.54	1.67	0.10	2.29	1.54	155.30	0.41	0.21	8.19	3.58	3.37
	Current	1,574,152	2.38	2.56	0.13	2.99	2.38	159.05	0.52	0.23	11.49	5.03	5.12
	Bridge	3,261,258	1.90	2.14	0.11	2.77	1.90	148.33	0.47	0.20	9.37	4.10	4.20
	Beaver	3,592,490	1.39	1.54	0.06	1.61	1.39	147.57	0.27	0.22	6.90	3.02	3.03
	Cloud	837,545	0.83	0.88	0.05	1.28	0.83	151.67	0.27	0.20	4.72	2.06	1.80
	437-SE	0	-	-	-	-	-	-	-	-	-	-	
TOTAL CURRENT DEPOSIT INDICATED RESOURCE		**10,388,964**	**1.67**	**1.84**	**0.09**	**2.23**	**0.05**	**150**	**0.38**	**0.21**	**8.32**	**3.64**	**3.65**
Inferred Current Deposit	Upper	0	-	-	-	-	-	-	-	-	-	-	
	Current	0	-	-	-	-	-	-	-	-	-	-	
	Bridge	0	-	-	-	-	-	-	-	-	-	-	
	Beaver	505,794	0.84	0.88	0.06	1.66	0.02	151	0.27	0.20	4.72	2.06	1.80
	Cloud	0	-	-	-	-	-	-	-	-	-	-	
	437-SE	4,769,004	0.60	0.63	0.07	0.98	0.01	115	0.33	0.13	3.74	1.64	1.31
TOTAL CURRENT DEPOSIT INFERRED RESOURCE		**5,274,798**	**0.62**	**0.65**	**0.07**	**1.05**	**0.01**	**118**	**0.32**	**0.14**	**3.83**	**1.68**	**1.35**

Table 14-23: Current Deposit Mineral Resource Estimate, Contained Metal by Geological Domain

Category	Geological Domain	Tonnes	Pt (oz)	Pd (oz)	Au (oz)	Ag (oz)	Rh (oz)	Co (Tonnes)	Cu (Tonnes)	Ni (Tonnes)	Pt Eq (oz)	Pd Eq (oz)	4 PGE (g/t)
Indicated Current Deposit	Upper Current	1,123,518	55,607	60,222	3,568	82,691	2,420	174	4,628	2,309	295,814	129,469	121,817
	Current	1,574,152	120,255	129,778	6,507	151,304	2,715	250	8,107	3,627	581,322	254,427	259,255
	Bridge	3,261,258	199,559	224,187	11,958	290,047	4,880	484	15,358	6,412	982,764	430,126	440,584
	Beaver	3,592,490	160,524	177,526	7,401	185,975	4,033	530	9,574	7,834	797,121	348,875	349,484
	Cloud	505,794	13,618	14,268	995	27,012	329	77	1,369	1,035	76,677	33,559	48,588
	437-SE	0	-	-	-	-	-	-	-	-	-	-	-
TOTAL CURRENT DEPOSIT INDICATED RESOURCE		**10,388,964**	**558,288**	**615,331**	**30,860**	**744,401**	**15,248**	**1,563**	**39,385**	**21,405**	**2,780,251**	**1,216,830**	**1,219,727**
Inferred Current Deposit	Upper Current	0	-	-	-	-	-	-	-	-	-	-	-
	Current	0	-	-	-	-	-	-	-	-	-	-	-
	Bridge	0	-	-	-	-	-	-	-	-	-	-	-
	Beaver	505,794	13,618	14,268	995	27,012	329	77	1,369	1,035	76,677	33,559	29,211
	Cloud	0	-	-	-	-	-	-	-	-	-	-	-
	437-SE	4,769,004	92,264	96,427	10,111	150,294	1,324	548	15,545	6,089	573,599	251,047	200,126
TOTAL CURRENT DEPOSIT INFERRED RESOURCE		**8,077,595**	**179,130**	**173,829**	**17,508**	**276,702**	**1,724**	**1,119**	**26,329**	**12,009**	**1,057,646**	**462,899**	**229,337**

14.9.2 Escape Deposit by Geological Domain

Table 14-24 and Table 14-25 outline the Mineral Resources for the Escape deposit by geological domain.

Table 14-24: Escape Deposit Mineral Resource Estimate, Grade and Tonnage Summary by Geological Domain

Category	Geological Domain	Tonnes	Pt (g/t)	Pd (g/t)	Au (g/t)	Ag (g/t)	Rh (g/t)	Co (g/t)	Cu (%)	Ni (%)	Pt Eq (g/t)	Pd Eq (g/t)	4 PGE (g/t)
Indicated Escape Deposit	Steepledge North	124,611	0.84	0.73	0.06	1.30	0.01	157.85	0.29	0.18	4.63	2.03	1.65
	Steepledge South	42,812	1.05	0.89	0.05	1.15	0.00	142.66	0.28	0.17	5.02	2.20	2.00
	Escape South Perimeter	1,672,990	0.62	0.51	0.08	1.47	0.04	176.82	0.37	0.21	4.69	2.05	1.25
	Escape South HGZ	2,323,948	1.67	1.28	0.16	3.31	0.08	238.05	0.66	0.34	9.99	4.37	3.18
TOTAL ESCAPE DEPOSIT INDICATED RESOURCE		**4,164,360**	**1.20**	**0.94**	**0.12**	**2.47**	**0.06**	**209.56**	**0.52**	**0.28**	**7.61**	**3.33**	**2.33**
Inferred Escape Deposit	Steepledge North	97,464	0.59	0.50	0.05	0.58	0.00	149.59	0.27	0.21	3.74	1.64	1.15
	Steepledge South	1,990,612	0.90	0.78	0.07	1.18	0.00	177.16	0.33	0.17	4.74	2.07	1.75
	Escape South Perimeter	649,938	0.62	0.50	0.08	0.92	0.00	176.30	0.35	0.19	4.03	1.76	1.20
	Escape South HGZ	64,784	0.53	0.40	0.09	1.43	0.01	186.07	0.36	0.20	4.01	1.75	1.03
TOTAL ESCAPE DEPOSIT INFERRED RESOURCE		**2,802,798**	**0.81**	**0.70**	**0.07**	**1.10**	**0.00**	**176**	**0.34**	**0.17**	**4.52**	**1.98**	**1.59**

Table 14-25: Escape Deposit Mineral Resource Estimate, Contained Metal by Geological Domain

Category	Geological Domain	Tonnes	Pt (oz)	Pd (oz)	Au (oz)	Ag (oz)	Rh (oz)	Co (tonnes)	Cu (tonnes)	Ni (tonnes)	Pt Eq (oz)	Pd Eq (oz)	4 PGE (g/t)
Indicated Escape Deposit	Steepledge North	124,611	3,379	2,931	250	5,200	45	20	359	218	18,560	8,123	6,604
	Steepledge South	42,812	1,448	1,223	75	1,581	0	6	119	72	6,913	3,026	2,746
	Escape South Perimeter	1,672,990	31,966	26,451	4,382	76,875	2,129	294	6,027	3,425	246,577	107,919	67,090
	Escape South HGZ	2,323,948	124,437	95,491	11,754	247,325	6,090	553	15,236	8,010	746,281	326,624	237,772
TOTAL ESCAPE DEPOSIT INDICATED RESOURCE		**4,164,360**	**161,229**	**126,095**	**16,462**	**330,980**	**8,264**	**873**	**21,742**	**11,726**	**1,018,330**	**445,692**	**312,050**
Inferred Escape Deposit	Steepledge North	97,464	1,846	1,578	169	1,805	0	15	260	204	11,730	5,134	3,594
	Steepledge South	1,990,612	57,381	50,208	4,410	75,364	0	353	6,613	3,308	303,144	132,677	111,999
	Escape South Perimeter	1,672,990	12,913	10,507	1,647	19,252	41	115	2,306	1,242	84,146	36,828	25,115
	Escape South HGZ	64,784	1,108	841	177	2,975	29	12	235	131	8,350	3,655	2,155
TOTAL ESCAPE DEPOSIT INFERRED RESOURCE		**2,802,798**	**73,248**	**63,134**	**6,403**	**99,395**	**70**	**494**	**9,414**	**4,885**	**407,369**	**178,293**	**142,855**

14.10 Cautionary Statement Regarding Mineral Resource Estimates

The information contained herein contains "forward-looking statements" within the meaning of applicable securities legislation, including statements regarding the potential of the Project and the Escape and Current deposits and timing of technical studies (include the PEA) and Mineral Resource Estimates. Forward-looking statements relate to information that is based on assumptions of management, forecasts of future results, and estimates of amounts not yet determinable. Any statements that express predictions, expectations, beliefs, plans, projections, objectives, assumptions or future events or performance are not statements of historical fact and may be "forward-looking statements." Forward-looking statements are subject to a variety of risks and uncertainties which could cause actual events or results to differ from those reflected in the forward-looking statements, including, without limitation: political and regulatory risks associated with mining and exploration; risks related to the maintenance of stock exchange listings; risks related to environmental regulation and liability; the potential for delays in exploration or development activities or the completion of feasibility studies; the uncertainty of profitability; risks and uncertainties relating to the interpretation of drill results, the geology, grade and continuity of mineral deposits; risks related to the inherent uncertainty of production and cost estimates and the potential for unexpected costs and expenses; results of prefeasibility and feasibility studies, and the possibility that future exploration, development or mining results will not be consistent with the Company's expectations; risks related to con price fluctuations; and other risks and uncertainties related to the Company's prospects, properties and business detailed elsewhere in the Company's disclosure record.

Should one or more of these risks and uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those described in forward-looking statements. Investors are cautioned against attributing undue certainty to forward-looking statements. These forward-looking statements are made as of the date hereof and the Company does not assume any obligation to update or revise them to reflect new events or circumstances, except in accordance with applicable securities laws. Actual events or results could differ materially from the Company's expectations or projection.

14.11 Mineral Resource Sensitivity to Reporting Cutoff

Reports on the block models were generated to reflect the Mineral Resource sensitivity to reporting cutoff, as seen in Table 14-26 (Indicated) and Table 14-27 (Inferred).

Table 14-26: Mineral Resource Sensitivity to Reporting Cutoff, Indicated

Category	Cutoff Insitu ($/t)	Tonnes	Pt (g/t)	Pd (g/t)	Au (g/t)	Ag (g/t)	Rh (g/t)	Co (g/t)	Cu (%)	Ni (%)	Pt Eq (g/t)	Pd Eq (g/t)
Indicated Current Deposit	77	15,191,639	1.55	1.41	0.08	1.95	0.04	146	0.33	0.19	7.19	3.15
	86	13,143,362	1.73	1.57	0.09	2.11	0.05	148	0.36	0.20	7.91	3.46
	93	**11,879,626**	**1.87**	**1.70**	**0.09**	**2.22**	**0.05**	**150**	**0.38**	**0.20**	**8.44**	**3.69**
	100	10,880,057	2.00	1.81	0.10	2.33	0.05	151	0.40	0.21	8.93	3.91
	110	9,755,864	2.16	1.96	0.10	2.46	0.05	153	0.42	0.22	9.58	4.19
	120	8,878,497	2.32	2.12	0.11	2.65	0.05	155	0.41	0.22	9.91	4.48
Indicated Escape Deposit	77	5,932,329	0.72	0.92	0.07	1.51	0.02	188	0.33	0.20	5.05	2.21
	86	5,116,115	0.81	1.03	0.11	2.21	0.06	201	0.47	0.26	6.75	2.95
	93	4,639,233	0.87	1.11	0.12	2.33	0.06	205	0.50	0.27	7.14	3.13
	100	**4,164,360**	**0.94**	**1.20**	**0.12**	**2.47**	**0.06**	**210**	**0.52**	**0.28**	**7.61**	**3.33**
	110	3,515,820	1.07	1.37	0.13	2.66	0.07	216	0.56	0.30	8.39	3.67
	120	2,995,727	1.21	1.55	0.14	2.86	0.07	222	0.59	0.31	9.21	4.03

Table 14-27: Mineral Resource Sensitivity to Reporting Cutoff, Inferred

Category	Cutoff Insitu ($/t)	Tonnes	Pt (g/t)	Pd (g/t)	Au (g/t)	Ag (g/t)	Rh (g/t)	Co (g/t)	Cu (%)	Ni (%)	Pt Eq (g/t)	Pd Eq (g/t)
Inferred Current Deposit	77	8,301,417	0.56	0.53	0.06	0.94	0.01	120	0.27	0.13	3.41	1.49
	86	6,097,335	0.60	0.63	0.06	1.02	0.01	119	0.30	0.13	3.70	1.62
	93	**5,274,818**	**0.65**	**0.62**	**0.07**	**1.05**	**0.01**	**118**	**0.32**	**0.14**	**3.83**	**1.68**
	100	4,840,267	0.67	0.64	0.07	1.05	0.01	120	0.32	0.14	3.90	1.71
	110	3,256,414	0.72	0.69	0.07	1.09	0.01	123	0.33	0.14	4.11	1.80
	120	1,188,886	0.94	0.90	0.07	1.24	0.02	138	0.31	0.16	5.02	2.20
Inferred Escape Deposit	77	5,347,493	0.54	0.62	0.06	1.03	0.00	162	0.28	0.17	3.71	1.62
	86	4,227,441	0.60	0.69	0.06	1.07	0.00	167	0.30	0.17	4.00	1.75
	93	3,405,362	0.65	0.75	0.07	1.11	0.00	172	0.32	0.17	4.27	1.87
	100	**2,802,798**	**0.70**	**0.81**	**0.07**	**1.10**	**0.00**	**176**	**0.34**	**0.17**	**4.52**	**1.98**
	110	2,220,097	0.77	0.90	0.07	1.11	0.00	181	0.35	0.18	4.83	2.11
	120	1,706,029	0.84	0.99	0.08	1.15	0.00	187	0.36	0.18	5.17	2.26

14.12 Comparison with the Previous Resource Estimate

The previous Mineral Resource Estimate completed by Nordmin in March 2021, reported as an Underground Mineral Resource Statement. The March 2021 Current Underground Mineral Resource Estimate includes all December 2021 domains (Upper Current, Current, Bridge, Beaver, Cloud Zone and 437/SEA). The March 2021 Mineral Resource Estimate used both palladium equivalency as well as insitu US$/tonne value. The December 2021 Mineral Resource Estimate is based solely off an insitu US$/tonne contained value. A comparison between the March 2021 and the December 2021 Mineral Resource Estimates are present in Table 14-28 and Table 14-29. The March 2021 insitu cutoff grade was US$77/tonne contained value for the Underground Mineral Resource Estimate, compared to the December 2021 Mineral Resource Estimate which used a US$93/tonne contained value.

The January 2021 Escape Mineral Resource Estimate and the November 2021 Escape Mineral Resource Estimate both contain estimates for Steepledge North, Steepledge South, Escape South Perimeter and Escape South HGZ. The previous estimate used an insitu US$77/tonne contained value, the same as was used for the previous Current estimate. The updated November 2021 Escape Mineral Resource Estimate insitu cutoff grade was US$100/tonne contained value for Escape deposit.

Table 14-28: 2021 Underground Mineral Resource Estimate Compared to the November 2021 Mineral Resource Estimate for the Current Deposit

March 2021 Underground Mineral Resource Estimate		Grade									Contained Metal								
Category @ Cutoff = US$77/tonne	Tonnes (x1000)	Pd (g/t)	Pt (g/t)	Au (g/t)	Ag (g/t)	Cu (%)	Ni (%)	Co (g/t)	Rh (g/t)	Pt Eq (g/t)	Pt (koz)	Pd (koz)	Au (koz)	Ag (koz)	Cu (kt)	Ni (kt)	Co (kt)	Rh (oz)	Pt Eq (oz)
Indicated	11,999	1.40	1.48	0.07	1.32	0.28	0.17	137	0.04	77	538,181	569,176	26,121	508,434	33,751	20,969	1,649	16,998	2,233,575
Inferred	6,406	0.65	0.68	0.06	0.95	0.30	0.14	123	0.01	77	133,333	140,400	12,888	195,484	19,155	9,113	785	1,836	700,621
November 2021 Underground Mineral Resource Estimate		Grade									Contained Metal								
Category @ Cutoff = US$93/tonne	Tonnes (x1000)	Pd (g/t)	Pt (g/t)	Au (g/t)	Ag (g/t)	Cu (%)	Ni (%)	Co (g/t)	Rh (g/t)	Pt Eq (g/t)	Pt (koz)	Pd (koz)	Au (koz)	Ag (koz)	Cu (kt)	Ni (kt)	Co (kt)	Rh (oz)	Pt Eq (oz)
Indicated	10,388	1.67	1.84	0.09	2.23	0.38	0.21	150.41	0.05	8.32	558,288	615,331	30,860	744,401	39,385	21,405	1,563	15,248	2,780,251
Inferred	5,274	0.62	0.65	0.07	1.05	0.32	0.14	118.46	0.01	3.83	105,882	110,695	11,106	177,307	16,914	7,124	625	1,654	650,277

Table 14-29: March 2021 Underground Mineral Resource Estimate Compared to the November 2021 Underground Mineral Resource Estimate for Escape Deposit

March 2021 Underground Mineral Resource Estimate		Grade									Contained Metal								
Category @ cutoff = US$77/tonne	Tonnes (x1000)	Pd (g/t)	Pt (g/t)	Au (g/t)	Ag (g/t)	Cu (%)	Ni (%)	Co (g/t)	Rh (g/t)	Pt Eq (g/t)	Pt (koz)	Pd (koz)	Au (koz)	Ag (koz)	Cu (kt)	Ni (kt)	Co (kt)	Rh (oz)	Pt Eq (oz)
Indicated	4,286	1.18	0.92	0.12	2.45	0.52	0.28	208.95	0.06	6.16	162,337	127,090	16,928	337,946	22,390	12,016	896	8,009	849,481
Inferred	3,445	0.73	0.64	0.07	1.13	0.33	0.18	172.63	0.00	3.75	80,989	70,520	7,754	124,809	11,293	6,046	595	71	414,932
November 2021 Underground Mineral Resource Estimate		Grade									Contained Metal								
Category @ cutoff = US$100/tonne	Tonnes (x1000)	Pd (g/t)	Pt (g/t)	Au (g/t)	Ag (g/t)	Cu (%)	Ni (%)	Co (g/t)	Rh (g/t)	Pt Eq (g/t)	Pt (koz)	Pd (koz)	Au (koz)	Ag (koz)	Cu (kt)	Ni (kt)	Co (kt)	Rh (oz)	Pt Eq (oz)
Indicated	4,164	1.20	0.94	0.12	2.47	0.52	0.28	209.56	0.06	7.61	161,229	126,095	16,462	330,980	21,742	11,726	873	8,264	1,018,330
Inferred	2,802	0.81	0.70	0.07	1.10	0.34	0.17	176.21	0.00	4.52	73,248	63,134	6,403	99,395	9,414	4,885	494	70	407,369

14.13 Factors That May Affect the Mineral Resources

Areas of uncertainty that may materially impact the Mineral Resource Estimate include:

- Changes to long to term metal price assumptions.
- Changes to the input values for mining, processing, and general, and administrative costs to constrain the estimate.
- Changes to local interpretations of mineralization geometry and continuity of mineralized zones.
- Changes to the density values applied to the mineralized zones.
- Changes to metallurgical recovery assumptions.
- Changes in assumptions of marketability of the final product.
- Variations in geotechnical, hydrogeological, and mining assumptions.
- Changes to assumptions with an existing agreement or new agreements.
- Changes to environmental, permitting, and social licence assumptions.
- Logistics of securing and moving adequate services, labour, and supplies could be affected by epidemics, pandemics and other public health crises, including COVID-19, or similar such viruses.

14.14 Comments on Section 14

The QP is not aware of any environmental, legal, title, taxation, socio to economic, marketing, political or other relevant factors that would materially affect the estimation of Mineral Resources that are not discussed in this Technical Report.

The QP is of the opinion that the Mineral Resources were estimated using industry to accepted practices and conform to the 2014 CIM Definition Standards and 2019 CIM Best Practice Guidelines. Technical and economic parameters and assumptions applied to the Mineral Resource Estimate are based on parameters received from the Company and reviewed within the Nordmin technical team to determine if they were appropriate.

15. MINERAL RESERVE ESTIMATE

This section is not relevant to this Technical Report.

16. MINING METHODS

16.1 Introduction

This section outlines the parameters and procedures used by Nordmin to perform the PEA level mine planning work for the Project at a proposed mill feed production rate of 1.296 Mtpa.

This PEA is preliminary in nature. In addition to the Measured and Indicated Resources, the mine plan presented in this section includes Inferred Mineral Resources. Inferred Mineral Resources are considered too geologically speculative to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There is no certainty that this PEA will be realized.

This PEA utilizes the Mineral Resource described in Section 14 with an effective date of November 1, 2021, that is conceptually mineable with underground mining methods. Only portions of the Mineral Resource that fall within the constraints defined by underground parameters of the PEA listed in this section are used to inform the PEA economics ("Mining Inventory").

16.2 Summary

The proposed operation involves underground mining at a rate of 3,600 t/d with an accompanying process plant with a matching 3,600 t/d capacity. Shown in Figure 16-1 is the proposed site plan with the mineable Current and Escape deposits.

The Current deposit is accessed via a portal from surface and has a 12-month pre-production development period, which allows for the Current deposit main decline system to connect to the Current main fresh air raise and provide secondary egress for the mine. Contractor decline development is assumed for the 12-month pre-production period as well as the following 2 years.

The Escape deposit is accessed via a separate portal from surface. The main decline development begins 12 months after the Current deposit decline begins and continues for 3 years, until the decline connects with the Escape main fresh air raise. Contractor decline development is assumed for the Escape deposit.

The Current deposit pre-production development period is followed by a production ramp-up period and achieves full production (3,600 t/d) in the first quarter of Year 1. The Current deposit production commences in the Current and Bridge mining areas and continues in these areas for the first 3 years. In Year 4, the Escape deposit begins production in the high grade mining area (HGZ) at 1,800 t/d and the Current deposit production rate is reduced to 1,800 t/d. Figure 16-2 and Figure 16-3 show long sections of the proposed Current deposit and Escape deposit.

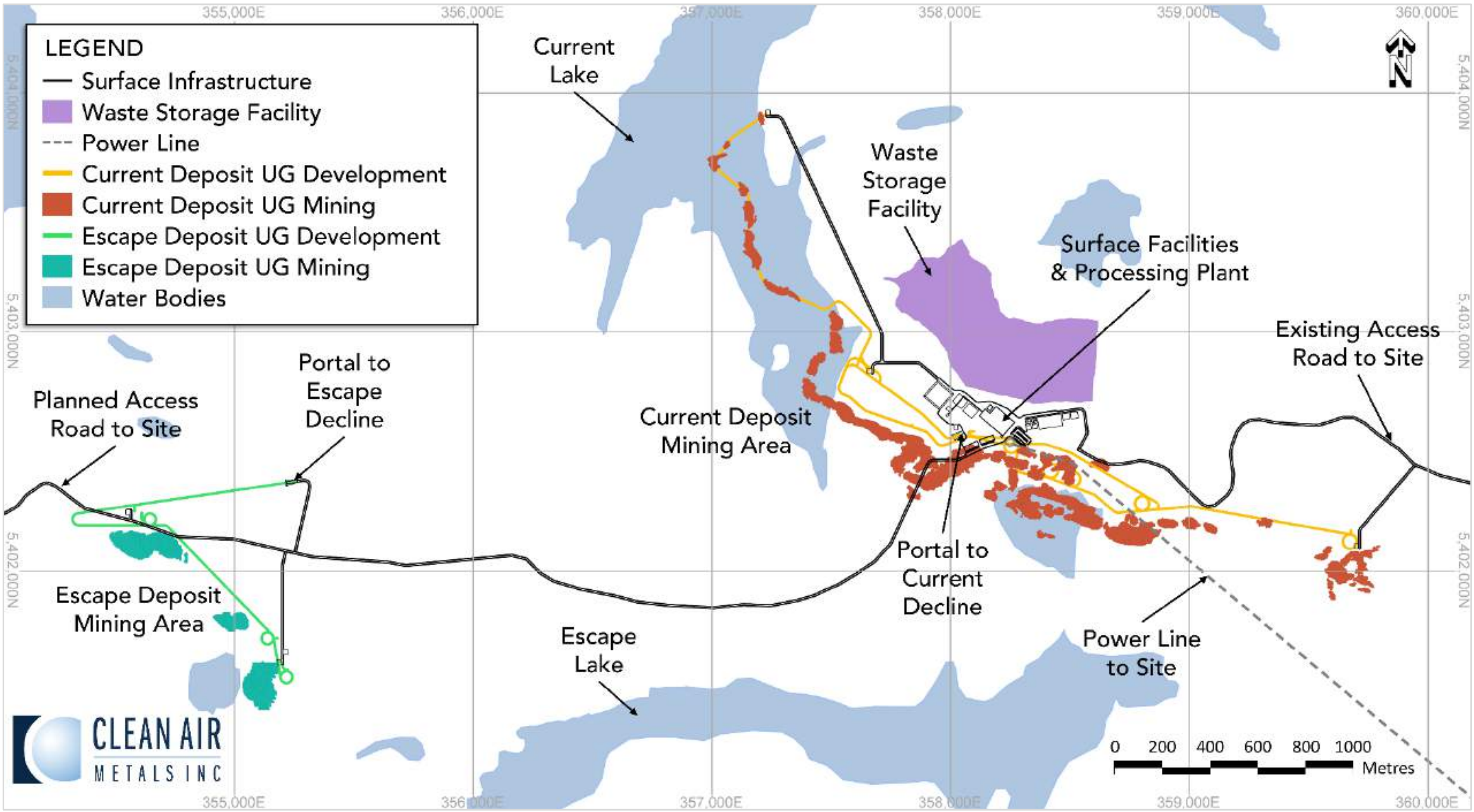


Figure 16-1: Proposed site plan with mineable Current and Escape deposits

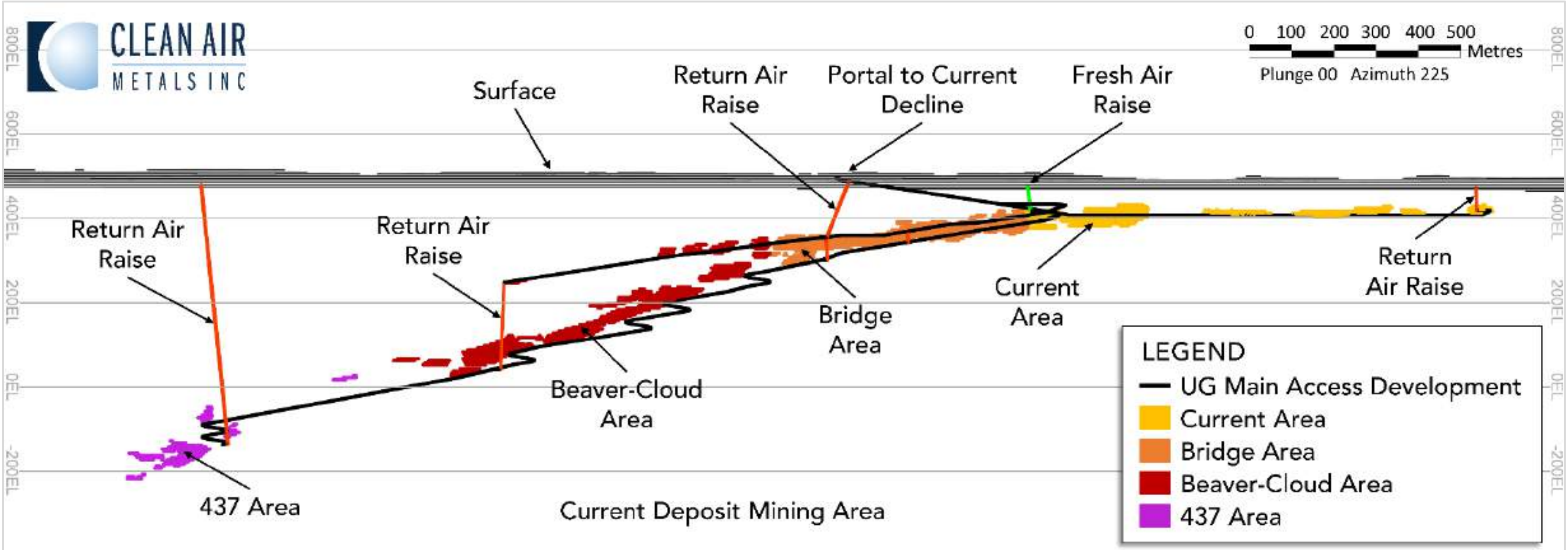


Figure 16-2: Current deposit long section (facing South-West)

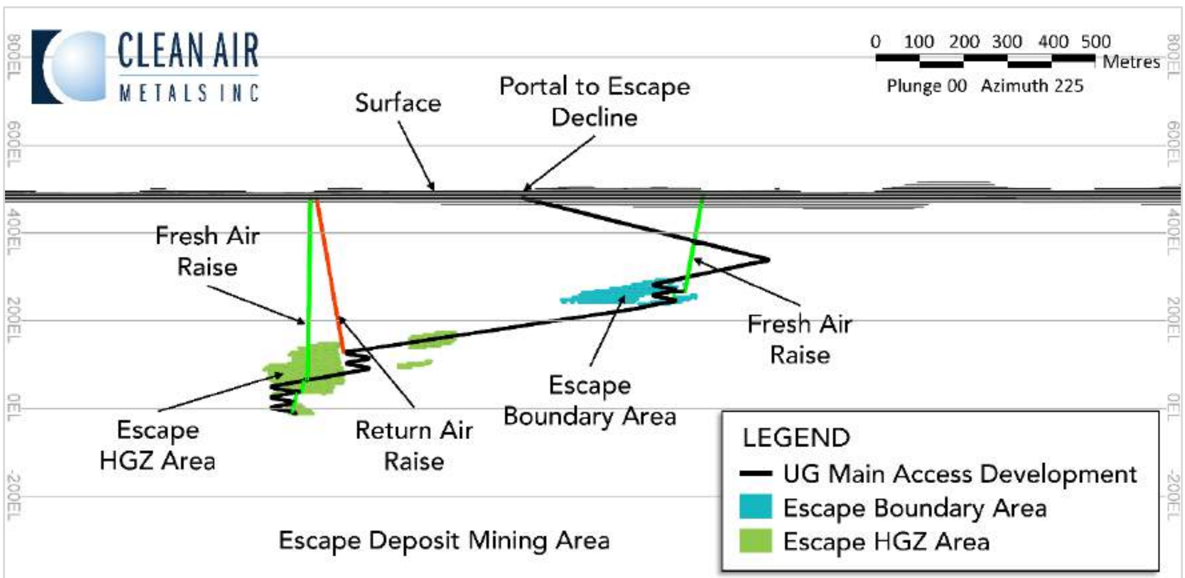


Figure 16-3: Escape deposit long section (facing South-West)

Underground production was scheduled based on 3,600 t/d mill feed and 850 t/d waste, excavated using a fleet of 10-tonne LHD, and hauled with 40-tonne trucks, using the Current and Escape declines to haul material to surface. The total LOM production is 12.3 Mt of mineralized material and 3.0 Mt of waste, with a mine life of 10 years. Table 16-1 details the LOM production plan and Figure 16-4 details the LOM production plan with waste material coloured in grey.

Table 16-1: LOM Production Plan (kt)

LOM Production (kt)	Year											Total
	-1	1	2	3	4	5	6	7	8	9	10	
LHOS Mineralized Material	94	1,209	1,129	1,097	1,069	1,127	1,235	1,208	990	1,003	178	10,338
Drift and Fill (DAF) Mineralized Material	3	44	167	199	227	169	61	88	306	293	388	1,946
Total Mineralized Material	**97**	**1,253**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**566**	**12,284**
Waste Material	226	571	583	486	202	135	126	131	211	240	98	3,008
Total Material	**323**	**1,824**	**1,879**	**1,782**	**1,498**	**1,431**	**1,422**	**1,427**	**1,507**	**1,536**	**664**	**15,292**

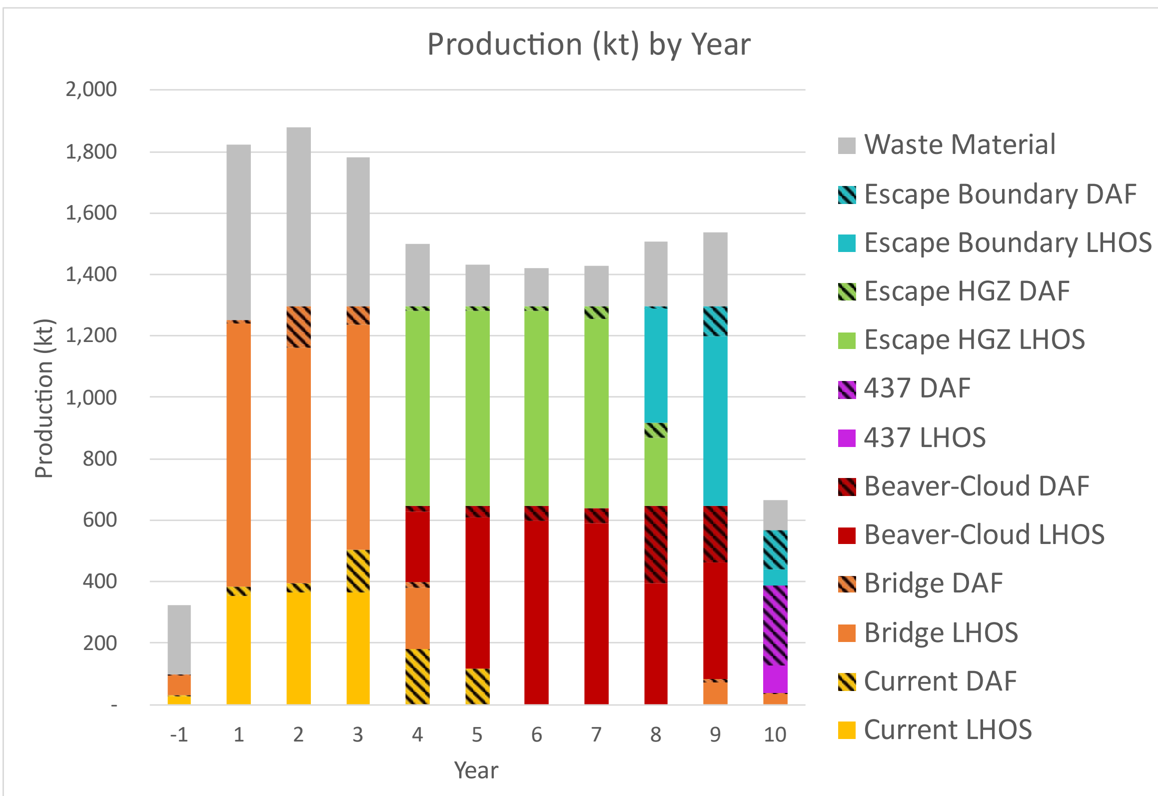


Figure 16-4: LOM production (kt) by year

The underground mining inventory was determined using Deswik's MSO software tool. The MSO uses the geological block model to generate shapes (e.g., stopes) based on economic and geometric parameters listed in Table 16-2 and Table 16-3. The mining underground inventory is a combination of five mining areas (Upper Current, Current, Bridge, Beaver-Cloud, and 437) within the Current deposit and the two mining areas (HGZ and Boundary) within the Escape deposit. The underground inventory spans along a strike length of 3.3 km and to a depth of 700 m within the Current deposit and spans along a strike length of 1 km and to a depth of 500 m within the Escape deposit. The underground stope inventory is constrained by a crown pillar, extending 30 m below the unconsolidated sentiments below Current Lake. Additional discussion regarding the crown pillar is found in Section 16.3.4.

The Current and Escape deposits will be mined via a combination of conventional underground long hole open stope and drift & fill mining methods, backfilled with a combination of CPB, CRF and URF. Stopes are designed to be accessed and excavated via overcut and undercut development cross-cut drifts, which connect to the main declines. The main declines provide ventilation, haulage to surface, and mine access.

Table 16-2: Underground Design Parameters

Parameter	Value
LHOS Size	
Length (Maximum)	20 m
Height (Maximum)	25 m
Width (Range)	5 m to 15 m
DAF Stoping Dimensions	
Height	5 m
Width	5 m
Development Drift Dimensions	
Ramp	5 m (height) x 5 m (width)
Cross-cut	4.5 m (height) x 5 m (width)
Mining Dilution & Recovery	
Underground (UG) Mining Dilution	9.6%
UG Mining Recovery	95%
Resources Used for MSO and UG Design	Measured + Indicated + Inferred

Table 16-3: Underground MSO Cutoff

Parameter	Unit	Current	Bridge	Beaver-Cloud	Boundary	HGZ
Direct Mining Cost (LHOS)	$/t mill feed	$34.7	$28.5	$30.8	$32.0	$34.5
Direct Mining Cost (DAF)	$/t mill feed	$44.0	$43.8	$46.5	$47.7	$52.9
Milling / WSF Cost	$/t mill feed	$23.0	$23.0	$23.0	$23.0	$23.0
Indirect / G&A Cost	$/t mill feed	$10.0	$10.0	$10.0	$10.0	$10.0
NSR Cutoff (LHOS)	**$/t mill feed**	**$67.7**	**$61.5**	**$63.8**	**$65.0**	**$67.5**
NSR Cutoff (DAF)	**$/t mill feed**	**$77.0**	**$76.8**	**$79.5**	**$80.7**	**$85.9**

Note: NSR calculation includes mining dilution and recovery, milling recoveries, smelter payables and deductions, royalties and transportation.

16.3 Geomechanical Evaluation

16.3.1 General

Knight Piésold provided geomechanical input for conceptual level underground mine design, including rock mass characterization, stope dimensions, stope dilution estimates, crown pillar dimensions, ground support requirements, and general rock mechanics considerations for the Current deposit.

16.3.2 Rock Mass Characterization

The large- and small-scale rock mass structures were evaluated using regional fault interpretations and surface mapping provided by Clean Air Metals. The dominant structural trends identified in the deposit include (Figure 16-5):

- Joint Set A: The dominant set is the foliation, which is sub-vertical, and strikes East-West, parallel to the regional Quetico Fault Zone and the Escape Lake Fault.
- Joint Set B: A sub-vertical set striking north south, parallel to the regional Diabase Dykes. There is limited evidence that this set may locally strike NE-SW, parallel to conjugate faults interpreted by Clean Air.
- Joint Set D: A less prominent set striking SE-NW and dipping at approximately 60° to the NE. This set is parallel to the interpreted anastomosing faults.
- Joint Set C: Sub-horizontal discontinuities were not identified in the surface mapping, though this method of data collection tends to be biased against these features. A review of the core photos suggests that a sub-horizontal set likely exists.

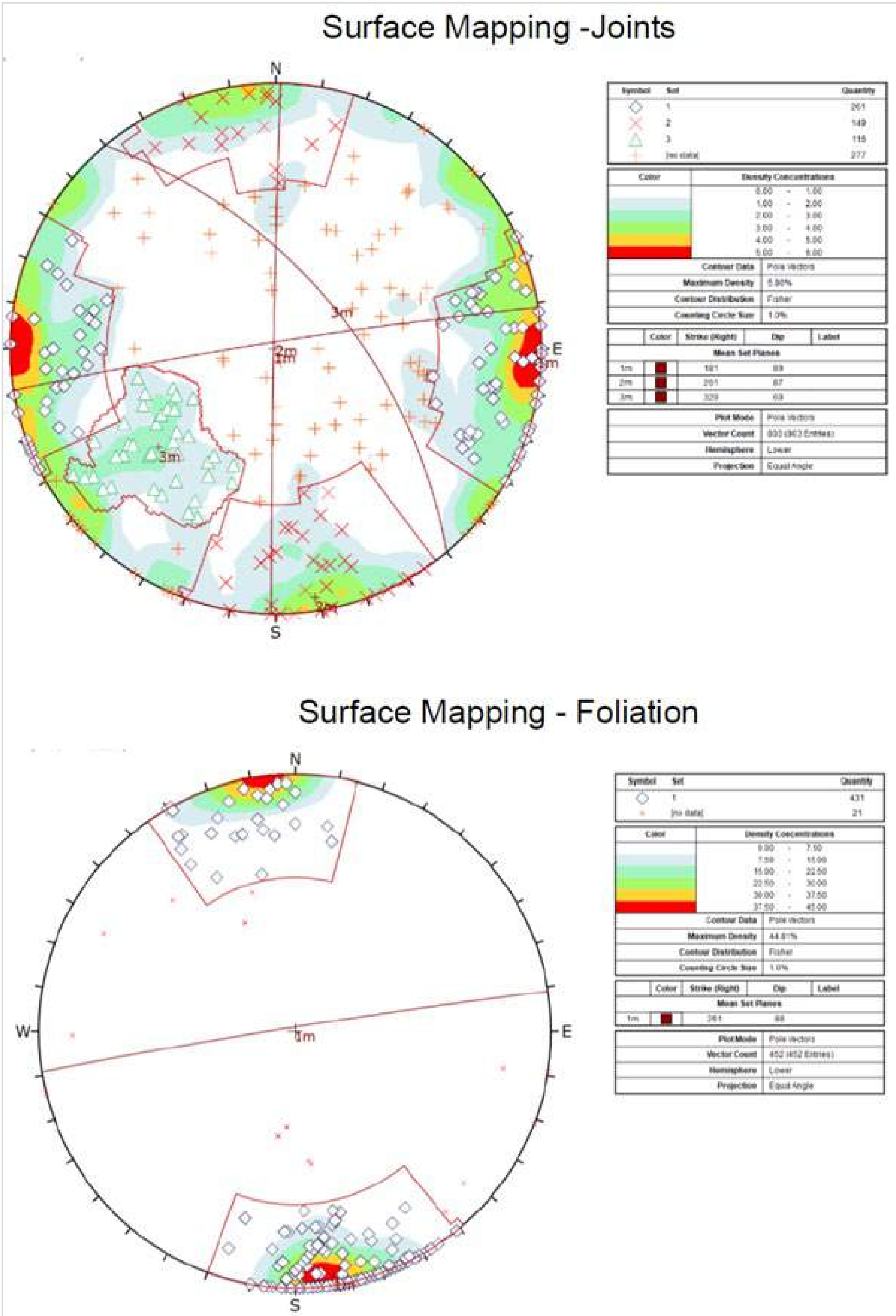


Figure 16-5: Stereonet plot of joints and foliation

The rock mass quality of the dominant lithologies forming the deposit was assessed based on observations made during a site visit, the drill hole rock quality data (RQD) database, an RQD block model developed by Nordmin, and core photos from select exploration drill holes. Rock mass quality was estimated using the Rock Mass Rating 1989 (RMR_{89}) classification system (Bieniawski, 1989). The assessment identified the following (Figure 16-6):

- The intrusion that hosts the mineralization is associated with the highest rock mass quality at the deposit. The Peridotite and Hybrid Red are of GOOD quality, with RMR89 values between 65 and 80. The Hybrid Grey is of lower and more variable quality, ranging from FAIR to GOOD (RMR89 between 55 and 70). Intervals of reduced rock mass quality are occasionally encountered within the intrusion, particularly at the contacts with the host rock or where the intrusion comes to the surface under Current Lake.
- The granitoid is the most competent of the host rocks and is of GOOD quality (RMR89 values between 60 and 75). The lower quality intervals are primarily associated with the Current Lake Zone and in the vicinity of the Quetico Fault Zone. The granitoid hosts the ramp and vent raises.
- The Sediments have lower and highly variable rock mass quality, ranging from FAIR to GOOD quality (RMR89 values between 40 and 70). The lowest quality intervals are most prominent within the Beaver mining area.
- The breccia is associated with the lowest rock mass quality at the deposit, ranging from POOR to FAIR (RMR89 values between 35 and 55). The breccia overlies the intrusion and is most prominent within the Bridge mining area and Beaver mining area.

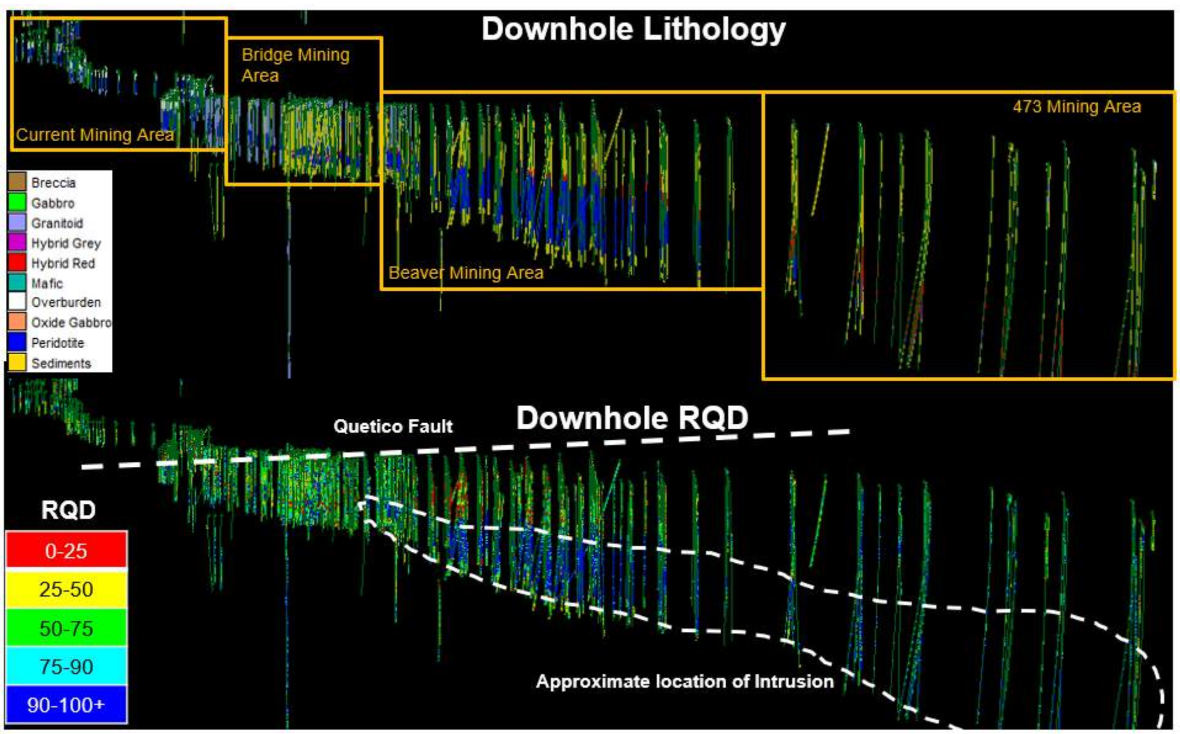


Figure 16-6: RQD long section

16.3.3 Stope Dimensions

Recommendations for stope dimensions and dilution were determined using empirical methods for the two proposed mining methods.

1. DAF Stopes: Stopes with a span of 5 m were recommended to allow the stopes to be developed with standard ground support and development practices (e.g., without the systematic use of cable bolts). A wide range of lithologies, rock mass qualities, and conditions was considered.
2. Transverse Open Stopes: Stopes with a height of 30 m (25 m sub-level spacing and 5 m high overcut), strike length of 15 m and hanging wall-footwall width of 15 m are expected to be achievable. This assumes a vertical stope within the peridotite and the Hybrid units.

External dilution due to geomechanical factors was estimated for the open stopes using the Equivalent Linear Overbreak/Slough (ELOS) Method (Capes, 2009 & Clark, 1997 & 1998). The analyses suggest that the dilution will be approximately 0.5 m for the hanging wall and 1 m in the end walls. Slightly less dilution was predicted in the end walls within the Current mining area (0.5 m to 1 m).

16.3.4 Crown Pillar Dimensions

The proposed mine plan extends under Current Lake, and design guidance was provided on the minimum thickness of the crown pillar between the lake and the underground mine workings. The mineralization below Current Lake is hosted within a peridotite/olivine melo gabbro intrusion hosted within a granitoid. Below the lake, the intrusion measures approximately 40 m vertically and 40 m horizontally, though this can vary. The overburden below the lake is understood to consist of unconsolidated sediments that range in thickness from approximately 2 m to 25 m based on the bathymetry and lithology model provided by Clean Air. A thickness of approximately 10 m is typical. The intrusion extends to the overburden contact in most areas below the lake. However, in some areas, up to approximately 10 m of granitoid is present between the intrusion and the overburden.

The stability and required dimensions of the crown pillar from a geomechanical perspective were assessed using the empirical Critical Scaled Span method (Carter, 1992). The results of the analyses suggest that a crown pillar thickness of 30 m of rock is required to meet the target Probability of Failure of 1% for an opening with a span of 5 m. The stability of the pillar is very sensitive to the effective span; increasing the span to 10 m would increase the required crown pillar rock thickness to between 60 m and 90 m. The following additional recommendations were provided:

- Ground support should be installed in any mine openings directly below the crown pillar.
- The mine openings below the crown pillar should be tight filled with backfill immediately after mining.
- The cost estimate should include an allowance for instrumentation (e.g., extensometers) and regular inspections by ground control personnel of the mine openings below the crown pillar while they remain open.

Note that potential hydrogeological limitations on the design of the crown pillar (e.g., significantly increased groundwater inflows) have not been considered at this level of study.

16.3.5 Ground Support

Recommendations for ground support requirements were developed using empirical methods, Unwedge, and typical practice in the Canadian mining industry. The following is recommended:

- Long-Term Development: 2.4 m long resin rebar in the back and 1.8 m long resin rebar in the walls installed on a 1.2 m square pattern with 6-gauge welded wire mesh. The mesh and bolts should extend to within 1.5 m of the floor. 0-gauge straps should be installed on pillar corners.
- Short-Term Development: 1.8 m long Friction Sets can be used in place of resin rebar in the walls.
- Intersections: 5 m long spin cables on a 2 m square spacing are recommended for the intersections.

Upgraded ground support, such as shotcrete, or cable bolts, is expected to be required when adverse conditions are encountered (e.g., the poor-quality breccia, adverse structure, etc.). Further details on the geomechanical work conducted can be found in Appendix E.

16.3.6 Escape Deposit

The Escape deposit was not included in the geomechanical analysis conducted by Knight Piésold. At the time of analysis, the focus of the study was restricted to the Current deposit due to the easy access, exceptionally high grade, and abundance of available geomechanical data. Subsequently a decision was made to include the Escape deposit. A high-level RQD comparison conducted by Nordmin suggests that the RQD values within the Escape deposit are as good or better than those at the Current deposit. As such, the stope dimension and ground support guidelines provided by Knight Piésold for the Current deposit have been adopted for the Escape deposit. Due to the depth of the Escape deposit, no crown pillar considerations were deemed necessary.

16.4 Underground Evaluation

The proposed operation involves underground mining at a rate of 3,600 t/d with an accompanying process plant with a matching 3,600 t/d capacity. Shown in Figure 16-7 is the proposed site plan with the mineable Current and Escape deposits.

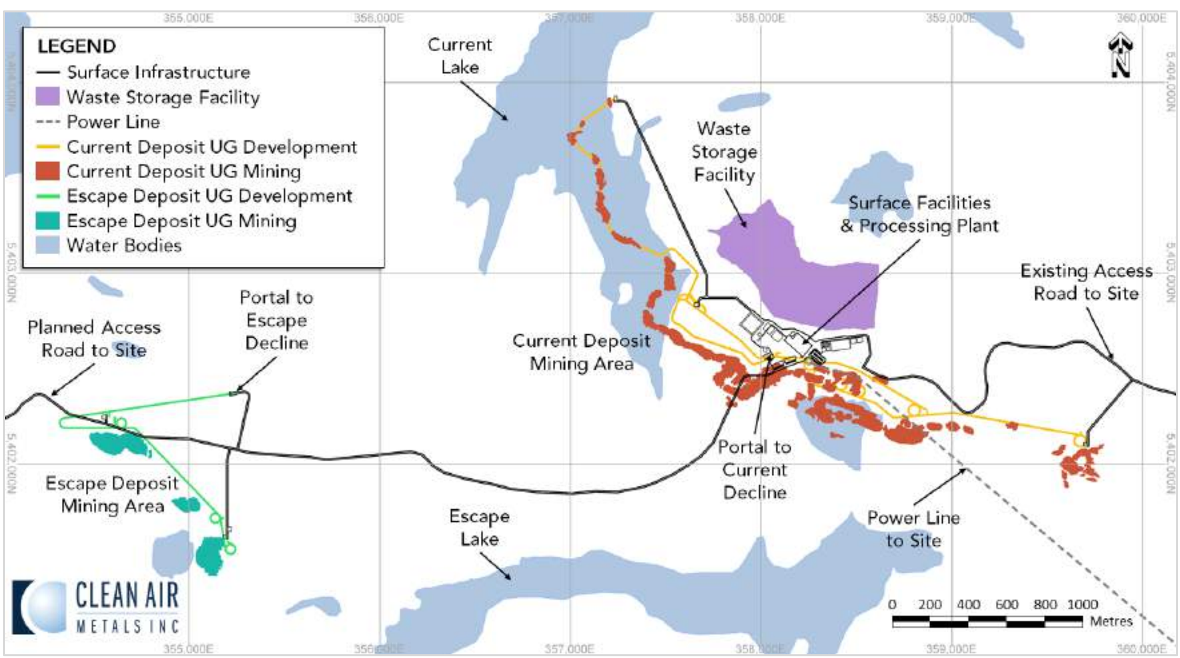


Figure 16-7: Proposed site plan with mineable Current and Escape deposits

16.4.1 Mining Method Selection

The mining methods for the Project were selected based on economic and geotechnical parameters, ensuring it was suitable for the mineralization geometry. Bulk underground mining methods, such as block caving, were deemed impractical due to the geometry of the deposit and unacceptable due to risk of surface instability. Conventional longitudinal long hole open stope retreat was explored; however, the average mineralized thickness was too large, and the plunge of the deposit made silling along the ore impractical.

A combination of transverse and modified longitudinal panelled LHOS and DAF was ultimately selected. In the Upper Current mining area, due to difficulties delivering paste backfill and ensuring tight filled stopes beneath Current Lake, DAF was selected. Modified longitudinal panelled LHOS was selected for the (lower) Current mining area, to minimize the amount of waste access development beneath the Current Lake. Shown in Figure 16-8 is the Current mining area modified longitudinal LHOS mining method configuration. For all other mining areas, transverse LHOS was selected where the height of mineralization was 10 metres or greater. Shown in Figure 16-9 is the transverse LHOS mining method configuration. DAF was selected for regions with a mineralized height of less than 10 metres. LHOS accounts for approximately 84% of the mineable inventory and DAF accounts for the remaining 16%.

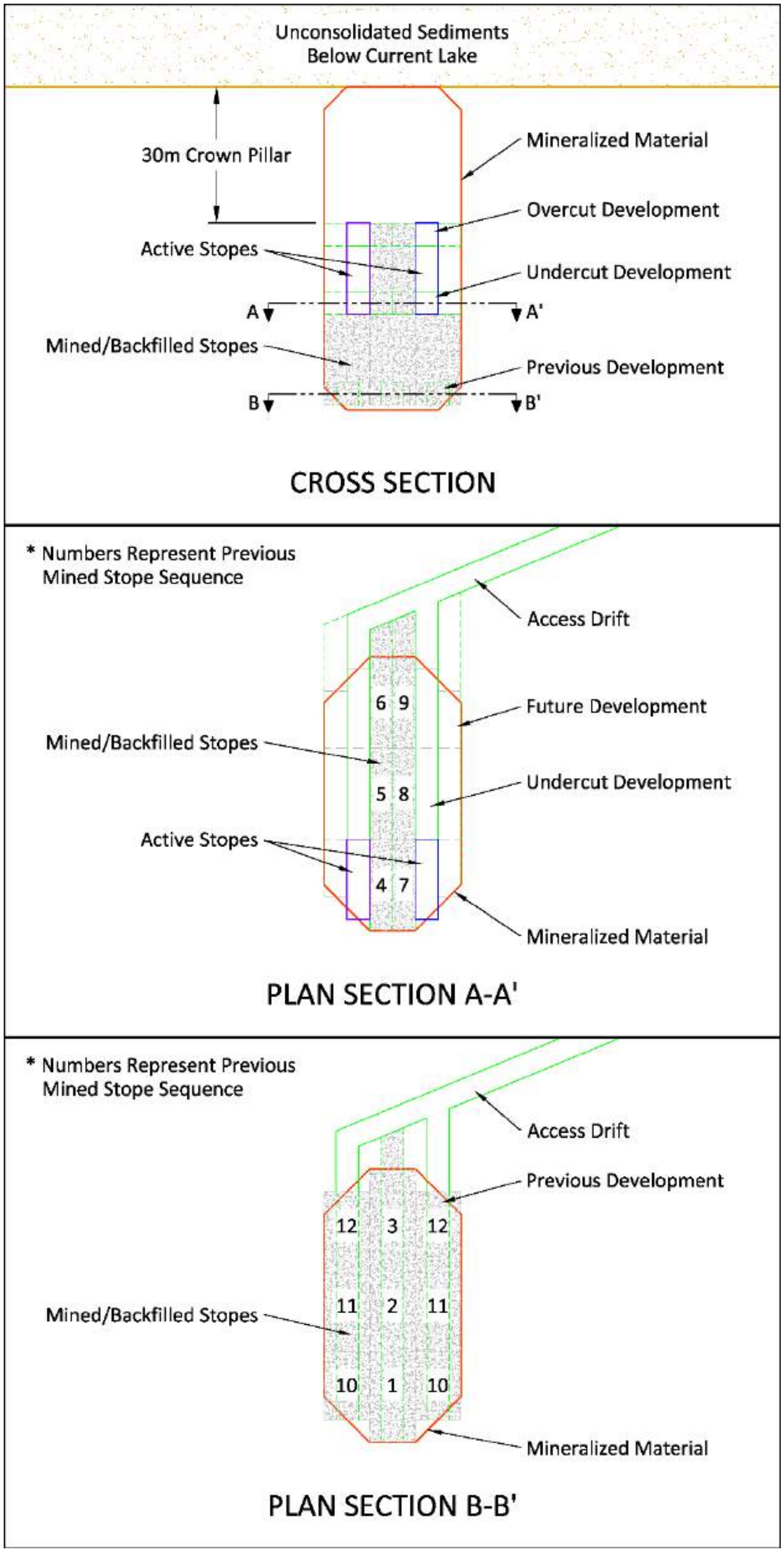


Figure 16-8: Current mining area LHOS mining method

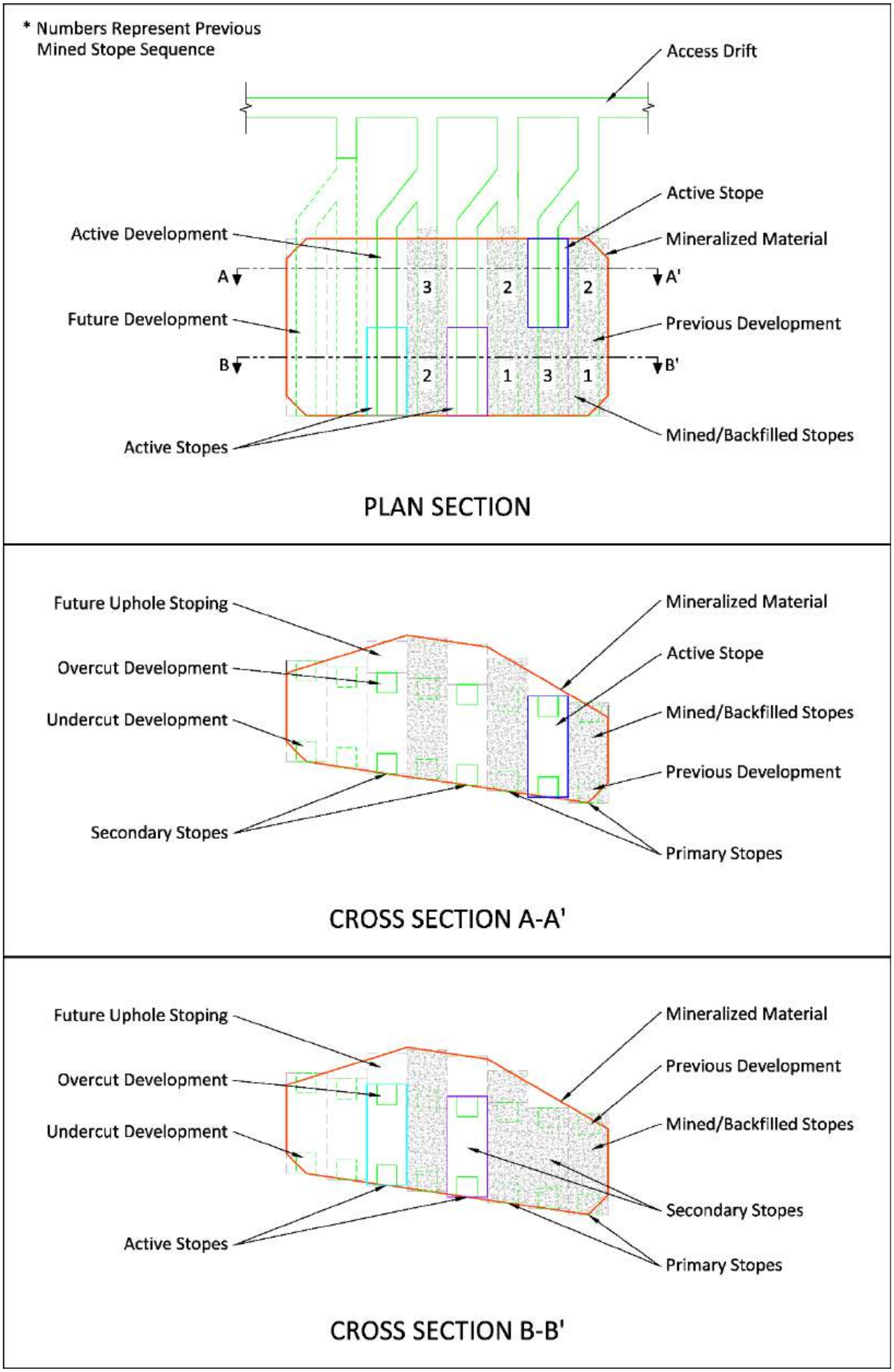


Figure 16-9: Transverse primary/secondary LHOS mining method

16.4.2 Cutoff Grades and NSR

The cutoff grade for the Current and Escape deposits was calculated using an NSR cutoff. The onsite operating costs for each mining method, within each mining area, was calculated. These values represent the NSR value cutoff grade. Table 16-4 outlines the NSR cutoff grade parameters.

Table 16-4: NSR Cutoff Grade Parameters

Parameter	Unit	Current	Bridge	Beaver-Cloud	Boundary	HGZ
Direct Mining Cost (LHOS)	$/t mill feed	$34.7	$28.5	$30.8	$32.0	$34.5
Direct Mining Cost (DAF)	$/t mill feed	$44.0	$43.8	$46.5	$47.7	$52.9
Milling / WSF Cost	$/t mill feed	$23.0	$23.0	$23.0	$23.0	$23.0
Indirect / G&A Cost	$/t mill feed	$10.0	$10.0	$10.0	$10.0	$10.0
NSR Cutoff (LHOS)	**$/t mill feed**	**$67.7**	**$61.5**	**$63.8**	**$65.0**	**$67.5**
NSR Cutoff (DAF)	**$/t mill feed**	**$77.0**	**$76.8**	**$79.5**	**$80.7**	**$85.9**

NSR, as applied to the block model, was calculated by summing together the NSR-component values for each of the six payable metals. Table 16-5 shows the metal prices applied in the NSR calculations. NSR-components were calculated by:

1. Converting the insitu grade of each metal to mill feed grade by applying an external dilution factor (Table 16-6).
2. Applying the respective process plant recovery to each metal's process plant feed grade, for both the copper and bulk concentrates (Table 16-7 and Table 16-8).
3. Calculating the expected concentrate mass percentages, which are based on copper grade for the copper concentrate and sulphur grade for the bulk concentrate (Table 16-7 and Table 16-8).
4. Calculating the grade of each metal within both concentrates.
5. Applying smelter payable terms to each metal, for both concentrates (Table 16-9).
6. Deducting smelter deductions to each metal, for both concentrates (Table 16-9).
7. Deducting treatment and refining charges to each metal (where applicable) for both concentrates (Table 16-10).
8. Deducting freight costs for transportation of the concentrates to respective smelters (Table 16-6).
9. Applying a mining recovery factor (Table 16-6).
10. Deducting royalties applied to blocks based on claim boundaries.

Table 16-5: 2-Year Trailing Price Deck

Metal	Unit	2 Year Trailing (Aug'19 - Jul'21)
Platinum	US$/oz	969
Palladium	US$/oz	2,214
Gold	US$/oz	1,723
Silver	US$/oz	22
Copper	US$/lb	3.09
Nickel	US$/lb	6.86

Note: 2-year price deck provided by CRU as of August 2021.

Table 16-6: NSR Block Model Factors

NSR Factor	Value
External Dilution Factor	10%
Freight to Smelter	$100/t
Mining Recovery Factor	95%

Table 16-7: Process Plant Copper Concentrate Recovery and Mass

	Formula (%)	Exceptions / Notes
Platinum Recovery	$-1.0795 * \text{Pt}HG + 17.783$	PtHG Above 6 ppm = 11%
Palladium Recovery	$-4.541 * \text{Pd}HG + 39.579$	PdHG Above 6 ppm = 12.3%
Gold Recovery	50%	AuHG Below 0.05 ppm = 0%
Silver Recovery	40%	AgHG Below 1 ppm = 0%
Copper Recovery	$4.4 * \text{Ln}(\text{Cu}HG) + 87.064$	CuHG Below 0.2% = $339.95 * \text{Cu}HG$
Nickel Recovery		NiGr% = Fixed 0.9%
Concentrate Mass	CuHG ∗ CuRec / CuGr%	CuGr% = $3.527 * \text{Cu}HG + 21.808$ Max CuGr% = 28.9%

Note: Blue Coast Metallurgy & Research provided concentrate process plant metal recovery estimates; see Section 13 for more information. HG is the head grade of each metal. Gr is the concentrate grade of each metal.

Table 16-8: Process Plant Bulk Concentrate Recovery and Mass

	Formula (%)	Exceptions / Notes
Platinum Recovery	$0.8438 * \text{Pt}HG + 64.542$	PtHG Above 6 ppm = 70%
Palladium Recovery	$4.2013 * \text{Pd}HG + 47.422$	PdHG Above 6 ppm = 72.6%
Gold Recovery	30%	AuHG Below 0.05 ppm = 0%
Silver Recovery	$1.8014 * \text{Ag}HG + 23.723$	AgHG Below 1 ppm = 0% AgHG Above 12 ppm = 45%
Copper Recovery	$-3.5899 * \text{Cu}HG + 13.841$	CuHG Below 0.2% = $65.5 * \text{Cu}HG$ CuHG Above 2.0% = 6.7%
Nickel Recovery	$21.777 * \text{Ln}(\text{Ni}HG) + 79.631$	NiHG Above 1.0% = 80%
Concentrate Mass	$1.9142 * \text{S}HG$%	SHG% is sulphur head grade

Note: Blue Coast Metallurgy & Research provided concentrate process plant metal recovery estimates; see Section 13 for more information. HG is the head grade of each metal. Gr is the concentrate grade of each metal.

Table 16-9: Smelter Payable % and Deductions

Payable Metal	Copper Concentrate		Bulk Concentrate	
	Payable %	Deductions	Payable %	Deductions
Platinum	90%	1.5 g/t	90%	1.5 g/t
Palladium	90%	2.0 g/t	90%	2.0 g/t
Gold	98%	1.0 g/t	98%	1.0 g/t
Silver	98%	30 g/t	92%	30 g/t
Copper	96.65%	1%	40%	1%
Nickel			65%	

Note: Minimum 3% copper grade in bulk concentrate required for payment.

Table 16-10: Smelter Treatment Charges (TC)/Refining Charges (RC)

Payable Metal	Copper Concentrate		Bulk Concentrate	
	TC	RC	TC	RC
Platinum		US$15/oz		US$15/oz
Palladium		US$15/oz		US$15/oz
Gold		US$4.5/oz		US$4.5/oz
Silver		US$0.45/oz		US$0.45/oz
Copper	US$67.33/wmt	US$0.067/lb		
Nickel			US$150/wmt	

16.4.3 Stope Optimization, Dilution and Recovery

The underground mineralization was evaluated using Deswik's MSO tool to create the mineable inventory. The MSO tool evaluates the deposit based on economic and geometric parameters. The economic parameter used for evaluation was NSR, as described in Section 16.4.2.

Preliminary attempts to model the Current deposit using pre-set full height stopes resulted in a poor approximation of the mineable inventory. The mineralized material within the Current deposit is contained within a shallow plunging conduit with a strike length of approximately 3 km, with variable mineralized height rarely exceeding 50 m, with an undulating bottom. This geometry, in conjunction with grade often being concentrated at the bottom of the conduit, resulted in the MSO tool generating stope shapes that incorporated large amounts of internal dilution or left economic mineralized material behind.

To better approximate the mineable inventory using the MSO tool, the geometric height parameters were reduced to 5 m, essentially creating sub-shapes. This resulted in better capturing mineable material within the top and bottom of the conduit. The sub-shapes are designed to be stacked one on another to approximate full height LHOS downhole stopes, with the remainder of sub-shapes assumed to be mined via LHOS uphole stopes (see Figure 16-10).

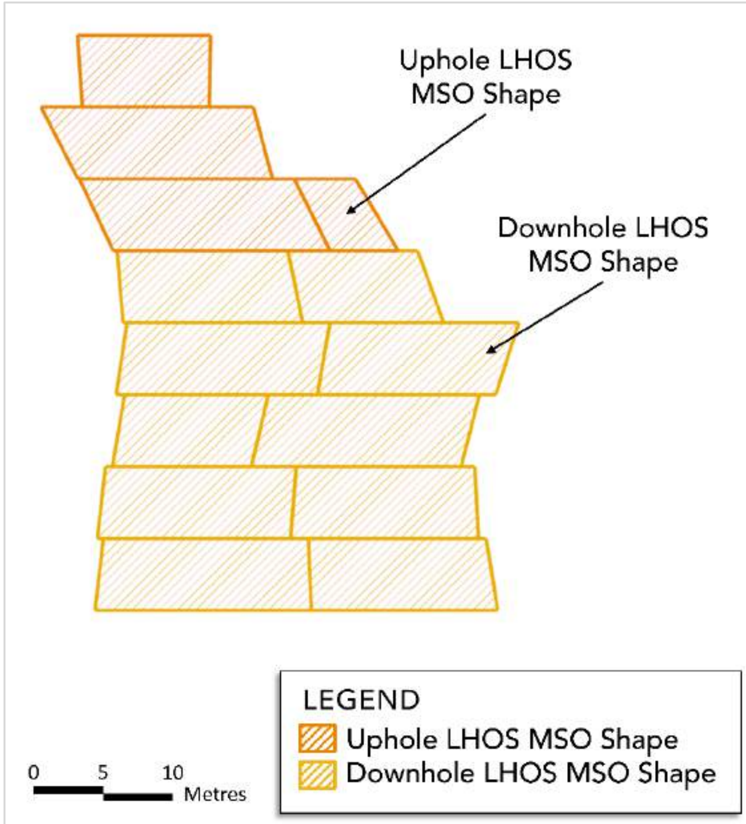


Figure 16-10: LHOS MSO shape example downhole and uphole stoping

The drawback to this modelling method is the hanging wall and footwall extents of each “level” of 5 m sub-shapes often do not match their neighbours above and below, which results in an underestimation of internal dilution (see Figure 16-11). An MSO validation factor was generated to account for this internal dilution. The MSO validation factor was generated by cutting cross-sections at intervals along the deposit and designing mineable stope outlines. The outlines were offset 1 m in either lateral direction and an NSR value obtained from the corresponding volume. The offset outline volume NSR was compared to the NSR of the stacked 5 m sub-shapes and represented as a percentage. MSO validation factors were generated for each mining area within the Current and Escape deposits and applied to the insitu MSO values.

Table 16-12 shows the MSO material tonnage, internal dilution validation factors, and adjusted insitu material tonnage.

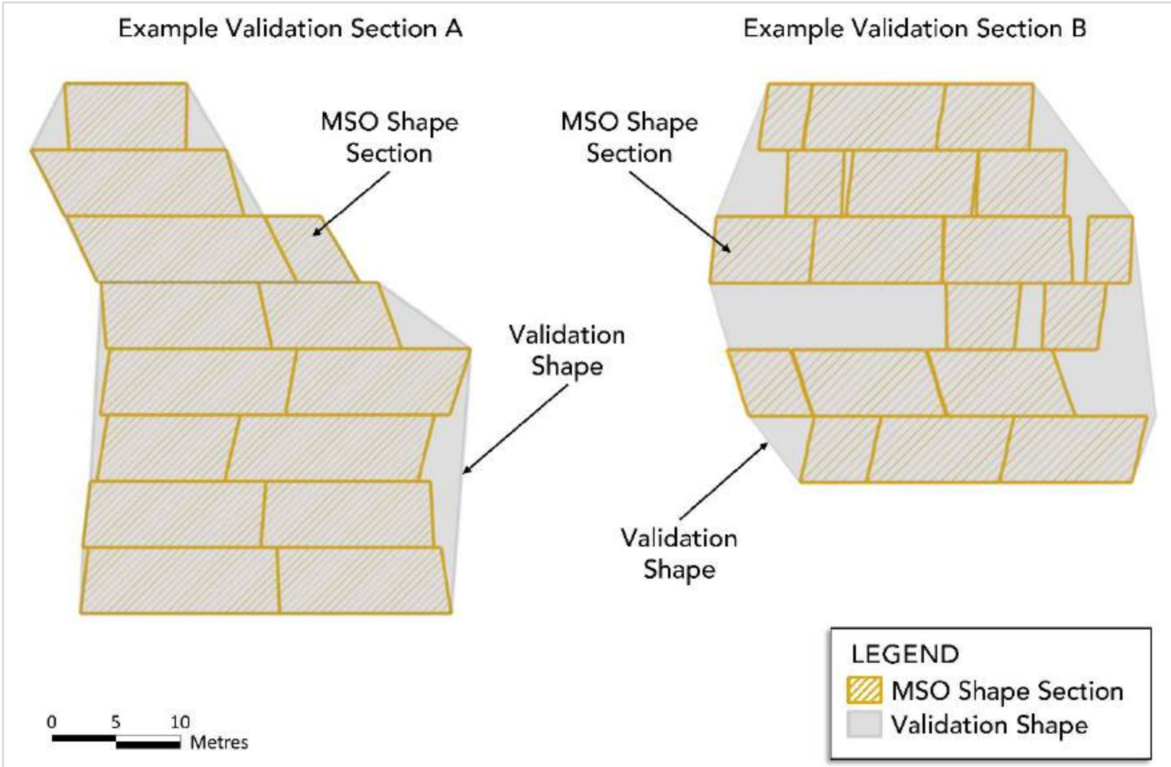


Figure 16-11: LHOS MSO shape example validation sections

The primary sources of external dilution were assumed to be generated from the hanging wall (HW) and footwall (FW). Lesser amounts of dilution were assumed from the secondary stope sidewalls via paste backfill sloughing and the undercut floor via unintentional downwards mucking. Due to a large portion of the overcut back being supported at the time of development and the primary stope sidewalls being considered part of the adjacent stopes, no dilution was assigned to these stope faces. Table 16-11 shows the LHOS external dilution percentage by face and mining area.

Table 16-11: LHOS External Dilution

External Dilution Face	Current	Bridge	Beaver-Cloud, 437, Boundary and HGZ
HW	2.5%	4%	5.0%
FW	4.0%	2.7%	3.0%
Sidewalls	0 - 5.0%	0 - 4.2%	0 – 3.3%
UC Floor	0.5%	0.4%	0.4%
OC Back	0%	0%	0%
Total (Average)	**7.0%**	**9.2%**	**10.1%**

Preliminary dilution analysis assumed zero grade was attributed to external dilution material. However, a dilution grade analysis was performed by expanding the manual stope shapes by their respective expected dilution, by mining area. The analysis yielded that, on average, roughly 50% of the expanded diluted material had a grade of roughly 50% of the average stope grade. Therefore, the mining dilution grade was assigned as 25% of the average grade for each mining area. The external dilution percentage, shown in Table 16-12, includes this 25% average grade.

LHOS in the Current mining area was planned as a modified longitudinal retreating panel, and in both the Bridge and Beaver-Cloud mining area as a transverse primary/secondary. Both mining methods allow for a relatively high degree of drill and blast precision. Additionally, due to the relatively narrow stope widths (5 m to 10 m, 12 m, and 15 m for Current, Bridge and Beaver-Cloud, respectively), negligible amounts of blind mucking were assumed to be necessary. For these reasons, a relatively high mining recovery (95%) was chosen for all mining areas within the Current deposit.

Table 16-12: Mineralized Material Dilution and Recovery

Mining Area	MSO Material (kt)	Internal Dilution Validation Factor %	Insitu Material (kt)	External Dilution %	Mining Recovery %	Mill Feed (kt)
Current LHOS	995	9.5%	1,090	7.0%	95%	1,108
Current DAF	480	0.0%	480	10.0%	95%	502
Bridge LHOS	2,459	7.0%	2,631	9.2%	95%	2,730
Bridge DAF	227	0.0%	227	10.0%	95%	237
Beaver-Cloud LHOS	2,430	5.7%	2,570	10.1%	95%	2,688
Beaver-Cloud DAF	568	0.0%	568	10.0%	95%	594
437 LHOS	82	5.7%	87	10.1%	95%	91
437 DAF	248	0.0%	248	10.0%	95%	259
Escape HGZ LHOS	2,498	5.1%	2,626	10.1%	95%	2,746
Escape HGZ DAF	119	0.0%	119	10.0%	95%	124
Escape Boundary LHOS	896	4.1%	933	10.1%	95%	975
Escape Boundary DAF	220	0.0%	220	10.0%	95%	230
Total	**11,222**	**5.1%**	**11,798**	**9.6%**	**95%**	**12,284**

16.4.4 Stope Design

As outlined in Section 16.3, maximum stope size was governed by geomechanical considerations. Maximum stope size, by mining area, is outlined in Table 16-13.

Stopes are accessed via cross cuts from the main ramp systems. In situations where the height of the mineralized material within the conduit is less than 25 m, only undercut access is driven. Stopes are drilled, blasted, mucked and backfilled via the undercut; these stopes are assumed to be mined via upholes. In situations where the mineralized material within of the conduit is 25 m, both overcut and undercut accesses are driven. Stopes are drilled, blasted and backfilled from the overcut and mucked via the undercut; these stopes are assumed to be mined via downholes. In situations where the height of the mineralized material within the conduit is greater than 25 m, the bottom 25 m is assumed to be mined via downhole stoping and the remaining portion above is assumed to be mined via uphole stoping. In situations where the height is above 50 m, the bottom multiples of 25 m are assumed to be mined via downhole stoping and the remaining portion above is assumed to be mined via uphole stoping. Figure 16-12 shows these four configurations. Downhole stopes are designed to be drilled via in-the-hole (ITH) production drills and uphole stopes are designed to be drilled via top-hammer (TH) production drills.

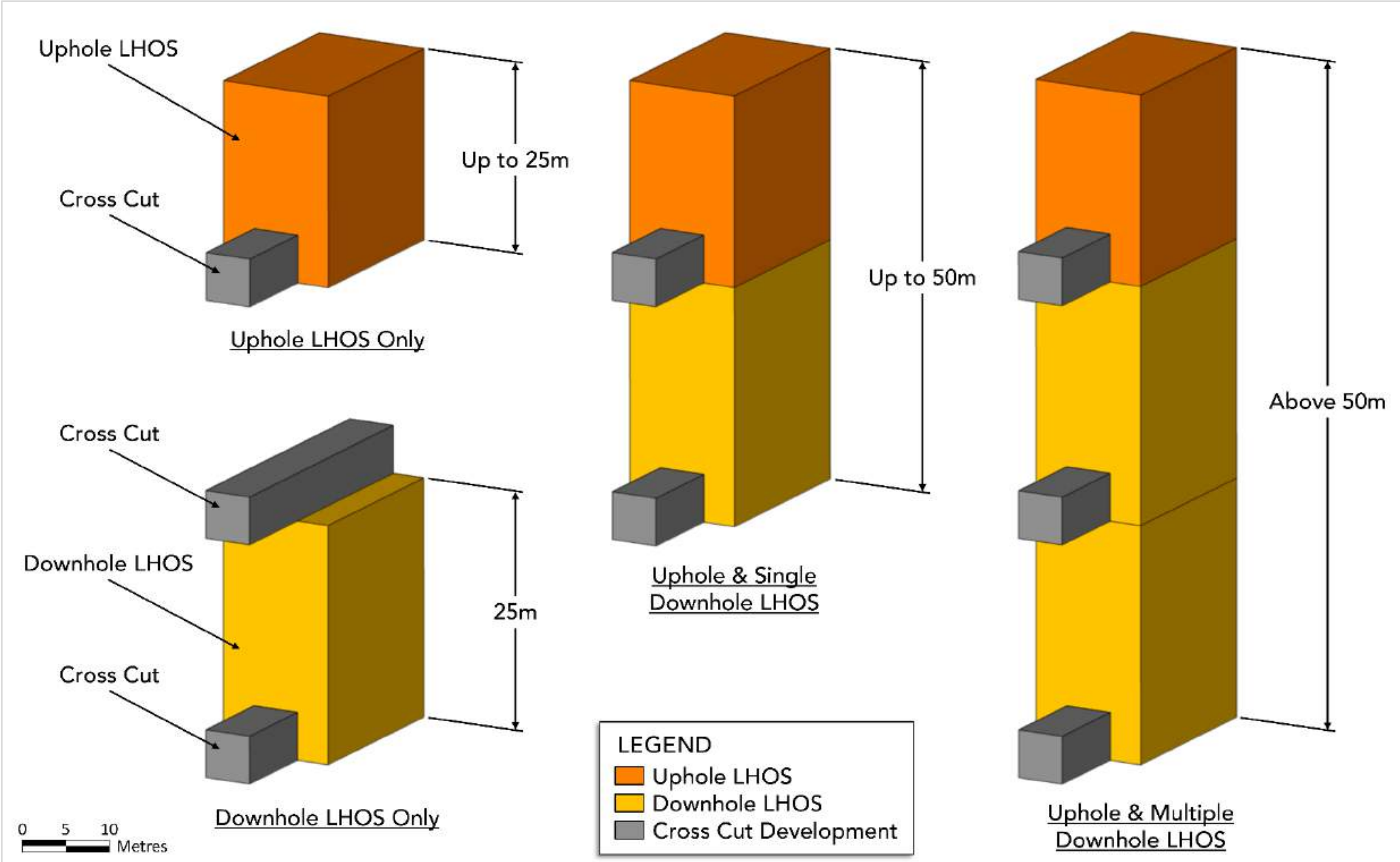


Figure 16-12: Uphole and downhole LHOS scenarios

As detailed in Table 16-13, the width of stopes varies from 5 to 15 m, depending on the mining area. In the Current mining area, LHOS stopes adjacent to the crown pillar below Current Lake are constrained to 5 m in width.

Table 16-13: LHOS Maximum Size

Mining Area	Height (m)	Width (m)	Length (m)
Current	25	5-10	15
Bridge	25	12	15
Beaver-Cloud/437	25	15	20
Escape HGZ	25	15	20
Escape Boundary	25	15	20

Downhole stopes are drilled, blasted and backfilled via overcut access. Stopes are assumed to be ring drilled, as shown in Figure 16-13. Stopes are blasted by first blasting a drop raise to create a void, and then blasting the remainder of the rings once a sufficient void has been created. Once a stope is mucked out, a fill barricade is constructed in the undercut access and the stope is backfilled with CPB. CPB is delivered via a series of boreholes and pipes from the surface CPB plant.

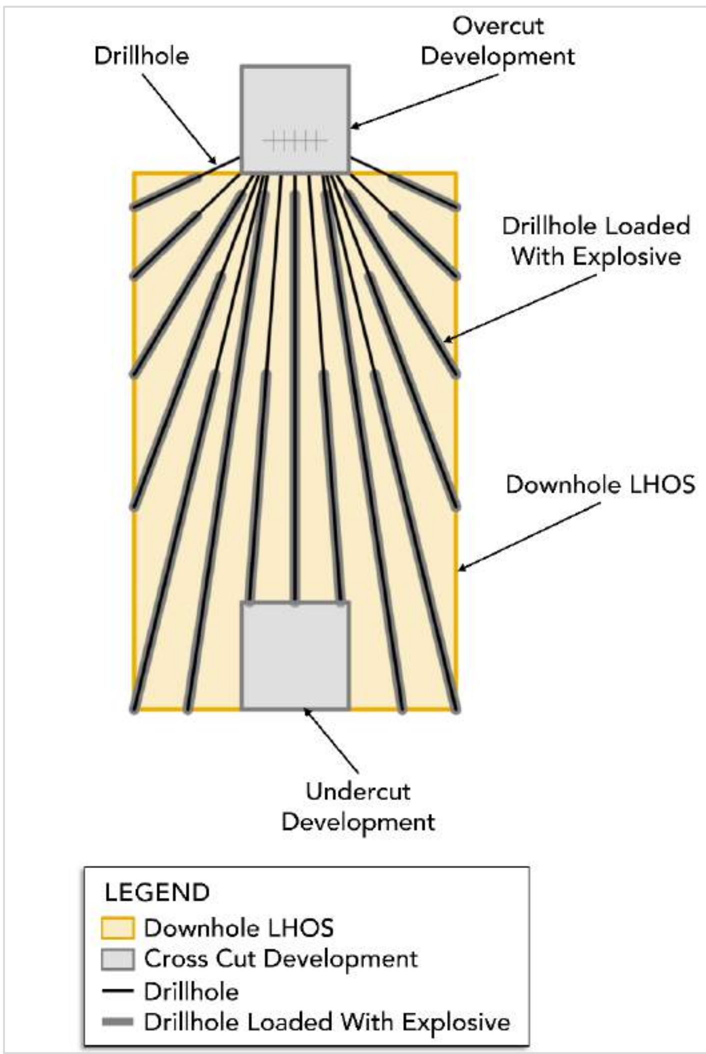


Figure 16-13: LHOS downhole drill pattern section

Upholes stopes are drilled, blasted, mucked and filled via undercut access. Similar to the downhole stopes, stopes are assumed to be ring drilled, as shown in Figure 16-14. Stopes are blasted by first blasting an inverse drop raise to create a void, and then blasting the remainder of the rings once sufficient void has been created. As shown in Figure 16-15, the rings are dumped at 15 degrees toward the inverse drop raise to facilitate blasting successive rings and aiding recovery.

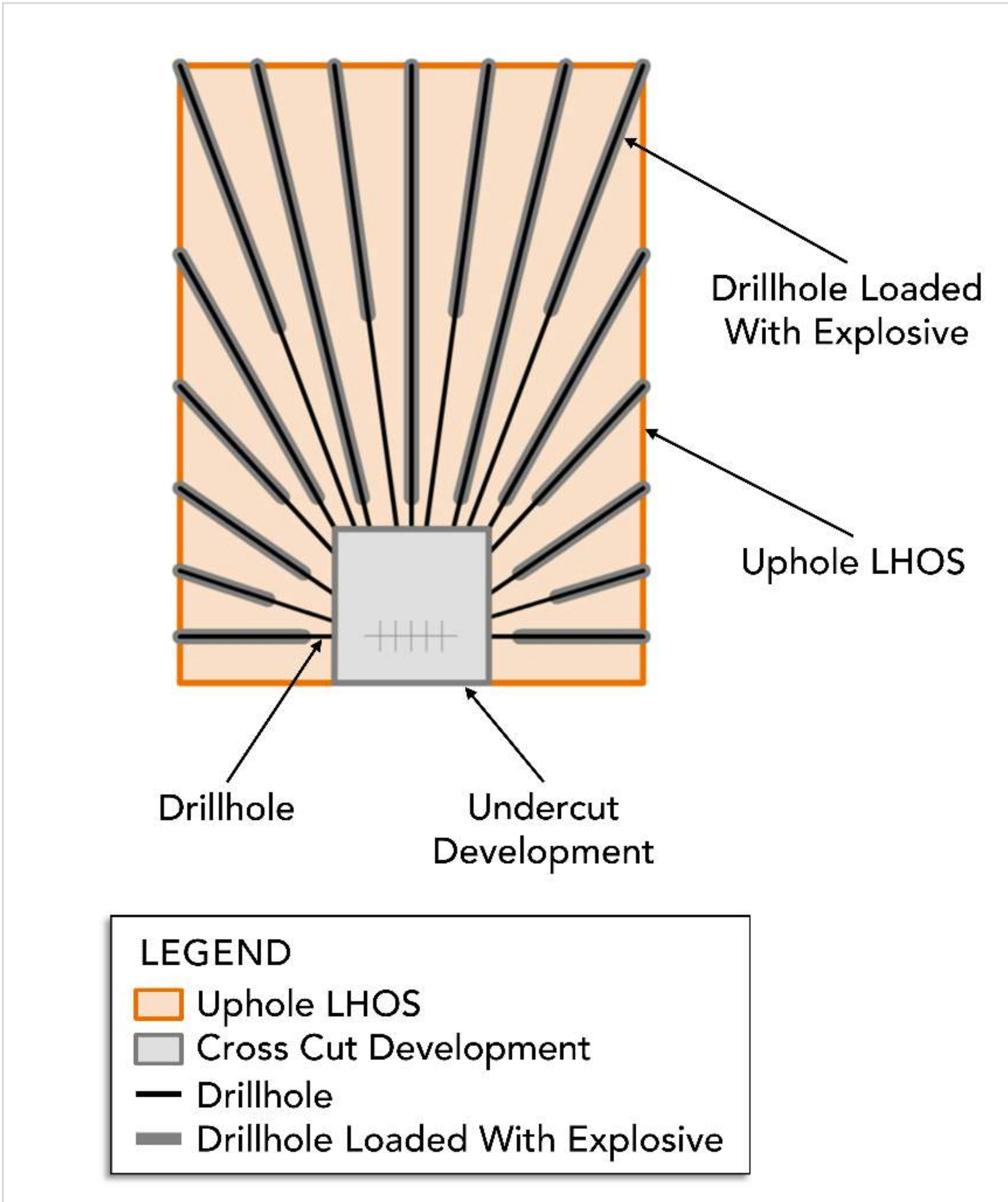


Figure 16-14: LHOS uphole drill pattern section

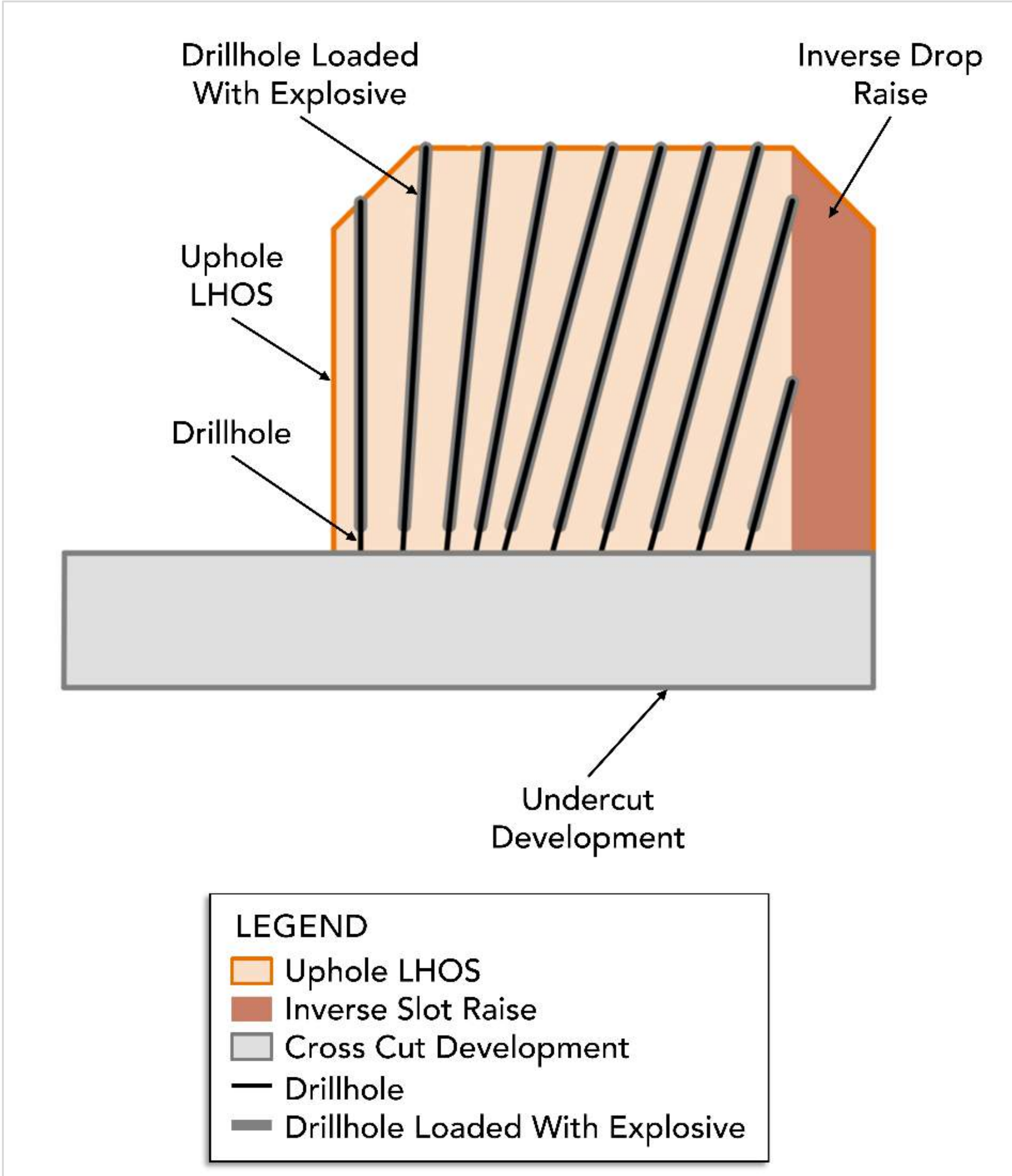


Figure 16-15: LHOS uphole drill pattern cross section

DAF stoping is utilized in areas where the height of the mineralization is not sufficient for LHOS or the mining area is not well suited for LHOS. DAF begins with a single 5 x 5 m drift. Depending on whether adjacent DAF stopes are above or beside the original drift, the adjacent DAF stope can be breasted or slashed into the original drift. DAF stopes are accessed via V-ramps, as shown in Figure 16-16. DAF stopes will be backfilled with CRF, delivered via either push-truck or LHD equipped with a rammer jammer.

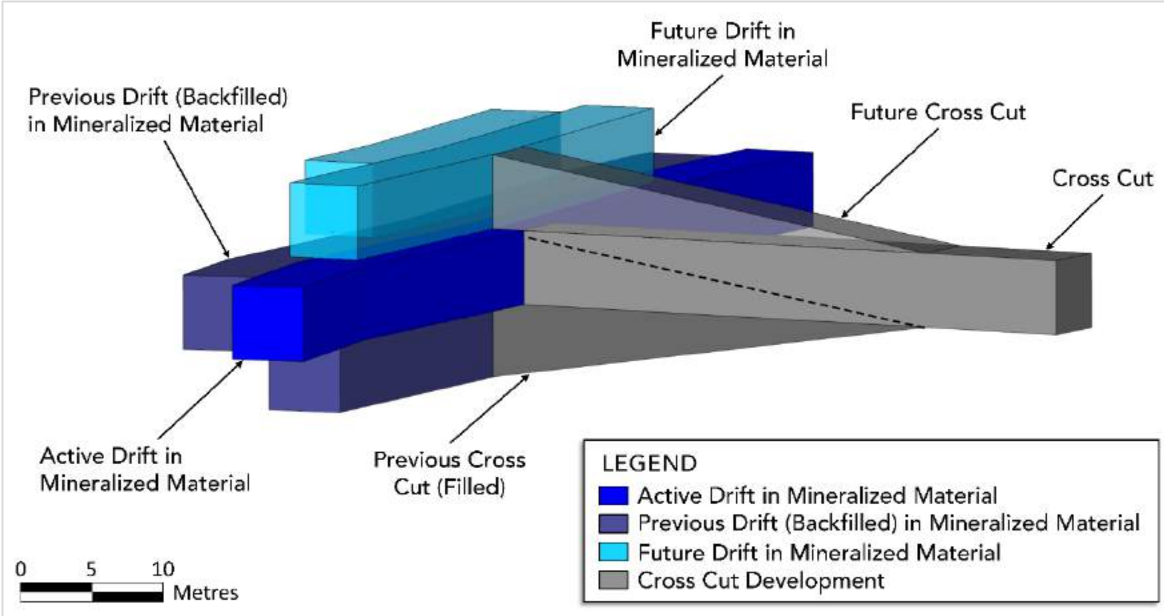


Figure 16-16: DAF mining method

16.4.5 Mine Access and Development

The Current and Escape deposits are accessed via separate portals from surface, as shown in Figure 16-1.

Lateral development primarily includes declines, level accesses and cross cuts. Aside from the main declines, waste development is primarily generated from level accesses within the Current mining area and cross cuts for all other mining areas. Waste development was estimated by designing representative sections within each mining area and factorizing to determine totals.

The declines are designed as 5 x 5 m at an average gradient of 15%. Cross cuts and level accesses are designed at 5 x 4.5 m. The lateral development is sized for the operation of the mining equipment fleet required for stope extraction and includes allowances for ventilation ducting and services. An additional 24% was added to the Current deposit decline metres and 15% to the Escape deposit decline metres to account for remucks, power and primer magazines, electrical substations, sumps and ventilation accesses.

16.4.6 Production

The feed to the mill is primarily sourced from LHOS and DAF stope production; however, 9.5% of mill feed is expected from cross-cut development. Figure 16-17 and Figure 16-18 show the LHOS and DAF production for both deposits. Table 16-14 shows the resource category by mining type.

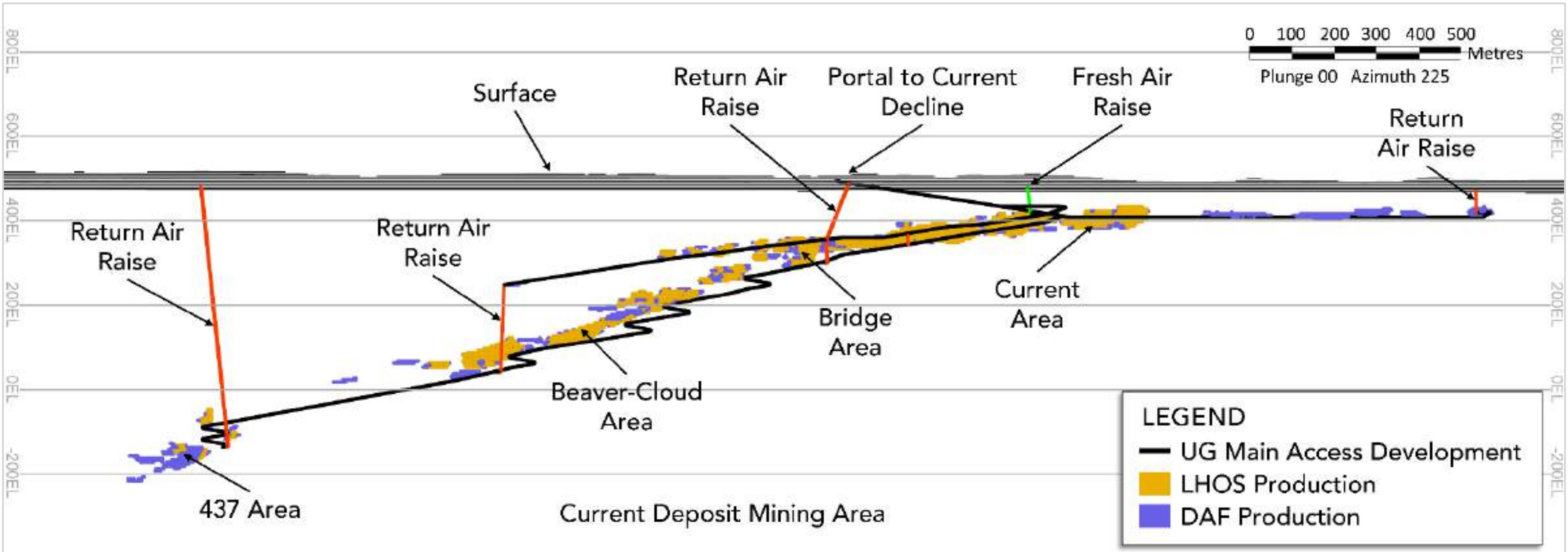


Figure 16-17: Current deposit production mining method

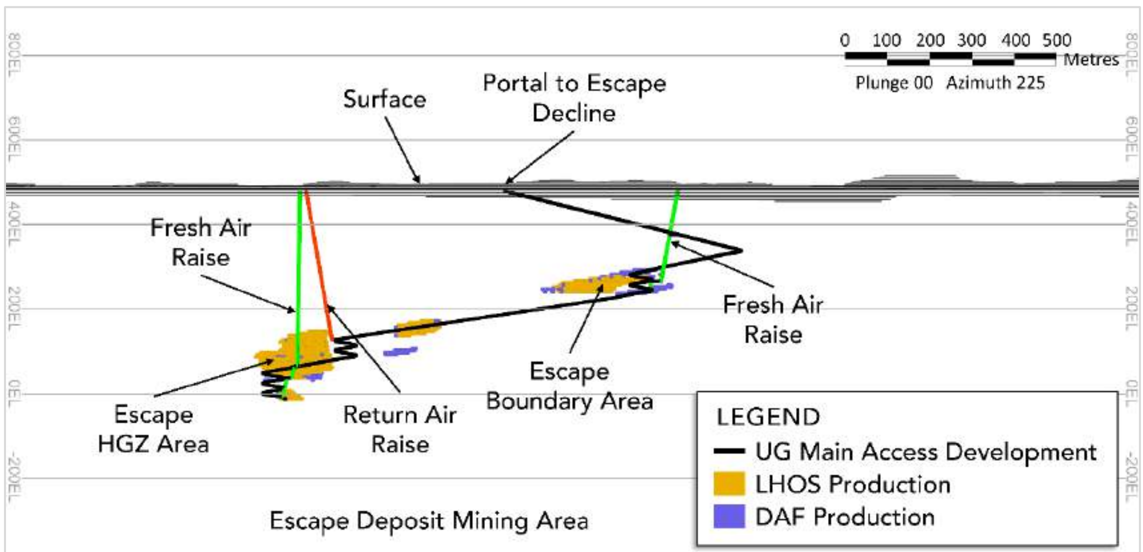


Figure 16-18: Current deposit production mining method

Table 16-14: Resource Category by Mining Area (kt)

LOM Production	Indicated		Inferred	
	Kt	EqPt (g/t)	kt	EqPt (g/t)
Current	1,610	9.6	-	-
Bridge	2,966	8.4	-	-
Beaver/Cloud	3,022	6.5	260	4.7
437	-	-	351	4.3
HGZ	2,649	7.8	221	3.8
Boundary	-	-	1,206	4.7

LHOS stopes are drilled via long hole drill and loaded/blasted via hand (downholes) or emulsion loader (upholes). DAF stopes are drilled via jumbo and blasted via ammonium nitrate/fuel oil (ANFO) loader. All stopes are excavated via 10-tonne LHD and loaded into 40-tonne underground haul trucks and hauled to surface. Haul trucks within the Current deposit transport the material to a surface ROM pad located near to the portal. Haul trucks within the Escape deposit transport the material to the portal access and deposit it into a stockpile. The stockpile is loaded into surface haul trucks and hauled to the ROM pad by contactor. Roughly half of mill feed is expected be redeposited underground as CPB, CRF or URF backfill. Table 16-15 shows (LHD) mucking cycle times and Table 16-16 provides the underground haul truck haulage times.

Table 16-15: Mucking Cycle Times

Mining Area	LHD Cycle Time (Minutes)
Current	6.4
Bridge	5.5
Beaver-Cloud/437	6.4
Escape HGZ	6.4
Escape Boundary	6.4

Table 16-16: Haulage Cycle Times

Mining Area	Haulage Cycle Time (Minutes)
Current	26.3
Bridge	30.5
Beaver-Cloud/437	51.5
Escape HGZ	54.3
Escape Boundary	36.8

16.4.7 Productivity

Productivities were developed from first principles. Rates were adjusted based on benchmarking the experience. Table 16-17 shows the shift productivity rates, followed by a description of the general and activity-specific parameters upon which the productivity rates are based.

Table 16-17: Shift Productivity Rates

Shift Productivity Rate:	Value	Unit
Annual Mining Days	360	Days / year
Mining Days per week	7.0	Days / week
Shifts per day	2.0	Shifts / day
Shift Length	11.0	Hours / shift
Shift Change (Beginning and End)	1.15	Hours / shift
Lunch time (inc. travel to lunchroom)	0.65	Hours / shift
Equipment inspection / refuel	0.25	Hours / shift
Total available work time	9.0	Hours / shift
Worker utilization	50.0	Min / hour
Effective work time per shift	7.5	Hours / shift

Production limits were applied to mining areas in both the Current and Escape deposits, to approximate stoping limitations. Table 16-18 outlines the production limits applied to the mining areas.

Table 16-18: Production Limits by Mining Area

Mining Area	Production Limit (t/d)
Current DAF	500
Current LHOS	1,100
Bridge	2,500
Beaver-Cloud/437	1,800
Escape HGZ	1,800
Escape Boundary	1,800

16.4.8 Sequencing

As referenced in Table 16-13, LHOS stopes have maximum lengths (perpendicular to strike) ranging from 15 m in the Current and Bridge mining areas, to 20 m in Beaver-Cloud, 437, Boundary and HGZ mining areas. It is common in both the Current and Escape deposits that the conduit thickness is larger than maximum stope length; therefore, stopes are required to be mined in panels. Panels furthest from the access are mined first and successively retreated toward the access, as shown in Figure 16-19. LHOS stopes are sequenced in a conventional primary/secondary arrangement, as shown in Figure 16-20.

DAF mining is sequenced starting at the bottom of the mineralized material or mining block and progresses upward. During the mining sequence, the back of the drift is temporarily supported using rock bolts before the stope is back filled to form the floor of the next level of drifting. It is also possible to mine an adjacent drift where width requires before mining the next level of drifting.

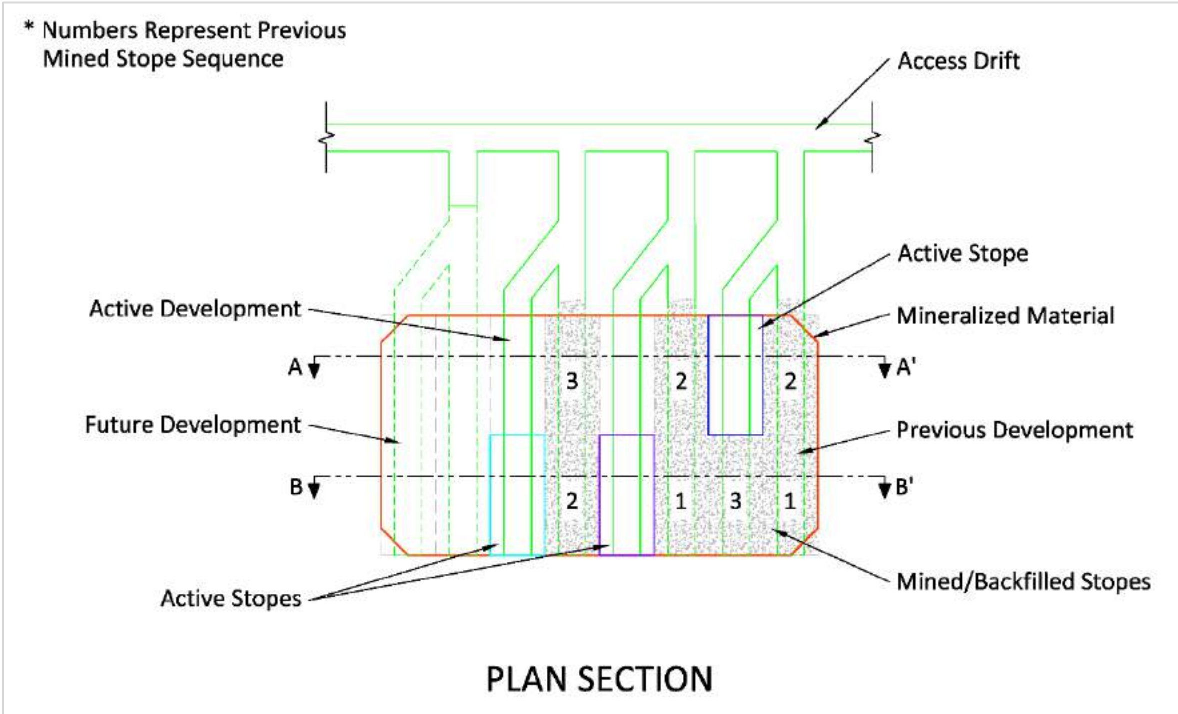


Figure 16-19: Transverse primary/secondary LHOS mining method plan section

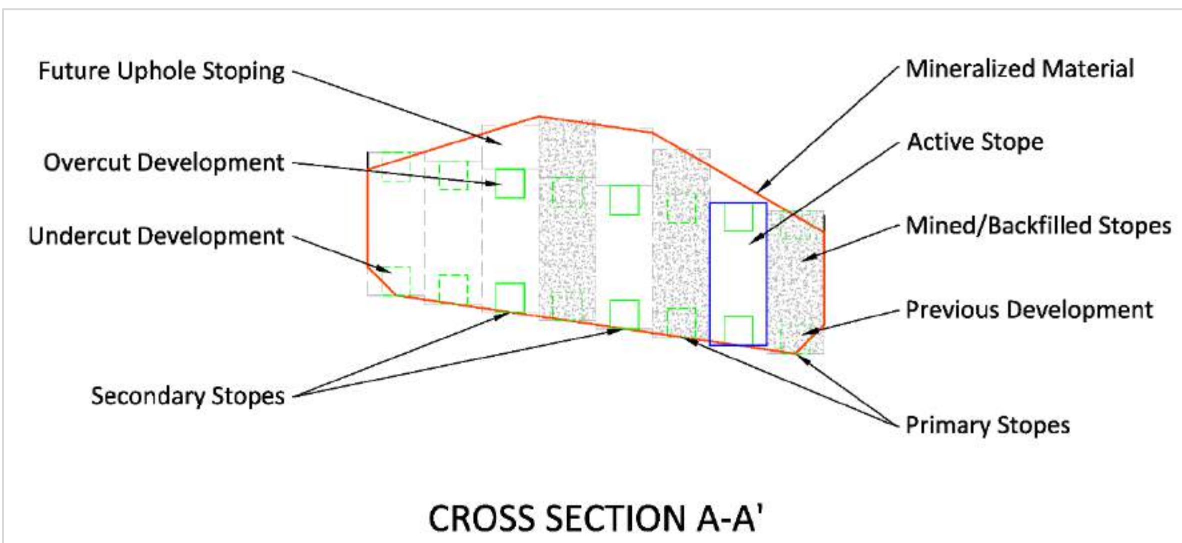


Figure 16-20: Transverse primary/secondary LHOS mining method cross section

16.4.9 Development & Production Schedule

The development and production schedule was created based on the input parameters from the mine design created in Deswik and Excel spreadsheets. The average stope cycle time is based on drilling, blasting, mucking, truck hauling and backfilling activities. Table 16-19 shows the average LHOS cycle time for each mining area.

Table 16-19: LHOS Average Stope Cycle Time

Days	Current	Bridge	Beaver-Cloud, 437, Boundary and HGZ
Drilling	4.6	5.7	8.8
Blasting	5.6	5.3	5.6
Mucking	7.1	10.3	19.1
Backfill Preparation	2.0	2.0	2.0
Backfilling	2.3	3.8	6.1
Backfill Curing	14.0	14.0	14.0
Total Days	**35.6**	**41.1**	**55.6**

The mining operation schedule is based on operating 360 days per year, 7 days per week, with two 11 hour shifts per day. A production rate of 3,600 t/d was targeted, with a 6-month ramp-up period to full production. The timeframe of the production schedule is yearly.

The Current deposit is accessed via a portal from surface and has a 12-month pre-production development period, which allows for the Current deposit main decline system to connect to the main fresh air raise and provide secondary egress for the mine. The pre-production period is defined as Years -1 and -2. Contractor decline development is assumed for the 12-month pre-production period as well as the following 2 years.

The Escape deposit is accessed via a separate portal from surface. The main decline development begins 12 months after the Current deposit decline begins and continues for 3 years, until the decline connects with the Escape main fresh air raise. Contractor decline development is assumed for the Escape deposit.

The Project begins production in the Current deposit and mines the Bridge and Current mining areas for the first three years and maintains a production rate of 3,600 t/d. The beginning of production is defined as achieving 60% of maximum production. Mining is comprised primarily of LHOS for the first 2 years of production, however in the third year, mining transitions into the Upper Current mining area, which is comprised entirely of DAF mining. Figure 16-21 shows production from the Current and Bridge mining areas in the first 3 years in red and yellow.

In the fourth year of production, with production in the high grade Bridge and Current mining areas nearing depletion, the Escape deposit decline reaches the HGZ fresh air raise and achieves secondary mine egress, allowing production of the HGZ to begin. As production within the Escape deposit begins within the HGZ area at 1,800 t/d, production within the Current deposit reduces to 1,800 t/d, and mining of the Beaver-Cloud mining area begins. Continued mining in the Beaver-Cloud and HGZ mining areas continue at a combined 3,600 t/d until Year 8, when mining within the Escape deposit transitions to the Boundary mining area. In Year 10, the Current deposit transitions to the 437 mining area and utilizes the 437 exhaust raise as secondary egress. Figure 16-21 and Figure 16-22 outline the progression of mining within each mining area. Table 16-20 shows the LOM production plan by mining area.

Table 16-20: LOM Production Plan by Mining Area (kt)

LOM Production (kt)	Year											Total
	-1	1	2	3	4	5	6	7	8	9	10	
Current LHOS	27	352	364	365	-	-	-	-	-	-	-	1,108
Current DAF	2	31	32	140	180	117	-	-	-	-	-	502
Bridge LHOS	67	857	765	732	202	-	-	-	-	73	34	2,730
Bridge DAF	1	13	135	59	16	-	-	-	-	8	4	237
Beaver-Cloud LHOS	-	-	-	-	231	492	600	590	395	380	-	2,688
Beaver-Cloud DAF	-	-	-	-	19	40	48	48	253	186	-	594
437 LHOS	-	-	-	-	-	-	-	-	-	-	91	91
437 DAF	-	-	-	-	-	-	-	-	-	-	259	259
Escape HGZ LHOS	-	-	-	-	636	636	636	618	222	-	-	2,746
Escape HGZ DAF	-	-	-	-	12	12	12	40	46	-	-	124
Escape Boundary LHOS	-	-	-	-	-	-	-	-	373	549	53	975
Escape Boundary DAF	-	-	-	-	-	-	-	-	7	99	125	230
Total Mineralized Material	**97**	**1,253**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**566**	**12,284**
Waste Material	226	571	583	486	202	135	126	131	211	240	98	3,008
Total Material	**323**	**1,824**	**1,879**	**1,782**	**1,498**	**1,431**	**1,422**	**1,427**	**1,507**	**1,536**	**664**	**15,292**

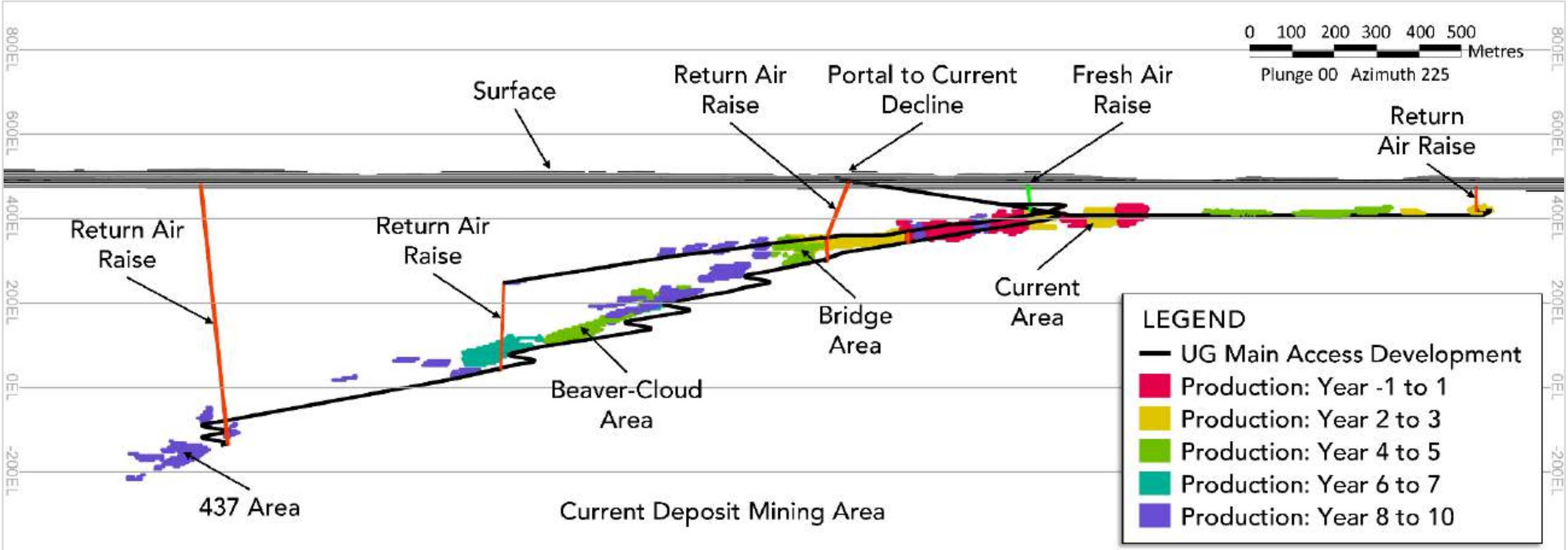


Figure 16-21: Current deposit production schedule

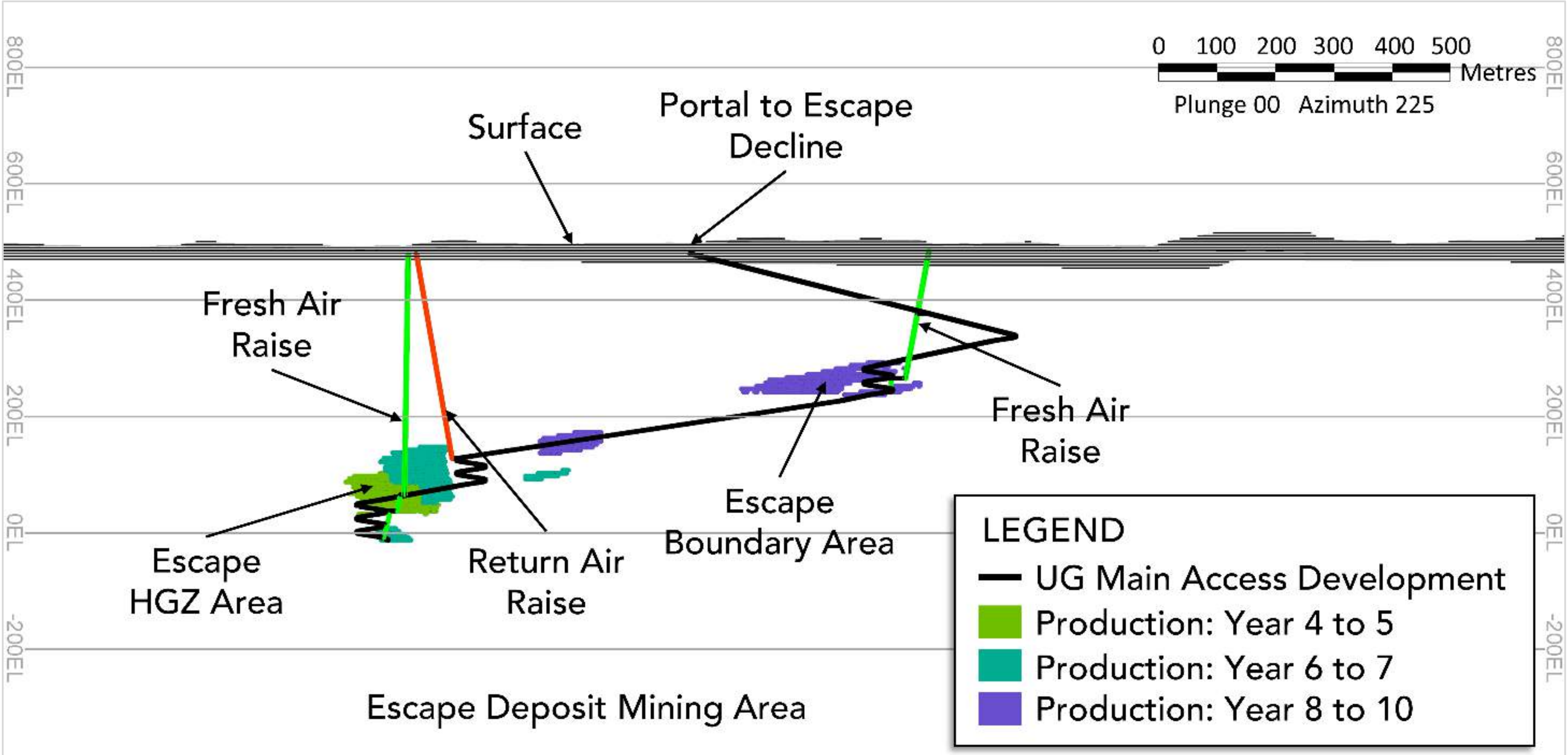


Figure 16-22: Escape deposit production schedule

16.5 Mine Infrastructure and Services

16.5.1 Ventilation

Ventilation requirements for the Current and Escape deposits are primarily based on diesel emissions from the equipment fleet, including contractor equipment. At peak productivity, the airflow required is 268 m^3/s (approximately 567kCFM) within the Current deposit and 255 m^3/s (approximately 539kCFM) within the Escape deposit. Preliminary peak productivity Ventsim designs were created for both the Current and Escape deposits. Figure 16-23 shows the LOM steady state Ventsim design for the Current deposit and Figure 16-24 shows the LOM steady state Ventsim design for the Escape deposit.

The Current deposit is provided fresh air via a single raise approximately 500 m northwest of the portal. During the first years of production, the Current and Bridge mining areas are provided flow through ventilation via a return air raise located at the boundary of the Beaver-Cloud mining area, which breaks through to surface near to the portal. The Upper Current mining area is provided flow through ventilation via a return air raise, which breaks through to surface on the northeast shore of Current Lake. As mining progresses into the Beaver-Cloud mining area, flow through ventilation is maintained with the use of an internal return air raise, which connects to the aforementioned Current and Bridge return air raise. In the last years of production, flow through ventilation is provided to the 437 mining area with a return air raise to surface, breaking through to surface approximately 1,750 m East of the portal. Figure 16-23 outlines the ventilation design of the Current deposit.

The Escape deposit is provided fresh air via two fresh air raises; the first is located in the Boundary mining area and the second is located at further depth in the HGZ. Flow through ventilation is achieved for both mining areas with the use of a return air raise located between the Boundary and HGZ mining areas. Figure 16-24 outlines the ventilation design of the Escape deposit.

Additional information on mine ventilation and design for the project is found in Appendix F.

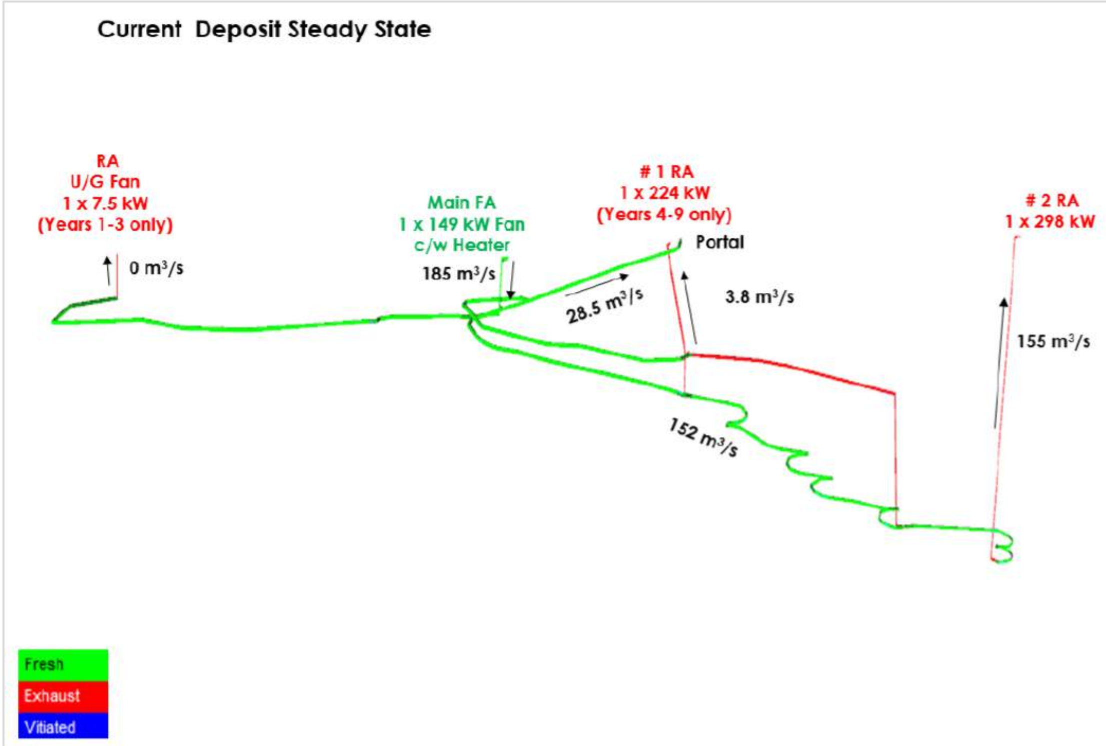


Figure 16-23: Current deposit steady state ventilation model

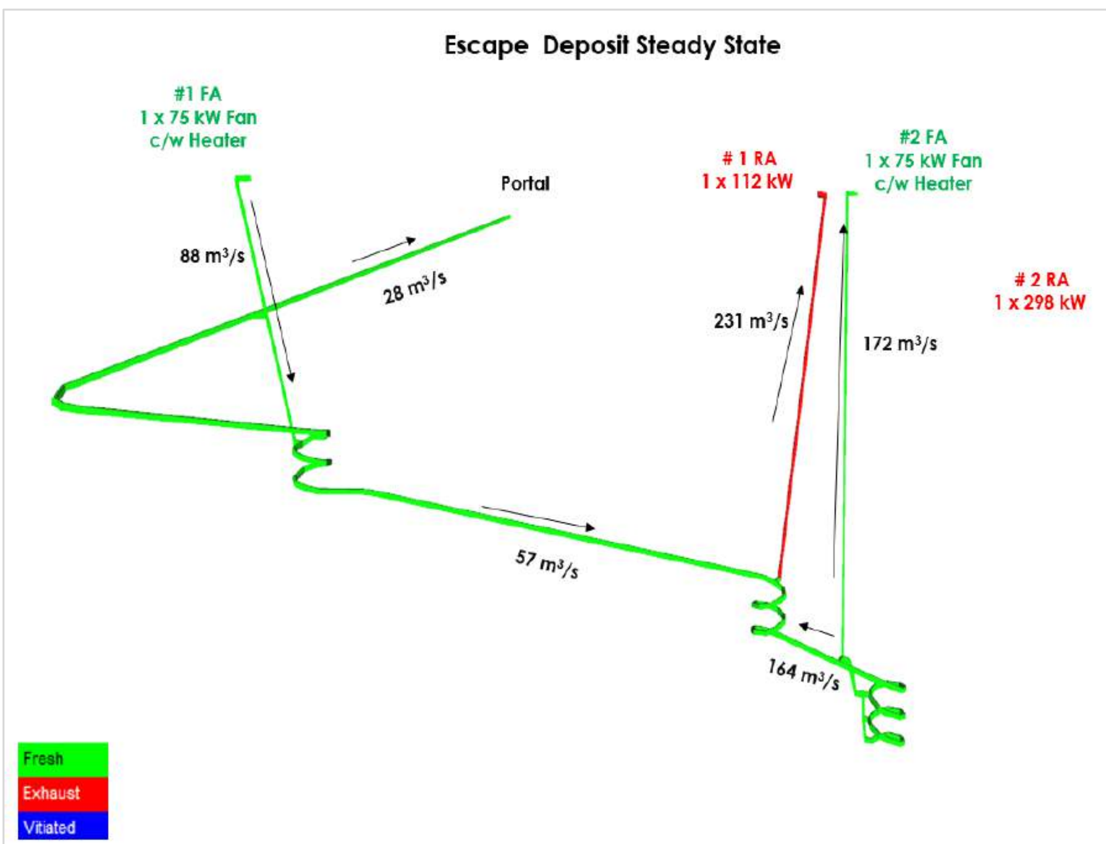


Figure 16-24: Escape deposit steady state ventilation model

16.5.2 Dewatering

The Current and Escape deposit mine dewatering systems are designed to accommodate the groundwater inflows from the portals and mine workings, along with inflows from drill and other underground operating equipment.

The Current deposit dewatering system includes a total of seven main sumps and four smaller sumps. As mining progresses at depth and along strike, the pumping methodology assumes that the sumps pump water in a “daisy chain” fashion, limiting the hydraulic head to no more than 150 m for any given sump.

The Escape deposit dewatering system includes a total of three main sumps and two smaller sumps. The “daisy chain” methodology is identical to the Current deposit, limiting the hydraulic head to no more than 150 m for any given sump.

16.5.3 Maintenance Shops

Maintenance for the mobile fleet within the Current deposit is assumed to be conducted via the surface maintenance shop. Maintenance for the mobile fleet within the Escape deposit is assumed to be conducted via a combination of the surface maintenance shop and an underground satellite shop. Due to the distance between the Escape deposit portal and the surface maintenance shop, it is assumed that most preventative maintenance will be conducted at the surface maintenance shop, and unexpected maintenance (e.g., flat tires) will be conducted via the underground satellite maintenance shop.

16.5.4 Explosives Storage

Underground power and primer magazines will be created from existing disused cut-outs. The mine explosives are stored offsite at a vendor location and deliveries are on an as-needed basis, with the underground magazines providing the capacity required for development and production needs.

16.5.5 Health and Safety

Mine Safety and Health Administration (MSHA) safety standards are incorporated in the mine design and include dual secondary means of mechanical egress for both the Current and Escape deposits. The mine communication system will have both mine phones and wireless communication through a leaky feeder system. A mine rescue team will be required to support the mine’s underground operations. The mine safety program will integrate with local providers in case of any mine emergency. Additionally, a stench gas emergency warning system will be installed in both the Current and Escape intake ventilation systems. This system can be activated to warn underground employees of a fire situation or other emergency whereupon emergency procedures will be followed.

Mobile refuge stations have been included within the underground mine design and are housed in existing disused cut-outs. Each refuge chamber will be sufficiently equipped to house 12 or more persons, depending on location and unit size, for up to 36 hours. The stations are self-sufficient and include seating, a chemical toilet, emergency food and water, backup power, lighting, and communications via external antenna and power supply. The breathable air system that is incorporated within the refuge chambers includes a standard compressed air line tie in, oxygen cylinder connection, as well as an oxygen candle. Each chamber can be located at the most strategic location as dictated by the mining operation and underground workings. The chambers are easily transported by forklifts or LHD units.

Underground dust suppression is achieved primarily by reducing airborne dust particulate with the use of wetting down muck piles, water sprays in blast headings and water atomizers in the main ramps.

16.5.6 Mine Service Distribution System

The underground mines will be supplied with two air compressors. The Current deposit is expected to utilize both air compressors for the first 4 years of mine life; once the Escape deposit begins production, one is expected to be relocated to the Escape portal entrance.

The Current and Escape deposits will each be equipped with a leaky feeder system that will allow phone and radio communications underground, as well as standard underground call phones with intercom.

The Current deposit includes eight permanent 5 kV substations and six portable 5 kV substations. The temporary substations will be moved as the production schedule necessitates. The Escape deposit will include five permanent 5 kV substations and one portable 5 kV substation.

16.5.7 Underground Workforce

The expected workforce for the underground mine will average 190 people, including technical service staff and management.

The workforce is estimated based on the production schedule and equipment requirements and includes a combination of local skilled labour with experienced technical service staff and management. Contractor labour and processing plant operations labour were not included in these workforce counts. Technical service and management staff are scheduled on a 10-hour, 4-day work week. The underground hourly workforce is scheduled on a 12-hour per shift, 2 shift per day, 7 days per week rotation, necessitating 4 crews to support the rotation. The underground maintenance hourly workforce is scheduled on a 12-hour per shift, 1 shift per day, and 7 days per week rotation, necessitating 2 crews to support the rotation. Table 16-21, Table 16-22, Table 16-23, Table 16-24, and Table 16-25 outline the management team and technical service staff, underground maintenance workforce, underground development workforce, and underground production workforce requirements, respectively.

Table 16-21: Yearly Workforce Count by Type

Workforce Type	Year												
	-3	**-2**	**-1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Management & Technical Staff	3	6	24	42	42	42	42	42	42	42	42	42	21
Maintenance Hourly	-	-	-	24	24	24	24	24	24	24	24	24	12
Development Hourly	-	-	-	44	44	44	44	36	36	36	36	36	18
Production Hourly	-	-	-	72	76	76	84	88	92	92	92	92	46
Total Workforce	**3**	**6**	**24**	**182**	**186**	**186**	**194**	**190**	**194**	**194**	**194**	**194**	**97**

Table 16-22: Yearly Management and Technical Staff Workforce Count

Management & Technical Staff	Year												
	-3	-2	-1	1	2	3	4	5	6	7	8	9	10
Mine Manager	1	1	1	1	1	1	1	1	1	1	1	1	0.5
Mine Superintendent	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Production General Foreman	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Development General Foreman	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Clerks	-	-	3	3	3	3	3	3	3	3	3	3	1.5
Technical Services Manager	-	1	1	1	1	1	1	1	1	1	1	1	0.5
Chief Mining Engineer	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Senior Mining Engineer	-	1	1	1	1	1	1	1	1	1	1	1	0.5
Long Range Planning Engineer	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Short Range Planning Engineer	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Short Range Planning Technician	-	-	-	2	2	2	2	2	2	2	2	2	1.0
Ventilation Technician	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Surveyors	-	-	2	2	2	2	2	2	2	2	2	2	1.0
Geotechnical Engineer	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Chief Geologist	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Senior Geologist	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Beat Geologist	-	-	1	2	2	2	2	2	2	2	2	2	1.0
Senior Modelling Geologist	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Logging Geologist	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Core Logger	-	-	1	2	2	2	2	2	2	2	2	2	1.0
Safety Superintendent	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Safety General Foreman	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Safety Coordinator	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Maintenance Superintendent	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Maintenance General Foreman	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Maintenance Planning Coordinator	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Maintenance Planning Engineer	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Maintenance Planning Technician	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Mill Superintendent	-	1	1	1	1	1	1	1	1	1	1	1	0.5
Mill General Foreman	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Mill Senior Engineer	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Mill Engineer	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Mill Technician	-	-	-	1	1	1	1	1	1	1	1	1	0.5
Project Lead	1	1	1	1	1	1	1	1	1	1	1	1	0.5
Mechanical Engineer	-	-	1	1	1	1	1	1	1	1	1	1	0.5
Civil Engineer	1	1	1	1	1	1	1	1	1	1	1	1	0.5
Total Management & Technical Staff	**3**	**6**	**24**	**42**	**42**	**42**	**42**	**42**	**42**	**42**	**42**	**42**	**21**

Table 16-23: Yearly Maintenance Hourly Workforce Count

Maintenance Hourly	Year												
	-3	-2	-1	1	2	3	4	5	6	7	8	9	10
Shop Supervisor	-	-	-	2	2	2	2	2	2	2	2	2	1
Journeyman Mechanic	-	-	-	4	4	4	4	4	4	4	4	4	2
Journeyman Millwright	-	-	-	2	2	2	2	2	2	2	2	2	1
Journeyman Electrician	-	-	-	4	4	4	4	4	4	4	4	4	2
Journeyman Welder	-	-	-	2	2	2	2	2	2	2	2	2	1
Apprentice Mechanic Helper	-	-	-	4	4	4	4	4	4	4	4	4	2
Apprentice Millwright	-	-	-	2	2	2	2	2	2	2	2	2	1
Apprentice Electrician	-	-	-	2	2	2	2	2	2	2	2	2	1
Apprentice Welder Helper	-	-	-	2	2	2	2	2	2	2	2	2	1
Total Maintenance Hourly	**-**	**-**	**-**	**24**	**24**	**24**	**24**	**24**	**24**	**24**	**24**	**24**	**12**

Table 16-24: Yearly Development Hourly Workforce Count

Development Hourly	Year												
	-3	-2	-1	1	2	3	4	5	6	7	8	9	10
Development Supervisor	-	-	-	4	4	4	4	4	4	4	4	4	2
Jumbo Operator	-	-	-	8	8	8	8	6	6	6	6	6	3
Bolter Operator	-	-	-	12	12	12	12	8	8	8	8	8	4
Development LHD Operator	-	-	-	4	4	4	4	4	4	4	4	4	2
Services	-	-	-	8	8	8	8	6	6	6	6	6	3
Cablebolting / Grouting	-	-	-	4	4	4	4	4	4	4	4	4	2
Utility / Nipper / Helper	-	-	-	4	4	4	4	4	4	4	4	4	2
Total Development Hourly	**-**	**-**	**-**	**44**	**44**	**44**	**44**	**36**	**36**	**36**	**36**	**36**	**18**

Table 16-25: Yearly Production Hourly Workforce Count

Production Hourly	Year												
	-3	-2	-1	1	2	3	4	5	6	7	8	9	10
Production Supervisor	-	-	-	4	4	4	4	4	4	4	4	4	2
Truck Driver	-	-	-	20	24	24	28	32	36	36	36	36	18
LHD Operator	-	-	-	12	12	12	12	12	12	12	12	12	6
Drill Operator	-	-	-	8	8	8	12	12	12	12	12	12	6
Blaster	-	-	-	8	8	8	8	8	8	8	8	8	4
Grader Operator	-	-	-	4	4	4	4	4	4	4	4	4	2
Pastefill Operator	-	-	-	2	2	2	2	2	2	2	2	2	1
Shotcrete Operator	-	-	-	4	4	4	4	4	4	4	4	4	2
Construction	-	-	-	2	2	2	2	2	2	2	2	2	1
Fuel / Lube Truck Operator	-	-	-	4	4	4	4	4	4	4	4	4	2
Utility / Nipper / Helper	-	-	-	4	4	4	4	4	4	4	4	4	2
Total Production Hourly	**-**	**-**	**-**	**72**	**76**	**76**	**84**	**88**	**92**	**92**	**92**	**92**	**46**

16.5.8 Mobile Equipment

Equipment requirements were calculated from production rates and typical availabilities for equipment in underground mines.

Equipment overhaul is scheduled 6 years after initial purchase for major mobile equipment (haul trucks, LHDs, jumbos, bolters, production drills and graders). The overhaul cost is expected at 60% of the initial purchase price.

Table 16-26 outlines the number of underground mobile equipment required for both the Current and Escape deposits, by year. Contractor equipment will be provided, as necessary, by the mine contractor and is not itemized in Table 16-26. Once the Escape deposit begins production in Year 4, the mobile equipment fleet is assumed to be shared, as necessary, between the Current and Escape deposits.

Table 16-26: Underground Mobile Equipment Required by Year

Underground Mobile Equipment (Company Only)	Year										
	-1	1	2	3	4	5	6	7	8	9	10
Haul Truck (45t)	-	6	7	7	8	9	10	10	10	10	10
LHD (10t)	-	5	5	5	5	5	5	5	5	5	5
Drill Jumbo	-	2	2	2	2	2	2	2	2	2	2
Bolter	-	4	4	4	4	4	4	4	4	4	4
Production Drill ITH	-	1	1	1	2	2	2	2	2	2	2
Production Drill TH	-	1	1	1	1	1	1	1	1	1	1
Scissor Lift	-	3	3	3	3	3	3	3	3	3	3
ANFO Loader	-	2	2	2	2	2	2	2	2	2	2
Emulsion Loader	-	1	1	1	2	2	2	2	2	2	2
Shotcrete Unit	-	1	1	1	1	1	1	1	1	1	1
Grouting Unit	-	1	1	1	1	1	1	1	1	1	1
Fuel / Lube Truck	-	1	1	1	1	1	1	1	1	1	1
Utility / Crane Truck	-	2	2	2	2	2	2	2	2	2	2
Boom Truck	-	1	1	1	1	1	1	1	1	1	1
Grader	-	1	1	1	1	1	1	1	1	1	1
Personnel Carrier	-	1	1	1	2	2	2	2	2	2	2
Pick-up Truck	3	6	6	6	6	6	6	6	6	6	6

17. RECOVERY METHODS

17.1 Summary

Section 13 of this Technical Report provides a summary of the metallurgical test work to date. A conceptual industrial process design for the PEA was developed based on metallurgical test work produced in 2021 by Blue Coast.

Grindability and flotation test work was conducted by Blue Coast. The metallurgical testwork program involved batch testing of drill core material. The results of which were used to derive the preliminary process flow sheet and mass balance of the facility. Process design parameters were established to define the equipment required for production and storage of concentrate. Overall capital and operating cost estimates, presented in Section 21, were based on the major equipment as identified within the process flow diagram.

The conceptual process plant was designed using conventional and proven technology. It is designed for a throughput of 3,600 metric tonnes per day (mtpd) at a planned availability of 92% per annum. The beneficiation plant will operate a planned 360 days per year, equating to an annual feed of 1,296,000 metric tonnes. The plant will produce two separate concentrates from the ore feed. The first process circuit will produce a copper concentrate primarily containing PGEs. The second circuit will produce a bulk concentrate recovered from the tailings of the copper circuit, containing additional PGEs and remaining sulphides. The two concentrates will be sold in the open market.

ROM ore from the underground workings will be hauled to a primary crusher facility, which will utilize a jaw crusher, before being conveyed to a 4,500-tonne surface stockpile prior to the mill facility. The comminution circuit consists of a SAG mill with a pebble crusher and a ball mill operating in a closed circuit with a hydrocyclone cluster. Cyclone overflow will report to the copper roughers bank, which will separate the two concentrate streams. The copper concentrate from the copper roughers will continue through to primary and secondary cleaning. The roughers and primary cleaners will utilize mechanical flotation tanks cells. The secondary cleaning stage will employ a column flotation cell. A regrind stage will treat rougher float products prior to primary cleaning.

The tailings from the copper roughers bank will be processed to produce the bulk concentrate via five additional stages of cleaning, consisting of a roughers bank, followed by primary, secondary, tertiary, and quaternary cleaners stages. Mechanical flotation tank cells will be utilized for all cleaning stages in this circuit.

17.2 Process Description

All throughput and mass balance calculations used as the basis of design were based on the average production mill feed of 3,600 mtpd of ore. The key process design criteria used for plant design is provided in Table 17-1. An overall simplified flowsheet is presented in Figure 17-1, followed by a surface infrastructure layout in Figure 17-2.

Table 17-1: Key Process Design Criteria Used for Plant Design

Parameter	Value	Unit
Plant Capacity	3,600	mtpd
ROM Ore SG	2.9	mt/m^3
ROM Ore Moisture	6.6	%
ROM Granulometry, F_{80}	914	mm
SAG Mill Work Index (85th Percentile)	11.00	kWh/mt
Ball Mill Work Index (85th Percentile)	17.29	kWh/mt
Primary Crushing Operating Hours	9	hr/d
Grinding Operating Hours	24	hr/d
Primary Crusher size	C150	Jaw
Primary Crusher Installed Power	225	kW
SAG Mill Dimensions	6.7 m dia. x 2.8m EGL	
SAG Mill Installed Power	2.75	MW
Pebble Crusher Type	Cone	
Ball Mill Dimensions	4.6 m dia. x 7m EGL	
Ball Mill Installed Power	2.75	MW
Ball Mill Circulating Load	250	%
Hydrocyclone Overflow % Solids	32	% w/w
Product Size, P_{80}	65	µm
Copper Roughers Flotation Cell Type	Mechanical Tank Cell	
Regrind Mill Type	Vertical Regrind Mill	
Copper First Cleaners Flotation Cell Type	Mechanical Tank Cell	
Copper Second Cleaner Flotation Cell Type	Column Cell	
Final Copper Concentrate Mass Pull	1.47	%
Copper Concentrate Thickener Type	High-rate	
Copper Concentrate Thickener Underflow	60	% w/w
Copper Concentrate Filter Type	Multi-plate Pressure	
Copper Concentrate Moisture Target	8	% w/w
Bulk Roughers Flotation Cell Type	Mechanical Tank Cell	
Bulk First Cleaners Flotation Cell Type	Mechanical Tank Cell	
Bulk Second Cleaner Flotation Cell Type	Mechanical Tank Cell	
Bulk Third Cleaner Flotation Cell Type	Mechanical Tank Cell	
Bulk Fourth Cleaner Flotation Cell Type	Mechanical Tank Cell	

Parameter	Value	Unit
Final Bulk Concentrate Mass Pull	3.31	%
Bulk Concentrate Thickener Type	High-rate	
Bulk Concentrate Thickener Underflow Density	60	% w/w
Bulk Concentrate Filter Type	Multi-plate Pressure	
Bulk Concentrate Moisture Target	10	% w/w

Source: Nordmin, 2021

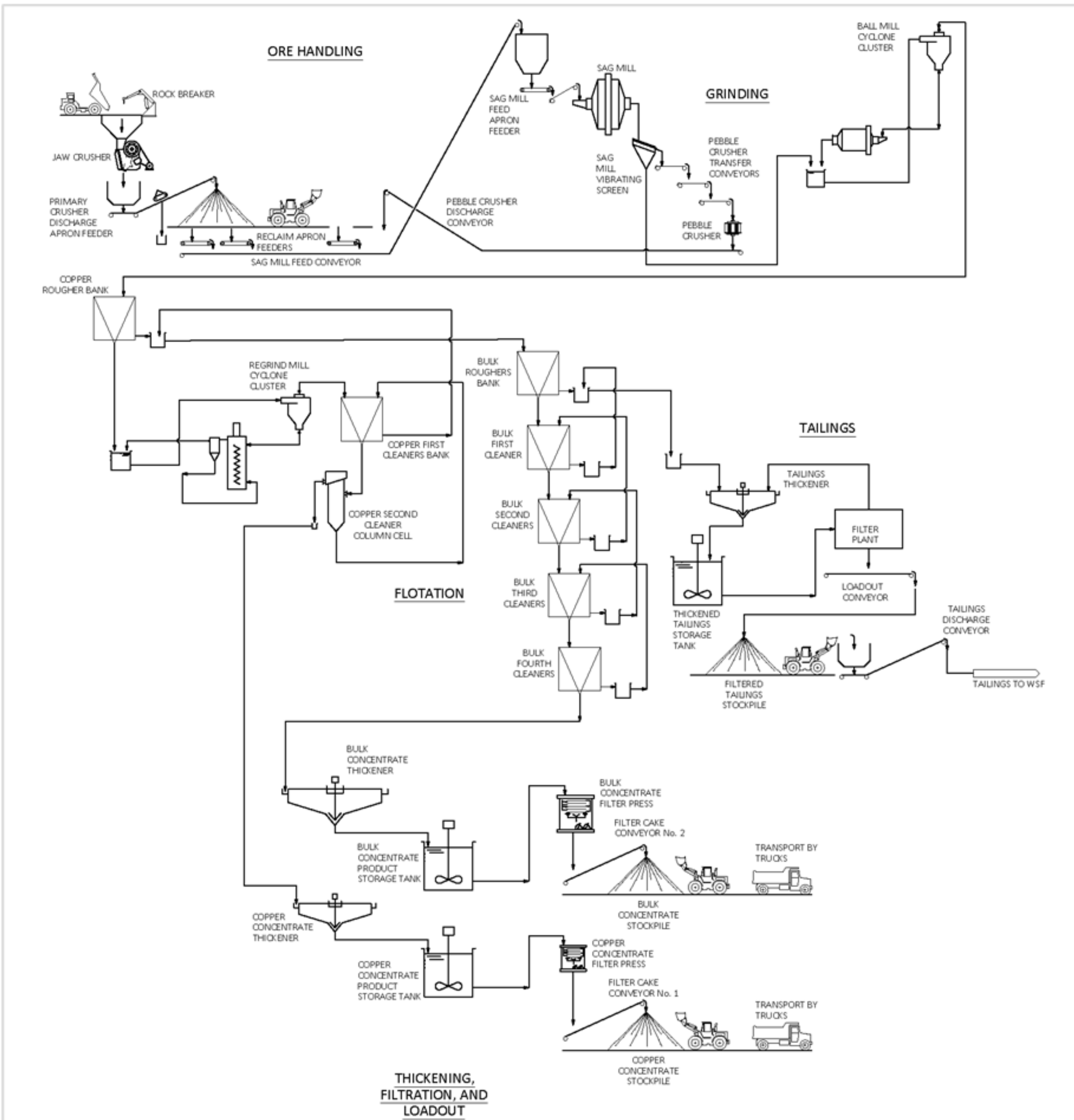


Figure 17-1: Simplified overall process flow diagram

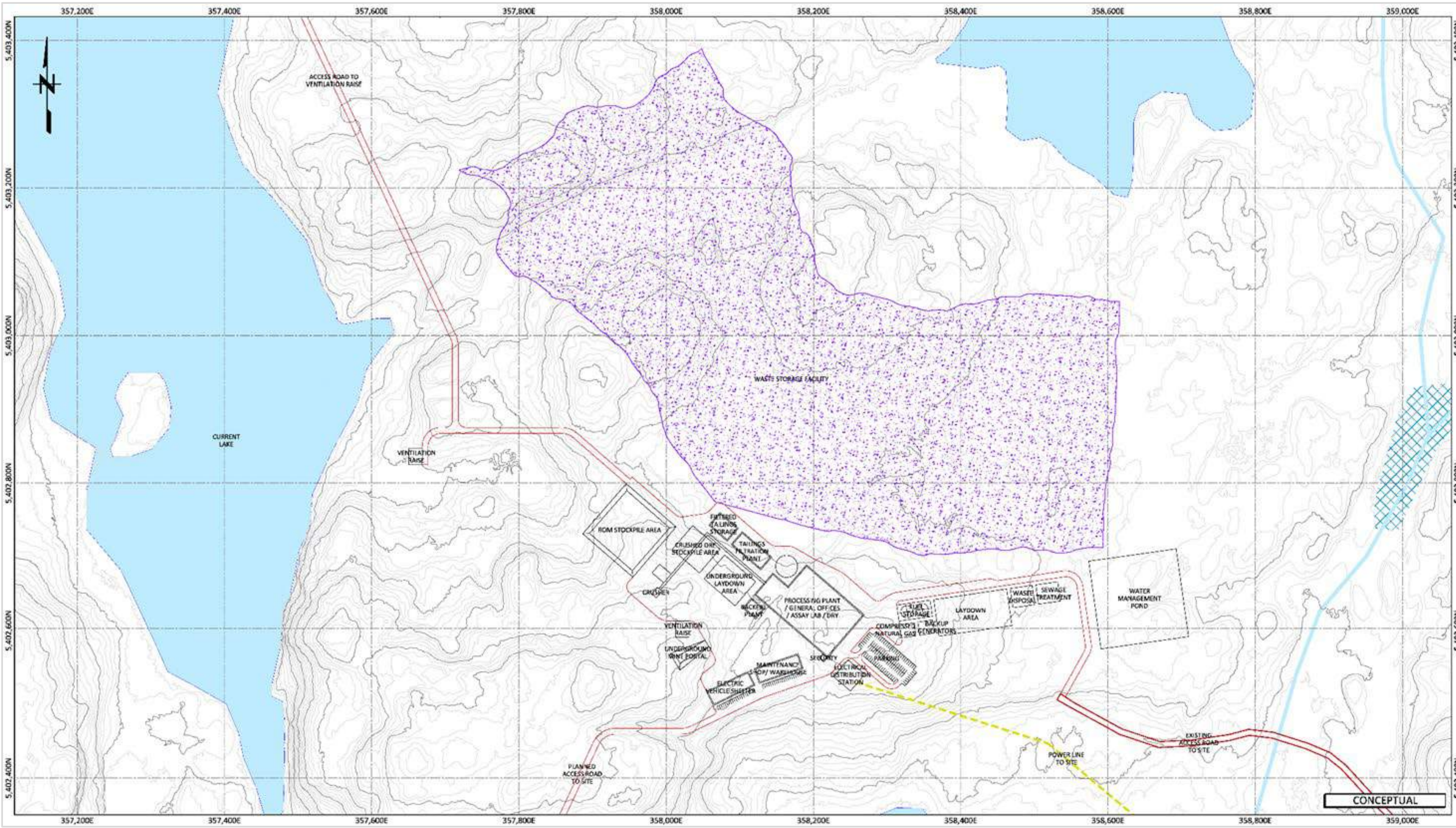


Figure 17-2: Surface infrastructure layout

17.3 Primary Crushing

17.3.1 Purpose

The crushing circuit is designed to reduce ROM ore with a nominal moisture content of 3% w/w and an F_{80} of 914 mm to feed the mill comminution circuit at a P_{80} of 200 mm.

17.3.2 Description

ROM ore is transported by LHD loader from the underground mine to a surface ROM stockpile. A front-end wheel loader will feed ROM ore from the stockpile to the crusher. Crusher feed ore will be dumped through a grizzly that will screen the ore to 914 mm minus before feeding the jaw crusher, where it is reduced to a P_{80} size of 200 mm. A Metso-Outotec C150 Jaw Crusher has been selected for the service. A remote-operated rock breaker will be installed at the dump point to reduce oversize material caught by the grizzly.

The crusher will operate at a nominal rate of 400 mtph which corresponds to a planned utilization of 37.5%. This allows hauling/crushing to occur within a single shift basis.

A product bin is located at the primary crusher outlet, crushed ore drops into the ore bin which is fitted with a discharge apron feeder which feeds a loadout conveyor.

A belt magnet is located on the loadout conveyor to remove tramp ferrous material entrained in the ore before it leaves the crusher building complex. A belt weigh scale on the loadout conveyor tracks the production rate of the crushing plant.

A baghouse collects dust at the ore transfer points within the primary crusher building, which once collected, will report to the tail end of the loadout conveyor. A sump pit is provided to collect wash-up residue and is designed to be emptied periodically by vacuum truck.

17.4 Coarse Ore Stockpile

17.4.1 Purpose

The coarse ore stockpile is designed to provide storage of concentrator feed ore prior to the concentrator, and capacitance between the crushing circuit and concentrator to allow for day shift ore handling only to the crushing circuit and a feed to the concentrator complex which operates on a continuous basis.

17.4.2 Description

Ore discharged from the primary crusher circuit is fed to the coarse ore stockpile via belt conveyor. The stockpile has a design storage capacity 4,500 tonnes. Excess crushed material can be broadcast away from conical stockpile via dozer, to provide adequate storage capacity for routine scheduled maintenance of the primary crushing facility without interrupting feed to the mill.

Two reclaim apron feeders (one running, one spare) will be located within a concrete reclaim tunnel and will be utilized to control the outlet flow from storage pile to feed the SAG mill feed conveyor. A third apron feeder will be located within the reclaim tunnel, but outside the extents of the stockpile, which can be fed via front-end loader in the event the pile freezes or the reclaim apron feeders are both unavailable. Feed rate control to the SAG mill will be accomplished via variable frequency drive (VFD) control of the apron feeders, and VFD control of the SAG mill feed conveyor. The reclaim tunnel will be large enough to accommodate a track loader for ore clean-up and will have two means of egress. All conveyor transfer points will be provided with either dust collection or water sprays to minimize the generation of dust.

17.5 Comminution

17.5.1 Purpose

The grinding circuit will consist of a conventional semi autogenous ball mill crusher (SABC) arrangement and has been designed to produce feed slurry fine enough for effective flotation. Design parameters for the circuit include an F_{80} of 203 mm and a ball mill closed-in with hydrocyclones. A hydrocyclone overflow P_{80} of 65 µm will report to the roughing circuit for the first stage of flotation.

17.5.2 Description

The grinding circuit is designed to produce feed slurry fine enough for effective flotation. Primary grinding will be achieved with a SAG mill. The SAG mill slurry will discharge through a double deck vibrating screen where the oversize material will be classified and diverted to a pebble crusher. Product of the pebble crusher will be returned to the SAG mill feed.

SAG mill discharge screen undersize will report to the common mill pump box to be pumped to the hydrocyclone. The ball mill will be fed by the cyclone underflow and will recirculate back into the pump box. The recirculating load through the ball mill and cyclone will be 250%.

Process water will be added to the grinding circuit to achieve a pulp density of 71% w/w feeding the hydrocyclones, equating to the cyclone overflow discharging a 30% solids w/w slurry to the copper roughers bank.

17.6 Flotation Circuit

17.6.1 Purpose

The flotation circuits are designed to concentrate target precious metals from the ROM ore prior to thickening, filtration, and loadout. Two flotation circuits will be utilized to concentrate and recover the optimal quantity of payable elements from the ore. The first flotation circuit will produce a copper concentrate, containing the majority of present PGEs and gold. The second flotation circuit will produce a bulk concentrate, which will recover additional PGEs from the tailings of the first circuit.

17.6.2 Copper Concentrate Circuit

The copper concentrate circuit will consist of a roughers bank, hydrocyclone cluster, regrind mill, first cleaners bank, and a secondary cleaner column cell.

The copper roughers flotation stage will utilize mechanical tank cells in series, equipped with agitators. Feed slurry will report to the roughers at a grind P_{80} of 65 µm, via the grinding circuit hydrocyclone overflow. The copper roughers bank tailings will report to the bulk rougher feed pump box. The concentrated float products (“concentrate” or “accepts”) will report to a single regrind stage closed-in with hydrocyclones.

Overflow from the regrind hydrocyclones will report to the copper first cleaners flotation stage, which will also employ agitated mechanical tank cells installed in series. Tailings from the copper fist cleaners will also report to the bulk roughers feed pump box. Concentrate from the copper first cleaners will continue through to the copper second cleaner column cell.

The copper second cleaner column cell is the final flotation stage in the copper concentrate circuit. Concentrate from this stage will report to the copper concentrate thickener. The copper column tails will report back to the copper first cleaner.

17.6.3 Bulk Concentrate Circuit

The bulk concentrate flotation circuit will utilize a roughers bank, followed by four stages of cleaners. All five of these flotation stages will use mechanical tank cells with agitators, installed in series.

The bulk roughers will take their feed slurry from the copper roughers and copper first cleaners tails. Tailings from the bulk roughers will report to the bulk rougher tails pump box. Concentrate from the bulk roughers will continue through to the bulk first cleaners, followed by the bulk second cleaners, third cleaners, and fourth cleaners stages. Concentrate from the bulk fourth cleaners bank will report to the bulk concentrate thickener. Tailings from each cleaning stage will report back to the prior bulk cleaners stage (i.e., fourth cleaners tails to third cleaners feed, third to second, etc.), with the first cleaners tails reporting to the bulk rougher tails pump box. Tails from the bulk roughers and first cleaners will be pumped to the tailings thickener.

17.7 Concentrate Thickening, Filtration, and Loadout

17.7.1 Purpose

Separate concentrate thickening, filtration, and loadout circuits will be utilized to further process the copper and bulk concentrates. Each circuit will employ similar equipment but sized accordingly to the material flow rate of each stream.

17.7.2 Copper Concentrate Circuit

Final copper concentrate from the copper second cleaner accepts are fed to a high-rate concentrate thickener, where the feed slurry at 18% solids w/w is mixed with flocculant and thickened to a target solids concentration of 60% w/w.

Thickened copper concentrate is pumped to a product storage tank (PST), outfitted with an agitator to prevent settling. The stored thickened concentrate is then pumped to the copper concentrate pressure filter, where the solids content is further increased to a target of 92% solids w/w.

Discharged filter cake from the pressure filter is conveyed to an enclosed stockpile for bulk storage prior to being transported offsite via dump truck.

Thickener overflow and filter filtrate are collected and recycled back to the process.

17.7.3 Bulk Concentrate Circuit

Final bulk concentrate from the bulk fourth cleaner accepts are fed to a high-rate concentrate thickener, where the feed slurry at 25% solids w/w is mixed with flocculant and thickened to a target solids concentration of 60% w/w.

Thickened bulk concentrate is pumped to an agitated PST. The stored thickened concentrate is then pumped to the bulk concentrate pressure filter, where the solids content is further increased to a target of 90% solids w/w.

Discharge from the pressure filter is conveyed to a separate enclosed stockpile for bulk storage prior to being transported offsite via dump truck.

Thickener overflow and filter filtrate are collected and recycled back to the process.

17.8 Tailings

17.8.1 Purpose

The tailings system dewaters waste products in the form of slurry, via a filtration process, in order to place the material in the WSF via dry-stack methods.

17.8.2 Description

Waste products rejected from the bulk roughers and bulk first cleaners flotation stages report to the tailings thickener, where the underflow is stored in a PST outfitted with an agitator. Thickened tails are then pumped from the PST to the filter plant where they are further dewatered to a target solids concentration of 90%. Filtered tails are conveyed to a covered stockpile where they can air dry to further reduce the moisture content. An operator will feed the material onto a hopper feeder that will discharge to an overland conveyor that will transport the filtered tailings to the WSF. The material will be spread via dozer and compacted in lifts.

17.9 Reagents

Reagents will be stored dry, when possible, onsite prior to being prepared and stored in a separate area adjacent to the concentrator facility for distribution to the process. Table 17-2 outlines the required reagents and volumes.

Table 17-2: Required Reagents

Reagents	g/tonne	kg/yr
Lime	950	1,197,000
TETA	80	100,800
Na_2SO_3	80	100,800
CMC	850	1,071,000
3418A	10	12,600
MIBC	190	239,400
H_2SO_4	220	277,200
$CuSO_4$	60	75,600
SIPX	150	189,000

17.10 Assay and Metallurgical Laboratory

The assay and metallurgical laboratory facilities will include all necessary equipment to filter, dry and pulverize mine and concentrator samples to prepare them for assay; to perform all digestions and analytical procedures required for tracking concentrator feed head grades (using mine samples); and to perform all digestions and analytical procedures required for tracking the day-to-day metallurgical performance of the concentrator facility (using grinding and flotation composite samples collected within the mill).

18. PROJECT INFRASTRUCTURE

18.1 Introduction

The main project infrastructure components include underground mine portals and process plant supporting infrastructure, WSF, external and internal access roads, power supply and distribution. The proximity of the mine site plan to power (230 kV East-West Tie Line) and transportation infrastructure (paved Highway 527) within the Company's mining claims is felt to offer a competitive advantage. The infrastructure for the PEA is situated within the locations shown in Figure 18-1 and Figure 18-2.

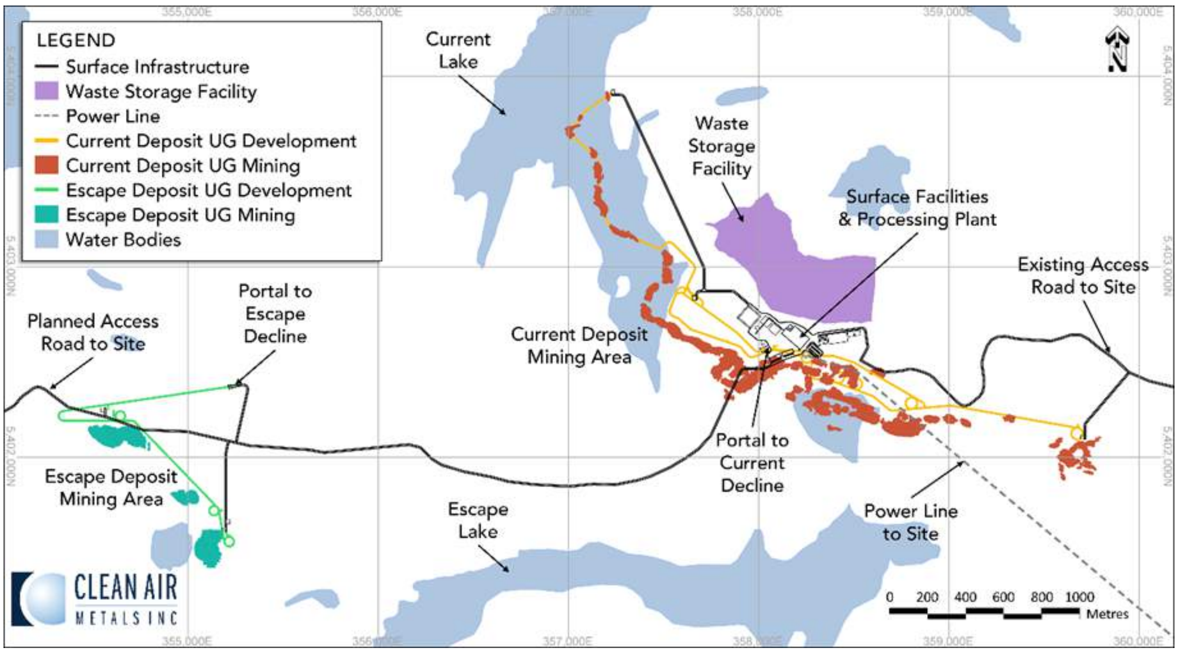


Figure 18-1: Site plan with deposits

18.2 Onsite Infrastructure

The final locations of infrastructure at the mining site will be determined following further geotechnical studies at the current level of study, preliminary locations have been selected. An overall site plan is shown in Figure 18-1.

18.3 Project Logistics

The Property is situated on in northwestern Ontario with the central point of Current Lake located at approximately 48° 46' 14.88" N latitude, 88° 56' 45.6" W longitude. The Property will have access to the substantial infrastructure, services, and skilled labour in the area. There will be reduced infrastructure cost requirements due to its location near Hwy 527 and approximately 50 km northeast of the city of Thunder Bay, Ontario, Canada. The elevation is nominally 490 m above sea level. The regional labour force includes experienced equipment operators, mine workers and material and equipment suppliers. Smaller logging roads and trails, accessed via Highway 527, provide good access to most areas of the Property.

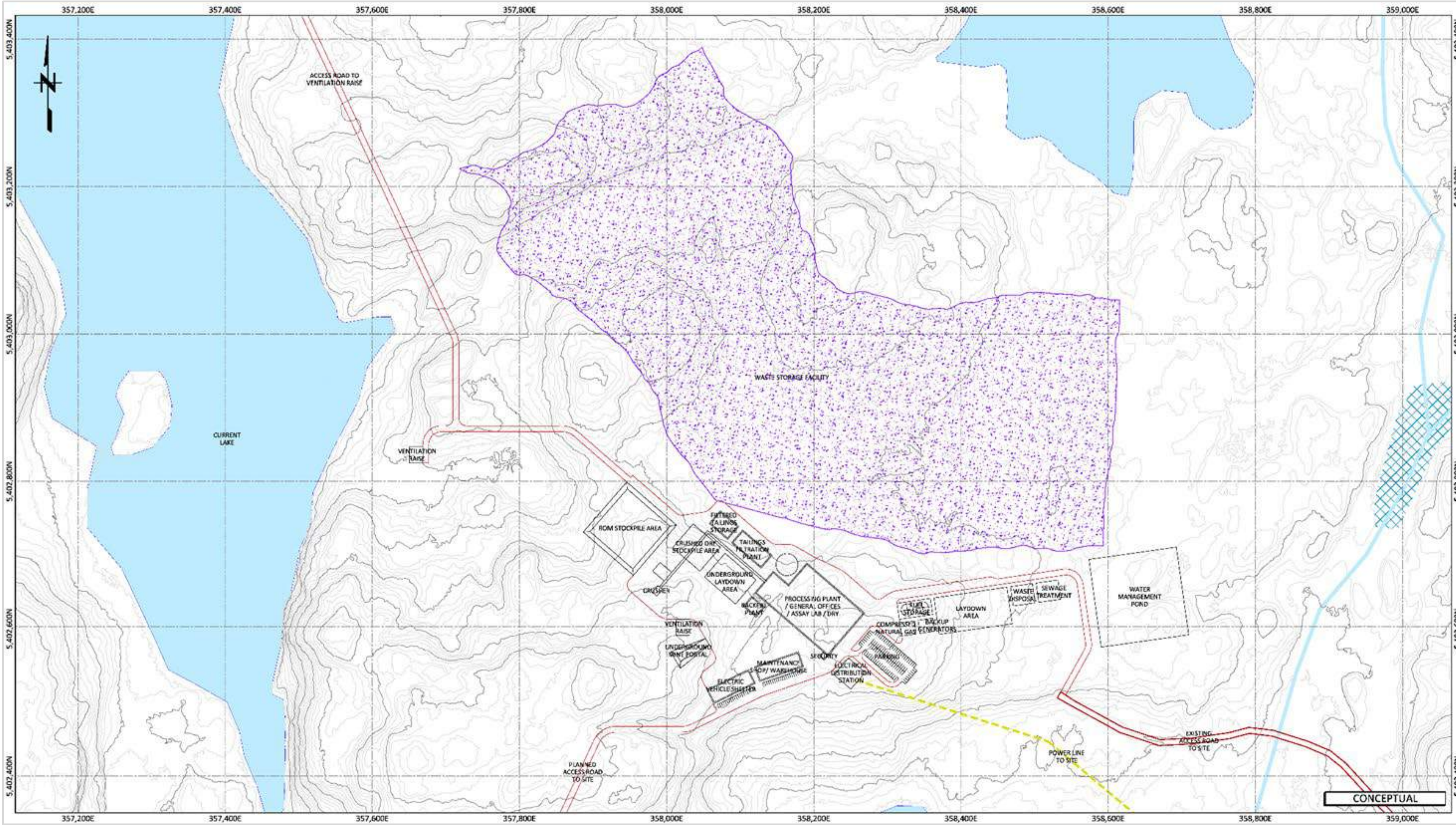


Figure 18-2: Surface infrastructure layout

18.4 Buildings and Facilities

The PEA general mine and process surface facilities assumptions include the following:

- 3,600 t/d mill and laboratory.
- A truck maintenance shop.
- A plant maintenance shop.
- An electric vehicle charging shelter.
- Fuel storage facility.
- Propane storage facility.
- An explosive storage magazine.
- Warehouse and laydown area.
- General administration building with dry.
- Core shed and a core storage yard.

The main operational and support buildings, including the mill and ROM, are located close to the Current deposit access portal. Further studies are required to determine the materials and method of construction that will be most cost-effective, efficient in construction, and appropriate to the local conditions.

18.5 Existing Infrastructure

The only recoverable surface infrastructure on the site are the existing access road to site, the current core storage and the access roads to the core storage. Access to the mine site is in discussion with a major forestry company via a combination of upgrades to existing logging roads and construction of new roads, totalling 10.5 km, connecting to Highway 527 to the West. It was also considered that all existing roads require partial clearing, minor granular refilling, culverts addition and/or repair, and to be levelled with a grader. The Company is coordinating with a major forestry company operator around co-funding of tree re-planting efforts in legacy areas including old gravel pits and decommissioned forestry access roads.

18.6 Power Supply and Distribution

As shown in Figure 18-2 power is anticipated to be supplied via a new 230 kV East-West Tie Line running to the southeast of the Project site (expected completion date of 2022), accessed by construction of a step-down transformer station and approximately 6 km of new 13.8 kV power lines. An onsite distribution and control building and approximately 3 km of additional 13.8 kV power lines to supply the Escape deposit will be necessary. In Years -2 and -1, during construction of the transformer station and power lines to mine site, temporary power generation will be used for onsite construction.

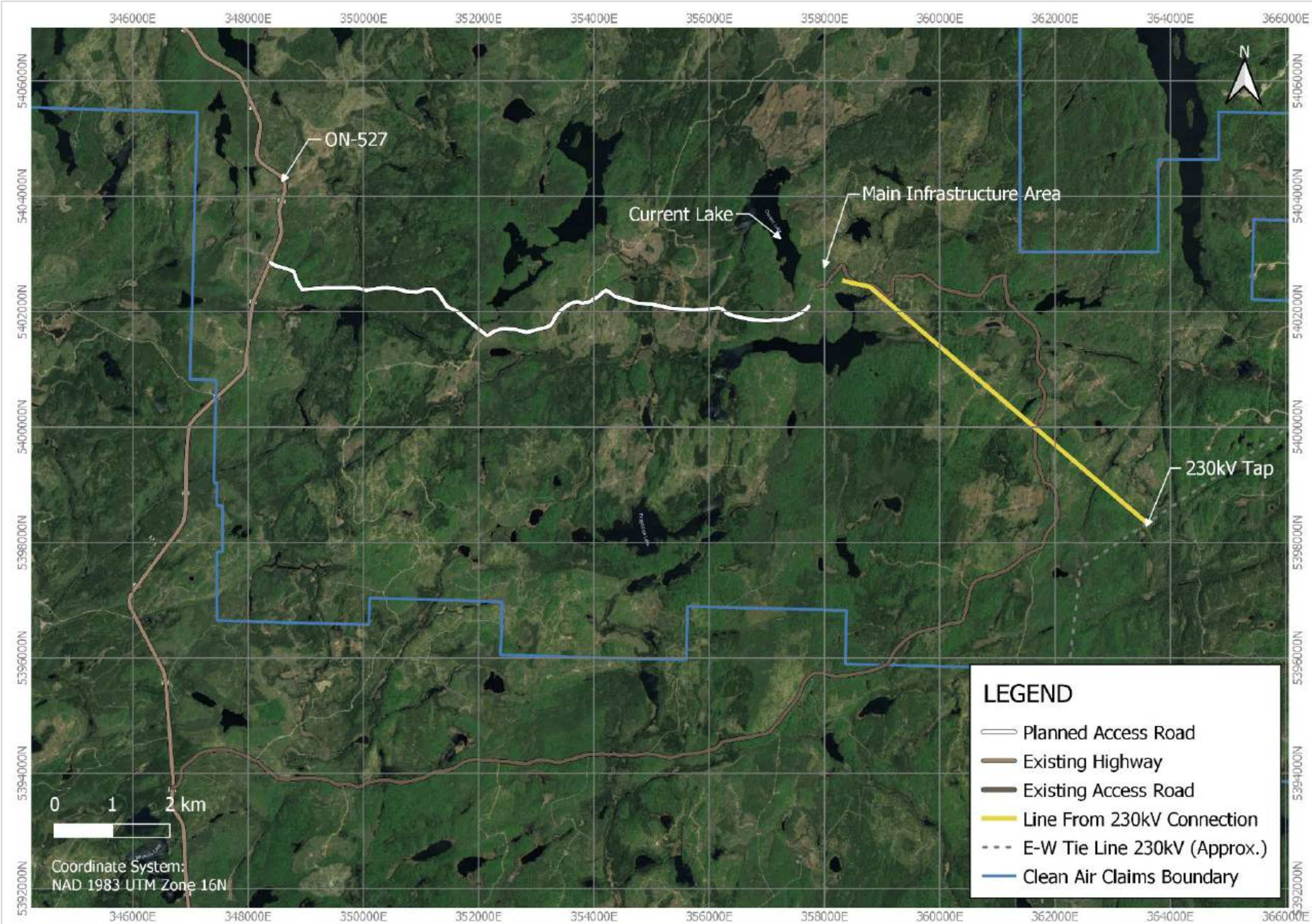


Figure 18-3: Offsite infrastructure

18.7 Waste and Water Management Plan

Knight Piésold was retained to develop the conceptual level waste and water management plan and cost estimates to store 6.0 M tonnes of PAG filtered tailings and 1.3 M tonnes of PAG waste rock.

18.7.1 Design Criteria

The key criteria used to develop the conceptual WSF and WMP arrangements over a development year (Year -1) and the first two years of operations (Years 1 and 2) are presented in Table 18-1. The overall design criteria over a development year (Year -1) and all ten years of operations (Years 1 through 10) are provided on Table 18-2. The Dam Class for the WSF has been selected as HIGH based on current Canadian Dam Association (CDA) guidelines (CDA, 2019). The HIGH classification is mainly based on a hypothetical slump of the filtered tailings mass reporting to fish bearing lakes and/or streams adjacent to the WSF. A significant loss or deterioration of important fish or wildlife habitat could occur in the event of a hypothetical failure of the outer slope of the WSF.

Table 18-1: Key Design Criteria - Development Year and the First Two Years of Operations

Item	Criteria
Mine Life	2 years
Tailings Production	Approx. 3,600 t/d
Total Tailings Production	2.6 Mt
Filtered Tailings for Surface Storage	1.3 Mt (50% of total, remainder to be used as u/g paste backfill)
Daily PAG Waste Rock Production to Surface	Approx. 400 t/d
Total PAG Waste Rock to Surface	0.37 Mt
Pre-production PAG Waste Rock to Surface	0.08 Mt
Operational PAG Waste Rock to Surface	0.29 Mt
NPAG Waste Rock Production to Surface	Approx. 600 t/d
Total NPAG Waste Rock to Surface	0.55 Mt
Pre-production NPAG Waste Rock to Surface	0.12 Mt
Operational NPAG Waste Rock to Surface	0.43 Mt
Dam Class	High (CDA, 2019)
Dam Construction Method	Upstream. NPAG waste rock, borrowed and processed select overburden, and quarried rockfill will be used for embankment construction
Dam Geometry	3.5H:1V downstream slope
	8 m wide crest
Tailings Final Average Placed Dry Density	1.8 t/m^3

Item	Criteria
Waste Rock Placed Dry Density	2.2 t/m^3
Total Required Storage Volume (Tailings and PAG Waste Rock)	0.89 Mm^3
Tailings Volume	0.72 Mm^3
PAG Waste Rock Volume	0.17 Mm^3
Total NPAG Waste Rock Volume for Embankment Construction	0.25 Mm^3
Pre-production NPAG Waste Rock to Surface	55,300 m^3
Operational NPAG Waste Rock to Surface	193,800 m^3
Design Earthquake (Operations)	1 in 2,475 year event
Slope Stability Requirements	The required Factor of Safety (FoS) against slope instability as per CDA (2019) guidelines are summarized as follows:
	Static Stability
	1.3 immediately following construction (undrained/total stress conditions) and prior to filling (upstream/downstream slopes)
	1.5 during operations and at closure (drained or effective stress conditions, downstream slope only)
	Pseudo-Static (Seismic) Stability - 1.0 (upstream and downstream slopes)
	Post-Earthquake (Residual Strengths) Stability - 1.2 (upstream and downstream slopes)
Seepage/Water Management	WSF basin to be excavated to competent bedrock and seepage to be directed to WCPs
	Contact water from WSF to be temporarily stored in the WMP, then reclaimed for re-use in the process or treated (if required) and discharged to the environment
	Stormwater management components are designed to manage runoff from storms up to and including the storm that is ⅓ between the 1 in 1,000 year, 24 hour storm event and the Probable Maximum Flood event

Notes:

1. The SG of the ore insitu is estimated to be 2.95, as reported by Nordmin.

2. The SG of the waste rock insitu is estimated to be 2.90, as reported by Nordmin. A bulking factor of 30% was applied for material brought to surface, which equates to a placed dry density of 2.2 t/m^3.

Table 18-2: Key Design Criteria - Over Development Year and all Ten Years of Operations

Item	Criteria
Mine Life	9.3 years
Tailings Production	Approx. 3,600 t/d
Total Tailings Production	12.0 Mt
Filtered Tailings for Surface Storage	6.0 Mt (50% of total, remainder to be used as u/g paste backfill)
Daily PAG Waste Rock Production to Surface	Approx. 400 t/d
Total PAG Waste Rock to Surface	1.3 Mt
Pre-production PAG Waste Rock to Surface	0.08 Mt
Operational PAG Waste Rock to Surface	1.18 Mt
Daily NPAG Waste Rock Production to Surface	Approx. 600 t/d
Total NPAG Waste Rock to Surface	1.9 Mt
Pre-production NPAG Waste Rock to Surface	0.12 Mt
Operational NPAG Waste Rock to Surface	1.77 Mt
Dam Class	High (CDA, 2019)
Dam Construction Method	Upstream. NPAG waste rock, borrowed and processed select overburden, and quarried rockfill will be used for embankment construction
Dam Geometry	2H:1V upstream slope
	3.5H:1V downstream slope
	8 m wide crest
Tailings Final Average Placed Dry Density	1.8 t/m^3
Waste Rock Placed Dry Density	2.2 t/m^3
Total Required Storage Volume (Tailings and PAG Waste Rock)	3.91 Mm^3
Tailings Volume	3.34 Mm^3
PAG Waste Rock Volume	0.57 Mm^3
Total NPAG Waste Rock Volume for Embankment Construction	0.86 Mm^3
Pre-production NPAG Waste Rock to Surface	55,300 m^3

Item	Criteria
Operational NPAG Waste Rock to Surface	806,100 m^3
Design Earthquake (Operations)	1 in 2,475 year event
Slope Stability Requirements	The required FoS against slope instability as per CDA (2019) guidelines are summarized as follows:
	Static Stability
	1.3 immediately following construction (undrained/total stress conditions) and prior to filling (upstream/downstream slopes)
	1.5 during operations and at closure (drained or effective stress conditions, downstream slope only)
	Pseudo-Static (Seismic) Stability - 1.0 (upstream and downstream slopes)
	Post-Earthquake (Residual Strengths) Stability - 1.2 (upstream and downstream slopes)
Seepage/Water Management	WSF basin to be excavated to competent bedrock and seepage to be directed to WCPs
	Contact water from WSF to be temporarily stored in the WMP, then reclaimed for re-use in the process or treated (if required) and discharged to the environment
	Stormwater management components are designed to manage runoff from storms up to and including the storm that is ⅓ between the 1 in 1,000 year, 24 hour storm event and the Probable Maximum Flood event

Notes:

1. The SG of the ore insitu is estimated to be 2.95, as reported by Nordmin.

2. The SG of the waste rock insitu is estimated to be 2.90, as reported by Nordmin. A bulking factor of 30% was applied for material brought to surface, which equates to a placed dry density of 2.2 t/m^3.

18.7.2 Geotechnical Conditions

Knight Piésold monitored a limited site investigation program in mid-September 2021, consisting of the excavation of 19 test pits. A relatively thin and discontinuous layer (up to 2.5 m in depth) of topsoil and overburden was identified in the vicinity of the WSF during the site investigations, with many areas identified as exposed bedrock. The topsoil layer was estimated to range in thickness from 0 m (not present) to 1.0 m. The overburden was observed to consist of silty sand with varying gravel content from 0 m (not present) to 1.5 m in thickness. The site investigation results on the overburden are summarized below.

- The results from 13 particle size distribution tests indicate that the overburden was measured to range from 0% to 29% gravel, 38% to 79% sand, and 6% to 62% fines. The results from five hydrometer tests indicate that the overburden was measured to range from 37% to 61% silt and 1 to 7% clay. Based on the hydrometer results, it is likely that the fines content from the other nine samples mainly consists of silt with minor amounts of clay (less than 5%).

- The natural moisture content was measured to range from 4% to 22% based on 13 tests.
- The SG was measured to range from 2.67 to 2.76 based on three tests.
- The results from two Standard Proctor tests on combined overburden samples indicate that the maximum dry density ranges from 1,875 kg/m^3 to 1,884 kg/m^3 and the optimum moisture content ranges from 11.6% to 12.0%.

The classification for the overburden is typically SM (silty sand; ASTM D2487) based on the results.

18.7.3 Tailings Characteristics

Tailings were supplied by Blue Coast for physical characterization and filtration testwork. Laboratory testing on the tailings was completed by Paterson & Cooke (2021) in Sudbury, Ontario. The results are summarized below. Note that all moisture content results use the geotechnical calculation method (Ms/Mw).

- The results from one particle size distribution test, as measured by laser diffraction, indicate that the tailings consist of 21% sand, 73% silt, and 6% clay. The D_{80} was estimated to be 78 µm.
- The solids density, as measured by helium gas pycnometer, was estimated to be 2,920 kg/m^3.
- The maximum dry density was measured to be 1,915 kg/m^3 at an optimum moisture content of 14.2% based on standard proctor testing (ASTM D698).
- Transportable Moisture Limit (TML) testing was completed to confirm the moisture content where the tailings could flow and become unstable. The flow moisture point (FMP) was also estimated as part of the TML testing. The TML and FMP were estimated to be 17.6% and 20.0%, respectively.
- Filtration testing was completed at filter feed solids contents of 55%, 60%, and 65% by weight. The filtration testing indicates that the TML (17.6%) can be achieved with the addition of a membrane press step and an air drying step.

The results from this testing indicate the following:

- The tailings can be filtered to a moisture content (TML) that can be transported from the plant site to the WSF.
- An average placed dry density of 1.8 tonnes/m^3 can be achieved with tailings filtered to the TML.

18.7.4 WSF Concept Summary

The location of the facility was selected in conjunction with the Consultants and Clean Air based on the following criteria:

- Topography
- Proximity to the plant site and portal
- Sufficient offset from local water bodies

The WSF will be constructed in two stages to reduce initial capital expenditures. The final (Stage 2) arrangement of the WSF is shown on Figure 18-4 plan and section. The Stage 1 arrangement is outlined within the overall final arrangement and shown on the section.

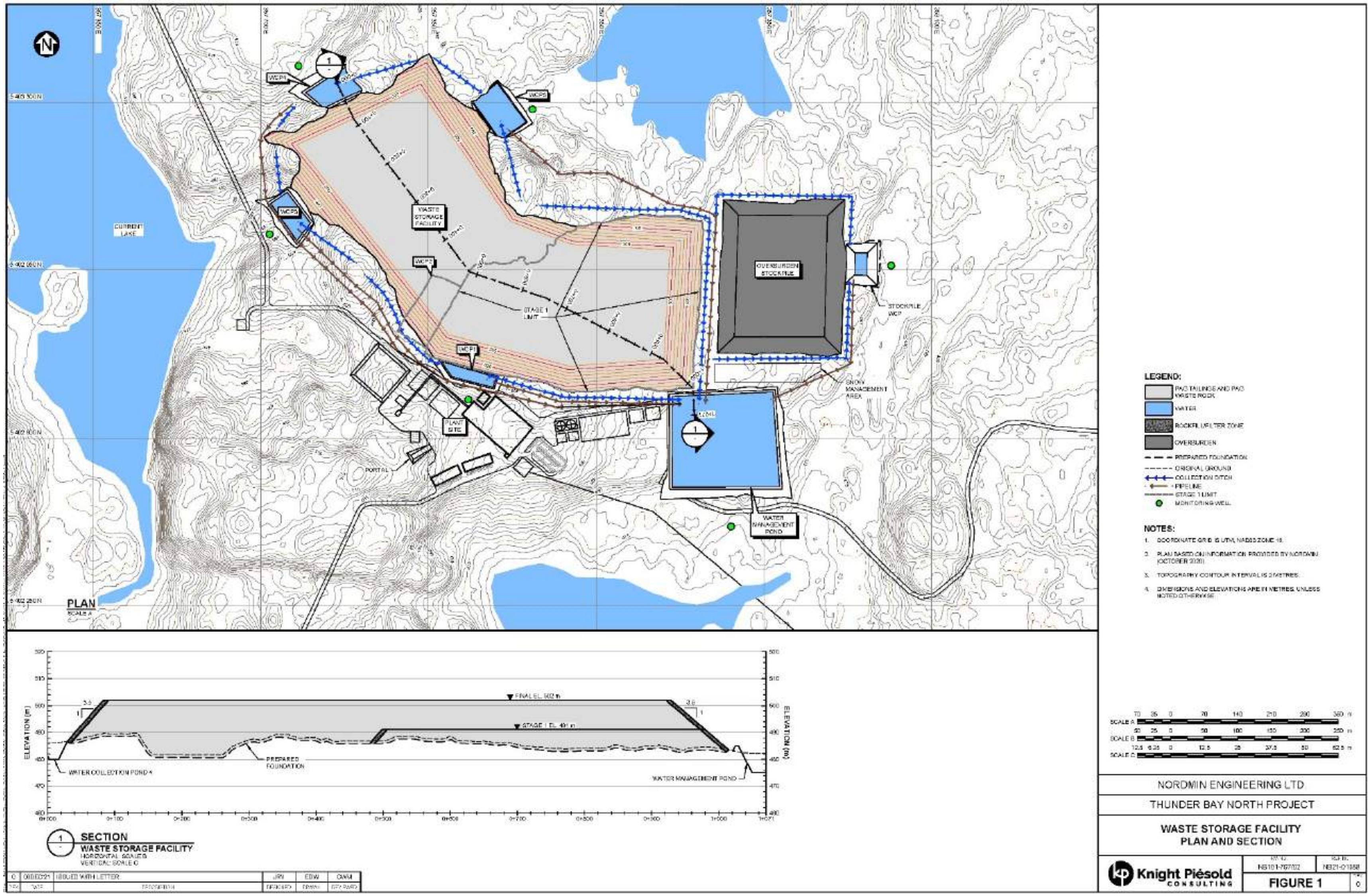


Figure 18-4: WSF plan and section

18.7.4.1 Stage 1 Construction

The Stage 1 WSF was developed to provide two years of waste storage (Year 1 through Year 2). Stage 1 construction will occur in Year -1. PAG waste rock will be produced during Year -1 through Year 2 and filtered tailings will be produced during Years 1 and 2.

Based on the results of the site investigations, the identified overburden within the Stage 1 WSF footprint will be removed to expose a competent bedrock foundation and prepare the area for construction and waste placement. It is anticipated that a portion of the bedrock foundation (assumed to be 2% of the surface area) will be treated with dental concrete to cover any identified faults, or other weak zones, in the bedrock. Further geotechnical and hydrological investigations (i.e., packer testing) will be required to confirm these assumptions and verify that a full lining system or grouting of select areas of bedrock will not be required. Careful inspection of the exposed bedrock following overburden excavation will also be important to fully understand the foundation conditions and address any identified areas of higher permeability within the bedrock. The excavated overburden will be placed in the Overburden Stockpile to the east of the WSF.

Following foundation preparation, NPAG waste rock and a filter zone will be used to construct a 1 m high, 8 m wide berm. The NPAG waste rock will be sourced from underground mine development and will be 7 m wide. The filter zone will consist of sand and gravel from the Overburden Stockpile and will likely require processing to meet the material specifications. The filter zone will be 1 m wide and placed upstream of the NPAG waste rock to prevent the migration of filtered tailings into the waste rock.

During Years 1 and 2, the NPAG waste rock, additional quarried rockfill, filter zone material, PAG waste rock, and filtered tailings will be placed and compacted on the treated bedrock foundation at the same time to maintain the same elevation along the WSF crest. The NPAG waste rock and rockfill will form a 7 m wide, erosion resistant shell for the WSF as it is raised. The 1 m thick filter zone will be constructed between the shell zone and the placed and compacted PAG waste rock and filtered tailings.

Placement of tailings and waste rock will commence at the lowest elevation and advance upslope until the WSF is level, and the WSF will then be raised in generally level lifts across the entire WSF footprint. This approach will minimize ponding of water on the WSF upper surface and allow any runoff to shed from the WSF. During the winter months, snow will be removed from the interim surfaces as the material is placed. A designated, lined Snow Management Area will be constructed adjacent to the WSF to store snow and the snow melt will report to the WMP. The Stage 1 WSF will be 8.5 m in height along the maximum section with the rockfill, filter zone, and filtered tailings constructed to crest El. 491.0 m. The overall outer slope angle of the WSF will be 3.5H:1V

18.7.4.2 Stage 2 Construction

The Stage 2 WSF will extend the facility footprint to the north as shown on Figure 18-4. Initial construction will take place during Year 2 of operations. The same procedures and materials will be used to prepare the foundation and construct the starter berm for the Stage 2 footprint. The Overburden Stockpile will also be expanded during Year 2.

Filtered tailings and PAG waste rock from Years 3 through 10 will be placed on the Stage 2 footprint following the placement and snow management methods described above. Once Stage 2 reaches the same elevation as Stage 1, the Stage 2 WSF will be raised across the entire facility footprint. The final WSF will be 19.5 m in height with the crest constructed to El. 502 m at an overall outer slope angle of 3.5H:1V.

18.7.4.3 Waste Management

The tailings will be filtered at the plant site and temporarily stockpiled adjacent to the mill building. is recommended that the storage area be lined to prevent seepage into the foundation. The storage area should also have a cover to shed rain/snow and keep the filtered tailings as dry as possible. The cover would also reduce the potential for dusting.

The filtered tailings will be conveyed to the WSF via a 300 m long fixed overland conveyor. Once the filtered tailings reach the WSF, several 30 m long stacker conveyors will convey the tailings to a suitable location and the tailings will be spread by a CAT D8 sized dozer and compacted with a 10 tonne compactor in 300 mm thick lifts.

It is envisioned that eight stacker conveyors will be needed to support Stage 1 operations and that an additional four stacker conveyors will be needed to support Stage 2 operations. The stacker conveyors will be re-positioned periodically by the dozer.

The NPAG and PAG waste rock from underground mine development will be temporarily stockpiled near the portal, then loaded, hauled, placed, and compacted in the WSF footprint. The inclusion of a lined pad to temporarily store the waste rock will prevent the PAG waste rock from leaching contaminants to the environment. In some cases, the PAG waste rock will be used to construct access roads within the WSF footprint to facilitate equipment routing and provide for dust mitigation during filtered tailings placement.

18.7.4.4 Water Management

The water management measures for the WSF are briefly described below. The approximate locations for the water management measures are shown on Figure 18-4.

Seepage Control

The treated bedrock foundation will minimize seepage into the bedrock. Drains will be strategically placed directly on the bedrock to convey any collected seepage to a local WCP.

Stormwater Management

The stormwater management components were sized to temporarily contain runoff from the EDF, which was defined as the 1 in 200 year, 24 hour duration storm event (CDA, 2019). The components were also designed to safely pass runoff from the IDF, which was defined as the storm that is ⅓ between the 1 in 1,000 year, 24 hour duration storm event and the Probable Maximum Flood (PMF) event. This criterion corresponds to a Dam Class of HIGH (CDA, 2019) during operations. The following components were envisioned to manage contact water from the site.

- **WSF Water Collection System** - Eleven collection ditches and five WCPs are included in the WSF arrangement to collect runoff from the WSF. The diches will be approximately 1 m in depth with a 1 m base width and 2H:1V side slopes. The collected runoff will be pumped to the WMP via floating pumps and 150 mm diameter, DR11 HDPE pipelines. Two WCPs and four collection ditches will be constructed in Year -1 as part of Stage 1 construction. WCP2 and one collection ditch will be decommissioned as the WSF is expanded to the north. The remaining three WCPs and an additional seven collection ditches will be constructed in Year 2.
- **Overburden Stockpile Water Collection System** - A total of two collection ditches and one WCP are included in the Stage 1 layout to collect runoff from the Overburden Stockpile. The diches will be approximately 1 m in depth with a 1 m base width and 2H:1V side slopes. The

collected runoff will be pumped to the WMP via floating pump and 150 mm diameter, DR11 HDPE pipeline.

- **Water Management Pond** - The WMP will be constructed to the southeast and downstream of the WSF during Year -1 to collect runoff from the Water Collection System. The WMP will also collect runoff and stormwater from the plant site, Overburden Stockpile, and Snow Management Area. The WMP will provide temporary storage of contact water during normal operations and temporarily store stormwater following storm events. A floating pump and pipeline will be installed at the WMP to draw down the pond in a controlled manner following a storm event and a spillway will be installed to safely pass flows from the IDF. The collected water will be pumped to the mill for re-use in the process or conveyed to a water treatment facility.

Snow Management

A lined Snow Management Area is included in the concept to stockpile snow removed from the WSF surface over each winter. The snow will melt each spring and the melt water will be directed to the WMP.

18.7.4.5 Instrumentation

Instrumentation, including vibrating wire piezometers and surface movement monuments, will be installed at the WSF to monitor the performance of the facility. A total of six groundwater monitoring wells will also be installed downstream of the WSF, WMP, and Overburden Stockpile. The wells will be installed into the bedrock foundation to monitor the groundwater quality. The monitoring wells will be sized to be upgraded to pumpback wells if the water quality does not meet the established criteria and groundwater seepage collection is warranted.

18.7.4.6 Reclamation and Closure

The reclamation and closure concept for the WSF includes for the following.

- **WSF -** The outer slopes of the WSF will be progressively covered with soil from the Overburden Stockpile and vegetated as the WSF is raised. A final cover will be installed over the WSF surface at closure and will consist of a capillary break layer (sand and gravel), low permeability layer (e.g., silt and clay), and vegetation. The material for the capillary break and soil layers will be obtained from the Overburden Stockpile. Re-grading of the outer slope is not anticipated to be required at closure.
- **Water Management Components -** These items will be decommissioned and removed as required. Disturbed areas will be re-graded and revegetated.
- **Monitoring -** For cost estimation purposes, the WSF and groundwater monitoring wells were assumed to be monitored for a minimum of 20 years.

18.8 Surface Infrastructure for Underground Mine

18.8.1 Compressed Air

Compressed air is supplied to the underground via compressed air systems located adjacent to the portals. Each system will feature two rotary screw compressors, two air receivers, and two air dryers, installed in a 40’ modified shipping container.

18.8.2 Mine Air Ventilation and Heating

The Current deposit is provided fresh air via a single raise approximately 500 m northwest of the portal, equipped with twin axial mine fans operating in parallel providing a maximum airflow of 268 m^3/s (approximately 567,000 cfm). The Escape deposit is provided fresh air via two fresh air raises (FAR), located approximately 650 m west and 750 m south of the portal. Both FARs are equipped with two axial mine fans operating in parallel providing a maximum airflow of 255 m^3/s (approximately 539,000 cfm).

The Current deposit includes three return air raise (RAR), located approximately 50 m north of the portal, 1,500 m northwest of the portal and 1,750 m east of the portal. The Escape deposit a single RAR, located approximately 750 m south of the portal. Two of the Current and the single Escape RAR are equipped with twin axial mine fans operating in parallel. The third Current RAR is equipped with a booster fan located underground.

During winter months, the mine air is heated via compressed natural gas (CNG) mine air heaters to a set point of 2.0° C in the intake FAR collars. CNG would be trucked to the site in trailers, several of which are expected to be used onsite as storage and swapped out for full trailers as required.

19. MARKET STUDIES AND CONTRACTS

19.1 Market Studies

The Company has not completed any formal marketing studies with respect to copper, nickel, cobalt, platinum, palladium, rhodium, gold and silver production that will result from the mining and processing. The Company currently anticipates that the two separate concentrate products will be shipped by truck to separate regional smelters suited to handle the separate marketable concentrate products.

The copper price remains closely tied to generally positive macroeconomic developments coupled with a selective focus on industry specifics such as visible inventories, intermittent supply problems and low TC/RCs. World usage of refined copper has more than tripled in the last 50 years thanks to expanding sectors such as electrical and electronic products, building construction, industrial machinery and equipment, transportation equipment, and consumer, and general products. Because of its properties, copper has become a major industrial metal, ranking third after iron, and aluminum in terms of quantities consumed.

As noted in the International Copper Study Group (ICSG) 2020 Copper Factbook, since 1900 when world production was less than 500 thousand tonnes copper world mine production has grown by 3.2% per annum to 20.5 million tonnes in 2019. In fact, more than 97% of all copper ever mined and smelted has been extracted since 1900.

Global demand for copper is expected to grow at 1.3% compound annual growth rate (CAGR) over the next five years. In the short-term, the copper market balance is expected to turn into a surplus, though in order to reach the future demand, more investments are needed in expansions and new projects.

Although copper demand scenarios differ among analysts, there is a general agreement that the major driver for increased copper demand will come from infrastructure investments associated with energy transitions.

The International Energy Agency (IEA) recently published a comprehensive report titled “The Role of Critical Materials in Clean Energy Transitions.” The IEA notes that the shift to clean energy naturally involves burning less fuel but building more equipment. Since 2010 the average amount of minerals needed for a new unit of power generation capacity has increased by 50%, with an onshore wind facility requiring nine times more mineral resources than a gas-fired plant of the same capacity. Clean energy rollout requires significant electrical network expansion. The IEA estimates an annual average grid expansion and replacement of approximately 3,600 thousand km by 2040. This translates to 7,613 kt of copper demand in 2040. The IEA also predicts copper demand from renewables will increase 108% to 1,289 kt Cu by 2040, 94% of which will come from solar photovoltaic and wind. The report details a tripling of solar photovoltaic deployment by 2040, driven by growth in emerging economies, which equates to the addition of just under 645 ktpa of copper demand from this energy type by the end of 2040 (Figure 19-1).

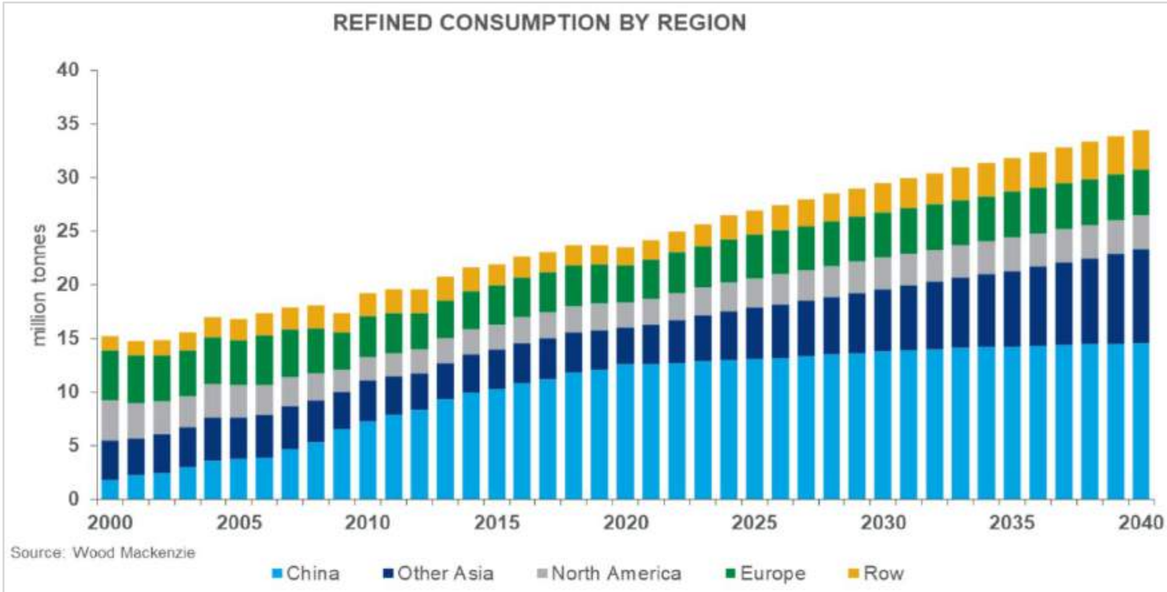


Figure 19-1: Global copper demand 2000 - 2040

Nickel demand is forecast to grow by a CAGR of 4-6% during 2022-2025. Nickel demand in batteries is set to reach over 600,000 t by 2025, causing growth in non-stainless steel applications related demand to outperform demand from stainless (Figure 19-2).

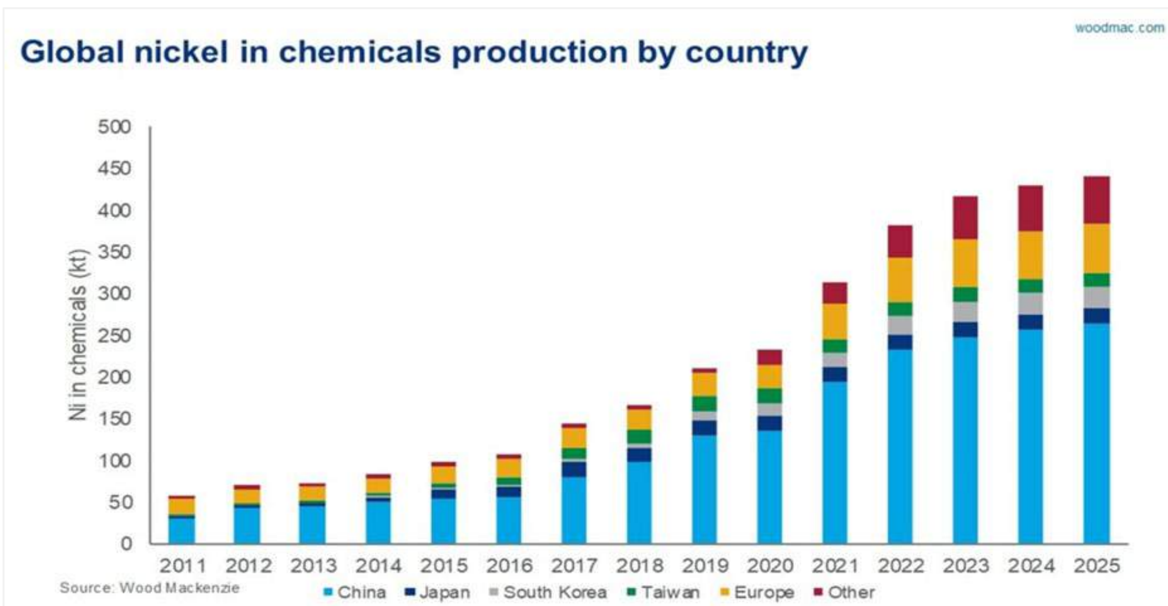


Figure 19-2: Global nickel in chemical production by country (Source: Wood Mackenzie)

PGMs face the 'basket problem' of supply, as platinum, palladium and rhodium are co-mined with each other and with nickel, copper, chrome etc. This means that supply decisions do not necessarily reflect market fundamentals for a specific metal. The PGM market outlook is outlined in Figure 19-3.

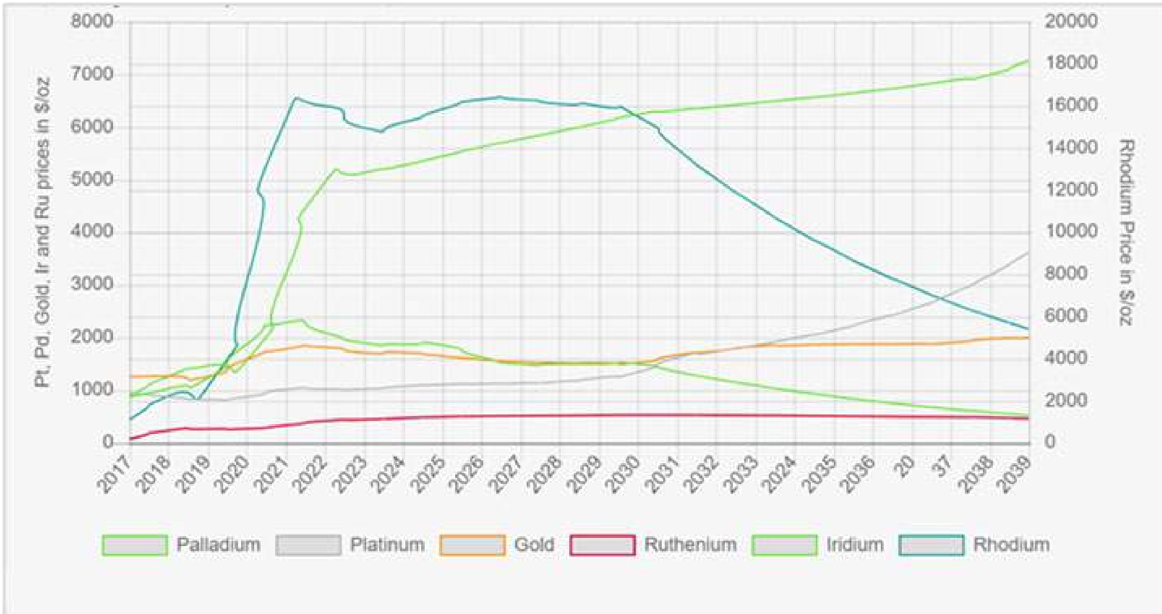


Figure 19-3: Global platinum, palladium, gold, ruthenium, indium and rhodium prices (Source: Edison Investment Research, Refinitiv)

The Edison investment research group expect a virtually balanced market until the end of 2029, after which we forecast demand for hydrogen production and consumption in fuel cells to accelerate, while increases in the supply of platinum are muted and above-ground stocks are depleted by 2027. Secondary supply is estimated to drop off as the recovery of spent autocats declines sharply from 2028 (assuming an eight-year average life of a car) because of the 2020 pandemic and low car sales persisting for the rest of 2021 and into 2022 due to the worldwide computer chip shortage[1].

Demand for palladium is dominated by autocats, with 83% currently used for emission control of gasoline engines. A further 7% is used in electronics, 5% in chemicals and the balance is used in dental, jewellery and other applications. Typically, governments set tighter emission standards every four years. However, we see the battery electric vehicles (BEV) starting to take significant market share from mainly gasoline vehicles, which currently represent 75% of all vehicles sold, by 2025. This is because BEVs are likely to make significant inroads into vehicle market share (in Europe, they represented 50% of sales in Q321 and 9.8% in China) with the resultant drop in demand for the metal over the coming years[1].

Demand for rhodium is dominated by autocats, which use 86% of metal produced for emissions control of gasoline engines, 8% for chemical applications, 3% for fibreglass and glass manufacturing and the balance for jewellery, investment and other. Rhodium has the exceptional quality of being 7x more efficient in converting the Nitrous Oxide emissions to benign gases in a gasoline engine. Hence, in a perfect world it should be priced 7x more than palladium (which, cannily, it currently is). Rhodium suffers from the same slackening demand outlook as palladium, with gasoline-powered cars losing market share to BEVs from 2025[1].

---

[1] https://www.edisongroup.com/investment-themes/the-pgm-markets-outlook-and-price-forecasts-2/

Gold prices are consolidating after a strong rally in 2020 and 2021. Coupled to the inflationary pressures, global recovery is expected to lose momentum and demand for gold is set to strengthen, pushing prices higher through to 2023. While silver is building a base while it awaits its next bullish price catalyst. This could come in many forms on both fundamental and macroeconomic levels, or even a combination of both.

CRU Consulting (a division of CRU International Ltd) provided the 2-year trailing average metal prices used in the revenue projections for the PEA. Nordmin applied these 2-year trailing averages to the minable Mineral Resource and economic model within the PEA (Table 19-1).

Table 19-1: 2-Year Trailing Price Deck

Metal	Unit	2 Year Trailing (Aug'19 - Jul'21)
Platinum	US$/oz	969
Palladium	US$/oz	2,214
Gold	US$/oz	1,723
Silver	US$/oz	22
Copper	US$/lb	3.09
Nickel	US$/lb	6.86

Note: 2 year price deck provided by CRU as of August 2021.

19.2 Contracts

It is anticipated that the two separate concentrate products will be shipped by truck to separate regional smelters suited to handle the separate marketable concentrate products.

Clean Air Metals' management have received indicative terms from selected smelters and refiners. The source of smelting terms is specifically excluded, as smelting terms are confidential in nature. The net payable for a metal is calculated as the payable content of the contained metal, less a minimum deduction (in g/t for palladium, gold, platinum and silver and a % for copper), if applicable. Table 19-2 shows the net payable rates and deductions for the copper concentrate and sulphide concentrate.

Table 19-2: Smelter Payable % and Deductions

Payable Metal	Payable %	Deductions	Payable %	Deductions
	(Copper Concentrate)		(Bulk Concentrate)	
Platinum	90%	1.5 g/t	90%	1.5 g/t
Palladium	90%	2.0 g/t	90%	2.0 g/t
Gold	98%	1.0 g/t	98%	1.0 g/t
Silver	98%	30 g/t	92%	30 g/t
Copper	96.65%	1%	40%	1%
Nickel			65%	

The TC and RC are charges deducted from the payable value of the concentrates to account for the costs of smelting and refining. The TC and RC are influenced by global supply and demand and governed by mine and smelter economics based on copper prices and operating costs. The TC and RC applicable to each concentrate may be based on variable annual negotiations, fixed rates and/or market benchmarks. Table 19-3 shows the TC and RC charges for the copper concentrate and bulk concentrate. The TC and RC shown in Table 19-3 was calculated from a 2-year trailing benchmark from CRU (August 19 – July 21). Currently there are no metal streaming or hedging agreements in place.

Table 19-3: Smelter TC/RC

Payable Metal	TC	RC	TC	RC
	(Copper Concentrate)		(Bulk Concentrate)	
Platinum		US$15/oz		US$15/oz
Palladium		US$15/oz		US$15/oz
Gold		US$4.5/oz		US$4.5/oz
Silver		US$0.45/oz		US$0.45/oz
Copper	US$67.33/wmt	US$0.067/lb		
Nickel			US$150/wmt	

20. ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL, OR COMMUNITY IMPACT

20.1 Environmental Setting

Environmental baseline data has been collected on the property since 2008. The former owners of the Project (Panoramic Resources and, prior to that, Magma Metals) retained DST to complete a series of environmental studies to collect baseline environmental data at the Project property from 2008 to 2013 and starting again in 2020.

20.1.1 Biophysical Setting

20.1.2 Meteorology

To conduct the meteorological study, raw hourly data from the Thunder Bay Automated Weather Observing System (AWOS), Thunder Bay A and Cameron Falls meteorological observatories and stations' raw data from 2006 to 2011 were utilized to calculate daily, monthly and annual summaries (DST 2012b). In addition, data collected from the onsite weather station for the year 2011 was compared to the weather normals established at the Cameron Falls and Thunder Bay A observatories (DST 2012b). Mean monthly temperatures at the Project appear to be similar to the previous five years, as depicted in Figure 20-1 (DST 2012b). Total precipitation (including rain and snow) is depicted in Figure 20-2. The average total precipitation for the region (considering all monitoring stations) was 504.9 mm (DST 2012b).

In the spring of 2021, the meteorology station was refurbished and reinstalled approximately 100 m away from the original automated weather station (AWS) site to continue to collect additional meteorological data for the Project area. A report detailing the results of the ongoing meteorological study is in progress.

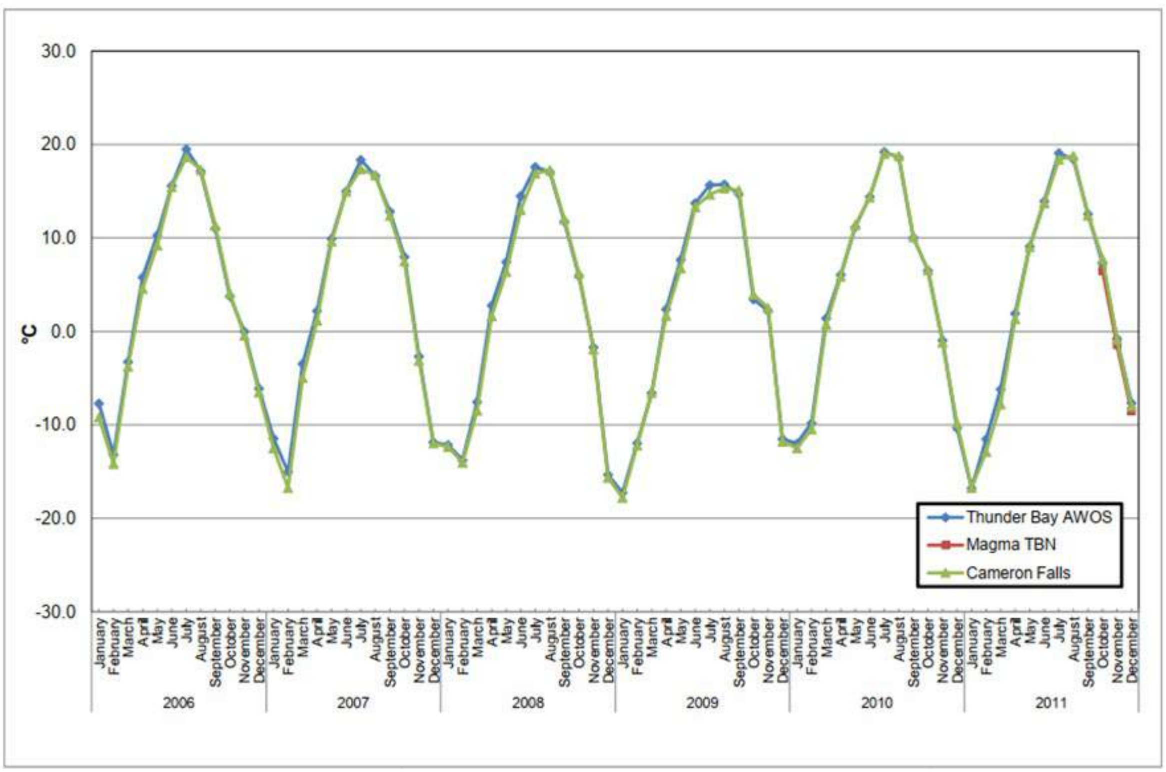


Figure 20-1: 2006 – 2011 Mean monthly temperatures (adapted from DST 2012b)

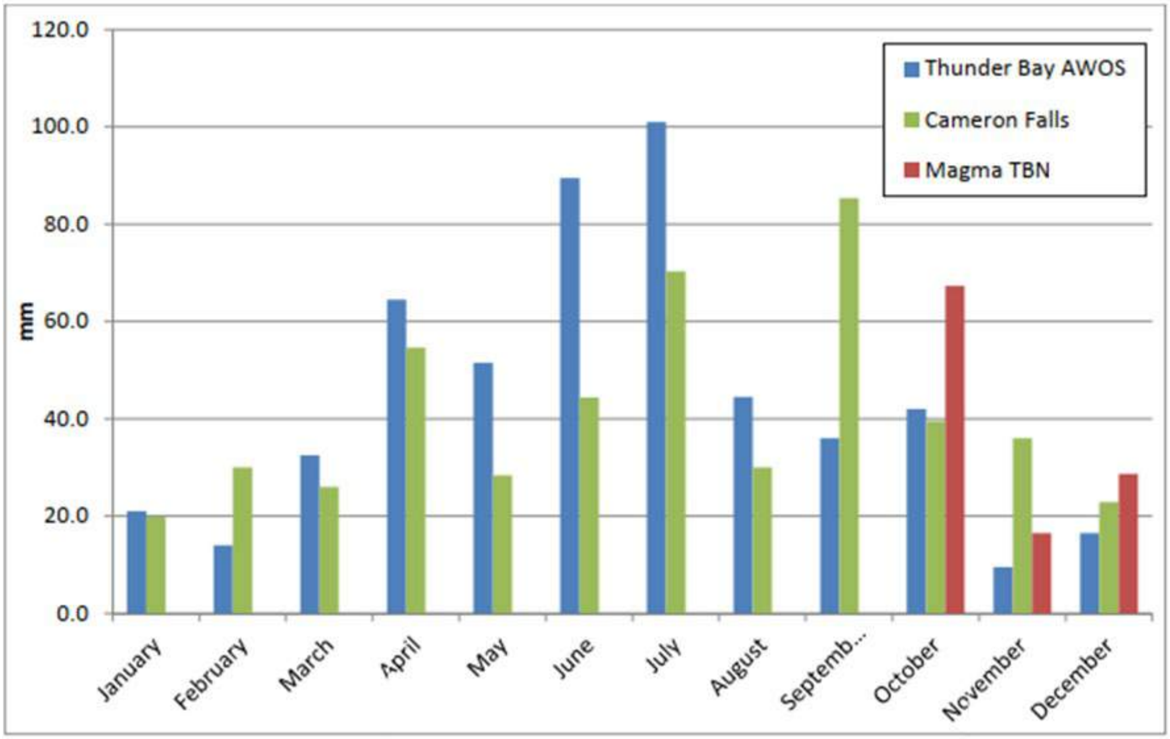


Figure 20-2: Monthly precipitation (adapted from DST 2012b)

20.1.2.1 Geochemistry

Geochemical testing consisting of static testing was completed for the former Magma Metals project including the Current, Bridge and Beaver zones (Mine Drainage Assessment Group (MDAG) 2010; 2011). DST completed the metal leaching and acid rock drainage (ML-ARD) Phase 1 in December 2010 and Phase 2 in March 2012. In 2021, onsite ML-ARD kinetic tests, each containing hundreds of kilograms of broken rock and/or core, were started and monthly testing was completed. Initial results indicate that the relatively high neutralization potential exists within the rock; however, some acid rock drainage is anticipated in the future. Drainage waters from the barrels were initially acidic in March 2021 in the pH range of 4-7, but by April all had recovered to near-neutral levels typically between pH 7 and 8.

Dissolved sulphate in drainage waters typically reflects the rate of sulphide oxidation and acid generation after any pre-existing soluble sulphate is quickly rinsed out early at peak levels. This was observed in 2021, with sulphate concentrations later in 2021 likely reflecting active sulphide oxidation. However, there is currently sufficient neutralization potential in the rock to maintain near-neutral pH for now.

At the Current deposit near-neutral pH, drainage waters from one or more ML-ARD barrels contain elevated levels of some leached and dissolved metal and other elements. These include dissolved arsenic, barium, boron, copper, molybdenum, nickel, selenium, uranium, and zinc.

Geochemical characterization testwork on the tailings was not completed as part of the conceptual level design. Additional static and kinetic test work of the Escape deposit and tailings is planned for future phases of the project.

20.1.2.2 Hydrogeology

Initial hydrogeological test work consisting of groundwater quality and packer testing in selected boreholes was initiated in 2021. Results are pending and upon review, further detailed testing is anticipated to fully assess and characterize the groundwater quality and hydraulic conductivity across the site.

20.1.2.3 Surface Water Quality

The baseline data collection for surface water began in fall of 2007 with two lake stations and one river station at Current Lake. The surface water baseline program was continued quarterly and expanded upon into the Steepledge and Ray Lake areas, until the fall of 2012 (DST 2009; 2010; 2012a; 2013). In total there were monitoring stations established throughout the Project area at six lake stations, 11 river stations and six reference stations (three lake and three river sites) at which point the program was suspended.

In the winter of 2020, the surface water baseline re-commenced with lake and river stations throughout the Project area, including Escape and Current Lake. In addition, the reference station at McWhinney Lake and the outlet from McWhinney Lake to the Spruce River were re-established as reference locations to support the baseline program. The surface water baseline program was expanded in 2021 to include the areas of Steepledge, Ray, and Lone Island Lake. In total, surface water monitoring stations were established in ten lakes and seven rivers from 2020 – 2021.

Surface water sample locations were analyzed for a suite of chemical parameters including dissolved and total metals, nutrients, and major anions and cations. Laboratory results since 2007 generally indicate that stream and lake water within the Thunder Bay North footprint (including McWhinney Lake outside the footprint) are commonly found to have aluminum and total iron concentrations above the Provincial Water Quality Objectives (PWQO). Dissolved mercury and total phosphorous were periodically found above PWQO at various sampling locations (DST 2009; 2010; 2012a; 2013).

20.1.2.4 Sediment Quality

Baseline sediment samples were collected from three lakes in the late summer of 2011 (DST 2012a). Sediment quality baseline studies were reinitiated in 2021 and included samples collected from nine lakes and eight streams within the Project area (including one reference lake and one reference stream).

All sediment samples were analyzed for analysis of metals, grain size, total organic carbon (TOC), total phosphorous (TP) and total kjeldahl nitrogen (TKN) and compared to the Provincial Sediment Quality Guidelines (PSQG) in the Guidelines for the Ministry of the Environment (MOE), Protection and Management of Aquatic Sediment Quality in Ontario. The results of the sediment quality study in 2011 indicated that chromium, copper, and nickel concentrations were found to be above the PSQGs in at least one sample in all three lakes studied (DST 2012a). A summary report detailing the results of the 2021 sediment study is in progress.

20.1.2.5 Noise

Noise data was collected in the Project area (DST 2012b) to assess background sound level in the Project area. Two nearby receptors were assessed for 24 hours to assess background noise levels within the Project area. The results of the previous study indicate that the changing of the seasons has a significant effect on the background sound level in the area but is indicative of a natural area expected within this region.

In 2021, further noise monitoring studies were completed in the Project area. A two-week unattended measurement campaign in each of the four seasons along with attended monitoring during the daytime, was conducted to quantify the components making up the background noise in each season. A report detailing the results of the 2021 studies is in progress.

20.1.2.6 Streamflow

Hydrological studies were undertaken from 2008 to 2013 at the Project property (DST 2009; 2010; 2014). Stations were installed and monitored during the open water months at various locations including the Current Lake Outlet, South Current River Outlet, Fitzpatrick Lake Outlet, Current Lake East Inlet, Current Lake Northeast Inlet, Steepledge Lake Inlet and the Ray Lake Outlet. Each year, discharge for each stream monitored was calculated. The greatest discharge was recorded during the spring freshet, as depicted below in Figure 20-3.

In 2021, hydrometric stations were reinstated or installed at the following locations: Current Lake Outlet, Escape Lake outlet, Beaver Lake inlet, Steepledge Lake inlet, Ray Lake Outlet, and the south Current River. The hydrometric stations will remain installed during the winter period to assess flow during the winter and spring freshet. A report summarizing the results from the 2021 hydrology study is in progress.

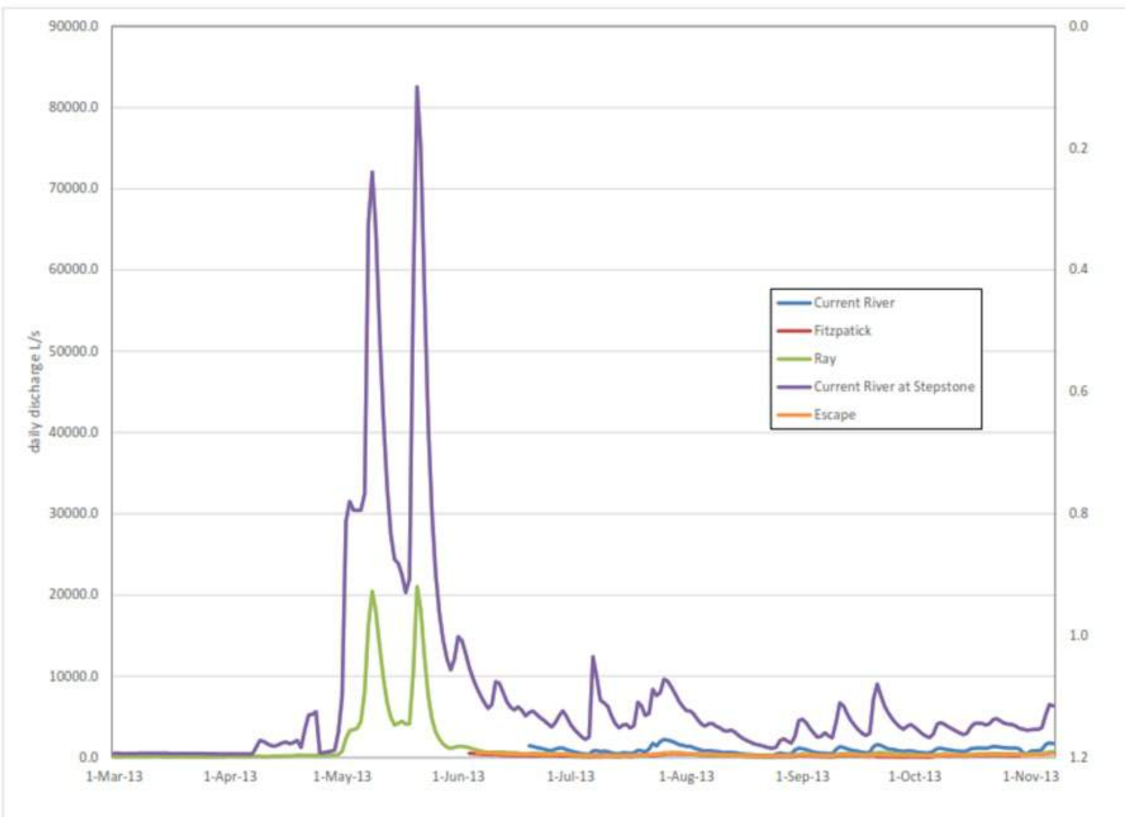


Figure 20-3: Study area hydrograph (adapted from DST, 2014)

20.1.2.7 Vegetation and Ecological Communities

The vegetation study area for the Project covers 24,060 ha, including 23,116 ha of terrestrial habitat. Vegetation surveys were conducted in the summer of 2021 and included surveys in 121 ecosite polygons throughout the Project area. The results of the vegetation field studies will be compared to existing Forest Resource Inventory (FRI) data in order to determine if the existing FRI accurately represents ground conditions in the Project area.

Wetland ecosites are also abundant within the Project area. A targeted wetland survey was completed following the Ontario Wetland Evaluation System (OWES; MNRF 2014) in the summer of 2021 to determine if there are any provincially significant wetlands impacted by the Project. The summary report discussing the results of the wetland surveys from 2021 is currently in progress.

20.1.2.8 Wildlife and Wildlife Habitat

Desktop and field studies were completed for the Project in 2011 and included a breeding bird survey, nocturnal owl survey, Whip-poor-will survey, and an amphibian and reptile survey. The desktop study indicated that there is potential for Yellow Rail to be present in the Project property area, however this species was not identified during the surveys. During the bird surveys a Common Nighthawk was identified. The Common Nighthawk is designated as a species of Special Concern provincially and Threatened federally. No provincially Threatened or Endangered species were encountered during the surveys (DST 2013).

Terrestrial wildlife studies are ongoing with a suite of surveys completed in the summer of 2021 including breeding bird, crepuscular, marsh bird, owls, waterfowl, ungulates, small mammals, bats, and amphibians and reptiles. During these surveys, special attention is paid to assessing for potential species at risk (SAR) including bat SAR and Eastern Whip-poor-will. Reports summarizing the findings of the most recent terrestrial wildlife studies are in progress.

20.1.2.8.1 Fish and Fish Habitat

Desktop and field studies of fish and fish habitat were completed for the Project from 2008 – 2012 (DST 2009; DST 2010; DST 2012a). Fish communities and fish habitat were assessed in seven lakes in the Project area.

All of the lakes surveyed contained fish communities that are characteristic of cool-water thermal regimes (northern pike, walleye, yellow perch), which are most often found in productive, shallow water (DST 2013). Catches from the streams were relatively low, possibly due to unseasonably low water levels. A total of ten different fish species including cyprinids and large-bodied fish were captured during the stream assessments (DST 2013).

To compliment the previously completed studies (DST 2009; DST 2010; DST 2012a), additional fish and fish habitat studies for the Project were completed in the summer of 2021. These studies included surveying the waterbodies in the Project area, similar to what was done in 2011 and 2012. A report summarizing the results of the 2021 fisheries program in in progress.

20.1.2.8.2 Benthic Invertebrates

In 2011 baseline benthic community samples were collected from six lakes and nine streams located within the Project area (DST 2011). The results of the benthic invertebrate study indicated that taxon richness was significantly different between Current Lake, Steepledge and Lone Island, when compared to Fitzpatrick Lake. Fitzpatrick Lake invertebrate community showed a more diverse number of taxa than Current, Steepledge and Lone Island Lakes (DST 2011).

Additional baseline benthics invertebrates studies were completed in the fall of 2021 in order to expand upon the data collected in 2011. Benthic invertebrate samples were collected from eight lakes and eight streams in the Project area (including McWhinney Lake and outlet as reference locations). A summary report detailing the results of the 2021 benthic invertebrate study is in progress.

20.2 Project Permitting Requirements

EA completion to meet the Impact Assessment Act is required if the Project is on the list of Physical Activities Regulations: SOR/2019-285. The current mine plan indicates an estimated throughput of 1,500 t/d and is therefore far less than the 5,000 t/d for a new metal mine to be subject to a federal EA. It is not anticipated that this Project will require a federal EA.

The province is currently undertaking an overhaul of the Environmental Assessment Act. Consultation and discussions with the Ministry of Environment Conservation and Parks (MECP) will be done to understand the regulatory changes and how they may or may not apply to the Project. At this time, it is anticipated that an Individual EA will be required.

Several provincial permits are anticipated to support mine development, such as Overall Benefit Permit for SAR habitat compensation, approvals for tailings dams under the Lakes and Rivers Improvement Act, Closure Plan under Ontario Regulation 240/00, Environmental Compliance Approvals for mine effluent release, air and noise; and Permit to Take Water.

20.3 Social and Community Setting

Clean Air Metals has excellent relationships with the First Nation communities in the Project area. They have signed a MOA with Fort William First Nation, Red Rock Indian Band and Biinjitiwaabik Zaaging Anishinaabek. This MOA provides a framework for a mutually beneficial relationship for the Project where the Company and the Participating First Nations identify:

- Potential impacts of the Project on the Participating First Nations interests and rights;
- The appropriate measures to mitigate and avoid any adverse effects; and,
- Opportunities to enhance positive impacts and benefits.

The MOA also sets out the initial economic accommodation that Clean Air Metals will provide to the Participating First Nations, in the form of a warrant instrument and pending the completion of further relationship agreements. The future agreements are intended to consist of an Exploration Agreement to be set out during the exploration phases of the project, followed by a Community Impact Benefits Agreement, at the appropriate time.

An introductory community meeting and feast was held at Red Rock Indian Band in November 2021. Representatives from Clean Air Metals corporate, technical and environmental teams were in attendance to present the project and answer questions. The Red Rock Indian Band had Chief and members of Council, as well as interested community members in attendance. Future introductory meetings with the other Participating Communities are planned for early 2021.

It is anticipated that this project will create hundreds of jobs and directly benefit the economy of the Participating First Nations, the city of Thunder Bay and the region. Future public consultations and information sessions will be planned at appropriate times.

20.4 Mine Closure

Clean Air Metals plans to prepare and file a closure plan in accordance with Ontario Regulation 240/00 – Mine Closure. The plan will detail the required components of mine closure and Clean Air Metals will be required to calculate and post financial assurance.

All underground workings will be filled using a combination of paste backfill and CRF. Openings such as portals and vent raises will be capped appropriately, and water will be allowed to flood the underground. All site buildings will be removed or demolished and disposed of in appropriate landfill facilities. The site will be graded to generally match the surrounding site and revegetated. Environmental monitoring will continue for 20 years post closure, as required. The conceptual level closure plan for the WSF is provided in Section18.8.4.6.

Costs associated with mine closure are estimated and presented in Section 21.

21. CAPITAL AND OPERATING COSTS

21.1 Basis of Estimate

The capital cost estimate was prepared by Nordmin with an expected accuracy range of:

- +50%/-35% weighted average accuracy of actual costs. Base pricing is in the second quarter of 2021 CAD dollars with no allowances for inflation or escalation beyond that time. currency exchange rate of 1.3 CAD to USD.

The estimate includes direct and indirect costs (such as engineering, procurement, construction and start-up of facilities) as well as owner costs and contingency associated with mine and process facilities and onsite and offsite infrastructure. The following areas are included in the estimate:

- Mine (underground development, equipment fleet, and support infrastructure and services).
- The WSF will provide secure storage for tailings and process water and protect groundwater and surface waters during operations and post closure. The PEA level design is based on a projected 10 year mine life at a nominal processing rate of approximately 3,600 t/d. Approximately half of the underground process feed is converted to paste backfill. The WSF has been sized to permanently store approximately 6.0 Mt of tailings and waste and 1.3 Mt of PAG waste rock.
- Direct costs include all contractors' direct and indirect labour, permanent equipment, materials, freight, and mobile equipment associated with the physical construction of the areas. The process plant design point daily throughput is 3,600 t/d.
- The process plant is designed for throughput of 3,600 metric tonnes per day (mtpd) at a planned availability of 92% per annum. The process plant will operate a planned 360 days per year, equating to an annual feed of 1,296,000 metric tonnes.
- Onsite infrastructure (water treatment and distribution, electrical distribution, shops, and other general facilities).
- Offsite infrastructure (water and power supply, and electrical substation).

A small amount of engineering work, being in the range of 1% to 2% of total engineering for the Project was carried out to support the estimate. The estimate was based on the following Project specific information:

- Preliminary conceptual mine, process plant and WSF design criteria.
- Preliminary conceptual process flowsheet.
- Preliminary major mechanical equipment list for process plant and mining equipment fleet.
- Preliminary general site layout.
- Conceptual electrical supply.
- Preliminary conceptual mine plan.
- Preliminary process plant general mechanical arrangement.
- Massive earthworks quantities derived from preliminary sketches (sections).

Factored, end-product units and physical dimensions methods were used to estimate costs based on historical data from similar projects or facilities. The ratio or factored estimating method was used in estimating the cost of process plant components or areas where the cost of the specialized process equipment made up a significant portion of the total component or area cost. Nordmin and its

Consultants used historical data available from similar projects; the end-product units estimating method was used to relate the end-product units (capacity units) of a plant component to construction costs. This allows an estimate to be prepared relatively quickly, knowing only the end-product unit capacity of the proposed component.

Data for the estimates have been obtained from numerous sources, including:

- Conceptual engineering design by Nordmin and Knight Piésold.
- Historical pricing data from similar projects in Northwestern Ontario region.
- In-house benchmarking data from similar projects in the Northwestern Ontario region.
- Topographical information.

The following assumptions were considered:

- All equipment and materials will be new.
- The main equipment will be purchased and manufactured in appropriate sizes to be transported by the existing main roads to the Project site.
- The execution work will be continuous without interruptions or stoppages.
- Concrete will be produced at the construction site.
- Contractors will be contracted under unit price contracts.
- The project will be executed through an EPCM contract.

The following are excluded from the capital cost estimate:

- Land acquisition.
- Finance costs and interests during construction.
- Costs due to fluctuations in exchange rates.
- Changes in the design criteria.
- Changes in scope or accelerated schedule.
- Changes in Canadian legislation.
- Site mitigation (identification and removal of contaminated soils – oil, fuel spilled, heavy metals, pesticides, etc.).
- Other than specified obligations and taxes.
- Provisions for force majeure.
- Wrap-up insurance.
- Reschedule to recover delays due to:
    - Change in scope.
    - Force majeure.
    - Notice to proceed with construction.
    - Labour conflicts.
    - Non-availability of qualified and other labour.
    - Lack of geotechnical and environmental definitions.
    - Different soil conditions.

The proposed Project includes approximately 2 years pre-production construction period, followed by six months of ramp-up production.

21.2 Labour Assumptions

The construction labour and equipment costs were included in the factors that were used in the estimation to account for installation costs or in the unit costs when applied.

21.3 Material Costs

All materials required for facilities construction are included in the capital cost estimate. Material costs include freight to the site. Material costs related to the processing plant such as concrete, structural steel, piping and fittings, and electrical cable were included within the installation factors applied to the mechanical equipment costs.

Material cost related to the processing plant platform, WSF and planned access roads were determined by material take off quantities from sketches/drawings and installation unit costs. All earthworks quantities were assumed to be neat in place, with no allowance for swell, waste, or compaction of materials. Industry-standard allowances for swell and compaction were incorporated into the unit rate.

21.4 Contingency

The contingency was established deterministically applying the following percentage factors associated with a PEA level estimate to capital costs:

- 25% on process plant/concentrate loadout.
- 25% on the WSF/water management and treatment infrastructure (WMT) capital costs.
- 20% on other surface site infrastructure and supporting offsite infrastructure.
- 20% on pre-production underground major infrastructure and 10% on LOM underground major infrastructure.
- 20% on underground mobile equipment.
- 15% on pre-production underground development, and associated owners construction and technical support.
- 0% on LOM capital underground development and LOM major infrastructure sustaining capital.

21.5 Capital Costs

Capital and operating cost estimates are stated in Canadian dollars and are estimated with an expected accuracy range of +50%/-35% weighted average accuracy of actual costs and were derived from various sources including consultant databases on analogous projects, indicative budget quotes, and from factoring.

Table 21-1 shows details of the Initial and Sustaining Capital estimate.

The estimate of initial capital costs is $367.18 million including working capital, indirect and contingency assumptions, as outlined in Table 21-1 (note that columns may not sum exactly due to rounding). EPCM capital costs of $41.16 million has been included in the estimate of initial capital costs, which amounts to 15.5% of initial pre-contingency capital costs. A contingency of $60.21 million has been included in the estimate of initial capital costs, which amounts to 22.6% of initial capital costs less EPCM.

The ongoing capital, including rehabilitation and closure costs, is estimated at $169.24 million over the LOM.

Table 21-1: Summary of Capital Costs

Capital Costs (C$ million)	Year			Total
	-2	-1	1 to 10	
Process Plant / Concentrate Loadout	77.06	77.06	0.00	154.11
WSF / WMT	0.00	12.39	9.85	22.25
Other Surface Site Infrastructure	8.80	27.19	6.54	42.54
Offsite Infrastructure	6.60	2.00	0.65	9.25
Underground Major Infrastructure	0.00	1.82	12.42	14.25
Underground Mobile Equipment	0.45	26.79	22.20	49.44
Underground Capital Development	0.00	14.76	62.14	76.90
Owners Construction Support / Technical	2.53	8.36	0.00	10.89
Sustaining Capital	0.00	0.00	45.85	45.85
EPCM	18.28	22.88	0.00	41.16
Contingency	22.82	37.39	9.58	69.79
Pre-Contingency/EPCM Initial Capital	95.45	170.37		265.82
Initial Capital EPCM	18.28	22.88		41.16
Initial Capital Contingency	22.82	37.39		60.21
Total Initial Capital	**136.54**	**230.64**		**367.18**
Pre-Contingency Ongoing Capital			159.66	159.66
Ongoing Capital Contingency			9.58	9.58
Total Ongoing Capital			**169.24**	**169.24**
Mine Closure			30.00	30.00
Salvage			-30.00	-30.00
Total Capital Costs	**136.54**	**230.64**	**169.24**	**536.42**

21.5.1 Initial Capital Costs

The initial capital costs are captured in these main categories: processing plant & concentrate loadout, WSF, other surface site infrastructure, underground major infrastructure, offsite infrastructure, underground mobile fleet, owner's construction support / technical, and underground pre-production development. Where applicable to the initial capital, EPCM costs are applied at rates that rely on included capital costs of the owner's construction support and technical team.

All capital costs related to the process plant and associated concentrate loadout, except for sustaining capital, occur during the initial capital period as there is no planned expansion of the process plant. These capital costs were estimated using analog costs of similar projects and adjusted to match the designed LOM production rate of 1.3 Mtpa. These costs combine both Current and Escape deposits. Table 21-2 shows the estimated process plant capital costs of approximately $154.1 million, $32.2 million EPCM, and $38.5 million contingency.

Table 21-2: Process Plant Initial Capital Costs

Process Plant/Concentrate Loadout (C$ million)	Year		Total
	-2	-1	
Plant General	48.02	48.02	96.04
Material Handling	2.91	2.91	5.83
Grinding	8.79	8.79	17.58
Flotation	4.61	4.61	9.22
Tailings, Thickening and Filtration	7.66	7.66	15.31
Reagents	1.14	1.14	2.27
Freight Costs	2.24	2.24	4.49
Mobilization/Demobilization	0.57	0.57	1.13
Capital Spares/First Fills	1.12	1.12	2.24
Subtotal Process Plant/Concentrate Loadout	**77.06**	**77.06**	**154.11**
EPCM @ 21%	16.09	16.09	32.18
Contingency @ 25%	19.26	19.26	38.53
Total Process Plant/Concentrate Loadout	**112.41**	**112.41**	**224.82**

Table 21-3 shows the estimated waste management facility (WSF) and water management and treatment infrastructure (WMT) initial capital costs of approximately $12.4 million, and $3.1 million contingency. Capital costs related to the WSF continue into the ongoing capital period as the facility is expanded. Capital costs for the WSF and water treatment infrastructure were estimated by Knight Piésold. These costs combine both Current and Escape deposits.

Table 21-3: WSF/WMT Initial Capital Costs

WSF/WMT (C$ million)	Year		Total
	-2	-1	
Mobilization/Demobilization		0.52	0.52
Earthworks		5.25	5.25
Geosynthetics & Appurtenances		1.41	1.41
Pipeworks & Appurtenances		0.36	0.36
Conveyors		3.65	3.65
Geotechnical Instrumentation		0.12	0.12
Engineering & Construction Management		1.08	1.08
Subtotal WSF/WMT	**0.00**	**12.39**	**12.39**
Contingency @ 25%		3.10	3.10
Total WSF/WMT	**0.00**	**15.49**	**15.49**

All other surface site infrastructure capital costs except for sustaining capital occur during the initial capital period. These capital costs were estimated using adjusted analog costs of similar projects to match the designed LOM production rate of 1.3 Mtpa and the expected underground mobile fleet size. Table 21-4 shows the estimated other surface site infrastructure capital costs of approximately $36.0 million, $6.1 million EPCM, and $7.2 million contingency.

Table 21-4: Other Surface Site Initial Capital Costs

Other Surface Site Infrastructure (C$ million)	Year -2	Year -1	Total
Current Deposit			
Backfill Plant		12.00	12.00
Underground Portal		0.50	0.50
Site Preparation - Clearing/Grubbing	2.00		2.00
Internal Site Roads/Ditching	1.00		1.00
Maintenance Shop/Warehouse	3.44	3.44	6.89
Administration Building/Dry		3.78	3.78
Surface Electric Vehicle Charging Shelter		1.43	1.43
Security Facilities	0.70		0.70
Explosives Storage		0.30	0.30
Potable Water System	0.15		0.15
Sewage Treatment	0.29		0.29
Communications to Site	0.15	0.15	0.30
Surface Electrical Distribution	0.10	0.10	0.20
Backup Generators	0.35		0.35
Underground Surface Compressors		0.60	0.60
Main Ventilation Fans and Heaters		4.14	4.14
Fuel Tanks	0.13		0.13
CNG Distribution		0.25	0.25
Subtotal Current Deposit	**8.30**	**26.69**	**35.00**
Escape Deposit			
Underground Portal		0.50	0.50
Site Preparation - Clearing/Grubbing	0.25		0.25
Internal Site Roads/Ditching	0.25		0.25
Subtotal Escape Deposit	**0.50**	**0.50**	**1.00**
Subtotal Other Surface Site Infrastructure	**8.80**	**27.19**	**36.00**
EPCM @ 17%	1.50	4.62	6.12
Contingency @ 20%	1.76	5.44	7.20
Total Other Surface Site Infrastructure	**12.06**	**37.25**	**49.32**

All offsite infrastructure capital costs, except for sustaining capital, occur during the initial capital period. The site access road capital costs were based on an escalated estimate provided external forestry contractor quote. Power line and electrical substation costs were based on high-level power line cost per kilometre combined with estimated substation analog costs. Table 21-5 shows the offsite infrastructure capital costs of approximately $8.6 million, $0.86 million EPCM, and $1.7 million contingency.

Table 21-5: Offsite Infrastructure Initial Capital Costs

Offsite Infrastructure	**Year**		**Total**
(C$ million)	**-2**	**-1**	
Current Deposit			
Site Access Road	1.40		1.40
Power Line/Electrical Substation	5.20	2.00	7.20
Subtotal Offsite Infrastructure	**6.60**	**2.00**	**8.60**
EPCM @ 10%	0.66	0.20	0.86
Contingency @ 20%	1.32	0.40	1.72
Total Offsite Infrastructure	**8.58**	**2.60**	**11.18**

Most underground major infrastructure capital costs occur during the ongoing capital period rather than the initial capital period, as the underground is expanded substantially through LOM. Capital costs were estimated using analog costs of similar projects and adjusted to match the scale and production of the underground operation. Table 21-6 shows the estimated underground major infrastructure initial capital costs of approximately $8.6 million, $0.3 million EPCM, and $0.4 million contingency.

Table 21-6: Underground Major Infrastructure Initial Capital Costs

Underground Major Infrastructure	**Year**		**Total**
(C$ million)	**-2**	**-1**	
Current Deposit			
Underground Electrical Distribution		0.27	0.27
Underground Electrical Substations		0.75	0.75
Underground Explosive Storage		0.15	0.15
Mobile Refuge Stations		0.40	0.40
Underground Ventilation Distribution		0.25	0.25
Subtotal Underground Major Infrastructure	**0.00**	**1.82**	**1.82**
EPCM @ 5%		0.09	0.09
Contingency @ 20%		0.36	0.36
Total Underground Major Infrastructure	**0.00**	**2.28**	**2.28**

Approximately 55% of the underground mobile fleet capital costs occur during the initial capital period, with the remaining 45% allocated to ongoing capital for fleet replacement and additional mobile equipment units required for mining at greater depth. Capital costs were estimated using database and analog costs compiled for similar projects. Table 21-7 shows the estimated underground mobile fleet initial capital costs of approximately $27.2 million, $1.9 million procurement, and $5.45 million contingency. These costs combine both Current and Escape deposits.

Table 21-7: Underground Mobile Equipment Initial Capital Costs

Underground Mobile Equipment (C$ million)	Year -2	Year -1	Total
Haul Truck (45t)		6.71	6.71
LHD (10t)		4.36	4.36
Drill Jumbo		4.00	4.00
Bolter		7.44	7.44
Production Drill (ITH)		1.29	1.29
Production Drill (TH)		0.82	0.82
Scissor Lift		0.37	0.37
ANFO Loader		0.20	0.20
Emulsion Loader		0.14	0.14
Shotcrete Unit		0.07	0.07
Grouting Unit		0.10	0.10
Fuel / Lube Truck		0.11	0.11
Utility / Crane Truck		0.29	0.29
Boom Truck		0.08	0.08
Grader		0.11	0.11
Personnel Carrier		0.25	0.25
Pick-up Truck	0.45	0.45	0.90
Subtotal Underground Mobile Equipment	**0.45**	**26.79**	**27.24**
Procurement @ 7%	0.03	1.88	1.91
Contingency @ 20%	0.09	5.36	5.45
Total Underground Mobile Equipment	**0.57**	**34.03**	**34.60**

During the initial pre-production development capital period, underground capital waste development occurs to prepare for production. These capital costs were comprised of estimated development quantities and cost per metre rates, using contractor labour and equipment.

Table 21-8 shows the estimated underground initial capital waste development costs of approximately $14.8 million and $2.2 million contingency.

Table 21-8: Underground Pre-production Development Capital Costs

Underground Pre-production Development (C$ million)	Year -2	Year -1	Total
Current Deposit			
Lateral Waste Development (5mx5m)		13.60	13.60
Lateral Stope Access Development (5mx5m)		1.16	1.16
Subtotal Underground Pre-production Dev.	**0.00**	**14.76**	**14.76**
Contingency @ 15%		2.21	2.21
Total Underground Pre-production Development	**0.00**	**16.97**	**16.97**

During the initial pre-production capital period, the estimate includes an owner's construction and technical support team to assist in construction management and underground pre-production development. These capital costs were estimated using analog costs of similar projects and adjusted to match the designed LOM production rate of 1.3 Mtpa. Table 21-9 shows the estimated owner's construction and technical support team costs of approximately $10.9 million and $1.6 million contingency. These costs combine both Current and Escape deposits.

Table 21-9: Owners Construction Support/Technical Capital Costs

Owners Construction Support/Technical (C$ million)	Year -2	Year -1	Total
Mining Power		1.02	1.02
Mine Air Heating		0.22	0.22
Mining Fixed Equipment Parts / Maintenance		0.20	0.20
Other Equip Diesel	0.10	1.72	1.82
Site / Road Maintenance	0.20	0.30	0.50
Management & Technical Staff	1.46	3.91	5.37
Safety Sply., Office Sply., IT, Legal, Consulting, Etc.	0.19	0.38	0.56
Employee Transportation Costs	0.11	0.22	0.33
Head Office / Corporate Support	0.13	0.25	0.38
Construction Power Generation	0.35	0.15	0.50
Subtotal Owners Const. Support / Technical	**2.53**	**8.36**	**10.89**
Contingency @ 15%	0.38	1.25	1.63
Total Owners Construction Support / Technical	**2.91**	**9.61**	**12.53**

21.5.2 Ongoing and Closure Capital Costs

The ongoing and closure capital costs are captured in these main categories: WSF, surface site infrastructure, offsite infrastructure ongoing, underground major infrastructure, underground mobile equipment, underground waste development and sustaining capital. During the ongoing capital period, all EPCM activities included in the estimate as being carried out by the onsite technical and management team.

Table 21-10 shows the estimated WSF and WMT ongoing and closure capital costs of $9.9 million and $2.5 million contingency. Ongoing capital costs for the WSF are related to expansion to contain LOM thickened tailing and acid generating waste rock. Capital costs for the WSF and WMT were estimated by Knight Piésold. These costs combine both Current and Escape deposits.

Table 21-11 shows the ongoing and closure surface site infrastructure costs of $6.5 million and $1.3 million contingency. Table 21-12 shows the ongoing and closure offsite infrastructure costs of $0.7 million and $0.1 million contingency.

Table 21-10: WSF/WMT Ongoing Capital Costs

WSF/WMT (C$ million)	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Mobilization/Demobilization		0.35								0.17	0.52
Earthworks		3.34								2.36	5.70
Geosynthetics & Appurtenances		0.31									0.31
Pipeworks & Appurtenances		0.47								0.34	0.80
Conveyors		1.33									1.33
Progressive Reclamation		0.04									0.04
Site Revegetation										0.11	0.11
Monitoring										0.50	0.50
Eng. & Const. Management		0.55									0.55
Subtotal WSF/WMT	**0.00**	**6.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.48**	**9.85**
Contingency @ 25%		1.59								0.87	2.46
Total WSF/WMT	**0.00**	**7.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**4.35**	**12.32**

Table 21-11: Surface Site Infrastructure Ongoing Capital Costs

Surface Site Infrastructure (C$ million)	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Current Deposit											
Main Ventilation Fans & Heaters	1.36		0.06						1.10		2.52
Subtotal Current Deposit	**1.36**	**0.00**	**0.06**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.10**	**0.00**	**2.52**
Escape Deposit											
Explosives Storage	0.15										0.15
Surface Electrical Distribution	0.10										0.10
Backup Generators	0.10										0.10
Underground Surface Compressors	0.30										0.30
Main Ventilation Fans & Heaters	0.05	1.15	0.79	1.38							3.37
Subtotal Escape Deposit	**0.70**	**1.15**	**0.79**	**1.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**4.02**
Subtotal Surface Site Infrastructure	**2.06**	**1.15**	**0.85**	**1.38**	**0.00**	**0.00**	**0.00**	**0.00**	**1.10**	**0.00**	**6.54**
Contingency @ 20%	0.41	0.23	0.17	0.28					0.22		1.31
Total Surface Site Infrastructure	**2.47**	**1.37**	**1.02**	**1.66**	**0.00**	**0.00**	**0.00**	**0.00**	**1.32**	**0.00**	**7.85**

Table 21-12: Offsite Infrastructure Ongoing Capital Costs

Offsite Infrastructure (C$ million)	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Escape Deposit											
Power Line	0.60										0.60
Eng. & Const. Management	0.05										0.05
Subtotal Offsite Infrastructure	**0.65**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.65**
Contingency @ 20%	0.13										0.13
Total Offsite Infrastructure	**0.78**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.78**

Most underground major infrastructure capital costs occur during the ongoing capital period rather than the initial capital period, as the underground is expanded substantially through LOM. Capital costs were estimated using analog costs of similar projects and adjusted to match the scale and production of the underground operation. Table 21-13 shows the ongoing and closure underground major infrastructure costs of $12.4 million and $1.2 million contingency.

Approximately 55% of the underground mobile fleet capital costs occur during the initial capital period, with the remaining 45% allocated to ongoing capital for fleet replacement and additional mobile equipment units required for mining at greater depth. Capital costs were estimated using database and analog costs compiled for similar projects. Table 21-14 shows the ongoing and closure underground mobile equipment costs of $22.2 million and $4.4 million. These costs combine both Current and Escape deposits.

Table 21-15 shows the ongoing and closure underground waste development costs of $61.2 million. These capital costs were comprised of estimated development quantities and cost per metre rates, using contractor labour and equipment.

Table 21-13: Underground Major Infrastructure Ongoing Capital Costs

Underground Major Infrastructure (C$ million)	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Current Deposit											
Underground Elect. Distribution	0.64	0.45	0.30	0.06	0.01		0.05	0.02	0.16		1.69
Underground Elect. Substations	1.00	1.05	0.90	0.25	0.25				0.25		3.25
Underground Explosive Storage			0.15								0.15
Mobile Refuge Stations	0.20										0.20
Backfill Distribution	0.73	0.07	0.32	0.07	0.07	0.07	0.07	0.07			1.49
Underground Vent. Distribution	0.50	0.10	0.10								0.70
Mine Dewatering	0.80	0.75	0.25	0.40						0.25	2.00
Subtotal Current Deposit	**3.87**	**2.43**	**2.02**	**0.78**	**0.33**	**0.07**	**0.12**	**0.09**	**0.41**	**0.40**	**10.52**
Escape Deposit											
Underground Explosive Storage				0.15							0.15
Underground Satellite Shop			0.30								0.30
Mobile Refuge Stations	0.20			0.20							0.40
Mine Dewatering		0.15	0.25	0.25	0.25	0.15					0.75
Subtotal Escape Deposit	**0.20**	**0.15**	**0.55**	**0.60**	**0.25**	**0.15**	**0.00**	**0.00**	**0.00**	**0.00**	**1.90**
Subtotal UG Major Infrastructure	**4.07**	**2.58**	**2.57**	**1.38**	**0.58**	**0.22**	**0.12**	**0.09**	**0.41**	**0.40**	**12.42**
Contingency @ 10%	0.41	0.26	0.26	0.14	0.06	0.02	0.01	0.01	0.04	0.04	1.24
Total Underground Major Infrast.	**4.47**	**2.83**	**2.83**	**1.52**	**0.64**	**0.25**	**0.13**	**0.10**	**0.45**	**0.44**	**13.66**

Table 21-14: Underground Mobile Equipment Ongoing Capital Costs

Underground Mobile Equipment (C$ million)	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Haul Truck (45t)	1.12		1.12	1.12	1.12	4.02	0.67				9.17
LHD (10t)						2.61					2.61
Drill Jumbo						2.40					2.40
Bolter						4.46					4.46
Production Drill (ITH)			1.29			0.77					2.06
Production Drill (TH)						0.49					0.49
Grader						0.07					0.07
Personnel Carrier			0.25			0.15					0.40
Pick-up Truck						0.27	0.27				0.54
Subtotal UG Mobile Equip.	**1.12**	**0.00**	**2.66**	**1.12**	**1.12**	**15.25**	**0.94**	**0.00**	**0.00**	**0.00**	**22.20**
Contingency @ 20%	0.22		0.53	0.22	0.22	3.05	0.19				4.44
Total Underground Mobile Equip.	**1.34**	**0.00**	**3.19**	**1.34**	**1.34**	**18.30**	**1.13**	**0.00**	**0.00**	**0.00**	**26.64**

Table 21-15: Underground Waste Development Ongoing Capital Costs

Underground Waste Dev. (C$ million)	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Current Deposit											
Lateral Waste Development	11.09	10.55	2.27					1.43	1.43		26.76
Vertical Development (4.5 m)	0.33	0.78	1.83	2.10							5.03
Vertical Development (3.5 m)	0.10	1.17	0.48	0.83	0.32				2.49		5.39
Subtotal Current Deposit	**11.52**	**12.49**	**4.58**	**2.93**	**0.32**	**0.00**	**0.00**	**1.43**	**3.92**	**0.00**	**37.19**
Escape Deposit											
Lateral Waste Development	6.45	6.45	6.32	0.53							19.75
Vertical Development (4.5 m)			1.83	2.10							3.93
Vertical Development (3.5 m)		0.48	0.48		0.32						1.28
Subtotal Escape Deposit	**6.45**	**6.93**	**8.63**	**2.63**	**0.32**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**24.96**
Total Underground Waste Dev.	**17.97**	**19.42**	**13.20**	**5.55**	**0.64**	**0.00**	**0.00**	**1.43**	**3.92**	**0.00**	**62.14**

Table 21-16 shows the ongoing and closure sustaining costs of $45.8 million. These sustain capital costs are estimated as a percentage of initial infrastructure capital costs.

Table 21-16: Sustaining Capital Costs

Sustaining Capital (C$ million)	Yearly Cost 1 to 5	Yearly Cost 6 to 8	Total
Process Plant / Con. Loadout	4.62	3.08	32.36
WSF/WMT	0.22	0.22	1.78
Other Surface Site Infrastructure	0.85	0.85	6.81
Underground Major Infrastructure	0.43	0.43	3.42
Offsite Infrastructure	0.19	0.19	1.48
Total Sustaining Capital	**6.31**	**4.77**	**45.85**

21.6 Operating Costs

Table 21-17 and Table 21-18 summarize the operating cost estimate for the Project. Total operating costs have an estimated average of $86.6/t ore processed at 1.3 Mtpa (3,600 t/d) during LOM production. The total operating cost per tonne ore processed is comprised of $47.4/t underground direct operating costs, $25.0/t process plant, WSF and WMT costs, $6.9/t G&A costs, $2.6/t royalties, and $4.7/t transportation to the smelter. Over LOM operating costs total $1,056.7 million and represent 12.3 Mt of mill feed processed.

21.6.1 Underground Mining Operating Costs

Table 21-19 and Table 21-20 summarize the underground mining operating cost estimate for the Project.

Table 21-17: Summary of Operating Costs

Operating Costs (C$ million)	Year 1	2	3	4	5	6	7	8	9	10	Total
Underground Mining	60.2	63.3	62.2	61.9	58.2	58.6	59.0	61.2	58.8	34.0	577.3
Process Plant/WSF/WMT	31.6	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	14.2	305.1
G&A Costs	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	4.4	83.7
Royalties	8.7	4.0	4.4	3.5	3.0	2.5	2.3	1.4	1.6	0.6	32.8
Transportation to Smelter	7.4	7.6	6.8	6.8	6.6	6.4	5.9	4.1	4.2	1.4	57.9
Total Operating Costs	**116.7**	**116.1**	**114.6**	**113.4**	**109.1**	**108.7**	**108.4**	**108.0**	**105.9**	**54.6**	**1,056.7**

Table 21-18: LOM Operating Costs per Tonne of Mill Feed

LOM Operating Costs	$/t mill feed
Underground Mining	47.37
Process Plant/WSF/WMT	25.03
G&A Costs	6.87
Royalties	2.63
Transportation to Smelter	4.71
Total Operating Costs	**86.61**

Table 21-19: Underground Mining Operating Costs

UG Mining Operating Costs (C$ million)	Year 1	2	3	4	5	6	7	8	9	10	Total
Long hole Open Stope Consumables	14.15	13.28	12.92	13.23	13.68	14.80	14.46	12.13	12.19	2.04	122.90
DAF Consumables	0.80	3.04	3.61	4.16	3.10	1.15	1.73	5.75	5.66	7.47	36.47
Waste Development Consumables	6.84	6.90	6.47	3.98	3.23	3.14	3.28	3.83	3.96	2.45	44.08
Infill Diamond Drilling	5.00	5.00	5.00	5.00	2.50	2.50	2.50	2.50	0.00	0.00	30.00
Electric Power	3.19	3.19	3.01	3.19	3.19	3.19	3.19	3.19	3.19	1.60	30.16
Mine Air Heating	0.81	0.81	0.90	0.90	0.97	0.97	0.97	0.97	0.97	0.48	8.74
Diesel	6.33	6.91	6.10	5.87	6.45	7.03	7.03	7.03	7.03	7.03	66.80
Mobile Equip. Parts/Maint.	4.48	4.69	4.69	5.09	5.29	5.50	5.50	5.50	5.50	2.75	48.98
Mining Fixed Equip. Parts/Maint.	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.24	3.84
Development Hourly Labour	6.22	6.22	6.22	6.22	5.05	5.05	5.05	5.05	5.05	2.52	52.64
Production Hourly Labour	9.15	9.64	9.64	10.67	11.16	11.65	11.65	11.65	11.65	5.82	102.69
Maintenance Hourly Labour	2.79	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	1.60	29.99
Total UG Mining Operating Costs	**60.17**	**63.29**	**62.16**	**61.92**	**58.22**	**58.57**	**58.96**	**61.20**	**58.79**	**34.00**	**577.29**

Table 21-20: LOM Underground Mining Operating Costs per Tonne of Mill Feed

LOM UG Mining Operating Costs	$/t mill feed
Long hole Open Stope Consumables	10.08
DAF Consumables	2.99
Waste Development Consumables	3.62
Infill Diamond Drilling	2.46
Electric Power	2.47
Mine Air Heating	0.72
Diesel	5.48
Mobile Equip. Parts/Maint.	4.02
Mining Fixed Equip. Parts/Maint.	0.32
Development Hourly Labour	4.32
Production Hourly Labour	8.43
Maintenance Hourly Labour	2.46
Total UG Mining Operating Costs	**47.37**

21.6.2 Process Plant Operating Costs

Table 21-21 and Table 21-22 summarize the process plant operating cost estimate for the Project. These are derived from benchmarking against existing processing plants located in Canada as well as in-house data.

Table 21-21: Process Plant Operating Costs

Process Plant Operating Costs (C$ million)	Yearly (Steady State)	LOM Total
Electric Power	6.98	65.65
Reagents	8.80	82.74
Grinding Media	2.03	19.10
Mill Liners	3.07	28.85
Maintenance Material	0.67	6.34
General/Other Costs	0.43	4.02
Labour	6.72	63.20
Total Process Plant Operating Costs	**28.71**	**269.94**

Table 21-22: Process Plant Operating Costs per Tonne of Mill Feed

Process Plant Operating Costs	$/t mill feed
Electric Power	5.39
Reagents	6.79
Grinding Media	1.57
Mill Liners	2.37
Maintenance Material	0.52
General/Other Costs	0.33
Labour	5.19
Total Process Plant Operating Costs	**22.15**

21.6.3 WSF and Water Management & Treatment Operating Costs

Table 21-23 and Table 21-24 summarize the WSF and WMT operating cost estimate for the Project. Some costs occur in the Year -1 pre-production period during the process plant ramp-up phase (approximately 97 kt of mill feed in Year -1). The operating costs for the WSF and WMT were calculated based on a dollar per tonne of stored material and include 6.0 Mt of PAG filtered tailings and 1.3 Mt of PAG waste rock over the LOM.

Table 21-23: WSF/WMT Operating Costs

WSF/WMT Operating Costs (C$ million)	Yearly (Steady State)	LOM Total
Earthworks	2.65	24.96
Conveyors and Electrical Power	0.26	2.45
Geotechnical Monitoring	0.01	0.13
Progressive Reclamation	0.04	0.34
Subtotal WSF/WMT Operating Costs	**2.97**	**27.88**
Contingency @ 25%	0.74	6.97
Total WSF/WMT Operating Costs	**3.71**	**34.85**

Table 21-24: WSF/WMT Operating Costs per Tonne of Mill Feed

WSF/WMT Operating Costs	$/t mill feed
Earthworks	2.05
Conveyors and Electrical Power	0.20
Geotechnical Monitoring	0.01
Progressive Reclamation	0.03
Subtotal WSF / WMT Operating Costs	**2.29**
Contingency @ 25%	0.57
Total WSF / WMT Operating Costs	**2.86**

21.6.4 General and Administrative Operating Costs

Table 21-25 and Table 21-26 summarize G&A operating cost estimate for the Project.

Table 21-25: G&A Operating Costs

G&A Operating Costs (C$ million)	Yearly (Steady State)	LOM Total
Site / Road Maintenance	0.40	3.80
Tech Services	6.72	63.83
Safety Sply., Office Sply., IT, Consulting, Etc.	0.75	7.13
Employee Transportation Costs	0.44	4.16
Head Office / Corporate Support	0.50	4.75
Total G&A Operating Costs	**8.81**	**83.67**

Table 21-26: G&A Operating Costs per Tonne of Mill Feed

G&A Operating Costs	$/t mill feed
Site/Road Maintenance	0.31
Tech Services	5.24
Safety Sply., Office Sply., IT, Consulting, Etc.	0.58
Employee Transportation Costs	0.34
Head Office/Corporate Support	0.39
Total G&A Operating Costs	**6.87**

21.6.5 Royalties and Transportation Operating Costs

Table 21-27 outlines annual royalty and concentrate transportation to smelter operating costs. Figure 4-3 outlines the claim boundaries that govern royalties for the Project. Detailed information on claims and royalties can be found in Section 4.2. Transportation to smelter costs have been estimated based on $100 per tonne of concentrate produced.

Table 21-27: Royalties and Transportation Operating Costs

Royalties and Trans.	Year										Total
(C$ million)	1	2	3	4	5	6	7	8	9	10	
Royalties	8.7	4.0	4.4	3.5	3.0	2.5	2.3	1.4	1.6	0.6	32.8
Transportation	7.4	7.6	6.8	6.8	6.6	6.4	5.9	4.1	4.2	1.4	57.9

22. ECONOMIC ANALYSIS

22.1 Introduction

An engineering economic model was prepared for the Project to estimate annual cash flows and assess sensitivities to certain economic parameters. The economic results of this report are based upon the services performed by:

- Nordmin for underground mining, surface infrastructure and processing.
- Knight Piésold for WSF & WMT.
- Blue Coast for geochemistry and processing.
- DST for environmental and social.
- BWB Consulting Services Inc. for taxation calculations.

The Company provided the inputs and related calculations with respect to the impact of taxation on the economic model. This included the calculation of applicable federal (Canadian) and provincial (Ontario) corporate income taxes and provincial (Ontario) mining taxes. Allowable deductions were based primarily on available capital cost pools for corporate income taxes. Application of deductions specifically available for Ontario mining taxes were also calculated. These included processing allowances and the application of the “New Mine” exemption for the Project.

Opening balances (costs carried forward from previous years) including non-capital (operating) losses and balances for various capital asset categories were included as per information provided by the Company.

The Project includes two underground mines and associated infrastructure, surface infrastructure to support he mine operations (e.g., maintenance and office facilities), water management features, ROM stockpiling area, processing facility and TMF.

The economic model for the Project indicates a pre-tax free cashflow of $651.6 million over a 10-year mine life, a pre-tax NPV 5% of $425.0 million and a pre-tax IRR of 31.1%. On an after-tax basis, the Project could generate free cashflow of $467.4 million, and after-tax NPV (5%) of $293.0 million and an after-tax IRR of 25.2%. The project is most sensitive to commodity prices. summarizes the Project economics for the described base case.

Table 22-1: Summary of Economic Analysis Results

Production	
Mill Feed - LHOS (kt)	10,338
Mill Feed - DAF (kt)	1,946
Mill Feed - Total (kt)	**12,284**
Mill Feed - Pt Equiv. Grade (g/t)	7.31
Mill Feed - Pd Equiv. Grade (g/t)	3.20
Mill Feed - 3PGE Grade (g/t)	3.25
Mill Feed - Pt Grade (g/t)	1.59
Mill Feed - Pd Grade (g/t)	1.56
Mill Feed - Au Grade (g/t)	0.097
Mill Feed - Ag Grade (g/t)	2.15
Mill Feed - Cu Grade (%)	0.41
Mill Feed - Ni Grade (%)	0.210
Capital Costs (C$ million)	
Pre-Contingency/EPCM Initial Capital	265.8
Initial Capital EPCM	41.2
Initial Capital Contingency	60.2
Total Initial Capital	**367.2**
Pre-Contingency Ongoing Capital	159.7
Ongoing Capital Contingency	9.6
Total Ongoing Capital	**169.2**
Mine Closure	30.0
Salvage	-30.0
Total Capital Costs	**536.4**
Operating Costs (C$ million)	
Underground Mining	577.3
Process Plant / WSF / WMT	305.1
General & Administration Costs	83.7
Royalties	32.8
Transportation to Smelter	57.9
Total Operating Costs	**1,056.7**
Revenue (C$ million)	
Revenue Pt	543.80
Revenue Pd	1,278.11
Revenue Au	29.71
Revenue Ag	4.50
Revenue Cu	336.77
Revenue Ni	153.03
Less Treatment Charges	-101.15
Total Revenue	**2,244.8**
Operating Margin (%)	**53%**
Cashflow (C$ million)	
Revenue	2,244.8
Operating Costs	1,056.7
Pre-Tax Operating Cashflow	1,188.1
Pre-Tax Free Cashflow	651.6
Pre-Tax Results	
NPV (Year -2) @ 5.0% (C$ million)	**425.0**
IRR (%)	**31.1**
Simple Payback (Years)	**2.4**
Post-Tax Results	
Taxes (C$ million)	**184.2**
NPV (Year -2) @ 5.0% (C$ million)	**293.0**
IRR (%)	**25.2**
Simple Payback (Years)	**2.6**
Production Years	**10**

22.2 Cautionary Statement

The results of the Economic Analysis are based on forward-looking information that are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

Forward-looking statements in this section include, but are not limited to:

- Future prices of payable metals
- Currency exchange rate fluctuations
- Estimation of Mineral Resource
- Realization of Mineral Reserve Estimate
- Estimated costs and timing of capital and operating expenditures

This PEA is preliminary in nature. In addition to the Measured and Indicated Resources, the mine plan presented in this study includes Inferred Mineral Resources. Inferred Mineral Resources are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There is no certainty that this PEA will be realized.

22.3 Principal Parameters and Assumptions

The cashflow estimate includes only revenue, costs, taxes, and other factors applicable to the Project. Corporate obligations, financing costs (other than for the purposes of surety bonding), and taxes at the corporate level are excluded.

The economic model was prepared from estimated mining schedules developed on an annual basis with the technical assumptions outlined in the previous sections, together with the economic assumptions and estimated capital and operating costs described in Section 21. The cashflow model was based on the following:

- All costs are reported in Canadian dollars (C$) and referenced as '$', unless otherwise stated.
- As discussed in detail in Section 19, Table 19-1 outlines the 2 year trailing payable metal prices and a constant exchange rate assumption of US$1: C$1.3.
- Annual gross revenue is determined by applying estimated metal prices with payable metal assumptions to the annual recovered metal estimated for each operating year.
- No cost escalation beyond 2021.
- Constant 2021 dollar analysis, no provision for potential future inflation.
- Exploration costs are deemed outside of the Project, other than drilling required to convert Inferred Resources which have been included in the PEA production profile.
- Any additional Project study costs have not been included in the analysis.
- Excludes potential land acquisition costs.
- Financing is assumed to be on a 100% equity basis; no debt or related financing costs have been included in the economic analysis.

22.4 Taxes

The economic analysis of the Project has also been completed on an after-tax basis. It must be noted that there are many potential complex factors that affect the taxation of a mining project. The calculation of federal and provincial income and mining taxes, including the application of deductions for tax purposes, in the PEA economic analysis, are preliminary like pre-tax PEA economics and are intended only to give a general indication of the potential tax implications of the Project. Opportunities may exist to optimize the taxation of the Project through application of appropriate strategic tax planning.

As of the time of this PEA, the Project will be subject to the following taxes as they relate to the Project:

- A Canadian Federal corporate income tax rate of 15%.
- An Ontario Provincial corporate income tax rates of 11.5%.
- An Ontario mining tax rate of 10%.

The estimated federal and provincial income taxes were broadly calculated by deducting from gross revenues operating and reclamation costs and claiming certain tax deductions such as capital cost allowances (CCA), Canadian development expense (CDE) deductions and Canadian exploration expense (CEE) deductions. No corporate level costs were included in any tax estimates. The PEA incorporated certain tax pools of the corporate entity that owns the Project (which is wholly-owned by Clean Air Metals), including unused non-capital losses and tax pools relating to development and exploration expenses.

Opening balances (costs carried forward from previous years) including non-capital (operating) losses and balances for various capital asset categories were included as per information provided by the Company. These include a non-capital (operating) loss of $23.9M, a CDE pool of $5.2M, a CCA pool of $5.2M, a CCA pool of $1M, and a CEE pool of $95.4M.

Federal and Provincial income tax law also allows deduction of any Ontario Mining Taxes payable.

Ontario Mining Taxes allow for deductions of CCA as well as specific allowances to provide incentives for mineral project investments, and construction and operation of mineral processing assets within the province. Most notably these include:

- A one-time deduction of $10M for projects meeting the “New Mine” definition. This deduction has been applied to the Project.
- An annual allowance for a deduction of a portion of the initial capital cost of processing assets constructed and operated in the province. This allowance is applicable to the Project in so far as the Project will operate a concentrator.

22.5 Economic Results

The results of the economic analysis are derived from the LOM schedule presented in Section 0, the processing and recovery methods discussed in Section 17, and capital and operating costs presented in Section 21., Table 22-3, and Table 22-4 summarize the capital and operating cost inputs for the economic analysis.

The estimate of initial capital costs is $367.18 million, including amounts for working capital, indirect EPCM costs and contingency, as outlined in Table 22-2 (note that columns may not sum exactly due to rounding). A contingency of $60.21 million has been included in the estimate of initial capital costs, which amounts to 22.6% of initial pre-contingency and EPCM capital costs.

Table 22-2: Summary of Initial Capital Costs

Initial Capital Costs	Total Pre-Production (C$ million)	% of Total
Process Plant/Concentrate Loadout	154.11	58.0%
WSF/Water Treatment	12.39	4.7%
Other Surface Site Infrastructure	36.00	13.5%
Offsite Infrastructure	8.60	3.2%
Underground Major Infrastructure	1.82	0.7%
Underground Mobile Equipment	27.24	10.2%
Underground Capital Development	14.76	5.6%
Owners Construction Support/Technical	10.89	4.1%
Pre-Contingency/EPCM Initial Capital	**265.82**	**100.0%**
Initial Capital EPCM @ 15.5%	41.16	
Initial Capital Contingency @ 22.6%	60.21	
Total Initial Capital Costs	**367.18**	

The ongoing capital, including rehabilitation and closure costs, is estimated at $169.24 million over the life of the mine. Details of the estimate are shown in Table 22-3 (note that columns may not sum exactly due to rounding).

Table 22-3: Summary of Ongoing Capital Costs

Ongoing Capital Costs	Total LOM (C$ million)	% of Total
WSF/Water Treatment	9.85	6.2%
Other Surface Site Infrastructure	6.54	4.1%
Offsite Infrastructure	0.65	0.4%
Underground Major Infrastructure	12.42	7.8%
Underground Mobile Equipment	22.20	13.9%
Underground Capital Development	62.14	38.9%
Sustaining Capital	45.85	28.7%
Pre-Contingency Ongoing Capital	**159.66**	**100.0%**
Ongoing Capital Contingency @ 6.0%	9.58	
Total Ongoing Capital Costs	**169.24**	
Mine Closure	30.00	
Salvage	-30.00	
Total Ongoing/Closure Capital Costs	**169.24**	

The operating costs, detailed in Table 22-4, are estimated at $86.61/t of material processed (note that columns may not sum exactly due to rounding).

Table 22-4: Summary of Operating Costs

Operating Costs	Total LOM (C$ million)	$/t Mill Feed
Underground Mining	577.3	47.37
Process Plant/WSF/WMT	305.1	25.03
G&A Costs	83.7	6.87
Royalties	32.8	2.63
Transportation to Smelter	57.9	4.71
Total Operating Costs	**1,056.7**	**86.61**

Figure 22-1 shows the cashflow model results. The cashflow is presented in Table 22-5.

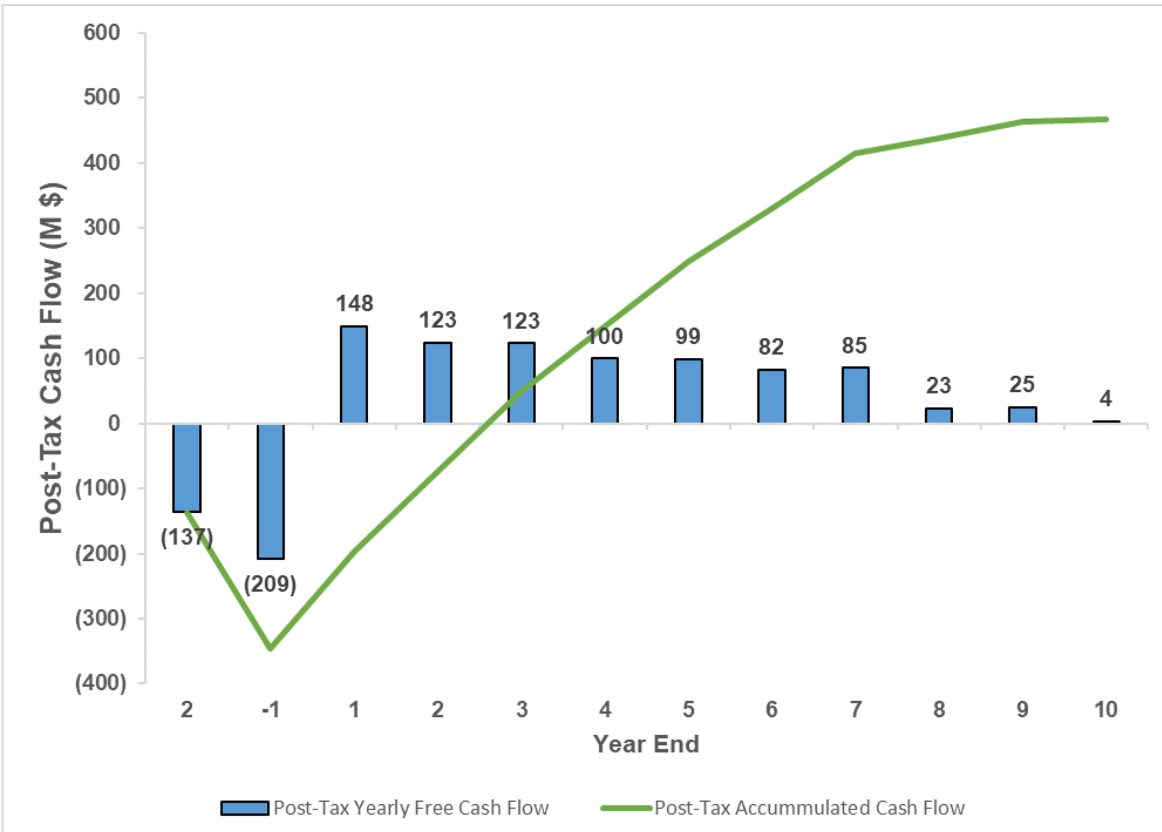


Figure 22-1: Cashflow model results

Table 22-5: Cashflow Model

Thunder Bay North Project Cash Flow	Year												Total
	-2	-1	1	2	3	4	5	6	7	8	9	10	
Production													
Mill Feed - Longhole Open Stoping (kt)	0	94	1,209	1,129	1,097	1,069	1,127	1,235	1,208	990	1,003	178	**10,338**
Mill Feed - Drift and Fill (kt)	0	3	44	167	199	227	169	61	88	306	293	388	**1,946**
Mill Feed - Total (kt)	**0**	**97**	**1,253**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**1,296**	**566**	**12,284**
Mill Feed - Pt Equiv. Grade (g/t)	0.00	9.31	9.31	8.89	8.93	7.99	7.78	7.74	7.19	4.53	4.58	4.40	**7.31**
Mill Feed - Pd Equiv. Grade (g/t)	0.00	4.08	4.08	3.89	3.91	3.50	3.41	3.39	3.15	1.98	2.00	1.92	**3.20**
Mill Feed - 3PGE Grade (g/t)	0.00	4.37	4.37	4.18	4.55	3.43	3.25	3.23	3.02	1.89	1.94	1.85	**3.25**
Mill Feed - Pt Grade (g/t)	0.00	2.20	2.20	2.13	2.38	1.62	1.52	1.52	1.43	0.90	0.92	0.88	**1.59**
Mill Feed - Pd Grade (g/t)	0.00	2.03	2.03	1.93	2.07	1.69	1.62	1.61	1.50	0.93	0.95	0.91	**1.56**
Mill Feed - Au Grade (g/t)	0.000	0.134	0.134	0.120	0.090	0.109	0.106	0.104	0.095	0.066	0.064	0.066	**0.097**
Mill Feed - Ag Grade (g/t)	0.00	3.32	3.32	2.64	2.14	2.46	2.43	2.39	2.09	1.11	1.23	1.07	**2.15**
Mill Feed - Cu Grade (%)	0.00	0.53	0.53	0.49	0.37	0.46	0.45	0.44	0.41	0.28	0.28	0.31	**0.41**
Mill Feed - Ni Grade (%)	0.000	0.203	0.204	0.208	0.164	0.254	0.271	0.273	0.253	0.154	0.148	0.129	**0.210**
Capital Costs (CA$ million)													
Pre-Contingency/EPCM Initial Capital	95.4	170.4											**265.8**
Initial Capital EPCM	18.3	22.9											**41.2**
Initial Capital Contingency	22.8	37.4											**60.2**
Total Initial Capital	**136.5**	**230.6**											**367.2**
Pre-Contingency Ongoing Capital			32.2	35.8	25.6	15.7	8.6	20.2	5.8	6.3	5.4	3.9	**159.7**
Ongoing Capital Contingency			1.2	2.1	1.0	0.6	0.3	3.1	0.2	0.0	0.3	0.9	**9.6**
Total Ongoing Capital			**33.4**	**37.9**	**26.5**	**16.4**	**8.9**	**23.3**	**6.0**	**6.3**	**5.7**	**4.8**	**169.2**
Mine Closure			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	**30.0**
Salvage			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-30.0	**-30.0**
Total Capital Costs	**136.5**	**230.6**	**33.4**	**37.9**	**26.5**	**16.4**	**8.9**	**23.3**	**6.0**	**6.3**	**5.7**	**4.8**	**536.4**
Operating Costs (CA$ million)													
Underground Mining	0.0	0.0	60.2	63.3	62.2	61.9	58.2	58.6	59.0	61.2	58.8	34.0	**577.3**
Process Plant / WSF / WMT	0.0	0.0	31.6	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	14.2	**305.1**
General & Administration Costs	0.0	0.0	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	4.4	**83.7**
Royalties	0.0	0.7	8.7	4.0	4.4	3.5	3.0	2.5	2.3	1.4	1.6	0.6	**32.8**
Transportation to Smelter	0.0	0.6	7.4	7.6	6.8	6.8	6.6	6.4	5.9	4.1	4.2	1.4	**57.9**
Total Operating Costs	**0.0**	**1.3**	**116.7**	**116.1**	**114.6**	**113.4**	**109.1**	**108.7**	**108.4**	**108.0**	**105.9**	**54.6**	**1,056.7**
Revenue (CA$ million)													
Revenue Pt	0.00	5.96	76.84	76.97	86.87	58.18	54.39	54.33	51.28	32.15	32.93	13.90	**543.80**
Revenue Pd	0.00	13.17	169.66	166.10	180.70	145.67	139.35	138.91	128.99	79.46	81.56	34.53	**1,278.11**
Revenue Au	0.00	0.33	4.22	3.89	2.92	3.48	3.37	3.28	2.98	2.09	2.02	1.14	**29.71**
Revenue Ag	0.00	0.06	0.82	0.60	0.52	0.55	0.55	0.54	0.45	0.16	0.22	0.05	**4.50**
Revenue Cu	0.00	3.50	45.16	42.61	31.63	40.43	39.53	38.47	35.52	23.80	23.75	12.37	**336.77**
Revenue Ni	0.00	1.14	14.66	15.62	10.93	21.01	23.02	23.24	20.87	9.94	9.33	3.28	**153.03**
Less Treatment Charges	0.00	-1.00	-12.90	-13.39	-12.34	-11.82	-11.47	-11.15	-10.30	-7.21	-7.43	-2.15	**-101.15**
Total Revenue	**0.0**	**23.2**	**298.5**	**292.4**	**301.2**	**257.5**	**248.7**	**247.6**	**229.8**	**140.4**	**142.4**	**63.1**	**2,244.8**
Operating Margin (%)			**61%**	**60%**	**62%**	**56%**	**56%**	**56%**	**53%**	**23%**	**26%**	**14%**	**53%**
Cash Flow (CA$ million)													
Revenue	0.0	23.2	298.5	292.4	301.2	257.5	248.7	247.6	229.8	140.4	142.4	63.1	**2,244.8**
Operating Costs	0.0	1.3	116.7	116.1	114.6	113.4	109.1	108.7	108.4	108.0	105.9	54.6	**1,056.7**
Pre-Tax Operating Cash Flow	0.0	21.9	181.8	176.3	186.6	144.1	139.6	138.9	121.4	32.4	36.5	8.6	**1,188.1**
Pre-Tax Free Cash Flow	-136.5	-208.7	148.4	138.4	160.1	127.7	130.7	115.6	115.3	26.1	30.8	3.8	**651.6**
Pre-Tax Accumulated Cash Flow	-136.5	-345.3	-196.9	-58.5	101.6	229.3	360.0	475.6	591.0	617.1	647.9	651.6	
Taxes	0.0	0.0	0.0	15.1	36.9	28.1	31.3	33.3	30.3	2.9	5.5	0.0	**184.2**
Operating Cash Flow	0.0	21.9	181.8	161.2	149.7	115.9	108.3	105.7	91.1	29.5	31.0	8.6	**1,003.8**
Free Cash Flow	-136.5	-208.7	148.4	123.3	123.1	99.6	99.4	82.4	85.1	23.2	25.3	3.8	**467.4**
Accummulated Cash Flow	-136.5	-345.3	-196.9	-73.6	49.5	149.1	248.5	330.8	415.9	439.1	464.4	468.1	

Discount Rate	**5.0%**

Pre-Tax Results	
NPV (Year -2) @ 5.0% (CA$ million)	**425.0**
IRR (%)	**31.1**
Simple Payback (Years)	**2.4**

Post-Tax Results	
NPV (Year -2) @ 5.0% (CA$ million)	**293.0**
IRR (%)	**25.2**
Simple Payback (Years)	**2.6**

An NPV calculation was performed at 5% discount rate to discount all future years of production to Year -2. The IRR was also calculated, which is defined as the rate at which the NPV of the cashflow equals zero. The payback period of the Project is defined as the point when the cumulative cashflow becomes positive.

Table 22-6 summarizes the economic indicators, both pre-tax and post-tax, for the estimated cashflow model.

Table 22-6: Economic Indicators

Economic Indicators	Units	Pre-Tax	Post-Tax
Payback Period (from start of production)	Years	2.4	2.6
IRR	%	31.1	25.2
NPV (Year -2) @ 5% Discount	C$ million	$425.0	$293.0

22.6 Sensitivity Analysis

To assess the project value drivers, sensitivity analyses were performed for the NPV and IRR considering variations in all metal revenues, initial capital, ongoing capital, underground operating costs, process plant/WSF/WMT operating costs, and other operating costs (G&A, royalties, transportation) on the post-tax NPV @ 5% discount rate. The NPV analysis results are shown in Table 22-8, Figure 22-2, and Figure 22-3 and the IRR analysis results shown in Table 22-9. The Project proved to be most sensitive to fluctuations in Pd revenue followed by Pt revenue, underground operating costs, and initial capital costs. Table 22-7 presents the Project NPV at a range of discount rates from 0 to 12% (the NPV 5%, being the base case, is bolded).

Table 22-7: Discount Rate Post-Tax NPV Sensitivity

Discount Rate (%)	Post-Tax NPV Sensitivity (C$ million)
0%	467
3%	354
5%	**293**
7%	241
12%	140

Table 22-8: Post-Tax NPV Sensitivity Analysis

	Post-Tax NPV Sensitivity (C$million)								
Sensitivity Item	**-20%**	**-15%**	**-10%**	**-5%**	**0%**	**5%**	**10%**	**15%**	**20%**
Revenue Pt	238.4	252.3	265.8	279.4	293.0	306.6	320.2	333.8	347.4
Revenue Pd	163.9	196.3	229.1	261.3	293.0	324.7	356.5	388.2	419.8
Revenue Au	290.0	290.8	291.5	292.2	293.0	293.7	294.5	295.2	295.9
Revenue Ag	292.5	292.6	292.8	292.9	293.0	293.1	293.2	293.3	293.4
Revenue Cu	259.7	268.1	276.4	284.7	293.0	301.3	309.6	317.9	326.3
Revenue Ni	278.2	281.9	285.6	289.3	293.0	296.7	300.4	304.1	307.8
Initial Capital	357.8	341.6	325.4	309.2	293.0	276.8	260.6	244.4	228.2
Ongoing Capital	318.4	312.1	305.7	299.4	293.0	286.6	280.3	273.9	267.5
Underground Operating	348.9	335.2	321.1	307.0	293.0	278.9	264.9	250.8	236.5
Process Plant/WSF/WMT Operating	322.6	315.2	307.8	300.4	293.0	285.6	278.2	270.8	263.4
Other Operating (G&A, Royalties, Trans.)	310.5	306.1	301.7	297.4	293.0	288.6	284.2	279.9	275.5

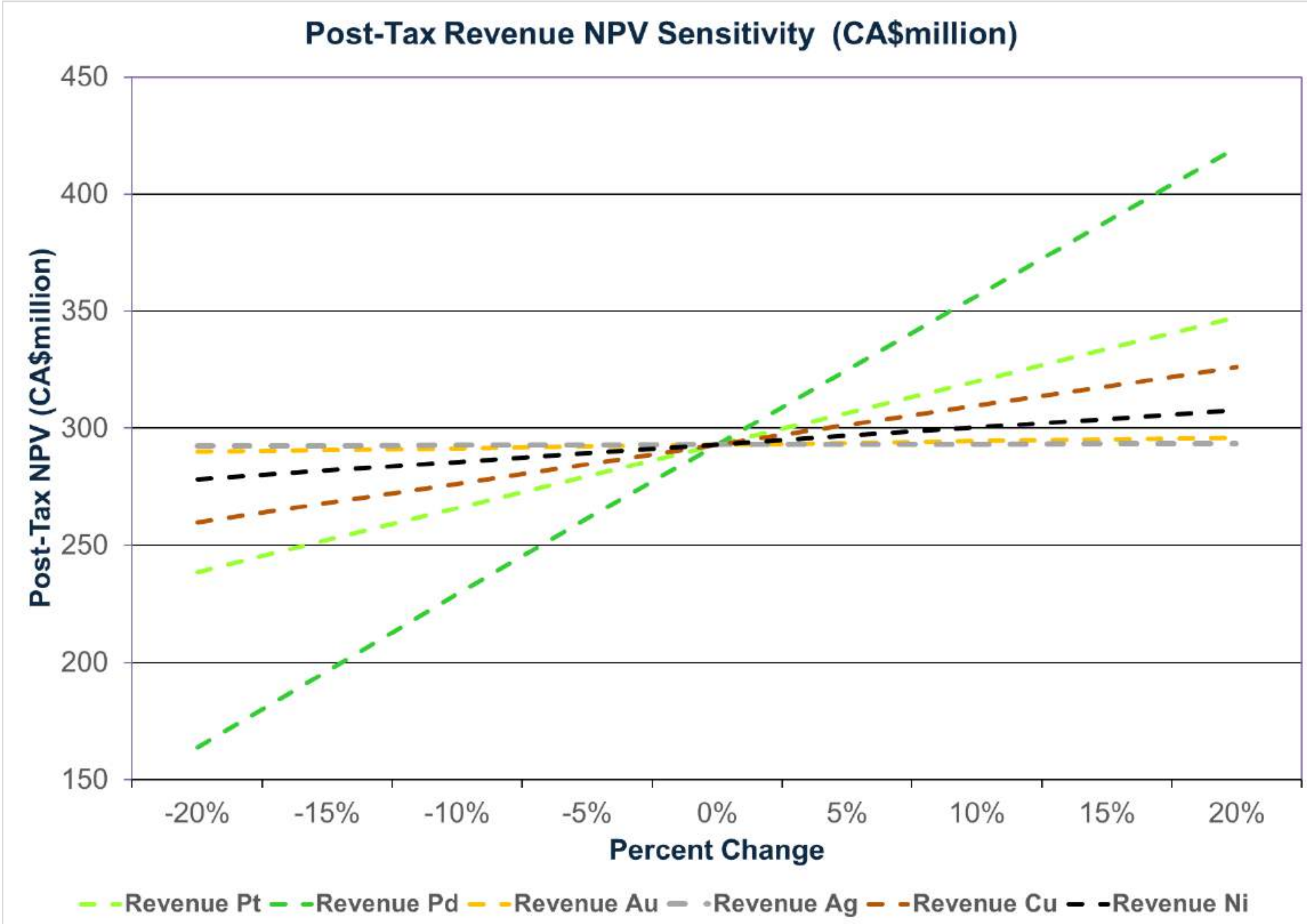


Figure 22-2: Post-tax revenue NPV sensitivity

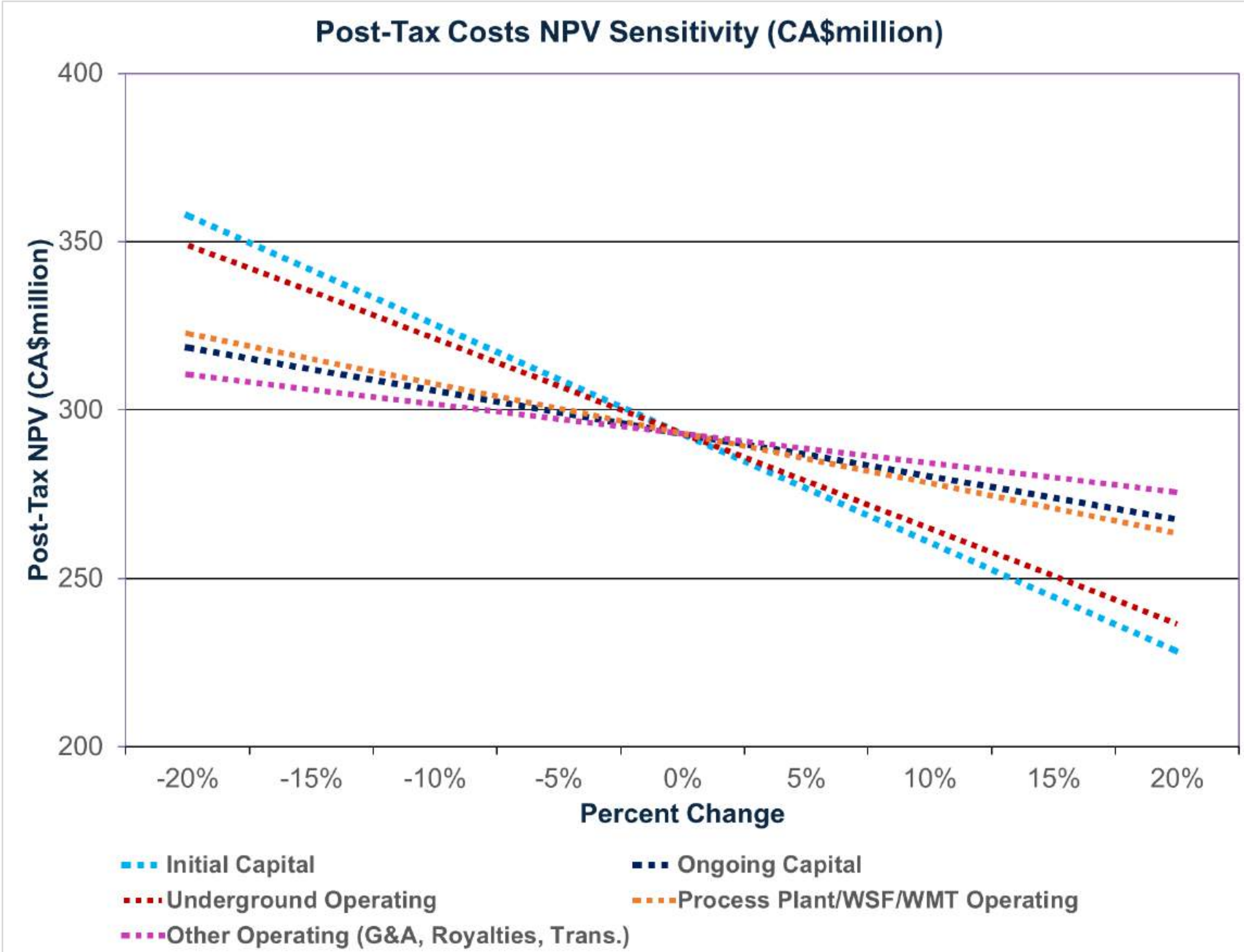


Figure 22-3: Post-tax costs NPV sensitivity

Table 22-9: Post-Tax IRR Sensitivity Analysis

	Post-Tax IRR Sensitivity (%)								
Sensitivity Item	**-20%**	**-15%**	**-10%**	**-5%**	**0%**	**5%**	**10%**	**15%**	**20%**
Revenue Pt	21.9	22.7	23.5	24.4	25.2	26.0	26.8	27.5	28.3
Revenue Pd	17.2	19.3	21.4	23.3	25.2	27.0	28.7	30.5	32.2
Revenue Au	25.0	25.0	25.1	25.1	25.2	25.2	25.2	25.3	25.3
Revenue Ag	25.1	25.1	25.1	25.2	25.2	25.2	25.2	25.2	25.2
Revenue Cu	23.3	23.8	24.2	24.7	25.2	25.6	26.1	26.5	27.0
Revenue Ni	24.4	24.6	24.8	25.0	25.2	25.4	25.6	25.7	25.9
Initial Capital	34.4	31.8	29.4	27.2	25.2	23.3	21.6	20.0	18.6
Ongoing Capital	26.8	26.4	26.0	25.6	25.2	24.8	24.3	23.9	23.5
Underground Operating	28.0	27.3	26.6	25.9	25.2	24.4	23.7	23.0	22.2
Process Plant/WSF/WMT Operating	26.7	26.3	25.9	25.5	25.2	24.8	24.4	24.0	23.6
Other Operating (G&A, Royalties, Trans.)	26.1	25.9	25.7	25.4	25.2	24.9	24.7	24.4	24.2

23. ADJACENT PROPERTIES

This section is not relevant to this Technical Report.

24. OTHER RELEVANT DATA AND INFORMATION

This section is not relevant to this Technical Report.

25. INTERPRETATION AND CONCLUSIONS

25.1 Introduction

The QP's note the following interpretations and conclusions in their respective areas of expertise, based on the review of data available for this Technical Report.

25.2 Mineral Tenure, Surface Rights, Royalties, and Agreements

The Project comprised of the Current Property and the Escape Property consists of 344 unpatented, single cell, multicell, and partial cell border claims (1,456 cell units) covering an aggregate area of approximately 29,725 ha. The Project is subject to a 1.5% NSR on the Escape Property, and a 0.5% and 3.0% NSR on portions of the Current Property (Figure 4-3).

The Company, as part of the Project, has executed a definitive agreement with Benton to acquire its:

- Right to purchase 100% of Panoramic Resource's Thunder Bay North Property for an aggregate amount of C$9 million. A C$4.5M down payment was completed on May 14, 2020, with a second installment of C$1.5M on May 11, 2021. A remaining balance of C$3M to Panoramic Resources remains on the property option.
- Right to purchase 100% of Rio Tinto's Escape Lake Project for C$6 million. Benton paid RTEC C$3M on signing of the option agreement. The Company assumed Benton's financial obligations by entering into a subsequent option agreement and has cleared the outstanding financial obligations with three C$1M payments on October 1, 2021, October 12, 2021, and final payment on November 10, 2021.

The Company's exploration activities are located on lands which the Cooperating Participants assert are part of their traditional territory and in which the Participating First Nations assert their members hold and exercise Rights. The Company and the Cooperating Participants signed a MOA effective as of January 9, 2021.

All claims and underlying agreements are in good standing.

25.3 Geology

Mineralization discovered on the Project to date is considered to be somewhat atypical of orthomagmatic Cu-Ni sulphide deposits, in particular part of the sub-class of deposits associated with rift and flood basalts and their associated magmatic conduits (Noril'sk type) (Naldrett 2004).

Mineralization within the Current deposit and Escape deposit are hosted within magmatic conduits comprised of melanocratic gabbro and ultramafic peridotites. Mineralization is strongly associated with sulphide abundance with the exception of the Cloud Zone within the Current deposit.

Nordmin examined and modelled the grade distributions for each of the elements. Grade distributions were created for Pd, Pt, Au, Ag, Cu, Ni, Co, and Rh. The analysis confirmed that the changes in mineralization and corresponding grade within the various conduits appear to be caused by preferential magma/fluid mixing. The higher-grade mineralization is largely settled near the lower portions of the conduits due to the high sulphide content associated with the different metals. The settling created a scenario in which the high grade mineralization is "pod"-like in nature and relatively equally spaced along the lower contact of each conduit. The material between the higher-grade pods is mineralized but with lower grades. Therefore, the higher-grade pods are connected within a lower grade matrix. As such, Nordmin created wireframe grade shells for each of the eight commodities to reflect the lithological and geochemical differences, along with sulphide abundance for the purpose of grade concentration and isolation of composites.

Mineralization wireframes were initially created on 10 m to 20 m vertical and plan sections and were adjusted between various views to edit and smooth each wireframe where required. The wireframes were encouraged and permitted to follow lithological boundaries and trends where applicable. When not cutoff by drilling, the wireframes terminate at the contact of the conduit or where a lack of drilling or significant change in grade distribution terminates them, whichever was most appropriate. No wireframe overlapping exists within a given grade domain, but wireframes were allowed to overlap across domains. The mineralization domain wireframes were modelled for eight grade elements, including Pt, Pd, Au, Ag, Cu, Ni, Co, and Rh. Structural and mineralization trends were used in the interpretation and selection of block modelling parameters. A final block model was built by estimating and combining block models for each domain; this block model has been fully validated with no material bias identified.

Explicit modelling was employed to allows for mineralization in context with the deposit geology and associated geochemistry to be considered.

The geological understanding of the setting (lithologies and structural) and alteration controls on mineralization is sufficient to support the estimation of Mineral Resources.

25.4 Exploration, Drilling, and Analytical Data Collection in Support of Mineral Resource Estimation

The exploration programs completed by the Company and previous operators are appropriate for the deposit style. The programs have delineated the Current Lake and Escape Lake deposits, as well as a number of exploration targets. Geophysical interpretations and regional surface exploration indicate the potential to discover further targets that warrant further investigation.

The quantity and quality of the lithological, collar and downhole survey data collected in the various exploration programs by various operators are sufficient to support the Mineral Resource Estimate. The collected sampling is representative of the Pt, Pd, Au, Ag, Cu, Ni, Co, and Rh grades in the deposit, reflecting areas of higher, and lower grades. The analytical laboratories used for legacy and current assaying are well known in the industry, produce reliable data, are properly accredited, and widely used within the industry.

Nordmin is not aware of any drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results. In Nordmin's opinion, the drilling, core handling, logging, and sampling procedures meet, or exceed industry standards, and are adequate for the purpose of Mineral Resource Estimation.

Nordmin considers the QA/QC protocols in place for the Project to be acceptable and in line with standard industry practice. Based on the data validation and the results of the standard, blank, and duplicate analyses, Nordmin is of the opinion that the assay and bulk density databases are of sufficient quality for Mineral Resource Estimation for the Project.

25.5 Metallurgical Testing

Based on the metallurgical testwork completed on composite samples from the Current and Escape deposits to date, the following conclusions are drawn:

- Chemical and mineralogical characterization of composite samples indicate that the copper is present as chalcopyrite, whereas nickel is present as nickel sulphide, but also contained in silicates. Major gangue minerals include serpentine, chlorite, and amphibole.

- Testwork conducted on the MC produced from coarse assay reject material in the Blue Coast Phase 1 testwork indicated that a sequential flowsheet and a moderate grind size P_{80} of 65 µm is suitable to achieve separate copper rougher and nickel rougher concentrates.
- A copper concentrate achieving high recovery and good grade can be achieved with a conventional chalcopyrite flowsheet including a moderate regrind and two stages of cleaning. The copper concentrate also yields partial recovery of platinum, palladium, gold, and silver.
- Flotation testwork on the Var1 composite revealed that a high grade nickel concentrate, >10% Ni, can be produced using a fine regrind, a selective nickel flotation collector, and moderate dosages of DETA to depress iron sulphides. Overall nickel recoveries to a selective concentrate are poor however, due to oxide nickel contained in silicates as well as sulphide nickel closely associated with iron sulphides.
- PGEs in the deposit were found to be closely associated with the sulphide minerals. A portion of the contained palladium is associated with chalcopyrite and was found to upgrade to the copper concentrate. Both platinum and palladium are associated with nickel and iron sulphides (pyrite, pyrrhotite). High PGE recoveries can be achieved with either a Cu/Bulk or Bulk only flotation flowsheet.
- The use of aged, assay reject material for flotation testwork was found to negatively effect test performance including flotation selectivity and final concentrate grade.
- CMC has been demonstrated to be effective at controlling the recovery of floatable gangue to the final concentrate.

25.6 Mineral Resource Estimate

The Mineral Resource Estimate for the Project conforms to industry best practices and is reported using the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves and 2019 CIM Best Practice Guidelines.

The Current deposit Mineral Resource Estimate benefits from approximately 171,465 m of diamond drilling in 767 drill holes spanning from 2006 until 2021. The Escape deposit Mineral Resource Estimate benefits from approximately 40,855 m of diamond drilling in 129 drill holes spanning from 2008 until 2020. Collectively this drilling by the Company and its predecessors has led to the delineation of the Current and Escape Mineral Resource Estimates.

The Escape deposit and Current deposit block models were estimated using NN, ID2, ID3, and OK interpolation methods for global comparisons and validation purposes. The OK method was used for the Mineral Resource Estimate; it was selected over ID2, ID3, and NN as the OK method was the most representative approach to controlling the smoothing of grades.

The Mineral Resource Estimate is predominately based on an unchanged geological model and methodologies utilized to calculate the 2021 Mineral Resource Estimate. The differences in the Current deposit relate to the incorporation of approximately 7,200 m of infill drilling within the Lower Bridge/Upper Beaver area and the corresponding reinterpretation of the infill drilling and incorporating updated metal prices (Table 14-18), metallurgical and smelter recoveries (Table 14-19).

The effective date of the Mineral Resource Estimate for the Project is November 1, 2021. Within the Project, the Current deposit contains an Indicated Mineral Resource of 10,388,964 tonnes at US$93/tonne contained value and an Inferred Mineral Resource of 5,274,798 tonnes at US$93/tonne contained value and has an effective date of November 1, 2021. The Escape deposit contains an

Indicated Mineral Resource of 4,164,360 tonnes at US$100/tonne contained value and an Inferred Mineral Resource of 2,802,798 tonnes at US$100/tonne contained value (Table 14-20 and Table 14-21) and has an effective date of January 18, 2021.

The updated Mineral Resource Estimate comprises a 14.6 million tonne Indicated Mineral Resource, averaging 8.12 g/t Pt Eq and an 8.1 million tonne Inferred Mineral Resource, averaging 4.07 g/t Pt Eq., reported at a cutoff insitu contained value of US$93/tonne for Current deposit and a cutoff insitu contained value of US$100/tonne for Escape deposit (Table 14-20).

The current resource represents a 4.5% increase in the indicated material on a contained Pt Eq metal ounce basis in comparison to the prior January 20, 2021, Mineral Resource Estimate due to the estimation of the 2021 infill drilling of 7,500 m within the Bridge/Beaver portion of the Current deposit (Table 14-28 and Table 14-29). The infill drilling improved the continuity of medium and higher-grade portions of the deposit.

The Mineral Resource Estimate is based on underground mining methods and milling and flotation/cyanidation concentration processing method. Areas of uncertainty that may materially impact the Mineral Resource Estimate include:

- Changes to long-term metal price assumptions.
- Changes to the input values for mining, processing, and G&A costs to constrain the estimate.
- Changes to local interpretations of mineralization geometry and continuity of mineralized zones.
- Changes to the density values applied to the mineralized zones.
- Changes to metallurgical recovery assumptions.
- Changes in assumptions of marketability of the final product.
- Variations in geotechnical, hydrogeological, and mining assumptions.
- Changes to assumptions with an existing agreement or new agreements.
- Changes to environmental, permitting, and social licence assumptions.
- Logistics of securing and moving adequate services, labour, and supplies could be affected by epidemics, pandemics and other public health crises, including COVID-19, or similar such viruses.

There is potential for an increase in the Mineral Resource Estimate if mineralization that is currently classified as Inferred can be upgraded to higher-confidence Mineral Resource categories and if any categorized mineralization within the various deposits can be expanded.

The 2021 PEA, while based largely on MSO analysis in continuous mineralized material within the Indicated Mineral Resource category, is preliminary in nature and includes an economic analysis that is based in part on Inferred Mineral Resources. Inferred Mineral Resources are considered too speculative geologically for the application of economic considerations that would enable them to be categorized as Mineral Reserves and there is no certainty that the results will be realized. Mineral Resources do not have demonstrated economic viability and are not Mineral Reserves.

25.7 Mineral Processing

The conceptional process plant has been designed as a conventional milling operation with a capacity of 3,600 t/d. ROM mineralized material will be reduced to P_{80} of 300 mm by a single jaw crusher. Crusher discharge would be transferred to a surface stockpile, from which material would be reclaimed by two active apron feeders. A front-end loader would be utilized on occasion to minimize size segregation and to motivate the pile during the winter period.

A conventional SAG and ball mill grinding circuit is proposed. The conceptual design targets a grind size P_{80} of 65µm, utilizing a SAG size of 6.7 m diameter by 2.8 m (EGL) long and a ball mill size of 4.5 m by 7 m (EGL) long. The SAG mill is closed-in with a pebble circuit where pebbles are crushed prior to being recycled to the SAG feed. The ball mill will be closed-in with hydrocyclones, with cyclone overflow reporting to the copper rougher circuit.

The flotation circuit will produce two separate marketable concentrates. A copper-PGE concentrate will be the primary float, utilizing a regrind stage of the rougher float product prior to two subsequent stages of cleaning. Cu-PGE concentrate will be thickened and dewatered via a filter press prior to being stored in a covered stockpile prior to shipment.

Copper rougher tails will be pumped to a bulk concentrate flotation circuit which consists of rougher stage, and four subsequent cleaning stages. The bulk concentrate product will be thickened and dewatered via a filter press prior to being stored in a covered stockpile prior to shipment.

Copper-PGE concentrate is anticipated to amount to approximately 53 t/d (dmt), with an assumed target moisture content of 8% which amounts to an annual concentrate production of 20,650 wmt. The remaining bulk concentrate production will be approximately 119 t/d (dmt), with an assumed target moisture content of 8% which translates to an annual concentrate production of 46,500 wmt.

It is anticipated that the two separate concentrate products will be shipped by truck to separate regional smelters suited to handle the separate marketable concentrate products.

25.8 Mining Methods

The PEA underground mine plan is based on the Mineral Resource Estimate outlined in Section 14. The underground mine plan was based upon the Current and Escape deposits.

The underground mine plan was designed using a combination of conventional underground long hole open stope and drift & fill mining methods, backfilled with a combination of CPB, CRF and URF. Stopes are designed to be accessed and excavated via overcut and undercut development cross-cut drifts, which connect to the main declines. The main declines provide ventilation, haulage to surface, and mine access.

The planned mining from underground consists of approximately 12.3 Mt of mill feed at an average PtEq grade of 7.3 g/t, and 3.0 Mt of waste rock material. The planned mining from underground consists of evaluated tonnes and grade within MSO shapes that met the minimum NSR cutoff grade, were outside of boundary constraints, and were assessed to be probable minable shapes. The NSR cutoff, as applied to MSO shapes, includes material within the shapes below cutoff.

Due to the preliminary nature of the PEA, it must be noted that the material considered in it are Mineral Resources, and as such are too geologically speculative to be categorized as Mineral Reserves, and there is no certainty that the PEA will result in an operating mine. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

25.9 Infrastructure

The Project is located in the Tartan and Greenwich Lake Areas approximately 50 km north of the city of Thunder Bay, Ontario, Canada. The site is paved highway accessible from Thunder Bay on Trans-Canada Highway 11-17 and then north on Highway 527 to the Escape Lake Road network. Access to the mine site is in discussion with a major forestry company via a combination of upgrades to existing logging roads and construction of new roads, totalling 10.5 km, connecting to Highway 527 to the West.

The main project components include the mine, process plant supporting infrastructure, WSF, external and internal access roads, power supply and distribution and freshwater supply and distribution.

Power is anticipated to be supplied via a new 230 kV East-West Tie Line running to the southeast of the Project site (expected completion date of 2022) that is accessed by construction of approximately 6 km of new 13.8 kV power lines. The proximity of the mine site plan to power (230 kV East-West Tie Line) and transportation infrastructure (paved Highway 527) within the Company's mining claims is felt to offer a competitive advantage.

Based on the current mine plan, the conceptual layouts developed for the WSF indicate that all PAG filtered tailings and PAG waste rock can be safely and securely stored in the area to the north of the plant site, while maintaining sufficient offsets from local waterbodies

The waste management strategy includes for the filter plant producing tailings that are amenable to transport during the entire operating period. There is the potential for higher moisture content tailings to be produced during filter plant commissioning, start-up, and during upset operating conditions that are not suitable for transport. It is assumed that higher moisture content tailings will be stored underground as paste backfill.

The WSF will be constructed and operated to shed water, minimize the infiltration of water into the tailings mass, and mitigate the generation of acid. It is expected that the WSF will operate under a net annual water surplus. A water treatment system is included in the overall development concept to discharge excess water to the environment over a portion of each operating year.

25.10 Enviromental Studies, Permitting and Social Impact

Environmental baseline studies are well underway to support the eventual EA and permitting required to advance the project to construction. Further baseline studies and data gathering are required to support the project. Specifically, data collection will continue for physical environment studies (hydrology, surface water, sediment, hydrogeology, metals leaching and acid rock drainage, meteorology and noise), biological environment studies (fish and fish habitat, mammals, birds, SAR, vegetation and wetlands) and archaeological studies.

Although no EAs or related permitting are yet underway, there are currently minimal environmental risks identified associated with these milestones. As the Ontario government contemplates changes to the Provincial Environmental Assessment Act, indications are that there will be no changes to how mining projects are approved, which reduces uncertainty around the process.

25.11 Capital and Operating Costs

The initial project capital cost is estimated at $367.2 million, including a contingency allowance of 20% to 25% for major items and the total capital cost is estimated at $536.0 million. The duration of the detailed design and construction phase of the project is estimated at 24 months.

The average operating costs (LOM) is estimated at $86.61 per tonne mined with an NSR of $178.02 per tonne over a 10-year LOM.

25.12 Economic Analysis

A LOM cashflow model was constructed based on the LOM production schedule for the deposits including an assessment of the sensitivities to certain economic parameters. The economic results of this report are based upon the services performed by:

- Nordmin for underground mining surface infrastructure and processing.
- Knight for WSF and underground geotechnical parameters.
- Blue Coast for Metallurgy.
- DST for environmental and permitting.
- BWB Consulting Services Inc. for taxation calculations.

The Company provided the inputs and related calculations with respect to the impact of taxation on the economic model. This included the calculation of applicable federal (Canadian) and provincial (Ontario) corporate income taxes and provincial (Ontario) mining taxes. Allowable deductions were based primarily on available capital cost pools for corporate income taxes. Application of deductions specifically available for Ontario mining taxes were also calculated. These included processing allowances and the application of the “New Mine” exemption for the Project.

Opening balances (costs carried forward from previous years) including non-capital (operating) losses and balances for various capital asset categories were included as per information provided by the Company.

The Project includes an underground mine and associated infrastructure, surface infrastructure to support the mine operations (i.e., maintenance and office facilities), water management features, stockpiling area, processing facility and WSF.

An economic analysis was conducted with undiscounted and discounted net cash flows before and after-tax. At the metal prices outlined in Table 16-5, the conclusions are as follows:

- The Project has a pre-tax NPV of $425.0 million, and after-tax NPV of $293.0 million, at a 5% discount rate.
- The pre-tax IRR is 31.1%, and the after-tax IRR is 25.2%.
- The capital payback is 2.6 years from start of production.
- Revenue’s average $239.8 million per year from sale of PGE and Copper mineral concentrates.
- Total mined metal production over a 10-year mine life based on the present resource base is expected to be 629 k oz platinum, 618 k oz Palladium, 111 M pounds Copper, 57 M pounds Nickel, 38 k oz Gold, 850 k oz Silver, or 2,886 k oz Pt Eq1.
- 65.2% of total mineral production occurs in the first 5 years.
- Operating margin of 59% in the first 5 years and LOM Operating margin of 53%.

25.13 Risks and Uncertainties

There are some risks that are inherent to a mining project such as:

- The PEA is preliminary in nature and includes an economic analysis that is based, in part, on Inferred Mineral Resources. Inferred Mineral Resources are considered too speculative geologically for the application of economic considerations that would enable them to be categorized as Mineral Reserves. There is no certainty that the PEA will result in an operating mine. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability;

Areas of uncertainty that may materially impact the PEA and Mineral Resource Estimate include:

- Changes to long-term metal price assumptions.
- Changes to the input values for mining, processing, and G&A costs to constrain the estimate.
- Changes to local interpretations of mineralization geometry and continuity of mineralized zones.
- Changes to the density values applied to the mineralized zones.
- Changes to metallurgical recovery assumptions.
- Changes in assumptions of marketability of the final product.
- Variations in geotechnical, hydrogeological, and mining assumptions.
- Changes to assumptions with an existing agreement or new agreements.
- Changes to environmental, permitting, and social licence assumptions.

  EA Timing, requirements and supporting documentation.
- The assumption that the electric power line will be available on time for the construction of the project.

  Discussions with various First Nation communities.
- Logistics of securing and moving adequate services, labour and supplies could be affected by epidemics, pandemics and other public health crises, including COVID-19 or similar such viruses.

25.14 Conclusions

The results of the PEA for the Company indicate that the Project has technical and financial merit using the base case assumptions. Throughout 2022, the Company will continue with ongoing exploration work, including geotechnical drilling, metallurgical/comminution studies and infill drilling. If a production decision is made, the Company will then commence the next phase of planning for underground mining.

The Company believes there is further potential to significantly expand the Mineral Resource and the geophysical survey will assist in identifying strike continuity and expanding mineralization potential.

The Company expects to complete a Mineral Resource update in 2022 on the greater than 35,000 m of step-out and delineation drilling that has been completed on the Escape deposit since the January 20, 2021 resource statement. Much of the Inferred material in the present PEA mine plan has been a focus of infill drilling activity as previously disclosed and is expected to convert to indicated mineral inventory. Continuity of mineralization has been also demonstrated geophysically (using the Magnetometric Resistivity (MMR) technique). The additional drilling is expected to support the use of the MSO algorithm in a PFS.

26. RECOMMENDATIONS

26.1 Phase 1 Recommendations – PEA Augmentation

The Phase 1 recommendations are focused on infill/expansion drilling, environmental baseline studies and technical trade-off studies. Table 26-1 tabulates the Phase 1 PEA augmentation recommendations which are anticipated to require a budget of C$3,190,000.

Table 26-1: Phase 1 Recommended PEA Augmentation Budget

Item	Units	Unit Cost	Cost (C$)
Approximately 10,000 m of infill/expansion drilling [2](used for metallurgy, geotechnical, etc.)	10,000	$200	$2,000,000
Environmental base line studies to support the EA			$350,000
WSF design (site investigations, water balance, engineering studies)			$250,000
Trade-off final concentrate testing and metallurgy			$300,000
Contingency (10%)		10%	$ 290,000
Total			**$3,190,000**

26.1.1 Geology and Mining Recommendations

The following are recommendations for the underground mine plan for the next stage of study:

- Complete infill drilling in both deposits focusing on areas within the first five years of mining to support metallurgical and geotechnical studies.
- Develop a comprehensive 3D lithology and structural model.
- Conduct detailed geotechnical analysis of the crown pillar below Current Lake to ensure its adequacy and to determine, with appropriate mitigations, whether additional mineral reserve can be mined under the lake.
- Conduct detailed mineable stope inventory, development design and sequencing analysis.
- Further hydrogeological study to obtain better understanding of underground dewatering requirements.
- Further geotechnical study to improve the characterization of the rock mass and refine the underground mine design inputs.
- Undertake testing of mine tails to determine suitability for paste fill and develop representative CPB using various cement percentages to determine strength at various time periods.
- Update all mine planning work done for this PEA, incorporating results from this PEA.
- Initiate discussions with mining contractors to obtain multiple budget quotes to perform the proposed underground mining operations and construction of the related underground infrastructure.

[2] Includes exploration drilling within the Thunder Bay North Project

26.1.2 Recommended Metallurgical Work

Additional testwork is required to advance the metallurgy presented to a PFS level. Goals of this phase of work will be to balance process plant recoveries with smelter off-take terms for the best business result. Recommendations for further work include:

- Preparation of representative zone and domain composites for the Current and Escape deposits using core material.
- Mineralogical characterization of zone and domain composites including bulk modals, association, liberation, and PGE mineralization.
- Flotation flowsheet optimization on zone and domain composites including primary grind size, collector addition, and depressant addition.
- Locked cycle testing of zone and domain composites.
- Hardness characterization on zone and domain composites including SMC, Bond RWi, and BBWi.
- Hardness characterization on up to eight variability composites for SMC and BBWi.
- Thickening and filtration testing on representative concentrate samples.
- Dewatering testwork on tailings samples.
- Environmental characterization of representative tailings samples including acid base accounting (ABA) and toxicity characteristic leaching procedure (TCLP) testing.

26.1.3 WSF Recommendations

The following key recommendations are provided to advance the design of the WSF as part of future studies:

- Site investigations should be completed, including geotechnical/hydrogeological drilling, test pit excavations, in situ testing, sampling, instrumentation installation, and laboratory testing. The testwork results will help to gain a better understanding of the geotechnical, hydrogeological, geological, and geochemical site conditions, develop more refined input parameters to support more detailed levels of design, and confirm that a geosynthetic lining system will not be required.
- Physical and geochemical characterization of the tailings and waste rock (including strength and additional filtration testwork on the tailings) should be undertaken to better estimate in situ placed densities, stable slope angles, filtered tailings management requirements, and potential ARD and ML of the wastes.
- Meteorological and hydrological data should continue to be collected to develop climate normals and extreme storm event estimates, as well as to estimate the water management requirements at the site.

26.1.4 Environmental Recommendations

Next phases of the project will include continued environmental baseline studies and data gathering to firm up data sets. The data will be used to advance an anticipated Provincial Environmental Assessment and future permitting. It is recommended that a Project Definition be prepared and submitted to the MNDMNRF to engage the various Ministries at both the federal and provincial levels through the "One Window" coordination process. Mining claims anticipated to be used by Clean Air Metals for operations will need to be brought to lease, and this process should be started as soon as feasible. Anticipated timelines for the claims to lease process is two to three years. Continued consultation and relationship building with the First Nations Participating Communities, as well as interested stakeholders, to meet the EA requirements, is strongly recommended as the project advances.

26.2 Phase 2 Recommendations – PFS

The Phase 2 recommendations are contingent upon the completion of the Phase 1 recommendations and subject to minimum NAV and IRR outcomes from the Phase 1 program and Company approval.

Phase 2 recommends a PFS on the Current deposit that is predicated on additional infill drilling to finalize an Indicated Mineral Resource, metallurgical test work, mine planning and related trade-off studies and a discounted cashflow model.

Table 26-2 tabulates the contingent Phase 2 PFS recommendations which are anticipated to require a budget of C$3,124,000.

Table 26-2: Phase 2 Recommended Current Deposit PFS Budget

Item	Units	Unit Cost	Cost (C$)
Technical studies 43-101 (PFS)			$1,200,000
General support and administration costs, legal fees, professional fees, staff, fixed costs, etc.		40%	$1,640,000
Contingency (10%)		10%	$ 284,000
Total			**$3,124,000**

27. REFERENCES

ASTM D698. Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort. ASTM International. West Conshohocken, PA. www.astm.org

ASTM D2487. Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). ASTM International. West Conshohocken, PA. www.astm.org

Bleeker, Wouter, et al., 2020. The Midcontinent Rift and its Mineral Systems: Overview and Temporal Constraints of Cu-Ni-PGE Mineralized Intrusions; *in* Targeted Geoscience Initiative 5: Advances in understanding of Canadian Cu-Ni-PGE and Cr ore systems – Examples from the Midcontinent Rift, the Circum-Superior Belt, the Archean Superior Province, and Cordilleran Alaskan-type intrusions, (ed.) W. Bleeker and M.G. Houlé; Geological Survey of Canada, Open File 8722, p. 7-35.

Canadian Dam Association, 2019. Technical Bulletin - Application of Dam Safety Guidelines to Mining Dams (2019 Edition).

Clark Exploration Consulting, January 2020: Technical Report on the Thunder Bay North and Escape Lake Properties, Northern Ontario, Canada.

Cole, G., and El-Rassi, D., 2009: Mineral Resource Evaluation, Thunder Bay North Polymetallic Project, Ontario, Canada: technical report prepared by SRK Consulting Ltd. for Magma Metals (Canada) Ltd., effective date 7 September 2009.

Continental Conveyor (Ontario) Ltd., 2021. Email from: Nathan Mutch. Email to: Jeffry Ganye, Knight Piésold Ltd. Re: Cost Estimates for Conceptual Level Design Project - Continental quote 32730. April 30. Napanee, Ontario (NB101-797/1).

DST Consulting Engineers. 2009. Thunder Bay North Project 2008 Aquatic Baseline Study. DST Ref.: OE-TB-008223.

DST Consulting Engineers 2010. Thunder Bay North Project 2009 Aquatic Baseline Study. DST Ref.: OE-TB-008223.

DST Consulting Engineers 2012a. Thunder Bay North Project 2011 Aquatic Baseline Study. DST Ref.: OE-TB-013435.

DST Consulting Engineers 2012b. Thunder Bay North Project – Magma Metals 2011 Meteorology, Air Quality and Noise Baseline Study. OE-TB-013435.

DST Consulting Engineers 2013. Thunder Bay North Project 2012 Aquatic Baseline Study. DST Ref.: OE-TB-014542.

DST Consulting Engineers. 2013. Thunder Bay North Project fisheries and fish habitat baseline summary 2011/2012. DST Ref.: OE-TB-013435.

DST 2013. Thunder Bay North Project 2012 Terrestrial Wildlife Baseline Study. DST Ref.: OE-TB-014542.

Eckstrand, O. Roger, and Hulbert, Larry J. 2007. Magmatic Nickel-Copper-Platinum Group Element Deposits; In Mineral Deposits of Canada, Geological Survey of Canada, Mineral Deposits Division, Special Publication No. 5., pp205-232.

Environment Canada. 2012. Metal Mining Technical Guidance for Environmental Effects Monitoring.

G&T Metallurgical Services Ltd. (G&T); Metallurgical Assessment of the Thunder Bay North Project, KM2533, Nov. 5, 2010.

Knight Piésold Ltd. (KP), 2021. Transmittal to: Glen Kuntz, Nordmin Engineering Ltd. Re: Site Investigation Results. North Bay, Ontario. Ref. No. NB21-01093 (NB101-797/2).

Leon, G., MacTavish, A., Heggie, G., Magma Metals Limited 2012: Mineral Resource Estimate for the East Beaver Lake Zone Extension [unpublished]. Internal report.

Miller, J.D., 2007: The Midcontinent Rift in the Lake Superior Region: A 1.1 Ga Large Igneous Province: article posted to Large Igneous Provinces website, November 2007, accessed 20 September 2010, http://www.largeigneousprovinces.org/07nov

Mine Drainage Assessment Group 2010. Thunder Bay North Project – Prediction of Minesite-Drainage Chemistry and of Metal Leaching and Acid Rock Drainage (ML-ARD), Phase 1.

Mine Drainage Assessment Group 2011. Thunder Bay North Project – Prediction of Minesite-Drainage Chemistry and of Metal Leaching and Acid Rock Drainage (ML-ARD), Phase 2.

Ministry of Environment. 1993. Guidelines for the Ministry of the Environment, Protection and Management of Aquatic Sediment Quality in Ontario. Queen's Printer for Ontario.

Ministry of Natural Resources. 2014. Ontario Wetland Evaluation System, Northern Manual. Queen's Printer for Ontario.

Naldrett, A.J., 2004: Magmatic Sulfide Deposits: Geology, Geochemistry and Exploration: Springer, 2004, 728 p.

Paterson & Cooke (P&C), 2021. Nordmin Clean Air Thunder Bay North Test Work - Test Work Report. November 2, 2021. Sudbury, Ontario. Ref. No. 32-0529-00-TW-REP-0001. Revision A.

Ross, William. 2010. Stage 1 and Stage 2 Archeological Assessment of Current Lake, District of Thunder Bay. PIF# P-044-063-2010.

Searston, S., AMEC 2011: Magma Metals Limited, Preliminary Assessment Report Thunder Bay Project, Ontario, Canada. Project No. 164115 [unpublished]. Internal report dated February 2011.

SGS Mineral Services (SGS); Project #12372-001 for Magma Metals Limited, The Grindability Characteristics of Samples from the Thunder Bay North Project, April 30, 2010.

Stott, G.M., Corkery, T., Leclair, A., Boily, M., and Percival, J., 2007. A revised terrane map for the Superior Province as interpreted from aeromagnetic data. *In* Woodruff, L. (ed.), Institute on

Lake Superior Geology Proceedings, 53rd Annual Meeting, Lutsen, Minnesota, v. 53, part 1, p. 74-75.

Thomas, D.G., Melnyk, J., Gormely, L., Searston, S., Kulia, G. AMEC 2011: Magma Metals Limited, Thunder Bay North Polymetallic Project Ontario, Canada, NI 43-101 Technical Report. Project No. 164115. Effective Date: 6 October 2010

Thomas, D.G., Melnyk, J., Gormely, L., Searston, S., Kulia, G. AMEC 2011: Magma Metals Limited, Thunder Bay North Polymetallic Project Ontario, Canada, NI 43-101 Technical Report on Preliminary Assessment. Project No. 164115. Effective Date: 17 March 2011 in support of a press release dated 7 February 2011, entitled "Positive Scoping Study for Thunder Bay North Project: Considerable upside potential to further enhance the economics of the project."

Xstrata Process Support (XPS), 2010; Mineralogical Report 5010809.00 for Magma Metals Limited, Qemscan Analysis of One Crushed Composite, June 8, 2010.

28. GLOSSARY

The Mineral Resources and Mineral Reserves have been classified according to CIM (CIM, 2014). Accordingly, the resources have been classified as Measured, Indicated or Inferred, the reserves have been classified as proven, and probable based on the Measured and Indicated Resources as defined below.

28.1 Mineral Resource

A **Mineral Resource** is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade, or quality, and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, or quality, continuity, and other geological characteristics of a Mineral Resource are known, estimated, or interpreted from specific geological evidence and knowledge, including sampling.

An **Inferred Mineral Resource** is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

An **Indicated Mineral Resource** is that part of a Mineral Resource for which quantity, grade, or quality, densities, shape, and physical characteristics are estimated with sufficient confidence to allow the application of modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the Project. Geological evidence is derived from the adequately detailed and reliable exploration, sampling, and testing, and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

A **Measured Mineral Resource** is that part of a Mineral Resource for which quantity, grade, or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of modifying factors to support detailed mine planning and final evaluation of the economic viability of the Project. Geological evidence is derived from the detailed and reliable exploration, sampling, and testing, and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

28.2 Mineral Reserve

A **Mineral Reserve** is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at prefeasibility or feasibility-level as appropriate that include the application of modifying factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.

The reference point at which Mineral Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported. The public disclosure of a Mineral Reserve must be demonstrated by a prefeasibility study or feasibility study.

A **Probable Mineral Reserve** is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the modifying factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.

A **Proven Mineral Reserve** is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the modifying factors.

28.3 Definition of Terms

Table 28-1: Definition of Terms

Term	Definition
Assay	The chemical analysis of mineral samples to determine the metal content.
Capital Expenditure	All other expenditures not classified as operating costs.
Composite	Combining more than one sample result to give an average result over a larger distance.
Concentrate	A metal-rich product resulting from a mineral enrichment process such as gravity concentration or flotation, in which most of the desired mineral has been separated from the waste material in the ore.
Crushing	The initial process of reducing the ore particle size to render it more amenable for further processing.
Cutoff Grade (CoG)	The grade of mineralized rock, which determines as to whether or not it is economical to recover its gold content by further concentration.
Dilution	Waste, which is unavoidably mined with ore.
Dip	The angle of inclination of a geological feature/rock from the horizontal.
Fault	The surface of a fracture along which movement has occurred.
Footwall	The underlying side of an orebody or stope.
Gangue	Non-valuable components of the ore.
Grade	The measure of the concentration of gold within the mineralized rock.
Hanging wall	The overlying side of an orebody or slope.
Haulage	A horizontal underground excavation which is used to transport mined ore.
Igneous	Primary crystalline rock formed by the solidification of magma.
Kriging	An interpolation method of assigning values from samples to blocks that minimize the estimation error.
Level	A horizontal tunnel, the primary purpose is the transportation of personnel and materials.
Lithological	Geological description pertaining to different rock types.
Milling	A general term used to describe the process in which the ore is crushed and ground and subjected to physical or chemical treatment to extract the valuable metals to a concentrate or finished product.
Mineral/Mining Lease	A lease area for which mineral rights are held.
Ongoing Capital	Capital estimate of a routine nature, which is necessary for sustaining operations.
Ore reserve	See Mineral Reserve.

Term	Definition
Pillar	Rock left behind to help support the excavations in an underground mine.
Sedimentary	Pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks.
Shaft	An opening cut downwards from the surface for transporting personnel, equipment, supplies, ore, and waste.
Sill	A thin, tabular, horizontal to the sub-horizontal body of igneous rock formed by the injection of magma into planar zones of weakness.
Smelting	A high-temperature pyrometallurgical operation conducted in a furnace, in which the valuable metal is collected to a molten matte or dolt phase and separated from the gangue components that accumulate in a less dense molten slag phase.
Stope	The underground void created by mining.
Stratigraphy	The study of stratified rocks in terms of time and space.
Strike	The direction of the line formed by the intersection of strata surfaces with the horizontal plane, always perpendicular to the dip direction.
Sulphide	A sulphur-bearing mineral.
Tailings	Finely ground waste rock from which valuable minerals or metals have been extracted.
Thickening	The process of concentrating solid particles in suspension.
Total Expenditure	All expenditures, including those of an operating and capital nature.
Variogram	A statistical representation of the characteristics (usually grade).

28.4 Abbreviations & Symbols

Table 28-2: Abbreviations and Symbols Used in this Technical Report

Abbreviation	Unit or Term
%	percent
<	less than
>	greater than
°	degree (degrees)
°C	degrees Celsius
µm	micrometre or micron
AA	atomic absorption
AAS	atomic absorption spectrometry
ABA	acid base accounting
Actlabs	Activation Laboratories Ltd.
Ag	silver
Ai	abrasion index
ANFO	ammonium nitrate/fuel oil
Au	gold
AWOS	automated weather observing system
AWS	automated weather station
BBWi	bond ball work index

Abbreviation	Unit or Term
BEV	battery electric vehicles
BG	Background Grade
BHEM	borehole electromagnetic
BIF	banded-iron formation
CAGR	compound annual growth rate
CapEx	capital expenditure
CPB	cemented paste backfill
CCA	capital cost allowances
CDA	Canadian Dam Association
CDE	Canadian development expense
CEE	Canadian exploration expense
CIM	Canadian Institute of Mining, Metallurgy, and Petroleum
Clean Air or the Company	Clean Air Metals Inc.
cm	centimetre
CMC	carboxymethyl cellulose
CNG	compressed natural gas
CPB	cemented paste backfill
CREAIT	Core Research Equipment and Instrument Training
CRF	cemented rock fill
CRM	certified reference material
DAF	drift and fill
DDH	diamond drilling
DETA	diethylenetriamine
DGPS	differential global positioning system
Dmt	dry metric tonnes
DWi	drop weight index
EA	environmental assessments
EBDZ	East Bay Deformation Zone
EDF	environmental design flood
EGL	effective grinding length
EIA	environmental impact assessment
ELOS	equivalent linear overbreak/slough
EM	electromagnetic
EMPA	electron microprobe analysis
EPCM	engineering, procurement, and construction management
FA	fire assay
FAR	fresh air raises
FMP	flow moisture point
FoS	factor of safety
FRI	forest resource inventory

Abbreviation	Unit or Term
ft	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)
g	gram
G&A	general and administrative
g/cm^3	grams per cubic centimetre
g/L	gram per litre
g/t	grams per tonne
Ga	giga-annum (1 billion years)
gal	gallon
GEMS	GEOVIA GEMS™
g-mol	gram-mole
GPS	global positioning system
ha	hectare (10,000 m^2)
HG	high grade
HGZ	high grade zone
HMC	heavy mineral concentrate
HPGR	high pressure grinding rolls
HW	hanging wall
ICP	inductively coupled plasma
ICP-AES	inductively coupled plasma atomic emission spectrometry
ID2	inverse-distance squared
ID3	inverse-distance cubed
IDF	inflow design flood
IDW	inverse-distance weighting to the first power
IEA	International Energy Agency
IP	induced polarization
IRR	internal rate of return
ISR	inductive source resistivity
ITH	in-the-hole
JORC	Joint Ore Reserves Committee
kg	kilogram
km	kilometre
km^2	square kilometre
kt	thousand tonnes
kV	kilovolt
KV	kriging variance
L	litre
lb	pound
LG	Low Grade

Abbreviation	Unit or Term
LHD	load-haul-dump
LHOS	long hole open stoping
LIDAR	light detection and ranging
LIMS	Laboratory Information Management System
LOM	life of mine
m	metre
M	million
Ma	mega annum (1 million years)
MC	master composite
MCR	Mid-continent rift
MECP	Ministry of Environment Conservation and Parks
MENDM	Ministry of Energy, Northern Development and Mines
Mg	magnesium
MG	Medium Grade
mg/L	milligrams/litre
MgO	magnesium oxide
mm	millimetre
mm^2	square millimetre
mm^3	cubic millimetre
MMR	magnetometric resistivity
MNDMNRF	Ministry of Northern Development, Mines, Natural Resources and Forestry
MOA	Memorandum of Agreement
MOE	Ministry of the Environment
Moz	million troy ounces
MSHA	Mine Safety and Health Administration
MSO	Mineable Shape Optimizer
MT	magnetotelluric
Mt	million tonnes
Mtpa	million tonnes per annum
MUN	Memorial University of Newfoundland
NAV	net asset value
NI 43-101	Canadian National Instrument 43-101
NN	nearest neighbour
NNW	north-northwest
NPAG	potentially non-acid generating
NPV	net present value
NSR	net smelter return
OK	ordinary kriging
OpEx	operating expenditures

Abbreviation	Unit or Term
oz	troy ounce
PAG	potentially acid generating
Panoramic	Panoramic PGMs (Canada) Limited
Pb	lead
PEA	Preliminary Economic Assessment
PFS	prefeasibility study
PGE	platinum group element
PGM	platinum group metal
PMF	probable maximum flood
ppb	parts per billion
ppm	parts per million
PSQG	Provincial Sediment Quality Guidelines
PST	product storage tank
PWQO	Provincial Water Quality Objectives
QA	quality assurance
QC	quality control
QP	Qualified Persons
RAR	return air raise
RC	refining charges
Rh	rhodium
ROM	run of mine
RQD	rock quality data
RTEC	Rio Tinto Exploration Canada
RWi	bond rod mill work index
S	sulphur
SABC	semi autogenous ball mill crusher
SAG	semi autogenous grinding
SAR	species at risk
SEA	South East Anomaly
SEC	Securities and Exchange Commission
SEM-MLA	scanning electron microscopy - mineral liberation analysis
SG	specific gravity
SI	International System of Units
SIPX	sodium isopropyl xanthate
SMC	SAG mill comminution
SRM	standard reference material
SSE	south-southeast
t	tonne (metric ton) (2,204.6 pounds)
t/d	tonnes per day
t/h	tonnes per hour

Abbreviation	Unit or Term
TC	treatment charges
TCLP	toxicity characteristic leaching procedure
TEM	transient electromagentic
TETA	triethylenetetramine
TH	top-hammer
the Project	Thunder Bay North Project
TKN	total kjeldahl nitrogen
TML	transportable moisture limit
TOC	total organic carbon
TP	total phosphorous
UG	underground
URF	unconsolidated rock fill
US	United States
UTM	Universal Transverse Mercator
VFD	variable frequency drive
VTEM	vertical time domain electromagnetic
WCP	water collection pond
WMP	water management pond
wmt	wet metric tonnes
WMT	water management and treatment
WSF	waste storage facility
XPS	Xstrata Process Support

Appendix A: QP Certificates of Authors

Knight Piésold
CONSULTING

CERTIFICATE OF QUALIFIED PERSON

I, Ben Peacock, P. Eng., of North Bay, Ontario do hereby certify:

1. I am a Senior Engineer with Knight Piésold Ltd. with a business address at 1650 Main Street West, North Bay, Ontario.
2. This certificate applies to the Technical Report titled "NI 43-101 Technical Report and Preliminary Economic Assessment for the Thunder Bay North Project, Thunder Bay, Ontario" with an Effective Date of December 1, 2021 (the "Technical Report").
3. I am a graduate of the University of Waterloo, 2008 with a Bachelor of Applied Science in Civil Engineering.
4. I am a member in good standing of the Professional Engineers of Ontario and registered as a Professional Engineer, license number 100141409.
5. My relevant experience includes 13 years of experience as a consulting engineer in the field of mining rock mechanics. I am a "Qualified Person" for the purposes of Canadian National Instrument 43-101 ("NI 43-101" or the "Instrument").
6. I visited the Thunder Bay North Project site, situated approximately 50 km northeast of the city of Thunder Bay, Ontario, Canada on October 20 and 21, 2020.
7. I am responsible for Sections 16.3.1 to 16.3.5 and the related portions of Sections 1, 25, and 26.
8. I am independent of Clean Air Metals Inc., as defined by Section 1.5 of the Instrument.
9. I have read the NI 43-101 reporting requirements and the portions of the Technical Report for which I am responsible have been prepared in accordance with the Instrument and Form 43-101F1.
10. As of the date of this certificate, to the best of my knowledge, information, and belief, the Sections of the Technical Report that I am responsible for contain all scientific and technical information relating to the Thunder Bay North Project that is required to be disclosed to make the Technical Report not misleading.
11. I have no prior involvement with the Thunder Bay North Project that is the subject of the Technical Report.

Signed and dated this 11th day of January 2022, at North Bay, Ontario.

LICENSED PROFESSIONAL ENGINEER
B. D. PEACOCK
100141409
2022-01-12
PROVINCE OF ONTARIO

Ben Peacock, P.Eng.
Senior Engineer
Knight Piésold Ltd.

Knight Piésold Ltd. | 1650 Main Street West | North Bay, Ontario | Canada, P1B 8G5
T +1 705 476 2165 | E northbay@knightpiesold.com | www.knightpiesold.com

Knight Piésold
CONSULTING

CERTIFICATE OF QUALIFIED PERSON

I, Wilson Muir, P. Eng., of North Bay, Ontario do hereby certify:

1. I am a Senior Engineer with Knight Piésold Ltd. with a business address at 1650 Main Street West, North Bay, Ontario.
2. This certificate applies to the Technical Report titled "NI 43-101 Technical Report and Preliminary Economic Assessment for the Thunder Bay North Project, Thunder Bay, Ontario". Effective Date of December 1, 2021 (the "Technical Report").
3. I am a graduate of the University of British Columbia, 1994 with a Bachelor of Applied Science in Geological Engineering.
4. I am a member in good standing of the Professional Engineers of Ontario and registered as a Professional Engineer, license number 100060272.
5. My relevant experience includes 29 years of experience as a consulting engineer in the field of geotechnical engineering. I am a "Qualified Person" for the purposes of Canadian National Instrument 43-101 ("NI 43-101" or the "Instrument").
6. I did not visit the Thunder Bay North Project site, located approximately 50 km northeast of the city of Thunder Bay, within the Thunder Bay Mining Division, Ontario, Canada.
7. I am responsible for Section 18.8 and the related portions of Sections 1, 21, 25, and 26.
8. I am independent of Clean Air Metals Inc., as defined by Section 1.5 of the Instrument.
9. I have read the NI 43-101 reporting requirements and the entirety of the Technical Report, for which I am responsible, has been prepared in accordance with the Instrument and Form 43-101F1.
10. As of the date of this certificate, to the best of my knowledge, information, and belief, the Sections of the Technical Report that I am responsible for contain all scientific and technical information relating to the Thunder Bay North Project that is required to be disclosed to make the Technical Report not misleading.
11. I have no prior involvement with the Thunder Bay North Project that is the subject of the Technical Report.

Signed and dated this 11th day of January 2022, at North Bay, Ontario.

LICENSED PROFESSIONAL ENGINEER
C.W. MUIR
2022-01-12
PROVINCE OF ONTARIO

Wilson Muir, P.Eng.
Senior Engineer
Knight Piésold Ltd.

Knight Piésold Ltd. | 1650 Main Street West | North Bay, Ontario | Canada, P1B 8G5
T +1 705 476 2165 | E northbay@knightpiesold.com | www.knightpiesold.com

CERTIFICATE OF QUALIFIED PERSON

I, Kurt Boyko, P. Eng., of Thunder Bay, Ontario do hereby certify:

1. I am the Consulting Specialist – Mechanical Systems with Nordmin Engineering Ltd. with a business address at 160 Logan Ave., Thunder Bay, Ontario.
2. This certificate applies to the Technical Report titled "NI 43-101 Technical Report and Preliminary Economic Assessment for the Thunder Bay North Project, Thunder Bay, Ontario" Effective Date of December 1, 2021 (the "Technical Report").
3. I am a graduate of Lakehead University, 1994, with a Bachelor of Engineering Degree, Mechanical.
4. I am a member in good standing of the Professional Engineers of Ontario and registered as a Professional Engineer, license number 90418484.
5. My relevant experience includes 29 years of experience of design and operation of industrial processing plants, including materials handling and pumping design, machine design, mine dewatering plans, and ventilation systems. I am a "Qualified Person" for the purposes of Canadian National Instrument 43-101 ("NI 43-101" or the "Instrument").
6. I have not inspected the site of the Thunder Bay North Project, located 50 km northeast of the city of Thunder Bay, within the Thunder Bay Mining Division, Ontario, Canada.
7. I am responsible for Section 17 and 19 and portions of Sections 1,18, 21,25 & 26 (the "Relevant Sections") summarized within the Technical Report.
8. I am independent of Clean Air Metals Inc., as defined by Section 1.5 of the Instrument.
9. I have read the NI 43-101 reporting requirements and the Relevant Sections of the Technical Report, for which I am responsible, have been prepared in compliance with the Instrument and Form 43-101F1.
10. As of the date of the Technical Report, to the best of my knowledge, information, and belief, the Relevant Sections of the Technical Report that I am responsible for, contain all scientific and technical information relating to the Project that is required to be disclosed to make the Technical Report not misleading.
11. I have no prior involvement with the Project that is the subject of the Technical Report.

Signed and dated this 11th day of January 2022, at Thunder Bay, Ontario.

____

Kurt Boyko, P.Eng.
Consulting Specialist – Mechanical Systems
Nordmin Engineering Ltd.

LICENSED PROFESSIONAL ENGINEER
K.A. BOYKO
90418484
11-Jan-22
PROVINCE OF ONTARIO

BWB Consulting Services Inc.
8 Telegram Mews, Suite 736
Toronto, Ontario

CERTIFICATE OF QUALIFIED PERSON

I, Brian William Buss, P.Eng., of Toronto, Ontario do hereby certify:

1. I am the President of BWB Consulting Services Inc. with business address at 8 Telegram Mews, Toronto, Ontario.
2. This certificate applies to the Technical Report titled "NI 43-101 Technical Report and Preliminary Economic Assessment for the Thunder Bay North Project, Thunder Bay, Ontario" with an effective date of December 1, 2021 (the "Technical Report").
3. I am a graduate of Queen's University at Kingston, Ontario.
4. I graduated in 1985 with a Bachelor of Applied Science in Mining Engineering.
5. I am a member in good standing of the Association of Professional Engineers Ontario (PEO) and I am a registered Professional Engineer, license reg. number 90303512.
6. I hold a Certificate of Authorization (COA) to practice through BWB Consulting Services Inc. under certificate number 100207862.
7. My relevant experience includes more 30 years of experience in mine operations, engineering, project management, and project evaluation. I am a "Qualified Person" for the purposes of Canadian National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101" or the "Instrument").
8. I have not visited the Thunder Bay North Project as my contribution to the report mentioned above is purely technical in relation to the development and operation of the taxation module used in the overall economic model developed for evaluation of the Project.
9. I am responsible for portions of the report specifically related to the development and operation of the taxation module mentioned above and discussed in section 1.13, 2.2, 2.6, 22.4 and 25.12
10. I am independent of Clean Air Metals, as defined by Section 1.5 of the Instrument.
11. I have read the NI 43-101 and those sections for which I am responsible, and I find that they have been prepared in compliance with the Instrument and Form 43-101F1.
12. As of the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Sections of the Technical Report that I am responsible for, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
13. I have no prior involvement with the Thunder Bay North Project.

Signed and dated this 9th day of January 2022, at Toronto, Ontario.

LICENSED PROFESSIONAL ENGINEER
B. W. BUSS
PROVINCE OF ONTARIO

Brian William Buss, P.Eng.
President, BWB Consulting Services Inc.

NORDMIN
RESOURCE & INDUSTRIAL
ENGINEERING

CERTIFICATE OF QUALIFIED PERSON

I, Harold Harkonen, P. Eng., of Thunder Bay, Ontario do hereby certify:

1. I am the Consulting Specialist – Power Systems with Nordmin Engineering Ltd. with a business address at 160 Logan Ave., Thunder Bay, Ontario.
2. This certificate applies to the Technical Report titled “NI 43-101 Technical Report and Preliminary Economic Assessment for the Thunder Bay North Project, Thunder Bay, Ontario” with an effective date of December 1, 2021 (the “Technical Report”).
3. I am a graduate of Lakehead University, 1989 with a Bachelor of Engineering.
4. I am a member in good standing of the Professional Engineers Ontario and registered as a Professional Engineer, license number 90299520.
5. My relevant experience includes 30 years of experience in design and engineering of mining and industrial infrastructure.
6. I am a “Qualified Person” for the purposes of Canadian National Instrument 43-101 – Standards of Disclosure for Mineral Projects (“NI 43-101” or the “Instrument”).
7. I have not visited the Thunder Bay North Project situated approximately 45 kilometers northeast of Thunder Bay, Ontario, Canada.
8. I am responsible for Section 18.6 and its related portion of Sections 1, 2, 25 and 26.
9. I am independent of Clean Air Metals Inc., as defined by Section 1.5 of the Instrument.
10. I have read the NI 43-101 and the Sections of the Technical Report, for which I am responsible, have been prepared in compliance with the Instrument and Form 43-101F1.
11. As of the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Sections of the Technical Report that I am responsible for, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
12. I have no prior involvement with the Thunder Bay North Project.

Signed and dated this 11th day of January 2022, at Thunder Bay, Ontario.

____

Harold Harkonen, P. Eng.
Consulting Specialist – Power Systems
Nordmin Engineering Ltd.

LICENSED PROFESSIONAL ENGINEER
H. E. HARKONEN
11-Jan-2022
PROVINCE OF ONTARIO

BLUE COAST
METALLURGY & RESEARCH

BLUE COAST RESEARCH LTD.
WWW.BLUECOASTRESEARCH.CA
2-1020 Herring Gull Way, Parksville
British Columbia, Canada, V9P 1R2
TEL: +1 250.586.0600
FAX: +1 250.586.0445

CERTIFICATE OF QUALIFIED PERSON

I, Lyn Jones, P. Eng., of Peterborough, Ontario do hereby certify:

1. I am the Manager, Process Engineering with Blue Coast Research with a business address at 2-1020 Herring Gull Way, Parksville, British Columbia.
1. This certificate applies to the Technical Report titled "NI 43-101 Technical Report and Preliminary Economic Assessment for the Thunder Bay North Project, Thunder Bay, Ontario" Effective Date of December 1, 2021 (the "Technical Report").
2. I graduated from the University of British Columbia with a Bachelor's of Applied Science in 1996, and a Master's of Applied Science in 1998.
3. I am registered as a Professional Engineer in the province of Ontario (PEO licence #100067095).
4. I have practiced my profession continuously for 23 years. I have been directly involved with base and precious metals projects in the mining sector with experience including metallurgical testwork, flowsheet development, process engineering, and plant commissioning. I am a "Qualified Person" for the purposes of Canadian National Instrument 43-101 ("NI 43-101" or the "Instrument").
5. I have not visited the Thunder Bay North Project, located 50 km northeast of the city of Thunder Bay, within the Thunder Bay Mining Division, Ontario, Canada.
6. I am responsible for Section 13 of this Technical Report, and its related portion of Sections 1, 25 and 26.
7. I am independent of Clean Air Metals Inc., as defined by Section 1.5 of the Instrument.
8. I have read NI 43–101 and the sections of the technical report for which I am responsible have been prepared in compliance with that Instrument.
9. As of the date of this certificate, to the best of my knowledge, information, and belief, Section 13 of the Technical Report that I am responsible for, contains all scientific and technical information relating to the Thunder Bay North Project that is required to be disclosed to make the Technical Report not misleading.
10. I have prior involvement with the Thunder Bay North Project as a Qualified Person for the January 20, 2021 Ni43-101 Technical Report and Mineral Resource Estimate for the Thunder Bay North Project, Thunder Bay, Ontario.

Signed and dated this 11th day of January 2022, at Peterborough, Ontario.

Lyn Jones, P. Eng.
Manager, Process Engineering
Blue Coast Research

LICENSED PROFESSIONAL ENGINEER
11/01/22
L. JONES
100067095
PROVINCE OF ONTARIO

NORDMIN
RESOURCE & INDUSTRIAL
ENGINEERING

CERTIFICATE OF QUALIFIED PERSON

I, Glen Kuntz, P. Geo., of Thunder Bay, Ontario do hereby certify:

1. I am the Consulting Specialist – Geology/Mining with Nordmin Engineering Ltd. with a business address at 160 Logan Ave., Thunder Bay, Ontario.
2. This certificate applies to the Technical Report titled "NI 43-101 Technical Report and Preliminary Economic Assessment for the Thunder Bay North Project, Thunder Bay, Ontario" Effective Date of December 1, 2021 (the "Technical Report").
3. I am a graduate of the University of Manitoba, 1991 with a Bachelor of Science in Geology.
4. I am a member in good standing of the Association of Professional Geoscientist of Ontario and registered as a Professional Geoscientist, license number 0475.
5. My relevant experience includes 30 years of experience in exploration, operations and resource estimations. I am a "Qualified Person" for the purposes of Canadian National Instrument 43-101 ("NI 43-101" or the "Instrument").
6. My most recent personal inspection of the Thunder Bay North Project, located 50 km northeast of the city of Thunder Bay, within the Thunder Bay Mining Division, Ontario, Canada was October 20 to October 21, 2020 inclusive.
7. I am responsible for sections 2 through 12, Section 14, 20 23, 24, 27 and 28 and its related portion of Sections 1, 25 and 26.
8. I am independent of Clean Air Metals Inc., as defined by Section 1.5 of the Instrument.
9. I have read the NI 43-101 reporting requirements and the entirety of the Technical Report, for which I am responsible, has been prepared in accordance with the Instrument and Form 43-101F1.
10. As of the date of this certificate, to the best of my knowledge, information, and belief, the Sections of the Technical Report that I am responsible for, contain all scientific and technical information relating to the Thunder Bay North Project that is required to be disclosed to make the Technical Report not misleading.
11. I have prior involvement with the Thunder Bay North Project as a Qualified Person for the January 20, 2021 Ni43-101 Technical Report and Mineral Resource Estimate for the Thunder Bay North Project, Thunder Bay, Ontario.

Signed and dated this 11th day of January 2022, at Thunder Bay, Ontario.

Glen Kuntz

PROFESSIONAL GEOSCIENTISTS ONTARIO
GLEN N. KUNTZ
PRACTISING MEMBER
0475

Glen Kuntz, P.Geo.
Consulting Specialist – Geology/Mining
Nordmin Engineering Ltd.

NORDMIN
RESOURCE & INDUSTRIAL
ENGINEERING

CERTIFICATE OF QUALIFIED PERSON

I, Brian Wissent, P. Eng., of Kitchener, Ontario do hereby certify:

1. I am the Senior Engineer with Nordmin Engineering Ltd. with a business address at 160 Logan Ave., Thunder Bay, Ontario.
2. This certificate applies to the Technical Report titled "NI 43-101 Technical Report and Preliminary Economic Assessment for the Thunder Bay North Project, Thunder Bay, Ontario" Effective Date of December 1, 2021 (the "Technical Report").
3. I am a graduate of Dalhousie University, 2007 with a Bachelor of Mineral Resource Engineering.
4. I am a member in good standing of the Association of Professional Engineers of Ontario and registered as a Professional Engineer, license number 100193972.
5. My relevant experience includes 15 years of experience as a mining engineer in mining companies (Barrick, Goldcorp) and in consulting firms (Nordmin, Global Mine Design), with specific expertise in underground planning, geotechnical and designs. I am a "Qualified Person" for the purposes of Canadian National Instrument 43-101 ("NI 43-101" or the "Instrument").
6. I have not visited the Thunder Bay Project situated approximately 50 km northeast of the city of Thunder Bay, Ontario within the Thunder Bay Mining Division, Canada.
7. I am responsible for Sections 16.1, 16.2, 16.3.6, 16.4, 16.5 and their related portion of Sections 1, 25, 26.
8. I am independent of Clean Air Metals Inc., as defined by Section 1.5 of the Instrument.
9. I have read the NI 43-101 reporting requirements and the entirety of the Technical Report, for which I am responsible, has been prepared in accordance with the Instrument and Form 43-101F1.
10. As of the date of this certificate, to the best of my knowledge, information, and belief, the Sections of the Technical Report that I am responsible for, contain all scientific and technical information relating to the Thunder Bay North Project that is required to be disclosed to make the Technical Report not misleading.
11. I have no prior involvement with the Thunder Bay North Project.

Signed and dated this 11th day of January 2022, at Thunder Bay, Ontario.

LICENSED PROFESSIONAL ENGINEER
B. J. WISSENT
100193972
11/01/22
PROVINCE OF ONTARIO

Brian Wissent, P.Eng.
Senior Engineer
Nordmin Engineering Ltd.

Appendix B: Claims List

Claim Number	Claim Type	Status	Anniversary	Holder	Property
101134	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
101250	Boundary Cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
101432	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
101637	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
101666	Boundary Cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
101693	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
102927	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
102928	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
116182	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
116183	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
116301	Single Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
116302	Single Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
116407	Boundary Cell	Active	2/22/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
116425	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
116691	Boundary Cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
116901	Single Cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
117612	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
117647	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
117705	Single Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
117728	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
117800	Boundary Cell	Active	7/30/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
118027	Single Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
118029	Single Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
121035	Boundary Cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
121768	Single Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
121769	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
122345	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
123091	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
123102	Boundary Cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
123782	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
123805	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
124455	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
125096	Boundary Cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
125800	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
129668	Single Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
151708	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
151710	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
152257	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
152337	Boundary Cell	Active	7/30/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
152410	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
159541	Boundary Cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
160892	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
160893	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
160960	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
161530	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property

Claim Number	Claim Type	Status	Anniversary	Holder	Property
161570	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
165526	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
165634	Boundary Cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
166320	Boundary Cell	Active	12/14/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
166844	Single Cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
166891	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
167524	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
167572	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
168268	Boundary Cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
168298	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
168344	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
178396	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
178969	Boundary Cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
178970	Boundary Cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
181023	Boundary Cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
181050	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
181051	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
181070	Boundary Cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
181116	Single Cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
181131	Single Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
182507	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
183039	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
188462	Boundary Cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
189173	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
194216	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
194293	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
194299	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
195625	Boundary Cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
195640	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
196201	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
196219	Boundary Cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
196931	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
197514	Single Cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
198238	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
198239	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
204958	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
205601	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
205643	Boundary Cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
205646	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
205648	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
205671	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
205703	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
206250	Single Cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
206376	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
214782	Single Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property

Claim Number	Claim Type	Status	Anniversary	Holder	Property
214856	Boundary Cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
215006	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
215778	Single Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
216406	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
216430	Boundary Cell	Active	2/22/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
217117	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
224868	Single Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
225627	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
225654	Boundary Cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
227054	Boundary Cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
231661	Single Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
232906	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
232907	Single Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
232909	Boundary Cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
233597	Single Cell	Active	11/13/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
233669	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
234935	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
234975	Boundary Cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
235021	Single Cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
235028	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
235037	Single Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
235042	Single Cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
235578	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
235602	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
235617	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
235620	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
235673	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
262217	Boundary Cell	Active	7/30/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
262831	Boundary Cell	Active	12/14/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
262834	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
263636	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
264164	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
264169	Boundary Cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
264218	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
264280	Boundary Cell	Active	12/14/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
264289	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
264846	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
264865	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
264867	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
264936	Boundary Cell	Active	7/30/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
265645	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
265646	Boundary Cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
266305	Boundary Cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
268916	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
269002	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property

Claim Number	Claim Type	Status	Anniversary	Holder	Property
269003	Boundary Cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
269557	Boundary Cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
269667	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
270278	Boundary Cell	Active	12/14/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
270280	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
271564	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
271565	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
271614	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
271635	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
271682	Single Cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
272239	Single Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
272279	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
280368	Single Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
280973	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
280974	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
283738	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
284283	Boundary Cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
284317	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
284318	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
284351	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
284355	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
284372	Boundary Cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
286362	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
289670	Single Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
289672	Single Cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
290396	Single Cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
291094	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
291102	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
291104	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
291661	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
291663	Boundary Cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
291686	Boundary Cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
292364	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
293680	Boundary Cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
298270	Boundary Cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
298876	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
298877	Boundary Cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
320950	Boundary Cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
327471	Boundary Cell	Active	7/30/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
328881	Single Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
328882	Single Cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
329443	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
329476	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
330252	Boundary Cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
330825	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property

Claim Number	Claim Type	Status	Anniversary	Holder	Property
330854	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
330870	Boundary Cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
330893	Boundary Cell	Active	7/30/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
341269	Single Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
343249	Boundary Cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
343299	Boundary Cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
343300	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
344610	Boundary Cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
345300	Boundary Cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538167	Multi-cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538168	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538169	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538170	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538171	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538172	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538173	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538174	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538175	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538176	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538177	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538178	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538179	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538180	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538181	Multi-cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538182	Multi-cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538183	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538184	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538185	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538192	Multi-cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538193	Multi-cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538194	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538195	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538196	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538197	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538198	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538199	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538200	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538201	Multi-cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538202	Multi-cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538234	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538235	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538236	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538237	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538238	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538239	Multi-cell	Active	10/7/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property

Claim Number	Claim Type	Status	Anniversary	Holder	Property
538240	Multi-cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538241	Multi-cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538243	Multi-cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538244	Multi-cell	Active	10/27/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538245	Multi-cell	Active	12/14/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538246	Multi-cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538247	Multi-cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538248	Multi-cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538249	Multi-cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538250	Multi-cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538251	Multi-cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538252	Multi-cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538253	Multi-cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538254	Multi-cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538255	Multi-cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538256	Multi-cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538258	Multi-cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538259	Multi-cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538260	Multi-cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538261	Multi-cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538262	Multi-cell	Active	12/14/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538263	Multi-cell	Active	7/30/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538264	Multi-cell	Active	12/14/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538265	Multi-cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538266	Multi-cell	Active	10/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538267	Multi-cell	Active	4/3/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538268	Multi-cell	Active	7/30/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538269	Multi-cell	Active	11/13/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538270	Multi-cell	Active	11/13/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538271	Multi-cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538272	Multi-cell	Active	5/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538273	Multi-cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538274	Multi-cell	Active	3/12/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538275	Multi-cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538276	Multi-cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538277	Multi-cell	Active	5/10/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538278	Multi-cell	Active	10/19/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538279	Multi-cell	Active	5/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538280	Multi-cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538281	Multi-cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538282	Multi-cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538283	Multi-cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538284	Multi-cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538285	Multi-cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538286	Multi-cell	Active	10/23/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property

Claim Number	Claim Type	Status	Anniversary	Holder	Property
538287	Multi-cell	Active	11/13/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538288	Multi-cell	Active	11/13/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538289	Multi-cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538290	Multi-cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538309	Multi-cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538310	Multi-cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538321	Multi-cell	Active	5/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538324	Multi-cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538338	Multi-cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538339	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538346	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538356	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538357	Multi-cell	Active	7/5/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538358	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538359	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538360	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538361	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538362	Multi-cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538363	Multi-cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538364	Multi-cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538365	Multi-cell	Active	5/22/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538366	Multi-cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538392	Multi-cell	Active	1/31/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538393	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538394	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538395	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538396	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538397	Multi-cell	Active	5/28/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538398	Multi-cell	Active	11/26/2023	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
538399	Multi-cell	Active	2/7/2024	(100) PANORAMIC PGMS (CANADA) LIMITED	Current Property
101168	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
117636	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
117637	Single Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
123686	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
151693	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
151694	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
151695	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
181106	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
198196	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
205637	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
216993	Single Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
235011	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
264188	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
264189	Single Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
271671	Single Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property

Claim Number	Claim Type	Status	Anniversary	Holder	Property
271672	Single Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
284276	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
284277	Single Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
291084	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
342702	Boundary Cell	Active	8/18/2023	(100) BENTON RESOURCES INC.	Escape Property
117648	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
117726	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
118051	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
121742	Single Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
121743	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
123785	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
160876	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
166873	Single Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
168872	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
168898	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
181115	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
198206	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
207686	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
215058	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
217068	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
270235	Single Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
272284	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
291098	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
320906	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
330939	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
341268	Boundary Cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
538449	Multi-cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
538450	Multi-cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property
538451	Multi-cell	Active	2/20/2023	(100) BENTON RESOURCES INC.	Escape Property

Appendix C: QA/QC Charts for the Standards and Blanks

List of Figures

CURRENT DEPOSIT 5

Standards 5

Figure 1: Current Deposit standard AMIS056 Pt (g/t) 5

Figure 2: Current Deposit standard AMIS056 Pd (g/t) 5

Figure 3: Current Deposit standard AMIS056 Cu (g/t) 6

Figure 4: Current Deposit standard AMIS056 Ni (g/t) 6

Figure 5: Current Deposit standard AMIS064 Pt (g/t) 7

Figure 6: Current Deposit standard AMIS064 Pd (g/t) 7

Figure 7: Current Deposit standard AMIS073 Pt (g/t) 8

Figure 8: Current Deposit standard AMIS073 Pd (g/t) 8

Figure 9: Current Deposit standard AMIS073 Co (g/t) 9

Figure 10: Current Deposit standard AMIS093 Pt (g/t) 9

Figure 11: Current Deposit standard AMIS093 Pd (g/t) 10

Figure 12: Current Deposit standard AMIS093 Cu (g/t) 11

Figure 13: Current Deposit standard AMIS093 Ni (g/t) 12

Figure 14: Current Deposit standard AMIS093 Co (g/t) 13

Figure 15: Current Deposit standard AMIS0099 Rh (g/t) 13

Figure 16: Current Deposit standard AMIS0124 Pt (g/t) 14

Figure 17: Current Deposit standard AMIS0124 Pd (g/t) 14

Figure 18: Current Deposit standard AMIS0124 Cu (g/t) 15

Figure 19: Current Deposit standard AMIS0124 Ni (g/t) 15

Figure 20 Current Deposit Standard AMIS0499 Pt (g/t) 16

Figure 21 Current Deposit Standard AMIS0499 Pd (g/t) 17

Figure 22: Current Deposit standard GBM306-12 Pt (g/t) 17

Figure 23: Current Deposit standard GBM306-12 Ni (g/t) 18

Figure 24: Current Deposit standard GBM398-4 Cu (g/t) 18

Figure 25: Current Deposit standard GBM398-4 Ni (g/t) 19

Figure 26: Current Deposit standard GBM908-10 Cu (g/t) 19

Figure 27: Current Deposit standard GBM908-10 Ni (g/t) 20

Figure 28: Current Deposit standard GBM908-10 Co (g/t) 20

Figure 29: Current Deposit standard GBM908-10 Ag (g/t) 21

Figure 30: Current Deposit standard Oreas 24P Cu (g/t) 21
Figure 31: Current Deposit standard Oreas 24P Ni (g/t) 22
Figure 32: Current Deposit standard Oreas 45c Pt (g/t) 22
Figure 33: Current Deposit standard Oreas 45c Pd (g/t) 23
Figure 34: Current Deposit standard Oreas 45P Pt (g/t) 23
Figure 35: Current Deposit standard Oreas 45P Pd (g/t) 24
Figure 36: Current Deposit standard Oreas 45P Cu (g/t) 24
Figure 37: Current Deposit standard Oreas 45P Ni (g/t) 25
Figure 38 Current Deposit OREAS 681 Pt (g/t) 25
Figure 39 Current Deposit OREAS 681 Pd (g/t) 26
Figure 40 Currrent Deposit OREAS 681 Cu (g/t) 26
Figure 41 Current Deposit OREAS 681 Ni (g/t) 27
Figure 42 Current Deposit OREAS 681 Au (g/t) 27
Figure 43: Current Deposit standard Oreas 683 Rh (g/t) 28
Figure 44: Current Deposit standard Oreas 684 Rh (g/t) 28
Figure 45: Current Deposit standard Oreas 904 Au (g/t) 29
Figure 46: Current Deposit standard PGMS-9 Pt (g/t) 29
Figure 47: Current Deposit standard PGMS-9 Pd (g/t) 30
Figure 48: Current Deposit standard PGMS-9 Au (g/t) 30
Figure 49: Current Deposit standard PGMS-13 Pt (g/t) 31
Figure 50: Current Deposit standard PGMS-13 Pd (g/t) 31
Figure 51: Current Deposit standard PGMS-13 Au (g/t) 32
Figure 52: Current Deposit standard PGMS-14 Pt (g/t) 32
Figure 53: Current Deposit standard PGMS-14 Pd (g/t) 33
Figure 54: Current Deposit standard PGMS-14 Au (g/t) 33
Figure 55: Current Deposit standard PGMS-15 Pt (g/t) 34
Figure 56: Current Deposit standard PGMS-15 Pd (g/t) 34
Figure 57: Current Deposit standard PGMS-15 Au (g/t) 35
Figure 58: Current Deposit standard PGMS-16 Pt (g/t) 35
Figure 59: Current Deposit standard PGMS-16 Pd (g/t) 36
Figure 60: Current Deposit standard PGMS-16 Au (g/t) 36
Figure 61: Current Deposit standard PGMS-17 Pt (g/t) 37
Figure 62: Current Deposit standard PGMS-17 Pd (g/t) 37

Figure 63: Current Deposit standard PGMS-17 Au (g/t) ... 38
Figure 64: Current Deposit standard PGMS-19 Pt (g/t) ... 38
Figure 65: Current Deposit standard PGMS-19 Pd (g/t) ... 39
Figure 66: Current Deposit standard PGMS-19 Au (g/t) ... 39
Blanks ... 40
Figure 67: Current Deposit BL08 coarse blanks for Cu (g/t) ... 40
Figure 68: Current Deposit BL08 coarse blanks for Ni (g/t) ... 40
Figure 69: Current Deposit BL08 coarse blanks for Ag (g/t) ... 41
Figure 70: Current Deposit BL08 coarse blanks for Au (g/t) ... 41
Figure 71: Current Deposit BL09 coarse blanks for Cu (g/t) ... 42
Figure 72: Current Deposit BL09 coarse blanks for Ni (g/t) ... 42
Figure 73: Current Deposit BL09 coarse blanks for Ag (g/t) ... 43
Figure 74: Current Deposit BL09 coarse blanks for Au (g/t) ... 43
Figure 75: Current Deposit BL12 coarse blanks for Pt (g/t) ... 44
Figure 76: Current Deposit BL12 coarse blanks for Pd (g/t) ... 45
Figure 77: Current Deposit BL12 coarse blanks for Cu (g/t) ... 46
Figure 78: Current Deposit BL12 coarse blanks for Ni (g/t) ... 47
Figure 79: Current Deposit BL12 coarse blanks for Ag (g/t) ... 48
Figure 80: Current Deposit BL12 coarse blanks for Au (g/t) ... 49
Figure 81: Current Deposit Blank coarse blanks for Pt (g/t) ... 50
Figure 82: Current Deposit Blank coarse blanks for Pd (g/t) ... 50
Figure 83: Current Deposit Blank coarse blanks for Rh (g/t) ... 51
ESCAPE DEPOSIT ... 52
Standards ... 52
Figure 84: Escape Deposit standard AMIS0060 Cu (g/t) ... 52
Figure 85: Escape Deposit standard AMIS0060 Ni (g/t) ... 52
Figure 86: Escape Deposit standard AMIS0064 Pt (g/t) ... 53
Figure 87: Escape Deposit standard AMIS0064 Pd (g/t) ... 53
Figure 88: Escape Deposit standard AMIS0073 Pt (g/t) ... 54
Figure 89: Escape Deposit standard AMIS0073 Pd (g/t) ... 54
Figure 90: Escape Deposit standard AMIS0073 Co (g/t) ... 55
Figure 91: Escape Deposit standard AMIS0093 Pt (g/t) ... 55
Figure 92: Escape Deposit standard AMIS0093 Pd (g/t) ... 56

Figure 93: Escape Deposit standard AMIS0093 Cu (g/t) 56
Figure 94: Escape Deposit standard AMIS0093 Ni (g/t) 57
Figure 95: Escape Deposit standard AMIS0093 Co (g/t) 57
Figure 96: Escape Deposit standard AMIS0099 Rh (g/t) 58
Figure 97: Escape Deposit standard AMIS0499 Rh (g/t) 58
Figure 98: Escape Deposit standard Oreas 602 Cu (g/t) 59
Figure 99: Escape Deposit standard Oreas 602 Ni (g/t) 59
Figure 100: Escape Deposit standard Oreas 602 Ni (g/t) 60
Figure 101: Escape Deposit standard Oreas 681 Rh (g/t) 60
Figure 102: Escape Deposit standard Oreas 682 Rh (g/t) 61
Blanks 62
Figure 103: Escape Deposit BL114 coarse blanks Cu (g/t) 62
Figure 104: Escape Deposit BL114 coarse blanks Ni (g/t) 62
Figure 105: Escape Deposit BL114 coarse blanks Ag (g/t) 63
Figure 106: Escape Deposit BL114 coarse blanks Au (g/t) 63
Figure 107: Escape Deposit BL114 coarse blanks Pd (g/t) 64
Figure 108: Escape Deposit BL114 coarse blanks Pt (g/t) 64
Figure 109: Escape Deposit Blank coarse blanks Pt (g/t) 65
Figure 110: Escape Deposit Blank coarse blanks Pd (g/t) 65
Figure 111: Escape Deposit Blank coarse blanks Cu (g/t) 66
Figure 112: Escape Deposit Blank coarse blanks Ni (g/t) 66
Figure 113: Escape Deposit Blank coarse blanks Ag (g/t) 67
Figure 114: Escape Deposit Blank coarse blanks Au (g/t) 67
Figure 115: Escape Deposit Blank coarse blanks Rh (g/t) 68
Figure 116: Escape Deposit Marble coarse blanks Au (g/t) 68
Figure 117: Escape Deposit Marble coarse blanks Ag (g/t) 69
Figure 111: Escape Deposit Marble coarse blanks Ni (g/t) 69
Figure 112: Escape Deposit Marble coarse blanks Pd (g/t) 70
Figure 113: Escape Deposit Marble coarse blanks Pt (g/t) 70

CURRENT DEPOSIT

Standards

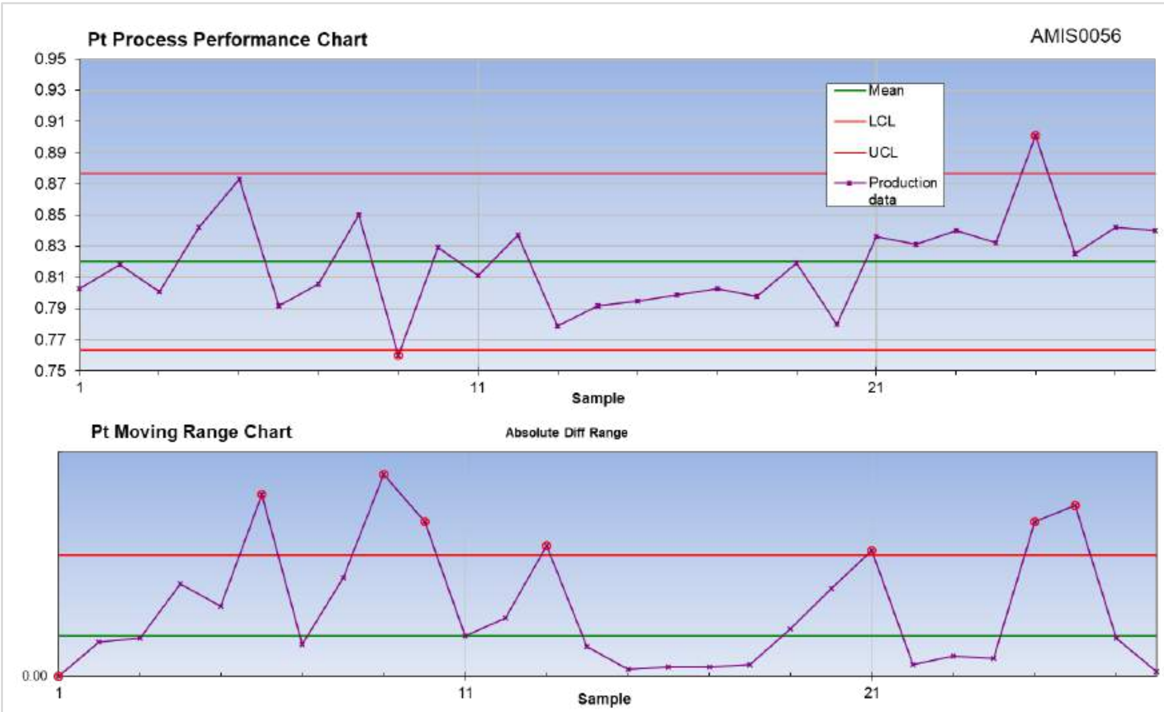


Figure 1: Current Deposit standard AMIS056 Pt (g/t)

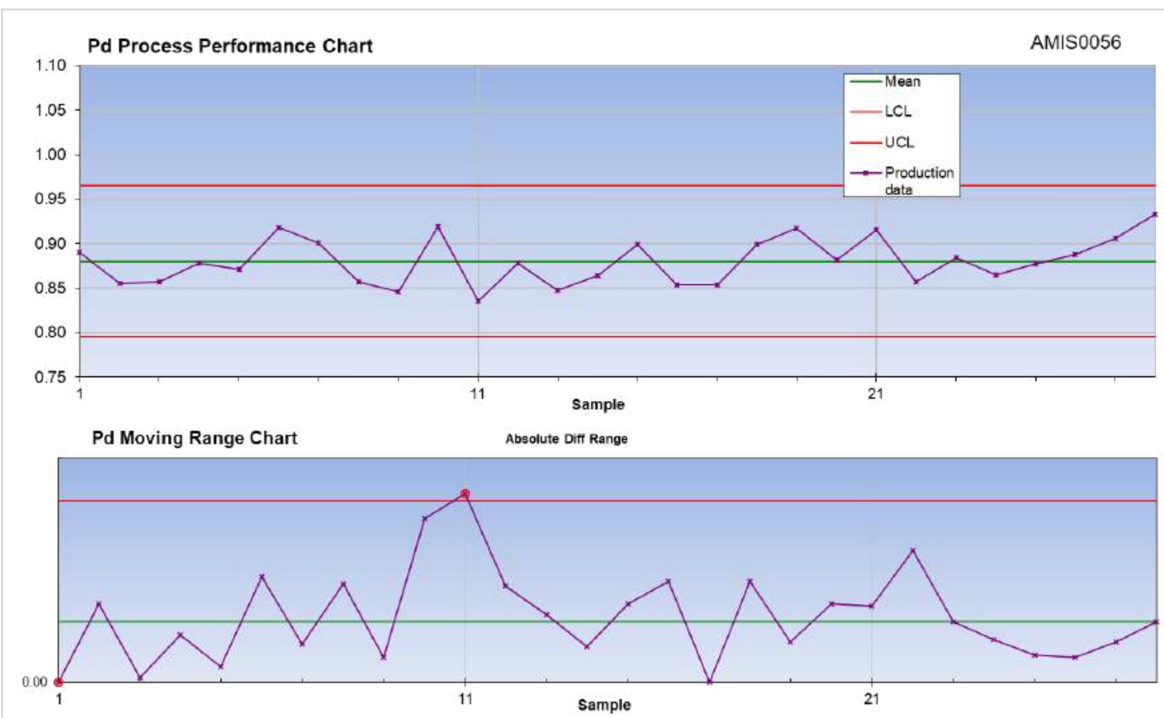


Figure 2: Current Deposit standard AMIS056 Pd (g/t)

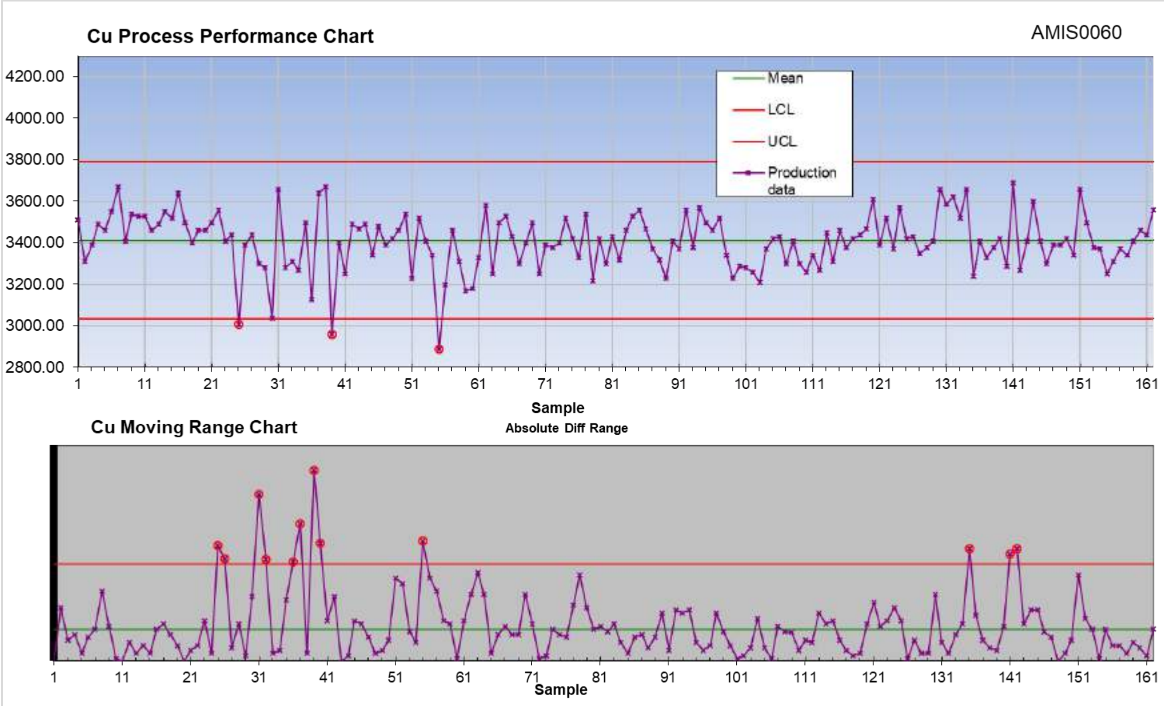


Figure 3: Current Deposit standard AMIS056 Cu (g/t)

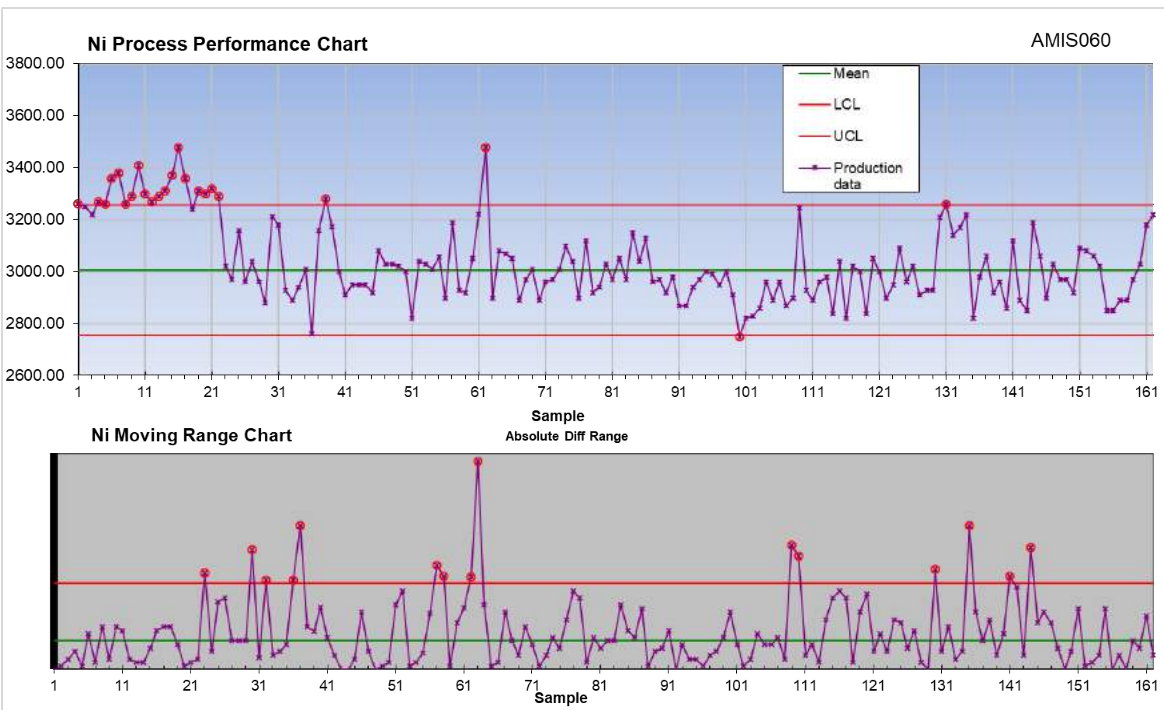


Figure 4: Current Deposit standard AMIS056 Ni (g/t)

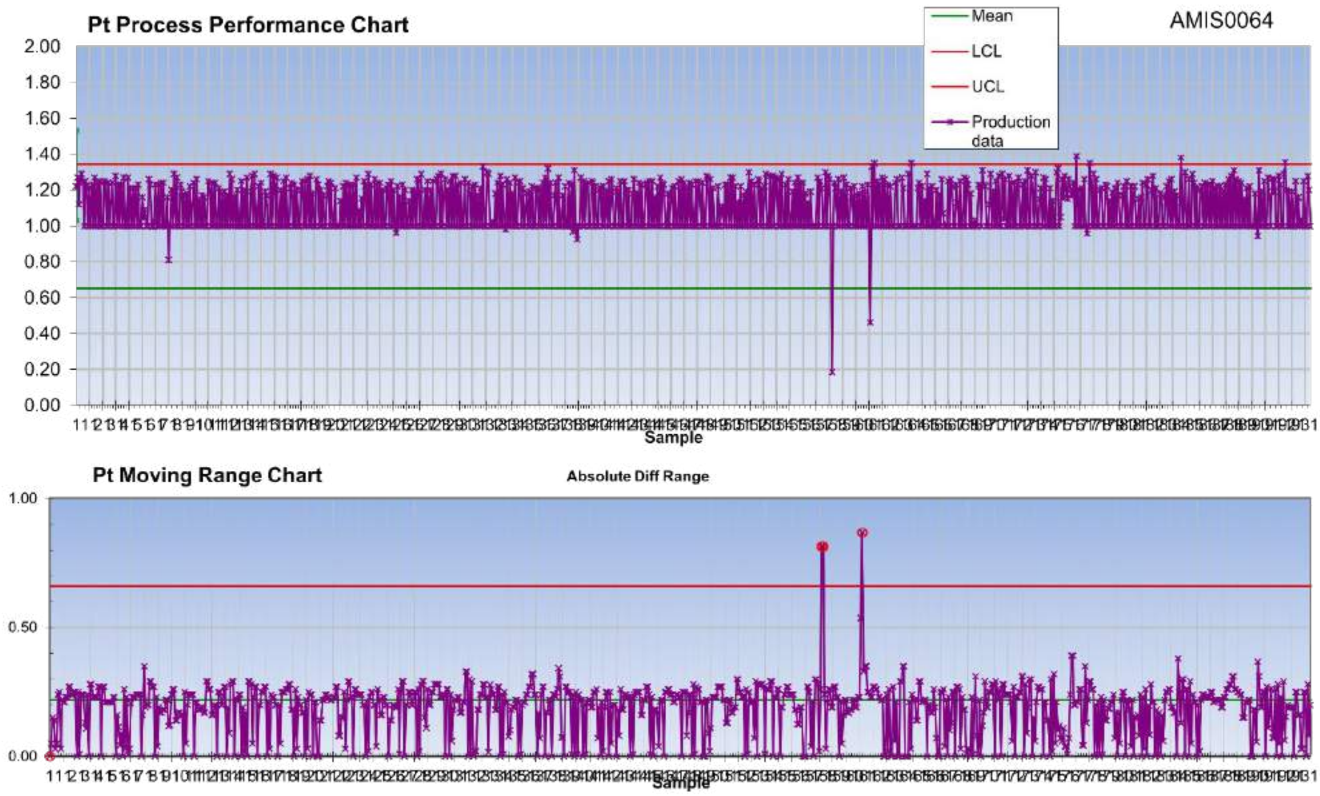


Figure 5: Current Deposit standard AMIS064 Pt (g/t)

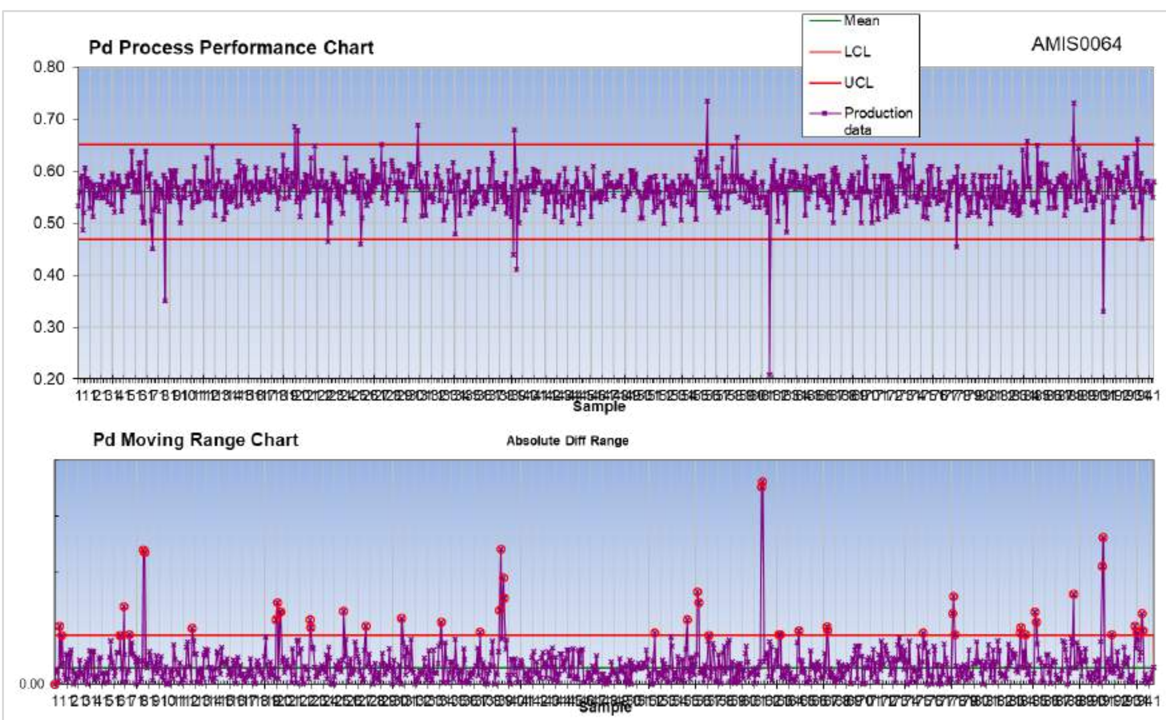


Figure 6: Current Deposit standard AMIS064 Pd (g/t)

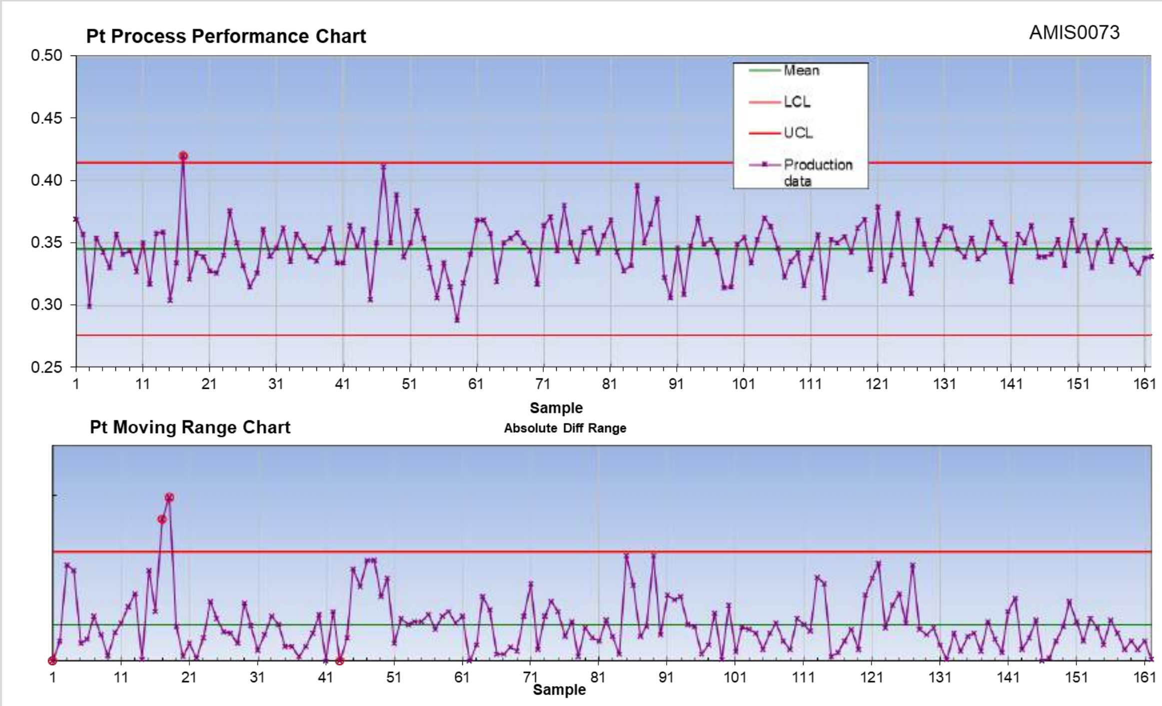


Figure 7: Current Deposit standard AMIS073 Pt (g/t)

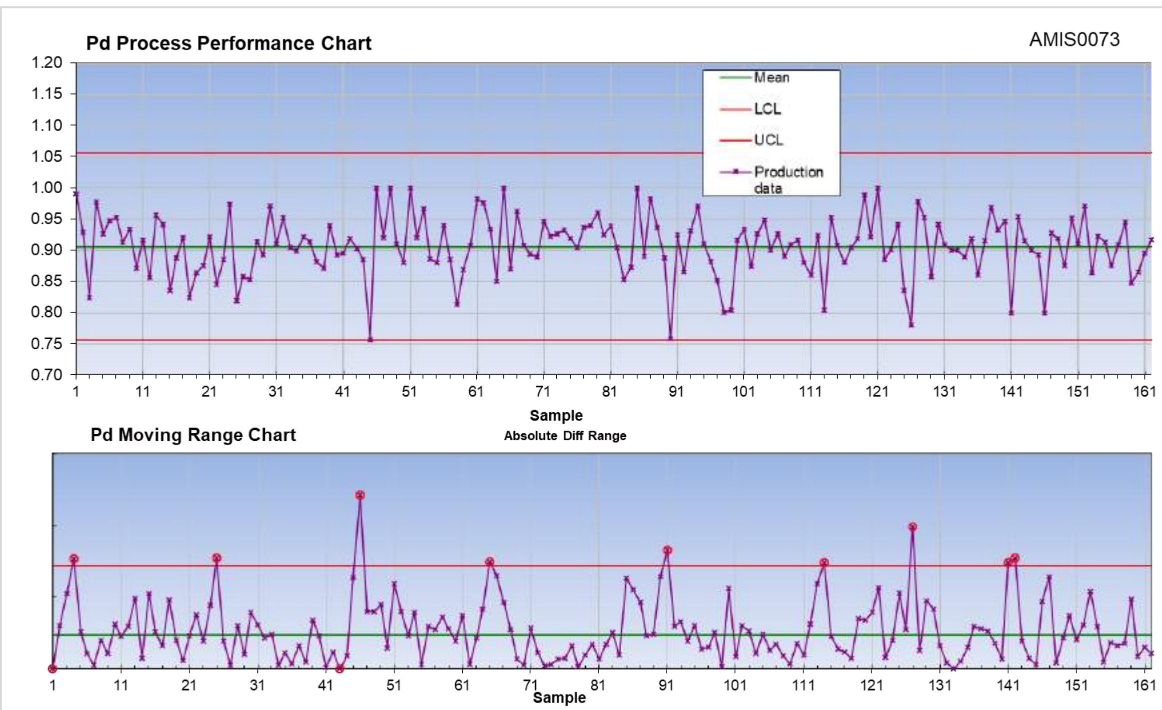


Figure 8: Current Deposit standard AMIS073 Pd (g/t)

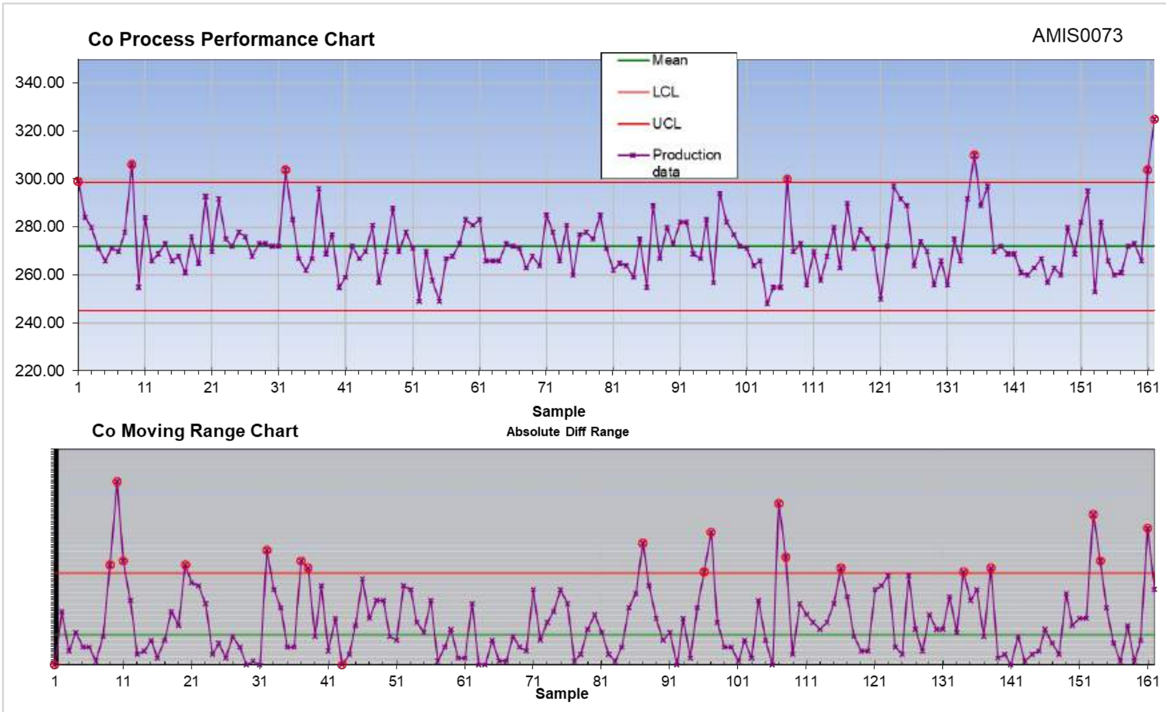


Figure 9: Current Deposit standard AMIS073 Co (g/t)

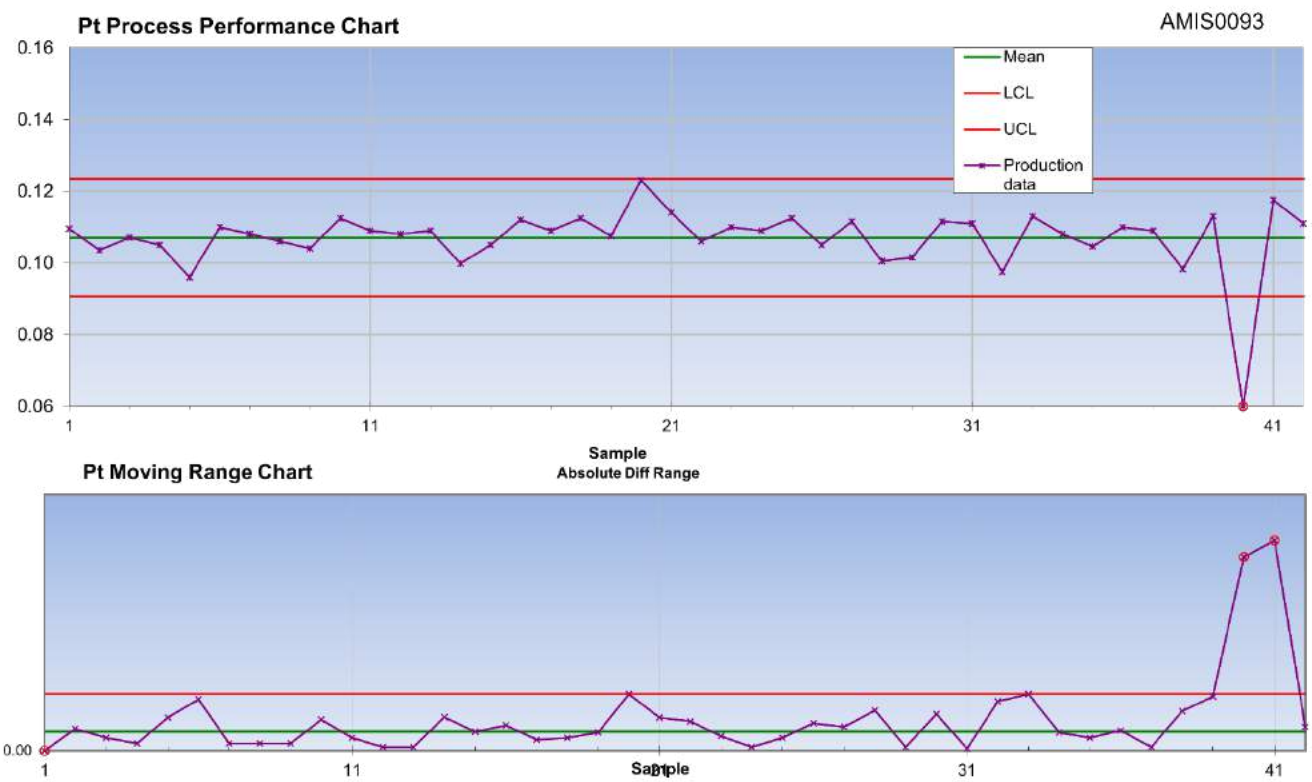
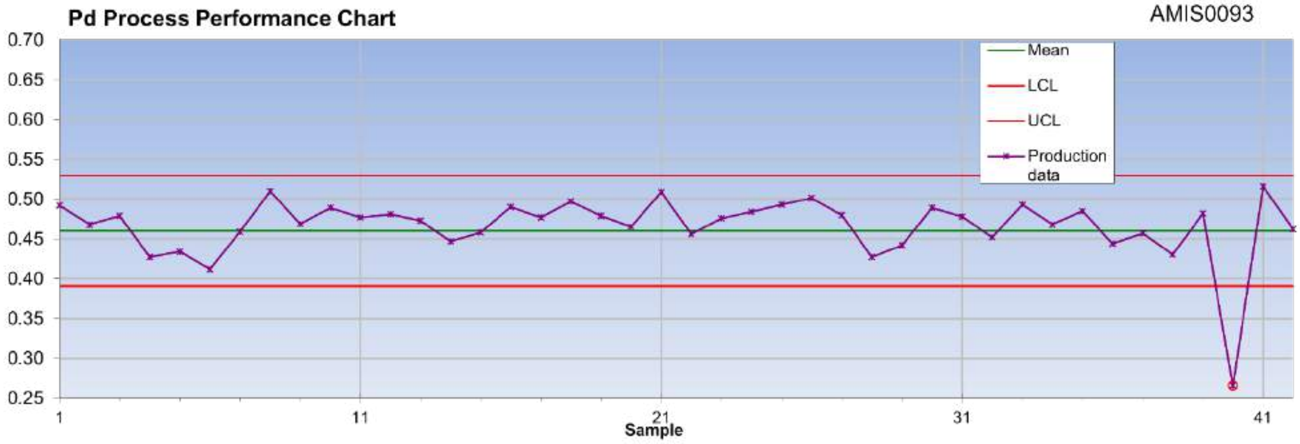


Figure 10: Current Deposit standard AMIS093 Pt (g/t)



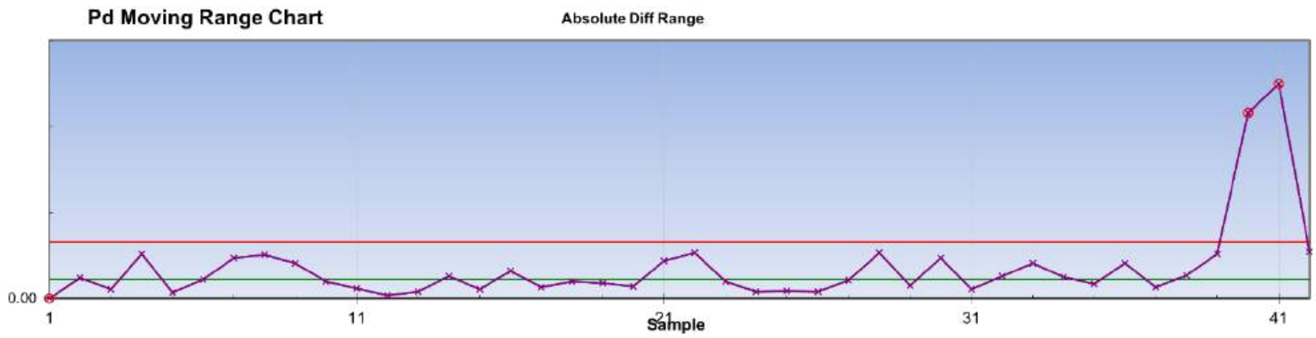


Figure 11: Current Deposit standard AMIS093 Pd (g/t)

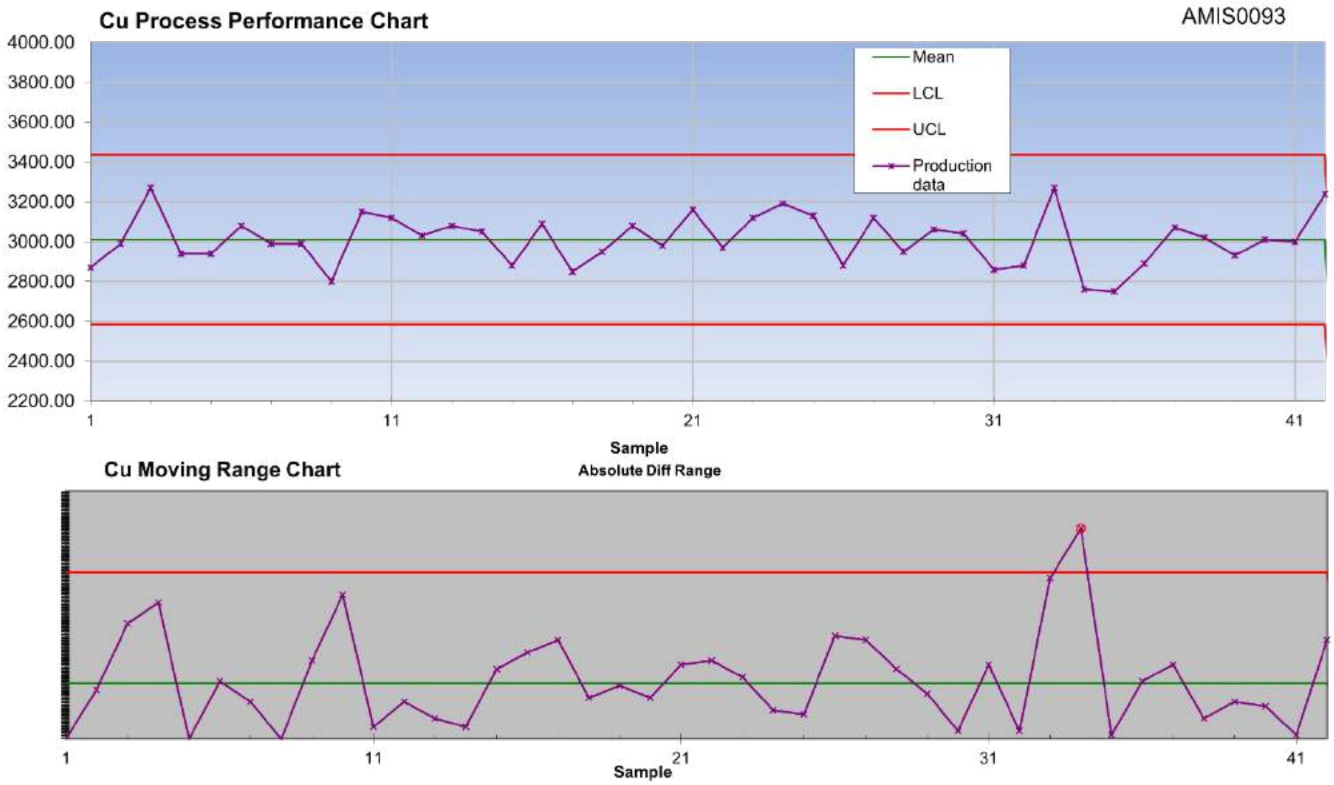


Figure 12: Current Deposit standard AMIS093 Cu (g/t)

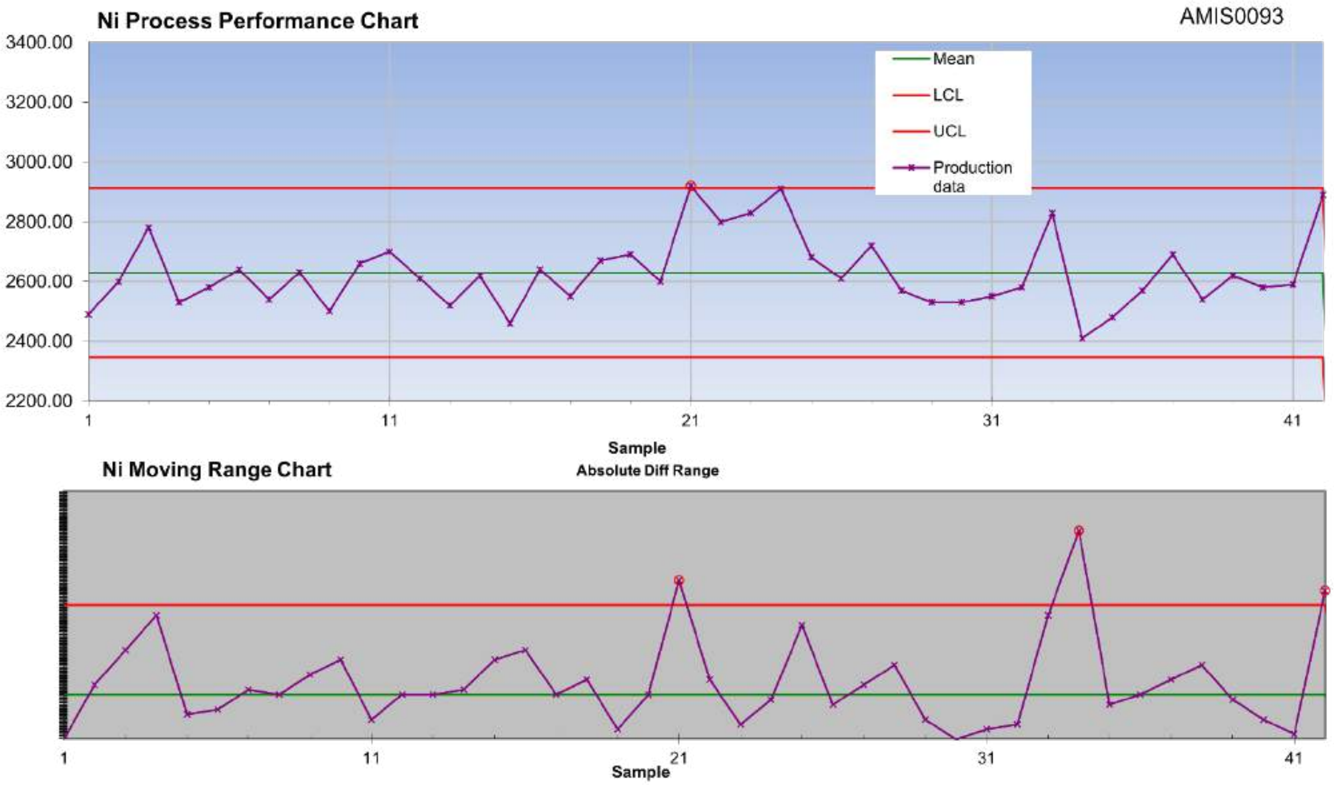


Figure 13: Current Deposit standard AMIS093 Ni (g/t)

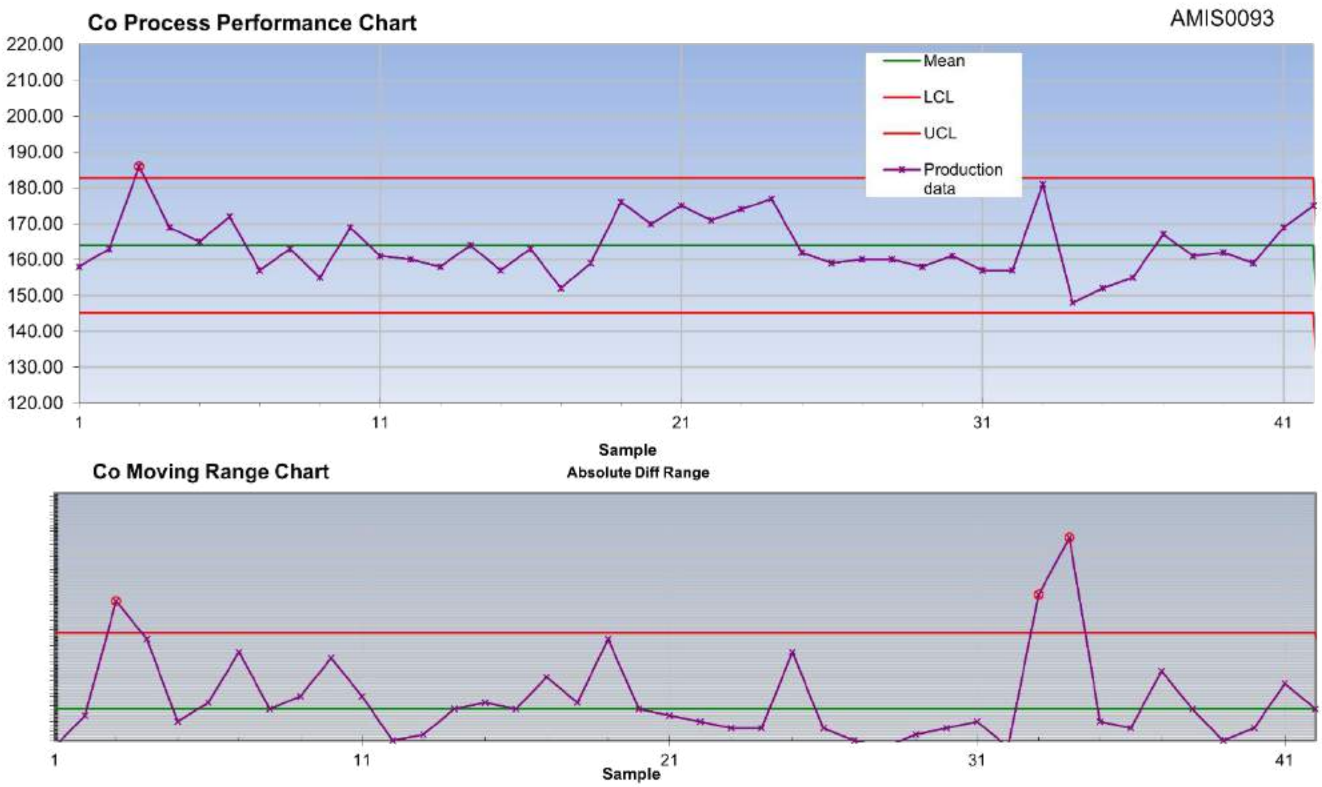


Figure 14: Current Deposit standard AMIS093 Co (g/t)

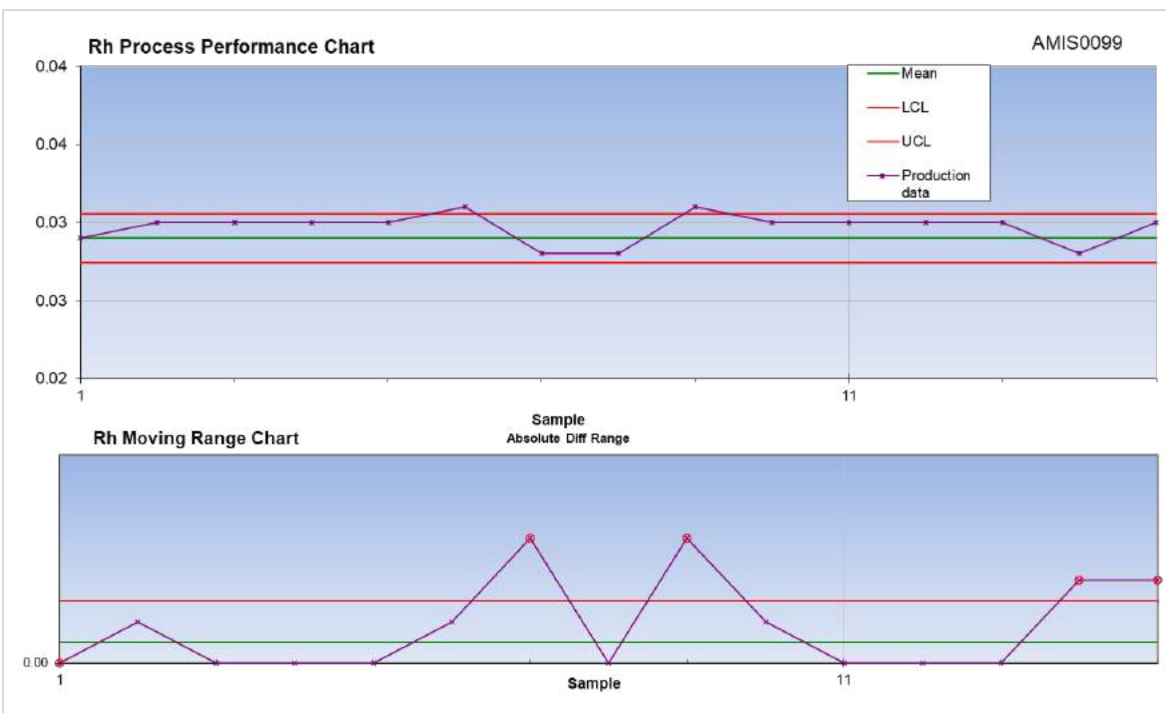


Figure 15: Current Deposit standard AMIS0099 Rh (g/t)

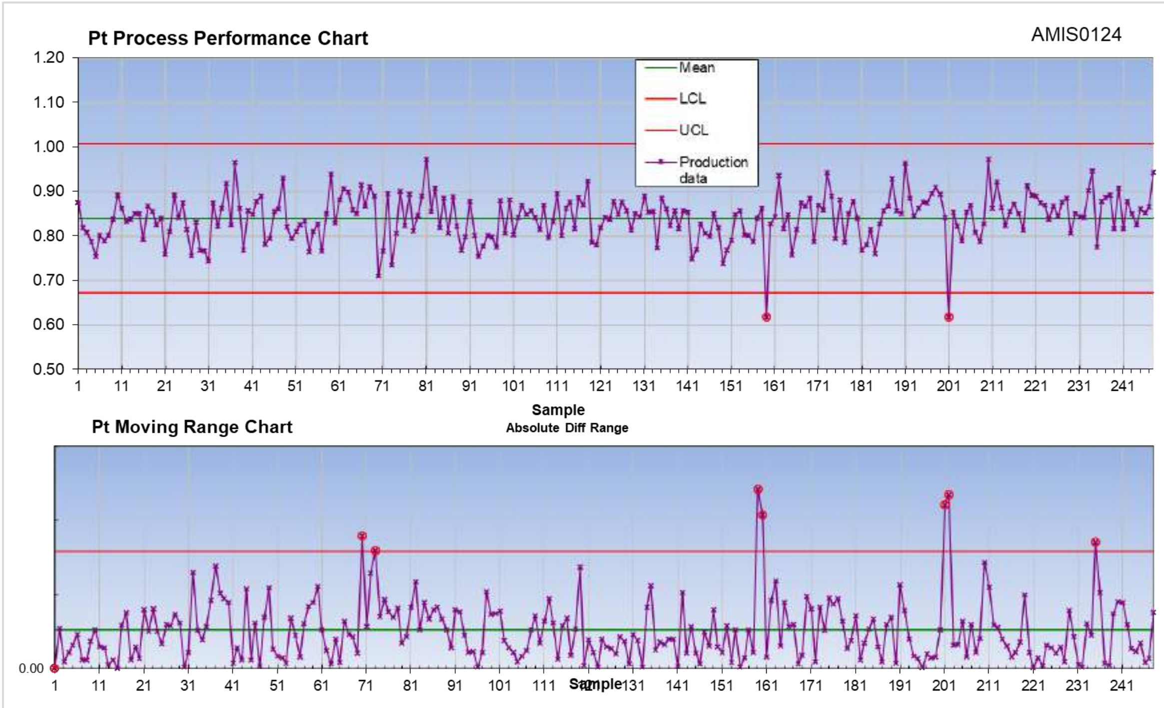


Figure 16: Current Deposit standard AMIS0124 Pt (g/t)

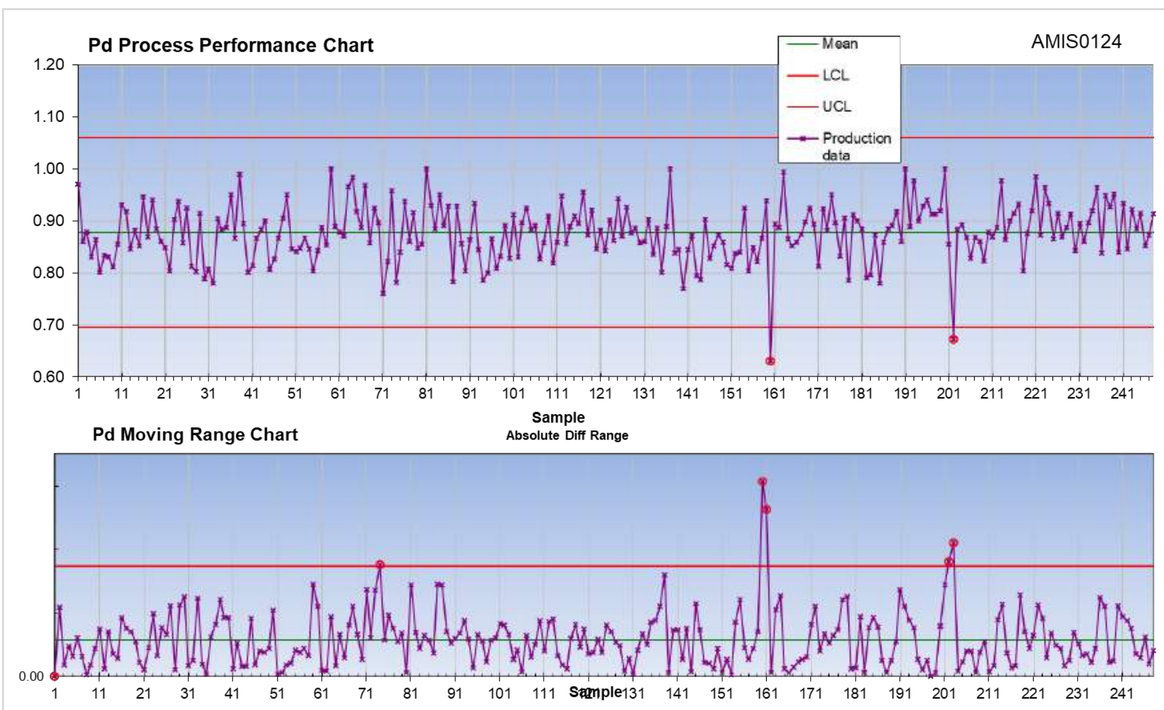


Figure 17: Current Deposit standard AMIS0124 Pd (g/t)

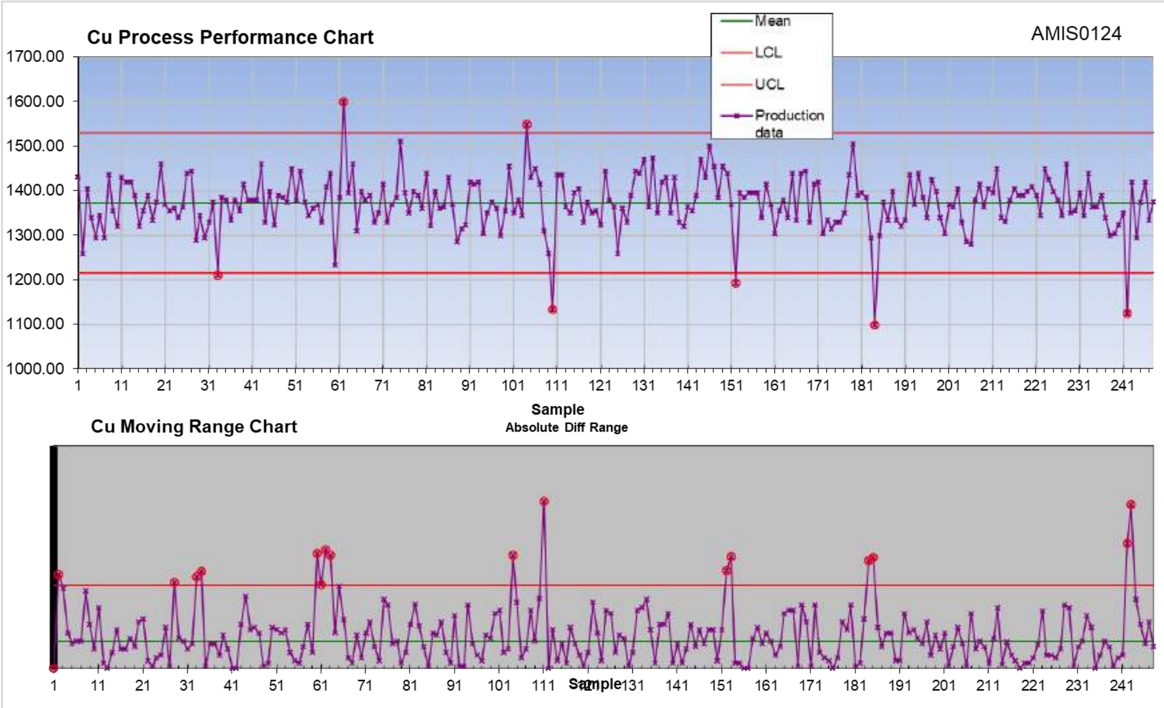


Figure 18: Current Deposit standard AMIS0124 Cu (g/t)

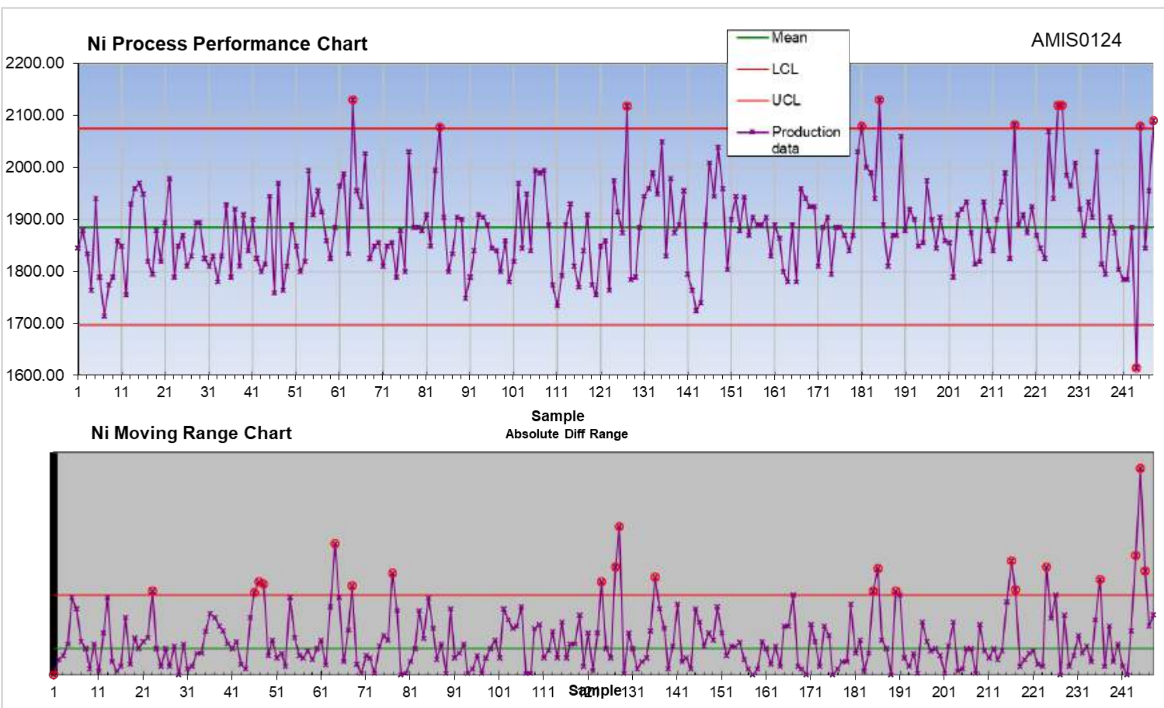


Figure 19: Current Deposit standard AMIS0124 Ni (g/t)

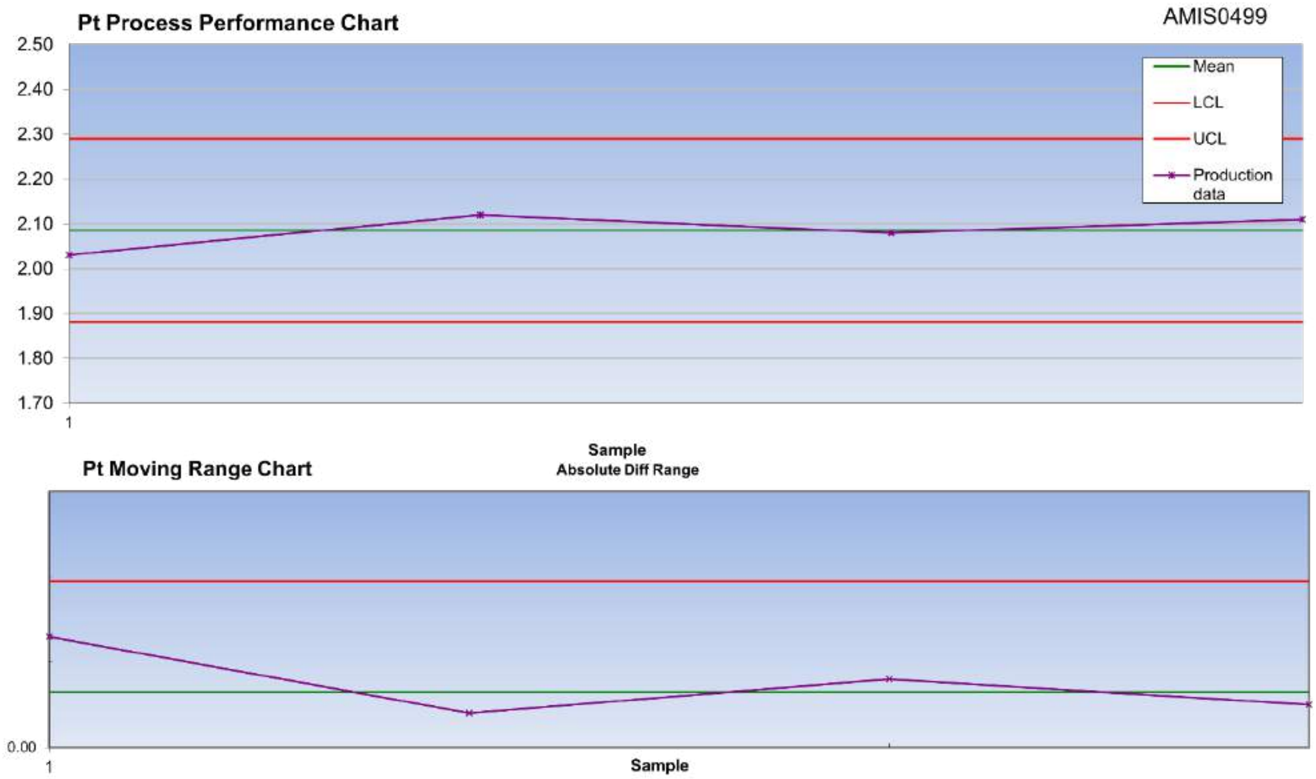


Figure 20 Current Deposit Standard AMIS0499 Pt (g/t)

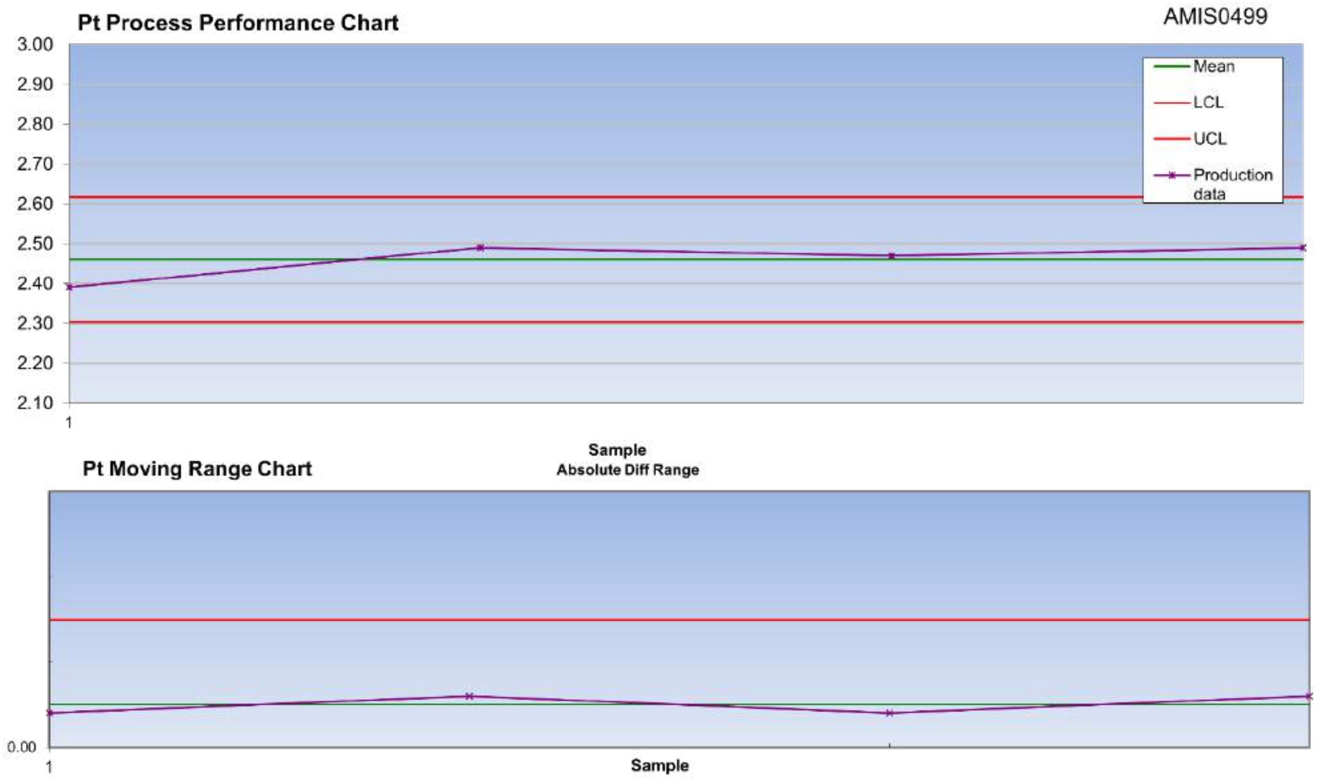


Figure 21 Current Deposit Standard AMIS0499 Pd (g/t)

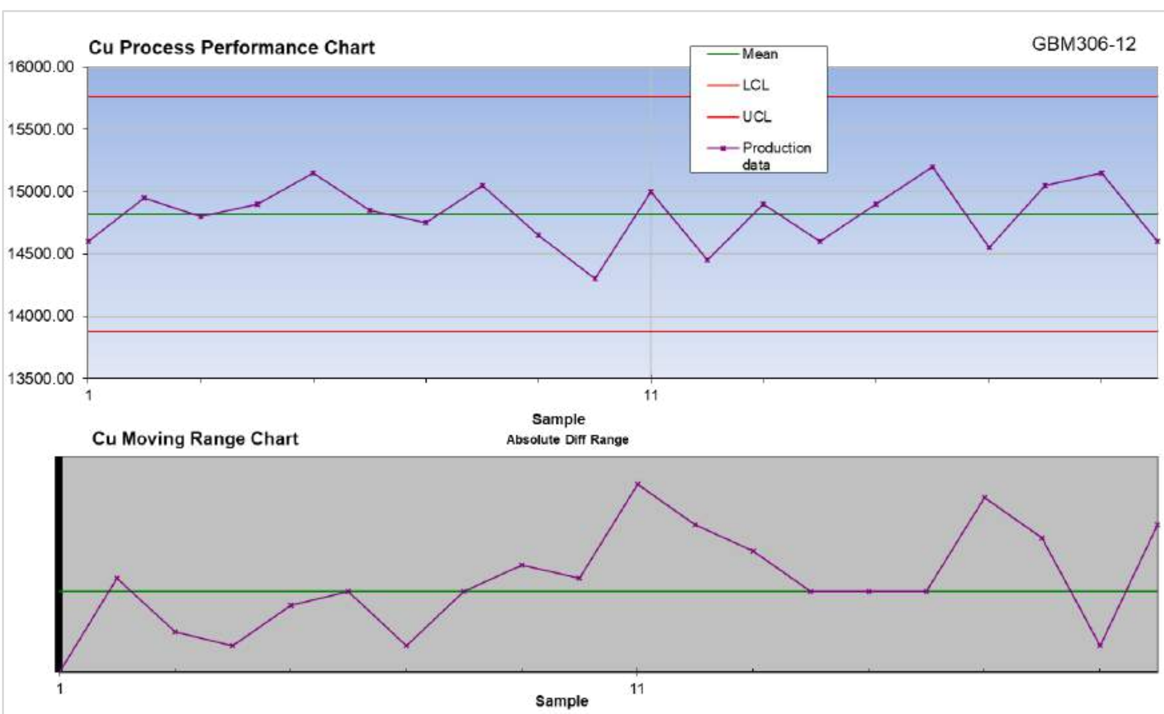


Figure 22: Current Deposit standard GBM306-12 Pt (g/t)

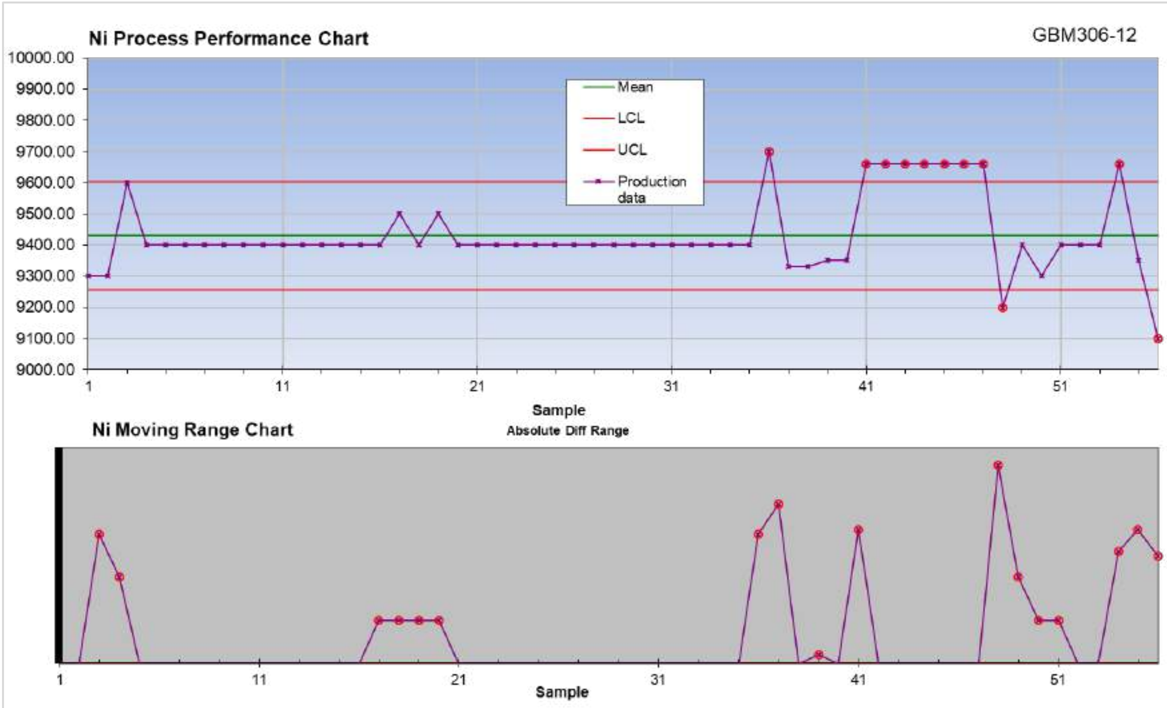


Figure 23: Current Deposit standard GBM306-12 Ni (g/t)

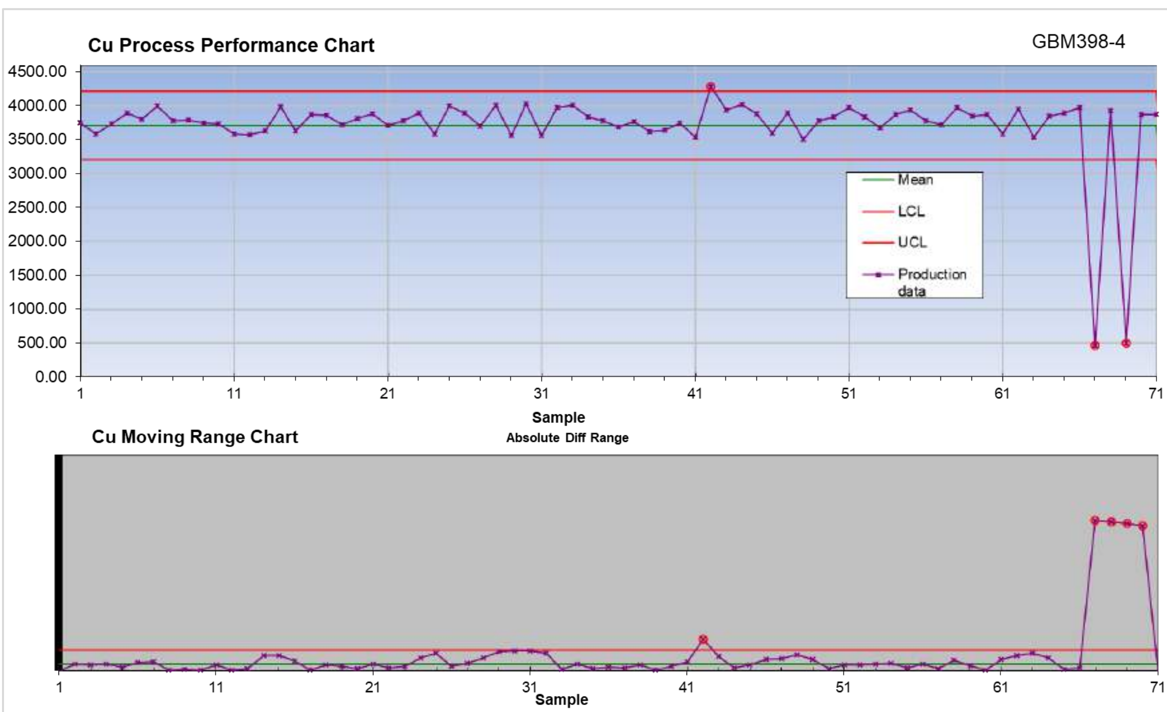


Figure 24: Current Deposit standard GBM398-4 Cu (g/t)

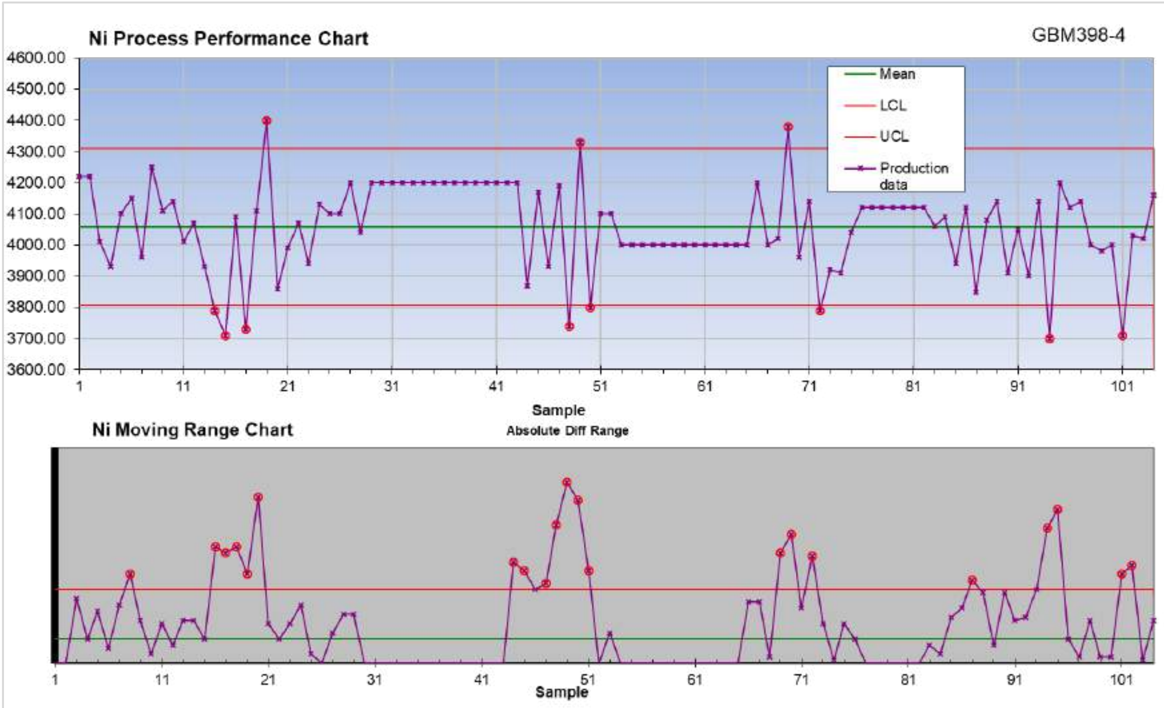


Figure 25: Current Deposit standard GBM398-4 Ni (g/t)

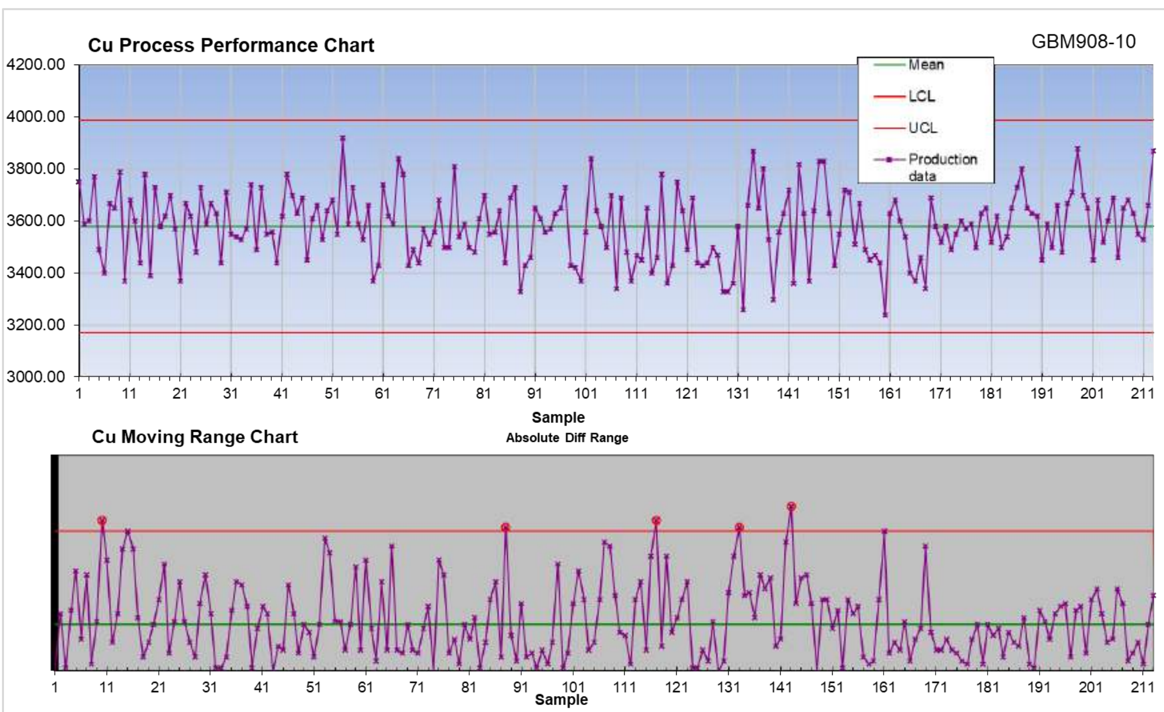


Figure 26: Current Deposit standard GBM908-10 Cu (g/t)

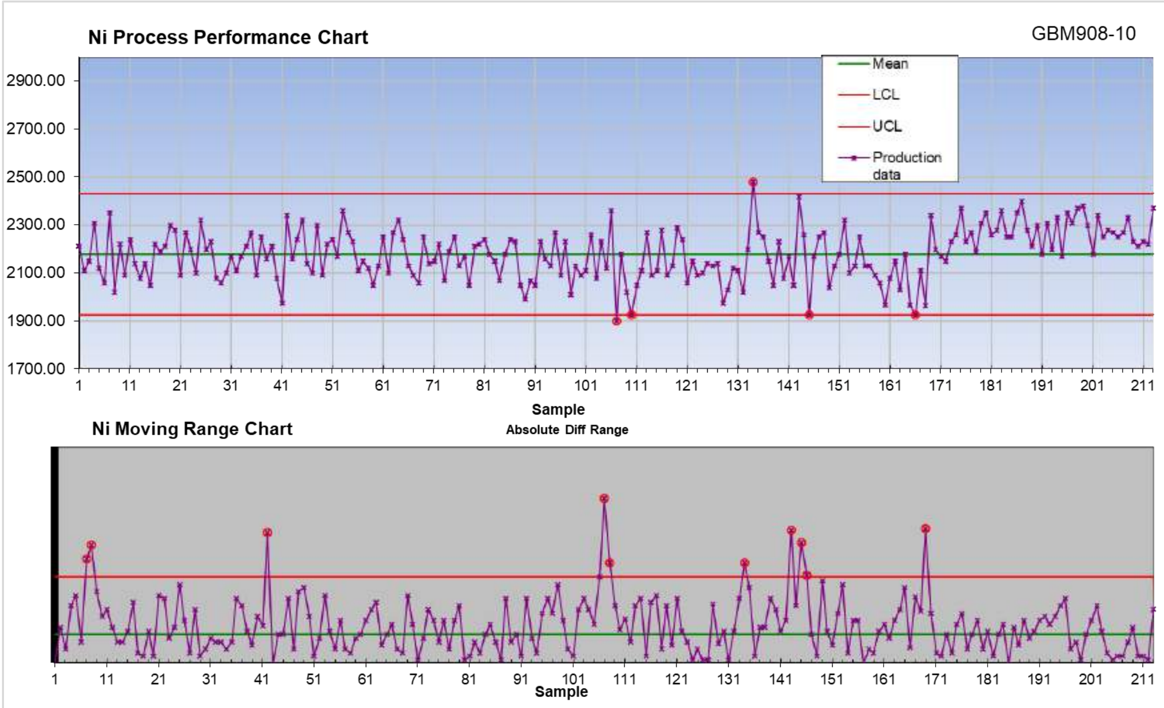


Figure 27: Current Deposit standard GBM908-10 Ni (g/t)

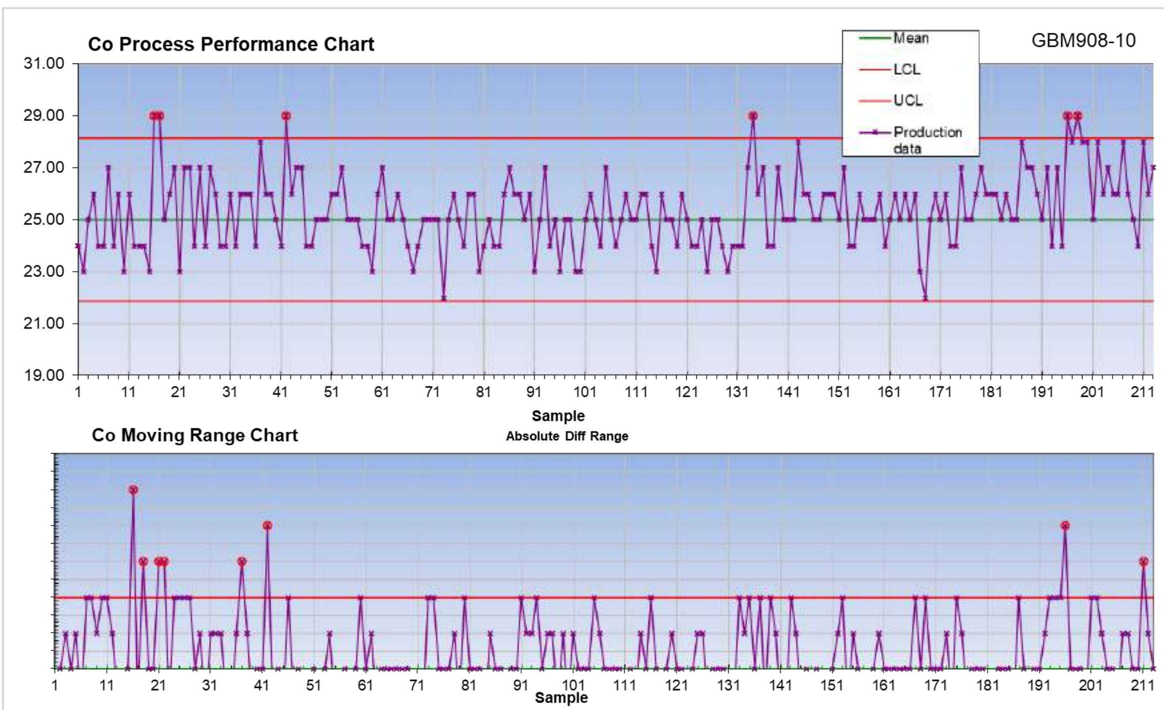


Figure 28: Current Deposit standard GBM908-10 Co (g/t)

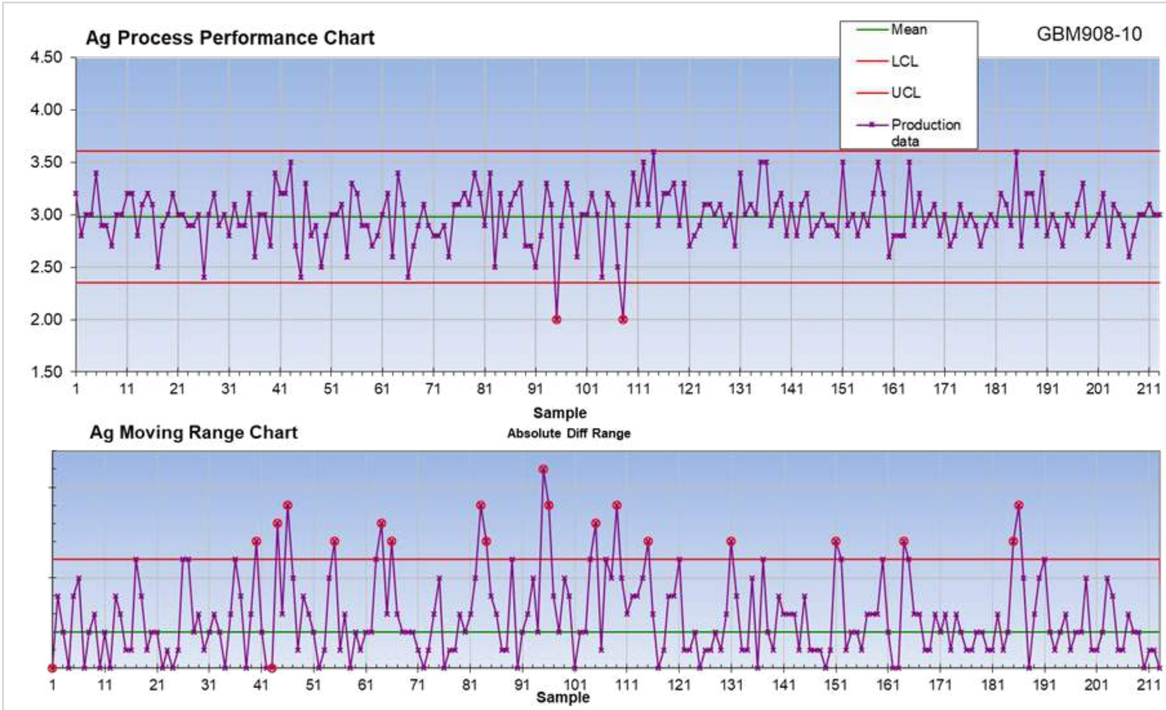


Figure 29: Current Deposit standard GBM908-10 Ag (g/t)

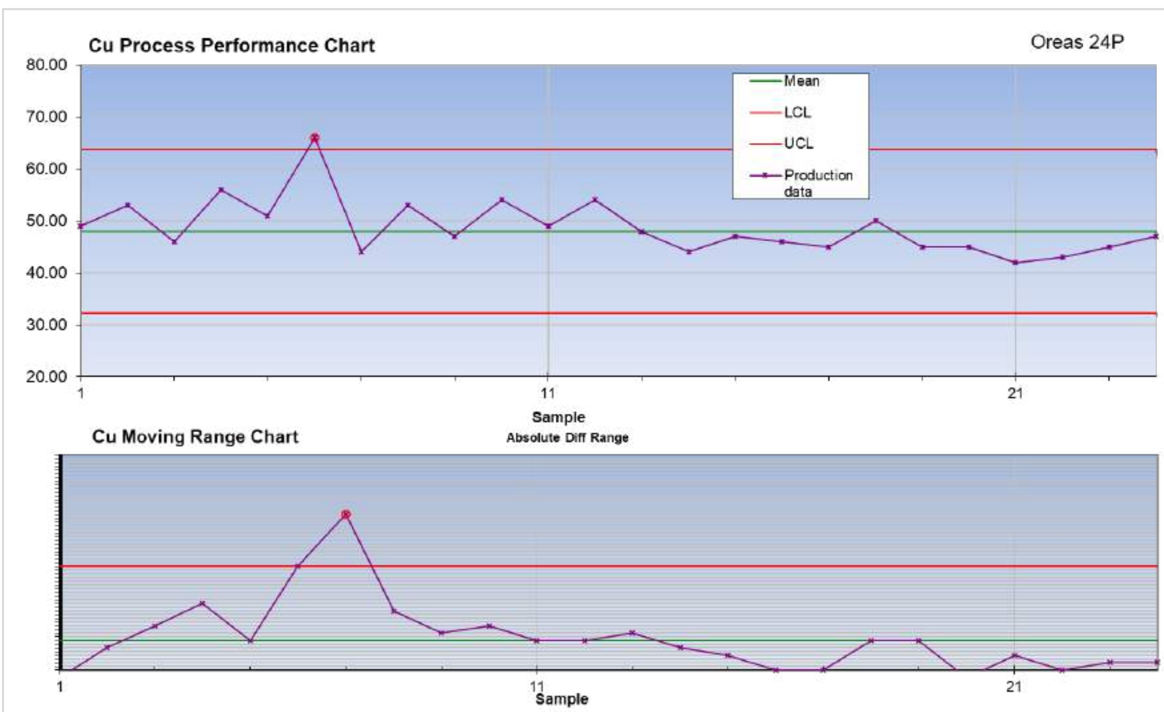


Figure 30: Current Deposit standard Oreas 24P Cu (g/t)

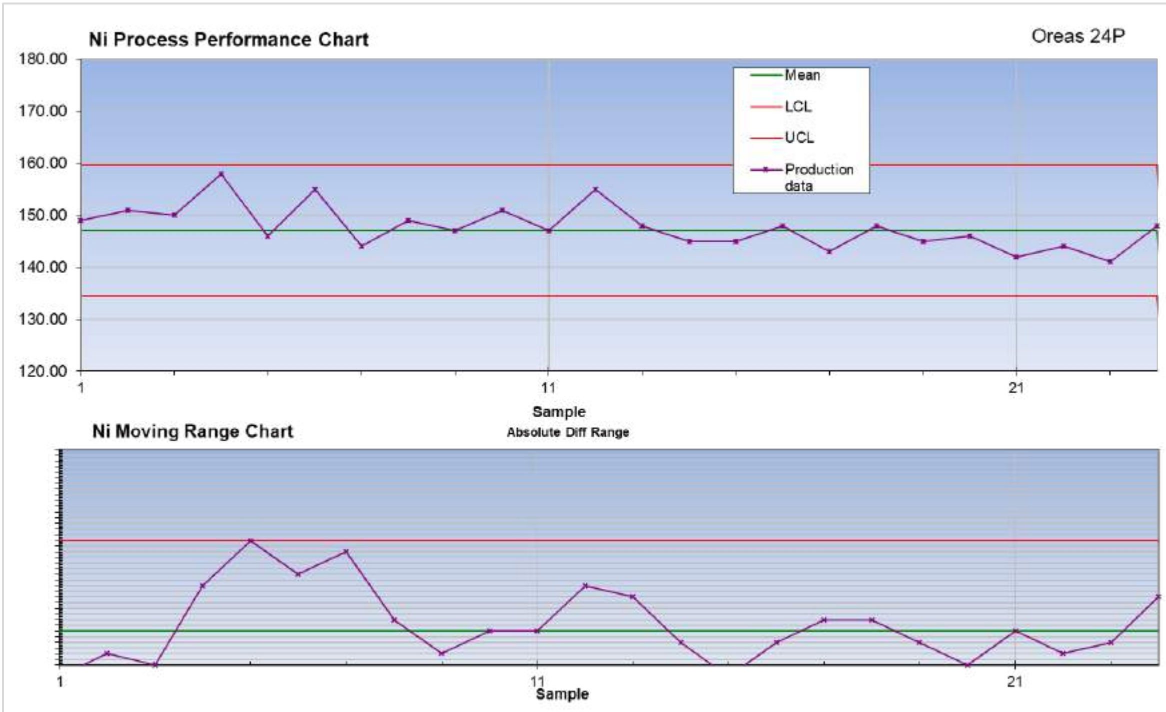


Figure 31: Current Deposit standard Oreas 24P Ni (g/t)

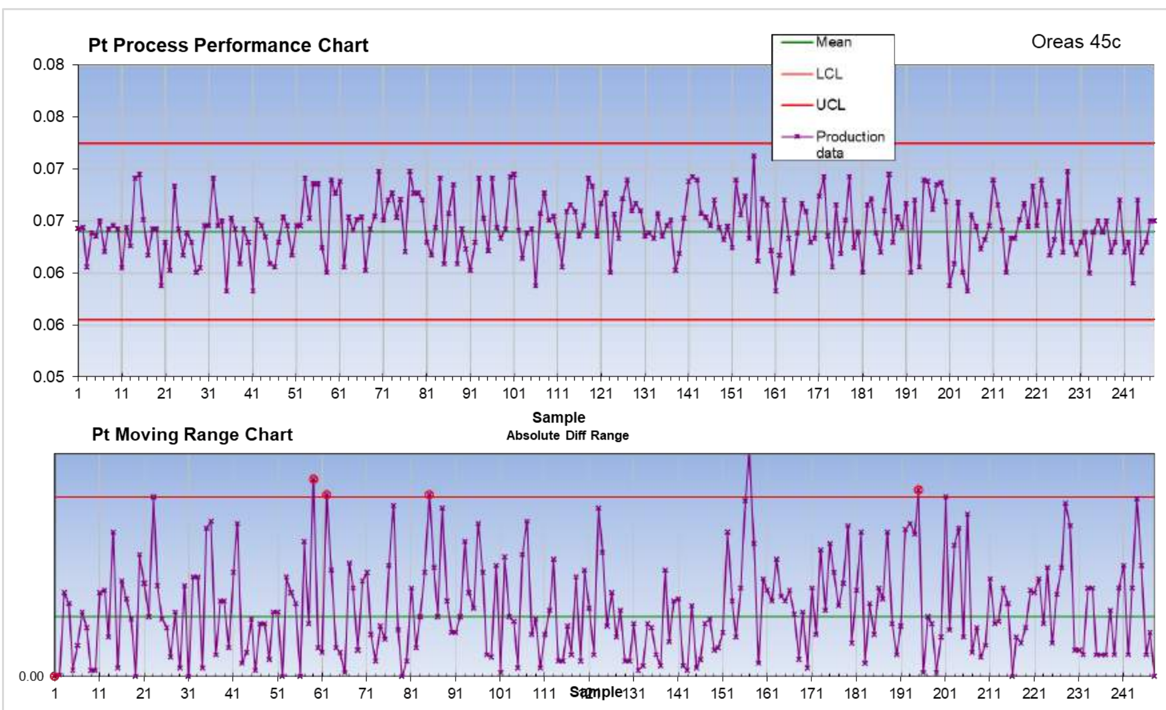


Figure 32: Current Deposit standard Oreas 45c Pt (g/t)

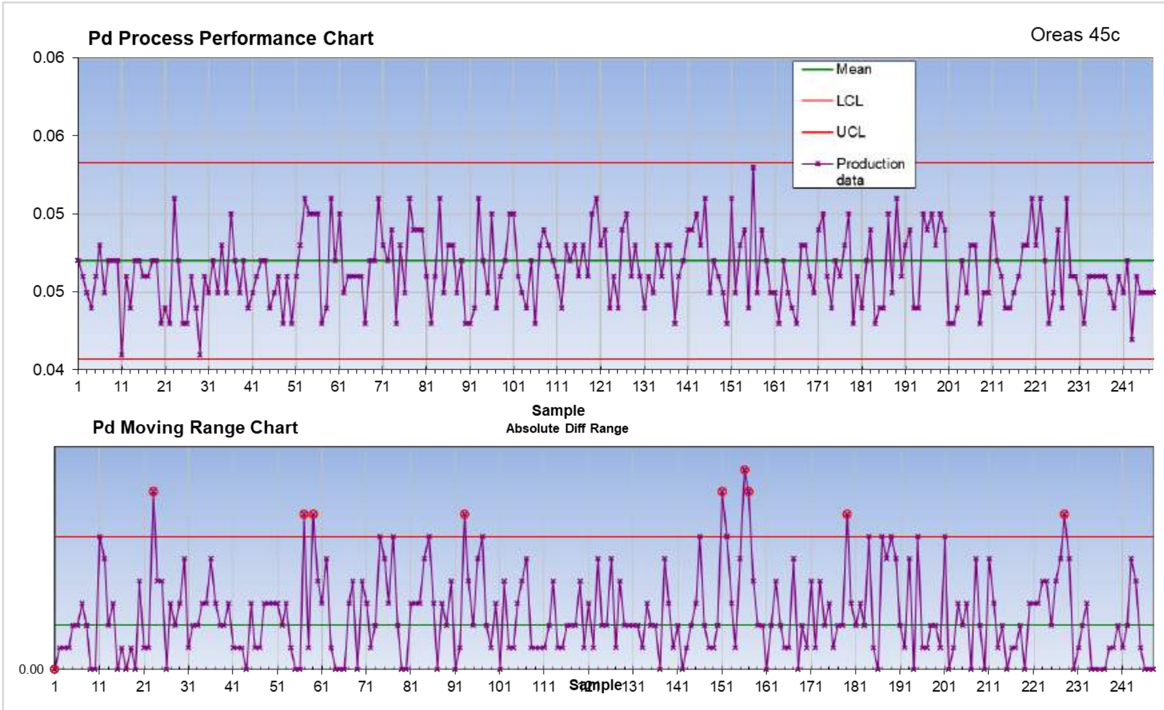


Figure 33: Current Deposit standard Oreas 45c Pd (g/t)

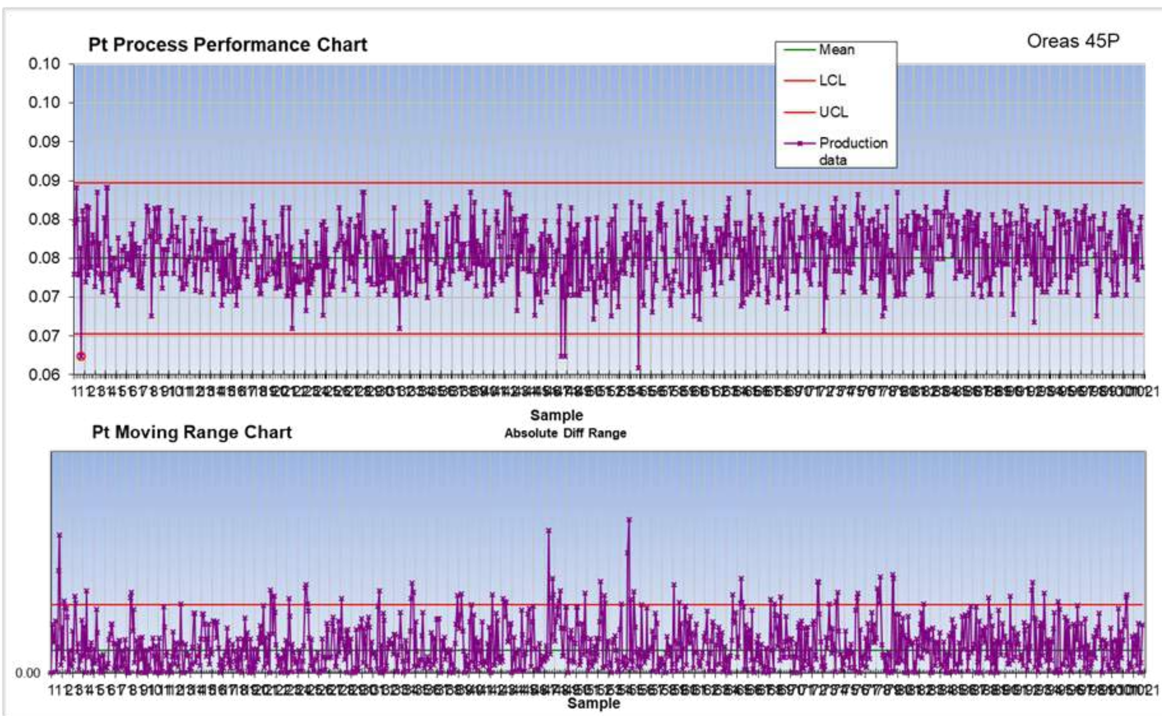


Figure 34: Current Deposit standard Oreas 45P Pt (g/t)

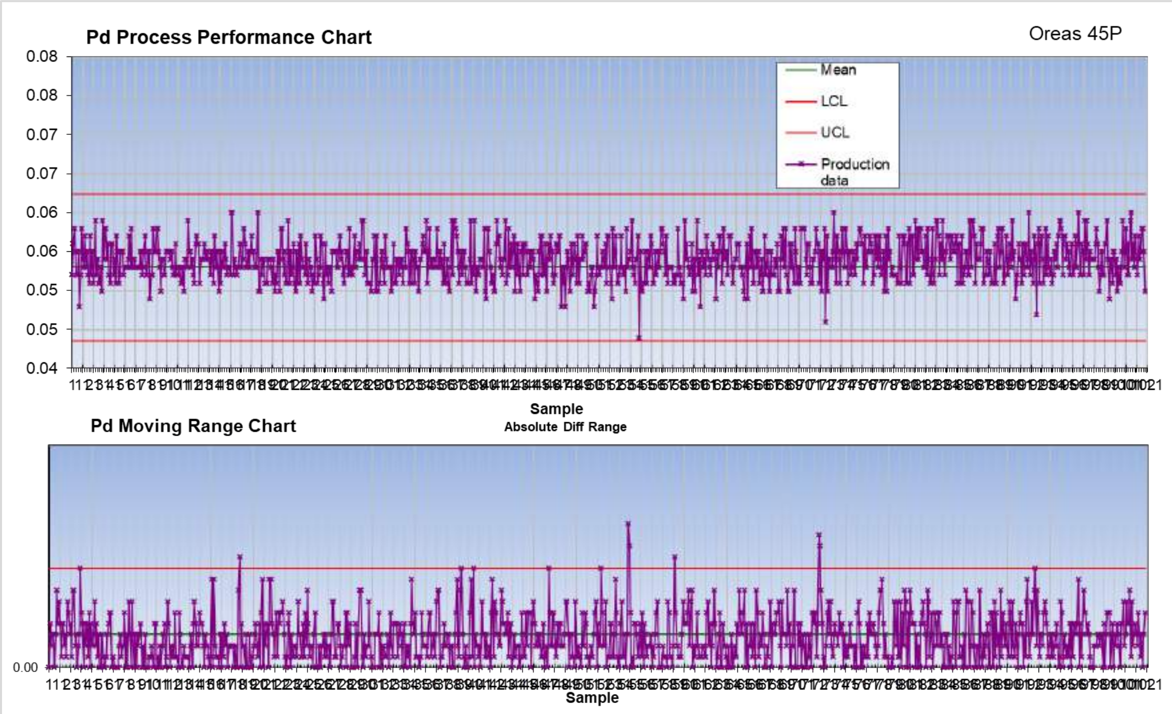


Figure 35: Current Deposit standard Oreas 45P Pd (g/t)

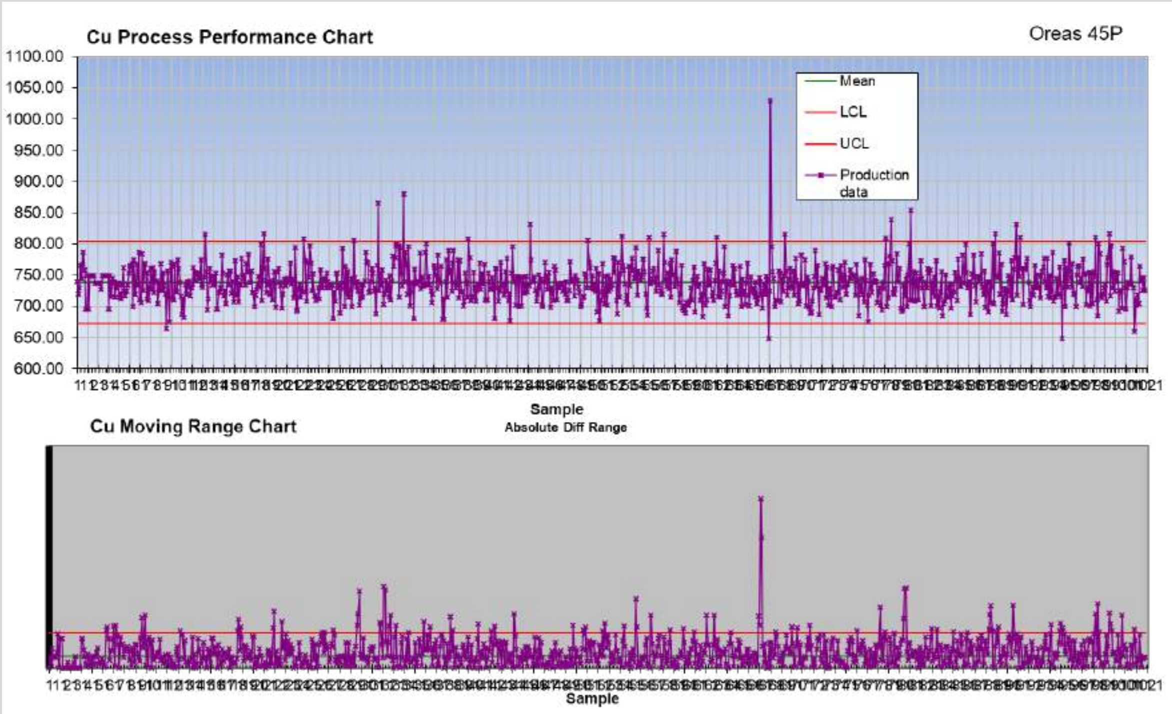


Figure 36: Current Deposit standard Oreas 45P Cu (g/t)

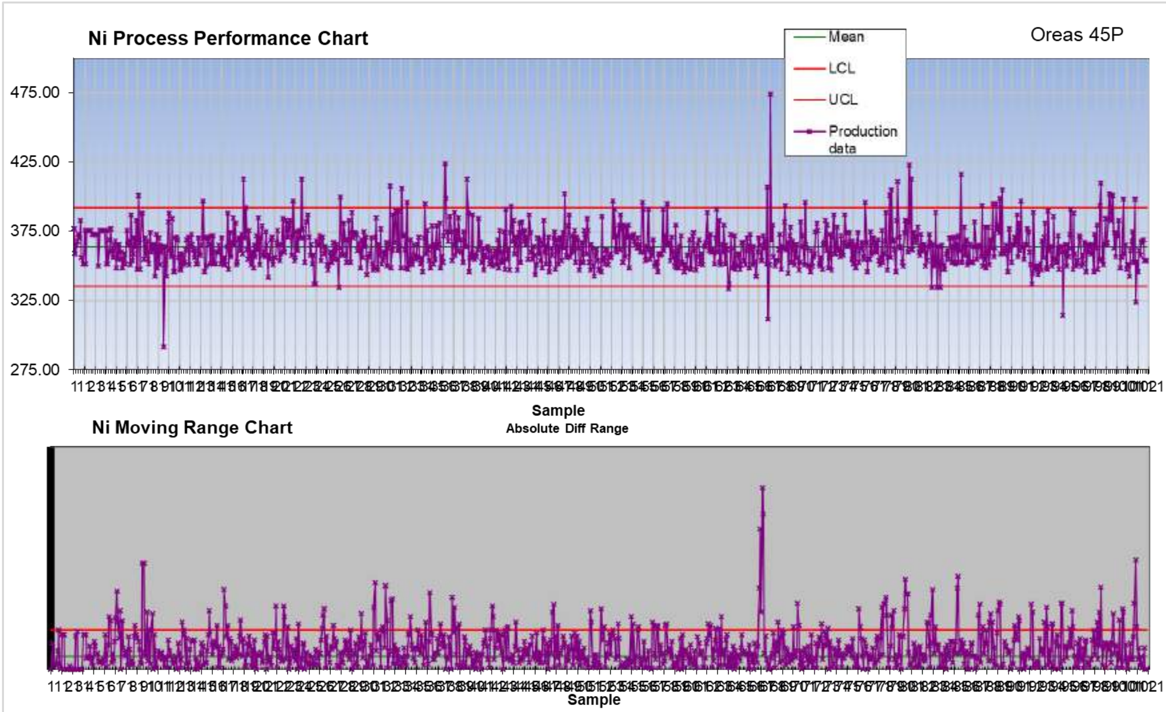


Figure 37: Current Deposit standard Oreas 45P Ni (g/t)

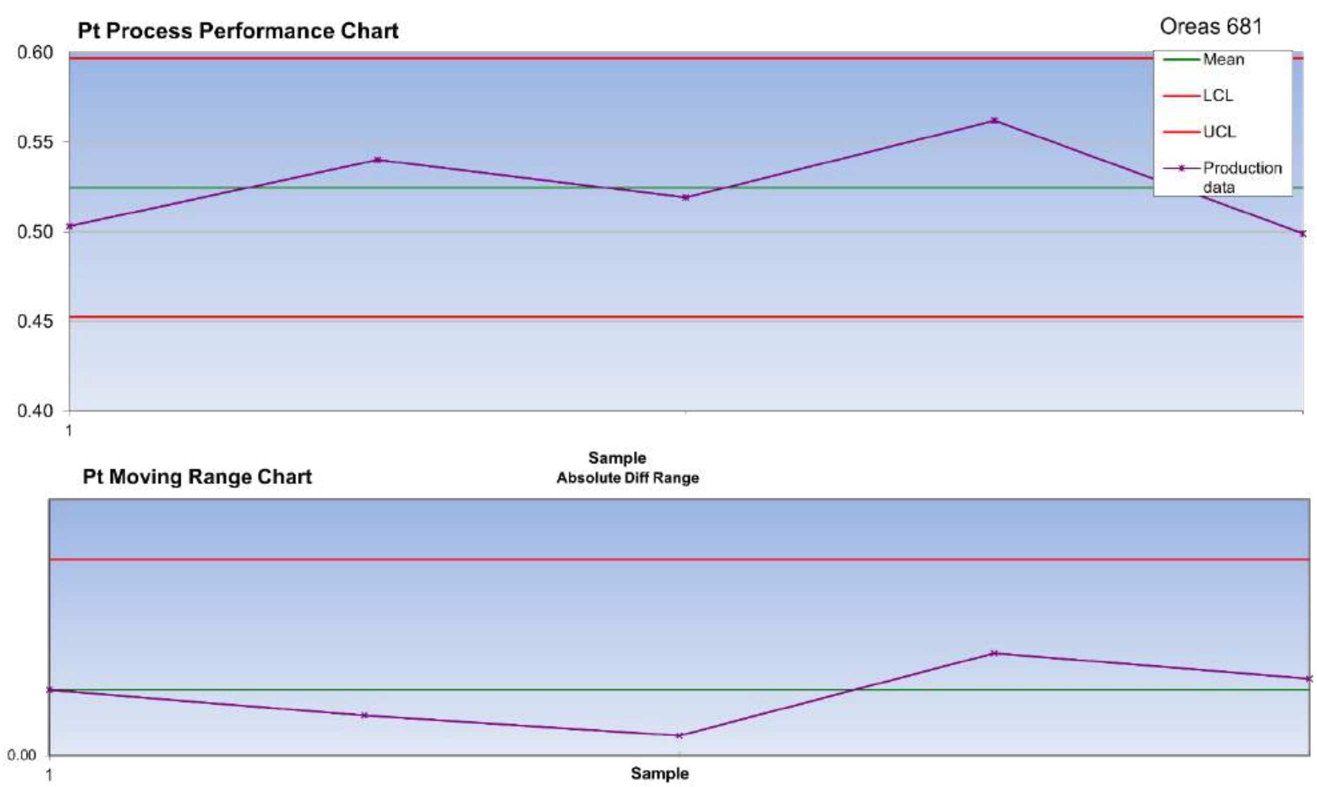


Figure 38 Current Deposit OREAS 681 Pt (g/t)

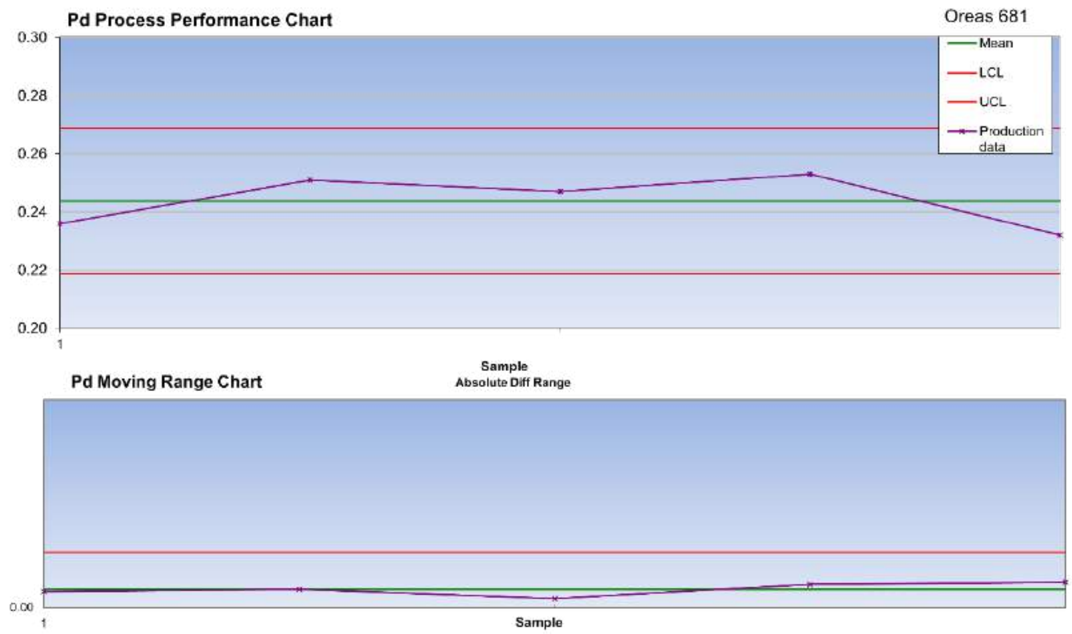


Figure 39 Current Deposit OREAS 681 Pd (g/t)

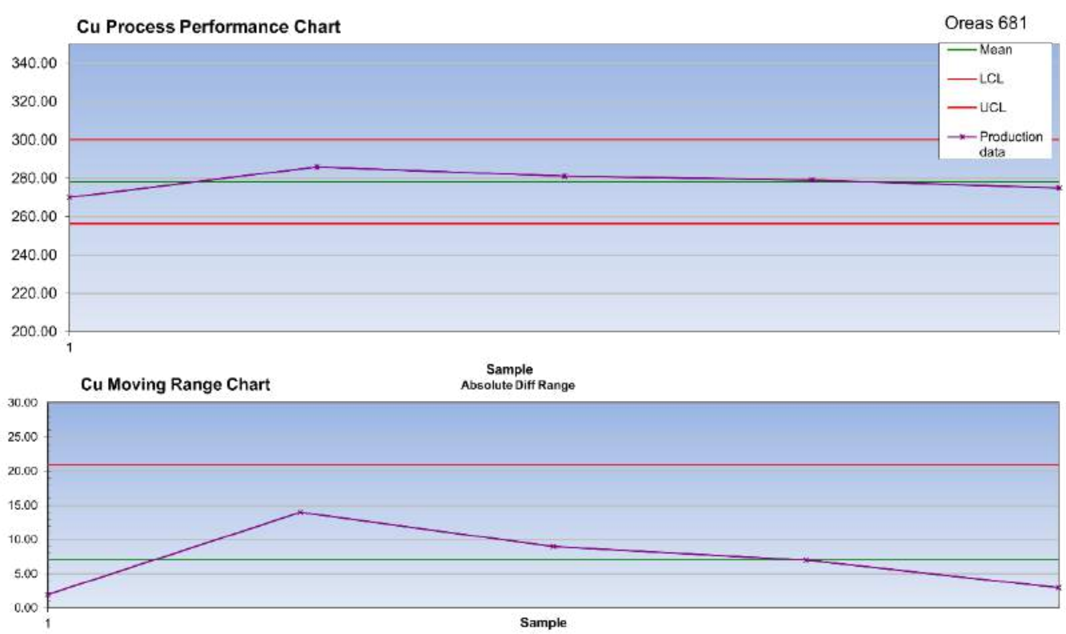


Figure 40 Currrent Deposit OREAS 681 Cu (g/t)

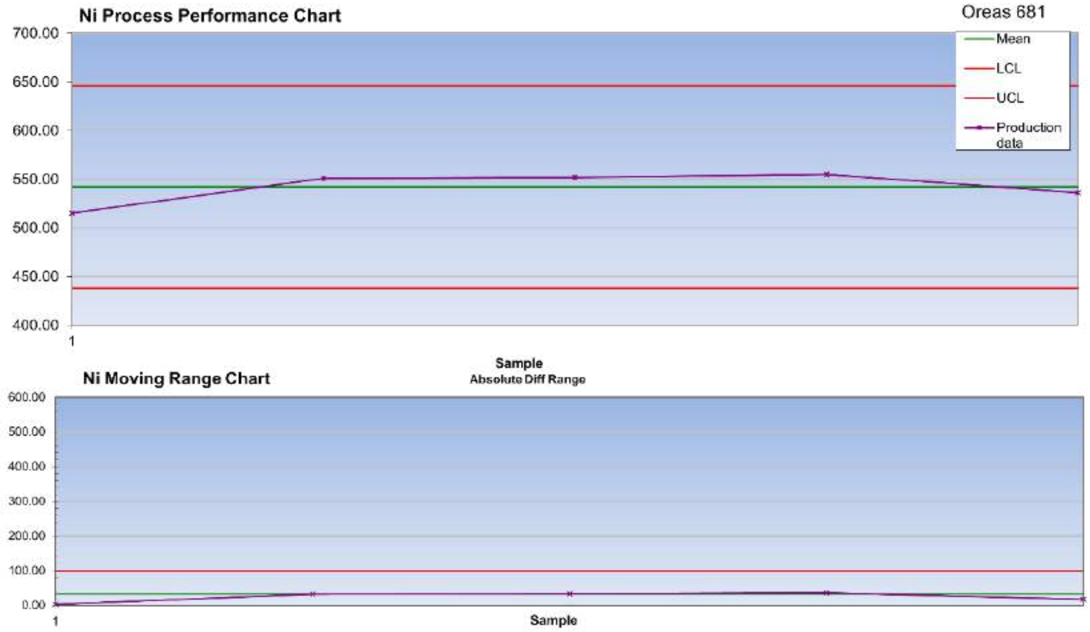


Figure 41 Current Deposit OREAS 681 Ni (g/t)

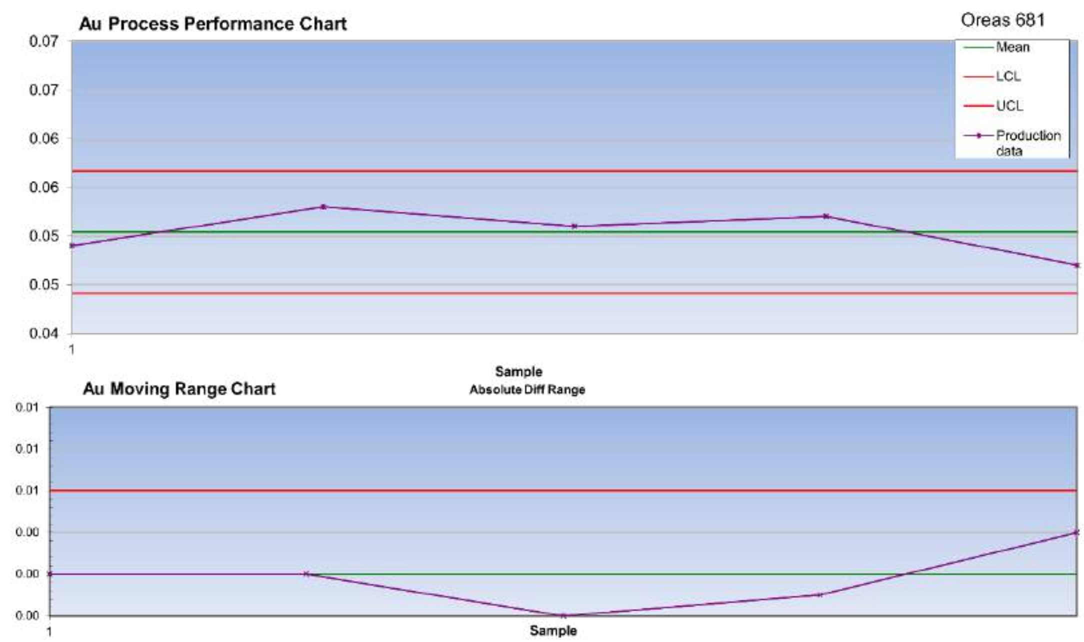


Figure 42 Current Deposit OREAS 681 Au (g/t)

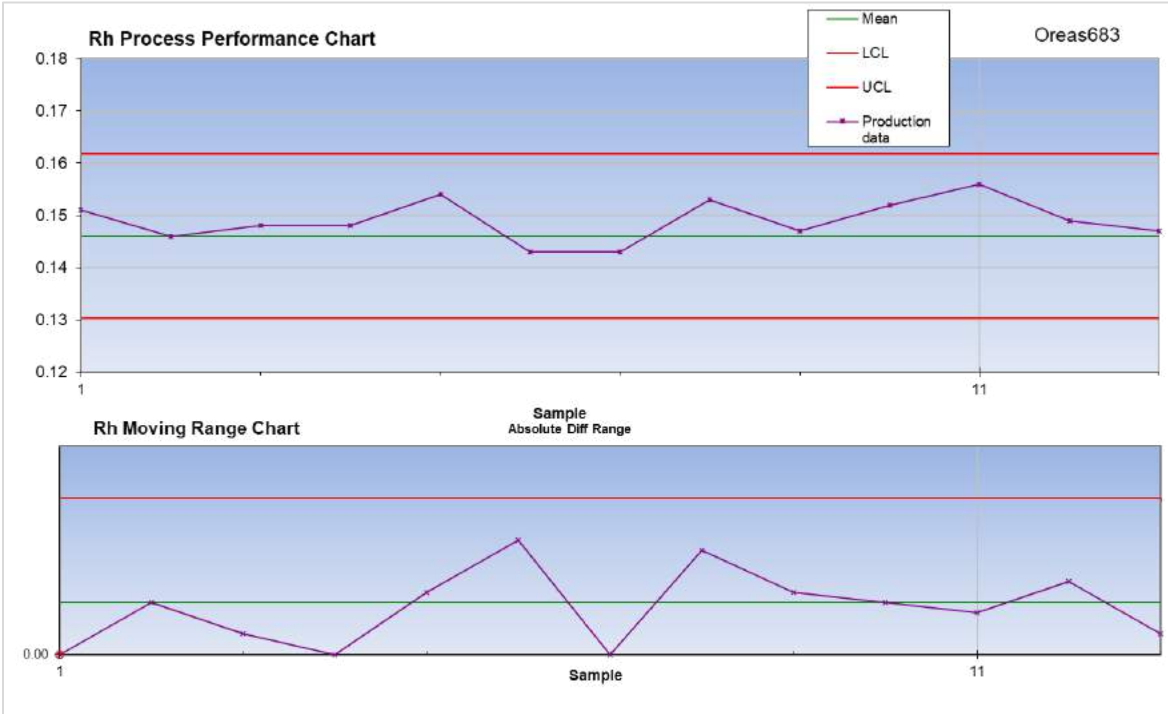


Figure 43: Current Deposit standard Oreas 683 Rh (g/t)

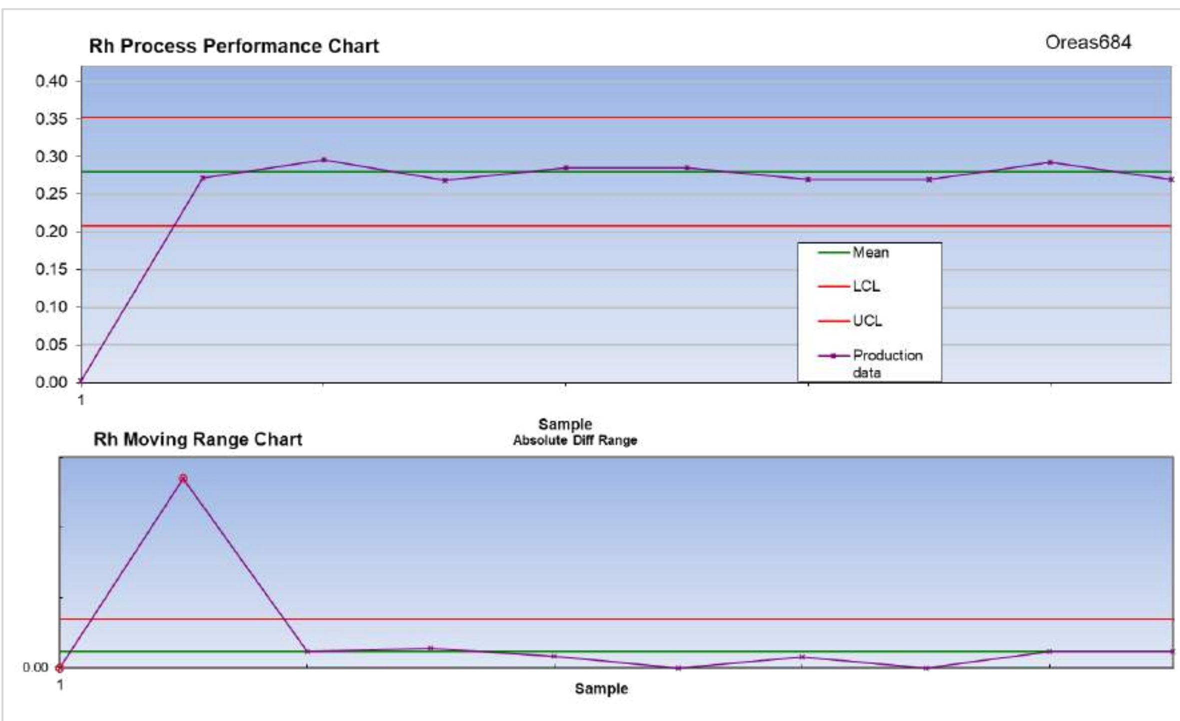


Figure 44: Current Deposit standard Oreas 684 Rh (g/t)

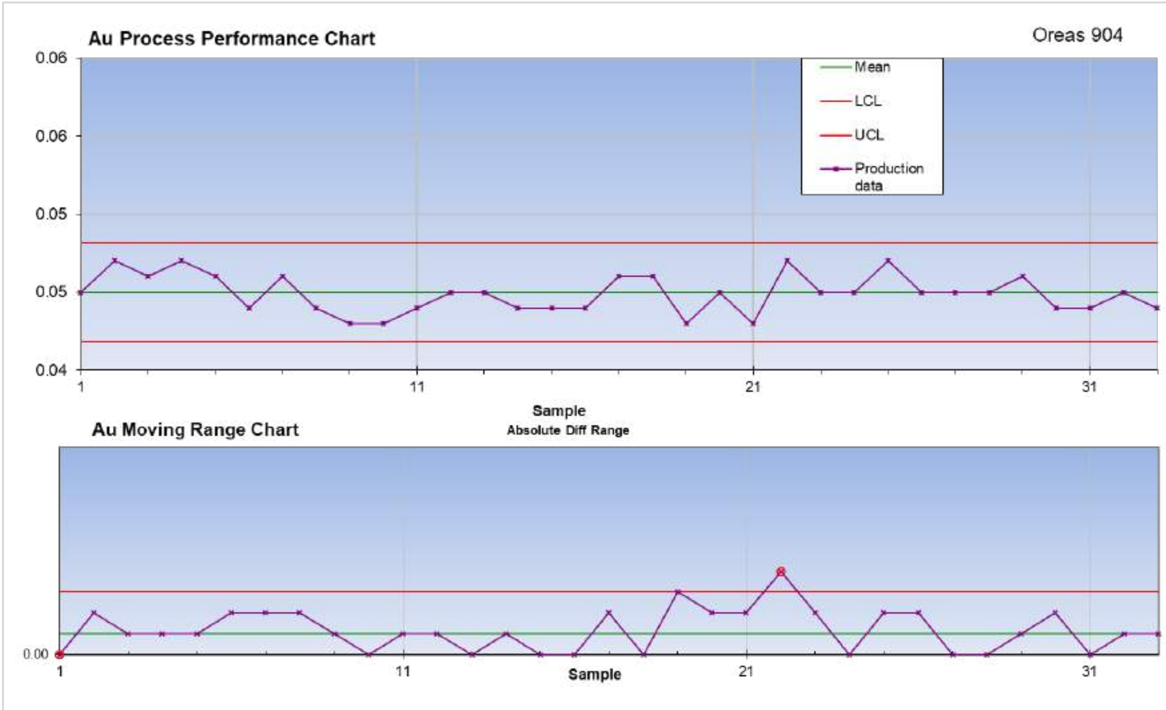


Figure 45: Current Deposit standard Oreas 904 Au (g/t)

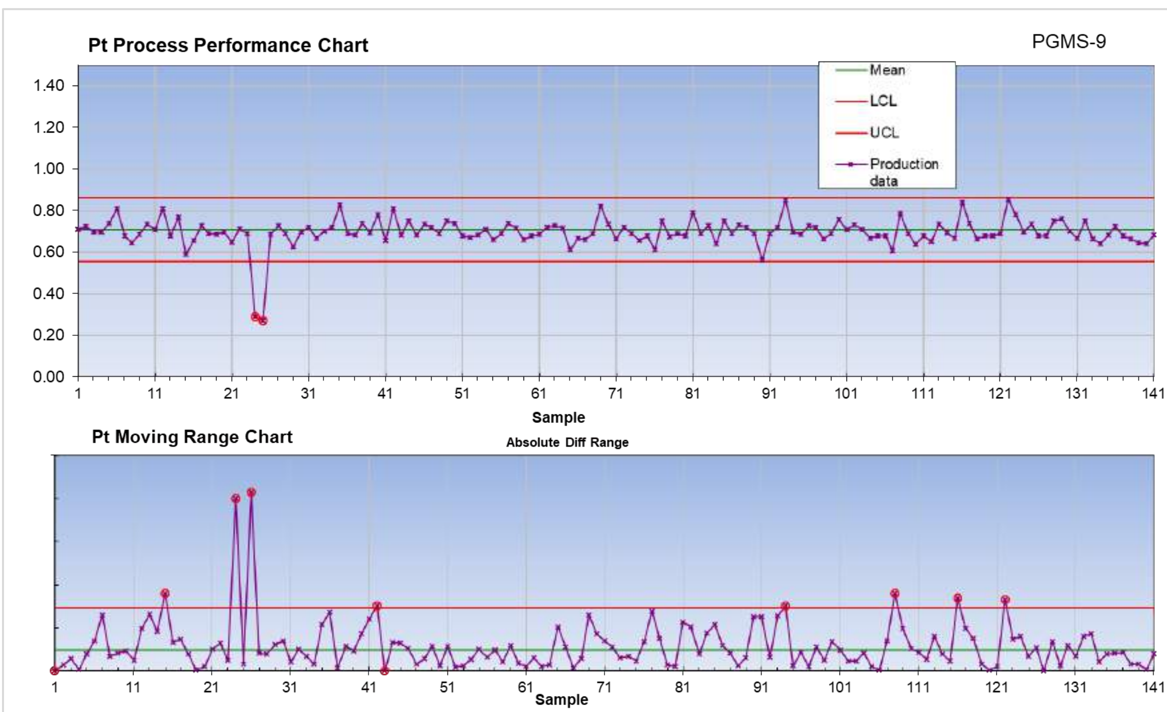


Figure 46: Current Deposit standard PGMS-9 Pt (g/t)

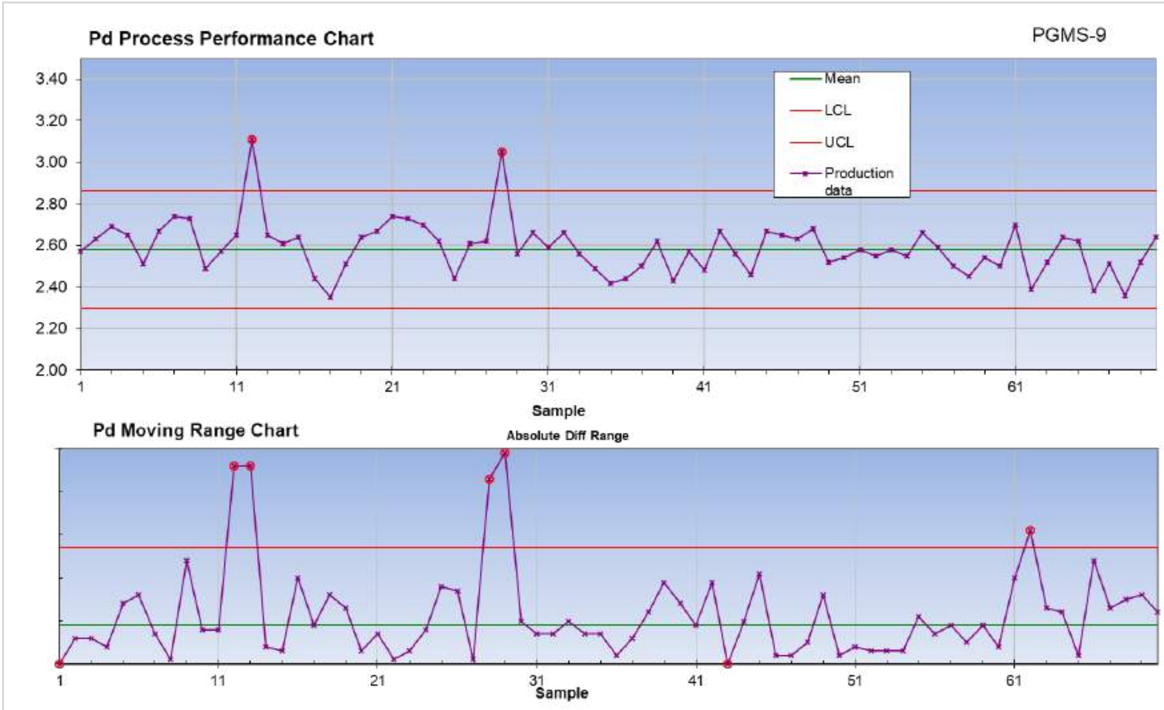


Figure 47: Current Deposit standard PGMS-9 Pd (g/t)

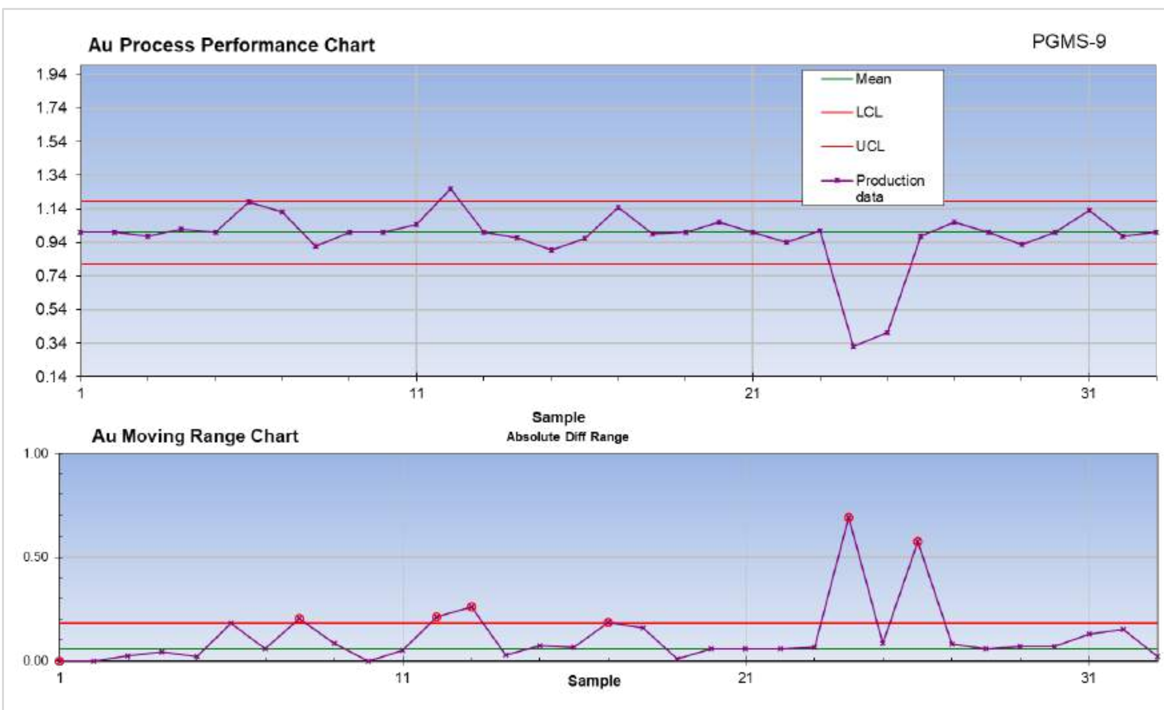


Figure 48: Current Deposit standard PGMS-9 Au (g/t)

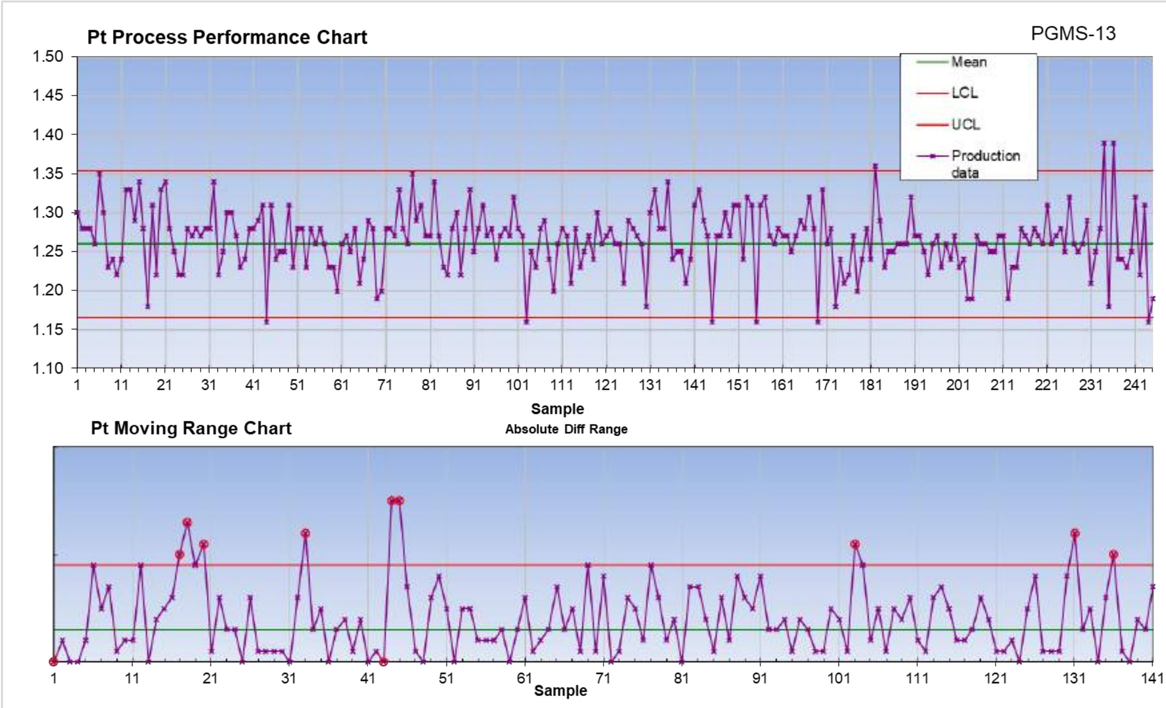


Figure 49: Current Deposit standard PGMS-13 Pt (g/t)

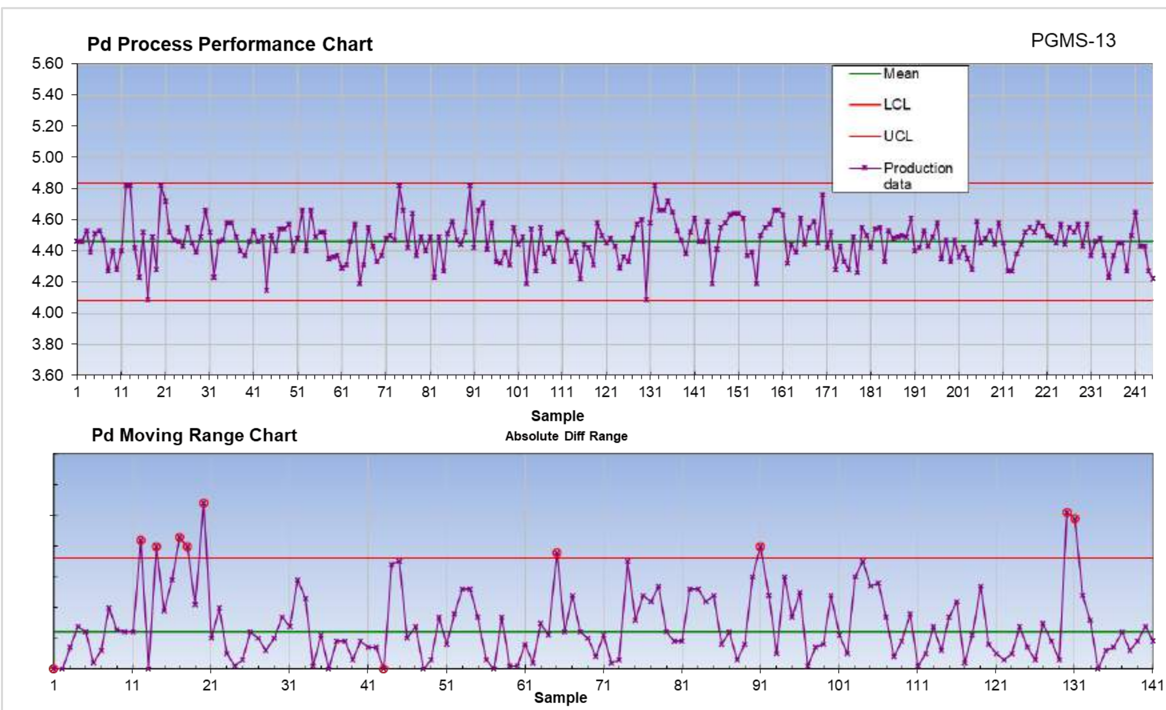


Figure 50: Current Deposit standard PGMS-13 Pd (g/t)

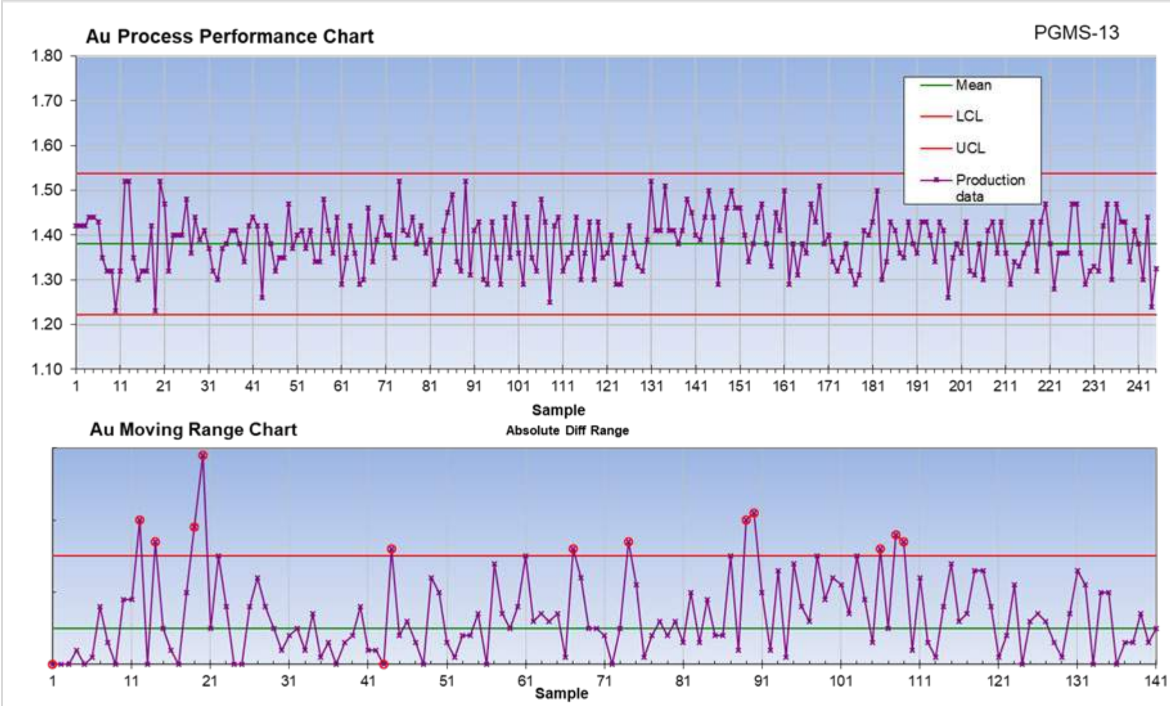


Figure 51: Current Deposit standard PGMS-13 Au (g/t)

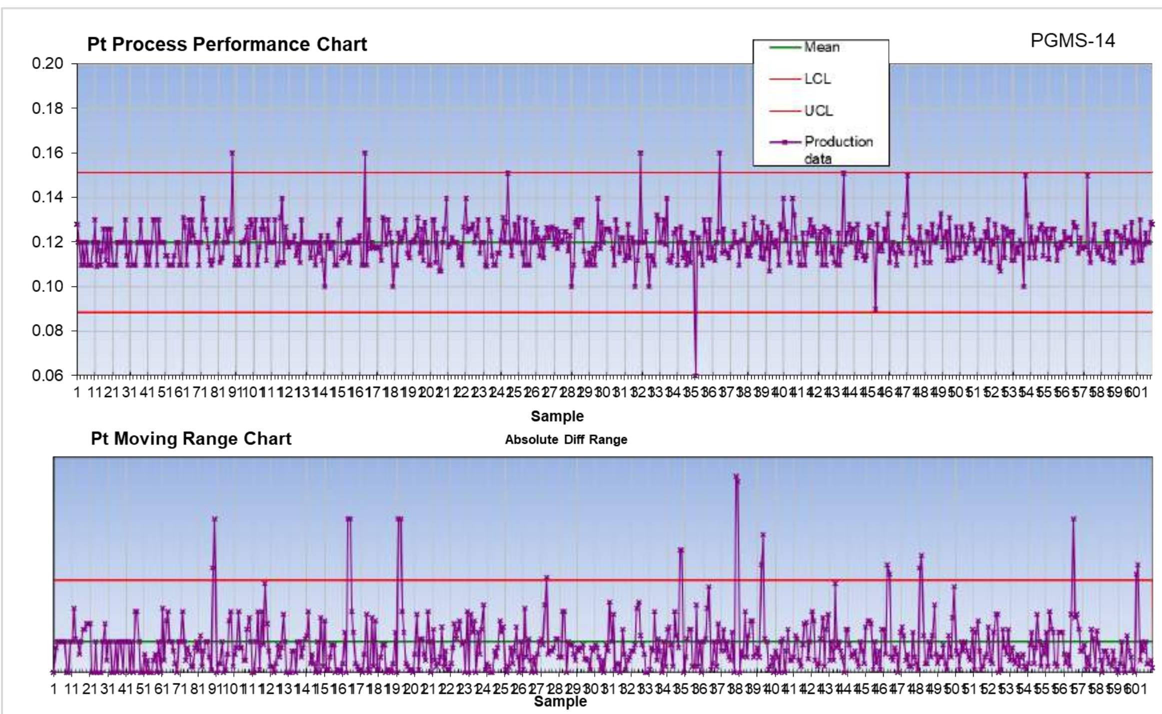


Figure 52: Current Deposit standard PGMS-14 Pt (g/t)

Figure 53: Current Deposit standard PGMS-14 Pd (g/t)

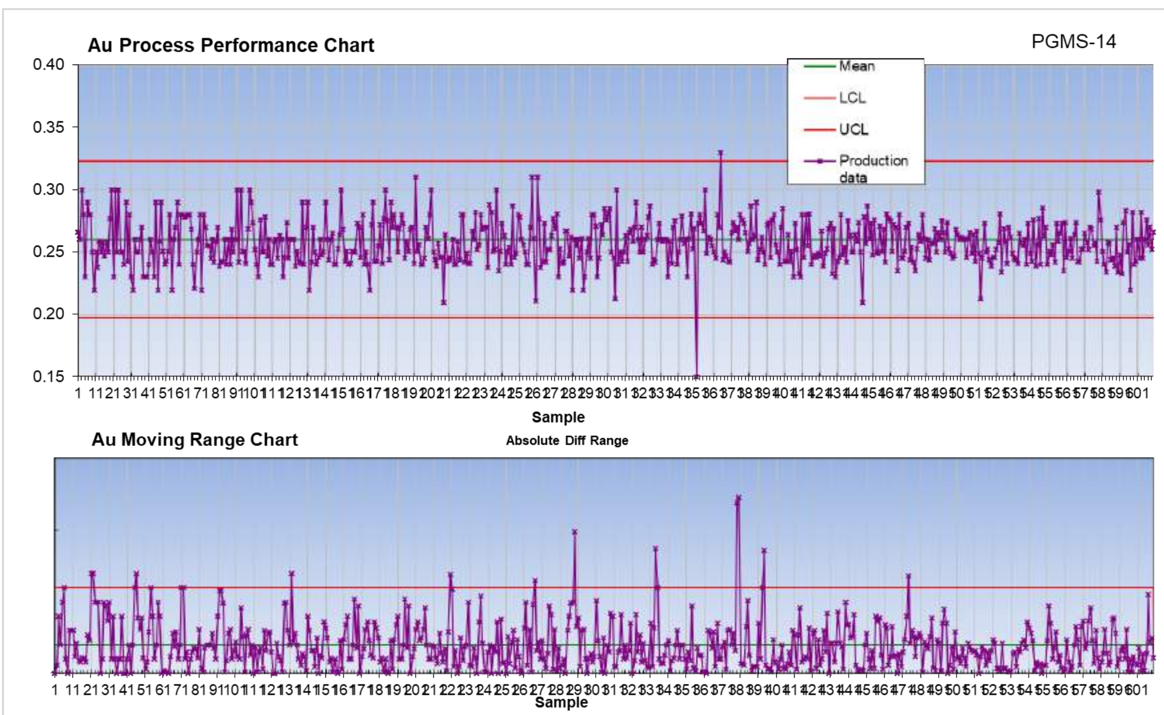


Figure 54: Current Deposit standard PGMS-14 Au (g/t)

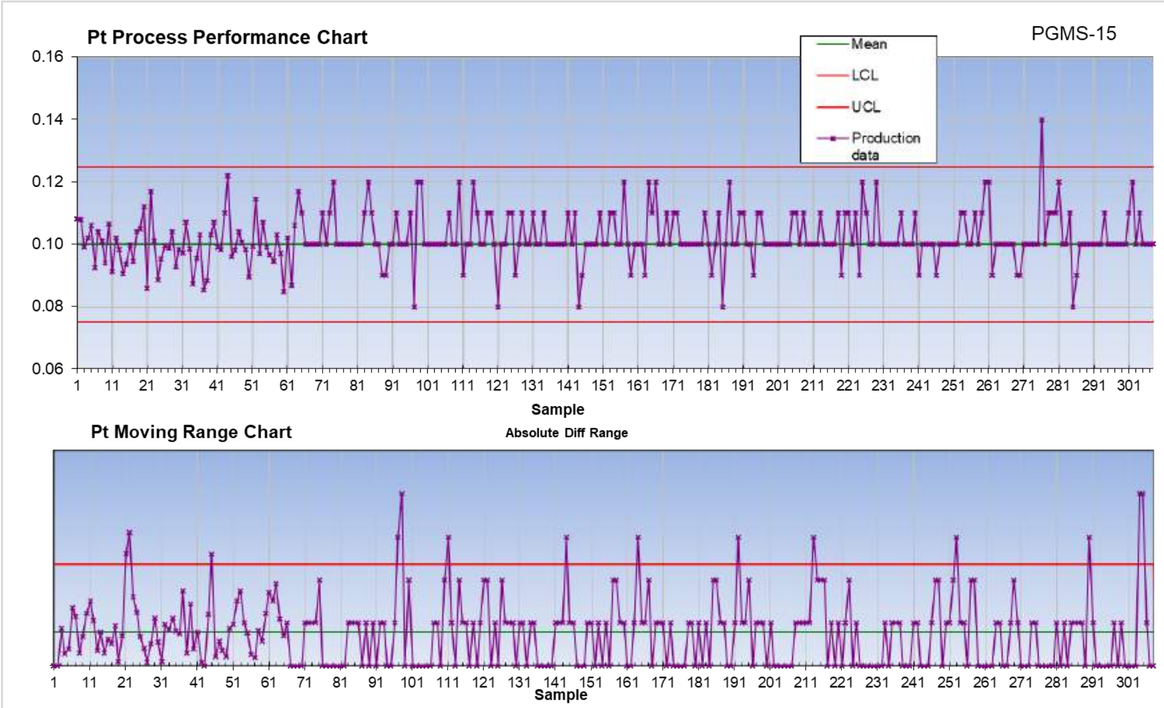


Figure 55: Current Deposit standard PGMS-15 Pt (g/t)

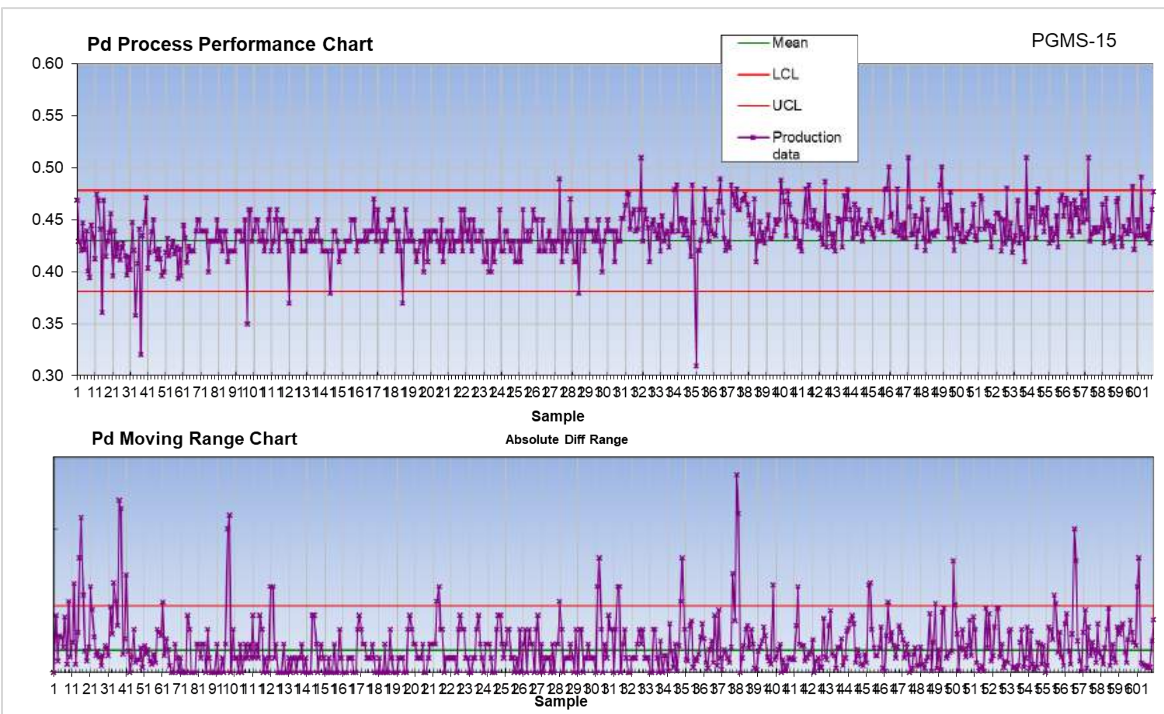


Figure 56: Current Deposit standard PGMS-15 Pd (g/t)

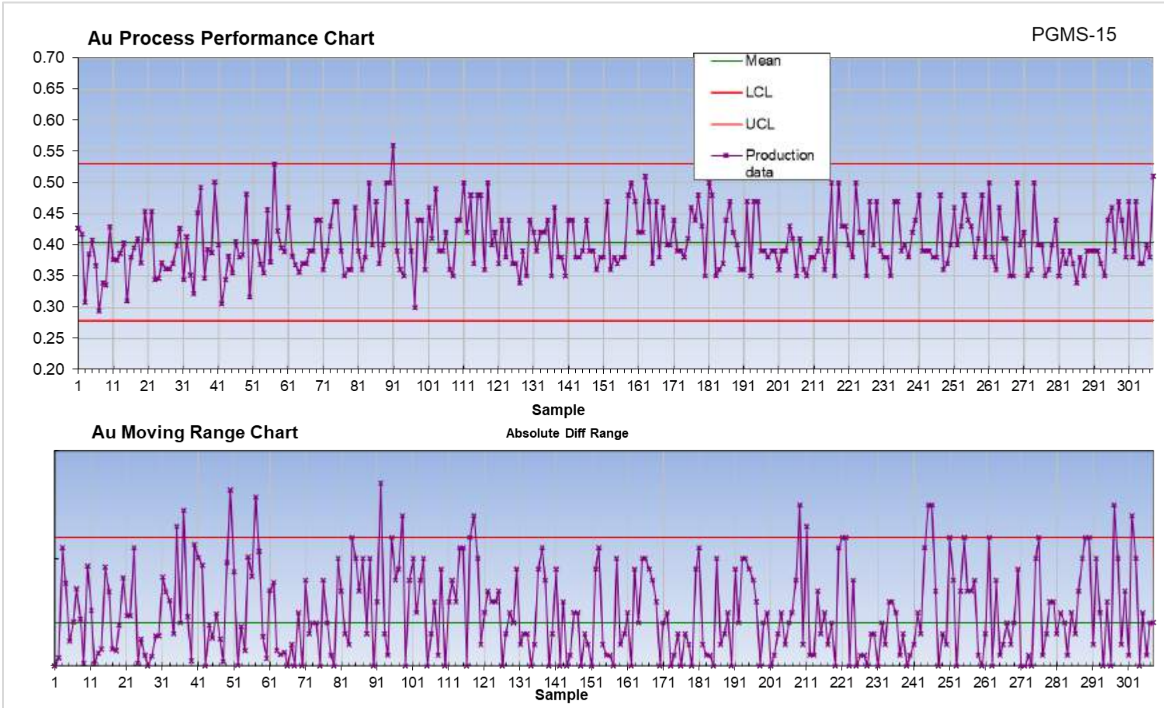


Figure 57: Current Deposit standard PGMS-15 Au (g/t)

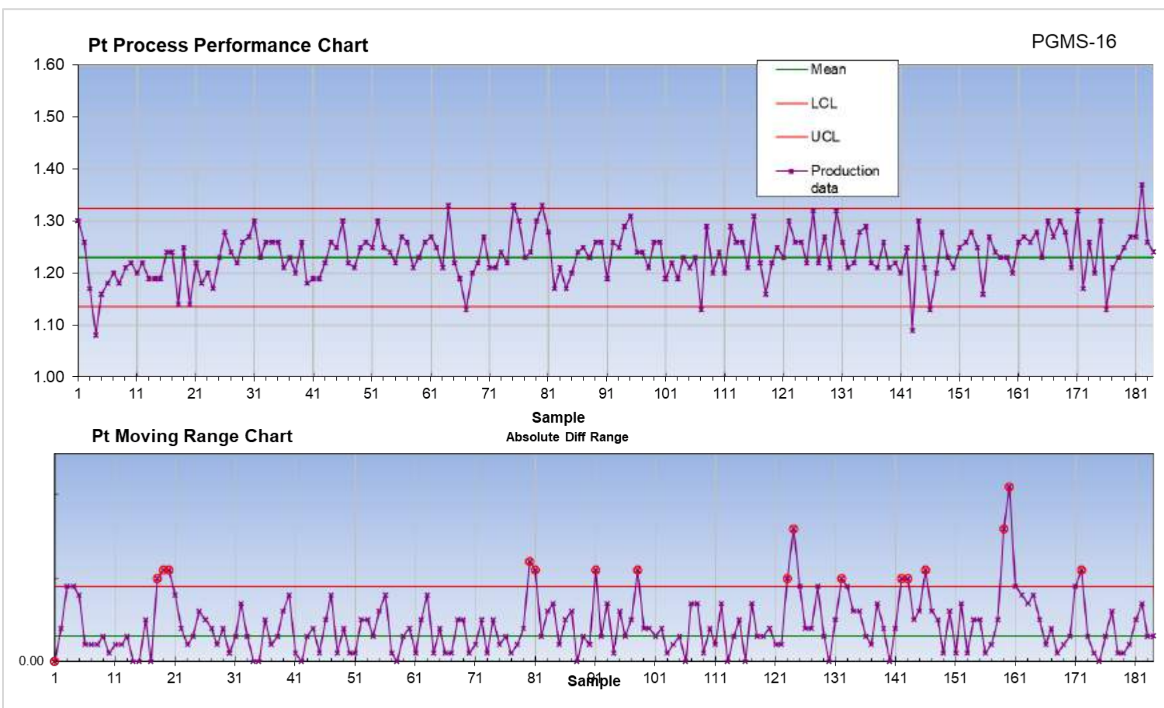


Figure 58: Current Deposit standard PGMS-16 Pt (g/t)

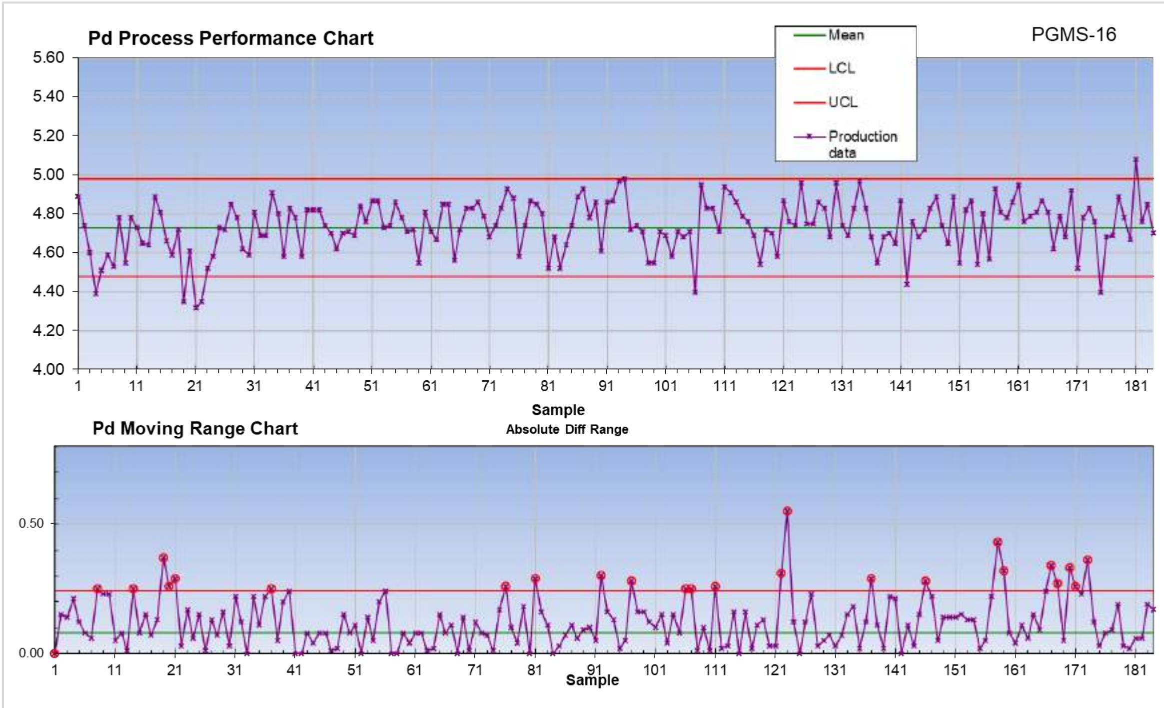


Figure 59: Current Deposit standard PGMS-16 Pd (g/t)

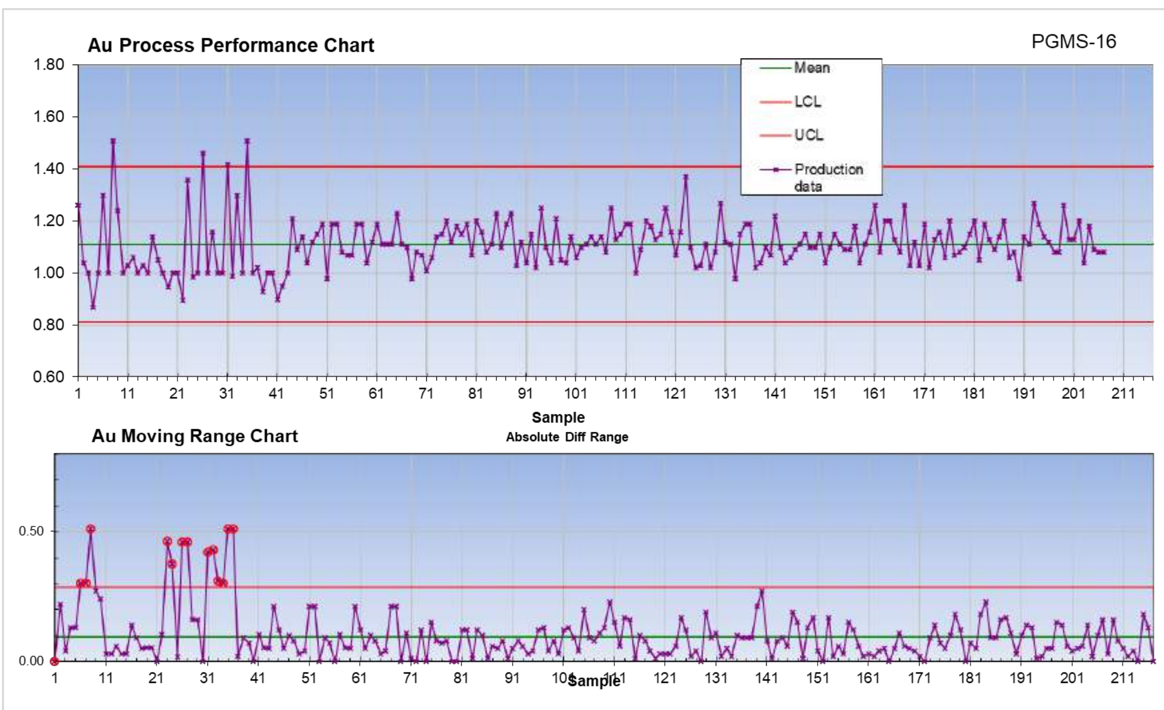


Figure 60: Current Deposit standard PGMS-16 Au (g/t)

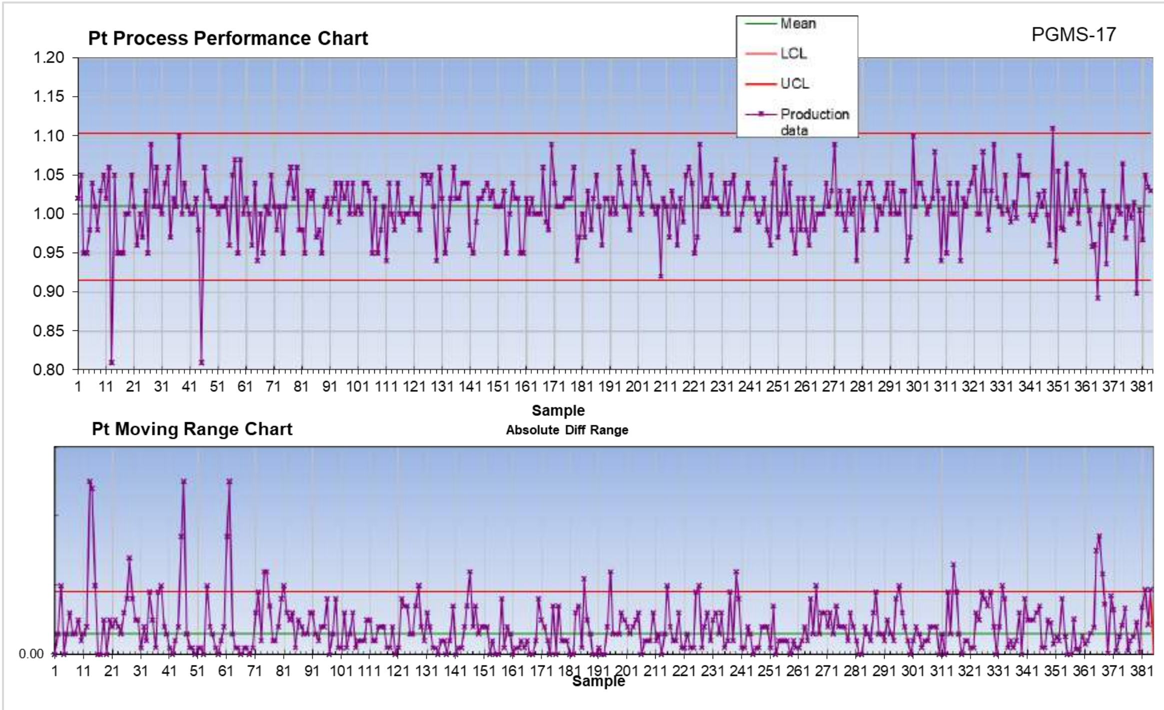


Figure 61: Current Deposit standard PGMS-17 Pt (g/t)

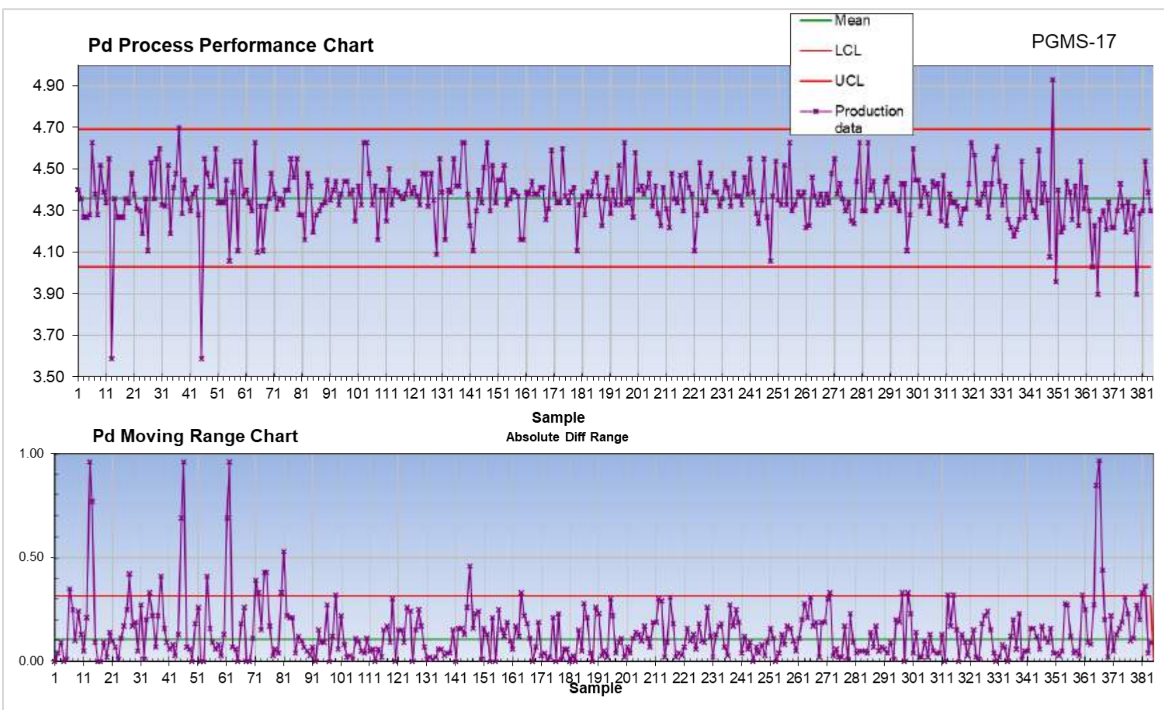


Figure 62: Current Deposit standard PGMS-17 Pd (g/t)

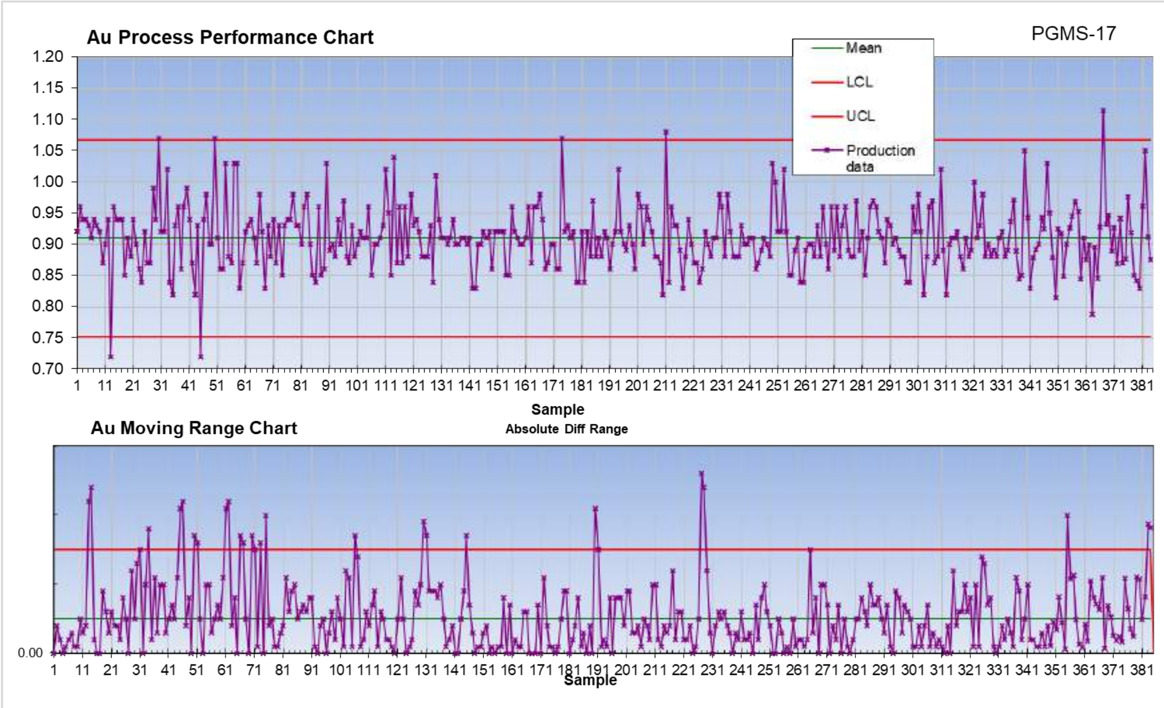


Figure 63: Current Deposit standard PGMS-17 Au (g/t)

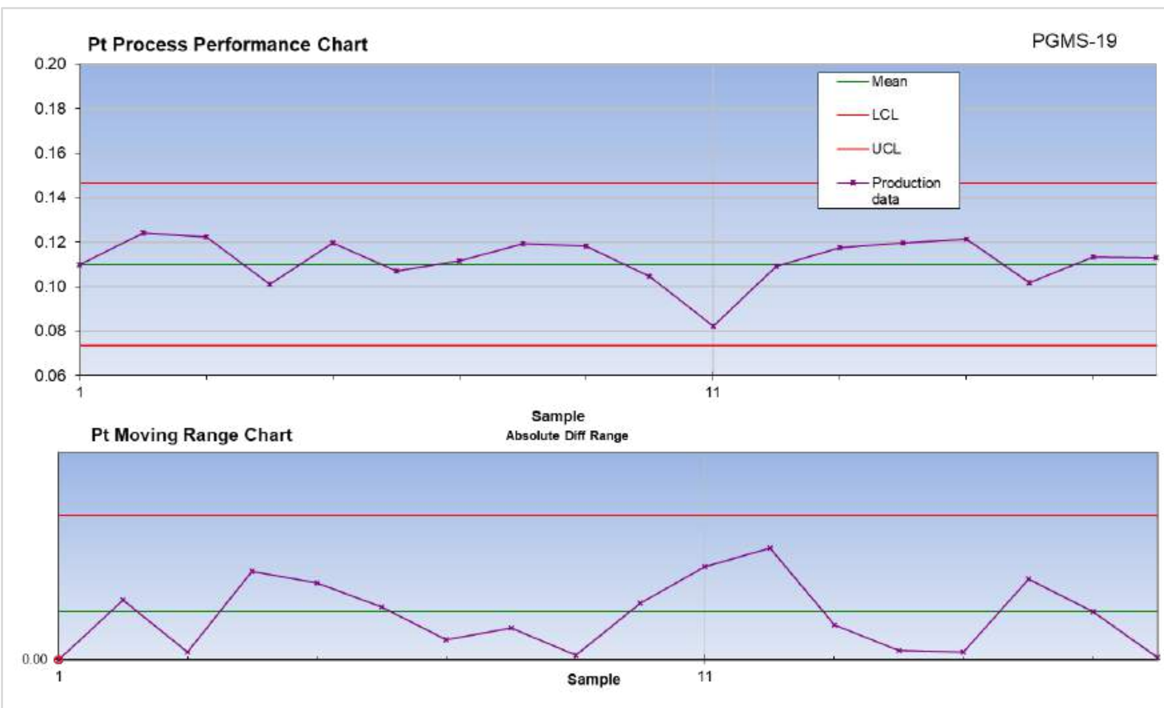


Figure 64: Current Deposit standard PGMS-19 Pt (g/t)

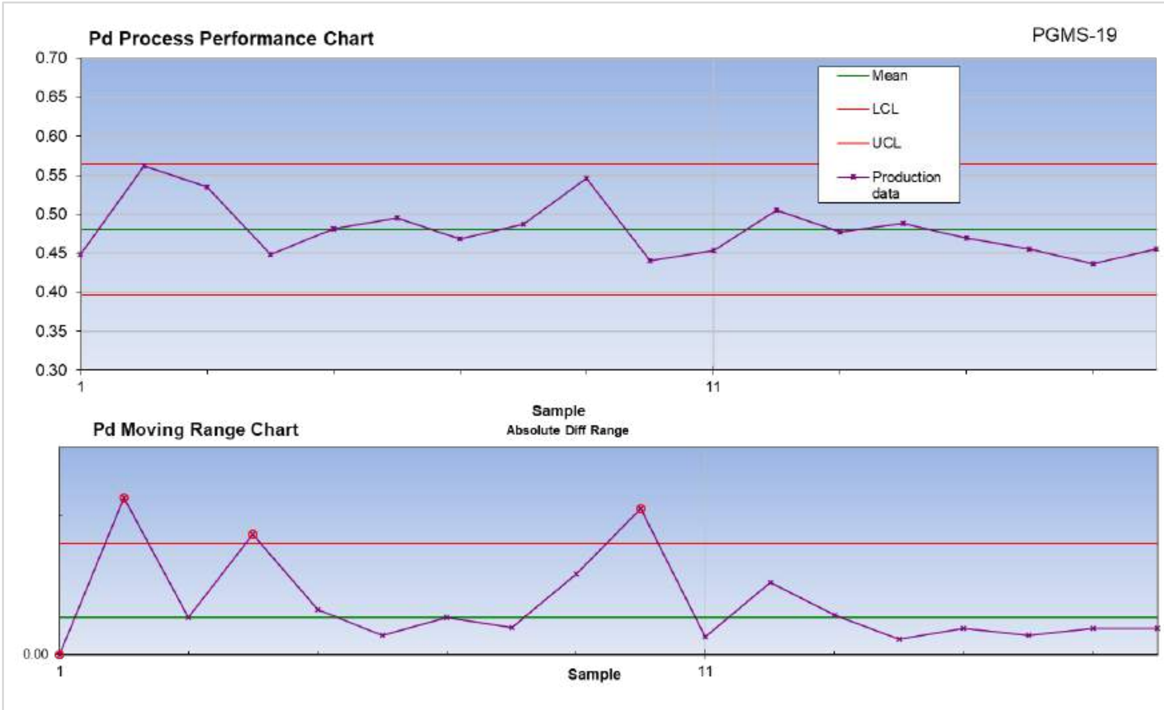


Figure 65: Current Deposit standard PGMS-19 Pd (g/t)

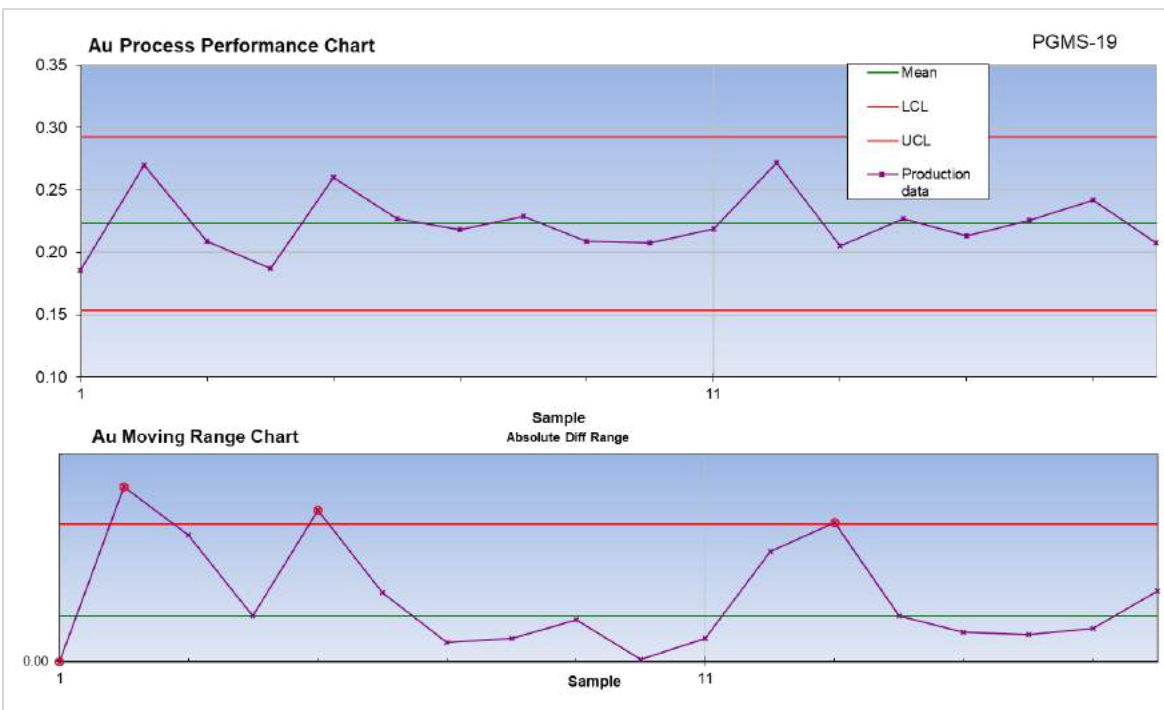


Figure 66: Current Deposit standard PGMS-19 Au (g/t)

Blanks

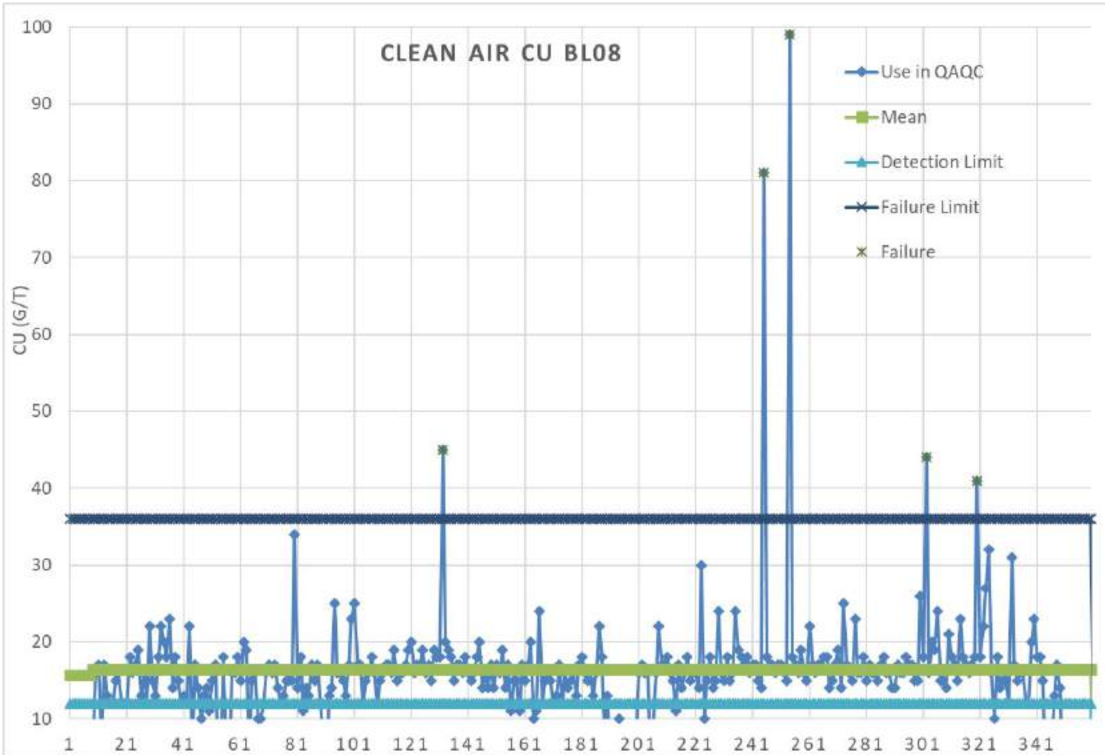


Figure 67: Current Deposit BL08 coarse blanks for Cu (g/t)

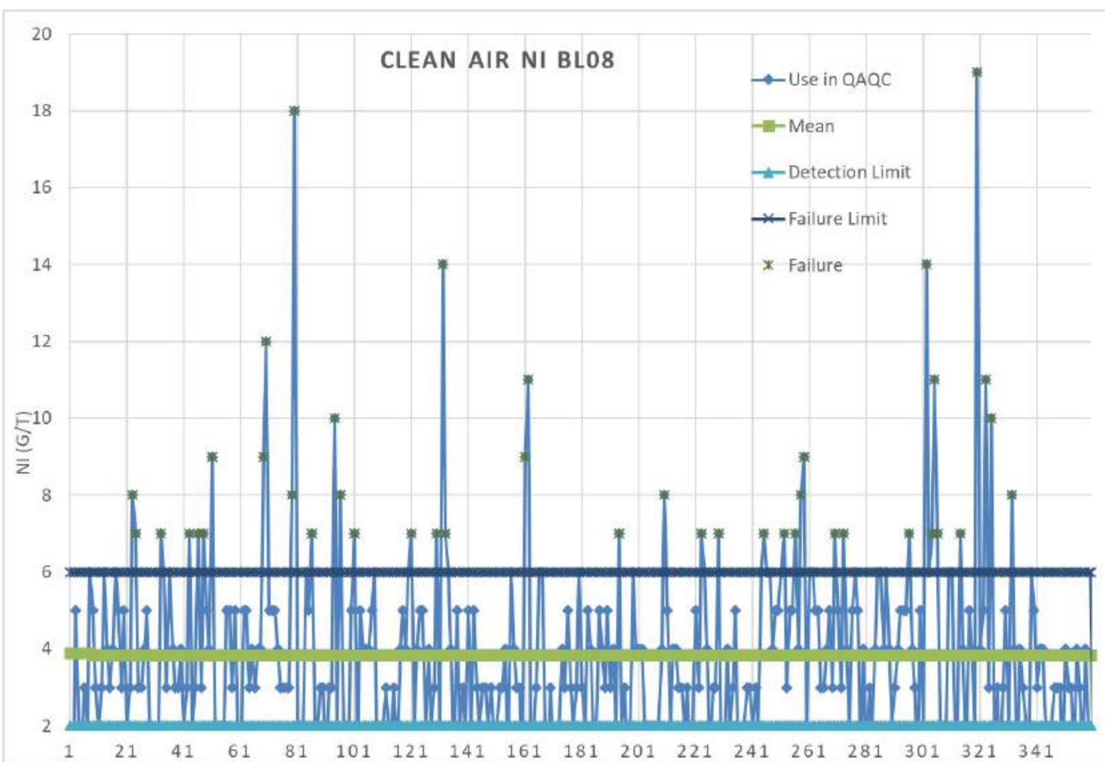


Figure 68: Current Deposit BL08 coarse blanks for Ni (g/t)

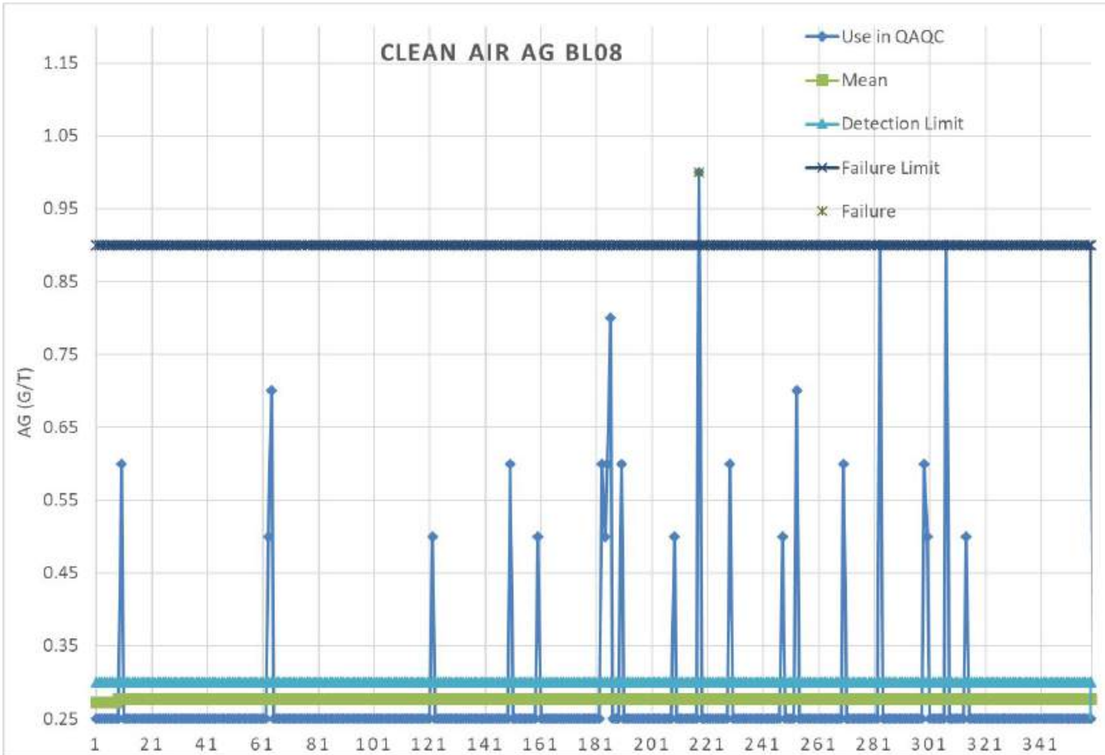


Figure 69: Current Deposit BL08 coarse blanks for Ag (g/t)

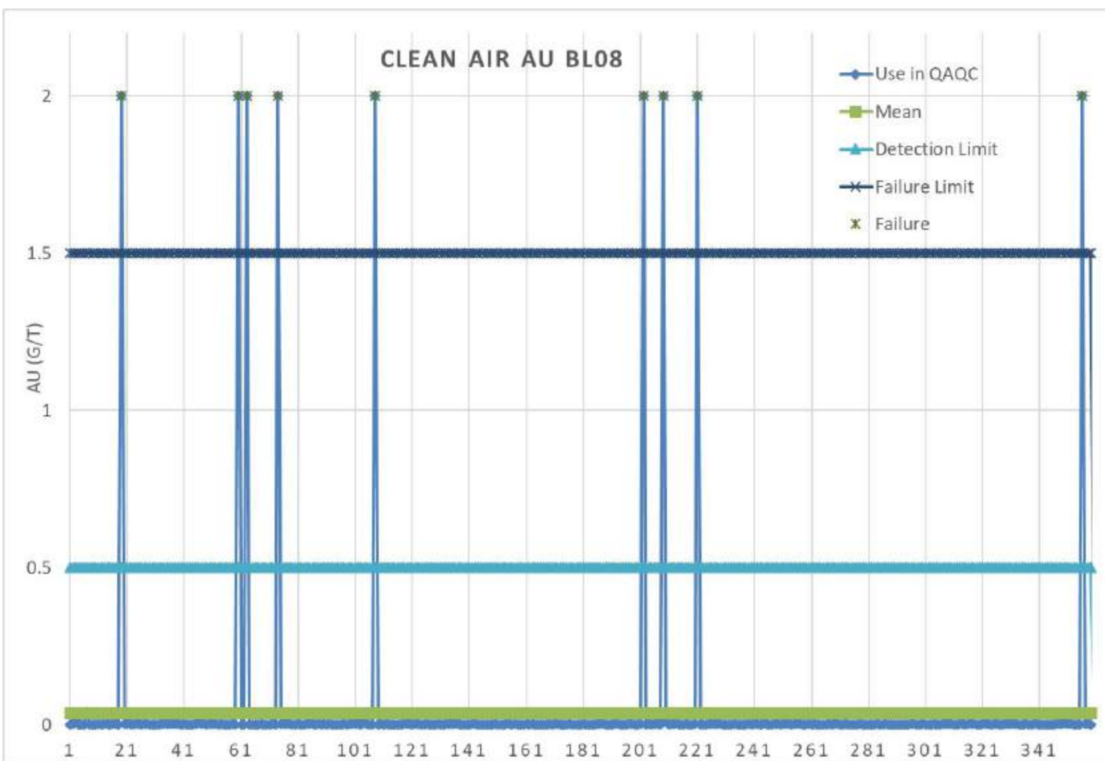


Figure 70: Current Deposit BL08 coarse blanks for Au (g/t)

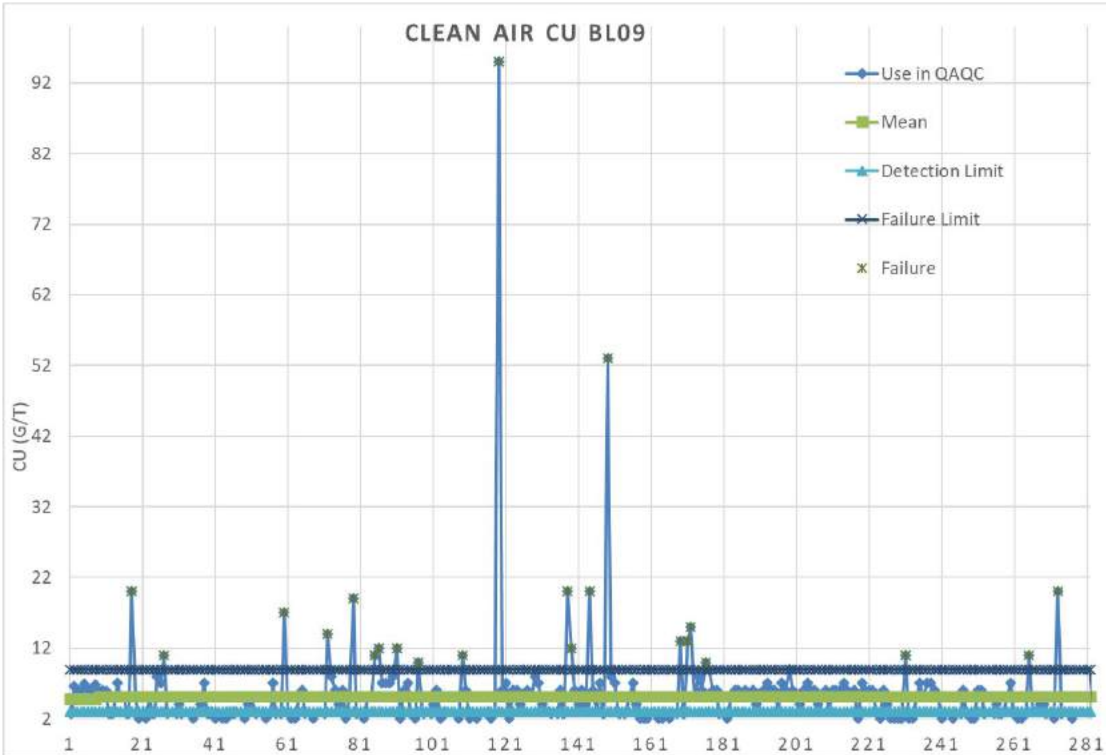


Figure 71: Current Deposit BL09 coarse blanks for Cu (g/t)

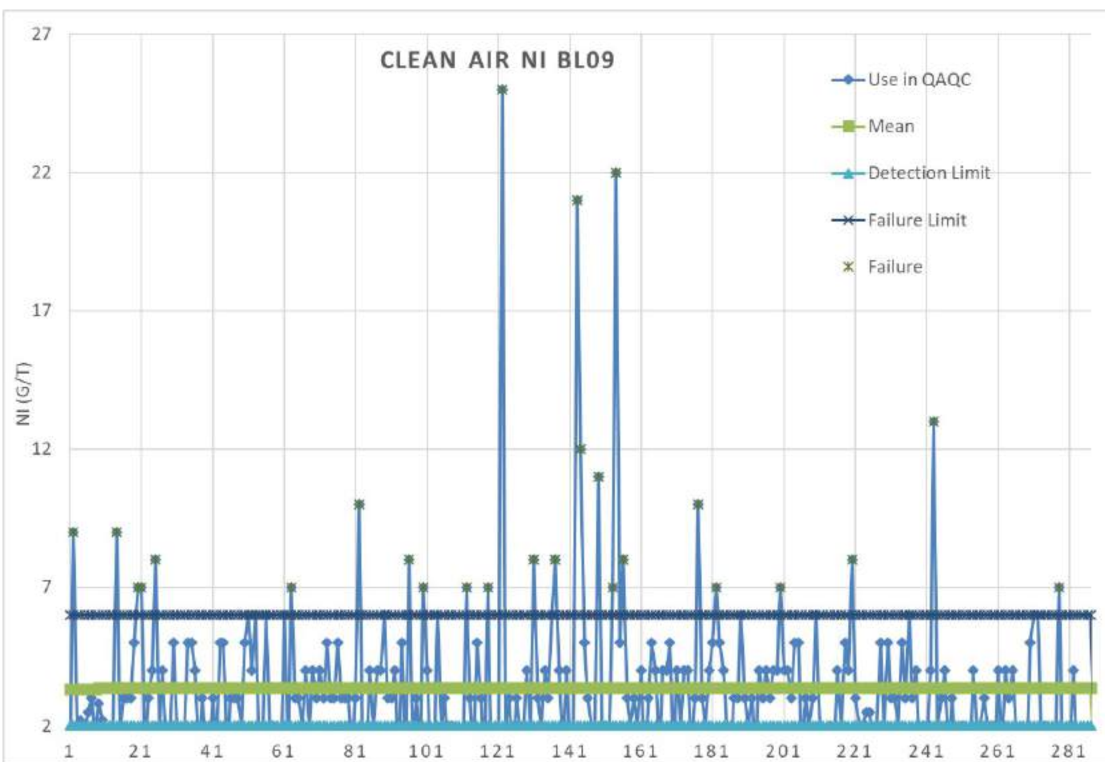


Figure 72: Current Deposit BL09 coarse blanks for Ni (g/t)

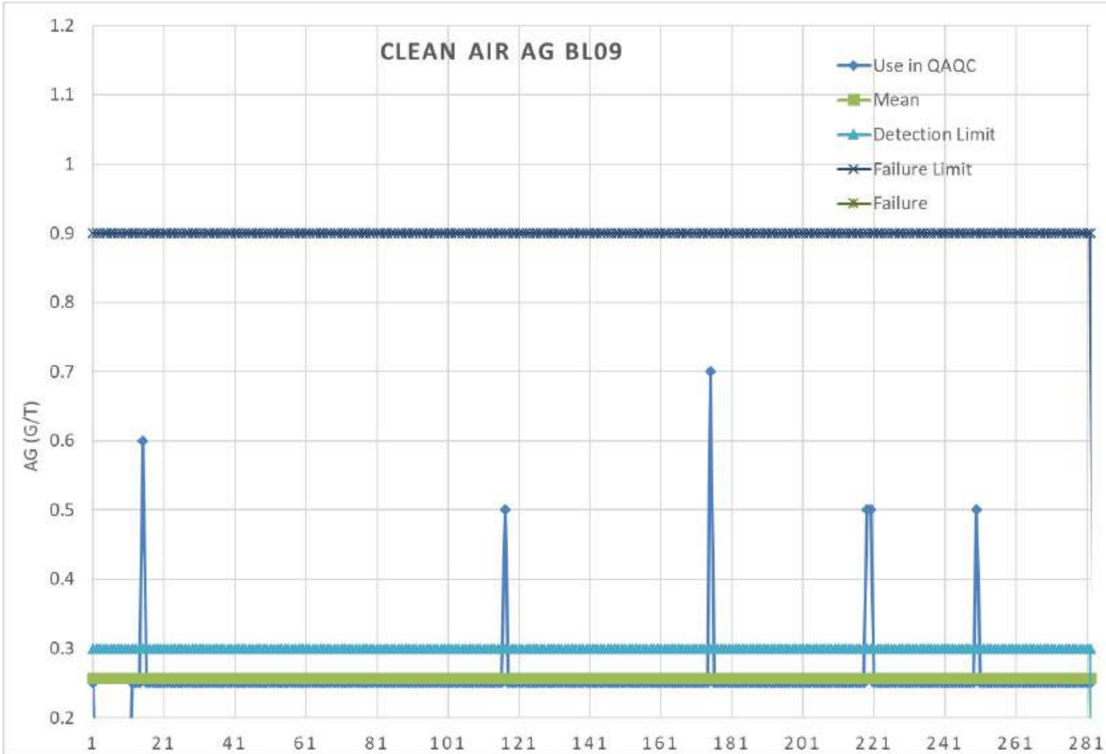


Figure 73: Current Deposit BL09 coarse blanks for Ag (g/t)

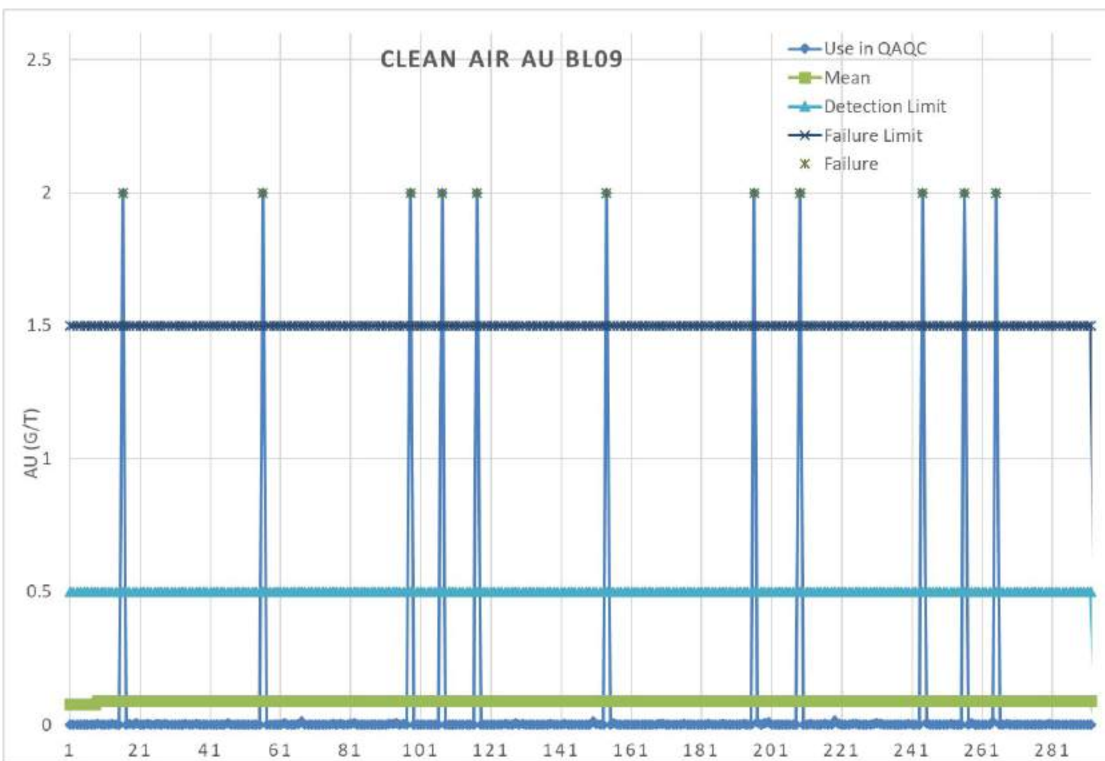


Figure 74: Current Deposit BL09 coarse blanks for Au (g/t)

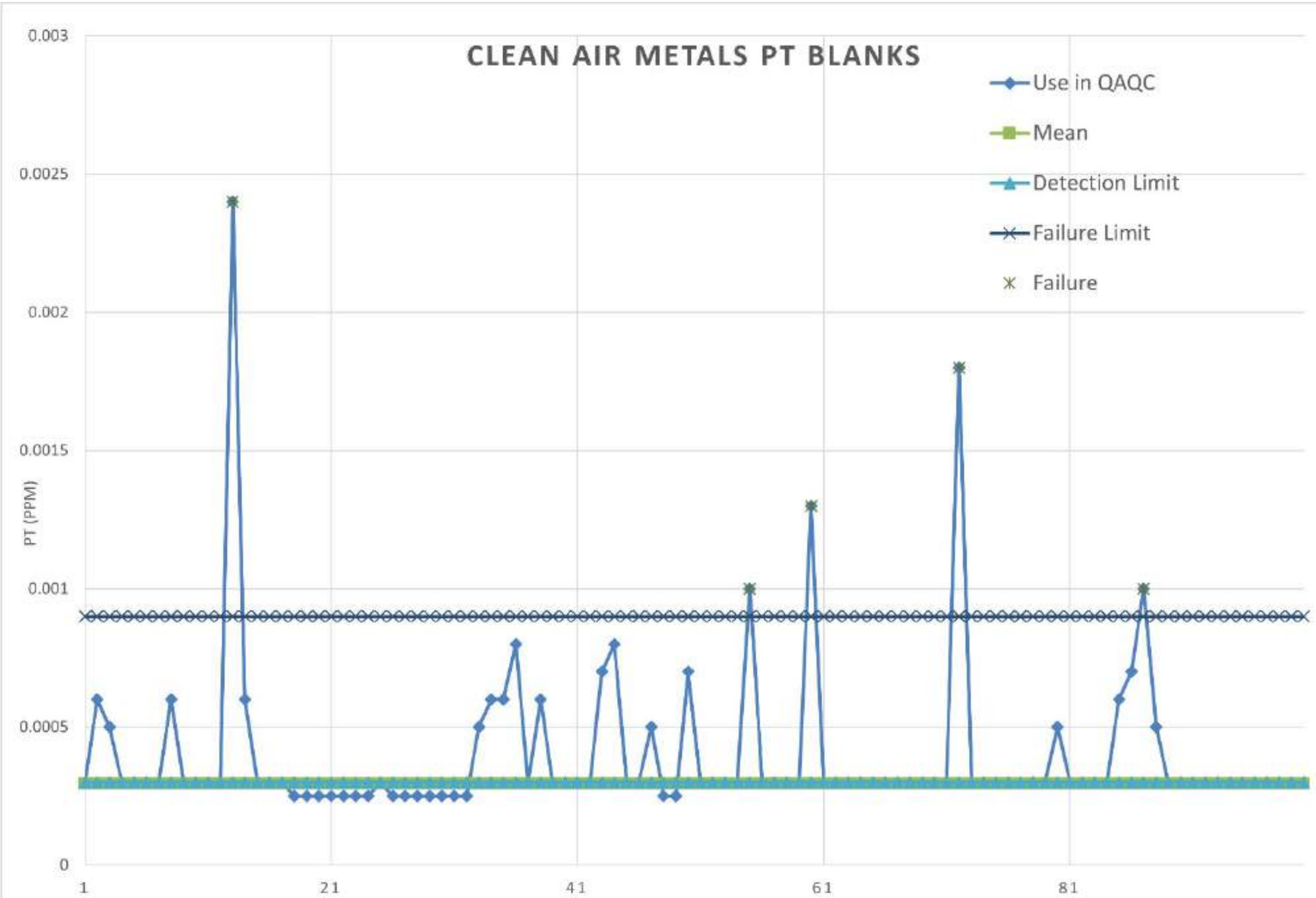


Figure 75: Current Deposit BL12 coarse blanks for Pt (g/t)

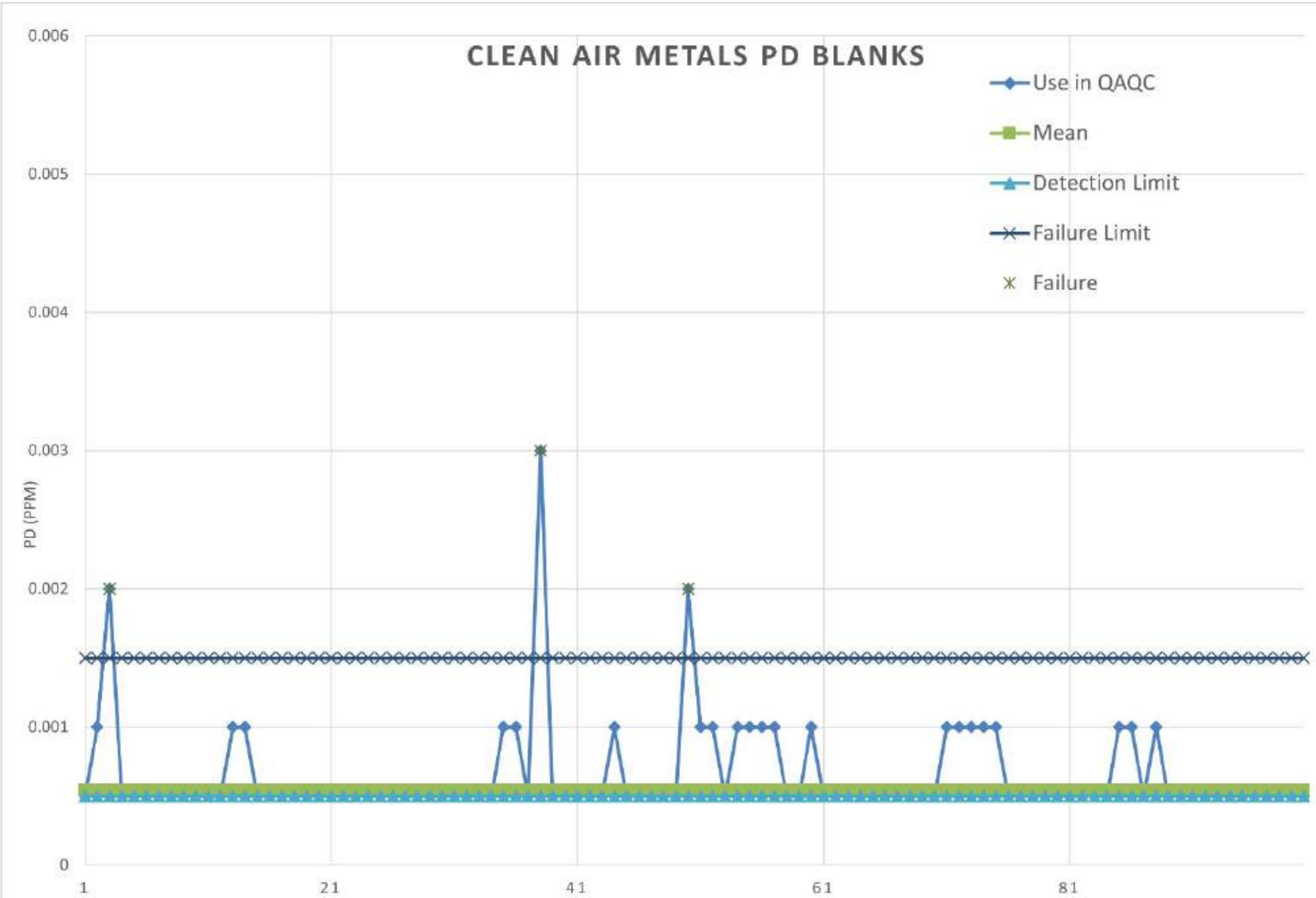


Figure 76: Current Deposit BL12 coarse blanks for Pd (g/t)

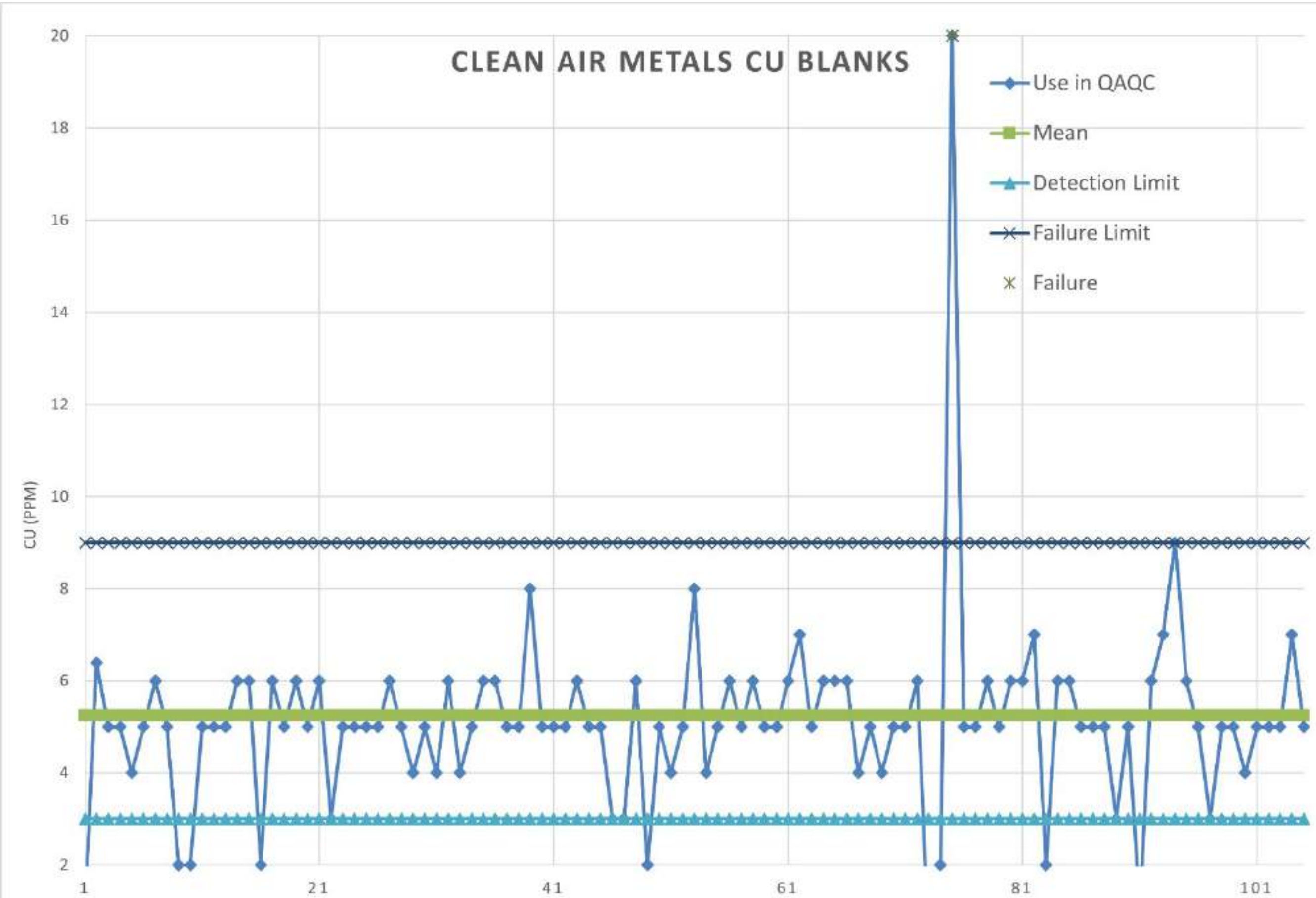


Figure 77: Current Deposit BL12 coarse blanks for Cu (g/t)

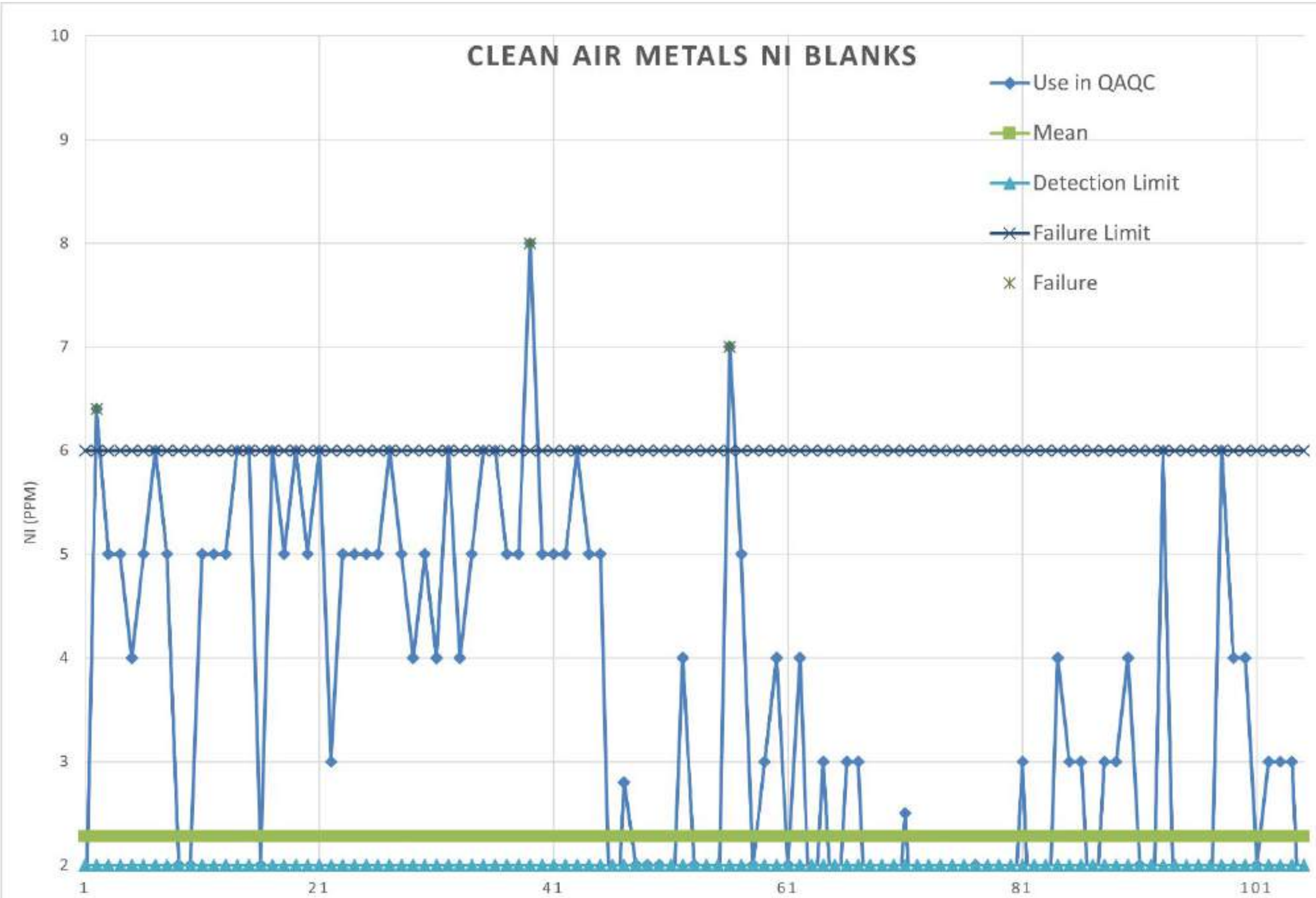


Figure 78: Current Deposit BL12 coarse blanks for Ni (g/t)

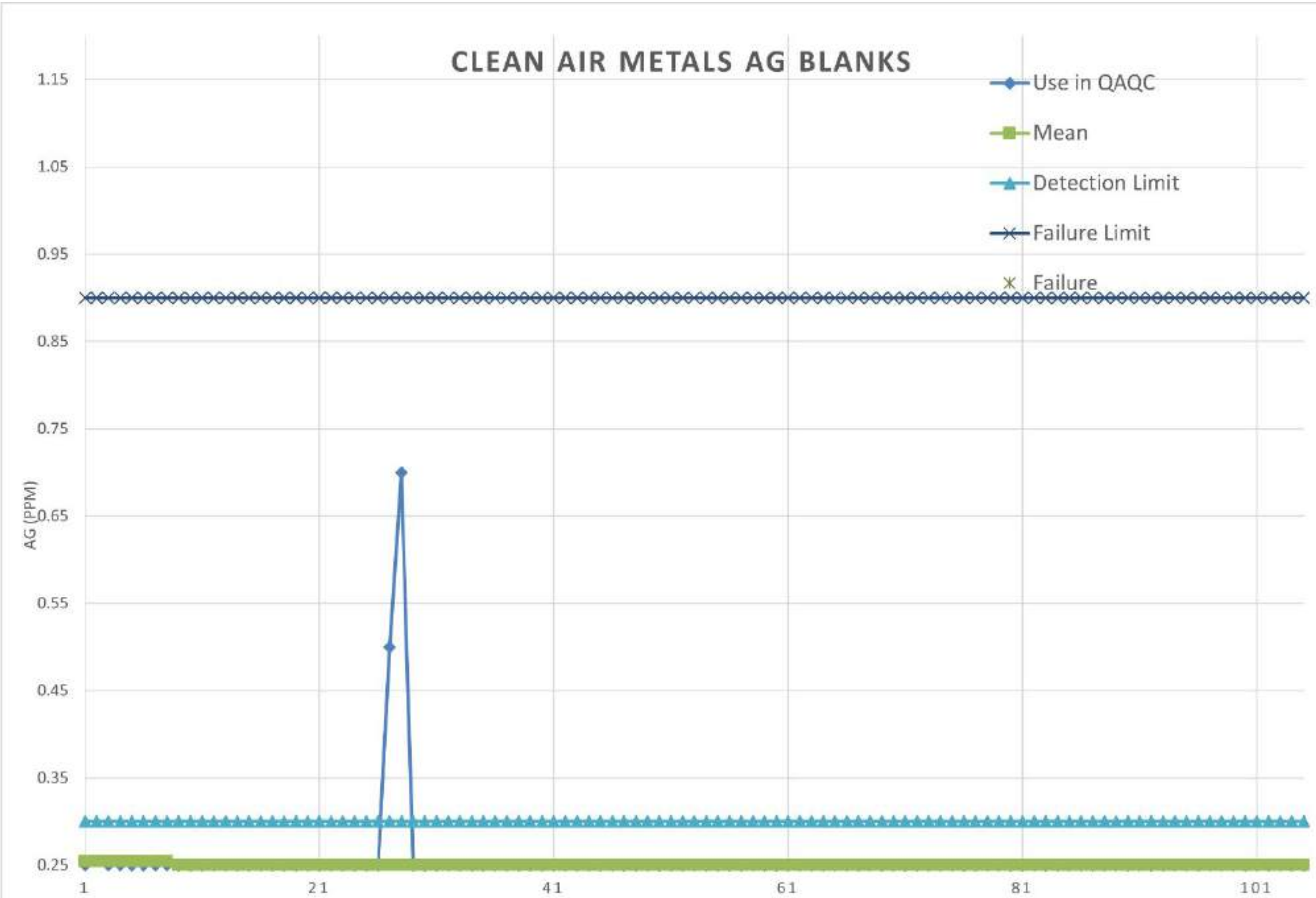


Figure 79: Current Deposit BL12 coarse blanks for Ag (g/t)

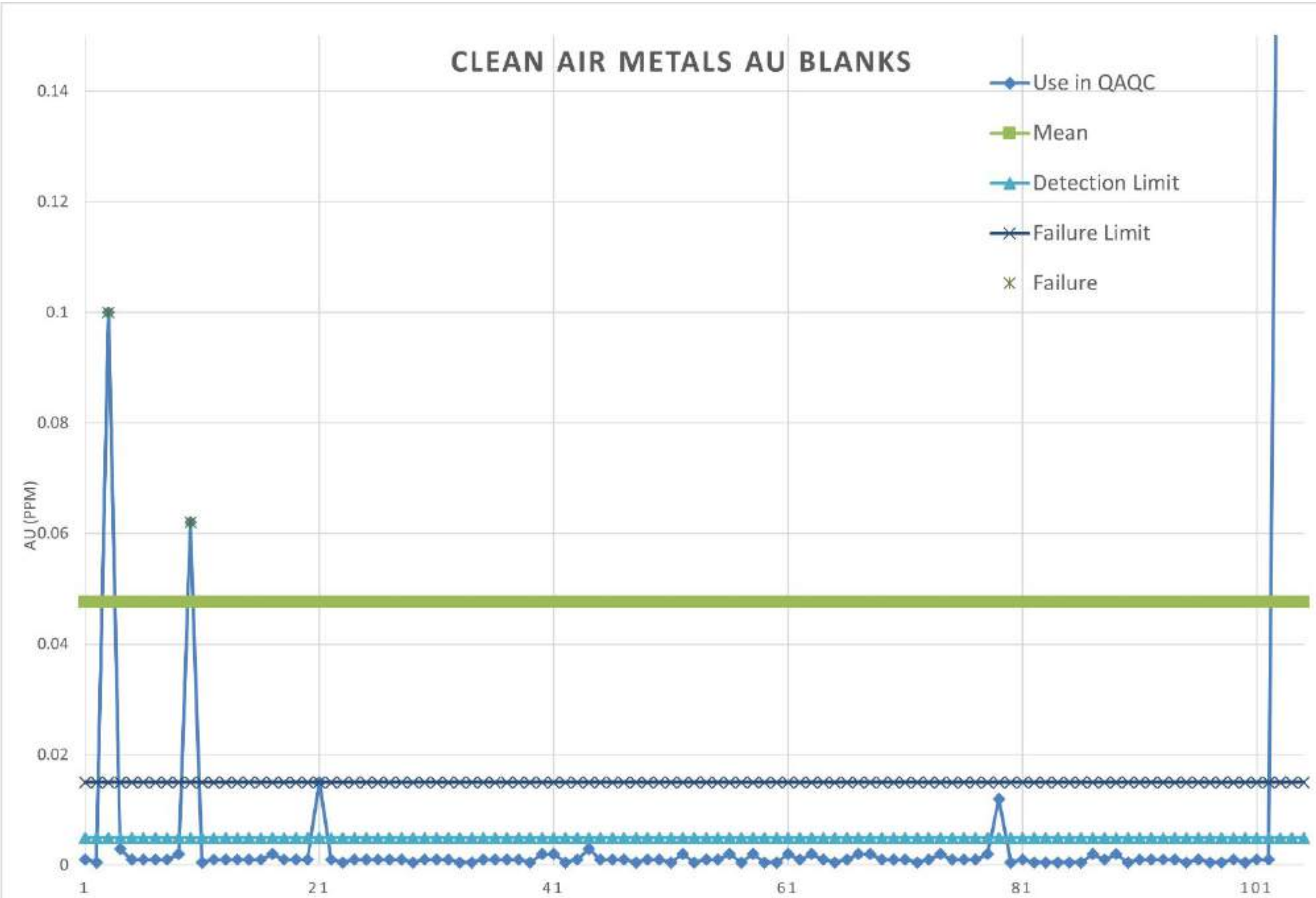


Figure 80: Current Deposit BL12 coarse blanks for Au (g/t)

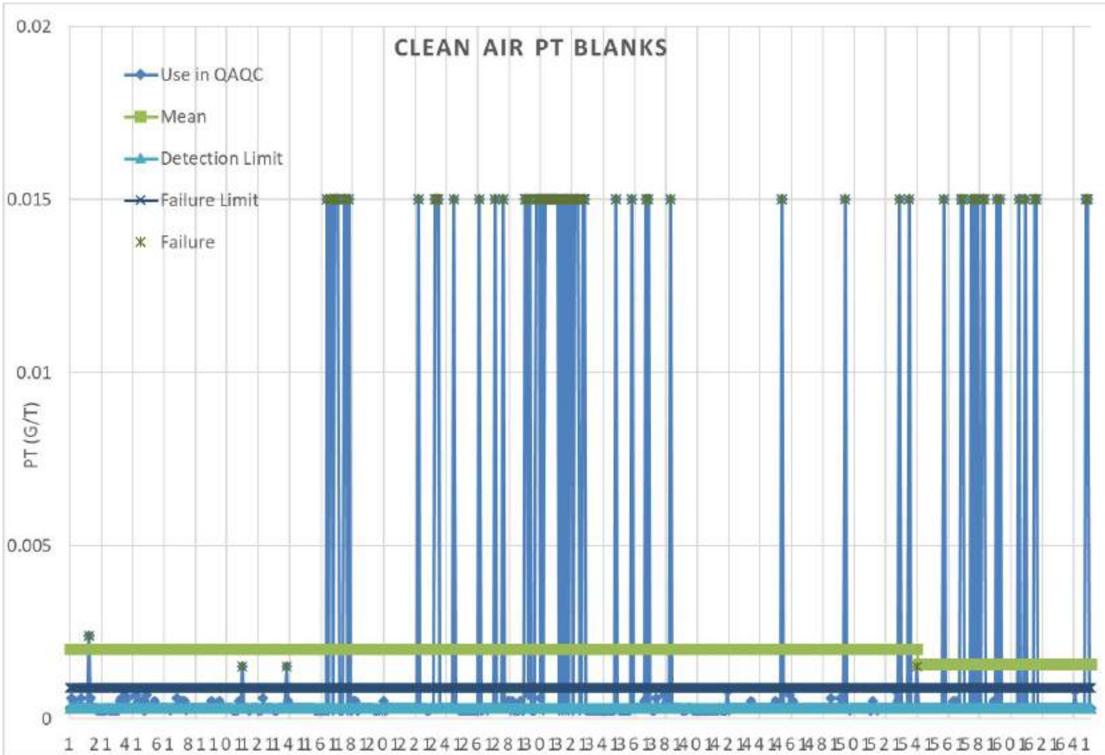


Figure 81: Current Deposit Blank coarse blanks for Pt (g/t)

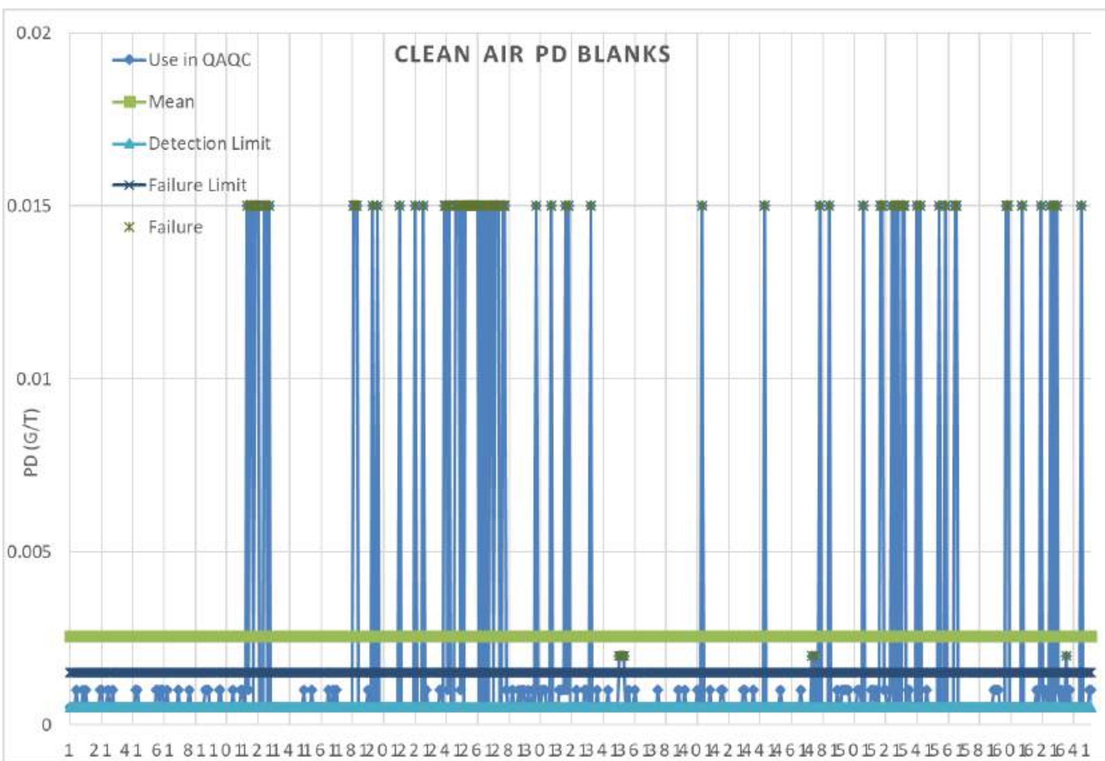


Figure 82: Current Deposit Blank coarse blanks for Pd (g/t)

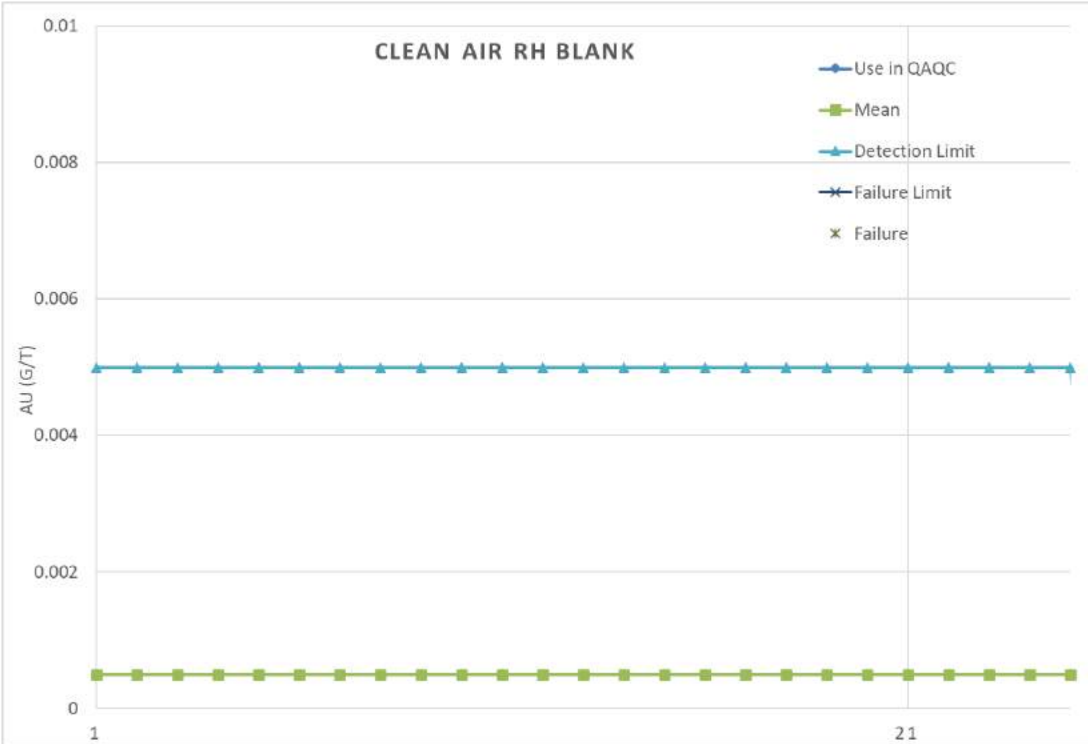


Figure 83: Current Deposit Blank coarse blanks for Rh (g/t)

ESCAPE DEPOSIT

Standards

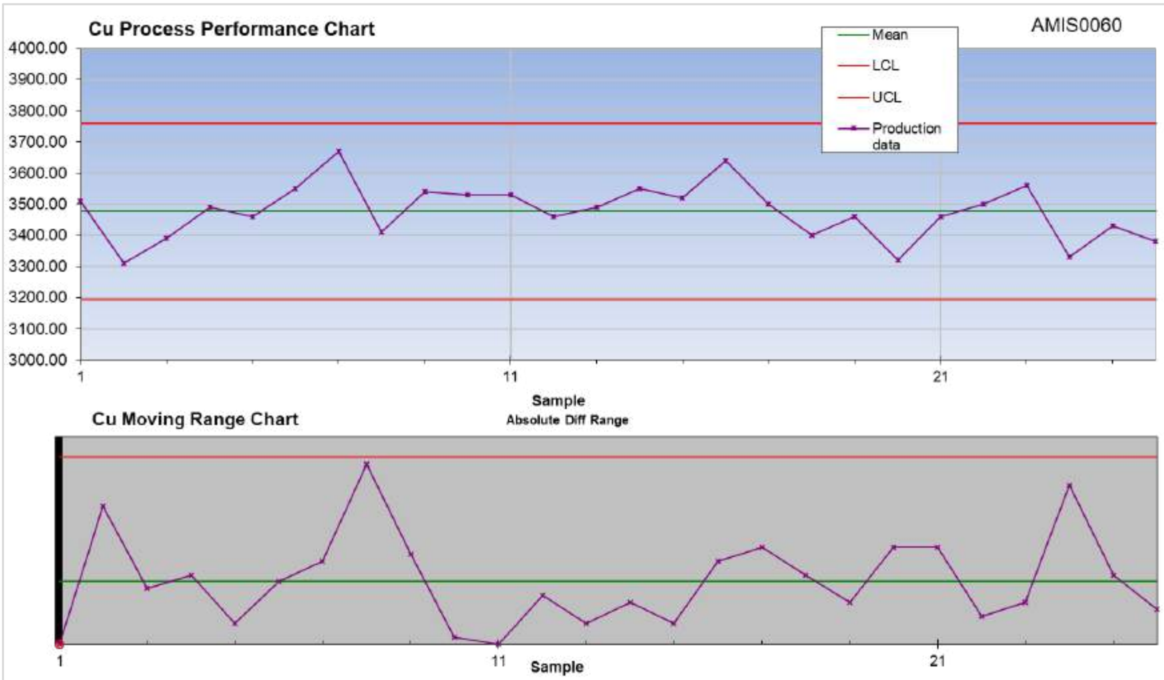


Figure 84: Escape Deposit standard AMIS0060 Cu (g/t)

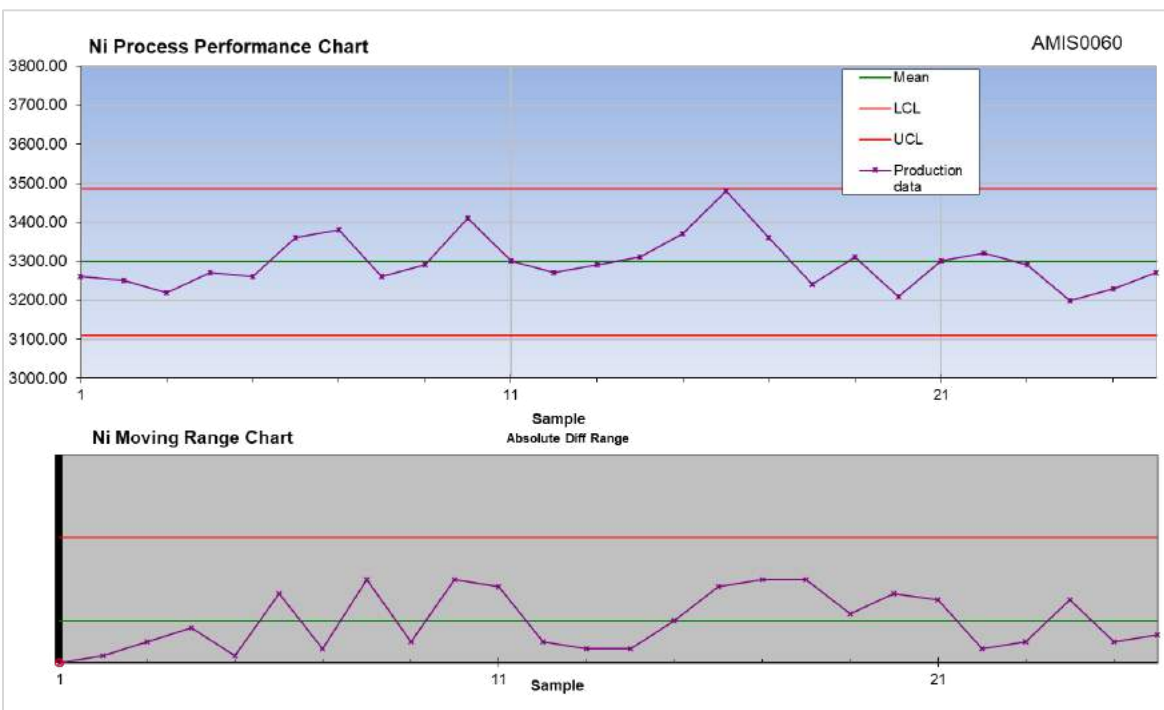


Figure 85: Escape Deposit standard AMIS0060 Ni (g/t)

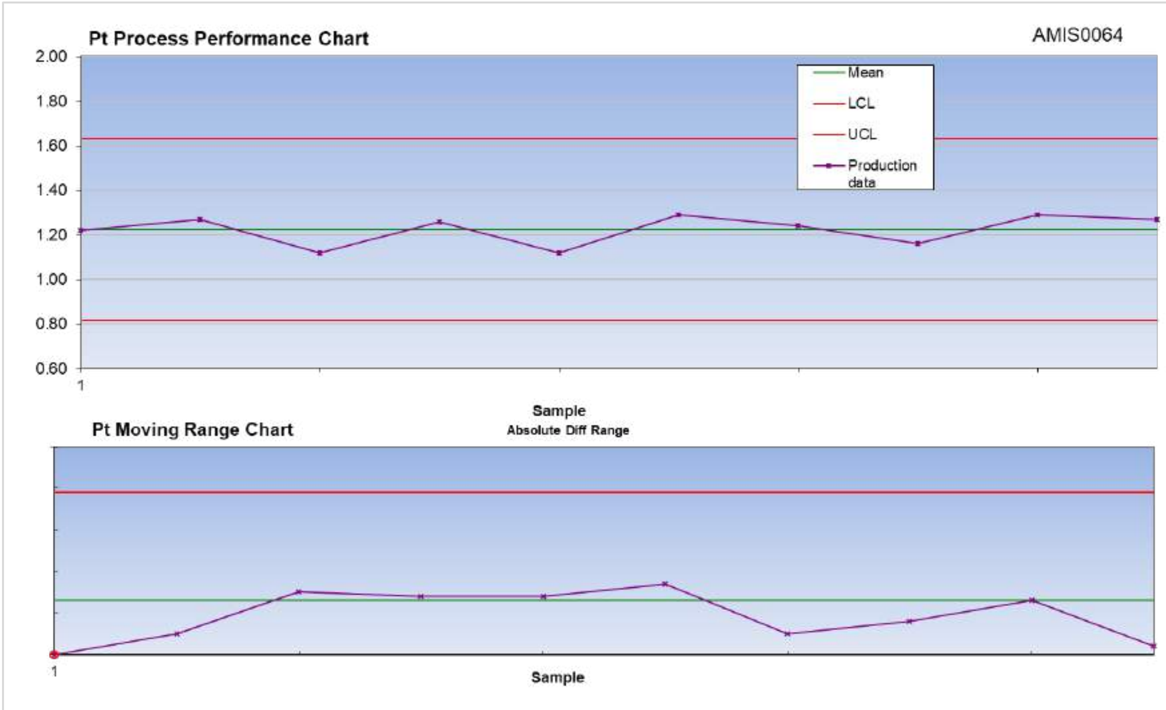


Figure 86: Escape Deposit standard AMIS0064 Pt (g/t)

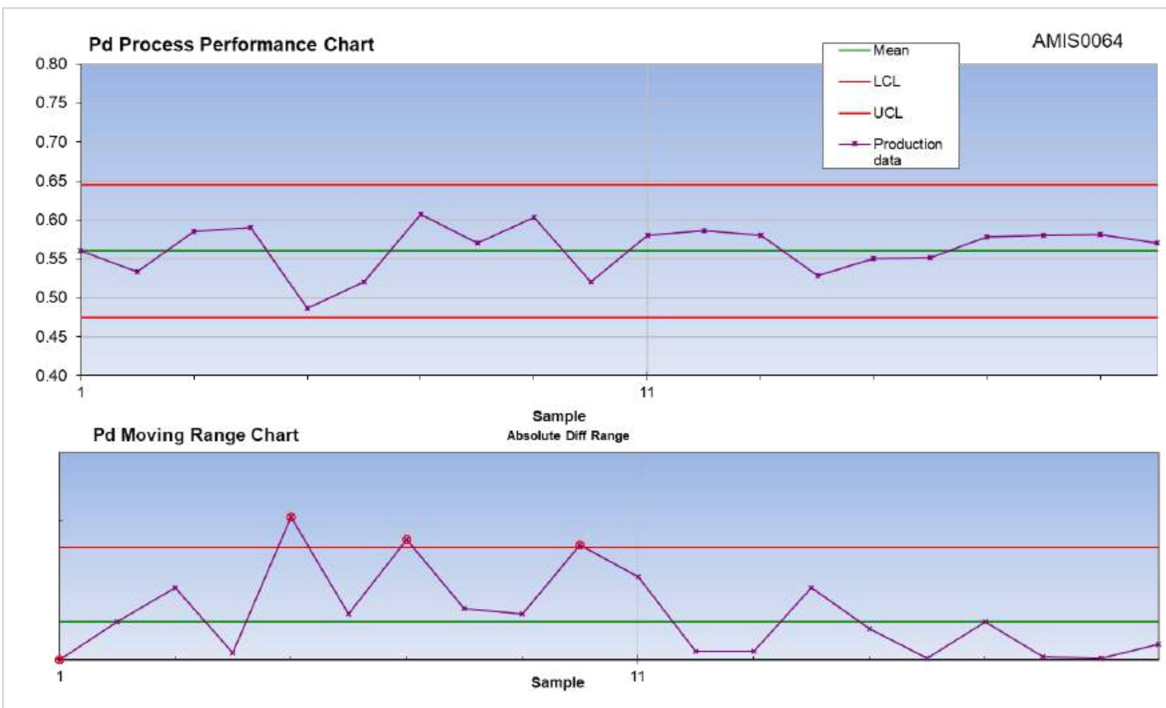


Figure 87: Escape Deposit standard AMIS0064 Pd (g/t)

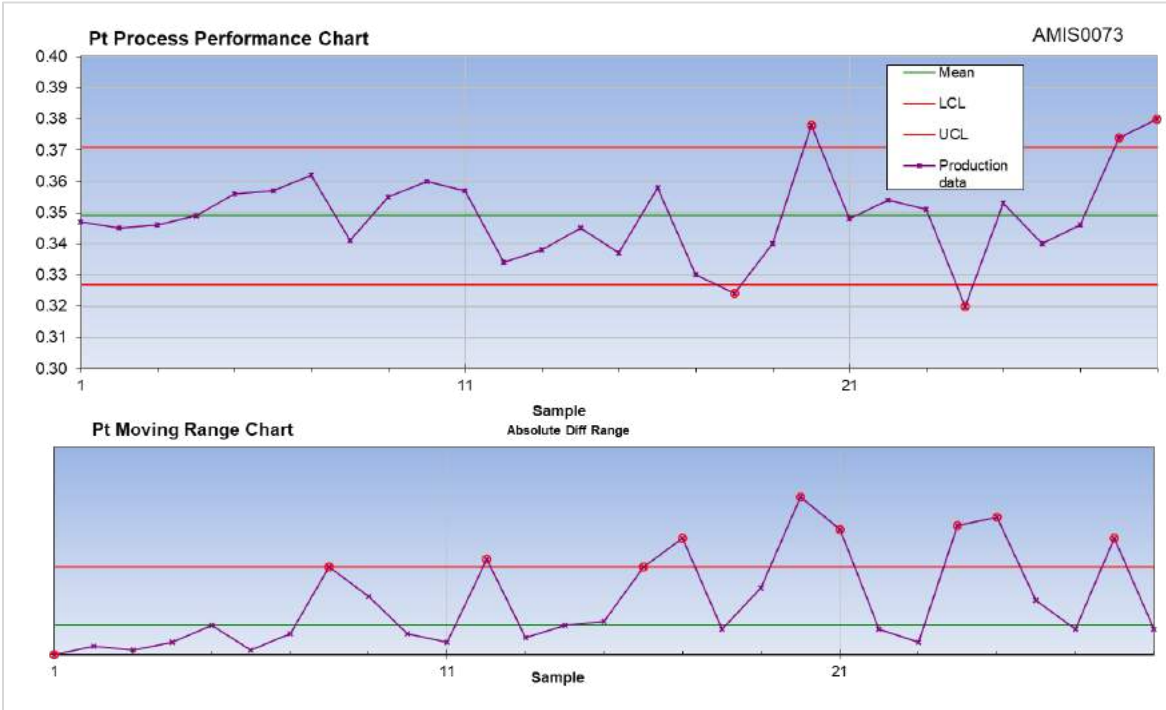


Figure 88: Escape Deposit standard AMIS0073 Pt (g/t)

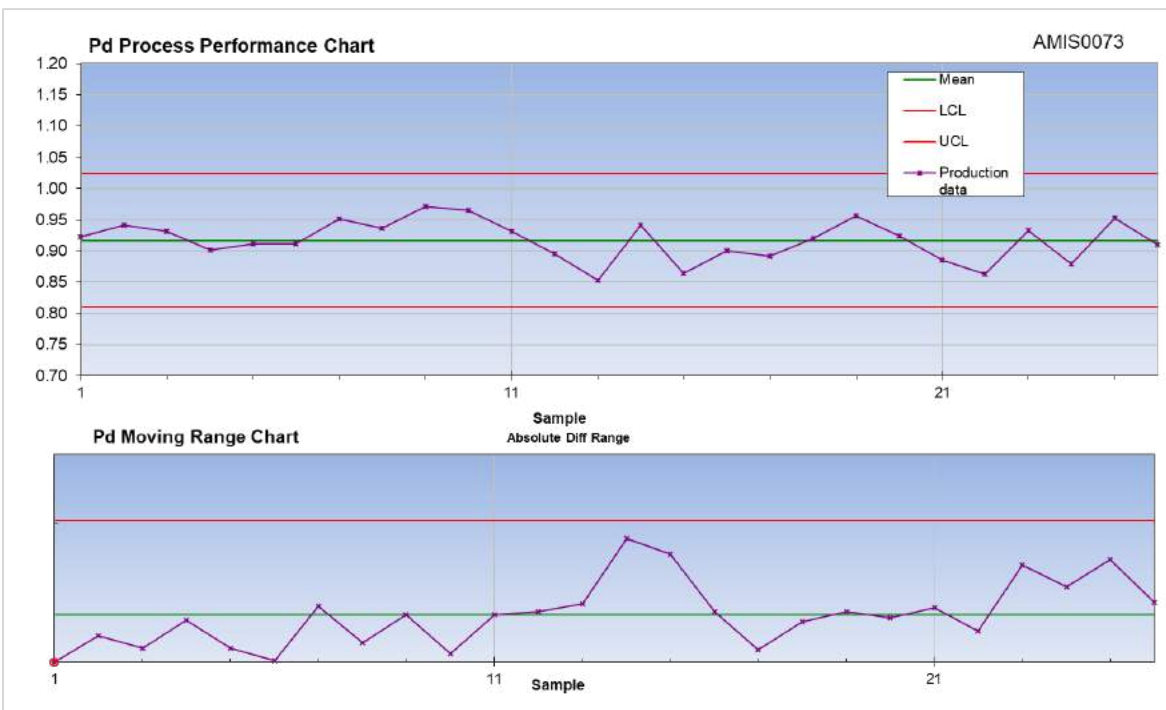


Figure 89: Escape Deposit standard AMIS0073 Pd (g/t)

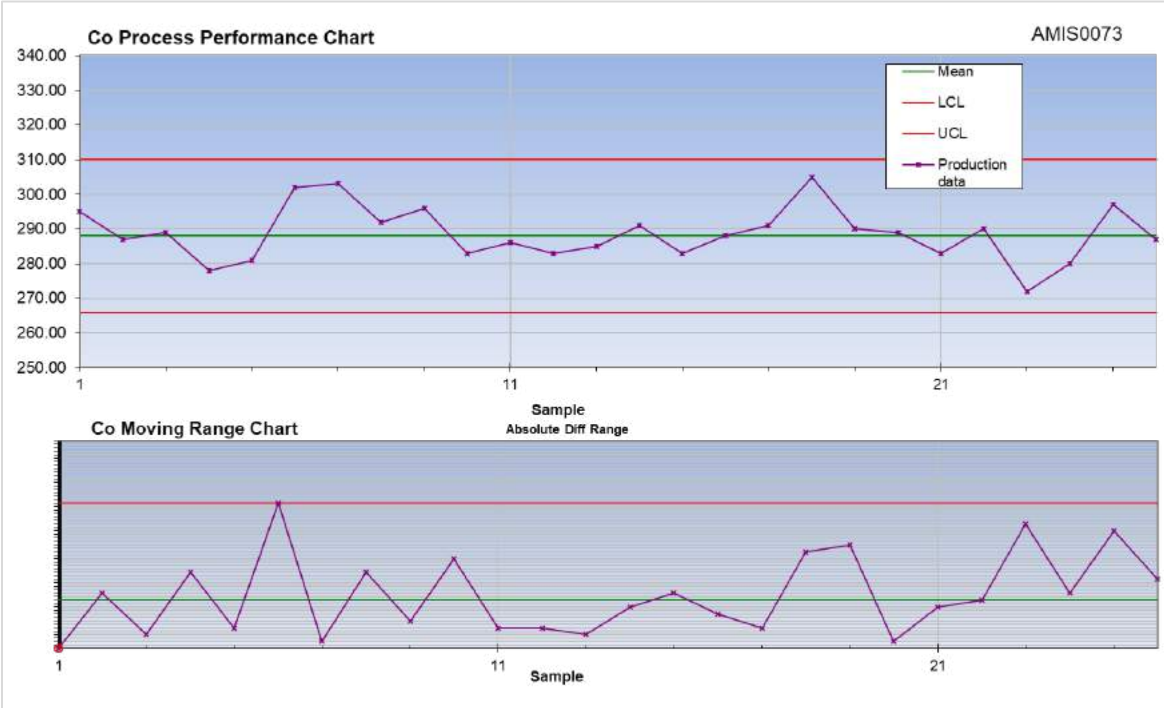


Figure 90: Escape Deposit standard AMIS0073 Co (g/t)

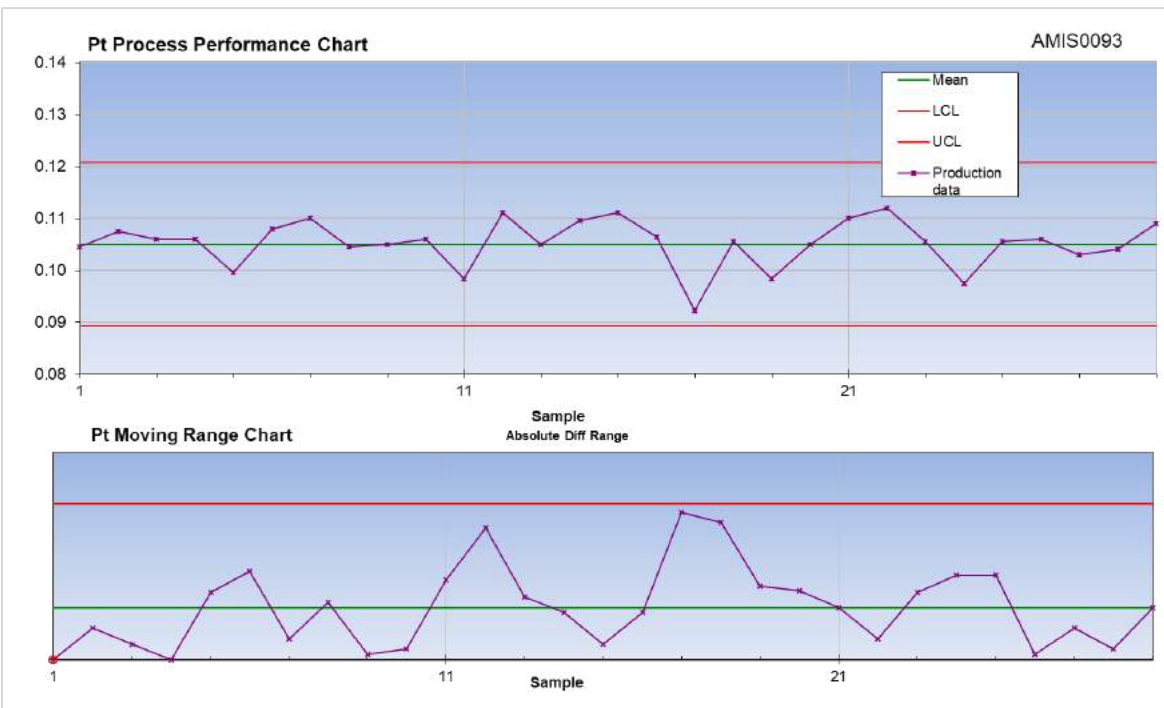


Figure 91: Escape Deposit standard AMIS0093 Pt (g/t)

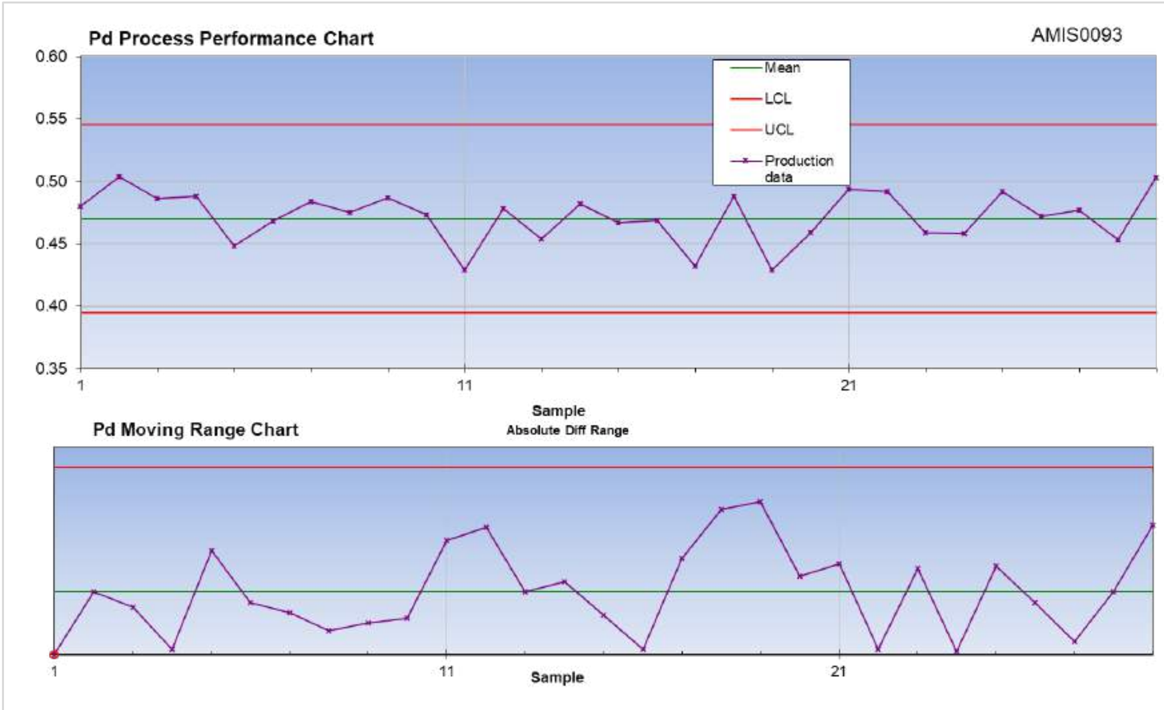


Figure 92: Escape Deposit standard AMIS0093 Pd (g/t)

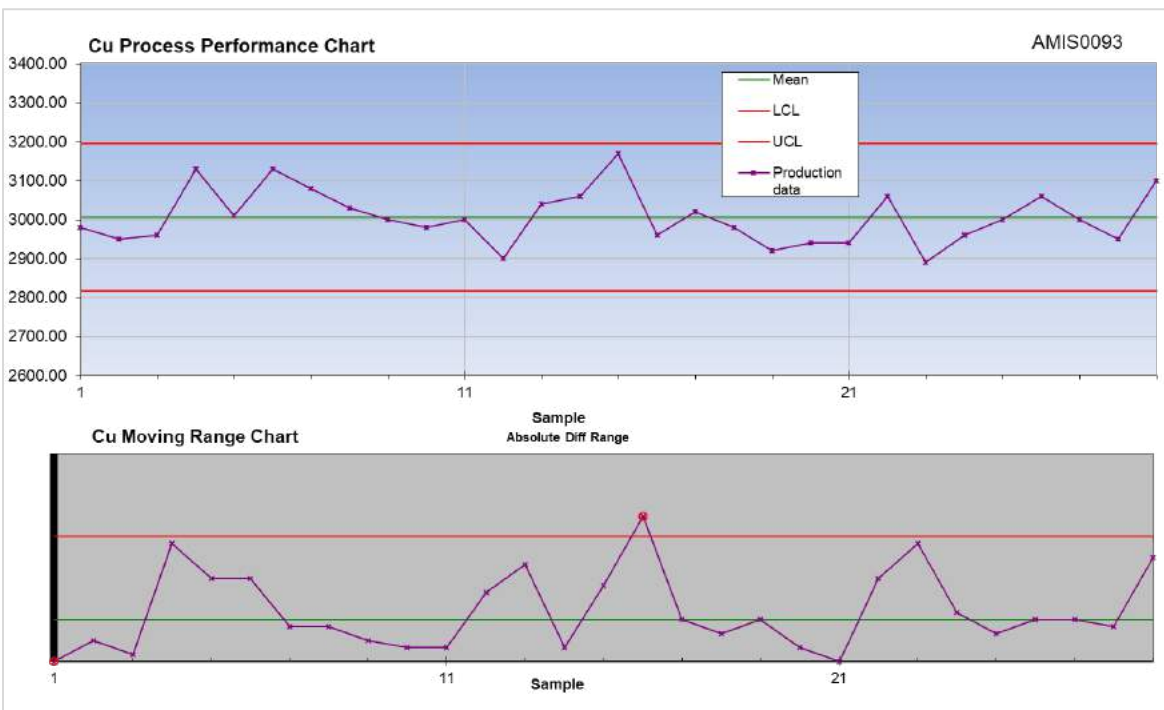


Figure 93: Escape Deposit standard AMIS0093 Cu (g/t)

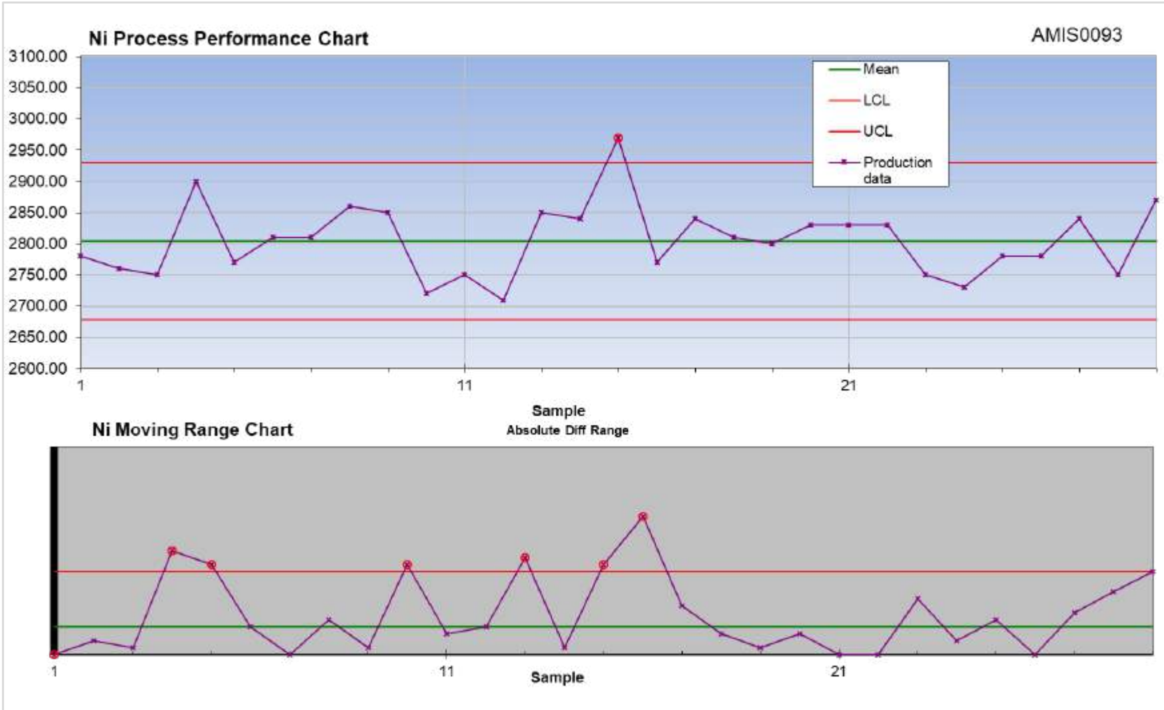


Figure 94: Escape Deposit standard AMIS0093 Ni (g/t)

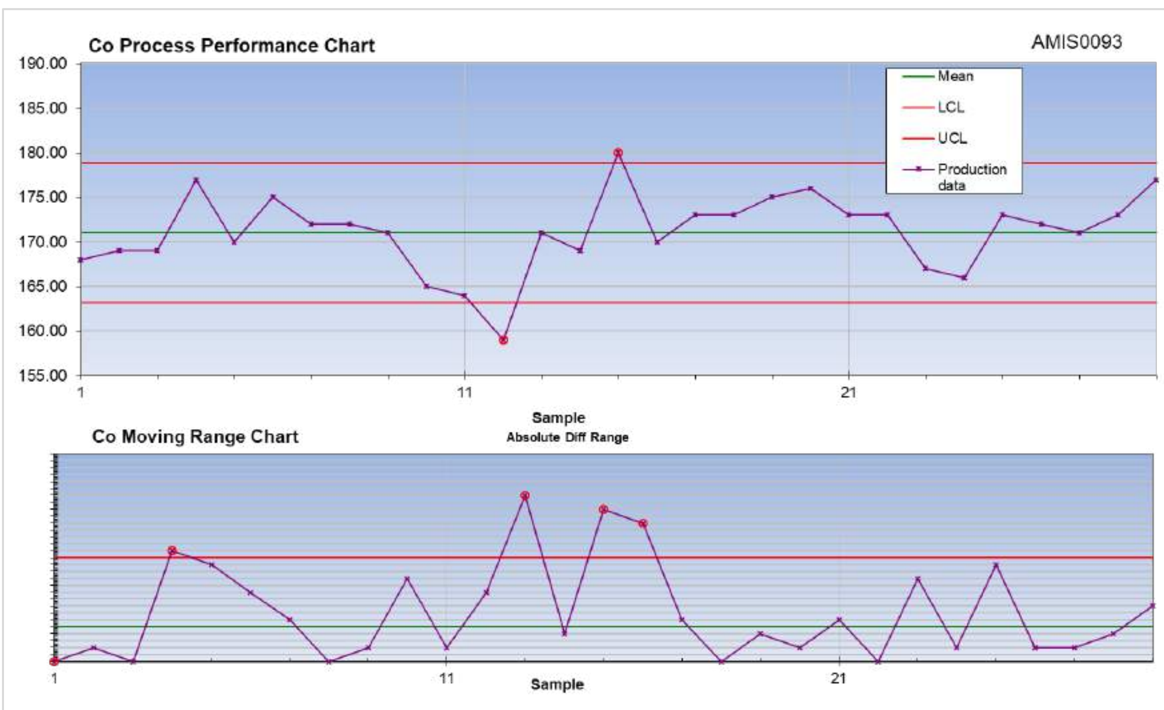


Figure 95: Escape Deposit standard AMIS0093 Co (g/t)

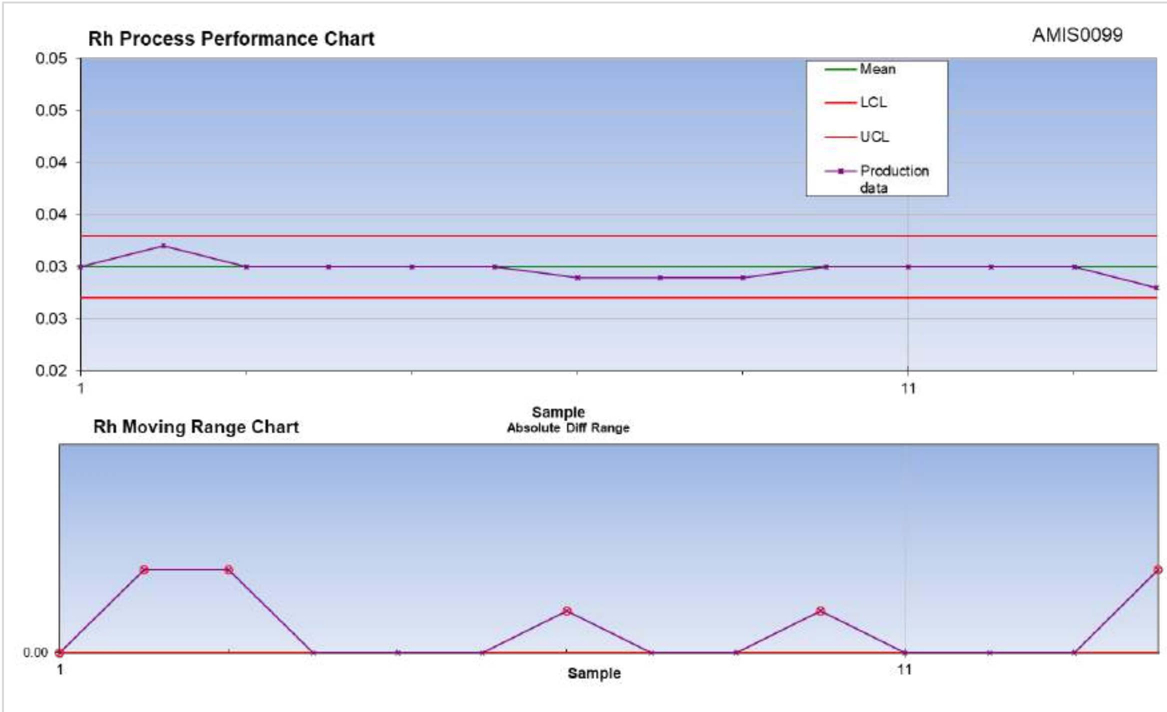


Figure 96: Escape Deposit standard AMIS0099 Rh (g/t)

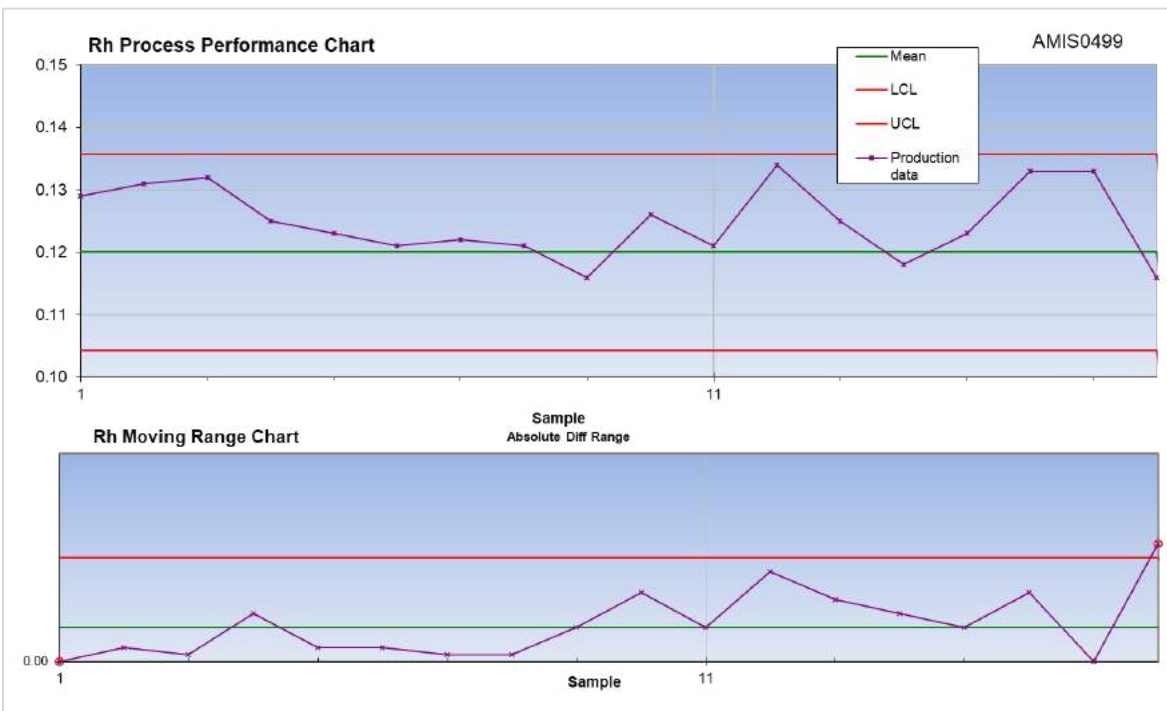


Figure 97: Escape Deposit standard AMIS0499 Rh (g/t)

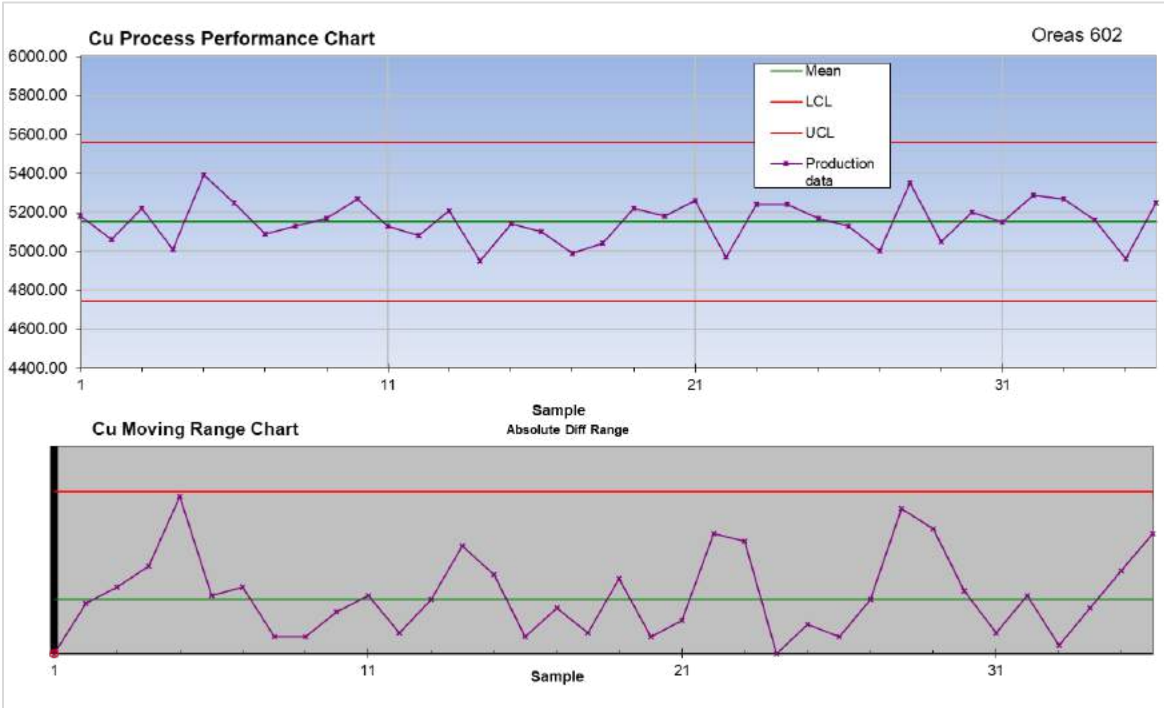


Figure 98: Escape Deposit standard Oreas 602 Cu (g/t)

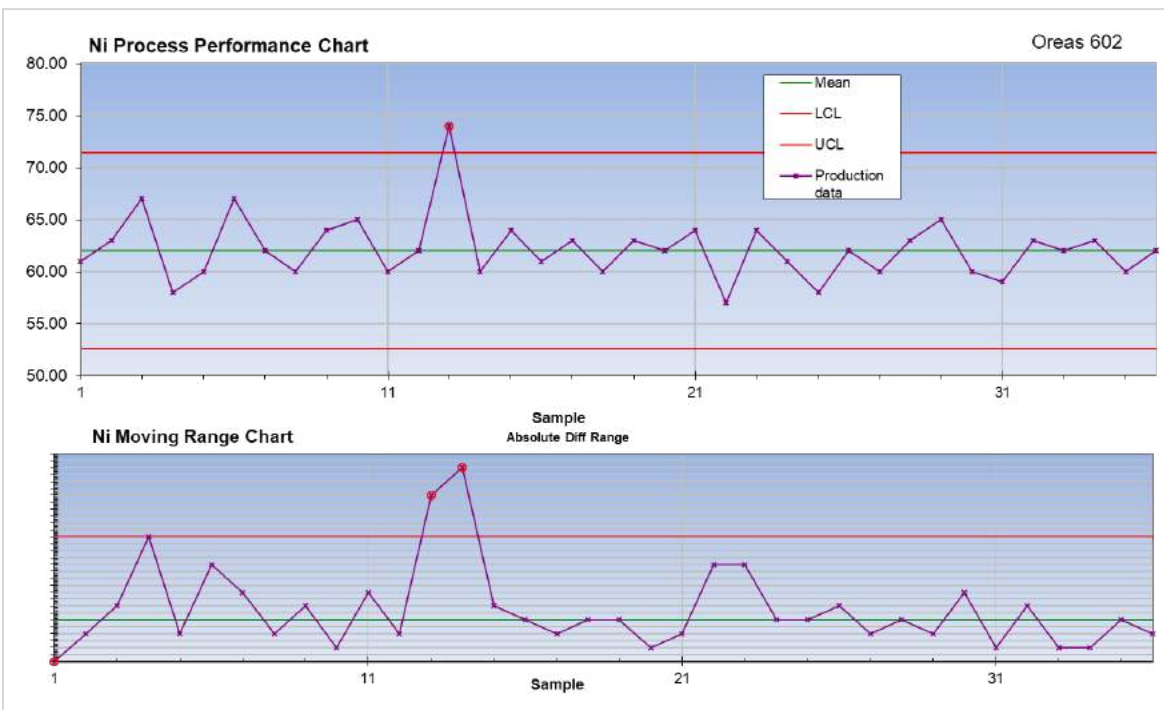


Figure 99: Escape Deposit standard Oreas 602 Ni (g/t)

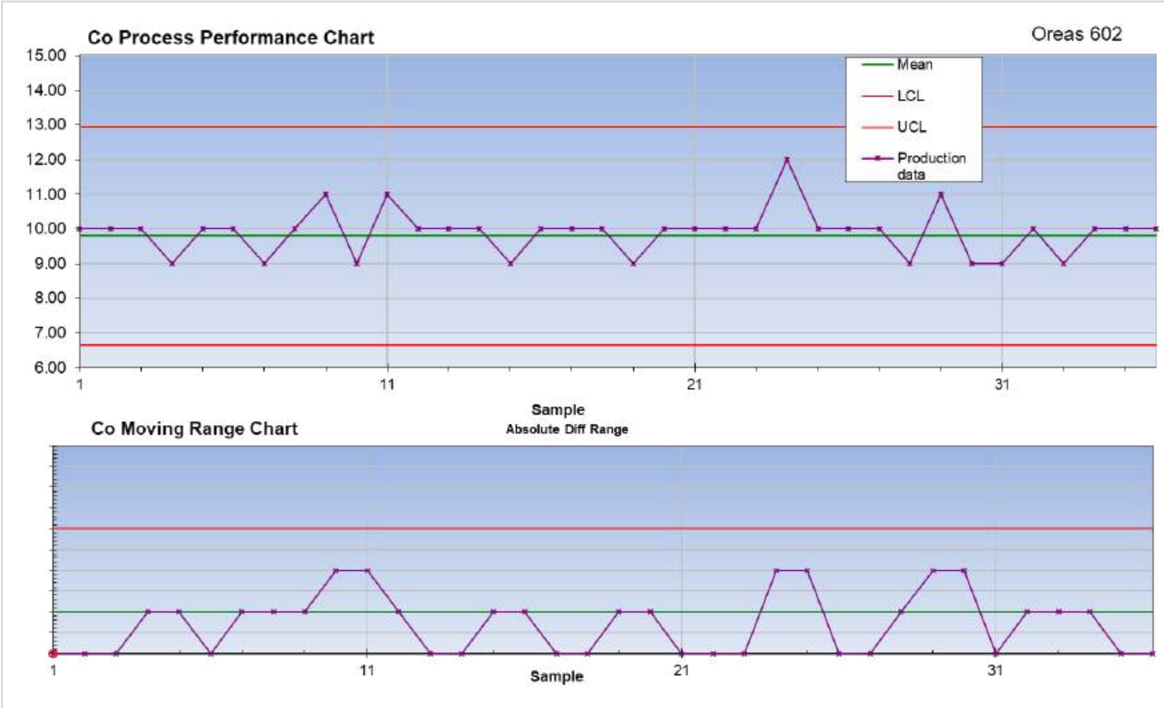


Figure 100: Escape Deposit standard Oreas 602 Ni (g/t)

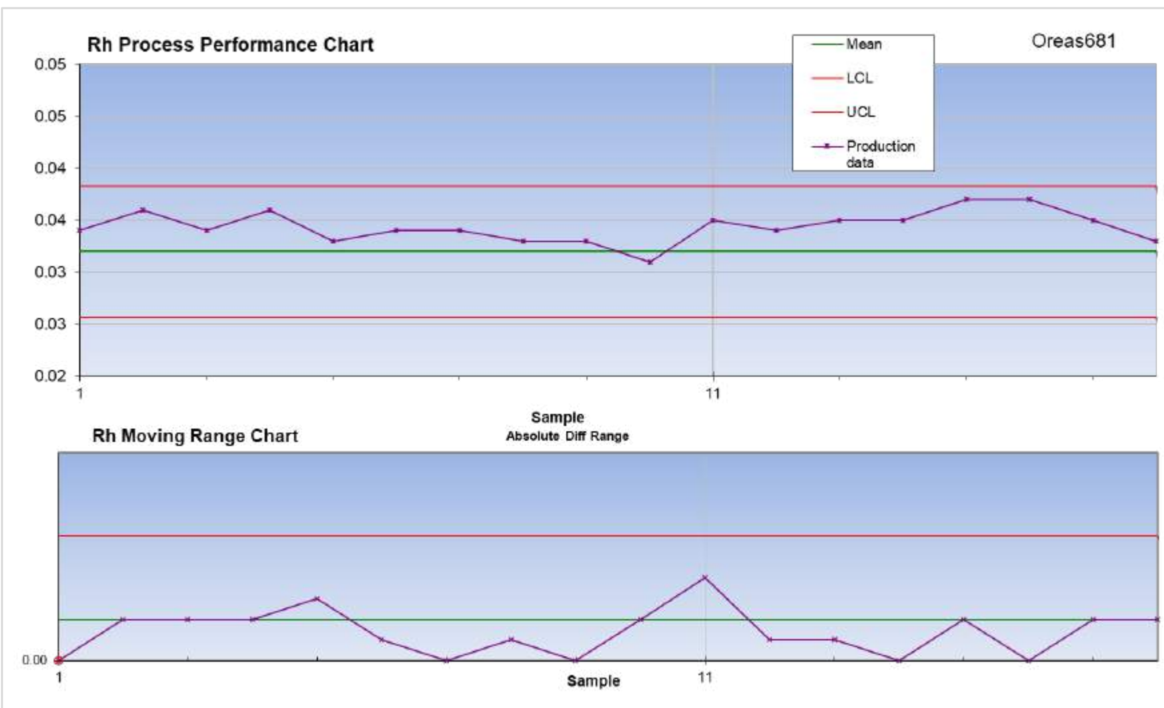


Figure 101: Escape Deposit standard Oreas 681 Rh (g/t)

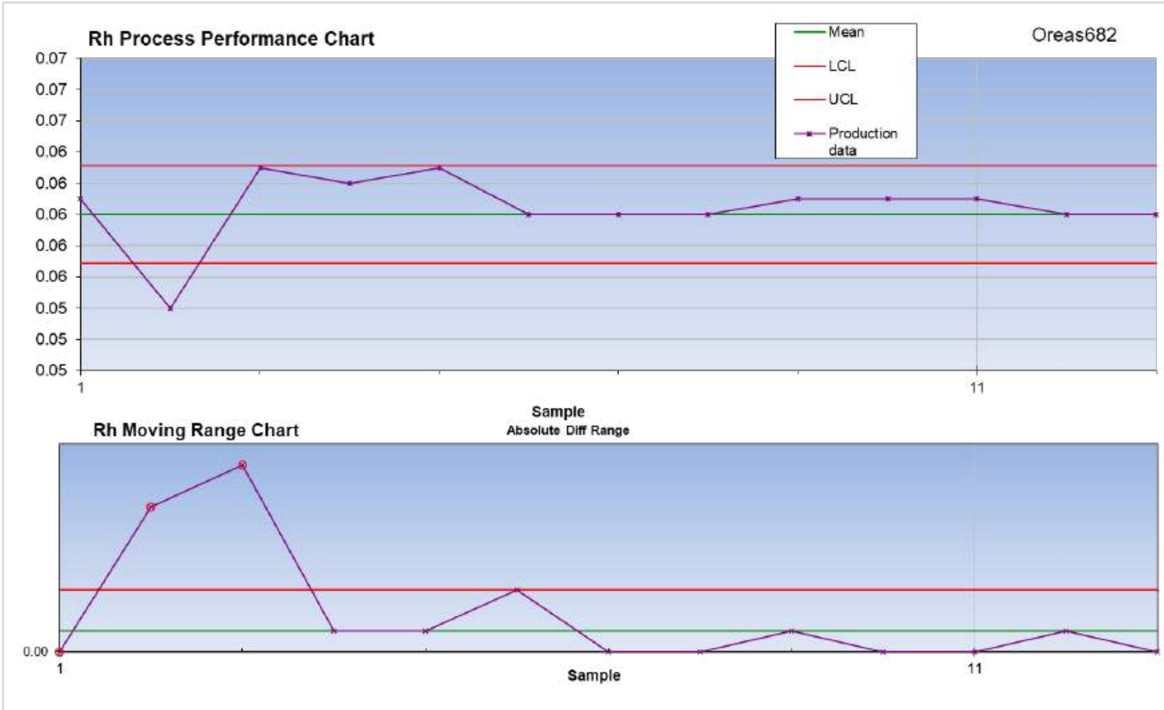


Figure 102: Escape Deposit standard Oreas 682 Rh (g/t)

Blanks

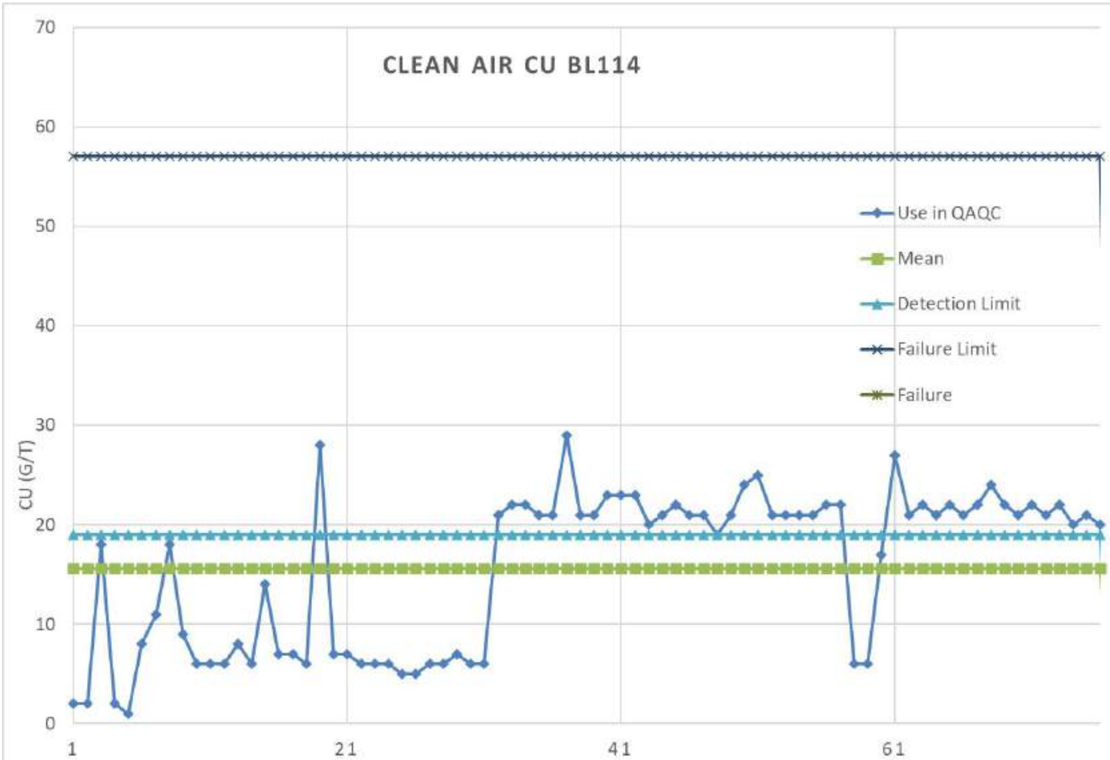


Figure 103: Escape Deposit BL114 coarse blanks Cu (g/t)

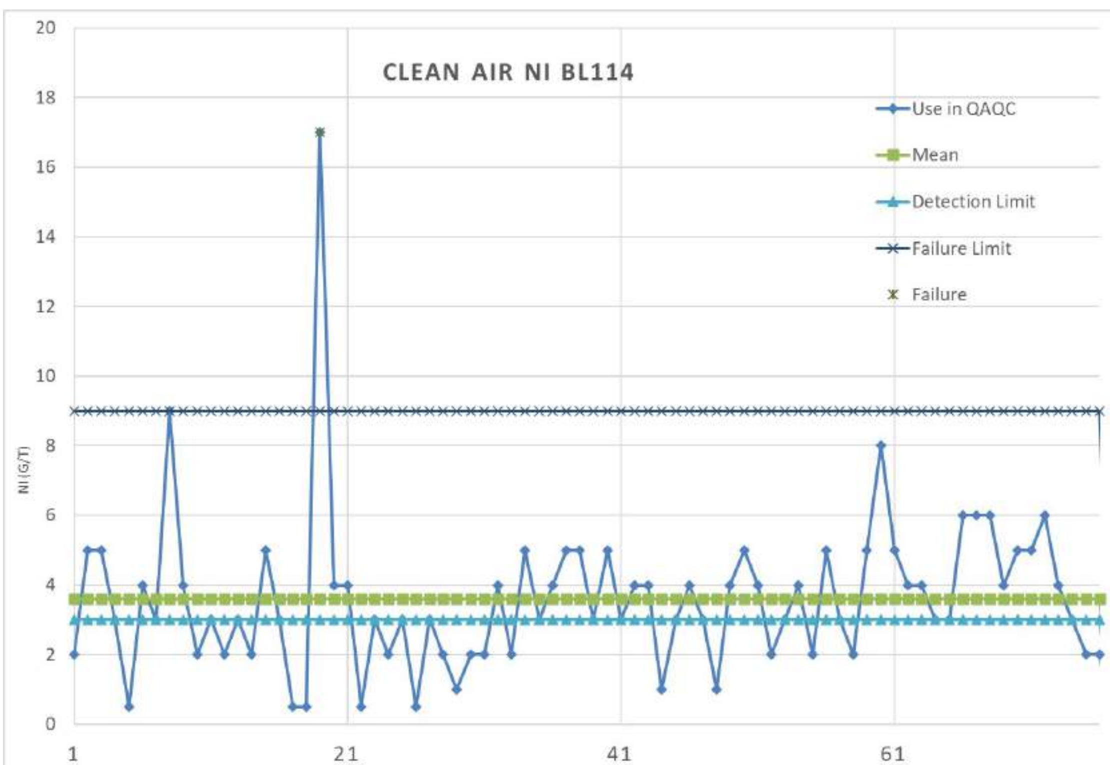


Figure 104: Escape Deposit BL114 coarse blanks Ni (g/t)

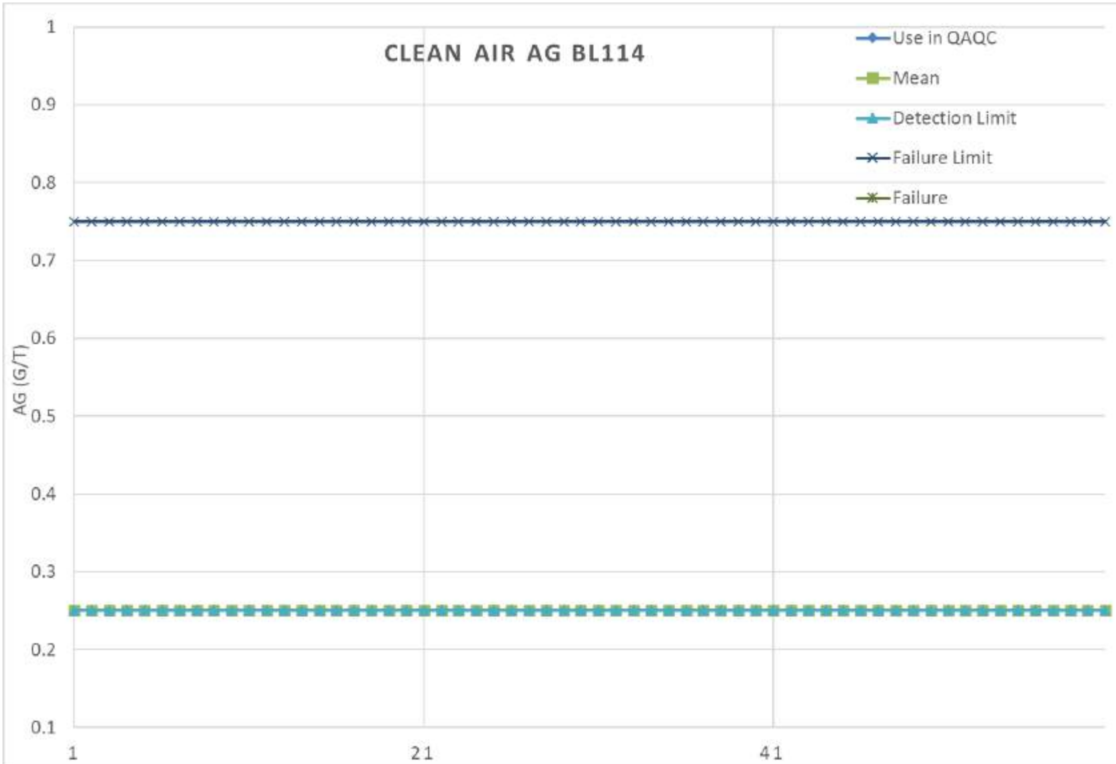


Figure 105: Escape Deposit BL114 coarse blanks Ag (g/t)

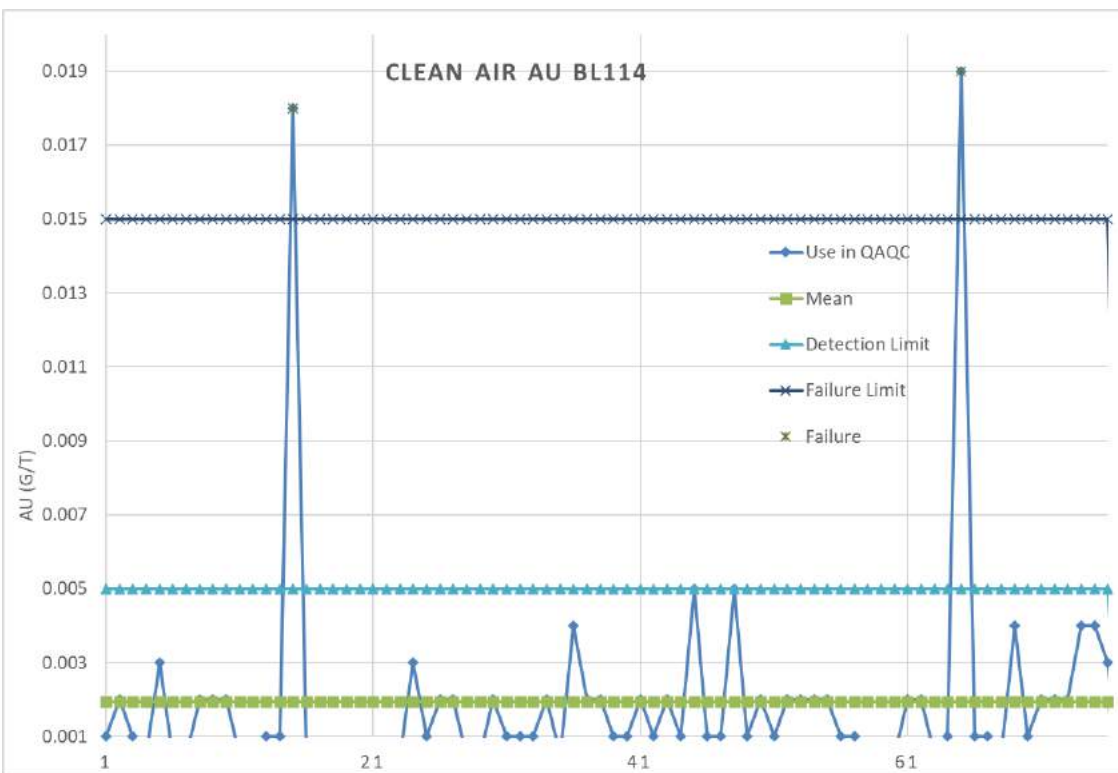


Figure 106: Escape Deposit BL114 coarse blanks Au (g/t)

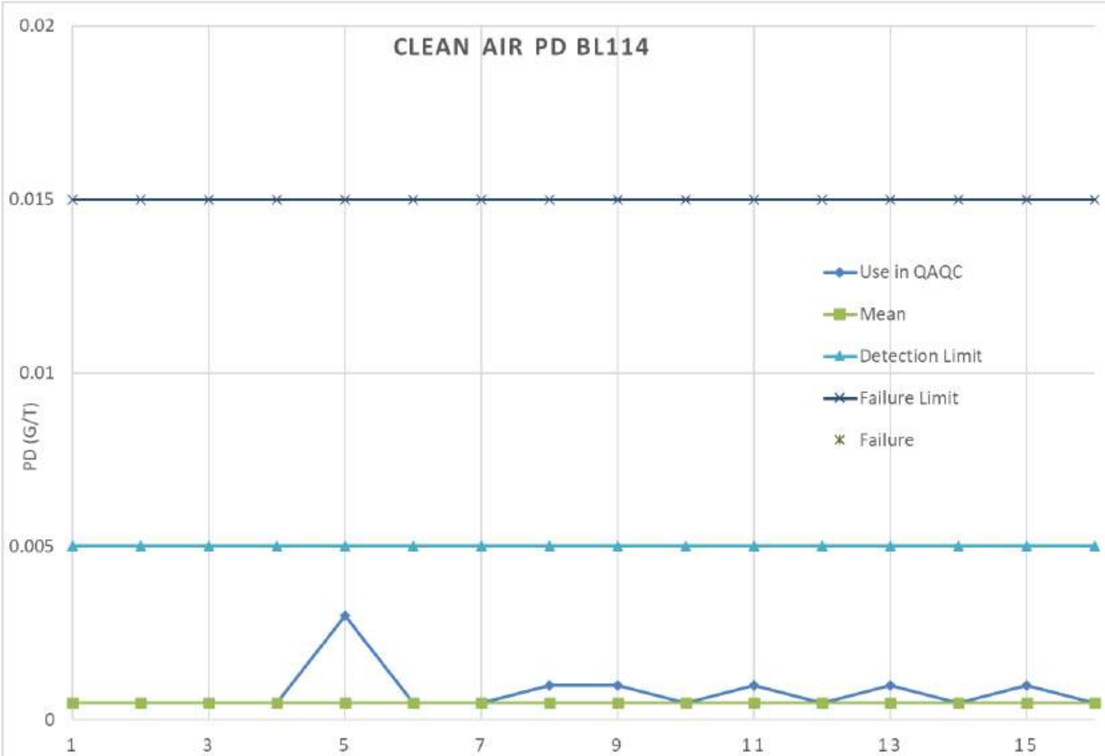


Figure 107: Escape Deposit BL114 coarse blanks Pd (g/t)

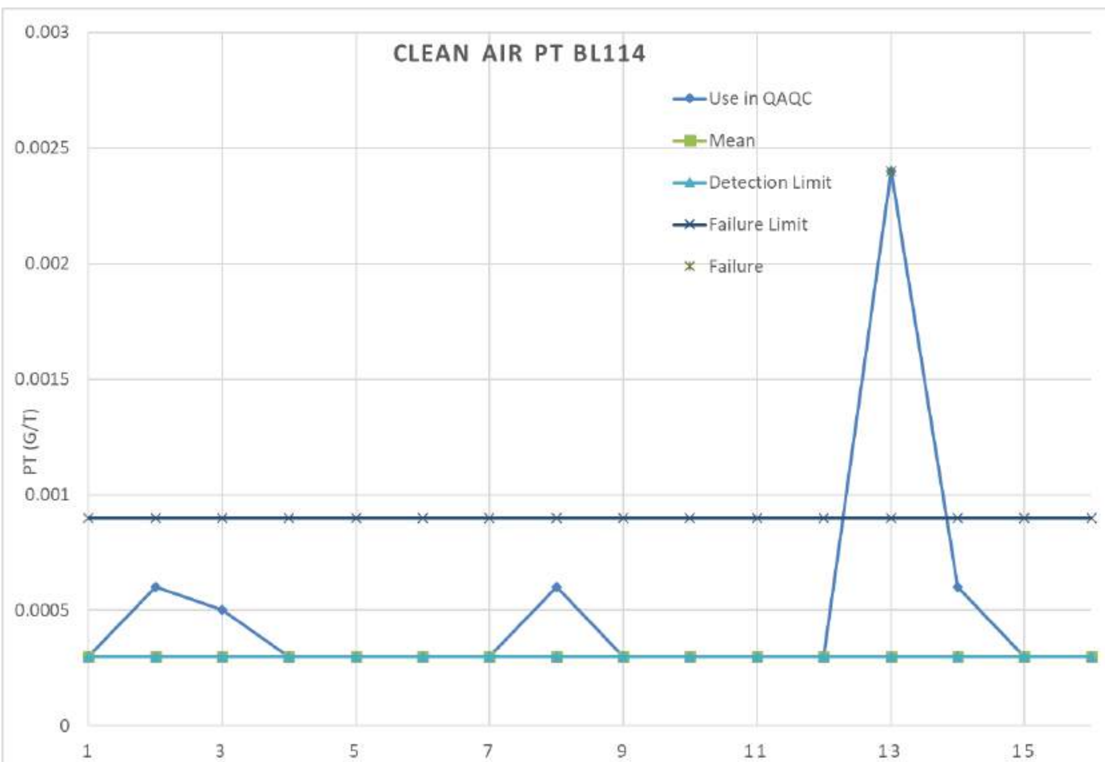


Figure 108: Escape Deposit BL114 coarse blanks Pt (g/t)

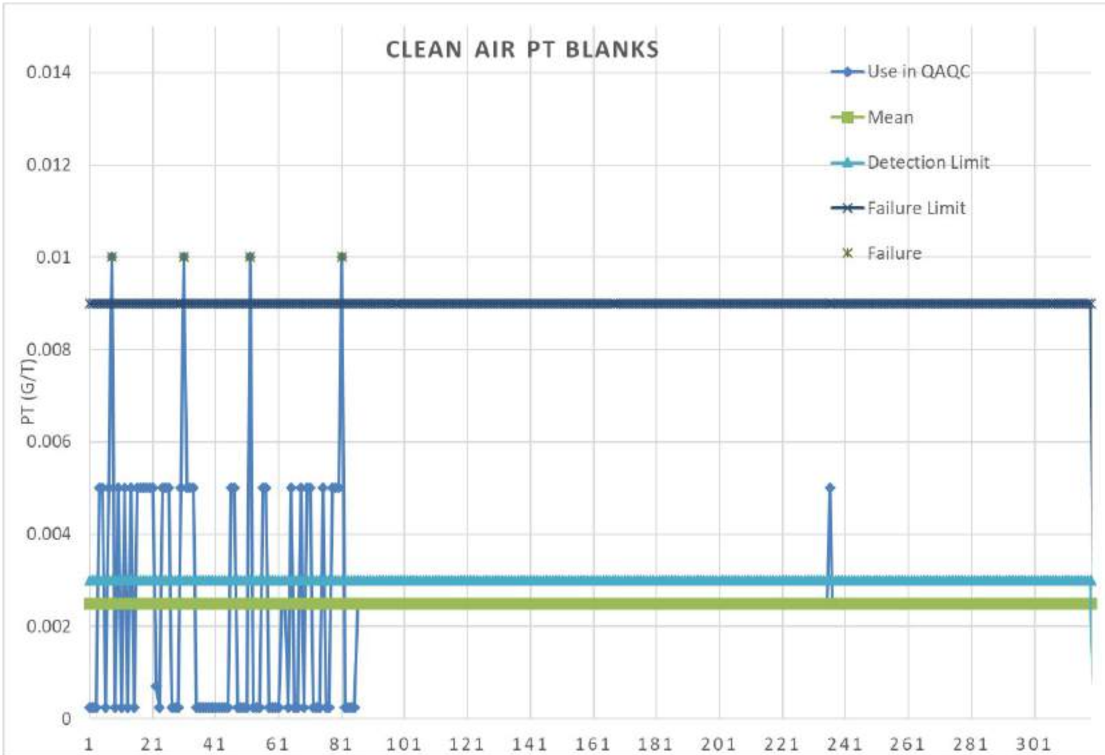


Figure 109: Escape Deposit Blank coarse blanks Pt (g/t)

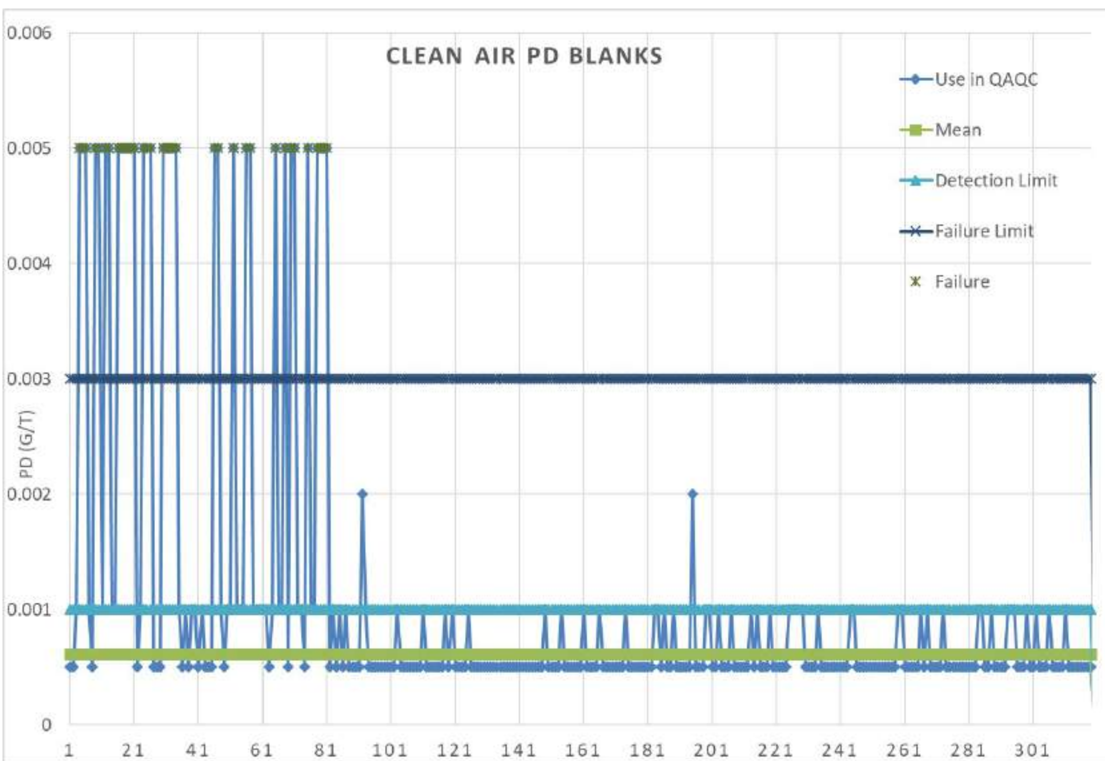


Figure 110: Escape Deposit Blank coarse blanks Pd (g/t)

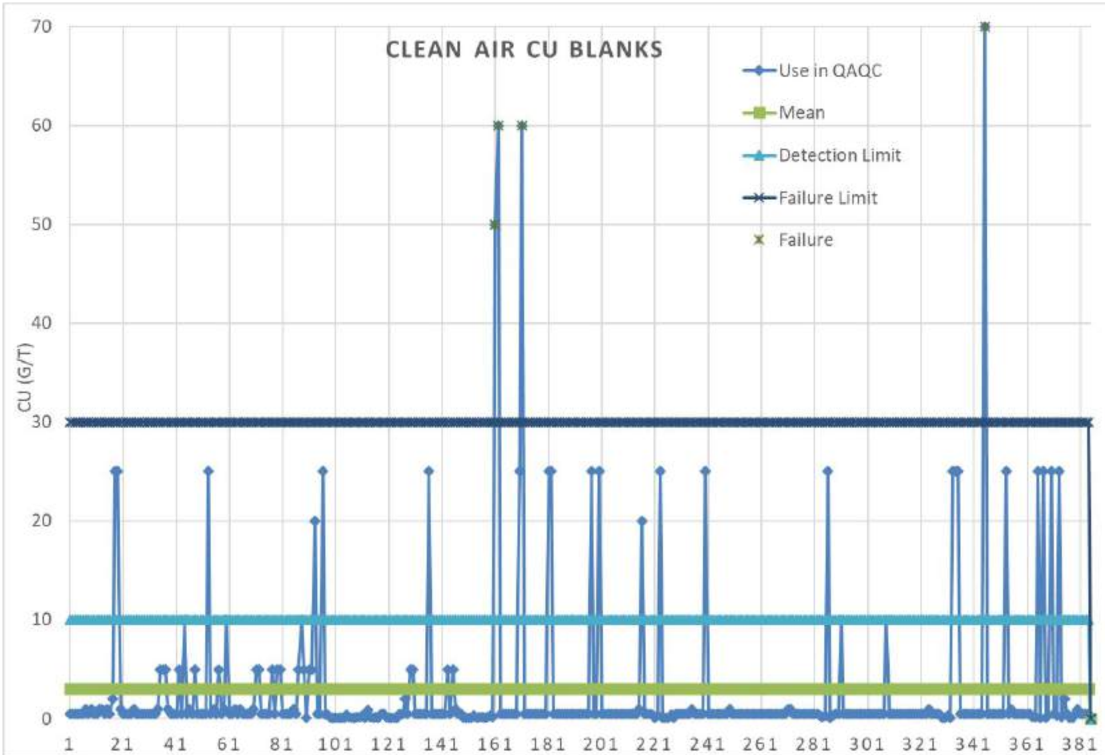


Figure 111: Escape Deposit Blank coarse blanks Cu (g/t)

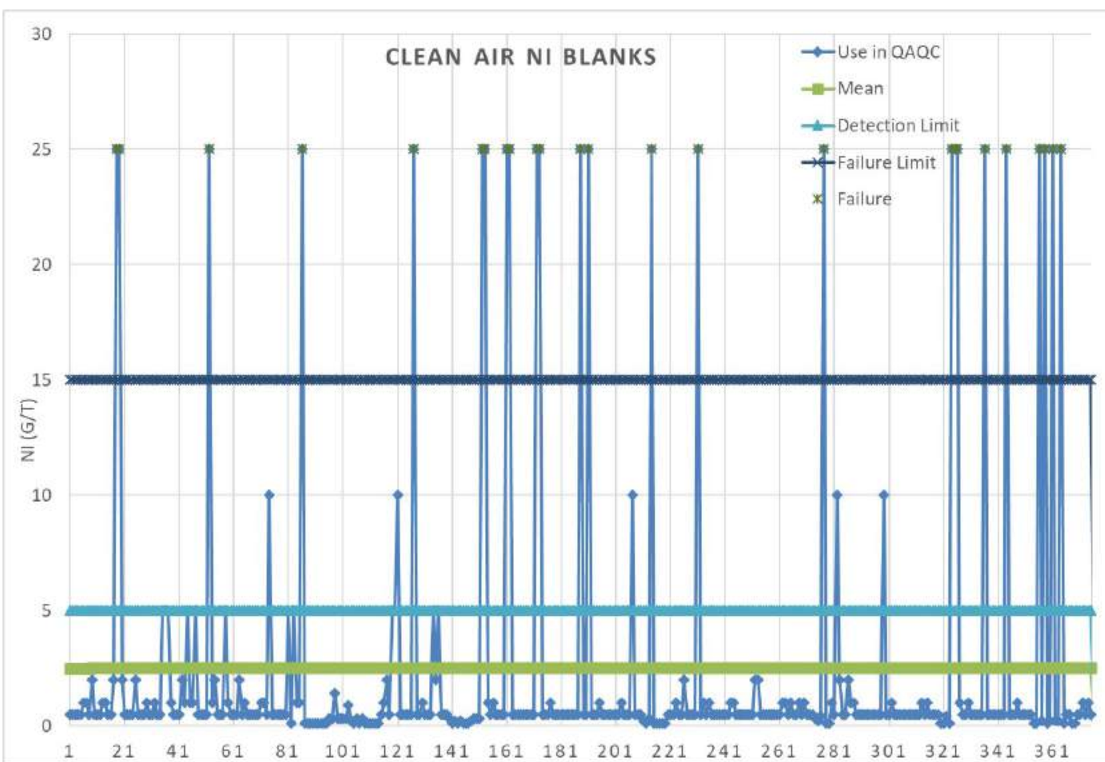


Figure 112: Escape Deposit Blank coarse blanks Ni (g/t)

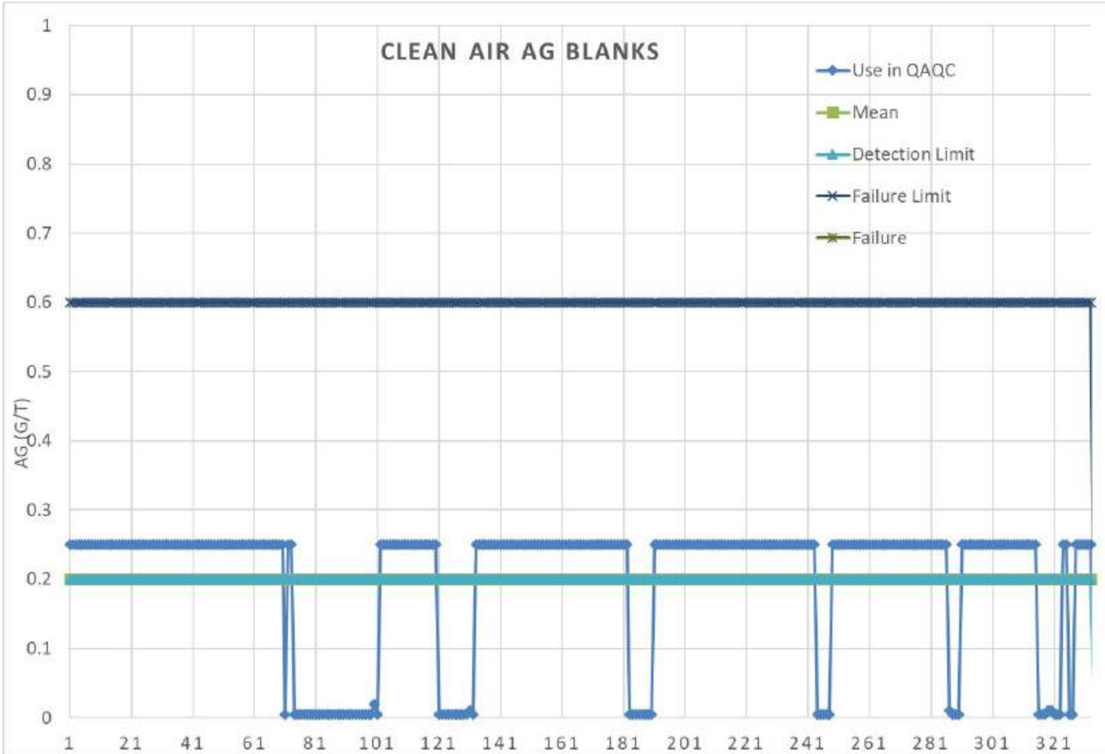


Figure 113: Escape Deposit Blank coarse blanks Ag (g/t)

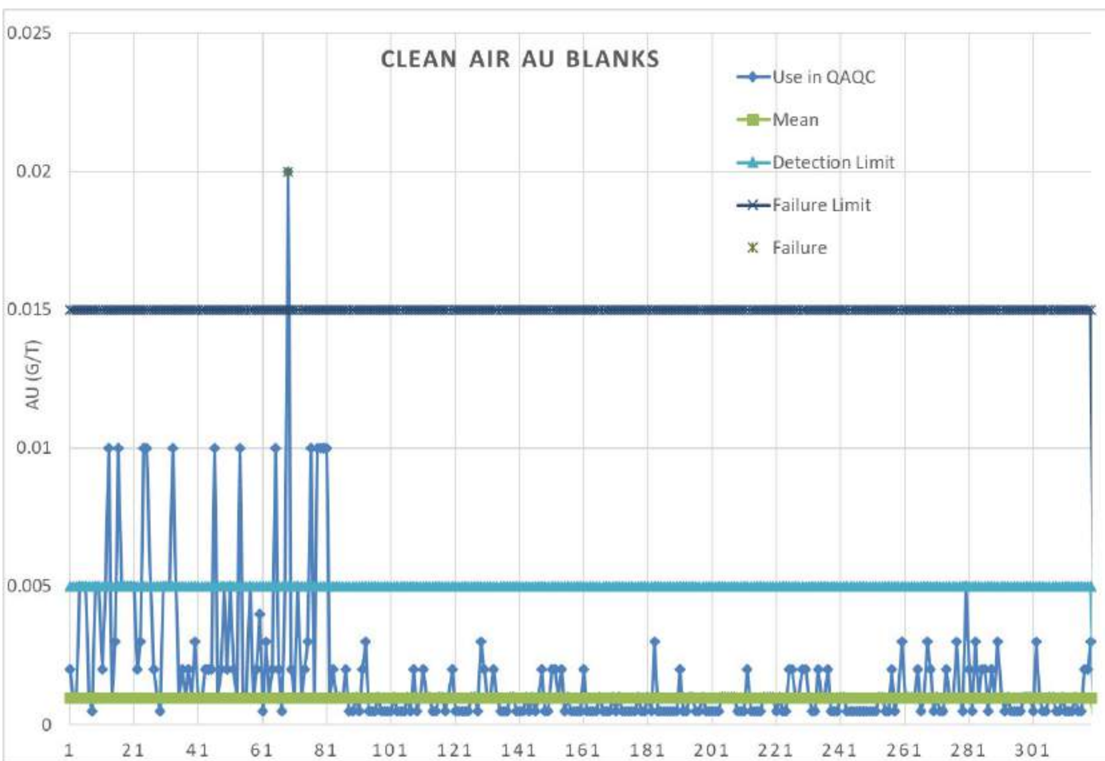


Figure 114: Escape Deposit Blank coarse blanks Au (g/t)

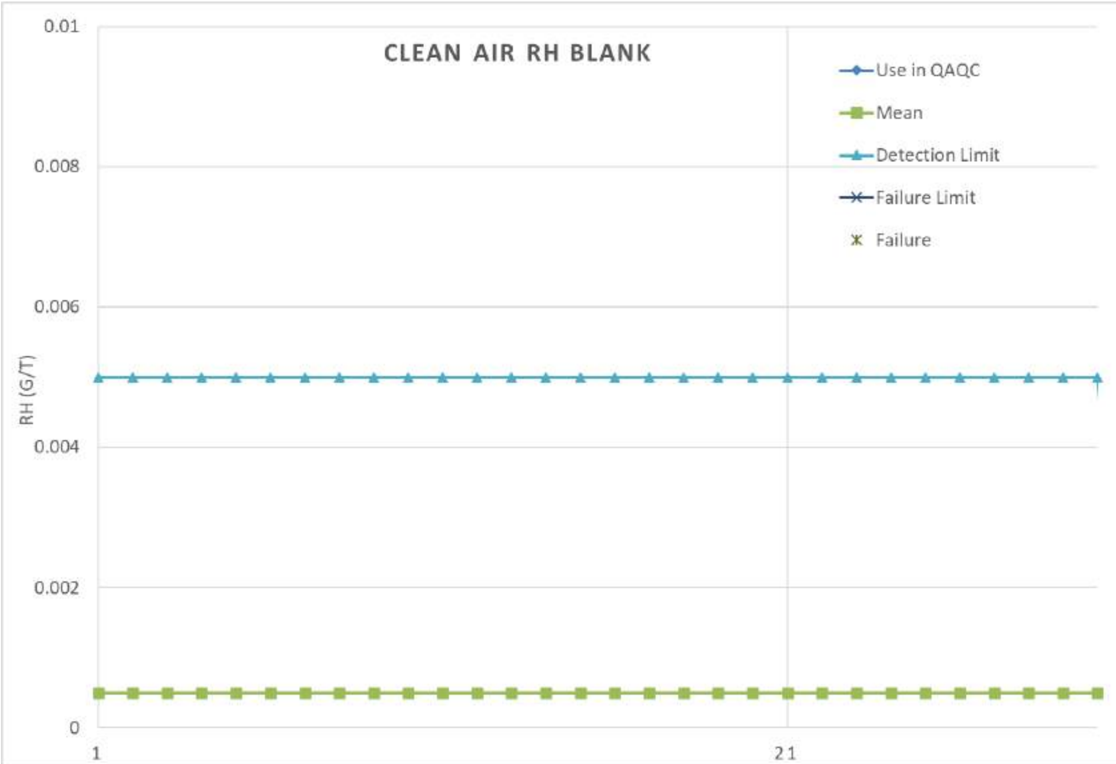


Figure 115: Escape Deposit Blank coarse blanks Rh (g/t)

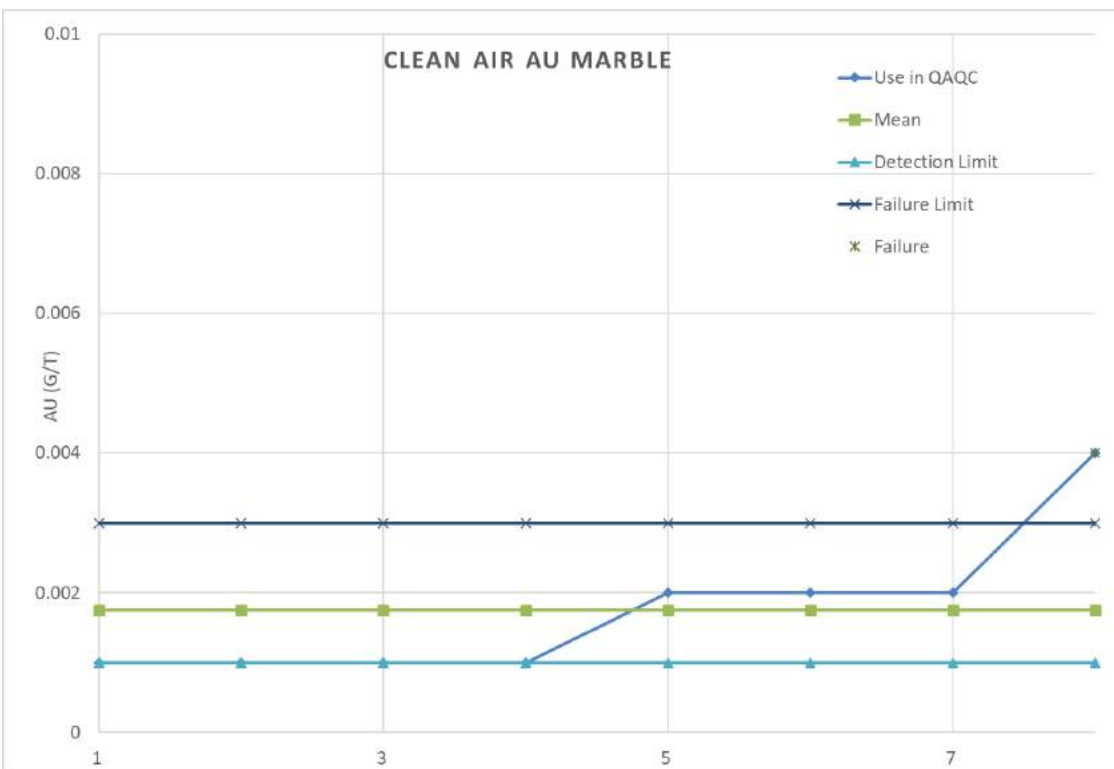


Figure 116: Escape Deposit Marble coarse blanks Au (g/t)

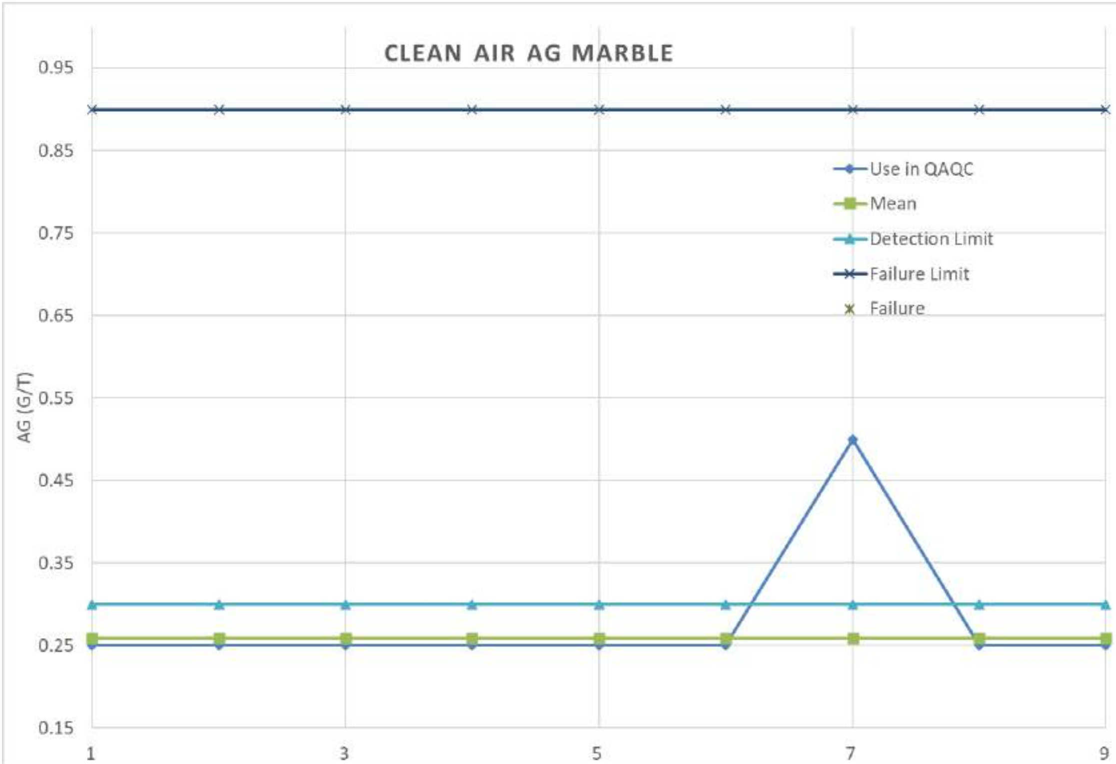


Figure 117: Escape Deposit Marble coarse blanks Ag (g/t)

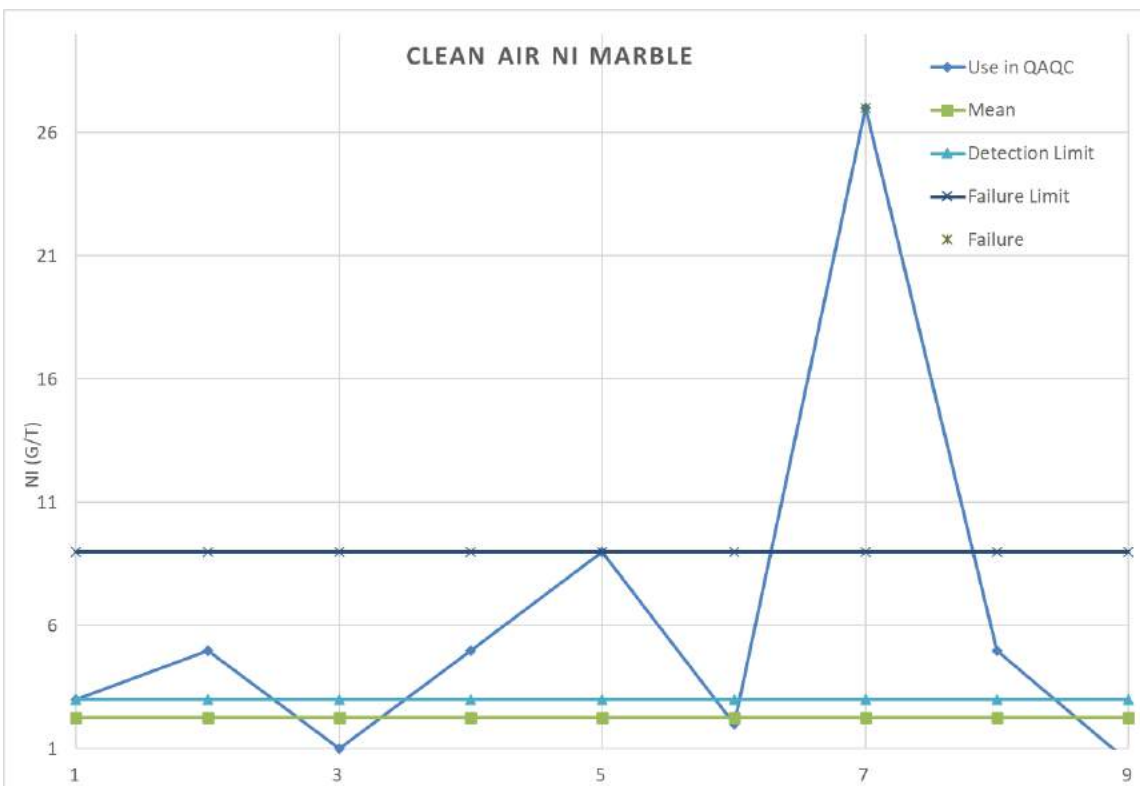


Figure 111: Escape Deposit Marble coarse blanks Ni (g/t)

Figure 112: Escape Deposit Marble coarse blanks Pd (g/t)

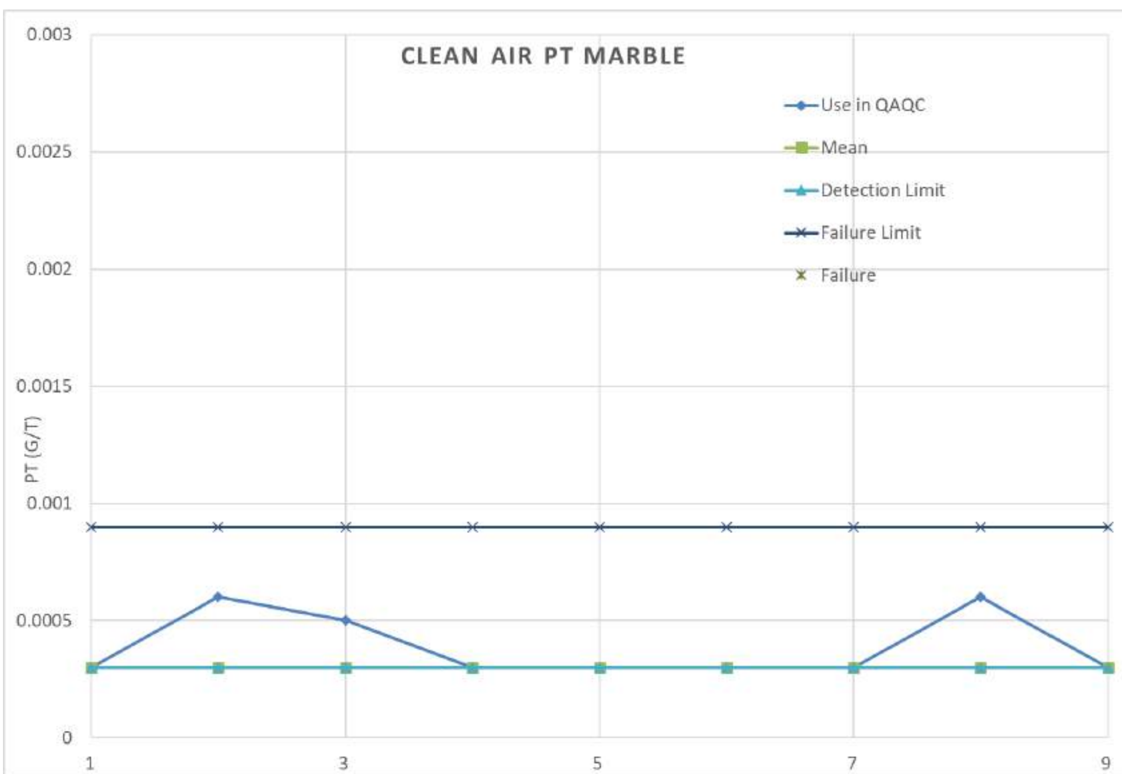
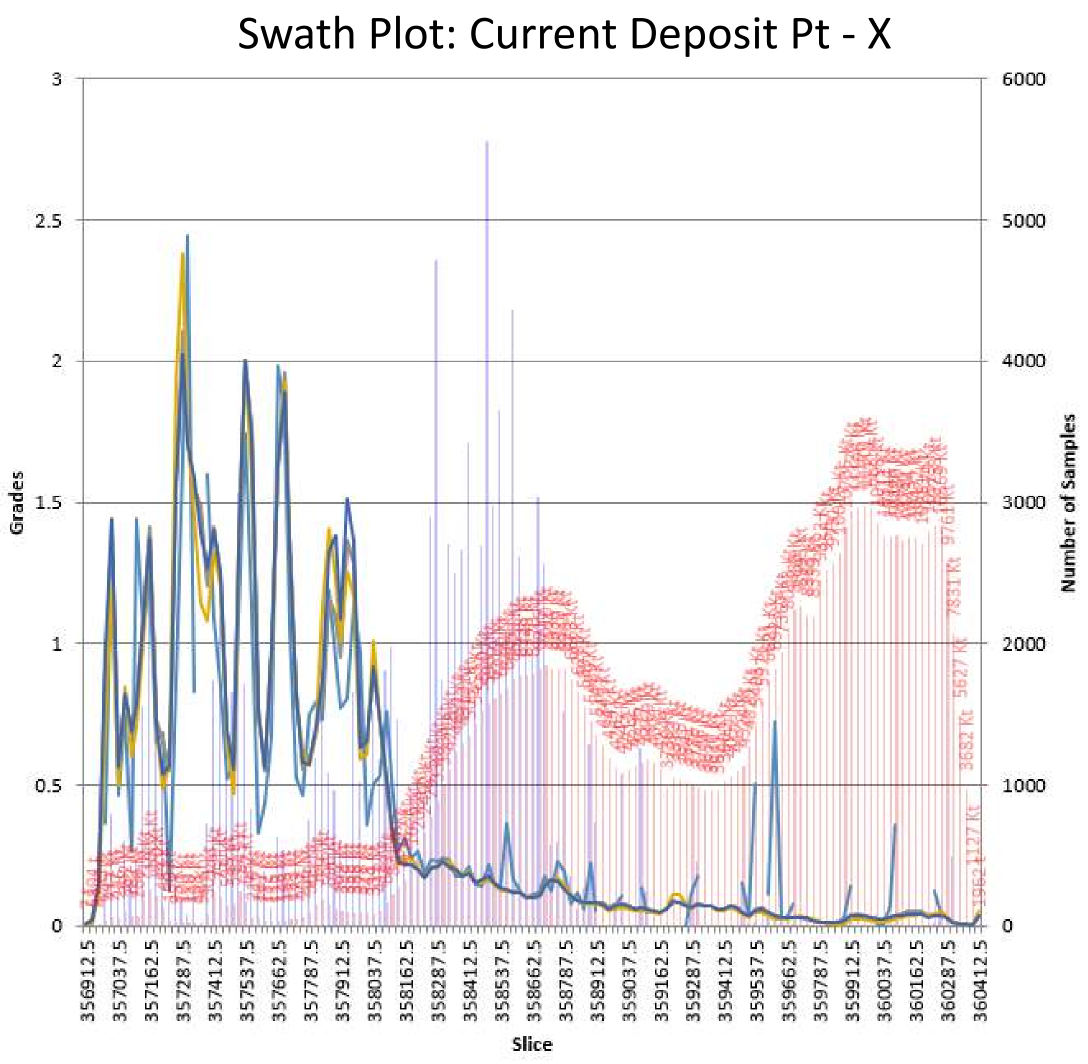


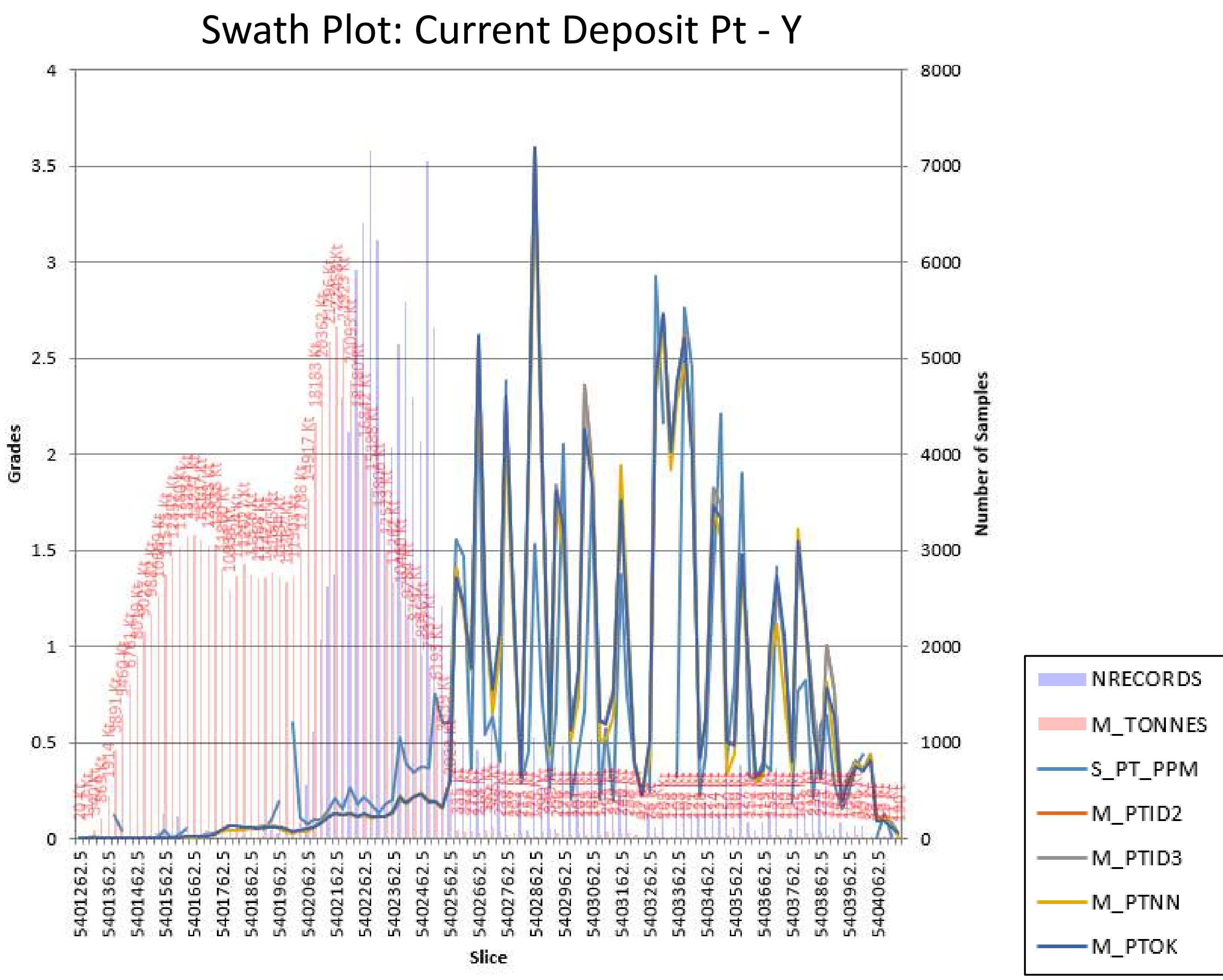
Figure 113: Escape Deposit Marble coarse blanks Pt (g/t)

Appendix D: Grade Distribution Swath Plots

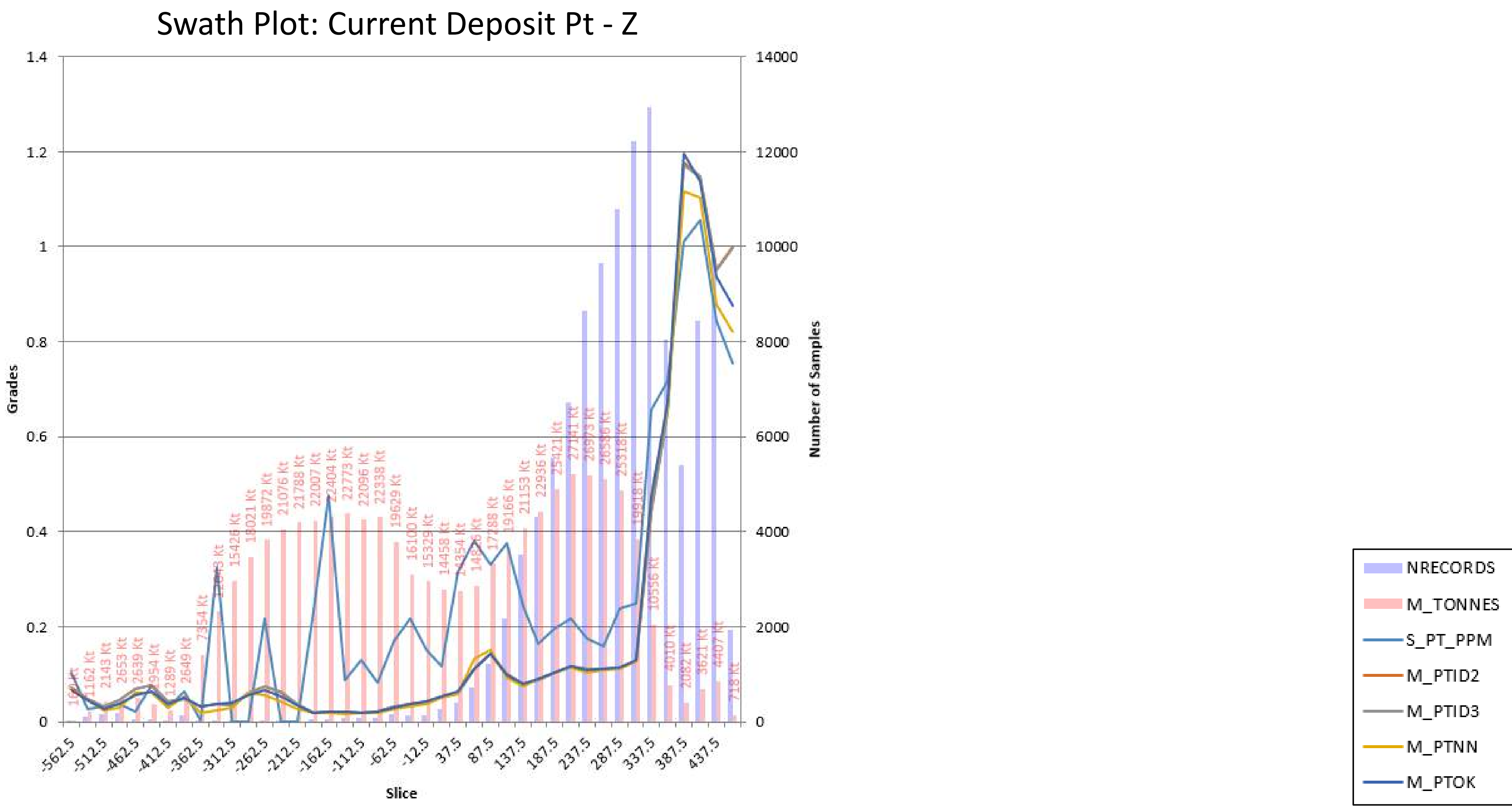
Current Deposit Swath Plots

Swath Plot, Current Deposit – Pt in X and Y directions (Easting and Northing)

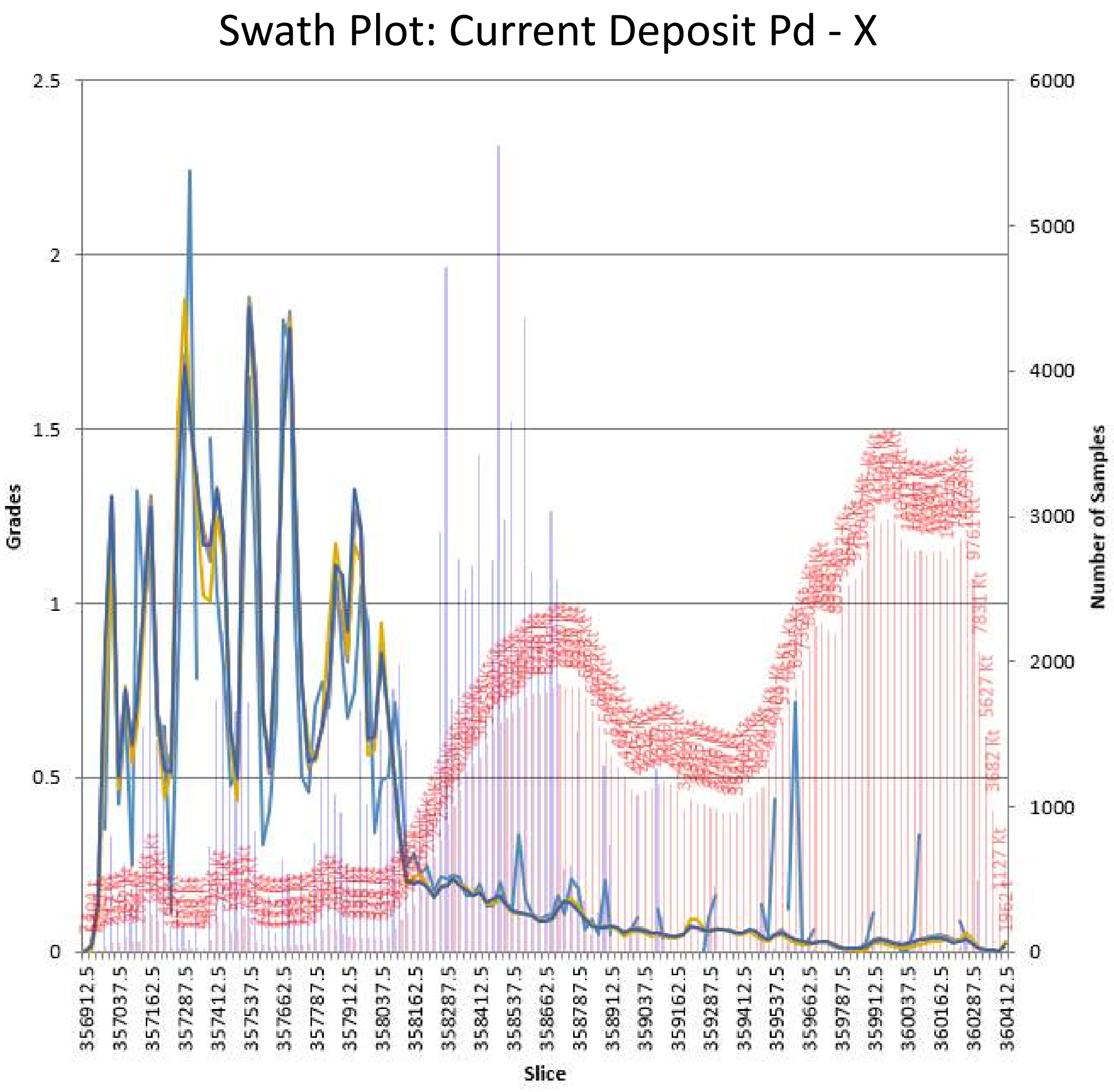


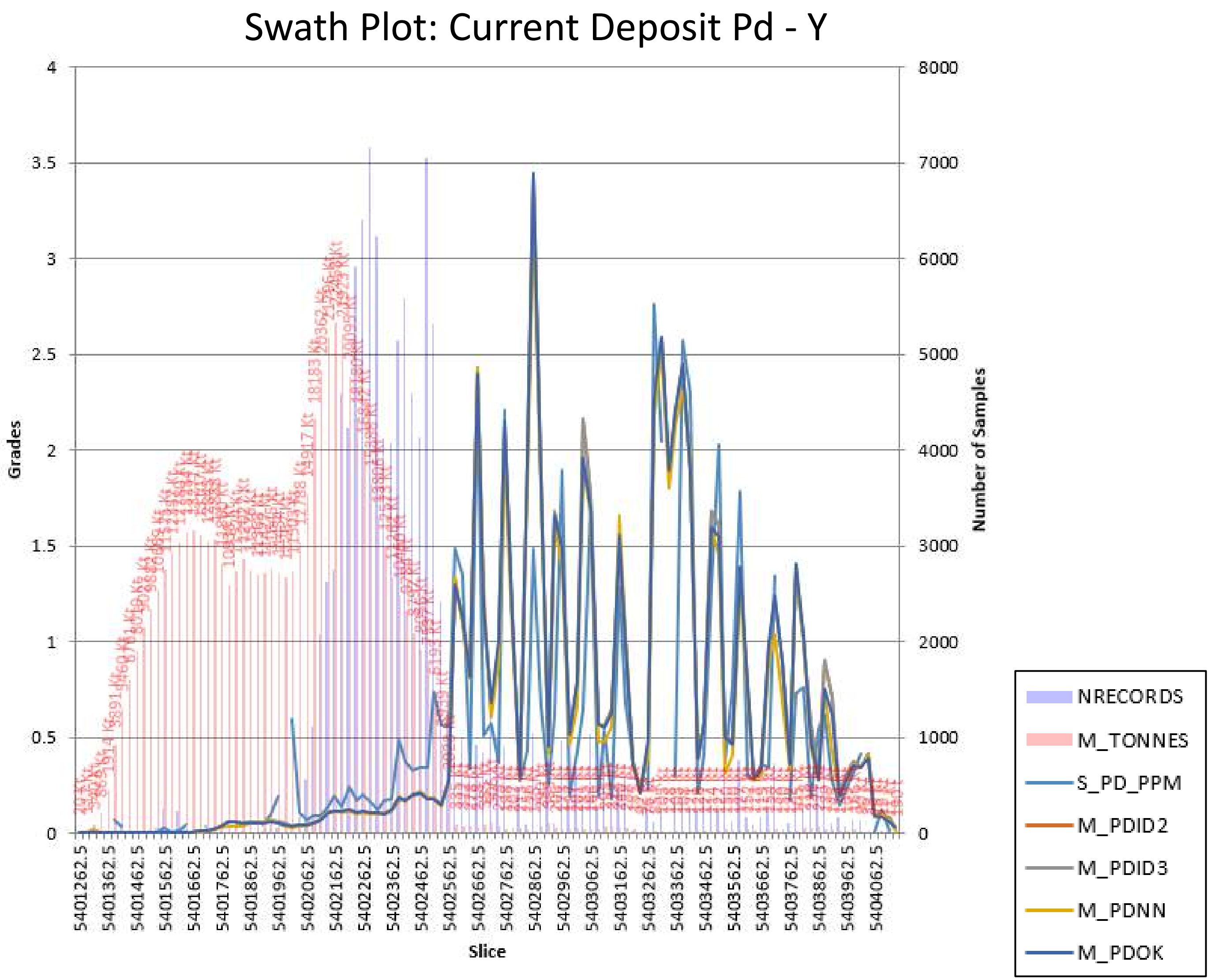


Swath Plot, Current Deposit – Pt in Z direction (Elevation)

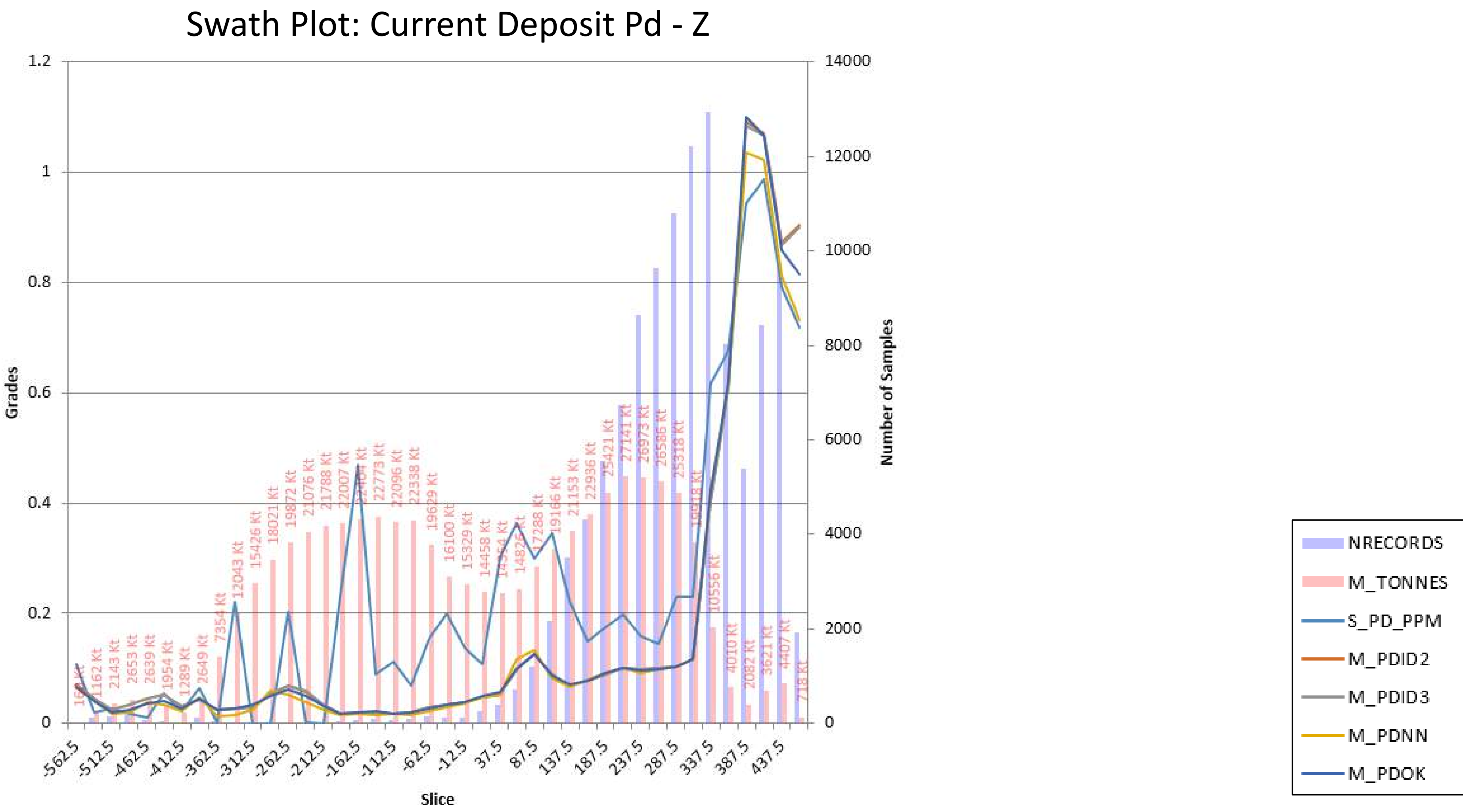


Swath Plot, Current Deposit – Pd in X and Y directions (Easting and Northing)

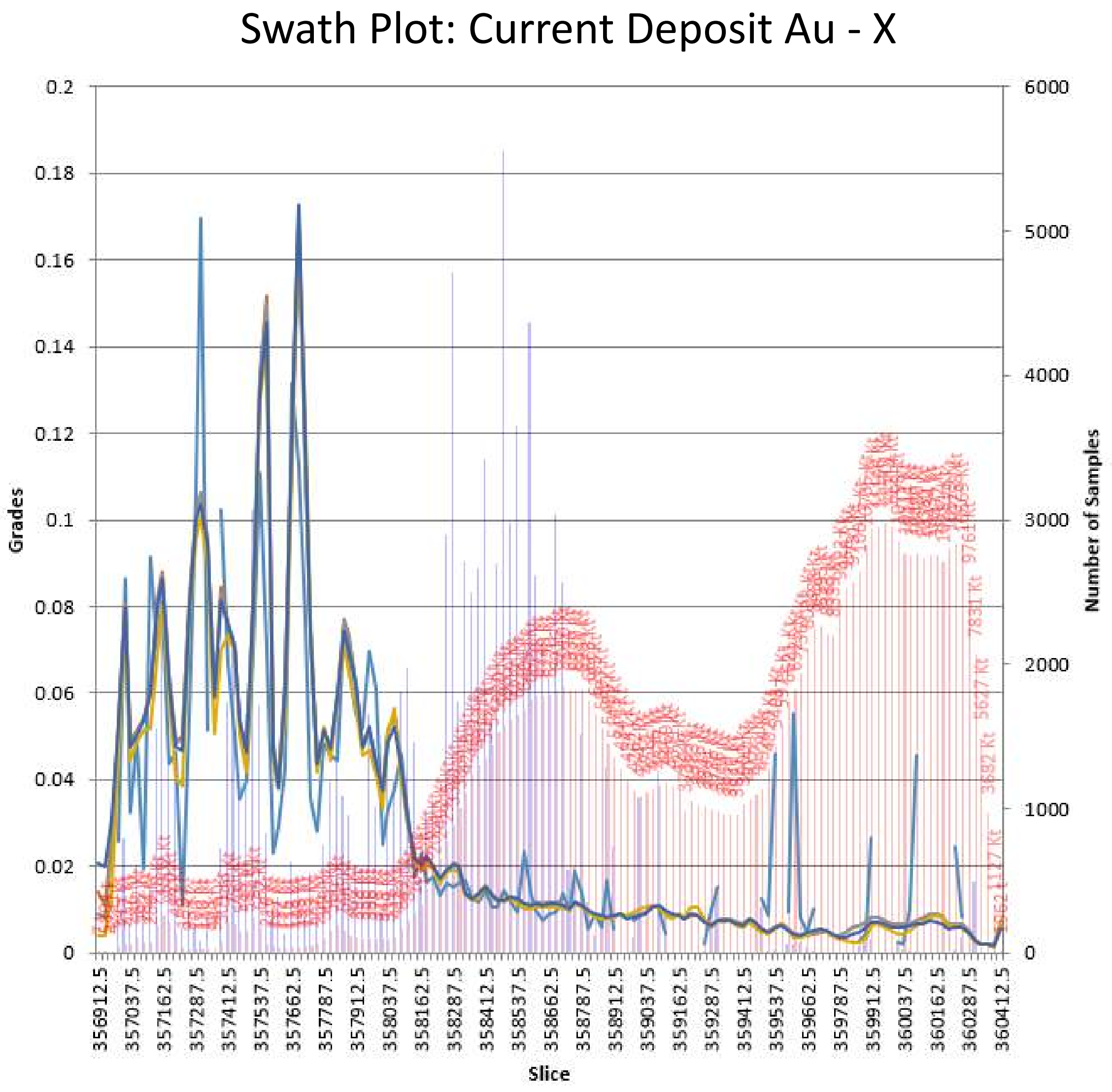


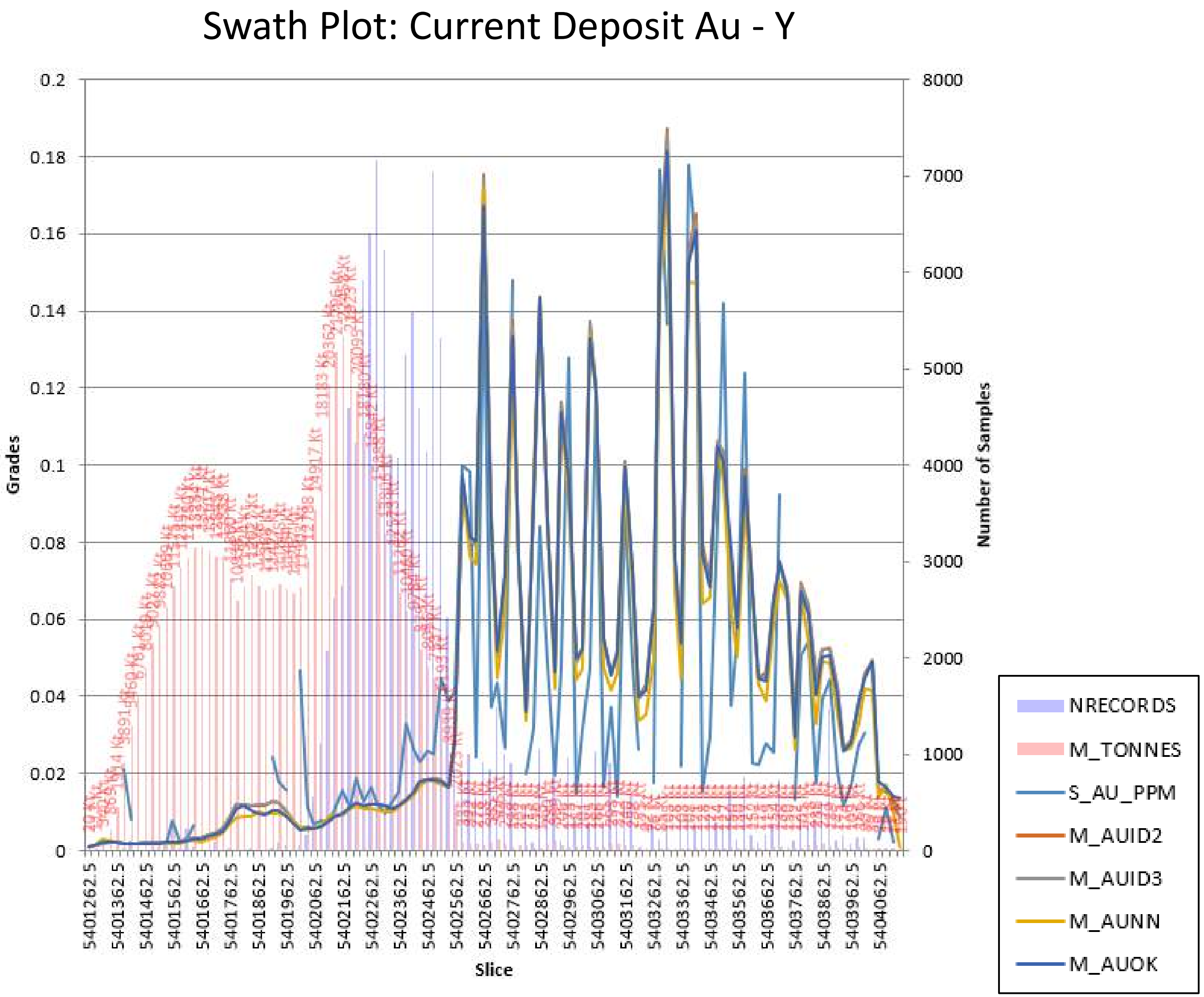


Swath Plot, Current Deposit – Pd in Z direction (Elevation)

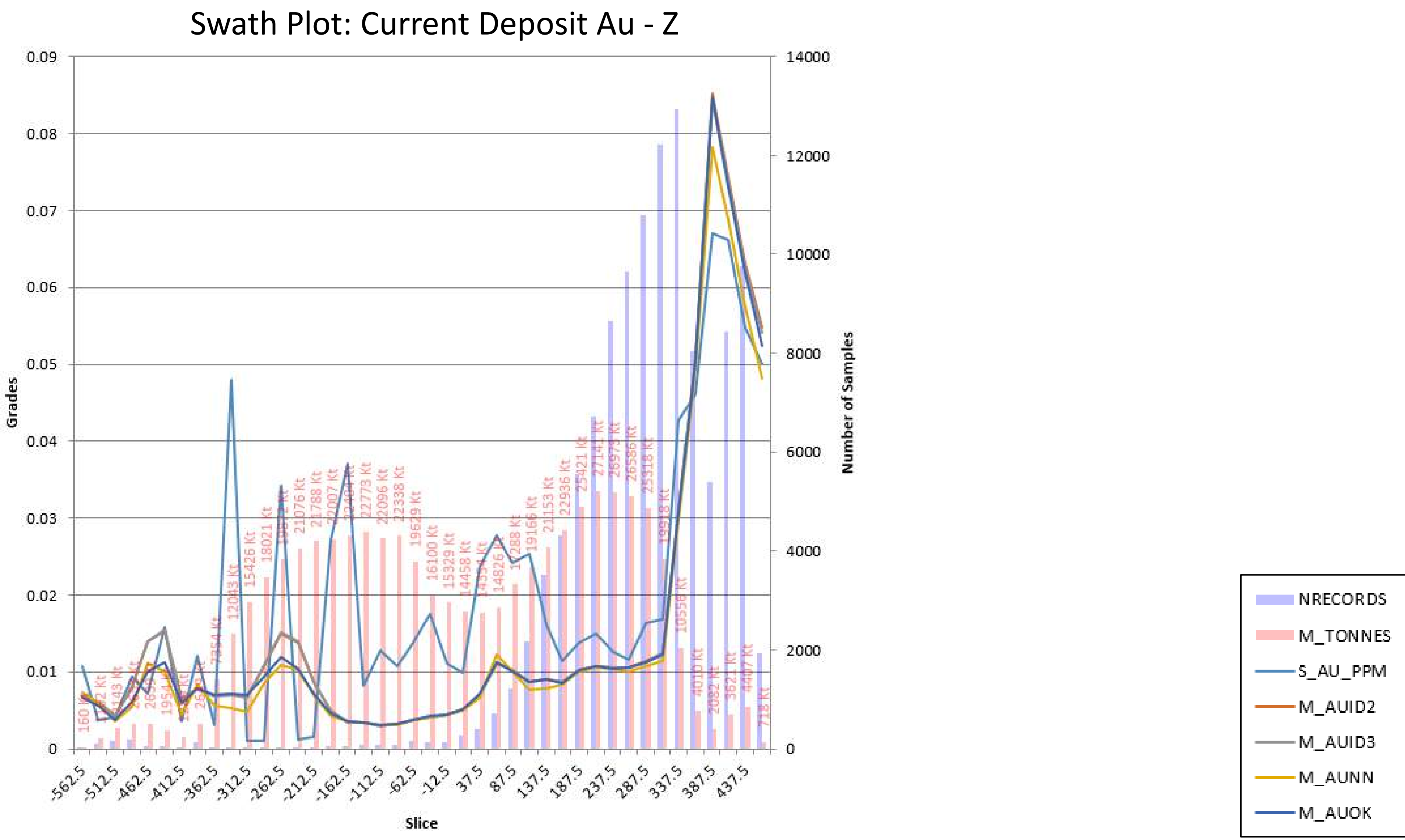


Swath Plot, Current Deposit – Au in X and Y directions (Easting and Northing)

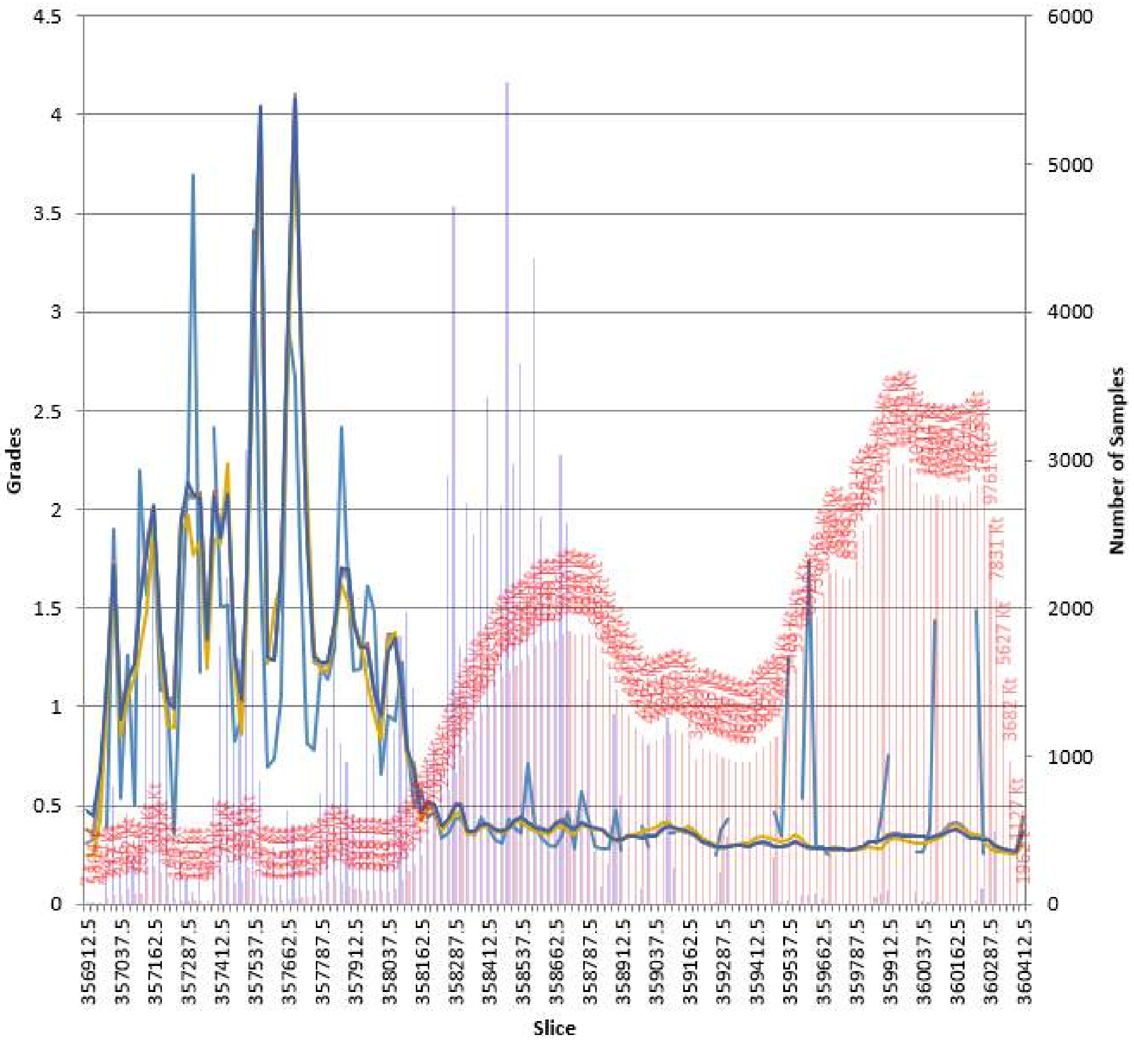


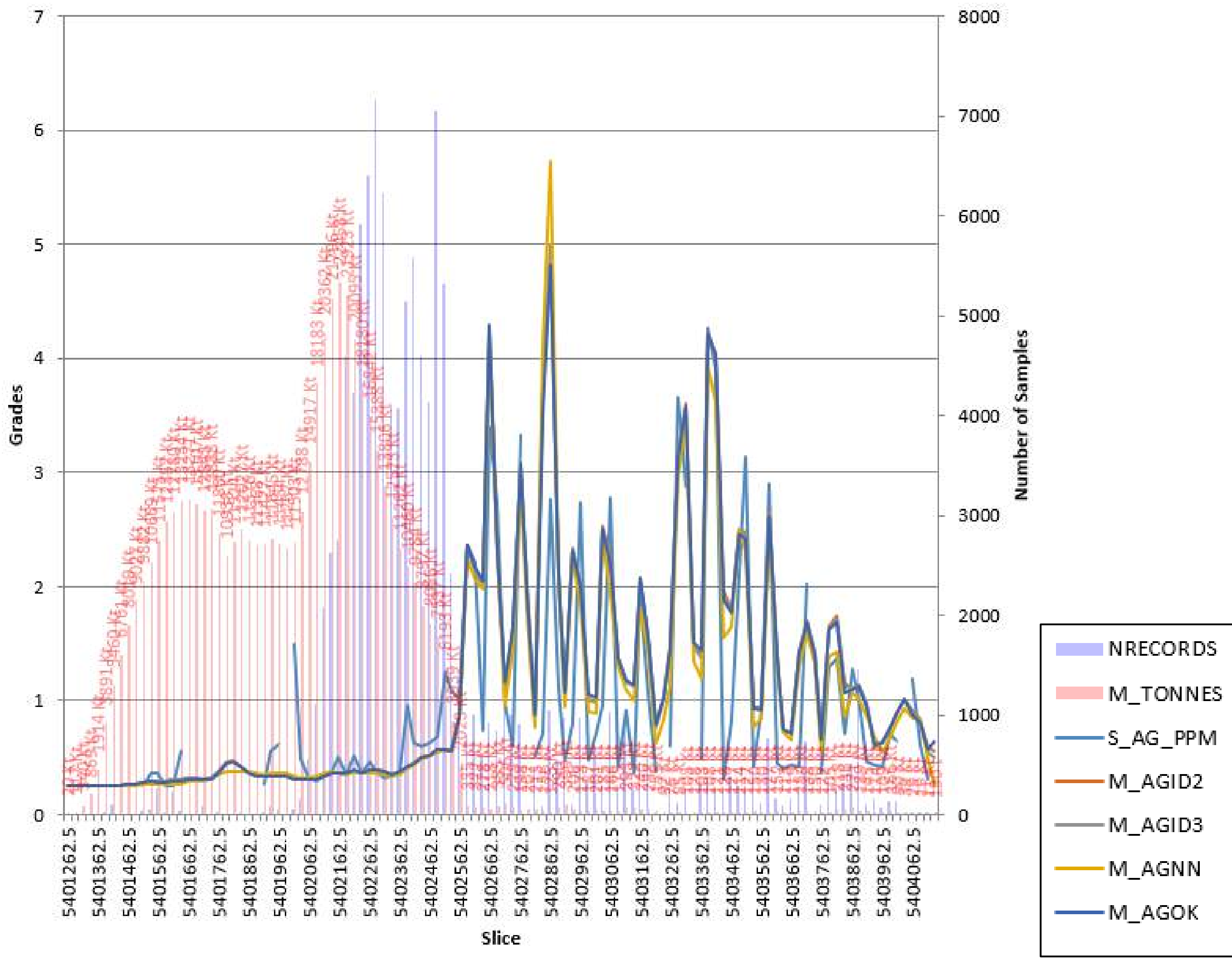


Swath Plot, Current Deposit – Au in Z direction (Elevation)

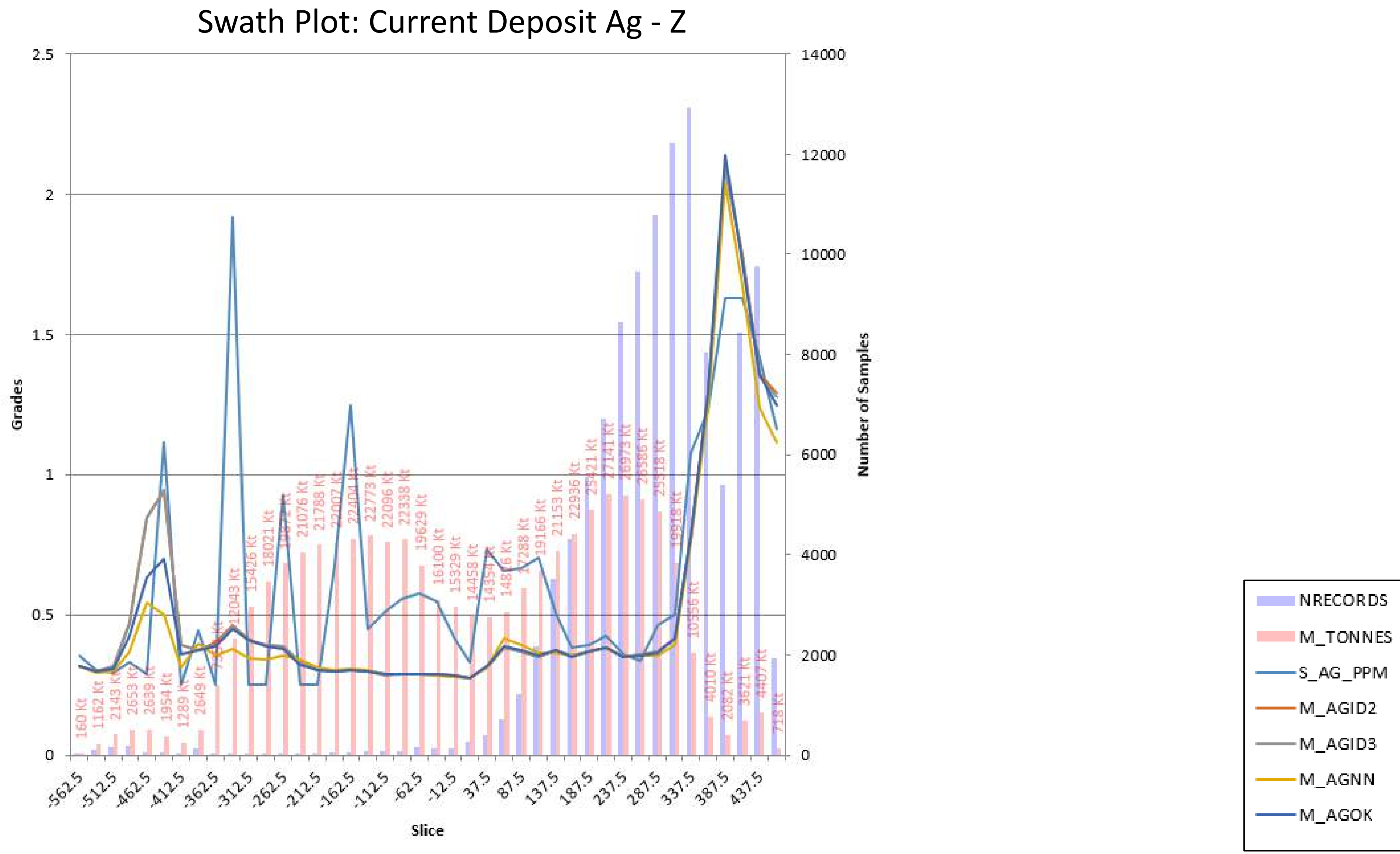


Swath Plot, Current Deposit – Ag in X and Y directions (Easting and Northing)

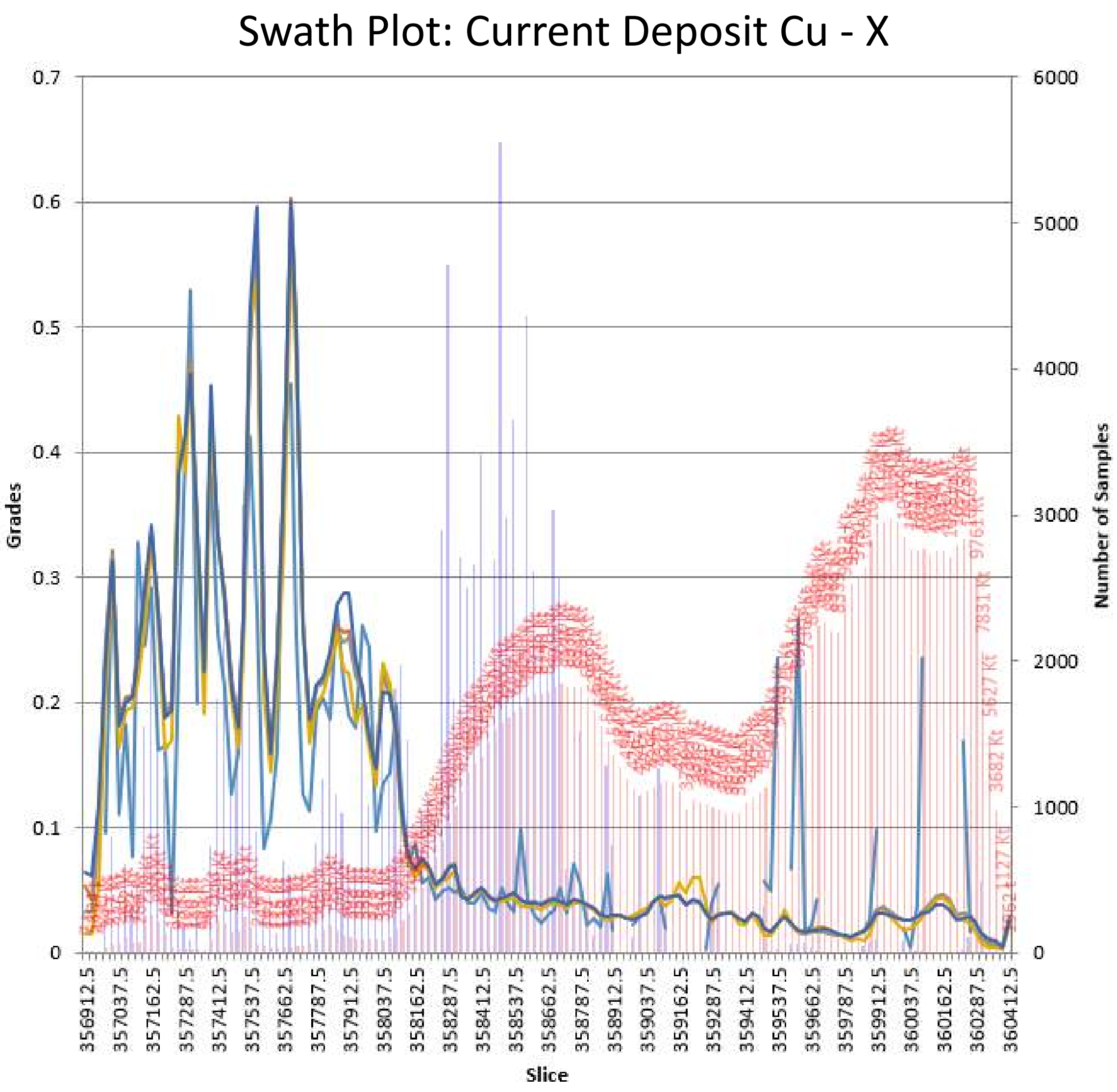


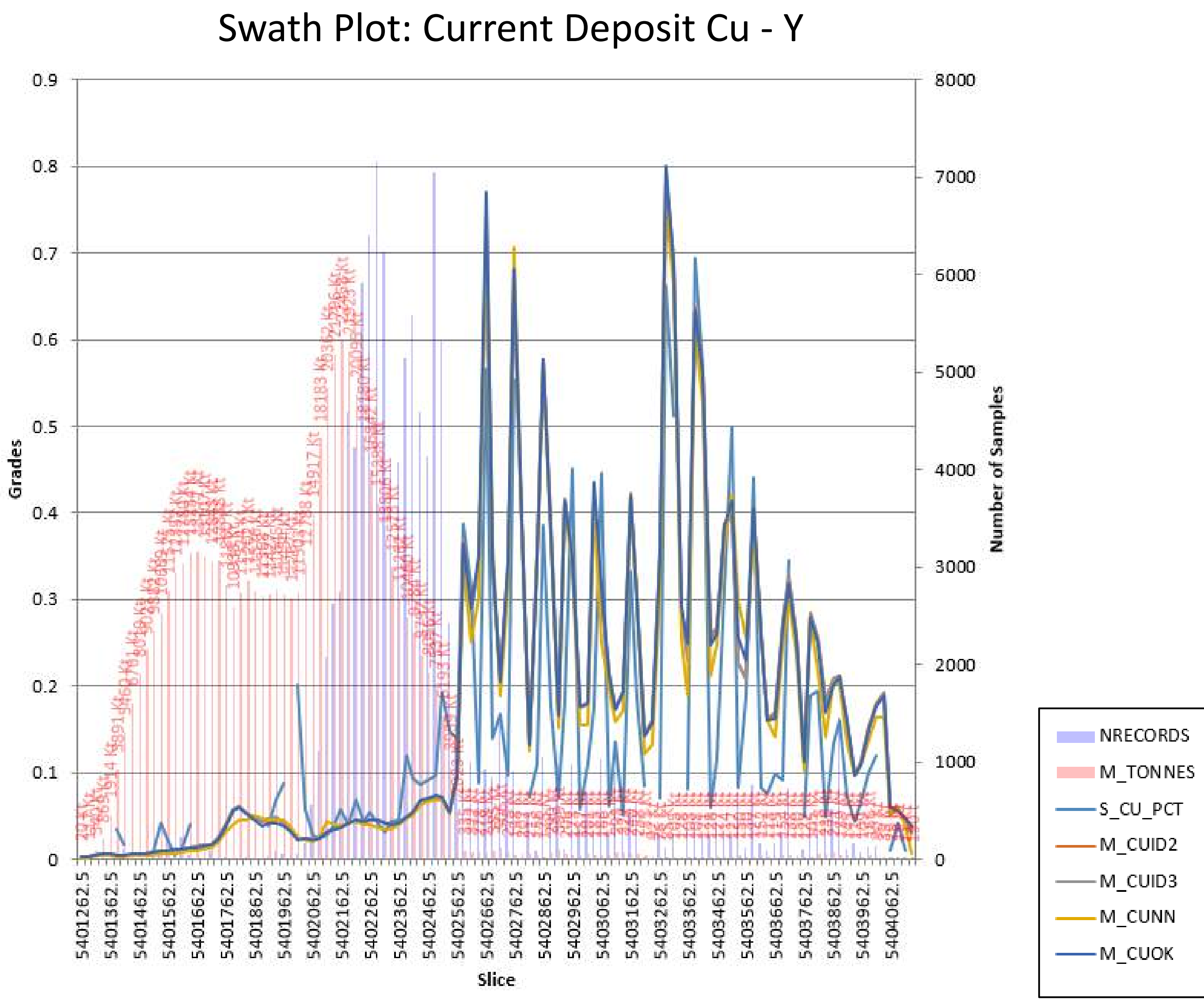


Swath Plot, Current Deposit – Ag in Z direction (Elevation)

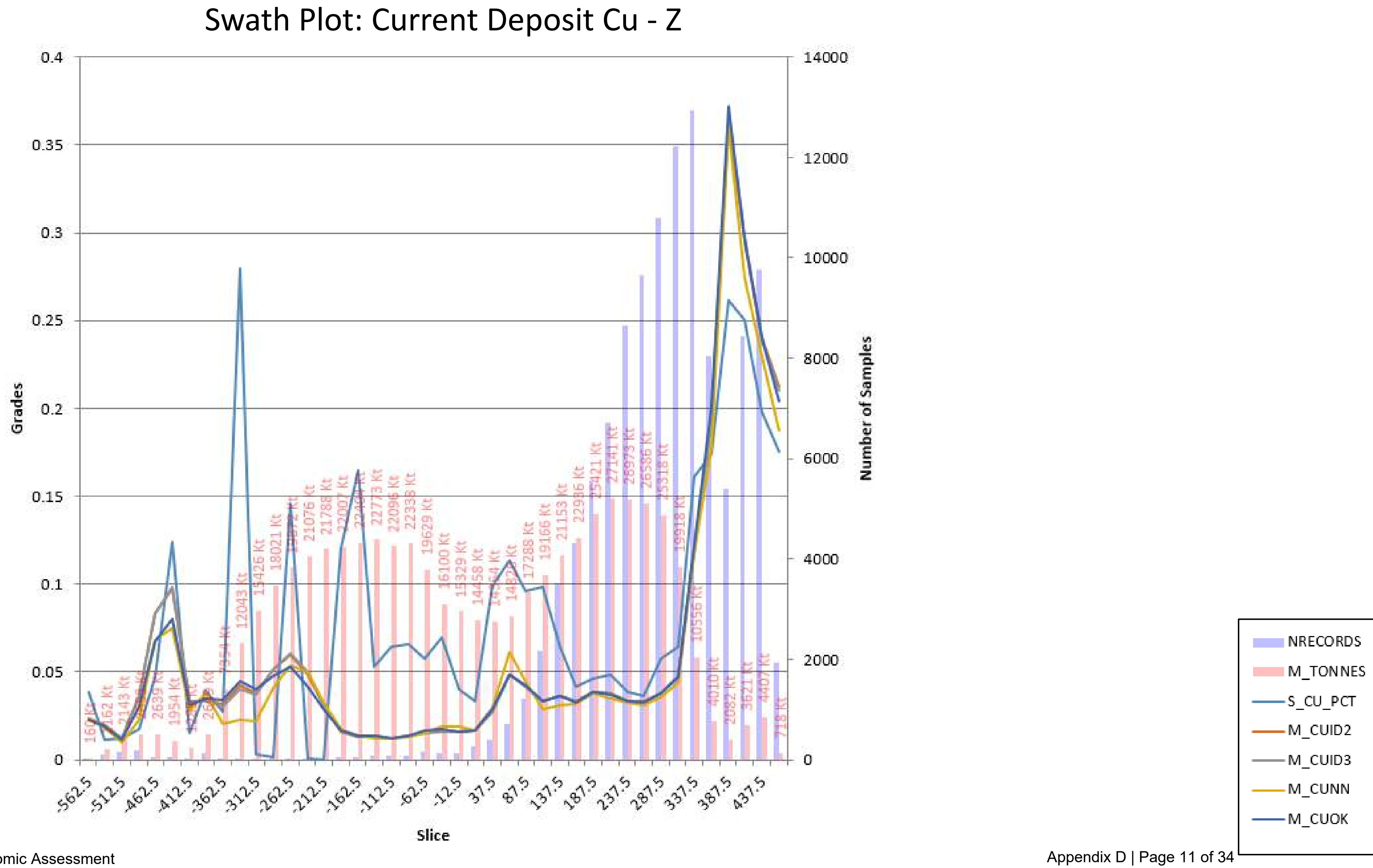


Swath Plot, Current Deposit – Cu in X and Y directions (Easting and Northing)

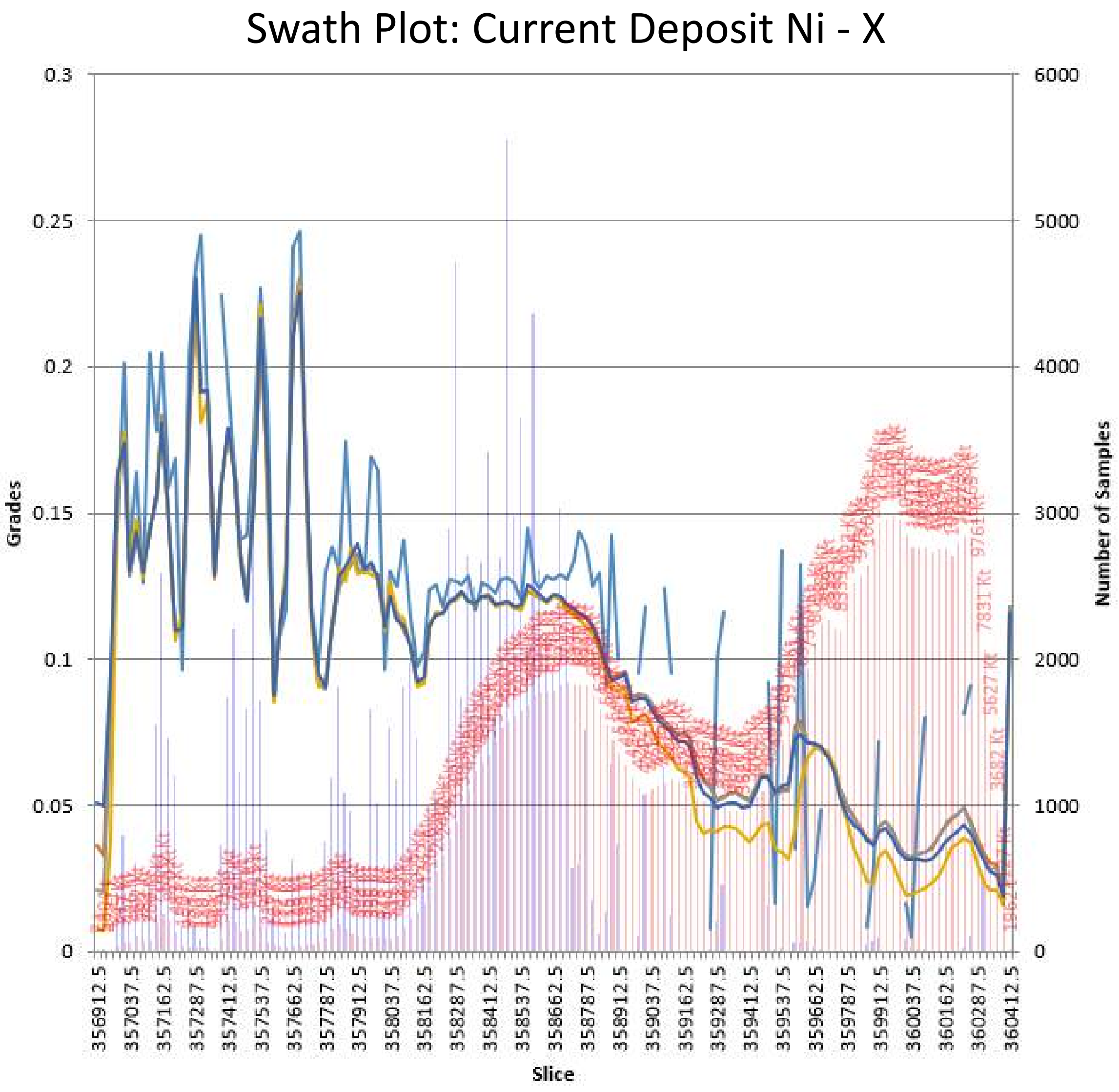


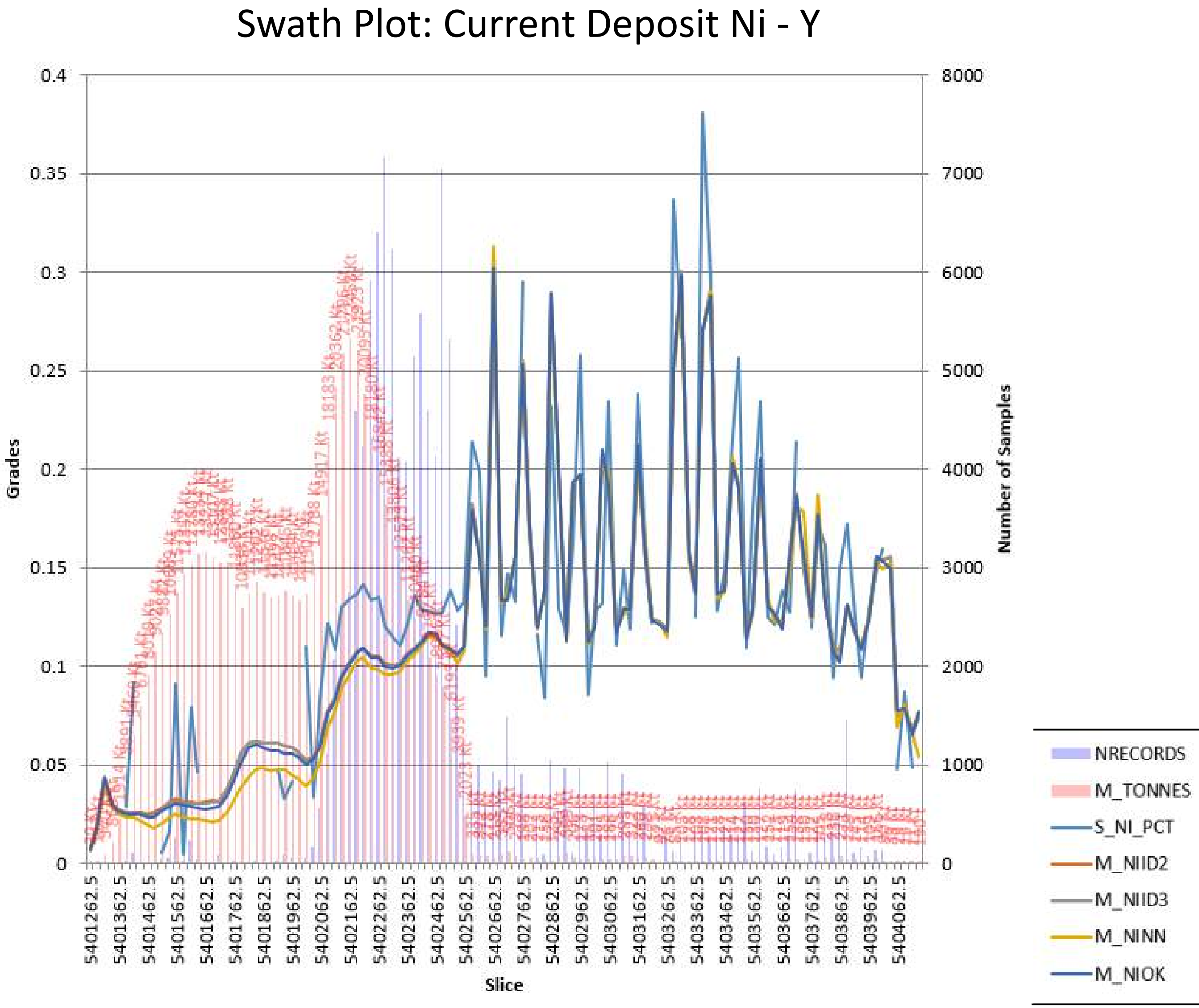


Swath Plot, Current Deposit – Cu in Z direction (Elevation)

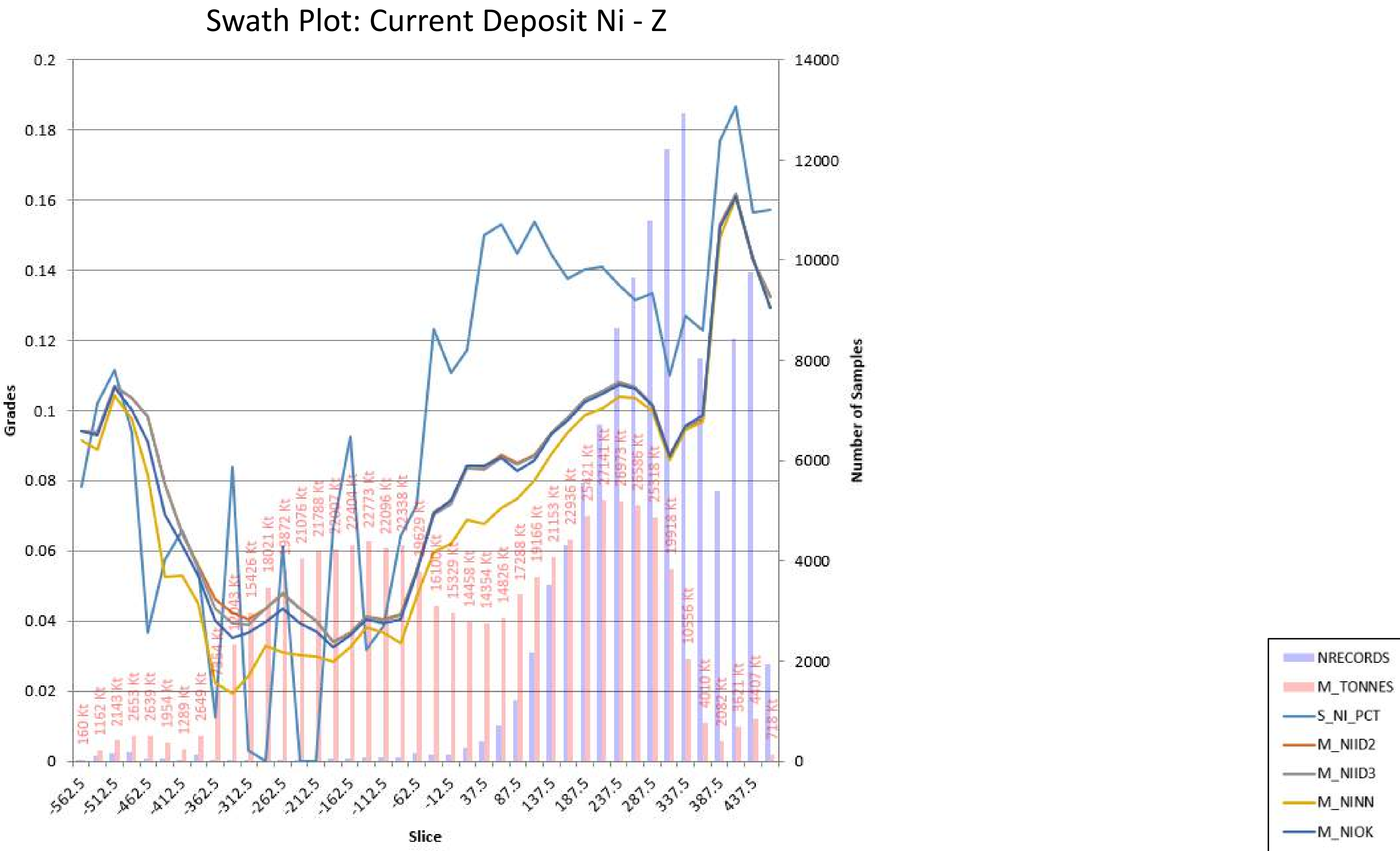


Swath Plot, Current Deposit – Ni in X and Y directions (Easting and Northing)

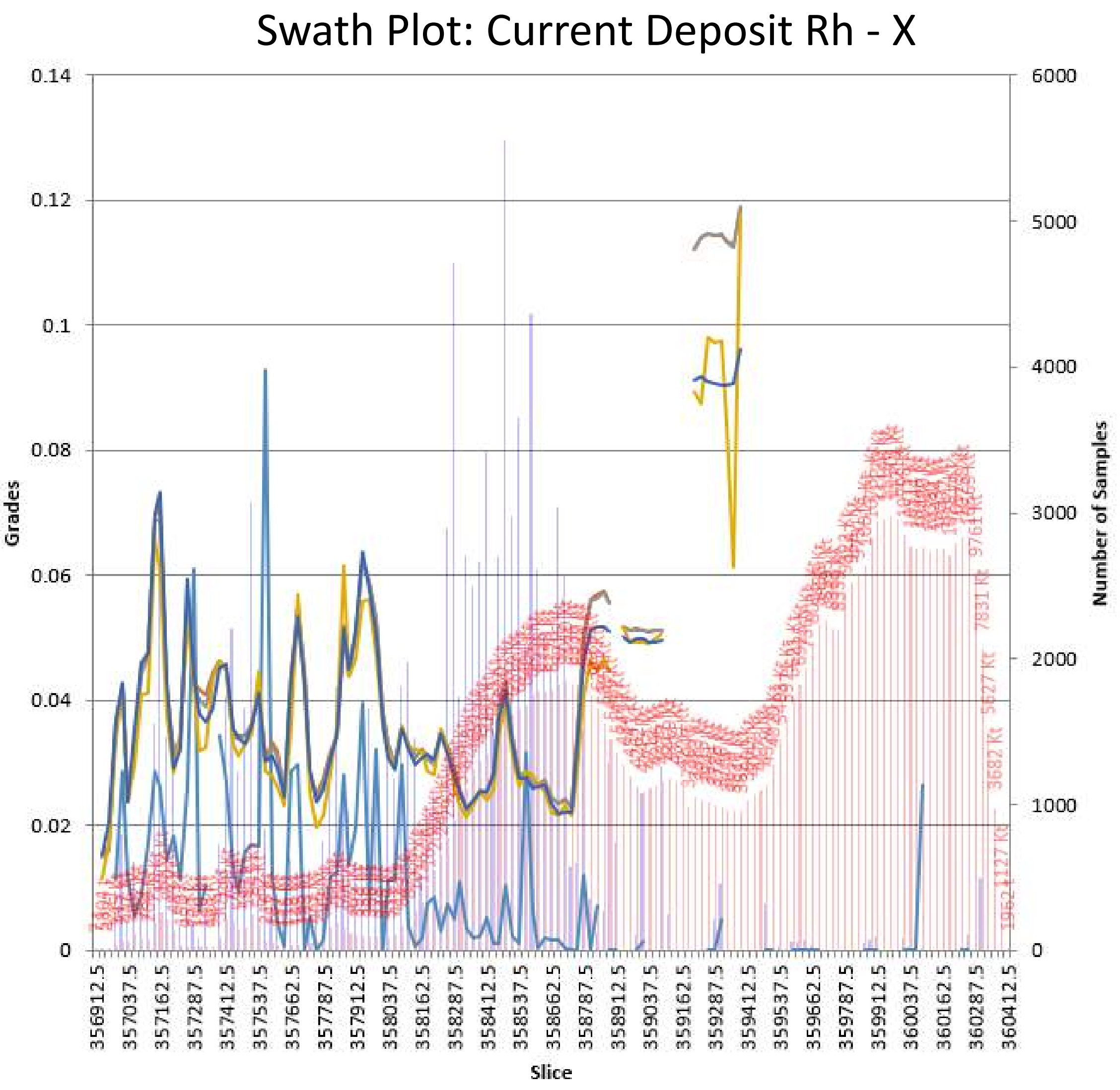


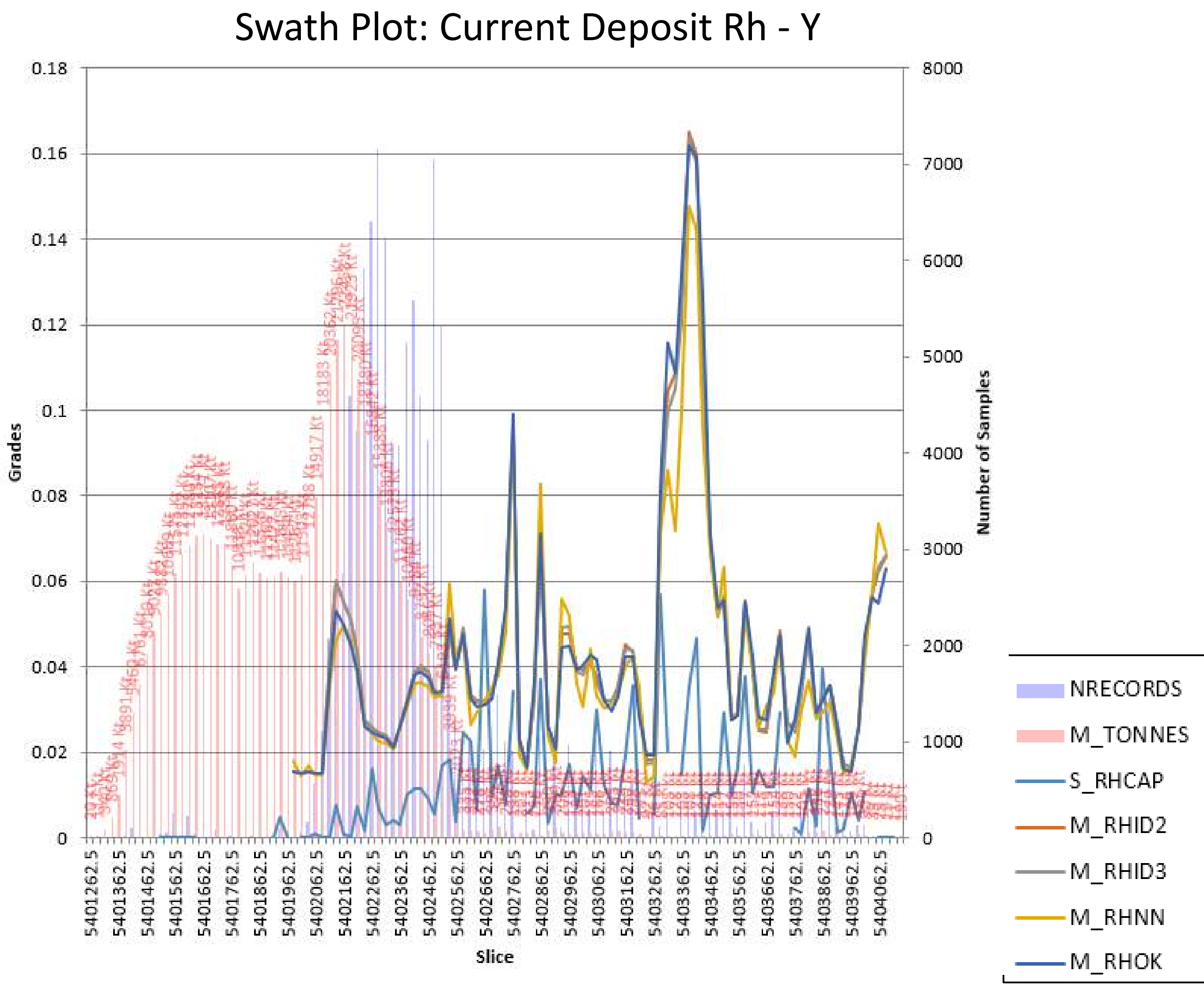


Swath Plot, Current Deposit – Ni in Z direction (Elevation)

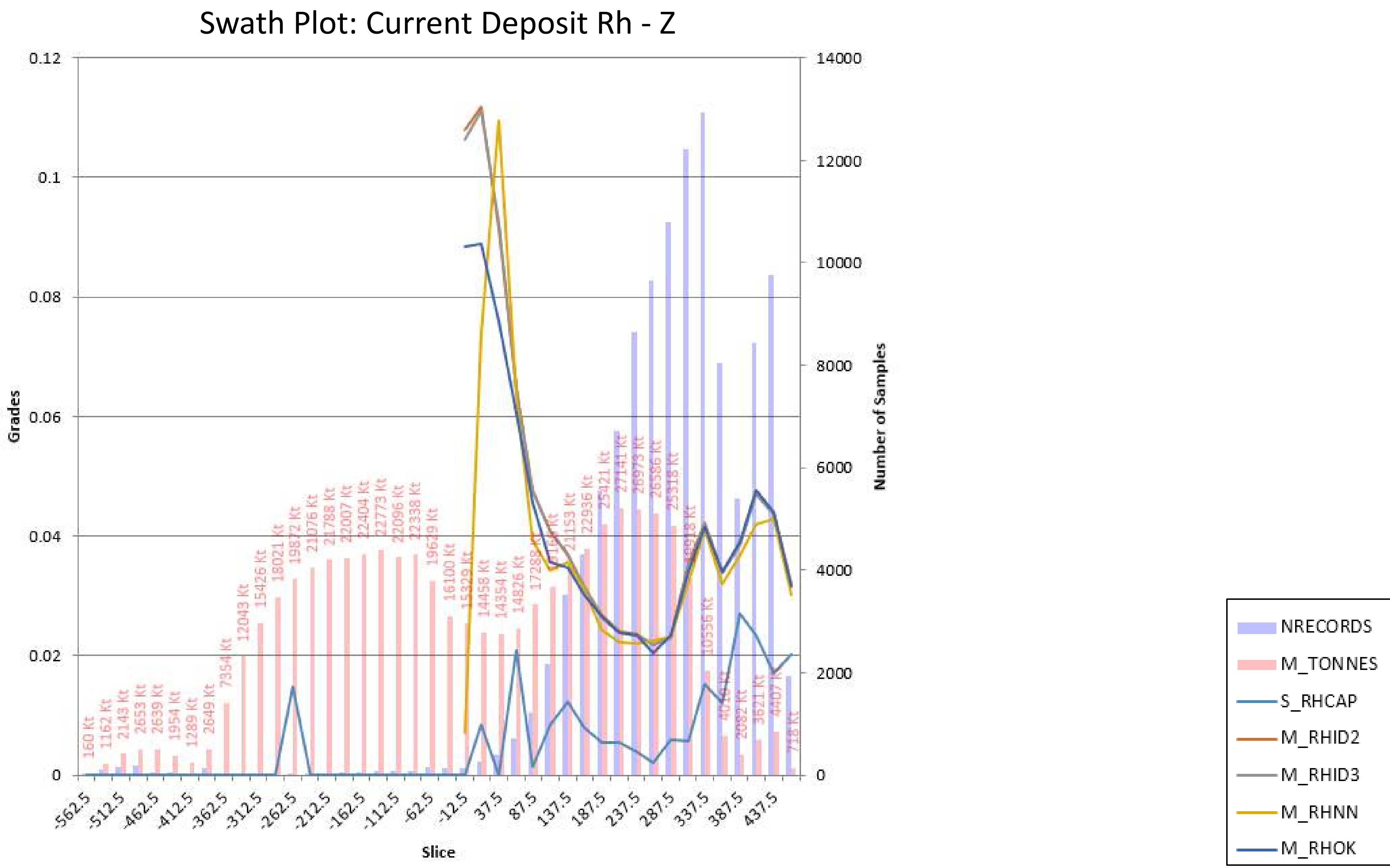


Swath Plot, Current Deposit – Rh in X and Y directions (Easting and Northing)

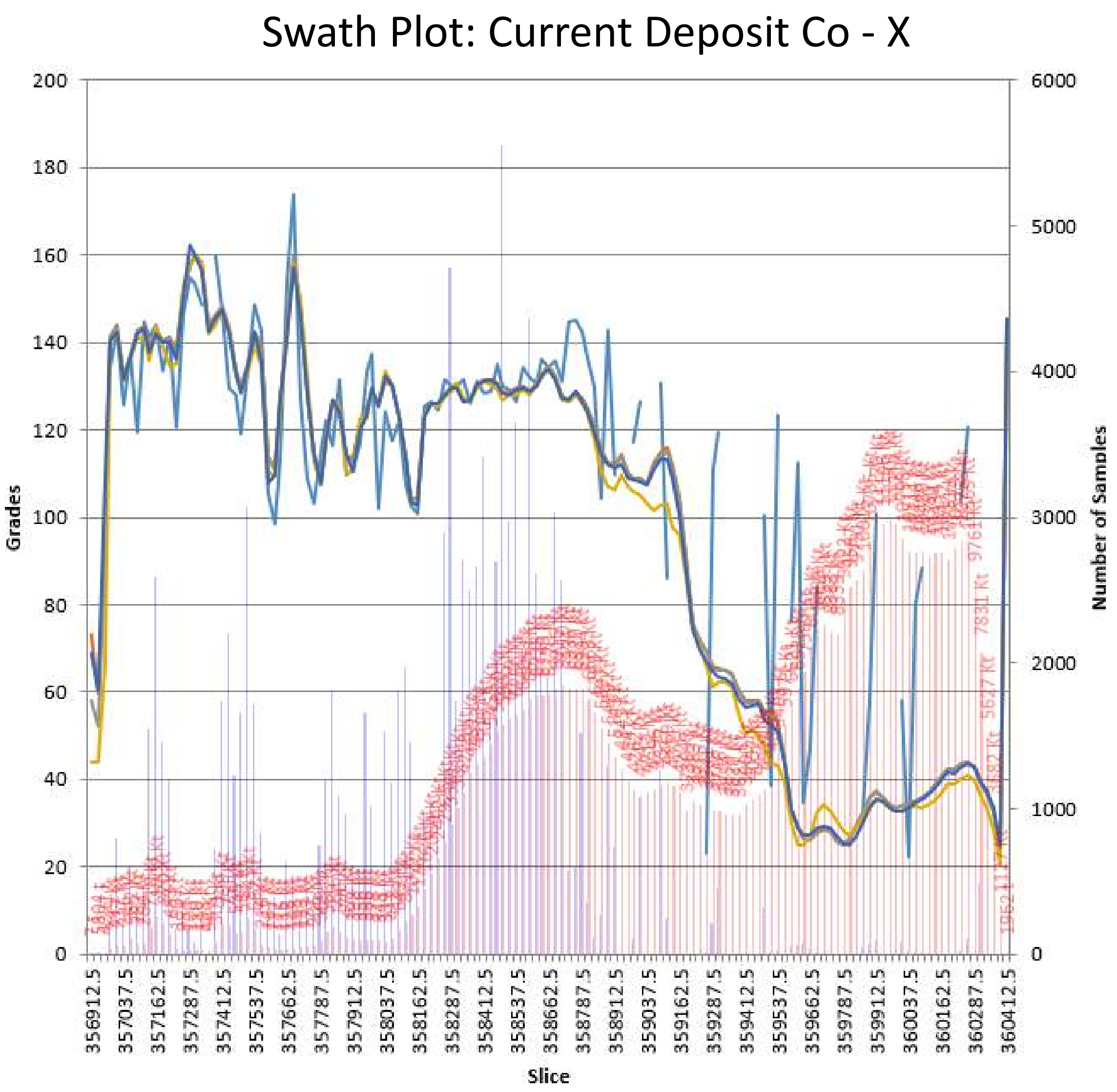


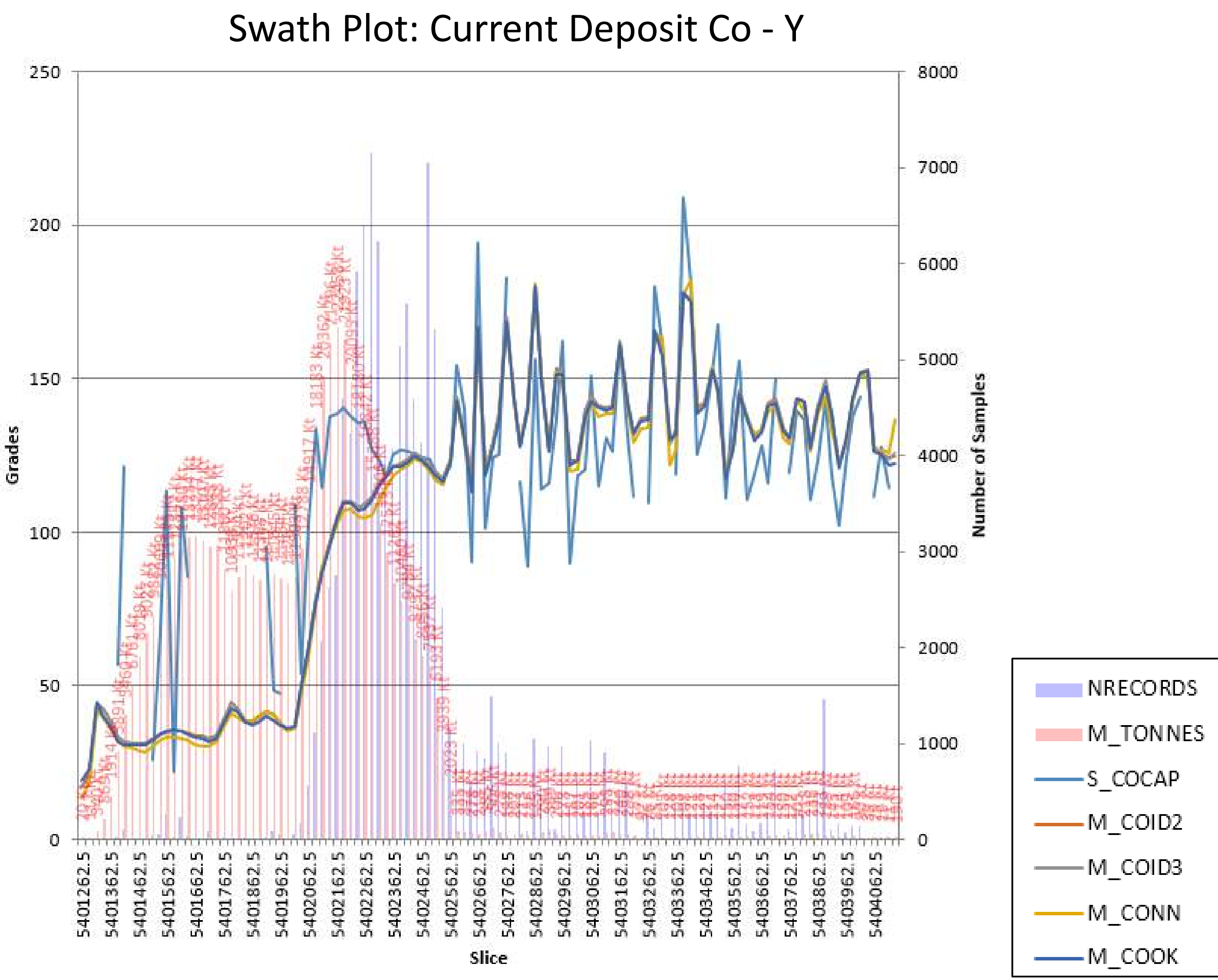


Swath Plot, Current Deposit – Rh in Z direction (Elevation)

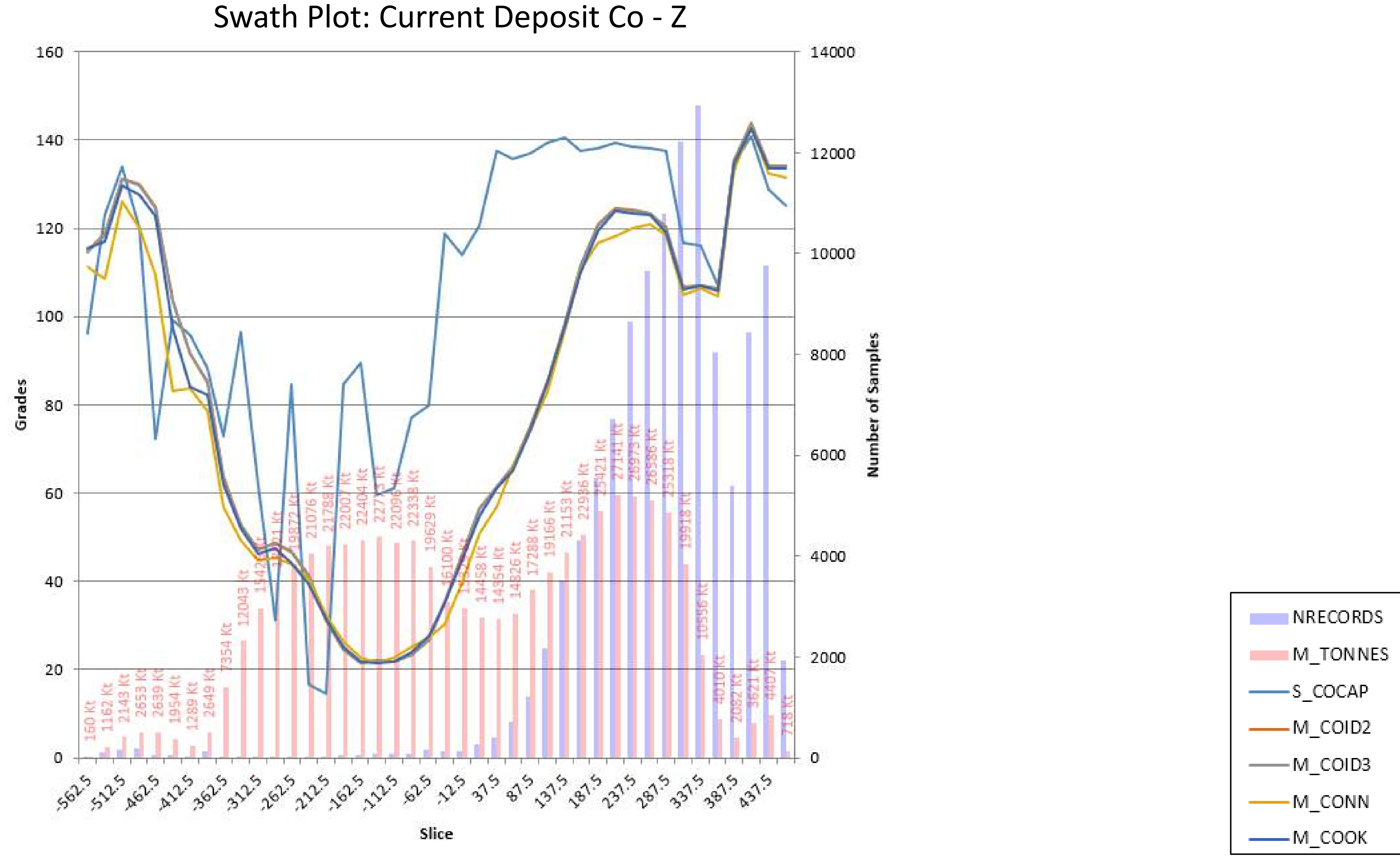


Swath Plot, Current Deposit – Co in X and Y directions (Easting and Northing)



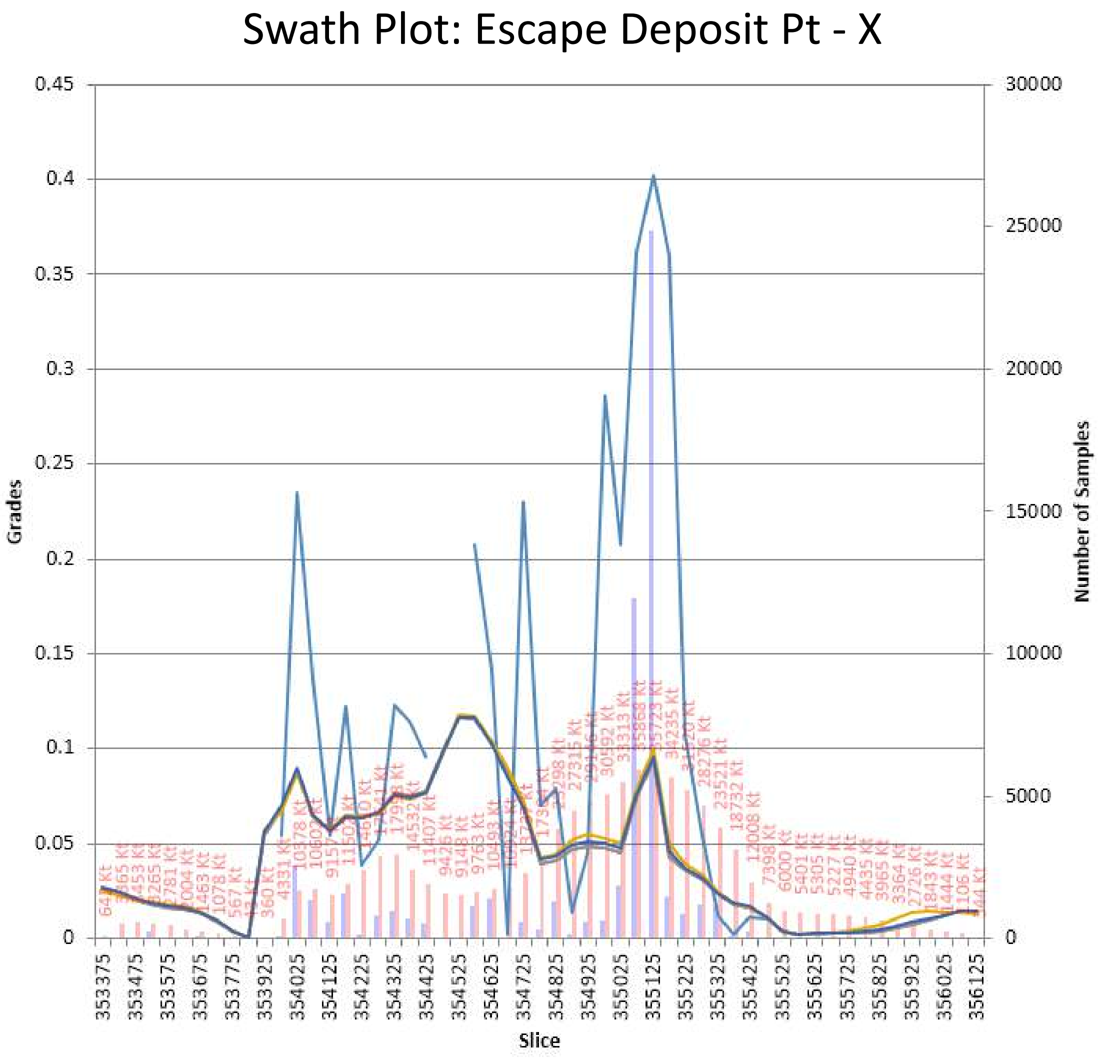


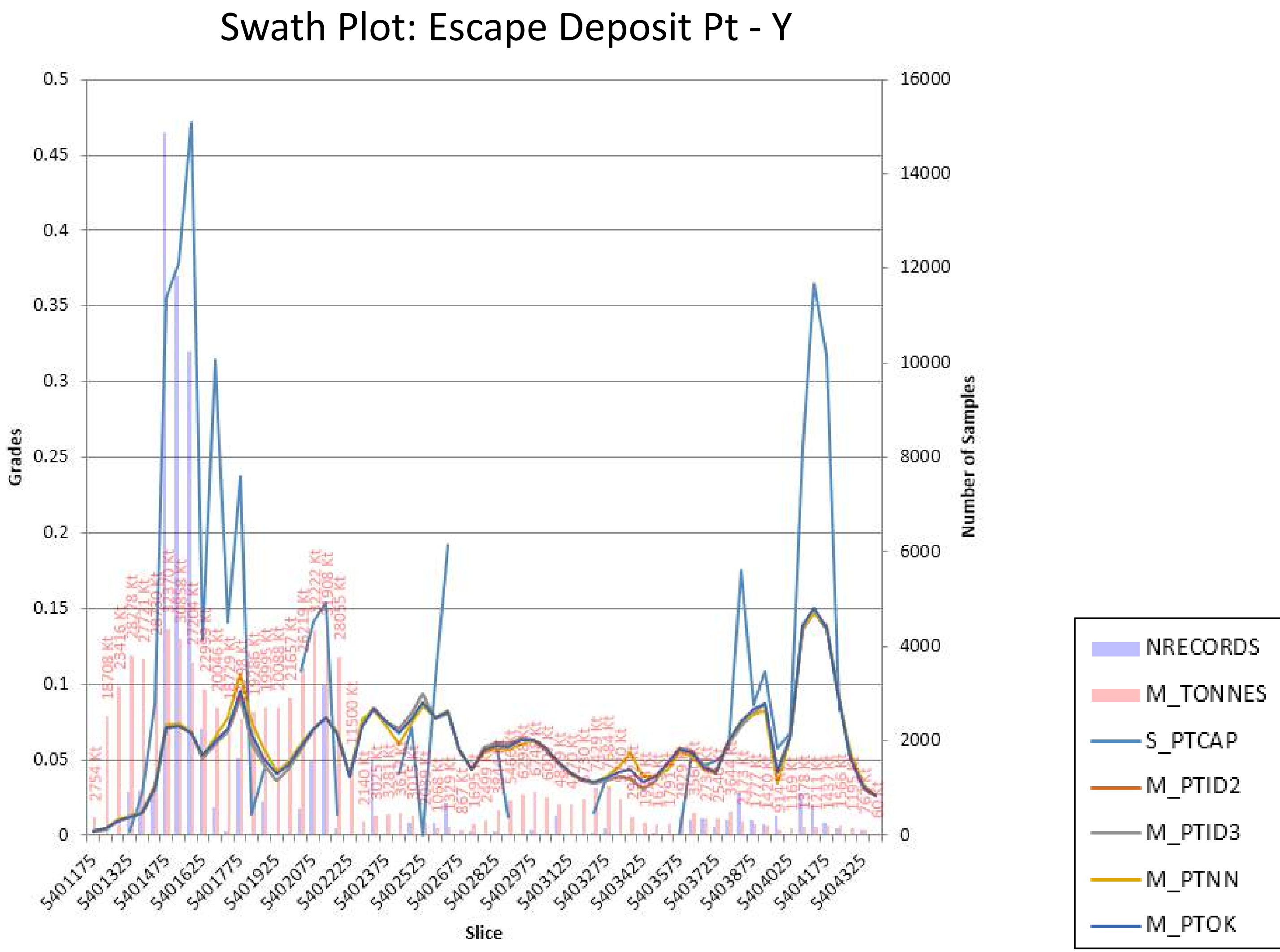
Swath Plot, Current Deposit – Co in Z direction (Elevation)



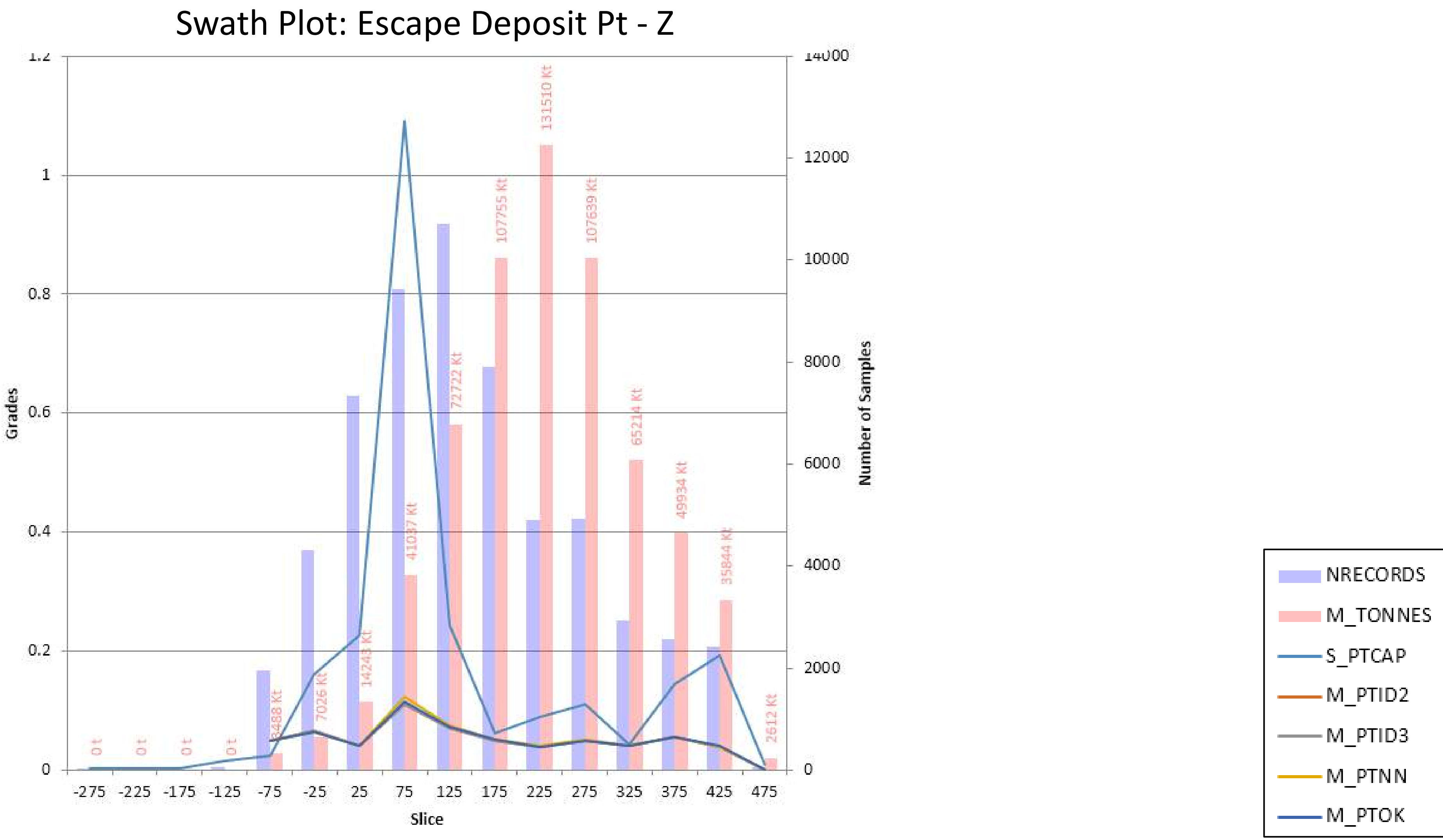
Escape Deposit Swath Plots

Swath Plot, Escape Deposit – Pt in X and Y direction (Easting and Northing)

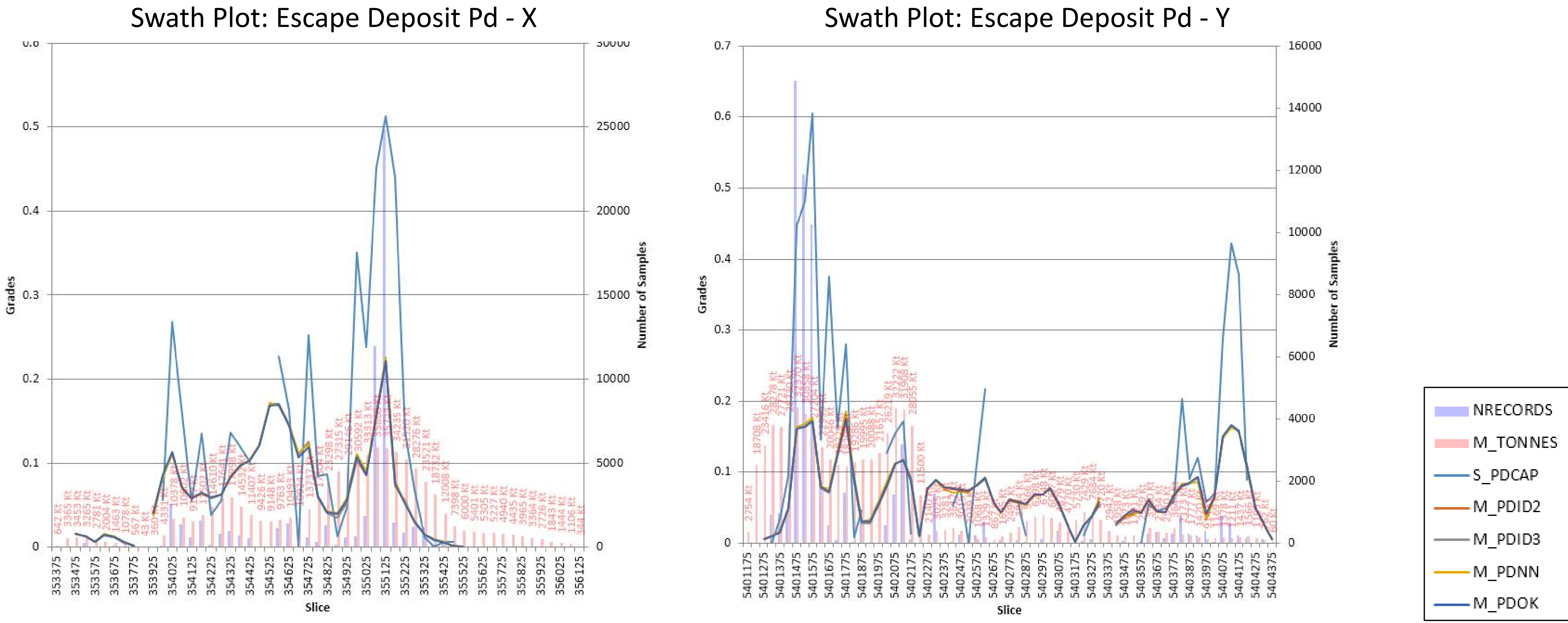




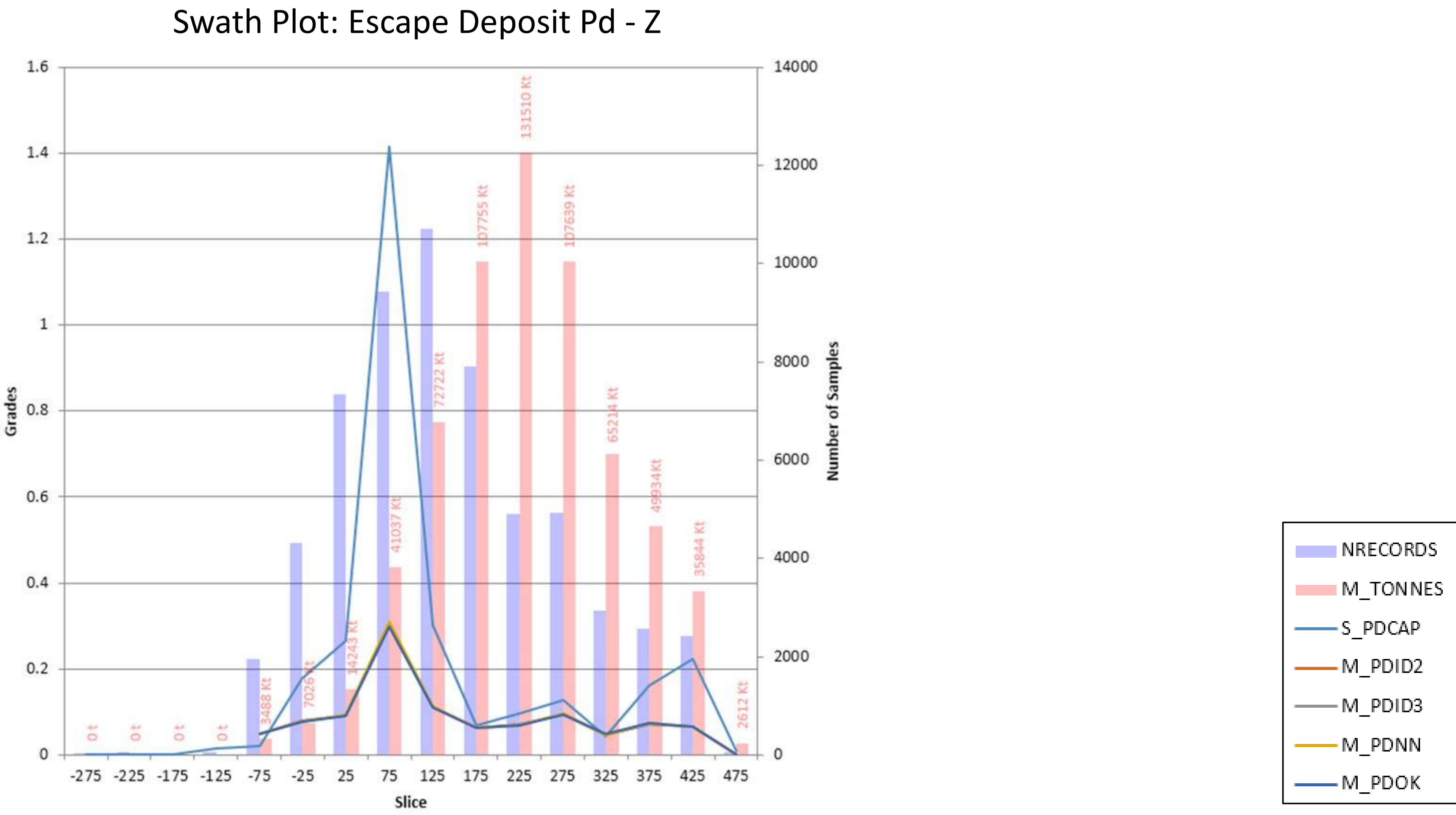
Swath Plot, Current Deposit – Pt in Z direction (Elevation)



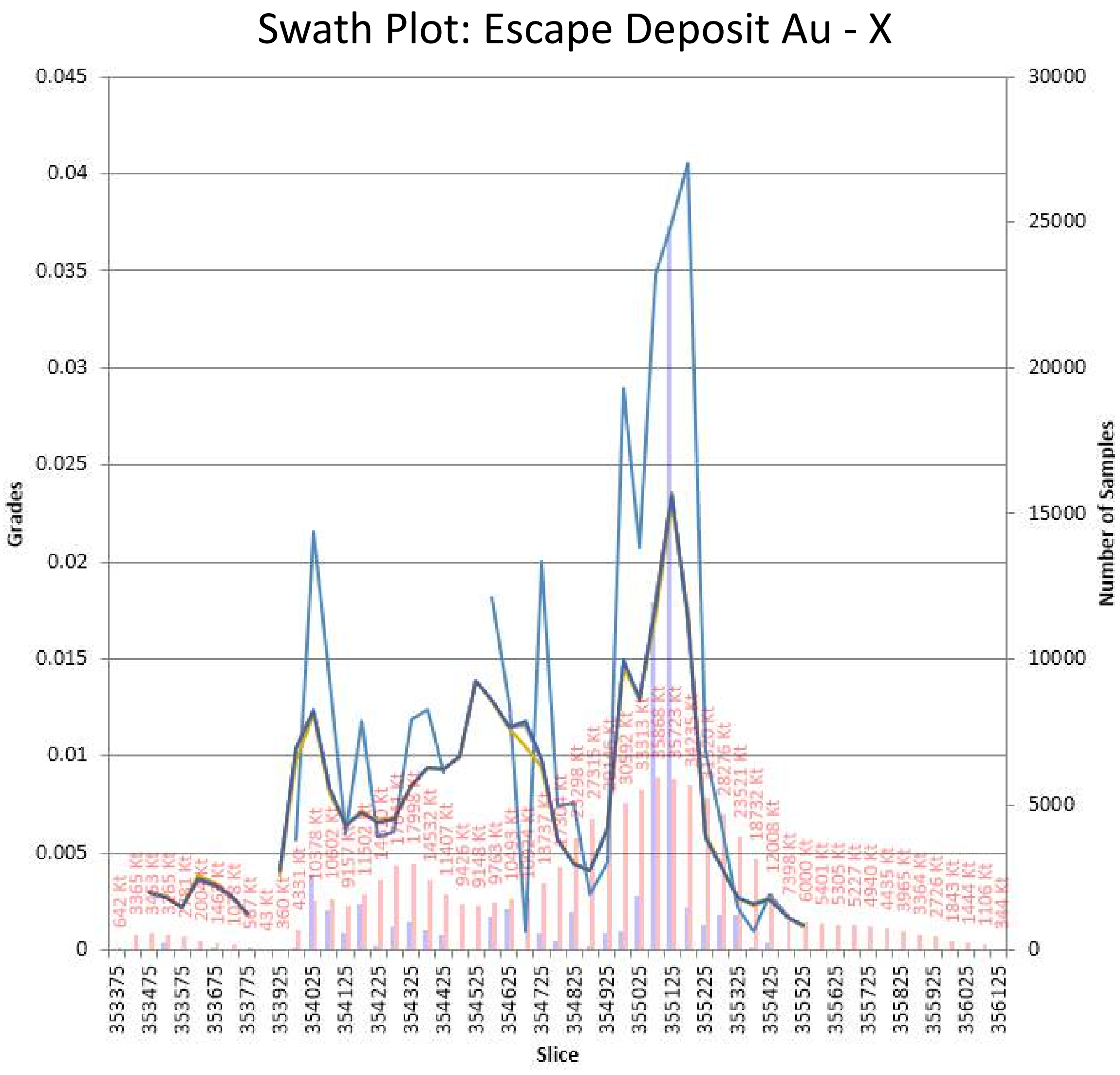
Swath Plot, Escape Deposit – Pd in X and Y directions (Easting and Northing)

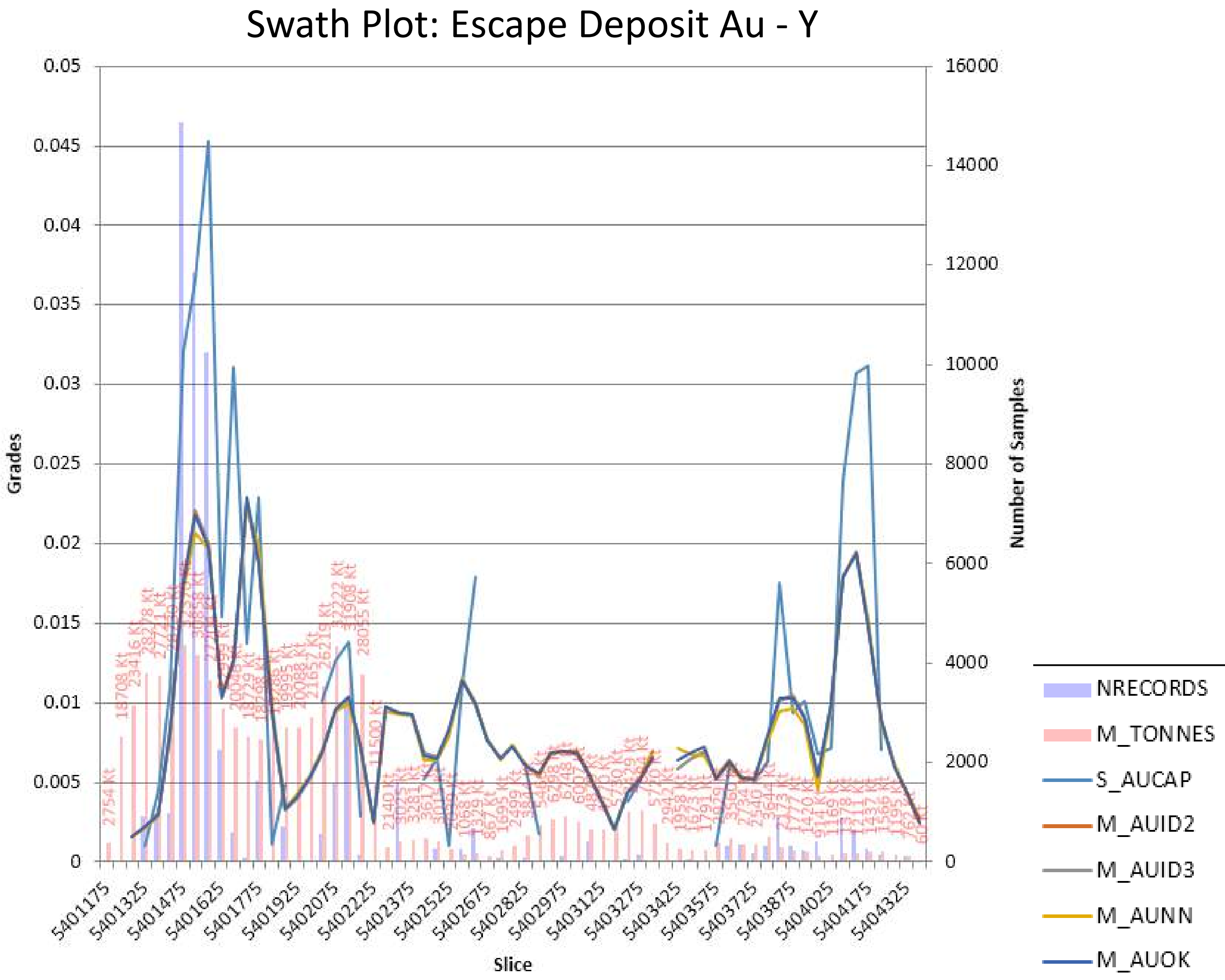


Swath Plot, Escape Deposit – Pd in Z direction (Elevation)

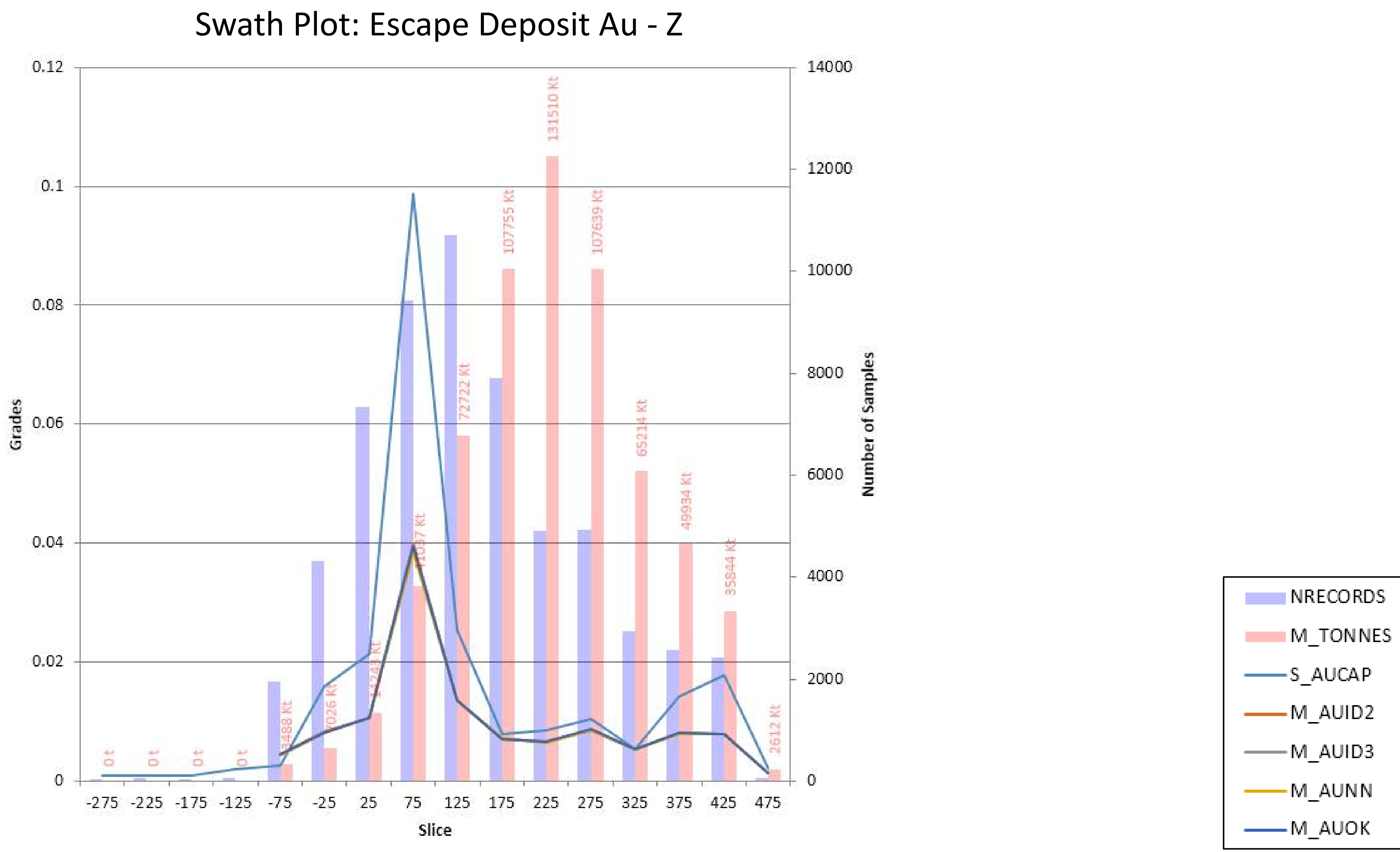


Swath Plot, Escape Deposit – Au in X and Y directions (Easting and Northing)

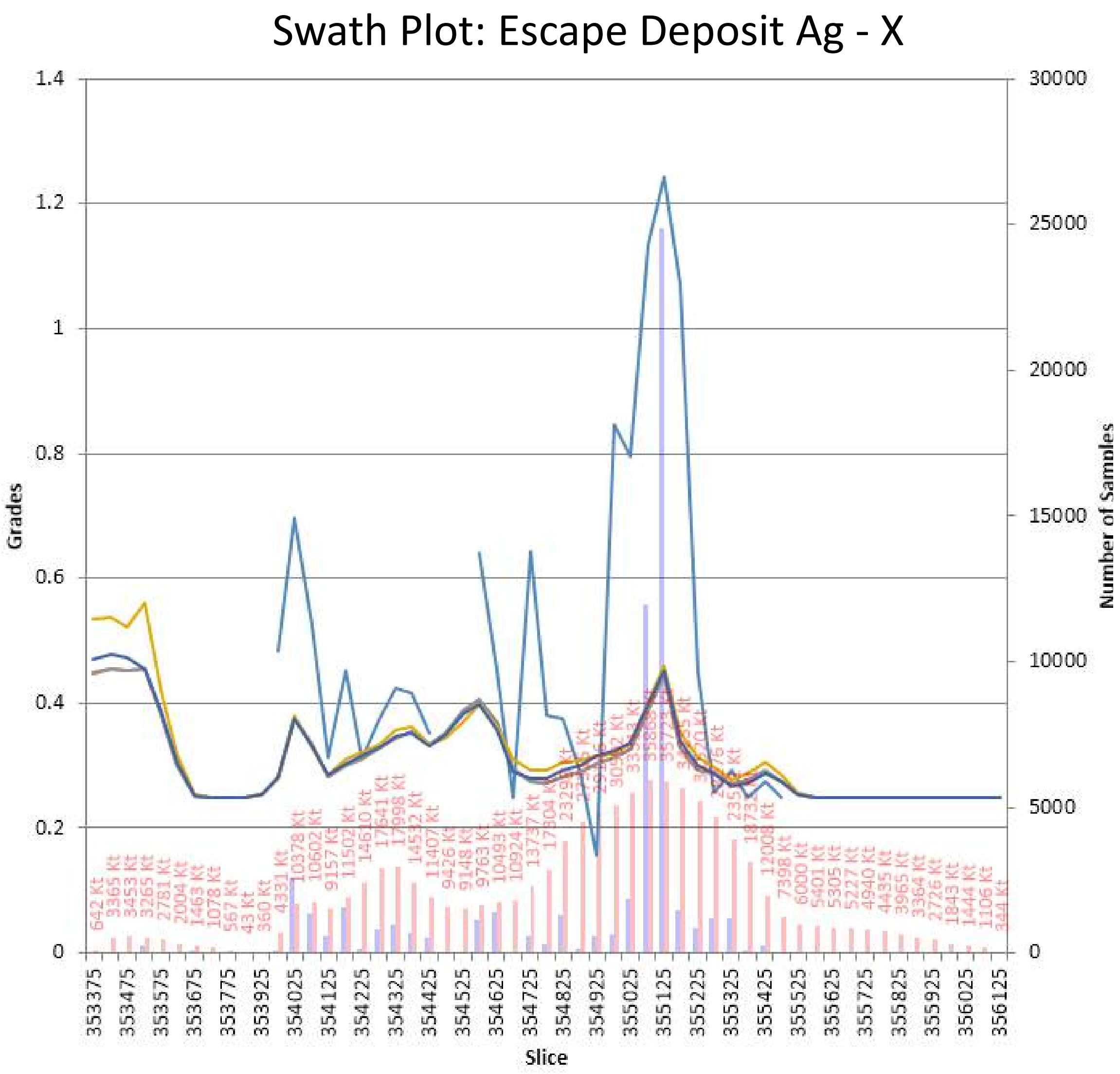


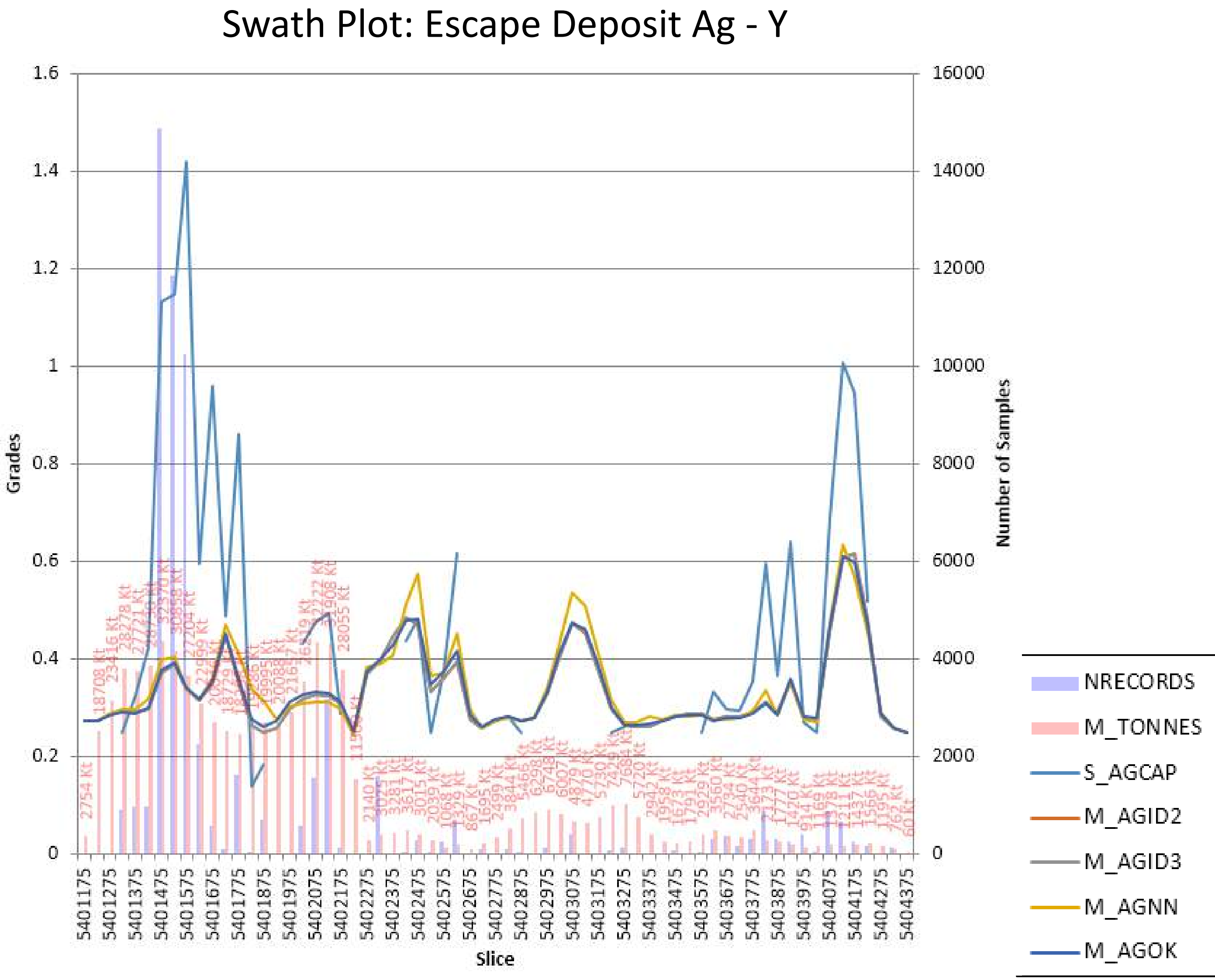


Swath Plot, Escape Deposit – Au in Z direction (Elevation)

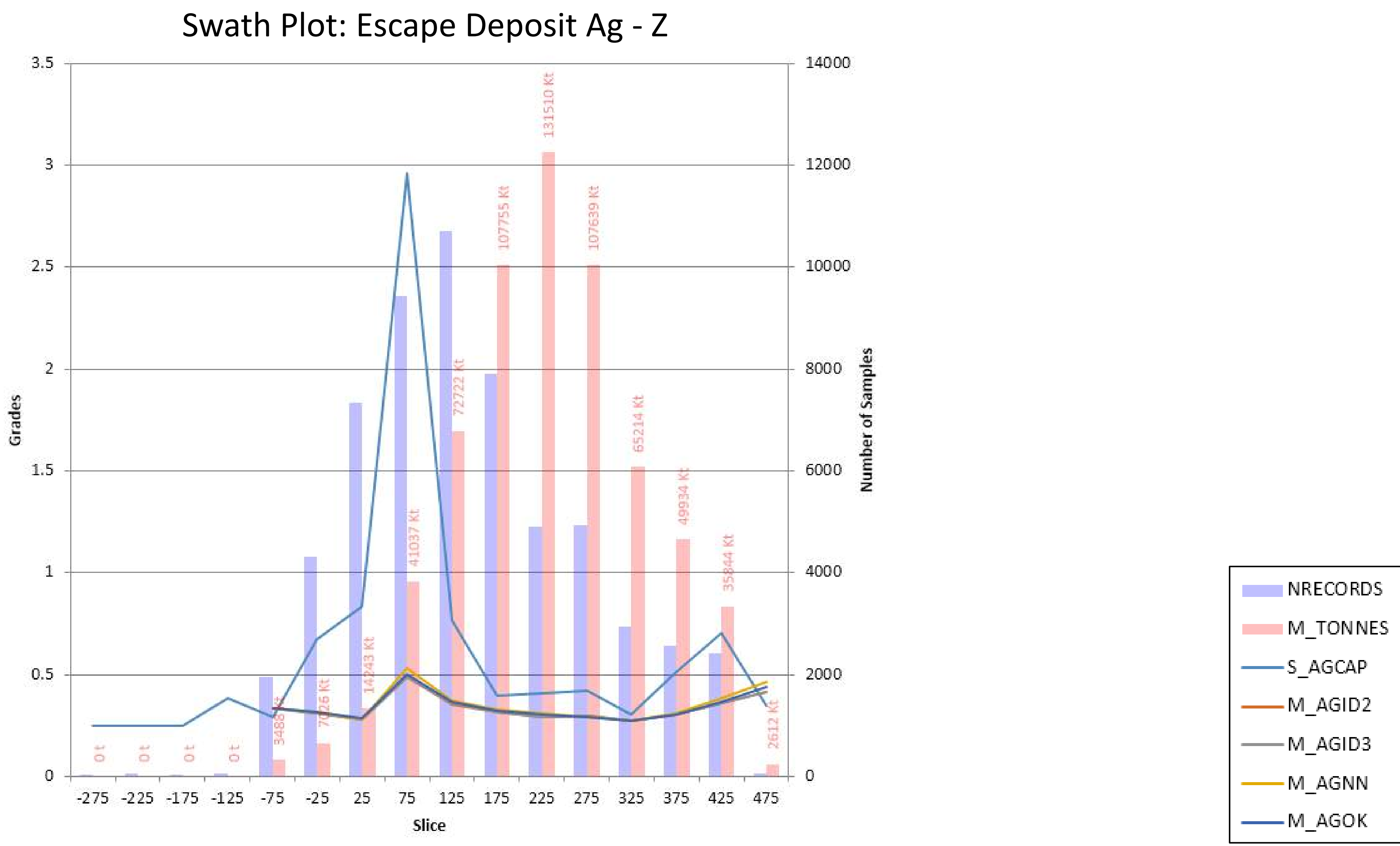


Swath Plot, Current Deposit – Ag in X and Y directions (Easting and Northing)

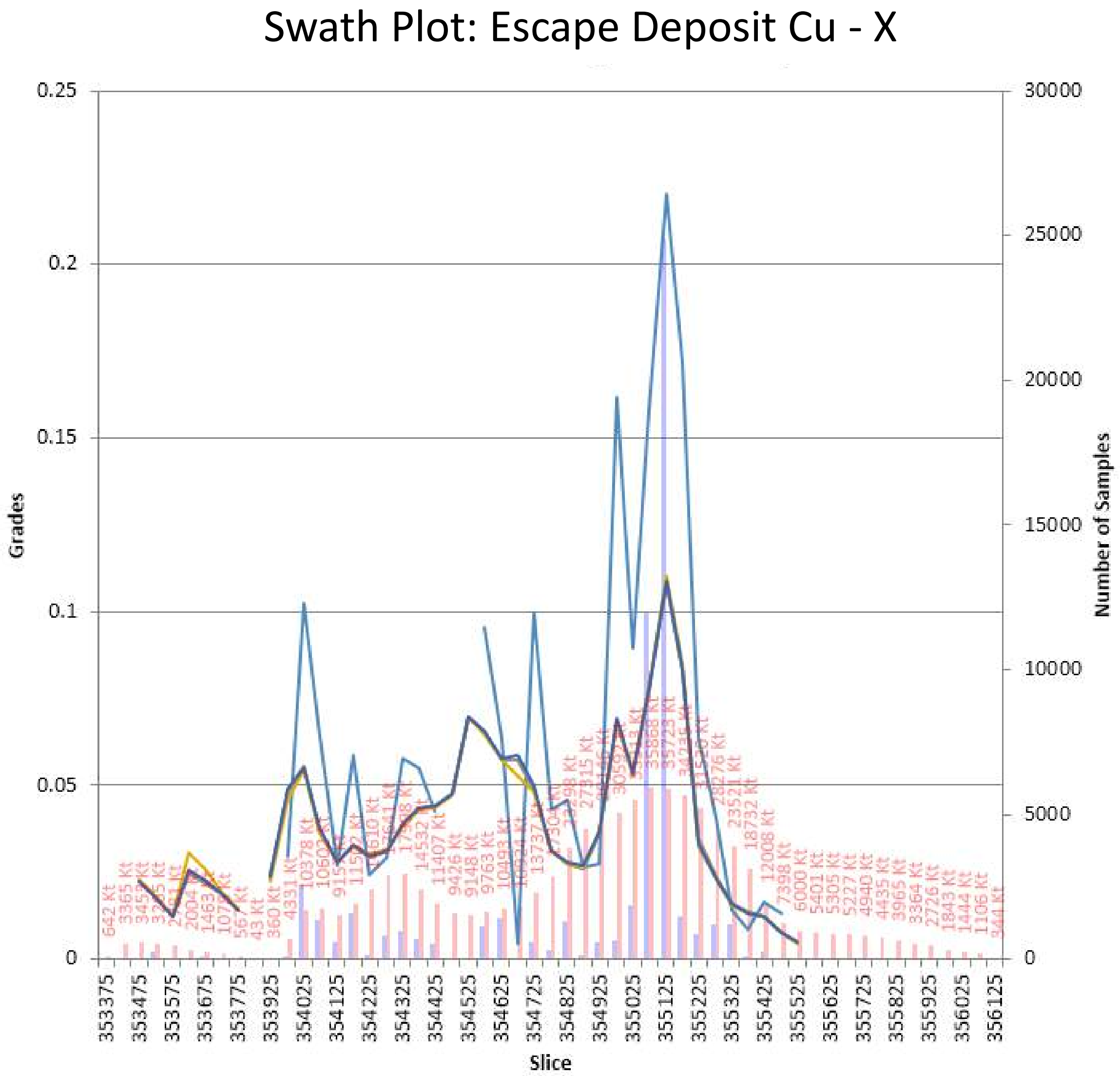


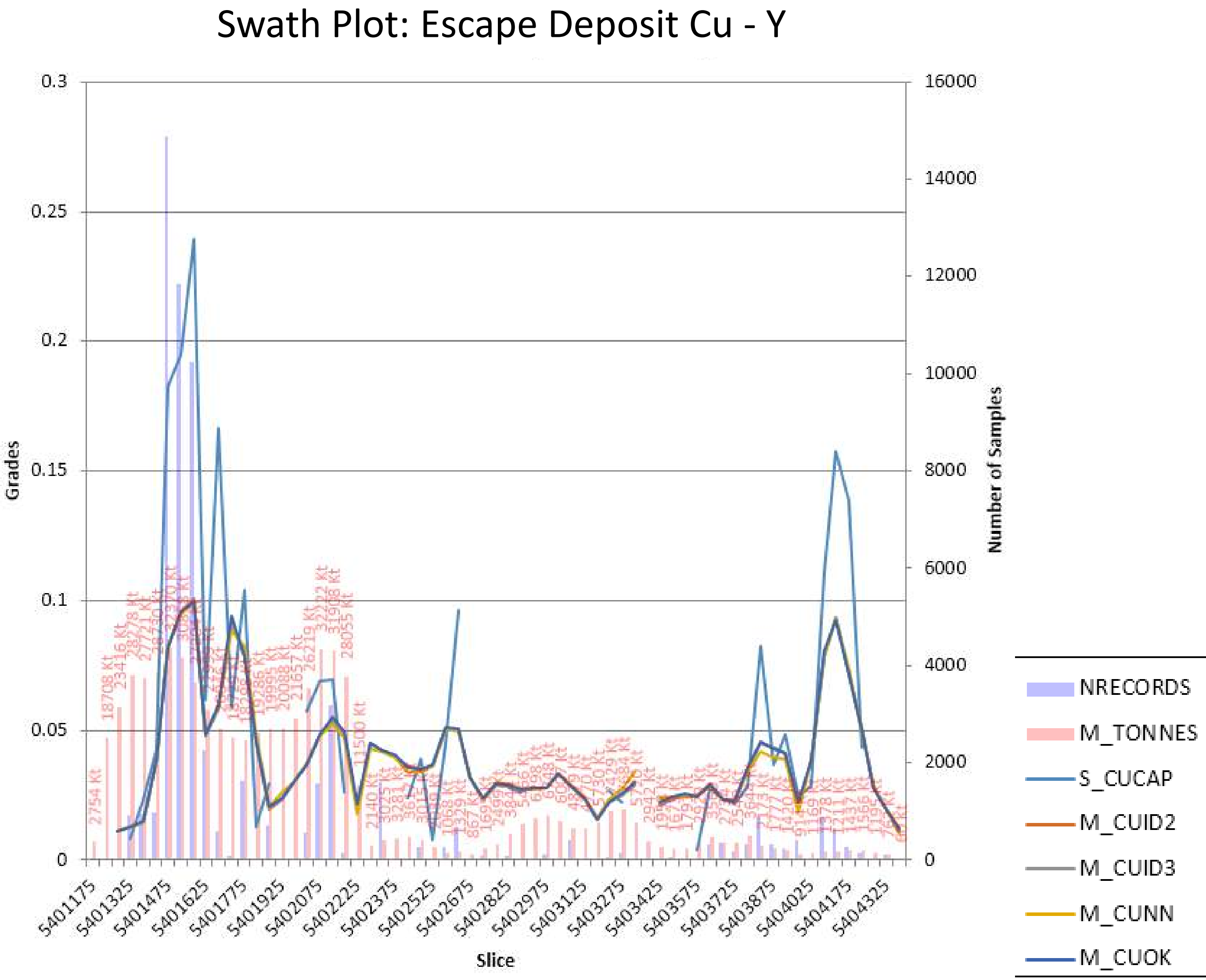


Swath Plot, Current Deposit – Ag in Z direction (Elevation)

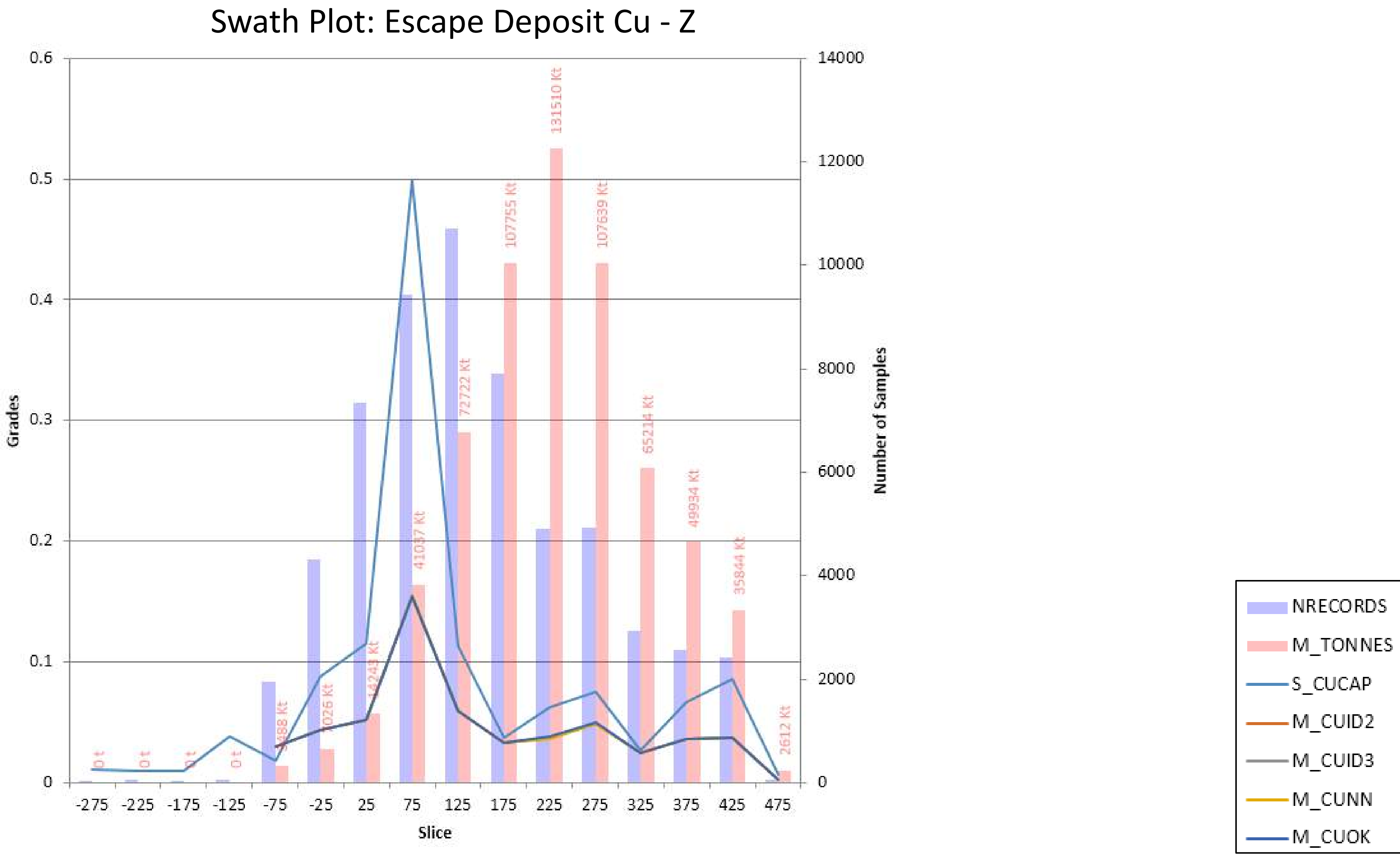


Swath Plot, Escape Deposit – Cu in X and Y directions (Easting and Northing)

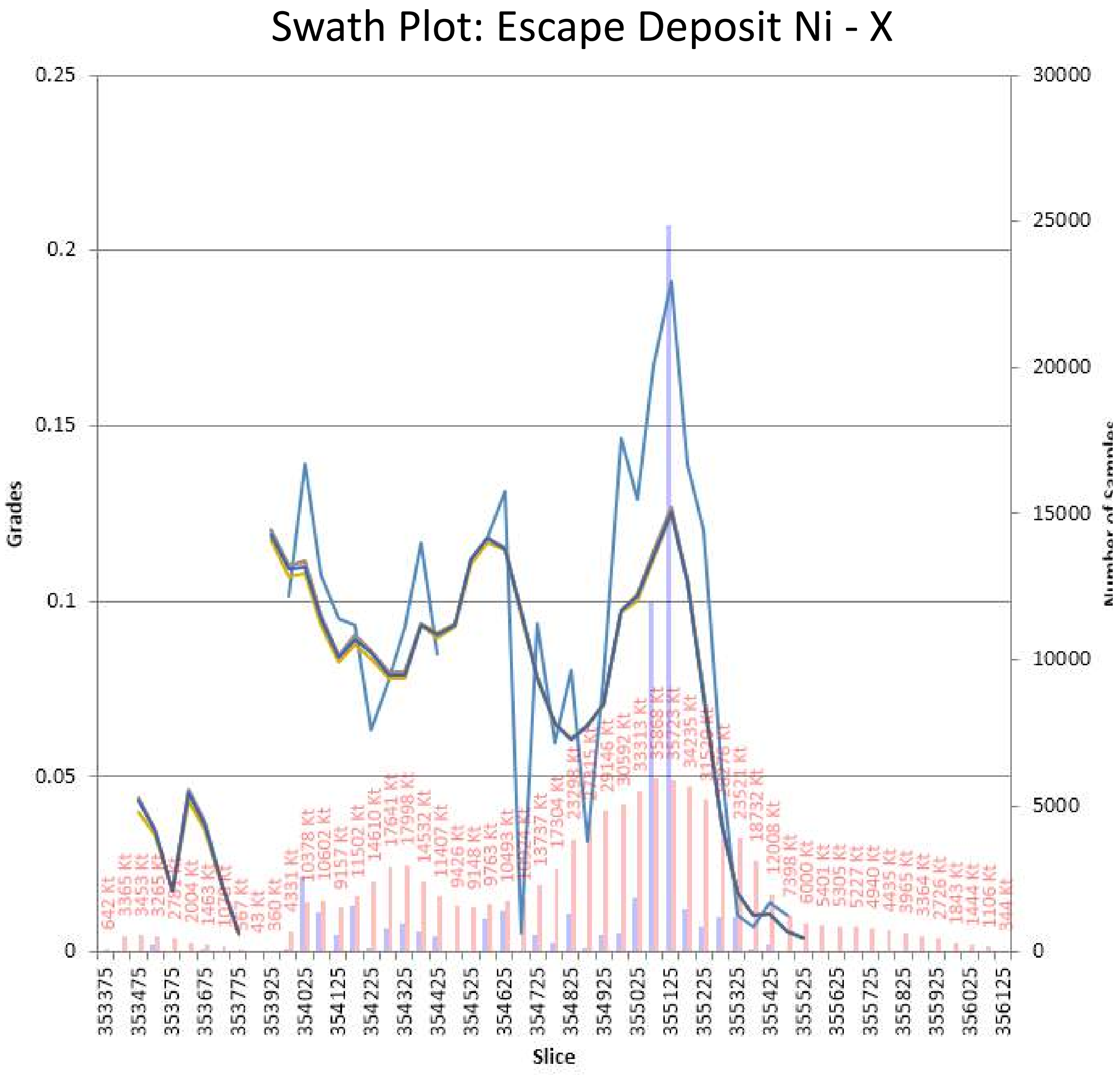


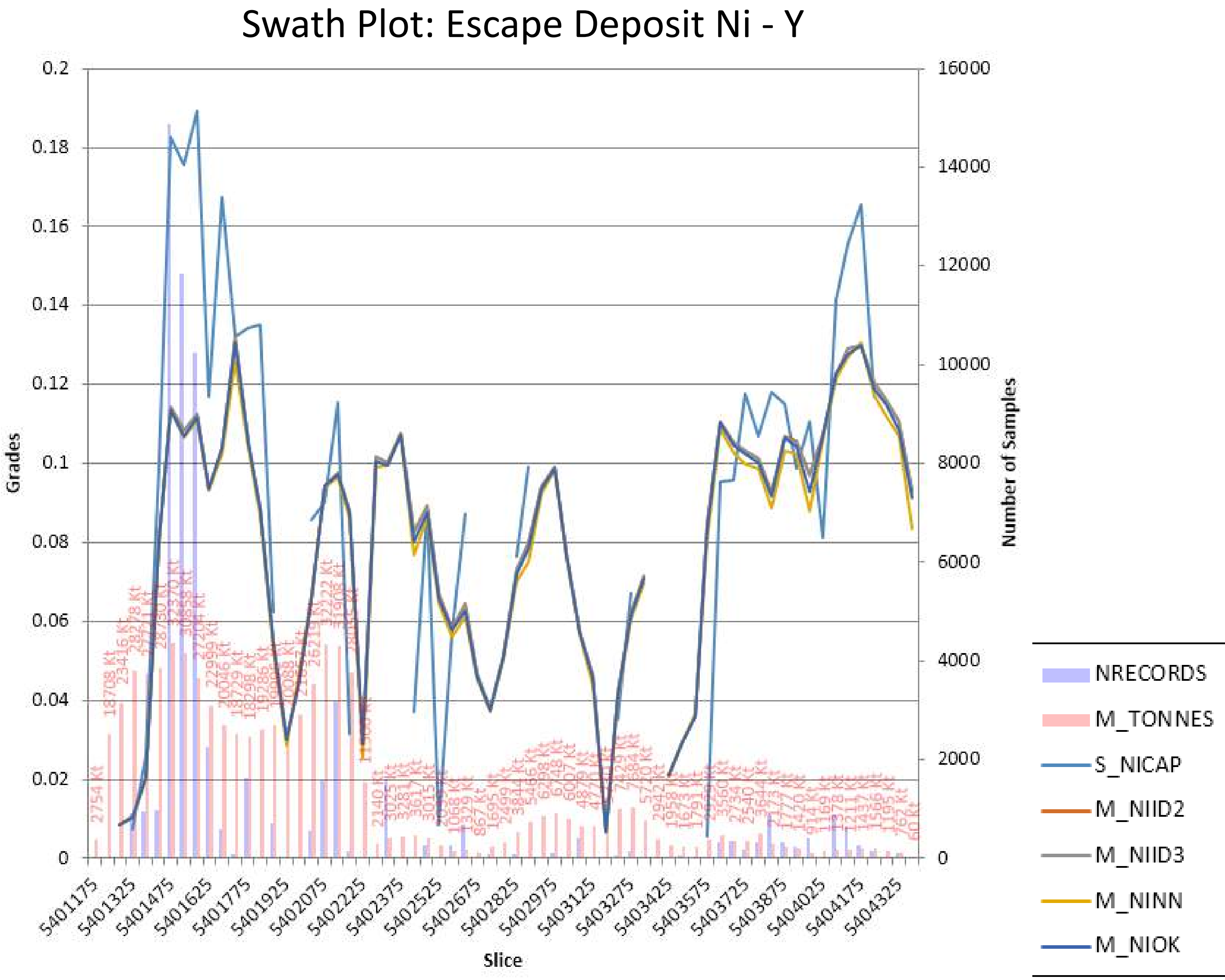


Swath Plot, Escape Deposit – Cu in Z direction (Elevation)

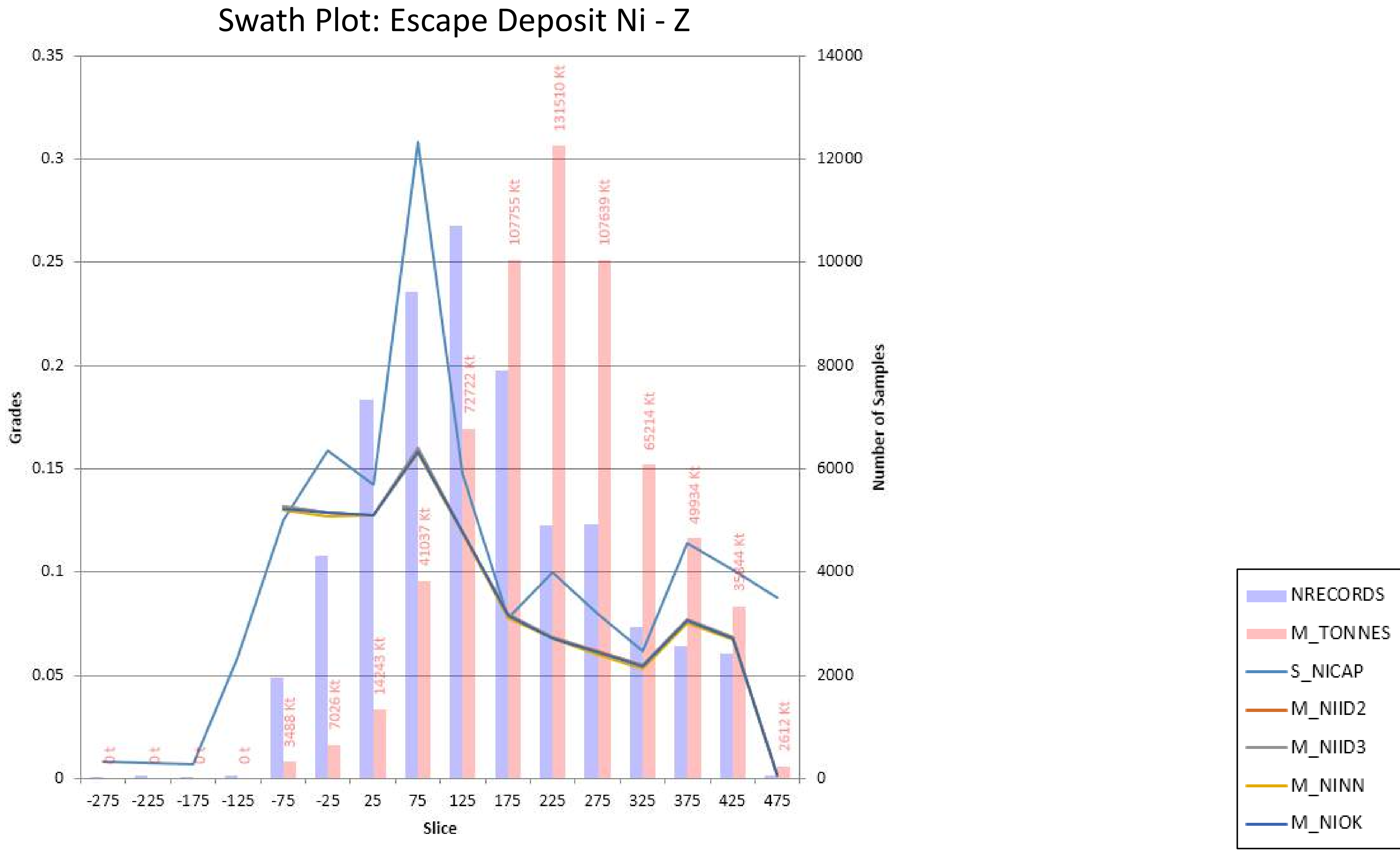


Swath Plot, Escape Deposit – Ni in X and Y directions (Easting and Northing)

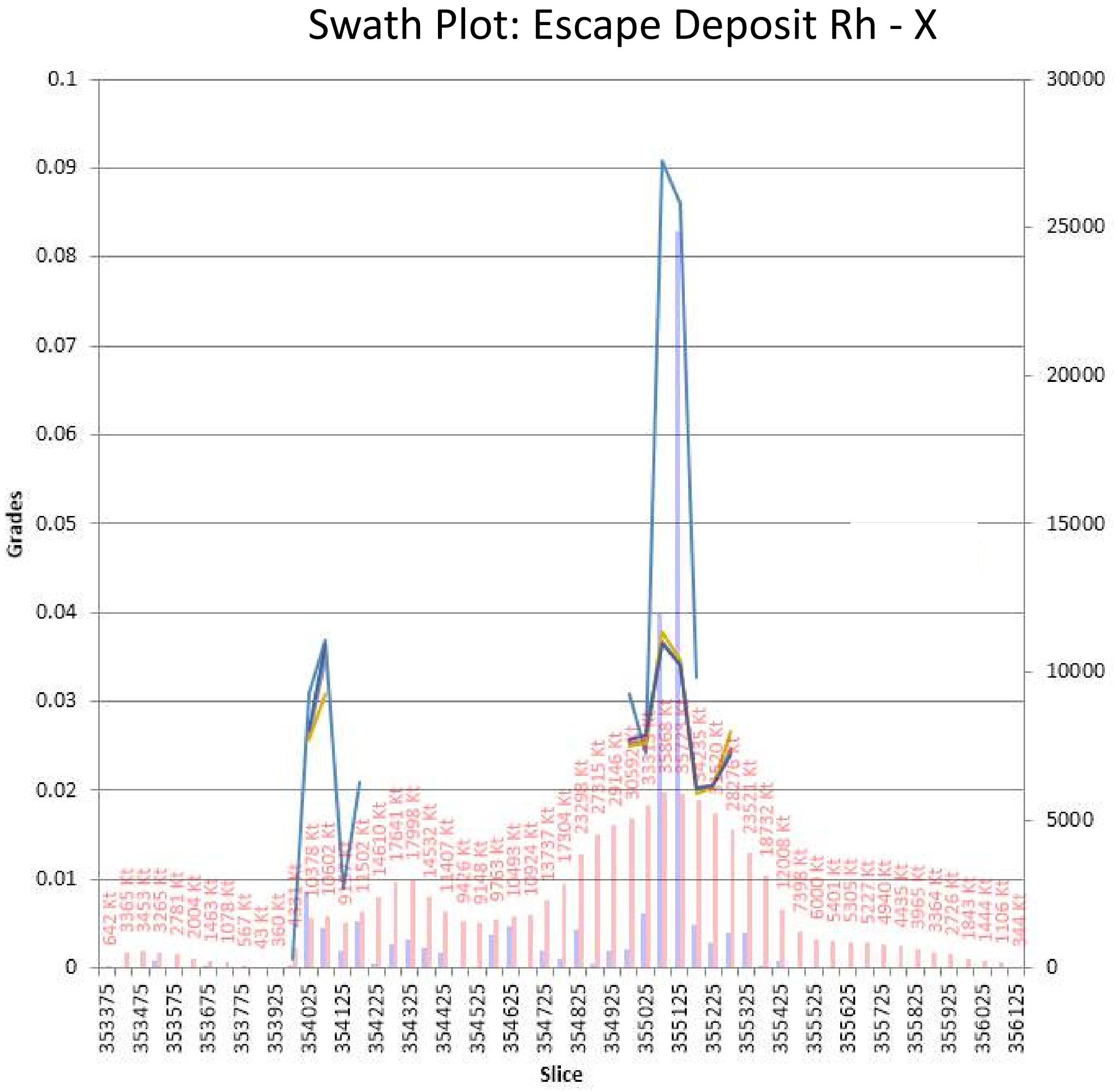


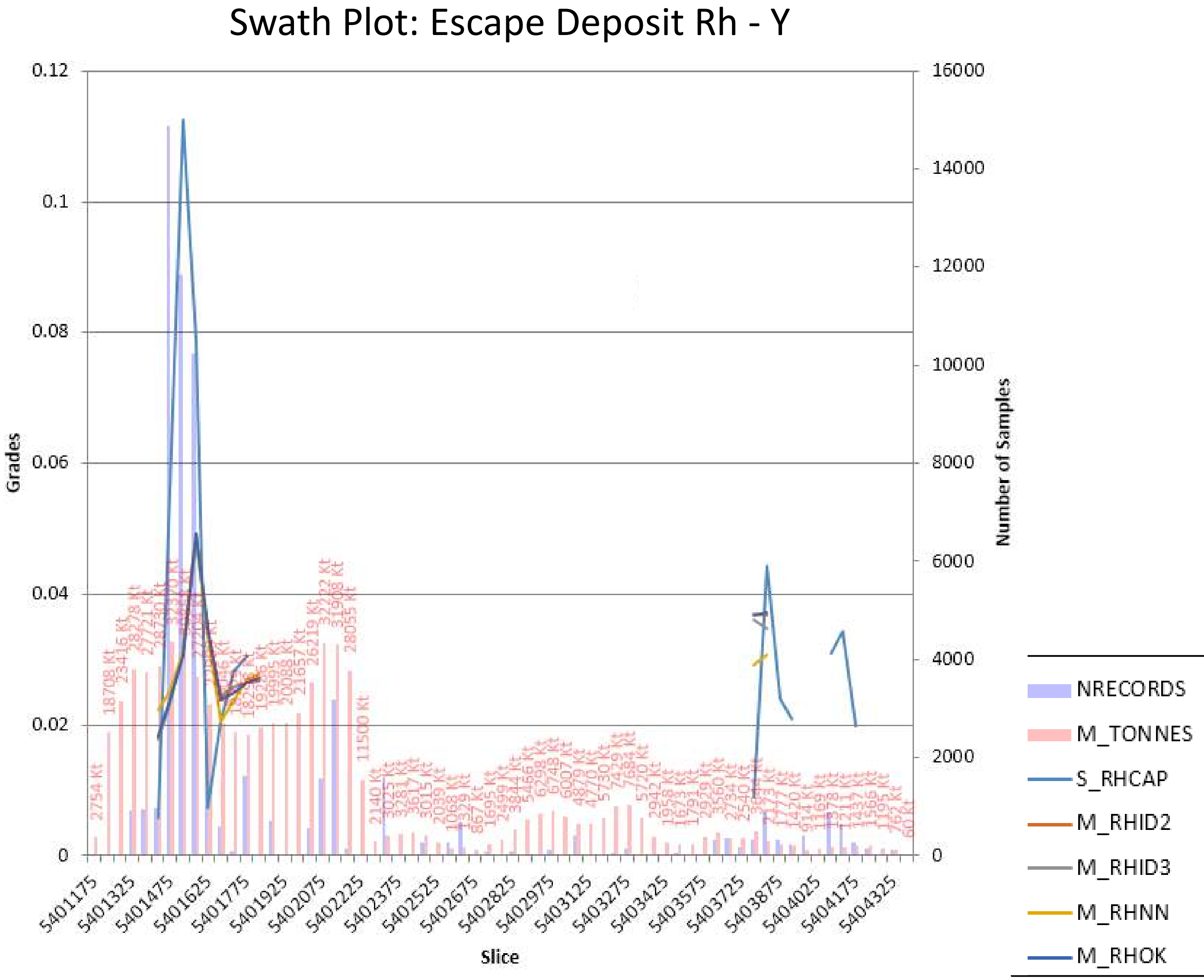


Swath Plot, Escape Deposit – Ni in Z direction (Elevation)

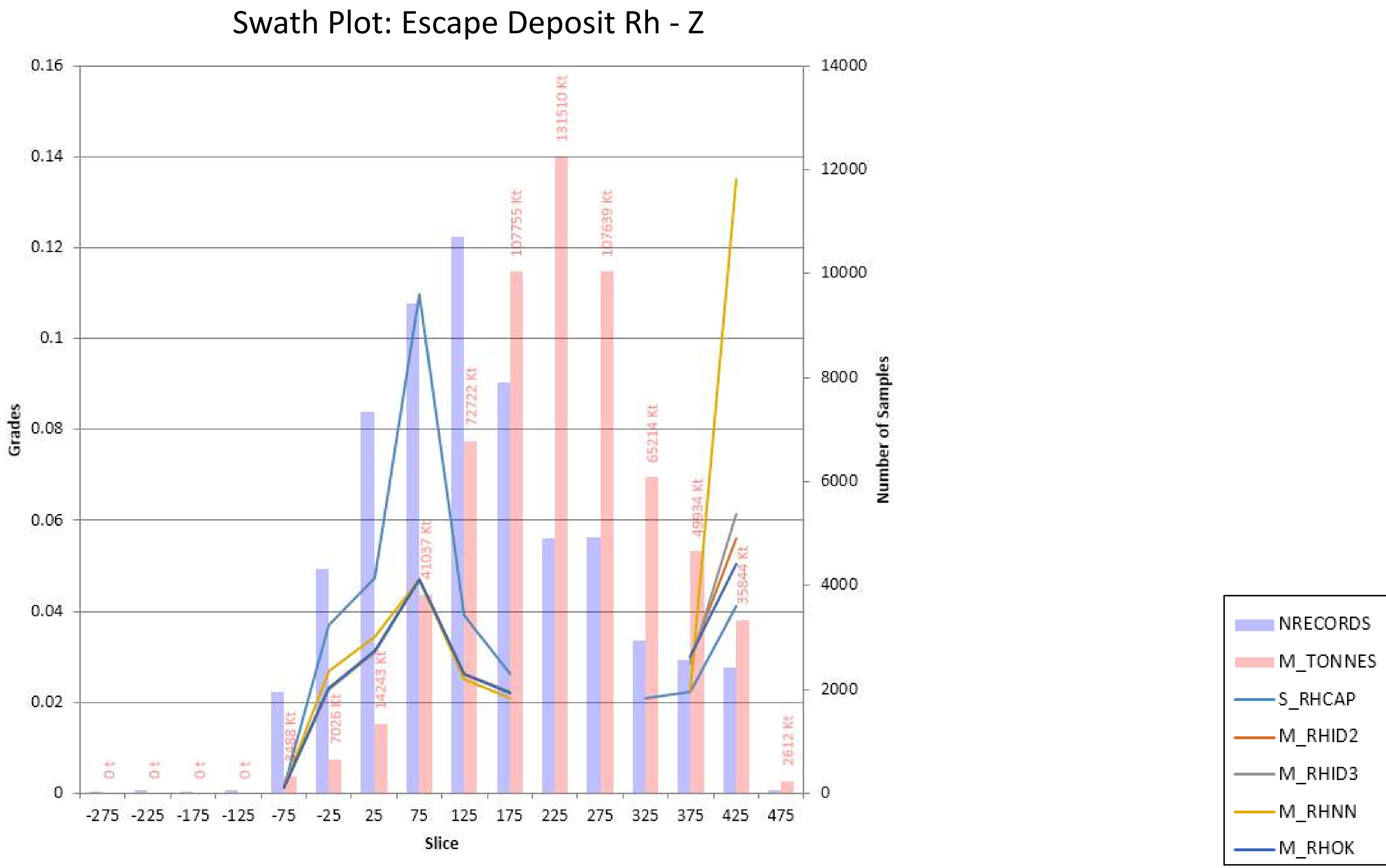


Swath Plot, Escape Deposit – Rh in X and Y directions (Easting and Northing)

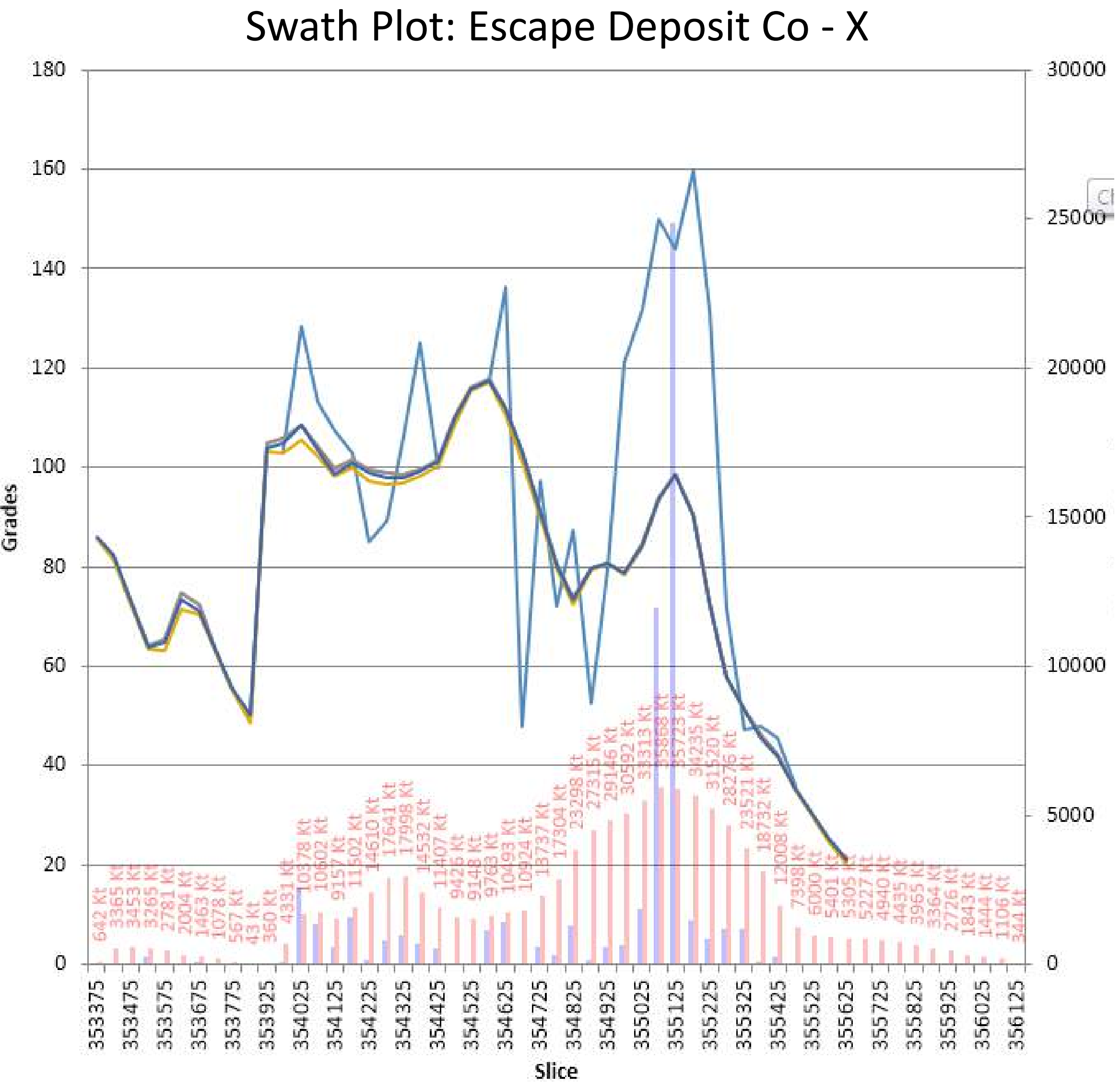


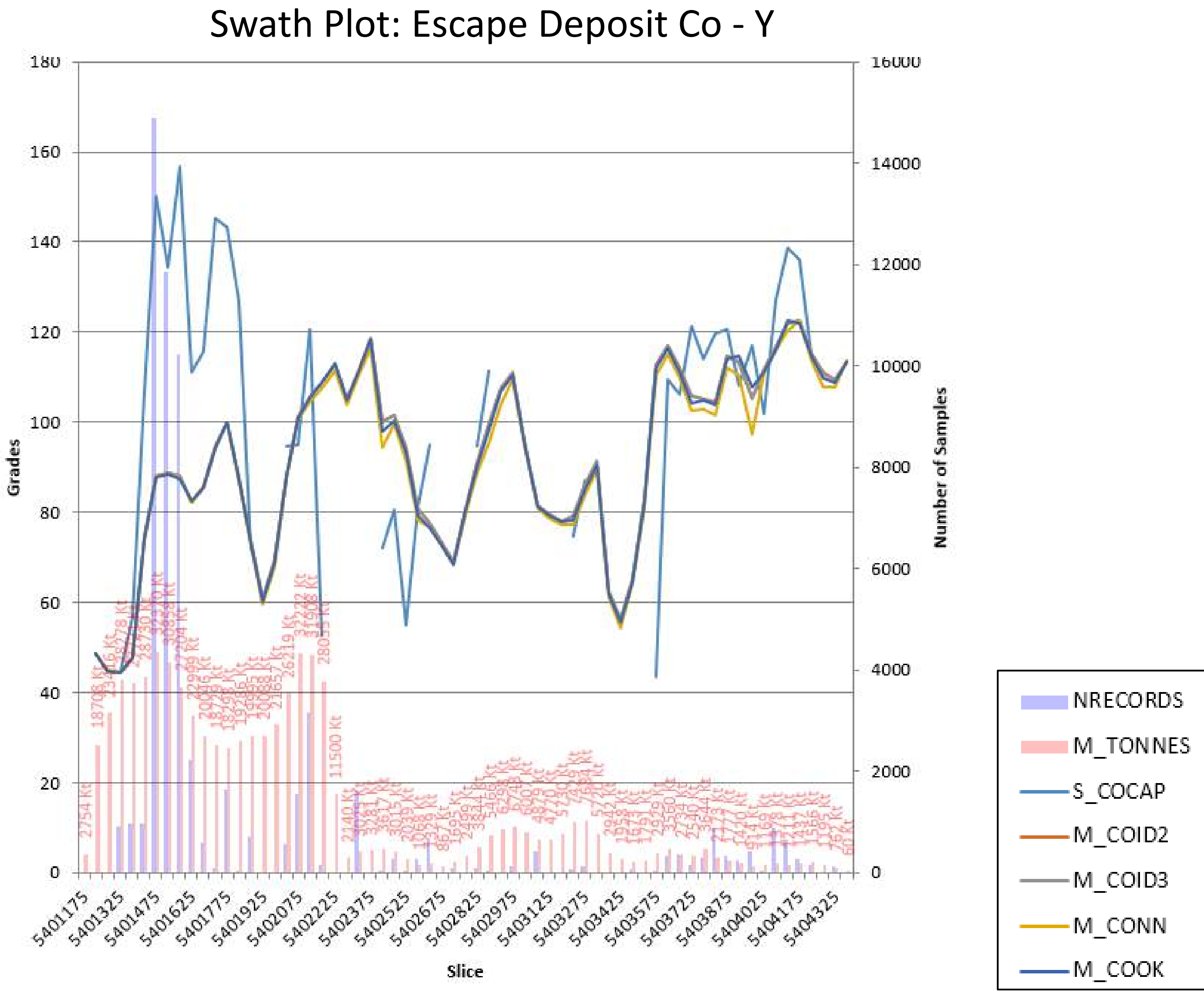


Swath Plot, Escape Deposit – Rh in Z direction (Elevation)

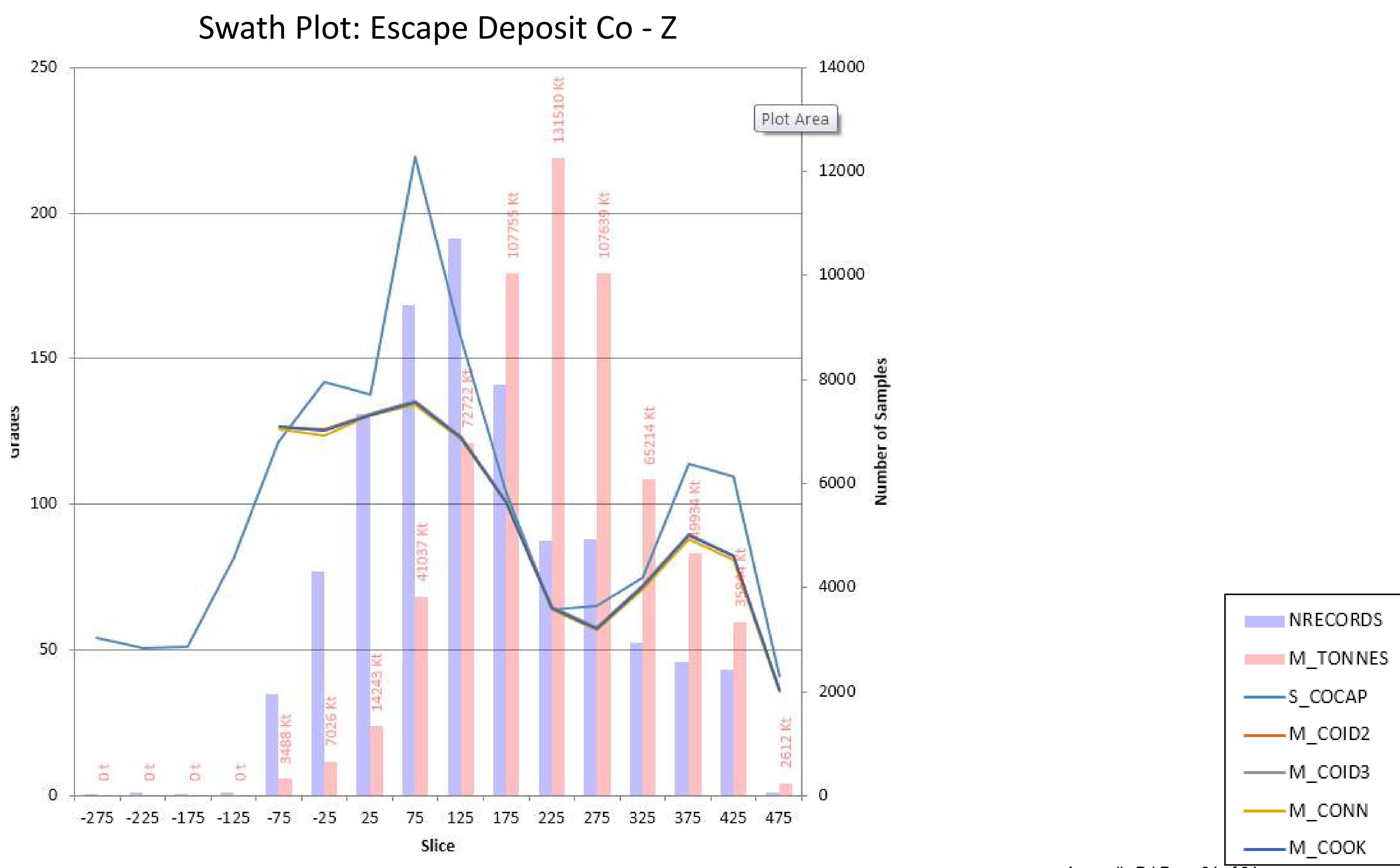


Swath Plot, Escape Deposit – Co in X and Y directions (Easting and Northing)





Swath Plot, Escape Deposit – Co in Z direction (Elevation)



Appendix E: Geomechanical Characterization

Knight Piésold CONSULTING

TRANSMITTAL

Thunder Bay North Project - Conceptual Level Design Support

Date:	November 20, 2020	**File No.:**	NB101-00797/01-A.01
		Cont. No.:	NB20-00986
To:	Nordmin Group of Companies 160 Logan Avenue Thunder Bay, Ontario Canada, P7A 6R1		
Attention:	Mr. Glen Kuntz		

Document Items

Item No.	**Description**
1.	Thunder Bay North Project - Geomechanical Characterization - PowerPoint Presentation

Remarks

Remarks	Please find attached a PowerPoint presentation providing a summary of the geomechanical and geological data for the Thunder Bay North Project, as well as a geomechanical characterization of the rock mass.

Prepared: Caroline Duval

Reviewed: Behrad Majd

Approval that this document adheres to the Knight Piésold Quality System:

Copy To: Ben Peacock, Knight Piésold Ltd.

/bm

Thunder Bay North Project

GEOMECHANICAL CHARACTERIZATION

Knight Piésold CONSULTING

Adding value. Delivering results.

Introduction

Overview

- Owner: Clean Air Metals Inc.
- Client: Nordmin Engineering Ltd.
- Location: 1.5 hrs northeast of Thunder Bay
- KP was retained to provide geomechanical design input to the current scoping study.
- This presentation summarizes a review of the available geological and geomechanical data to characterize the geomechanical properties of the deposit rock masses at a conceptual level.
- The project consists of two main deposits: Current Lake and Escape Lake. The focus of this study is on the Current Lake deposit.
- Current Lake has a 9.8Mt deposit of PGE-Ni-Cu, and a potential high grade massive sulphide including Pd, Pt, Au, Cu, Ni.

Introduction

Available Data

The following information was used as the basis for the characterization of the deposit rock masses. The Block Model was provided by Nordmin. The remaining data were received from Clean Air Metals.

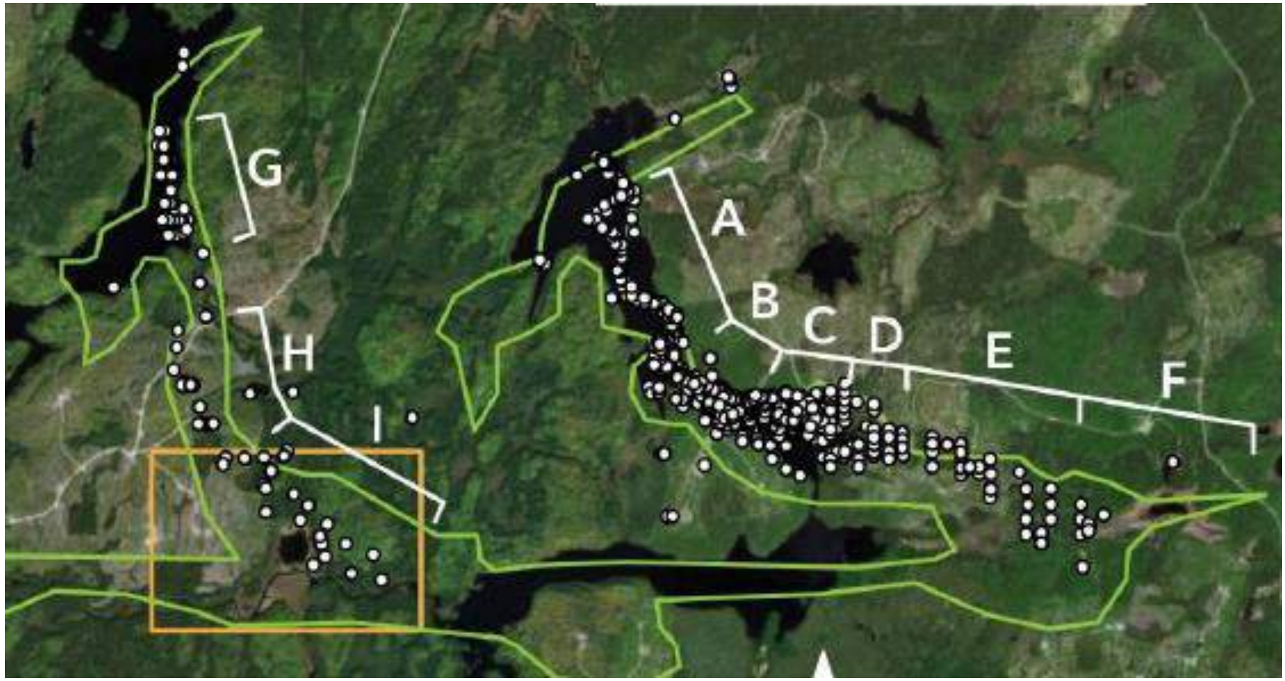
- Drillhole Database (October 10, 2020), including downhole surveys, major lithology, recovery, RQD and structure surface condition
- Block Model (October 10, 2020)
  - RQD
  - Lithology
- Wireframes (October 10, 2020)
  - Topography
  - Overburden
  - Lithologies (Only for Current Lake Deposit) (updated Nov. 11, 2020)
  - Mineralization (one wireframe received from Nordmin on Nov.16, 2020)
  - Major structures (faults)
- Surface Mapping Data (October 28, 2020)
- Core Photos (October 10, 2020)
- Site Visit Observations and Notes from a site visit by Ben Peacock of KP on October 20 and 21, 2020

Geology

Deposits

Current Lake

- The deposit consists of a magma conduit/intrusion extending from NW to SE. The deposit has been subdivided into several zones:
  - a) Current Lake and b) Bridge Zones:
    - Intrusion is an oval shaped tube roughly 40-60 m in diameter that undulates through the host rock.
    - In the Current Lake Zone, the upper portion of the intrusion is at the bedrock contact below the lake and has been partially eroded.
  - c) Beaver Lake West, d) Beaver Lake, e) Beaver Lake East Zones:
    - Intrusion broadens out, forming a tabular lens 500-800m x 2 km that is 150 to ~230 m thick and dips at a shallow angle to the SE (< 15°).



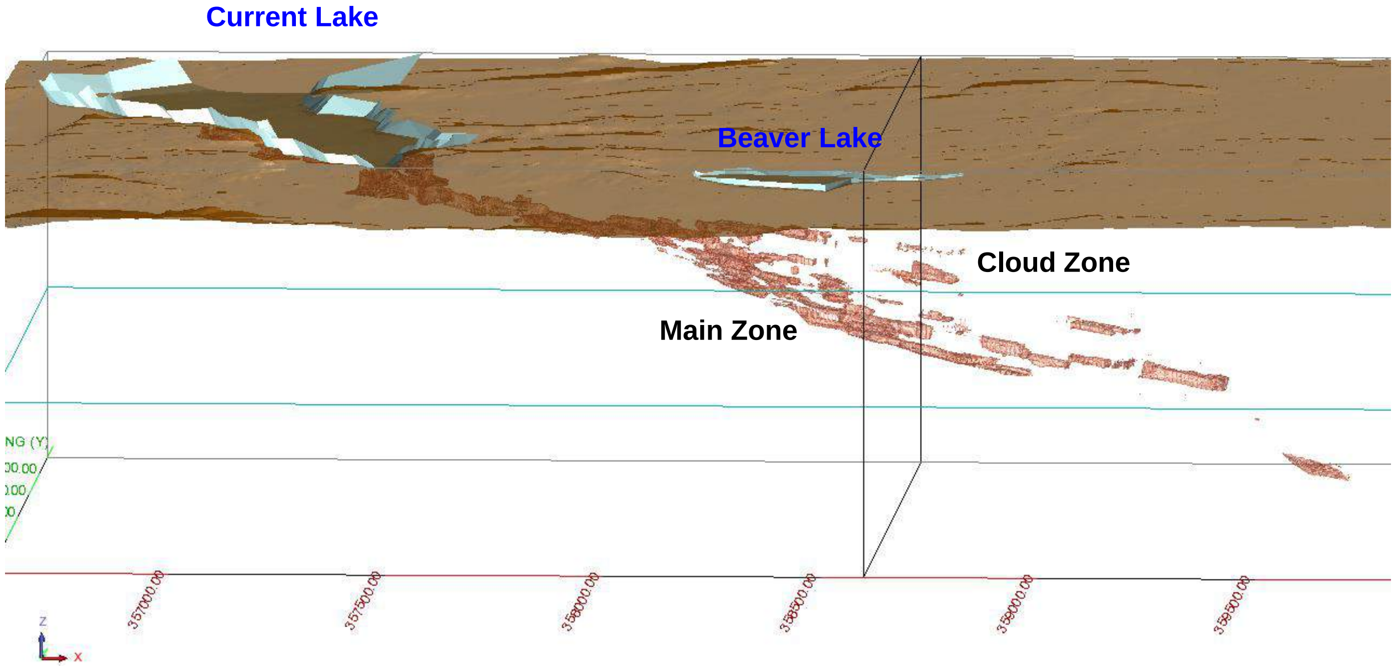
f) 473 Zone

Extension of the deposit at depth (approx. 1000 m). Limited drilling has been completed in this zone to date.

Deposits

Cloud Zone

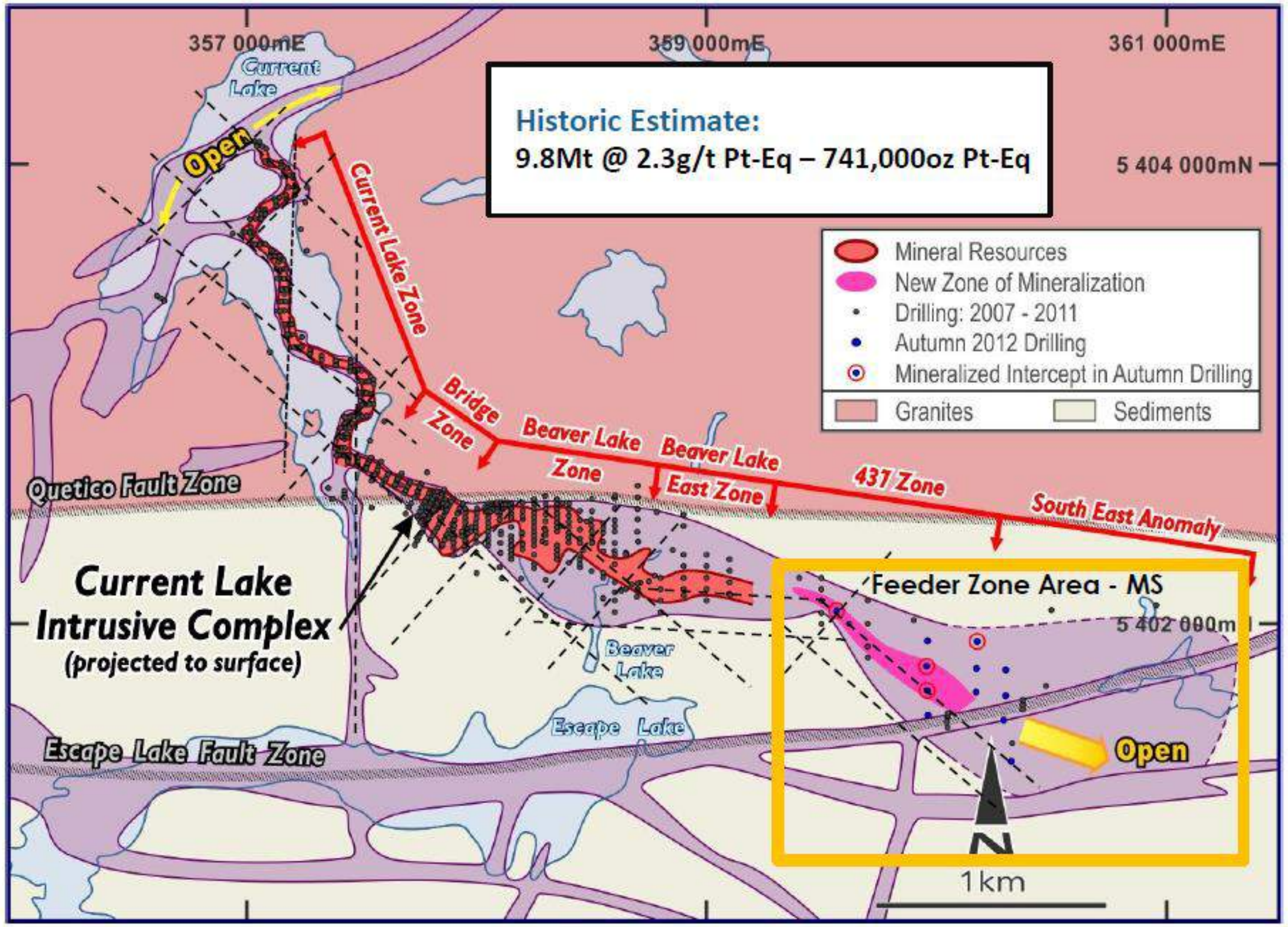
- In the broader part of the intrusion (i.e. Beaver Lake and 437 Zones) a second mineralized zone called the Cloud Zone is present above the main ore body.
- The Cloud Zone is sub-parallel to the main ore body and is a few meters thick.
- The screenshot on the right shows roughly the Main and Cloud Zones that are starting to separate off from under the east of Beaver Lake Zone.
- It should be noted that the picture is based on an in-progress wireframe of mineralization. Updated wireframes may provide a clearer picture of the two zones.



Lithology

Current Lake

- The intrusion consists of olivine-rich rocks, primarily Peridotite or Gabbros.
- Within the intrusion, an Olivine Melo Gabbro (OMG) hosts the mineralization. The mineralization primarily consists of disseminated sulphides hosting Palladium, Platinum, Nickel and Copper with some Rhodium and minor Silver and Gold.
- The highest grades tend to be located in topographic lows of the magma conduit but can occur anywhere within it.
- Typical stratigraphy within the intrusion consists of:
  - Red Hybrid
  - Grey Hybrid
  - Gabbro,
  - Ferro Gabbro,
  - Peridotite / OMG
  - Hybrid
- The various hybrids, gabbro and ferro gabbro are transitional variants of each other. The thickness varies from 0-10 m in the NW to > 100 m thick by the time it is at the 437 Zone.

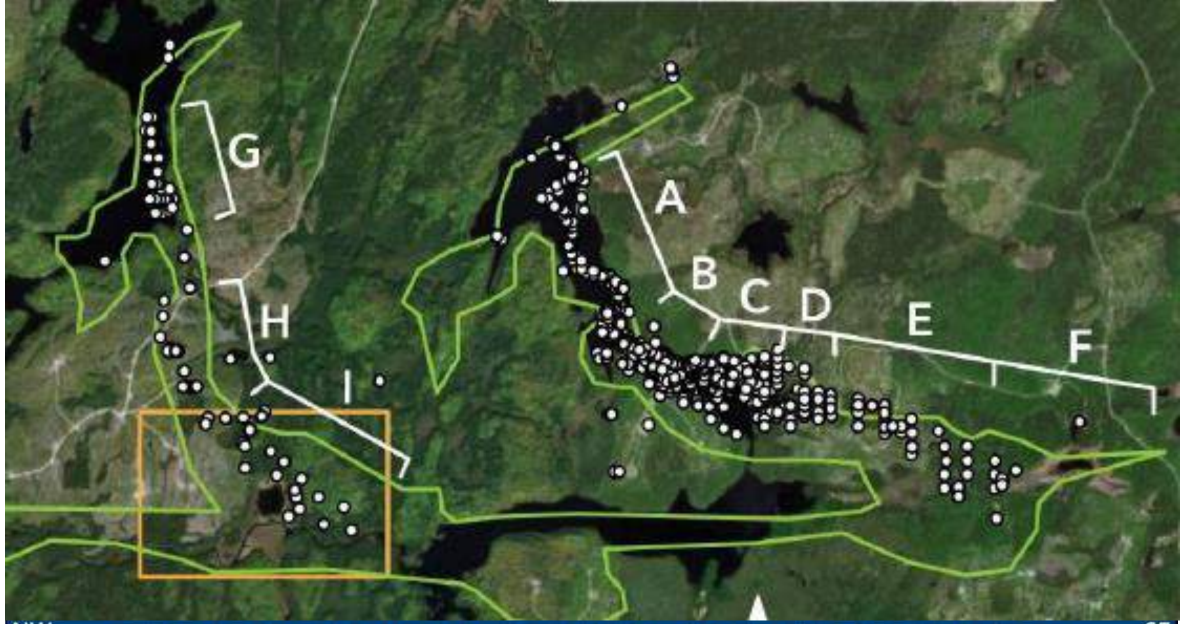


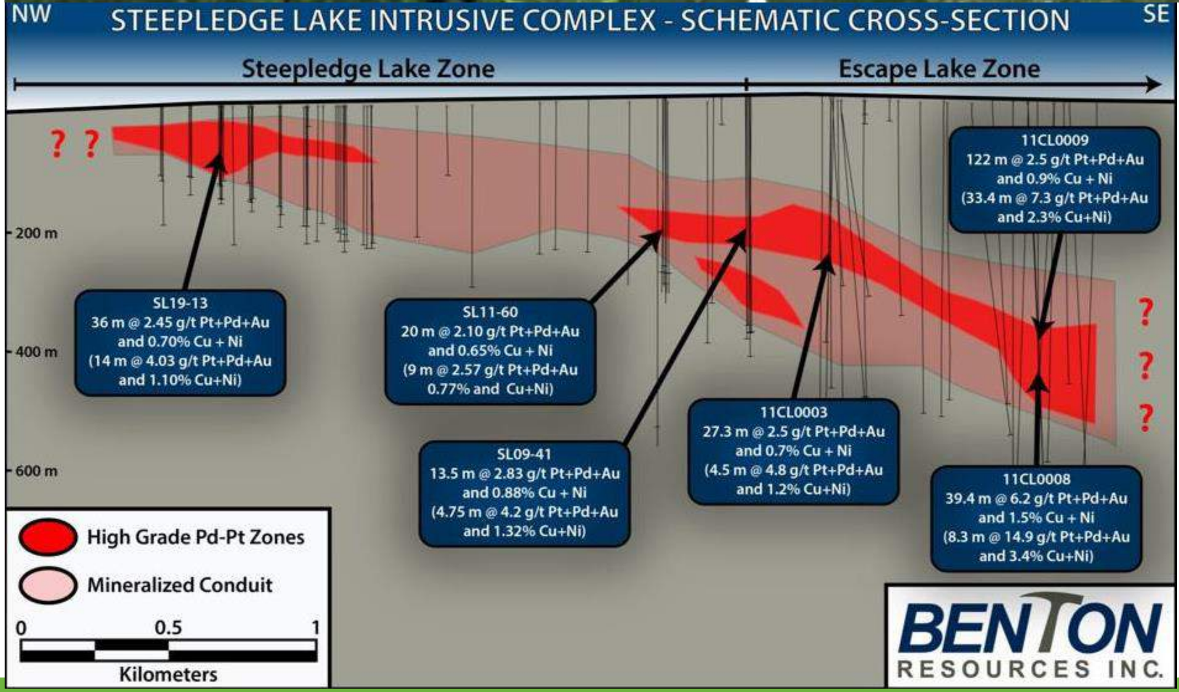
- A Granitoid hosts the intrusive in the Current Lake and Bridge Zones.
- The intrusive conduit then enters the regional Quetico Fault Zone and transitions to being hosted within Sediments.
- A locally broken-up Breccia Zone approx. 10-20m thick is present in the immediate HW of the conduit, particularly in the Beaver Lake West zone.

Lithology

Escape Lake

- Located approx. 3 km to the west of the Current Lake deposit.
- Consists of the Escape Lake Zone (I) and the Steepledge Zone (G, H). The Steepledge Zone is not included in this study.
- Escape Lake Zone
  - An intrusion measuring roughly 100-200 m wide and 100-200 m high
  - Lower grade than Current Lake
  - Only 30 drillholes have been drilled in this zone to date
- The intrusion at Escape Lake is hosted entirely within Sediments.
- The Hybrid overlaying the Peridotite is thicker than the Hybrid to the west of Beaver Lake East Zone at Current Lake. The thickness, within limited drillholes, is quite uniform and changing in the range of 100-120 m.





Lithology

Drillhole Database and Lithology Codes

- The drillhole data base includes 57 individual lithology codes. These have been grouped into 10 major units based on discussions with Clean Air Metals:
  - Host Rock
    - Sediments
    - Granitoid
    - Breccia
  - Intrusion
    - Hybrid (Red)
    - Hybrid (Grey)
    - Peridotite, Mafic
    - Gabbro, Oxide Gabbro
  - Diabase Dykes
- The Mafic, Oxide Gabbro and Diabase are minor units with limited data. They have not been considered in the rock mass classification process.

Rock Mass Structure

Rock Mass Structure

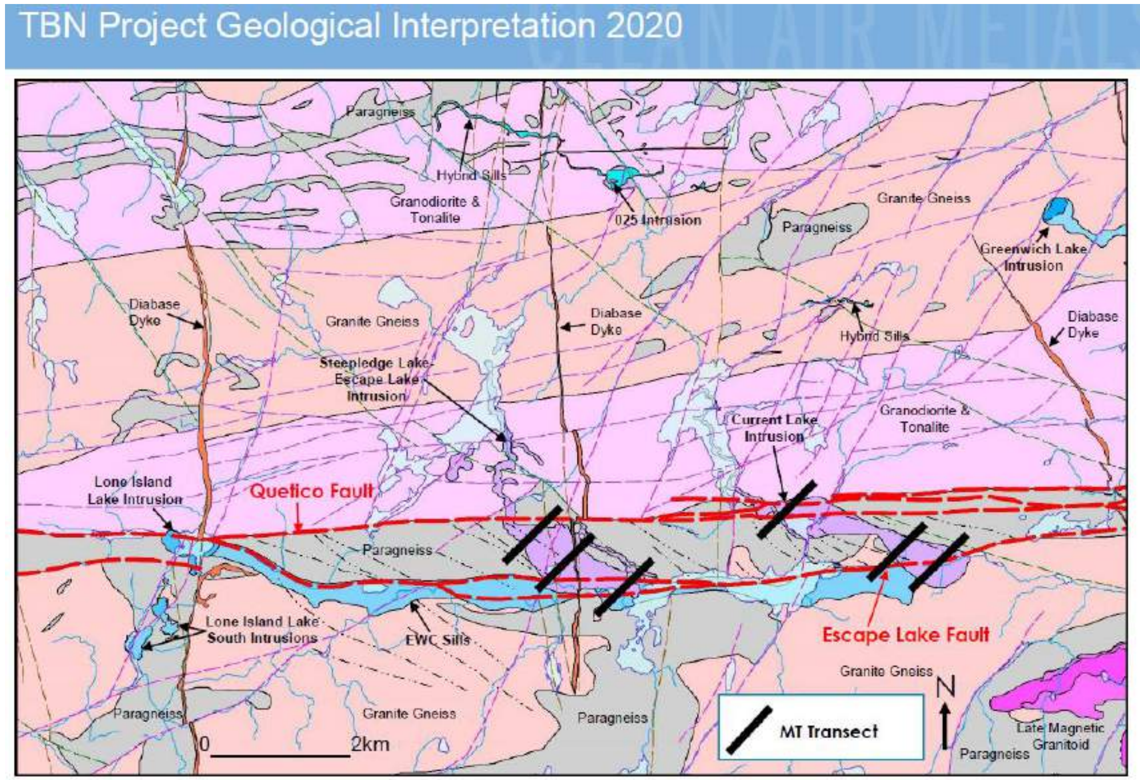
Overview

- The review of the large and small-scale rock mass structure was based on the following data:
  - Regional faults interpreted by Clean Air Metals from geophysical surveys and surface mapping.
  - Small scale surface mapping completed by Clean Air Metals. The data included mapped faults, foliation, joint sets, bedding planes.
- Note that the “TBN_Structural Tables” structural database was also reviewed, but due to a lack of consistency and missing data, it was not used in the analysis.
- The available data were reviewed in DIPS and analyzed to see if there are any correlation and similarities in trends.
- The small-scale surface mapping data is from both the Escape Lake and Current Lake deposits, providing a reasonable spatial coverage. A comparison between the structures of two deposits shows consistency.
- Limited data are available on the lithology associated with the structural measurements. As a result, the data are presented without considering lithological domains.

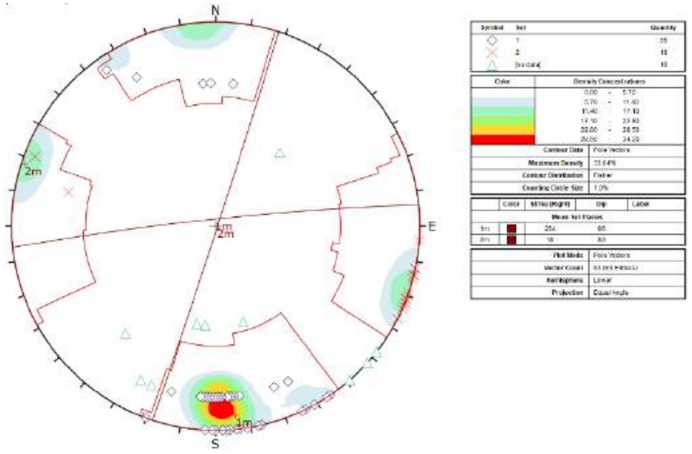
Rock Mass Structure

Faults

- Two major regional faults have been identified based on drilling and geophysics: the Quetico and Escape Lake Faults. Both are sub-vertical and trend E-W.
- The Quetico Fault shown on the map at right represents the northern contact of the much larger Quetico Fault Zone that encompasses much of the Sediments.
- Conjugate NE-SW trending sub-vertical faults and anastomosing SE-NW trending faults have also been interpreted by Clean Air Metals based on geophysics.
- North-South trending sub-vertical regional Diabase Dykes are also known to be present in the project area.
- The surface mapping of the faults agrees well with the dominant E-W trend as well as the conjugate NE-SW faults.



Small-Scale Surface Mapping - Faults



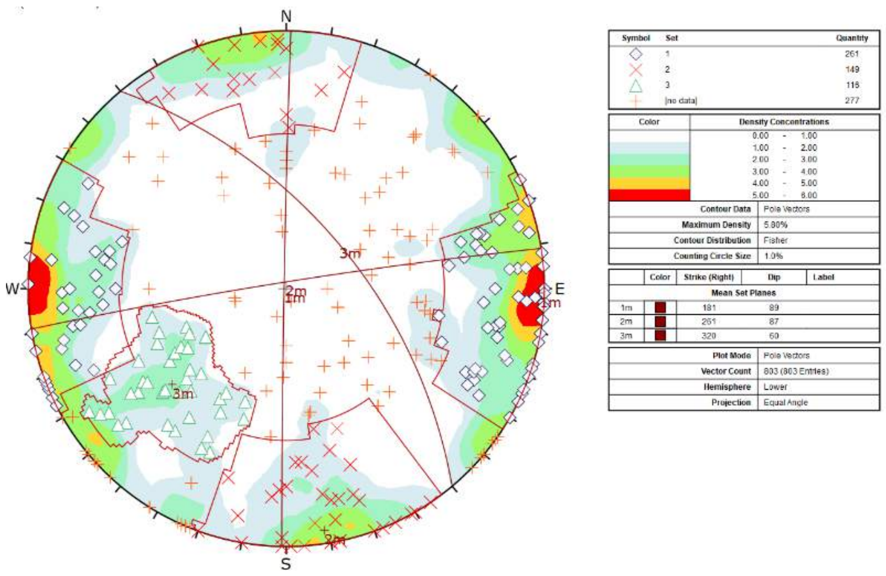
Rock Mass Structure

Joints and Foliation

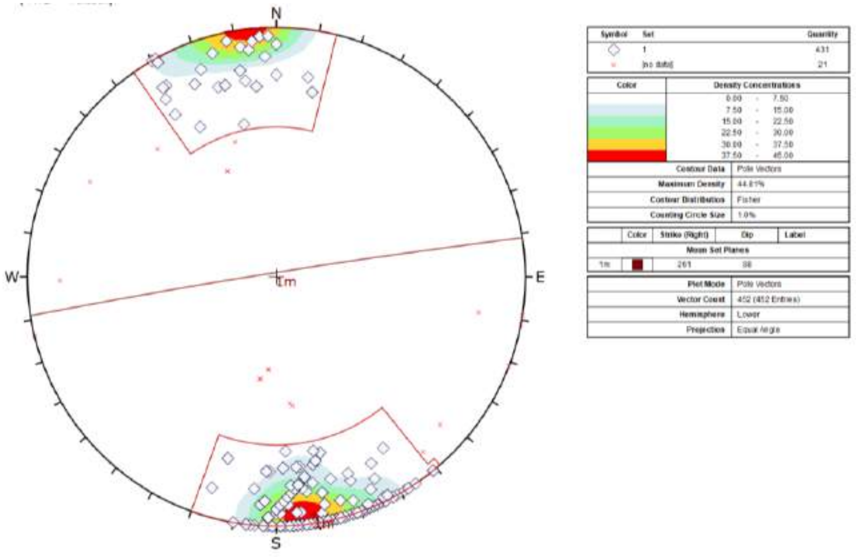
- The small-scale discontinuity orientation data from the surface mapping were reviewed and the following sets identified:
  - The dominant set is the foliation, which is sub-vertical and strikes East-West, parallel to the regional faulting system.
  - A sub-vertical set striking North-South. There is limited evidence of variations within this set that strike NE-SW, parallel to the conjugate faults.
  - A less prominent set striking SE-NW and dipping at approximately 60°. This set is parallel to the interpreted anastomosing faults.
  - Sub-horizontal discontinuities were not identified in the surface mapping, though this method tends to be biased against these features. A review of the core photos suggest the potential existence of a sub-horizontal feature.
- Based on this review, it is assumed that two steeply dipping, one moderately dipping are present. The near-horizontal set are not seen every where within the rock mass, so it is reasonable to assume a Jn=9, not to overly downgrade the rock mass quality.

Set ID	Strike	Dip
A	180	90
B	260	90
D	320	60

Surface Mapping -Joints



Surface Mapping - Foliation



Rock Mass Structure

Summary

- The interpreted faults and small-scale mapping agree well.
- The dominant structural orientation at both a regional and small scale is East-West striking and sub-vertical.
- Four joint sets, including the foliation, were identified or inferred from the mapping data and a review of core photos:
  - Joint Set A / Foliation is sub-vertical and strikes East-West
  - Joint Set B is sub-vertical and strikes North-South
  - Joint Set C is inferred to be sub-horizontal
  - Joint Set D dips at approximately 60° and strikes SE-NW
- Although the structures could not be associated with individual lithologies, the consistent trends in the data suggest these joint sets are independent from lithology.

Rock Mass Quality

Rock Mass Quality

Overview

- The review of rock mass quality was based on the following data:
  - Drillhole Database (RQD, lithology, discontinuity surface conditions)
  - Core Photos
  - Observations made during a site visit by Ben Peacock of KP on October 20 and 21, 2020
  - Block Model (RQD and lithology)
  - Topography, overburden, lithology and mineralization wireframes
- Note that the block model as well as the topography, lithology and mineralization wireframes do not include the Escape Lake deposit.
- The available data were reviewed to evaluate possible variations in the rock mass quality between lithologies and locations. This review is summarized in a series of cross-sections on the following slides.
- The drillhole RQD database was compared to the Block Model in order to determine which dataset to use for the review (next slide). Note that the density of drillholes decreased to the east of Beaver Lake, extending to the 473 Zone.
- Spatial trends were assessed using the RQD data. Estimates of RMR89 were then made based on a review of core photos.
- Laboratory strength testing has not been completed to date. Intact strength was estimated during the site visit using a geology hammer and empirical relationships developed by the ISRM.

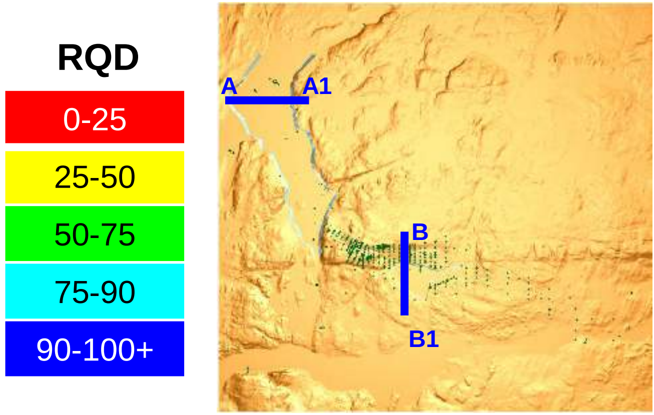
Rock Mass Quality

Drillhole Database vs. RQD Block Model

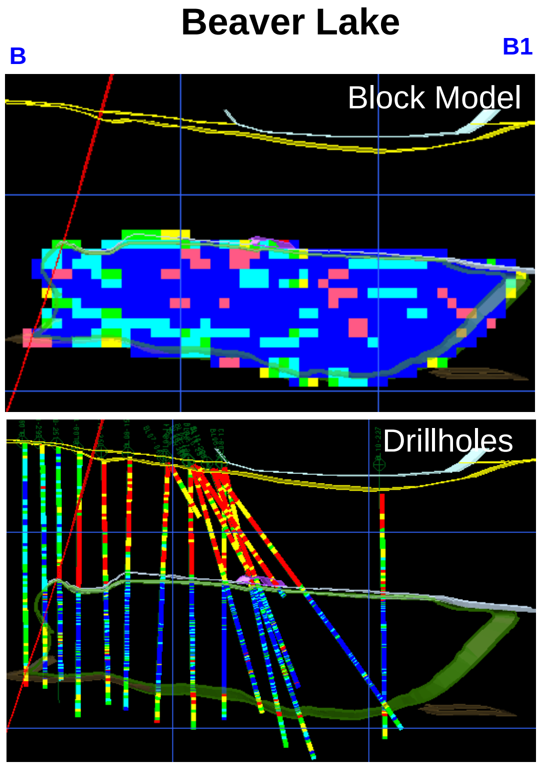
- The RQD values from the drillhole database and the block model were compared (examples on next slide).
- Overall, there is reasonable agreement between the two sources. However, there are areas where they disagree, particularly associated with low quality intervals within the crown pillar, the larger intrusion, and the contacts. This believed to be due to both the resolution of the Block Model as well as the averaging of data within the blocks.
- As a result, the drillhole database was given priority over the block model for this review.
- Note that the Block Model also only includes data within the intrusion.

Rock Mass Quality

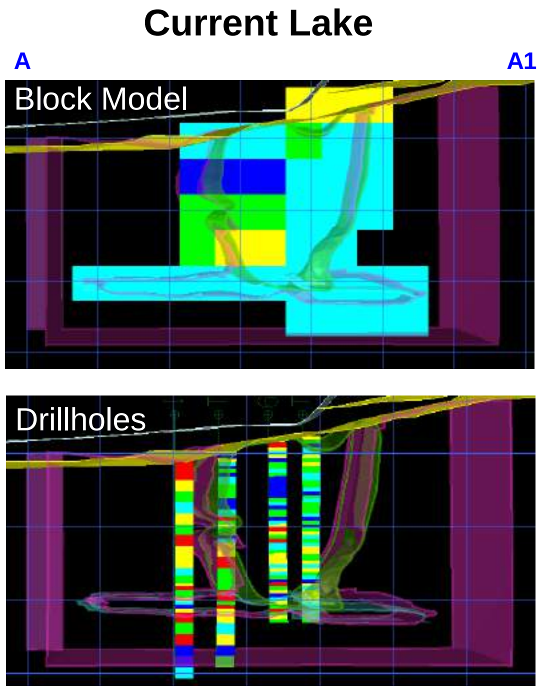
Drillhole Database vs. RQD Block Model



- Example of generally good agreement between the Block Model and the Drillholes within the intrusion.
- No coverage of host rock in block model.



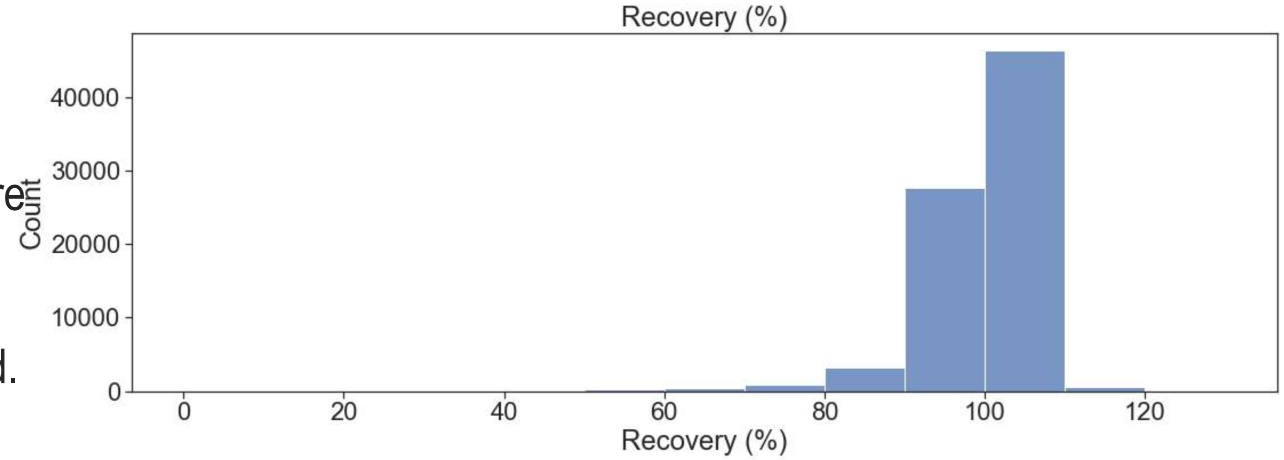
- Example of poor agreement between the Block Model and the Drillholes.
- Low quality intervals within the intrusion and near the contact are not captured by the Block Model.

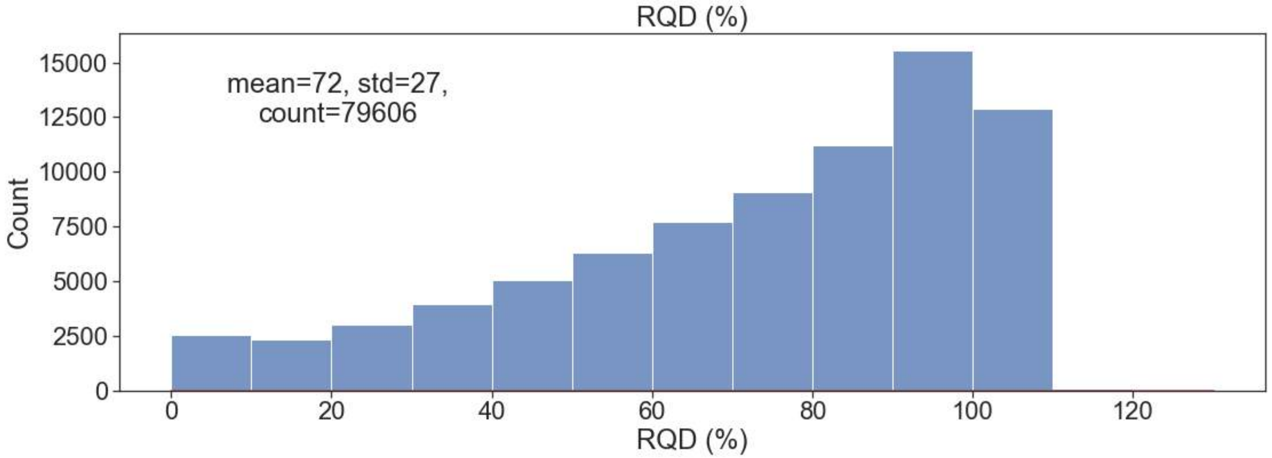


Rock Mass Quality

Drillhole RQD Data

- The drillhole database covers 894 drillholes at both deposits.
- Except for several angled drillholes drilled from the shore to below Current Lake, the drillholes completed to date are vertical. Accordingly, the drillhole database is biased towards sub-horizontal features and sub-vertical features (such as cross-cutting faults) are likely under-represented.
- Lower density of drillholes to the east of Beaver Lake.
- 739 holes out of 894 drillholes have RQD data.
- Many intervals have Recovery and RQD ranging in 100-110%. A negligible number of intervals have values >110%, which are considered erroneous.

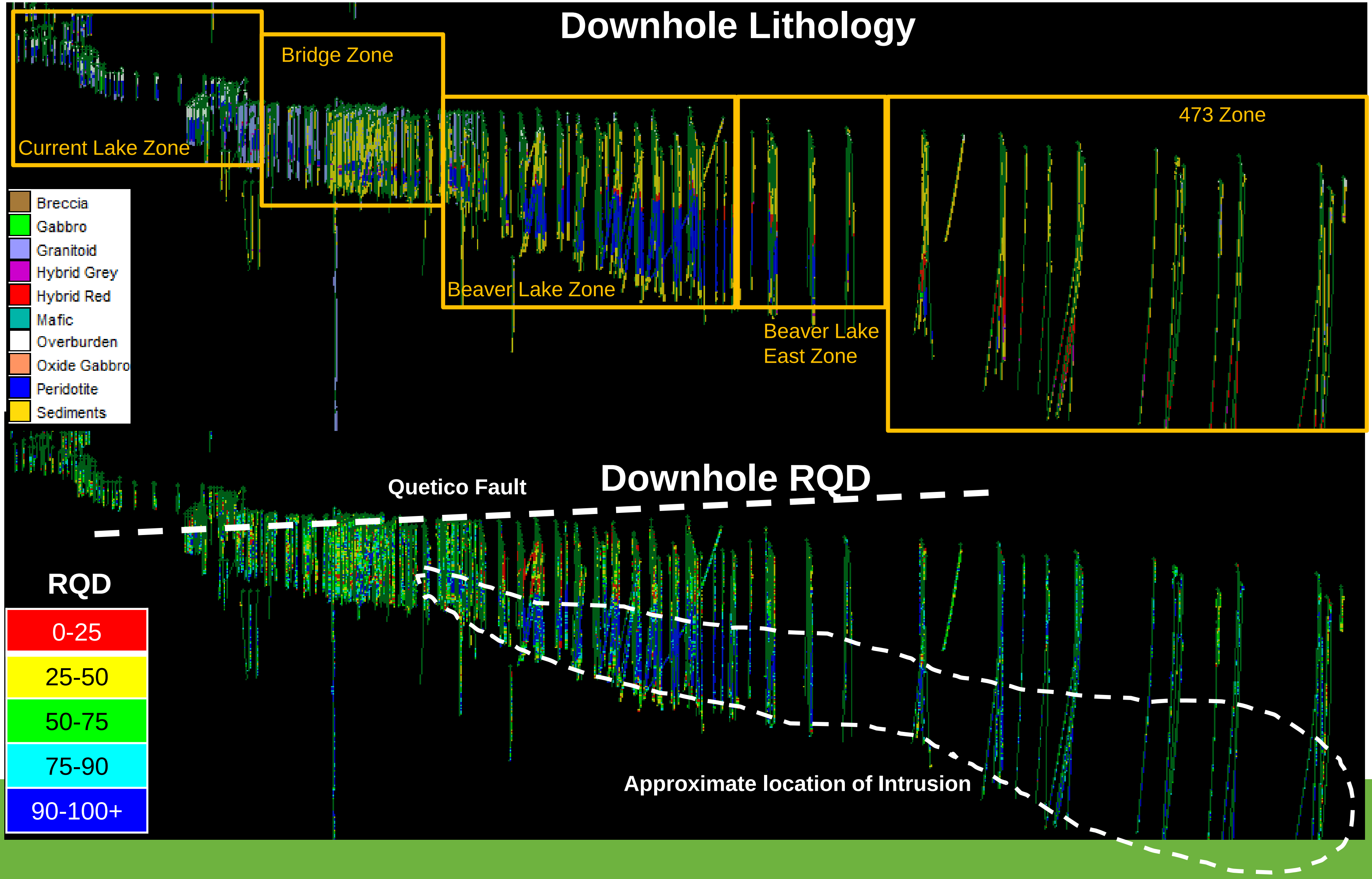




Rock Mass Quality

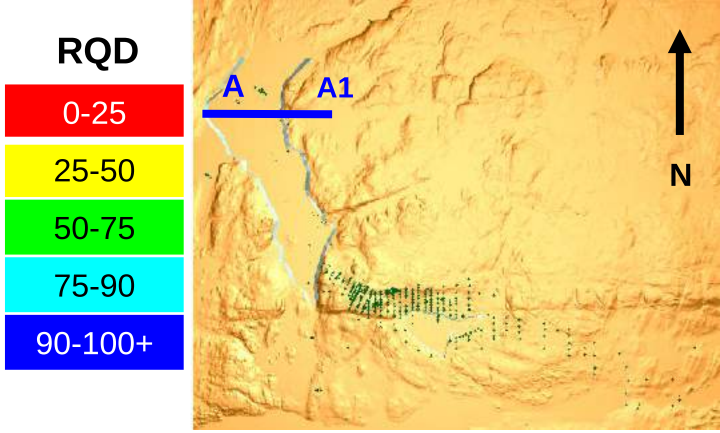
RQD Data - Big Picture

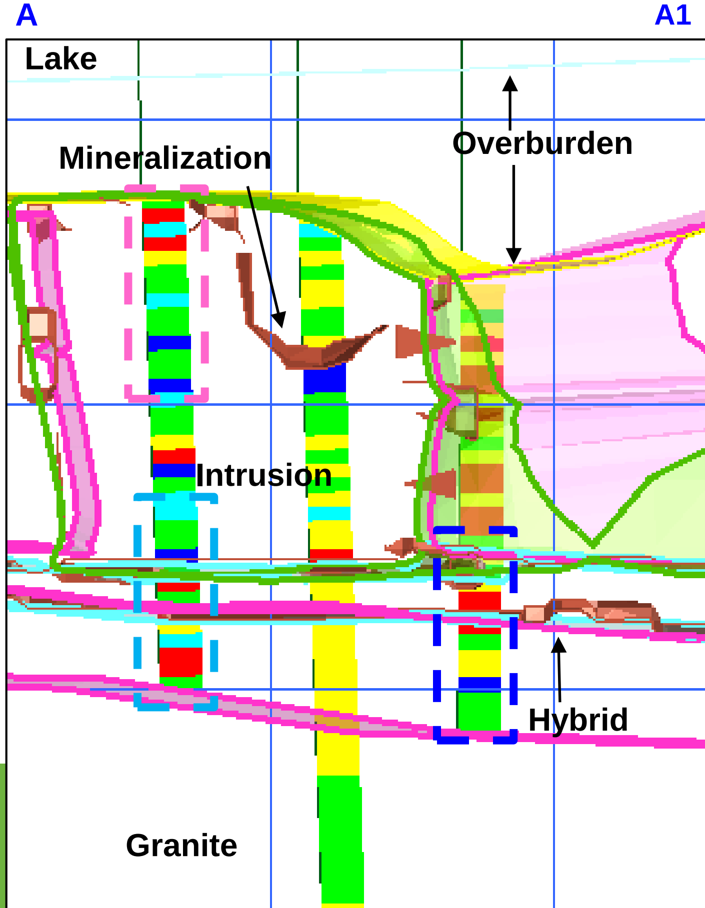
- Overburden in the crown pillar under Current Lake Zone with varying thickness overlays Intrusion.
- Among host rock Granite show generally a better quality than Sediments.
- Sediments show spatially varying quality. Near the Bridge and Beaver Lake Zones it can have very low quality (RQD<25%). The quality improves more to the east.
- The highest rock quality (i.e., RQD>90%) corresponds to the intrusion (i.e., peridotite/gabbro/hybrid).
- The lowest quality rock within the Bridge Zone and Beaver Lake Zone is where the Quetico Fault intersects.
- Breccia within Bridge and Beaver Lake zones is of varying but predominantly low quality (RQD<50). This is shown on later slides.



Current Lake

- Intrusion and mineralization comes to overburden contact below Current Lake.
- Approx. 8-15 m of overburden present below the lake. No significant interval of low RQD below the overburden.
- RQD typically > 50% within the intrusion.
- Host rock is primarily Granite, however, Sediments are also locally present.
- Hybrid Grey at base of intrusion shows some low quality interval (RQD<25%).
- Some low RQD intervals observed at the contact between the intrusion and the host rock.

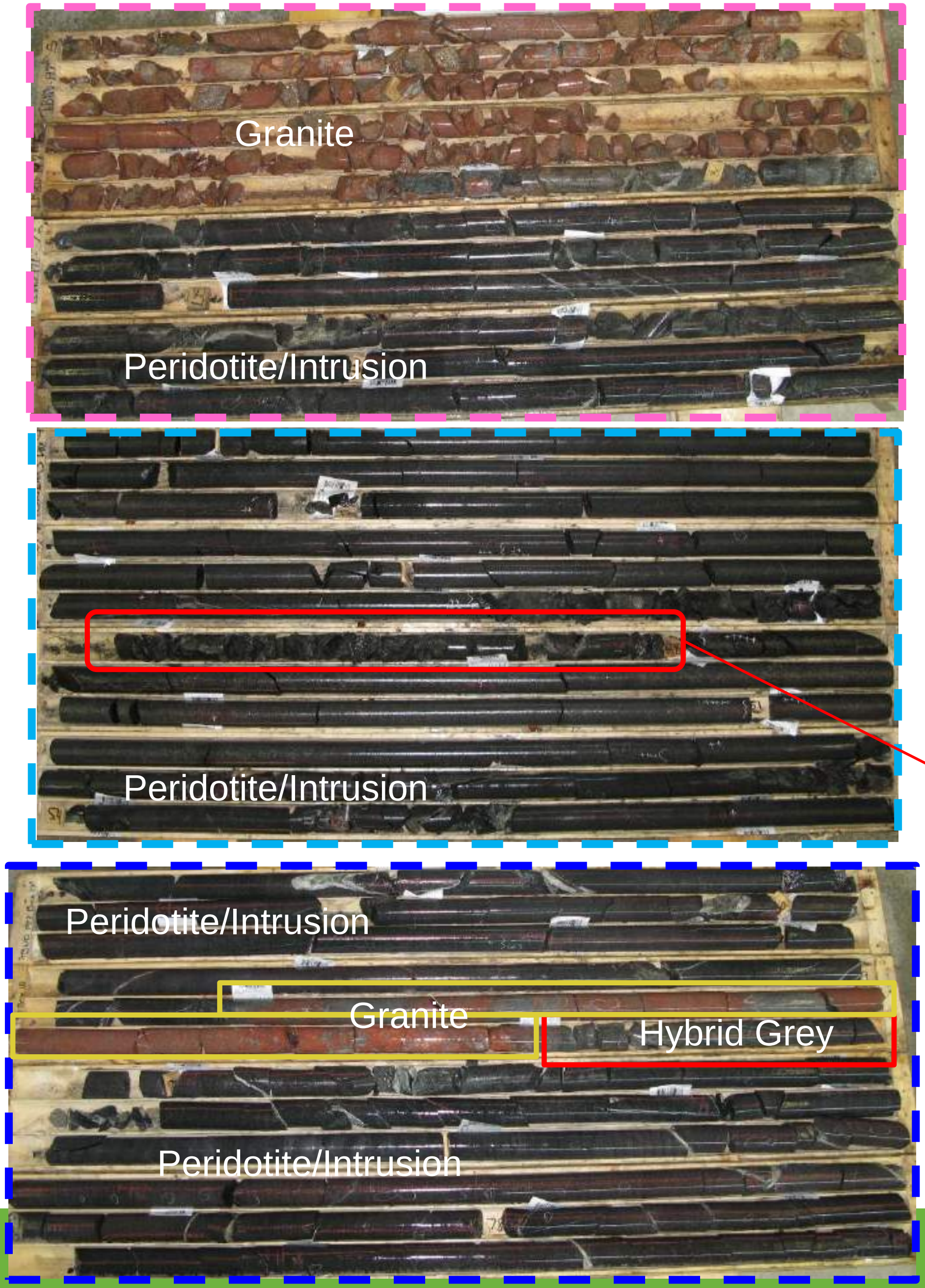


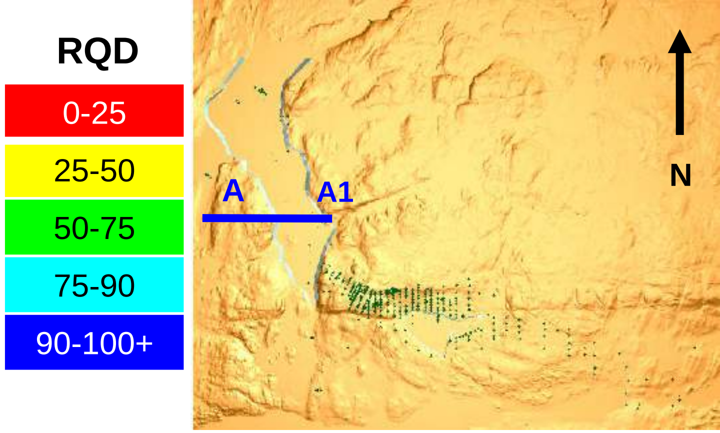


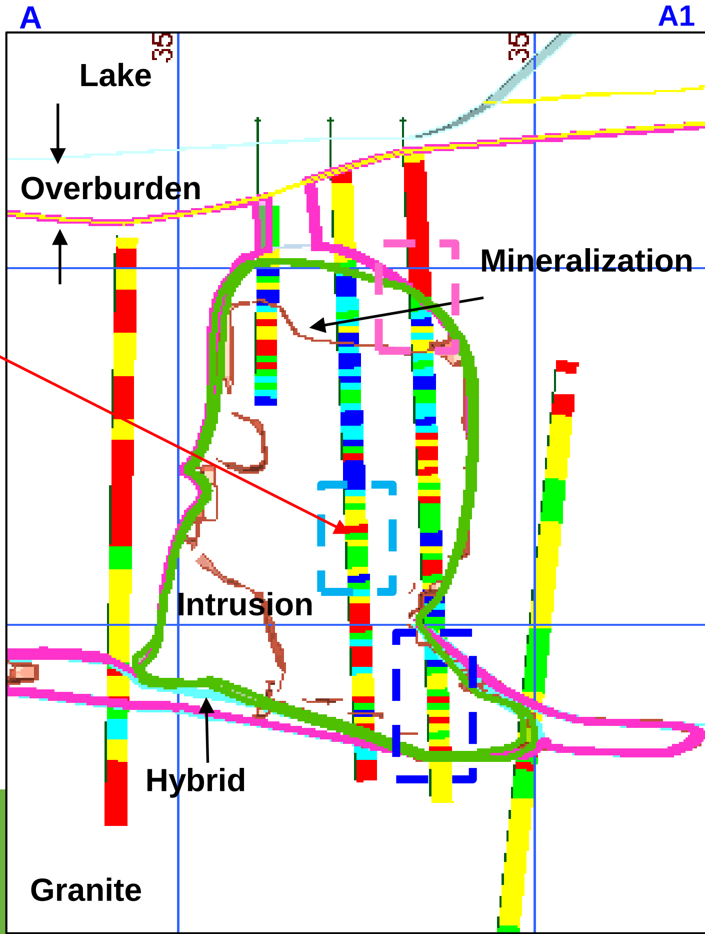
Knight Piésold CONSULTING

Current Lake

- Approx. 2-10 m of overburden present below the lake.
- Intrusion is getting deeper into the host rock to South and comes to ~8m below overburden.
- Host rock is Granite. The Granite generally shows low quality (RQD<50%), particularly immediately above the intrusion.
- Intrusion shows varying quality from low (RQD<25%) to high (RQD>75%).
- Mineralization does not extend to roof of the intrusion, resulting in the crown pillar partially being within the intrusion.
- Some low RQD intervals observed at the contact between the intrusion and the host rock.



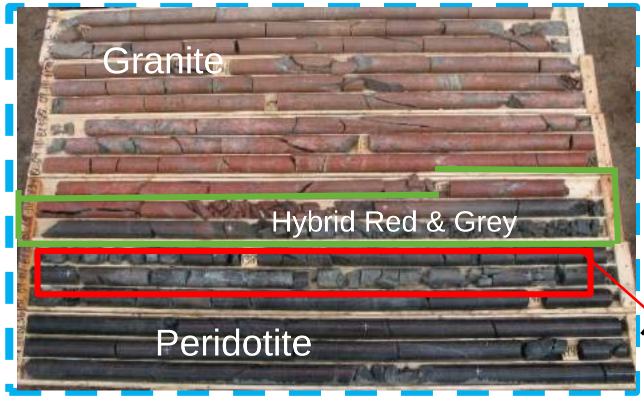




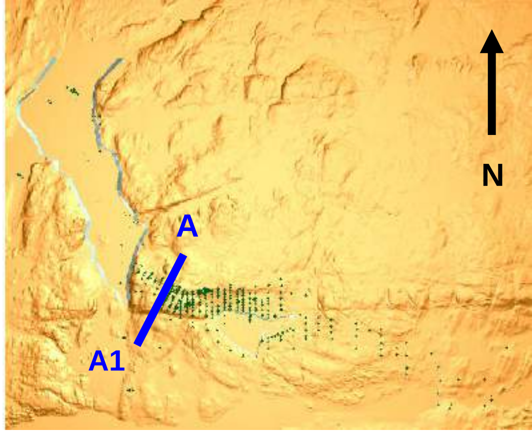
Knight Piésold CONSULTING

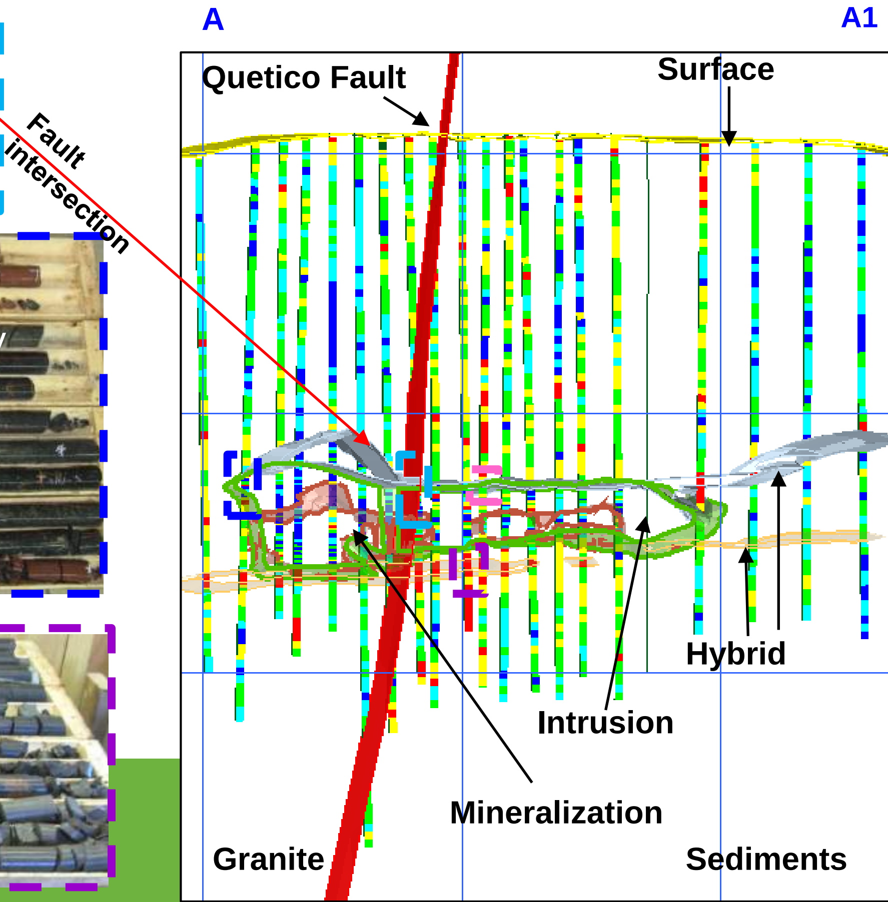
Bridge Zone

- Intrusion enters the Quetico Fault Zone. Host rock is Granite to the North and Sediments to the South of Quetico Fault.
- Granite and Sediments (RQD>50%) show varying quality, with Granite having somewhat higher RQD (>75%).
- Some low quality Breccia is present in Sediments.
- Hybrid zone is getting thick above the main intrusion zone, with good quality except near fault and host rock contact.
- Intrusion generally shows good quality (RQD>75%).
- Specific to this section, it was found that the intrusion is slightly of lower quality in the Sediments (south of Quetico Fault), but this is widespread.
- Some low RQD intervals observed at the contact between the intrusion and the host rock.
- Evidence of lower quality rock, translated into a broken zone where the Quetico fault intersects.
- Low quality host rock and Hybrid Grey is observed in the immediate below the intrusion.



RQD
0-25
25-50
50-75
75-90
90-100+

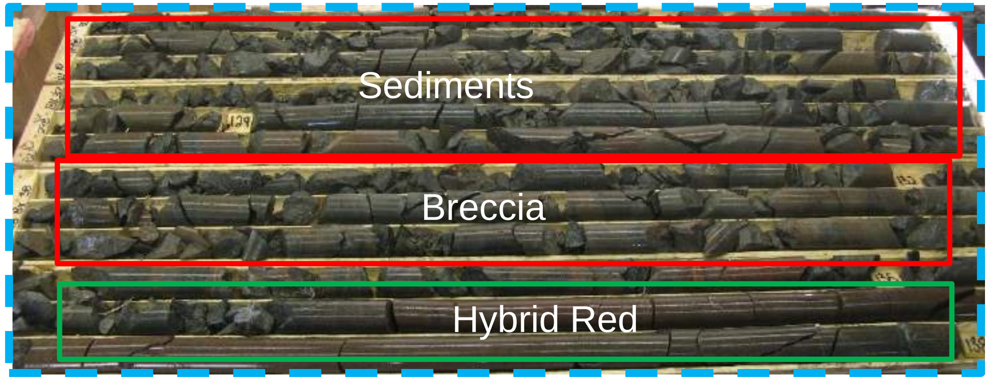




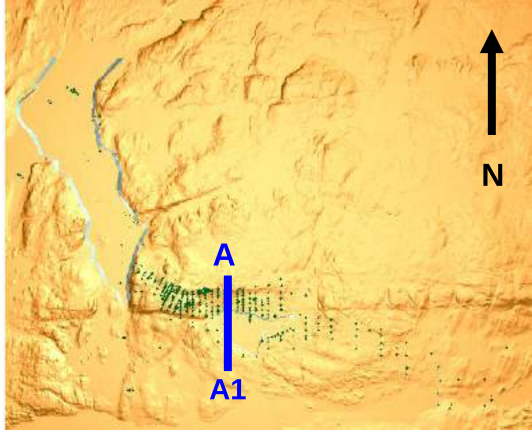
Knight Piésold CONSULTING

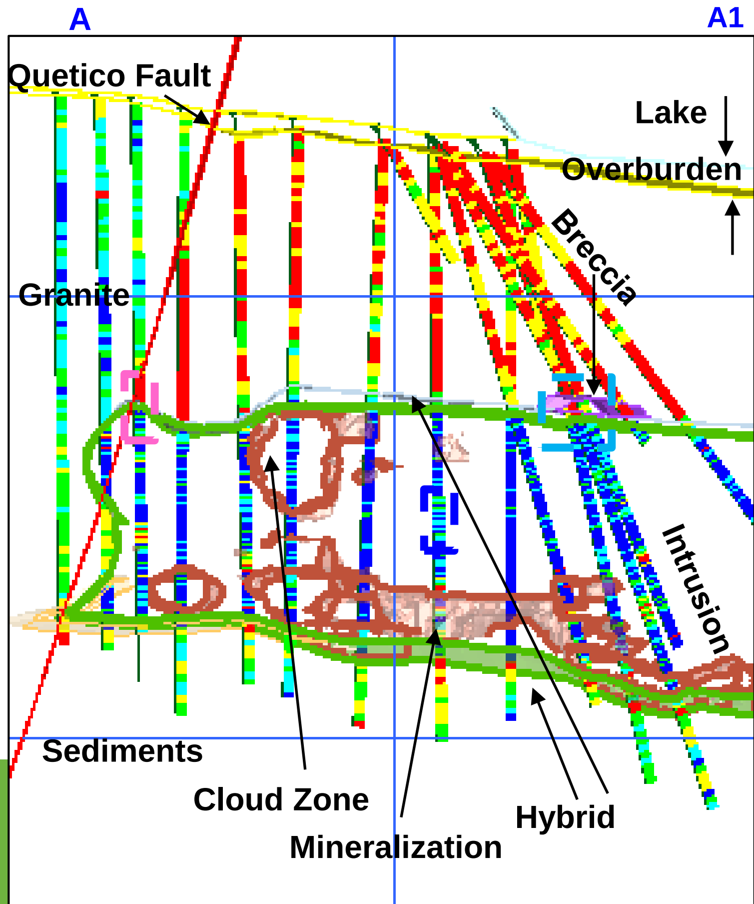
Beaver Lake

- Intrusion is almost entirely within Sediments to the South of Quetico Fault.
- Quality of Sediments has decreased significantly (RQD<25%) moving from Bridge Zone to Beaver Lake Zone. Sediments are of much lower quality than the Granite.
- The Hybrid Grey at the base of the intrusion is low quality (RQD<25%).
- Very low quality Breccia interval is present above the intrusion.
- Low quality Sediments and Breccia transit into the Hybrid Zone immediately sitting above intrusion (and Cloud Zone) with high Hybrid Red Quality.
- Intrusion generally shows high quality (RQD>75%).



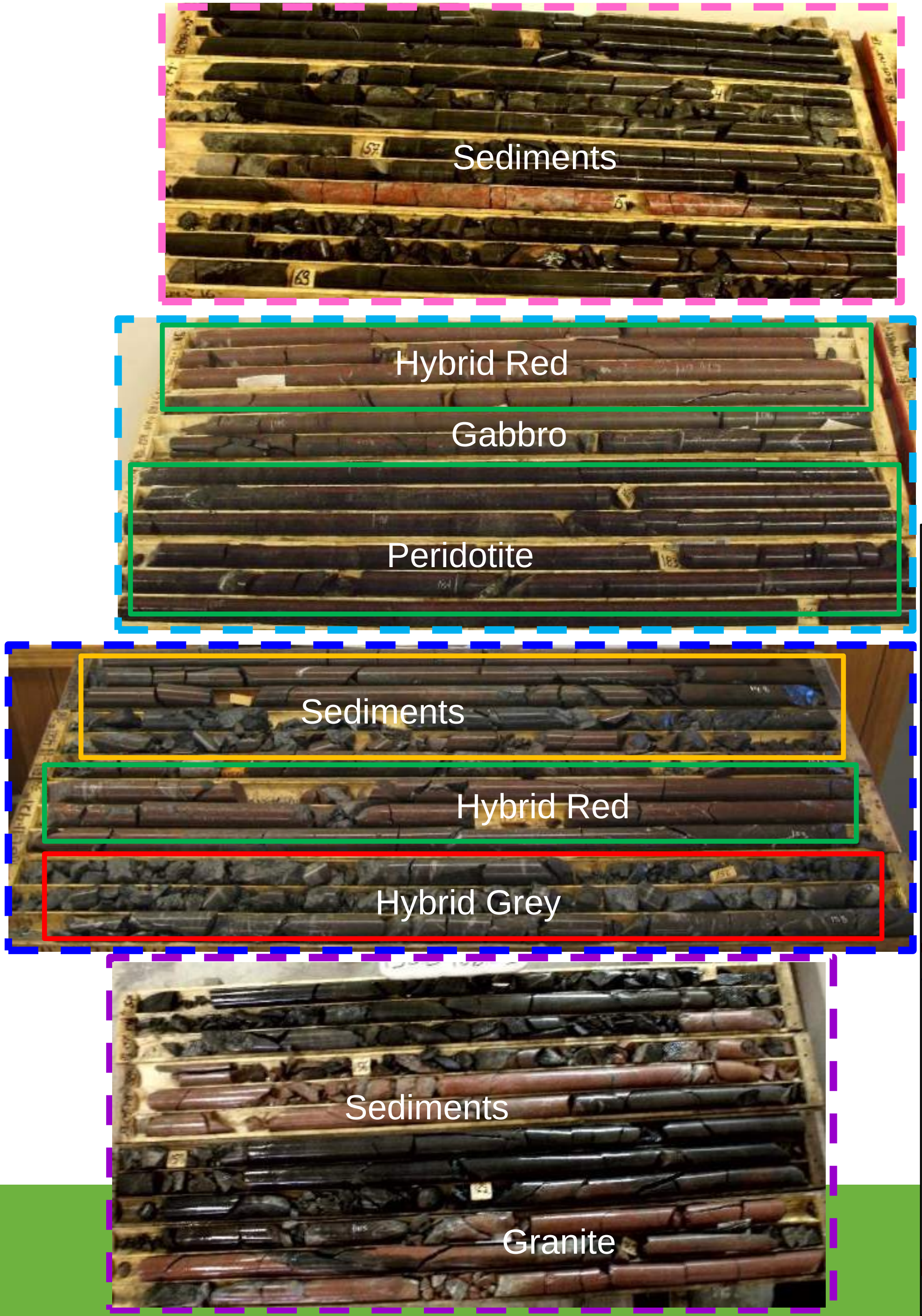
RQD
0-25
25-50
50-75
75-90
90-100+

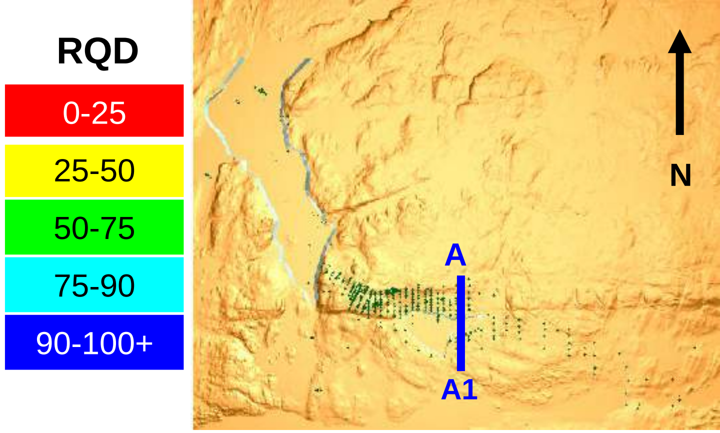


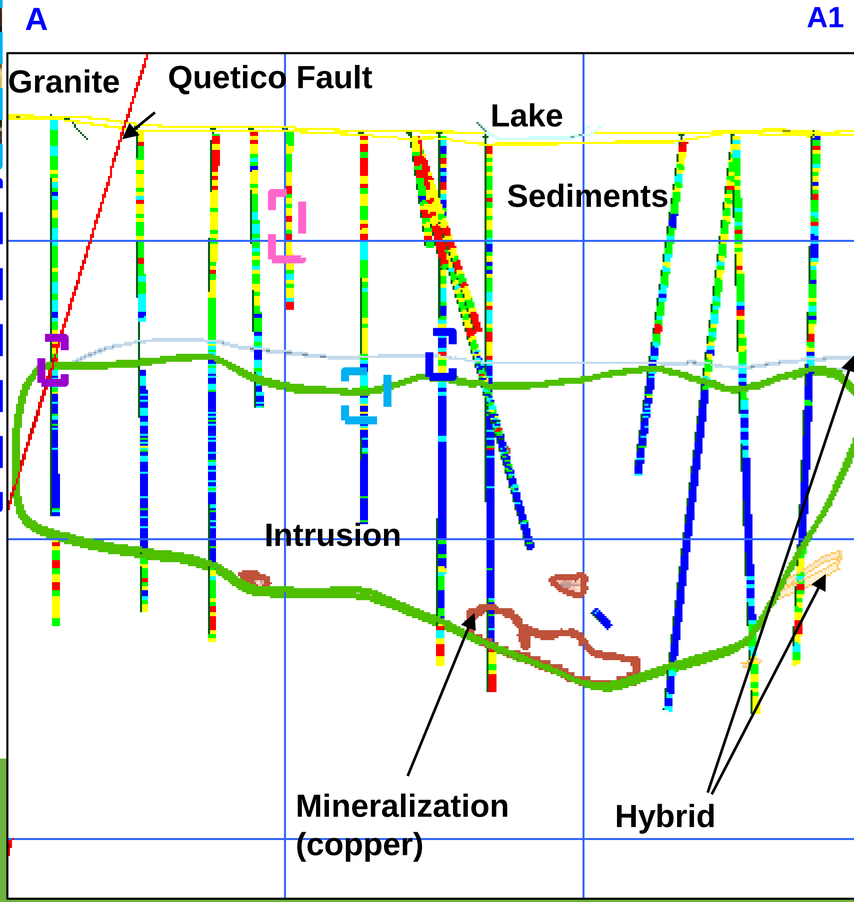


Beaver Lake

- The quality of the Sediments improves noticeably to the east of Beaver Lake, with less very poor quality intervals (RQD<25%).
- The Hybrid Zone is thicker above the main intrusion zone.
- The Hybrid Zone contains high quality Hybrid Red and Poor to Fair quality Hybrid Grey.
- Intrusion is of high quality.
- Host rock near the Fault is a mix of Granite and Sediments.
- Granite transition to intrusion at Quetico Fault intersection shows locally poor quality.

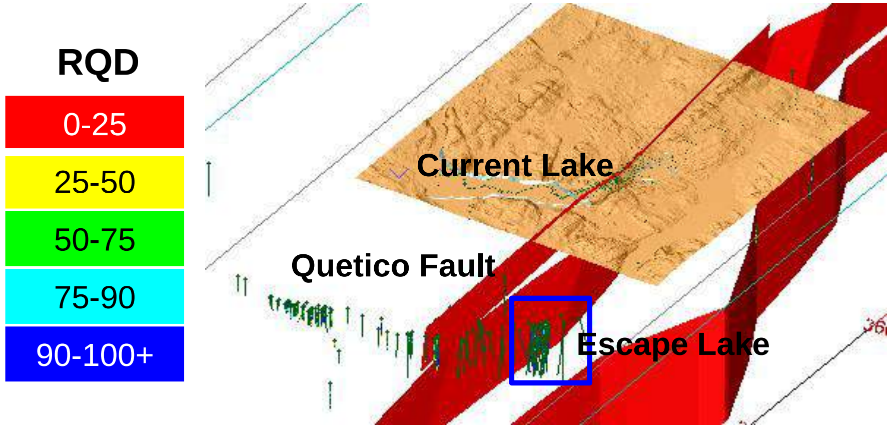


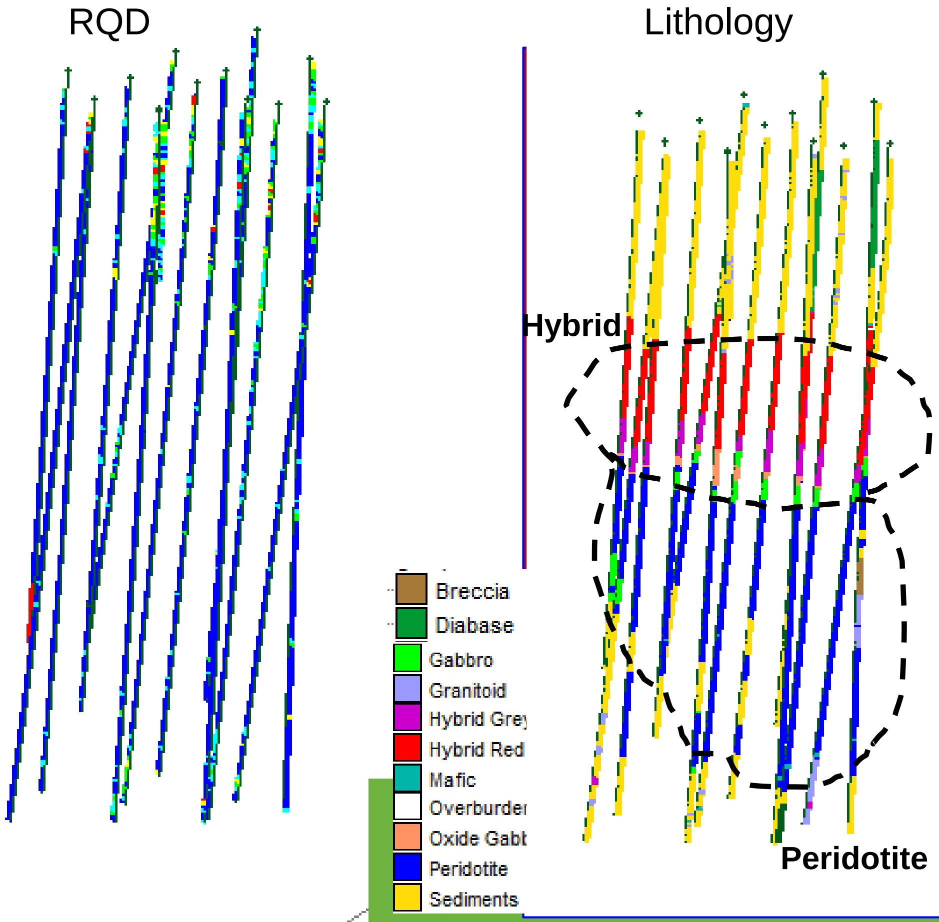




Escape Lake

- The Escape Lake Deposit is hosted entirely within the Sediments.
- Within the intrusion, a 70-90 m thick zone of Hybrid Red and 10-40 m thick zone of Grey overlays the Peridotite.
- The Peridotite geometry is highly variable, ranging from 80 to 250 m thick between drillholes.
- Gabbro is locally present within or at the base of the intrusion.
- A Diabase Dyke complex intersects the Escape Lake, which is not identified on the regional geology map.
- Limited RQD data are available. Overall, the rock mass quality is very good, with limited intervals of fair quality (RQD>25%) within the Sediments.
- However, a more thorough review will be required once more data become available, including drillholes and wireframes.





Rock Degradation

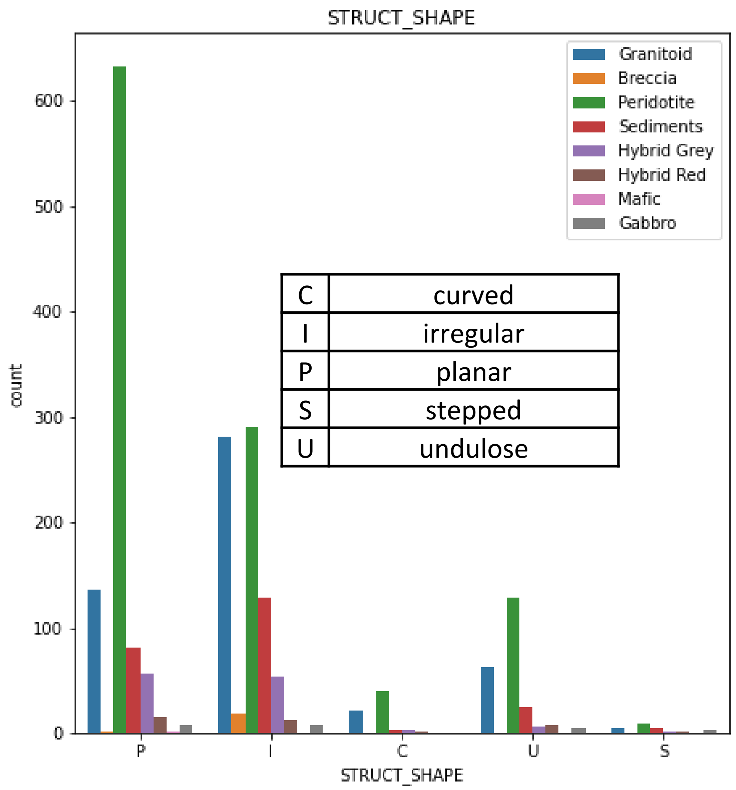
Long-term exposure

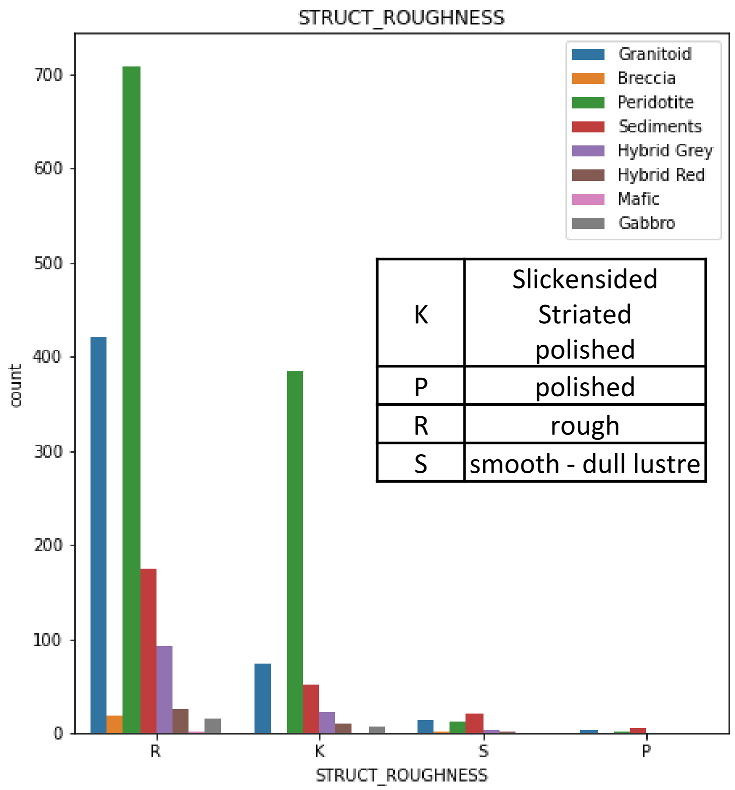
- Long term exposure of the rock to different environment factors, i.e., air, water, changing temperature, can have a prominent impact on the rock quality and strength.
- Evidence of rock core degradation was observed during October 2020 site visit. The degradation is attributed by Clean Air Metals to clays within the Peridotite. It is understood that Nordmin intends to test this theory as part of on-going metallurgical testing.
- The picture belongs to drillhole TBND065, which has been sitting outside for a couple of years, according to on-site staff. The core was cut twice prior to this photo, suggesting the degradation is a slow process.
- Unfortunately, the core box photo from this hole is not available to compare the quality of the core at the time of logging.

Rock Mass Quality

Large & Small Scale Discontinuity Roughness

- The drillhole database also documented the discontinuity surface shape:
- Large Scale (Waviness)
    - The host Granitoid, Breccia and Sediments generally have an irregular surface.
    - The Peridotite, Hybrid Grey, Hybrid Red and Gabbro generally have a planar surface.
- Small Scale (Roughness)
    - Majority of features from different lithology including host rocks and intrusion show a rough surface.
    - A large amount of discontinuities are recorded as Slickensided. Based on the October 2020 site visit this is considered unlikely and the discontinuities are likely better characterized as smooth.





Rock Mass Quality

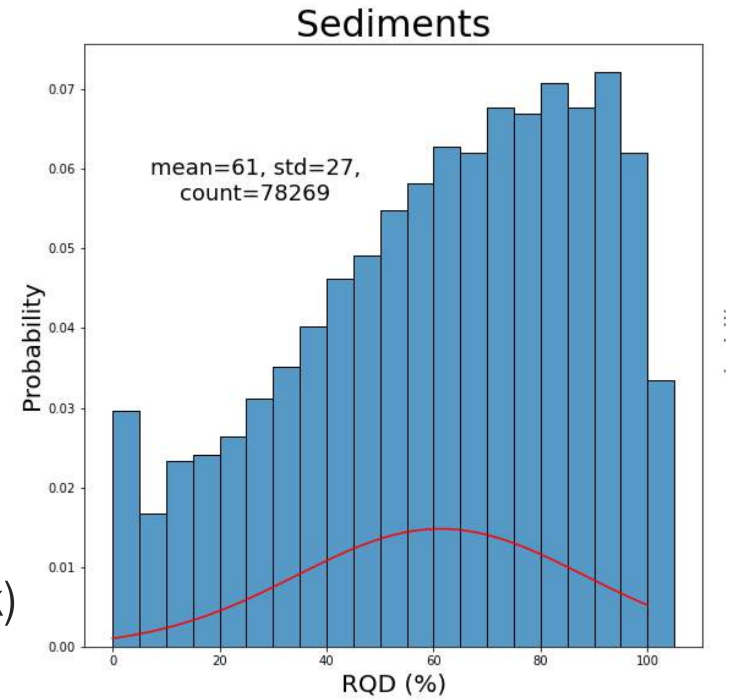
Estimates of RMR89

- Estimates of rock mass quality were made using the Rock Mass Rating 1989 classification system (Bieniawski, 1989). The estimates were based on core phots.
- The estimates incorporate several assumptions:
  - The ground water condition is assumed to be Dry. Groundwater will be considered separately in any stability analyses.
  - As no laboratory strength testing has been completed, the intact rock strength was based on estimates made with a rock hammer. A UCS of 50-100 MPa was used as the core consistently broke with a single blow of hammer.
- The discontinuity surface conditions have been estimated based on the data in the drillhole database, core photos, and site visit observations.

Rock Mass Quality

Sediments

- The Sediments have an average RQD of 61, but are of highly variable quality.
- Typically has discontinuities with 60-600 mm spacing, 0.1-1 mm aperture, no infill, slightly rough, fresh surface.
- A lower bound case was evaluated using the lower bound RQD (25-50%) and “Broken” surface conditions.
- The RMR89 values range from approximately 40 to 70, spanning from Class III (Fair Rock) to Class II (Good Rock) of RMR89.



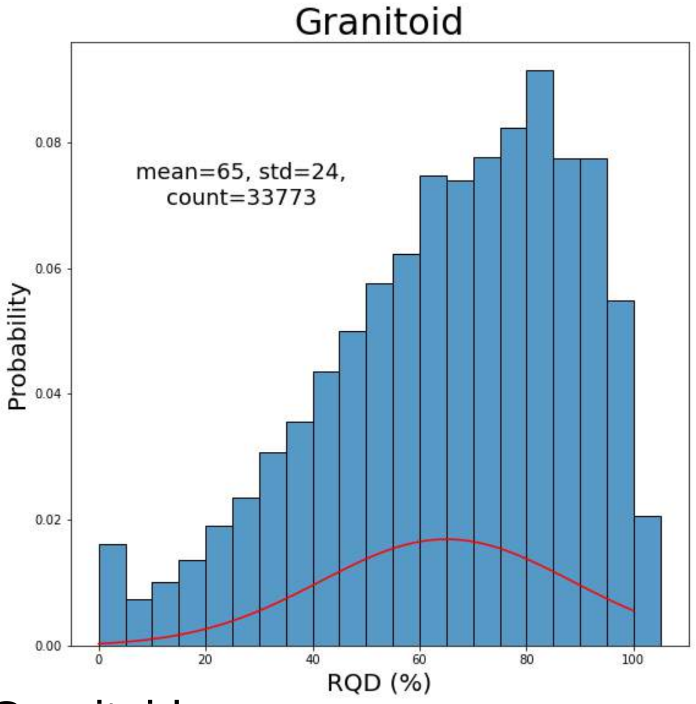
Typical low-quality Sediments

Typical Sediments

Rock Mass Quality

Granitoid

- The Granite has an average RQD of 65.
- Typically has discontinuities with 200-600+ mm spacing, 0.1-1 mm aperture, no or hard infill < 5mm thick, slightly rough to rough, fresh surface.
- A lower bound case was evaluated using RQD in 50-75% range.
- The RMR89 values range from 60-75, corresponding to RMR89 Class II (Good Rock).



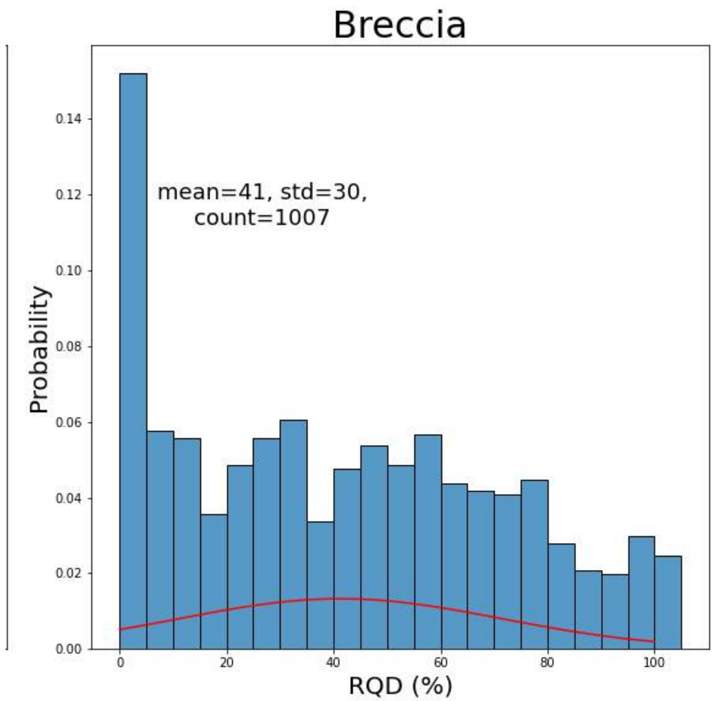
Typical low-quality Granitoid

Typical Granitoid

Rock Mass Quality

Breccia

- The Breccia has an average RQD of 41 and is the poorest quality unit encountered. The rock mass quality is highly variable.
- Typical discontinuities have <60-200 mm spacing.
- The discontinuity surface conditions were assumed as “Broken”.
- The RMR89 values range from 35-55, corresponding to Class IV (Poor Rock) to Class III (Fair Rock) of RMR89.



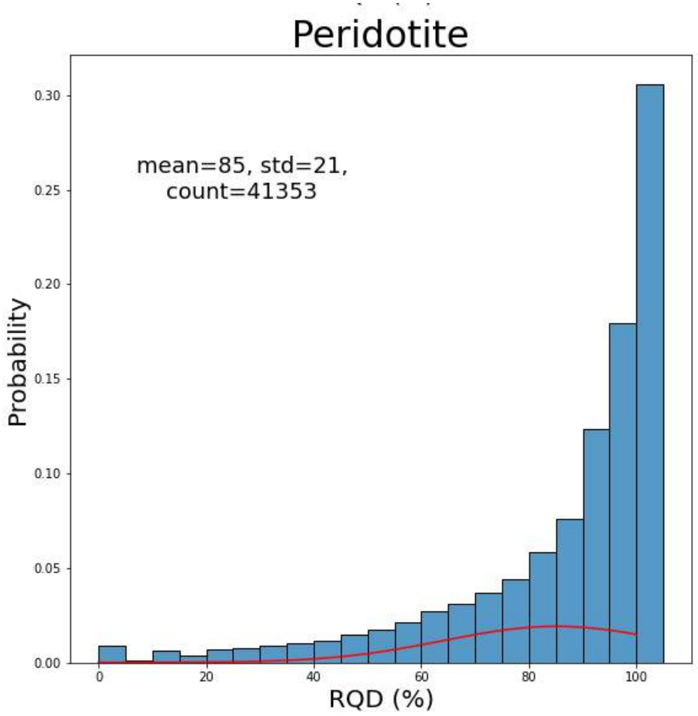
Better quality, healed Breccia

Typical Breccia

Rock Mass Quality

Peridotite

- The Peridotite has an average RQD of 85.
- Typical discontinuities have 200-600+ mm spacing, 0.1-1 mm aperture, no or hard infill < 5 mm thick, slightly rough to rough, fresh to slightly weathered surfaces.
- The RMR89 values range from 65-80, corresponding to RMR89 Class II (Good Rock).



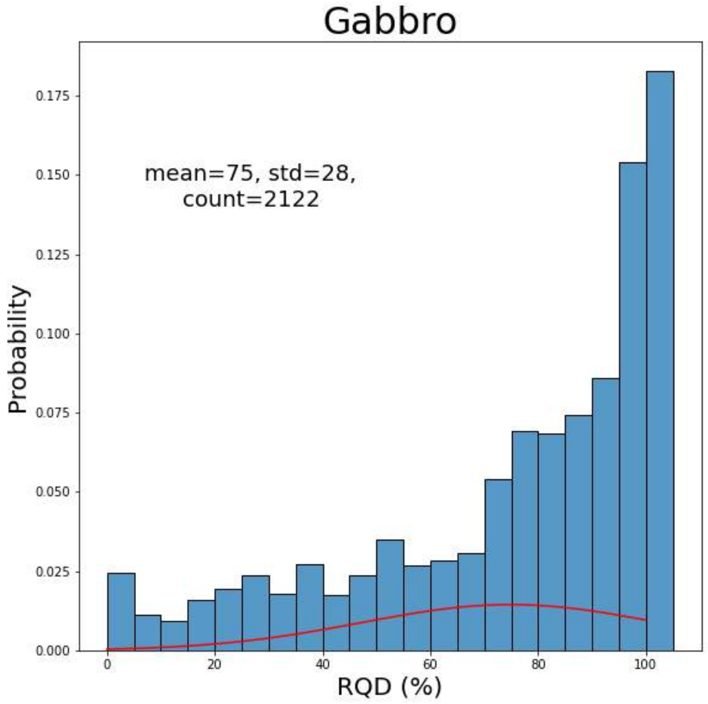
Typical low-quality Peridotite

Typical Peridotite

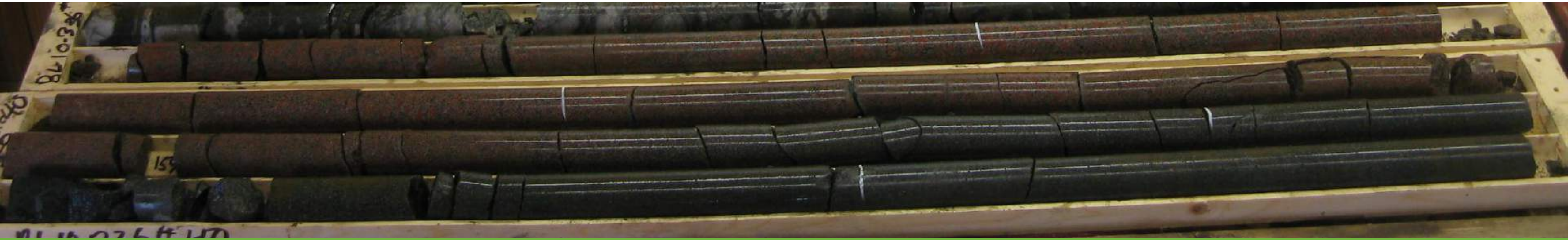
Rock Mass Quality

Gabbro

- The Gabbro has an average RQD of 75.
- The Gabbro is present in small scattered intervals (<5 m) within many holes.
- Typical discontinuities have 60-200 mm spacing, 0.1-1 or 1-5 mm aperture, no infill, slightly rough, fresh surfaces.
- The RMR89 values range from 60-70, corresponding to RMR89 Class II (Good Rock).



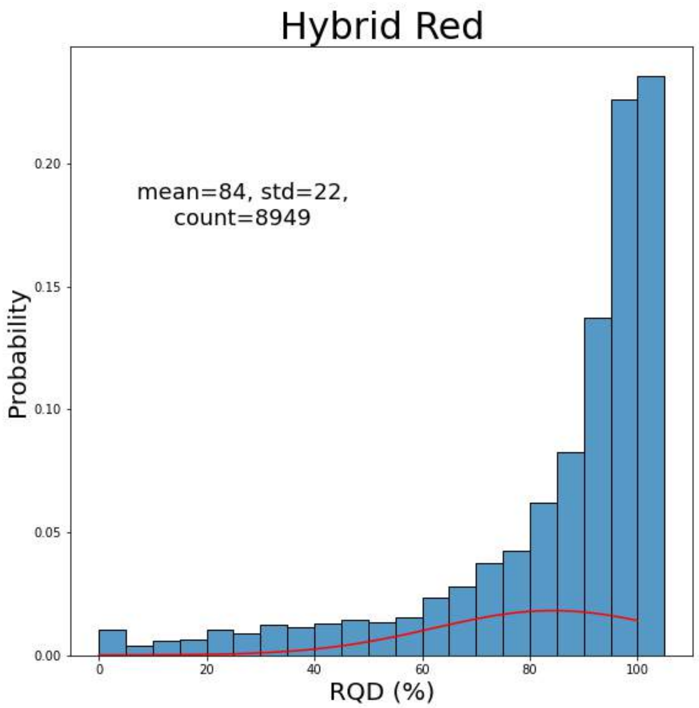
Typical Gabbro



Rock Mass Quality

Hybrid Red

- The Hybrid Red has an average RQD of 84.
- Typical discontinuities have 200-600+ mm spacing, 0.1-1 mm aperture, no infill, slightly rough, fresh surface.
- The RMR89 values range from 70-80, corresponding to RMR89 Class II (Good Rock).

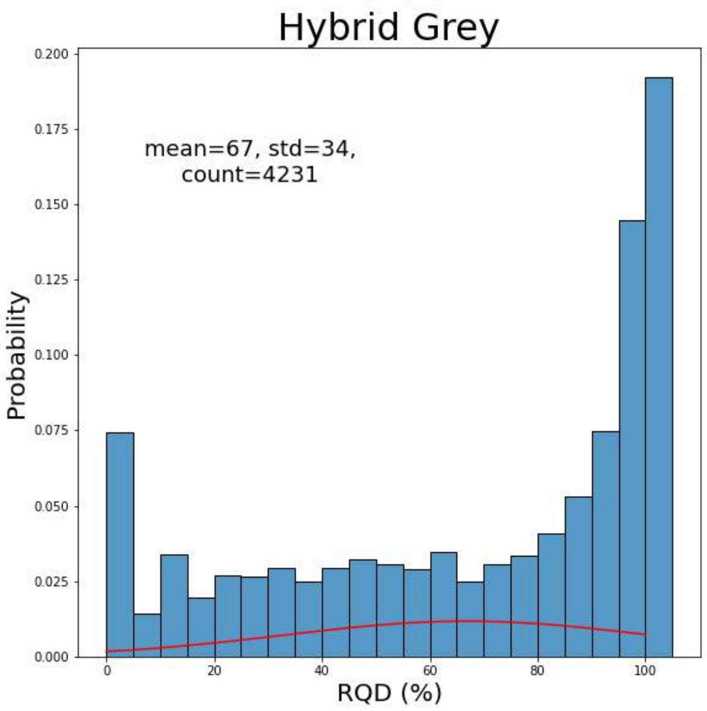


Typical Hybrid Red

Rock Mass Quality

Hybrid Grey

- The Hybrid Grey has an average RQD of 67.
- Hybrid Grey is more scattered than Hybrid Red within hole intervals.
- Typical discontinuities have 60-200+ mm spacing, 0.1-5 mm aperture, hard infill <5mm, smooth to slightly rough, fresh surface.
- RMR89 values range from 55-70, corresponding to RMR89 Class III-II (Fair to Good Rock).
- Since the Hybrid Grey has a scattered presence in the Hybrid Zone and mostly shows up in the footwall, for the design purposes it can be assumed an RMR89 of Good Rock Class.



Typical high-quality Hybrid Grey

Typical low-quality Hybrid Grey

Rock Mass Quality

Lithology	Zone	RQD		Discontinuity Spacing		Discontinuity Conditions		RMR89	Design RMR89
		Value (mean, std)	Rating	Value	Rating	Value	Rating		
Sediments	All Other	61, 27	8-17	<60-600mm	5-10	Aper. Broken to 0.1-1 Rough. Broken to SL Infill: Broken to none Weath. Broken to Fresh	1-4 1-5 4-6 3-6	55-70	65
	Beaver Lake							40-55	45
Granitoid	All	65, 24	13-17	200-600+mm	10-15	Aper. 0.1-1 Rough. SR-R Infill: none to H<5mm Weath. Fresh	4 3-5 4-6 6	60-75	70
Breccia	All	41, 30	3-13	<60-200mm	5-8	Aper. Broken to 1-5 Rough. Broken to SR Infill: Broken to H<5mm Weath. Broken to MW	1 1-3 2-4 3	35-55	40
Peridotite	All Other	85, 21	17-20	200-600+mm	10-15	Aper. 0.1-1 Rough. SL-R Infill none to H<5mm Weath. Fresh to SW	4 3-5 4-6 5-6	70-80	75
	Current Lake Host Rock Contact							65-70	65
Gabbro	All	75, 28	17-20	60-200mm	8	Aper. 0.1-5 Rough. SL Infill none Weath. Fresh	1-4 3 6 5-6	60-70	65
Hybrid Red	All	84, 22	17-20	200-600+mm	10-15	Aper. 0.1-1 Rough. SL-R Infill none Weath. Fresh	4 3-5 6 6	70-80	75
Hybrid Grey	All	67, 34	13-17	60-600mm	8-10	Aper. 0.1-5 Rough. SM-SR Infill H<5mm Weath. Fresh	1-4 1-3 4 6	55-70	60

Rock Mass Quality

Summary

General

- Rock mass quality was assessed based on the RQD drillhole database and a review of core photos. There are some limitations with this approach, primarily due to the limited intact rock strength data available and directional bias due to most of the drillholes being drilled vertically.
- Generally the rock mass quality ranges from Fair to Good according to the RMR89 classification system.
- The rock mass quality varies between lithologies. The faults are typically associated with a local reduction in rock mass quality. However, there are locations where the faults have been healed and have a negligible impact on quality.

Intrusion

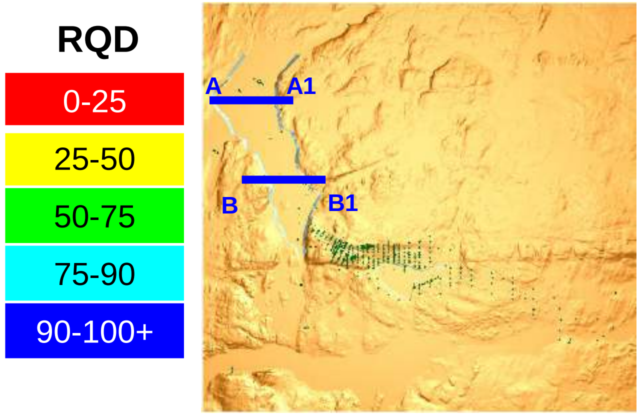
- The highest rock mass quality is associated with the intrusion, particularly the Peridotite and Hybrid Red. These units have RMR89 values of 65-80.
- The Hybrid Grey is of lower and more variable quality, with RMR89 values ranging from 55-70. Since the Hybrid Grey has a scattered presence in the Hybrid Zone and mostly shows up in the footwall, for the design purposes an RMR89 of 60-70 can be assumed.
- Within the intrusion, there are intervals of reduced rock mass quality (RMR89 of 65-70), particularly at the contacts with the host rock or where the intrusion comes to surface under Current Lake).

Host Rock

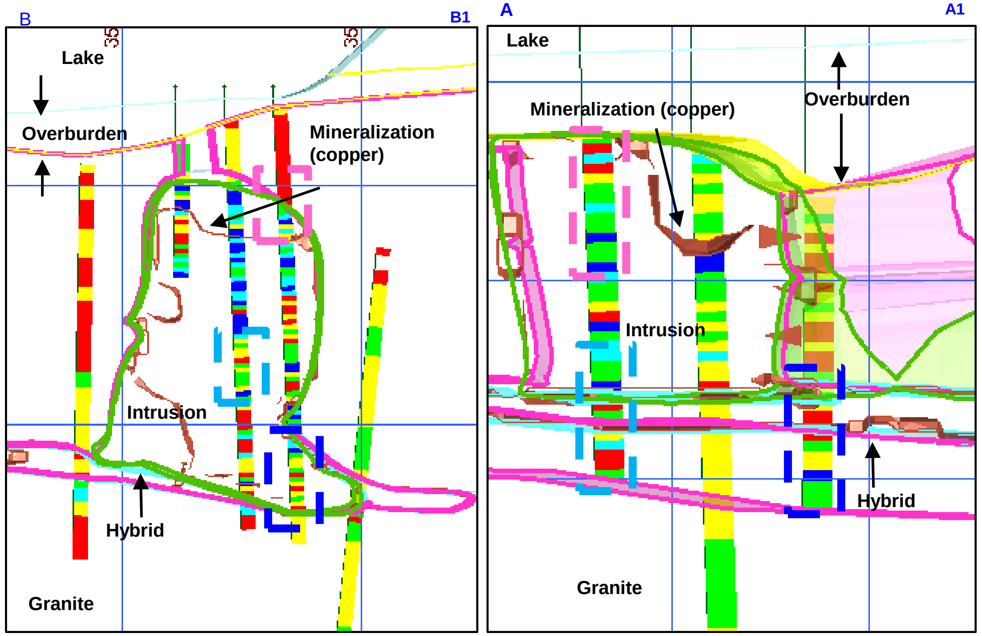
- The Granitoid is the most competent of the host rocks, with RMR89 values ranging from 60-75. The lower bound values are primarily associated with the Current Lake Zone and in the vicinity of the Quetico Fault Zone.
- The Sediments are of lower and highly variable quality, with RMR89 values ranging from 40-70. The lowest quality intervals are most prominent within the Beaver Lake Zone.
- The Breccia is associated with the lowest rock mass quality at the deposit. The RMR89 values range from 35-55. The lowest quality Breccia is primarily located in the Bridge Zone and Beaver Lake Zone. The Breccia can be of better quality where the rock has been healed.

Special Considerations

Current Lake Zone



- The intrusion come to the surface (overburden contact) below Current Lake. The overburden can be as thin as 2 m under the Lake.
- The depth to the intrusion increases gradually to the south of Current Lake, where the overburden >25 m.
- The intrusion extends to, or close to, the overburden contact over almost the full length of Current Lake. The thickness of host rock (Granite) between the intrusion and the overburden varies from 0 to 20 m. See examples at right.
- The position of the mineralization within the intrusion also varies (see examples at right). As a result, the thickness of the crown pillar between the stopes and the lake will vary. It is expected to be thinnest at the north end of Current Lake (section A-A1).
- Within the crown pillar, the Intrusion is expected to be of better quality than the Granite. However, the intrusion is of varying quality depending on the location.



Knight Piésold CONSULTING

Special Considerations

Bridge Zone and Beaver Lake Zone

- The intrusion in in these zones is much deeper (>100m) than in the Current Lake Zone.
- The intrusion transitions in the Bridge Zone from being hosted within the Granite to being hosted within the Sediment. The modelled Quetico Fault loosely defines this transition, though some Sediment is present to the north of the fault and some Granite is present to the south.
- Between the Bridge Zone and the east end of the Beaver Lake Zone, the intrusion is aligned parallel to the Quetico Fault Zone. The intrusion is of higher quality (RMR89 of 70-80) in these areas than in the Current Lake Zone (RMR89 of 65-70).
- The quality of the Sediments varies the Bridge Zone to the Beaver Lake East Zone. The Sediments are typically of low quality (25%<RQD<50%) in the Bridge Zone Lake and very poor quality (RQD<25%) below Beaver Lake. The quality of the Sediments improves gradually to the east of Beaver Lake Zone. This effect is attributed to the presence of the Quetico Fault Zone.
- Breccia is locally present above the intrusion within the Sediments. The Breccia is of with varying quality, but is mostly poor quality (RQD<50%). However, there are intervals within of better quality, with RQD>50%. The Breccia may also be associated with faulting.
- The Hybrid overlying the Peridotite is generally of high quality (RQD>75%). The thickness of the Hybrid varies from as little as 2 m in the Bridge Zone to >50m in the Beaver Lake East Zone. This is an important consideration for crown pillar design.

Appendix F: Mine Ventilation and Design

PREPARED FOR:
NORDMIN ENGINEERING LTD.

NORDMIN
GROUP OF COMPANIES
ENGINEERING·CONSTRUCTION·OPERATION

Attention: Brian Wissent

CONCERNING:
Clean Air Metals inc.
PEA Ventilation Design

PREPARED BY:
Jodouin Mine Ventilation Ltd.
62 Westport Street
Sudbury, Ontario P3B 0G2
Canada

JMVL JODOUIN
MINE VENTILATION LTD.

Nov 10, 2021

Table of Contents

1.0 EXECUTIVE SUMMARY 2
1.1 Introduction 2
1.2 Basis of Technical Report 3
2.0 AIRFLOW DETERMINATION 4
3.0 VENTILATION NUMERICAL MODELING 6
3.1 LOM - Steady State Full Production 7
3.2 Main Decline Development 10
3.3 Main Fan Operating Points 11
3.4 Ventilation Raise Dimensions 13
3.5 Velocities 15
4.0 COSTS: CAPITAL AND OPERATING COSTS 18
4.1 Capital 18
4.1.1 Main Fans and Heaters 18
4.2 Operating 19
4.2.1 Main Intake Raise Mine Air Heating 19
4.2.2 Mine Air Heating Consumption 20
4.2.3 Electrical 22
5.0 CONCLUSIONS AND RECOMMENDATIONS 23

1.0 EXECUTIVE SUMMARY

1.1 Introduction

Jodouin Mine Ventilation Ltd. (JMVL) has been commissioned by Nordmin Engineering Ltd. (Nordmin) to provide a Preliminary Economic Assessment (PEA) level LoMP Ventilation Design for Clean Air Metals Inc. project located 50 kilometres northeast of the city of Thunder Bay, Ontario, Canada. The project is comprised of the Current and the Escape Deposits.

This technical report summarizes the PEA study performed for the LoMP ventilation system, in which JMVL established airflow requirement estimates, a primary ventilation plan, and required ventilation infrastructure and controls required for the long-term design. JMVL estimated the size and location of primary ventilation fans and air heaters, appropriate raise sizing, ventilation controls such bulkheads, doors, and regulators. JMVL also estimated the capital and steady-state operating costs of the ventilation system.

The airflows required are driven by regulated diesel emission requirements (where and when applicable), best-practice velocity requirements for air circulation and dust control requirements. Study results indicated that the project requires a maximum airflow of 268 m^3/s (567,000 cfm) for the Current Deposit and 255 m^3/s (539,000 cfm) for the Escape Deposit to meet LoM planned development and production plans.

In order to achieve the LoM airflow requirements, the following mine ventilation installations are required;

1. Current and Escape Portal Development fans and heaters
2. Current and Escape Mine Development Fans
3. Current Deposit Surface FA Fan and Heater
4. Current Deposit U/G RA Booster
5. Current Deposit Surface # 1 RA Fan
6. Current Deposit Surface # 2 RA Fan
7. Escape Deposit # 1 Surface FA Fan and Heaters
8. Escape Deposit # 2 Surface FA Fan and Heaters
9. Escape Deposit Surface RA Fan

This report presents JMVL's proposed primary ventilation plan and required ventilation infrastructure and controls required for the long-term design. JMVL has also provided PEA level capital and steady-state operating costs for the revised ventilation system .

1.2 Basis of Technical Report

This report is based on information provided by Nordmin throughout the course of JMVL's investigations.

This information includes:

- Life of Mine (LoM) design strings
- Production and development schedules and plans
- List of all the underground diesel equipment, complete with make, models and power ratings.
- Design and operating criteria to meet Nordmin requirements.
- Current and projected costing for
  - Electricity
  - Propane

2.0 AIRFLOW DETERMINATION

The estimated underground air volume requirements have been based on the Ontario Occupational Health and Safety Act, Regulations 854 Section 183.1 (3).

The regulation states:

"The flow of air must be at least 0.06 cubic metres per second for each kilowatt of the diesel- powered equipment operating in the workplace".

The airflow requirement is commonly expressed in cubic feet per minute (cfm) and the conversion is 100 cfm per horsepower (hp).

The maximum ventilation demand would occur if all mobile equipment in the mine was operating simultaneously. Although this is possible, in practice it is very unlikely to occur. To estimate a more likely peak ventilation demand, utilization factors have been applied to the mobile equipment.

The utilization factors reflect the likely combination of equipment that will be running during the busiest periods of any working shift (i.e., during the work periods with high diesel activity). Refer to Table 1.

Table 1: Utilization Cycle

Shift Start	Work Period	Lunch	Work Period	Shift End
Low Activity	High Diesel Activity	Low Activity	High Diesel Activity	Low Activity

Utilization factors vary with the type of equipment and reasonable judgement has been used. Equipment such as drill jumbos which operate on diesel power only while moving from one workplace to the next are utilized much less than LHDs or haul trucks.

Airflow determination was performed based on Diesel LHD's and Trucks provided by Nordmin Engineering, with the remaining fleet planned to be Battery Electric Vehicles (BEV) .

Ventilation simulation modelling and associated facility designs have been prepared to reflect the expected equipment utilizations during the work periods define in Table 1 above.

The capacity required for each stage is related to the peak level of development and production activity. The equipment horsepower, utilization factors applied to the equipment fleet, and resulting ventilation flows at steady state operation are shown for the Current Deposit in Table 2 and Escape Deposit Table 3.

Table 2: Current Deposit Steady State Fresh Air Ventilation System Capacities

Preliminary - UG Diesel Equipment Fleet - Steady State

Unit	Quantity	Hp each	kW each	Utilization (diesel engine)	Total Hp	Total kW	Total CFM (100cfm/hp)	Total M3/Sec
Years 1-3								
Development + Production								
Current #1								
6 Yard	4	250	186	100%	1,000	746	100,000	47
Haul Truck 40t	5	589	439	100%	2,945	2196	294,500	139
Current #2								
6 Yard	1	250	186	100%	250	186	25,000	12
Push Truck 28t	2	317	236	100%	634	473	63,400	30
Subtotal							482,900	228
Leakage	5%						24,145	**11**
SUBTOTAL Surface Volume FA REQUIRED							507,045	239
Portal 1 truck							60,000	28
TOTAL SURFACE							**567,045**	**268**

Table 3: Escape Deposit Steady State Fresh Air Ventilation System Capacities

Preliminary - UG Diesel Equipment Fleet - Steady State

Unit	Quantity	Hp each	kW each	Utilization (diesel engine)	Total Hp	Total kW	Total CFM (100cfm/hp)	Total M3/Sec
Years 4 - 7								
Development + Production								
6 Yard	3	250	186	100%	750	559	75,000	35
Haul Truck 40t	4	589	439	100%	2,356	1757	235,600	111
Push Truck 28t	1	317	236	100%	317	236	31,700	15
Subtotal							342,300	162
Leakage (Modeled)	5%						17,115	8
SUBTOTAL Surface Volume FA REQUIRED							359,415	170
Portal 1 truck							180,000	85
TOTAL SURFACE							**539,415**	**255**

3.0 VENTILATION NUMERICAL MODELING

JMVL performed ventilation simulation modelling, and associated infrastructure designs were prepared based on the following:

- Mine development and production plans, including access and production level 3D designs.
- Underground mobile equipment list and engine power estimates.

Note : *The numerical model analysis presented in this report was solely based on the quality of information available and provided by Nordmin engineering personnel*

A LOM steady-state model was developed for each Deposit as representative of the mine during its steady-state peak production period, with the maximum number of equipment operating.

Proposed ventilation infrastructure (raising) was inserted into the model to achieve a proposed LOM ventilation design. This proposed development would need to be reviewed by the mine design team and optimized as it is currently at a PEA level of study.

This selection represents the combination of greatest airflow demand (representing steady-state peak production) and an early furthest extent of ventilation infrastructure, resulting in the maximum fan duty requirement.

3.1 LOM - Steady State Full Production

A maximum production ventilation model was created. This selection represents the combination of furthest extent of ventilation infrastructure and the highest total airflow demand, resulting in the maximum fan duty requirement.

The steady state numerical model for both the Current and Escape Deposits have been illustrated in Figures 3 and Figure 4 below.

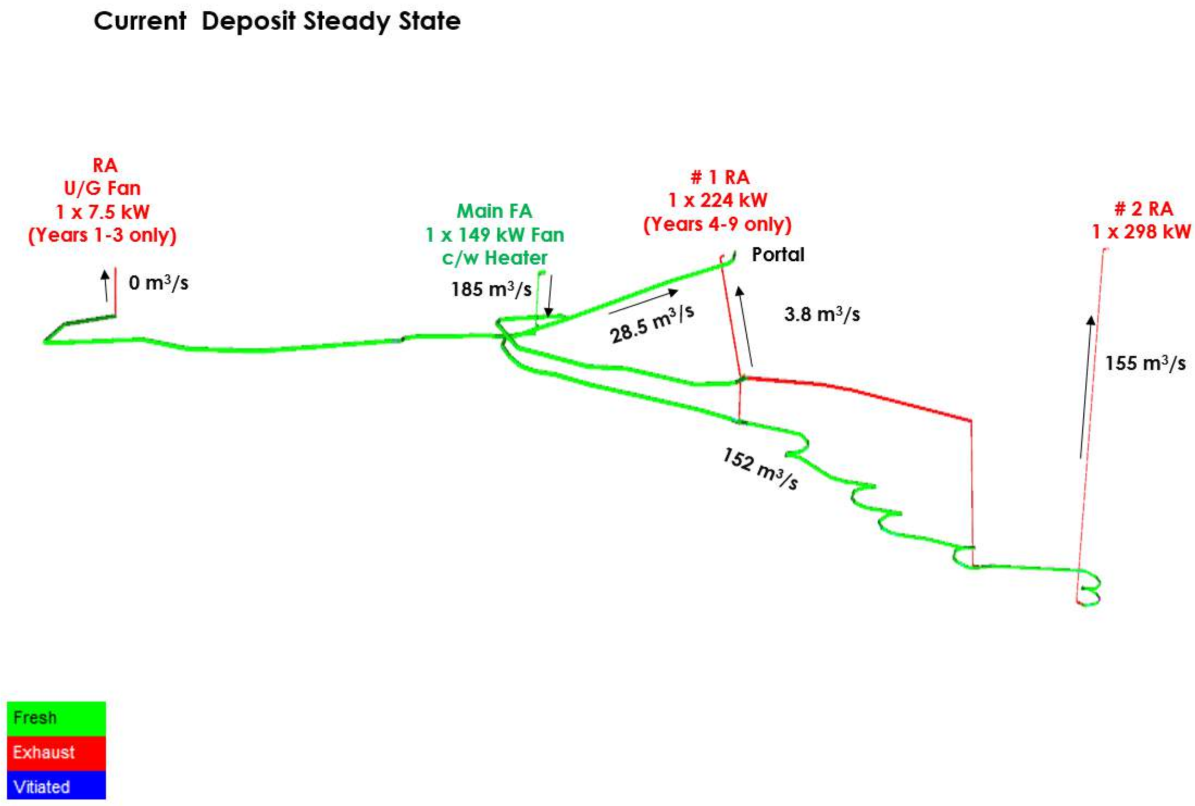


Figure 3 Current Deposit Steady State Model

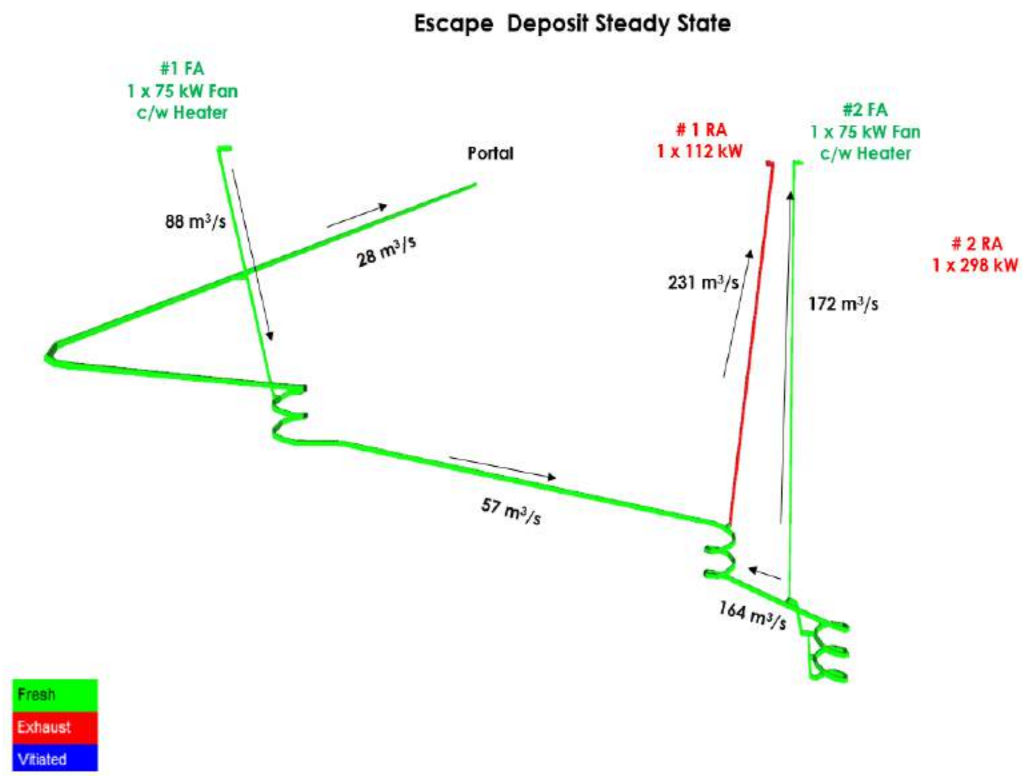


Figure 4 Escape Deposit Steady State Model

3.2 Main Decline Development

The Current and Escape main declines are to be driven at 5m wide x 5m high from the portal to a maximum length of 1000 m. The diesel equipment utilized for this development are:

- 6 Yard LHD: 186 kW (250 HP) requiring 12 m^3/s (25,000 cfm)
- 40 T Haulage Truck: 589 KW (439 HP) requiring 28 m^3/s (58,900 cfm)

With operations in a single face heading, the maximum air volume required is for the simultaneous operation of the LHD and haulage truck. To allow for leakage of approximately 15% for rigid poly duct, the total design air volume at the fans location should be 46.0 m^3/s (97,000 CFM).

The most practical auxiliary tubing installation consists of two x 1.22 m (48") diameter ventilation lines connected to one 150 HP fans per line. The installation should consist of 150 HP fan, inlet silencer and inlet bell with screen.

For the initial drives from the portals, two individual 4.2 MMBTUH mine air heaters are required for heating the development air and will be assembled in a skid arrangement with the fans.

The auxiliary ventilation system (fans and duct diameter) is presented in Table 4.

Table 4: Main Decline Auxiliary Vent System

Option	Duct Pressure Loss - 1000 m	Fan Type	Total Number of Fans	Connected Fan kW	Remarks
Twin 1.22 m Diameter Poly ducts (48" diameter)	2.8 kPa	4800-Vax-2700 c/w 112 kW(150 hp) motor	1	112 Kw	1 fan connected per vent line

3.3 Main Fan Operating Points

Main fan operating duties for the modeled scenarios and the resultant maximum duties used for fan specification are shown in Table 5.

Nordmin - Clean Air Metals - Ventilation Fan Operating Points			
Fan Location	Density (lb/ft^3)	Operating Point 1	
		Volume[1] (cfm)	Pressure[4] (in. w.g.)
Current & Escape Portal Development Fans	0.065	97,000	11.40
Current and Escape Development Fans	0.065	97,000	11.40
Current Deposit Surface FA Fan	0.065	567,000	0.40
Current Deposit U/G RA Booster	0.0656	93,000	0.20
Current Deposit Surface #1 RA Fan	0.0646	297,600	3.30
Current Desposit Surface #2 RA Fan	0.0644	342,000	4.40
Escape Deposit # 1 FA Fan	0.0651	300,000	0.50
Escape Deposit #2 FA Fan	0.0651	364,000	0.90
Escape Deposit Surface RA Fan	0.0651	490,000	0.50

[1] Volumes are in ACFM

[2] Pressure is Total at Collar (inches of water guage) (excluding surface losses)

[3] Pressure is Total Pressure across installation (excluding installation losses)

[4] Fan operating pressures points are based on actual density

Table 5: Main Fan Operating Points

Figure 5 illustrates a typical main fresh air fan installation on surface. Figure 6 and Figure 7 illustrate a typical main return air fan installation on surface.

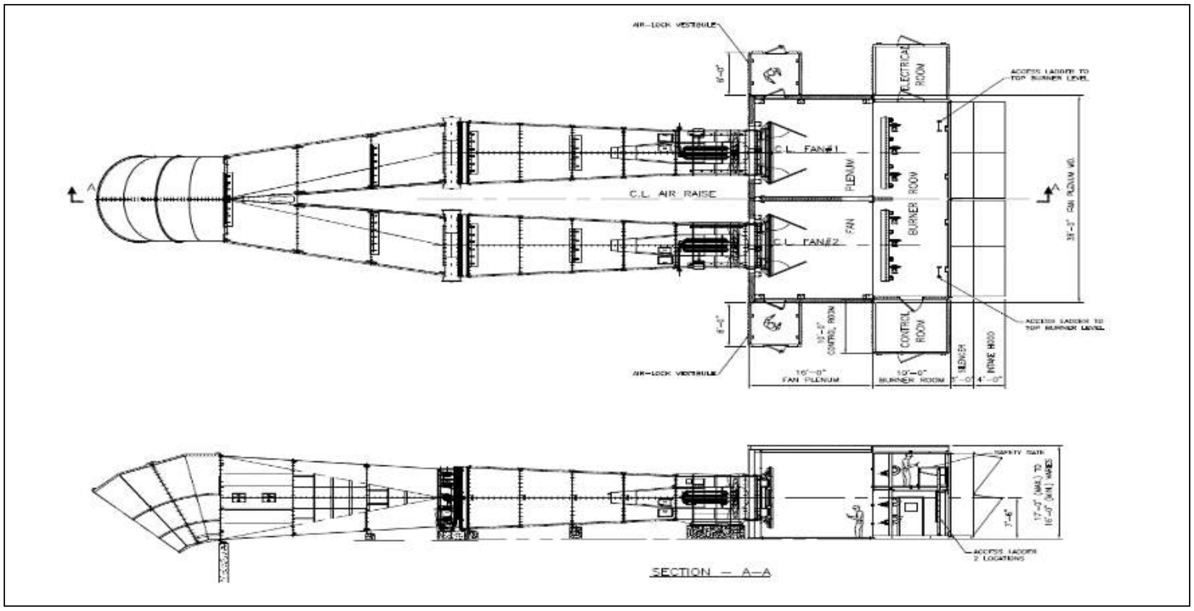


Figure 5: Main Intake System

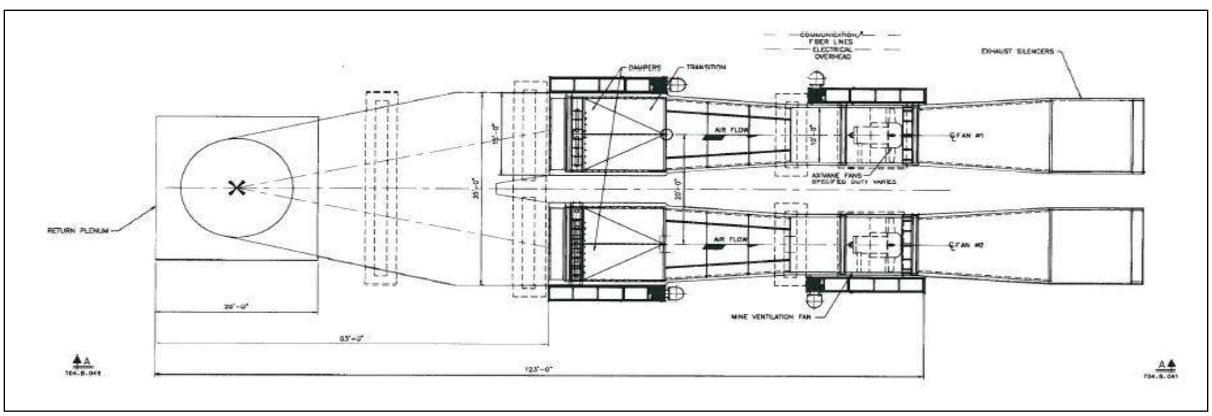


Figure 6: Main Return System Plan

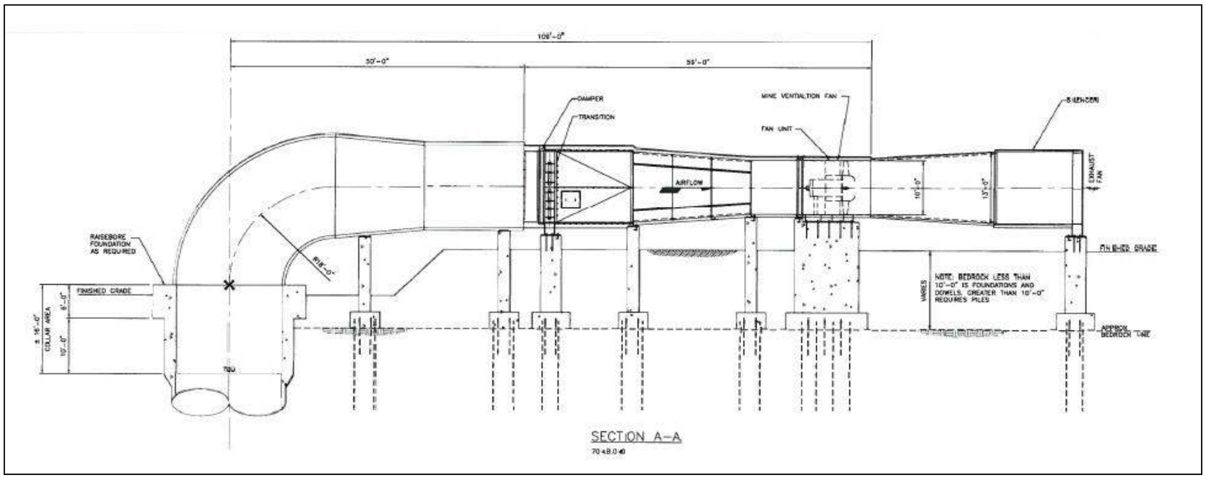
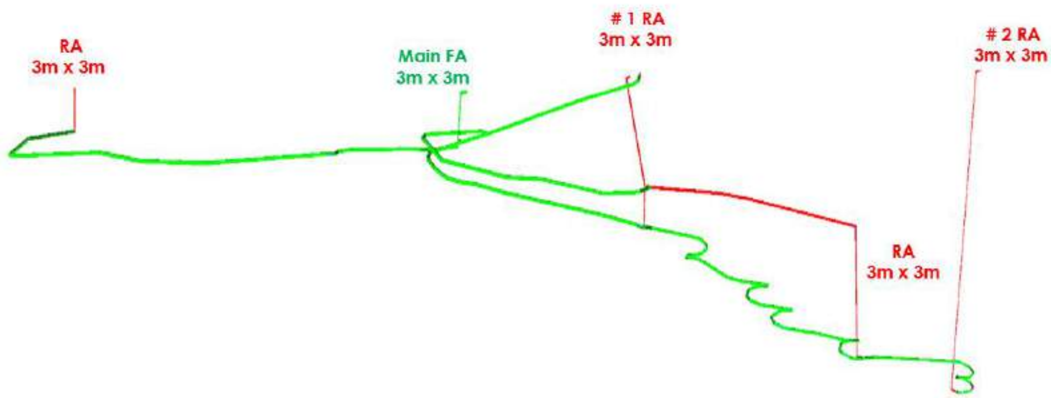


Figure 7: Main Return System Section

3.4 Ventilation Raise Dimensions

Nordmin indicated that they prefer the maximum size Alimak is 3m x 3m without slashing. Without knowledge of any ground conditions impacting raise location and/or development rates, JMVL has provided dimensions for the proposed raises, whether constructed as Alimak raises or raise bores as illustrated in Figure 8.

Current Deposit Raise Sizes



Escape Deposit Raise Sizes

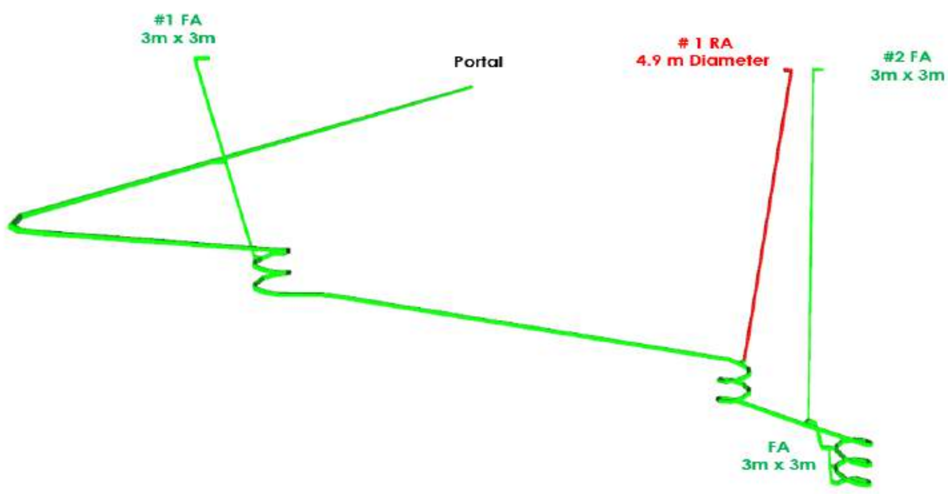


Figure 8: Raise Sizes

3.5 Velocities

JMVL recommends optimum velocity for track haulage drifts at 4 m/s (800 ft/min) and the maximum air velocity at 6 m/s (1200 ft/min) within its mine ventilation design. This is to ensure that dust is not re-entrained in the primary airflow and that unnecessarily high ventilation pressures (and consequently high electric fan power costs) are not imposed on the mine ventilation system.

Should dust be an issue, dust generation can be partially mitigated by the following:

- Enclosed cabs, which will remove personnel from the airway.
- Restrict airways to personnel access.
- Stabilize roadway surfaces (i.e., wetted, calcium) to prevent dust pick up from tires being entrained into ventilation air.
- Cover truck beds to keep material from being drawn into the air.

JMVL provides an outline of relative dust concentrations respective to velocity as illustrated in Figure 1. The graph summarizes that very small particles (below -5 microns, respirable fraction) require a higher air velocity to provide dilution; and in contrast the larger (+10 microns) particles require a lower air velocity so that they are not picked up and become airborne.

The larger particles that become airborne potentially cause eye injuries and general discomfort. The graph shows that there is an optimum velocity to accommodate both small and large dust particles of 1.5 m/s (300 ft/min) to 3.0 m/s (590 ft/min).

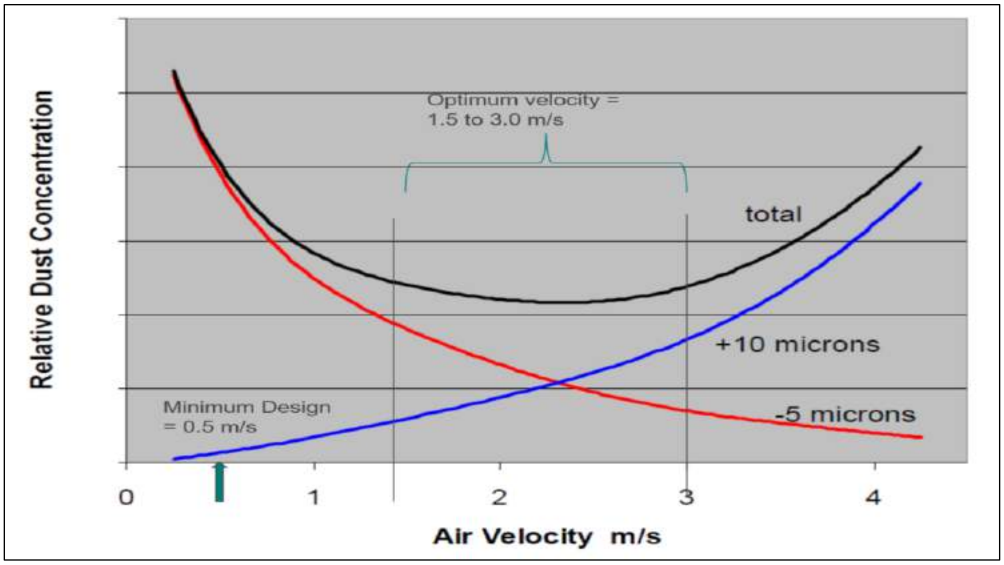


Figure 1: Dust Concentration Respective to Air Velocity

The ventilation system design and modeling were designed to mitigate air velocity concerns within the main ramp workings. Strategic placement of the Main Raise breakthrough from surface was analyzed and performed.

There is although a section of the main access ramp within the Escape Deposit only (Figure 2) that contains slightly higher velocities ~ 7.0 m/s (1376 m/s), which exceeds the recommended best practice maximum velocities. This ramp section can be managed with the mitigating strategies mentioned earlier in this section.

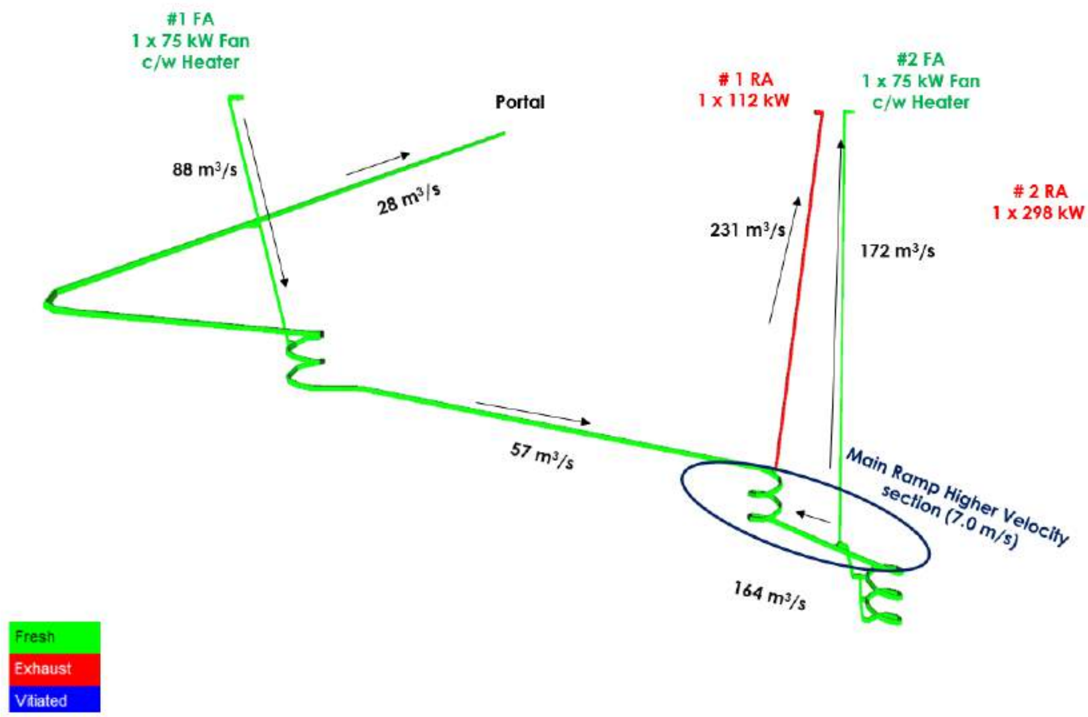


Figure 2: Higher Velocity Ramp Section – Escape Deposit

4.0 COSTS: CAPITAL AND OPERATING COSTS

4.1 Capital

4.1.1 Main Fans and Heaters

Requests for PEA level quotations for the main fans and heating system were obtained and provided. Costing based on the assumption that power will be provided at 600V for all installations. There is also the possibility of combining equipment in E-houses should the different raises be close enough to each other. This could possibility reduce the number of E-houses required.

The Vendors provided PEA level quotations for the following ventilation systems:

1. Current and Escape Portal Development fans and heaters
2. Current and Escape Mine Development Fans
3. Current Deposit Surface FA Fan and Heater
4. Current Deposit U/G RA Booster
5. Current Deposit Surface # 1 RA Fan
6. Current Deposit Surface # 2 RA Fan
7. Escape Deposit # 1 Surface FA Fan and Heaters
8. Escape Deposit # 2 Surface FA Fan and Heaters
9. Escape Deposit Surface RA Fan
10. Set of Airlocks Doors
11. Vent Regulators

A summary of new required Main Fan and Heater Ventilation infrastructure capital is Summarized in Table 5. (Howden Costing was utilized)

Table 5 : Required Main Fan and Heater: Capital Estimate Summary

Item	Description	Estimate
1	Current & Escape Portal Development Fans	**$ 1,179,592**
2	Current and Escape Development Fans	**$ 103,638**
3	Current Deposit Surface FA Fan	**$ 2,786,176**
4	Current Deposit U/G RA Booster	**$ 58,608**
5	Current Deposit Surface #1 RA Fan	**$ 1,099,562**
6	Current Desposit Surface #2 RA Fan	**$ 1,103,562**
7	Escape Deposit # 1 FA Fan	**$ 1,145,748**
8	Escape Deposit #2 FA Fan	**$ 1,380,102**
9	Escape Deposit Surface RA Fan	**$ 789,330**
10	Airlock Doors (one set Current and one Set Escape)	**$ 260,000**
11	Regulators (wooden) with bulkhead personnel airlock	**$ 120,000**
	Total (excluding applicable taxes)	**$ 10,026,318**

4.2 Operating

4.2.1 Main Intake Raise Mine Air Heating

The main fresh air raises mine air heating system will be required to heat the mine air during the winter months. The heating system capacity is designed for a 47°C (80°F) temperature range to allow for heating of the mine air at low temperatures.

4.2.2 Mine Air Heating Consumption

4.2.2.1 Portal Heaters Propane Consumption

The portal propane mine air heaters are designed for a maximum temperature differential of 80°F (-40^{0}F to +40^{0}F) but will modulate to provide an output temperature setpoint in the intake raise collar of +35.50°F (2.0^{0}C) during winter months. The estimated propane gas consumption and associated costs ($0.6/L) are shown in Table 6 and Table 7.

Table 6: Propane Gas Consumption Estimate (During Winter Months)

Area	Temperature Setpoint (F)	Airflow (Acfm)	November	December	January	February	March	Total Winter Consumption (Litre)
Portal	35.6	97000	31,002	87,563	107,496	85,243	48,409	**359,712**

Table 7: Propane Gas Cost (During Winter Months)

Area	Temperature Setpoint (F)	Airflow (Acfm)	Propane Cost (C$)					Total Winter Cost
			November	December	January	February	March	
Portal	35.6	97,000	18,601	52,538	64,497	51,146	29,045	**215,827**

4.2.2.2 Main Fresh Air Raise Natural Gas Consumption

The main fresh air raise portal natural gas mine air heaters are designed for a maximum temperature differential of 80°F (-40^{0}F to +40^{0}F) but will modulate to provide an output temperature setpoint in the intake raise collar of +35.50°F (2.0^{0}C) during winter months. The estimated propane gas consumption and associated costs ($0.013/ft^3) are shown in Table 8 and Table 9.

Table 8: Natural Gas Consumption Estimate (During Winter Months)

Area	Temperature Setpoint (F)	Airflow (Acfm)	November	December	January	February	March	Total Winter Consumption (ft3)
Current Fa	35.6	567,000	3,909,451	11,042,027	13,555,659	10,749,542	6,105,535	**45,361,216**
Escape #1 FA	35.6	300,000	2,068,493	5,842,342	7,172,307	5,687,589	3,229,913	**24,000,643**
Escape #2 FA	35.6	364,000	2,509,771	7,088,709	8,702,399	6,900,941	3,918,961	**29,120,780**

Table 9: Natural Gas Cost (During Winter Months)

Area	Temperature Setpoint (F)	Airflow (Acfm)	Propane Cost (C$)					Total Winter Cost
			November	December	January	February	March	
Portal	35.6	567,000	50,823	143,546	176,224	139,744	79,359	**589,696**
Escape # 1 FA	35.6	300,000	26,890	75,950	93,240	73,939	41,989	**312,008**
Escape # 2 FA	35.6	364,000	32,627	92,153	113,131	89,712	50,946	**378,570**

4.2.3 Electrical

Figure 9 illustrates the estimated power consumption for main fans at steady state

	Current	Escape
Total kW	933.00	606.00
Vent Fan Power Costs $0.125 / kWh (CAD)	$ 1,021,088	$ 663,707

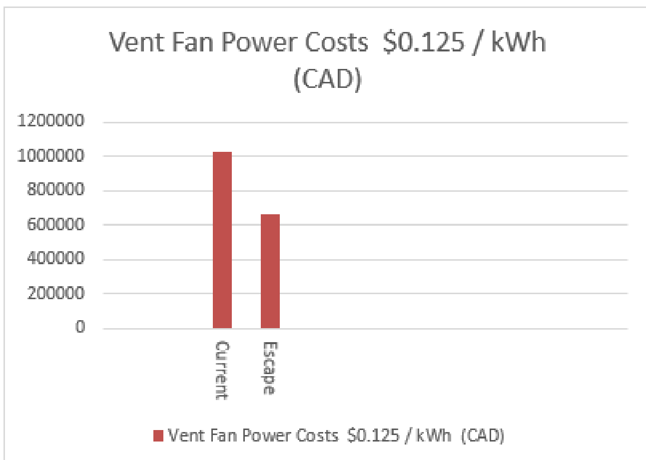


Figure 9: Main Fan Power Estimate

5.0 CONCLUSIONS AND RECOMMENDATIONS

As Nordmin continues to progress with Life of Mine planning, it will be important to update the numerical model and associated staged scenarios to define ventilation requirements and more precisely define main fan operating requirements.

In this study, JMVL performed the following scope of work for Nordmin:

- Determined airflow requirements for proposed LoM equipment diesel fleet.
    - Updated steady-state airflow determination based on new equipment lists.
    - Determined airflow requirement by allocation to activities.
- Created numerical models:
    - LoM Steady State scenarios .
- Optimized numerical models :
- LOM ventilation requirements: primary fans, ducts, air heating.
- Specified LOM ventilation raising requirements.
- Provided capital and operating cost estimates for ventilation fans, heating and electrical.

Jodouin Mine Ventilation Ltd.

Jacques Jodouin CET, LET
Director