NI 43-101 Technical Report: Hirsikangas Gold Project, Finland

Rupert Resources Ltd

Effective Date: 9th November 2018

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Document Information Page

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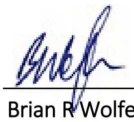
Effective Date	9th November 2018	
Versions / Status	FINAL	
Print Date		

Document Review and Sign Off



Brian R Wolfe

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1. EXECUTIVE SUMMARY

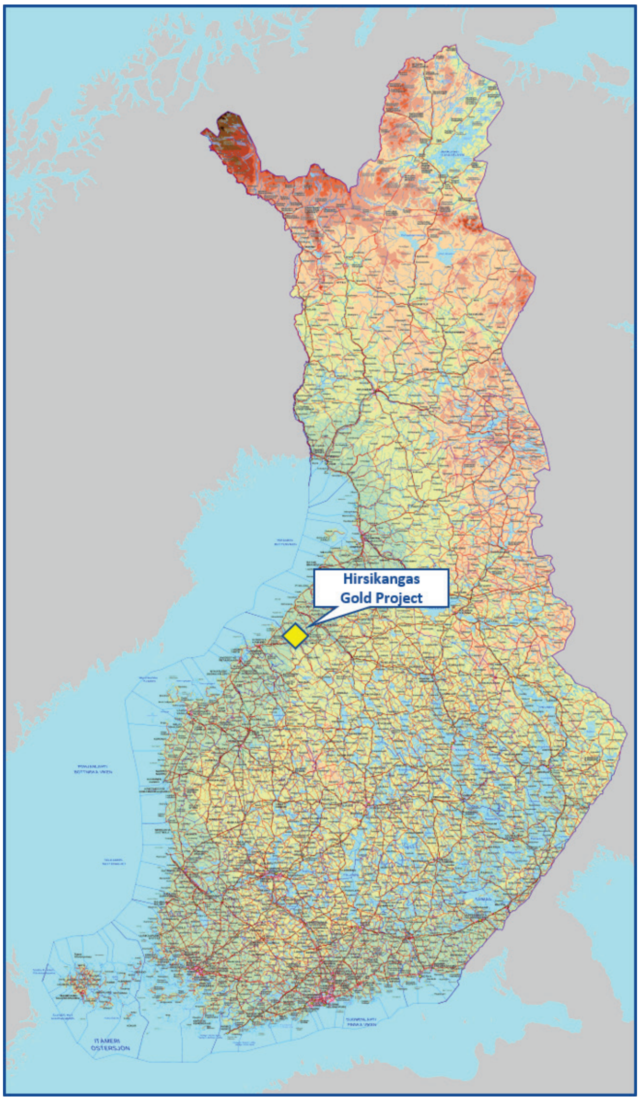
1.1 Introduction

This mineral resource estimation report has been prepared by International Resource Solutions Pty Limited and was commissioned by Rupert Resources Ltd. The report comprises an independent estimation of the mineral resources of the Hirsikangas Gold Project ("Hirsikangas" or "the Project"). Hirsikangas is wholly owned by Northern Aspect Resources Ltd which is in turn a 100% owned subsidiary of Rupert Resources Ltd (hereinafter referred to as "Rupert").

1.2 Location

The Hirsikangas Gold Project is located near the western coast of Finland in the southern part of Northern Ostrobothnia (Figure 1.2_1). The local administrative municipality is Kalajoki municipality (formerly Himanka prior to 2010). The area is approximately 7km east northeast of the town of Himanka (Figure 4.1_1, Table 4.1_1). For coordinates see Table 4.1_1.

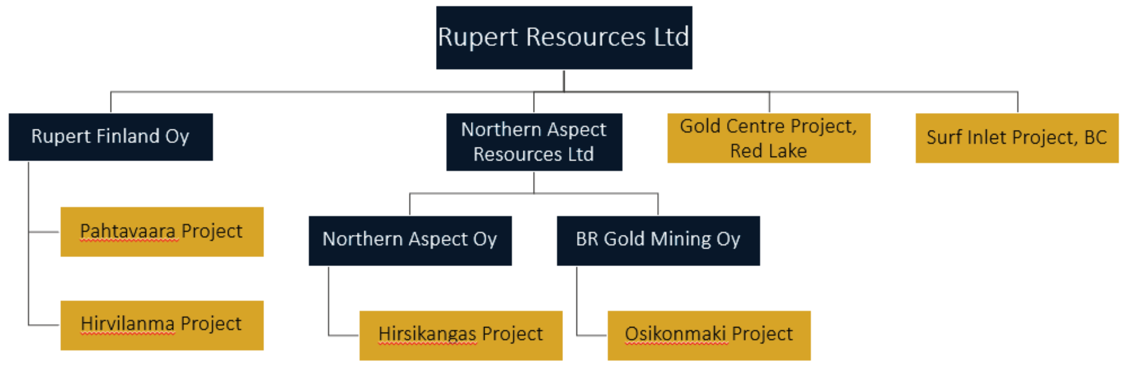
Figure 1.2_1
Location of the Hirsikangas Gold Project, Finland



1.3 Ownership

The Hirsikangas Gold Project is wholly owned by Northern Aspect Resources Oy which is a wholly owned subsidiary of Northern Aspect Resources Ltd, which itself is in turn a wholly owned subsidiary of Rupert Resources Ltd, a company incorporated in British Columbia, whose office is at 82 Richmond Street East, Suite 203, Toronto, Ontario, Canada, M5C 1P1. Northern Aspect Resources Ltd was acquired by Rupert in May 2018. See Figure 1.3_1 for the Corporate ownership structure.

Figure 1.3_1
Corporate Ownership Structure



Royalties on Osikonmäki (%) and Gold Centre (1.5%)

1.4 Geology

The Hirsikangas Gold Project is located within the Svecofennian area, which is composed of three different arc complexes of the central Finland granitoid complex (Figure 7.1_1). The prospect area belongs also to the so-called Raahe-Ladoga zone (i.a. Korsman 1988, Ekdahl 1993), which runs parallel to the Archean craton margin and represents the product of complex Paleoproterozoic subduction and collision processes (Gaál 1986 and 1990).

The bedrock of the Hirsikangas area consists mainly of mica schist, mafic and ultramafic volcanic rocks and felsic schist, the main host rock of the gold mineralisation. These rocks are in places intruded by late-stage granite porphyry dykes and pegmatites.

1.5 Mineralisation

Mineralisation at Hirsikangas is orogenic hydrothermal in origin and is principally hosted within deformed felsic schists. The felsic schist is massive, fine-grained, grey, quartz rock that is extremely hard. Within the felsic schist, randomly disseminated blebs of sulphides can account for up to 10% of the rock, although more typically they account for 1-2% (or much less) combined sulphides (arsenopyrite, pyrite and pyrrhotite). The presence of blebs of arsenopyrite is a good indicator of the presence of gold, which is sometimes visible.

1.6 Project Status

Gold mineralisation in the area has been known since the 1990s or earlier. The knowledge was principally confined to the existence of mineralised boulder trains. GTK started exploration at Hirsikangas in the year 2004 as a part of a 4-year' project to explore for gold resources in the Central Finland region. GTK held tenure over the ground until 2007 when the claims were put out to tender. Belvedere Resources Finland Oy, a wholly owned subsidiary of Belvedere Resources Ltd won the tender and the claim rights were awarded in September 2007 under a claims agreement with the Ministry of Trade and Industry, signed on November 8th 2007. Belvedere Resources Finland Oy (hereinafter referred to as "Belvedere") carried out diamond drilling campaigns in 2008 (2,638 meters) and 2012 (1,106 meters) along with outcrop and boulder sampling. The aim of the drilling programmes was to verify and infill the GTK drilling, as well as to extend the size of the known mineralisation. On the 14th December 2016 the claims held by Belvedere were acquired by Northern Aspect Resources Oy, a wholly owned subsidiary of Northern Aspect Resources Ltd. Northern Aspect Resources Oy undertook surface geochemical sampling, along with boulder and outcrop sampling in 2017 and 1318m of drilling in ten holes at the project in early 2018. Rupert Resources Ltd announced a transaction to acquire Northern Aspect Resources Ltd on the 15th January 2018 and the transaction was completed on the 15th May 2018.

1.7 Resources

The Mineral Resource estimate for the Hirsikangas Gold Deposit is reported in accordance with National Instrument 43-101 and has been estimated using the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") "Estimation of Mineral Resources and Mineral Reserves best Practice Guidelines". This mineral resource estimate is classified as Inferred as defined by the CIM. Numbers displayed in Table 1.7_1 are affected by rounding. A preferred cutoff of 0.5g/t Au was selected for the reported estimate based on an optimised pit shell described in Section 14.10 including a metallurgical recovery of 92% and a gold price of EUR1,200/oz. The Inferred Mineral Resource is reported entirely within this shell and significant unreported mineralisation extends at depth beneath this pit.

Table 1.7_1
Hirsikangas Gold Deposit
Mineral Resource Report - Summary Grade Tonnage Report

	Lower Cutoff Grade (g/t Au)	Tonnes (kt)	Average Grade (g/t Au)	Gold Metal (kozs)	Gold Metal (Kg)
Inferred Resource	0.4	2,380	1.2	91	2,820
	0.5	**2,270**	**1.2**	**89**	**2,770**
	0.6	2,080	1.3	86	2,670
	0.8	1,510	1.5	73	2,270
	1.0	1,110	1.7	62	1,920

Note: All figures have been rounded to reflect the relative accuracy of the estimates

1.8 Conclusions

The new Inferred Mineral Resource of 2,270kt grading 1.2g/t Au (89koz) is reported using a 0.5g/t cutoff and is based on an updated geological interpretation of the deposit following a review of all available data that has been collected since project initiation. Additionally, the Mineral Resource is reported entirely within an optimised pit shell and significant unreported mineralisation extends at depth beneath this pit.

The current Inferred Mineral Resource therefore represents a recoverable resource reported within an open pit. This represents a significant difference from the previous (2009) Mineral Resource which was an in situ estimate and reported to a much greater depth. The previous Mineral Resource was not subject to any rigorous test of potential criteria for eventual economic extraction such as pit optimisation algorithms. Using the cutoff grade of 0.5g/t Au, the previous Mineral Resource comprised of Indicated Mineral Resources of 3.002Mt at a grade of 1.23g/t Au for 119koz gold and Inferred Mineral Resources of 2.673Mt at a grade of 1.27g/t Au for 109koz gold.

1.9 Recommendations

The Hirsikangas gold deposit is controlled by a NW-SE trending structure which extends for approximately 30km on a land position entirely held by wholly owned subsidiaries of Rupert Resources Ltd. The reported resource is contained on 800m of this strike and potential to extend the resource exists to the south east, where mineralisation has not been fully closed out. The resource reported is constrained by an open pit to a depth of 120m but mineralisation is shown to continue to a depth of 300m. In addition, further drill testing of parallel structures and off-sets may potentially add to the resource where anomalous gold values have been identified in drilling conducted in both 2012 and 2018. Other recommended work programmes to investigate regional potential along the controlling structure include geochemical sampling and geophysical targeting.

2. INTRODUCTION

2.1 Terms of Reference

In September 2018, Rupert Resources commissioned International Resource Solutions Pty Ltd of Perth, Australia to prepare an independent technical report in compliance with the Canadian Securities National Instrument 43-101 Standards of Disclosure for Mineral Properties and Form 43-101F1. The work was undertaken by the Principal and Director of the company, Brian Wolfe, BSc(Hons), MAIG.

The purpose of the Report is to update the existing NI43-101 report and to update the NI43-101 compliant resource estimate for the Hirsikangas Gold Project. This report has an effective date of 9th November 2018.

This report was prepared at the request of Mr James Withall, CEO of Rupert, a TSXV-listed company with symbol RUP.V and incorporated in the Province of Ontario. The Company's offices are located at: 82 Richmond Street East, Suite 203, Toronto, Ontario, M5C 1P1.

2.2 Site Visit

The Independent Qualified Person (Resource Geologist) Brian Wolfe, Principal Consultant at International Resource Solutions Pty Ltd, visited the Hirsikangas Gold Project Site between 2nd and 4th October 2018. This visit included:

- Visits to the exploration sites, outcrop exposures, and observation of surface drilling, review of drill core from several diamond holes that form part of the Project resource estimate;
- Review of the exploration procedures used at the Hirsikangas Gold Project;
- Review of the exploration database; and
- Review of geological setting of the deposit and surrounding area.

2.3 Sources of Information

Sources of information include internal technical reports, documents and maps provided by Rupert to the author in addition to the publicly available information. A list of reports is provided in Section 27.

2.4 Abbreviations

A full listing of abbreviations used in this report is provided in Table 2.4_1 below.

Table 2.4_1
Hirsikangas Gold Project
List of Abbreviations

	Description		Description
$	United States of America dollars	l/hr/m²	litres per hour per square metre
µ	Microns	M	million
2D	two dimensional	m	metres
3D	three dimensional	Ma	Million years
AAS	atomic absorption spectrometer	MIK	Multiple Indicator Kriging
Au	Gold	ml	millilitre
bcm	bank cubic metres	mm	millimetres
CC	correlation coefficient	MMI	mobile metal ion
CLGB	Central Lapland Greenstone Belt	Moz	million ounces
cfm	cubic feet per minute	Mtpa	million tonnes per annum
CIC	carbon in column	Mt	Million tonnes
CIL	carbon-in-leach	N (Y)	northing
cm	Centimetre	NaCN	sodium cyanide
cusum	cumulative sum of the deviations	NATA	National Association of Testing Authorities
CV	coefficient of variation	NPV	net present value
DDH	diamond drillhole	NQ2	size of diamond drill rod/bit/core
DTM	digital terrain model	ºC	degrees centigrade
E (X)	Easting	OK	Ordinary Kriging
EDM	electronic distance measuring	oz	troy ounce
EV	expected value	P_{80} -75µ	80% passing 75 microns
g	Gram	PAL	pulverise and leach
g/m³	grams per cubic metre	ppb	parts per billion
g/t	grams per tonne	ppm	parts per million
HARD	half the absolute relative difference	psi	pounds per square inch
HDPE	high density poly ethylene	PVC	poly vinyl chloride
HQ2	size of diamond drill rod/bit/core	QC	quality control
hr	Hours	Q-Q	quantile-quantile
HRD	half relative difference	RAB	rotary air blast
ICP-MS	inductivity coupled plasma mass spectroscopy	RC	reverse circulation
ID	Inverse Distance weighting	RL (Z)	reduced level
ID²	Inverse Distance Squared	ROM	run of mine
IPS	integrated pressure stripping	RQD	rock quality designation
IRR	internal rate of return	SD	standard deviation
ISO	International Standards Organisation	SGS	Société Générale de Surveillance
ITS	Inchcape Testing Services	SMU	selective mining unit
kg	Kilogram	t	tonnes
kg/t	kilogram per tonne	t/m³	tonnes per cubic metre
km	Kilometres	Y	year
km²	square kilometres		

3. RELIANCE ON OTHER EXPERTS

While information provided by Rupert relating to the project history, metallurgy, environmental studies and permitting, mineral rights, and surface rights has been reviewed, no opinion is offered in these areas. The Qualified Person is not expert in these aspects of the project and therefore has relied upon and is satisfied that there is a reasonable basis for this reliance on the information provided by the company management regarding the relevant sections of this Technical Report.

4. PROPERTY DESCRIPTION AND LOCATION

4.1 Location of Hirsikangas Project

The Hirsikangas Gold Project is located near the western coast of Finland in the southern part of Northern Ostrobothnia. The local administrative municipality is Kalajoki municipality (formerly Himanka prior to 2010). The area is approximately 7km east northeast of the town of Himanka (Figure 4.1_1, Table 4.1_1). The deposit is close to the northwest-trending Ruhaperä shear zone, which is one of the main structures of the Raahe–Ladoga suture zone.

Figure 4.1_1
Hirsikangas Gold Deposit Location Map

For coordinates see Table 4.1_1.

Table 4.1_1
Hirsikangas Gold Deposit Project Coordinates

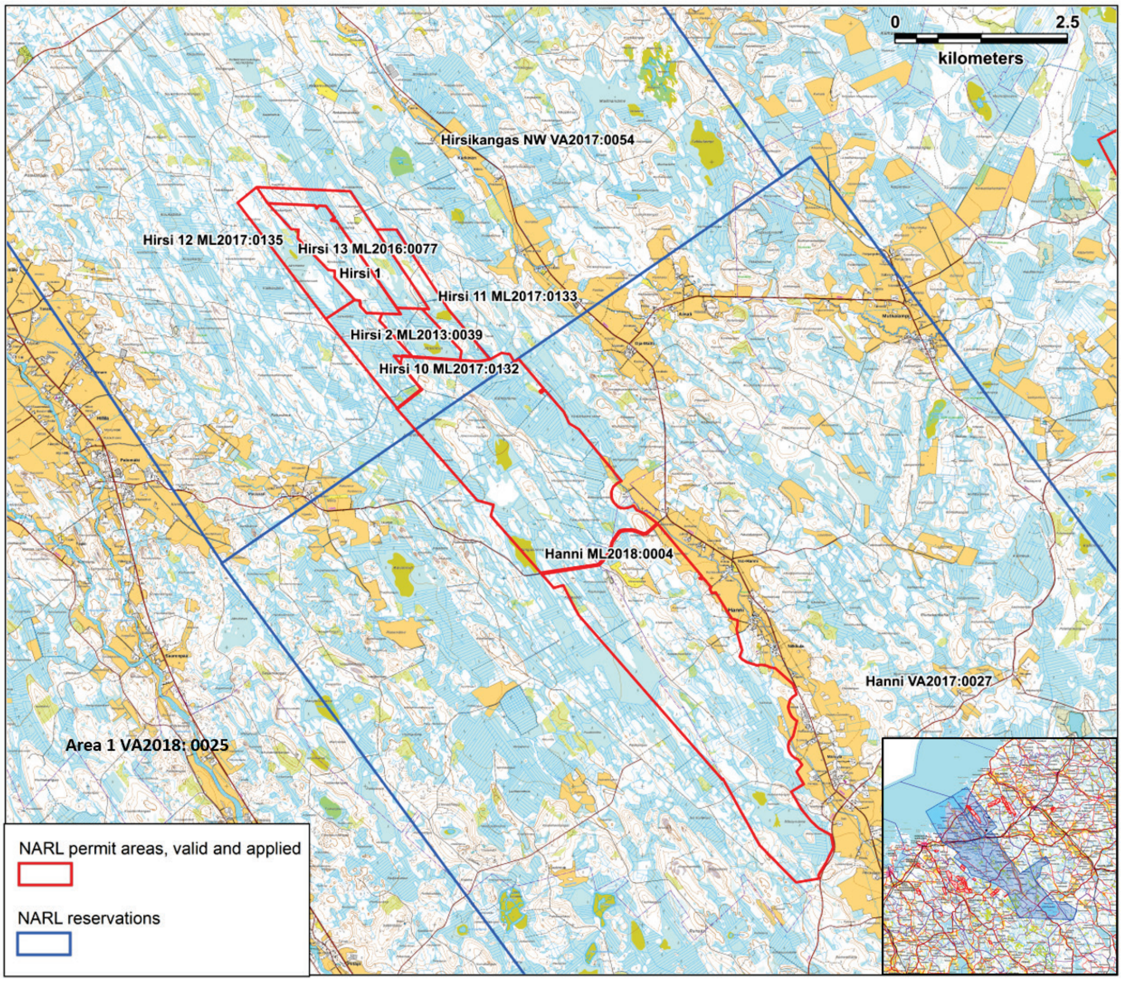
Reference Grid	Easting	Northing
EUREF	344,070	7,106,190
KKJ	2,490,500	7,105,350

4.2 Right of Tenure

The Hirsikangas Gold Project is wholly owned by Northern Aspect Resources Oy (hereinafter referred to as "NAR Oy") which is a wholly owned subsidiary of Northern Aspect Resources Limited (hereinafter referred to as "NARL") which is in turn a wholly owned subsidiary of Rupert. NARL was acquired by Rupert in May 2018.

Hirsikangas is comprised of a package of exploration licences, claims and reservations for exploration totalling an area of 30,405.05ha (see Table 4.2_1 for component parts, expiry and annual fees and Figure 4.2_1 for a licence map).

Figure 4.2_1
Hirsikangas Licence Claim Map



The rights conveyed to the landholder are defined in the Mining Act of Finland (621/2011) and summarised as follows:

4.2.1 Exploration Permit

The holder of an exploration permit has the right to explore the structures and composition of geological formations on the permit holder's own land and on land owned by another landowner within the area referred to in the permit (exploration area). The permit holder also has the right to conduct other prospecting in order to prepare for mining activity and other exploration in order to locate a deposit and to investigate its quality, extent and degree of exploitation in accordance with the exploration permit.

The permit holder may build or transfer to the exploration area temporary constructions and equipment necessary for exploration activity in accordance with the exploration permit. An exploration permit does not authorise the exploitation of the deposit. It does, however, provide the holder with a privilege for the mining permit, which in turn provides the right to exploit the deposit. The prerequisites for the granting of the mining permit are to do with the size, ore content and technical characteristics of the deposit concerning its exploitability.

Exploration permits are valid for up to 15 years.

4.2.2 Reservation

For the purpose of preparing an application for an ore prospecting permit, an applicant may reserve an area for themself by submitting a notification to the mining authority about the matter (reservation notification). A privilege based on a reservation notification becomes valid once the reservation notification has been submitted in compliance with the provisions laid down in section 44 of the Mining Act (621/2011) and there is no reason, as specified in the Mining Act, for the rejection of the reservation. The validity of the privilege expires when the decision made by the mining authority on the basis of the reservation notification (reservation decision) expires or is cancelled. The reservation does not entitle the applicant to perform exploration. Instead, the reservation grants a privilege as regards the submission of an ore prospecting application.

Table 4.2_1
Hirsikangas Gold Deposit
Land Components

Mining Register ID	Name	Company	Type	Status	App. Date	Granted	Expires	Area (ha)	Fee/ha
ML2012:0185	Hirsi 1	Northern Aspect Resources Oy	Exploration Permit	Valid	2017/05/19	2017/12/21	2020/12/21	100.42	€50.00
ML2013:0039	Hirsi 2	Northern Aspect Resources Oy	Exploration Permit	Extension pending	2013/06/27	2014/12/18	2018/01/20	52.07	N/A
8789/1	Hirsi 10	Northern Aspect Resources Oy	Claim	Extension pending	2009/07/21	2013/02/28	2018/02/28	87.61	N/A
9432/1	Hirsi 11	Northern Aspect Resources Oy	Claim	Extension pending	2009/07/21	2013/02/28	2018/0228	58.89	N/A
8796/1	Hirsi 12	Northern Aspect Resources Oy	Claim	Extension pending	2009/08/20	2013/02/28	2018/0228	87.88	N/A
ML2016:0077	Hirsi 13	Northern Aspect Resources Oy	Exploration Permit	Valid	2016/12/23	2017/12/21	2020/1221	99.15	€30.00
ML2018:004	Hanni	Northern Aspect Resources Oy	Exploration Permit	Valid	2018/01/31	2018/06/14	2022/0614	1359.03	€20.00
VA2017:0027	Hanni	Northern Aspect Resources Oy	Reservation	Valid	2017/04/04	2017/07/20	2019/04/03	16,431.00	N/A
VA2017:0054	Hirsikangas NW	Northern Aspect Resources Oy	Reservation	Valid	2017/06/19	2017/09/12	2019/06/18	12,129.00	N/A
VA2018:0025	Area 1	Northern Aspect Resources Oy	Reservation	Valid	2018/04/04	2018/05/29	2019/04/03	185,517.00	N/A

4.3 Annual Fees and Royalties

Legislation requires holders of exploration and mining permits to make annual payments to landowners on EUR/ha basis (see Table 4.3_1). A statutory mining royalty of 0.15% of the value of the exploited mineral / metal is also payable to the landowner.

Table 4.3_1

Hirsikangas Gold Deposit

Annual Royalty Payments According to Finland Mining Act 2011

Permit Type	EUR/ha
Exploration (years 1 - 4)	20
Exploration (years 5 - 7)	30
Exploration (years 8 - 10)	40
Exploration (years 11 - 15)	50
Mining	50

4.4 Environmental Bonds

NAR Oy has deposited a collateral of €12,500 for the purpose of offsetting potential damage and inconvenience and performing after-care measures.

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

5.1 Property Access

The closest airports are Kokkola, 60km to the SW and Oulu 160km NE of the project. Both have regular daily flights to Helsinki with Oulu airport the 2nd busiest airport in Finland. Both cities also have large general ports. The Finnish railroad network from Helsinki to Oulu runs through the area, with stations in Kokkola, Kannus and Ylivieska. Highway 8 from Turku to Oulu passes the Himanka municipal centre. Hirsikangas is located 7km SE of Himanka municipal centre with access to the site along sealed highway 7730 from Himanka centre and subsequently by 4km of gravel road. A network of gravel forest roads provides easy access to most of the property.

Access to the site is possible throughout the year.

5.2 Physiography

The Hirsikangas deposit is located in an area of gently sloping moraine hills, with boggy land in between the hills. A deep, excavated drain (Jänesjärvenoja) runs through the area. Most of the study area lies between 34m and 36m above sea level (m.a.s.l.) and the highest hills reach 40m m.a.s.l. Outcrops occur generally rather sparsely on the claim areas. Based on diamond drillings the bedrock is usually covered by an overburden of 1 - 10m (mean slightly over 4m). The overburden consists mostly of sandy till and locally also of peat. The thickness of the peat varies from 0.5m to 2m in boggy areas. The top layer is often washed and contain abundant large boulders. The boggy terrain can potentially cause problems during drill rig movement, which is why the drilling operations are best carried out in winter time.

5.3 Climate

According to Köppen climate classification, this area of Finland is classified as Dfc (sub-arctic, continental, without a dry season and a cold summer). The region has cold, wet winters, where the mean temperature of the warmest month is no lower than 10°C and that of the coldest month no higher than -3°C. The rainfall is, on average, moderate in all seasons.

The climate is typical of northern Fennoscandia with temperate summers and cold winters. During the summer months (June to August), temperatures are mostly between 10°C and 20°C, and during the winter months (November to April) between -2°C and -10°C. Based on 10 year averages from 2005 to 2015 for Kokkola, snow covers the terrain on an average of 183 days in the year with a maximum snow thickness varying from 0.6m to 1.2m in March. Bogs, lakes and rivers are frozen for four to five months of the year. Exploration work can be conducted during the winter by taking advantage of the frozen bogs for access.

Annual rainfall is around 600mm with a monthly range between 30mm (April) to 90mm (July). The wettest period is June to July and the driest period from February to April. The climate of northern Finland is influenced by its arctic location between the 60th and 70th northern parallels located in the Eurasian continental coastal zone. This region has characteristics of both the maritime and continental climate depending on the direction of airflow. When westerly winds prevail, the weather is warm and clear due to the airflows from the Atlantic Gulf Stream. When airflow is from the east, the Asian continental climate prevails resulting in severe cold in winter and extreme heat in summer. The mean temperature in northern Finland is several degrees higher than that of other areas in these latitudes such as Siberia and southern Greenland due to the moderating effect of the Atlantic Ocean and the Baltic Sea.

Weather patterns in the project area and in the general region can change quite rapidly, particularly in winter, because northern Finland is located in a zone of prevailing westerly winds where cooling sub-tropical and polar air masses collide. The weather systems known to have the greatest influence on the climate are the low-pressure systems originating near Iceland and the high-pressure systems drifting in from Siberia and the Azores.

5.4 Local Resources and Regional Infrastructure

The nearest major city, Oulu is the fifth most populous city in the country (Figure 5.4_1). Oulu has a population of over 200,000 and is the administrative and commercial centre of the Oulu Province. It is an important traffic hub having highway 4 and European highways E8 and E75 pass by. Oulu railway station is hub of three railways, with several daily passenger connections to Helsinki, Turku, Kuopio, Kolari and Rovaniemi. Over 500 ships visit the Oulu port annually, and some three million tons of cargo is hauled through it every year. Oulu airport is the busiest in Finland after Helsinki-Vantaa, and has some twenty daily flights to Helsinki.

Figure 5.4_1
Regional Infrastructure

Note: Road infrastructure denoted by red lines, rail infrastructure by dashed black/white lines.

Kokkola is a major town of around 48,000 inhabitants and it is located 40km SW of Hirsikangas. Like Oulu, Kokkola is situated along the highway 8 and main railway and has a major port. Kokkola hosts Boliden's zinc smelter and world's largest cobalt refinery.

20km NE along the coast from Himanka there is a popular tourist resort Hiekkasärkät with many hotels and restaurants.

The area has a long mining tradition with base metal mines and one nickel mine having operated in the region. Pyhäsalmi Zn-Cu mine is still operating. Nearest gold mine is Laivakangas in Raahe, only some 78km NE from Himanka. A skilled workforce is in place.

Hydroelectric power in the region is relatively inexpensive for commercial use. High voltage electrical power is available from the main line located 3km NW of the claim area.

6. HISTORY

Gold exploration in the Ostrobothnia region has been ongoing since the 1980's and has been mainly undertaken by the Geological Survey of Finland (GTK) and Outokumpu. An early discovery of some low-grade gold bearing outcrops, comprising plagioclase porphyritic subvolcanic rock with arsenopyrite, was reported in an area called Isokallio – Matalakallio about 8km SE of Hirsikangas. There has been no significant follow up exploration work on this discovery. During the 1990's an amateur prospector sent a gold-bearing boulder to Outokumpu. This sample was collected from an area about 600m northwest of Hirsikangas.

GTK started exploration at Hirsikangas in the year 2004 as a part of a 4-year' project "Exploration for gold in Central Finland". The aim of this project was to explore gold resources and to find new gold potential areas in the Central Finland region.

The first indication of the gold mineralisation in the Hirsikangas area was a gold bearing (3.6g/t Au) boulder located in the autumn of 2003. In the autumn of 2004 the Hirsikangas outcrop area with the same lithology as the reference boulder was discovered. The mineralisation was located after geophysical ground measurements and drilling program during 2004-2006.

GTK started exploration in the autumn 2004 by boulder tracing, ground geophysical measurements and first stage diamond drilling. After this work a gold potential horizon was located. In 2005 – 2006 the drilling was continued by other four stages, and at the same time, bedrock mapping and extra geophysical measurements were carried out in the study area (Kontoniemi & Mursu 2006).

GTK held tenure over the ground until 2007 when the claims were put out to tender. Belvedere Resources Finland Oy (Belvedere), a wholly owned subsidiary of Belvedere Resources Ltd won the tender and the claim rights were awarded in September 2007 under a claims agreement with the Ministry of Trade and Industry, signed on November 8th 2007. Belvedere carried out diamond drilling campaigns in 2008 (2638 meters) and 2012 (1106 meters) along with outcrop and boulder sampling. The aim of the drilling programmes was to verify and infill the GTK drilling, as well as to extend the size of the known mineralisation. On the 14th December 2016 the claims held by Belvedere were acquired by NAR Oy, a wholly owned subsidiary of NARL. NAR Oy undertook surface geochemical sampling, along with boulder and outcrop sampling in 2017 and 1318m of drilling in ten holes at the project in early 2018. Rupert announced a transaction to acquire NARL on the 15th January 2018 and the transaction was completed on the 15th May 2018. Since the transaction, fieldwork has continued on the project consisting of geological mapping, boulder and outcrop sampling, geochemical soil sampling and a detailed UAV magnetic geophysical survey.

6.1 Previous Mapping and Surface Sampling

Boulder tracing and preliminary outcrop mapping were the first reconnaissance stage exploration operations carried out in the area of Hirsikangas. The work was completed mainly in the claim areas but also southeast from Hirsikangas as far as in the region of the Märsylä village. Geological mapping was made only in the claim areas Hirsi 1 and 2 (GTK claims, slightly different from the current Hirsi 1 and 2 areas). In all 46 (54 assays) boulder observations and 69 outcrop observations (11 assays) were made. Samples from boulders were taken by hammer and from outcrops by a small drill machine (mini-drill).

6.2 Previous Geochemical Surveys

No targeted geochemical surveys were carried out by previous owners.

6.3 Previous Geophysical Surveys

GTK carried out regional low altitude airborne measurements in the area of map sheet 2413 in the year 2004-2006 employing magnetic, electromagnetic and radiometric methods. The prospect area and its surroundings were well covered by the survey.

Both ground magnetic and induced polarisation measurements were performed by GTK in 2004 and 2006.

A total of 19 drill core samples from drillholes R316, R311 and R317 were analysed in GTK's Petrophysics Laboratory in Kuopio. Susceptibility, remanent magnetisation and density were measured from all samples; apparent resistivity was successfully analysed only from 5 samples.

6.4 Drilling by Previous Explorers

Between November 2004 and July 2006 GTK completed a total of 32 diamond drillholes for 4,093.15m (Table 6.4_1). Drilling was performed in five phases, the first of which identified the mineralisation and others extended and infilled.

Table 6.4_1
Hirsikangas Gold Deposit
Summary of Available Drill Data

Company	Contractor	Date	Holes	Diameter (mm)	Metres	Dhid
GTK	Geotek Oy	11/2004 – 01/2005	9	T-56 (41.7)	1,052.20	301 - 309
	Arctic Drilling	08/2005 – 09/2005	8	WL-56 (39)	993.95	310 – 317
	Oy Kati AB	10/2005 – 11/2005	6	WL-56 (39)	1,195.20	318 – 323
	GTK	03/2006 – 05/2006	5	T-56 (41.7)	460.10	324 – 328
	GTK	06/2006 – 07/2006	4	T-56 (41.7)	391.70	329 - 332
Belvedere	Suomen Malmi Oy	04/2008 – 09/2009	15	T-76 (61.7)	2,638.48	BELHIRSI001-015
	Suomen Malmi Oy	04/2012 – 05/2012	16	BGM (42)	2,639.20	BELHIRSI015 -031
NAR Oy	Oy Kati AB	03/2018 – 04/2018	10	WL-76 (57.5)	1,318.10	HIR001 - 010
Total			73		9,155.83	

Belvedere drilled a total of 31 diamond drillholes in two phases. Drillholes 1-15 were drilled during the year 2008 and drillholes 16-31 during 2012. Total drilled metres in 2008 was 2638.5m and in 2012 1106.10m. The aim of the operation in 2008 was to verify and infill the GTK drilling, whereas the 2012 campaign was targeted to explore the fold/shear structure NW of the known mineralisation and follow up the possibility of parallel mineralisation indicated by 2008 drilling. The year 2008 operation was successful in both respects leading to the new improved resource estimate in 2009. Drilling in 2012 was unsuccessful for its most parts. However, drillhole BELHIRSI030 intersected a gold bearing structure on the NE side of Hirsikangas mineralisation. The drillhole intersected 11.04m @ 3.34ppm Au.

6.5 Historical Resource and Reserve Estimates

In 2006 the GTK carried out a resource estimation. The calculation was not NI 43-101 compliant. Calculations were made with conventional sectional outlining of the mineralised bodies with a 1g/t cutoff grade for gold in the area of the 50-100 metre drilling grid. Four metres of internal dilution were allowed. A bulk density of 2.7g/cm³ was used. The preliminary resource calculation estimated a resource of 2Mt at a grade of 1.85g/t Au (Kontoniemi & Mursu 2006).

The first resource reported according to NI 43-101 was completed by Belvedere in 2009. Using the cutoff grade of 0.5g/t Au, reported Indicated Mineral Resources comprised 3.002Mt at a grade of 1.23g/t Au for 119koz gold. Inferred mineral resources comprised 2.673Mt at a grade of 1.27g/t Au for 109koz gold (Lindholm *et al* 2009). This resource comprises an in-situ resource number and has not been subjected to any potential criteria for eventual economic extraction.

There are no historical reserve estimates.

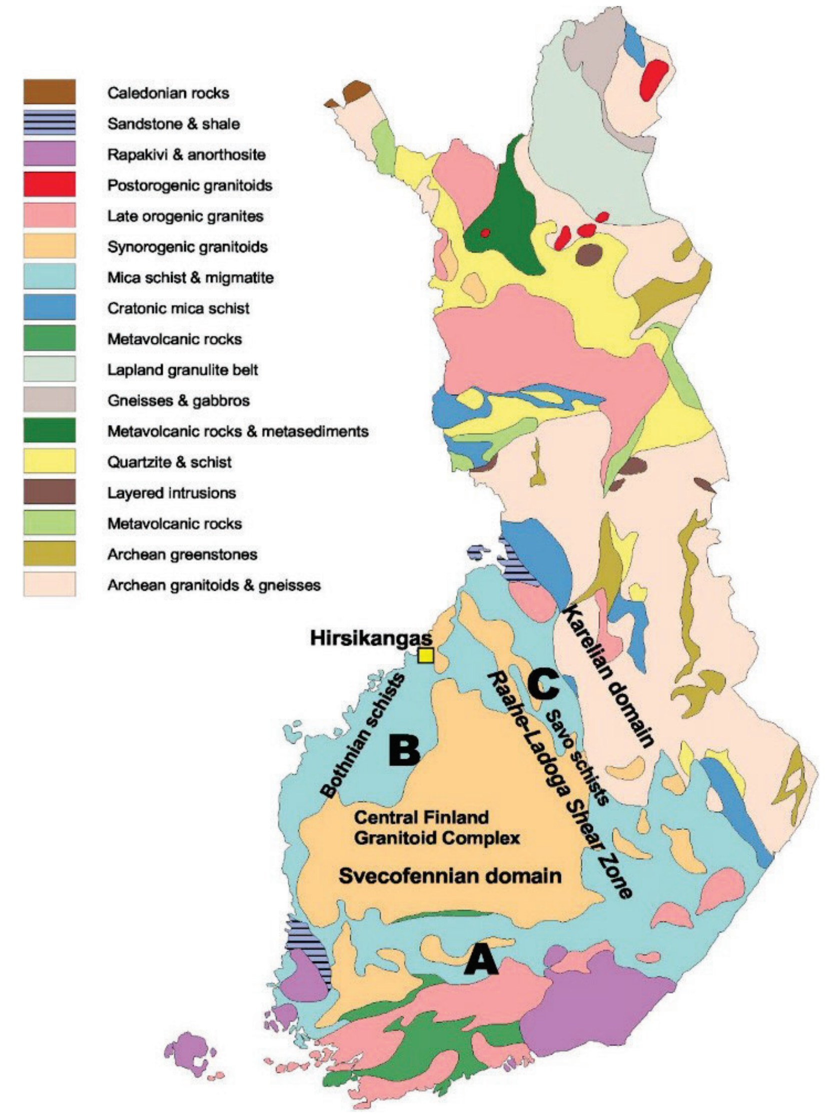
There has been no historical production from Hirsikangas.

7. GEOLOGICAL SETTING AND MINERALISATION

7.1 Geological Setting

The bedrock of Finland is divided into two main areas: eastern Karelian and western Svecofennian domain (Korsman et al. 1997). The Hirsikangas project is located within the Svecofennian area, which is composed of three different arc complexes and of the central Finland granitoid complex (Figure 7.1_1). The prospect area belongs also to the so-called Raahe-Ladoga zone (Korsman 1988, Ekdahl 1993), which runs parallel to the Archean craton margin and represents the product of complex Paleoproterozoic subduction and collision processes (Gaál 1986 and 1990). The Raahe-Ladoga deformation zone is divided into different shear zones especially in the NW-part of the zone and is the most important sulphide mineralisation zone of Finland.

Figure 7.1_1
Geological Map of Finland



The Raahe-Ladoga zone has experienced a range of metamorphic (subducting plate during convergence and/or thickening of the crust during collision, late thermal event) and magmatic (different phases of granitoid intrusion) processes that have contributed to generation and migration of gold-bearing fluids (Kontoniemi 1998). These fluids were particularly focussed into obliquely oriented dilatational sites, and the role of relatively competent rock units (granitoids, plagioclase porphyry and coarse, quartz-rich sediments) was important in channelling fluids to higher crustal levels.

The bedrock of the Hirsikangas area consists mainly of mica schist, mafic and ultramafic volcanic rocks and felsic schist, the main host rock of the gold mineralisation. These rocks are in places intruded by late-stage granite porphyry dykes and pegmatites.

The Quaternary geology of the Hirsikangas area consists of overburden deposited during and immediately after the end of the last glaciation. Low drumlins running in a northwest-southeast direction are typical and they are composed mainly of sandy till. The bedrock is occasionally exposed. Between drumlins, peat-covered depressions occur. The average thickness of the overburden is slightly over 4 meters.

7.2 Mineralisation

Mineralisation at Hirsikangas is orogenic hydrothermal in origin and is principally hosted within deformed felsic schists. The felsic schist is massive, fine-grained, grey, quartz rock that is extremely hard. Within the felsic schist, randomly disseminated blebs of sulphides can account for up to 10% of the rock, although more typically they account for 1-2% (or much less) combined sulphides (arsenopyrite, pyrite and pyrrhotite). The presence of blebs of arsenopyrite is a good indicator of the presence of gold, which is sometimes visible.

The alteration related with ore-forming processes seems to be divided in two types, first one related with ductile deformation and the second one with brittle deformation style. The first type assemblage includes quarts, sericite, K-feldspar, chlorite, epidote, carbonate, sphene, tourmaline and sometimes garnet, scheelite and/or other ore minerals. The second type associated with fractures and quartz veins include quartz, chlorite, epidote, carbonate, rutile, biotite, green amphibole and variably sericite, diopside, garnet and ore minerals.

When the gold mineralisation occurs in mafic volcanite inclusions, it usually is related to fracturing or quartz veining and the alteration corresponds to the second type. Between the mica schist or felsic schist and the mafic volcanite a reaction rim is common, where the rock is altered to diopside-amphibole skarn.

Ore minerals are typically present as irregular disseminations throughout the sheared and altered host rock forming discontinuous bands within the foliation. The most characteristic ore minerals are pyrrhotite, arsenopyrite and löllingite with accessory graphite, ilmenite, sphalerite, chalcopyrite, scheelite and gold with associated minerals.

Gold and associated minerals typically occur at boundaries or fractures of the silicate minerals but rarely also associated with sulphide minerals. Gold occurs mainly in native form or as electrum, Ag content varying between 6 - 39wt-%. Although the gold grains are generally less than 20µm in diameter, grains up to 1-2mm in size have been recorded from many drill cores. The most common mineral associated with gold is native antimony and other minerals found by Turbo Scan are aurostibite ($AuSb_2$), gudmundite (SbFeS), ullmannite (SbNiS) and some Sb-Pb-sulphide possibly boulangerite, and Bi-telluride.

Base metal contents are usually very low (tens of ppm) within the felsic schist but some samples of the altered mica schist, graphite-sulphide schist of DH 328 or skarn samples might have elevated contents. Maximum Cu content is 914ppm, Zn 1620ppm, Pb 130ppm and Ni 892ppm, respectively. Sulphur content of the gold-bearing rock is mostly below 1% but graphite-sulphide schist has up to 8.41% S. Gold shows only a weak correlation with antimony in the case of all samples but no correlation with any other metal, if gold content is over 0.5ppm (Kontoniemi & Mursu 2006).

7.3 Project Geology

The bedrock of the Hirsikangas area consists mainly of mica schist, mafic and ultramafic volcanics and felsic schist which is the main host rock of the gold mineralisation (Figure 7.3_1). These rocks are in places intruded by late-stage granite porphyry dykes which are unmineralised.

The strike of the volcanics follows the direction of a positive magnetic anomaly i.e. NW strike. Ductile-brittle shears are focused within vertical en-echelon lenses of felsic schist and the orientation of lenses follows the strike of these shears. The mineralisation is associated with quartz and sulphides emplaced parallel with the strike and dip of the shearing and lithological units.

Regional prograde metamorphism took place up to amphibolite facies and the most characteristic metamorphic minerals in metasediments are biotite, andalusite and fibrolitic sillimanite (Kontoniemi & Mursu 2006).

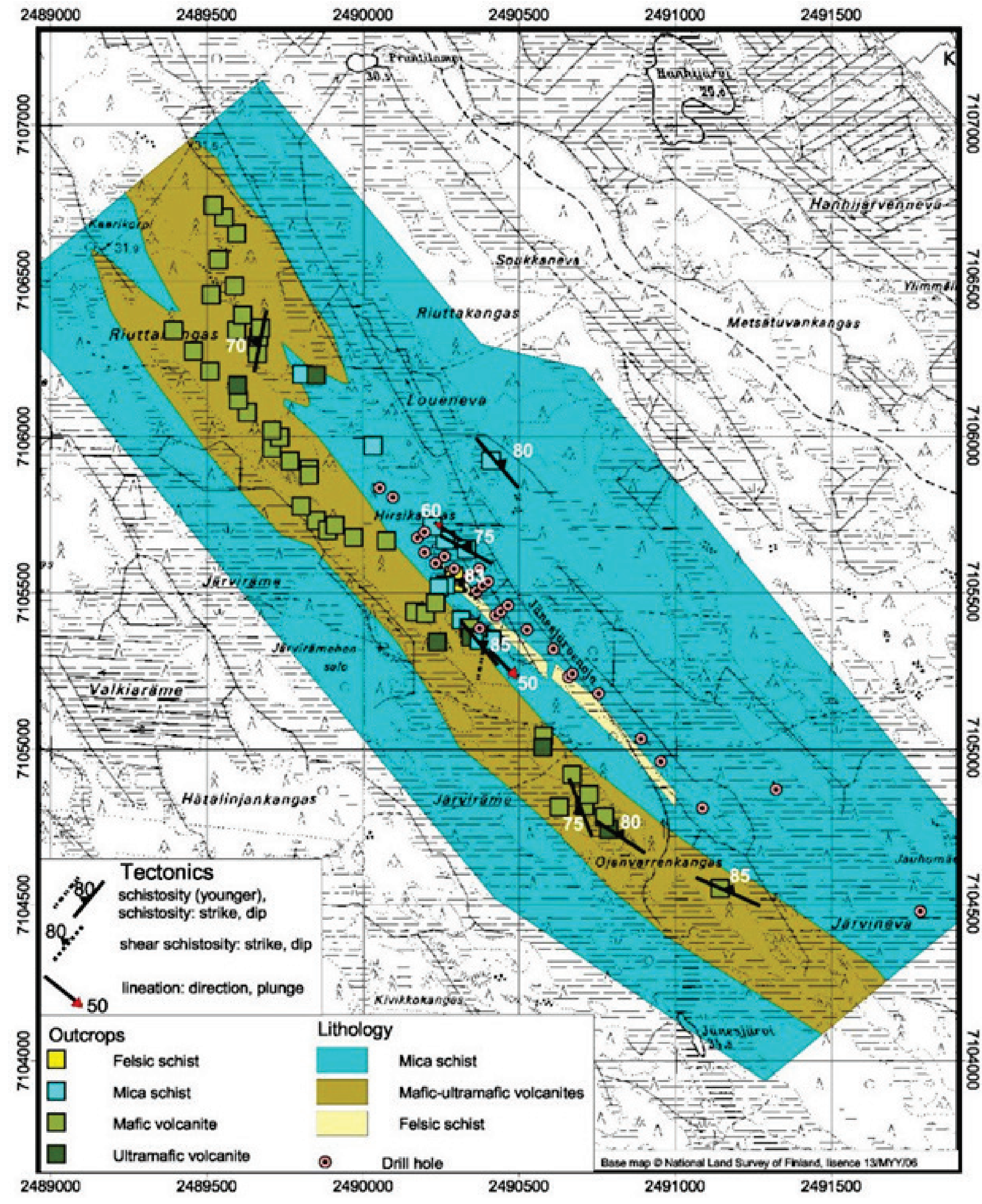
In places the felsic schist has a weak porphyric appearance and occasionally pebble structures similar to sediments or deformed intrusive breccias are evident. Thus it is possible that a parent rock of felsic schist is mica schist, plagioclase porphyry or greywacke-type metasediment or all together. The principal minerals of the felsic schist are quartz, plagioclase and micas (biotite, muscovite) with accessory minerals such as ore minerals, sphene, apatite, zircon and secondary K-feldspar, chlorite, sericite, carbonate, epidote, green amphibole, garnet and tourmaline. Shearing of the felsic schist is mostly ductile type appearing as shear schistosity but in places brittle fractures with quartz, ore mineral and amphibole-chlorite-epidote fillings also occur (Kontoniemi & Mursu 2006).

7.4 Structure

The deposit is close to the northwest-trending Ruhaperä shear zone, which is one of the main structures of the Raahe–Ladoga suture zone.

To the NW of the Hirsikangas project dextral folding is associated possibly with a strike slip shearing system. Ductile-brittle shears are focused within vertical en-echelon lenses of felsic schist, and the orientation of the lenses follows the strike of the ductile shears and perhaps also the axial plane of shear folding. Lenses or ore shoots have been postulated to plunge gently to SE, but the dip of the plunge is uncertain because of relatively sparse drilling. Lineation observations at the outcrops are made from quartz veins, however their relationship to the plunge of the ore shoots is uncertain. Felsic schist has magnetic pyrrhotite, which causes a weak positive anomaly but there occurs also non-magnetic pyrrhotite, which means that mineralisation might exist also outside the positive magnetic anomaly. The anomaly weakens to the SE-direction perhaps with the plunge of the ore (Kontoniemi & Mursu 2006).

Figure 7.3_1
Geological Map of the Hirsikangas Gold Project



(Kontoniemi & Mursu 2006)

8. DEPOSIT TYPES

Hirsikangas is defined as a Palaeoproterozoic orogenic gold deposit (Eilu 2007), comprising a set of steeply-dipping en-echelon shear zones oriented in a northwest-southeast direction, with quartz and sulphide bearing lodes, and is hosted by strongly silicified felsic schist and altered mica schists and mafic volcanics. The deposit is located along a parallel structure to the main Raahe–Ladoga suture zone. The deposit is clearly shear zone-related and like typical orogenic deposits, hosts gold-only mineralisation.

9. EXPLORATION

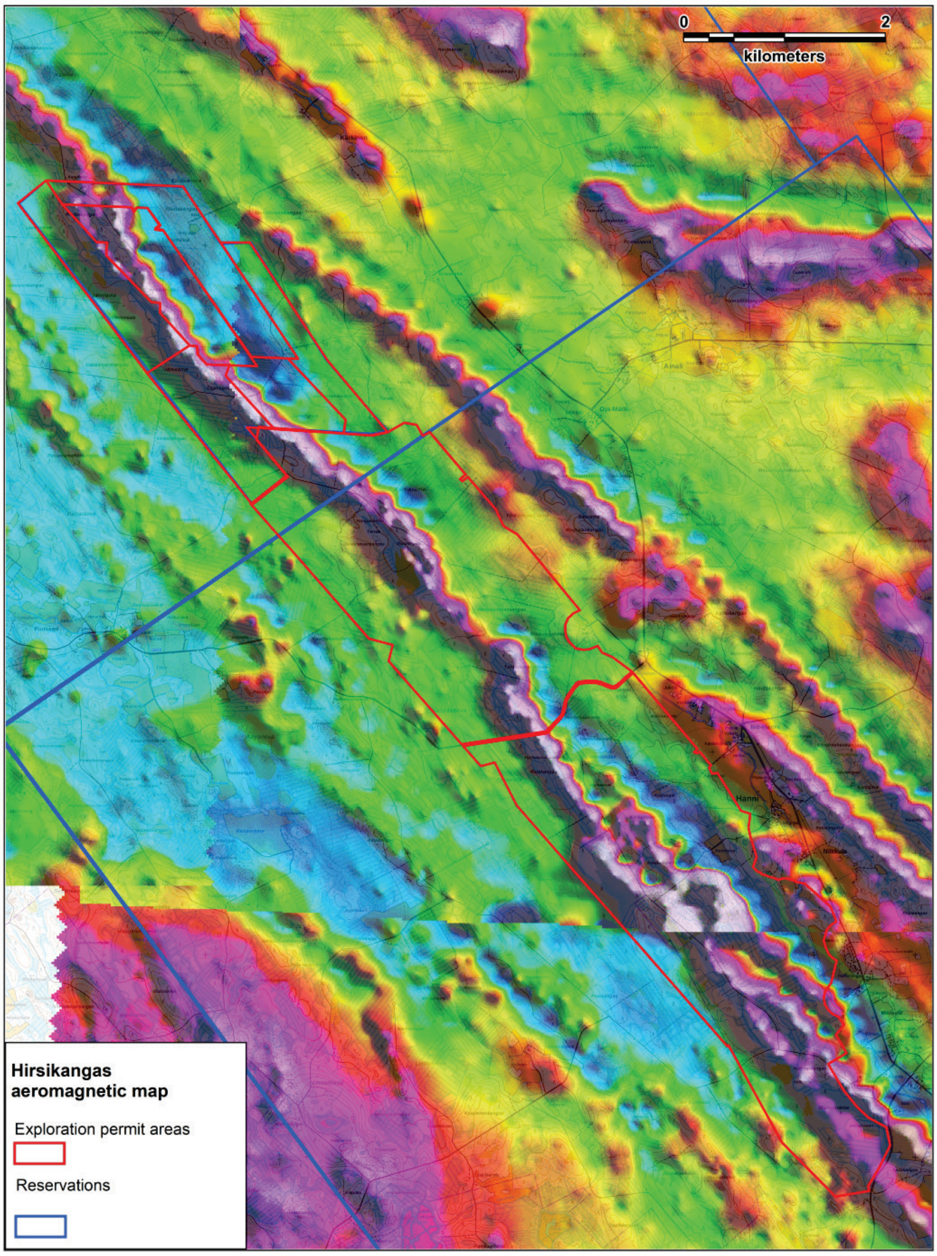
9.1 Previous Exploration

Apart from small-scale field mapping and a ground IP-survey, the exploration work of the previous owners is confined to diamond drilling.

9.2 Geophysical Surveys by Previous Operators

GTK carried out regional low altitude airborne measurements in the area of map sheet 2413 in the year 2000 employing magnetic, electromagnetic and radiometric methods. The prospect area and its surroundings are thus well covered (Figure 9.2_1).

Figure 9.2_1
Hirsikangas Gold Project Aeromagnetics



Both magnetic and induced polarisation measurements were performed by GTK in 2004 and 2006. Line staking was carried out in two stages corresponding to the phases of the geophysical survey. The first stage took place in October-November 2004 and the second stage, in February-March 2006 and the second stage was associated to an increment in the survey area. The total area covered by the ground surveys was 4.03km².

The magnetic survey was carried out as total field measurement using Scintrex EnviMag device. Line spacing was 50m and station spacing 10m. IP measurement was done using dipole-dipole survey method with Scintrex IPR-10 device. Line spacing in IP survey was 50m and station spacing 10-20m depending on survey configuration used (Kontoniemi & Mursu 2006).

9.3 Exploration Undertaken by Northern Aspect Resources Oy

During the years 2017 and 2018, NARL carried out geological mapping, boulder hunting and soil sampling. Ionic Leach sampling was also tested but found to be an unsuitable method for Hirsikangas prospect. A small, 17 sample heavy mineral sampling program was initiated in October 2018, and the work is currently ongoing. In August 2018 a UAV (unmanned aerial vehicle) magnetic survey was conducted over 22km length of Himanka volcanic belt.

9.3.1 Soil Sampling

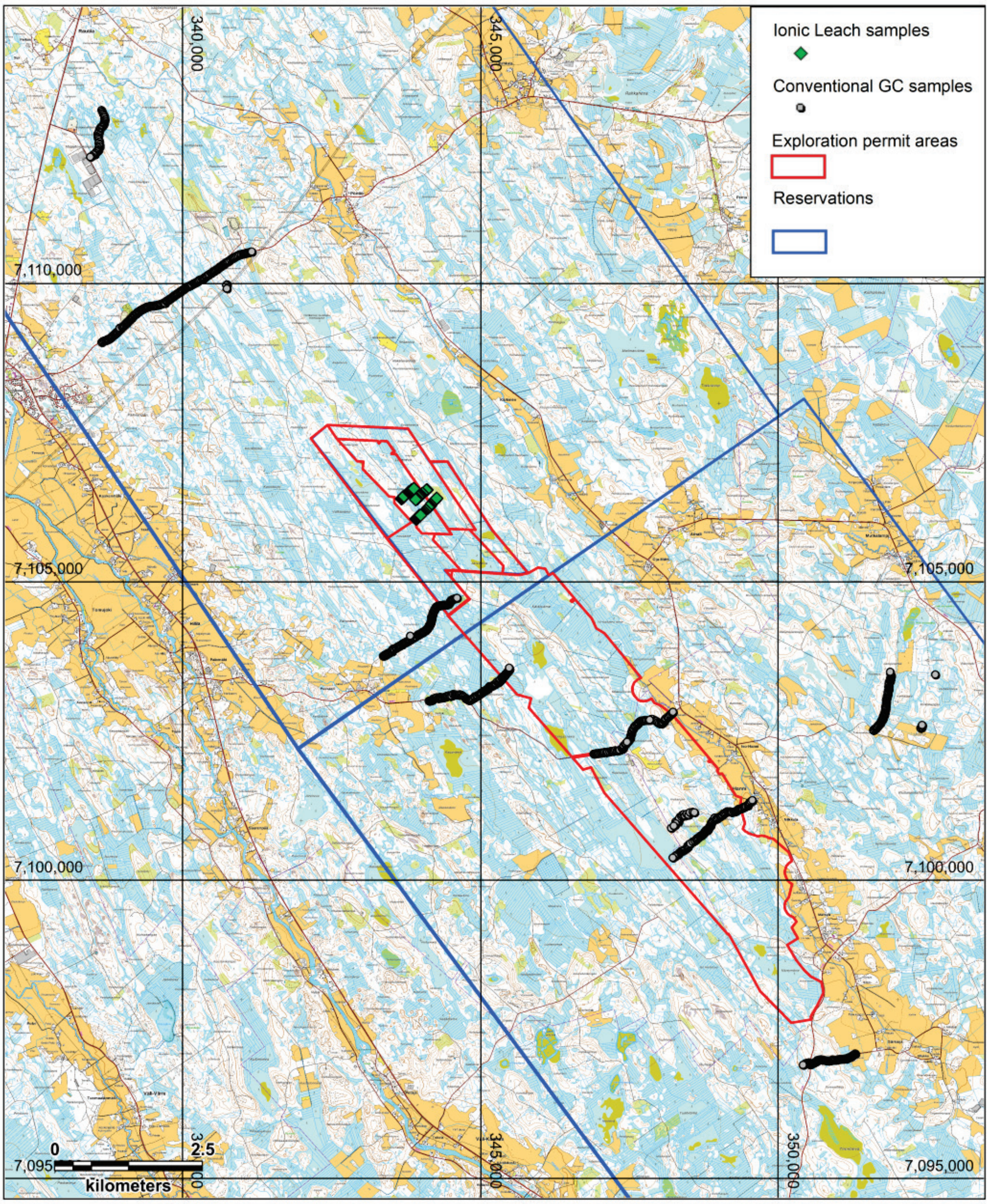
The soil sampling program was initiated with four planned orientation lines across the known Hirsikangas mineralisation to test the suitability of Ionic Leach (IL) method as well as conventional geochemical sampling on Hirsikangas type mineralisation (Figure 9.3_1).

The area was found to be very challenging for the IL method because of washed and boulder-rich overburden and thick peat layers (<1m). In addition, heavy forestry machinery and dense drainage had disturbed the soil layers, which disrupts the chosen assay method and results. IL-sampling was still done in areas where it was possible. Because of these difficulties, the samples were henceforth treated as conventional geochemical samples with Aqua regia digest. The sampling was done utilising the drains on road sides to avoid having to go through thick peat or the washed top layer of the soil. The total number of collected IL samples was 37.

The geochemical soil samples were assayed for gold with fire assay method and multi-element assays with aqua regia digest with ICP-MS finish.

Up to October 2018, NARL personnel has collected 623 till samples from 14 profiles. The profiles across the Himanka volcanic belt are targeted to specify the location of mineralised structures and to help in drill planning. The rest of the profiles are aimed to explore the still undiscovered sources for the several boulder trains found in the current reservation area. Results to date have revealed anomalous trends in till along nearly all of the sampled profiles and for two of the boulder trains the possible source area has been narrowed down considerably.

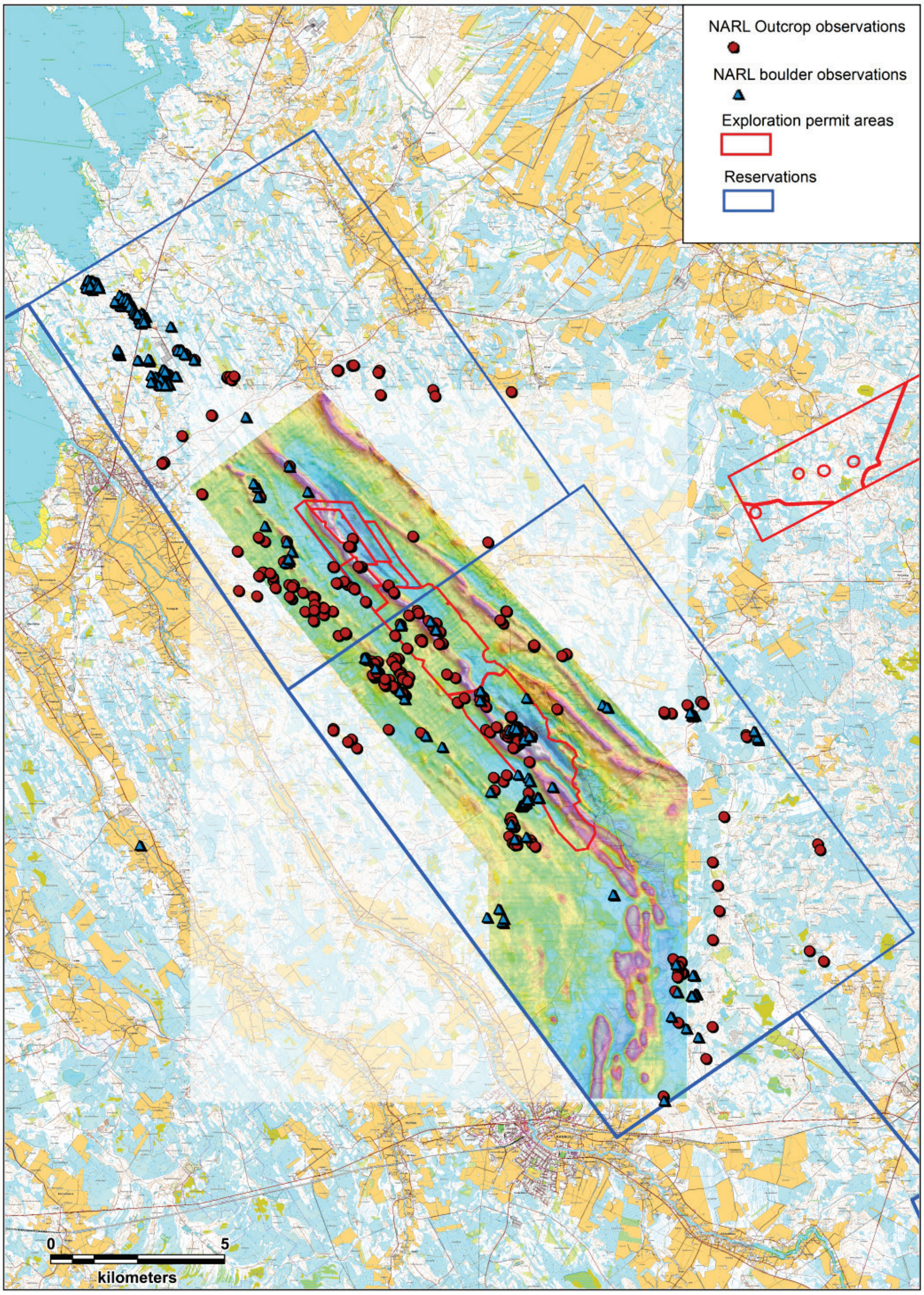
Figure 9.3_1
Hirsikangas Gold Project Soil Sampling



9.3.2 Field Mapping and Boulder Tracing

Field mapping and boulder tracing have mostly been confined within the limits of the reservation area (Figure 9.3_2). At the end of October 2018, 646 field observations had been made; 333 outcrop samples and 226 boulder samples had been assayed. 13 of the outcrop samples were chip samples cut from three different outcrops. Additionally, another 78 outcrop observations were made for mapping purpose. From grab samples gold was assayed after aqua regia digest with fire assay and AA finish, multi-element assay for 48 elements was conducted with four acid digest and ICP-MS.

Figure 9.3_2
Geological Map of the Hirsikangas Project



NAR Oy managed to replicate a number of Au bearing boulder findings in the area, but no significant grades were discovered from outcrops.

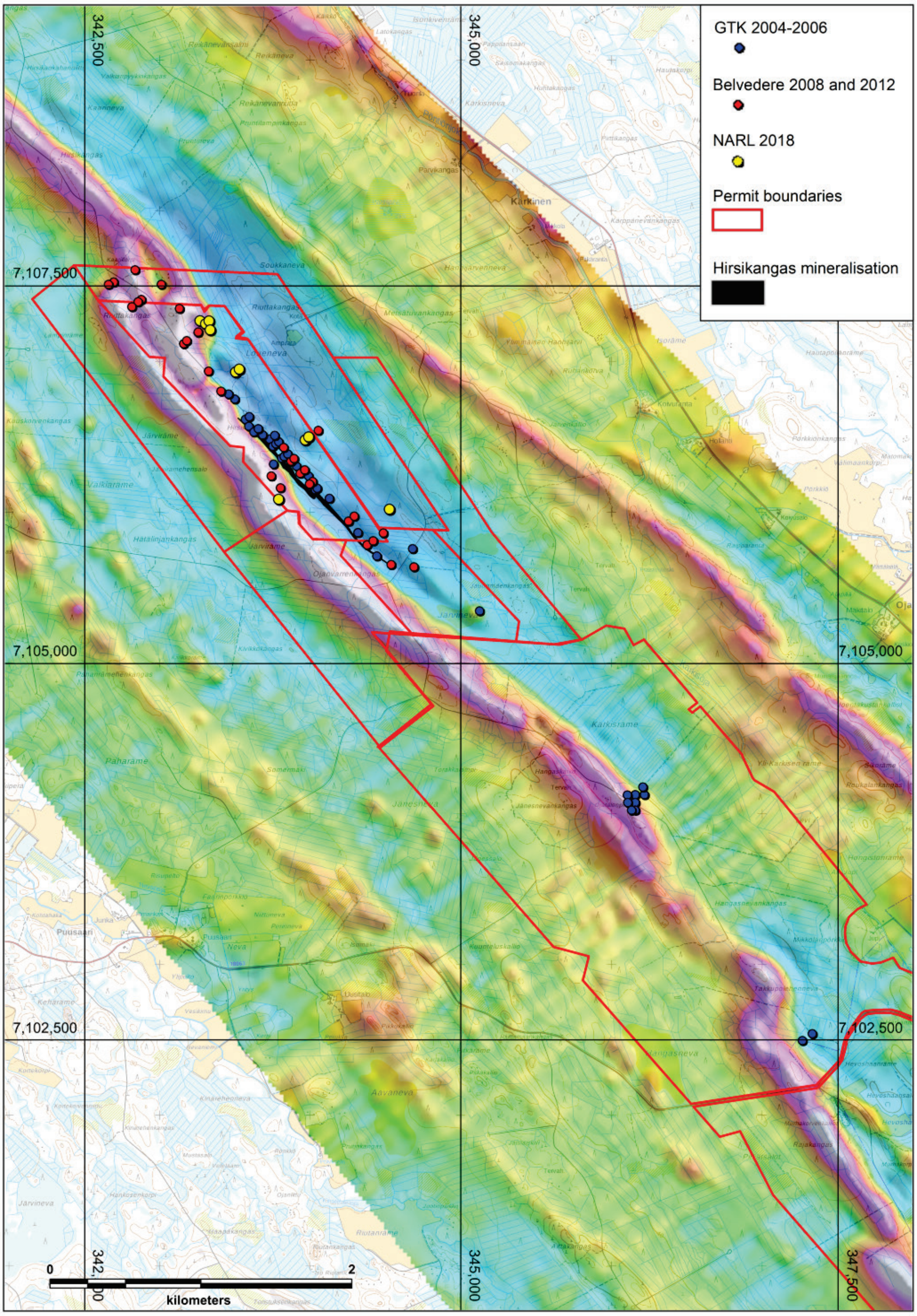
9.3.3 UAV Survey

The UAV airborne magnetic survey was carried out by Radai Oy in 2018. Radai's magnetic measurement system was installed into a custom-made UAV. The magnetic field was measured by a digital 3 component fluxgate magnetometer that is located in the tail boom of the UAV. The X, Y, and Z components of the magnetic field were recorded with a datalogger combined with Radai's own measurement device. The measurement device also records the GPS time (UT) and position (latitude, longitude and height), and barometric pressure. The accuracy of the GPS positioning was about ±1m during flight. Total survey length was about 2,820 kilometres (Pirttijärvi 2018).

10. DRILLING

A total of 73 diamond drillholes has been completed for 9,156.15m over the project. Figure 10_1 presents Hirsikangas claims with the drilling colour-coded by operator.

Figure 10_1
Drill Plan of the Hirsikangas Project



10.1 Drilling by Previous Operators

GTK drilled 32 diamond drillholes totalling 4,093.15m during 2004-2006. Belvedere drilled a total of 31 diamond drillholes (3,744.60m) in two phases in 2008 and 2012. For further details see Table 6.4_1 and Section 6.4.

10.2 Drilling by Northern Aspect Resources

In the spring of 2018 Northern Aspect Resources conducted a small-scale drilling campaign at the Hirsikangas project. The objective of the campaign was to identify and explore a mineralised zone a few hundred meters to the NE of the main Hirsikangas mineralisation. The structure had been intercepted with two drillholes in 2008 and 2012 drillings. The two drillholes are 1,800m apart and they both intercepted a graphite bearing breccia zone in metasediment and elevated gold grades in and in vicinity of the breccia. The breccia zone shows as an irregular low resistivity anomaly in ground IP survey map.

Initially eleven drillholes totalling 1,410m were planned for the 2018 drilling campaign. Ten out of eleven planned holes were targeted to test the Au potential of the breccia structure, and one to test deeper level of the main Hirsikangas mineralisation. The first four drillholes (HIR001 to HIR004) were collared near drillhole BELHIRSI030 which has a mineralised intercept of 11.04m @ 3.34ppm Au. Drillholes HIR005 to HIR-009 were planned as fences on the resistivity highs and HIR010 was collared close to the other original intercept, BELHIRSI012. The final number of drillholes was eventually reduced to ten, as the spring thaw had softened the ground at the site of planned drillhole HIR011. HIR010 and 011 were replaced by one long hole to cover the entire length of the initially planned fence. The total drilled meters summed up to 1,318.40m.

The drilling contract was assigned to Kati Oy, whose head quarter is in Rautio, only 20km from the project. Kati also managed the preparation of the drilling field; they cleared the routes for the rig and at the same time, made the tree damage evaluation. The final tree damage compensation to the land owners was calculated by the local forest management association. Drillhole collars were marked using differential GPS by Kalajoki municipality land surveyors. After drilling, surveyors measured the final collar locations and start azimuths of the drillholes.

The drilling campaign was successful in intersecting the target structure with eight out of nine drillholes. Drillhole HIR008 missed the target by few meters. The intersected breccia intervals were 2 to 13m thick, and in two profiles more than one parallel interval was discovered. HIR007, which was targeting the deep extension of the Hirsikangas main ore body, intersected a mineralised host rock unit (felsic schist) with similar thicknesses and grade as that encountered higher in the profile.

The drill core was oriented with Reflex ACT tool. Deviation survey for each drilled hole was made with Reflex Gyro tool directly after completion of each hole with the rig still standing on the site.

10.3 Dry Bulk Density Collection

A bulk density database has been supplied containing 2,206 data, of which 686 have been recorded by NAR Oy in 2018 and the remainder by Belvedere. The determination process (via the weight in air weight in water method) is the same for both companies and is described as follows.

Measurements of specific gravity (SG) of representative samples were carried out for selected boreholes and 100-200mm lengths of intact drill core were selected. The weight of the sample varied from 100 to 800 grams, depending on the size and composition of the sample. The measurement procedure used was as follows:

- The weight of the sample was measured in air (Wa) with a scale capable of reading to an accuracy of 1 gram;
- The weight of the same sample was measured with the same scale by immersing the sample completely in water (Wb), by hanging it with a relatively weightless thread from the scale.

Attention was paid that the scale read zero grams before any measurement was taken. The specific gravity (SG) was calculated using the following formula:

$$SG = Wa/(Wa-Wb)$$

Densities may be subdivided into mineralised and non-mineralised sets. Density statistics have been calculated based on the whole dataset and on the mineralised portion only. Results are tabulated below (Table 10.3_1). It can be seen that mineralised material has a somewhat lower density than non-mineralised.

Table 10.3_1
Hirsikangas Gold Deposit
Density Statistics

Data	Count	Minimum	Maximum	Mean	Std. Dev.	Variance	CV
All	2,206	1.67	3.18	2.747	0.153	0.02	0.06
Mineralised	271	2.4	3.15	2.71	0.077	0.005	0.03

10.4 Survey Coordinate System

The coordinate system used for all data collection and surveying on the Hirsikangas property is the ETRS-TM35FIN coordinate system. This system has been in use in Finland since 2005 and uses a Universal Transverse Mercator (UTM) projection with the EUREF-FIN geodetic datum.

10.5 Drill Database

The current database contains 85 diamond drillholes of which 73 have targeted the primary focus of the mineralisation. With respect to those 73 drillholes, drilling database contains 5,482 primary Au assays and 1,319 check samples, 5,261 primary multi-element assays and 1,287 check samples. The database contains 1,875 surveys and 2,206 density measurements.

11. SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Sample Method and Approach

11.1.1 Historical Sampling Methods

For GTK assays each core was halved with a diamond saw and divided usually into one metre long sample intervals.

Belvedere's sampling protocol involved the core being photographed in the core boxes (both wet and dry) on arrival from the drilling site and the metre depths marked onto the core and box with a wax pencil. The core was then logged by geologists and the lithological, mineralogical, structural, geophysical and rock mechanical (SG, RQD) properties recorded as required. Samples were marked out for assaying and cut using a diamond saw. One half was sent for assay, and the other half was retained for verification purposes. All of remaining core is currently stored in the marked core boxes, on pallets, at NAR Oy's premises in Nivala.

The main criterion for selecting core for sampling was the presence and intensity of mineralisation, quartz veins, and shear zones. The mineralised portions of the drill cores were sampled regularly and continuously. Only a few check samples were collected from outside the zones containing significant visible mineralisation, veins or shear zones. Within the identified mineralised zones, the sample length was typically about 1 metre. The minimum sample length was 0.1m. No apparently high-grade mineralised intersection was sampled in conjunction with low grade mineralisation and sampling across lithological contacts was avoided.

The drill core was split into two parts using a diamond saw and dried in ambient temperature (heated, if necessary, in rare cases) before sampling. Core was cut wherever possible, along the true vertical plane of the core.

11.1.2 Historical Chain of Custody, Sample Preparation and Analyses

GTK 2004 - 2006

GTK's drill core samples (1,604) were crushed at the Kuopio laboratory of GTK by a Mn steel jaw crusher and pulverised by a ring mill with a carbon steel bowl. Each mineralised sample with was analysed by GTK method 511P, which is based on ICP-AES technique with aqua regia digestion. In the beginning (DH 301-309) gold and related elements (Bi, Sb, Se, Te) were analysed by GTK method 523U (20 g, aqua regia digestion, Hg-co-precipitation, GFAAS) and also the samples from DH 310-312, 318 and 324-332 were analysed by the same method. Best intersections of DH 301-309 and all samples from DH 314-317, 319-323 were analysed by GTK method 703P (sample 10-15g) or 705P (sample 50g). The codes 703P and 705P refer to a fire assay technique where gold is determined by the ICP-AES technique after fire assay. Bi, Sb, Se and Te of those samples were analysed by GTK method 511U (GFAAS, sample 0.15g).

For whole rock analyses 17 samples, mainly sulphide-poor, were taken from the drill core and crushed in a Mn steel jaw crusher and pulverised in a tungsten carbide bowl before analyses by the GTK method 175X (pressed powder pellets).

Belvedere 2008 - 2012

From the drilling site, the core was transported by the company's geologists to the secured core processing facilities in Pyhäsalmi during the 2008 drilling, and to the Nivala facility near Hitura mine during 2012 drilling campaign.

After core handling procedures had been completed and the core cut, One half of the split samples were collected in a strong polyethylene sample bag marked with the sample number in permanent ink. A paper tag with the sample number was also put inside the sample bag. The sample bags were then packed in sacks (about ten samples per sack) for transport to the laboratory. The sacks were dispatched using a local transport company either to the Labtium Oy laboratory at Sodankylä in Northern Finland or to the Laboratory of ALS Chemex in Öjebyn, northern Sweden for assaying. Both of these laboratories are internationally accredited laboratories (ISO9001:2208 and ISO/IEC 17025:2005). The majority of assays were carried out at the ALS Chemex laboratories in Öjebyn, Sweden. Here, the samples were prepared using PREP-22 method which comprises "Log sample in tracking system, weigh, dry, coarse crush the entire sample and pulverise entire sample to better than 85% passing 75 micron." This is applicable to samples up to 3kg. The gold analysis was carried out using the method Au-AA25 gold fire assay, which consists of analysing Ore grade Au (0.01-100ppm) by fire assay (30g nominal sample weight) with AAS finish. In addition, the trace elements were analysed with ME-ICP61 method, which uses Trace Level Method. Thirty-three elements were analysed by HF-HNO3-HClO4 acid digestion, HCl leach, and ICP-AES. The method quantitatively dissolves nearly all elements for the majority of geological materials. Only the most resistive minerals, such as Zircons, are only partially dissolved.

11.1.3 NAR Oy Chain of Custody, Sample Preparation, and Analyses

The drilling contractor stores the core boxes in a locked trailer on site. Once a day, NAR Oy's geologist picks up the core and drives it to the Company's core facility near Nivala town centre.

The sample handling team then checks that core samples are in right order and moves the core inside the trays against its left border and assembles any broken segments if possible.

After organising the core boxes and core samples, a "bottom line" is drawn on the core. Reflex ACT III orientation tool is used to get oriented core. The core is measured and meter intervals are marked on core boxes and on core.

Core logging is done by using Geobank Mobile logging software. Log sheets to be filled include lithology, structural data, magnetic susceptibility and core recovery (RQD) sheets and a sample data sheet.

The geotechnical logging includes the magnetic susceptibility and core recovery data. Once the meters are measured and marked correctly onto the core, the magnetic susceptibility of the core is measured. This is done meter by meter, at each meter mark by using a KT-10V2 handheld magnetic susceptibility meter. KT-10V2 has also a scanner mode, which automatically calculates the average susceptibility for each scanned interval.

RQD values are measured each meter interval and marked on the left side of each meter line in the core box with pencil. Geobank mobile calculates RQD percentage automatically from given recovery and RQD centimetres.

The geology logging includes the geology, "geozone" code, structure and sample data including company check samples.

After all the logging and sampling has been undertaken, all the core boxes are photographed. Two photographs are taken: the first of dry core and second of wet core.

The Geobank Mobile sampling table creates automatically one-meter long sampling intervals. It also inserts a QC sample as every fourth sample. QC samples include commercial standards, blanks, and core, crush and pulp duplicates. Unique sample numbers are assigned to the QC samples based on sample books.

Sampling intervals are marked on the core box (below a certain interval) with a red marker. Places where the sampling intervals begin and end are marked with red arrows (on the core box and on the core) and the sampling number is written with the first 6 numbers at the top right edge of the core box and the last 3 numbers under each sample interval on the core box below the core at the beginning of the interval. The QC samples are marked on the core boxes. All sampling documents for a batch of samples, along with sachets containing standards and blanks and sample tickets are placed in a sealed bag for dispatch along with the batch of samples.

Drill core is sawn in the NAR Oy core logging and sampling facility by a geotechnician. During 2018 drilling extra staff were contracted from Palsatech for core cutting. After the core has been sawn, the samples (half core samples, QC samples, blanks, core duplicates and standards) are packed in plastic bags tagged with the sample tag from the sample book. Samples are packed onto EUR-pallets to be shipped to the laboratory. During packing each sample is weighed and the information is added to the database.

Geologists are responsible for creating new sample batches and sending the sample submittal form and assay order form to the laboratory. The courier used for the transportation was Posti.

The laboratory used by NARL for the 2018 drill core assays was ALS Chemex, which is an ISO9001:2208 and ISO/IEC 17025:2005 accredited laboratory. The sample preparation was completed in the Outokumpu lab at Karjalankatu 1, 83500 Outokumpu, from where the samples were forwarded to ALS Loughrea, Galway, Ireland. The assay method for gold was Au-AA24 by fire assay and analysis by AAS. The over limit analysis method used for samples with >10ppm Au was Au-GRA22 by fire assay and gravimetric finish. Multielement analysis (48 elements) method used was ME-ICP61 by HF-HNO_3-$HClO_4$ acid digestion, HCl leach, and a combination of ICP-MS and ICP-AES.

All core is under custody from the drill site to the core processing facility. The Company's QA/QC program includes the regular insertion of blanks and standards into the sample shipments, as well as duplicate sampling. Standards, blanks and duplicates are inserted at appropriate intervals. Approximately five percent (5%) of the pulps and rejects are sent for check assaying at a second lab with the results averaged and intersections updated when received.

11.2 Assay Quality Control

Analysis of internationally accredited assay standards or certified reference material ("CRM") has been carried out by both Belvedere and Northern Aspect. Available data relates to the periods 2008 to 2012 (Belvedere) and 2018 (NARL). No QAQC data has been provided as relates to the GTK drilling programs. The original assay reports from the relevant laboratories have been provided however the QAQC data contained in these has not yet been collated into a suitable database.

For drilling carried out since 2008 the following sets of data have been reviewed and statistically assessed:

- CRM ("standards") submitted by the operators to the independent assay laboratories.
- Sample pairs, including, drill core duplicates, crushed core duplicates, pulp duplicates and pulp replicates.
- Barren samples ("blanks") submitted by both the operators.

11.3 Certified Reference Material and Blanks

11.3.1 Belvedere

Belvedere routinely submitted CRM to both ALS Piteå (PI) and ALS Outokumpu (OT) and results are presented in Table 11.3_1. Blanks were submitted at the rate of 1% of total and standards at the rate of 5%. With the exception of CDN-GS-P7B the results are within an acceptable level of tolerance. In the case of CDN-GS-P7B, the available analysis were all within a short timeframe of 17th May 2012 to 18th June 2012 and may be considered indicative of a short term issue.

Table 11.3_1
Hirsikangas Gold Deposit
Standards and Blanks

Standard	Assay Method	Laboratory	Number	Expected Value	Mean	% Bias	% RSD	% in Tolerance
Standards & Blanks Submitted by Belvedere 2008 - 2012								
BLK-CO01	Au-AA25-ppm	ALS PI	23	0.01	0.01	-	-	-
CDN-GS-3B	Au-AA25-ppm	ALS PI	50	3.47	3.45	-0.6	3.4	100
CDN-GS-P7A	Au-AA25-ppm	ALS PI	55	0.77	0.77	-0.3	6.7	96.4
CDN-GS-11	Au-AA25-ppm	ALS PI	3	3.4	3.3	-2.6	3.1	100
BLK-CO01	Au-AA25-ppm	ALS OT	7	0.01	0.01	-	-	-
CDN-GS-3H	Au-AA25-ppm	ALS OT	3	3.04	3.07	1.0	1.2	100
CDN-GS-P7B	Au-AA25-ppm	ALS OT	20	0.71	0.67	-6.0	4.4	80
CDN-GS-P8	Au-AA25-ppm	ALS OT	6	0.78	0.80	2.1	2.4	100
CDN-GS-10D	Au-AA25-ppm	ALS OT	4	9.50	9.69	2.0	0.8	100

A total of 370 internal lab CRM analysis exist that relate to the Belvedere programs consisting of 1 blank and 16 standards. This data has not been assessed as part of the current QAQC review.

Appendix 1 contains the control graphs for the CRM and blanks

11.3.2 Northern Aspect Resources Oy

NAR Oy submitted CRM to ALS Loughrea and results are presented in Table 11.3_2. Blanks were submitted at the rate of 6% of total and standards also at the rate of 6%. All results are within an acceptable level of tolerance with no indication of systemic bias.

A total of 162 internal lab CRM analysis exist that relate to the Belvedere programs consisting of 1 blank and 5 standards. This data has not been assessed as part of the current QAQC review.

Appendix 2 contains the control graphs for the CRM and blanks.

Table 11.3_2 Hirsikangas Gold Deposit Standards and Blanks								
Standard	Assay Method	Laboratory	Number	Expected Value	Mean	% Bias	% RSD	% in Tolerance
Standards & Blanks Submitted by NARL 2018								
BLK-CO01	Au-AA24-ppm	ALS LR	73	0.01	0.001	-	-	-
CDN-GS-3H	Au-AA24-ppm	ALS LR	9	3.04	3.12	2.8	2.8	100
CDN-GS-P7B	Au-AA24-ppm	ALS LR	60	0.71	0.70	-1.0	4.6	100
CDN-GS-10D	Au-AA24-ppm	ALS LR	3	9.5	9.19	-3.2	1.4	100

11.4 Data Pairs

11.4.1 Introduction

Available data pairs have been reviewed, subdivided by the assay laboratory. The different types of data pairs comprise the following:

- Core duplicates (quarter core pairs).
- Crush duplicates (duplicates taken after the jaw crush stage).
- Lab duplicate (duplicate samples taken after size reduction to a P_{80} of 745 microns).
- Pulp duplicates (duplicates samples taken from within one pulp sachet).

The paired assay data has been assessed using the following techniques and plots:

- Thompson and Howarth Plot (T & H).
- Ranked percentage Half Absolute Relative Difference plot (Rank % HARD).
- Mean versus % HARD plot.
- Mean versus percentage Half Real Difference plot (% HRD).
- Correlation Plot.
- Quantile-Quantile Plot.

In order to remove the potential distorting effect of sample pairs returning very low gold grades, the statistical analysis has been undertaken on sample pairs returning great or equal to 0.1g/t as well as routine review of all available samples.

11.4.2 Samples Submitted by Belvedere

Data relating to sample pairs submitted to ALS for data pair analysis only includes Lab duplicates. A total of 23 samples pairs are available from Labtium and 103 for ALS. When filtered to 0.1g/t Au this reduces to 5 and 20 sample pairs respectively. It is difficult to draw conclusions from such small datasets as the available data may not be statistically representative.

Table 11.4_1 summarises the results of the statistical analysis of the various data pairs submitted to ALS Piteå and ALS Outokumpu. The pattern of reduced correlation between the very low grade sample pairs is evident when the entire dataset is reviewed. Low levels of bias between the pairs is demonstrated.

Table 11.4_1
Hirsikangas Gold Deposit
Duplicate Sample Review: Samples Submitted by Belvedere

Lab/filter	Duplicate Type	Assay Method	Min.	Number	Au1 Mean (g/t)	Au2 Mean (g/t)	Correlation		HARD (%)	HRD (%)
							Pearson	Spearman		
ALS/all	Lab Dup	Au-AA25-ppm	0.001	413	0.029	0.03	1.00	0.46	2.26	-0.4
ALS/0.1g/t	Lab Dup	Au-AA25-ppm	0.001	20	0.51	0.52	0.99	0.99	4.4	0.37

In the case of the sample pairs analysed at ALS OT, the low numbers of available data do not allow a meaningful interpretation of the results however it is noted there are extreme differences in the results for some of the data pairs and this requires further investigation.

The graphs for sample pairs submitted to ALS are contained in Appendix 3.

11.4.3 Samples Submitted by Northern Aspect Resources Oy

- Core Duplicates.
- Crush duplicates.
- Lab Duplicates (LAB1 and LAB2 a two sets of sub samples from the main sample after size reduction to a notional particles size of P_{80} passing 75 microns).
- Pulp duplicates (duplicates samples taken from within one pulp sachet).

Table 11.4_2 summarises the results of the statistical analysis of the various data pairs submitted by NARL.

Table 11.4_2
Hirsikangas Gold Deposit
Duplicate Sample Review: Samples Submitted by NAR Oy

Lab/Filter	Duplicate Type	Assay Method	Min.	Number	Au1 Mean (g/t)	Au2 Mean (g/t)	Correlation		HARD (%)	HRD (%)
							Pearson	Spearman		
ALS/all	Core dup	Au-AA24-ppm	0.001	71	0.588	0.536	0.98	0.96	14.5	4.5
	Crush Dup	Au-AA24-ppm	0.001	75	0.122	0.131	1.00	0.99	8.1	-0.3
	Lab Dup	Au-AA24-ppm	0.001	90	0.223	0.216	0.99	0.85	12.0	4.4
	Pulp Dup	Au-AA24-ppm	0.001	74	0.178	0.165	0.97	0.99	6.5	0.5
ALS/0.1g/t	Core dup	Au-AA24-ppm	0.1	37	1.086	0.99	0.97	0.87	15.8	3.8
	Crush Dup	Au-AA24-ppm	0.1	14	0.511	0.554	1.00	0.93	9.7	-0.4
	Lab Dup	Au-AA24-ppm	0.1	32	0.56	0.54	1.00	0.74	11.9	6.1
	Pulp Dup	Au-AA24-ppm	0.1	18	0.636	0.584	0.95	0.96	7.8	-0.1

In general, the typical pattern of reduced variability (precision) as the particle size of the sample is reduced is seen, for example, in drill core sample pairs, the percentage HARD value reduces from 14.5% for the core duplicates to 6.5% for the pulp duplicates. The same example shows low levels of bias (% HRD) between the sample pairs. The lab duplicate sample pairs stand out as slightly anomalous with the relevant statistical parameters slightly higher than the crush duplicate pairs.

The pattern of reduced correlation between the very low-grade sample pairs is not particularly compelling here with similar values for the filtered and complete dataset. Low levels of bias between the pairs is demonstrated.

The full set of graphs for sample pairs submitted to ALS are contained in Appendix 5.

11.5 Discussion

The review of the CRM submitted by the various operators has shown that the use of CRM, which have an expected value based on fire assay analyses, demonstrates an acceptable level of accuracy by the various laboratories that have been utilised. There is no evidence of systemic bias in the datasets.

When the sample pair data are reviewed the typical pattern of a reduction in the level of variability as the particle size of the source material is reduced is noted from quarter core samples to pulp sachet samples. For the latest set of drilling assay data (NAR Oy), the lab duplicates stand out as slightly anomalous. The levels of variability for much of the datasets are typical for gold deposits.

11.6 Conclusions

These methods of data verification are considered at or above industry standard. The results of the QAQC data analyses discussed in the preceding sections demonstrate that the quality of the data is acceptable for use in mineral resource estimation.

Where known, all sample preparation and analyses were carried out at independent laboratories in Finland or Sweden. No aspect of laboratory sample preparation or analysis was conducted by an employee, officer, director or associate of either NARL or its predecessors.

NAR Oy and predecessors have largely used a combination of duplicates, checks, blanks and standards to ensure suitable quality control of sampling methods and assay testing. The procedures and QA/QC management are consistent with good industry practice and are deemed fit for purpose. Results of recent sampling have not identified any issues which materially affect the accuracy, reliability or representativeness of the results.

12. DATA VERIFICATION

12.1 Independent Qualified Person Review and Verification

Mr Brian Wolfe visited the Hirsikangas Gold Project in October 2018. Steps undertaken to verify the integrity of data used in this report include:

- Field visits to the areas outlined in this report.
- Verification of drillhole collar locations by GPS.
- Inspection of diamond drill core.
- Review of data collection, database management and data validation procedures.
- Review of the previous technical documentation for the Hirsikangas Gold Project.

The Qualified Person has reviewed and cross-checked sections of this Report prepared by Rupert geologists.

The Qualified Person completed the updated resource estimate for the Hirsikangas Gold Project. Additional data verification steps undertaken during this estimate process included the following:

- Validation of drilling, geology and assay database (including checks overlapping intervals, samples beyond hole depth and other data irregularities.
- Review of QAQC data and charts for standards, blanks and duplicates.
- Visual and statistical analysis of resource estimate model outputs versus primary data.
- Random cross checks of assay reports against the database.

Based on this review work, the Qualified Person is of the opinion that the dataset provided is of an appropriate standard to use for resource estimation work.

12.2 QAQC Data Analysis

The quality control data has been statistically evaluated, and summary plots have been produced for interpretation as described in the previous sections.

12.3 Conclusions

These methods of data verification are considered at or above industry standard. The results of the QAQC data analyses discussed in the preceding sections demonstrate that the quality of the data is acceptable for use in mineral resource estimation.

13. MINERAL PROCESSING AND METALLURGICAL TESTING

The following tests were carried out on behalf of Belvedere prior to 2009. The results of the tests cannot be verified and the description below is based on the previous 43-101 report published in 2009.

Labtium Oy, an internationally accredited laboratory, previously owned by GTK, carried out Cyanide bottle roll tests on selected drill core samples from continuous mineralised intervals at its Sodankylä laboratory. The tests were carried out on reject assay pulps for selected mineralised intervals for both Belvedere and GTK drill core. The results indicate an average recovery rate of 93% for gold in cyanide bottle rolls.

The tests were carried out using a PAL1000 machine, which does simultaneous pulverising and cyanide leaching of the sample. Five hundred grams of the sample was leached for 2 hours with a commercial Leachwell-reagent, which contained sodium cyanide, sodium hydroxide and some patented accelerating chemicals. The chemicals were added as a tablet to 500ml slurry containing sample and water. The PAL1000 machine consists of steel cylinders with steel balls inside to agitate and pulverise the sample. The cylinders are tumbled head over head. After leaching an aliquot was taken and analysed for cyanide leachable Au (or Ag, Cu) with Flame -AAS. The tailings were filtered off and washed to get rid of cyanide solution, dried, homogenised and assayed for Au with 50g Fire Assay and analysed with Flame-AAS (Labtium method 705A) for unrecoverable Au.

14. MINERAL RESOURCE ESTIMATE

14.1 Introduction

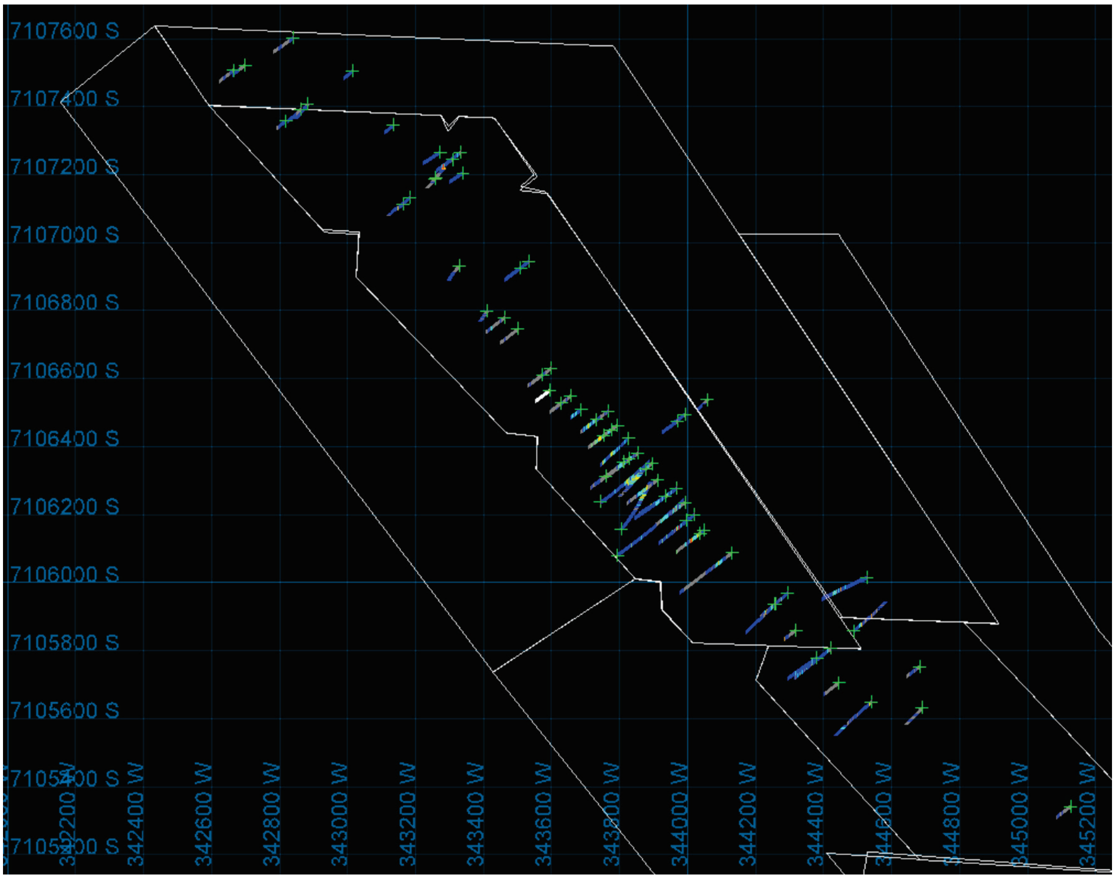
This Mineral Resource for the Hirsikangas Gold Deposit has been estimated as at the effective date of the 11th November 2018. Gold grade estimation was completed using Multiple Indicator Kriging (MIK). MIK grade estimates have been localised to an SMU dimension using an analogous methodology to Localised Uniform Conditioning. This estimation approach was considered appropriate based on review of a number of factors, including the quantity and spacing of available data, the interpreted controls on mineralisation, and the style, geometry and tenor of mineralisation. The estimation was constrained with geological and mineralisation interpretations.

14.2 Database Validation

The resource estimation was based on the available exploration drillhole database which was compiled in-house. The database has been reviewed and validated prior to commencing the resource estimation study.

The database consists of surface diamond drilling. Database statistics from the different operators are provided in Table 6.4_1 and it can be seen the bulk of the data originates from Belvedere (58%). A plan view of all drilling is presented in Figure 14.2_1.

Figure 14.2_1
Hirsikangas Gold Deposit
Plan View of All Drilling



Upon examination of the drillhole assay tables it is evident that part of the drilling has been selectively sampled. For the purposes of the current resource estimate it has been assumed that the unsampled portions of the drill core are essentially un-mineralised. Those absent intervals in the database have been set to -999. To allow for appropriate investigation and substitution during compositing and statistical analysis, all following data analysis is on the basis of the described data substitution.

The resultant database was validated, and the checks made to the database prior to use included:

- Check for overlapping intervals.
- Downhole surveys at 0m depth.
- Consistency of depths between different data tables.
- Check gaps in the data.
- Replacing less than detection samples with half detection.
- Replacing absent values with -999.

14.3 Interpretation and Modelling

14.3.1 Mineralisation Interpretation

Gold mineralisation at the Hirsikangas Gold Project is hosted by sheared and altered felsic rocks of probable sedimentary origin. The principal structural control in the area is considered to be a northwest-trending shear zone in a vertical or steeply NE dipping orientation. The northwest-trending Ruhaperä shear zone lies to the NE.

Ductile-brittle shears are focused within vertical en-echelon lenses of felsic schist and the orientation of lenses follows the strike of these shears. The mineralisation is associated with quartz and sulphides emplaced parallel with the strike and dip of the shearing and lithological units. Gold and associated minerals typically occur at boundaries or fractures of the silicate minerals but rarely also associated with sulphide minerals as described in Section 7.2.

Mineralisation has been encountered over 2.2km of strike length and has been interpreted to extend to more than 300m below the surface. The main occurrence of mineralisation occupies the eastern 800m strike extent of the known shear zone. Less significant mineralisation occurs at the either end of the known strike extent with sporadic gold grades encountered. Drilling is however sparse beyond the extents of the main modelled mineralisation. Mineralisation remains open down-dip and parallel mineralised shears are thought to be present to the NE, however they are poorly drilled.

To establish appropriate grade continuity, the mineralisation models were based upon a nominal 0.3ppm Au cutoff using a sectional interpretation as a basis for a wireframe interpretation. This interpretation is designed to capture the broad mineralisation halo that encompasses the geological shear - vein system and is not intended to constrain individual veins or shears. As the grade estimation technique is MIK with change of support technique, this type of mineralisation constraint is deemed appropriate.

Wireframed grade shells were reviewed in multiple orientations and in plan and section views prior to being accepted for grade estimation and block modelling purposes.

No detailed topographical surface was made available, however as the area is mainly flat it was deemed appropriate to construct the topography based on the drillhole collar locations. In addition to the topography, a base of overburden layer has been interpreted on a sectional basis. The mineralisation models have all been terminated by this surface.

A single mineralisation estimation domain was thus defined for the purpose of grade estimation. The mineralisation strikes NW and steeply dips to the NE. An isometric southerly view and a typical sectional view are presented in Figures 14.3_1 and 14.3_2.

Figure 14.3_1
Hirsikangas Gold Deposit
Isometric S view

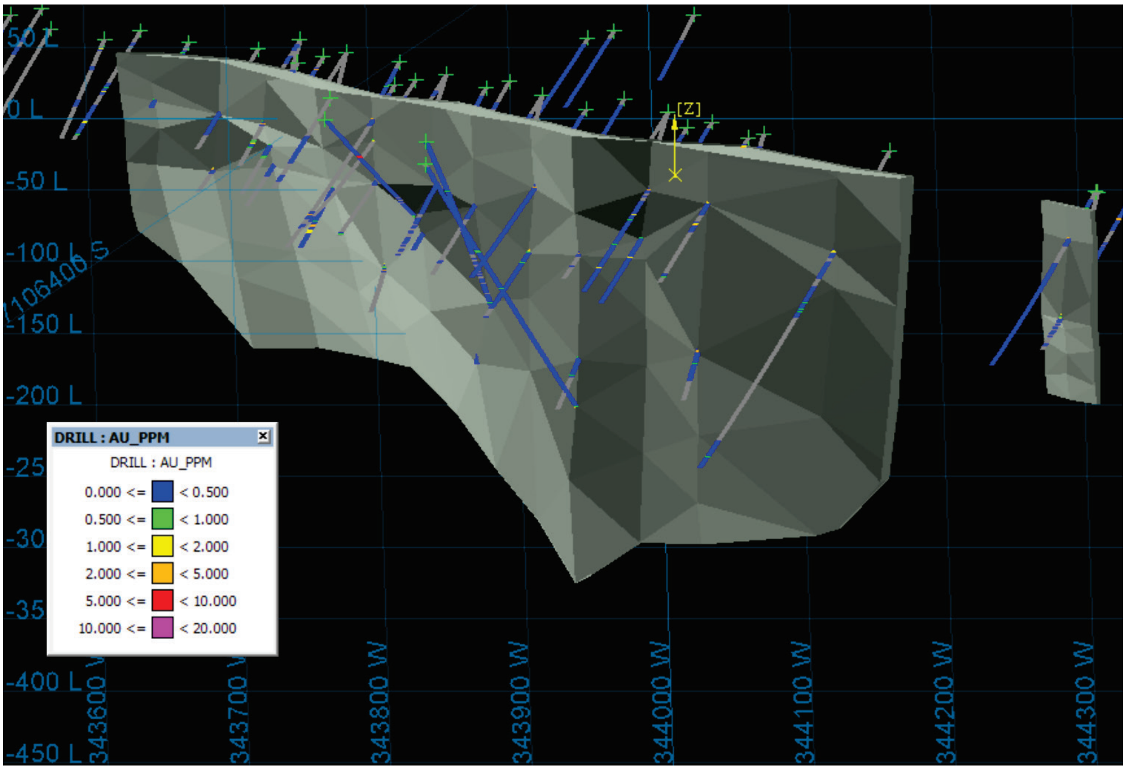
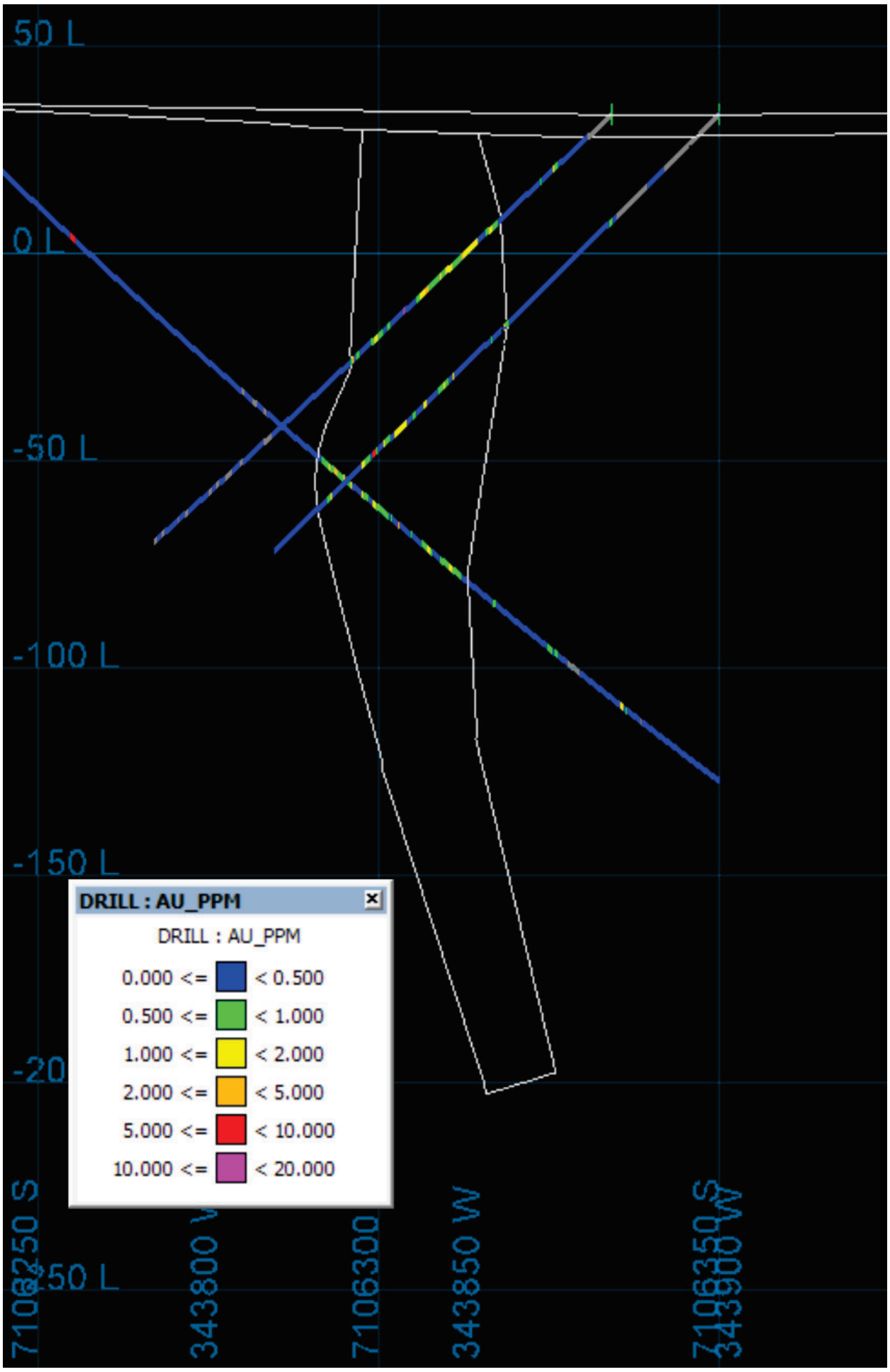


Figure 14.3_2
Hirsikangas Gold Deposit
Typical Sectional View



14.4 Data Flagging and Compositing

Drillhole samples were flagged with the relevant mineralisation wireframe and topographical surfaces. Coding was undertaken on the basis that if the individual sample centroid fell within the mineralisation grade shell boundary it was coded as within the grade shell.

The drillhole database was then composited as a means of achieving a uniform sample support. It should be noted, however, that equalising sample length is not the only criteria for standardising sample support. Factors such as angle of intersection of the sampling to mineralisation, sample type and diameters, drilling conditions, recovery, sampling/sub-sampling practices and laboratory practices all affect the 'support' of a sample. Exploration/mining databases which contain multiple sample types and/or sources of data provide challenges in generating composite data with equalised sample support, and uniform support is frequently difficult to achieve.

With respect to previous comments regarding unsampled intervals (Section 14.2) and as the unsampled intervals have been deemed unmineralised any unsampled interval encountered during the compositing process have been assigned a value 0f 0.001ppm Au. This may be seen as a spike in the lower tail of the histogram.

After consideration of relevant factors relating to geological setting and mining, including likely mining selectivity and bench/flitch height, a regular 2m run length (downhole) composite was selected as the most appropriate composite interval to equalise the sample support at Hirsikangas Gold Deposit. Compositing was broken when the routine encountered a change in flagging (grade shell boundary) and composites with residual intervals of less than 2m were retained in the composite file.

14.5 Statistical Analysis

14.5.1 Summary Statistics

The composites flagged as described in the previous section were used for subsequent statistical, geostatistical and grade estimation investigations.

Summary descriptive statistics were generated (Tables 14.5_1). The grade distribution are typical for gold deposits of this style and show a positive skew or near lognormal behaviour (Figure 14.5_1). The coefficient of variation (CV - calculated by dividing the standard deviation by the mean grade) is moderate, consistent with the presence of high outlier grades that potentially require cutting (capping) for grade estimation.

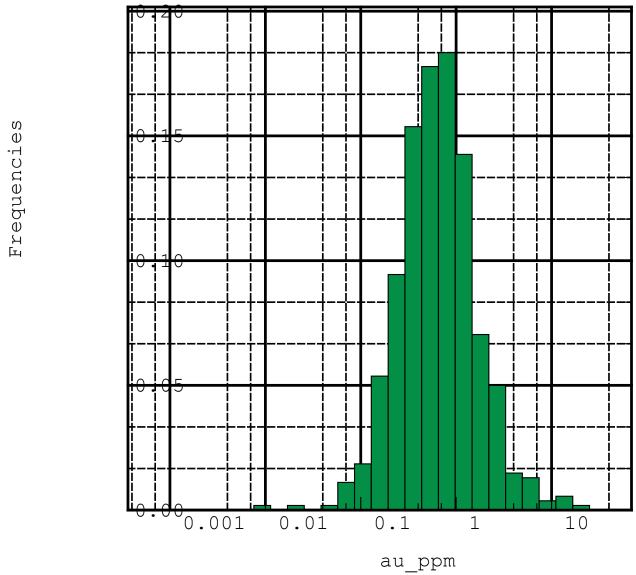
Table 14.5_1
Hirsikangas Gold Deposit
Summary Statistics for 2m Composites of Uncut Gold Grade (g/t)

Domain	Count	Minimum	Maximum	Mean	Std. Dev.	Variance	CV
100	540	0.01	24.114	1.047	1.698	2.884	1.622

14.5.2 High Grade Outlier Analysis

MIK has been selected as the method to estimate the gold grades for the Hirsikangas Gold deposit. The grade datasets for the various estimation domains are characterised by moderate CV values, indicating potential for high-grade values to contribute significantly to the mean grades reported for the various datasets.

Figure 14.5_1
Log Histogram of Uncut Gold Grade



The effects of the highest-grade composites on the mean grade and standard deviation of the gold dataset for each of the estimation domains have been investigated by compiling and reviewing statistical plots (histograms and probability plots). The resultant plots were reviewed together with probability plots of the sample populations and an upper cut for each dataset was chosen coinciding with a pronounced inflection or increase in the variance of the data. Composite data was also viewed in 3D to determine the clustering or otherwise of the highest grades observed in each domain to assess the appropriateness of the high-grade cut. Clustering of the highest grades in one or more areas may indicate that the grades do not require cutting.

Upon review of the above statistical data it was determined that high grade cutting of the composite data was necessary at 12g/t Au. Descriptive statistics are presented in Table 14.5_2.

Table 14.5_2
Hirsikangas Gold Deposit
Summary Statistics for 2m Composites of Topcut Gold Grade (g/t)

Domain	Count	Minimum	Maximum	Mean	Std. Dev.	Variance	CV
100	540	0.01	12	1.019	1.411	1.991	1.385

It should be noted that while gold grades are not cut or capped for the purposes of MIK estimation the use of cut grades is often employed for variography and the change of support process. As MIK estimates are essentially a series of OK estimates applied to the binary transformation of a series of indicator cutoffs, high grade cutting will have no effect on the resultant MIK estimate unless the high-grade cut is lower than the chosen upper indicator cutoff and this scenario should normally not arise in the context of MIK estimation. A full description of the MIK estimation method with change of support is provided in Section 14.9.

14.5.3 Cell Declustering Analysis

Visual inspection of the available dataset indicates some potential clustering of the data within certain regions of the deposit. Data clustering often occurs when drilling campaigns selectively target higher grade regions of the deposit, resulting in an artificially high mean grade in many cases. Declustering was therefore completed to examine any effects of preferential sampling of high-grade areas that may have occurred.

Cell declustering was completed with weights determined as 1/n, with "n" representing the number of data in each cell. Declustered composite statistics are presented in Table 14.5_3. In this instance the mean grade increases slightly over a wide range of cell declustering sizes.

Table 14.5_3
Hirsikangas Gold Deposit
Summary Statistics 2m Composites of Declustered Gold Grade (g/t)

Domain	Count	Minimum	Maximum	Mean	Std. Dev.	Variance	CV
100	540	0.01	12	1.051	1.465	2.147	1.394

14.5.4 Multiple Indicator Kriging Cutoffs and Indicator Class Statistics

Indicator Kriging cutoffs or indicator bins were selected for the mineralised domain. Cutoffs were based upon population distributions and metal proportions above and below the mean composite value of the proposed cutoff bins. Conditional statistics are listed in Table 14.5_4. A total of 17 cutoffs were applied. Top cuts have not been applied for the purposes of conditional statistics calculation.

Table 14.5_4
Hirsikangas Gold Deposit
Indicator Class Statistics

Domain 100		
Grade Threshold (Au g/t)	Probability Threshold	Class Mean (Au g/t)
0.25	0.148	0.1700
0.35	0.237	0.3008
0.45	0.341	0.3888
0.55	0.435	0.4973
0.67	0.530	0.6103
0.8	0.604	0.7242
0.93	0.667	0.8701
1.05	0.720	0.9816
1.25	0.770	1.1629
1.4	0.820	1.3131
1.6	0.857	1.4785
1.85	0.894	1.7227
2.3	0.920	2.0764
2.7	0.946	2.4639
3.5	0.963	2.9820
5	0.978	4.1985
7	0.989	5.8233
Max	Max	13.680

14.6 Variography

14.6.1 Introduction

Variography is used to describe the spatial variability or correlation of an attribute (gold, silver etc.). The spatial variability is traditionally measured by means of a variogram, which is generated by determining the averaged squared difference of data points at a nominated distance (h), or lag (Srivastava and Isaacs, 1989). The averaged squared difference (variogram or γ(h)) for each lag distance is plotted on a bivariate plot, where the X-axis is the lag distance and the Y-axis represents the average squared differences (γ(h)) for the nominated lag distance.

Several types of variogram calculations are employed to determine the directions of the continuity of the mineralisation:

Traditional variograms are calculated from the raw assay values:

- Log-transformed variography involves a logarithmic transformation of the assay data.
- Gaussian variograms are based on the results after declustering and a transformation to a Normal distribution.
- Pairwise-relative variograms attempt to 'normalise' the variogram by dividing the variogram value for each pair by their squared mean value.
- Correlograms are 'standardised' by the variance calculated from the sample values that contribute to each lag.

Fan variography involves the graphical representation of spatial trends by calculating a range of variograms in a selected plane and contouring the variogram values. The result is a contour map of the grade continuity within the domain.

14.6.2 Hirsikangas Variography

The variography was calculated and modelled using the geostatistical software, Isatis. The rotations are tabulated as dip and dip direction of major, semi-major and minor axes of continuity. Modelled variograms were generally shown to have moderate structure and were used throughout the MIK estimation and the change of support process.

Grade and indicator variography was generated to enable grade estimation via MIK and change of support analysis to be completed. In addition, Gaussian variograms were also examined as part of the change of support process. Indicator thresholds for Domain 100 had variograms modelled with every third variogram typically modelled. Variograms not modelled have had their parameters interpolated based on the bounding modelled variograms.

Interpreted anisotropy directions correspond well with the modelled geology and overall geometry of the interpreted domains. Grade variography has been based on the back-transformed Gaussian variograms. A common feature of the grade variography is the moderately short ranges, especially for the first modelled structure, and the dominance of the overall variance by the nugget and the first sill. A slight plunge to the data has also been modelled as 20° to the NW.

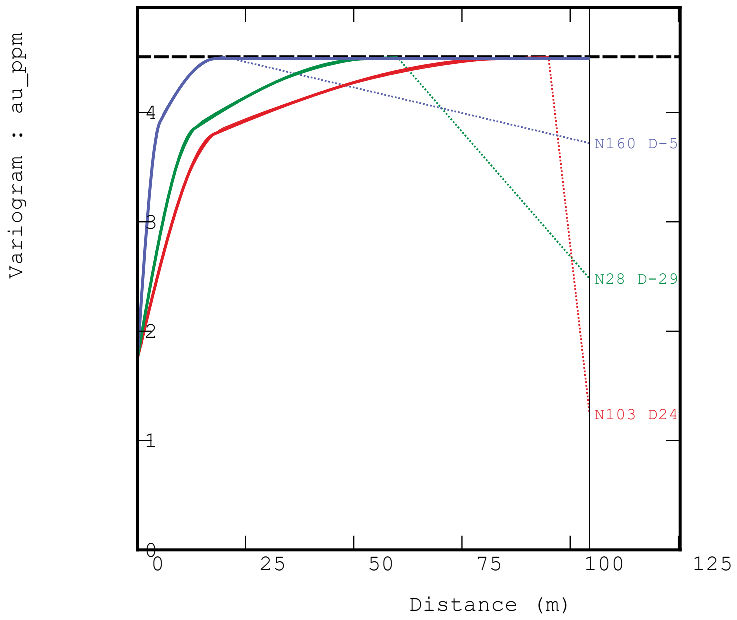
Grade variography and indicator variography as modelled for MIK and OK grade estimation and change of support analysis is presented in Table 14.6_1 and Figure 14.6_1.

Table 14.6_1
Hirsikangas Gold Deposit
Domain 100 Grade Variogram and Indicator Variogram Models Au g/t

Grade Variable or Indicator Threshold	Nugget (C0)	Rotation (dip→dip dir)			Structure 1				Structure 2			
		Major	Semi Major	Minor	Relative Sill 1 (C1)	Range (m)			Relative Sill 2 (C2)	Range (m)		
						Major	Semi Major	Minor		Major	Semi Major	Minor
Au g/t	1.078	20→320	70→140	0→230	0.600	65	30	3	0.446	160	90	6
0.25(1)	0.0400	20→320	70→140	0→230	0.0620	100	50	6	0.0300	220	100	9
0.35(1)	0.0600	20→320	70→140	0→230	0.0760	80	45	6	0.0500	200	100	9
0.45	0.0840	20→320	70→140	0→230	0.0970	70	40	5	0.0430	170	90	8
0.55(2)	0.0944	20→320	70→140	0→230	0.1038	70	40	5	0.0456	160	90	8
0.67(2)	0.0998	20→320	70→140	0→230	0.1046	70	40	5	0.0455	160	90	8
0.80	0.1000	20→320	70→140	0→230	0.1000	65	40	5	0.0430	160	90	8
0.93(3)	0.0977	20→320	70→140	0→230	0.0925	65	40	5	0.0401	160	90	8
1.05(3)	0.0927	20→320	70→140	0→230	0.0832	65	35	5	0.0364	160	90	8
1.25	0.0800	20→320	70→140	0→230	0.0680	65	35	5	0.0300	150	80	8
1.40(4)	0.0683	20→320	70→140	0→230	0.0565	60	35	5	0.0243	140	70	8
1.60(4)	0.0579	20→320	70→140	0→230	0.0468	60	35	5	0.0195	140	70	8
1.85	0.0470	20→320	70→140	0→230	0.0370	60	35	5	0.0150	140	70	8
2.30(5)	0.0371	20→320	70→140	0→230	0.0279	60	35	5	0.0115	140	70	8
2.70(5)	0.0249	20→320	70→140	0→230	0.0178	60	35	5	0.0074	140	70	5
3.50	0.0190	20→320	70→140	0→230	0.0130	60	35	3	0.0055	140	70	5
5.00(6)	0.0126	20→320	70→140	0→230	0.0082	60	35	3	0.0034	140	70	5
7.00(6)	0.0068	20→320	70→140	0→230	0.0041	60	35	3	0.0016	130	70	5

Note:
1) Assumed model based on 0.45 Au g/t variogram model
2) Assumed model based on 0.45 Au g/t and 0.8 Au g/t variogram models
3) Assumed model based on 0.80 Au g/t and 1.25 Au g/t variogram models
4) Assumed model based on 1.25 Au g/t and 1.85 Au g/t variogram model
5) Assumed model based on 1.85 Au g/t and 3.5 Au g/t variogram model
6) Assumed model based on 3.5 Au g/t variogram model

Figure 14.6_1
Hirsikangas Gold Deposit
Domain 100 – Grade Variogram : Gaussian Back-Transformed



14.7 Block Modelling

A 3-D block model was created in the ETRS-TM35FIN coordinate system using Vulcan mining software. The parent block size was selected on the basis of the average drill spacing together with consideration of potential mining parameters. A parent cell size of 10mE by 25mN by 10mRL which was sub-blocked down to 5mE by 12.5mN by 5mRL (to ensure adequate volume representation). The models covered all the interpreted mineralisation zones and included suitable additional waste material to allow later mining engineering studies. Block coding was completed on the basis of the block centroid, wherein a centroid falling within any wireframe was coded with the wireframe solid attribute. The block model is unrotated.

The main block model parameters are summarised below in Tables 14.7_1. Variables were coded into the block models to enable multiple indicator kriging and ordinary kriging estimation and subsequent MIK change of support and grade tonnage reporting. A visual review of the wireframe solids and the block model indicated correct flagging of the block model. Additionally, a check was made of coded volume versus wireframe volume which confirmed the above.

Table 14.7_1
Hirsikangas Gold Deposit
Block Model Parameters

	Northing (Y)	Easting (X)	RL (Z)
Min. Coordinates	7,105,700	344,100	-300
Extent	1,100	400	400
Block size (m)	25.0	10.0	10.0
Sub Block size (m)	12.5	5	5
Rotation (° around axis)	0°	55°	0°

14.8 Bulk Density Data

A dry bulk density database has been supplied containing a total of 2,206 data and this is discussed in Section 10.3.

Based on the density statistics of mineralised rock, a bulk density of 2.7t/m³ has been applied as a tonnage factor to allow for appropriate grade tonnage reporting. In the case of the overburden, a bulk density of 2.0t/m³ has been assumed although there are no direct measurements.

14.9 Grade Estimation

14.9.1 Introduction

Multiple Indicator Kriging (MIK) was applied to grade estimation at the Hirsikangas Gold Project within Domain 100. MIK grade estimation and geostatistical change of support parameters were developed in Isatis geostatistical software. MIK is considered a robust estimation methodology for grade estimates for gold deposits such as Hirsikangas where high levels of short scale variability are present. MIK grade estimation with change of support has been applied to produce 'recoverable' gold estimates targeting a selective mining unit (SMU) of 5mE x 12.5mN x 5mRL.

14.9.2 The Multiple Indicator Kriging Method

The MIK technique is implemented by completing a series of Ordinary Kriging ("OK") estimates of binary transformed data. A composite sample, which is equal to or above a nominated cutoff or threshold, is assigned a value of 1, with those below the nominated indicator threshold being assigned a value of 0. The indicator estimates, with a range between 0 and 1, represent the probability the point will exceed the indicator cutoff grade. The probability of the points exceeding a cutoff can also be considered broadly equivalent to the proportion of a nominated block that will exceed the nominated cutoff grade.

The estimation of a complete series of indicator cutoffs allows the reconstitution of the local histogram or conditional cumulative distribution function ("ccdf") for the estimated point. Based on the ccdf, local or block properties, such as the block mean and proportion (tonnes) above or below a nominated cutoff grade can be investigated.

Post MIK Processing - E-Type Estimates

The E-type estimate provides an estimate for the grade of the total block or bulk-mining scenario. This is achieved by discretising the calculated ccdf for each block into a nominated number of intervals and interpolating between the given points with a selected function (e.g. the linear, power or hyperbolic model) or by applying intra-class mean grades. The sum of all these weighted interpolated points or mean grades enables an average whole block grade to be determined.

The following example shows the determination of an E-type estimate for a block containing three indicator cutoffs.

The indicator cutoffs and associated probabilities calculated are shown in Table 14.9_1.

The whole block grade can now be determined in this block with the following parameters used for the purposes of the interpolation:

- Number of discretisation intervals: 4.
- Linear extrapolation between all points (median grade between nominated cutoffs).

Table 14.9_1 Hirsikangas Gold Deposit Indicator Cutoff and Probability		
Indicator	Cutoff Grade Au g/t	Indicator Probability (cumulative)
minimum grade *	0	0.00 **
indicator 1	1	0.40
indicator 2	2	0.65
indicator 3	3	0.85
maximum grade *	4	1.00 **

Note: * Cutoff grades determined by the user.
** Indicator probability is assumed at the minimum and maximum cutoff.

The worked example is then calculated with the following steps:

- Interval 1 (0-1g/t Au) median grade x probability/proportion attributed to the interval (0.5g/t Au x 0.40 = 0.200).
- Interval 2 (1 - 2g/t Au) median grade x proportion (1.5g/t Au x 0.25 = 0.375).
- Interval 3 (2 - 3g/t Au) median grade x proportion (2.5g/t Au x 0.20 = 0.500).
- Interval 4 (3 - 4g/t Au) median grade x proportion (3.5g/t Au x 0.15 = 0.525).
- Calculate total grade average all calculated intervals ((0.2+0.375+0.500+0.525)/1) = 1.60g/t Au.

It is also possible from this example to calculate the proportion and grade above a nominated cutoff (e.g. 2g/t - at sample support or complete selectivity). The following steps would be undertaken to calculate the tonnes and grade at sample selectivity using a 2g/t cutoff:

- Interval 3 (2 - 3g/t Au) median grade x proportion (2.5g/t Au x 0.20 = 0.500).
- Interval 4 (3 - 4g/t Au) median grade x proportion (3.5g/t Au x 0.15 = 0.525).
- Calculate total grade average all calculated intervals ((0.500+0.525)/0.35) = 2.93g/t Au with 0.35% of the block above the cutoff.

The effect of using a non-linear model to interpolate between cutoffs is to shift the grade weighting associated with that cutoff away from the median. The intra-class means based on the cut composite data have been used to reconstitute the ccdf and produce block statistics.

It is noted, however, that the calculation of the E-type estimate and complete selectivity often does not allow mine planning to the level of selectivity which is proposed for production. To achieve an estimate which reflects the levels of mining selectivity envisaged, a selective mining unit ("SMU") correction is often applied to the calculated ccdf.

Support Correction (Selective Mining Unit Estimation)

A range of techniques are known to produce a support correction and therefore allow for selective mining unit emulation. The common features of the support correction are:

- Maintenance of the mean grade of the histogram (E-type mean).
- Adjustment of the histogram variance by a variance adjustment factor (the 'f' factor).

The variance adjustment factor, used to reduce the histogram or ccdf variance, can be calculated using the variogram model. The variance adjustment factor is often modified to account for the likely grade control approach or 'information effect'.

In simplest terms, the variance adjustment factor takes into account the known relationship derived from the dispersion variance.

Total variance = variance of samples within blocks + variance between blocks.

The variance adjustment factor is calculated as the ratio of the variance between the blocks and the variance of the samples within the blocks, with a small ratio (e.g. 0.10) indicating a large adjustment of the ccdf variance and large ratio (e.g. 0.80) representing a small shift in the ccdf.

Two simple support corrections that are available include the Affine and Indirect Lognormal correction, which are both based on the permanence of distribution. The discrete Gaussian model is often applied to global change of support studies and has been generated on the composite dataset as a comparison. The indirect lognormal correction was applied to the MIK grade estimates.

Indirect Lognormal Correction

The indirect lognormal correction can be implemented by adjusting the quantiles (indicator cutoffs) of the ccdf with the variance adjustment factor so that the adjusted ccdf represents the statistical characteristics of the block volume of interest.

This is implemented with the following formula:

$$q' = a \times q^b$$

q = quantile of distribution.

q' = quantile of the variance-reduced distribution.

where the coefficients a and b, are given by the following formula:

$$a = \sqrt{\frac{m}{f.\ CV^2 + 1}} \left[\sqrt{\frac{CV^2 + 1}{M}} \right]$$

$$b = \sqrt{\frac{\ln(f.\ CV^2 + 1)}{\ln(CV^2 + 1)}}$$

m	=	mean of distribution.
f	=	variance adjustment factor .
CV	=	coefficient of variation.

At the completion of the quantile adjustments, grades and tonnages (probabilities are then considered a pseudo-tonnage proportion of the blocks) at a nominated cutoff grade can be calculated using the methodology described above (E-type). The indirect lognormal correction, as applied to Hirsikangas, is the best suited of the common adjustments applied to MIK to produce selective mining estimates for positively skewed distributions.

14.9.3 Multiple Indicator Kriging Parameters

MIK estimates were completed using the indicator variogram models (Section 14.6), and a set of ancillary parameters controlling the source and selection of composite data. The sample search parameters were defined based on the variography and the data spacing, and a series of sample search tests performed in Isatis geostatistical software. A total of 17 indicator thresholds were estimated for Domain 100 (see Table 14.5_4).

The sample search parameters for the MIK estimations are provided in Table 14.9_2. Hard domain boundaries was used for the estimation throughout. A two-pass estimation strategy (where required) was applied, applying a progressively expanded and less restrictive sample search to the successive estimation pass, and only considering blocks not previously assigned an estimate. Parent cell estimations (10mE by 25mN by 10mRL) were applied throughout and discretisation was applied on the basis of 3X by 3Y by 3RL for 27 discretisation points per block.

Table 14.9_2
Hirsikangas Gold Deposit
MIK Sample Search Criteria

Domain	Pass	Sample Search Orientation (dip/dip direction°)			Sample Search Distance (m)			Numbers of 2m Composites			% Blocks Estimated
		Major	Semi Major	Minor	Major	Semi Major	Minor	Min.	Max.	Max Per Drillhole	
100	Pass 1	20→320	70→140	0→230	100	100	20	24	36	6	67
	Pass 2	20→320	70→140	0→230	300	300	60	24	36	-	33

14.9.4 Change of Support

Applying the modelled variography, variance adjustment factors were calculated for to emulate a 5mE x 12.5mN x 5mRL selective mining unit ("SMU") via the indirect lognormal change of support. The intra-class composite mean grades (Table 14.5._1) were used in calculating the whole block and SMU grades. The change of support study also included the calculation of the theoretical global change of support via the discrete Gaussian change of support model.

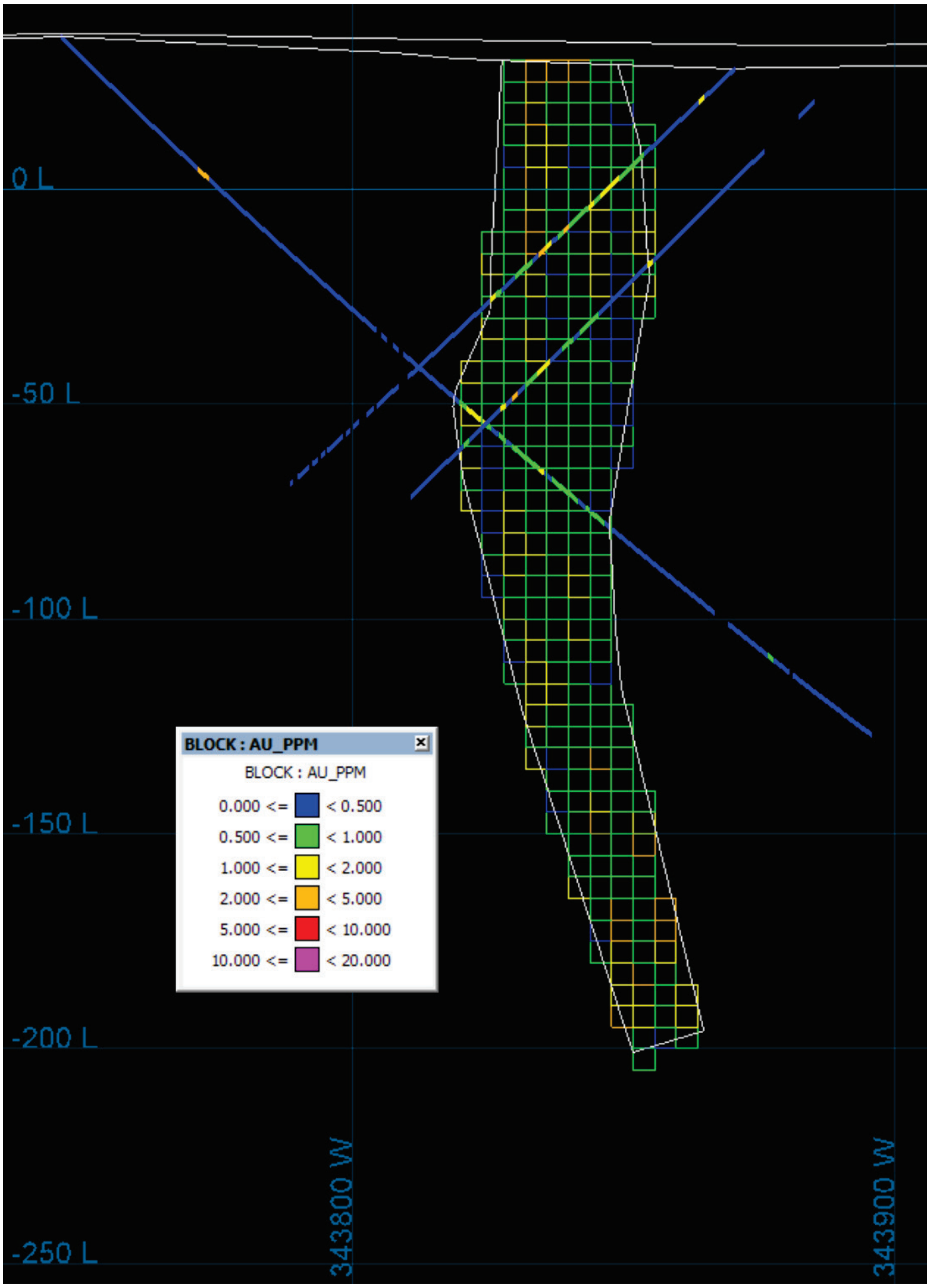
An 'information effect' factor is commonly applied to the originally derived panel-to-block variance ratios to determine the final variance adjustment ratio. The goal of incorporating information effect is to calculate results taking into account that mining takes place based on grade control information. There will still be a quantifiable error associated with this data and it is this error we want to incorporate. This is achieved in practice by running a test kriging estimation of an SMU using grade control data (the results required to incorporate this option in the change of support do not depend on the assay data so the grade control data can be hypothetical). The incorporation of the information effect is commonly found to be negligible, however can have a significant effect in some cases. In this case, the information effect factor was found to have a minor effect and has been incorporated in the calculation.

The variance adjustment ratios as applied to Domain 100 was 0.25.

14.9.5 Grade Localisation

MIK grade estimates are generated in large blocks or panels (in the case of Hirsikangas, 10mE x 25mN x 10mRL) and are inherently not intuitive to review. Post processing of these MIK estimates aims to simplify the presentation by producing a single SMU dimension block grade where the distribution of the grades in the panel matches that of the distribution in the SMU's. The MIK panel grades have been localised to SMU dimension blocks in Isatis software. The SMU dimension was 5mE x 12.5mN x 5mRL. Validation of the results indicates a near identical distribution and the resultant model has been accepted. A typical section is presented below (Figure 14.9_1).

Figure 14.9_1
Sectional View 3,563,840mE Displaying Localised Au Grades



14.9.6 Estimate Validation

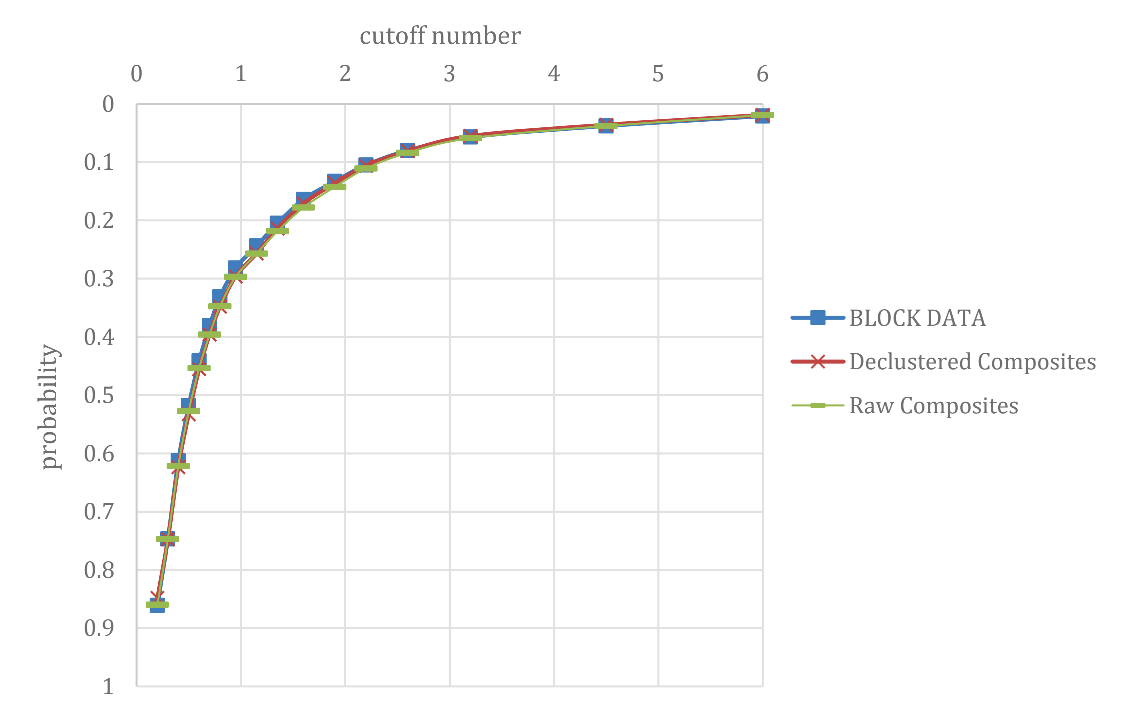
All relevant statistical information was recorded to enable validation and review of the MIK estimates. The recorded information included:

- Number of samples used per block estimate.
- Number of drillholes from which samples selected.
- Average distance to samples per block estimate and distance to nearest sample.
- Estimation flag to determine in which estimation pass a block was estimated.
- Number of drillholes from which composite data were used to complete the block estimate.

The estimates were reviewed visually and statistically prior to being accepted. The review included the following activities:

- Comparison of the E-type estimate versus the mean of the composite dataset, including weighting where appropriate to account for data clustering.
- Comparison of the reconstituted cumulative conditional distribution functions of the estimated blocks (indicator kriging) versus the input composite data (Figure 14.9_2).
- Visual checks of cross sections, long sections, and plans.

Figure 14.9_2
CCDF Validation Domain 100



Alternative estimates were also completed to test the sensitivity of the reported model to the selected MIK interpolation parameters. An insignificant amount of variation in overall grade was noted in the alternate estimations.

Validation of localised block Au grades has been undertaken by comparing the block mean grades with the relevant composite mean grades (Table 14.9_3).

Table 14.9_3
Hirsikangas Gold Deposit
Comparison of Block Grades with Composite Mean Grades – All Data Used

	Zone	All Composites	Block Model Grades	% Diff Block Model versus Composites
MIK Domain	100	1.019	0.961	-6%

A reasonable correlation can be drawn with the difference being approximately -6%. Differences in grade of this order can be considered normal and are explained by the data clustering effect which arises when high- or low-grade areas have a higher density of drillholes.

14.9.7 Resource Classification

The resource categorisation was based on the robustness of the various data sources available, including:

- Geological knowledge and interpretation.
- Variogram models and the ranges of the first structure in multi-structure models.
- Drilling density and orientation.
- Estimation quality statistics.

The resource estimates for the Hirsikangas Gold Deposit have been classified as Inferred Mineral Resources based on the confidence levels of the key criteria as presented in Table 14.9_4.

Table 14.9_4
Hirsikangas Gold Deposit
Confidence Levels by Key Criteria

Items	Discussion	Confidence
Drilling Techniques	Diamond drilling Industry Standard approach.	High
Logging	Standard nomenclature has been adopted but not used in entire database. Historical database dating back to 1990's and before.	Moderate
Drill Sample Recovery	Recoveries are not recorded in entire database but diamond core recoveries acceptable.	Moderate
Sub-sampling Techniques and Sample Preparation	Diamond sampling conducted by industry standard techniques.	Moderate/High
Quality of Assay Data	Appropriate quality control procedures only available for work completed by Belvedere and NARL. They were reviewed on site and considered to be of industry standard.	Moderate/High
Verification of Sampling and Assaying	Sampling and assaying procedures have been assessed and are considered of appropriate industry standards.	Moderate
Location of Sampling Points	Survey of all collars conducted with accurate survey equipment. Investigation of downhole survey indicates appropriate behaviours.	Moderate/High
Data Density and Distribution	Majority of regions defined on a notional 50mE x 25mN drill spacing. On section spacing of drillholes is variable	Moderate
Audits or Reviews	Data collection assessed during site review.	N/A
Database Integrity	Data base is largely legacy with numerous campaigns.	Moderate
Geological Interpretation	Mineralisation controls are moderately well understood. The mineralisation constraints are robust but relatively broad and therefore of moderate confidence.	Moderate
Estimation and Modelling Techniques	Multiple Indicator Kriging is considered to be appropriate given the geological setting and grade distribution.	High
Cutoff Grades	MIK is independent of cutoff grade although the mineralisation constraints were based on a notional 0.3g/t Au lower cutoff grade. A 0.5g/t lower cutoff grade is considered appropriate for reporting.	Moderate/High
Mining Factors or Assumptions	A 5mE x 12.5mN x 5mRL SMU emulated for gold. Open pit mining assumed. Change of support for Inferred component has higher degree of uncertainty.	Moderate
Metallurgical Factors or Assumptions	Not applied or available.	N/A
Tonnage Factors (In-situ Bulk Densities)	Sufficient data exists to enable high confidence in the applied density values.	High

14.10 Resource Reporting

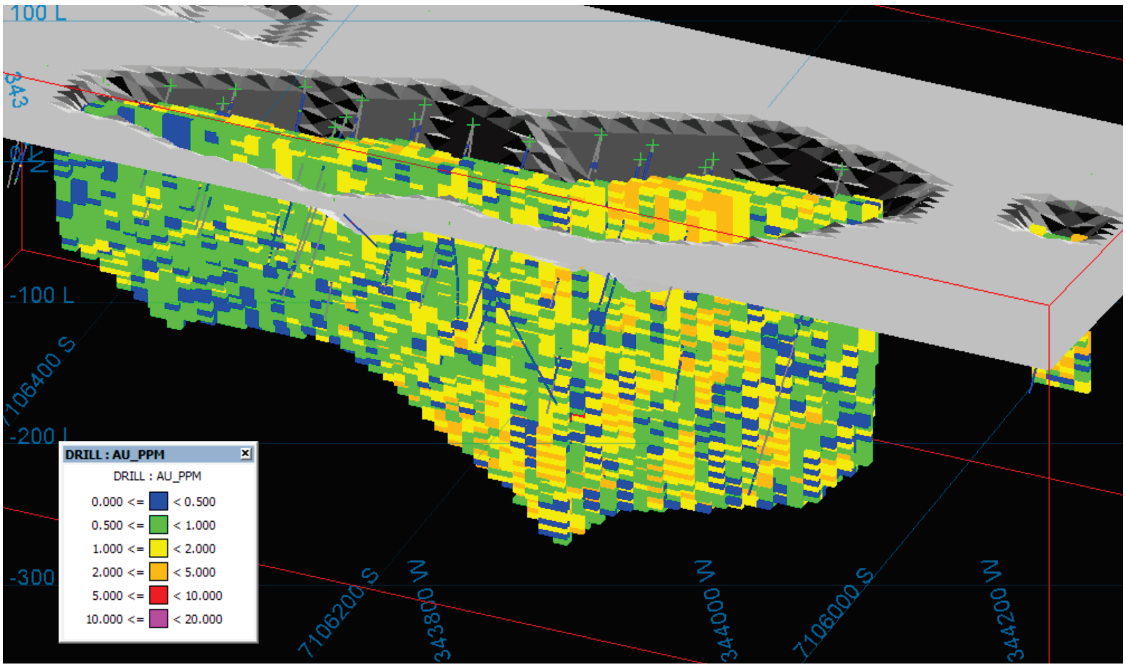
The summary resource for the Hirsikangas Gold Project is provided in Table 14.10_1 below. The Inferred Mineral Resource is reported within an optimised pit shell described below. Figure 14.10 depicts the pit shell applied to the grade tonnage report and demonstrates the range of mineralised blocks that lie below the pit which are unreported. The preferred lower cutoff grade for reporting is 0.5g/t Au. In view of the nature and style of the mineralisation and potential mining approach and method, this is considered an appropriate cutoff grade. A range of cutoffs have been presented to demonstrate how the tonnes and grade vary with differing cutoffs. It should be noted that mineral resources that are not mineral reserves do not have demonstrated economic viability.

Table 14.10_1
Hirsikangas Gold Deposit
Mineral Resource Report - Summary Grade Tonnage Report

	Lower Cutoff Grade (g/t Au)	Tonnes (kt)	Average Grade (g/t Au)	Gold Metal (kozs)	Gold Metal (Kg)
Inferred Resource	0.4	2,380	1.2	91	2,820
	0.5	**2,270**	**1.2**	**89**	**2,770**
	0.6	2,080	1.3	86	2,670
	0.8	1,510	1.5	73	2,270
	1.0	1,110	1.7	62	1,920

Note: All figures have been rounded to reflect the relative accuracy of the estimates

Figure 14.10_1
Isometric View of Block Model and $1400 Pit Shell



The Mineral Resource estimates are predicated on an open pit mining and conventional CIL processing scenario and have been reported within optimised pit shells using a gold price of US$1400/oz and a cutoff grade of 0.45g/t Au for all mineralisation. Key pit optimisation input parameters are as follows:

- Metallurgical recovery for CIL processing of 92% for fresh rock.
- Mining costs: $3.0/t.
- Process costs: $12.00/t.
- G&A: $6.00/t
- Pit slope angles of 45° throughout.

Based on the above parameters, the preferred reporting cutoff grade is 0.5g/t Au. The Mineral Resource estimate has also been reported at a range of additional cutoff grades to demonstrate grade tonnage relationships at higher and lower cutoff grades.

The effective date of this Mineral Resource is 11th November 2018. It is not anticipated that this Mineral Resource estimate will be materially affected, to any extent, by any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors.

14.11 Comparison with Previous Resource

The first resource reported according to NI 43-101 was completed by Belvedere in 2009 (Table 14.11_1). Using the cutoff grade of 0.5g/t Au, reported Indicated Mineral Resources comprised 3.002Mt at a grade of 1.23g/t Au for 119koz gold. Inferred mineral resources comprised 2.673Mt at a grade of 1.27g/t Au for 109koz gold (Lindholm *et al* 2009).

Table 14.11_1
Hirsikangas Gold Deposit
Belvedere Resource Estimation 2009

	Lower Cutoff Grade (g/t Au)	Tonnes (kt)	Average Grade (g/t Au)	Gold Metal (kozs)
Indicated	0.5	3,002	1.23	119
Inferred	0.5	2,673	1.27	109

The current reported Inferred Mineral Resource is much smaller than the previous work suggested. The primary reason is that the previous resource was not reported as constrained within an open pit shell (Figure 14.10_1).Other differences are described below and tabulated in Table 14.11_2.

The mineralisation interpretation relating to the 2009 work has been described as having overall dimensions of 1,100m strike length by 200m vertical extension and was generated by sectional polygonal interpretation at a nominal 0.5g/t Au lower cutoff. A total of seven wireframes solids were interpreted. The grade estimate was assumed to have been completed by an inverse distance method (although this is not specified) into relatively small blocks compared to the data spacing. This resource comprises an in-situ resource number and has not been subjected to any potential criteria for eventual economic extraction such as a pit optimisation process and has been reported in its entirety.

Table 14.11_2 Hirsikangas Gold Deposit Comparison with previous Resource		
Criteria	**2018 Resource**	**2009 Resource**
Strike Length	800m	1,100m
Depth Extension	300m	200m
LCOG for Domaining	0.3g/t Au	0.5g/t AU
Number Domains	1	7
Estimation Methodology	MIK	Inverse Distance
Resource Type	Recoverable	In-Situ
Optimisation Applied to Reporting	Yes	No
Unreported Mineralisation	Yes	No

In contrast, the current interpretation consists of two wireframes solids with dimensions of approximately 800m along strike and extending to a maximum of 300m below surface. The nominal lower cutoff used for the interpretation was 0.3g/t Au. The grade estimate was completed by Multiple Indicator Kriging in to blocks that were relatively large in comparison to the data spacing (Section 14.9). Change of support was then implemented on the parent block estimates to emulate a mining selectivity of 5mE x 12.5mN x 5mRL. Grade estimates have been localised from the parent cell dimensions to an SMU dimension. The grade estimates have been categorised as an Inferred Mineral Resource only and this is in contrast to the previously defined Indicated and Inferred Mineral Resource. In the opinion of the QP, the current drillhole spacing is not sufficient to enable the confidence required to apply technical and economic parameters to support production planning and economic evaluation. Finally the Inferred Mineral Resource has undergone pit optimisation using the input parameters described in Section 14.10. Significant additional mineralisation lies beneath this pit which is currently unreported.

15. MINERAL RESERVE ESTIMATES

This section is not applicable to this Report.

16. MINING METHODS

This section is not applicable to this Report.

17. RECOVERY METHODS

This section is not applicable to this Report.

18. PROJECT INFRASTRUCTURE

This section is not applicable to this Report.

19. MARKET STUDIES AND CONTRACTS

This section is not applicable to this Report.

20. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Environmental Studies Done and Relevant Environmental Issues

A basic environmental condition study by GTK (Putkinen *et al* 2006, in Finnish) was made in the area of Hirsikangas. The text below is from the abstract of that report.

No Natura or any other protected areas occur in the area or in neighbourhood. The quaternary deposits and bedrock as well as the conditions of surface and ground water of the actual claim area and its immediate surroundings are described in the report. The analyse results of the surface and ground water samples, brook sediments and soil samples taken in the summer 2006 are also presented (Putkinen *et al* 2006).

NAR Oy had a preliminary nature study made from the area within the current Hirsikangas reservations in winter 2018. The work was carried out as desktop study by Eurofins Ahma Oy. No such objectives or natural values were identified, that would influence exploration work (Väyrynen 2018).

Eurofins Ahma Oy is also contracted for the monitoring of the quality of surface waters from seven monitoring points over the exploration area. The samples are collected and analysed four times of year.

20.2 Applicable Codes

20.2.1 Mining Code

Mining and exploration projects in Finland are subject to the Finland Mining Act (621/2011). The General Provisions of this act are described as follows:

The objective of this Act is to promote mining and organise the use of areas required for it, and exploration, in a socially, economically, and ecologically sustainable manner. In order to fulfil the purpose of the Act, the securing of public and private interests is required, with particular attention to:

1) *the preconditions for engaging in mining activity;*
2) *the legal status of landowners and private parties sustaining damage; and*
3) *the impacts of activities on the environment and land use, and the economic use of natural resources.*

A further objective of the Act is to ensure the municipalities' opportunities to influence decision-making, and the opportunities of individuals to influence decision-making involving them and their living environment. Furthermore, an objective of the Act is to promote the safety of mines and to prevent, decrease, and avert any inconvenience and damage incurred in the activities referred to in this Act, and to ensure liability for damages for the party causing the inconvenience or damage.

20.2.2 Environmental Code

The Mining Act (621/2011) also refers to other legislation for "*decisions on permit issues or other matters hereunder and other activities in accordance with this Act shall comply with, inter alia, the provisions of the Nature Conservation Act (1096/1996), the Environmental Protection Act (86/2000), the Act on the Protection of Wilderness Reserves (62/1991), the Land Use and Building Act (132/1999), the Water Act (264/1961), the Reindeer Husbandry Act (848/1990), the Radiation Act (592/1991), the Nuclear Energy Act (990/1987), the Antiquities Act (295/1963), the Off-Road Traffic Act (1710/1995) and the Dam Safety Act (494/2009)*".

20.2.3 Regulations

Regulations specified for exploration permits in the Mining Act (621/2011).

Section 51 - Regulations to be included in an exploration permit.

The exploration permit shall specify provisions for the location and borders of the exploration area. The exploration permit shall include the necessary provisions for securing public and private interests concerning the following:

1) *the times and methods of exploration surveys and the equipment and constructions related to exploration;*
2) *measures to diminish harm caused to reindeer herding in a special reindeer herding area;*
3) *wording to ensure that activity under the permit will not endanger the status of the Sami as an indigenous people in the Sami Homeland, or the rights of the Skolts in accordance with the Skolt Act in the Skolt area;*
4) *obligation to report about exploration activities and results;*
5) *post-mining measures and the final deadline for submission of notification concerning these measures;*
6) *the waste management plan for extractive waste and compliance therewith;*
7) *the obligation to report on the exploration work to the appropriate authority overseeing public interests within its line of duty;*
8) *the schedule for decreasing the size of the exploration area;*
9) *collateral in accordance with Chapter 10;*
10) *other terms concerning exploration and use of the exploration area in order to ensure that the activity does not result in any consequence prohibited by this Act 16; and*
11) *other specifications that are necessary in view of public and private interests and pertaining to the implementation of the conditions of the permit.*

20.2.4 Environmental Protection Policies and Strategies

Rupert Resources has a corporate social policy, environmental policy, community policy and health and safety policy that have been designed provide a risk management framework for the Project. These documents are available on the Company website. As Rupert's subsidiary, the same policies apply to Northern Aspect as well. There are no Natura areas or national protected areas on Northern Aspect's current land package.

20.2.5 International Agreements, Protocols and Conventions

Rupert's activities are currently confined to Finland where local legislation is considered to meet or exceed international best practice. Rupert also holds two project in Canada that are currently dormant.

21. CAPITAL AND OPERATING COSTS

This section is not applicable to this Report.

22. ECONOMIC ANALYSIS

This section is not applicable to this Report.

23. ADJACENT PROPERTIES

The existing mines in the same region as the Hirsikangas Gold Project are Hitura Ni-Cu- mine, the Laivakangas gold mine and Pyhäsalmi Zn-Cu-S mine in Pyhäjärvi (see Figure 5.4_1).

- Hitura Ni-Cu mine 70km ESE from Hirsikangas was operated by Belvedere Mining Oy until the closure of the mine in 2013.
- Pyhäsalmi mine some 130km ESE from the project site is the deepest base metal mine in Europe. It is operated by First Quantum Minerals and the estimated closure will take place in 2019.
- Laivakangas gold mine in Raahe, 70km NNE from Hirsikangas was previously owned and operated by Nordic Mines. The production was closed in 2014. The current owner, Firesteel Resources, is planning on re-opening the mine in autumn 2018.

24. OTHER RELEVANT DATA AND INFORMATION

This section is not applicable to this Report.

25. INTERPRETATION AND CONCLUSIONS

The new Inferred Mineral Resource of 2,270kt grading 1.2g/t Au (89koz) is reported using a 0.5g/t cutoff and is based on an updated geological interpretation of the deposit following a review of all available data that has been collected since project initiation. Additionally, the Mineral Resource is reported entirely within an optimised pit shell and significant unreported mineralisation extends at depth beneath this pit.

The current Inferred Mineral Resource therefore represents a recoverable resource reported within an open pit. This represents a significant difference from the previous (2009) Mineral Resource which was an in situ estimate and reported to a much greater depth. The previous Mineral Resource was not subject to any rigorous test of potential criteria for eventual economic extraction such as pit optimisation algorithms. Using the cutoff grade of 0.5g/t Au, the previous Mineral Resource comprised of Indicated Mineral Resources of 3.002Mt at a grade of 1.23g/t Au for 119koz gold and Inferred Mineral Resources of 2.673Mt at a grade of 1.27g/t Au for 109koz gold.

The current Inferred Mineral Resource is open to the south-east and at depth. The interpretation of the currently defined mineralisation is that it represents a relatively high level in the mineralised system and that the mineralisation will potentially extend to depth. This has partially been confirmed by the latest drill campaign by NAR Oy which intersected mineralisation beneath the historic GTK drilling.

NAR Oy have also drilled parallel or offset target structures during 2018 drilling. A number of parallel breccia zones with mineralised quartz veining were identified. Gold mineralisation in these structures appears sporadic to date however the drill spacing is wide and insufficient to determine the true continuity of those structures. Potential therefore exists to identify parallel or offset mineralised structures and thereby add to existing mineral resources.

26. RECOMMENDATIONS

The Hirsikangas gold deposit is controlled by a NW-SE trending structure which extends for approximately 30km on a land position entirely held by Rupert Resources. The reported resource is contained on 800m of this strike and potential to extend the resource exists to the south east, where mineralisation has not been fully closed out. The resource reported is constrained by an open pit to a depth of 120m but mineralisation is shown to continue to a depth of 300m.

Further work at the Hirsikangas deposit should be focused on increasing the resource by drill testing continuity of the mineralisation along strike of the main deposit. Mineralisation also extends at depth and is currently open. A step-out drill program to systematically test the resource in this area could incorporate currently outlying mineralisation. In addition, further drill testing of parallel and off-set structures, which have been identified from reconnaissance exploration drilling, would be warranted to increase the overall resource.

It is also recommended that metallurgical and beneficiation studies be undertaken to improve confidence.

Further regional exploration should also be considered in order to identify additional resources associated with the fertile structure that controls the Hirsikangas mineralisation. Known gold occurrences along trend, such as the Hanni mineralisation previously identified by GTK, indicates that potential exists for encouraging exploration targets. A regional program of soil/base of till sampling, coupled with detailed interpretation of the available geophysics, may allow further targets to be developed. A potential exploration program and costings is tabulated in Table 26_1.

Table 26_1
Hirsikangas Gold Deposit
Proposed Exploration Program

Item	Cost (€)
Resources Extension Drilling	500,000
Drill Testing of Parallel and Offset Structures	500,000
Reconnaissance Exploration Geochemistry	200,000
Drill Targeting of Geochem Targets	200,000
Metallurgical and Beneficiation Study	50,000
Total	**1,450,000**

27. REFERENCES

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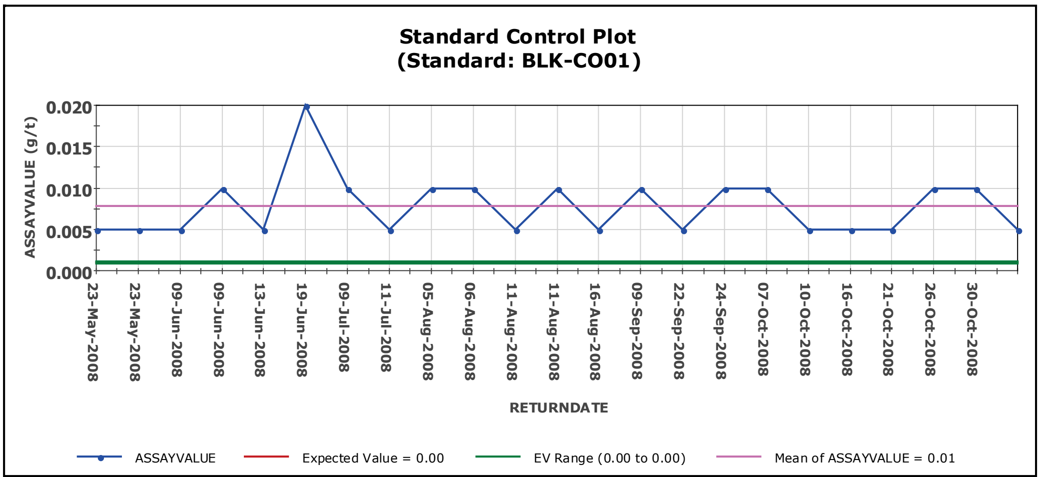
RUPERT RESOURCES

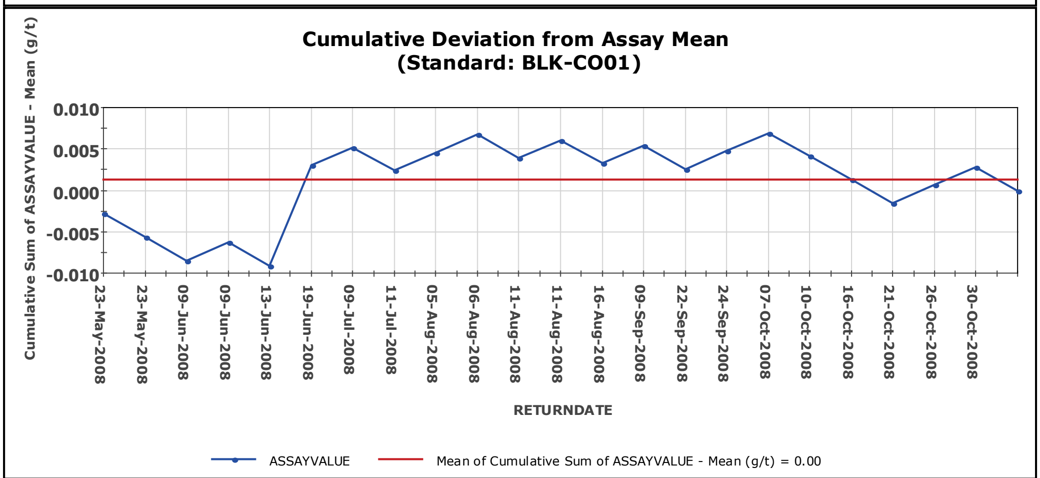
Appendix 1

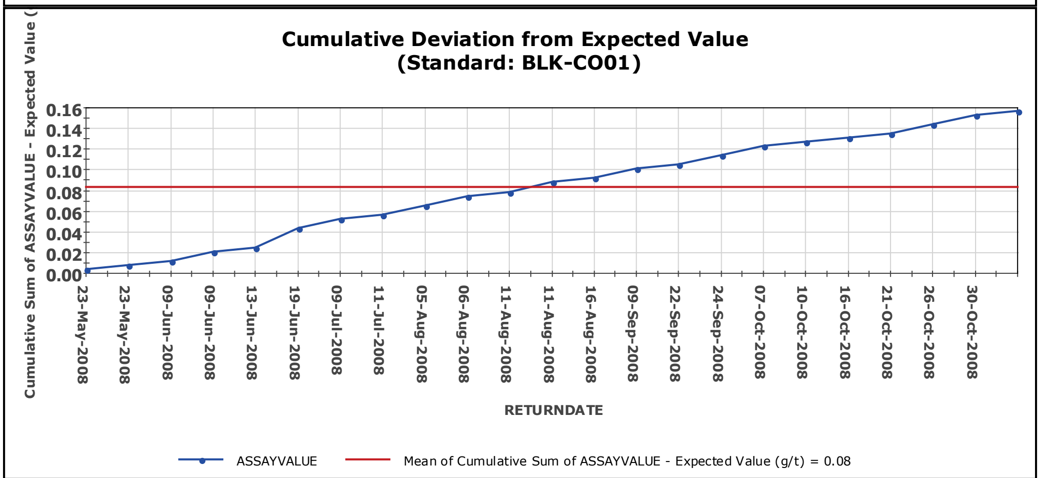
CRM Control Graphs for CRM submitted by Belvedere to ALS

Summary
(Standard: BLK-CO01)

Standard:	BLK-CO01	No of Analyses:	23
Element:	ASSAYVALUE	Minimum:	0.01
Units:		Maximum:	0.02
Detection Limit:		Mean:	0.01
Expected Value (EV):	0.00	Std Deviation:	0.00
E.V. Range:	0.00 to 0.00	% in Tolerance	0.00 %
		% Bias	682.61 %
		% RSD	45.47 %







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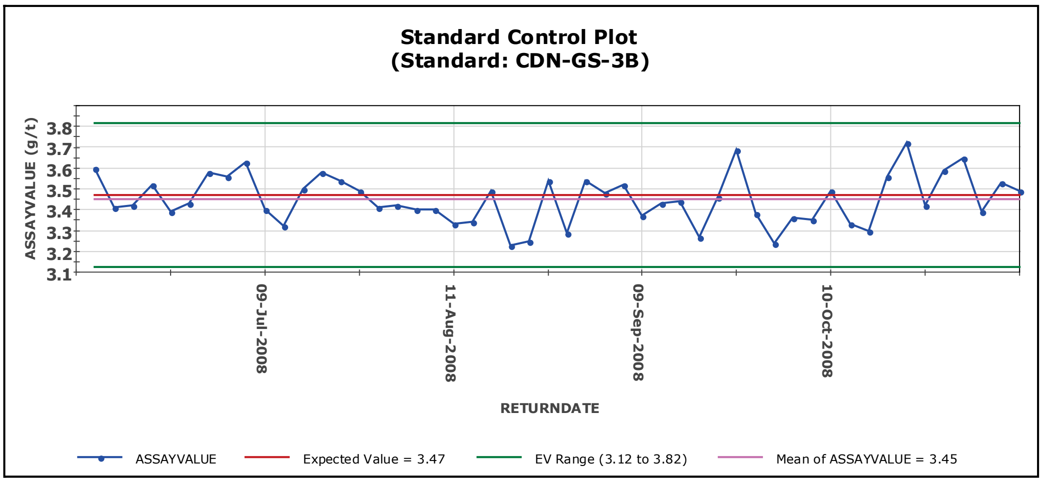
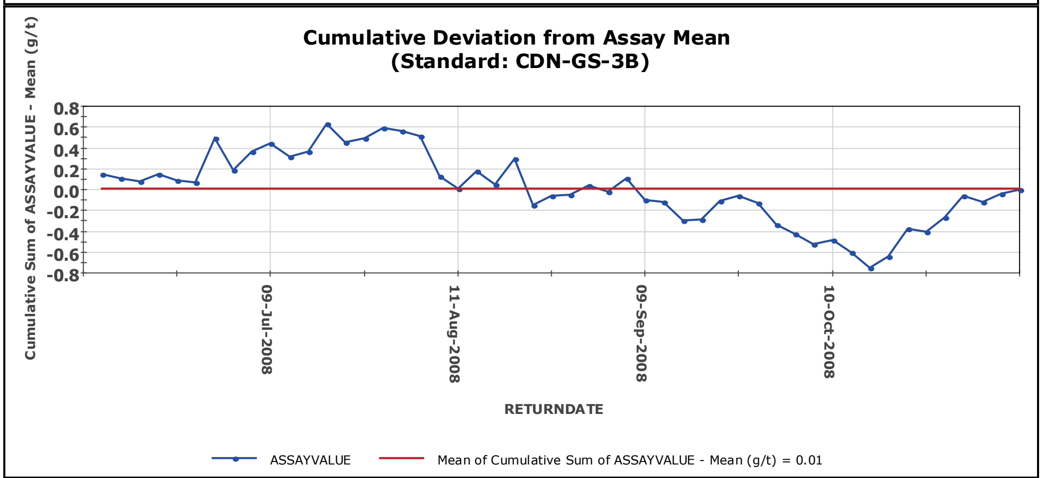
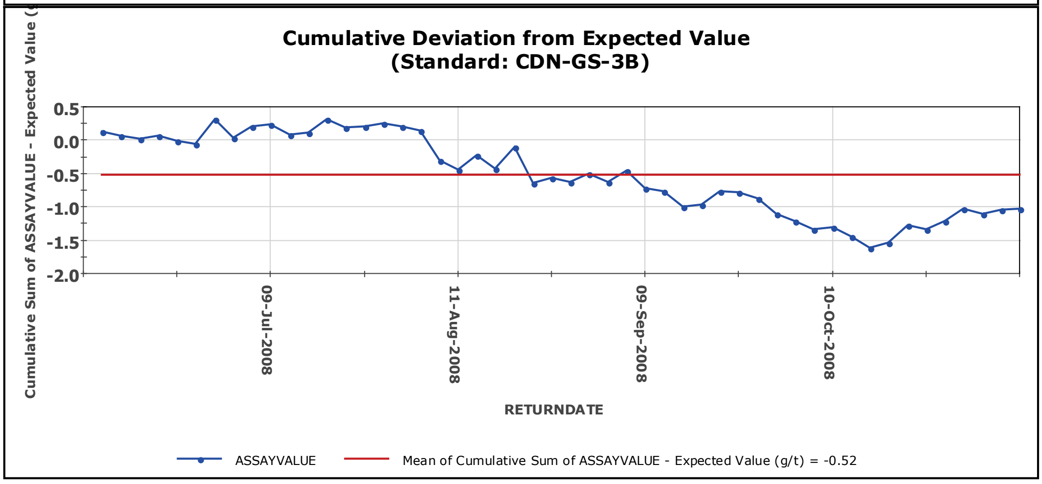
Summary
(Standard: CDN-GS-3B)

Standard:	CDN-GS-3B	No of Analyses:	50
Element:	ASSAYVALUE	Minimum:	3.23
Units:		Maximum:	3.72
Detection Limit:		Mean:	3.45
Expected Value (EV):	3.47	Std Deviation:	0.12
E.V. Range:	3.12 to 3.82	% in Tolerance	100.00 %
		% Bias	-0.59 %
		% RSD	3.37 %







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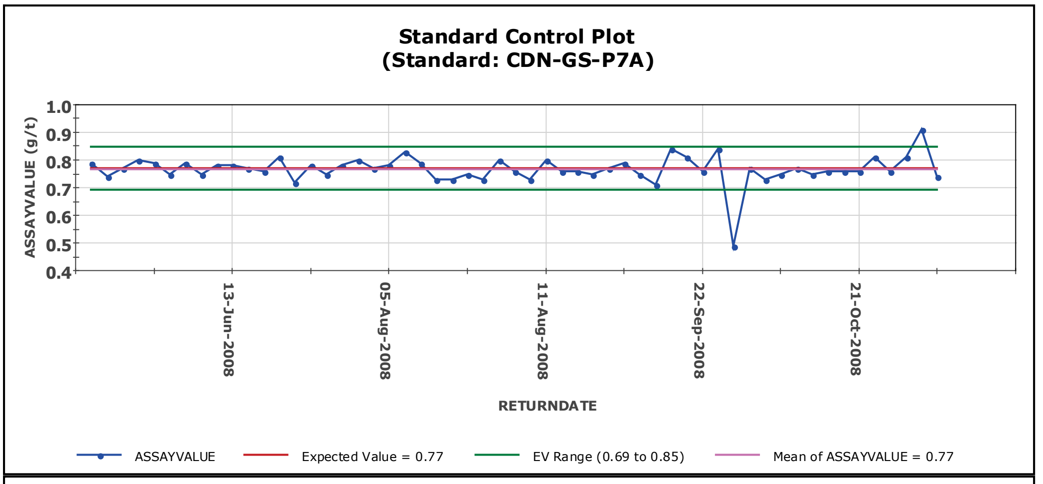
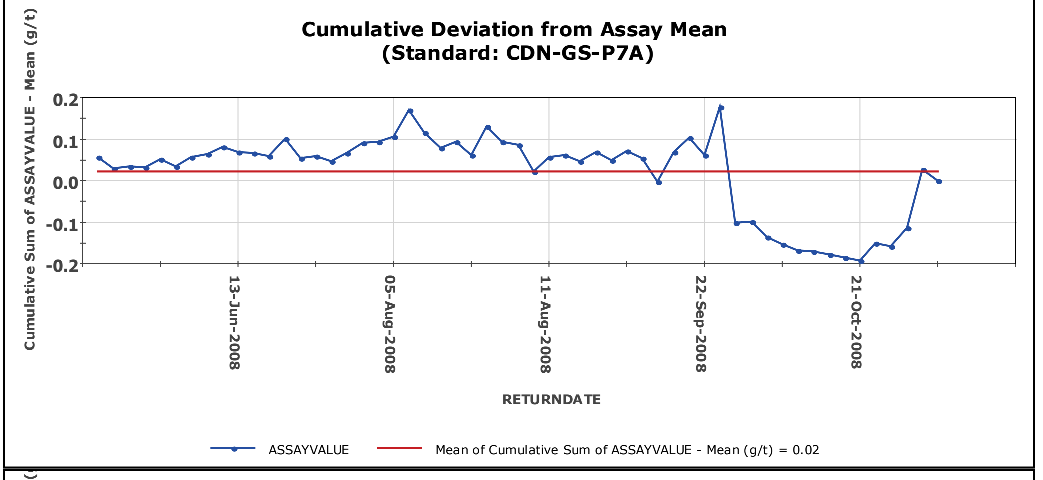
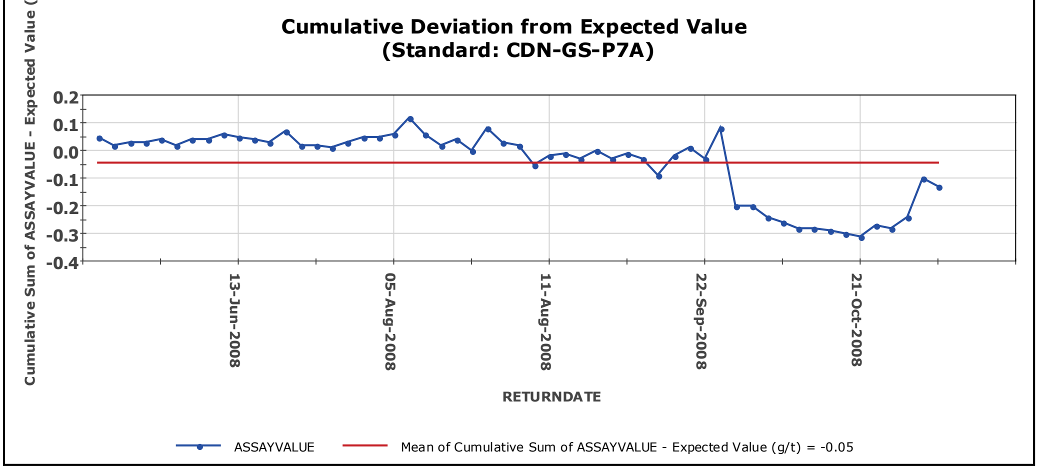
Summary
(Standard: CDN-GS-P7A)

Standard:	CDN-GS-P7A	No of Analyses:	55
Element:	ASSAYVALUE	Minimum:	0.49
Units:		Maximum:	0.91
Detection Limit:		Mean:	0.77
Expected Value (EV):	0.77	Std Deviation:	0.05
E.V. Range:	0.69 to 0.85	% in Tolerance	96.36 %
		% Bias	-0.31 %
		% RSD	6.66 %







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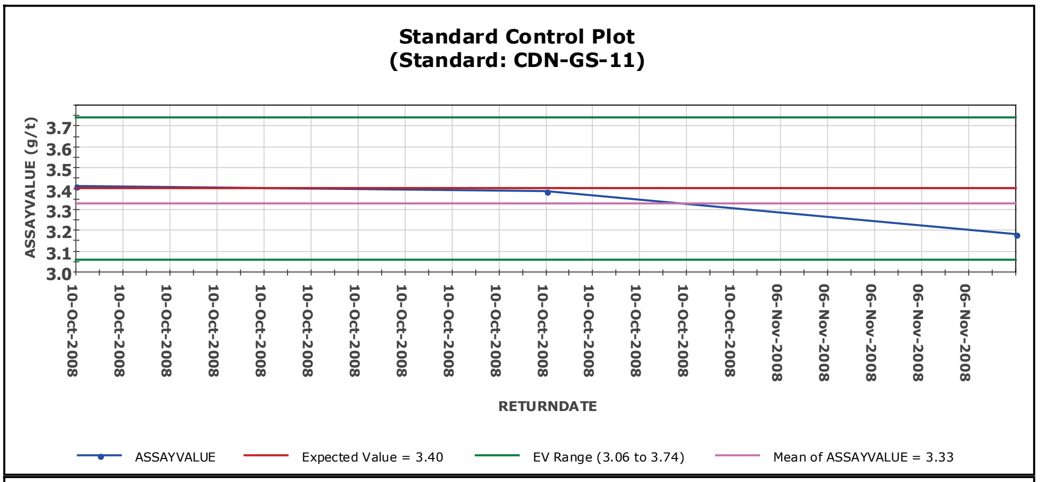
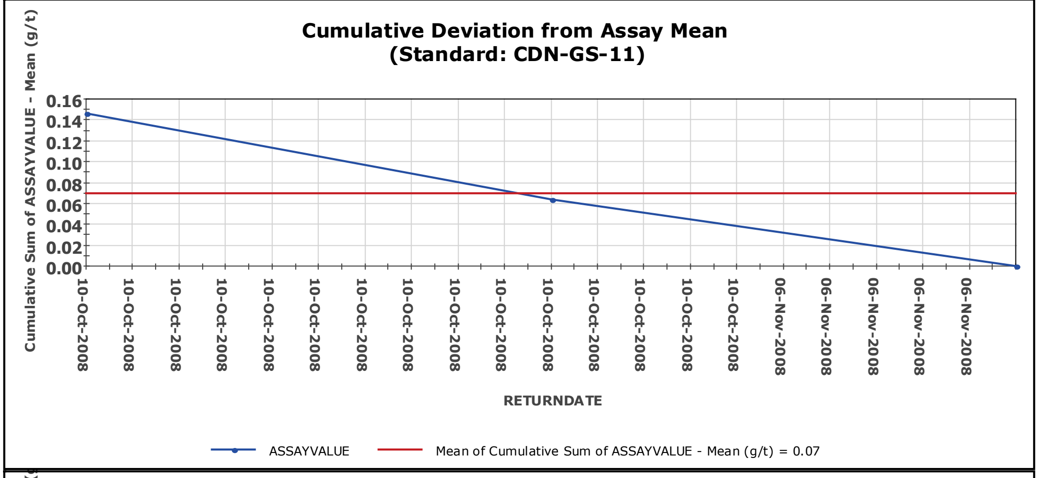
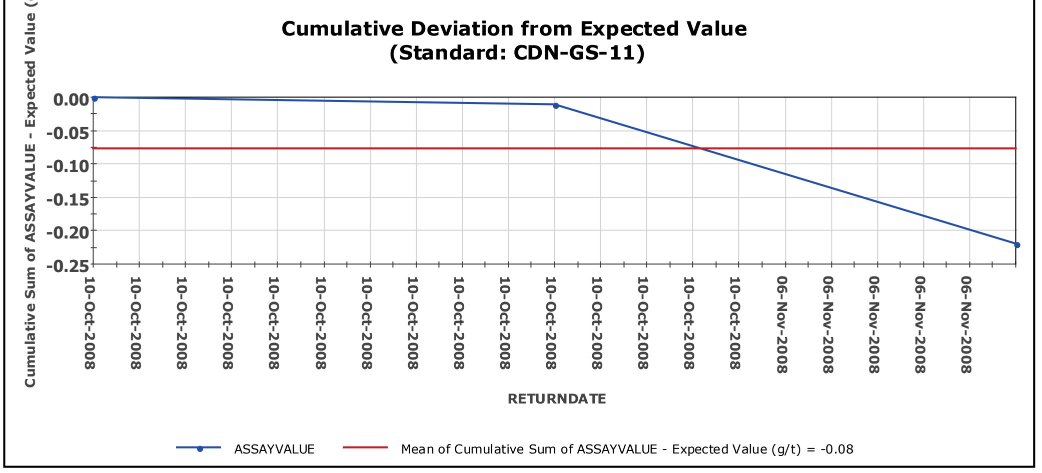
Summary
(Standard: CDN-GS-11)

Standard:	CDN-GS-11	No of Analyses:	3
Element:	ASSAYVALUE	Minimum:	3.18
Units:		Maximum:	3.41
Detection Limit:		Mean:	3.33
Expected Value (EV):	3.40	Std Deviation:	0.10
E.V. Range:	3.06 to 3.74	% in Tolerance	100.00 %
		% Bias	-2.16 %
		% RSD	3.13 %







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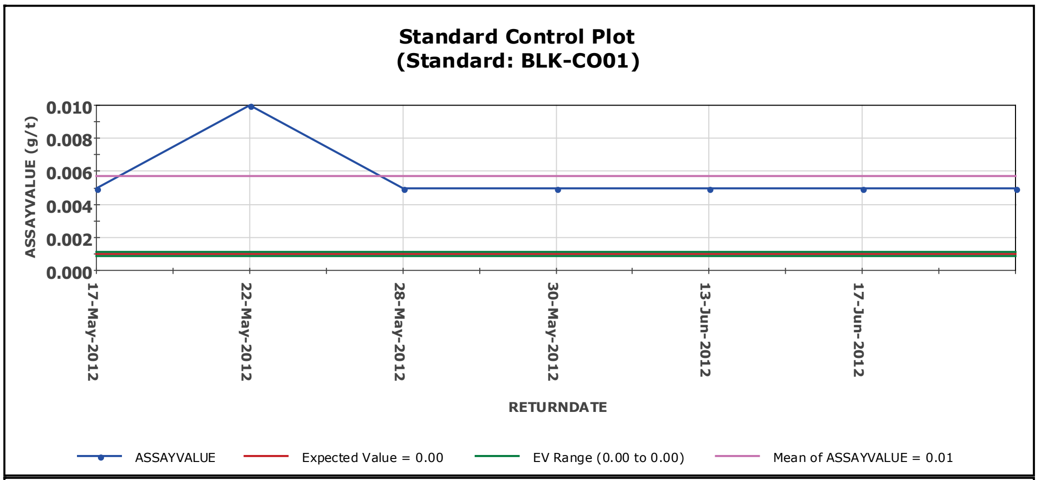
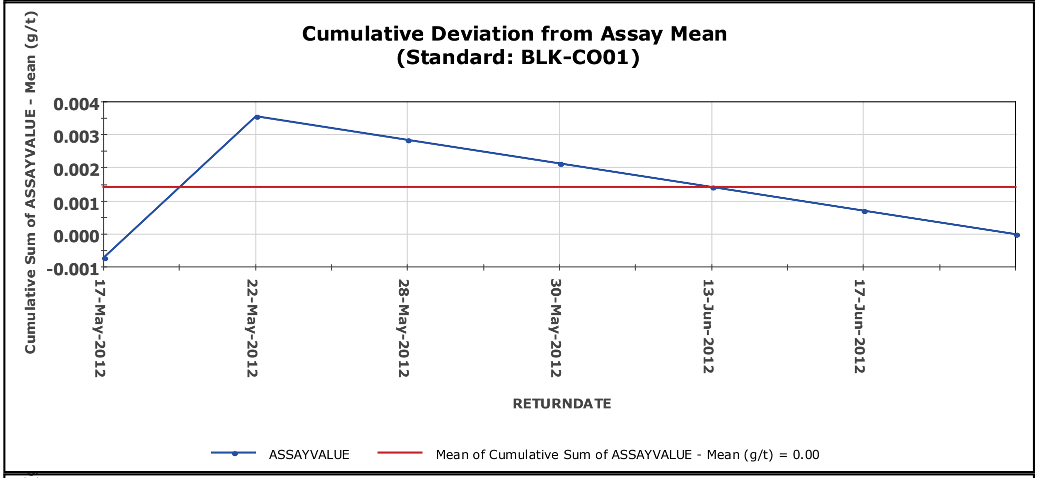
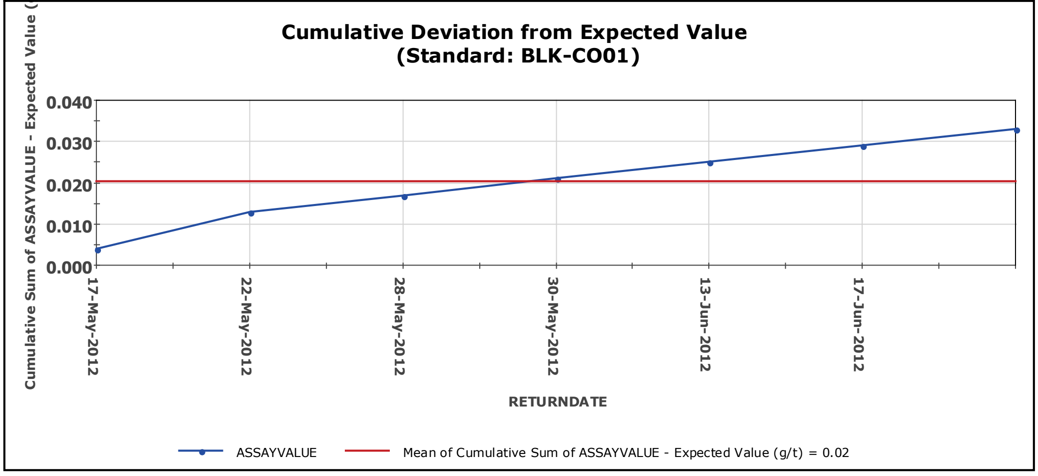
Summary
(Standard: BLK-CO01)

Standard:	BLK-CO01	No of Analyses:	7
Element:	ASSAYVALUE	Minimum:	0.01
Units:		Maximum:	0.01
Detection Limit:		Mean:	0.01
Expected Value (EV):	0.00	Std Deviation:	0.00
E.V. Range:	0.00 to 0.00	% in Tolerance	0.00 %
		% Bias	471.43 %
		% RSD	30.62 %







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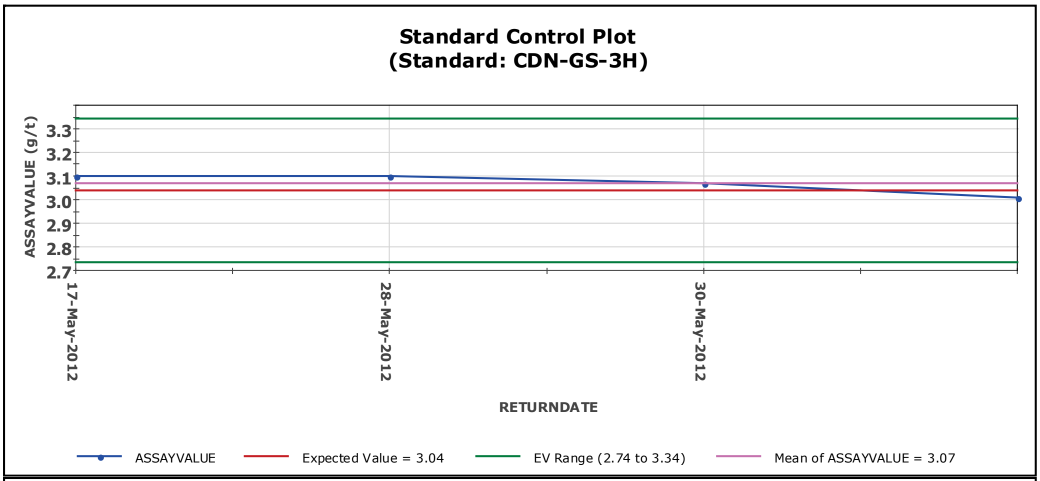
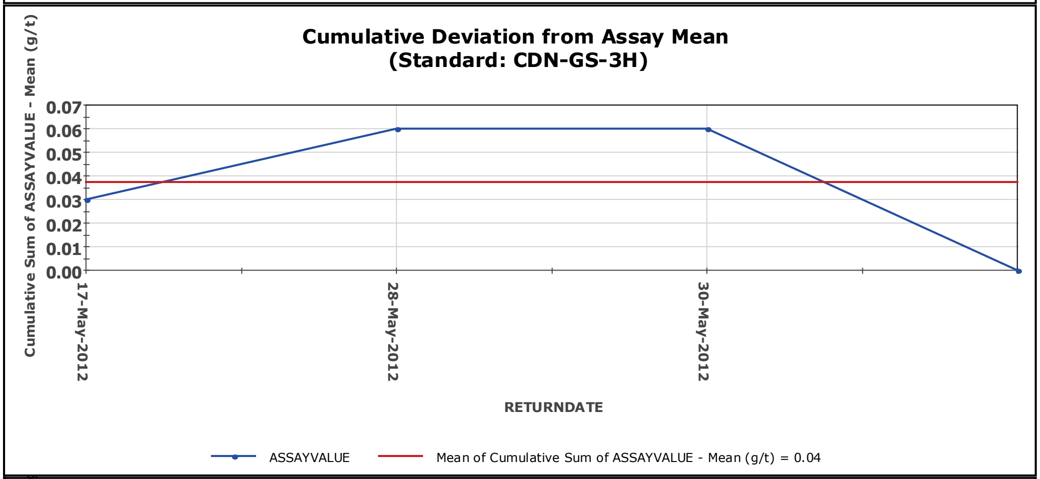
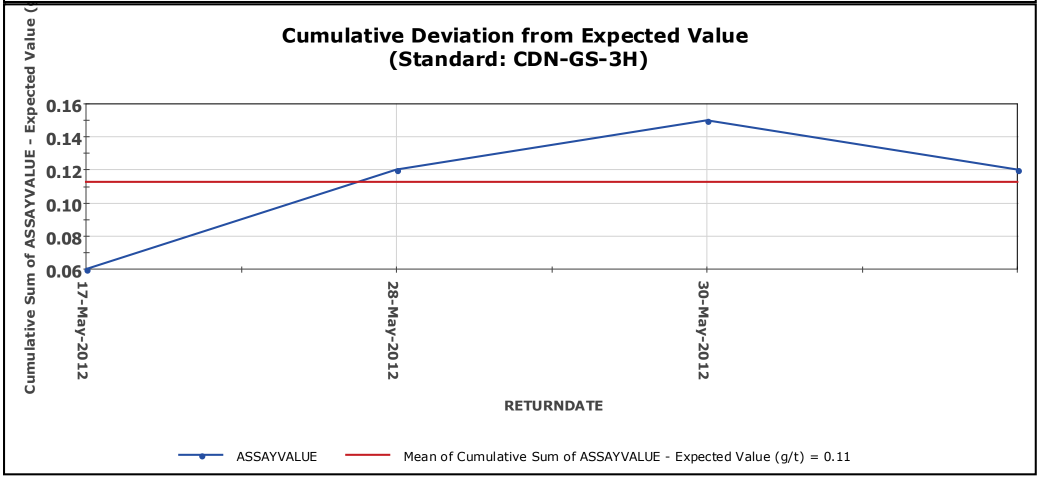
Summary
(Standard: CDN-GS-3H)

Standard:	CDN-GS-3H	No of Analyses:	4
Element:	ASSAYVALUE	Minimum:	3.01
Units:		Maximum:	3.10
Detection Limit:		Mean:	3.07
Expected Value (EV):	3.04	Std Deviation:	0.04
E.V. Range:	2.74 to 3.34	% in Tolerance	100.00 %
		% Bias	0.99 %
		% RSD	1.20 %







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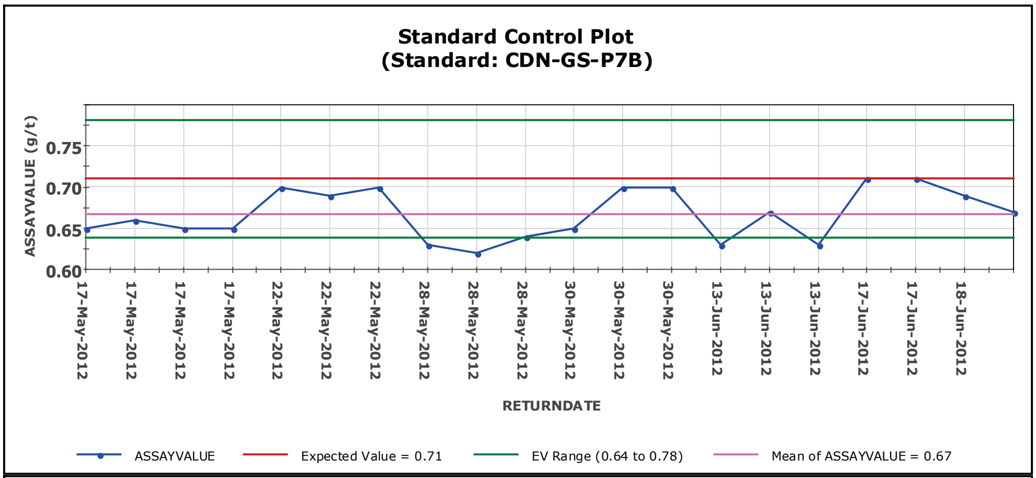
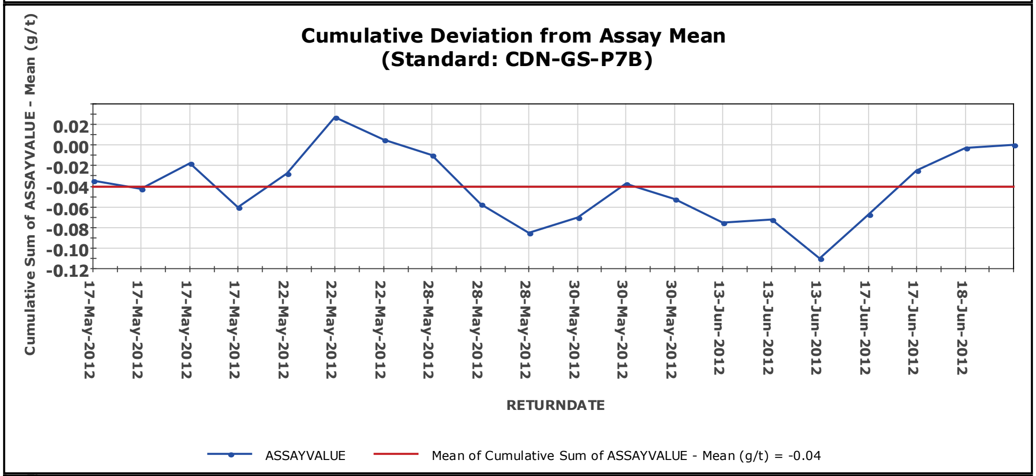
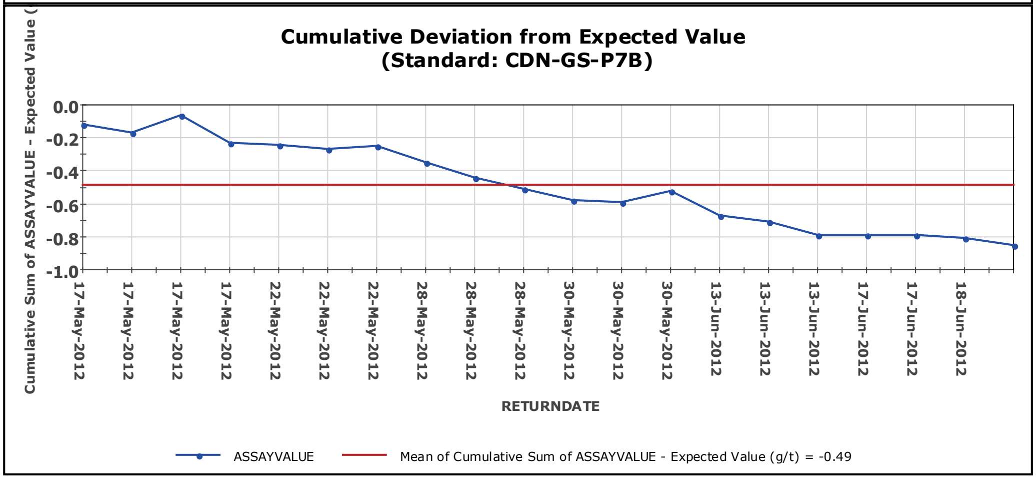
Summary
(Standard: CDN-GS-P7B)

Standard:	CDN-GS-P7B	No of Analyses:	20
Element:	ASSAYVALUE	Minimum:	0.62
Units:		Maximum:	0.71
Detection Limit:		Mean:	0.67
Expected Value (EV):	0.71	Std Deviation:	0.03
E.V. Range:	0.64 to 0.78	% in Tolerance	80.00 %
		% Bias	-5.99 %
		% RSD	4.42 %







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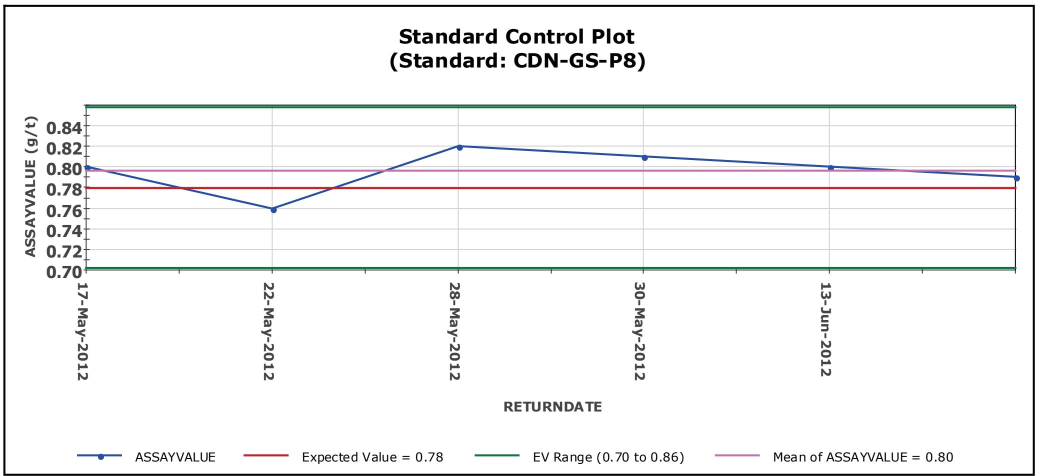
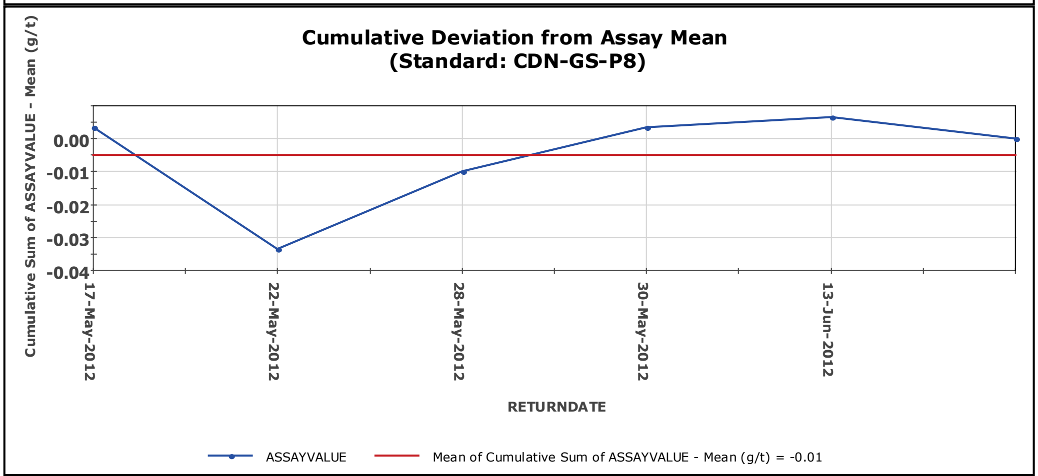
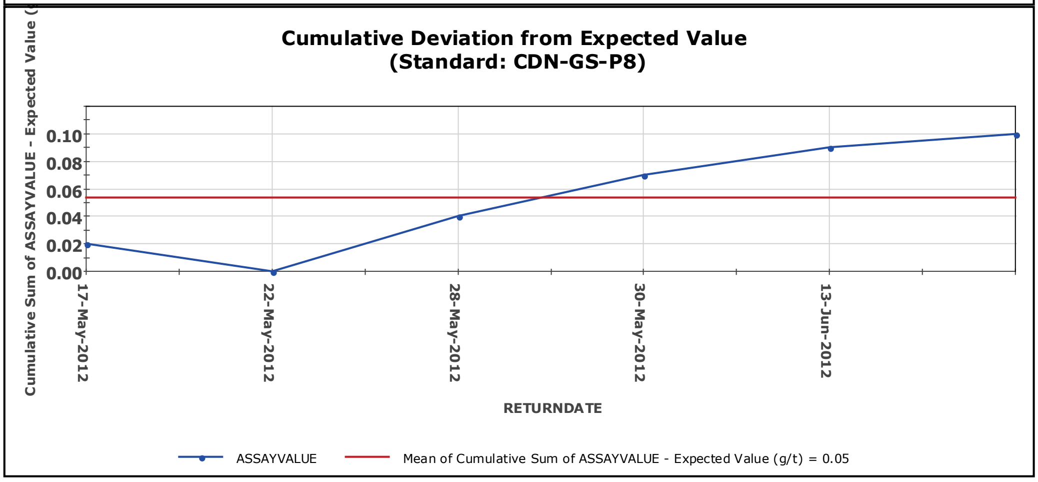
Summary
(Standard: CDN-GS-P8)

Standard:	CDN-GS-P8	No of Analyses:	6
Element:	ASSAYVALUE	Minimum:	0.76
Units:		Maximum:	0.82
Detection Limit:		Mean:	0.80
Expected Value (EV):	0.78	Std Deviation:	0.02
E.V. Range:	0.70 to 0.86	% in Tolerance	100.00 %
		% Bias	2.14 %
		% RSD	2.37 %







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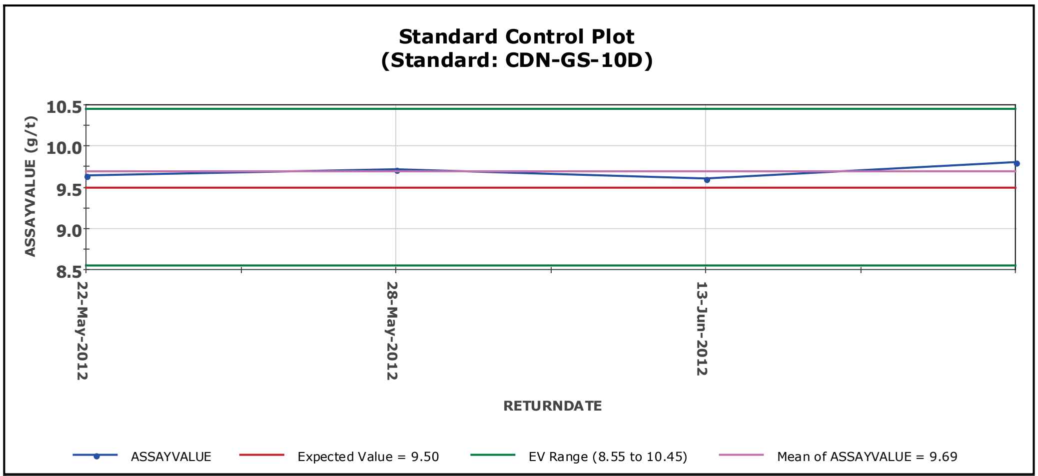
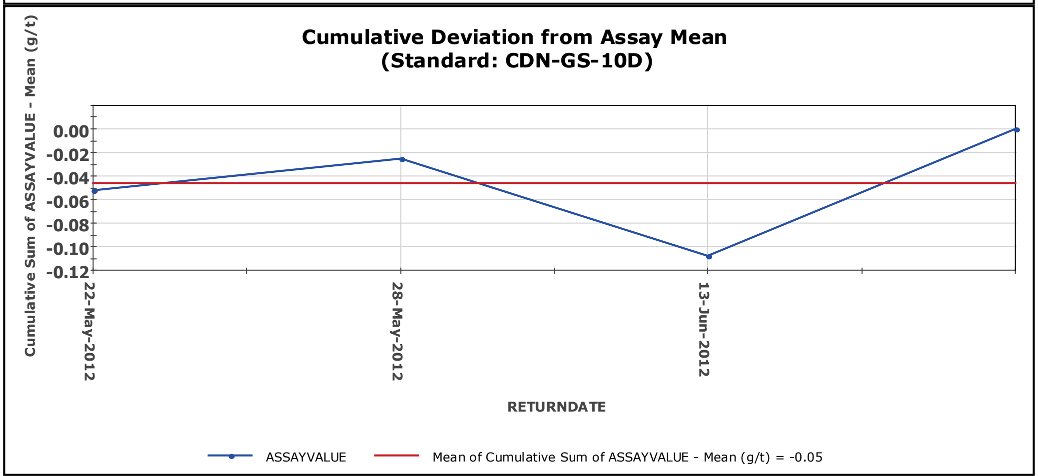
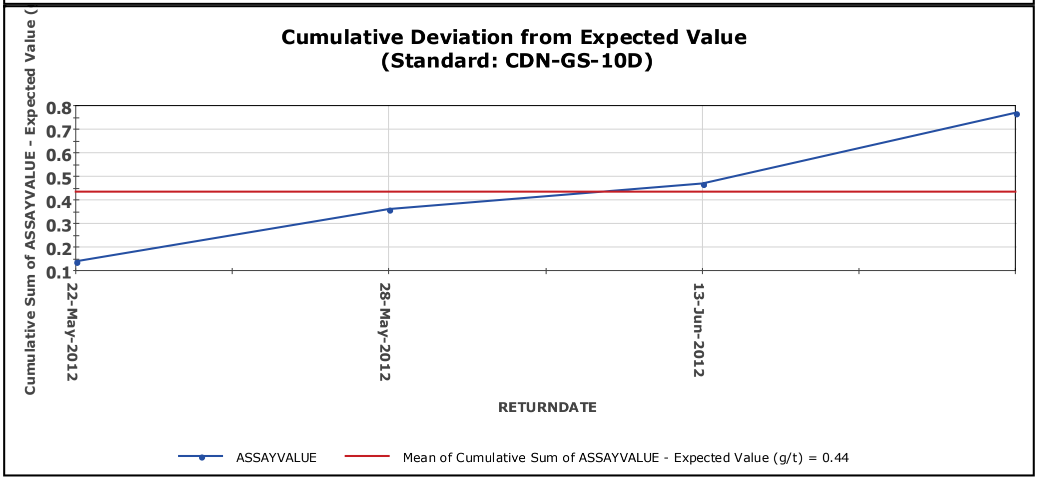
Summary
(Standard: CDN-GS-10D)

Standard:	CDN-GS-10D	No of Analyses:	4
Element:	ASSAYVALUE	Minimum:	9.61
Units:		Maximum:	9.80
Detection Limit:		Mean:	9.69
Expected Value (EV):	9.50	Std Deviation:	0.07
E.V. Range:	8.55 to 10.45	% in Tolerance	100.00 %
		% Bias	2.03 %
		% RSD	0.76 %







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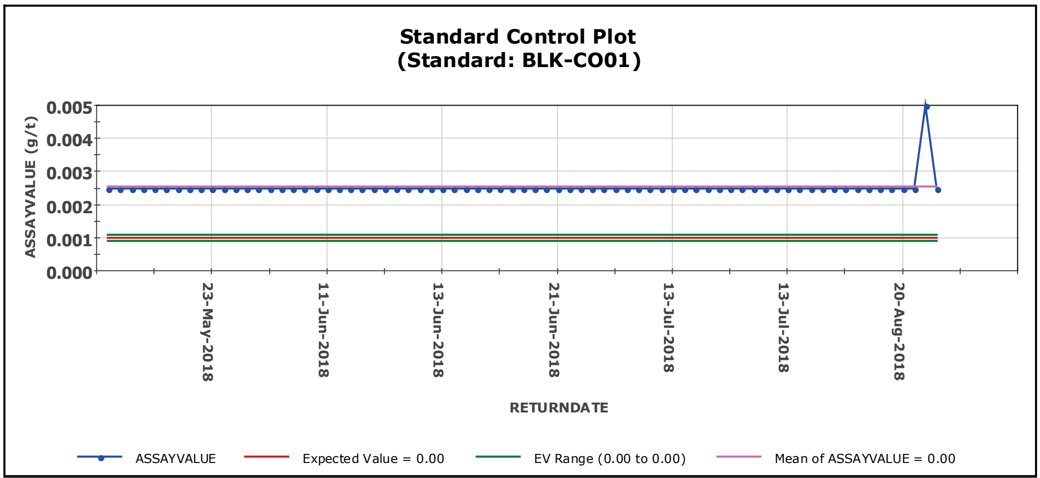
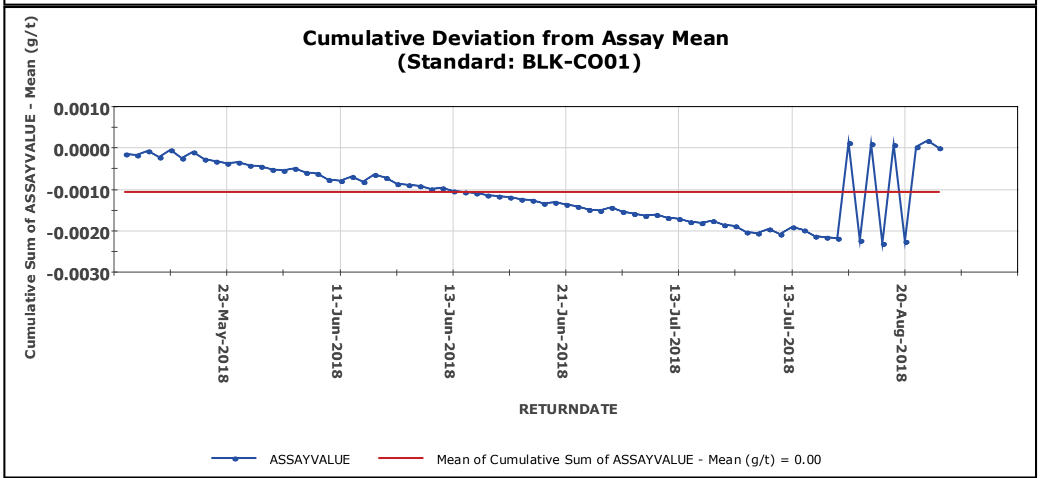
Appendix 2

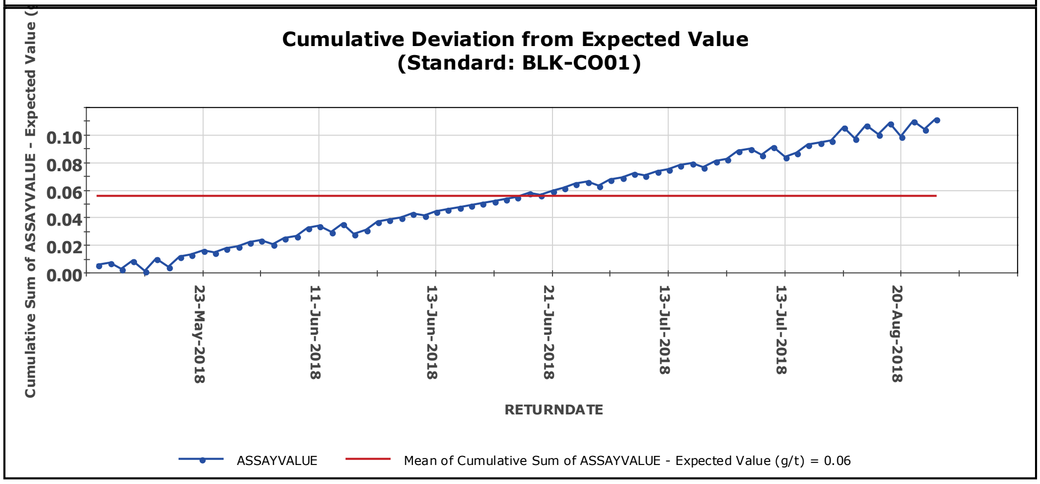
Control Graphs for Standards submitted by NARL to ALS

Summary
(Standard: BLK-CO01)

Standard:	BLK-CO01	No of Analyses:	73
Element:	ASSAYVALUE	Minimum:	0.00
Units:		Maximum:	0.01
Detection Limit:		Mean:	0.00
Expected Value (EV):	0.00	Std Deviation:	0.00
E.V. Range:	0.00 to 0.00	% in Tolerance	0.00 %
		% Bias	153.42 %
		% RSD	11.47 %



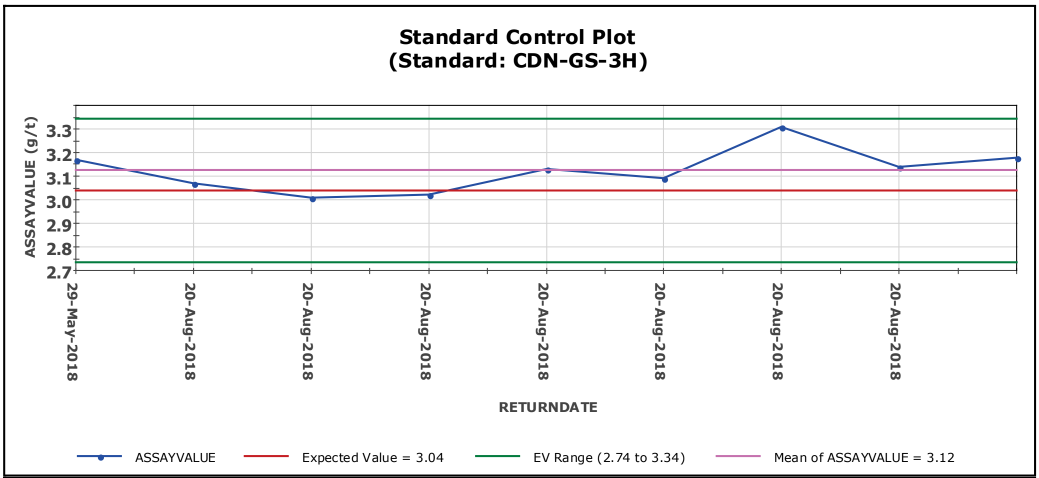


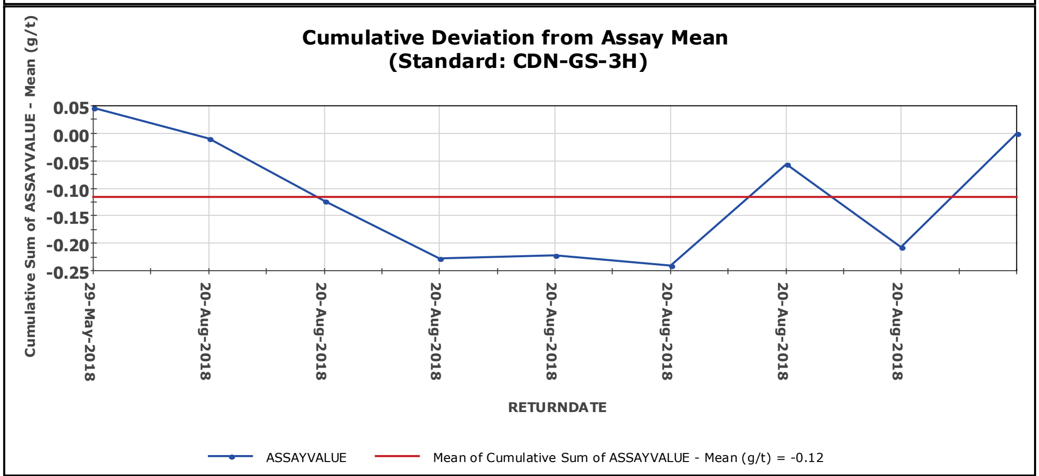


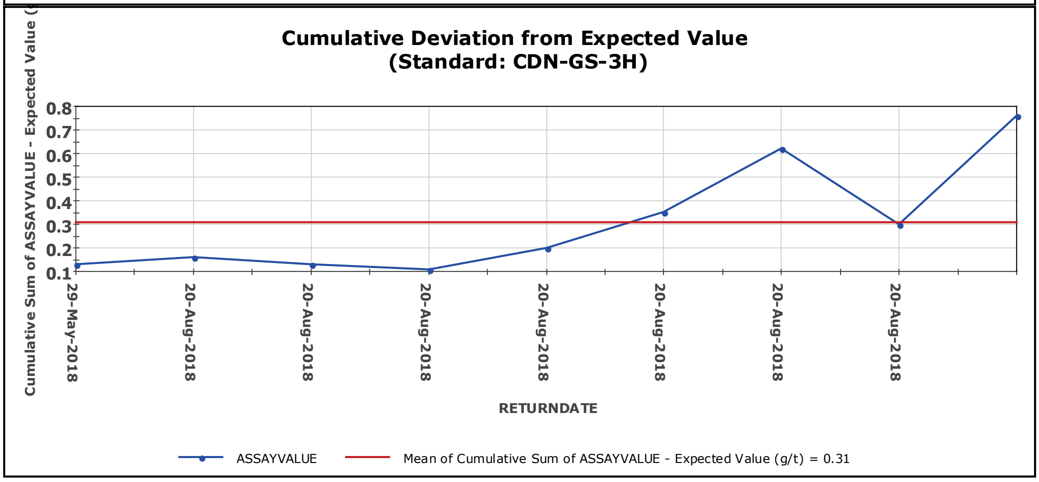
Printed: 29-Oct-2018 14:40:50 Data Refreshed: 29-Oct-2018 14:40:36 Page 1

Summary
(Standard: CDN-GS-3H)

Standard:	CDN-GS-3H	No of Analyses:	9
Element:	ASSAYVALUE	Minimum:	3.01
Units:		Maximum:	3.31
Detection Limit:		Mean:	3.12
Expected Value (EV):	3.04	Std Deviation:	0.09
E.V. Range:	2.74 to 3.34	% in Tolerance	100.00 %
		% Bias	2.78 %
		% RSD	2.78 %



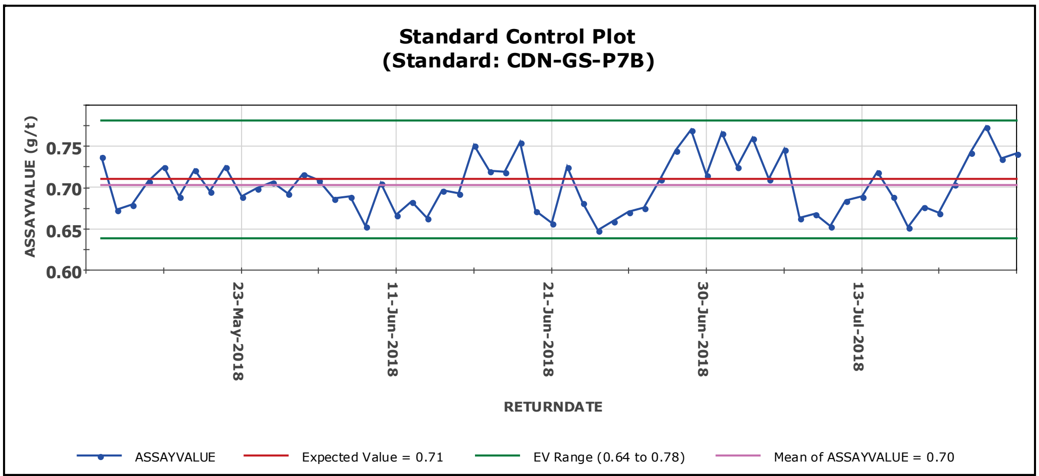


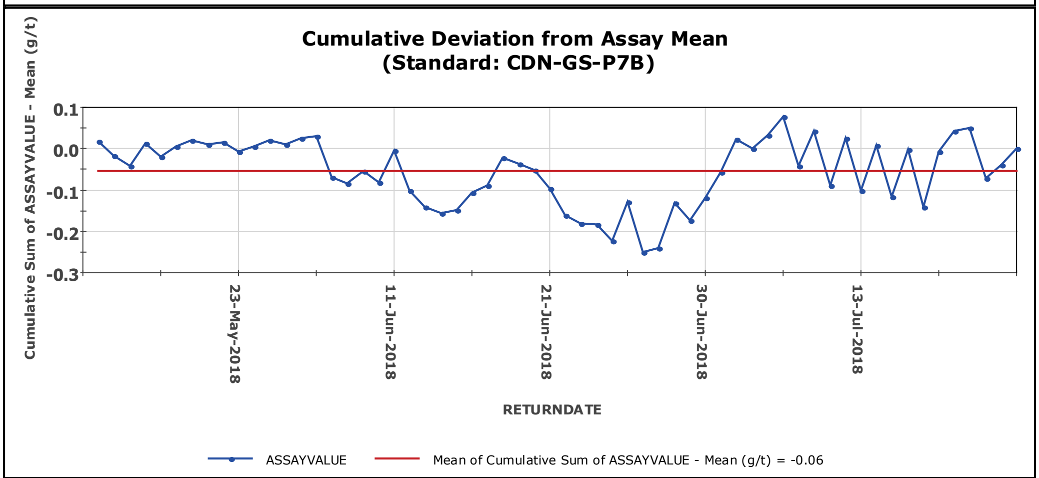


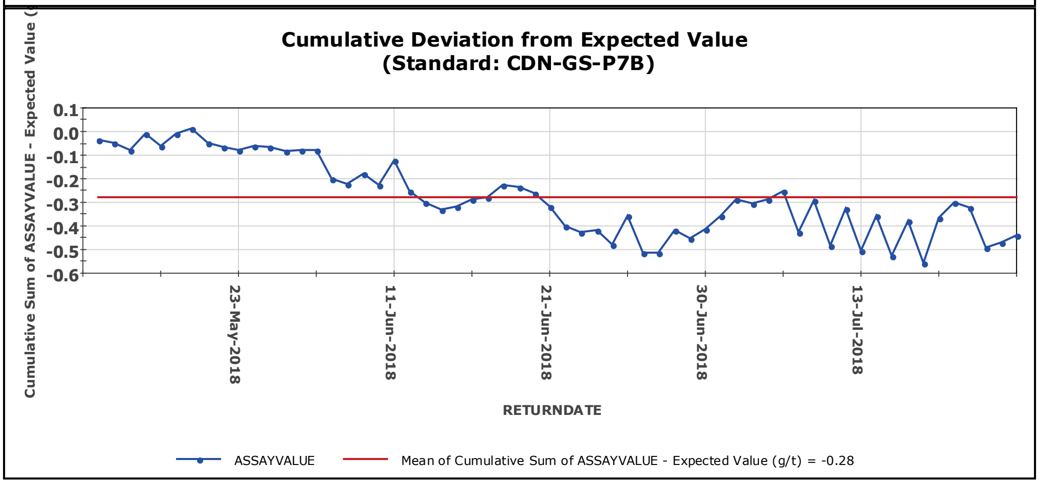
Printed: 29-Oct-2018 14:41:59 Data Refreshed: 29-Oct-2018 14:40:36 Page 1

Summary
(Standard: CDN-GS-P7B)

Standard:	CDN-GS-P7B	No of Analyses:	60
Element:	ASSAYVALUE	Minimum:	0.65
Units:		Maximum:	0.77
Detection Limit:		Mean:	0.70
Expected Value (EV):	0.71	Std Deviation:	0.03
E.V. Range:	0.64 to 0.78	% in Tolerance	100.00 %
		% Bias	-1.03 %
		% RSD	4.62 %



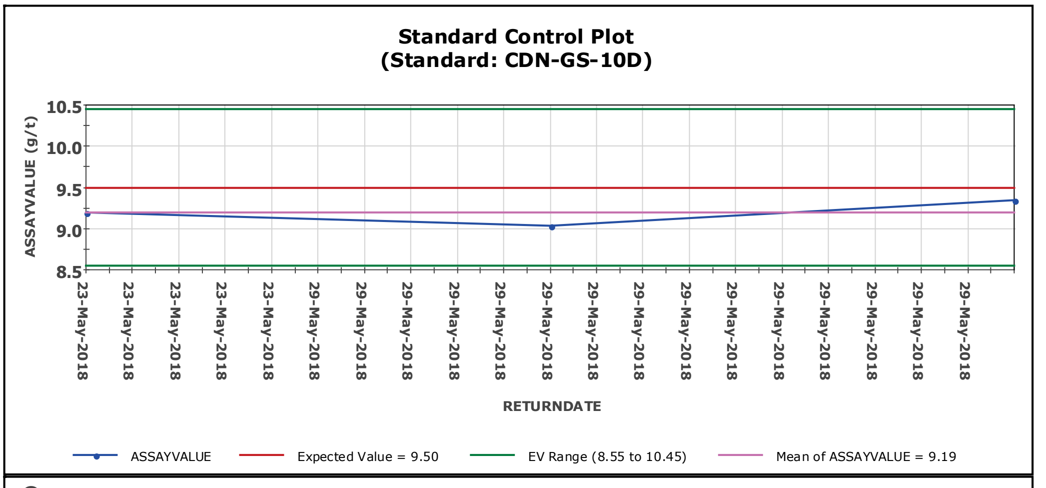


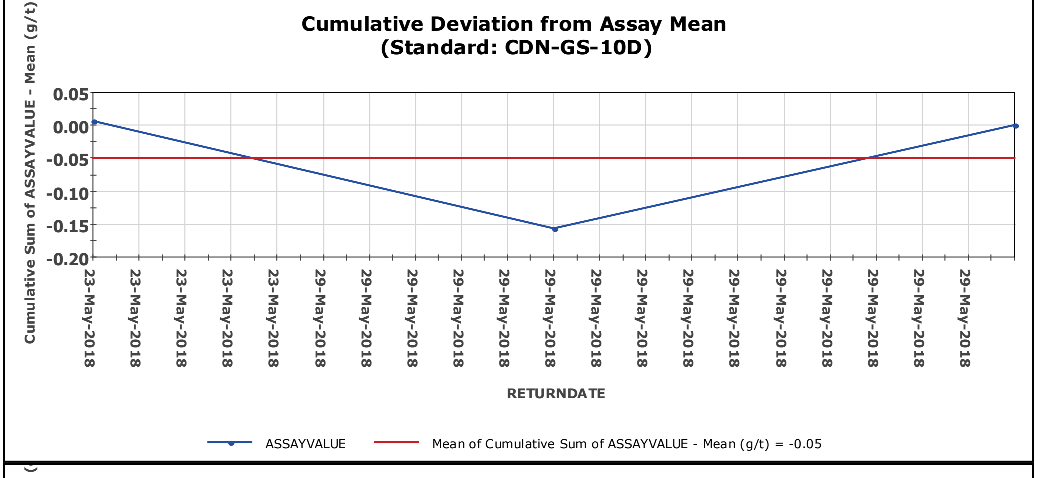


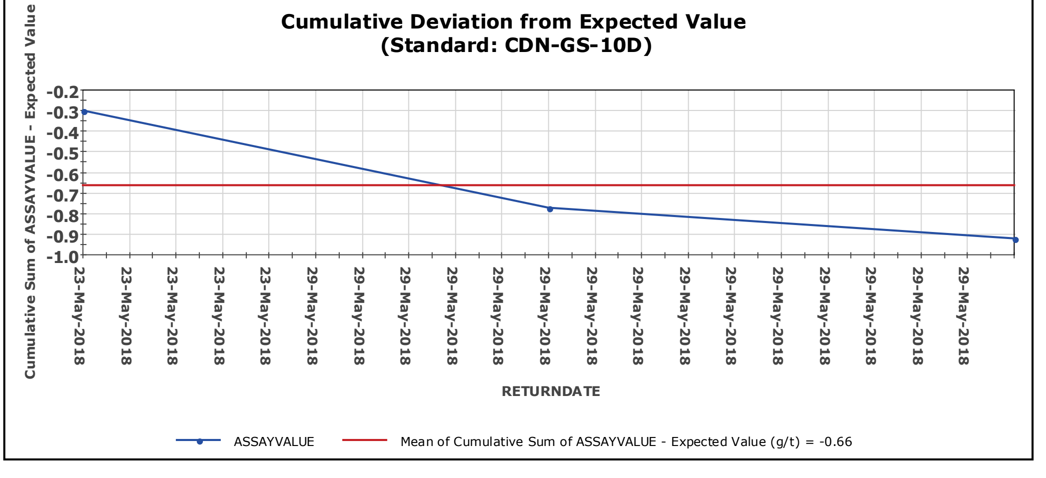
Printed: 29-Oct-2018 14:42:33 Data Refreshed: 29-Oct-2018 14:40:36 Page 1

Summary
(Standard: CDN-GS-10D)

Standard:	CDN-GS-10D	No of Analyses:	3
Element:	ASSAYVALUE	Minimum:	9.03
Units:		Maximum:	9.35
Detection Limit:		Mean:	9.19
Expected Value (EV):	9.50	Std Deviation:	0.13
E.V. Range:	8.55 to 10.45	% in Tolerance	100.00 %
		% Bias	-3.23 %
		% RSD	1.42 %







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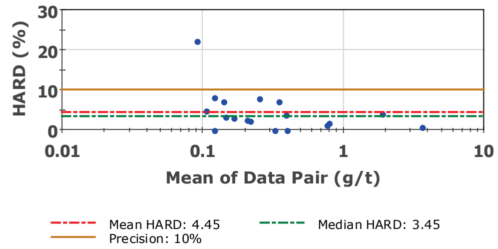
Appendix 3

Sample Pairs submitted to ALS by Belvedere

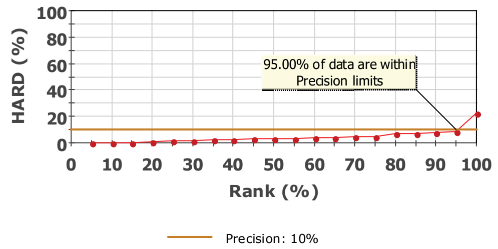
Summary
(Labdup > 0.1)

	ASSAYVALUE_OR	ASSAYVALUE_CK	Units		Result
No. Pairs:	20	20		Pearson CC:	1.00
Minimum:	0.11	0.07	g/t	Spearman CC:	0.99
Maximum:	3.56	3.61	g/t	Mean HARD:	4.45
Mean:	0.51	0.52	g/t	Median HARD:	3.45
Median	0.21	0.21	g/t		
Std. Deviation:	0.80	0.82	g/t	Mean HRD:	0.37
Coefficient of Variation:	1.57	1.59		Median HRD	0.00

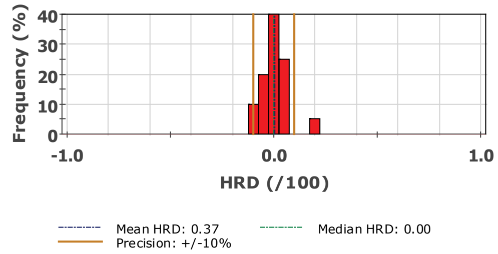
Mean vs. HARD Plot (Labdup > 0.1)



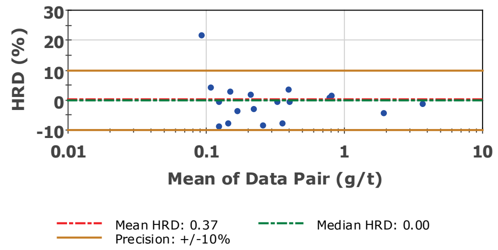
Rank HARD Plot (Labdup > 0.1)



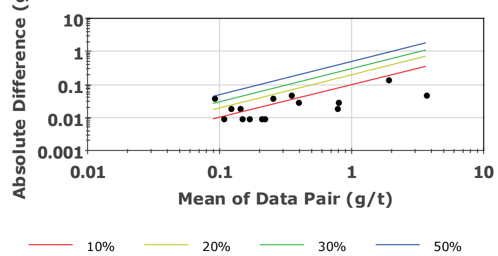
HRD Histogram (Labdup > 0.1)



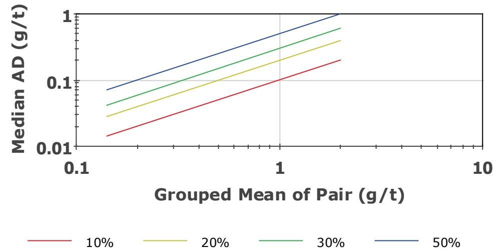
Mean vs. HRD Plot (Labdup > 0.1)



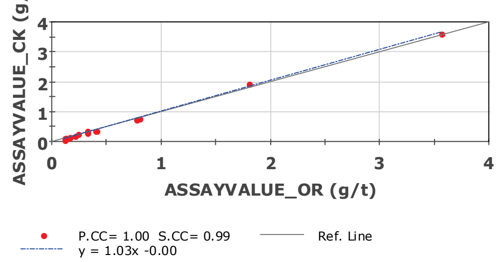
T & H Precision Plot (Assay Pairs) (Labdup > 0.1)



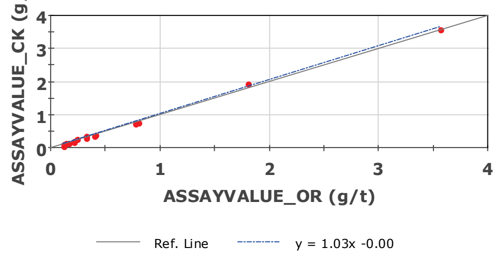
T & H Precision Plot (Grouped Pairs) (Labdup > 0.1)



Correlation Plot (Labdup > 0.1)



QQ Plot (Labdup > 0.1)



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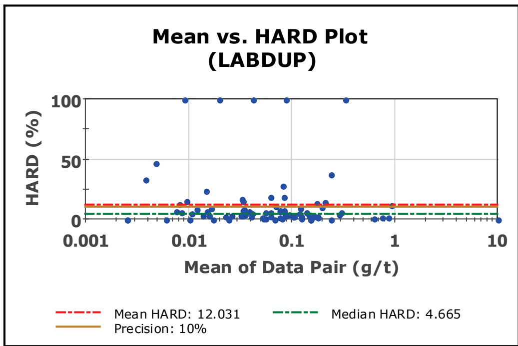
RUPERT RESOURCES

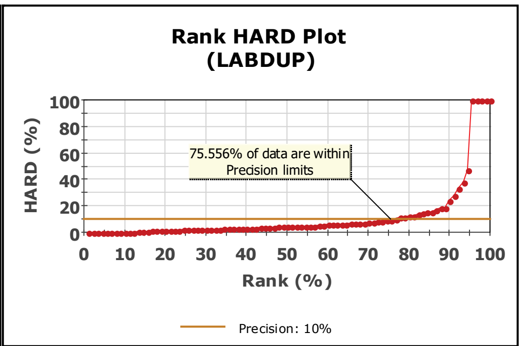
Appendix 4

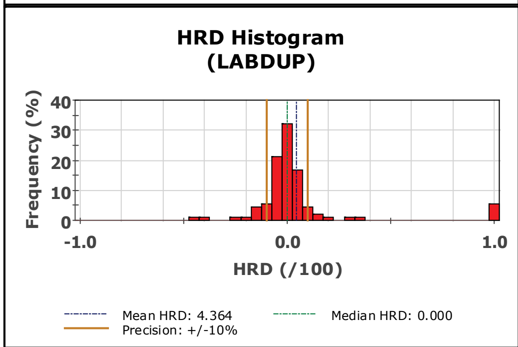
Sample Pairs submitted to ALS by NARL

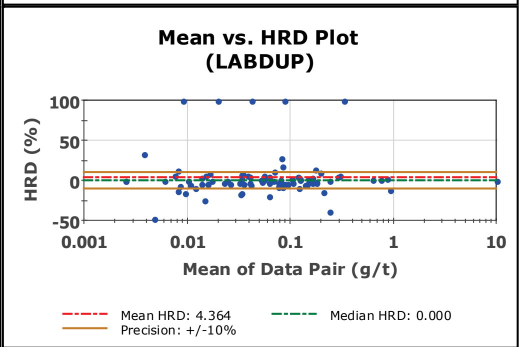
Summary
(LABDUP)

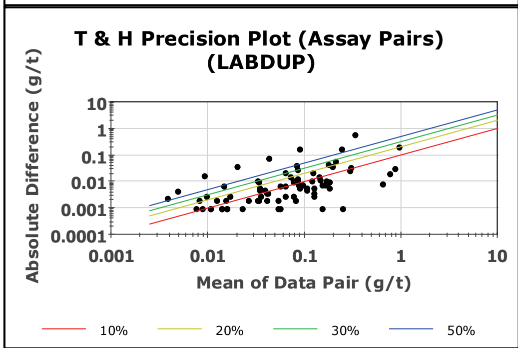
	ASSAYVALUE_OR	ASSAYVALUE_CK	Units		Result
No. Pairs:	90	90		Pearson CC:	0.997
Minimum:	0.003	0.000	g/t	Spearman CC:	0.851
Maximum:	10.000	10.000	g/t	Mean HARD:	12.031
Mean:	0.223	0.216	g/t	Median HARD:	4.665
Median	0.066	0.057	g/t		
Std. Deviation:	1.050	1.051	g/t	Mean HRD:	4.364
Coefficient of Variation:	4.706	4.877		Median HRD	0.000

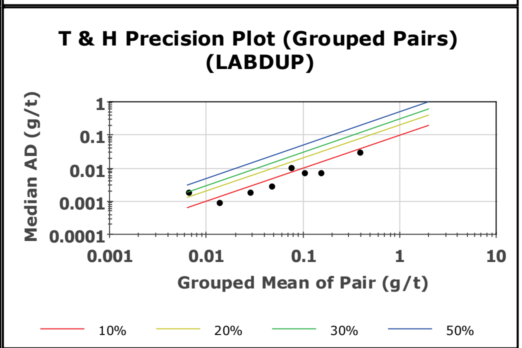


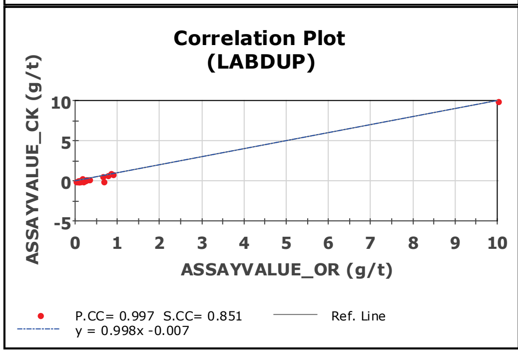


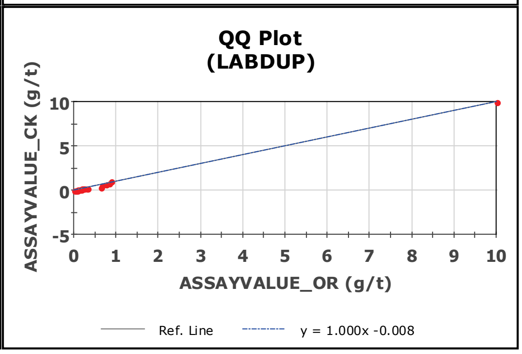












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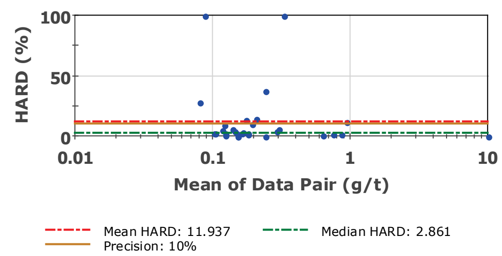
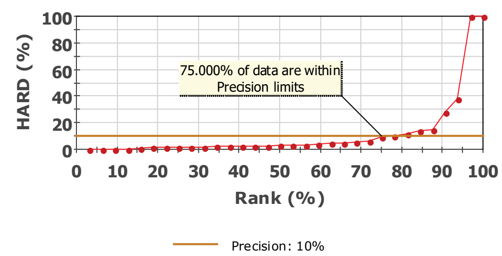
Summary
(LABDUP > 0.1)

	ASSAYVALUE_OR	ASSAYVALUE_CK	Units		Result
No. Pairs:	32	32		Pearson CC:	0.997
Minimum:	0.101	0.000	g/t	Spearman CC:	0.741
Maximum:	10.000	10.000	g/t	Mean HARD:	11.937
Mean:	0.560	0.541	g/t	Median HARD:	2.861
Median	0.163	0.150	g/t		
Std. Deviation:	1.710	1.715	g/t	Mean HRD:	6.122
Coefficient of Variation:	3.054	3.169		Median HRD	1.312

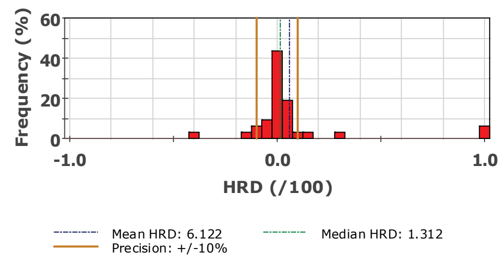
Mean vs. HARD Plot (LABDUP > 0.1)



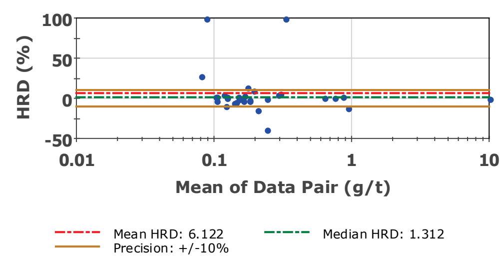
Rank HARD Plot (LABDUP > 0.1)



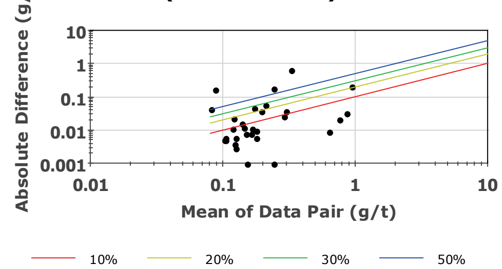
HRD Histogram (LABDUP > 0.1)



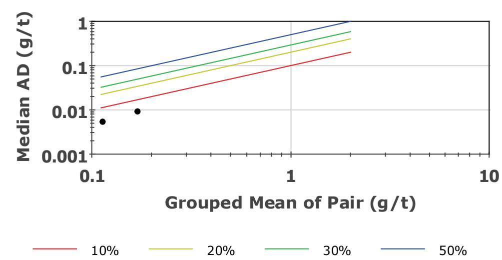
Mean vs. HRD Plot (LABDUP > 0.1)



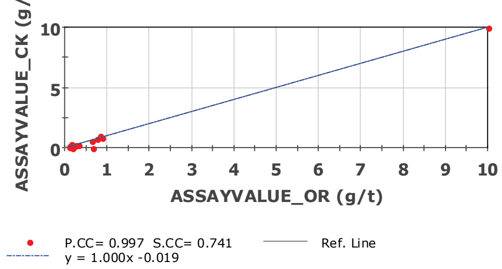
T & H Precision Plot (Assay Pairs) (LABDUP > 0.1)



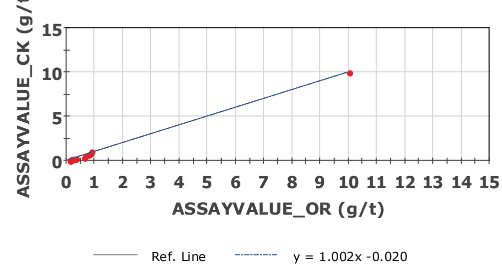
T & H Precision Plot (Grouped Pairs) (LABDUP > 0.1)



Correlation Plot (LABDUP > 0.1)



QQ Plot (LABDUP > 0.1)



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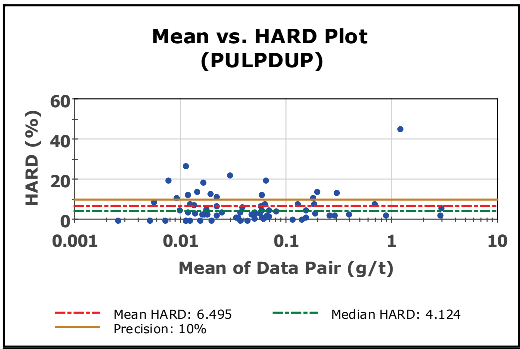
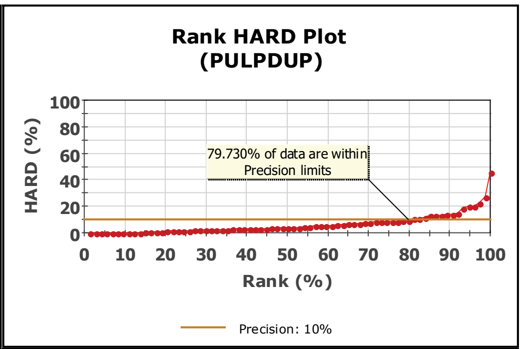
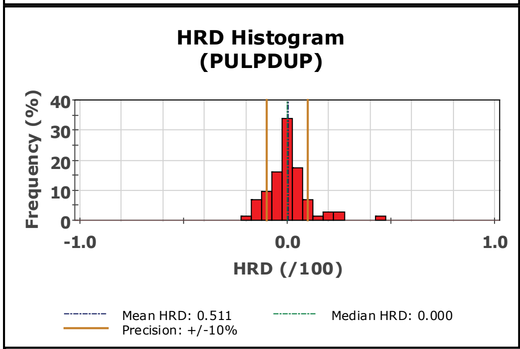
RUPERT RESOURCES

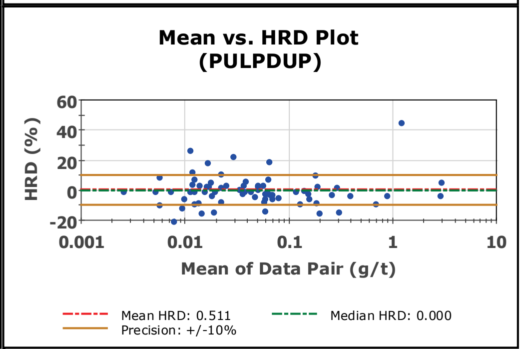
Summary
(PULPDUP)

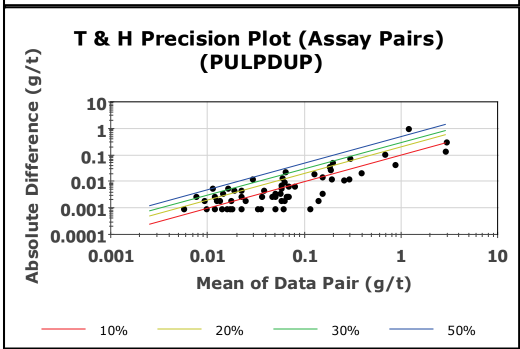
	ASSAYVALUE_OR	ASSAYVALUE_CK	Units		Result
No. Pairs:	74	74		Pearson CC:	0.966
Minimum:	0.003	0.003	g/t	Spearman CC:	0.987
Maximum:	3.030	2.890	g/t	Mean HARD:	6.495
Mean:	0.178	0.165	g/t	Median HARD:	4.124
Median	0.041	0.039	g/t		
Std. Deviation:	0.506	0.465	g/t	Mean HRD:	0.511
Coefficient of Variation:	2.845	2.814		Median HRD	0.000

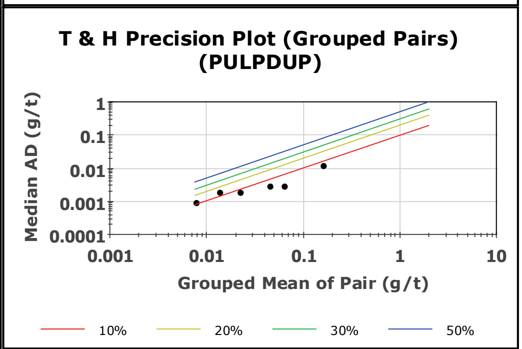


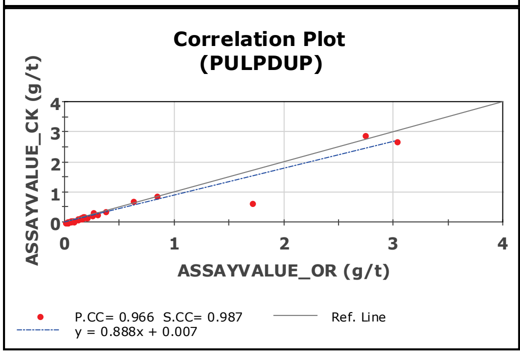


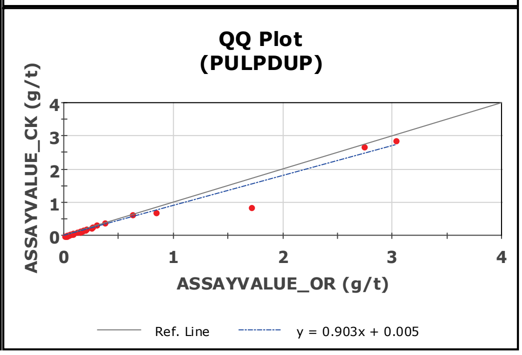












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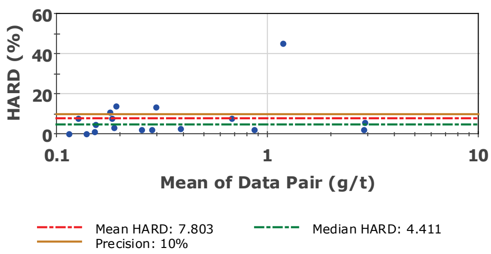
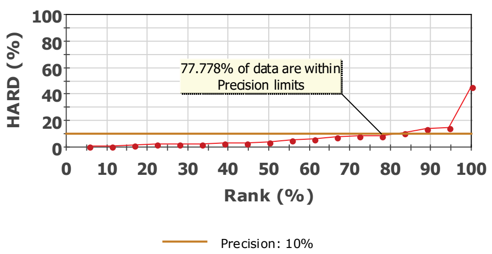
Summary
(PULPDUP > 0.1)

	ASSAYVALUE_OR	ASSAYVALUE_CK	Units		Result
No. Pairs:	18	18		Pearson CC:	0.954
Minimum:	0.112	0.113	g/t	Spearman CC:	0.957
Maximum:	3.030	2.890	g/t	Mean HARD:	7.803
Mean:	0.636	0.584	g/t	Median HARD:	4.411
Median	0.220	0.237	g/t		
Std. Deviation:	0.880	0.809	g/t	Mean HRD:	-0.118
Coefficient of Variation:	1.385	1.385		Median HRD	-2.532

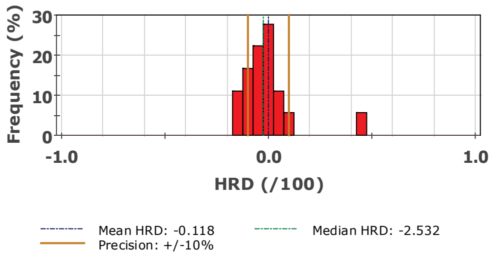
Mean vs. HARD Plot (PULPDUP > 0.1)



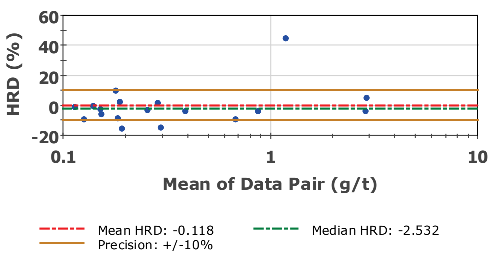
Rank HARD Plot (PULPDUP > 0.1)



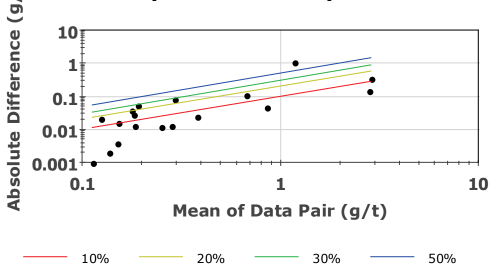
HRD Histogram (PULPDUP > 0.1)



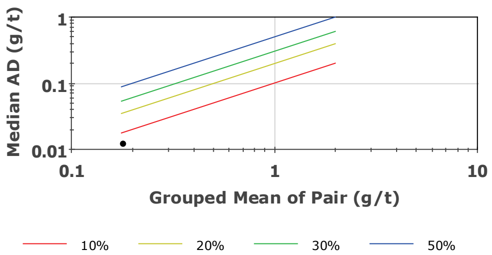
Mean vs. HRD Plot (PULPDUP > 0.1)



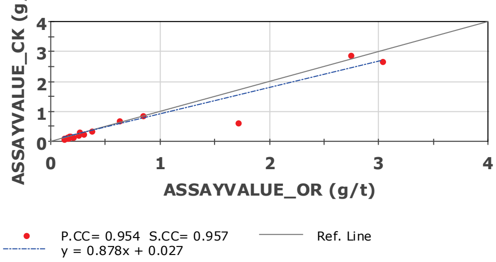
T & H Precision Plot (Assay Pairs) (PULPDUP > 0.1)



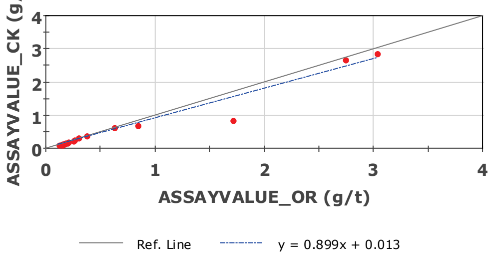
T & H Precision Plot (Grouped Pairs) (PULPDUP > 0.1)



Correlation Plot (PULPDUP > 0.1)



QQ Plot (PULPDUP > 0.1)



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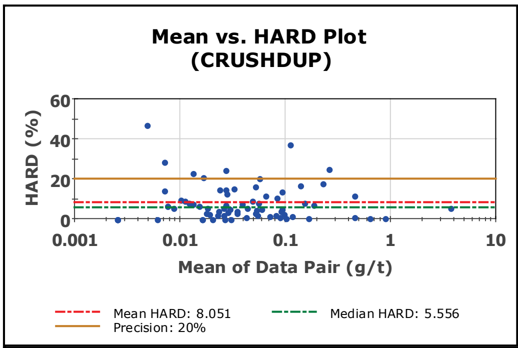
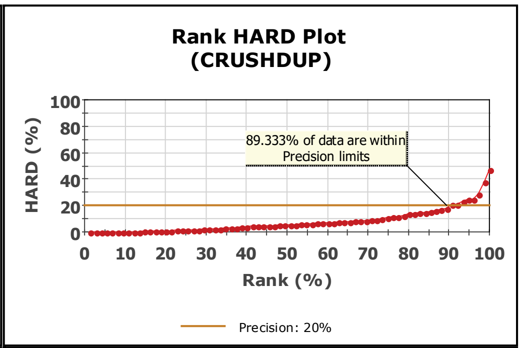
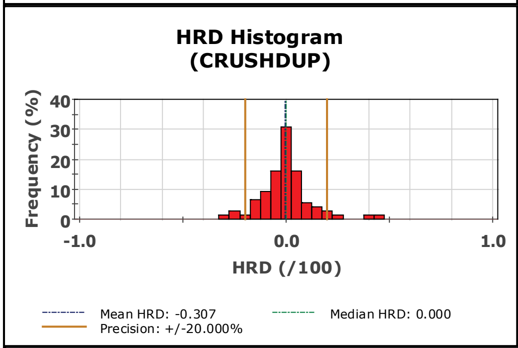
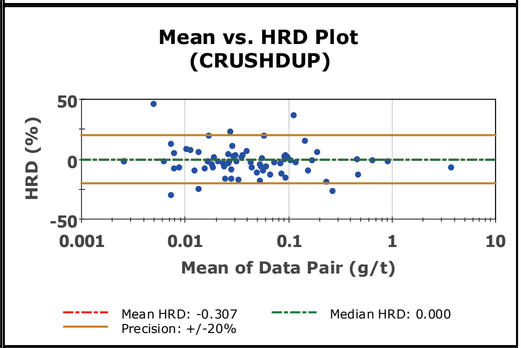
Summary
(CRUSHDUP)

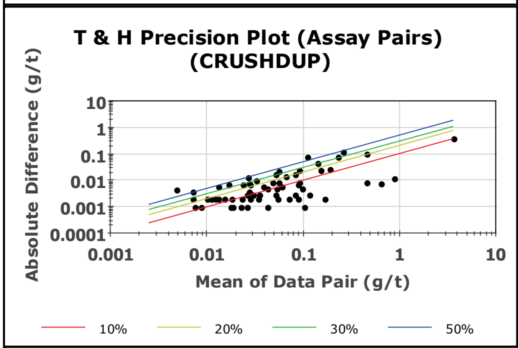
	ASSAYVALUE_OR	ASSAYVALUE_CK	Units		Result
No. Pairs:	75	75		Pearson CC:	0.998
Minimum:	0.003	0.003	g/t	Spearman CC:	0.985
Maximum:	3.410	3.830	g/t	Mean HARD:	8.051
Mean:	0.122	0.131	g/t	Median HARD:	5.556
Median	0.033	0.033	g/t		
Std. Deviation:	0.406	0.453	g/t	Mean HRD:	-0.307
Coefficient of Variation:	3.325	3.464		Median HRD	0.000

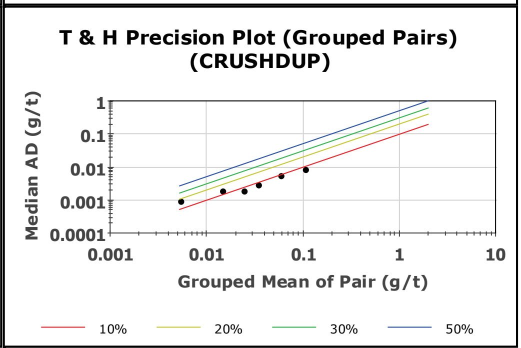


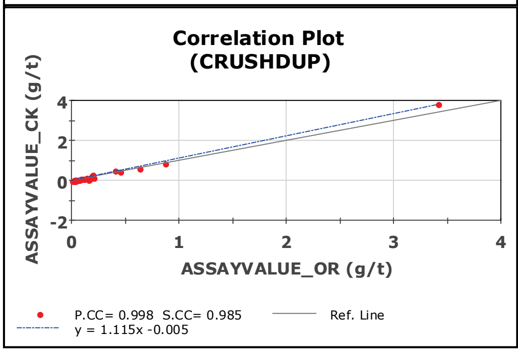


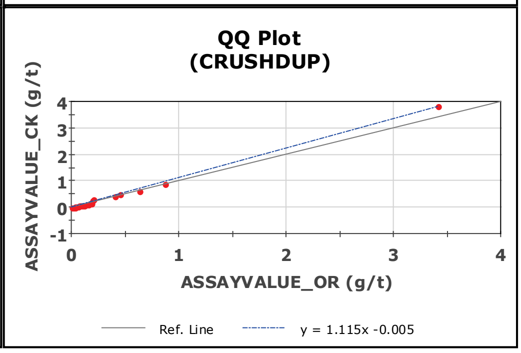












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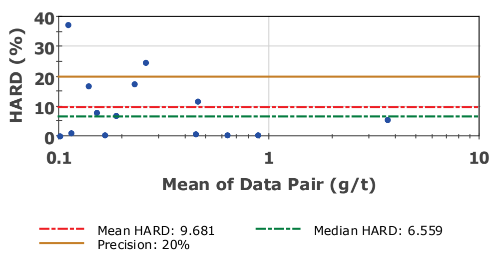
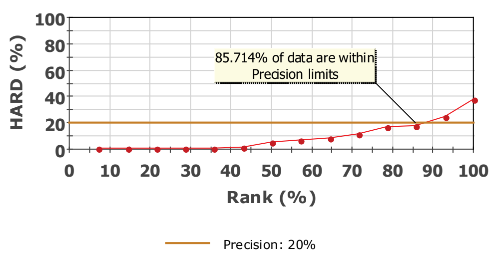
Summary
(CRUSHDUP > 0.1)

	ASSAYVALUE_OR	ASSAYVALUE_CK	Units		Result
No. Pairs:	14	14		Pearson CC:	0.998
Minimum:	0.101	0.068	g/t	Spearman CC:	0.934
Maximum:	3.410	3.830	g/t	Mean HARD:	9.681
Mean:	0.511	0.554	g/t	Median HARD:	6.559
Median	0.188	0.218	g/t		
Std. Deviation:	0.833	0.937	g/t	Mean HRD:	-0.426
Coefficient of Variation:	1.629	1.691		Median HRD	-0.094

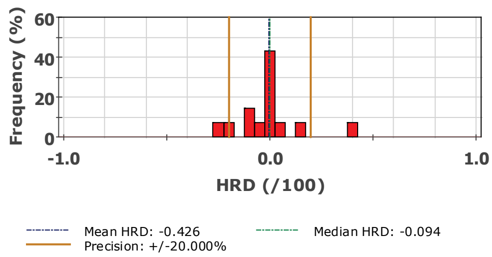
Mean vs. HARD Plot (CRUSHDUP > 0.1)



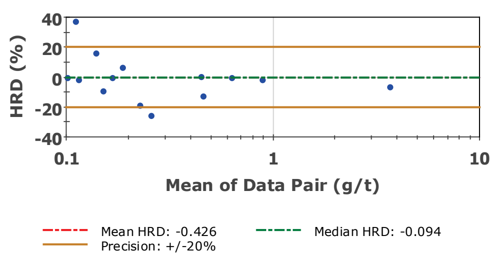
Rank HARD Plot (CRUSHDUP > 0.1)



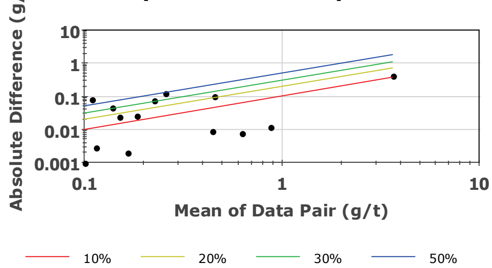
HRD Histogram (CRUSHDUP > 0.1)



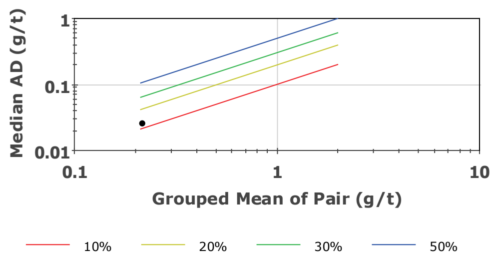
Mean vs. HRD Plot (CRUSHDUP > 0.1)



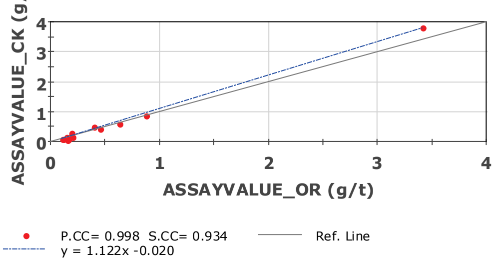
T & H Precision Plot (Assay Pairs) (CRUSHDUP > 0.1)



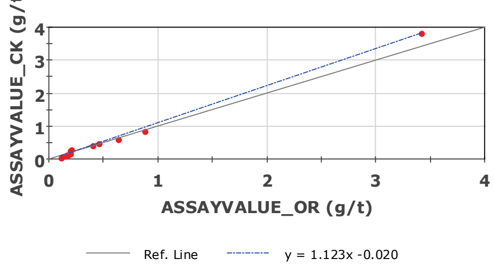
T & H Precision Plot (Grouped Pairs) (CRUSHDUP > 0.1)



Correlation Plot (CRUSHDUP > 0.1)



QQ Plot (CRUSHDUP > 0.1)



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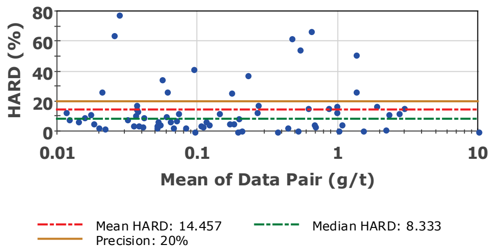
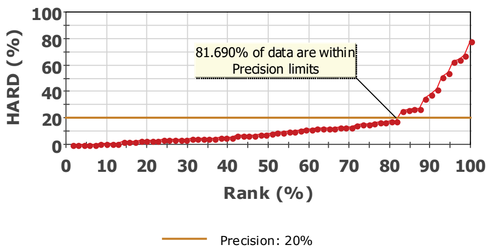
Summary
(COREDUP)

	ASSAYVALUE_OR	ASSAYVALUE_CK	Units		Result
No. Pairs:	71	71		Pearson CC:	0.976
Minimum:	0.010	0.006	g/t	Spearman CC:	0.955
Maximum:	10.000	10.000	g/t	Mean HARD:	14.457
Mean:	0.588	0.536	g/t	Median HARD:	8.333
Median	0.114	0.106	g/t		
Std. Deviation:	1.340	1.287	g/t	Mean HRD:	4.533
Coefficient of Variation:	2.280	2.403		Median HRD	2.422

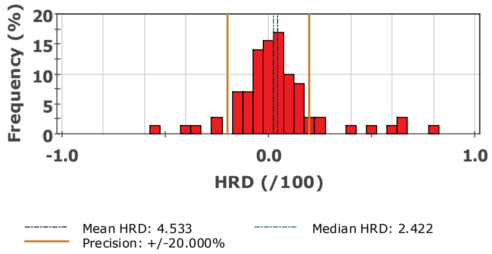
Mean vs. HARD Plot (COREDUP)



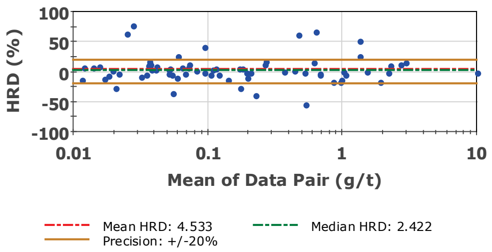
Rank HARD Plot (COREDUP)



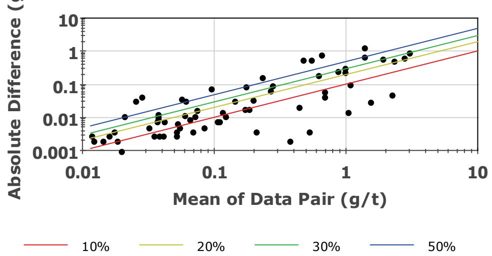
HRD Histogram (COREDUP)



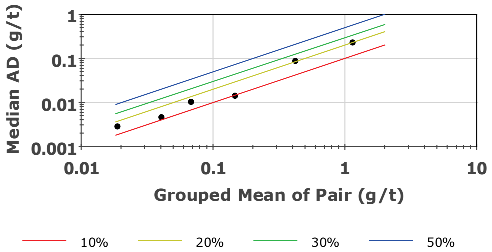
Mean vs. HRD Plot (COREDUP)



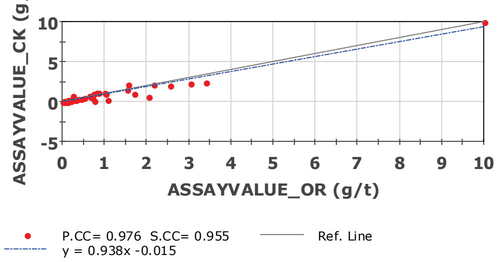
T & H Precision Plot (Assay Pairs) (COREDUP)



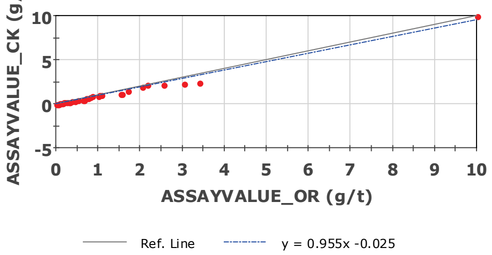
T & H Precision Plot (Grouped Pairs) (COREDUP)



Correlation Plot (COREDUP)



QQ Plot (COREDUP)



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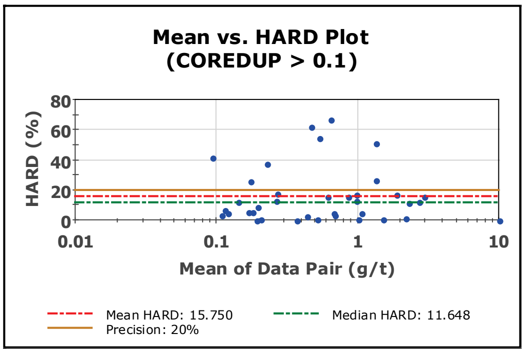
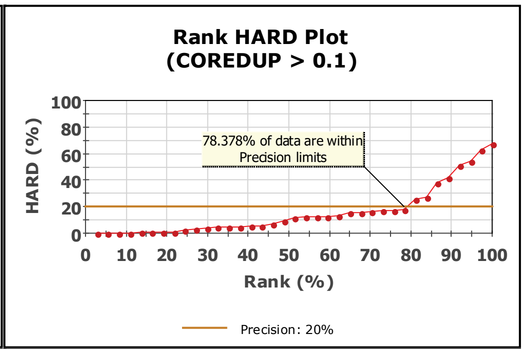
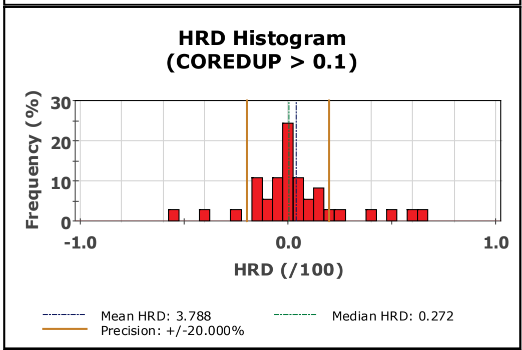
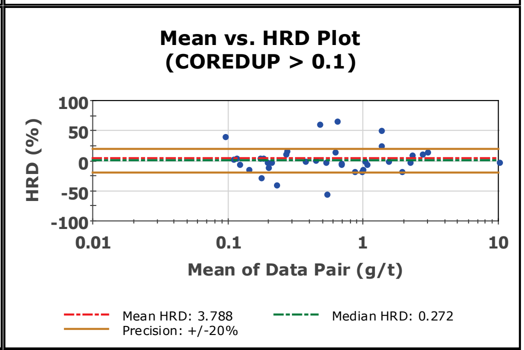
Summary
(COREDUP > 0.1)

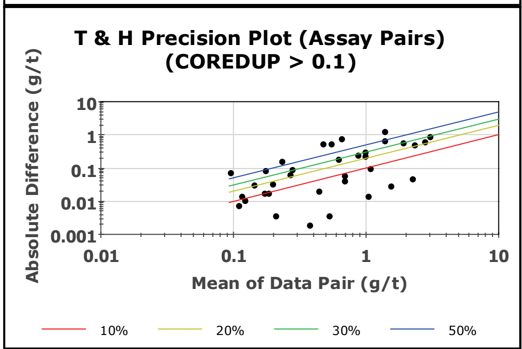
	ASSAYVALUE_OR	ASSAYVALUE_CK	Units		Result
No. Pairs:	37	37		Pearson CC:	0.973
Minimum:	0.112	0.054	g/t	Spearman CC:	0.866
Maximum:	10.000	10.000	g/t	Mean HARD:	15.750
Mean:	1.086	0.990	g/t	Median HARD:	11.648
Median	0.642	0.512	g/t		
Std. Deviation:	1.710	1.658	g/t	Mean HRD:	3.788
Coefficient of Variation:	1.575	1.675		Median HRD	0.272

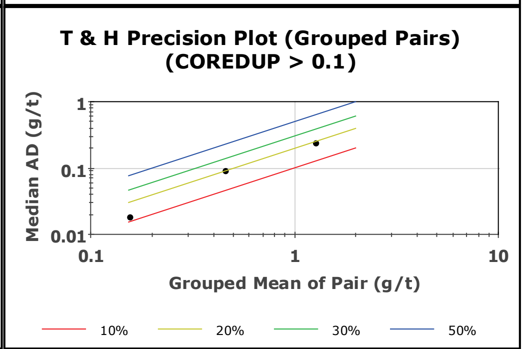


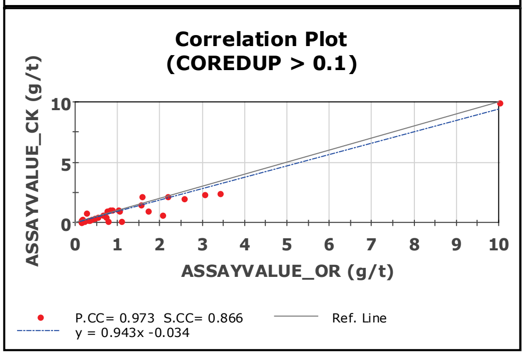


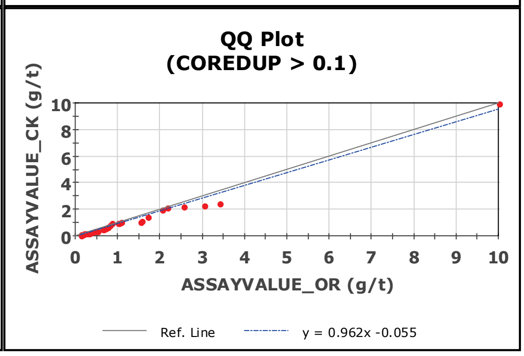












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