Altan Tsagaan Ovoo Project (ATO)

2021 Mineral Resources Technical Report (Amended NI 43-101)

Effective 30th March 2021
Amended: 9th June 2021

Report for
Steppe Gold Limited

By principal Author & Qualified Person (QP)
Robin A Rankin
MAusIMM CP(Geo)

Reviewed by Alternate Qualified Person (QP)
Ochirkhuyag Baatar
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GeoRes
Project
GR2104

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2021 Mineral Resources
Technical Report (Amended NI 43-101)

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On Mineral Resource estimation at the ATO property in Mongolia for **Steppe Gold Ltd**.

These estimates replace the previous 2017 estimates prepared by GSTATS Consulting LLC.

The ATO Project is located in eastern Mongolia and is governed by
Mining License MV-017111.

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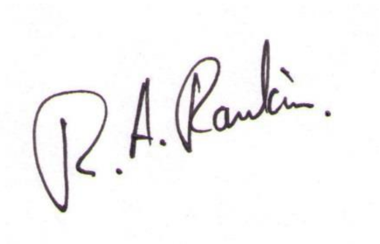
DATE AND SIGNATURE PAGE

This Technical Report (entitled "Altan Tsagaan Ovoo Project (ATO) 2021 Mineral Resources Technical Report (Amended NI 43-101)", effective date 30th March 2021) has been prepared, signed and dated by the following Qualified Person (QP). The QP designation is within the meaning of Canadian National Instrument 43-101 of 24th June 2011.



Robin A Rankin (Qualified Person)
MSc DIC MAusIMM CP(Geo)[1]

Principal Consulting Geologist – **Geo**Res

Signed 9th June 2021

At Bowral, NSW, Australia

[1] Accredited by The Australasian Institute of Mining & Metallurgy (The AusIMM) since 2000 as a Chartered Professional (CP) in the Geology discipline.

CERTIFICATE OF AUTHOR / QUALIFIED PERSON

I, **Robin A Rankin**, do hereby certify that:

- I am Principal Consulting Geologist and operator of GeoRes, with business address at 4 Warenda Street, Bowral, New South Wales, Australia, 2576.

- This certificate applies to the report entitled "Altan Tsagaan Ovoo Project (ATO) 2021 Mineral Resources Technical Report (NI 43-101)", (the "Technical Report"), of effective date 30th March 2021. The Report relates to Mining License MV-017111 constituting the property of the ATO Project (the Project) in eastern Mongolia.

- I graduated with a Bachelor of Science (BSc) degree in Geology from the University of Cape Town, South Africa, in1980. In addition, I have obtained a Master of Science (MSc) degree in Mineral Production Management from the University of London (Royal School of Mines at Imperial College London), United Kingdom, in 1988 and a Diploma of the Imperial College (DIC) from Imperial College London in 1988. I have practiced my profession (geology) virtually continuously since 1981. A summary of my relevant experience follows:
  - 1981 – 1987: Mineral exploration geologist employed or contracted by several mining, exploration and consulting companies including Goldfields of South Africa, Australian Groundwater Consultants Union Oil Development Corporation, and BHP (under contract).
  - 1989 – 2003: Metals geologist, employed by Exploration Computer Services (ECS) and then Surpac Minex Group (SMG), specialising in mining software and resource modelling and estimation.
  - 2003 – 2006: Principal metals geologist employed by SMG Consultants.
  - 2006 – Present: Principal consulting geologist and proprietor of GeoRes.

- I am a member (#110551) of the Australasian Institute of Mining and Metallurgy (MAusIMM). Furthermore, I have been registered as a Chartered Professional (CP) in the Geology discipline (CP(Geo)) by the AusIMM since 2000.

- I am a "Qualified Person" (QP) for the purposes of National Instrument 43-101 (NI 43-101) due to my education, past relevant experience, and current affiliation and membership designation with an accepted foreign professional organisation (MAusIMM CP(Geo)) as defined in NI 43-101.

- Due to the current Covid 19 pandemic I have NOT visited the Project.

- I am the principal author of this Technical Report.

- **Ochirkhuyag Baatar**, the alternate QP, engaged by Steppe, took responsibility for various aspects and/or sections of the Report outside my area of experience, qualifications or Project knowledge.

- I am independent of the Issuer in terms understood from Part 1.5 of NI 43-101 and the tests detailed in Part 1.5 of the Companion Policy 43-101CP.

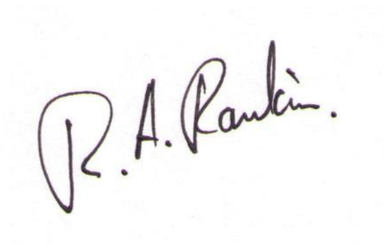
- I have had no prior involvement with the Project that is the subject of the Technical Report, or with the Project operator, Steppe Gold Ltd, before undertaking the work leading to this Report.

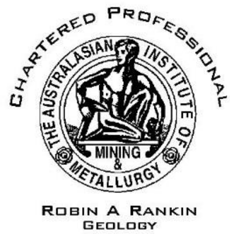
- I have read National Instrument 43-101, and this Technical Report has been prepared in compliance with that instrument and Form 43-101F1.

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

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

Dated 30th March 2021





Robin A Rankin (Qualified Person)
MSc DIC MAusIMM CP(Geo)[2]

Principal Consulting Geologist – **Geo**Res

[2] Accredited by The Australasian Institute of Mining & Metallurgy (The AusIMM) since 2000 as a Chartered Professional (CP) in the Geology discipline.

CERTIFICATE OF QUALIFIED PERSON

I, **Ochirkhuyag Baatar**, do hereby certify that:

- I am a Chief Geologist of Erdenyn Erel LLC, with business address at Centrum Building, Suite 906, Olympic Street-7/3, Sukhbaatar district 1, Ulaanbaatar 14240, Mongolia.

- I graduated with a Bachelor of Science (BSc) degree in Geology from the Mongolian Technical University, Ulaanbaatar City, in1992. In addition, I have obtained a Master of Science (MSc) degree in Geology from the Mongolian Technical University, Ulaanbaatar City, in1999. I have practiced my profession (geology) virtually continuously since 1992. A summary of my relevant experience follows:
    - 1992 - 1994: Teacher in Geological School of Mongolian Technical University.
    - 1995 - 1998: Chief Geologist in "GCS" Company
    - 1998 - 2001: Project Geologist in Geological Information Centre / Mineral Resources Authority of Mongolia.
    - 2001 – 2003: Chief Geologist in Geological Investigation Centre of Mongolia
    - 2003 – 2006: Geologist and Project Geologist in Anglogold Ashanti Mongolia LLC.
    - 2006 – 2009: Geoscientist, Project Geoscientist and Project leader in BHP Billiton World Exploration Inc.
    - 2009 – 2010: Consultant Geologist in East Asia Minerals Corporation.
    - 2010 – 2020: Principal Geologist in Rio Tinto Exploration Inc.
    - 2020 – present: Chief Geologist in Erdenyn Erel LLC

- I am a reviewer of the technical report entitled Altan Tsagaan Ovoo Project (ATO) 2021 Mineral Resources Technical Report with an effective date of 30th March 20, 2021 (the "**Technical Report**") prepared for Steppe Gold Ltd. (the "**Issuer**"). The report relates to Mining License MV-017111 constituting the property of the ATO Project (the "Project") in eastern Mongolia.

- I am a member (#12017) of the American Institute of Professional Geologist (AIPG) since 2019. Furthermore, I have been registered as a Certified Professional Geologist (CPG) in the Geology by the AIPG since 2019.

- I have read the definition of "qualified person" set out in National Instrument 43-101 ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and experience, I am a "qualified person" for the purposes of NI 43-101.

- I visited to the Project site in October 2020 and undertook familiarizing mine operation and geological setting of ATO project in a week period.

- I assisted with the preparation of the Technical Report prepared for the Issuer and, in particular, I prepared the Data verification described in Section 12 of the Technical Report.

- I am independent of the Steppe Gold Ltd. (the "**Issuer**") as described in section 1.5 of NI 43-101.

- I have read NI 43-101 and Form 43-101F1, and the sections of the Technical Report for review of which I was responsible have been prepared in compliance with that instrument and form.

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

Dated this 30th March, 2021.

____Ochirkhuyag Baatar_
(Certified Professional Geologist, AIPG)
Chief Geologist – Erdenyn Erel LLC

CERTIFICATE OF QUALIFIED PERSON

To accompany the Report titled "Altan Tsagaan Ovoo Project (ATO) 2021 Mineral Resources Technical Report (NI 43-101)", (the "Technical Report"), of effective date 30th March 2021. The Report relates to Mining License MV-017111 constituting the property of the ATO Project (the "Project") in eastern Mongolia prepared for Steppe Gold LLC (the "Company").

I, **David Frost,** FAusIMM, B. Met Eng, do hereby certify that:

- I am employed by DRA Americas in the role of Vice President Process Engineering, with my office located at 20 Queen Street West, 29th Floor, Toronto, Ontario, Canada M5H 3R3;
- I graduated from the Royal Melbourne Institute of Technology (RMIT), Melbourne, Australia with a Bachelor of Metallurgical Engineering in Metallurgy in 1993;
- I am a registered **Fellow Member of the Australian Institute of Mining and Metallurgy (FAusIMM) membership #110899**;
- I have worked as a Metallurgist and Process Engineer in various capacities since my graduation from university in 1993;
- My work experience includes 4 years supervising, operating and maintaining a heap leach operation in Peak Hill, NSW, Australia between 1999 and 2003. I have carried out heap leach design work for various clients during my career working as a process engineer. I previously signed the NI 43-101 Technical Report – "Altan Tsagaan Ovoo (ATO) Gold , Tsagaan Ovoo, Dornod, Mongolia" effective as of September 6th, 2017 and issued on October 4th, 2017 prepared for Steppe Gold LLC. I have also been a signatory for an NI43101 compliant operational heap leach project (Guanaco Gold Project) located in Chile along with a heap leach feasibility study level design for Dundee Precious Metals (DPM) Timok Gold project ;
- I have read the definition of "qualified person" set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;
- I participated in the preparation of this Technical Report. I am responsible for Sections 13, 17, 18, 19, 21 and 22 and parts of Section 1 relating to the process plant operating costs for the project;
- I visited the Altan Tsagaan Ovoo Project (ATO) location in August 2018 and personally viewed the drill cores on site and in storage in Ulaanbataar used for metallurgical testing;
- I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this Report;
- Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Steppe Gold LLC, or any associated or affiliated entities;
- Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Steppe Gold LLC, or any associated or affiliated companies;
- Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Steppe Gold LLC, or any associated or affiliated companies;

- I have read NI 43-101 and Form 43-101F1 and have reviewed the relevant sections involved in (as listed in point 6) in the Technical Report in compliance with NI 43-101 and Form 43-101F1; these Sections were prepared in conformity with generally accepted - mining industry best practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the Technical Report contains the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

This 30th day of March 2021,

"Original Signed and Sealed"

David Frost, FAusIMM, B. Met Eng.
Vice President – Process Engineering
DRA Americas Inc.

CERTIFICATE OF QUALIFIED PERSON

To accompany the Report titled "Altan Tsagaan Ovoo Project (ATO) 2021 Mineral Resources Technical Report (NI 43-101)", (the "Technical Report"), of effective date 30th March 2021. The Report relates to Mining License MV-017111 constituting the property of the ATO Project (the "Project") in eastern Mongolia prepared for Steppe Gold LLC (the "Company").

I, **Ghislain Prévost,** P. Eng., B. Mining Eng, M.Sc.A. Mineral Eng. do hereby certify that:

- I am employed by DRA Americas in the role of Senior Mining Engineer, with my office located at 555 René Lévesque West, 6th Floor, Montreal, Quebec Canada H2Z 1B1;
- I am a graduate of École Polytechnique de Montréal, Montréal, Canada with a Bachelor of Mining Engineering in 1996 and a Master degree of Mineral Engineering in 1999;
- I am registered as a Professional Engineer in the Province of Quebec (Reg. # 119054);
- I have worked as a Mining Engineer in various capacities since my graduation from university in 1999;
- My relevant work experience includes:
  - Design, scheduling, cost estimation and Mineral Reserve estimation for several open pit studies
  - Technical assistance in mine design and scheduling for mine operations in Canada, Brazil and Guinea.
- I have read the definition of "qualified person" set out in the National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be an independent qualified person for the purposes of NI 43-101;
- I participated in the preparation of the final Technical Report. I am responsible for Sections 15 and 16 relating to the Mineral Reserves Estimate and Mining Methods;
- I did not visit the Altan Tsagaan Ovoo Project (ATO) that is subject to the Technical Report;
- I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this Report;
- Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Steppe Gold LLC, or any associated or affiliated entities;
- Neither I, nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Steppe Gold LLC, or any associated or affiliated companies;
- Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three (3) years from Steppe Gold LLC, or any associated or affiliated companies;
- I have read NI 43-101 and Form 43-101F1 and have reviewed the relevant sections involved in (as listed in point 6) in the Technical Report in compliance with NI 43-101 and Form 43-101F1; these Sections were prepared in conformity with generally accepted - mining industry best practice, and as of the date of the certificate, to the best of my knowledge, information and belief, the Technical Report contains the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

This 8th day of June 2021,

“original signed and sealed”
Ghislain Prévost, P. Eng.
Principal Mining Engineer – Mining Engineering
DRA Americas Inc.

CERTIFICATE OF QUALIFIED PERSON

I **Dan V. Michaelsen, FAusIMM (CP) Env**, do hereby certify that:

- I am Principal Adviser Sustainability with Beaumont Consulting in Ulaanbaatar, Mongolia, and Senior Associate of Ulzii Environmental (Mongolia), LLC., Orient Plaza office 2nd floor, Room 206 Sukhbaatar District-1 Chagdarjav Street-9 Ulaanbaatar 14210, Mongolia.
- This certificate applies to the technical report titled "NI 43-101 Technical Report, Feasibility Study, Altan Tsagaan Ovoo Gold Project of Steppe Gold Project, with an Effective Date of May 31, 2021 (the "Technical Report" update).
- I have more than 40 years' experience in Environmental and Sustainability Management in the international mining industry in Australia, Indonesia, Papua New Guinea, Mongolia and Ghana for recognized multinational mining companies.
- My mining experience in Mongolia includes leading the environment function for Ivanhoe Mines Mongolia at Oyu Tolgo, Boroo Gold Corporation, and Bayan Airag Exploration LLC in Zavkhan aimag. This is my tenth consecutive year working in Mongolia.
- Throughout my career I have been responsible for planning, executing, monitoring and reporting on all aspects mining environmental programs to the satisfaction of National Regulators, Company management, Signatory bodies (such as the International Cyanide Management Code, International Standards Organization), and multilateral lenders including the IFC. I draw upon my diverse background for knowledge to potential evaluate environmental impacts of mining and mineral processing operations.
- I hold the following academic credentials:
  - Bachelor of Science (Hons), University of Western Australia,
  - Master of Environmental and Business Management, University of Newcastle, NSW.
  - Master of Business Administration, University of New England, NSW.
  - Diploma of Project Management, University of New England, NSW.
- Since 1996 I have been affiliated with the Australasian Institute of Mining and Metallurgy, where I am a Fellow and Chartered Professional (Env) (No. 20099).
- I am very familiar with studies and work carried out at the Altan Tsagaan Ovoo gold project site.
- I have read NI 43-101 and Form 43-l0lFl and the sections of the Technical Report.
- I supervised preparation of ITEM 20 as 20. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL IMPACT with that instrument and form.
- As of the aforementioned Effective Date, to the best of my knowledge, information and belief, the sections of the Technical Report I am responsible for contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and dated this 7th day of June 2021, at Ulaanbaatar, Mongolia.

Dan V. Michaelsen

Senior Associate
FAusIMM (CP) Env {#200991)
Ulzii Environmental (Mongolia), LLC.

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1 SUMMARY

This Altan Tsagaan Ovoo Project (ATO) 2021 NI 43-101 Mineral Resources Technical Report (the Report) summarises the 2021 Mineral Resource estimate of the of gold and related base and precious metals by the Author in four in-situ deposits forming Steppe Gold Ltd's (Steppe) ATO Project in eastern Mongolia. Resources in three of the deposits were previously estimated and reported in 2017 by GSTATS Consulting LLC (GSTATS) in an NI 43-101 report (2017 NI 43-101)[3]. The Project is now the site of the ATO Gold Mine operated by Steppe.

The following headings approximately equate to the major NI 43-101 Report Sections.

Introduction: Robin Rankin (the Consultant, principal Author and Qualified Person (QP)) of geological consultancy GeoRes was engaged by Mr Matthew Wood, Executive Chairman of Steppe, in August 2020[4] for geological consulting work on Mineral Resource estimation and reporting (according to CIM, JORC 2012 and NI 43-101 (see Terms of Reference Section 0 and Introductory Statements to the Resource estimation Section 0) standards) at the ATO Project (ATO) in Mongolia. This Consulting work would be a re-estimate of three adjacent deposits (Pipes 1, 2 and 4, now known as ATO1, 2 and 4 by Steppe) previously reported in the 2017 GSTATS NI 43-101) and an initial estimate of a nearby newly drilled fourth deposit (Mungu). The Consulting would also include authoring this NI 43-101 Report. Steppe would be the issuer of the Report. The Author QP had no previous contact with Steppe or ATO. All units in the Report are metric and currency is in United States Dollar terms.

Sources of information & reliance on others: Considerable information used to support this Report was derived from the previously reported 2017 NI 43-101 and from reports and documents listed in the references section of this report. Note that large parts of Sections 4 to 9 in the 2017 NI 43101 have been repeated in those Sections in this Report for completeness. The Author QP has reviewed the 2017 NI 43-101 and believes the information repeated is correct. The Author QP also relied, for some information he could not collect (Property related details and a site visit) on Alternate QP Ochirkhuyag Baatar (engaged by Steppe). All Project data used in this Consulting was supplied to the Author QP by Steppe.

Property inspection: The principal Author QP (Robin Rankin) has not visited the Property – due to current international travel restrictions. Consequently responsibility for a site visit was undertaken by Alternate QP Ochirkhuyag Baatar who vised the site in October 2020 for a week.

Property: Steppe's ATO Property is in Eastern Mongolia. In mining terms the Property is defined by Mining License MV-017111. Surface area of the Mining Licence MV-017111 is 5,492.63 ha or ~55 km^2 (1 ha = 10,000 m^2). The immediate Project area of the four deposits is ~2 km^2, with dimensions ~1.4 km east/west * ~1.2 km north/south. Regionally ATO is ~660 km east of Mongolia's capital Ulaanbaatar, ~120 km west-north-west of provincial capital Choibalsan, and ~38 km west of the closest town Tsagaan Ovoo Soum (which it is reached from by dirt roads). The coordinate datum used is WGS84, Zone 49 (108°E to 114°E in northern hemisphere) in the UTM system.

Geography: The license area is located in the low mountain zone at the north-east end of the Khentii Mountain Range and at the south-west part of the Dornod high steppe. The topography of the project area generally consists of small rounded, separate mountain complexes with small hillocks in a steppe. Average elevation is 980 – 1,050 m above sea level. The area is effectively grass-covered. The land surrounding the Property is predominantly used for nomadic herding of goats, cows, horses and sheep by small family units.

Climate of the region is characterized by extreme cold and hot weather. Wide daily, monthly, and yearly fluctuations of temperature are common. Winter is harsh and very cold. Stable snow cover persists from November to March. Freezing of soil starts from mid-September and continues till late May, with the freezing depth reaching 2.5 m. Summer is shorter than other seasons, dry and chilly. The hottest temperature is up to +40˚C in summer. 60-80% of the annual precipitation falls as rain during July and August. Number of days with precipitation is 59 days per year. ATO Mine will operate all year around.

History: Modern exploration in the region commenced in 1997 when CogeGobi (a wholly owned subsidiary of the French multinational company AREVA) began their exploration efforts in eastern Mongolia looking for gold and uranium. After a six year reconnaissance effort CogeGobi settled on a selected exploration region in 2003 and then

[3] Oyungeral Bayanjargal, 4 October 2017. *NI 43-101 Technical Report – Altan Tsagaan Ovoo Gold Project*. Report for Steppe Gold LLC by GSTATS Consulting LLC, Mongolia. Report reviewed by Qualified Persons Leonid Tokar (GSTATS), Tim Fletcher (DRA Americas Inc), David Frost (DRA) and Dr Martin Stapinsky (DRA). Referenced here as the '2017 NI 43-101' or '2017 Report'.
[4] Matthew Wood (Executive Charmain), 27 August 2020. *Geological Consultant engagement letter*. Emailed letter to GeoRes, from Steppe Gold Ltd., for consulting (amongst other things) to estimate new Resources at ATO and supply a NI 43-101 report.

obtained eight exploration licenses in eastern and south-eastern Mongolia. CogeGobi then embarked upon a four-year concerted exploration effort. Two of the licenses (3,425.5 km^2 in all) were in the general area of ATO. Grab sampling of vein quartz lead to a stream sediment sampling program and gold anomalies were identified from two of the hills above the current deposits. CogeGobi withdrew due to falling uranium prices.

In 2010 CGM acquired the Exploration License and in 2012 acquired a Mining Licence. CGM quickly appreciated the potential for gold and commenced a significant exploration program leading to drilling ~600 holes. These discovered the three pipe-shaped deposits 1, 2 and 4. Steppe acquired the Property in 2017 and since then have more than doubled the quantity of drilling.

In 2016 CGM published an AIF with Measured and Indicated Mineral Resource of 18.6 Mt @ 1.3 g/t gold. Inferred Resources of 0.4 Mt @ 0.6 g/t gold were also reported. Reporting details were sketchy.

In 2017 Steppe published Measured and Indicated Mineral Resources of 17.6 Mt @ 1.4 g/t gold, along with Inferred Resources of 1.3 Mt @ 1.0 g/t gold. These latter Resources were in the 2017 NI 43-101. In 2017 Steppe also published Proven and Probable Mineral Reserves of 5.2 Mt @ 1.3 g/t gold. The Reserves were reported from three pits designed within the upper oxide parts of the Pipe 1, 2 and 4 deposits.

Since 2020 Steppe has opened the ATO Gold Mine at the Property. They produced 1,018.5 kg gold and 748 kg silver with 57% metal recovery in the first production year.

Geology: ATO sits regionally within the Devonian through Late Jurassic Mongol-Okhotsk tectonic collage that has been emplaced along a transform-continental margin of the North Asian Craton (NAC). A number of Late Jurassic-early Cretaceous broad, gold-bearing mineral belts have been recognized in eastern Mongolia. ATO is located north of the Main Mongolian Lineament (MML), and midway along the NNE trending 600km long Onon base and precious-metal province that crosses eastern Mongolia. Though ATO presently represents the only well-explored gold deposit in this part of Mongolia, a large number of minor gold occurrences have been recognized throughout the region.

The geology of the ATO Project region consists of metamorphosed Devonian sedimentary rock overlain by a volcanic and sedimentary sequence of Permian age and remnant scraps of probable Jurassic volcanoclastic units, intruded by Jurassic plutons ranging from diorite to granite in composition and including rhyolitic phases mainly as dykes.

Mineralisation: The ATO deposit is an epithermal gold and polymetallic deposit of transitional sulphides in breccia pipes in a Mesozoic continental rift zone in eastern Mongolia. It could be characterised as an intermediate sulphidation system. Up to 2017 exploration focussed on three gold, silver and base metal mineralised sub-vertical pipes (Pipes 1, 2 and 4) spaced ~300 m apart on a WNW trend. Another pipe (Pipe 3) exists just west of the others but is not mineralised. Subsequently a fourth pipe-like body (Mungu) was found ~600 m to the north east of Pipes 1, 2 and 4). The pipes have been emplaced into stratified rocks. The three pipes are elliptical in shape with the long axis oriented toward the north east. Each have approximate surface dimensions of 300 * 150 m. The pipes taper to depth vertically. Mungu is a north east plunging system of tall lenticular lodes. Pipes 1 and 2 are near paleo surface, epithermal (hot spring) emplacements and the upper parts of mineralized breccia pipes. Pipe 4 is slightly buried without the surface mineralisation.

Deposit type: ATO's mineral deposit type is that of multiple surface epithermal deposits with intermediate sulphidation (feeder) pipes below. This implies a specific shape where the top part (near or at current surface) would represent a wide thinnish roughly circular accumulation of mineralisation in country rock around an original surface ground-water-interacting hydro-thermal or fumarole vent system. Below that would be a tall root-shaped breccia pipe, flared at the top and narrowing downwards, through which the magmatic or meteoric fluids rose above a lower hot igneous body. The pipe would be vertically veined and/or brecciated.

Exploration: Several companies have explored the area with regional focus shifting to the specific ATO deposit area because of its prospectivity. Various surface based programs (mapping stream and soil Geochem, geophysics, grab sampling) lead into concerted drilling commencing in 2010 on soil Geochem gold anomalies, the strongest of which were over the pipes now host deposits. Trench was initially undertaken to confirm the anomalies. In all 244 trenches were excavated in ATO district (28,809 m) and surrounding areas including 168 trenches at the ATO prospect (2012 to 2014).

Drilling: Up until the previous 2017 Resource estimate, and since acquiring the ATO Project in 2007, CGM had completed, a total of approximately 63,866 m of exploration drilling in 597 holes (to the end of 2014). Of that, 54,425 m was core drilling in 370 holes and 9,441 m was reverse circulation (RC) drilling in 227 RC holes. That drilling has been spread over the ATO mining license as well in the exploration area to the south (Figure 34). Drilling efforts were focused on expanding the known mineralization at the pipes and exploration drilling in several potential southern target areas.

Steppe commenced drilling in 2018 and to 2020 had added ~56,036 m (?) in 170 diamond holes. That brought the grand total to 120,320 m in 767 drill holes. Of that diamond holes total 110,879 m in 540 holes. In the Project area trenching (pseudo surface drill holes) account for 10,184 m in 167 trenches. NB: It is not clear if these totals include holes and trenches outside the Project area. Drilling during this period was focussed on Pipes 1,2 and 4 and increasingly on Mungu (Figure 35).

Initial RC discovery drill holes were relatively short (~40 m), vertical, and drilled on a 100 * 100 m square pattern. The bulk of the diamond core (DDH) holes were located on drilling cross-sections oriented at 125° and 30 m apart. This direction was perceived to be approximately across strike of the deposits. These holes were drilled dipping at 60° below vertical and oriented parallel to the cross-sections on 125° azimuths, with a few also drilled the other way on the sections towards 315°. On section the collars were either 30 or 60 m apart (and typically wider at the edges of the deposits). These hole orientations and spacings are illustrated well in Figure 6. A limited number of diamond holes were also vertical, and a limited number were inclined holes and drilled at random azimuths. The “AT” diamond holes drilled at the Pipe 1, 2 and 4 deposits averaged ~190 m in length and the “MG” drilled at Mungu averaged ~240 m in length.

Sample preparation, analysis and security: Most samples were of drill core which was cut and split on site before being sent away for analysis (of gold, silver and associated base metals) in the capital Ulaanbaatar. Drill hole samples were taken continuously over their full length and at 1 to 2 m intervals through mineralized zones (mostly 1 m) and at 2 to 3 m intervals through unaltered host rocks. In general core recoveries were very good and averaged 97% for the deposits.

Bulk density was determined in 2010/11 from 226 samples from diamond core holes. Bulk densities by oxidation level were 2.46 t/m^3 in oxide material, 2.59 t/m^3 in transitional material and 2.64 t/m^3 in fresh rock.

Opinion on drilling and sampling: The Author QP’s overall pinion of the drilling, sampling and subsequent assaying (albeit without the benefit of a site visit to observe it) was that it was well performed, comprehensive, consistent (and extensive) and very adequate from a point of view of allowing a straight-forward interpretation of mineralisation at the deposits and of estimation of their Resources. The sample preparation, QA/QC, security and analysis procedures were considered positively.

Data verification: CGM originally implemented a series of industry standard routine verifications to ensure the collection of reliable exploration data. Documented exploration procedures exist to guide most exploration tasks to ensure the consistency and reliability of exploration data. In accordance with NI 43-101 guidelines, the Steppe QP visited the ATO deposit on August 23 and October 2, 2017. The site visits were conducted to ascertain the geological setting of the ATO Project gold-lead-zinc mineralization and to witness the extent of exploration work carried out on the property.

For the 2017 estimate routine verifications were completed by the QP to ensure the reliability of the drill hole and topography surface data, and analytical data provided by Steppe. In the opinion of the QP then the electronic drill holes data was reliable, appropriately documented and exhaustive. The analytical results were sufficiently reliable for the purpose of resource estimation.

For this 2021 estimate the Author QP’s overall opinion was that ATO’s drilling data was completely adequate* for Resource estimation (the purpose of the Consulting and this Report). *This opinion is qualified by the fact that the Author has not physically been able to sight any of the Project’s geology or drilling himself (largely due to the current 2020 and 2021 un-avoidable inability to visit the site).

Metallurgical Tests and Processing

Metallurgical tests for mineral processing at ATO deposit were conducted at the Central Laboratory of Xstrata Support Process in Canada, "ALS Metallurgy-Ammtec" laboratory in Australia and "Boroo Gold" LLC processing plant in Mongolia.

Mineral processing method was effectively chosen for a heap leaching of oxidized ore and most metallurgical tests were concentrated to the oxide ore testing.

Metallurgical test samples consisted of samples from the drill core and bulk samples from the oxidized zone of the pipes including some sulfide ore from deeper zone of the pipes. Metallurgical tests included a step-by-step leaching test carried out by the roll-up test (bottle-roll test) and granular ore test. Tests were conducted in 4 phases:

1. Bottle-Roll tests of the Xstrata Process Support Center in Canada (from 4 April 2010 to June 30, 2011)

2. Destruction Testing and Analysis – Canadian Xstrata Process Support (September 2011)

3. Column leach tests with low diameter (75 mm) (conducted in crushed ore) - ALS Metallurgy in AMMTEC laboratory in Perth, Australia (completed in November 2011 in April 2012)

4. Additional analysis of column tests with a large-scale diameter (280mm) - in CIL plant of Boroo Gold LLC in Mongolia - September 2012)

Mineral Resources - modelling, analysis, grade estimation and Resources:

Introductory statements: This 2021 Resource estimation was independently undertaken by the Author QP / CP under the CIM, JORC and NI 43-101 Codes, Instruments and definitions. Resources were reported according to JORC, accepted as a foreign Code by NI 43-101, and using equivalent definitions to The CIM.

Data: All data was supplied by Steppe. Data used was raw drill hole data, topography data, data extracted from the 2017 Report (such as bulk density), and parameters supplied by Steppe (cut-off grades).

Drill hole database: A Minex software drill hole database was loaded with raw collar, down-hole survey and assay data. It was subsequently updated with interpreted data for assay population domains and oxidation surface intercepts.

Map database: A Minex map database was loaded with raw topography 1 m interval contour data. It would subsequently store deposit outline interpretations and models.

Geological interpretation and modelling of deposits: 3D inspection of the drill holes indicated that "wire-frame" modelling (joining cross-section outlines together with wires) would best suite the massively (rather than thinly) shaped deposits. With the abundance of relatively close-spaced drilling the deposit boundary outlines were interpreted around their gold (approximately >0.15 g/t), and to a lesser extent silver (approximately >1.0 g/t), whilst being also cognoscent of the lead, zinc and arsenic values, mineralisation on multiple parallel vertical cross-sections oriented at 125°. All bodies had a general north-east elongation (or strike), consequently the cross-sections were effectively across strike.

Deposit Pipes 1, 2 and 4 (now known as ATO1, 2 and 4) were wire-frame modelled (by connecting the cross-sectional outlines together to form solids) as single individual bodies; Mungu was modelled as a series of eight tightly packed, north-easterly striking sub-parallel and approximately en-echalon tall semi-vertical bodies. Samples were domain segregated by Pipe and in Mungu's case by individual body.

Geological interpretation and modelling of oxidation levels: Interpretation of the oxidation levels at the deposits was done in all drill holes from the lithological logs. This was necessary as bulk density would be assigned for Resource reporting by oxidation level. From surface the hole interval was interpreted as oxidised (code OX), partly oxidised or transitional (code TR), and un-oxidised or fresh (code FR). The interfaces to the intervals, representing the base of oxidation and the top of fresh rock, were modelled as DTM gridded surfaces with a 5 * 5 m grid mesh.

Topography surface model: Topography was modelled as a gridded DTM surface from the contour strings.

Grade statistics: Sample grades were briefly analysed statistically to determine data limits and block grade estimation parameters. The presence of few anomalous gold grades (<1%, unusually low for gold) prompted abandoning the use of grade cutting for the estimations. However the 1% limits derived from the simple statistics (at 10-20 g/t gold) were used to produce good variograms in the following brief geostatistical analysis. Those variograms mostly produced ranges >25 m (which agreed with results from the 2017 study where gold ranges were ~20-60 m). That distance continuity was of the same order of magnitude or longer than the typical 30 * 30 m drill hole spacing. It also implied that the grade continuity distances were approaching the same dimensions (50-100 m) observed of the well mineralised parts of the interpreted deposits. In terms of continuity directions the Author QP chose to use the clear mineralisation directions evident during the deposit cross-sectional interpretation. At Pipe 1 this was a steep 80°W dip. At Pipes 2 and 4 it was an intermediate 45°W dip. And at Mungu it was a vertical dip with the lodes striking 033°.

Resource block models: A block model was built for the Pipe 1,2 and 4 deposits (domains 1, 2 and 4 respectively) and another for the Mungu deposit (domains 5 to 11 and 15). Block models were built un-rotated within the wire-frames – deposits Pipe 1 2, and 4 with equi-dimensional 5*5*5 m blocks; Mungu with tall thin east-west 2*5*5 m blocks better representing the tall thin lodes.

Block grade estimation: Block grades were estimated individually for gold (Au), silver (Ag), copper (Cu), lead (Pb) and zinc (Zn) using an Inverse Distance squared algorithm (ID2). Drill hole sample intervals were down-hole composited by domain to 2.0 m for Pipes 1,2 and 4 and to 1.0 m for Mungu. No grade clipping or cutting was necessary. A maximum sample scan distance of 75 m was used (although in practice this wasn't needed due to the tight wire-frame model constraints and the close drill spacing).

For Pipe 1 axes were rotated 10° to give an 80°W dip and weighted to give down dip preference. For Pipes 2 and 4 axes were rotated 45° to give an 45°W dip and also weighted to give down dip preference. For Mungu axes were rotated 33° to give a 033° strike and weighted to give vertical preference.

A "gold equivalent" (AuEq) block value was computed from the individual elements by factoring them by their international metal prices averaged over the month to mid-January 2021.

Resource classification: Although the Author QP considered that proportions of Measured and Indicated Resources reported in 2017 were relatively too high he nevertheless considered that the bulk of estimated material in the 2021 estimate should be classified Measured or Indicated.

JORC classification was done here by block and was based on average sample distances (D) and numbers of sample points (P, minimum 1, maximum 18) in estimating each gold block grade. A Resource class was calculated for each block based on criteria combining these variables. The combinations were determined from a combination of statistics and observation of their distributions (the latter with the objective of ensuring contiguous class zones and avoiding spotting). Measured class criteria for all deposits was D ≤ 27.5 m and P ≥ 12; Inferred criteria was D ≤ 35.0 m and P ≥ 6; and Inferred was D > 35.0 m and P >1. All blocks were classified. This created Measured zones typically in the centre of deposits and in areas with highest drill hole densities. Indicated zones were in areas of sparser drilling and Inferred zones were generally restricted to the edges of deposits.

Mineral Resources: Combined Measured and Indicated JORC classified in-situ Mineral Resources (directly equivalent to CIM categorisation) was reported for all four deposits, using fixed densities and lower AuEq grade cut-offs by oxidation level (see tabulation below). Total Measured and Indicated in-situ Resources were reported at **41.6 Mt** at an average **AuEq** grade of **1.67 g/t** (for 2.2 M oz metal). In the following tabulations deposits ATO1, 2 and 4 represent Pipes 1, 2 and 4. The Resource break-down into separate classes was:

Resource Class	Tonnes (M t)		AuEq (g/t)	AuEq metal (M oz)
Measured	23.9	58%	1.84	1.4
Indicated	17.7	42%	1.44	0.8
Total	**41.6**		**1.67**	**2.2**

The break-down by deposit was:

Deposit	Tonnes (M t)		AuEq (g/t)	AuEq metal (M oz)
ATO1	15.2	37%	1.83	0.9
ATO2	3.1	8%	1.01	0.1
ATO4	15.7	38%	1.62	0.8
Mungu	7.6	18%	1.74	0.4
Total	**41.6**		**1.67**	**2.2**

The break-down by oxidation level (giving the AuEq lower grade cut-offs and densities used in all Resource reporting) was:

Oxidation level	Cut-off (g/t)	SG (t/m^3)	Tonnes (M t)		AuEq (g/t)	AuEq metal (M oz)
Oxide	0.15	2.46	8.0	19%	1.26	0.3
Transition	0.40	2.59	10.3	25%	1.92	0.6
Fresh	0.40	2.64	23.3	56%	1.70	1.3
Total			**41.6**		**1.67**	**2.2**

Further and separate Inferred JORC class in-situ Resources were reported at **5.6 Mt** at an average AuEq grade of **1.15 g/t** (for 0.2 M oz metal).

Reconciliation: Reconciliation of these 2021 Resources could only be done for the three deposits also reported in the 2017 estimate (Pipes 1, 2 and 4). No data existed to reconcile the Mungu deposit against. Reconciliation (Table 62) was approximated to account for differences in estimate reporting parameters between 2017 and 2021, particularly the different cut-off grades used.

This 2021 Resource contained 25% more tonnes (34.0 Mt vs 27.2 Mt) at a 3% lower Au grade (1.01 g/t vs 1.04 g/t) and a 16% higher Ag grade (9.65 g/t vs 8.32 g/t). These combined to give the 2021 Resource 22% more contained Au metal (1.11 M oz vs 0.91 M oz) and 45% more contained Ag metal (10.56 M oz vs 7.27 M oz).

The QP considers that the comparable 2017 and 2021 Resources can be well reconciled. Whilst the tonnage differences are notable they are considered to be almost wholly due to the different deposit modelling approaches of the two estimates. And further drilling at the deposit since 2017 was also thought to have increased its volume.

Potential impacts on Resources: The Author QP was not aware of any other factors (excluding those specifically mentioned below), including environmental, title, economic, market or political, which could generally or in-particularly influence the Resources reported here for the ATO Project. Factors that could alter the Resources (but in all cases relatively insignificantly in the QP's view) were changes in grade cut-off; bulk density; gold equivalent (through variations in world metals prices); geological model; JORC classification; and mining method with depth (possibly a factor at the deeper Mungu where underground mining would be considered and which would have a considerably higher grade cut-off).

Mineral Reserve Estimates and Statement

The Mineral Reserve estimate has been prepared utilizing acceptable estimation methodologies and the classification of Proven and Probable Mineral Reserves conform to CIM Definition Standards and NI 43-101.

The Mineral Reserve estimate was developed through the construction of an ultimate open pit design within the Mineral Resource model at cost estimates defined in Section 15, Table 15.1 and the reserve metal price assumptions of $1,300/oz gold and $21.5/oz silver.

Pit optimization was done using MineSight Project Evaluator to define pit limits with input for economic and slope parameters. Optimization used only Measured and Indicated Resources for oxide ore processing. All material under 0.4 g/t AuEq was considered as a waste.

The Proven and Probable Mineral Reserve totals 2.6 Mt at 1.33 g/t Au and 13.83 g/t Ag containing 110 thousand oz of gold and 1,142 thousand oz of silver.

The Mineral Reserve estimate takes into consideration mining and processing costs, metallurgical recoveries, sales prices, refining charges and royalties in determining economic viability.

The Mineral Reserve estimate is classified as 62% Proven and 38% Probable.

The methodology used for mine planning, pit limit determination, production sequence and scheduling, and estimation of equipment/manpower requirements is in line industry practice.

Mining Method

The ATO mine is an open-pit truck and shovel operation. The truck and shovel method provides reasonable cost benefits and selectivity for this type of deposit. Only open-pit mining methods are considered for mining at ATO.

Pit designs were created to use 5.0 meters benches for mining. Slope parameters were applied as up to 50-degree inter-ramp slope angles; up to 70 degree bench face angles. Ramps were designed to have a maximum centerline gradient of 10%. Design criteria accounts for 3.5 times the width of the truck for running room in areas using two-way traffic. For roads designed outside of the pit, and additional safety berm is accounted for in the road widths. The ultimate pit is separates 3 small mines. Based on a resource block size of 5 m by 5 m by 2.5 blocks, ore loss and dilution was assumed not more than 3% and 2%.

Mine Production Schedule

Proven and Probable Reserves were used to schedule mine production, and Inferred Resources inside of the pit were considered as waste. The final production schedule uses trucks and shovels as required to produce the ore to be fed into the process plant.

Table 1 ATO Mine production schedule

Years	Total rock tonnage	Oxide ore tonnage, ROM	Waste tonnage	Au (g/t)	Ag (g/t)	Au Eq (g/t)	Contained Metal	
							Au, k Oz	Ag, k Oz
2021	2,372,660	1,160,303	1,212,357	1.55	8.56	1.63	57.7	319.2
2022	3,104,549	1,236,000	1,868,549	1.23	19.78	1.42	48.7	785.9
2023	201,988	184,819	17,170	0.37	7.14	0.44	2.2	42.4
Total	**5,679,197**	**2,581,121**	**3,098,075**	**1.31**	**13.83**	**1.44**	**108.6**	**1,147.5**

Recovery Methods. The recovery methods used for the oxide portion of the ATO Project is crushing and heap leach. Flowsheet development, operating parameters and design criteria were based on results from metallurgical test work. The gold recovery process was designed on the basis of leaching 1.2 Mt of ore per year with an average gold grade of 1.13 g/t, average silver grade of 9.25 g/t at an overall gold recovery of 70%, silver recovery 40%.

Commercial production was achieved in April 2020. As at December 31st, 2020, 1,531,790 tonnes of ore have been mined from the pit and 1,068,462 tonnes crushed and stacked ore under irrigation at a gold grade of 2.03 g/t Au on the heap leach pad (Cells 1 and 2) for 69,734 gold ounces stacked.

The Company commenced stacking of Cell 1 in the fourth quarter of 2019 and Cell 2 in June 2020. Gold produced as of the 31st of December 2020 were 33,154 ounces or 47.5% recovered. An additional 170,130 tonnes were mined in the fourth quarter of 2021 for a total of 1,701,920 tonnes and 189,283 tonnes crushed, stacked and under irrigation at a grade of 1.91 g/t Au for a total of 1,257,745 tonnes at 81,357 ounces. No additional gold was recovered in the first quarter of 2021 giving an overall reconciled gold recovery of 40.8%.

The three-stage crushing plant operates at a nominal 5860 t/d throughput, 275 days per year. The process plant is located near and down-gradient from the heap leach facility (HLF) minimizes pumping and pipeline requirements for pregnant and barren solutions. Pregnant solution flows to the plant at a nominal rate of 200 m3/h. The plant processes 5 tonnes of carbon per day using an adsorption, desorption and refining (ADR) process to extract gold from the pregnant solution to produce the gold doré.

Project Infrastructure

Infrastructure and construction buildings have been designed and constructed for Mongolian harsh weather. The following facilities are installed at the site;

- Process plant building and laboratory;
- Fuel storage;

- Chemical storage;
- Power supply;
- Water supply;
- Heap leach facilities and ponds; and
- Camp.

Since the start of mining operations in 2019, ANFO explosive is delivered straight to the hole for blasting. A new explosive storage will be installed in 2021 and will be located 3 km from open pit. All explosive, detonators and transfer wires will be in separate containers.

Environmental, Permitting and Social Considerations

Steppe Gold has conducted stakeholder and community participatory regular/routine environmental monitoring program at ATO gold project site and surrounding areas, and reporting to relevant authorities and local communities addressing the monitoring and control impacts on air, water, land/soil and biodiversity. The General Environmental Impact Assessment (GEIA) was completed and approved by Ministry of Environment and Tourism of Mongolia. The environmental and social impacts are summarized in the report, and include changes to topography from mining operations, impacts on vegetation from mine clearing, impacts on fauna from land clearing, surface water hydrology impacts from interrupted natural drainage and soil and water contamination from mine development. Based on all completed environmental and social studies and assessments, Steppe Gold have been developing the Annual Environmental management plans, implementing the planned environmental and social activities. Steppe Gold has conducted water resource studies from 2017 to 2019 and received water resource statements from the relevant authorities and received land use permits for mining, construction, other infrastructures sites from local authorities. A list of completed and received environmental and social permits is included in the report section 20.3.2. Steppe Gold has a strong support for mining industry at all levels of government. The Company has been building a strong local support and relationships for many years and has a Government of Mongolia approved Local Cooperation Agreement that acts to support province level social development activities. The mine minerals waste handling plan has been developed to ensure that the management of mining activities and the implementation of environmental and social management plans and mine closure at the ATO will be conducted according to best practice methodologies to eliminate the potential for contamination. The management of the ATO gold project's significant environmental and social aspects and impacts is achieved through a suite of Management Plans that have been developed and is maintained such as Air Quality Management Plan and Water Resources Management Plan. These are listed in section 20.6 in the report.

Markets and Contracts

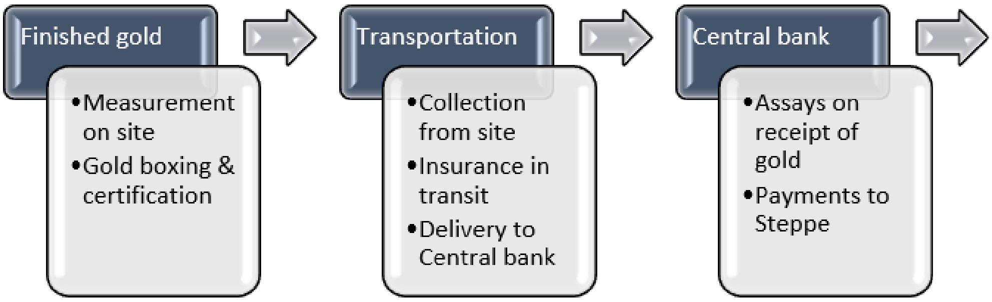
Steppe Gold sells its gold production directly to the Mongolian government at spot price. Two types of dore are produced on site at the operation, the first is dore containing approximately 70% gold by weight and the remaining 30% is a mixture of silver, base metal and iron. The second type is silver dore produced and sold separately.

Dore is transported to the Bank of Mongolia (BOM). The BOM announces the official gold and silver rates for the day using the London Metal Exchange (LME) closing rate from the previous day.

The following deductions apply on the LME dore closing date which is BOM official rate for the day;

- Refining charge of US$2 per gold oz sold;
- Refining charge of US$1 per silver oz sold;
- 5% royalty on gross gold revenue; and
- 5% royalty on gross silver revenue (up to $25); otherwise as per below pricing table

The Dore is sent to a refinery for smelting and sampling to determine gold and silver content. Once these assay grades are determined the proceeds from the sale are credited to the Steppe Gold account. A flowsheet for the receipt of income is shown below:



Capital & Operating Costs Estimates

Plant and Equipment of US$ 37.8 million was reported on December 31st, 2020 a reduction of US$ 3.5 million over December 31, 2019 due to depreciation. Total capital expenditure for 2020 was US$ 1.8 million with US$ 0.3 million spent in the fourth quarter compared to USD1.5 million in third quarter which included the leach pad expansion for Cells 3,4 and 5 and exploration drilling at the ATO Project in the third quarter. A new primary jaw crusher was also acquired in the third quarter of 2020. Capital expenditure for the three months ended March 31, 2021, in the first quarter of 2021 was US$1.0 million.

All-in-sustaining cost ("AISC") for the three months ending December 31, 2020 was US$902 per ounce on gold sales of 7,923 ounces of gold compared to US$794 and US$739 in the third and second quarter respectively, with the increase primarily due to higher administrative costs.

Operating costs are presented as US$ per tonne mined rather than per tonne crushed and stacked. The total cost for 2020 was US$ 13.82 per tonne and Q1 2021 US$ 24.77 per tonne for an average cost of US$ 15.24 per tonne of ore mined.

Economic Analysis

The ATO Oxide operation was valued using a simple cash flow model excluding discounted cash flows. Estimates were prepared for all the individual elements of cash revenue and cash expenditures for ongoing operations. Cash flows are assumed to occur in the middle of each period. Operating costs were prepared based on recent operating history and technical assumptions associated with the production profile. Capital costs were prepared based on engineering estimates, vendor quotes, maintenance strategies, or estimated long-term requirements based on recent operating history and current asset values. The currency used to calculate the cash flow is American dollars (US$).

The gold price assumption used in the revenue analysis is different from month to month, minimum gold price used was US$1,684/oz Au in June 2020 and the maximum was US$2,036/oz Au in July 2020. The silver price assumption used in the revenue analysis is also different from month to month, minimum silver price used was US$13.91/oz Ag in April 2020 and the maximum was US$26.5/oz Ag in September 2020.Gold and Silver price assumptions are determined corporately by Steppe Gold.

The operational profit cash flow model 2022 before tax is estimated at US$32.38 M. The operational profit cash flow model 2022 after tax is US$15.82 M. Internal rate of return and payback period results are not relevant as the cumulative discounted after-tax free cash flows are never negative. This reflects the fact that the ATO Phase 1 is already in operation and that operating cash flows in 2021 and 2022 are sufficient to cover sustaining and growth capital requirements.

Adjacent properties: The Author QP has not been supplied with any information by Steppe concerning adjacent properties to ATO which Steppe may have interests in.

Other relevant data and information: The Author QP is not aware of any other data or information (additional to already included in this Report) which would make the Report more understandable and not misleading.

Interpretations and conclusions: The Author QP's overall interpretation of the estimation and resulting Resources was that it proceeded as expected, confirmed the 2017 modelling and results of Pipes 1, 2 and 4, and produced a more accurate second generation result. Interpretation of mineralisation at the new Mungu deposit showed it to be more complex and lode-like than the other deposits, with greater potential for increasing the Resource with targeted drilling. Its different shape gives encouragement for further regional exploration to find other deposits of its style.

The Author's conclusions were that:

- *The 2021 Measured and Indicated Resources*:
  - Pipes 1, 2 and 4:
    - The 2021 Resources confirmed the 2017 estimate generally.
    - It increased the Resource tonnage significantly (by 25%), decreased the gold grade slightly (by 3%), increased the silver grade reasonable (by 16%), leading to an overall significant increases in metal contents (gold by 22%, silver by 45%). NB: This comparison uses equivalent reporting cut-offs between the two estimates.
    - The increase in deposit volume was not only because of additional drill holes but also because of more practical and geologically controlled deposit shape interpretation.
  - For Mungu:
    - The cross-sectional interpretations hung together and created a significant deposit.
    - This maiden Measured and Indicated Resource was significant at 7.6 Mt at 1.16 g/t gold (282 k oz gold metal) and 40.75 g/t silver (9,916 k oz silver metal).
    - Mungu now represents 18% by tonnage of the Resources, 20% of the gold metal and 48% of the silver metal (as the silver grade is 320% higher than for Pipes 1, 2 and 4).
  - All deposits:
    - The total Resource for all deposits stands at 41.6 Mt at 1.04 g/t gold (1.4 Moz gold metal) and 15.31 g/t silver (20.5 Moz silver metal).
    - The absolute comparison (Table 83) of the 2017 Resource (reported at much higher cut-off grades) with the 2021 Resource shows a 136% increase in tonnage, decreases of average gold grade of -27%, and increases of average silver grade of 53%.
    - The absolute comparison of contained metal shows a 73% increase in gold metal (to 1.4 Moz) and a 262% increase in silver metal (to 20.5 Moz).
- *Adequacy of data*: The Author QP believes that all data supplied and used in the estimation was suitable for the purpose of Mineral Resource estimation and JORC classification.
- *Drilling data*: The Author QP's overall pinion of the drilling, sampling and subsequent assaying (albeit without the benefit of a site visit to observe it) was that it was well performed, comprehensive, consistent (and extensive) and very adequate from a point of view of allowing a straight-forward interpretation of mineralisation at the deposits and of estimation of their Resources.
- *Compliance with JORC and Canadian standards*:
  - To the best of his knowledge the Author QP believes that the Mineral Resource estimation Project, and the reporting of it, comply with the JORC (2012) and NI 43-101 (June 2011) standards.
  - He notes that in order to comply with the CIM Definitions requirement of "reasonable prospects for eventual economic extraction" the 2017 Report included details on pit optimisation studies and pit design leading to the reporting of Mineral Reserves and made the assertion that the Resources met the requirement.
  - The Author QP considers the results of that previous work to have been successful and therefore continue to demonstrate the "reasonable prospects for economic extraction".
  - The fact that mining has commenced at the ATO Mine further reinforces this compliance with the Code.

Recommendations: Recommendations were outside the Scope of Work for the Author QP's Resource estimation. And with the ATO Mine now in operation and mine planning assumed to be at a fairly advanced stage the capacity for recommendations is limited. However, the Author QP sees the potential for further drilling to enlarge the defined deposits (particularly at Mungu) and for further exploration to find new ones. The latter includes exploring locally for Mungu style deposots which may have previously geologically been overlooked.

2 INTRODUCTION

ISSUER – FOR WHOM THE REPORT WAS PREPARED

GeoRes prepared this NI 43101[5] Technical Report (the Report) for **Steppe Gold Limited** (Steppe, the Company, and GeoRes's Client) and Steppe will be the Issuer. Steppe is a precious metals company operating in Mongolia.

DRA Americas Inc. (DRA) was a supplementary contributor and author to this Technical Report, and provided input and responsibility in certain sections, as follows:

Name	Title, Company	Responsible for Section	Visited Site?
David Frost	Vice President – Process Engineering, DRA	13, 17, 18, 19, 21 and 22 and portions of 1	Yes (2018)
Ghislain Prévost, P. Eng.	Principal Mining Engineer, DRA	15, 16, and portions of 1	No
Dan V. Michaelsen	Senior Associate, FAusIMM (CP) Env	20	No

TERMS OF REFERENCE

Engagement: Independent Consulting Geologist **Robin Rankin** , MAusIMM CP(Geo)[6], (the Consultant, principal Author and Qualified Person (QP)) of GeoRes was engaged by **Mr Matthew Wood**, Steppe's Executive Chairman, in August 2020 for geological consulting work on Mineral Resource estimation and reporting (according to JORC 2012 and NI 43-101 standards) at the **Altan Tsagaan Ovoo Project (ATO) in Mongolia** (the Project and Property). This Consulting work was to re-estimate Mineral Resources at three adjacent deposits (Pipes 1, 2 and 4, now referred to as ATO1, 2 and 4 by Steppe) and estimate initial Resources at another (Mungu) close by. Consulting included authoring an NI 43-101 report. Instructions and discussions were conducted largely by email and video conference calling.

Past involvement: The Author QP and GeoRes had no previous experience or contact with Steppe or the Project.

CIM Definition Standards reconciliation: The Canadian NI 43-101 standards for disclosure on mineral projects takes the CIM[7] definitions of Resource categories as its home code. The Instrument states that where "an acceptable foreign code" (such as the JORC Code) is used the Issuer must reconcile[8] the differences between the codes. In compliance with NI 43-101 the Author and QP states that the JORC Mineral Resource categorisation used in this Technical Report is directly equivalent to the CIM categorisation. See also the Introductory Statements (Section 0) to the Resource estimation itself.

Units: All measurement units used here are metric and currency is in United States Dollar terms.

PURPOSE

Steppe's general (and primary) objectives were understood to be exploration and development of the **gold** and related base and precious metals in the ATO Project in Mongolia. The Project is now the site of the ATO Gold Mine as production commenced in 2020.

[5] Canadian Securities Administrators (CSA), 24th June 2011. *National Instrument 43-101 Standards of Disclosure for Mineral Projects* (form 43-101F1). Companion Policy 43-101CP document setting out the CSA views on how they interpret and apply the provisions of the Canadian National Instrument 43-101 and Form 43-101F1.
[6] Accredited by the Australasian Institute of Mining & Metallurgy (The AusIMM) since 2000 as a Chartered Professional (CP) in the Geology discipline
[7] CIM, 10th May 2014. *CIM definition standards – for Mineral Resources and Mineral Reserves.* Prepared for the CIM Standing Committee on Reserve Definitions and adopted by the CIM Council on 10th May 2014. Incorporated in NI 43-101 by reference.
[8] NI 43-101. Part 7.1 (2).

The specific aim of GeoRes's work reported here (the Consulting) was to a re-estimate Mineral Resources in three adjacent deposits (Pipes1, 2 and 4), previously reported in the 2017 GSTATS NI 43-101, and an initial estimate of a fourth nearby deposit (Mungu) drilled since then. JORC Resources were to be reported in an NI 43-101 report. Resource classification under JORC was understood to be directly equivalent to the Canadian CIM standards.

NI 43-101 reporting: Consulting included reporting to Canadian National Instrument 43-101 (NI 43-101) standard (this Report). This is as required by Canada's securities regulatory system of disclosure and reporting for minerals projects. The format of this NI 43-101 Report (including all principal Sections) is defined in the instrument. The disclosure of Resource categories is specifically governed by the Instrument, in contrast to straight JORC reporting, to preclude the addition of Inferred Resources[9] to the other categories.

SOURCES – OF INFORMATION & DATA

Source: All information and data was supplied directly to GeoRes by Steppe in late 2020 and early 2021.

Format: All data was supplied in digital form – predominantly in MS Excel spreadsheets. CAD data was supplied in DXF format. Reports were supplied in PDF and/or MS Word format.

Data & information:

- Drill hole data:
    - A series of ~7 incremental spreadsheets contained various periods of drilling data.
    - Data was supplied for drill hole collars, down-hole surveys, assays and lithology logging.
- Topography map data:
    - Mapping data was supplied as 1.0 m intervals contour strings and various road boundaries.
    - Data covered a square area 2.7 km in easting and nothing.
- Reports:
    - A 2017 NI 43-101[10] report on the ATO Project by GSTATS Consulting LLC (GSTATS) was supplied.
- General information:
    - Project data and details continuously communicated through email.
    - Direct communication by telephone and video conferencing.

PROPERTY INSPECTIONS

The Author QP has **NOT** visited and inspected the Property. This situation was directly attributable to limitations on international travel caused by the Covid 19 pandemic.

Responsibility for this NI 43-101 requirement is therefore met by Steppe's QP Ochirkhuyag Baatar (see QP Certificate above and Section 3). The Qualified Person conducted site visits on 7th October 2020. Other visits were made in core shed and meetings in Steppe office in Ulaanbaatar. Site visits and meetings include existing documentation and report review, fact materials investigation, geology, exploration and drilling, metallurgy, operation plans and existing development information, and previous drill hole location verification.

One of DRA's QPs, Dave Frost has previously visited the site in 2018, as indicated in the table above.

PREVIOUS TECHNICAL REPORTS

1. **NI 43-101 TECHNICAL REPORT ALTAN TSAGAAN OVOO GOLD PROJECT, Tsagaan Ovoo, Dornod, Mongolia** dated October 4, 2017.:

[9] NI 43-101. Part 2.2 (c).

[10] Oyungeral Bayanjargal, 4 October 2017. *NI 43-101 Technical Report – Altan Tsagaan Ovoo Gold Project*. Report for Steppe Gold LLC by GSTATS Consulting LLC, Mongolia. Report reviewed by Qualified Persons Leonid Tokar (GSTATS), Tim Fletcher (DRA Americas Inc), David Frost (DRA) and Dr Martin Stapinsky (DRA). Referenced as the '2017 NI 43101' or '2017 Report'.

3 RELIANCE ON OTHER EXPERTS

DIRECT RESPONSIBILITY (NO RELIANCE ON OTHERS)

The Author/QP was directly responsible here for the processing and evaluation of data to estimate and report (in this Report) new in-situ Mineral Resources at ATO. These tasks were essentially covered by:

- Geology (NI 43-101 Sections 7 and 8).
- Resource estimation (Section 14).
- Conclusions and recommendations (Sections 25 and 26).

RELIANCE ON OTHERS

As far as the other non-directly Resource related aspects contained in this report go (listed below) the Consultant/QP relied upon:

- The 2017 NI 43-101 report by GSTAT (referenced above).
- General input from the Company.
- Specific provision of other Experts and/or Qualified Persons (listed in Section 0) by the Company for those other aspects.

The non-directly Resource related aspects included:

- Back-ground Property details (NI 43-101 Sections 4 to 6).
- Exploration (Sections 9 to 11).
- Data verification (Section 12).

Whilst not doubting the data on the non-directly Resource related aspects relied upon (listed above), the Consultant specifically disclaims responsibility for all information on legal aspects (such as mineral and land tenure, other agreements, environmental obligations and rights to operate). These aspects are beyond the Consultants area of expertise and/or ability to verify.

The Consultant also specifically disclaims responsibility for the data collection (exploration and drilling), sample preparation and data verification. Those aspects became beyond the Consultants ability to evaluate because of the limited exposure to the Company and the Property due to the inability to visit the Property during the Covid 19 pandemic.

Notwithstanding the statements above – of all of the external sources of Project data that the Consulting used the Consultant was of the professional opinion that it originated from personnel who either were or would have constituted Competent Persons, Qualified Persons or Experts. This impression was either gained first hand or was assumed through the (known and assumed) professional standing and/or reputation of the organisations they represented.

OTHER EXPERTS (QPS)

For sections of this report prepared by DRA, the information, conclusions, opinions, and estimates contained herein are based on:

- Information available to DRA at the time of report preparation;
- Assumptions, conditions, and qualifications as set forth in this report; and
- Data, previous reports, and other information supplied by Steppe Gold and other third-party sources.

The Author QP relied on input from the following Alternate QP for the non-Resource aspects mentioned above:

- **Ochirkhuyag Baatar.**

For the purpose of this Report, the QPs have relied on information related ownership, environmental liabilities, and permits provided by Steppe. The QPs have not researched property title or mineral rights for the ATO property and expresses no opinion as to the ownership status of the property.

For **Section 20 Environmental Studies, Permitting and Social Impact, QP Dan V. Michaelsen**, supervised the preparation.

The QPs have relied on Steppe for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from ATO.

Except for the purposes legislated under provincial securities law, any use of this report by any third party is at that party's sole of risk.

4 PROPERTY DESCRIPTION, LOCATION, TENURE & ENCUMBRANCES

This Report describes Steppe's Property in Eastern Mongolia called Altan Tsagaan Ovoo (ATO). In mining terms the Property is defined by Mining License **MV-017111**.

The bulk of the information in this Section is extracted from the 2017 NI 43-101 Report[11] and has been reviewed and/or amended by Steppe's appointed Alternate QP Ochirkhuyag Baatar.

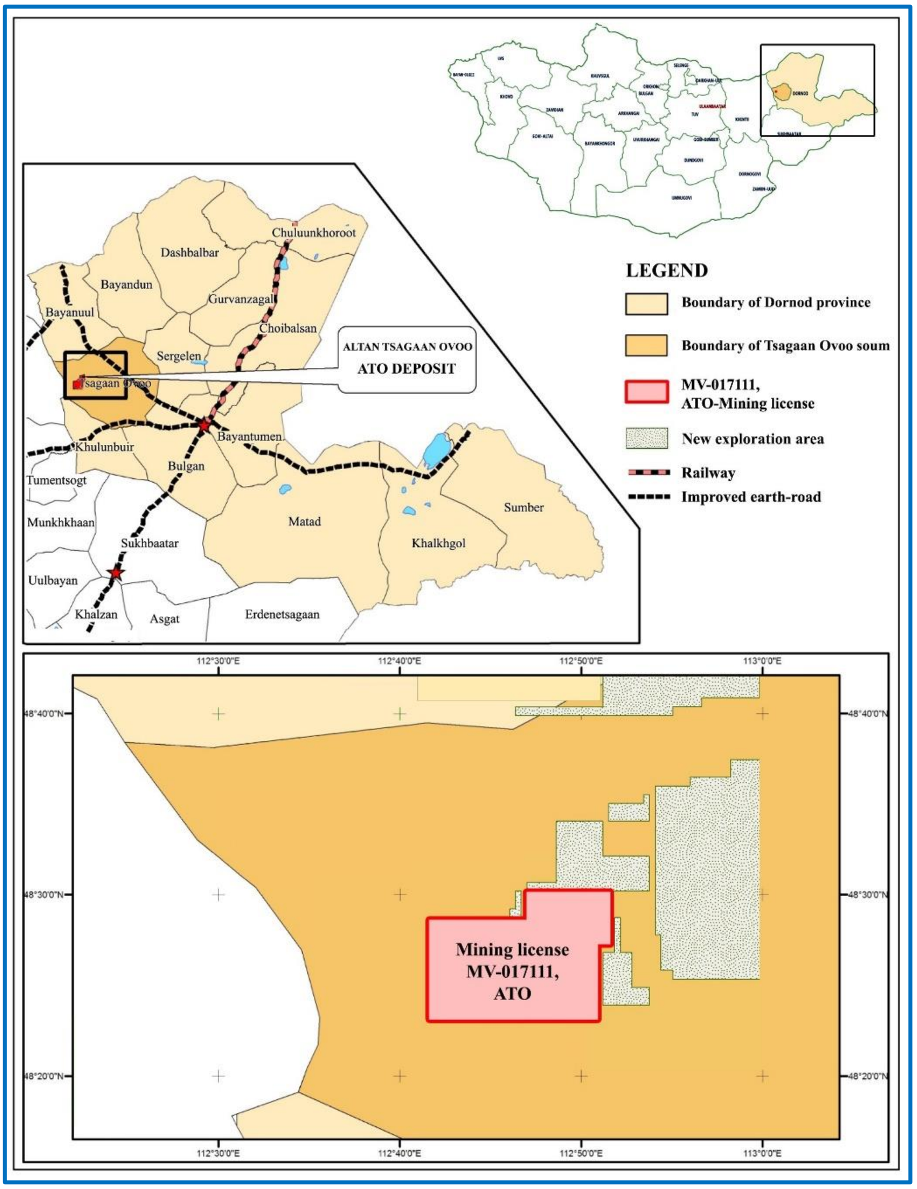
SURFACE AREA

Surface area of the Mining Licence MV-017111 is **5,492.63 ha** or ~55 km^2 (1 ha = 10,000 m^2). The immediate Project area of the four deposits is **~2 km^2**, with dimensions ~1.4 km east/west * ~1.2 km north/south.

LOCATION & COORDINATES

Location: Figure 1[12] illustrates the ATO Project regional location in Eastern Mongolia. ATO is in the border Dornod Province (light orange shading) adjacent to China in the east and south and Russia in the north. ATO is in the Territory of Tsagaan Ovoo Soum (darker orange shading on the western side of Dornod Province. Regionally ATO is ~660 km east of Mongolia's capital Ulaanbaatar, ~120 km west-north-west of Dornod provincial capital Choibalsan (centre of radial black roads), and ~38 km west of the closest town Tsagaan Ovoo Soum.

Figure 1 ATO Project regional location



Coordinates: The coordinate datum used is **WGS84, Zone 49** (108°E to 114°E in northern hemisphere) in the UTM system. A point just to the south of the deposits would have lats and longs of 112°47'00"E;48°26'30"N and metric coordinates of 632,000E;5,367,000N.

[11] 2017 NI 43-101 Report, Section 4, pp22 onwards.
[12] 2017 NI 43-101 Report, Fig 4.1, pp22

MINERAL TENURE

Mineral tenure has seen a steady movement from large to reduced Exploration Licenses and then similarly reducing Mining Licenses.

- Exploration License 6727X was issued to Coge Gobi LLC (CogeGobi) in 2003 of 109,118 ha.
- Subsequently 85,500 ha were relinquished in 2007, leaving 23,597 ha.
- The Exploration License was transferred to Centerra Gold Mongolia LLC (CGM) in 2010.
- CGM obtained a Mining License (MV-017111) in August 2012 of 11,614 ha. The duration of the License was 30 years, to August 2042. The boundary had 19 corner points.
- Subsequent simplification of the Mining Licence reduced it to 8 corner points and area of 5,492.63 ha.

ISSUER'S TITLE – TO THE PROPERTY

Mining License: The ATO Project comprises one mining licence (MV-017111) over an area of 5,492.63 ha. The ATO Project is located in the territory of Tsagaan Ovoo soum, Dornod province of Eastern Mongolia, 660 km east of the Ulaanbaatar, the capital of Mongolia, 120 km northwest of Choibalsan, the provincial capital of Dornod Province, 38 km west of Tsagaan Ovoo soum. The geographic zone of ATO Project is in datum WGS-84 Zone 49N of UTM coordinate system and the geographic centre of the property is 48°26'N latitude and 112°46'E longitude.

Surface rights / ownership: Pursuant to the Licence Purchase Agreement dated January 31, 2017, Steppe Mongolia acquired the ATO Project from CGM on September 15, 2017. The ATO mining licence was registered in the name of Steppe Mongolia effective on September 5, 2017. Steppe Mongolia now has legal ownership of 100% of the ATO Project licences.

Property access: Access to the property from Ulaanbaatar is possible by highway to Choibalsan, the capital of the Dornod Province, and then by improved unpaved roads to Tsagaan Ovoo soum. The property is connected to other settlements by dirt roads. It is possible to fly to Choibalsan from Ulaanbaatar via domestic airlines.

ROYALTIES, AGREEMENTS & ENCUMBRANCES

Royalties: Mineral production in Mongolia is subject to fixed and sliding scale government royalties. The production of gold is subject to a flat rate 5% royalty and Silver is subject to a sliding scale royalty starting at 5%. up to $25 USD.

Table 2 Silver Royalties

№	Product type	Unit	Market price level per ounce	Percentage to be added to the base rate depending on the level of processing of the product /Progressive rate/		
				Ore	Concentrate	Product
1	Silver	ounces	$0 - $25			0.00
			$25 - $30			1.00
			$30 - $35			2.00
			$35 - $40			3.00
			$40 - $45			4.00
			$45 and above			5.00

:

The ATO Project is also subject to a 1.75% net smelter returns royalty in favour of CogeGobi.

In connection with the ATO acquisition, Steppe Mongolia and Steppe BVI entered into a metals purchase and sale agreement, known as a "Stream Agreement", dated August 11, 2017 with Triple Flag Mining Finance International Inc ("Triple Flag").

Under the original terms of the Stream Agreement, Triple Flag advanced Steppe Gold $23 million, obligating Steppe BVI to sell Triple Flag 25% of the gold ounces and 50% of the silver ounces produced from the ATO project until such time that Steppe BVI has sold an aggregate of 46,000 ounces of gold and 375,000 ounces of silver

respectively, known as the "Delivery Milestones". On these terms the parties agreed that Triple Flag will pay for the delivered metal ounces at 30 percent of the relevant market price on the delivered date.
Once these milestones have been achieved, Steppe BVI is obligated to sell Triple Flag 5,500 ounces for gold (plus 250 ounces of gold for each three month period in which the commercial production date follows September 30, 2018) and 45,000 ounces for silver (plus 2,045 ounces of silver for each three month period in which the commercial production date follows September 30, 2018) annually, known as the "Annual Cap Amounts". This obligation is in effect for the life of the mine and includes all gold or silver produced by Steppe Mongolia within an agreed area of 20km from the original mineral licenses comprising the ATO project. Triple Flag has now determined the Annual Cap Amounts upon the achievement of the Commercial Production Date as the Gold Cap Amount to be 7,125 ounces of Produced Gold annually and the Silver Cap Amount to be 59,315 of Produced Silver annually.
On September 30, 2019, Steppe BVI and Triple Flag agreed to amend the terms of the existing Stream Agreement. Under the new terms, Triple Flag advanced an additional $5 million to Steppe that was used to repay the final $5 million payment on a promissory note issued as part of the purchase price for the ATO project.
In consideration of this additional advance, the parties agreed to reduce Triple Flag's agreed upon purchase price of gold and silver from 30 percent to 17 percent of the relevant market price for delivered metals. In addition, Steppe West granted a 3% net smelter returns royalty to a subsidiary of Triple Flag International on minerals derived from the Uudam Khundii property owned by Corundum. All other terms of the agreement as noted above remain the same.

ENVIRONMENTAL LIABILITIES

Operation: Under the Environmental Protection Law of Mongolia (the EPL) business entities and organizations have the following duties, including, but not limited to, with respect to environmental protection:

A. Comply with the EPL and the decisions of the government, local self-governing organizations, local governors and Mongolian state inspectors.
B. Comply with environmental standards, limits, legislation and procedures and to supervise their implementation within their organization.
C. Keep records on toxic substances, adverse impacts, and waste discharged into the environment.
D. Report on measures taken to reduce or eliminate toxic chemicals, adverse impacts, and waste.

The Minerals Law and the Law on Environmental Impact Assessment (EIA) state that the Mining License holder shall prepare and submit an environmental impact assessment report to relevant government authority for its approval.

According to the Minerals law (Clause 35.3). the Company had engaged Midas Mining to commence updated feasibility study based on the Mongolian guidance as "Preliminary assessment of mineral mining potential, general requirements for feasibility study of mining projects and regulations for submitting feasibility study" in 2018.

In accordance with Clause 4.14 of Environmental impact assessment procedure, addendum assessment was done on Detailed environmental impact assessment and it was approved by professional commission of Ministry of Environment and Tourism.

In accordance with Law on Environmental Impact Assessment and Procedure of Environmental management plan development, revision, approval, the Company is developing and obtaining approval on Annual Environmental management plan and fulfilling its implementation.

Closure and reclamation: Mine closure and rehabilitation activities need to be planned prior to mine operation commencement. Therefore Steppe Gold has developed its mine closure conceptual plan in 2019. This conceptual plan regularly gets updated as new information becomes available. The Company develops and submits Asset Retirement Obligation /ARO/ Report quarterly basis.

ATO mine site will turn into grassland once rehabilitated and local perennial plant species will be planted as part of mine restoration activities. Since the beginning of mine operation, company conducts different studies to ensure effective closure and rehabilitation.

In accordance with this research, the company built "Tree nursery and trial plantation", and is planting 10 types of tree and bush in 2 different timelines using 3 different planting method to research and analyse the results and choose suitable method for future rehabilitation from these varieties. Also the Company is collecting aboriginal perennial plants seeds and using them on topsoil stockpile in accordance with relevant standard to research and analyse the results.

PERMITS REQUIRED

Approval for commencement of mining: Since the 2017 NI 43-101 report mining has commenced.

Land possession right: The Mining License holder can request to use or possess land for the mine claim, camp and other permanent facilities for its mining operations. Only Mongolian citizens and legal entities are entitled to hold a land possession right (Clause 32.1 of Land Law). Land use or possession rights are evidenced by a Land Use or Possession Certificate issued by a local authority of the soum (district) in which the relevant land is located. The terms and conditions of land use or possession rights are governed by a land possession agreement entered into with the land division of a local authority of the relevant soum (district).

Water Use Permit: The Company has obtained the “Water reserve conclusion” from Mongol-Us SOE on 2018 in accordance with Mongolian Law on Water, therefore, obtaining Water usage conclusion from either Environment and Tourism Agency of Dornod province or Mongol-Us SOE depending on the amount of water to be used and making Water usage contract with either Tsagaan-Ovoo soum or Kherlen River Basin Administration.

Energy and Powerline permits: The project area is located in a moderately developed area in Mongolia, but in the recent years, mineral exploration has activated for gold, base metal, coal and oil prospects around this area and tends to become a major economic and infrastructure region. Currently, Steppe Gold LLC provides ATO projects reliable electricity to its customers as processing plant, crusher and camp’s electricity supplied by CATERPILLER diesel generator and annual electricity consumption estimation is 6,100 kW. During the entire project operation, there will have to be three electricity consumers as:

1. Camp
2. Pit
3. Processing plant
    a. Oxidized ore - 1-5 year
    b. Fresh ore - 6-11 year

During the entire period of fresh ore mining ATO projects total the total electricity capacity will be 13,262.4 кW.

Construction permit: The Company has built required facilities for heap leaching of oxidized ore as water supply system, heap leach pad, processing plant, fuel station, boiler house and chemical storage and has been commissioned recently.

1. Mining permission
2. Processing permission
3. Permissions related to the commissioning of the construction /Camp, Processing plant, Chemical storage, crusher and heap leach pad/
4. Chemical permissions

Mine drilling and blasting performed by the blasting contractor company named as “Special Mining Service” LLC.

OTHER ISSUES INFLUENCING THE RIGHT OR ABILITY TO OPERATE

Socio-economic impacts: As an example of the Company’s (and predecessor) successful ability to operate in Mongolia its recent past operations are detailed briefly here. Centerra Gold Inc. (CGI) is the parent company of Mongolia based CGM which has had assets in Mongolia. CGM owns a 100% interest in the Boroo Mine, a 100% interest in the Gatsuurt property, and previously owned a 100% interest in the ATO Property. Boroo is an open-pit operation and Mongolia’s largest hard-rock gold mine. It began commercial production in 2004 and produced approximately 1.8 million ounces of gold from March 2004 through to December 2016. Boroo is operated through CGI’s Mongolian subsidiary, Boroo Gold Company. The operations at the Gatsuurt property are pending due to suspended negotiations with the Mongolian Government. The Project will begin ore production on receipt of the final approvals and permits (Centerra Gold Inc. 2011a). The Gatsuurt property is being currently advanced by CGM. CGM owned 100% interest in the ATO Project before it was acquired by STEPPE in 2017.

ATO project puts special attention on society-economy issues therefore, developed Sustainable development policy and implementing it in its operations. In this policy, local community relation, human resources, safety and environment was included specifically therefore, developed a good management system.

Community policy, planning, consultation and engagement: This Social Baseline Assessment has provided useful preliminary information for the planning of Project developments by CGM and it will provide Steppe with an effective pathway for conducting additional public consultations with local communities. The Alternate QP is not aware of any environmental liability or significant issues to affect development of the property. Careful Project planning, including the implementation of an international-style social and environmental impact assessment (SEIA), a Mongolian EIA, and a land use management and reclamation plan, will be important components for the success of the project.

There are several key observations drawn from this Social Baseline Assessment, based on survey work in the field, research and analysis, and also from the expressions of concern and interest by the local people. These observations include:

- There are archaeological sites on the ATO LA and sacred places located in the general area:
  - sacred places must be fully avoided and protected from any sort of Project activities;
  - archaeological sites should also be avoided. If absolutely necessary to use the area for mining and/or infrastructure, archaeological excavations should be planned and conducted prior to the mining of the site.
- New jobs will be created that will provide opportunities for local people, including possibly youths. The local people believe that:
  - use of local labour and the conditions for initial training should be investigated by Steppe;
  - a hiring policy that optimizes the opportunity for hiring a local labour force should be adopted by Steppe, and proper training programs should be developed.
- Regular communications with local authorities and local people will be vital to the success of the Project. To address this important aspect of the Project, it is recommended that Steppe should:
  - establish a local community liaison office;
  - conduct regular communications with all stakeholders with particular attention paid to vulnerable groups (nomadic communities, retired people, others);
  - develop mutually acceptable communication rules with the local people.
- Participation/sponsorship in local infrastructure development and community development projects by Steppe, as well as a safe driving program, are important issues for the local people.

5 PROPERTY GEOGRAPHY

The geography of the Property is described in terms of:

- General topography, elevation, vegetation and wildlife.
- Access to the site and nature of transport.
- Proximity to population centres.
- Climate and operating season.
- Infrastructure suitable for mining operations.
- Natural risks.

The bulk of the information in this Section is extracted from the 2017 NI 43-101 Report[13] and has been reviewed and/or amended by Steppe's appointed Alternate QP Ochirkhuyag Baatar.

TOPOGRAPHY (GENERAL)

Topography: Geographically, the license area is located in the low mountain zone at the north-east end of the Khentii Mountain Range and at the south-west part of the Dornod high steppe. The topography of the project area generally consists of small rounded, separate mountain complexes with small hillocks in a steppe.

Elevation: Average elevation is 980 – 1,050 m above sea level, with the lowest point being Deliin Well (979.3 m) and the highest point being Mount Temdegt (1,144.7 m). Relative elevation is 60 – 120 m.

Vegetation: Mostly, brown and black brown gravel, sandy loam, and gravel-mild clay of steppe zone are predominant. Quaternary loose sediments are widespread in the license area where there are no trees. Mounds and hills in the area are bald and rounded. Vegetation and grass cover the entire area and includes pasture plants such as khazaar grass, wormwood, stipa, brome-grass, and couch grass.

Wildlife: Hoofed animals of steppe in the region include white gazelle. Carnivores are wolf, fox and corsac. Rodents include marmot, gopher, shrew-mouse, and stoat. Birds include lark, red nose, crane, bustard, scoter, and brown nose. Also, crawlers, locust, grasshoppers, mosquitoes and midges are abundant.

Existing land use: The land surrounding the Property is predominantly used for nomadic herding of goats, cows, horses and sheep by small family units. Use is based on informal traditional Mongolian principles of shared grazing rights with limited land tenure for semi-permanent winter shelters and other improvements.

ACCESS & NATURE OF TRANSPORT

Road: The ATO property is situated in the western side of Mongolia, 660 km east of the city of Ulaanbaatar, 120 km northwest of Choibalsan city and 38 km west of Tsagaan Ovoo soum. Access to the property from the Mongolian capital, Ulaanbaatar is possible by highway to Choibalsan, the centre of the Dornod province and improved unpaved road continue to Tsagaan Ovoo soum. The property is connected to other settlements by dirt roads.

Air: It is possible to fly to Choibalsan from Ulaanbaatar via domestic airlines.

PROXIMITY TO POPULATION CENTRES

The nearest settlement to the property is the central village of the Tsagaan Ovoo soum, which is settled at side of the Khuuvur Lake, with moderately developed infrastructure. The Tsagaan Ovoo soum consists of six subsections and has total population of 3,800. Nationality consists of 80% Buryats and the rest of Khalkh people. The community is mainly engages in domestic animal husbandry. Some of them run plantation and grow vegetable for their own household uses. The central village accommodates administrative offices, a cultural centre, secondary schools, a hospital, a kindergarten, a communications centre, cellphone stations, a gas station, and high-voltage sub-stations.

[13] 2017 NI 43-101 Report, Section 5, pp27 onwards.

CLIMATE & OPERATING SEASON

Climate summary: Climate[14] of the property region is characterized by extreme cold and hot weather. Wide daily, monthly, and yearly fluctuations of temperature are common. Winter is harsh and cold and extends from November to March. Coldest temperature reaches to -46°C near the river valleys and flatlands in January. Stable snow cover persists from November to March. Freezing of soil starts from mid-September and continues till late May, with the freezing depth reaching 2.5 m. Spring begins in late March and continues till early June, and it is characterized by fluctuant atmospheric temperature and air dryness and strong wind. Summer is shorter than other seasons, dry and chilly. The hottest temperature is up to +40°C in summer. 60-80% of the annual precipitation falls as rain during July and August. Number of days with precipitation is 59 days in average in a year. Average wind speed is 4-8 m/s, with dominant directions from north-west, north and north-east and maximum speed reaches 20-22 m/s.

Operating season: ATO Mine will operate all year around.

INFRASTRUCTURE FOR MINING

Water: Water network of the area belongs to the Pacific Ocean basin. Small local rivers with short-lived stream fed from eastern branch mountains of the Khentii Range flow into small lakes. Sizes of these rivers vary depending on their main source of water collection which is precipitation. Drinking water could only be taken from wells due to low density of water network. Lakes in the region such as Duut, Tsagaan, Ovoot, Eregtseg, Ukhaagiin Tsagaan, Davkhariin Tsagaan, and Khaichiin and many other small salt lakes are also fed by rainfall. In recent years, small rivers and streams have been dried up due to a global warming and decrease of precipitation. In the summer time, seasonal springs found from the melt of small patchy permafrost in small intermountain valleys and from seasonal thawing of frozen ground.

Land Use. The land surrounding the property is predominantly used for nomadic herding of goats, cows, horses and sheep by small family units. Use is based on informal traditional Mongolian principles of shared grazing rights with limited land tenure for semi-permanent winter shelters and other improvements

Risk Assessments. The Law on Environmental Impact Assessment (2012) and the guidelines require the inclusion of a risk assessment in project documentation. This means identification and prediction of the possible emergencies and accidents that could occur during the production process or natural disasters, and elimination and mitigation of their consequences.

There are mining license for mining operations and related permits, the availability of power source, water, potential areas for waste material and heap leach pad area, mining personnel and local working power in the project area.

Closure and Reclamation. As part of overall project planning, a preliminary reclamation and closure plan was prepared. Certain features of the mine, such as the open pit, waste dumps, and tailings impoundment, will create permanent changes to the current landscape that cannot be completely remedied through reclamation. The closure plan will; however, ensure that these disturbed areas are seismically and chemically stable as to limit the ecological impacts to the surrounding water, air, and land.

NATURAL RISKS

The Law on Environmental Impact Assessment (2012) and the guidelines require the inclusion of a risk assessment in project documentation. This means identification and prediction of the possible emergencies and accidents that could occur during the production process or natural disasters, and elimination and mitigation of their consequences.

There are mining license for mining operations and related permits, the availability of power source, water, potential areas for waste material and heap leach pad area, mining personnel and local working power in the project area.

[14] 2009. *National Atlas of Mongolia.*

6 HISTORY

The history of the Property is described in terms of:

- Prior ownership and initial exploration.
- Previous exploration leading to discovery.
- Historical Resource and Reserve estimates – by CGM and Steppe.
- Historical and recent mine production.

The bulk of the information in this Section is extracted from the 2017 NI 43-101 Report[15] and has been reviewed by Steppe's appointed Alternate QP Ochirkhuyag Baatar.

PRIOR OWNERSHIP & INITIAL EXPLORATION

The area of immediate interest at ATO is centred on three, at most 200 m high, gently rounded hills (herein termed Hills 1, 2 and 3 from SE to NW) that are surrounded by widespread unconsolidated Quaternary deposits. Presently, the known most intensely mineralized rocks underlie Hills 1 and 2, respectively underlain by Pipes 1 and 2, as well as the completely covered Pipe 4. Low gently rounded slopes or somewhat steeper inclines with moderate slopes characterize the surrounding ranges.

Regional geologic field parties working for CogeGobi were the first to recognize mineralized rocks cropping out at ATO. In 1997 CogeGobi (a wholly owned subsidiary of the French multinational company AREVA) began their exploration efforts in eastern Mongolia. After a six year reconnaissance effort, CogeGobi settled on a selected exploration region in 2003 and then obtained eight exploration licenses in eastern and south-eastern Mongolia. CogreGobi then embarked upon a four-year-long concerted effort in the search for viable gold and uranium deposits in all eight of their licensed areas. Two of their licenses (3,425.5 km^2 in all) were in the general area of ATO. As part of that effort, CogeGobi geologists eventually collected 52 grab samples from outcrops and sub-crop at ATO and identified anomalous gold concentrations in vein quartz-rich rock there (0.06 to 27.8 g/t Au). Those sample results initially led to a stream sediment sampling program. Almost all Au–anomalous samples collected by CogeGobi were from Hills 1 and 2. CogeGobi then proceeded to describe the occurrence at ATO as "intense hydrothermal alteration associated with volcano-plutonic structures"[16].

At the end of a four-year-long exploration cycle by CogeGobi in their eight licensed areas (which was primarily focused on gold deposits but also included uranium) uranium prices skyrocketed in mid-2007 from $30/lb U_3O_8 to approximately $140/lb. AREVA subsequently acquired East Asia Minerals Energy Company in September 2007 and became AREVA Mongol in 2008. As of 2017 AREVA Mongol had a 100 percent interest in CogeGobi. Because of the uranium economics AREVA Mongol's interest shifted from precious metals to the energy sector, and one of their two exploration licenses surrounding ATO was dropped. At the time the CogeGobi geologists were probably discouraged by the economic potential of ATO due to their belief that all high gold-bearing rocks resided in a small volume (i.e., low tonnage) of near-surface mineralized quartz veins above a shallow-dipping contact with underlying low-to-nil gold-bearing rocks[17]. Subsequent exploration efforts at ATO by CGM proved this concept incorrect.

The Company acquired the ATO Project from CGM on September 15, 2017 pursuant to agreements entered into between the parties on January 31, 2017 for aggregate consideration of US$19,800,000 plus S$1,980,000 of VAT. The Company satisfied the purchase price through the payment of US$9,800,000 in cash, the issuance by Steppe Mongolia to CGM of two US$5 million principal amount non-interest bearing secured promissory notes due September 30, 2018 and September 30, 2019 (the "Purchase Notes") and a US$1 million promissory note due October 9, 2017 in respect of VAT (the "VAT Note"). The cash portion of the purchase price was satisfied with a portion of the Initial Upfront Deposit made by Triple Flag Bermuda under the Stream Agreement, which was funded concurrently with the closing of the ATO Acquisition on September 15, 2017.

The parties also entered into a guarantee agreement dated January 31, 2017 (the "Guarantee") pursuant to which the Company guaranteed all of the obligations of Steppe Mongolia under the Purchase Agreement and Steppe Mongolia agreed to assume the obligations of CGM for the 1.75% net smelter returns royalty payable to CogeGobi in respect of products extracted from the ATO mining licence.

[15] 2017 NI 43-101 Report, Section 6, pp29 onwards.
[16] Hocquet, 2005.
[17] Hocquet, 2005.

On the closing of the ATO Acquisition, the Company, Steppe Mongolia and CGM entered into a share pledge agreement whereby the Company pledged its shares of Steppe Mongolia to secure its guarantee of the obligations of Steppe Mongolia under the Notes. As the Steppe Mongolia shares were concurrently pledged to Triple Flag Bermuda as collateral to secure the Company's obligations under the Stream Agreement, CGM and Triple Flag Bermuda entered into a security sharing agreement dated September 15, 2017 to establish their respective rights in respect of the shares in the event of default (the "Security Sharing Agreement").

The Company has repaid the VAT Note that was due October 9, 2017 and the US$5 million Purchase Note that was due September 30, 2018.

PREVIOUS EXPLORATION LEADING TO DISCOVERY

CGM geologists were invited by AREVA Mongol (CogeGogi owner) to visit ATO in the fall of 2009. In May 2010 CGM obtained from AREVA Mongol an initial agreement to explore the one remaining licensed area (Tsagaan Ovoo) encompassing ATO. All rights to the property were obtained by CGM late in 2010. AREVA retains a 1.75 percent NSR in the Tsagaan Ovoo license. In 2017 Steppe acquired 100% of the ATO Project from CGM.

Key outcrops in the ATO property were at Hill 1 where gold-bearing silica sinter is now considered to represent a paleo hot spring environment (previously, to the best the knowledge, unknown in Mongolia). It forms a silica cap to underlying base and precious metal mineralized rock, basically at a Mesozoic paleo surface. Reticulated mats of silicified reeds, feathery in longitudinal section and oval in cross section, are well preserved in this sinter at ATO (see below). The sinter is highly phosphatic, > 1,500 ppm phosphorous, all of which calls to mind features forming today at the surface at the Yellowstone geyser field.

But most importantly, siliceous sinter at ATO includes free gold. Silica cap includes mostly quartz (sparse chalcedonic fabrics are preserved; bladed silica locally replaces calcite) and variable concentrations of iron oxide minerals. Less abundant are kaolinite, illite, numerous primary and a number of secondary lead (Pb) minerals. Secondary Pb minerals include Pb–Al phosphate plumbogummite; pyromorphite (also a Pb phosphate); and Pb–Mn oxide minerals. Sparse galena in siliceous sinter was encapsulated in quartz, as is rare sphalerite, arsenopyrite, and argentite. Barite was present in narrow micro veins, as well as large tabular crystals in open cavities.

Even during CGM's first brief visit to the property, it became clear that exposures of the mineralized system at ATO include highly disrupted, near paleosurface epithermal, silica-dominated rocks that had the potential to host a significant tonnage of precious and base-metal mineralized rock. Four grab samples collected by CGM (1.3 to 3.3 g/t Au) during its initial visit to the property confirmed the presence of the anomalous Au originally reported at the ATO site by CogeGobi.

Beginning in May 2010 and through to December 2014 CGM designed significant amount of exploration work in the area, incorporating geologic mapping (including ASTER imaging), widespread grab sampling, additional grid soil sampling, stream-sediment sampling, geophysical surveys (air mag, ground mag, IP, gravity), trenching, and extensive core drilling. In addition, a wide-ranging district-wide grab sampling program was conducted in association with regional geologic mapping.

CGM's drilling comprised 597 holes for a total of 63,866 m. Of that 370 holes for 54,425 m were core holes.

As a result of CGM's exploration efforts (and up to the time of Steppe's 2017 NI 43-101 Report) it had become readily apparent that the bulk of the known precious and base metal mineralization at ATO was in **three** carrot-shaped vertically downward plunging, presumably Jurassic, breccia pipes. Two of the pipes (Pipes 1 and 2 respectively) underlie Hills 1 and 2. The third pipe (Pipe 4) is completely concealed to the SE of Pipe 2.

Since 2017 Steppe has undertaken considerable exploration, primarily through very extensive phased targeted drilling programs. This has confirmed the existence of a **fourth** deposit (Mungu) to the north-east of the first three. Mungu is north east trending sub-vertical structure controlled precious mineralization host in dacitic volcano-sedimentary rocks of Permian age. Mungu ore body is plunging downward to the north east and continued about 800m along the structure.

The recent exploration history at ATO, thus, comprises four stages:

1) Initial work by CogeGobi / AREVA.
2) A due diligence stage by CGM that also included soil geochemistry and limited IP.
3) Post May 2010 comprehensive exploration by CGM.
4) Post 2017 extensive drilling by Steppe.

Commencing in 2018, the Company (Steppe) commenced a three phase exploration drill program.

The Phase 1 exploration program focussed on the ATO4, Mungu, Tsagaan Temeet, Bayanmunkh and Bayangol targets at the ATO Project. A total of 66 holes were drilled at the Mungu Deposit, 3 holes at the ATO4 Deposit, 4 drill holes at the Tsagaan Temeet prospect, 1 drill hole at the Bayanmunkh prospect and 16 shallow drill holes at the Bayangol prospect for a total of 8,821 m. The drilling program was successful in outlining and extending known gold and silver mineralization. In addition to this, new high grade zones in deeper parts of the deposit were discovered that increased the understanding on the controls of mineralized structures and associated feeder zones.

The Phase 2 drill program focused on the ATO4 end of the ATO4-Mungu trend at the ATO Project and of exploration activities at the Uudam Khundii Project. The drilling program was completed with three diamond core drilling rigs completing a total of 36 drill holes for 9,006 m. The completion of the Phase 2 drilling program saw the identification of the first ever visible gold seen at ATO project, with super high gold grades being returned in ATO299 and ATO317.

The Phase 3 drilling program targeted at the ATO4-Mungu trend has commenced with 8 drill holes being complete for 2,228 m of drilling[18].

In 2019 the Company completed a drill program with two diamond core drilling rigs focused updating resources and reserves for the ATO1, ATO2 and ATO4 deposits in addition to a maiden resource and reserve delineation for the Mungu Discovery. The Company drilled 1,840 metres at ATO1, 1,662 metres at ATO2, 14,760 metres at ATO4 and over 26,573 metres have been drilled at the Mungu Discovery[19].

Commencing 2020, the Company drilled an additional 55 drill holes for a total of 18,200 m. A total of 53,000 m have been drilled since 2018[20]. The drilling information was used to update the interpretation of the geologic model, geometry of the mineralized zones and domain.

HISTORICAL RESOURCE AND RESERVE ESTIMATES

Exploration report 2012: Prior to CGM's 2016 Resource reporting (below) an exploration report on the ATO Project was prepared in 2012 for Mongolian jurisdiction. It is **not** known if that report contained Resources. That report was not prepared under compliance with NI 43-101 and the authors of the report appear not to have been qualified. Although that report was not NI compliant most of the information and studies reported were prepared similar guidelines or standards to NI 43-101.

CGM Resources 2016: Centerra Gold Inc. (CGI, owner of CGM) reported a Mineral Resource summary at ATO in its 2016 Annual Information Form on SEDAR in May 31, 2017 (Table 3). The combined Measured and Indicated Resource was **18.6 Mt at 1.3 g/t gold** (771 koz contained metal). An Inferred Resource of 0.4 Mt at 0.6 g/t gold was also reported. NB: It is not know what lower grade cut-off was used, or what density was used. And it was also not stated in the Table if the reporting was JORC or NI 43-101 compliant.

[18] 2019 AIF and 2018 news releases.
[19] 2019 AIF and 29 July 2020 news release.
[20] 21 February 2021 news release.

Table 3 CGM 2016 Mineral Resources[21]

Table 1 (see additional footnotes page 30)
Centerra Gold Inc. 2016 Year-End Mineral Reserve and Mineral Resource Summary – Gold [(1) (6)]
(as of December 31. 2016)

Measured and Indicated Mineral Resources [(2)]									
	Measured			Indicated			Total Measured and Indicated		
Property	Tonnes (kt)	Grade (g/t)	Contained Gold (koz)	Tonnes (kt)	Grade (g/t)	Contained Gold (koz)	Tonnes (kt)	Grade (g/t)	Contained Gold (koz)
ATO [(5)]	9,663	1.5	465	8,920	1.1	306	**18,583**	**1.3**	**771**

Inferred Mineral Resources [(3)]			
Property	Tonnes (kt)	Grade (g/t)	Contained Gold (koz)
ATO [(5)]	386	0.6	8

1) Centerra's equity interests as of this AIF are as follows: Mount Milligan 100%, Kumtor 100%, Gatsuurt 100%, Boroo 100%, Ulaan Bulag 100%, ATO 100%, Öksüt 100% and Greenstone Gold properties (Hardrock, Brookbank, Key Lake, Kailey) 50%.
2) Mineral resources are in addition to mineral reserves. Mineral resources do not have demonstrated economic viability.
3) Inferred mineral resources have a great amount of uncertainty as to their existence and as to whether they can be mined economically. It cannot be assumed that all or part of the inferred mineral resources will ever be upgraded to a higher category.
4) Royal Gold streaming agreement entitles Royal Gold to 35% of gold sales from the Mount Milligan mine. Under the stream arrangement, Royal Gold will pay $435 per ounce of gold delivered.
5) As of January 31, 2017, Centerra Gold's Mongolian subsidiary, Centerra Gold Mongolia (CGM) entered into definitive agreements to sell the ATO Project, located in Eastern Mongolia, to Steppe Gold LLC and Steppe Gold Limited. The transaction is subject to conditions.
6) Numbers may not add up due to rounding.

Centerra Gold Inc.
2016 Annual Information Form

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The CGM Resources were superseded by the newly estimated ones reported in the 2017 NI 43-101 Report itself.

Steppe Resources 2017: Steppe reported newly estimated Resources in the 2017 NI 43-101 Report compiled by GSTATS (summary in Table 4). [NB: In Table 4 the three tabulations are incorrectly labelled – the upper tabulation should read "ATO Mineral **Oxide** Resource", the lower two tabulations should read "ATO Mineral **Fresh** Resources"]. The Resources were for the three Pipes 1, 2 and 4. The Recourses were fully JORC and NI 43-101 compliant.

The total combined Measured and Indicated Resources were:

Oxide:	**5.3 Mt at 1.23 g/t gold** (208 koz contained metal). Lower cut-off 0.30 g/t AuEq.
Fresh:	**12.4 Mt at 1.50 g/t gold** (594 koz contained metal). Lower cut-off 1.1 g/t AuEq.
Total:	**17.6 Mt at 1.42 g/t gold** (803 koz contained metal)

An Inferred Resource of 1.3 Mt at 0.97 g/t gold was also reported.

[21] 2017 NI 43-101 Fig 6.1, pp30

Table 4 Steppe 2017 Mineral Resources[22] – Oxide & Fresh – Pipes 1, 2 & 4

ATO Mineral Reserves (1)(3)(5)(6)(7)(8)(9)(10)(12)

	Tonnage	Au	Ag	Contained Metal		Recovered Metal	
				Au	Ag	Au	Ag
	(mt)	(g/t)	(g/t)	(koz)	(koz)	(koz)	(koz)
Proven	3.41	1.41	9.72	155	1,065	108	426
Probable	1.82	0.93	10.52	55	616	38	246
Proven and Probable	**5.23**	**1.25**	**10.00**	**210**	**1,681**	**147**	**673**

ATO Mineral Resources (1)(2)(4)(5)(8)(9)(10)(12)

Measured and Indicated Mineral Resources

	Tonnage	Au	Ag	Pb	Zn	Contained Metal			
						Au	Ag	Pb	Zn
	(mt)	(g/t)	(g/t)	(%)	(%)	(koz)	(koz)	(mlb)	(mlb)
Measured	7.77	1.51	8.16	0.86	1.54	378	2,039	148	263
Indicated	4.46	1.46	13.17	0.55	1.01	209	1,889	54	99
Measured + Indicated	**12.23**	**1.49**	**9.99**	**0.75**	**1.34**	**587**	**3,927**	**202**	**362**

Inferred Mineral Resources (11)

	Tonnage	Au	Ag	Pb	Zn	Contained Metal			
						Au	Ag	Pb	Zn
	(mt)	(g/t)	(g/t)	(%)	(%)	(koz)	(koz)	(mlb)	(mlb)
Inferred	1.05	1.03	25.18	0.52	1.11	35	848	12	26

Notes:

1. ATO Mineral Reserves and Mineral Resources are as at August 21, 2017 using the CIM Definition Standards (2014).
2. Mineral Resources are in addition to Mineral Reserves.
3. Mineral Reserves are constrained within an optimized pit shell based on a gold price of $1,300 per ounce.
4. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability for heap leaching.
5. Contained gold estimates have not been adjusted for metallurgical recoveries.
6. Recovered gold estimates have been adjusted for metallurgical recoveries based on 70% for Au and 40% for Ag.
7. Mining dilution is 3% and Ore loss is 2%.
8. Mineral Reserves and Mineral Resources are estimated using a 0.3 g/t AuEq cut-off grade for oxide material and a 1.1 g/t AuEq cut-off grade for fresh material.
9. A conversion factor of 31.103477 grams per ounce 453.59237 grams per pound are used in the reserve and resource estimates.
10. AuEq has been calculated using assumed metal prices ($1,306/oz for gold, $21.60/oz).
    Oxide ore calculation: AuEq(g/t) = Au(g/t) + (Ag(g/t) x 21.60 x 0.0321507 x 0.4) / (1,306 x 0.0321507 x 0.7)
    Fresh ore calculation: AuEq(g/t) = Au(g/t) + ((Ag(g/t) x 21.60 x 0.0321507 x 0.75) + (Pb% x 1,844 x 10^{-6} x 0.6) + (Zn% x 1,944 x 10^{-6} x 0.55)) / (1,306 x 0.0321507 x 0.71)
11. Inferred Mineral Resources have a great amount of uncertainty as to their existence and as to whether they can be mined economically. It cannot be assumed that all or part of the Inferred Mineral Resources will ever be upgraded to a higher category.
12. Totals may not match due to rounding.

The 2017 Steppe Resources are superseded by the newly estimated ones reported in this 2021 NI 43-101 Report.

Steppe Reserves 2017: Steppe designed open-cut mines on the three Pipes and reported Reserves from them in the 2017 NI 43-101 Report compiled by GSTATS (Table 5). The pits were essentially designed to mine only the Oxide Resources.

The total combined Proven and Probable Reserves in the three pits, before dilution, ore loss or factored gold recovery, were:

Proven:	**3.4 Mt at 1.45 g/t gold** (157 koz contained metal). Lower cut-off 0.30 g/t AuEq.
Probable:	**1.8 Mt at 0.96 g/t gold** (55 koz contained metal). Lower cut-off 0.30 g/t AuEq.
Total:	**5.2 Mt at 1.28 g/t gold** (213 koz contained metal)

[22] 2017 NI 43-101, Table 1.5 in the Summary section 1, pp 15

Table 5 Steppe Mineral Reserves[23] – Oxide – Pits 1, 2 & 4 – before dilution

Classification	Tonnage	Au	Ag	Contained Metal	
				Au	Ag
	(mt)	(g/t)	(g/t)	(koz)	(koz)
Pipe 1 (0.3 g/t AuEq Cut-off)					
Proven	2.74	1.54	9.29	136	818
Probable	0.41	1.13	9.93	15	132
Total Reserve - Pipe 1	**3.15**	**1.49**	**9.38**	**151**	**950**
Pipe 2 (0.3 g/t AuEq Cut-off)					
Proven	0.24	0.74	5.13	6	40
Probable	0.82	0.60	4.70	16	124
Total Reserve - Pipe 2	**1.06**	**0.63**	**4.80**	**22**	**164**
Pipe 4 (0.3 g/t AuEq Cut-off)					
Proven	0.39	1.25	17.22	16	219
Probable	0.57	1.33	19.98	25	367
Total Reserve - Pipe 4	**0.97**	**1.30**	**18.85**	**40**	**586**
ATO Deposit (0.3 g/t AuEq Cut-off)					
Proven	3.37	1.45	9.92	157	1,076
Probable	1.80	0.96	10.74	55	623
TOTAL RESERVE - ATO	**5.18**	**1.28**	**10.21**	**213**	**1,700**

These Reserves were also reported with 2% ore loss, 3% dilution and 70% gold recovery (Table 6).

Table 6 Steppe Mineral Reserves[24] – Oxide – Pits 1, 2 & 4 – after dilution and recovery

Classification	Tonnage	Au	Ag	Contained Metal		Recovered Metal	
				Au	Ag	Au	Ag
	(mt)	(g/t)	(g/t)	(koz)	(koz)	(koz)	(koz)
ATO Deposit (0.3 g/t AuEq Cut-off)						70%	40%
Proven	3.41	1.41	9.72	155	1,065	108	426
Probable	1.82	0.93	10.52	55	616	38	246
TOTAL RESERVE - ATO	**5.23**	**1.25**	**10.00**	**210**	**1,681**	**147**	**673**

Notes:

1. Estimate of Mineral Resources has been estimated by the QPs.
2. ATO Mineral Reserves are as at August 21, 2017.
3. Mineral Reserves are included in Mineral Resources.
4. Mineral Reserves are constrained within an optimized pit shell based on a gold price of $1,300 per ounce.
5. Mining dilution factor is 3% and Ore loss factor is 2%.
6. Contained gold estimates have been adjusted for metallurgical recoveries.
7. The open pit Mineral Reserves are estimated using a cut-off grade of 0.3 g/t AuEq for oxide material.
8. A conversion factor of 31.103477 grams per ounce 453.59237 grams per pound are used in the reserve and resource estimates.
9. AuEq has been calculated using assumed metal prices ($1,306.6/oz for gold, $21.6/oz).
   Oxide ore calculation: AuEq(g/t) = Au(g/t) + (Ag(g/t) x 21.6 x 0.0321507 x 0.4) / (1,306.6 x 0.0321507 x 0.7)
10. Totals may not match due to rounding.

HISTORICAL & RECENT MINE PRODUCTION

Historical mine production: It is understood that the ATO Project had seen no past mining.

Recent mine production: Steppe Gold remained busy, working non-stop and smoothened the phase one operation of Altan Tsagaan-Ovoo project and continuously produced its products. The Altan Tsagaan-Ovoo gold and polymetal deposit has completed the first stage by constructing its oxidized ore refinery infrastructure from 2018-2019 which includes a gold and silver refinery with a capacity of 300 m^3 solution per hour, a heap leach pad with a capacity of 5.37 Mt of ore, a rich and barren solution pond with a capacity of 43,000 m^3, and camp capable of containing 250 people, and thus is ready to commence operations.

Steppe Gold produced 1,018.5 kg Au and 748 kg Ag with 57.2% metal recovery in first production year.

[23] 2017 NI 43-101 Report, Table 15.3 in Mineral Reserve Estimates section 15.5, pp154
[24] 2017 NI 43-101 Report, Table 15.5 in Mineral Reserve Estimates section 15.5, pp155

7 GEOLOGICAL SETTING & MINERALISATION

The geological setting and mineralisation of the Project is described in terms of:

- Regional geology.
- District geology and magmatism.
- District mineralisation.
- Geology of the mineralised ATO deposits.
- Mineralisation at ATO.

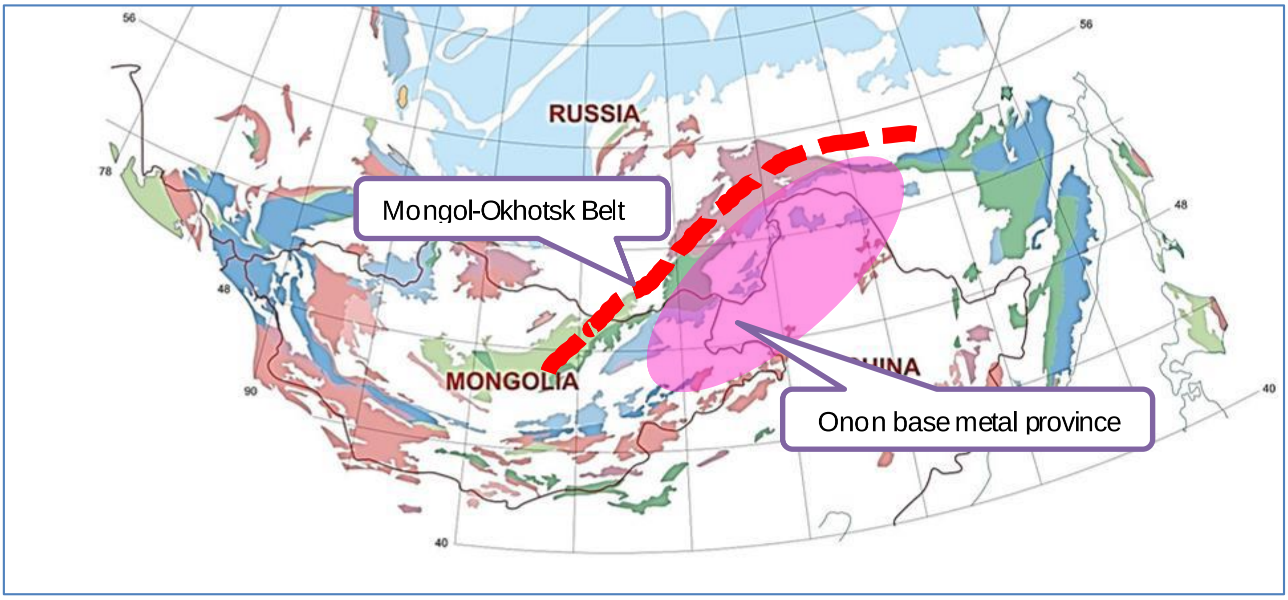
The bulk of the information in this Section is extracted from the 2017 NI 43-101 Report[25] and has been reviewed by Steppe's appointed QP **Ochirkhuyag Baatar.**

NB: The principal author of the Report, QP Robin Rankin (geologist) has also reviewed this geological information and, notwithstanding his lack of a site visit and detailed inspection, has no argument with the geological description or mineralisation setting.

REGIONAL GEOLOGICAL SETTING

Relative to its continental-scale geologic framework, ATO is situated within the Devonian through Late Jurassic Mongol-Okhotsk tectonic collage (Figure 2[26]) that has been emplaced along a transform-continental margin of the North Asian Craton (NAC) as shown by Parfenov and others (2010). In addition the Transbaikalian-Daxinganling transpressional magmatic arc that is present south of ATO along an ENE, 2,000 km long trend was thought to range in age from 175 to 96 Ma (Middle Jurassic to Early Cretaceous) (Parfenov and others, 2010).

Figure 2 Location of Mongol-Okhotsk Belt and Onon precious base metal province



Regional metallogenic setting of ATO is important from an exploration perspective. Mineral deposits range widely in age throughout Eastern Mongolia and neighbouring regions of Russia and China. For example, the China Altay hosts 380–360 Ma siliciclastic VMS deposits with bimodal geochemistry in a major magmatic arc (Goldfarb and others, 2003). Further, as summarized by Xiao and others (2009), end-Permian to mid-Triassic docking of the Tarim and North China cratons against the Siberian craton resulted in (1) closure of the Paleoasian Ocean and led to (2) formation of a number of world-class metal deposits, some of which are Triassic in age.

A number of Late Jurassic-early Cretaceous (175–96 Ma) broad, gold-bearing mineral belts also have been recognized in eastern Mongolia and in the surrounding region (Rodionov and others, 2004). Their Middle Jurassic-Early Cretaceous (175–96 Ma) time slice yields 31 gold-bearing mineral belts among 56 belts in all (55%) – the most mineral belts outlined for the various time slices established in the above-cited report.

[25] 2017 NI 43-101 Report, Section 7, pp32 onwards.
[26] CGM 2012 Exploration Report

Most gold-bearing belts during the Middle Jurassic-Early Cretaceous have moved decidedly "inboard" towards the Siberian craton relative to older belts, and they are present in China and Mongolia, as well as eastern Siberia. Areal distribution of the gold-bearing belts generally follows the tectonic grain or trend of the various geologic terranes and their overlap and "stitch" assemblages throughout the region.

ATO is located north of the Main Mongolian Lineament (MML – red dashed line in Figure 2) and midway along the NNE trending 600km long Onon base and precious-metal province that crosses eastern Mongolia (pink oval in Figure 2).

The overwhelming bulk of the Pb–Zn occurrences and deposits in eastern Mongolia are located north of the MML and east of the Onon trend. The Novo and Lugiin polymetallic deposits in the Russian Federation were used to anchor the northern terminus of the Onon province as depicted in the Russian Federation. The two major mineralized trends or metallotects in this part of Mongolia (Onon and Yeroogol, red dashed line) parallel Lake Baikal, and must represent deep-seated splays possibly dating from zones of crustal weakness first developed at the time of Devonian-age accretion and dislocations along the MML. However, rifting in Lake Baikal is much younger as it began about 30 m.y. ago; i.e., during the Middle Oligocene.

Therefore, the two mineralized trends (Onon and Yeroogol) must mark zones of rifting in the earth's crust, somewhat deeper seated than that at Lake Baikal, and whose regional least principal stress direction must have been oriented NW–SE (present day coordinates). However, this orientation of the regional least principal stress must represent a clockwise rotation from its essentially EW orientation that prevailed during final stages of rifting in the Cretaceous following mineralization and associated magmatism at ATO (see below).

A number of Hg–Sb occurrences are aligned closely along the trace of the Onon trend, as are numerous clusters of gold occurrences that are associated somewhat more broadly in the immediate region.

Further, as defined herein, the Onon base and precious-metal province coincides with relatively thick crust, roughly greater than 125 km in thickness, which partly explains abundance of base metals (especially Pb) throughout the province. Rocks south of the MML are considered to be largely Silurian to Carboniferous island-arc volcano-stratigraphic packages of rock.

Though ATO presently represents the only well-explored gold deposit in this part of Mongolia, a large number of minor gold occurrences have been recognized throughout the region. Most of these gold occurrences are located outside the Onon province, as are the overwhelming number of recognized porphyry systems. The Onon province also includes a number of primarily Ag occurrences, as well as a few porphyry systems, including the Avdartolgoi porphyry, about 200 km NE of ATO, which only is mentioned briefly in passing by Dejidmaa and others (1999) without any further details.

A number of major base and precious-metal deposits also are present in the region with metal associations similar to ATO. These include the Novo and Lugiin polymetallic deposits at the northern distal end of the Onon province.

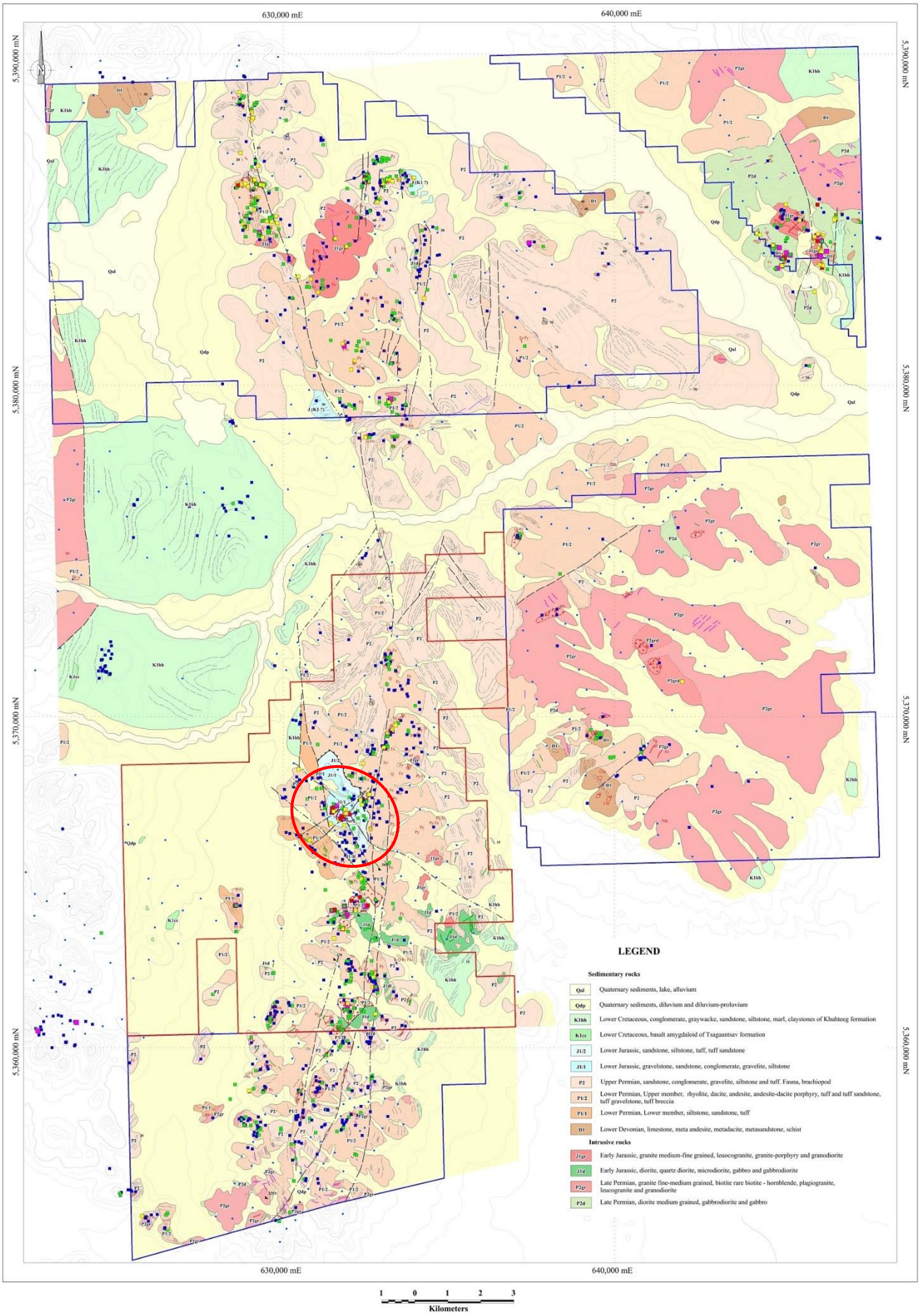
DISTRICT GEOLOGY AND MAGMATISM

The term "district" is used here in its broadest sense ("sensu lato") because no unifying genetic model or linked group of models has been established confidently for all mineralized occurrences close to ATO other than a presumed association with Jurassic magmatism. Furthermore the age of gold-mineralized rock has not been determined radiometrically, either at ATO or at mineralized rock in most all its surrounding occurrences.

Figure 3 presents the district geology around the ATO Project (red oval). The area shown has approximate dimensions 25 km E/W and 35 km N/S.

The oldest layered rocks in the ATO district are Devonian. Relatively small isolated areas of outcrop of Early Devonian trachyrhyolite, trachyrhyolite porphyry, ignimbrite (welded tuff), and minor limestone are present in the northern part of the ATO district (Figure 3). The Devonian rocks are in tectonic contact with Early and Late (?) Permian strata along pre-Lower Cretaceous NW–striking, high angle faults near the NW corner of the area, and Lower Cretaceous rocks overlie unconformably the Devonian rocks. Devonian rocks are intruded by Early Permian leucogranite near the NE corner of the district (Figure 3).

Figure 3 Geology map of ATO district



Though the ATO district includes limited exposures of Devonian and Triassic rocks, the most widespread rocks in the district are Early Permian volcaniclastics including tuff breccias, as well as high K andesite, and rhyolite exposed in the cores of broad uplifts. Zircons from rhyolite have been dated at 285.9 Ma (Early Permian) by a major ongoing collaborative program (to date magmatism and mineralization in the district) by CGM with Jim Mortensen at the University of British Columbia. The Early Permian volcaniclastics in the ATO district are further intruded by early Permian leucogranite, plagio-granite, and diorite; zircons from plagio-granite have been dated at 279.5 Ma.

Nonetheless, Permian strata largely form the cores of broad horsts in three areas: (1) a relatively small area of outcrop (2 km in long dimension) near the NE corner of the district; (2) an approximately 25 km long, NW elongated expanse that extends from the east central part of the area to the north edge of the district; and (3) a 16 km long, NS elongated belt that extends from about 5 km N of ATO to the south edge of the district. Rocks shown as Early Permian strata are mostly volcanic affiliated (rhyolite, dacite, ignimbrite, andesite-dacite porphyry, tuff, and tuffaceous sandstone), whereas strata assigned provisionally to the Late Permian are mostly sandstone, conglomerate, siltstone, and tuff.

Early Permian diorite crops out near the NE corner of the district. The age of this unit is inferred from the age of rocks that intrude it. The diorite in this area is intruded by Late Early Permian leucogranite, plagio-granite, and granodiorite, as well as Early Jurassic granite and granodiorite at the Bayan Munkh prospect. Late Early Permian leucogranite, plagio-granite, and granodiorite crop out mainly in four areas: (1) near the NE corner of the area; (2) near the west-central edge of the area, (3) NW of ATO, and (4) near the south edge of the mapped area. Early Permian leucogranite intrudes Devonian rocks as well as rocks assigned to both Permian units (P1 and P2).

At ATO, presumably Middle-Late Jurassic (?) gravel and coarse pebbly sandstone (as described above) fill a broad shallow depression on the flanks of a Permian-cored uplift. Mesozoic intrusive rocks also crop out in various locales in the district. Some are mineralized as at Bayan Munkh.

Cretaceous sedimentary rock unconformably rests on all of the older units in the district (green and light green, Figure 3). Cretaceous siltstone, sandstone, conglomerate, and basalt fill a narrow NS Cretaceous graben NW of ATO. Preliminary PIMA examination of four samples of laminated siltstone in a drill hole into the graben indicate presence of chlorite (D. John, written commun., 2012), as opposed to presence of mixed layer clays now known to form the host mineral for lithium in similar basins elsewhere. A number of prominent NS striking faults pass just to the east of ATO, and NE-striking, high-angle faults also are present at ATO.

The Cretaceous graben reaches its maximum width of about 6 km approximately 22 km N of ATO. Coarse-grained Paleozoic granite (Early Permian?) also is well exposed and widespread west of the graben that probably opened in response to crustal EW (present coordinates) regional extension beginning in the Late Cretaceous.

DISTRICT MINERALISATION

Though the ATO Project is the most important discovery to date (and is present in the south-central part of the district) a number of other mineralized occurrences also are present nearby including from N to S the Bayan Munkh, the High Land, Duut Nuur, Bayan Gol, Mungu, Apricot and Davkhar Tolgoi prospects. CGM discovered in the exploration area a hard-rock gold-lead-zinc deposit and other similar occurrences and mineralization points as well as two gold occurrences, four gold mineralized points, three lead mineralized points, three lead-zinc mineralized points, and several secondary dispersion halos of gold, lead, zinc and silver.

GEOLOGY OF THE MINERALISED ATO DEPOSITS

The geology of the mineralised ATO deposits is described in terms of:

- Deposit geology.
- Deposit mineralisation controlling factors.
- Silicate alteration in the mineralised pipes.
- Silica cap to Pipe 1.
- Styles of sulphide mineralised rock at ATO.

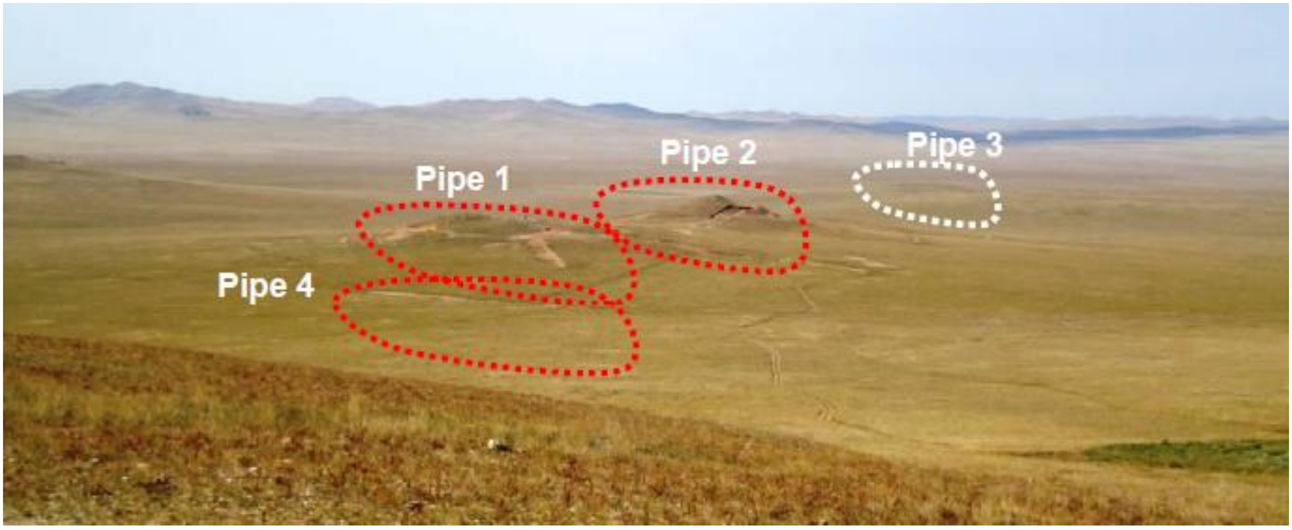
ATO DEPOSIT GEOLOGY

Pipes 1, 2 and 4: Up to 2017 exploration focussed on three mineralized pipes at ATO. These were named Pipe 1, 2, and 4 (now ATO1, 2 and 4) and are illustrated with red ovals in Figure 4 and in plan in Figure 5. Pipe 3 to the west (white oval) is only poorly mineralised and has not been evaluated further so far.

Subsequently a fourth well mineralised deposit (Mungu) was discovered slightly to the north east of Pipe 4.

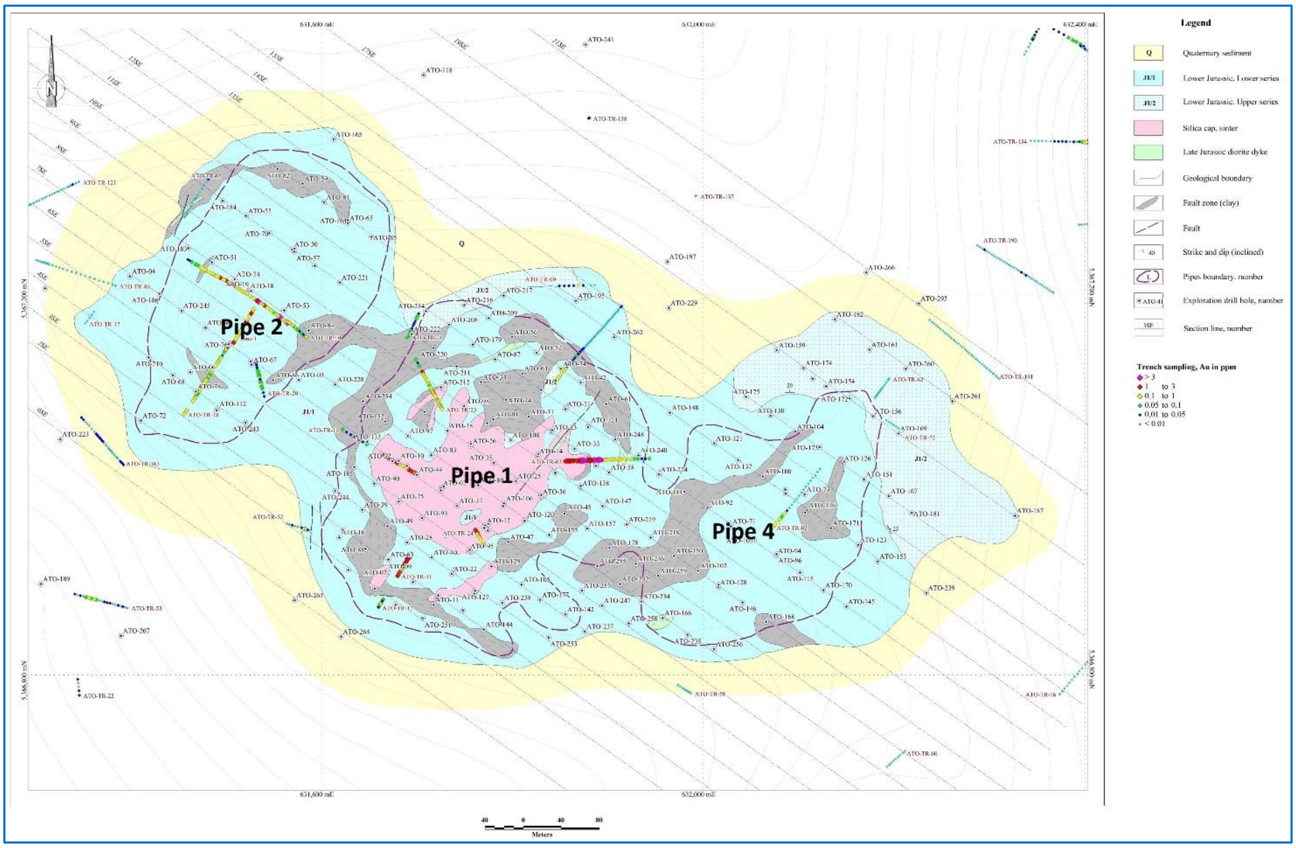
Adjacent pipes ATO 1, 2 and 4 were emplaced into stratified rocks as young as presumably Early to Middle Jurassic. Pipe 4 is mainly concealed. Pipe 3 to the west contains abundant pyrite, but no significant amounts of Au, Ag, Pb, and Zn – and hence has not so far been explored further. There is a strong Au anomaly in soil at ATO, as well as other accompanying metals, particularly Pb. In the aeromagnetic field, only post-mineral young dikes have a prominent positive response; much weaker responses outline some ring-shaped features. ATO resides near the centre of the latter. Sinter and silicified rocks are reflected as shallow resistivity anomalies, but broad clay and chlorite-altered rocks are characterized by low resistivity. The pipes coincide with chargeability anomalies that overall are quite weak.

Figure 4 Perspective view of ATO Pipes 1, 2 and 4, looking WNW



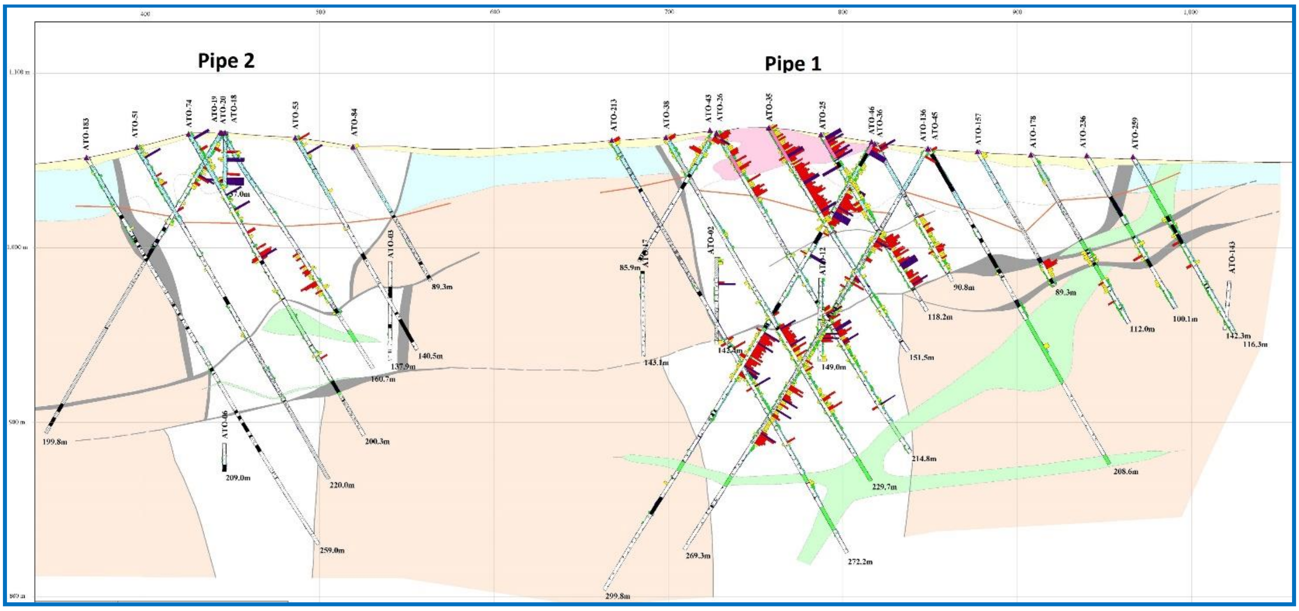
Surface projection of the morphology of Pipes 1, 2, and 4 is shown in Figure 5. An upper zone of Au-Pb-Zn-Ag mineralized rock at Pipe 1 is approximately oval in shape and is ~320 m wide. Pipe 2 is elongate to the NE and is ~320 m by ~160 m in maximum dimension. Pipe 4, which is completely concealed, also is elongate to the NE and is ~400 m by ~200 m. The NW/SE cross section through Pipes 1 and 2 (Figure 6) shows that the pipes taper slightly with depth and have a carrot-shaped 3D configuration, narrowing gradually at depth to ~200 m wide.

Figure 5 Geology map of ATO Pipes 1, 2 and 4



The deepest hole into Pipe 1, inclined 60°, is ~700 m long. Silica cap rock (pink) has a variable thickness in Pipe 1, generally tapering from a maximum thickness of about 40 m under the topographic high point of the pipe to less than 1 m near its margins. However, bottom surface of the cap rock is highly irregular, showing sharp undulations with underlying quartz-veined Middle-Late Jurassic (?) gravel and coarse pebbly sandstone, some blocks of which are totally engulfed by massive silica.

Figure 6 Cross-section through Pipes 1 and 2



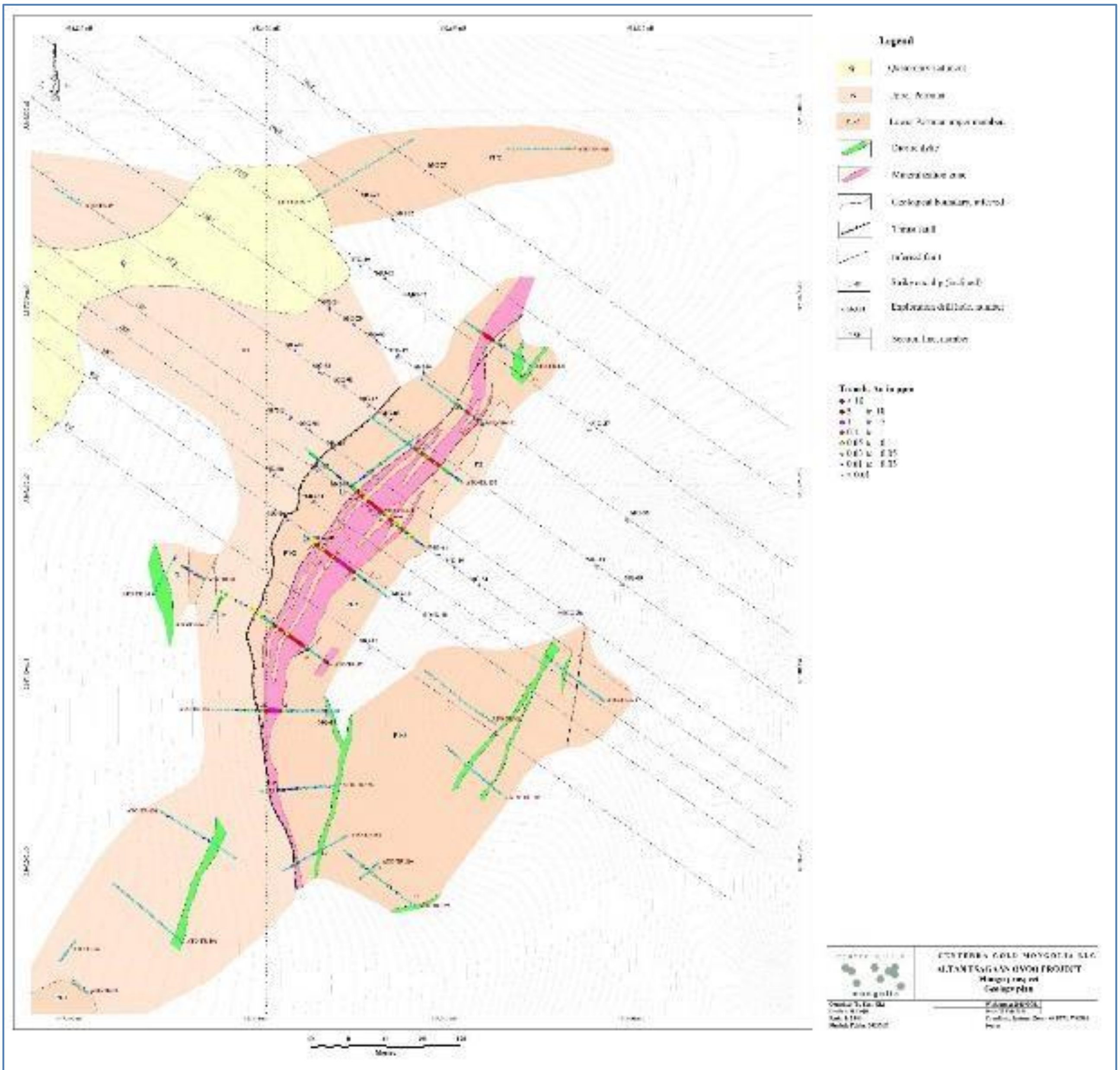
The pipes also are cut by a number of minor faults, both steeply dipping and shallow dipping. Some narrow flat-lying post-mineral diorite dikes also have been emplaced along faults that offset margins of the pipes.

Pebbly conglomerate and pebbly sandstone were being shed from both nearby mostly Early Permian highlands elevated during emplacement of Early Jurassic magmatic rocks, as well as apparent high walls of an enclosing oval collapse feature. Continued deposition of Jurassic strata then covered the pipes after cessation of mineralization.

Despite the three mineralized pipes being so geographically close to one another, there are distinct differences in their metal geochemistry. Pipe 2 is notably base-metal enriched; Pipe 1 contains less base metals, and Pipe 4 contains further decreases in base metals, particularly near its margins where extremely high Ag contents (locally 100's of ppm Ag across narrow intercepts) are present in association with base metal concentrations of a few hundred ppm in all. Mungu is particularly enriched in silver in comparison to the others.

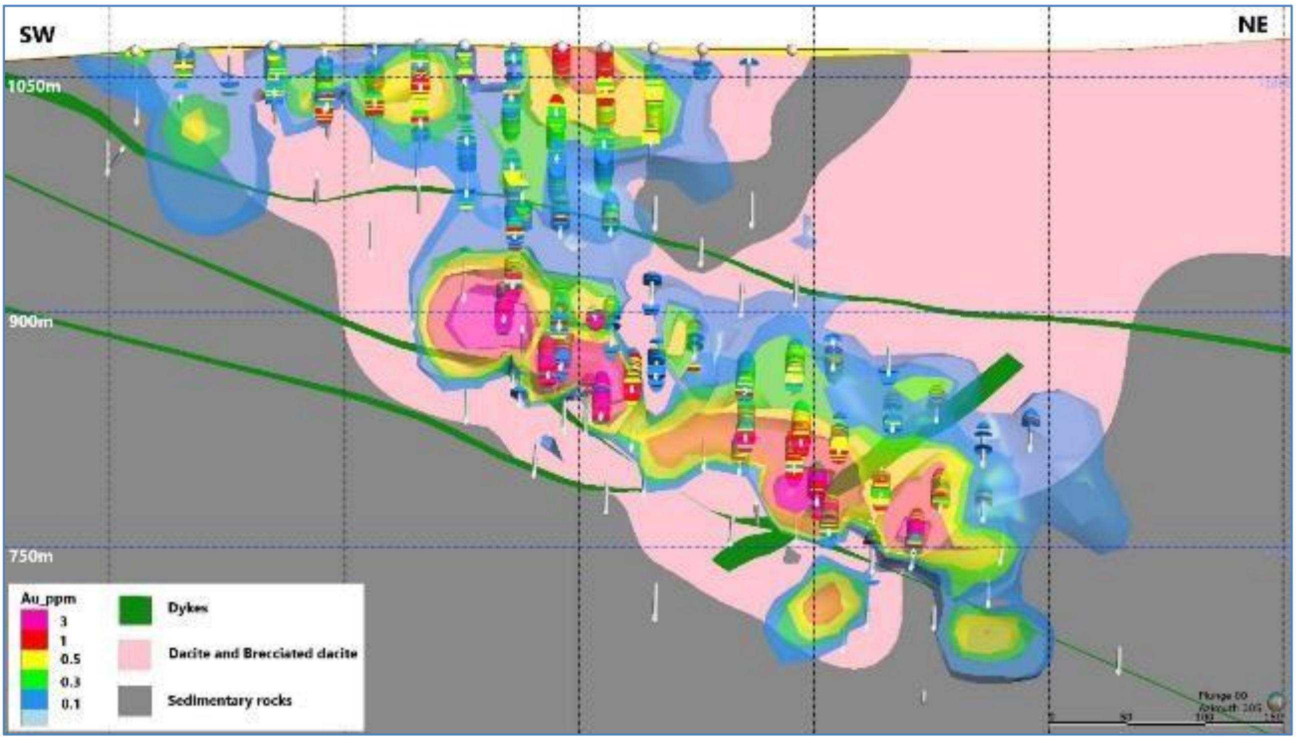
Mungu: Mungu deposit is hosted in Lower Permian age volcano-sedimentary rocks and overlying Upper Permian sedimentary rocks and is itself cut by late diorite dykes (Figure 7). Post-mineralization diorite porphyrite dykes are abundant in the area. Weakly to moderately chloritized, black green coloured diorite porphyrite dykes with rare pyrite dissemination occur at depths of 150-180 m. They are in massive structure, have undergone little fracturing, and are consistently continuous along dip with average thickness of 10-15 m in almost horizontal position. They are branched out in some parts in varying directions. Also, light green coloured, weakly sericitized, strongly fractured and deformed diorite dyke have been found that undergone clay alteration and have a small thickness (up to 1 m). This post-mineral dyke is found close to a fault that displaced the orebody along a horizontal plane. These dyke plays destructive role in deposit settings.

Figure 7 Geology map of Mungu deposit



Mungu is a structurally controlled epithermal gold-silver system with localized bonanza grades, and an Ag:Au ratio approximating 10:1. Mineralization occurs in brecciated zones controlled by NE trending structure and tiny dark coloured quartz-sulphide veinlets developed along the big fault zones. Ore body has almost linear shape, almost vertical and directing to NE by azimuth 035°. Trend of mineralization is plunging to NE by azimuth 035 and dip angle 40°. The mineralized bodies separated by late post-mineralized dykes into parts and most significant dyke occur in 150 m depth below the surface, lies almost horizontally. Surface projection of the morphology Mungu orebody shown in Figure 7. Mungu orebody is elongate to the NE direction and continued about 700 m along the structure and orebody thickness varies up to 200 m in plan. The SW/NE cross section through Mungu orebody along the strike of mineralization is show in Figure 8.

Figure 8 Mungu deposit in cross-section looking NW



Mineralization consists of variable concentrations of mainly pyrite with arsenical rims, plus minor amounts of base metal sulphides and rare silver sulfosalts as veins, disseminations, and breccia fill in a relatively steep, narrow structure which has been traced over a lateral distance of about 700 m and vertical extension about 350 m depth from surface, mainly within dacitic rocks. Quartz veining is a minor component of the mineralization, and banding and other typical epithermal textures are essentially absent. Argillic alteration forms as envelope with tens of meters wide. About 5-40 m wide zone of low-grade mineralization with localized narrow zones of high-grade mineralization at depth has yielded bonanza grades in both gold (to 172.88g/t) and silver (to 1500.0g/t).

DEPOSIT MINERALISATION CONTROLLING FACTORS

Important geologic controlling factors for the mineralized pipes at ATO include:

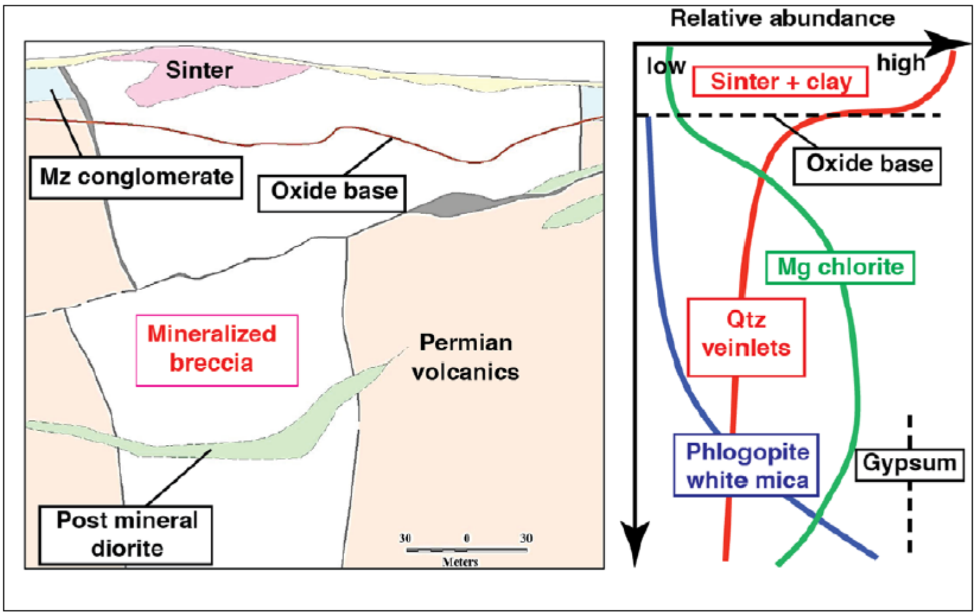
1) Presence in a major base metal (Pb-Zn) province (thick crust) known to include large tonnage Au-Pb-Zn deposits, combined with
2) Near paleo surface, epithermal (hot spring) emplacement of the upper parts of mineralized pipes associated with Jurassic magmatism into a near surface area
3) Shallow depression where Middle-Late Jurassic pebbly conglomerate and pebbly sandstone were being deposited prior to mineralization and continuing after mineralization.

Origin of brecciation in the mineralized pipes remains unclear however but shows features of both magmatic and hydromagmatic breccias (see Sillitoe, 1985). Some fine-grained, matrix-supported breccias with abundant rock flour are encountered at depth at ATO and are typical of a magmatic breccia-style diatremes (magmatic hydrothermal systems that extend to surface).

SILICATE ALTERATION IN THE MINERALISED PIPES

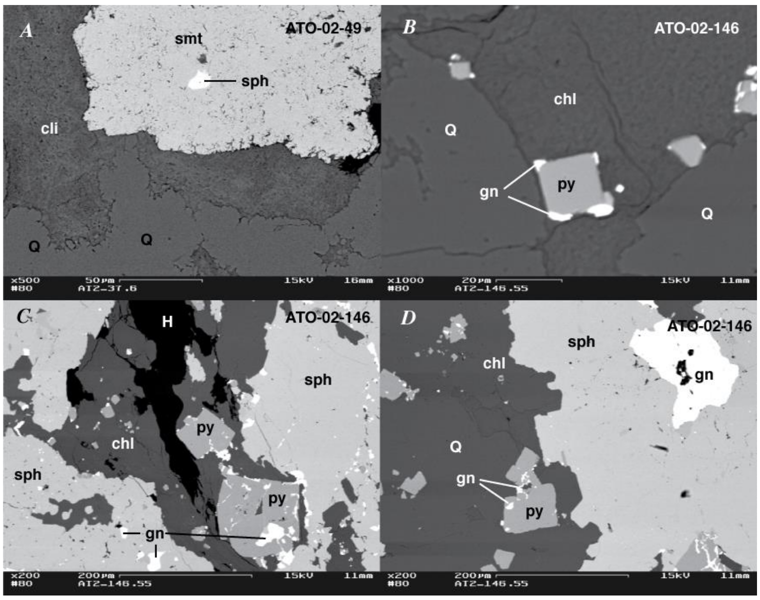
ATO is characterized by an absence of adularia that is relatively abundant elsewhere in epithermal Au-Ag deposits. As discussed below, at ATO this primarily is a reflection of high $Mg/2H^+$ ratios and a correspondingly low K/H^+ ratio in mineralizing fluids associated with an underlying largely dioritic magmatic complex. At ATO siliceous sinter forms a cap rock at the top of Pipe 1 (left side Figure 9) and includes barite (in narrow micro veins as well as tabular crystals in open cavity fillings), clinochlore (Mg chlorite), and less abundant Mg-Fe chlorite. With increasing depth (right side Figure 9), silica is increasingly present in the pipes as relatively late paragenetic stage vein quartz filling central parts of sulfide mineral-rich veins. Though clays (mostly kaolinite) occur with sinter at the top of the mineralized column at Pipe 1, clinochlore (Mg chl) is the dominant alteration hyrosilicate mineral at depth throughout mineralized breccia. At depths near 200 m, however, clinochlore begins to give way to phlogopitic white mica. White mica also increases near margins of Pipe 4. Gypsum (after anhydrite) is concentrated near margins of the pipes.

Figure 9 Schematic geological cross-section through Pipe 1 (left), showing alteration mineral changes with depth (right)



Pipe 2 at the surface, in place of a massive silica cap, instead is marked by variable concentrations of quartz veins and veinlets in networks that cut Middle-Late Jurassic (?) pebbly conglomerate and pebbly sandstone. The veined pebbly conglomerate and pebbly sandstone at this pipe extends outward to where it eventually is covered by unconsolidated Quaternary deposits.

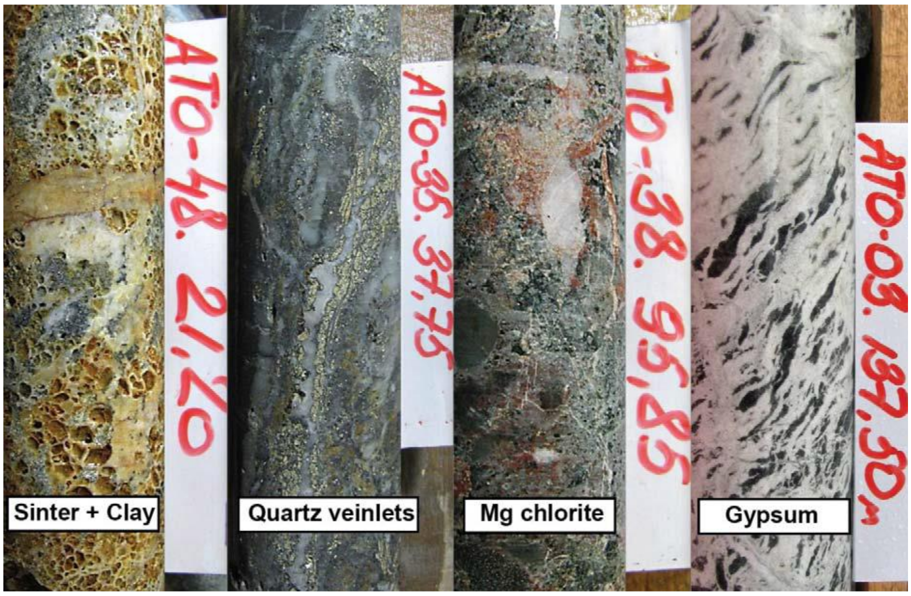
Figure 10 Polished thin section micrograph



Back scattered electron micrographs (Figure 10) of polished thin sections show clinochlore (cli) and chlorite (chl) compatibility with various sulphide and carbonate minerals in drill core at ATO Pipe 1. A (top left, Figure 10): Sample DDH ATO-02-49; sph, sphalerite; Q, quartz; smt, smithsonite. B (top right): Sample ATO-02-146. Chlorite associated with pyrite (py) and galena (gn). C (bottom left): Sample ATO-02-146. Same as B. H, hole in polished thin section. D (bottom right): Sample ATO-02-146. Galena inclusions in pyrite and sphalerite mantled by chlorite.

Though quartz is the dominant alteration mineral at the surface, magnesium minerals also are widespread in the pipes. They, in essence, replace rock flour during pipe development and eventually comprise a fluidized matrix together with iron sulphide and base-metal sulphide minerals. Their importance is well indicated by mineralized core contents of many 10s of thousands ppm Mg to greater than 100,000 ppm Mg throughout the mineralized pipes. The dominant Mg alteration mineral in the pipes is clinochlore (hydrous Mg Al silicate member of the chlorite group). With increasing depth in the pipes, clinochlore becomes progressively enriched in Fe and assumes petrographic characteristics of typical chlorite and, in turn, becomes associated with increased abundances of phlogopitic white mica.

Figure 11 Alteration assemblages typically seen in ATO drill core

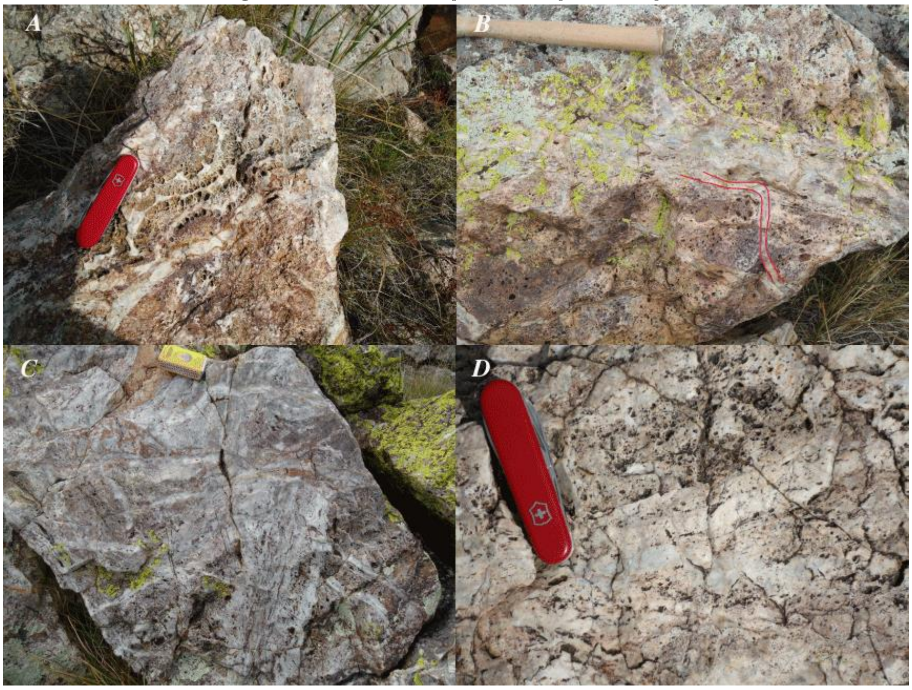


Alteration assemblages typically appearing in drill core at ATO (Figure 11, left to right) include (1) oxidized siliceous sinter; (2) steeply dipping quartz veinlets with associated pyrite and base metals; (3) matrix supported mineralized breccia where magnesian chlorite is the dominant hydrosilicate in the matrix; and lastly (4) gypsum after anhydrite especially concentrated near pipe margins. As depicted in Figure 11 (ATO-35-37.75), many quartz veinlets containing abundant sulfide minerals can be steeply dipping in the pipes (i.e., essentially parallel to core axes). In addition, Mg chlorite (clinochlore) plus sulfide minerals also may be disseminated widely throughout heavily mineralized core where the rocks in effect are matrix supported by alteration silicates and sulfide minerals (ATO-38-95.85). These relations, together with presence of well-defined sulfide-silicate banding in many veins (see below), suggest veining in the pipes continued well after initial replacement of rock flour during the earliest stages of mineralization.

SILICA CAP IN PIPE 1

Because of the importance that the silica cap at Pipe 1 played in the discovery of the mineralized pipes at ATO it was described in detail in the 2017 NI 43-101 Report[27] (but is not repeated in full here for brevity).

Figure 12 Silica cap outcrops at Pipe 1



Silica cap, though presently recrystallized multiple times during repeated passage of fluids streaming upwards through the pipe, has a number of characteristics that indicate it was originally deposited as colloform-banded sinter near the original paleosurface of an intermediate sulfidation system. Silica cap rock is highly resistant and readily recognizable even from moderate distances because of its stark white colour against a dark landscape. Figure 12 shows (clockwise from top left): A: Ribs of silica marking margins of empty cavities formerly occupied by sulphide minerals, mostly pyrite but also a number of Pb minerals. B: Feeder vein of quartz (outlined in red) into basal part of banded quartz veins. C: Angular blocks of colloform-banded quartz veins engulfed by additional vein

[27] 2017 NI 43-101, Section 7.3.3.1, pp40

quartz. Note matchbox near centre top of photo for scale. D: Close up view of recrystallized banded silica showing cavities formerly filled by mostly pyrite.

Highly disrupted banded quartz veins comprise a silica cap rock in Pipe 1 at ATO. These silica outcrops are dominated by quartz which, under the microscope show effects of repeated recrystallization, commonly marked by newly grown quartz transecting growth zones in previously crystallized colloform or banded quartz. Potassium feldspar is not present in these rocks.

Almost all silica cap rock encountered by drilling is oxidized and includes various abundances of secondary minerals and traces of primary sulphide minerals. Silica cap is made up predominantly of quartz (sparse chalcedonic fabrics are preserved) and variable concentrations of iron oxide minerals, as well as less abundant kaolinite, illite, numerous primary and a number of secondary Pb minerals (rare galena mostly preserved in a surrounding mantle of a Pb–Al phosphate (plumbogummite); pyromorphite (Pb phosphate); and Pb–Mn oxide minerals), sphalerite (rarely encapsulated in quartz), arsenopyrite (also in quartz), argentite, barite (in narrow micro veins as well as tabular crystals in open cavity fillings), clinochlore, chlorite, and rare prehnite. It is the secondary Pb minerals at ATO that provide the source for the strong Pb anomaly in soils at ATO.

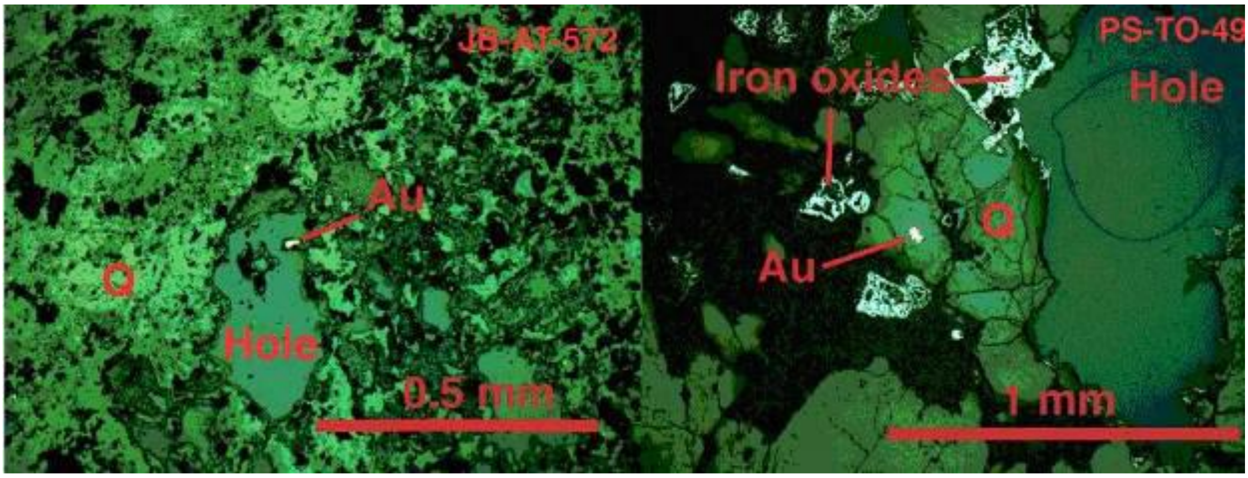
Outcrops on Pipe 1 indicate overall that its silica records a complex geologic history. The rocks display highly disturbed almost chaotic orientations even within individual outcrops of about 3-5 m wide. Banded and crustified silica has orientations that are extremely variable. Further, presence of now bladed silica that replaced earlier deposited calcite indicates that boiling had to have occurred near the top of the ATO system, wherein removal of CO_2 after breakdown of bicarbonate led to deposition of early paragenetic stage, bladed calcite at the paleo uppermost levels of the silica cap. A boiling environment must have contributed to further disruption of the rocks, as well as a number of other geologic events. This boiling environment must have been below the water table underlying sinter at the actual paleosurface of Pipe 1.

Some surface outcrops of silica cap initially must have crystallized almost at the Middle-Late Jurassic (?) paleosurface during mineralization at ATO. Presence of reticulated mats of silicified reeds both in longitudinal section and in cross section are well preserved in some grab samples. Typically, phosphorous contents of drill core through silica cap are in excess of 1,500 ppm. The fossil reeds at ATO are inferred to be somewhat analogous to reeds present today in thermal ponds surrounding the geysers at Yellowstone National Park. In fact, the micro plumose or feathery outlines of the reeds preserved in thin section at ATO are quite similar to those of present-day reeds at Yellowstone.

All introduced silica, especially below the surface, shows complex recrystallization textures indicating repeated passage of fluids associated with base and precious metal introduction. Undoubtedly near-surface siliceous sinter and banded silica must have largely recrystallized as the sinter was broken and disrupted during repeated passage of mineralizing fluids. From the present day extent of the silica cap at Pipe 1 the paleo thermal field must not have had that wide a footprint.

Most importantly, particles of free gold containing variable amounts of silver are present in surface samples of silica cap rock. Figure 13 shows photomicrographs in reflected light of particles of free gold (Au) in surface grab samples at ATO. Sample JB-AT-572 (left) from silica cap at Pipe 1; Sample PS-TO-493 (right) at Pipe 2.

Figure 13 Photomicrograph of free gold particles in cap rock surface grab samples



Presence of free gold in surface samples of silica cap at ATO was further verified using the SEM. Some of this free gold can have about a 60/40 ratio in its Au/Ag content, and gold has been shown by drilling to be especially concentrated throughout the silica cap portion of the underlying pipe.

Though recognition of Au in high-grade grab samples from surface outcrops proved to be relatively straightforward by both SEM and standard petrographic methods, this turned out to become increasingly difficult at depth as the mineralized system becomes highly enriched in galena.

STYLES OF SULPHIDE MINERALISED ROCK AT ATO

A number of styles of sulphide-mineralized rock are present below the oxide zone in the pipes at ATO, ranging from disseminated flooding by sulphide minerals in matrix of breccia to multiply banded veins. The latter may be either flat lying or steeply dipping.

Figure 14 Mineralised breccia fabrics from Pipe 2

Figure 14 shows general fabric of mineralized breccia in diamond holes ATO-19 and ATO-20, Pipe 2. A: Interval contains 1,783 ppm Cu and 33.9 ppm Ag. B: Amythestine quartz associated with introduction of galena and sphalerite. Interval contains 21.1 ppm Ag, 47,200 ppm Pb, and 52,900 ppm Zn. C: Abundant calcite–impregnated breccia near pipe margin where breccia fragments are sugary textured, chilled margin of post-mineral dike. Interval contains 0.6 ppm Ag, 1,164 ppm Pb, and 2,196 ppm Zn. D: Sphalerite (pale brown) and galena (blue gray). Interval contains 1.94 ppm Au, 5,738 ppm Cu, 146,900 ppm Pb, and 106,300 ppm Zn. E: Quartz-sphalerite banded veins. Interval contains 19.2 ppm Ag, 79,400 ppm Pb, and 133,400 ppm Zn. F: Breccia including angular fragments of pale brown meta-siltite.

Generally, sphalerite becomes more Fe rich with depth in the system. Compare honey brown sphalerite at 82.4 m in hole ATO-19 in Pipe 2 (A in Figure 14) with brown sphalerite at 97.80 m associated with weakly amethystine quartz (B in Figure 14). Or compare honey brown sphalerite at 85.9 m in hole ATO-20 (E in Figure 14) versus dark brown sphalerite at 193.9 m (F in Figure 14). The latter is associated with amethystine quartz.

Figure 15 Mineralised rock styles at ATO

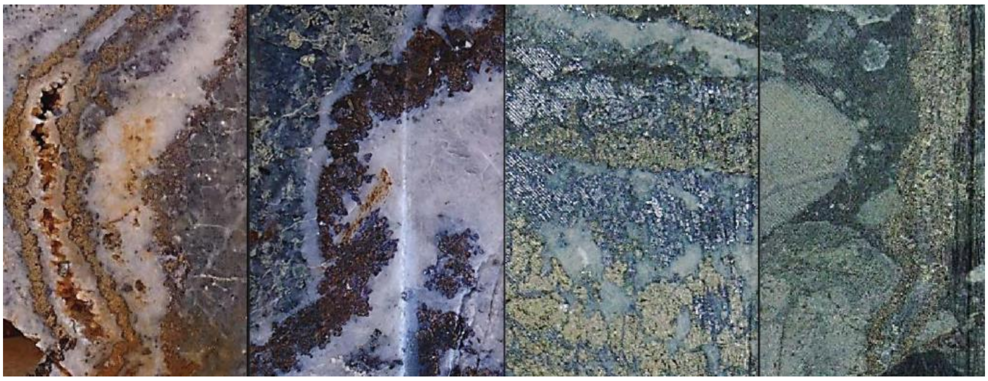


Figure 15 shows general styles of mineralized rock at ATO (from left: ATO-20 85.9 m; ATO 142.7 m; ATO-111 266.5 m; ATO-111 275.1m).

Flat-lying galena-sphalerite flooding in diamond hole ATO-111 at 266.5 m (second from right in Figure 15) can be followed down hole within a few meters by steep veins at 275.1 m (right). The latter veins also cut paragenetically earlier disseminated sulphide minerals that form a matrix support to mineralized breccia. In addition, late paragenetic stage manganiferous calcite, in places actual rhodocrocite, rarely cuts across locally layered breccia. In addition, the multiple bands of sulphide minerals and quartz in many veins suggest a protracted period of vein emplacement after initial onset of brecciation associated with pipe emplacement.

Overall, the mineralized system at ATO really does not contain that much manganiferous calcite, though some is present rarely in cm wide veins.

MINERALISATION AT ATO

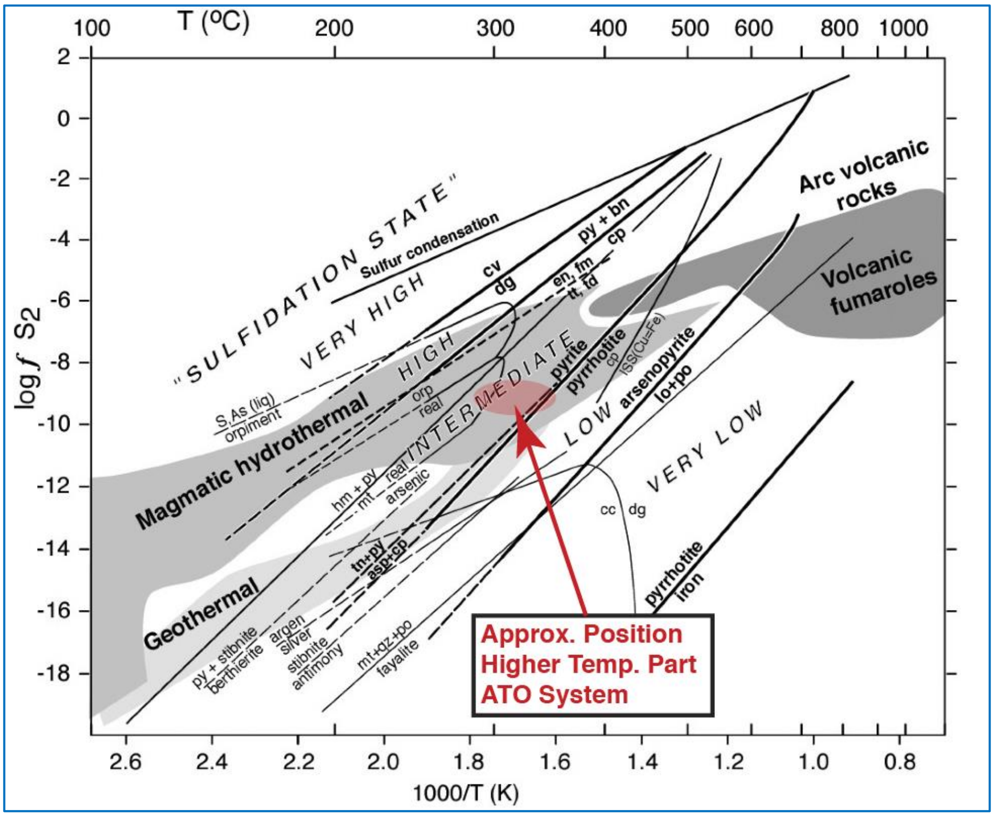
Summary: Mineralization at ATO is summarised as:

- An intermediate sulfidation system (IS).
  - Neutral low temperature, near paleo surface fluids, bladed silica after calcite indicates some local boiling. Related to Jurassic magmatic event.
  - Banded silica, broken sinter, repeatedly recrystallized at paleo top.
- Confined to pipe bodies.
  - Multiple collapse and upward transport in the pipes, repeated brecciation followed by continued ingress of steep and shallow veins, veinlets and flooding.
- Magnesium chlorite and silica dominant system.
  - Quartz, clinochlore (high Mg, Al silicate), kaolinite, gypsum (peripheral after anhydrite), adularia is absent.
- Dominated by free gold, base metal and Ag sulphides.
  - Lead-phosphates (near surface) – Pb-carbonates – galena (at depth).
  - Zinc-carbonate (near surface) – low FeS sphalerite (at depth).
  - Au in quartz & in sulphides; Ag mostly in tetrahedrite & miargyrite.

Figure 16[28] shows a diagram of sulphur fugacity versus temperature and various sulphide mineral assemblages in epithermal deposits that reflect sulfidation states varying from low through intermediate to very high sulfidation states. Approximate compositional fields of geothermal, magmatic hydrothermal, and volcanic fumaroles are shown in varying shades of grey.

The approximate position of higher temperature parts of the ATO mineralized system is shown in pink on the basis of sulphide mineral assemblages stable in pipes.

Figure 16 Diagram of sulphur fugacity versus temperature



[28] From Sillitoe and Hedenquist, 2003. *Linkages between volcanotectonic settings, ore-fluid compositions, and epithermal precious-metal deposits*. In Simmons, S.F., ed., Giggenbach Volume, Society of Economic Geologists and Geochemical Society, Special Publication 10.

Details: The mineralized pipes at ATO are unusual from a variety of standpoints. Nonetheless, a number of general statements can be made concerning their genesis and classification. As noted above, the ATO base (Pb-Zn-(Cu)) metal and Au-Ag mineralized pipes are intermediate sulfidation (IS) epithermal deposits characterized by an absence of adularia. They are apparently magma affiliated on the basis of their sulphur isotopic data and must thus be associated with emplacement of Jurassic igneous rock at depth. The predominance of low FeS sphalerite, galena, Ag-bearing tetrahedrite-miargyrite, and chalcopyrite at ATO unquestionably are all compatible with an IS state (Figure 16).

However, as opposed to a strong correspondence of IS deposits worldwide (Western US, Peru, central and Eastern Europe) with andesitic magmas (Sillitoe and Hedenquist, 2003), ATO appears instead to be associated with more mafic, dioritic Jurassic arc terrane magmas. These magmas thereby must have contributed to a correspondingly high Mg/2H+ component in fluids associated with mineralization that in turn inevitably led to widespread presence of the Mg chlorite clinochlore as a gangue mineral in the pipes as opposed to adularia. In addition, Jurassic volcanic rocks are not present in the region of ATO even though the pipes appear to have been formed near surface (banded silica, siliceous reed-bearing sinter at Pipe 1). This in turn suggests rapid (?) emplacement of the pipes occurred as a temporally transient or fleeting event. Regardless, well-formed sulphide-silicate banded veins in the pipes suggest protracted veining continued after formation of the brecciated columns of rock. However, the question still remains as to whether or not the mineralized pipes at ATO represent distal parts of a deep-seated porphyry environment.

Thus, upward flaring brecciation in Pipes 1, 2, and 4 at ATO provided fluid pathways for ingress of fluids associated with an open-space filling mineralization event that occurred over a protracted time interval. Mineralization in the pipes does not represent an instantaneous event essentially contemporaneous or immediately following the pipes' piercing through their surrounding host rocks. Fist-sized veins, well banded with successive layers of early low FeS sphalerite and somewhat later galena, together with precious metals, in the pipes attest to a relatively protracted time for individual vein emplacement within the confines of the pipes.

Origin of brecciation remains enigmatic, however, and shows features of both magmatic and hydromagmatic breccias, as well as tectonic breccias (see Sillitoe, 1985). Additional complications hampering straight forward interpretation results from superposition of brecciation associated with mineralization onto detrital fragment-rich Early Permian volcaniclastic rock and Jurassic pebbly conglomerate, as well as protracted passage of fluids associated with mineralization in the pipes. Nonetheless, some fine-grained, matrix-supported breccias with abundant rock flour encountered at depth at ATO north-west of Pipe 2 are typical of magmatic breccia-style diatremes (magmatic hydrothermal systems that extend to surface). Rock flour where present at ATO, though important from a pipe genesis standpoint, is itself not mineralized, and represents those brecciated rocks that did not encounter mineralizing fluids and thus were spared alteration during subsequent passage of the fluids.

After near-surface deposition of banded siliceous sinter in an essentially horizontal orientation, sinter was disturbed into jumbled blocks as the process of underlying mineralization continued to evolve. This may account for the highly discordant attitudes of sinter layering among nearby outcrops at Pipe 1, though tectonic disturbance after pipe emplacement also may have contributed to the discordant attitudes. Banded and crustified silica has orientations that are extremely variable in outcrop at Pipe 1. Further, presence of now bladed silica that replaced earlier deposited calcite indicates that some boiling had to have occurred near the top of the ATO system, wherein removal of CO_2 after breakdown of bicarbonate led to deposition of early paragenetic stage, bladed calcite at the paleo uppermost levels of the silica cap. A boiling environment also must have contributed to disruption of the rocks, as well as a number of other geologic events. This boiling environment must have been below the water table underlying the well-developed sinter at Pipe 1.

The pipes at ATO were cut by a number of post-mineralisation fairly flat-lying faults and dikes. Norton and Cathles (1973) note that the primary question concerning any hypothesis of breccia development is how the void amongst the fragments was created. Voids in breccias typically provide sites that are filled partially to completely by subsequently introduced gangue (quartz, magnesian chlorite, phlogopitic white mica at ATO) and ore minerals (sphalerite, galena, chalcopyrite, pyrite, tetrahedrite /tennantite, miargyrite, and particles of free gold at ATO). As further noted by Sawkins and Sillitoe (1985), the largest variety worldwide of breccia types resides in magmatic arc terranes.

Sillitoe (1985) lists the following six fundamental mechanisms for formation of breccias:

- Release of fluids from high-level magma chambers during second boiling;
- Magmatic heating and expansion of meteoric pore fluids;
- Cool ground waters interacting with magma;

- Magmatic-hydrothermal brecciation, including pre- and post-mineralisation diatremes;
- Mechanical disruption of a magma's wall rocks by subsurface movement;
- Fault displacements.

For a variety of reasons, at ATO the most likely mechanism associated with emplacement of Pipe 1, 2, and 4 is the fourth one listed above (i.e., magmatic hydrothermal brecciation). Decompression of volatiles associated with second boiling in a dioritic complex at depth led to formation of the permeable channel ways that subsequently were filled by mineralized rock. Another characteristic of these types of breccias is that in many districts they tend to be present in clusters (Sillitoe, 1985), a characteristic that applies to ATO. Yet, what is observed at ATO, and not at many other magmatic-hydrothermal breccia occurrences, is upward pipe termination where at Pipe 1 now highly disturbed siliceous sinter (and highly Au-mineralized as well) is present very close to the original paleosurface.

Nonetheless, some differences from the norm for many well-described, mineralized magmatic-hydrothermal breccias elsewhere characterize the breccias at ATO. These differences include typically diffuse or poorly marked pipe margins at ATO attributable largely to a relatively prolonged mineralization event that continued well after cessation of the brecciation that first created the voids.

8 DEPOSIT TYPE

The ATO deposit type is described in terms of:

- Mineral deposit type – surface epithermal deposits with intermediate sulphidation pipes below.
- Geological model – the shape of the deposits and the metal zonation expected.
- Exploration model – essentially the area drilling.

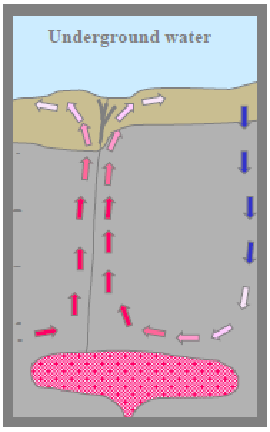
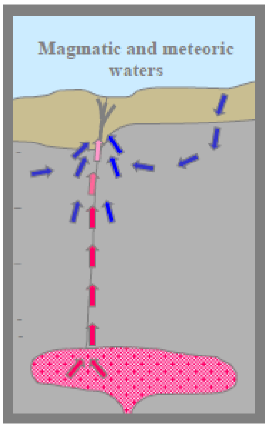
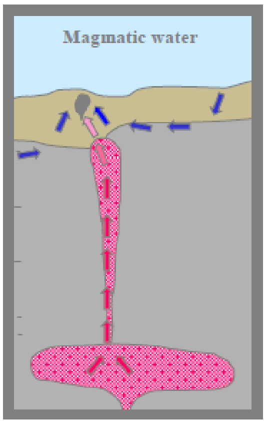
The bulk of the information in this Section is extracted from the 2017 NI 43-101 Report[29] and has been reviewed and/or amended by the QP here and by Steppe's Alternate QP **Ochirkhuyag Baatar**.

MINERAL DEPOSIT TYPE

This Project's mineral deposit type (from the viewpoint of exploration and subsequent geological modelling) is that of multiple **surface epithermal deposits with intermediate sulphidation (feeder) pipes below**. This implies a specific shape where the top part (near or at current surface) would represent a wide thinnish roughly circular accumulation of mineralisation in country rock around an original surface ground-water-interacting hydro-thermal or fumarole vent system. Below that would be a tall root-shaped breccia pipe, flared at the top and narrowing downwards, through which the magmatic or meteoric fluids rose above a lower hot igneous body. The pipe would be vertically veined and/or brecciated.

This deposit classification is based on the ATO mineralization texture, geochemical associations, and mineral composition. The classification process involved comparison of the ATO deposit with natures of the high, intermediate and low sulfidations of epithermal deposits (as illustrated in Figure 17).

Figure 17 Schematic epithermal system types

EPITHERMAL MINERALIZATION		
LOW SULPHIDATION (LS)	INTERMETIATE SULPHIDATION (IS)	HIGH SULPHIDATION (HS)
		
Au-Ag	Zn-Pb-Ag- (Au) or Zn-Pb-Ag- (Cu-Sn)	Cu-Au-Ag or Zn-Pb-Ag
Neatral pH (increases in gas and acidity)	Neutral pH	Very acidic pH
Sinter	Sinter possible	No sinter
Quartz, chalcedony, adularia, calcite, illite	Quartz, calcite, minor chalcedony, chlorite, Mn carbonate, anhydrite (gypsum), illite	Quartz, alunite, argillic alteration minerals
Reticulate, banded, colloform	Banded veins, brecciated, colloform, cockade, crustification, and, reticulate	Vuggy, massive sulfide

[29] 2017 NI 43-101 Report, Section 8, pp48 onwards.

NB: This model applies well for Pipes 1, 2 and 4. The QP is not sure how directly it applies to the Mungu deposit – but assumes it represents the pipe root system without the development (or remains) of the surface deposit (see below also).

GEOLOGICAL MODEL FOR ESTIMATION AND EXPLORATION

The geological deposit style model is described in terms of:

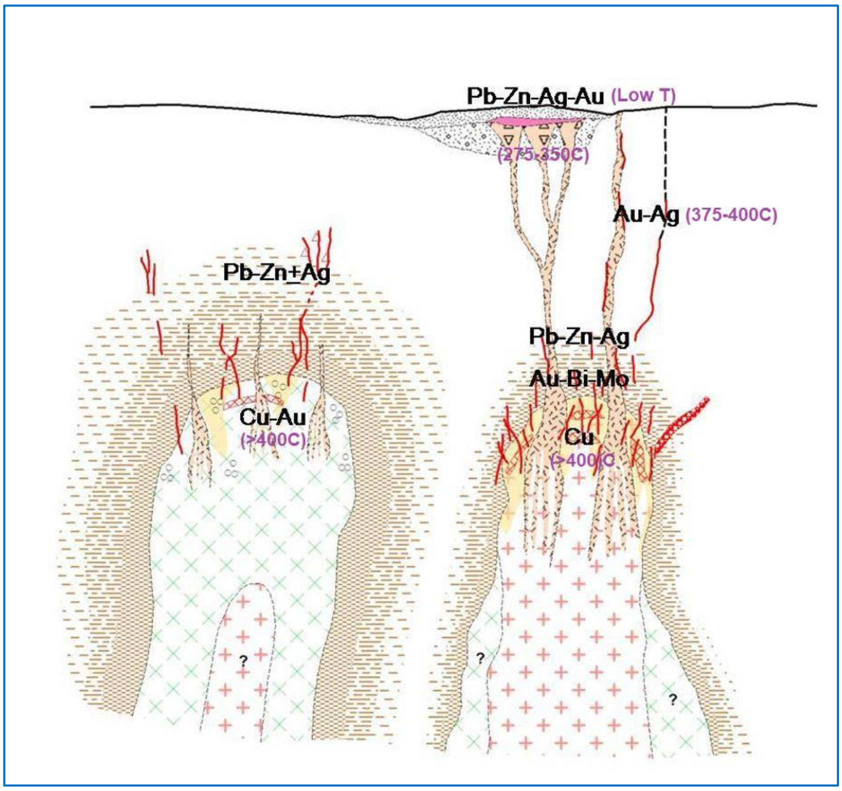
- Geological and mineralisation model – effectively defining the shape.
- Genesis of the ATO deposits.
- Geochemical zonation.

GEOLOGICAL AND MINERALISATION MODEL

The geology of the property consists of metamorphosed Devonian sedimentary rock overlain by a volcanic and sedimentary sequence of Permian age and remnant scraps of probable Jurassic volcaniclastic units, intruded by Jurassic plutons ranging from diorite to granite in composition and including rhyolitic phases mainly as dikes. Petrographic study suggests simple, single-pulse injections of the intrusions, with late-stage generation/expulsion of felsic phases and contemporaneous concentration of metal-rich fluids.

Vertical metal zonations and mineralisation temperatures expected to be associated with Jurassic intrusives at ATO are shown in Figure 18.

Figure 18 Cartoon at ATO of Jurassic intrusives with streaming mineralisation emanations above



The rock types (Figure 18) are:

- Diorite-granodiorite intrusions – green crosses
- Granite intrusions – pink plusses
- Rhyolite upwardly extrusive dykes – tan with flecks and triangular breccia symbols
- Deuteric alteration above intrusions – yellow
- Hornfels contact metamorphosed wall rocks – brown shading adjacent to intrusions, decreasing outwards
- Quartz veins – red
- Sinter cap at surface – dark pink

Mineralization at ATO is probably related to the Jurassic intrusive magmatic rocks as sources of heat, metals, and fluids (Figure 18). The main ATO system (Pipes 1, 2 and 4, represented by the intrusive and surface deposit on the right in Figure 18) is associated with a stratigraphic unit that appears to be localized in a graben or collapse feature that is possibly but not certainly Jurassic in age; any stratigraphy could potentially be prospective for this style of mineralization. The ATO mineralization appears to have occurred as a protracted single-stage process in separately upward-flaring pipe-shaped bodies, with temperatures ranging from ~300-350°C at depth to possibly ambient temperature in surficial sinter.

The nearby Mungu mineralization (possibly represented by the intrusive on the left in Figure 18) also appears to have occurred in a single pulse, but at higher temperatures of ~375-400°C intimately associated with emplacement of rhyolite.

Metal zonation: In a broad sense, metal zoning shows a clear, classic pattern of intrusion-centred copper (plus or minus molybdenum, tungsten, gold, and other elements) outward to country-rock hosted lead, zinc, and silver (plus or minus gold, arsenic, antimony, mercury, and other elements). It is presumed that this lateral zonation also occurs vertically, as evidenced by increasing copper values at depth in ATO.

Intrusions: The three main Jurassic intrusive phases are:

- diorite-granodiorite;
- granite; and
- rhyolite.

The diorite-granodiorite plutons are highly magnetic and typically develop large aureoles of magnetic hornfels. They show little or no quartz veining and exhibit no significant alteration apart from weak chloritization, which may be a regional metamorphic effect. On their upper and outer contacts, they locally have patchy albite-sericite (muscovite) zones which are considered to be simple deuteric alteration related to final crystallization processes. In some cases, they appear to be zoned inward to more felsic phases. Pegmatite-aplite phases show diffuse margins, suggesting segregation and streaming of more felsic fractions during late-stage crystallization. Miarolytic cavities are common and locally abundant, containing coarse euhedral biotite, magnetite, pyrite, chalcopyrite, and local bornite.

The granite plutons are moderately magnetic and produce smaller, patchy hornfels aureoles. They may locally be zoned outward to more mafic composition. The upper and outer contacts typically show patchy to pervasive sericite (muscovite) alteration and common to ubiquitous grey quartz-sulphide veins which are often druzy. Pegmatite-aplite phases are common and locally show possible unidirectional solidification textures, and rhyolitic phases with diffuse margins are present, all suggesting segregation and streaming of volatile-rich phases during late-stage crystallization.

The rhyolitic phases are typically emplaced as dikes and small plugs. They are moderately magnetic but do not produce contact metamorphic aureoles. The rhyolites are typically pyritic, and locally highly so.

Intrusion metal associations: Metal patterns appear to vary systematically with intrusive composition.

The diorite-granodiorite bodies have a copper-gold-tungsten signature related to visually obvious disseminated sulphide and sulphide-filled miarolytic cavities. Flanking hornfelsed country rocks generally show annular halos of geochemically anomalous lead and zinc, and locally contain percent-level concentrations of base metals plus or minus silver.

The granite bodies show essentially the same patterns, with some differences. Granite intrusions show copper anomalies, but typically at only geochemical levels, and the anomalies in the flanking country rocks have a more distinctly silver-rich character. The largest apparent difference however is the local development of a gold-bismuth-molybdenum zone in an intrusion-proximal setting within hornfels.

The rhyolites have different metal patterns depending on the level of emplacement. At deeper levels, where the rhyolites were confined under lithostatic load, the geochemical signature is gold-silver-copper. In this setting it appears that sulphides may have been admixed with the rhyolite magma as it was being emplaced, and it is likely that metal deposition was caused by cooling and fluid mixing. At shallower levels under hydrostatic conditions the geochemical signature is lead-zinc-silver-gold, with metal deposition related to cooling, possible boiling, and possible wall rock interactions.

Mineralisation temperatures: There is relatively little hard data available on temperatures and isotopes for mineralization in the ATO district. Petrographic relationships would indicate that the disseminated and miarolytic cavity-filling sulphides in the diorite-granodiorite intrusives were deposited at magmatic temperatures of 400°C or more, and the temperatures would be roughly equivalent or slightly lower for the granites. Mineral geothermometry using paired arsenopyrite and sphalerite in drill core from ATO gives ~275-350°C. The lower end of the possible temperature range is suggested by siliceous material at the outcrop of ATO Pipes 1 and 2, which has been interpreted as sinter based on textures and high phosphorus contents.

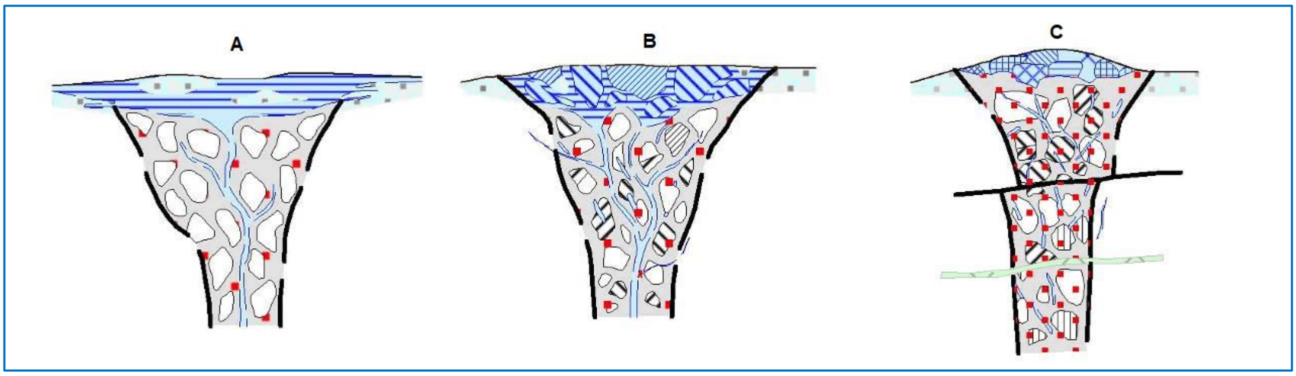
GENESIS OF THE ATO DEPOSITS

It is believed that the ATO deposit is an epithermal gold and polymetallic deposit of transitional sulphides in breccia pipes in a Mesozoic continental rift zone in eastern Mongolia. Below are accounts on similarity of ATO to other deposits in terms of formation of breccia pipe, its development stages, geochemical zonation, and the type of deposit genesis.

Formation of breccia pipe: Tectonic-magmatic activities began to take place in the area around ATO deposit in Early Jurassic when hydrothermal and metasomatic alterations and mineralization were formed in relation to intrusions and dykes. Absolute age of an intrusive massive located outside and east of ATO prospect area was determined to 189 million years. In addition, an Early Jurassic massive was formed in the southern part of the area comprises two phases of rocks of sub-alkaline series distributed in small, separate outcrops of small intrusions. Criteria or signs for copper porphyry mineralization have been noticed in these two intrusions. It is believed that the pipe bodies of ATO deposit were formed in a structure that resulted from partial melting and upheaval of magmatic fluids. This can be explained in more detail in a model proposed by Noel White.

In the area of ATO deposit, a small basin was deposited with sediments in Lower Jurassic, which include sandstone, siltstone, tuff sandstone, and gravelite, conglomerate, with coarser rocks at the bottom and finer rocks at the top. Quartz sinter (blue layers in Figure 19) was accumulated in pipe structures at ATO deposit as a result of hot spring activities (A in Figure 19) at the same time as the formation of these sedimentary rocks. This can be explained by the facts that sinter materials and fragments of low temperature chalcedonic quartz vein are found in the gravelite, and that lenticular bodies of gravelite are found in the sinter.

Figure 19 Model of upper breccia pipe formation at ATO



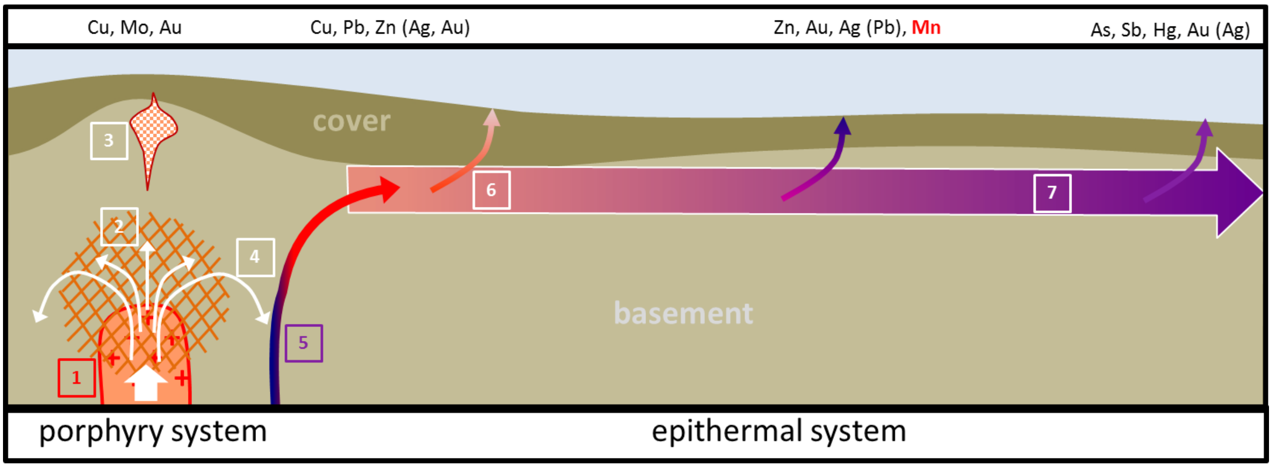
After the formation of layered quartz accumulation, or sinters, on the surface of the ground, the sinters were broken apart into blocks of varying sizes (individual upper blue layered blocks in B, Figure 19). This explains the outcrop called Pipe 1 where the layered quartz sinter is broken into blocks and the layering in these blocks has become disordered and oriented in random directions. Sedimentary rocks in the pipe structures become brecciated allowing flow of fluids and providing a domain for mineralization.

Lower pipe-form mineralization (grey parts in Figure 19) were subjected to post-mineralization horizontal faulting and the pipes appear to be displaced along the fault (black line in C, Figure 19. Small bodies of diorite have been found in these faults.

GEOCHEMICAL ZONATION

The pipes that have been identified in the deposit are aligned in a row in a structure with a trend from south east to north west and form mineralization with differing horizontal geochemical zonation with certain metallic concentrations. Noel White (2001) devised a pattern of flow of fluids based on this geochemical zonation similarity with that found adjacent to porphyry copper intrusions (presented schematically in Figure 20). White's model postulates that the horizontal mineral zonation between the ATO pipes could originate from a large intrusion (such as a porphyry copper) located tens of kilometres away from ATO deposit.

Figure 20 Schematic relationship of ATO mineral zonation to a porphyry copper system



Of the ore minerals sphalerite is the most common mineral in the ATO pipes with light yellow sphalerite as the dominant variety. In addition, abundance of veins and veinlets of gypsum indicate the oxidizing environment of the fluids and original magma. It is very likely that such kind of magma may be connected to porphyry mineralization (1 in Figure 20). A gold and copper molybdenum stockwork would surround the intrusion (2 in Figure 20), with a high sulfidation epithermal mineralization on top of them (3 in Figure 20). Magmatic fluids with high metallic content (5 in Figure 20) would rise upward, halt at certain level, and drift horizontally away along open spaces to get mixed with underground water and change its composition. After that the fluids would break the cover burden at some points to travel out to the surface through several different routes (6 in Figure 20).

It is postulated that this process could explain the differing metal zonation between the ATO pipes. Concentration of metallic components varies from pipe to pipe due to differences between pH levels, variations in pressure and temperature, and the differing composition of the fluids that were injected to the pipes of ATO deposit. It ranges from copper rich to lead and zinc rich and this explains the geochemical zonation in the deposit. As for ATO deposit, the burden that kept the fluids from traveling upward is thought to be a unit of very dense and massive, black coloured siltstone. The siltstone unit occurs at the bottom of some of the deeper drill holes having thickness ranging from a dozen meters to 30-40 m. A break in the black siltstone unit caused hydrothermal explosion and rapid upheaval of CO_2, which resulted in formation of breccia pipes. Fluids rose through open spaces between breccia fragments where pressure and temperatures were lower and gangue and ore minerals filled them completely or partially. As a result, mineralization took place.

EXPLORATION MODEL

The exploration model for recent exploration (since the general appreciation of the location and extents of Pipes 1, 2 and 4 and Mungu) has been to drill and sample holes on an increasingly close regular pattern across the deposits. Drilling commenced with relatively short vertical holes at wide spacing. This could be characterised as mostly drilling the upper oxidised material. More recent drilling has mostly been with closer and longer holes predominantly driller towards the south east. This could be characterised as drilling the lower transitional and fresh material.

The drilling model is essentially to traverse the deposits fully in plan and to a reasonable depth. Hole spacing and short sampling intervals would be tight enough to ensure grade continuity between holes.

9 SURFACE EXPLORATION (EXCLUDING DRILLING)

Exploration (other than drilling) at ATO is described in terms of:

- Surface exploration methods and parameters.
- Sampling methods, quality and representation.
- Sample data details.
- Surface exploration results and interpretations

The bulk of the information in this Section is extracted from the 2017 NI 43-101 Report[30] and has been reviewed and/or amended by Steppe's appointed Alternate QP **Ochirkhuyag Baatar.**

SURFACE EXPLORATION METHODS AND PARAMETERS

PREPARATION

At this stage, reports and related materials, including maps, sketches, and logs, of historical mapping and prospecting works conducted by earlier researchers were collected, compiled and studied. Interpretation of aerial and satellite images were also performed. Coordinates used by CGM for exploration on the project is UTM coordinates with the datum set to WGS-84, Zone 49N. The boundary coordinates of the exploration and mining licenses are defined by latitude and longitude coordinates.

FIELD WORK PROGRAMS

The field investigation that was conducted in the license area can generally be subdivided into two stages: prospecting and exploration.

In 2003-2009, geologists of COGEGOBI, who had been specialized in prospecting and exploration of uranium projects, conducted geological mapping and prospecting traverses and collected geochemical samples in the exploration license area, supplemented by a magnetic survey. The result was they discovered an epithermal gold occurrence.

In 2010, CGM carried out a prospecting stage consisting of geological mapping and prospecting traverses, surface and other sampling tasks, variety of geophysical surveys, and some trenching and drilling. As a result of the prospecting ATO occurrence was chosen to a detailed study, and an intensive drilling program began in late 2010 to advance the project to exploration stage.

GEOLOGICAL MAPPING

Systematic mapping and prospecting traverses carried out in the entire ATO exploration license area. Traverses were placed 100 m apart. During traverses, grab samples were collected from alteration zones and rocks with possible mineralization. As a result, a 1:25,000 scale geological map was produced covering the entire license area.

A total of 397 grab samples were collected in 2010 during mapping. Systematic mapping continued until 2014 including detail mapping at the ATO prospect, as well as recon scale mapping with some grab samples.

Mapping and prospecting work was assisted by maps such as 1:32,000 scale aerial image, a satellite image, and topographic maps at scales of 1:25,000 and 1:50,000.

As a result of this work the area now contains the ATO gold-polymetallic occurrence chosen as a potential target. Detailed prospecting work was aimed to draw a shape and size of a mineralized body, boundaries of lithology and alteration zones, and study the sources of secondary dispersion halos and geophysical anomalies. Based on the result of the detailed prospecting traverses, detailed 1:10,000 scale geological map of the ATO deposit area was interpreted.

[30] 2017 NI 43-101 Report, Section 9, pp4853 onwards.

STREAM SEDIMENT SAMPLING

The ATO district is characterized by limited and weak systems of streams and galleys, wherein down stream sediment transport is practically non-existent. Thus, minimal stream-sediment sampling was carried out to obtain a general geochemical characteristic of the area in 2010.

As an initial task of the field work, stream sediment samples were taken from Holocene ditches and ravines, where outcrops of Late Paleozoic to Early Mesozoic rocks distributed, to detect stream sediment anomalies. Samples were taken using hand augers and shovels to dig 0.2-0.6 m deep holes and extract 1.5-2.0 kg samples from alluvial gravel and sand materials. To avoid contaminating the samples, stainless steel drills and sifters were used. Samples were air dried before sieved in a 20 mesh sifter. The samples were reduced to 150-200 g after sieving and the reduced samples were submitted to the laboratory for analyses. A total of 509 stream sediment samples were collected counting 1 sample for per square km. Coordinates of sample location were recorded by a field GPS devices, and a simple field illustration was drawn including catchments width, depth, rank, and direction; and the sand ratio, gravel and clay size, colour, degree of gravel rounding of samples; and information on nearby country rocks. A stream sediment map was produced as a result and used for further studies.

SOIL GEOCHEMICAL SAMPLING

Initial soil sampling (20 * 100 m) was completed at the ATO prospect in the fall of 2009 by CGM. During 2010, an additional 4,256 samples were collected at 100 * 100 m and 200 * 200 m in areas showing potential, and, during 2012, an additional 18,471 soil samples were collected from broad areas across the entire ATO district (gold shown in Figure 21). These 18,471 soil samples are from seven domains within the ATO district and include 7,290 samples collected from the Davkhar Tolgoi area south of the mineralized pipes at ATO, and 4,860 soil samples are from areas close to the pipes. Thus, broad expanses of the licensed areas to the north-north-east of the ATO deposit finally were covered in 2012 by systematically gathered soil grids, areas of the seven exploration licenses held by CGM at the end of 2012 that previously had not been sampled.

The best indicator of presence of significant, underlying gold-mineralized rock at ATO was a gold anomaly in soil at ATO. This gold anomaly in soil at ATO was as much as 600 m wide in its longest dimension and includes concentrations of 50–500 ppb Au. By far, this is the strongest gold anomaly in the immediate area of the pipes within ATO district.

In addition, a strong lead anomaly in soil is mostly coincident with the soil gold anomaly and contains generally 50–300 ppm Pb. Most lead in soil is derived from secondary lead minerals, including plumbogummite (a Pb-Al phosphate), pyromorphite (a Pb phosphate), and Pb–Mn oxide minerals in the uppermost, oxidized parts of the underlying mineralized pipes. In addition, anomalous lead in soil E–SE of the Bayangol prospect appears to be defined, in part, by the trace of an inward-dipping low-angle thrust fault exposed in some trenches, though Early Jurassic intrusive rocks emplaced into Early Permian volcanic rock, largely rhyolite, also may be contributing to the lead anomaly.

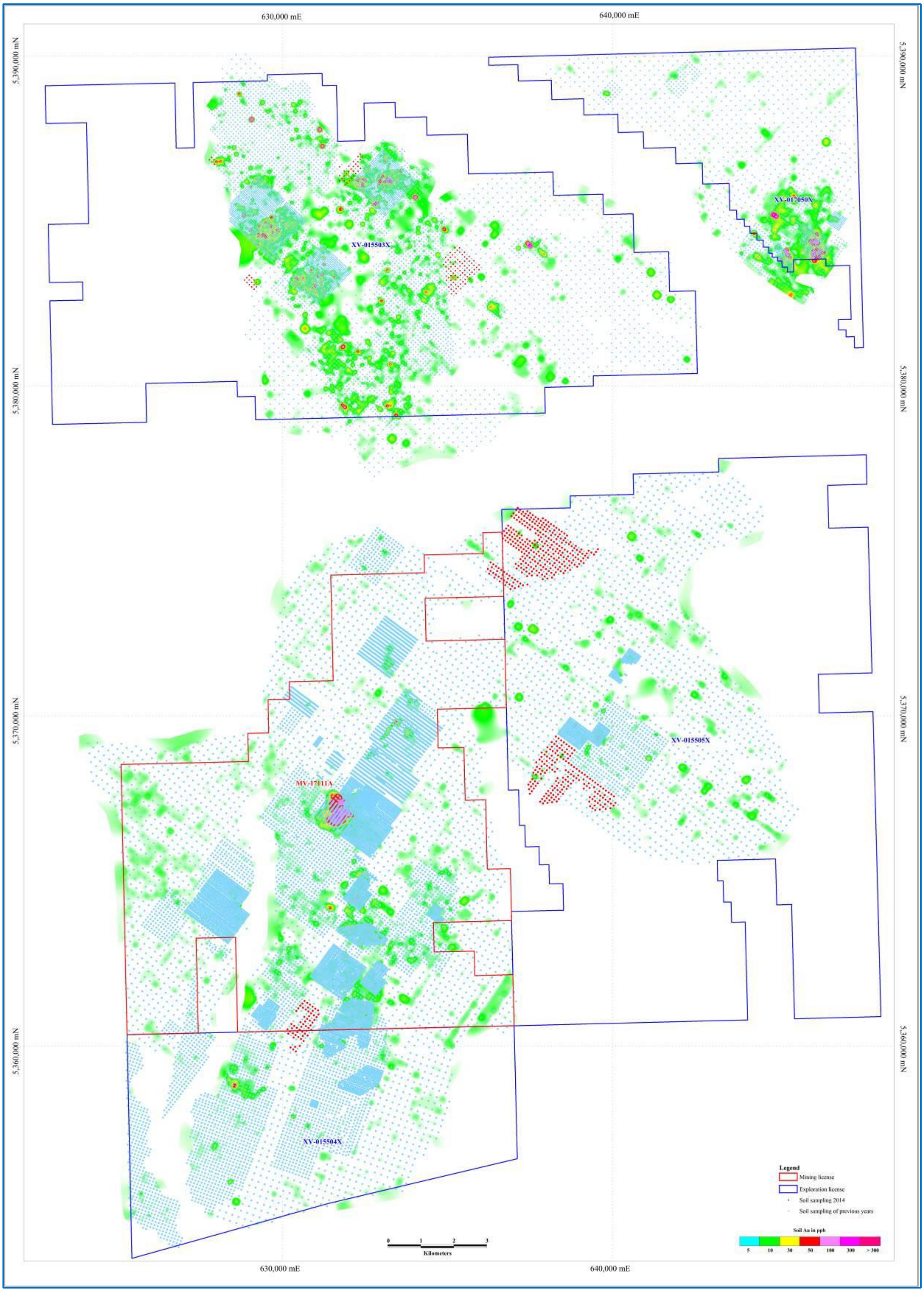
Further, anomalous >500 ppm Zn in soil is present in soil on top of Quaternary-covered mineralized rock in Pipe 4, as well as on the northern fringe of the surface projection of Pipe 1 and on the SW margin of Pipe 2.

The combined Au, Ag, Pb and Zn anomaly over the pipes is illustrated in Figure 22.

Extensive soil sampling was undertaken in 2013 and a minor amount of soil sampling was undertaken in 2014 to infill the grid spacing in various areas on the property, and to slightly expand the grids beyond their previous coverage in a few places. Most areas were infilled from a pre-existing 200 * 200 m grid spacing to 100 * 100 m and 100 * 50 m and 50 * 50 m on target areas. The infill sampling enhanced some anomalies detected in the wider spaced grids, but did not identify any new significant anomalies.

Occurrence of rock outcrops was sparse in the license area; most of it was covered by loose sediments. Soil samples were extracted from a depth of 30-60 cm (B horizon), or form underneath the brown soil with plant roots, sometimes from 1 to 2-meter depths drilled by hand augers when the cover was significantly thick. Each weighing 1.5-2 kg, the samples were dried and sieved in 80 mesh steel sifters to produce 150-200 gr samples ready for analyses. Coordinates of sampling sites were recorded in GPS devices, and a journal was kept about the composition, colour, and structure of soil, the depth of extraction, and information on nearby rock bodies.

Figure 21[31] Gold soil sampling in the ATO district – 2010 to 2014



[31] CGM 2014 ER.

The red boundary in Figure 21 illustrates Mining License MV-17111 (the previous boundary to the current one).

GRAB SAMPLING

To evaluate the potentiality of occurrences, mineralized points and altered rocks identified by the prospecting and exploration work, and to determine elemental grades, size and shape, and boundaries of mineralization, samples such as grab samples, channel samples were collected.

Grab samples were collected from outcrops and fragments of altered and/or mineralized rocks during prospecting and mapping traverses in order to determine and evaluate the grades of valuable elements. Sometimes a composite sample was taken with certain intervals from sites where there is extensive alteration and mineralization. A grab sample weighed 1-2 kg. Each of the samples was placed in a proper bag and its coordinate was recorded. A total of 422 such samples were collected during the program.

CHANNEL SAMPLING

A significant channel sampling (trenching) program was carried out in 2010 and 2011 to test geochemical anomalies and the geological environment mainly in the ATO prospect but also in the surrounding Davkhar Tolgoi, Bayan Munkh, Bayan Gol and Duut Nuur occurrences. In some cases, trenching led to new target discoveries. Trenching was concentrated mainly in ATO deposit area from 2012 to 2014. In all 244 trenches were excavated in ATO district and surrounding areas including 168 trenches in ATO prospect. A total of 28,809 m of trenching was done.

Trenching was performed to confirm the results of surface geochemical and grab sampling and the geophysical anomalies that had been surveyed in the area where precious and base metal mineralization found from previous and year 2014.

When excavating trenches, the black-coloured topsoil was stripped carefully and piled separately on one side of the trench and 1 m away from the edge of the trench, and the materials below topsoil were dumped on the other side of the trench. Depth of the trench varied depending on the thickness of loose sediments present and it averaged of 2 m. Excavation did not reach the hard rock in some of the trenches where cover sediment was more than 6 m deep. Width of the trenches varied from 1 to 1.2 m and the walls were slightly sloped to ensure safety. The trenching was aimed at defining alteration zones and soil profiles and evaluating the geochemical and geophysical anomalies that cover large areas. Length of the trenches varied depending on the purpose of each trench, with a minimum of 15 m and a maximum of 276 m. Surveying of trenches were made using differential GPS records.

After making a description and documentation of a trench, the trench was cleaned, and a channel sample was taken from the walls and floor of the trench using a chisel and a sledge hammer. Mineralized bodies and alteration zones found in trenches were sampled over 1 to 2 m. Unaltered rocks were sampled with intervals up to 5 m. With cross-section measured 10 by 5 cm, the samples weighed 8 to 15 kg. Locations of the samples were recorded using a differential GPS device. A total of 7,689 channel samples were taken.

Documentation of a trench was performed after thorough cleaning of the walls and floor of the trench and it involved mapping at the scale of 1:100 and taking of photos. After that, channel samples and rock chip samples were taken. After documenting the trench and taking samples, the trench was filled with rock material that was initially taken from the bottom of the trench and covered it with black topsoil material. 100% of the excavated material was put back in the trench and the local authority and local environmental office approved a fact of reclamation.

GEOPHYSICAL SURVEYING

Geophysical data gathered during 2009-2012 was acquired by CGM during its exploration efforts, and included magnetic, gravity, and IP (induced polarization) surveys. Geophysical work included a ground magnetic survey carried out by Monkarotaj, as well as a D-D IP and gravimetric survey completed by Geomaster.

Magnetic surveys: Ground magnetic surveys were conducted at a grid 25 * 100 m over an area of 79.3 km^2 south and north of the initial completed grid and also at other prospects in the CGM licensed areas in 2010. Air-magnetic and spectrometry surveys were conducted over ~1,000 km^2 (four licenses of CGM). Surveys was carried along profiles 100 m apart – 11,021 km in 2011.

IP dipole-dipole (D-D IP) survey: A D-D IP survey was initially completed across the ATO prospect in the fall of 2009 on recommendations of CGM and then carried on during 2010-2011 using two modifications – 50 and 100 m measurement spacing. D-D IP Sections were placed 100 or 200 m apart over 324.9 km.

Gravity survey: A gravity survey (200 * 200 m, 1,704 stations) was completed in 2010 over the ATO prospect and its vicinity. A detailed 50 * 50 m grid was used in the immediate area of Pipes 1, 2 and 3. In 2011, 3,318 stations were completed.

METALLURGICAL SAMPLING

A minimum of 500 g sample from each of selected diamond drill holes was submitted to the laboratory of Actlabs Asia for Bottle-roll test for gold. When selecting samples, they were sorted with regard to their grades of gold and Pb-Zn, degree of oxidation (oxidized, intermediate, and unoxidized), and the type of host rock, and they were selected for their relative consistency of distribution and ability to represent their respective mineralized bodies (Table 7). Sampling was aimed to test the metal recovery of mineralized bodies. A total of 93 metallurgical samples were prepared.

Table 7 Metallurgical sample schedule

Grade	Very high			High			Medium			Low		
Degree of oxidation	Oxidized	Transition	Unoxidized	Oxidized	Transition	Unoxidized	Oxidized	Transition	Unoxidized	Oxidized	Transition	Unoxidized
Au	+	+	+	+	+	+	+	+	+	+	+	+
Au-Pb-Zn	+	+	+	+	+	+	+	+	+	+	+	+
Pb-Zn	+	+	+	+	+	+	+	+	+	+	+	+

In addition, a contract was established with the laboratory of Xstrata Process Support Centre to perform metallurgical test, and pursuant to it, initial test samples were sent to the laboratory in April 2011 followed by the second test samples in July 2011. The test work involved using of gravity method to produce low-grade concentrates and then flotation method for separating lead and zinc. The purpose of the test work was to maximize metal recovery from the ore and solving the issue of process plant design. Below are accounts on the two stages of test work.

1. The initial stage of the test work was performed on five sets of samples representing oxidized, intermediate, and unoxidized zones of the upper and lower parts Pipe 1 and 2 (Table 8). Eleven drill holes were selected and the samples from them were sorted according to their high, medium or grades of gold and lead-zinc.

Table 8 Sample sets for metallurgical testing

Zone	Oxidation	Drill Hole ID	Intervals (m)		Width (m)	Set No	Weight (kg)
Upper	Oxidized	ATO-12	2.00	44.30	45.6	ATO - 1	128.8
		ATO-14	2.60	27.30	14.0		
		ATO-15	0.90	13.00	4.0		
	Transition	ATO-07	32.70	54.90	22.2	ATO - 2	127.7
		ATO-11	38.90	75.90	37.0		
		ATO-14	66.95	78.05	11.1		
	Unoxidized	ATO-11	75.90	97.00	21.1	ATO - 3	127.8
		ATO-11	101.40	120.20	18.8		
		ATO-27	74.35	88.35	14.0		
		ATO-28	61.15	74.65	13.5		
Lower	Unoxidized (Fresh)	ATO-15	108.70	154.25	45.6	ATO - 4	127.3
		ATO-32	140.20	154.20	14.0		
		ATO-38	128.05	132.05	4.0		
		ATO-07	147.40	150.55	3.2	ATO - 5	128.8
		ATO-07	162.30	170.10	7.8		
		ATO-12	125.00	127.00	2.0		
		ATO-12	130.00	136.00	6.0		
		ATO-14	94.10	100.35	6.3		
		ATO-24	124.40	144.40	20.0		
		ATO-34	189.50	209.20	19.7		
Total							**640.4**

2. The second stage of test work was performed on nine sets of samples. First seven of the nine sets of samples were taken from the following locations, respectively (Table 9).
    - Weakly mineralized intervals with the minimum grades of Au and Pb-Zn.
    - Intervals with certain grades but not included in resource blocks
    - Intervals with extreme gold grades and moderate Pb-Zn grades
    - Intervals with high gold grades and high to moderate Pb-Zn grades
    - Intervals with moderate gold grades and extreme Pb-Zn grades
    - Intervals with weak gold grades and moderate to weak Pb-Zn grades
    - Intervals with mixed grades of gold and Pb-Zn

In addition, one of the two remaining sets was chosen in order to evaluate the metal recovery of the newly discovered Pipe 4. The other set was taken with an aim to increase the metal recovery of Pipe 2.

Table 9 Sample sets for second metallurgical test

	Drill Hole ID	Intervals (m)	Width (m)	Set No	Weight (kg)
Weakly mineralized	ATO-128	70.00	82.00	Set-1	75.98
	ATO-162	50.70	62.60		
Outside of pipes	ATO-55	114.00	122.00	Set-2	74.58
	ATO-160	30.00	45.80		
Mixed-1	ATO-64	115.80	121.80	Set-3	36.00
	ATO-92	108.30	111.30		
Mixed-2	ATO-41	60.10	69.10	Set-4	30.88
Mixed-3	ATO-60	110.95	119.10	Set-5	35.61
Mixed-4	ATO-60	81.05	89.40	Set-6	31.72
Master	ATO-19	85.70	91.70	Set-7	249.95
	ATO-40	50.25	58.40		
	ATO-49	101.00	106.00		
	ATO-71	74.60	84.60		
	ATO-87	172.10	177.30		
	ATO-110	55.30	62.55		
	ATO-135	50.50	69.00		
	ATO-136	160.90	174.90		
Pipe 4	ATO-96	109.80	140.00	Set-8	200.29
	ATO-116	25.00	50.00		
Pipe 2	ATO-20	60.10	88.40	Set-9	168.27
	ATO-55	135.05	145.50		
	ATO-60	119.10	141.80		
Total				**9.00**	**903.29**

To prepare these samples, all of the half cores from the selected drill holes were retrieved from storage. Each of the sets was packed in a 60 L barrels, and all necessary documents were obtained for customs clearance. The samples were shipped via freight forwarder DHL. The samples weighed a total of 1,543.7 kg.

GEOTECHNICAL SAMPLING

Geotechnical samples were selected to have consistent distribution in the pipes of the deposit taking into account the types of rocks present, degree of oxidation of pies, and grades of gold and other metals. The samples were prepared in two different forms before submitting them to the Actlabs laboratory (ACTLABS).

- 10 cm long sample accounting for ¼ of the core sample. 117 such samples were tested for bulk density by coating them with paraffin and dipping them in distilled water to measure displaced water. The volume obtained was then compared with density of the distilled water to determine the bulk density of rocks.

- 124 samples each weighing 50 g were taken from remnants of the pulverized samples that had been prepared for assays. The pulverized samples were put into fluids in a standard condition, the volume of displaced water was measured, and it was compared with the density of the distilled water to determine the ultimate relative density.

PETROGRAPHIC ANALYSIS SAMPLING

To study the lithological composition and mineral composition of rocks found in the deposit area, a total of 45 samples were taken from all types of rocks and alterations. Their petrographic descriptions have been made by

Professor Bal-Ulzii (PhD) of University of Science and Technology of Mongolia and PhD A.B. Ted Theodore of USGS, an adviser to CGM. Ted Theodore used in his petrographic analyses Zeiss Axioskop 40 Pol microscope with zooms at 2.5X, 5X, 10X, 20X, and 50X and a lens 10X-20 Pol capable of zooming at 500X. The microscope is able to work with reflected and absorbed lights. The microscope was equipped with a digital camera MicroPublisher 3.3 RTV, which was connected to an iMac computer with 2.4 GHz Intel Core 2 Duo processor. Photos taken with this camera was then processed in Adobe Illustrator CS5 and Adobe Photoshop CS5 to jpeg format. The results were presented in the previous sections describing ATO deposit styles and geological settings.

MINERALOGICAL SAMPLING

To study the mineral composition of the deposit's mineralization, possible sequence of concentrating of minerals, and the nature of structure and texture of the mineralization, a total of 59 samples were taken representing all of mineralized assemblages at the deposit, and they were analysed by senior teacher Myagmarsuren of the University of Science and Technology and Ph.D A.B. Ted Theodore of USGS, an adviser to CGM. Ted Theodore conducted his analyses in Menlo Park of USGS in California. He used a LEO 982 electronic microscope to determine the sequence of crystallization of minerals and their textures. He also determined chemical compositions at some random points in the samples. Necessary photos were taken and have been included in the report in jpeg format and results are presented in previous sections.

ABSOLUTE AGE DETERMINATION SAMPLING

In order to determine the ages of extrusive and intrusive rocks mapped in the area, seven samples were taken and sent for analyses by U-Pb dating on zircon crystals to Ph.D. J.K. Mortensen of the Pacific Centre for Isotopic and Geochemical Research of the University of British Columbia.

15 to 20 zircon crystals were picked from each of the samples were analysed by the Laser Ablation ICP-MS (described by Tafti, 2009) using a New Wave UP-213 laser. Zircon crystals that measure no less than 74 microns were selected and mounted in an epoxy puck along with several crystals of internationally accepted standard zircon (Plesovice, FC1) that dates 197 million years and a couple of internal quality control samples, and they were fed into the instrument in a linear form. Crystals selected were washed by reduced nitric acid for about 10 minutes and then rinsed in distilled water to make them high quality crystals with no alterations and no prints. Laser beam level was taken at 45% to allow ablation crater size to be 15 microns. Laser beam was off for 10 seconds and of for 35 seconds. Data collected was reduced in GLITTER software. Biases were corrected using the Plesovice standard. Adjustment of the instrument was controlled by zircons of the internal quality control. The analytical regime included 4 measurements of Plesovice's standard zircon, two measurements of internal quality control, and 5 measurements of prepared zircons. Interpretation of the processed results was performed using ISOPLOT software of Ludwig.

PALEONTOLOGICAL SAMPLING

Six samples were taken from the paleontological faunal and floral relics found in the exploration area and they were analysed to determine stratigraphic ages. The task was performed by PhD Minjin of the University of Science and Technology of Mongolia, who is a member of the Stratigraphic Commission of Mongolia. He delivered his descriptions of the samples along with photographs.

GROUND-WATER EXPLORATION

A comprehensive preliminary hydrogeological exploration program was successfully completed across the Davkhar basin at ATO prospect area through a 2011 and 2012 work program to support a C_2 groundwater reserve estimate under Mongolian classification systems. The exploration program comprised surface geophysics (VES and MRS), core exploration bores completed as observation bores and test bores for aquifer testing.

SURFACE EXPLORATION RESULTS & INTERPRETATION

SOIL GEOCHEMICAL RESULT ANALYSIS

Results of the soil sampling at the ATO license area were produced to analyse dispersion halos for elements of Au, Ag, Pb, and Zn. Analysis was attempted to determine the vertical and horizontal zonations of elements associated geochemically to the ATO deposit and figure out the geochemical features of the deposit.

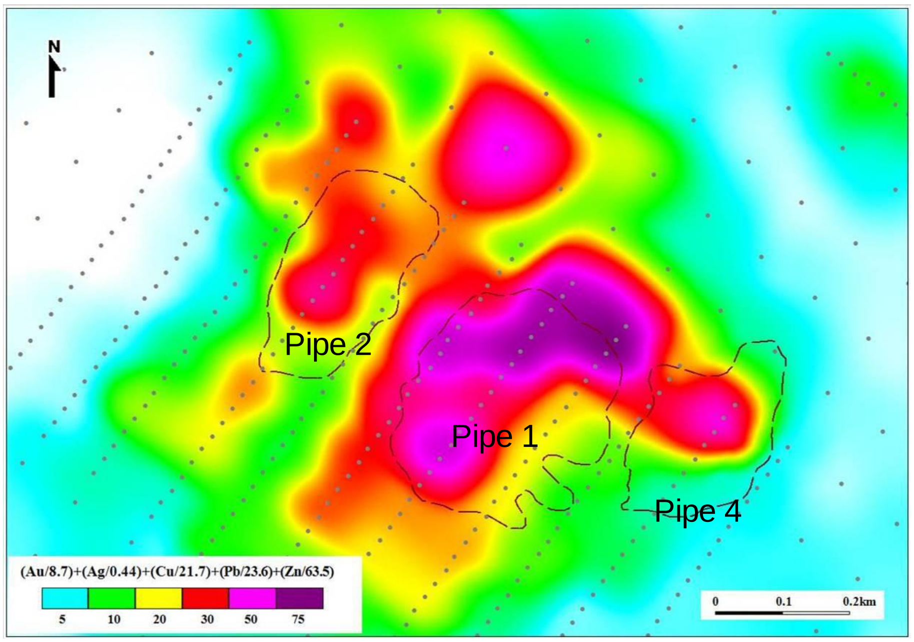
In order to determine the horizontal zonation of the deposit, 959 samples were analysed (analysed for a suite of 49 elements by ICP in the Stuart Global Laboratory) that belong only to the ATO deposit area. In addition, certain representative drill holes were selected at each of the pipes and their samples were analysed for a suite of 45 elements by IPC in the ACTLABS laboratory. A total of 2,651 core samples from a total of 19 drill holes were included in the study.

Elemental associations differ with verticality and horizontality for the mineralized pipes of the ATO deposit and their grades vary.

Horizontal geochemical zonation of the deposit: At the ATO deposit elements such as Au, Ag, Pb and Zn have spatially coincident anomalous grades. Therefore, anomalous grades of these elements were combined to make an integrated dispersion halo map, shown in Figure 22. The background grades of elements are 8.7 ppb Au, 0.44 ppm Ag, 21.7 ppm Cu, 23.6 ppm Pb, and 63.5 ppm Zn.

A geochemical anomalous halo of combined elements was outlined with a size of 750 * 900 m, slightly elongated to the north. The pipe-shaped mineralization is coincident with and clearly distinguished by the contour of combined value of 30 (red shading). This contour is generally irregular in shape. Pipe 1 has the highest concentration of metals in soil whereas Pipe 2 has low intensity. Anomalous contours have gradual weakening to the south west and south of Pipe 1, which reflects the transportation of elements along the features of relief. Very high intensity is attained over a small distance at the north eastern part of the pipe.

Figure 22 Soil combined element halo map over ATO pipes



The degree of correlation between any two of important elements at the ATO deposit can be seen for each of the pipes in the following Tables.

Table 10 Element correlation in Pipe 1 soil geochemical halo

Correlation	Au	Ag	As	Cu	Mn	Mo	Pb	Sb	Zn
Au	1.00	0.66	0.53	0.44	-0.40	0.14	0.46	0.52	-0.04
Ag	0.68	1.00	0.56	0.60	-0.41	0.44	0.59	0.54	0.01
As	0.53	0.56	1.00	**0.85**	-0.33	0.56	**0.76**	**0.82**	0.30
Cu	0.43	0.60	**0.85**	1.00	-0.44	0.48	0.92	0.64	0.15
Mn	-0.40	-0.41	-0.33	-0.44	1.00	-0.33	-0.30	-0.31	0.12
Mo	0.14	0.44	0.56	0.48	-0.33	1.00	0.37	0.49	0.23
Pb	0.46	0.59	**0.76**	**0.92**	-0.30	0.37	1.00	0.54	0.06
Sb	0.52	0.54	0.82	0.64	-0.31	0.49	0.54	1.00	0.06
Zn	-0.04	-0.01	0.30	0.15	0.12	0.23	0.06	0.06	1.00
Based on analyses of 62 samples									

Table 11 Element correlation in Pipe 2 soil geochemical halo

Correlation	Au	Ag	As	Cu	Mn	Mo	Pb	Sb	Zn
Au	1.00	0.63	0.46	0.76	-0.14	0.07	0.73	-0.14	0.08
Ag	0.63	1.00	0.59	0.50	-0.09	0.38	0.51	-0.02	0.12
As	0.46	0.59	1.00	0.39	-0.06	0.60	0.33	0.34	0.35
Cu	0.76	0.50	0.39	1.00	-0.16	-0.01	0.64	-0.08	0.33
Mn	-0.14	0.09	0.06	-0.16	1.00	-0.04	0.09	0.19	0.54
Mo	0.07	0.38	0.60	-0.01	0.04	1.00	0.05	0.48	0.07
Pb	0.73	0.51	0.33	0.64	0.09	0.05	1.00	-0.06	0.31
Sb	-0.14	0.02	0.34	-0.08	0.19	0.48	0.06	1.00	0.09
Zn	0.08	0.12	0.35	0.33	0.54	0.07	0.31	0.09	1.00
Based on analyses of 46 samples									

Table 12 Element correlation in Pipe 4 soil geochemical halo

Correlation	Au	Ag	As	Cu	Mn	Mo	Pb	Sb	Zn
Au	1.00	0.59	0.88	0.81	-0.42	0.68	0.86	0.61	0.71
Ag	0.59	1.00	0.79	0.82	-0.08	0.84	0.72	0.89	0.89
As	0.88	0.79	1.00	0.97	-0.19	0.88	0.98	0.81	0.89
Cu	0.81	0.82	0.97	1.00	-0.08	0.94	0.97	0.88	0.95
Mn	-0.42	-0.08	-0.19	-0.08	1.00	0.11	-0.20	0.05	0.00
Mo	0.68	0.84	0.88	0.94	0.11	1.00	0.84	0.90	0.96
Pb	0.86	0.72	0.98	0.97	-0.20	0.84	1.00	0.77	0.86
Sb	0.61	0.89	0.81	0.88	0.05	0.90	0.77	1.00	0.95
Zn	0.71	0.89	0.89	0.95	0.00	0.96	0.86	0.95	1.00
Based on analyses of 25 samples									

Gold in Pipe 1 has moderate correlations with silver, arsenic, antimony, and lead, and a weak correlation with copper, which in turn has a very good correlation with lead. At Pipe 2, gold gives moderate correlations to copper, lead, silver, and arsenic. At Pipe 4, it has high correlations with lead, zinc, and copper, and moderate correlations with arsenic, antimony, and molybdenum.

Vertical geochemical zonation of the deposit: These results are presented in Section 0 with the drilling results.

CHANNEL SAMPLING RESULTS

A selection of significant results from the channel sampling programs is given in Table 13.

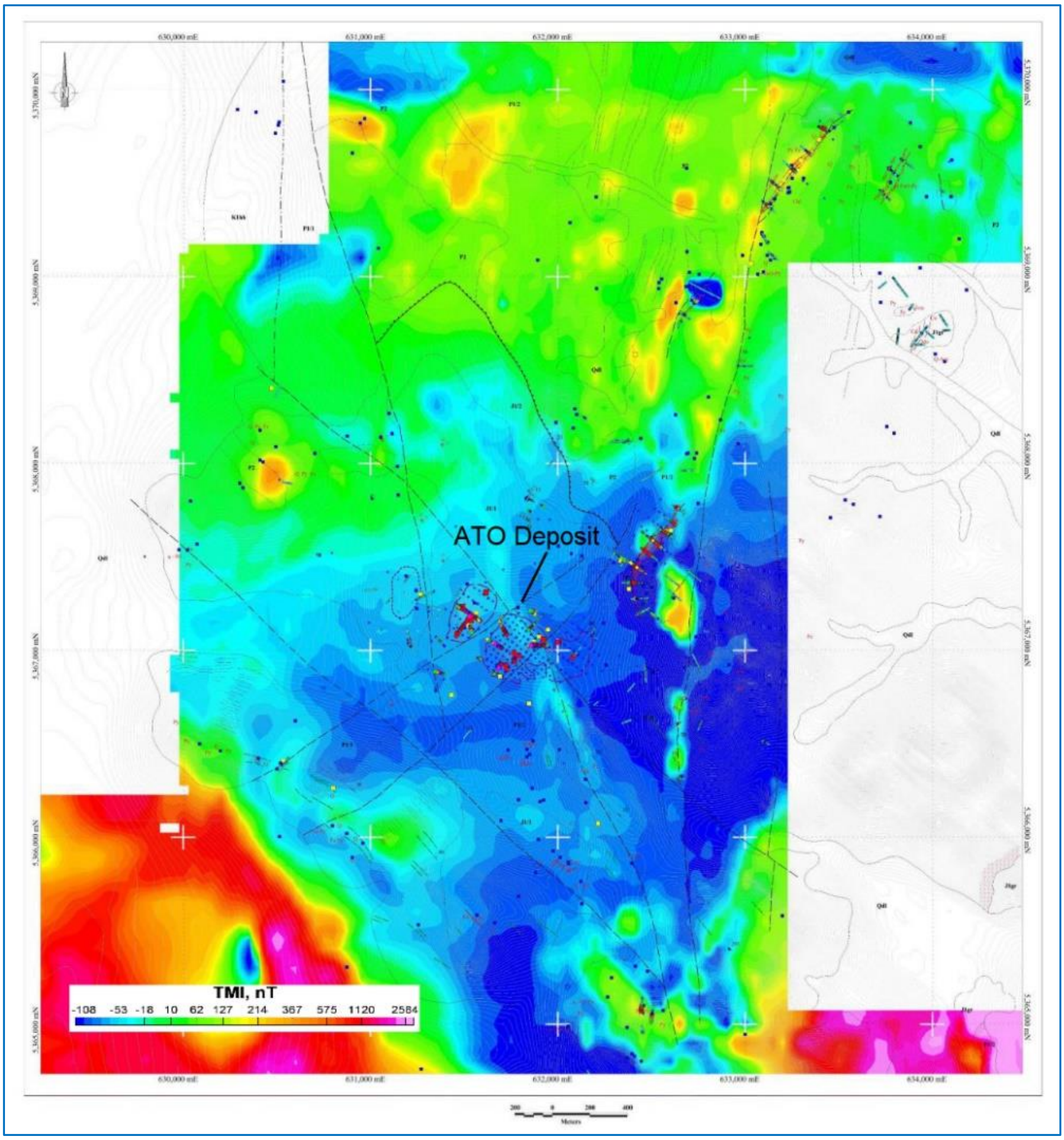
Table 13 Channel sample significant results

Trench ID	Length (m)	From (m)	To (m)	Lithology	Au ppm	Ag ppm	As ppm	Cu ppm	Pb ppm	Zn ppm
ATO-TR-117	2.2	2.8	5.0	Tuff dacite	0.13	<	201	11	15	89
	1.2	19.5	20.7	Tuff dacite	0.10	<	124	12	43	59
ATO-TR-238	1.7	70.6	72.3	Fault	0.38	6.0	3980	184	583	12400
ATO-TR-239	0.5	19.6	20.1	Andesite	1.99	<	8420	256	6	97
ATO-TR-240	1.0	19.5	20.5	Andesite	3.16	<	459	332	10	127
	1.0	21.5	22.5	Andesite	1.97	<	423	86	6	79
	1.2	22.5	23.7	Andesite	1.98	<	1610	218	8	91
ATO-TR-241	1.0	22.5	23.5	Crush zone	0.14	<	685	88	9	258
	1.0	41.0	42.0	Andesite	0.33	<	257	81	6	395
ATO-TR-184	1.0	2.0	1.0	Fracture zone	0.11	2.0	218	18	37	222
	2.0	4.8	2.8	Rhyolite	0.13	<	321	31	43	112
	27.1	28.8	1.7	Rhyolite	0.16	2.0	604	22	27	35
	52.8	55.0	2.2	Siltstone	0.12	2.0	152	48	91	80
ATO-TR-187	6.0	6.7	0.7	Silica	0.24	3.0	160	75	107	126
ATO-TR-218	1.0	3.0	2.0	Siltstone	0.13	<	714	194	29	336

GEOPHYSICAL SURVEY RESULTS

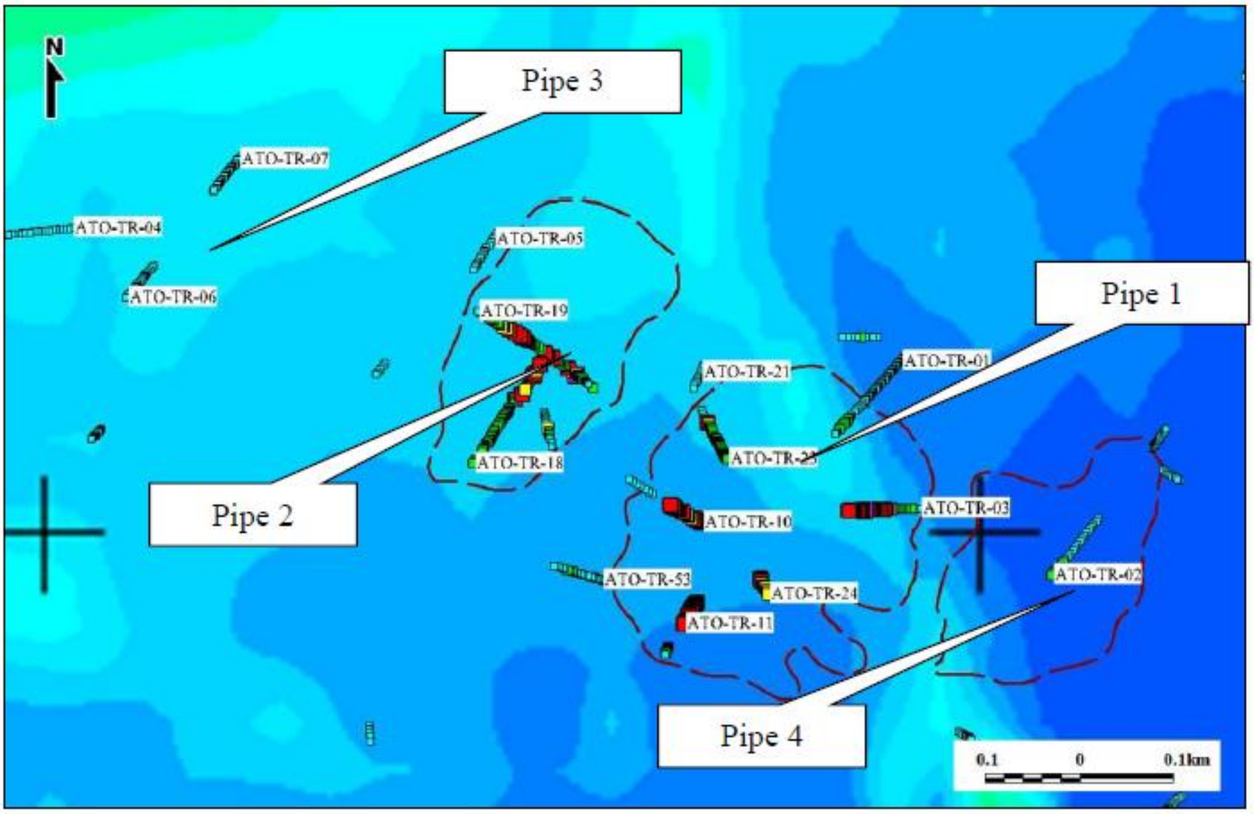
Magnetic survey results: Magnetic data were instrumental in identifying major structures, mafic dykes, and ring intrusion-related anomalies. The deposit at ATO is in a broad generally low magnetic area that contains linear, low level positive features that coincide with NW and N striking faults (Figure 23).

Figure 23 Magnetic survey map over ATO district



The result map of the magnetic survey shows that the pipes of the ATO deposit are in an area which generally has weak magnetic intensity with magnetic field values slightly higher to the northwest than to the southeast. In another word, Pipe 4 is characterized by very low magnetic values whereas Pipe 2 has relatively higher magnetic response. A strip of higher magnetic values ~100 m wide is observed extending in a northwest direction from the southwest of Pipe 4 to the north of Pipe 1, and this strip spatially coincides with a diorite dyke that is found on the geology map of the area (Figure 24).

Figure 24 Magnetic survey map over ATO deposit



IP dipole-dipole (D-D IP) survey results: D-D IP surveys play critical roles in detecting silica and clay alteration (respectively high and low resistivity) and sulphide mineralization (high chargeability), even though a direct 100% relationship is not always present.

The mineralized pipes at ATO coincide with D-D IP 100-m chargeability and resistivity highs, as shown in Figure 25 and Figure 26.

Figure 25 D-D IP 100 m chargeability survey map over ATO district

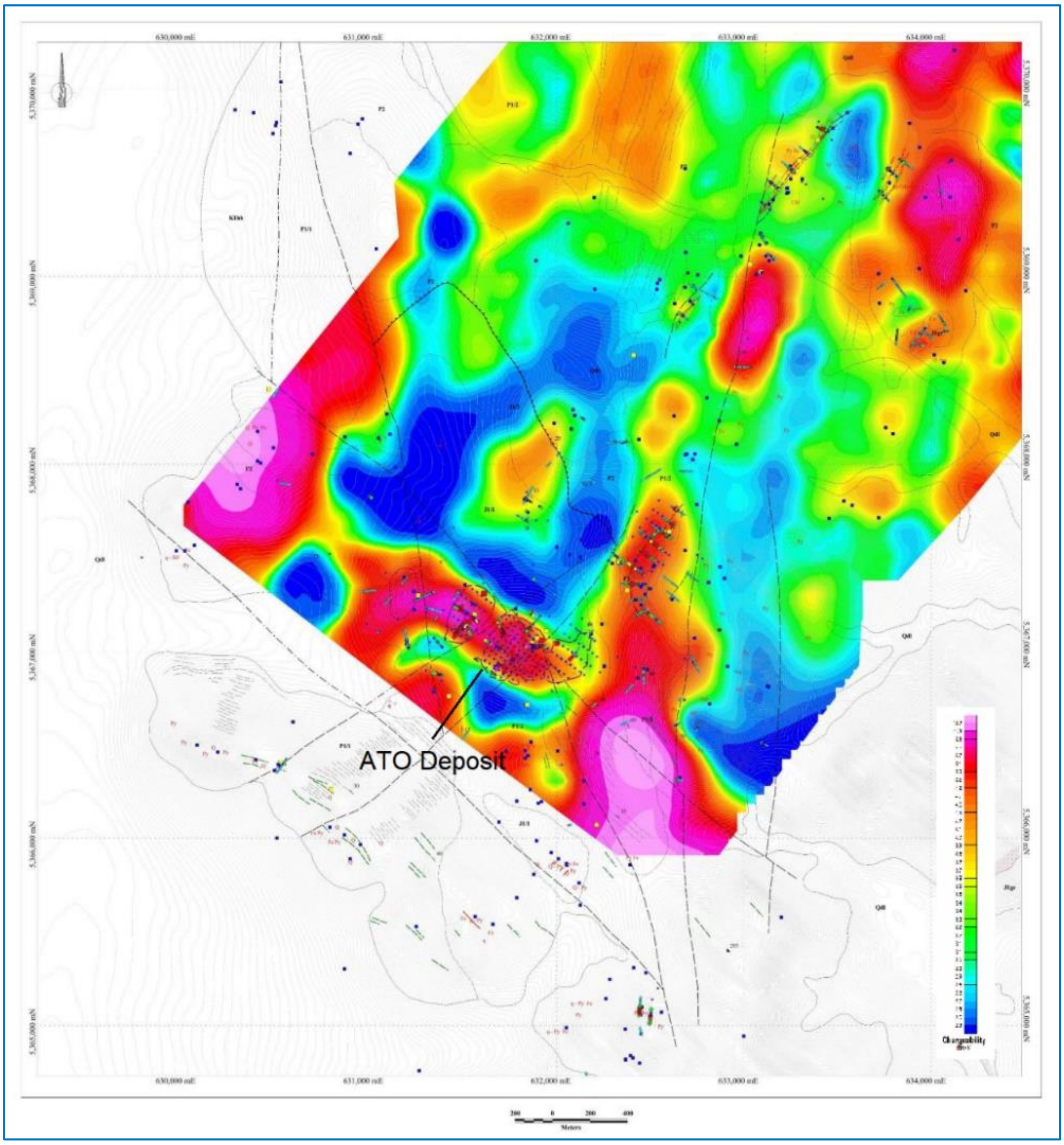
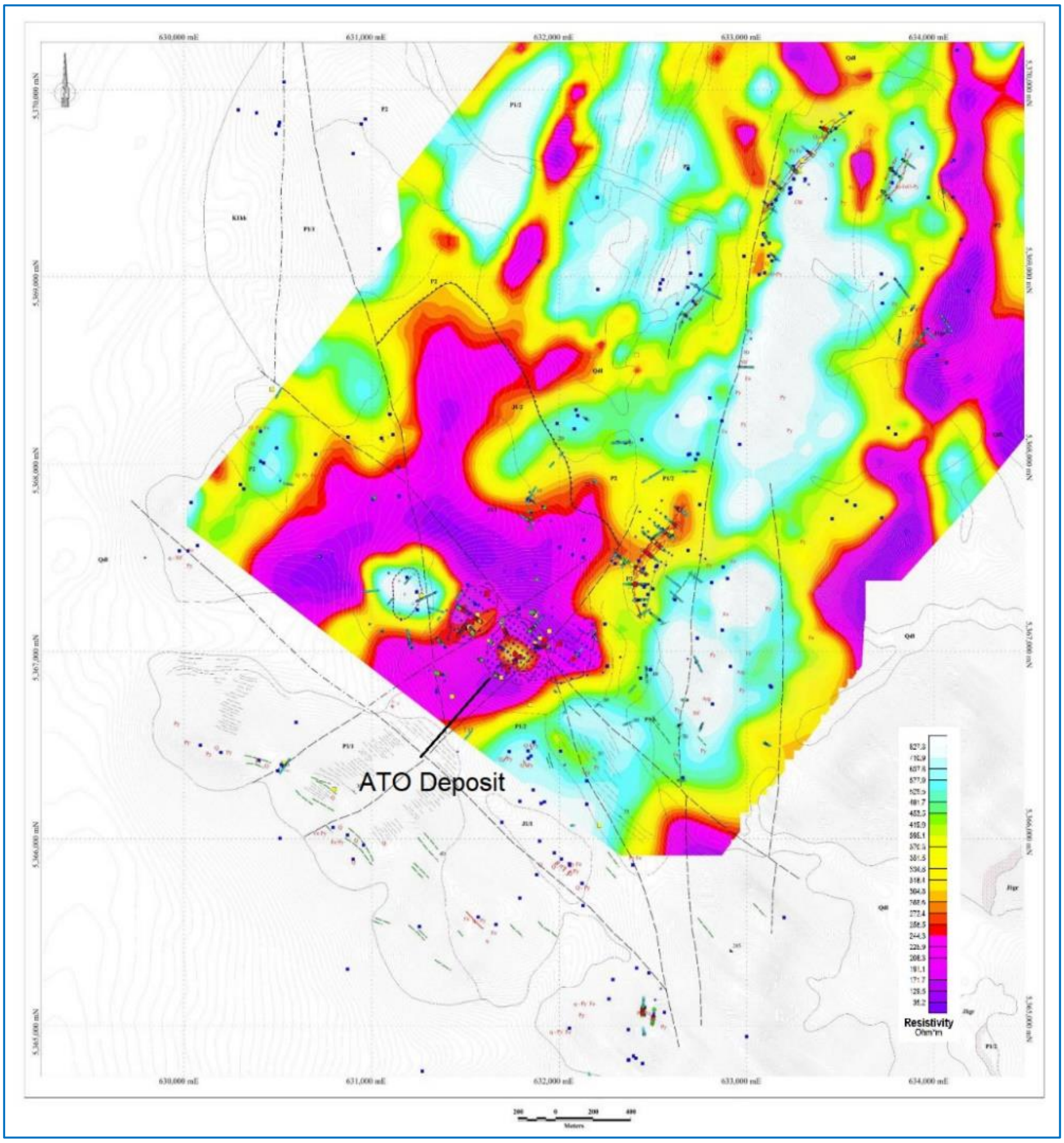
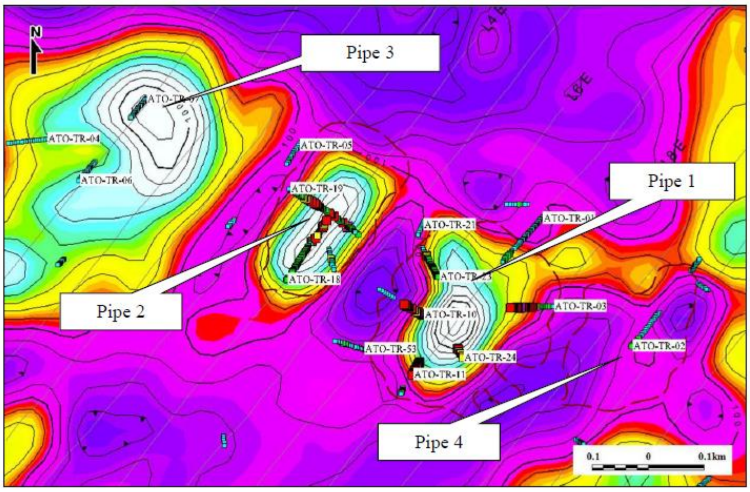


Figure 26 D-D IP 100 m resistivity survey map over ATO district



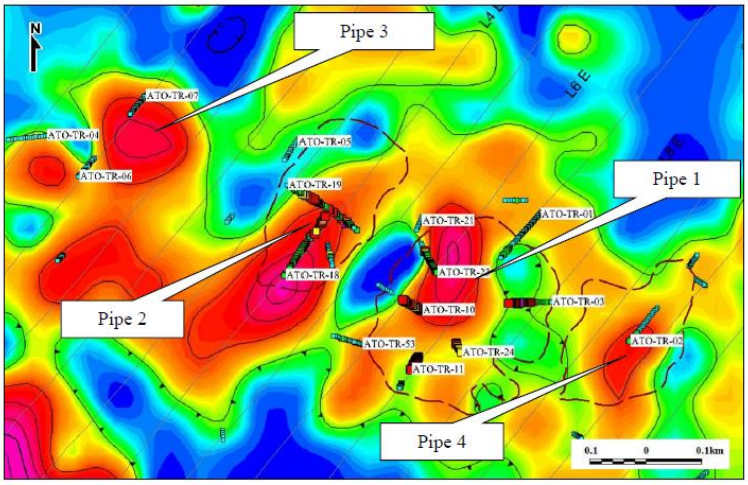
Based on the results in sections, 10 m below the ground surface, several separate areas of very distinct resistivity anomalies were identified and they spatially coincide with a north west-trending series of small hills that are formed of pipe bodies. Therefore, boundaries of pipes and the locations of trenches are plotted on a map of Level N1, where the anomalies are named after their corresponding pipes (Figure 27).

Figure 27 D-D IP resistivity map over ATO deposit



The chargeability map (Figure 28) shows the pipes not so clearly but as some small anomalous areas of medium to weak responses.

Figure 28 D-D IP chargeability map over ATO deposit



Pipe 1 area anomaly: This anomalous area is ~220 m long and 140 m wide and its size is smaller than the outline of the pipe. Resistivity values range from 100 to 1000 ohm.m. It has been observed that the resistivity values decreases with depth. On the chargeability map, there is a small anomaly that coincides with the northern half of the resistivity anomaly of Pipe 1. With sub-longitudinal strike, this chargeability anomaly is 200 m long and 80 m wide.

The pipe bodies are well distinguished in the dipole-dipole sections of chargeability and resistivity. They are sourced from the large, high response anomalies identified at depth, have moderate values and show columnar and tunnel shapes (Figure 29 and Figure 30).

Figure 29 D-D IP resistivity cross-section through ATO pipes 1, 2, 3

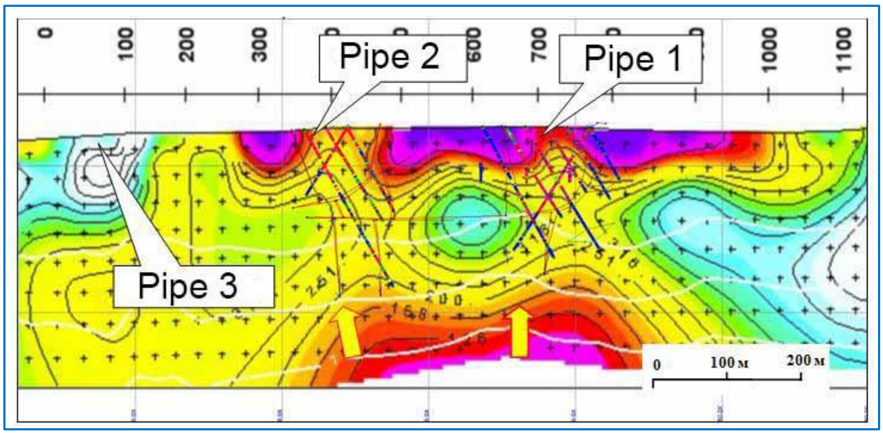
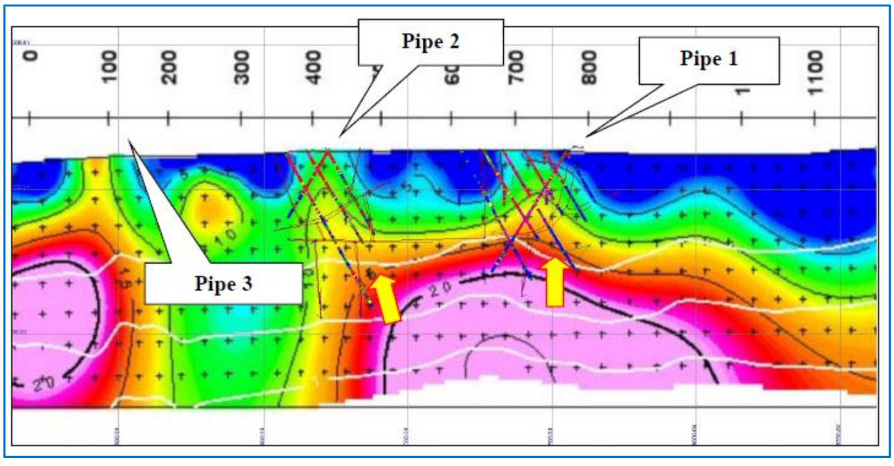


Figure 30 D-D IP chargeability cross-section through ATO pipes 1, 2, 3

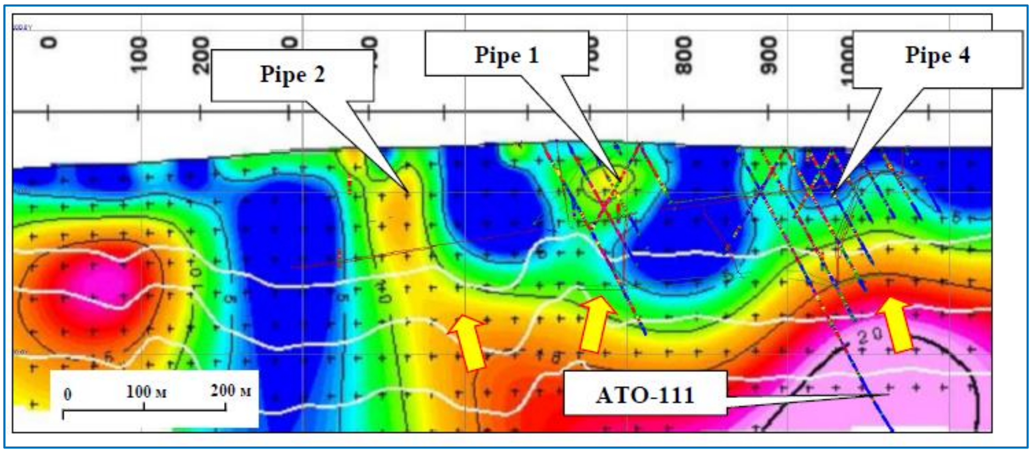


Pipe 2 area anomaly: Anomalous area measures 280 m long and 130 m wide. Responses of the area are similar to Pipe 1 in terms of values. Chargeability map shows a 350 m long, elongated anomalous area that coincides with the southern part of the resistivity anomaly. They are distinguished clearly in sections (Figure 29 and Figure 30).

Pipe 3 area anomaly: This is similar to Pipes 1 and 2 and features an area of high resistivity values. Size of the anomalous area is 300 * 200 m, relatively larger than the two pipes discussed above. The chargeability map shows three separate anomalies for this anomalous area, but they join at depth and form one big anomaly in the dipole-dipole chargeability section. However, on the dipole-dipole resistivity section the anomalous values disappear at depth and this is how the anomalous area of Pipe 2 differs from the other two. Barren rhyolite with pyrite alteration intersected by drill holes serves as the explanation of this anomalous area.

Pipe 4 area anomaly: No resistivity anomaly is noticed near the ground surface on the resistivity map but only a small area of weak chargeability anomaly is observed in the chargeability map, attracting no interest at this level. However, an anomalous area similar to those of other pipes is manifested in lines of dipole-dipole sections in this part. It was assumed that it may be an underground mineralization after making a comparison of it with the geophysical anomalous areas of the other known mineralization. The small area of weak chargeability anomaly in the dipole-dipole chargeability section has a consistent continuance to depth, is similar to those of Pipes 1 and 2, and is a columnar body sourced from a large anomaly of higher values at depth (Figure 31).

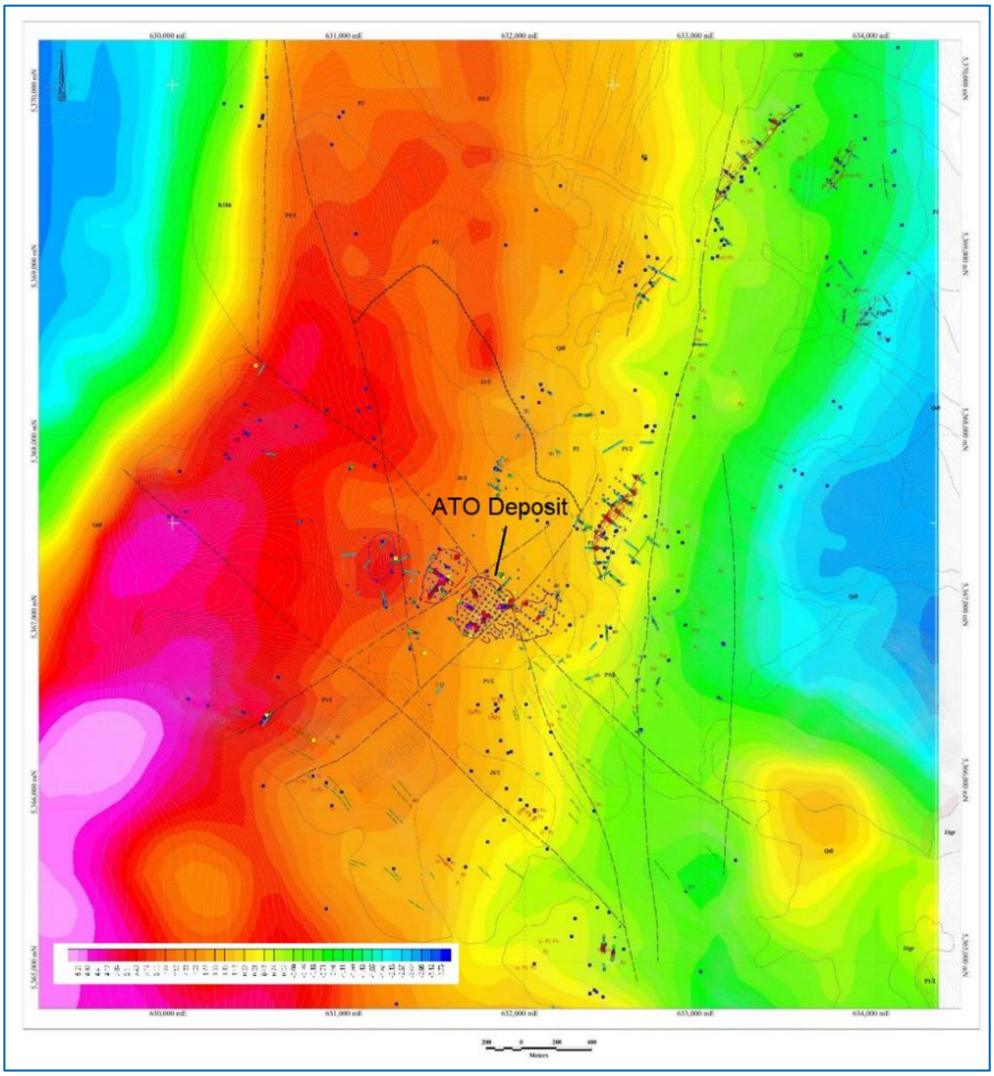
Figure 31 D-D IP chargeability cross-section through ATO pipes 1, 2, 4



Drill hole ATO-111 was drilled to a depth of 500 m in order to check the more extensive and higher geophysical values but it did not yield any mineralization. Therefore, the columnar resistivity and chargeability anomalies of weak to moderate values sourced from the larger anomaly of higher values at more depth serve as a signature for pipe-shaped mineralization.

Gravity survey results: The gravity survey of the ATO deposit and its surrounding area shows that the deposit is on the flank of a broad NNE-trending gravity high (Figure 32).

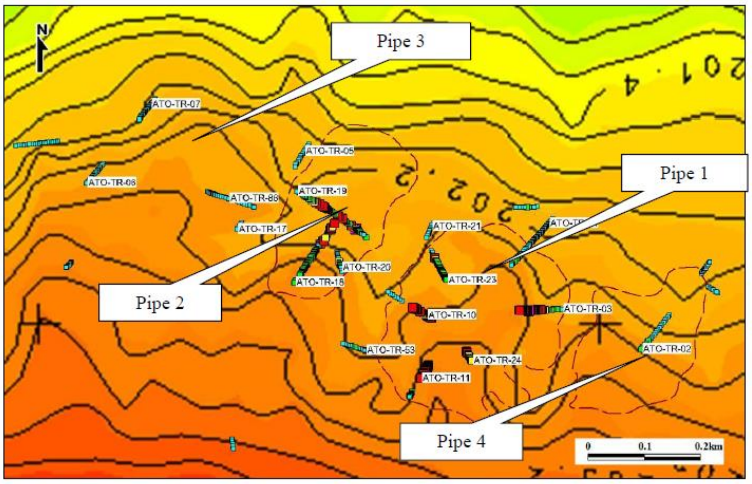
Figure 32 Gravity survey map over ATO district



As seen from the gravity map the pipes are located within the limit of values of 202.2-203.2 mgal that extend sub-latitudinally. The gravity contours are bent and folded around the ATO deposit itself and it was interesting that the mineralized pipes are located in these folds (Figure 33).

Pipe 1 sits 100 to 150 m wide and is at the center of an area of relatively high gravity response intruding from south to north while Pipe 2 locates at the northern end of a 100 m wide area of relatively high gravity response that slightly pushes from south west to north east. Pipe 4 is at the eastern part of an area of relatively high gravity response protruding from south to north.

Figure 33 Gravity survey map over ATO deposit



GROUND-WATER EXPLORATION RESULTS

Exploration works have identified two potential groundwater flow systems extending over an area up to 140 km^2 that can be characterized as:

- Partial coverage of a shallow system extending from surface to between 0 (absent) to 100 mbgl comprising unconsolidated Quaternary and/or weathered Cretaceous sediments.
- A deeper system extending from 0m to over 250 mbgl comprising semi consolidated Cretaceous sediments.

No continuous low permeability strata have been identified separating the deep and shallow systems across the basin and aquifer testing has demonstrated hydraulic continuity across the systems indicating a leaky or unconfined aquifer system prevails across the exploration area. As such it is assumed the groundwater systems will act as one system through long term supply development. A total saturated sedimentary sequence of at least 250 m has been identified.

Aquifer test interpretation indicates variable transmissivity and aquifer responses from the two test bores with higher transmissivity in the north (>150 m^2/d) and lower transmissivity conditions (50 m^2/d) in the south. An aquifer storage range of 2.0E-04 – 1.5E-03 has been established from the preliminary aquifer testing. Local barrier boundary conditions are apparent in the south and vertical leakage effects were observed in the north. Individual bore yields of 16 and 18 l/s with pumping bore drawdown limited to 37 and 39 m support the supply potential of the basin. Insufficient data currently exists to firmly characterize permeability distribution which will require assessment as part of future work programs.

Groundwater quality analysis has established various water types across the area which can be generally grouped into ion exchanged waters and areas subject to increased mixing and recharge influences. Groundwater quality is generally brackish across the exploration area; this water should be suitable for industrial purposes, but treatment would be required should drinking water use be required.

A numerical groundwater model has been developed to support the groundwater reserve estimate. The model was developed to simulate a conceptual bore-field in the southern basin area in proximity to the mine site operating over a 20-year period assuming conservative aquifer parameters. Model predictions indicate a maximum drawdown of 113 m (45% of the initial model saturated aquifer thickness) under assumed worst case reduced hydraulic conductivity and aquifer storage conditions.

A C_2 reserve estimate of 417 l/s is presented based on traditional analytical methodology and supported by a preliminary groundwater numerical model with adoption of conservative parameters for each of aquifer area (140 km^2), saturated aquifer thickness (150 m) and specific yield (2.5%).

10 DRILLING & SAMPLING

Drilling and sampling at ATO are described in terms of:

- Drilling details – the incremental programs and drilling contractors.
- Drill holes – the numbers, types and lengths of holes drilled. Trenches were treated as pseudo drill holes.
- Collar and down-hole surveying – methods.
- Locations – of drill holes in plan and on cross-section line.
- Spacing and orientation of drill holes – most commonly on the section lines at 30 * 30 m spacing and dipping 60° towards 125°.
- Sampling – method of cutting and sampling the diamond drill core.
- Drill core recovery – good average 97%.
- Geological modelling – methods.
- Sample intervals for assaying – continuous over full hole length, and typically 1 m long in mineralisation and 2 to 3 m in the remainder.
- Sample attitude to mineralisation – effectively across strike and as close to across true width as practicable.
- Anomalous mineralisation – effectively none due to the style of the deposit.
- Factors that could impact accuracy – effectively none.
- Summary – the Author QP's opinion of the drilling (albeit without the benefit of a site visit to observe it) was that it was well performed and very adequate for the task of interpretation and Resource estimation.

The bulk of the information in this Section is extracted from the 2017 NI 43-101 Report[32]. Drilling since then has been described by the Author QP and has been reviewed and/or amended by Steppe's appointed QP Alternate QP **Ochirkhuyag Baatar.**

DRILLING DETAILS

DRILLING UP TO 2017

Programs: An exploration drilling program was completed by CGM between 2010 to 2014. Diamond core drill holes (DDH) were the principal source of geological and grade data for ATO. Some reverse circulation (RC) drilling was completed between 2012 and 2014 through cover to map bedrock geochemical patterns as a method of exploring for blind ATO-style mineralization on the project area. CGM carried out a hydrogeology and geotechnical drilling program in 2011.

Drilling contractors: Diamond and RC drilling on the project were done by Falcon Drilling Mongolia, based out of Canada, using a BBS-56 rig. Core diameter was HQ-size (63.5 mm nominal core diameter).

DRILLING 2017 TO 2021

Programs:

- Commencing in 2018, the Company (Steppe) commenced a three-phase exploration drill program:
  - Phase 1 exploration program focussed on the ATO4, Mungu, Tsagaan Temeet, Bayanmunkh and Bayangol targets at the ATO Project. A total of 66 holes were drilled at the Mungu Deposit, 3 holes at the ATO4 Deposit, 4 drill holes at the Tsagaan Temeet prospect, 1 drill hole at the Bayanmunkh prospect and 16 shallow drill holes at the Bayangol prospect for a total of 8,821 m. The drilling program was successful in outlining and extending known gold and silver mineralization. In addition, new high grade zones in deeper parts of the deposit were discovered.
  - Phase 2 drilling program focused on the ATO4 end of the ATO4-Mungu trend at the ATO Project and at the Uudam Khundii Project. The drilling program was completed with three diamond core drilling rigs completing a total of 36 drill holes for 9,006 m. The completion of the Phase 2 drilling program saw the identification of the first ever visible gold seen at ATO project, with super high gold grades being returned in ATO299 and ATO317.
  - Phase 3 drilling program targeted at the ATO4-Mungu trend has commenced with 8 drill holes being complete for 2,228 m of drilling[33].

[32] 2017 NI 43-101 Report, Section 10, pp74 onwards.
[33] 2019 AIF and 2018 news release.

- In 2019 the Company completed a drilling program with two diamond core drilling rigs focused on updating resources and reserves for the ATO1, ATO2 and ATO4 deposits in addition to a maiden Resource and Reserve delineation for the Mungu Discovery. The Company drilled 1,840 m at ATO1, 1,662 m at ATO2, 14,760 m at ATO4 and over 26,573 m at the Mungu Discovery[34].
- Commencing 2020, the Company drilled an additional 55 drill holes for a total of 18,200 m. A total of 53,000 m has been drilled since 2018. The drilling information was used to update the interpretation of the geologic model, geometry of the mineralized zones and domains[35].

DRILL HOLES

HOLES UP TO 2017

All holes: At the end of the 2014, a total of 597 drill holes for ~63,866 m had been drilled over the whole Project area (Table 14). Of these 54,425 m was core drilling in 370 holes and 9,441 m was in 227 RC holes.

Table 14[36] Exploration drill hole summary – to 2017

Exploration Drilling Program		Core Holes	RC Holes	TOTAL
2010	Number	62		**62**
	Length (m)	11,606		**11,606**
2011	Number	141		**141**
	Length (m)	24,874		**24,874**
2012	Number	52	90	**142**
	Length (m)	10,444	2,259	**12,703**
2013	Number	7	137	**144**
	Length (m)	1,539	7,182	**8,721**
2014	Number	108		**108**
	Length (m)	5,962		**5,962**
TOTAL	**Number**	**370**	**227**	**597**
	Length (m)	**54,425**	**9,441**	**63,866**

Deposit holes: The 2017 drill hole data base for the deposit Resource estimation (?) contained 265 diamond drill holes[37]. In the Pipe 1, 2 and 4 deposit area there were in 238 diamond drill holes for a total of 44,284.2 m. That data included 32,791 assays.

HOLES UP TO 2021

All holes: At the end of 2020 the Author's database contained 767 drill holes for 120,320.3 m. These were over the wider Project area as well as over the deposits. A break-down of these is given in Table 15. Older hole names, and those principally over the southern Pipe 1, 2 and 4 deposits, carry the prefix "AT". New hole names over the Mungu deposit carry the prefix "MG".

Table 15 Exploration drill hole summary – to 2021

Holes	Number	Length (m)	Av length (m)
AT diamond	385	73,133.8	190.0
AT RC	227	9,441.0	41.6
Mungu diamond	155	37,745.5	243.5
All holes	**767**	**120,320.3**	**156.9**

This newer diamond core drilling total was 540 holes for 110,879.3 m and increase of 170 holes for 56,036 m (?). These holes were predominantly from the Mungu deposit, and although the number of diamond holes added was ~50% of before the increase in metres was ~100% (as holes at Mungu were considerably longer).

[34] 2019 AIF and 29 July 2020 news release.
[35] 21 February 2021 news release. Information adopted from.
[36] 2017 NI 43-101. Section 10.1. Table 10.1, pp 74.
[37] 2017 NI 43-101. Section 14.1.1, pp118.

Holes and trenches: Drill holes were augmented by a considerable number of channel samples taken from trenches. The trenches represent pseudo-holes. Trench names also carried the prefix "AT" (similar to the older holes) but with the addition of "TR". A summary of the Project's holes and trenches is given in Table 16.

Table 16 Exploration drill hole & trench summary - to 2021

Holes/Trenches	Number	Length (m)	Av length (m)
All holes	767	120,320.3	156.9
Trenches	167	10,184.3	61.0
All	**934**	**130,504.5**	

COLLAR AND DOWN-HOLE SURVEYING

Proposed drill hole collars were surveyed by a hand-held GPS unit for preliminary interpretations.

Completed drill holes had PVC pipes inserted and the hole collar was marked by a cement block inscribed with the drill hole number (e.g., ATO-99). A differential GPS was used for a final survey pickup.

The two collar readings were compared, and if any significant differences were noted the collar was re-surveyed; otherwise, the final survey was adopted as the final collar reading.

CGM used down-hole survey instrument, Reflex Instrument AB, to collect the azimuth and inclination at each 50 m depth increment in most of the diamond drill holes.

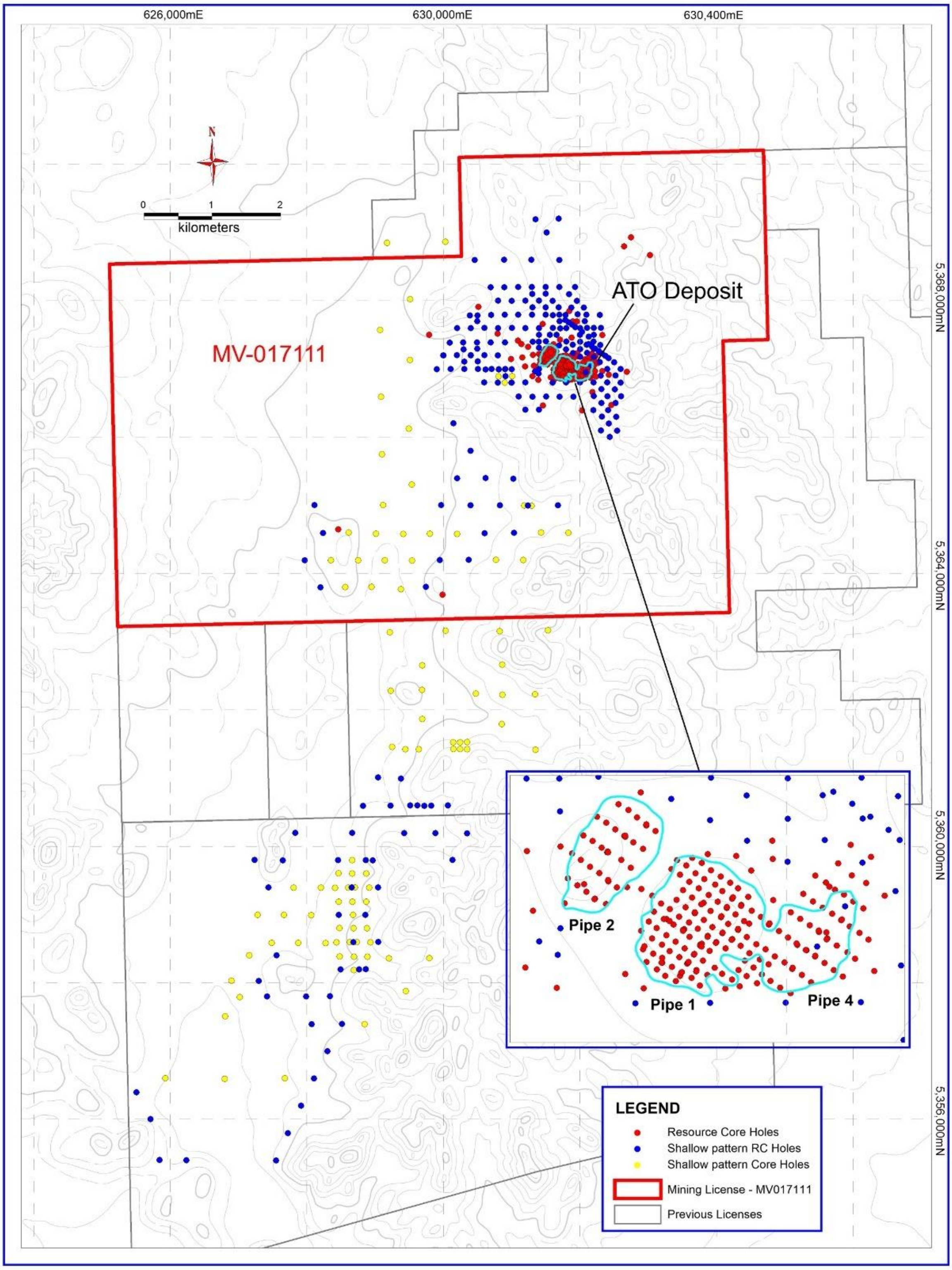
A Reflex ACT II Rapid Descent tool was used for core orientation.

DRILL HOLE LOCATIONS

LOCATION OF HOLES UP TO 2017

The drilling prior to 2017 had been spread over the ATO mining license as well as a south exploration area (Figure 34).

Figure 34[38] Drill holes locations – holes to 2017



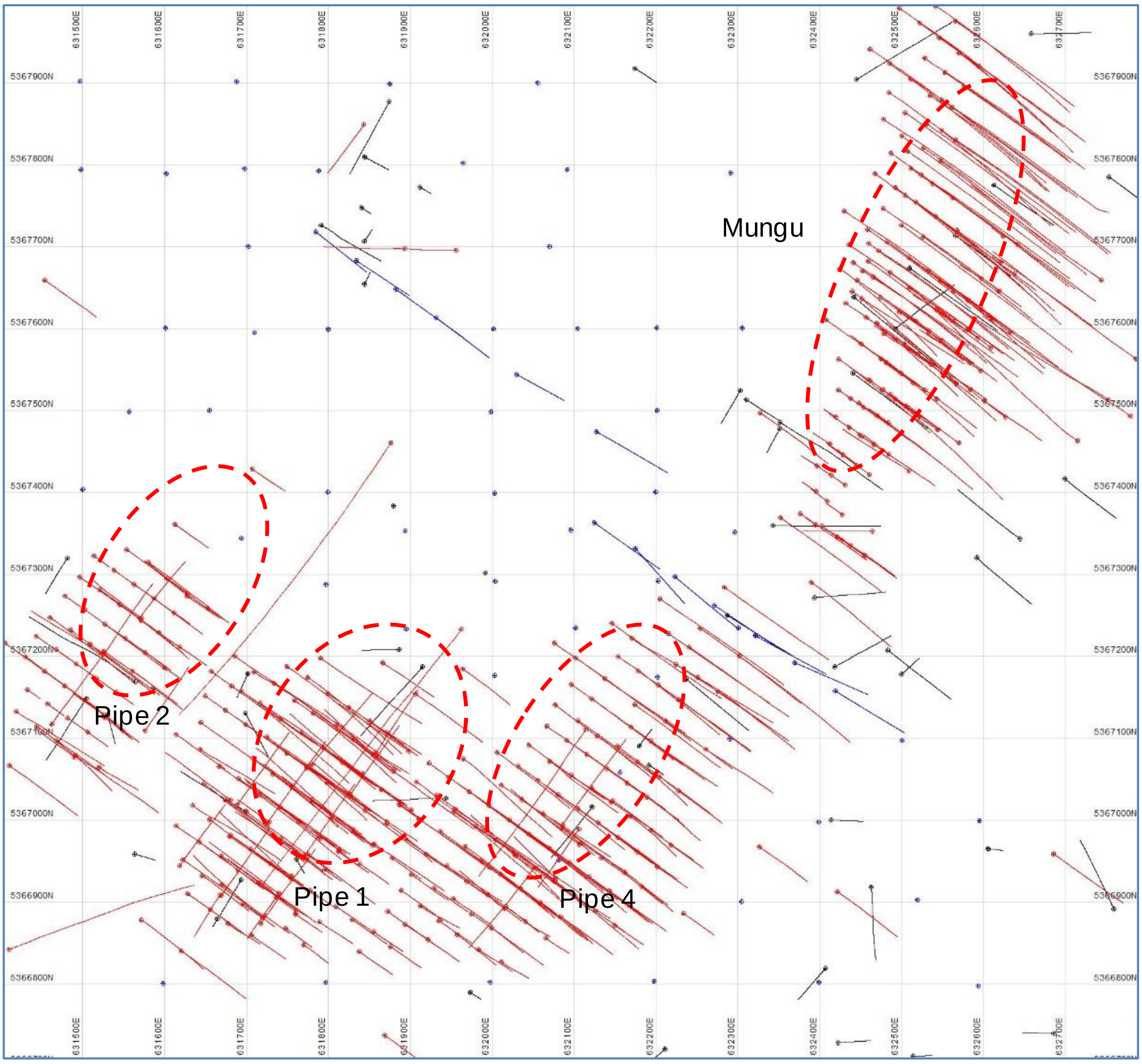
Drilling at the ATO deposit was conducted along 18 cross-section lines oriented WNW to ESE (125°) traversing Pipes 2, 1 and 4 respectively in order west to east (see lines in Figure 5). The sections were spaced 30 m apart. The western end of a typical cross-section was shown in Figure 6.

[38] 2017 NI 43-101. Section 10.2, Fig 10.1, pp75.

LOCATION OF HOLES TO 2021

Diamond drilling and trenching in the period 2017 to 2021 was all in the area of the ATO deposits. The diamond drilling was predominantly at the new Mungu deposit in the north (Figure 35). In the Figure the older RC holes are shown in blue, the diamond holes in red, and the trenches in black. The four deposits locations are approximately shown with labelled red dashed ovals.

Figure 35 Drill hole & trench locations – deposit area 2021



Drilling since 2017 by Steppe continued through to Mungu on the 30 m spaced 125° oriented cross-section lines (see Figure 60).

HOLE SPACING AND ORIENTATION

The older RC drill holes (blue dots in Figure 35, drilling through cover exploring for blind deposits) were drilled vertically and on a square 100 * 100 m pattern. These short holes averaged ~40 m in depth. A 125° oriented line of longer parallel inclined RC holes was also drilled across the centre of the deposit area (and turned out to between the Pipe 1, 2 and 4 deposits and Mungu).

The bulk of diamond core (DDH) holes were located on drilling cross-sections oriented at 125° and 30 m apart. These holes were drilled dipping at 60° below vertical and oriented parallel to the cross-sections on 125° azimuths, with a few also drilled the other way on the sections towards 315°. On section the collars were either 30 or 60 m apart (and typically wider at the edges of the deposits). These hole orientations and spacings are illustrated well in

Figure 6. A limited number of diamond holes were also vertical, and a limited number were inclined holes and drilled at random azimuths.

The AT diamond holes drilled at the Pipe 1, 2 and 4 deposits averaged ~190 m in length and the MG holes drilled at Mungu averaged ~240 m in length.

All core holes were down-hole survey to determine hole orientation.

CORE SAMPLING METHOD

Core samples were taken from diamond drill holes to examine mineralization at depth. Before sampling, core sample was placed in wooden boxes in a proper order, geotechnical measurements were made, and core recovery was estimated. After this, geological documentation and descriptions were recorded, and samples were taken with intervals of 1 to 2 m at mineralized zones and 2 to 3 m at unaltered host rocks. The samples were weighed 8-12 kg each.

At the head of the core boxes, notes were put down as to drill hole ID, box number, length of core in the box, and depth intervals in metres. Relevant notes were put down on aluminum plates nailed next to sampled intervals, and the cores in the boxes were then sliced into two by diamond saw. Photo documentation was performed both before and after slicing a sample.

Saw blades were cleaned by working 5 cm deep into a barren rock before slicing a sample. Coolant water was applied in a continuous flow to prevent contamination of the sample during the core slicing process.

After slicing the core, half of every sample was placed in a special plastic bag, which was then tied with cable ties, to be sent to a laboratory. The other half was put back in the box, which was then sealed and sent to Ulaanbaatar for storage.

CORE SAMPLE RECOVERY (%)

The methodology used for measuring core recovery was standard industry practice. In general, core recoveries averaged 97% for the deposit. In localized areas of faulting and/or fracturing the recoveries decreased; however, this occurred in a very small percentage of the overall mineralized zones.

GEOLOGICAL LOGGING

Core logging was done at core shed at the ATO site camp. The geological logging procedure was:

- Quick review.
- Box labelling check: The core boxes are checked to ensure they are appropriately identified with the drill hole number, meters from–to, and box number written with a permanent marker on the front.
- Core re-building: Core was usually rotated to fit the ends of the adjoining broken pieces.
- Core photography.
- Geotechnical logging: Used pre-established codes and logging forms, includes length of core run, recovered, drilled ratio, rock quality designation (RQD), and maximum length, structural data, and oriented core data.
- Geological logging: Logging was completed on a paper logging forms. Thereafter information was entered into MS Excel software, which used standardized templates and validated logging codes that must be filled out prior to log completion. The template included header information, lithology description and lithology code, graphic log, coded mineralization, and alteration.
- Core cutting: The geologist marks a single, unbiased cutting line along the entire length of the core for further processing.

RC logging involved capture of geological, alteration, and mineralization data on paper logging forms using samples collected in plastic chip trays.

SAMPLE INTERVALS FOR ASSAYING

All holes were sampled continuously over their full length.

Sample intervals were predominantly 1.0 m long in mineralised zones. Other interval lengths of 1.5 m, 2.0 m and 3.0 m were generally used in un-altered non-mineralised rock and sporadically.

Drill core was geologically logged on-site before the core was transported to core sheds in Ulaanbaatar for storage, cutting and sampling.

SAMPLE ATTITUDE TO MINERALISATION

The drilling of 60° inclined holes on 125° oriented cross-sections was aimed at drilling across the perceived strike of the deposits (and so normal to the mineralisation strike). It was also as close to across true width as practicable (see below also).

In terms of the small scale (say 20 to 50 m) continuity and width of mineralisation (at approximately a NE/SW strike) the Author QP considers the drilling orientation to be roughly normal in all holes. And this would also be so in terms of the general NE/SW elongation of the deposits. This situation would be strongest at Mungu with the more linear lenticular interpretations of the Author QP.

However, the generally massive shape of the mineralisation in the deposits (particularly for the southern Pipe 1, 2 and 4 deposits) meant that drill hole orientation was not particularly important. This should be seen in the context of the deposits generally being much wider than several adjacent holes.

And being massive in shape the drill hole lengths did not measure any “true width” as the dimensions of the deposits would be described from the interpreted shapes.

ANOMALOUS MINERALISATION INTERVALS

The Author QP would take the view that mineralised zones were fairly repeatable although variably sized and that whilst the quantum of their mineralisation was considerably above background it was still relatively “restrained” in variability. This is demonstrated by the geochemical zonation described in Section 0 below.

No wildly anomalous values are seen, and the grade variability that does exist horizontally would be typical of the style of the deposit where the bulk would be typified by vertical streaming of vein fluids upwards.

DRILLING & SAMPLING ACCURACY FACTORS

The Author QP considers that errors in collar surveys and down-hole surveying could be a source of inaccuracy but would not have made a material difference for the Resource estimation at Pipes 1 ,2 and 4 (trusting particularly that collar errors seem very unlikely given consistent drilling results over a long time). At Mungu down-hole survey errors would have a greater impact as the deposit is taller, thinner and deeper. However, any error would seem mitigated by the fact that virtually all holes were drilled the same direction at the same dip, with potentially the same drift if there was one.

The Author QP would similarly consider that potential sampling inaccuracy would be minimal given that the vast bulk of drilling was diamond core, with minimal recovery loss, and sampling intervals were consistent lengths.

SUMMARY OF DRILLING RESULTS & INTERPRETATION

OVERALL OPINION OF DRILLING

The Author QP’s overall pinion of the drilling, sampling and subsequent assaying (albeit without the benefit of a site visit to observe it) was that it was well performed, comprehensive, consistent (and extensive) and very adequate from a point of view of allowing a straight-forward interpretation of mineralisation at the deposits and of estimation of their Resources.

This opinion was reinforced by the vertical geochemical analysis (Section 0 immediately below) previously performed which effectively indicated good data.

VERTICAL GEOCHEMICAL ZONATION AT ATO

In order to investigate the deposit to depth, some drilling sections were selected to represent the general characteristics and features of the deposit and used the analytical data of core samples from the mineralized pipes to establish the general pattern of vertical geochemical zonation by converting the intervals of core samples to elevation levels and comparing the grades of gold and associated polymetallic elements.

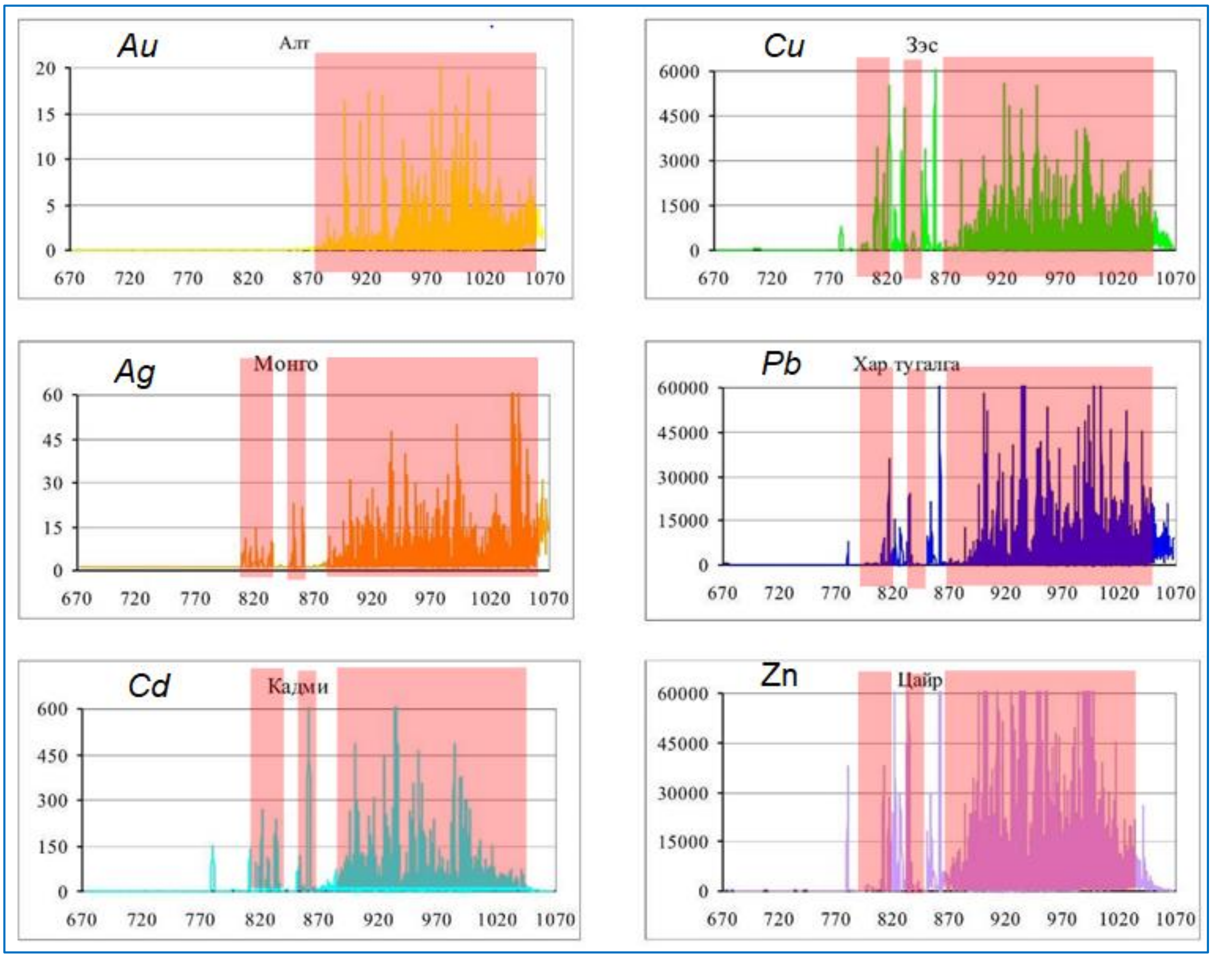
Pipe 1: A total of 1,329 samples from eight drill holes were assayed for 45 elements for Pipe 1. However, the table below shows correlations of only the following elements, which have been selected because of their importance in hydrothermal explosion deposits (Table 17). Gold in Pipe 1 has moderate correlations with silver, cadmium, copper, and zinc, and copper has strong correlations with cadmium, lead, and zinc, and moderate correlations with silver and antimony. Lead has strong correlations with cadmium, copper, and zinc, a moderate correlation with silver, and a weak correlation with antimony. Zinc has a very strong correlation with cadmium, strong correlations with copper and lead, a moderate correlation with silver, and a weak correlation with antimony.

Table 17 Pipe 1 core sample element correlations

Correlation	Au	Ag	As	Cd	Cu	Mo	Pb	Sb	Zn
Au	**1.00**	0.37	0.16	0.38	0.46	-0.05	0.52	0.05	0.38
Ag	0.37	**1.00**	0.47	0.49	0.56	0.28	0.57	0.34	0.49
As	0.16	0.47	**1.00**	0.08	0.23	0.33	0.18	0.46	0.08
Cd	0.38	0.49	0.08	**1.00**	0.68	0.08	**0.78**	0.25	**0.98**
Cu	0.46	0.56	0.23	0.68	**1.00**	0.04	0.68	0.43	**0.70**
Mo	-0.05	0.28	0.33	0.08	0.04	**1.00**	0.02	0.17	0.07
Pb	0.52	0.57	0.18	**0.78**	0.68	0.02	**1.00**	0.22	**0.77**
Sb	0.05	0.34	0.46	0.25	0.43	0.17	0.22	**1.00**	0.27
Zn	0.38	0.49	0.08	**0.98**	**0.70**	0.07	**0.77**	0.27	**1.00**

An element correlation with depth analysis (Figure 36) shows the gold mineralization in Pipe 1 continues from the 880 m level to the 1070 m level. As per polymetallic elements, their mineralization occurs at two separate depth ranges such as from level 810 m to level 860 m and from level 880 m to level 1070 m. The lower range of polymetallic mineralization has no gold and discontinuous while the mineralization at upper levels coincides with gold mineralization and feature discontinuous high grades. Grades of cadmium, zinc, and copper decrease dramatically near surface, or at the 1060 m level, while those of gold, silver, and lead remain relatively stable.

Figure 36 Pipe 1 element correlation with depth



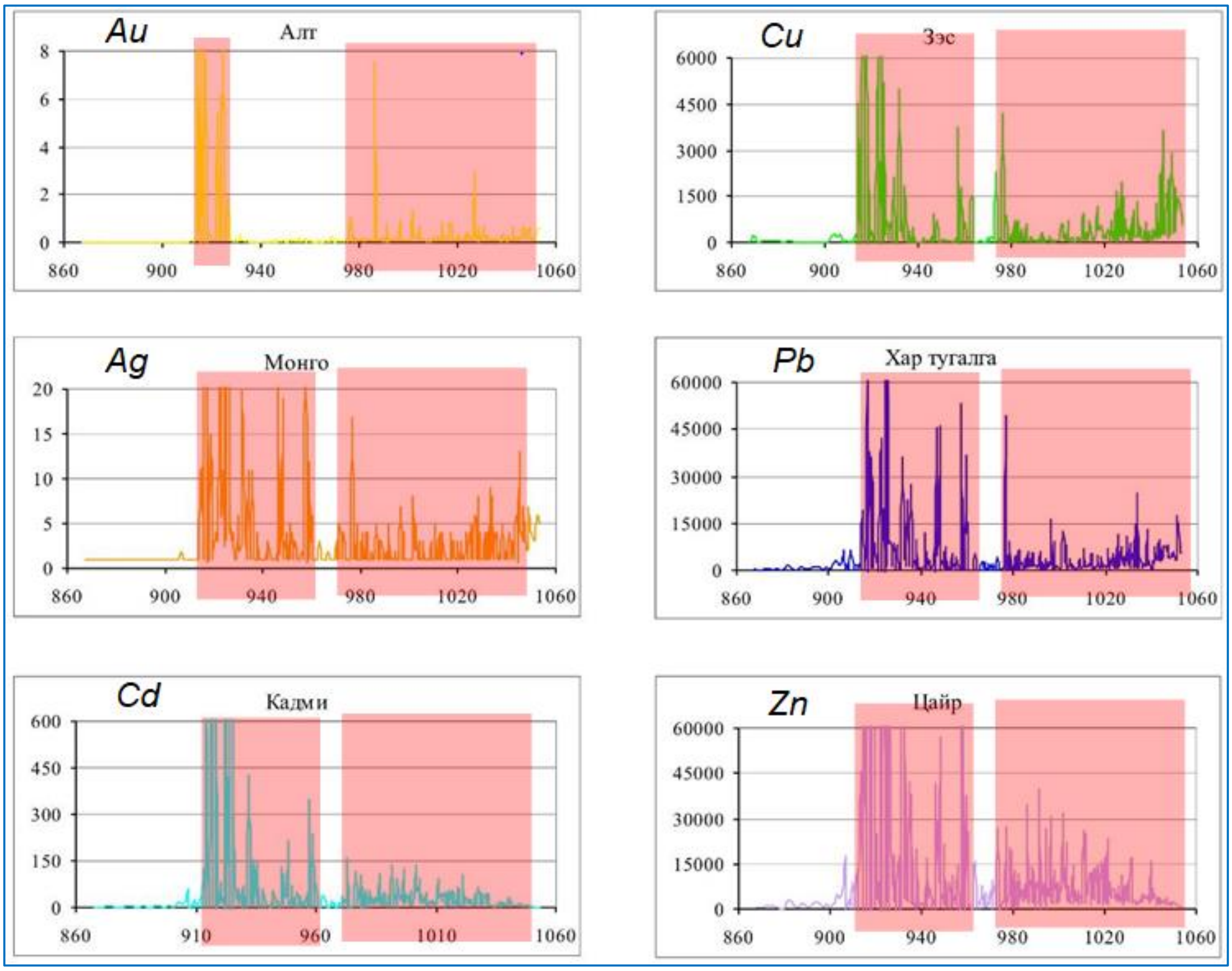
Pipe 2: A total of 374 samples from three drill holes were assayed by multi-element analyses for Pipe 2. The results were then processed and displayed in Table 18showing correlations of gold and polymetallic elements. Gold (Table 18) has moderate correlations with cadmium, copper, tin, and zinc, and weak correlations with silver, bismuth, and lead. Copper has strong correlations with silver, cadmium, and zinc, a moderate correlation with antimony, and weak correlations with bismuth and molybdenum. Lead has a very strong correlation with silver, strong correlations with cadmium, copper, antimony, tin, and zinc, and weak correlations with arsenic, bismuth, and molybdenum. Zinc has a perfect correlation with cadmium, strong correlation with silver, copper, lead, and tin, a moderate correlation with antimony, and a weak correlation with bismuth.

Table 18 Pipe 2 core sample element correlations

Correlation	Au	Ag	As	Bi	Cd	Cu	Mo	Pb	Sb	Sn	Zn
Au	1.00	0.28	-0.01	0.11	0.43	0.38	-0.03	0.18	0.08	0.30	0.43
Ag	0.28	1.00	0.18	0.25	**0.79**	**0.87**	0.15	**0.96**	0.66	**0.72**	**0.79**
As	-0.01	0.18	1.00	-0.02	0.07	0.05	0.09	0.16	0.37	0.03	0.06
Bi	0.11	0.25	-0.02	1.00	0.29	0.24	0.00	0.25	0.16	0.32	0.29
Cd	0.43	**0.79**	0.07	0.29	1.00	**0.86**	0.09	**0.73**	0.47	**0.87**	1.00
Cu	0.38	**0.87**	0.05	0.24	**0.86**	1.00	0.13	**0.79**	0.59	**0.79**	**0.86**
Mo	-0.03	0.15	0.09	0.00	0.09	0.13	1.00	0.14	0.22	0.15	0.09
Pb	0.18	**0.96**	0.16	0.25	**0.73**	**0.79**	0.14	1.00	0.63	0.66	**0.72**
Sb	0.08	0.66	0.37	0.16	0.47	0.59	0.22	0.63	1.00	0.44	0.46
Sn	0.30	**0.72**	0.03	0.32	**0.87**	**0.79**	0.15	0.66	0.44	1.00	**0.88**
Zn	0.43	**0.79**	0.06	0.29	1.00	**0.86**	0.09	**0.72**	0.46	**0.88**	1.00

According to the depth analysis in Pipe 2 (Figure 37), gold occurs at a zone from 910 m level to 930 m level with very high grades and at a zone from 975 m level to 1050 m level with irregular lower grades. As for other metals, there is a zone of irregular high grades from 910 m level to 960 m level, followed by a zone of lower grades from 960 m level to 1050 m level. The graphs show that the grades of copper, silver, and lead increase slightly near surface whereas grades of zinc and cadmium start to drop at 1040 m level to very low grades.

Figure 37 Pipe 2 element correlation with depth



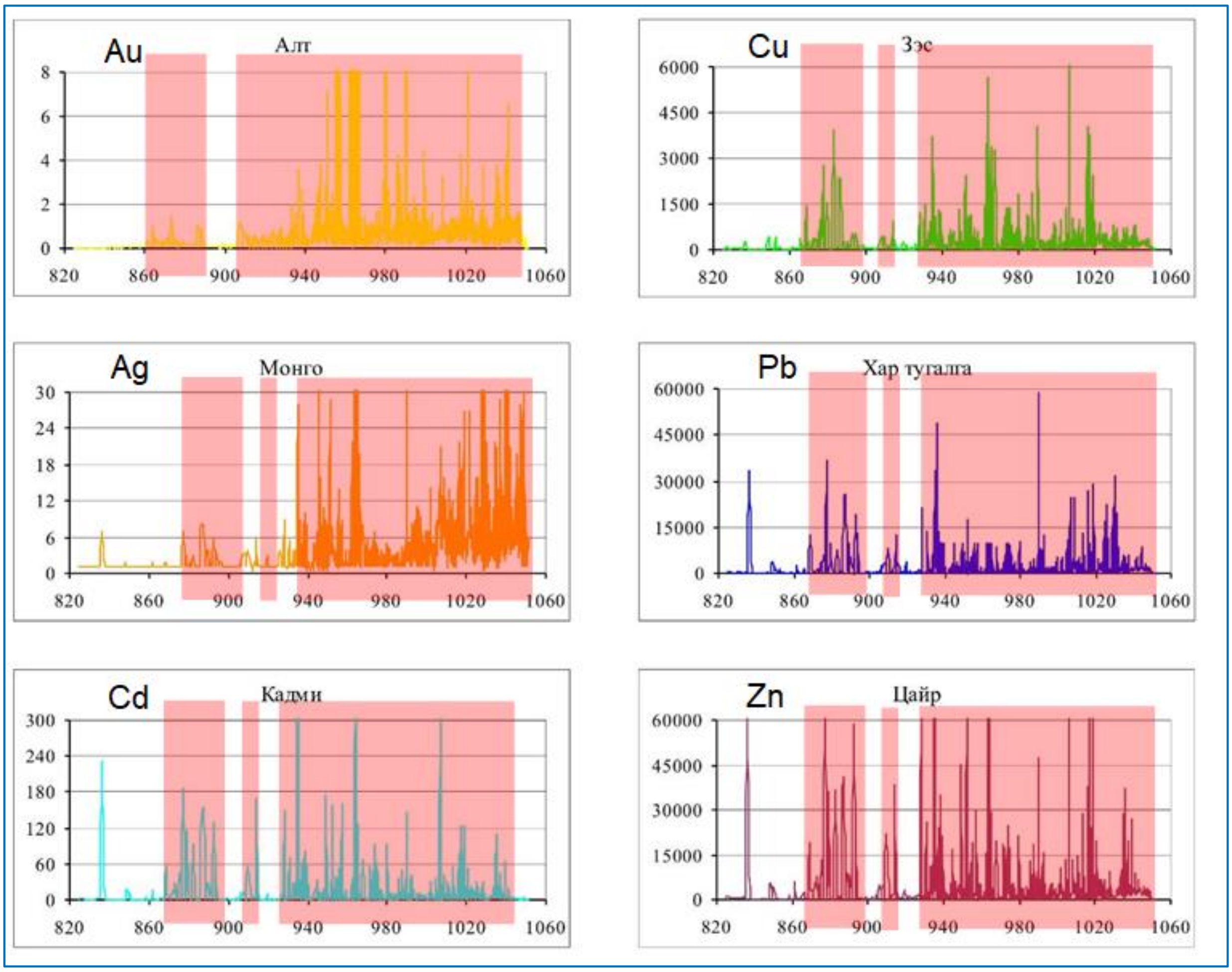
Pipe 4: Correlations of elements in Pipe 4 are provided in Table 19. In Pipe 4, gold has a moderate correlation with copper and weak correlations with silver, cadmium, lead, antimony, and zinc. Copper has strong correlations with cadmium, lead, and zinc, a moderate correlation with antimony, and weak correlations with silver and molybdenum. Zinc has very a strong correlation with cadmium, strong correlations with copper and lead, and a moderate correlation with antimony.

Table 19 Pipe 4 core sample element correlations

Correlation	Au	Ag	As	Cd	Cu	Mo	Pb	Sb	Zn
Au	**1.00**	0.11	0.06	0.26	0.36	0.03	0.19	0.12	0.23
Ag	0.11	**1.00**	0.05	0.07	0.11	0.17	0.09	0.06	0.09
As	0.06	0.05	**1.00**	-0.02	0.07	0.40	0.04	0.50	0.01
Bi	0.01	0.00	0.00	0.04	0.02	-0.01	0.04	-0.01	0.03
Cd	0.26	0.07	-0.02	**1.00**	**0.75**	0.07	0.63	0.33	**0.97**
Co	-0.12	-0.08	-0.05	-0.15	-0.17	-0.05	-0.11	-0.12	-0.16
Cu	0.36	0.11	0.07	**0.75**	**1.00**	0.10	0.61	0.49	**0.77**
Mo	0.03	0.17	0.40	0.07	0.10	**1.00**	0.17	0.37	0.09
Pb	0.19	0.09	0.04	0.63	0.61	0.17	**1.00**	0.33	0.67
Sb	0.12	0.06	0.50	0.33	0.49	0.37	0.33	**1.00**	0.36
Zn	0.23	0.09	0.01	**0.97**	**0.77**	0.09	0.67	0.36	**1.00**

These results suggest that polymetallic elements have better correlations with each other than with gold for Pipe 4. This is also seen clearly on the graphs of grades of gold and polymetallic elements displayed in Figure 38. Elements such as copper, lead, cadmium, and zinc have irregular pattern of grades at depth ranges of 860-900 m level, 910-925 m level and 925-1050 m level. As per gold, its mineralization is established at depth ranges of 860-885 m level and 910-1050 m level. In general, gold and polymetallic mineralization has been identified having stable and relatively thick distribution below surface. This near-surface zone is marked by good correlations of gold, silver, cadmium, copper, lead and zinc, while the zones of high grades of certain metals with irregular distribution and low thickness that are found below it do not demonstrate correlations with gold; only the polymetallic elements have good correlations with one another.

Figure 38 Pipe 4 element correlation with depth



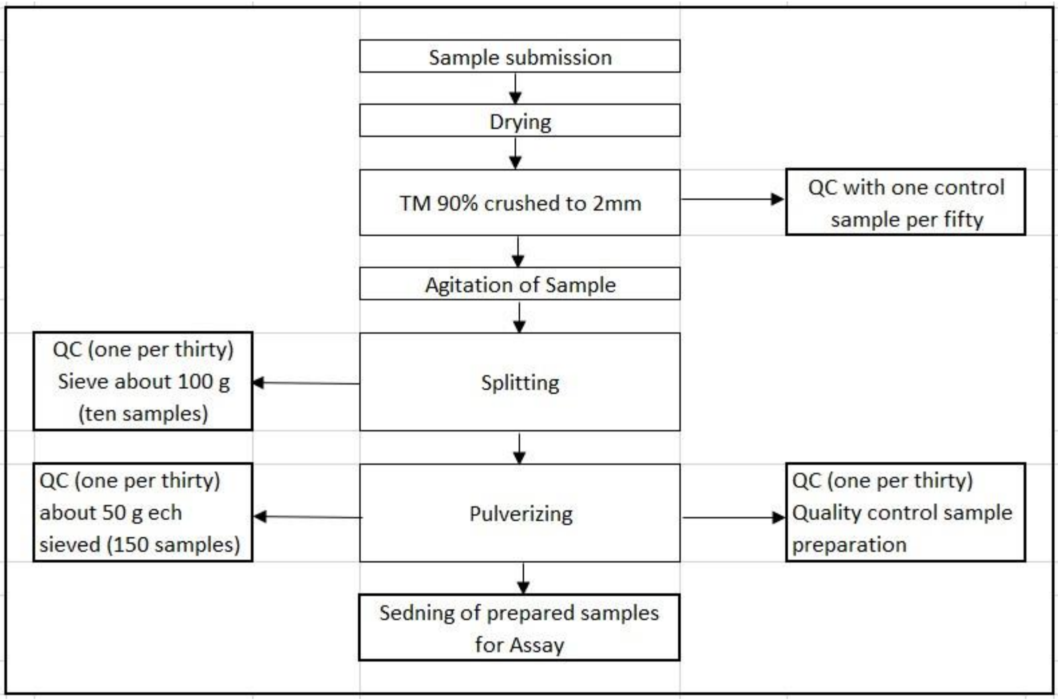
11 SAMPLE PREP, ANALYSIS & SECURITY

SAMPLE PREPARATION BEFORE LAB ANALYSIS

Sample preparation is a process that requires such delicate and meticulous procedures as implemented in laboratory analyses. Rock samples (drill core) had been prepared from drill cores using blade saw cutting the drill core on site and sampling 50% of every meter interval from mineralized zones and remaining 50% of drill core kept in storage. Samples bagging in cotton samples bags and numbered to be ready for submission to a laboratory.

The sample preparation for analysis to be done at ALS laboratory workshop in Ulaanbaatar, and the remainders of the samples are kept in ALS storage. The actual preparation starts with a jaw crusher Rhino-Terminator, which produces an average of 2 to 3 mm fractions. About 750-1500 g of material from the jaw crusher is then fed into a Lab Tech Essa 2018 type rotary mill, and after that, into bowl and ring pulverizers like Lab tech LM1 and LM2, reducing 90% of the material to 75 µm. After preparation of each sample, all crusher and mills are cleaned by blowing with high-pressure air. Samples each weighing 300 g were sent for assay at ALS Ulaanbaatar for precious and base metals. Figure 39 below is a diagram showing the sample preparation procedure at ALS laboratory, inclusive of an internal quality control regime.

Figure 39 Sample preparation procedure



Sample preparation Quality Control (QC) regimes:

- Control samples of preparatory stage
    - Duplicate sample was submitted 1 in 50 samples
    - It must be duplicated from the preceding sample
    - This will serve to control the preparation process and must be prepared the same way as primary samples
- Control samples of pulverizing process
    - A control sample was prepared 1 in 30 samples
    - It must the duplicated from the preceding sample
    - This will serve to control the pulverizing process and must be prepared the same way as primary samples

SAMPLE SECURITY

At the drill rig, the drillers removed core from the core barrel and place it directly in wooden core boxes. Individual drill runs were identified with small wooden blocks, where the depth (m) and drill hole numbers are recorded.

Unsampled core was never left unattended at the rig; boxes were transported to the CGM core logging facility at the ATO camp under a geologist's supervision.

Core was logged on-site before cut for sampling. Remaining core after sampling was transported in sealed boxes by truck to the core shed in Ulaanbaatar.

All core was stored in a secure location in Ulaanbaatar. Core storing workshop was facilitated with the stable shelfs and logging and sample cutting areas. A full-time assistant were working for the core workshop to ensure core and samples security and tidiness.

SAMPLE ANALYSIS

All of the core samples, some of the channel and grab samples were assayed at the ALS Ulaanbaatar laboratory used an analytical suite as Multi elements by Aqua-Regia digestion with ICP-AES finish (ME-ICP41). This analytical suite detects 35 analytes, but some analytes have incomplete digestion. These analytes and detection limits are:

Analytes and Detection limits (ppm)									
Ag	0.2-100	Co	1-10,000	Mn	5-50,000	Sr*	1-10,000
Al*	0.01-25%	Cr*	1-10,000	Mo*	1-10,000	Th*	20-10,000
As	2-10,000	Cu	1-10,000	Na*	0.01-10%	Ti*	0.01-10%
B	10-10,000	Fe*	0.01-50%	Ni*	1-10,000	Tl*	10-10,000
Ba*	10-10,000	Ga*	10-10,000	P	10-10,000	U*	10-10,000
Be	0.5-1000	Hg	1-10,000	Pb	2-10,000	V	1-10,000
Bi	2-10,000	K*	0.01-10%	S*	0.01-10%	W*	10-10,000
Ca*	0.01-25%	La*	10-10,000	Sb*	2-10,000	Zn	2-10,000
Cd	0.5-1000	Mg*	0.01-25%	Sc*	1-10,000		
Reportable analytes upon request							
Ce*	10-10,000	Nb*	10-10,000	Sn*	10-10,000	Y*	10-10,000
Hf	10-10,000	Rb*	10-10,000	Ta*	10-10,000	Zr*	5-10,000
Li*	10-10,000	Se*	10-10,000	Te*	10-10,000		
* Indicates possible incomplete digestion							

For gold analysis, we used an analytical suite as Fire assay with AAS finish (Au-AA24).

Analytes and Detection limits (ppm)	
Au	0.005-10

Duration for one submission of laboratory analyses was two weeks turnaround during the field exploration and the results were returned periodically. The dispatch of analysis consists of about 1000 samples each, including standard, blank and duplicate samples.

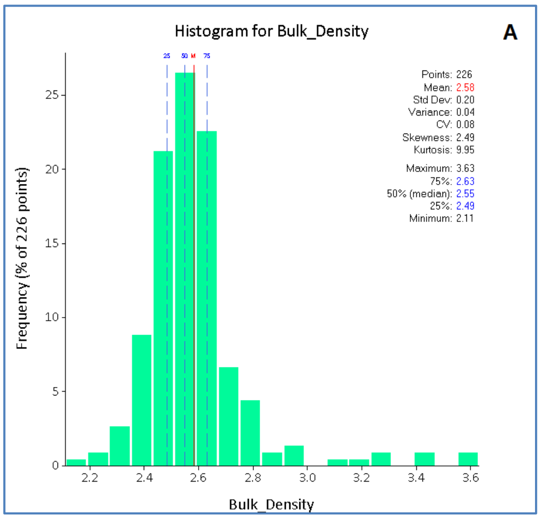
BULK DENSITY MEASUREMENTS

A total of 226 bulk density determinations were made in 2010 and 2011 from some of the 238 diamond drill holes.

Bulk densities for all samples ranged from 2.11 t/m^3 to 3.63 t/m^3 with a mean of 2.58 t/m^3 (Figure 40 (A)).

NB: The Author QP has moved to using t/m^3 units of density (specific gravity) here rather than the g/cm^3 used previously.

Figure 40 Density histogram - all samples



When sorted by oxidation level the densities were:

- Oxide average density 2.46 t/m^3 (Figure 41 (B))
- Transition average density 2.59 t/m^3 (Figure 42 (C))
- Fresh average density 2.64 t/m^3 (Figure 43 (D))

Oxide material densities (62 samples) were the lowest and had a 0.15 t/m^3 spread in the 25 to 75% range.

Transitional material densities (42 samples) were markedly higher than for oxide, and the small number of high values were probably from mis-sorted fresh samples. They also had a lower 0.11 t/m^3 spread in the 25 to 75% range (were more consistent than oxide).

Fresh material densities (116 samples, more than twice the others) were the highest and had a 0.12 t/m^3 spread in the 25 to 75% range, similar to the transitional material.

Figure 41 Density histogram - oxide

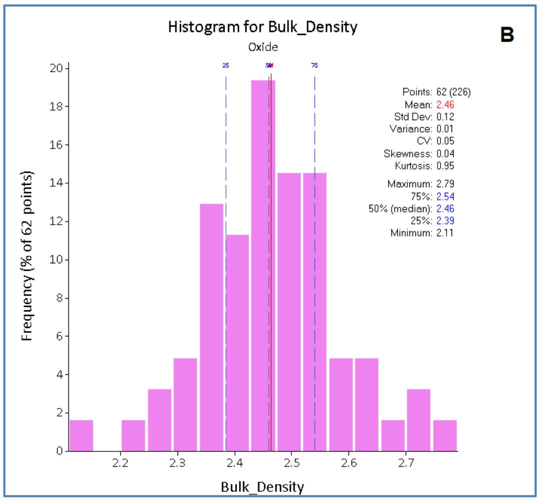


Figure 42 Density histogram - transition

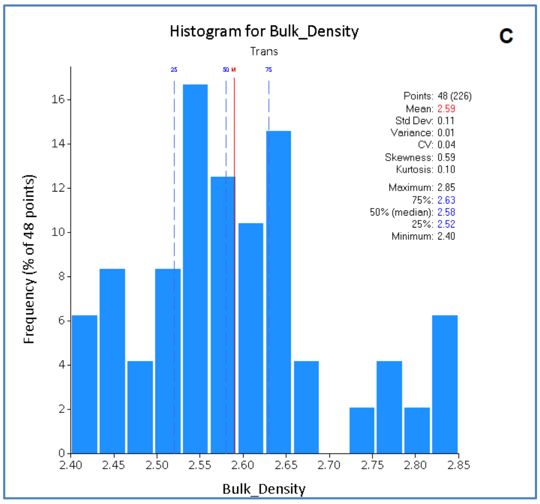
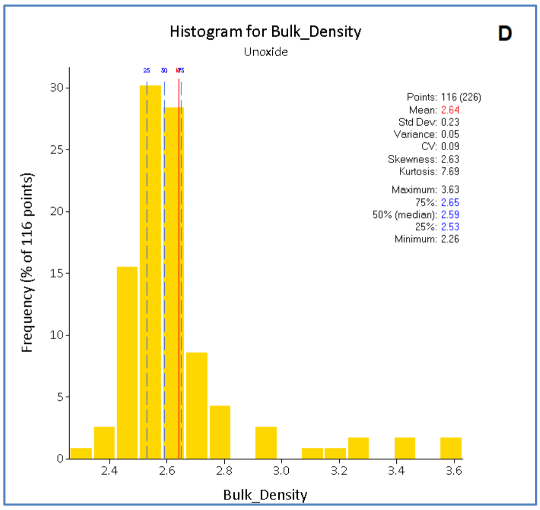


Figure 43 Density histogram - fresh



Samples were considered to have had a regular spatial distribution and the 2017 QP considered the averages to represent the deposits.

These density averages for the three oxide levels were used for the 2021 estimation reporting here.

QA/QC PROCEDURES BEHIND SAMPLE CONFIDENCE

Quality assurance and quality control of samples are some of the procedures that are mandatory in mineral exploration projects from the discovery of a deposit to a pre-production feasibility study stage. These have many advantages, and most important of these advantages are, firstly, actual existence of a mineral deposit and the assurance to the investors as to quality of work performed by geologists, secondly, controlling of laboratories that perform analyses of samples and materials by the exploration company and geologists, and thirdly, confirmation to the professional regulatory organizations as to the reality of information and data collected by exploration activities.

A quality control procedure was maintained before exploration program. Standards for quality control of sampling and assaying have been well maintained during the exploration work of the company. The following types of control samples have been implemented and these constitute the primary actions of Steppe Gold designed to control the works of laboratories.

Steppe Gold's QAQC protocols for diamond drilling comprise three standards, two blanks and one core (field) duplicate inserted randomly in batches of 100 samples. Field duplicates are prepared by initially cutting the core in half down the long axis with a diamond circular saw. One half is subsequently cut it again so that quarter core samples were submitted to the laboratory as field duplicates.

Standard Reference Material (SRM): SRMs purchased from Ore Research & Exploration P/L, have been used for ATO project since 2018. Certified Value and standard deviation data for the SRMs is shown in Table 20.

Table 20 Standard Reference Material samples used at ATO

DESCRIPTION	STANDARD_ID	ELEMENT	NOMINAL VALUE	STD_DEVIATION
Lateritic soil Lithogeochem	OREAS 45e	Cu (ppm)	709	52
		Pb (ppm)	14.3	2.4
		Zn (ppm)	30.6	4.8
		Au (ppb)	53	3
Porphyry Copper-Gold-Molybdenum	OREAS 504b	Ag (ppm)	2.98	0.21
		Cu (%)	1.1	0.022
		Mo (ppm)	476	19.4
		Pb (ppm)	20.1	0.92
		Zn (ppm)	96	5.2
		Au (ppm)	1.61	0.04
High Sulphidation Epithermal Ag-Cu-Au Ore	OREAS 600	Cu (ppm)	488	19.4
		Mo (ppm)	1.92	0.31
		Pb (ppm)	157	5
		Zn (ppm)	598	35.3
		Au (ppm)	0.2	0.006
	OREAS 601	Ag (ppm)	49.4	1.47
		Cu (%)	0.101	0.003
		Mo (ppm)	3.8	0.64
		Pb (ppm)	283	9.5
		Zn (ppm)	1293	78.6
		Au (ppm)	0.78	0.031
Gold-Silver Ore	OREAS 60d	Ag (ppm)	4.45	0.237
		Cu (ppm)	72	2.8
		Pb (ppm)	8.67	0.799
		Zn (ppm)	32.9	2.14
		Au (ppm)	2.47	0.079
	OREAS 61f	Ag (ppm)	3.61	0.171
		Cu (ppm)	39.2	2.2
		Pb (ppm)	7.95	0.529
		Zn (ppm)	44.4	2.59
		Au (ppm)	4.6	0.134
Volcanic Hosted Massive Sulphide Zn-Pb-Cu-Ag-Au Ore	OREAS 620	Ag (ppm)	38.4	1.31
		Cu (%)	0.175	0.005
		Mo (ppm)	8.97	0.71
		Pb (%)	0.774	0.024
		Zn (%)	3.12	0.086
		Au (ppm)	0.685	0.021
	OREAS 621	Ag (ppm)	68	2.41
		Cu (%)	0.366	0.011
		Pb (%)	1.36	0.03
		Zn (%)	5.17	0.148
		Au (ppm)	1.25	0.042
	OREAS 623	Ag (ppm)	20.4	1.15
		Cu (%)	1.72	0.066
		Pb (%)	0.252	0.01
		Zn (%)	1.01	0.038
		Au (ppm)	0.827	0.039

Blanks: These are also submitted to the lab in purpose to detect contamination and sequencing errors. For analysis, blanks purchased from Ore Research& Exploration was utilised as blank material to check for contamination. Those blanks are shown in Table 21

Table 21 Standard blank samples used at ATO

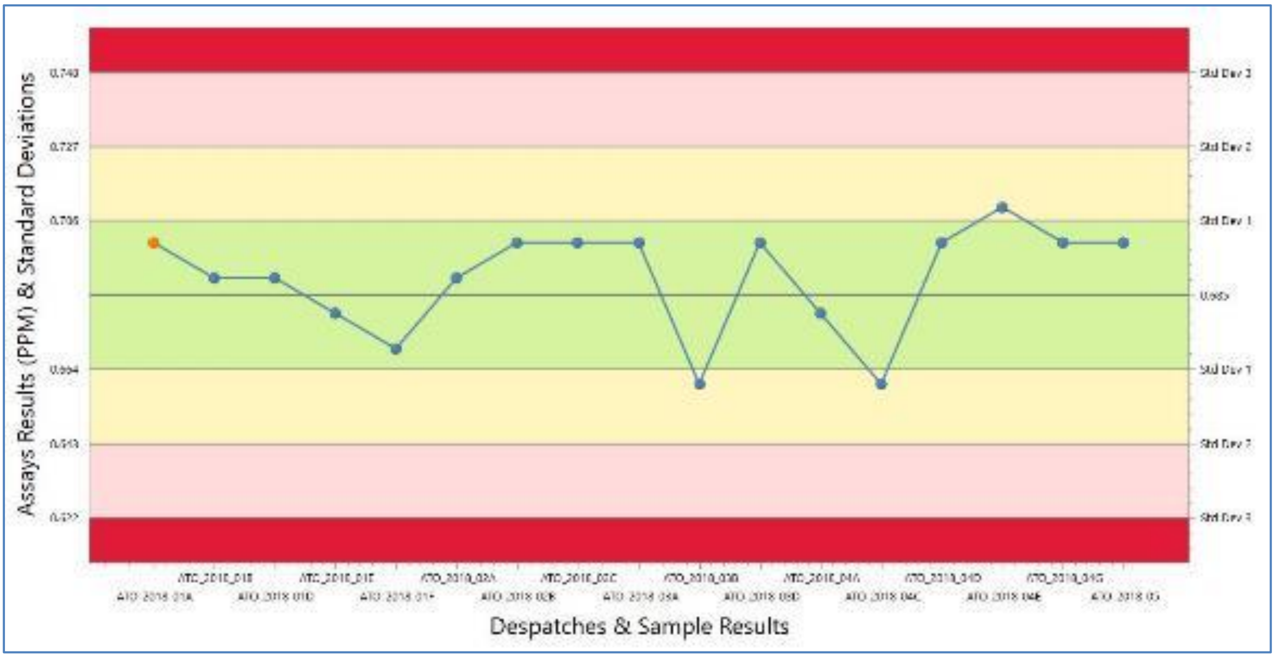
STANDARD_ID	DESCRIPTION	ELEMENT	NOMINALVALUE	STD_DEVIATION
OREAS 21e	Oxide quartz blank	Cu (ppm)	5.68	0.81
		Pb (ppm)	<1	0
		Zn (ppm)	2.91	0.56
		Au (ppb)	<1	0
		Ag (ppm)	<0.05	0
OREAS 24d	Basalt Blank pulp	Cu (ppm)	43.2	2.29
		Mo (ppm)	4.46	0.350
		Pb (ppm)	3.56	0.44
		Zn (ppm)	104	7
		Au (ppb)	<1	0
		Ag (ppm)	<0.2	0

SRM and blank evaluation: For the purpose of Monitoring QC/QA procedure, there have been set a batch failure criterion using the Standard reference materials and Blanks as follows:

- Individual standards assayed greater than +3 SD of round robin mean
- Two or more consecutive standards assayed greater +2 SD of round robin mean
- Individual blanks assayed greater than a cut-off limit of about 0.05 to 0.10 g/t

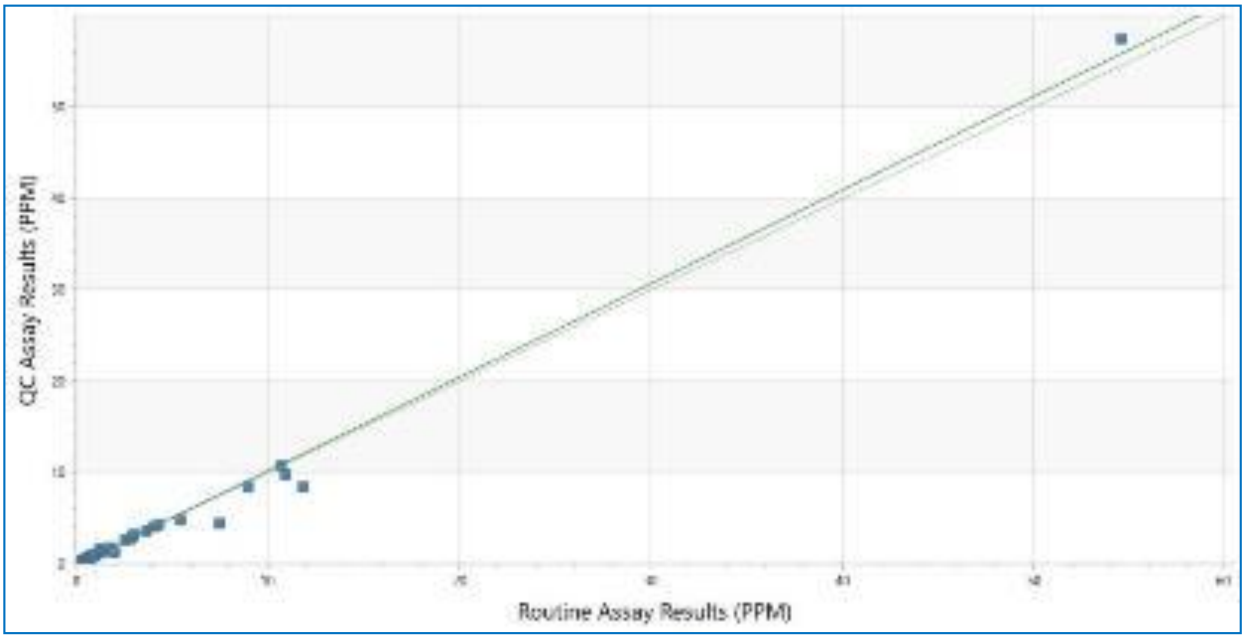
Shewhart plots (Figure 44) is constructed from SRM assay results to show the assay mean and distribution compared to the expected mean and distribution as defined by the certificates.

Figure 44 Standard – ID:OREAS 620, Element: Au|Au-AA26



Field Duplicate evaluation: The precision of a measurement system is the degree to which repeated measurements under unchanged conditions show the same results. Scatter plots (Figure 45) are created to pair each duplicate with the original assay.

Figure 45 XY chart - routine VS duplicate (F&L): Element: Au|Au-AA26



During the exploration program since 2017, a total of 20,640 samples were submitted from drill cores to the laboratories for analyses. 995 QAQC samples were analysed as part of QAQC procedures, and they account for approximately 4.8% of all core samples.

Laboratories that assayed the samples from the ATO deposit implemented their own internal quality control measures by assaying all of the standard samples, gold-blank samples, and other control samples. In particular, they conducted a control assay on remainder of one pulverized sample out of ten. Quality control of assays of all samples have been monitored and graphed. It is considered a warning sign when standard deviation reaches a point two times greater than actual, and control measures are taken when it is three times greater. Re-assays were conducted on selected samples when standards exceeded the warning level, and when the results of re-assays exceeded it again, all samples in the batch in question were internally re-assayed.

QP'S OPINION ON ADEQUACY OF SAMPLING

The Author QP's overall opinion* of ATO's sample preparation, sample security, and sample analysis procedures (including their QA/QC) is positive. The procedures appear sound, thorough, and likely to result in truthful and accurate analyses. They also follow typical industry standards.

The fact that all drilling is now by diamond coring lends further overall confidence in sampling as geology may be inspected more thoroughly than with other methods and storage of core allows future duplicate sampling if issues are found.

*This opinion is qualified by the fact that the Author has not physically been able to sight any of the sampling himself (largely due to his current un-avoidable inability to visit the site). Although all information has been remotely supplied to the Author (by Steppe, Steppe's Alternate QP and past reporting) he nevertheless finds no reasons or evidence to doubt it. He would comment that ATO's sample security procedures are most difficult to evaluate, and he is simply forced to trust Steppe's word that it is adequate.

12 DATA VERIFICATION (BY QP)

Relevant data verification here applied to that data used in the Resource estimation work – namely drilling data.

DATA VERIFICATION

Data verification by the Author QP was on the drill hole data supplied by Steppe. It was necessarily only undertaken in an overall viewpoint, on checking locations, and in a statistical manner.

Overall view: The viewpoint approach was to evaluate whether all data, and particularly the new (since 2017) data, "hung together" well. This was evaluated in terms of the described drill hole locations, their orientation and spacing, and the down-hole sampling – from the viewpoint of adequately exploring the geology (particularly as it was appreciated at the time of collection) and the style of mineralisation and deposit.

The drilling was found to be well laid out, spaced and sampled in order to explore the pipe-like deposits. At Mungu the drilling has not yet determined the full extent of the deposit, a situation simply pertaining because sufficient time has not yet been spent exploring it.

This overall view on data adequacy and accuracy also took into account the similar views expressed in the 2017 Report[39].

Hole locations: Databased drill holes were checked against hard copy plots. All holes were found to match.

Drill hole database: A variety of semi-automatic data checks were made whilst loading raw data into the drill hole database. Very few data issues were found, and those that were (such as the trench surveys) were all and easily corrected.

Statistical approach: Raw drill hole data assays were inspected using simple statistics to evaluate if the data was inside normal bounds and if the later data conformed to earlier results. All data was found to be within reasonable limits and comparable with earlier data.

LIMITATIONS ON DATA VERIFICATION

The principal limitations to the Author QP's data verification (and understanding of the Project generally) were a site visit and geological rock type logging analysis.

Site visit: The initial limitation was simply the inability to physically check drill hole locations, inspect local geology, inspect drill core, and view sampling procedures. This limitation was solely due to the lack of a site visit, itself caused by the Covid 19 pandemic interrupting international travel. As of the issue data Australia (the Author QP's country of residence) was still barring all citizen exit from the country.

Rock type logging: The overly complex geological logging data prevented a serious analysis of the influence of primary rock types on mineralisation and the geological deposit interpretation. However, the Author expects that the logging would not make a material difference to the mineralisation modelling as the mineralisation observed is too continuous in many areas.

QP'S OPINION ON DATA ADEQUACY FOR TASK

The Author QP's overall opinion was that ATO's drilling data was completely adequate* for Resource estimation (the purpose of the Consulting and this Report).

*As before this opinion is qualified by the fact that the Author has not physically been able to sight any of the Project's geology or drilling himself (largely due to his current un-avoidable inability to visit the site).

[39] 2017 NI 43-101. Section 12.1, pp 99.

13 MINERAL PROCESSING & METALLURGICAL TESTING

Metallurgical tests for processing of ore samples from ATO deposit were conducted at the Central Laboratory of Xstrata Support Process in Canada, "ALS Metallurgy-Ammtec" laboratory in Australia and "Boroo Gold" LLC processing plant in Mongolia.

Metallurgical test samples consisted of samples from the drill core and bulk samples from the oxidized zone of the pipes. Metallurgical tests for ore samples included a step-by-step leaching test carried out by the roll-up test (bottle-roll test) and granular ore test. Tests were conducted in 4 phases:

- Bottle-Roll tests of the Xstrata Process Support Center in Canada (from 4 April 2010 to June 30, 2011)
- Destruction Testing and Analysis - Canadian Xstrata Process Support (September 2011)
- Column leach tests with low diameter (75 mm) (conducted in crushed ore) - ALS Metallurgy in AMMTEC laboratory in Perth, Australia (completed in November 2011 in April 2012)
- Additional analysis of column tests with a large-scale diameter (280mm) - in CIL plant of Boroo Gold LLC in Mongolia - September 2012).

XSTRATA PROCESS SUPPORT (XPS) METALLURGICAL OXIDE TESTING

Xstrata Process Support (XPS) undertook metallurgical testwork on composites from 5 zones from ATO deposit including Upper Oxide Zone, Upper Transition Zone, Lower Transition Zone, Upper Sulphide Zone, and Lower Sulphide Zone composites along with basic mineralogical characterization of the Upper Oxide, Upper Transition and Lower Sulphide Zone composites. Samples were received at XPS in December 2010 and work commenced shortly thereafter. The program used methods and practices developed at the Xstrata Process Support Centre focused on providing quality and preliminary mineralogical and metallurgical data. Phases of work completed are in accordance with the agreed scope of work issued October 13th 2010 and include the following:

- QEMSCAN analysis
- Electron Probe Microanalysis
- Polished thin section by QEMSCAN
- Gravity Recovery Test (GRG) on Upper Oxide (ATO-01).
- Leaching tests on Upper Oxide (ATO-01).
- Data interpretation and reporting

13.1 Results

Basic mineralogical characterization has been completed using unsized -6 mesh samples of Oxide, Upper Transition and Sulphide Zones. Samples have been analyzed by QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscope) and EPMA (Electron Probe Micro Analysis). This work is preliminary in nature, and more detailed work on representative samples is recommended. A second set of high-grade samples (5 in total), selected directly from the uncrushed drill core were prepared as polished thin sections and also measured via QEMSCAN. The reason for including this second set of samples was to define in-situ textures prior to crushing and to search for Au minerals.

QEMSCAN is an automated system that produces mineral maps (colour coded by mineral), through collection of rapidly acquired energy dispersive x-rays (EDX). These maps describe the texture and mineral associations in each of the samples. In addition to the coloured map, the output of the QEMSCAN measurement includes a quantitative measure of modal mineralogy, mineral grain size, and elemental deportment.

Quantitative compositional analysis was completed using a Cameca SX-100 Electron Microprobe. Electron Probe Microanalysis (EPMA) produces higher electron beam currents and increased beam stability, coupled with higher resolution wavelength dispersive spectrometry (WDS). These features allow for improved detection limits and accuracy of the resulting analysis. Detection limits can be as low as 200 ppm for some elements which provides trace element compositions within the various mineral species in this study. Resulting detailed compositional data is then input back into the QEMSCAN software, in order to refine the final elemental deportment calculations. Compositional data from microprobe analysis can also be used to update the "Species Identification Program" within QEMSCAN.

13.1.1 Mineralogical results

Figure 46 Modal Mineralogy of Oxide, Upper Transition and Lower Sulphide Zones

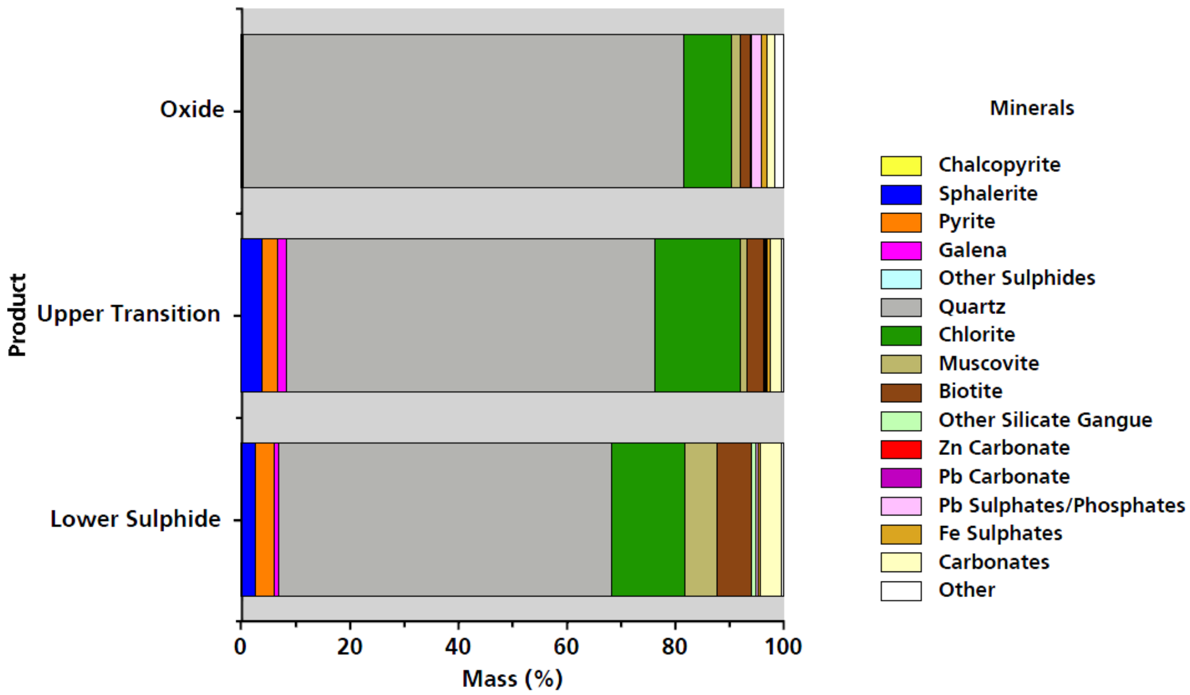


Table 22 Minerals distribution within mineralization types

	Oxide	Upper Transition	Lower Sulphide
Chalcopyrite	0.03	0.13	0.14
Sphalerite	0.03	3.84	2.48
Pyrite	0.23	3.2	4.13
Galena	0.14	1.81	1.13
Other Sulphides	0.05	0.02	0.02
Quartz	81.13	67.86	61.37
Chlorite	8.83	15.51	13.35
Muscovite	1.58	1.26	6.08
Biotite	1.82	3.18	6.35
Other Silicate Gangue	0.3	0.13	0.71
Zn Carbonate	0	0.2	0
Pb Carbonate	0	0.02	0
Pb Sulphates/Phosphates	1.78	0.29	0
Fe Sulphates	1.07	0	0
Carbonates	1.4	2.2	3.8
Other	1.59	0.37	0.43

13.1.2 Mineral Composition Analysis

Compositional analysis using the SX-100 Cameca microprobe was completed for the Lower Sulphide, Upper Transition and Oxide Zones using the same polished sections prepared for QEMSCAN analysis. Results are summarized in **Table 23**. Values that fall below the analytical detection limits are greyed out. Analytical totals for non-sulphides do not include the hydrous component and oxygen is a calculated value.

Table 23 QEMSCAN analysis result

	S	Fe	Cu	Zn	As	Ag	Au	Pb	Al	Total
Chalcocite	25.49	0.33	72.25	0.04	0.07	0.12	-0.1	0.1	0.04	98.45
Galena	13.31	0.04	0	-0.01	0	-0.1	-0	86.9	0	100.3
Pb Carbonate	-0.01	0	-0.02	-0.04	-0.02	-0.1	-0	80.53	0.01	80.55
Pyrite	51.1	46.33	0.06	0.01	0.28	0.01	-0	0.47	0.01	98.28
Sphalerite	32.51	0.6	0.06	63.94	0.02	0.01	-0.1	0.11	0.01	97.28

	Na	Mg	Al	Si	K	Ca	Ti	Cr	Mn	Fe	Cu	Zn	Pb	S	As	O	Total
Biotite	0.02	0.81	10.29	14.61	4.73	0.25	0.03	0.01	0	22.38	0.24	0.12	0.67	0.06	0.27	34.13	88.63
Muscovite	0.06	3.24	15.03	22.87	4.87	0.11	0.06	0	0.07	1.84	0.03	0.59	0.01	0.01	-0.01	43.2	92.02
Fe Clay w Zn	-0.15	4.27	5.21	6.33	0.01	0.38	0.01	0	0.14	37.14	0.48	1.91	0.53	0.03	-0.01	25.92	82.38
Chlorite	0	13.3	9.08	16.19	0.02	0.69	0.06	0	0.27	8.93	0.17	0.36	0.21	0.02	-0.01	37.69	87.07
Pb Sulph/Phos w Fe	-0.06	0.01	1.64	1.2	0.12	0.06	0	0	0	11.05	5.51	1.05	23.99	3.79	0.02	13.3	61.74
Pb Sulph/Phos w As Fe	-0.03	-0.1	2.31	1.34	0.3	0.07	0.02	0	-0.01	17.5	1.33	0.64	29.52	2.56	6.27	15.86	77.76
PbCarb	-0.03	-0.02	0.02	0.08	-0.01	6.53	0	-0.01	-0.02	0.24	0.06	0.13	60.02	0.02	0.05	6.92	74.06
Siderite wPb	-0.31	0.23	2.62	2.27	0.03	0.76	0.01	0	0.01	50.56	0.66	0.44	1.38	0.08	0.4	20.34	79.78

METALLURGICAL TESTWORK RESULTS

13.1.3 Feed Preparation and Head Assay

Approximately 130 kg of drill core each from Upper Oxide, Upper Trans, Upper Sulphide, Lower Trans Zone and Lower Sulphide Zone composites was received by XPS in December 2010. A fifteen (15 kg) sample each was extracted from Upper Trans (ATO-02), Upper Sulphide (ATO-03) and Lower Sulphide (ATO-05) for SMC testing. A fifteen (15 kg) sample each was extracted from Upper Trans (ATO-02), Upper Sulphide (ATO-03) and Lower Sulphide (ATO-05) for Bond Rod Work Index testing. A ten (10 kg) sample each was extracted from Upper Trans (ATO-02), Upper Sulphide (ATO-03) and Lower Sulphide (ATO-05) for Bond Rod Work Index testing. The remaining drill core was stage crushed down to 100% passing 10 mesh (1.7mm) and underwent Odds and Evens Blending to produce two homogenized sample lots. These lots were split into representative 2.0 kg charges.

The following table summarizes the feed grades for the Upper Oxide composite: The Upper Oxide (ATO 01) sample has arsenic and antimony at 0.030% and 0.006%, respectively.

Table 24 Oxide (ATO-01) Composite

	%Cu	%Zn	%Pb	%Fe	%S	Au(ppm)	Ag(ppm)	Cd (%)
Average	0.09	0.27	1.45	2.61	0.69	2.35	6.37	0.001
St Dev	0	0.02	0.06	0.04	0.04	0.12	0.26	0
RSD (%)	2.39	5.76	4.44	1.43	6.38	5.08	4.06	6.55

Table 25 Minor Elements Analysis for Composites

Element	Units	ATO-01
SiO2	%	92.4
Al2O3	%	3.28
Fe2O3	%	3.06
MgO	%	1.26
CaO	%	0.16
K	g/t	3560
Ti	g/t	426
Mn	g/t	230
Cr	g/t	90
V	g/t	< 80
Na	g/t	174
P	g/t	1750
Cl	g/t	85
Fe2O3	%	0.066
SiO2	%	0.63
Hg	µg/g	0.3
As	µg/g	270
B	µg/g	2
Be	µg/g	0.46
Bi	µg/g	< 0.09
Cd	µg/g	6.5
Co	µg/g	0.83
Cu	µg/g	550
Ni	µg/g	11
Pb	µg/g	9100
Sb	µg/g	43
Se	µg/g	< 0.7
Sn	µg/g	< 0.5
Te	µg/g	< 0.1
Zn	µg/g	1600

13.1.4 Gravity Recoverable Gold

A sample of ATO-01 was submitted to the Knelson Research and Technology Centre to determine its GRG value. The gravity recoverable gold (GRG) test is based on progressive particle size reduction followed by precious metals recovery using a Knelson concentrator at each stage. The progressive size reduction stages allow for precious metals recovery as they are liberated while minimizing over grinding and smearing. The gravity gold recovery for sample ATO-01 was only 4.8% with a tailings grade of 1.92 g/t Au from a head grade of 2.66 g/t Au. The sample was not amenable to gravity concentration and too low to provide a GRG value.

13.1.5 Bottle Roll Leach Tests

Bottle roll cyanidation tests were performed on the Oxide (ATO-01) composite. The ERD for ATO-01 was Average ERD head grade is 0.09% Cu, 0.27% Zn, 1.45% Pb, 2.35 ppm Au, 6.37 ppm Ag.

A design of experiments (DOE) was used. The NaCN concentrations used were 150, 450 and 750 mg/l. The grind sizes (P80) used were 38, 56 and 75 micrometers. A total of 8 tests were performed. The results are shown in Table 26.

Table 26 Cyanide Leach Results

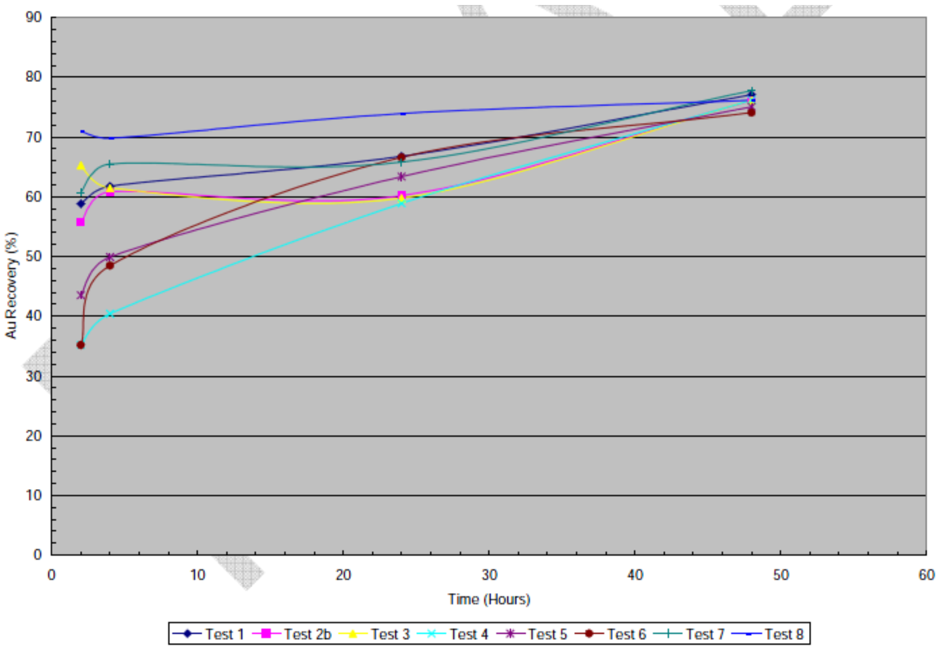
Test No.	Cyanide Concentration (mg/L NaCN)	Grind (k_{80}, µm)	Calculated Head Grade (g/t Au)	Recovery (% Au)	Cyanide Consumption (kg/t NaCN)
1	750	75	2.37	77.1	3.23
2	450	56.5	2.41	76.1	1.95
3	750	38	2.29	76.2	6.13
4	150	7538	2.39	76.2	1.22
5	150	75	2.48	75.1	1.07
6	150	38	2.32	74.1	1.14
7	450	56.5	2.35	77.8	2.16
8	750	75	2.51	76.1	5.19

The results show that recovery was not sensitive to grind or cyanide concentration. Cyanide consumption increased with increasing concentration. The calculated head grades were very close to the assayed head grade of 2.35 g/t Au, indicating that there is very little free gold. This is also supported by the gravity recoverable gold test.

Cyanidation recoveries did not meet expectations in this phase. XPS recommends further tests to test the impact of several parameters such pre-aeration, longer leaching time and possibly oxygen addition during cyanidation. Following these tests, if recoveries have not improved, low pH leaching (pH=9) should be attempted as the ore material could be refractory due to the presence of stibnite.

Samples of the leach solution were taken at 2, 4, 24 and 48 hours. The Au recovery was computed at each of these times. Figure 47 illustrates the Au recovery as a function of leaching time.

Figure 47 Au recovery as a function of leaching time



From Figure 47, the leach kinetics are slower at 150 mg/l NaCN (tests 4, 5 and 6). Also, there is some indication that increased recovery can occur at longer than 48 hours of leaching. This is more pronounced at lower NaCN concentration. Table 27 shows the results of the DOE at 48 hours of leaching.

Table 27 Results of the DOE at 48 hours of leaching

Test No.	Cyanide Concentration (mg/L NaCN)	Grind (k_{80}, µm)	Calculated Head Grade (g/t Au)	Recovery (% Au)	Cyanide Consumption (kg/t NaCN)
1	750	75	2.37	77.1	3.23
2	450	56.5	2.41	76.1	1.95
3	750	38	2.29	76.2	6.13
4	150	7538	2.39	76.2	1.22
5	150	75	2.48	75.1	1.07
6	150	38	2.32	74.1	1.14
7	450	56.5	2.35	77.8	2.16
8	750	75	2.51	76.1	5.19

From the DOE analysis, the concentration of NaCN and grind size tested did not affect Au recovery at 48 hours of leaching. The maximum Au recovery obtained was 77.8% at 450 mg/l NaCN and P80 56 micrometers. The Au recovery for the tests is not high. One possible reason is that the gold particles may be fine grained requiring finer grinding. Mineralogical analysis of the oxide sample would be required to confirm this. Another possible reason is the arsenic and antimony in the feed. This will be discussed shortly.

The initial CN concentration had a significant impact on NaCN consumption after 48 hours of leaching. The NaCN consumption increased with increasing initial NaCN concentration. The grind size did not have an impact on NaCN consumption.

The lowest NaCN consumption at 1.1 g/t was obtained at 150 mg/l NaCN and a grind size of P80 75 micrometers. The highest NaCN consumption was 6.1 kg/t. This consumption was obtained at a NaCN concentration of 750 mg/l and a grind size of P80 38 micrometers.

Table 28 Comparison of Hemlo Gold and CGM samples

	Hemlo Gold		Centerra Gold M
	Low (%)	High (%)	(%)
Antimony	0.007	0.115	0.007
Arsenic	0.007	0.028	0.03

The antimony level in the feed was low compared to the antimony levels for Hemlo Gold. The arsenic level in the feed was at the high limit for CGM compared to the levels found for Hemlo Gold. The levels of arsenic and antimony found in CGM samples are not high, thus, are not a factor in the mediocre gold recovery.

G&T METALLURGICAL OXIDE TESTING PROGRAM

The composites tested in this program represented the oxide mineralization of the upper portion of the pipes. This preliminary program was designed to study the ore characteristics and metallurgical response of the oxide zone as part of the overall ATO property. The assessment included mineralogy, ore hardness, gold and silver extraction response to grind size, and multi-stage diagnostic gold leach test work in accordance with the scope of work directed by CGM.

Two composites were constructed for this program of study. The Master Composite 1 (MC 1) was assessed by the following parameters:

- Chemical, mineralogical, and diagnostic characteristics of the feed.
- Ore hardness by conducting an abrasion index test, Bond rod mill work index test, and Bond ball mill work index test on the feed.
- Gold and silver extraction response, including grind versus extraction.

The Column Leach Composite was utilized for the preliminary heap leach amenability test program.
The composites were constructed from half core samples, under the direction of Centerra Gold Inc (CGI). The Master Composite 1 (MC 1) was created from 40 interval samples, whilst the Column Leach Composite was created from 21 interval samples.

The program commenced in November 2011 and the test work was completed in April 2012. Following the test work, the preparation of this technical report commenced.

The following technical brief summarizes the key technical points of the program. All of the test data generated through the execution of this program can be reviewed in a series of appendices attached to this brief. The appendices are arranged as follows:

13.1.6 Sampling

Samples for the ATO Project were received at G&T Metallurgical Services in two shipments. The first shipment, received October 14, 2011, consisted of 40 individual half core samples. These were combined to generate the Master Composite 1. It was then stage crushed to 20mm, homogenized, and rotary split into sub-samples for subsequent comminution and extraction test work. Representative head assay cuts were removed and assayed for elements of interest for this project. A sub-sample was split and sent to ALS Metallurgy – Ammtec for diagnostic leach test work.

A second shipment, received November 1, 2011, consisted of 21 individual half core samples. These were combined to generate the Column Leach Composite.

The composite was staged crushed to 12.5mm, homogenised, packaged, and sent to ALS Metallurgy Ammtec for preliminary heap leach amenability test work. Table 29 and Table 30 display the mass and identification of the samples received.

Table 29 Master Composite 1

Sample ID	Weight (kg)	Form
ATO 93 38.75-39.75	3.4	Half Core
ATO 93 37.75-38.75	2.9	Half Core
ATO 93 36.75-37.75	2.2	Half Core
ATO 93 35.75-36.75	2.8	Half Core
ATO 93 34.75-35.75	2.9	Half Core
ATO 93 33.75-34.75	3.4	Half Core
ATO 93 32.75-33.75	2.3	Half Core
ATO 93 31.75-32.75	3.2	Half Core
ATO 93 30.75-31.75	3.3	Half Core
ATO 92 29.40-30.40	4.1	Half Core
ATO 92 28.40-29.40	3.1	Half Core
ATO 92 27.40-28.40	3.8	Half Core
ATO 92 26.30-27.40	4	Half Core
ATO 92 25.20-26.30	3.7	Half Core
ATO 92 24.10-25.20	2.5	Half Core
ATO 92 23.00-24.10	3	Half Core
ATO 92 21.90-23.00	3.5	Half Core
ATO 92 20.80-21.90	3.8	Half Core
ATO 80 26.00-27.00	3.3	Half Core
ATO 80 25.00-26.00	3.3	Half Core
ATO 80 24.00-25.00	3.4	Half Core
ATO 80 23.00-24.00	2.9	Half Core
ATO 80 22.00-23.00	3.6	Half Core
ATO 80 21.00-22.00	3.4	Half Core
ATO 80 20.00-21.00	3	Half Core
ATO 74 55.55-56.80	5	Half Core
ATO 74 54.30-55.55	4.5	Half Core
ATO 74 53.05-54.30	4.3	Half Core
ATO 74 51.80-53.05	4.4	Half Core
ATO 74 50.55-51.80	4.2	Half Core
ATO 116 9.40-10.40	2.7	Half Core
ATO 116 11.40-12.40	2.7	Half Core
ATO 116 10.40-11.40	2.7	Half Core
ATO 110 24.80-25.80	3.5	Half Core
ATO 110 23.80-24.80	4.1	Half Core
ATO 110 21.80-22.80	2.7	Half Core
ATO 110 20.80-21.80	2.9	Half Core
ATO 110 19.80-20.80	1.4	Half Core
ATO 110 18.80-19.80	3.4	Half Core
Total	132.4	

Table 30 Column Leach Composite

Sample ID	Weight (kg)	Form
ATO-35 13.0-14.0	3.6	Half Core
ATO-35 14.0-15.0	3.4	Half Core
ATO-35 15.0-16.0	3.5	Half Core
ATO-35 16.0-17.0	2.4	Half Core
ATO-35 17.0-18.0	2.7	Half Core
ATO-35 18.0-19.0	3.6	Half Core
ATO-35 19.0-20.0	1.8	Half Core
ATO-35 20.0-21.0	3.1	Half Core
ATO-35 21.0-22.0	3.1	Half Core
ATO-35 22.0-22.95	3.2	Half Core
ATO-35 22.95-23.95	2.9	Half Core
ATO-35 23.95-24.95	3.5	Half Core
ATO-35 24.95-25.95	3.3	Half Core
ATO-89 16.1-17.3	3.5	Half Core
ATO-89 17.3-18.5	4	Half Core
ATO-89 18.5-19.7	4	Half Core
ATO-89 19.7-20.9	3.6	Half Core
ATO-89 20.9-22.1	3.8	Half Core
ATO-89 22.1-23.3	3.5	Half Core
ATO-89 23.3-24.5	2.1	Half Core
ATO-89 24.5-25.7	3.8	Half Core
Total	68.4	

Master Composite 1

The mineral composition data was generated by conducting a Bulk Mineral Analysis with Liberation (BMAL) on the unsized (nominal 75µm K80) composite sample using QEMSCAN. The mineral composition data is summarized in Table 31 and Figure 48

The following comments relate to the data:

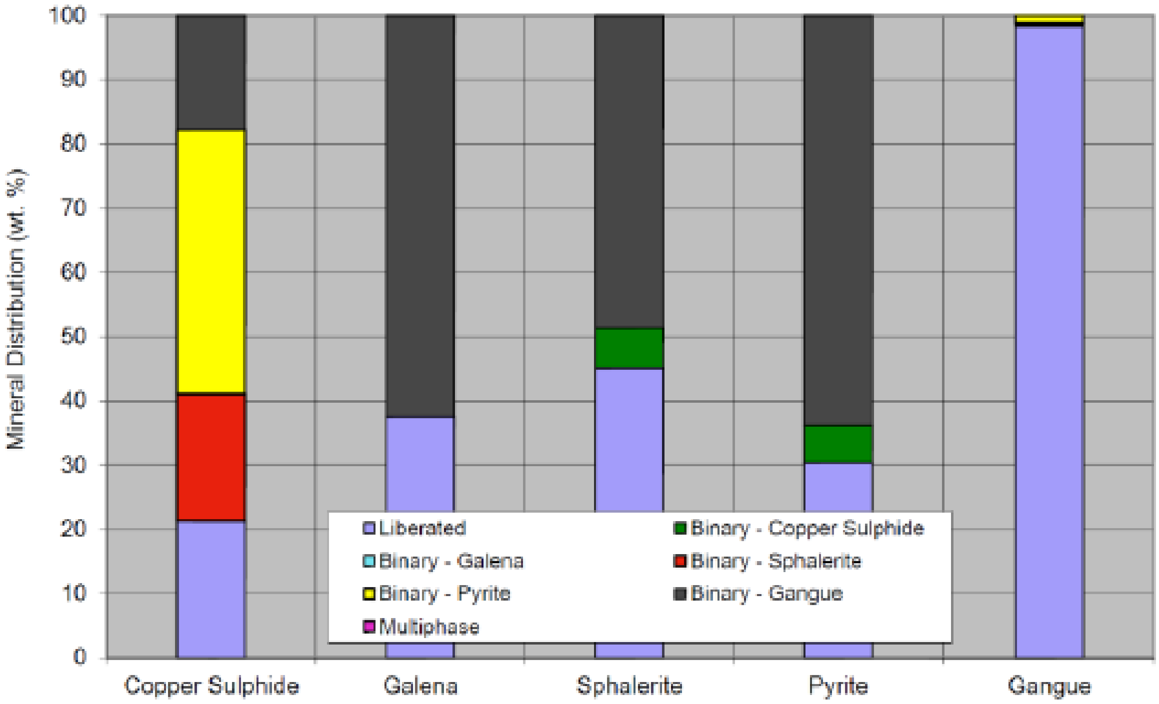
- Sulphide mineral content was approximately 1.5 percent by weight of the feed.
- Pyrite represented about 61 percent by weight of the sulphide minerals.
- Pyrite, sphalerite, and galena are mainly associated with gangue, whilst the copper sulphides tend to be mainly associated with the pyrite and to a lesser extent sphalerite and gangue.
- The liberation data indicates that, at the 78µm K80 sizing, between 20 and 45 percent of pyrite, sphalerite, galena, and the copper sulphides were liberated.
- At these liberation levels, flotation of a sulphide concentrate might be viable. However, the presence of talc and barite might cause dilution of the concentrate if not appropriately controlled.
- The initial work completed included mineralogical evaluation of the composite sample. The predominant gangue mineral are silica and silicates (77% of sample). Oxide minerals account for 4% of the identified minerals while sulphides account for 1.5% of the sample.

Table 31 Mineral Composition and Elemental Deportment of the Oxide Composite

Mineral Composition (wt. %)				Sulphur Deportment (%)		Lead Deportment (%)	
Sulphide Minerals	Mass	Gangue Minerals	Mass	Sulphur Minerals	Mass	Lead Minerals	Mass
Copper Sulphides	0.1	FePb Oxide	1.4	Copper Sulphides	2.2	Galena	42.9
Galena	0.3	FePb Sulphate	1.1	Galena	5.6	Pyromophite (PbPOx)	5.6
Sphalerite	0.1	Pyromophite (PbPOx)	0.1	Fe Pb Sulphate	9.9	Fe Pb Sulphate	37.4
Pyrite	1.0	Quartz/ Feldspars	77.3	Sphalerite	5.2	FePb Oxide	14.0
Arsenopyrite	0.01	Chlorite	11.7	Pyrite	60.6		
		Iron Oxides	1.4	Arsenopyrite	0.2		
		Micas	1.4	Barite	16.3		
		Talc	1.2				
		Barite	1.1				
		Smithstonite	0.3				
		Other Gangue	1.4				
Total	1.5	Total	98.5	Total	100	Total	100

Note: 1) Copper Sulphides includes Chalcopyrite, Chalcocite and Covellite. 2) Other Gangue includes Kaolinite (clay), Calcite , Apatite and trace amounts of garnet and other unresolved mineral species.

Figure 48 Mineral distribution by class of association Master composite 1, (78µm k80).



Note: Pyrite includes Arsenopyrite.

Diagnostic Leach Test Work – Master Composite 1

The distribution or deportment of gold in various minerals is determined by a series of selective leaches, usually by increasingly stronger oxidative acid leaches. Between each stage, cyanide leaching is used to extract the released gold. In this study a total of ten analysis stages were carried out for the composite at a grind size of 150µm. A summary of the results can be seen in Table 32 This test work was conducted at ALS Metallurgy Ammtec in Perth, Australia.

Table 32 Multi-stage sequential diagnostic gold leach summary

Description	Recovered Au (g/t)	Distribution (%)
Gravity/Free Cyanidable Gold	1.28	79.3
Carbonate Locked Gold Content	0.14	8.7
Iron Oxide Locked Gold Content	0.04	2.2
Arsenical Mineral Locked Gold Content	0.11	7.1
Pyritic Sulphide Mineral Locked Gold Content	0.007	0.5
Silicate (Gangue) Locked Gold Content	0.036	2.2

The diagnostic results indicate that the bulk of the gold content occurred as free (gravity/cyanidable) old, being 79.3 percent of the total gold content. There was a moderate amount of gold associated with iron oxide minerals and arsenical minerals, being 8.7 percent and 7.1 percent, respectively.

The remainder of the gold content was distributed in various categories, but these were generally quite low concentrations, being less than 0.05 g/t.

Ore Hardness – Master Composite 1

Ore hardness was measured using a standard Bond abrasion index, Bond rod mill work index, and bond ball mill work index test procedure. A closing sieve aperture of 106µm was utilized for the Bond ball mill work index determination. The results of the tests are summarized in Table 33

Table 33 Ore hardness data

Composite	BBWI Closing Screen mm	BBWI kWh/ton	Bond Abrasion Index Ai	BRWI kWh/ton
MC 1	106	15.6	0.2802	13

13.1.7 Ore Characteristics

Chemical composition, mineralogical characteristics, diagnostic leach test work, and ore hardness were all measured. These important parameters, that impact on process design, are discussed further in the following subsections.

13.1.8 Chemical Content

Using standard chemical assaying techniques, the chemical composition of the composite was determined. The results from the analyses are shown in Table 34.

Table 34 The results from the chemical analyses

Composite	Assays – percent or g/t										
	Fe	Pb	Zn	Au	Ag	S	C	As	Sb	PbOx	ZnOx
Master Composite 1	2.46	0.74	0.31	1.45	27	0.83	0.08	0.019	<0.001	0.29	0.041
Colum Leach *	2.02	2.12	0.7	1.61/1.5	10.5	0.3	<0.03	0.012	0.002	-	-

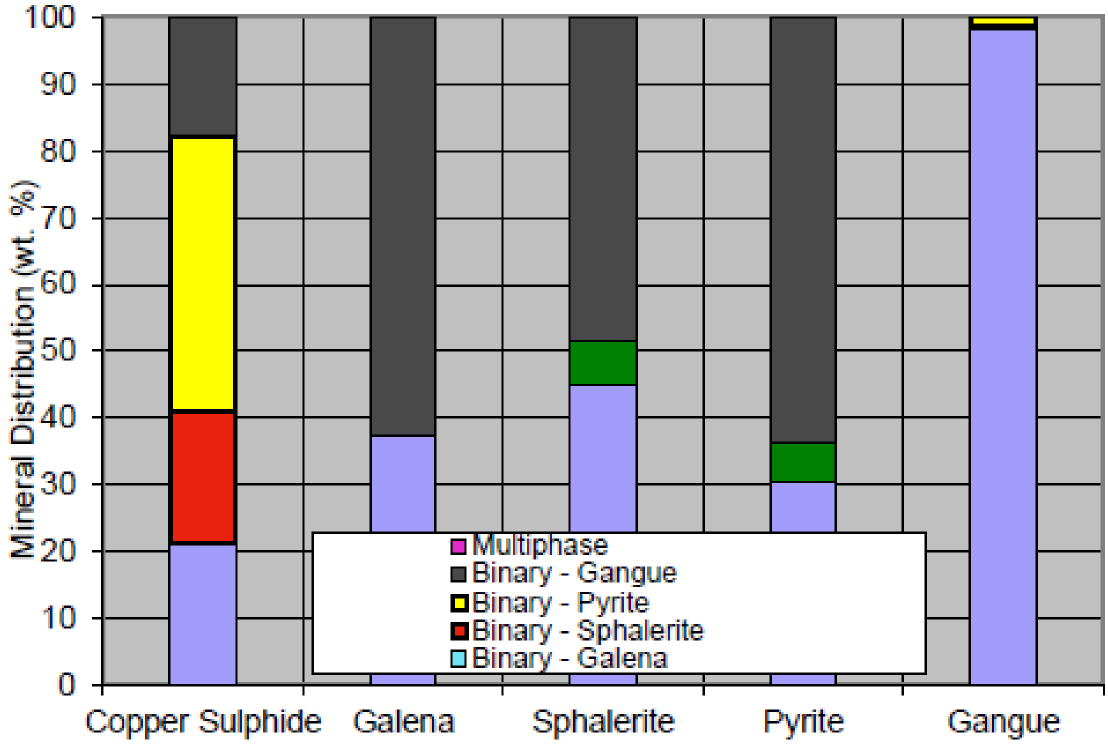
Note: Au and Ag assays are reported in g/t, all others in percent. * Assays reported by ALS Ammtec.

13.1.9 Oxide Hardness

The oxide composite sample was submitted for standard Bond testing (rod mill and ball mill work indices and abrasion index). The results are summarized in **Figure 49**. The Bond ball mill work index is nearly identical to the Master Composite ball mill work index. Although the material tested is oxidized it is still classified as moderately hard. The high content of silica and silicates that will not readily oxidize provides the hardness.

This is also confirmed by the relatively high abrasion index. The sample is quite competent despite its oxidized state.

Figure 49 Mineral distribution by class of association Master composite 1, (78µm k80).



Note: Pyrite includes Arsenopyrite.

Diagnostic Leach Test Work – Master Composite 1

The distribution or deportment of gold in various minerals is determined by a series of selective leaches, usually by increasingly stronger oxidative acid leaches. Between each stage, cyanide leaching is used to extract the released gold. In this study a total of ten analysis stages were carried out for the composite at a grind size of 150µm. A summary of the results can be seen in Table 35. This test work was conducted at ALS Metallurgy – Ammtec in Perth, Australia.

Table 35 Multi-stage sequential diagnostic gold leach summary

Description	Recovered Au (g/t)	Distribution (%)
Gravity/Free Cyanidable Gold	1.28	79.3
Carbonate Locked Gold Content	0.14	8.7
Iron Oxide Locked Gold Content	0.04	2.2
Arsenical Mineral Locked Gold Content	0.11	7.1
Pyritic Sulphide Mineral Locked Gold Content	0.007	0.5
Silicate (Gangue) Locked Gold Content	0.036	2.2

The diagnostic results indicate that the bulk of the gold content occurred as free (gravity/ cyanidable) old, being 79.3 percent of the total gold content. There was a moderate amount of gold associated with iron oxide minerals and arsenical minerals, being 8.7 percent and 7.1 percent, respectively.

The remainder of the gold content was distributed in various categories, but these were generally quite low concentrations, being less than 0.05 g/t.

Ore Hardness – Master Composite 1

Ore hardness was measured using a standard Bond abrasion index, Bond rod mill work index, and bond ball mill work index test procedure. A closing sieve aperture of 106µm was utilized for the Bond ball mill work index determination. The results of the tests are summarized in Table 36.

Table 36 Ore hardness data

Composite	BBWI Closing Screen mm	BBWI kWh/ton	Bond Abrasion Index Ai	BRWI kWh/ton
MC 1	106	15.6	0.2802	13

13.1.10 Ore Characteristics

Chemical composition, mineralogical characteristics, diagnostic leach test work, and ore hardness were all measured. These important parameters, that impact on process design, are discussed further in the following subsections.

13.1.11 Chemical Content

Using standard chemical assaying techniques, the chemical composition of the composite was determined. The results from the analyses are shown in Table 37.

Table 37 The results from the chemical analyses

Composite	Assays – percent or g/t										
	Fe	Pb	Zn	Au	Ag	S	C	As	Sb	PbOx	ZnOx
Master Composite 1	2.46	0.74	0.31	1.45	27	0.83	0.08	0.019	<0.001	0.29	0.041
Colum Leach *	2.02	2.12	0.7	1.61/1.5	10.5	0.3	<0.03	0.012	0.002	-	-

Note: Au and Ag assays are reported in g/t, all others in percent. * Assays reported by ALS Ammtec.

13.1.12 Oxide Hardness

The oxide composite sample was submitted for standard Bond testing (rod mill and ball mill work indices and abrasion index). The results are summarized in Table 38 and Figure 50. The Bond ball mill work index is nearly identical to the Master Composite ball mill work index. Although the material tested is oxidized it is still classified as moderately hard. The high content of silica and silicates that will not readily oxidize provides the hardness. This is also confirmed by the relatively high abrasion index. The sample is quite competent despite its oxidized state.

Figure 50 Mineral Distribution by Class of Association

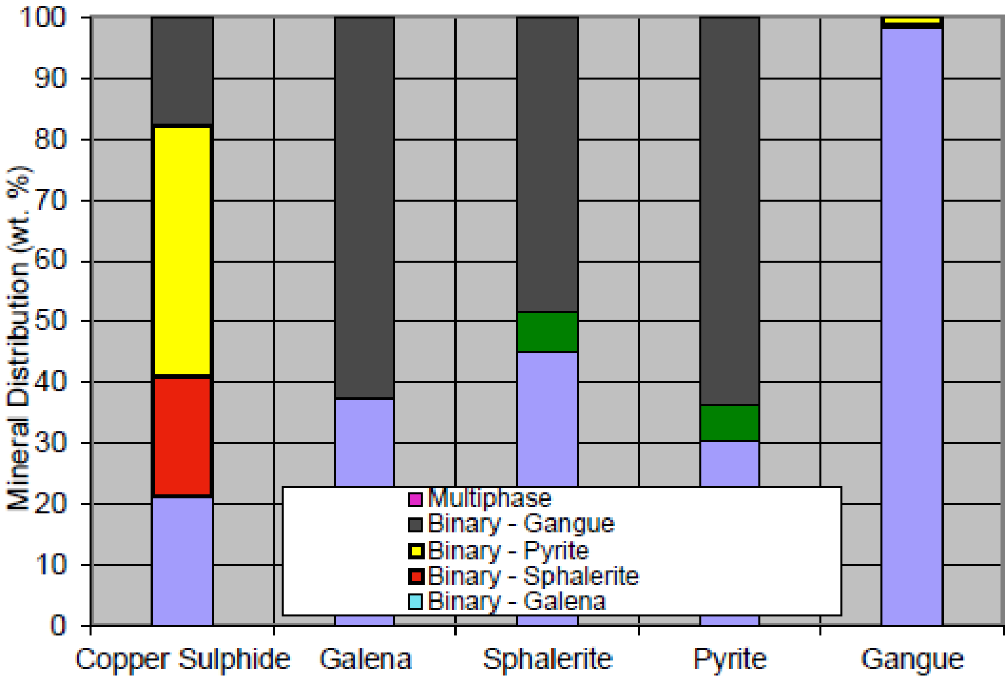


Table 38 Oxide Composite Sample Hardness Testing Results

Test	
Bond rod mill work index (metric)	13.0
Bond ball mill work index (metric)	15.6
Bond abrasion index	0.2802

13.1.13 Recovery Response to Grind Size – Master Composite 1

The preliminary cyanidation test program included tests aimed at investigating the effect that grind size had on gold and silver extraction via cyanidation. Heap leaching was subsequently investigated. The following subsections discuss the results of these tests.

A schematic of the test flowsheet, along with the test results, are displayed in Figure 51 and **Table 39.** The results of these tests reveal the following points of interest:

- Gold extraction appears to be insensitive to grind size, with recovery being approximately 80 percent for a range of grind sizes; from 78µm K80 to crush size of K100 3,350µm.
- Silver extraction increased markedly, from about 50 percent to 69 percent, when the feed size to the cyanidation was decreased from 3,350µm K100 to 299µm K80. Below this sizing, there was no significant improvement in silver extraction.
- Sodium cyanide consumption levels are moderate, being less than 2.0 kg/t. Lime consumption decreases as grind size increases, being 4.3 kg/t at 78µm K80 and 1.6 kg/t at 3,350µm K100.

Figure 51 Flowsheet - Master composite 1

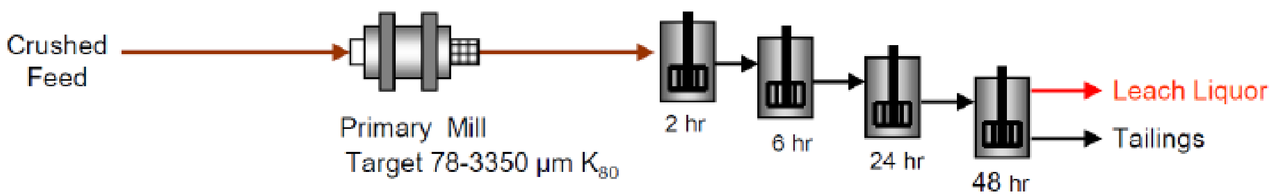
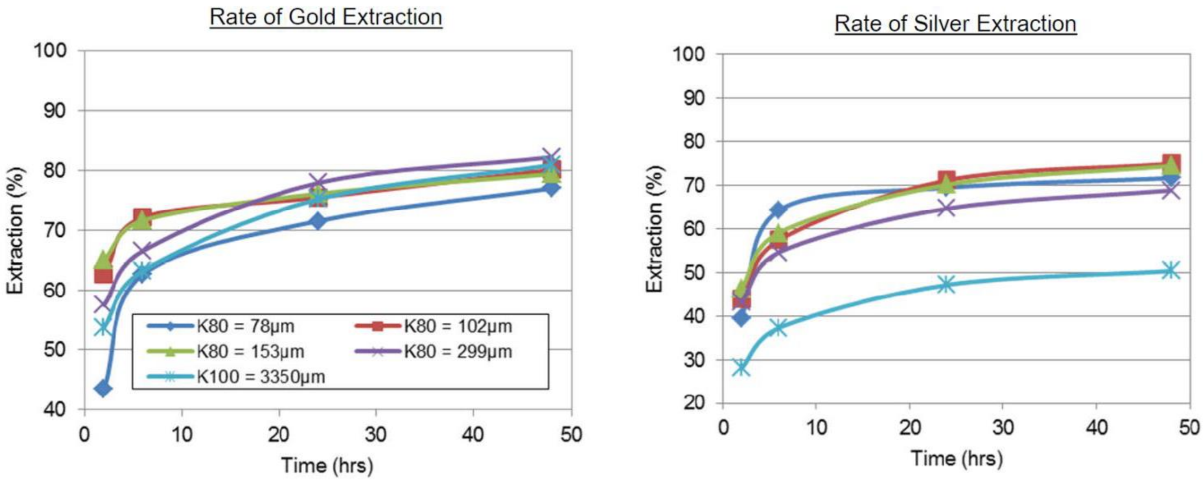


Table 39 Test results – Master composite 1

Test	Grind Size µm	Percent Au Extraction at Time Hours				Percent Ag Extraction at Time Hours				Consumption (kg/t)	
		2	6	24	48	2	6	24	48	NaCN	Lime
1	78	43.6	62.6	71.5	77	39.6	64.3	69.5	71.7	1.9	4.3
2	102	62.7	72.1	75.5	80.1	43.9	57.4	71.2	75.0	1.7	2.5
4	153	65	71.6	76.1	79.4	46.3	59.1	70.2	74.5	1.4	2.0
5	299	57.5	66.5	77.9	82.2	43.2	54.6	64.7	68.9	1.5	1.5
3	3350	53.8	63.2	75.2	80.9	28.1	37.3	47.2	50.4	1.8	1.6

* 3,350µm was K100 crush size.

Figure 52 Rate of extraction



13.1.14 Heap Leach Amenability Test Work – Column Leach Composite

The Column Leach Composite was subjected to a preliminary heap leach amenability test work program. A crush size of 12.5 mm was selected by the client. This test work was conducted at ALS Metallurgy – Ammtec in Perth, Australia.

13.1.15 Natural Percolation Rate Test Work

Percolation rate test work was carried out on the Column Leach Composite at the selected crush size of less than 12.5 mm. This test was carried out on the as-crushed ore without, agglomeration with binding agents such as cement or lime. If percolation is deemed satisfactory the next stage of the program would be the column cyanidation leaching of the ore. However, if percolation is poor, then agglomeration testing is necessary prior to committing to column cyanidation test work.

Table 40 Natural percolation summary results

Sample	Test	Discharge Liquor			Slumpage
		L/min	L/m²/hr	pH	Auto (%)
MC 1	1	1.09	13,021	7.6	-
	2	0.9	10,689	7.6	0.37

13.1.16 Column Cyanidation Leach Test Work

A 50 kg sub-sample of the Column Leach Composite, crush size less than 12.5 mm, was subjected to a 40 day column cyanidation leach. Test summary of results is shown below.

Table 41 Column leach test conditions

Sample	Test	Crush Size (mm)	Leach Duration (days)	Wash Duration (days)	Percolation Rate*	
					L/min	L/m²/hr
MC 1	JS1059	<12.5	40	7	0.216	413.2

Note: *This is on final day prior to column being dumped.

Table 42 Column leach extraction results

Sample	Test	Element	Gold and Silver Extractions Percent at Day								Consumption (kg/t)	
			1	2	5	10	20	30	40	Final*	NaCN	Lime
MC 1	JS1059	Au	30.9	44.3	59.2	68.6	76	80.3	81.9	82.5	4.6	1.6
		Ag	3.2	7.7	19.3	33.4	48	57.4	61.5	62.5		

Note: * Forty days of leaching plus seven days of water wash.

The results of the column leach cyanidation reveal the following points of interest:

- Column leach cyanidation test work resulted in an excellent gold extraction level of 81.9 percent after 40 days of leaching. The extraction level of silver at 61.5 percent, would be considered good for a column leach cyanidation test.
- Gold dissolution kinetics were relatively rapid with the bulk of exposed cyanidable gold being solubilised within ten days from the start of column leaching process.
- Sodium cyanide consumption was relatively high, being 4.6 kg/t; this may be due to the open environment to which the column leach is exposed as compared to the closed environment for the earlier bottle roll leach tests.

13.1.17 Large-Scale Column Tests

Boroo Gold Mine site metallurgical section received 1300 kg samples from ATO oxidized ore. The composites crushed by 3 categories, such as 12.5 mm, 25 mm and 50 mm. Each column diameters were 280mm.

The natural percolation rate of the composite, 200 L/h/m2, indicated by ALS Metallurgy/G&T Metallurgical that agglomeration was not necessary.

All samples classified and Au, Ag grade determined by ACTLABS in UB before loading to column. Leaching solution PH10,0-10,5 stabilized by hydrated lime Ca(OH)2 after the loaded to column 10 % Cyanide solution added to column ore level to 300-500 mg/l after stabilized solution PH10,0-10,5 Solution cycle rate was 12 L/h/m2.

Column test continue 57 days and recoveries reached maximum level on 35th day. Solution and ore ratio was 2.38-2.6:1 end of the test. After column testing, Au and Ag grade in each class determined by lab. Fresh water added to column for 4 days after test stops.

Figure 53 Large scale column test at Boroo Mine

Figure 54 Large scale column test flowsheet

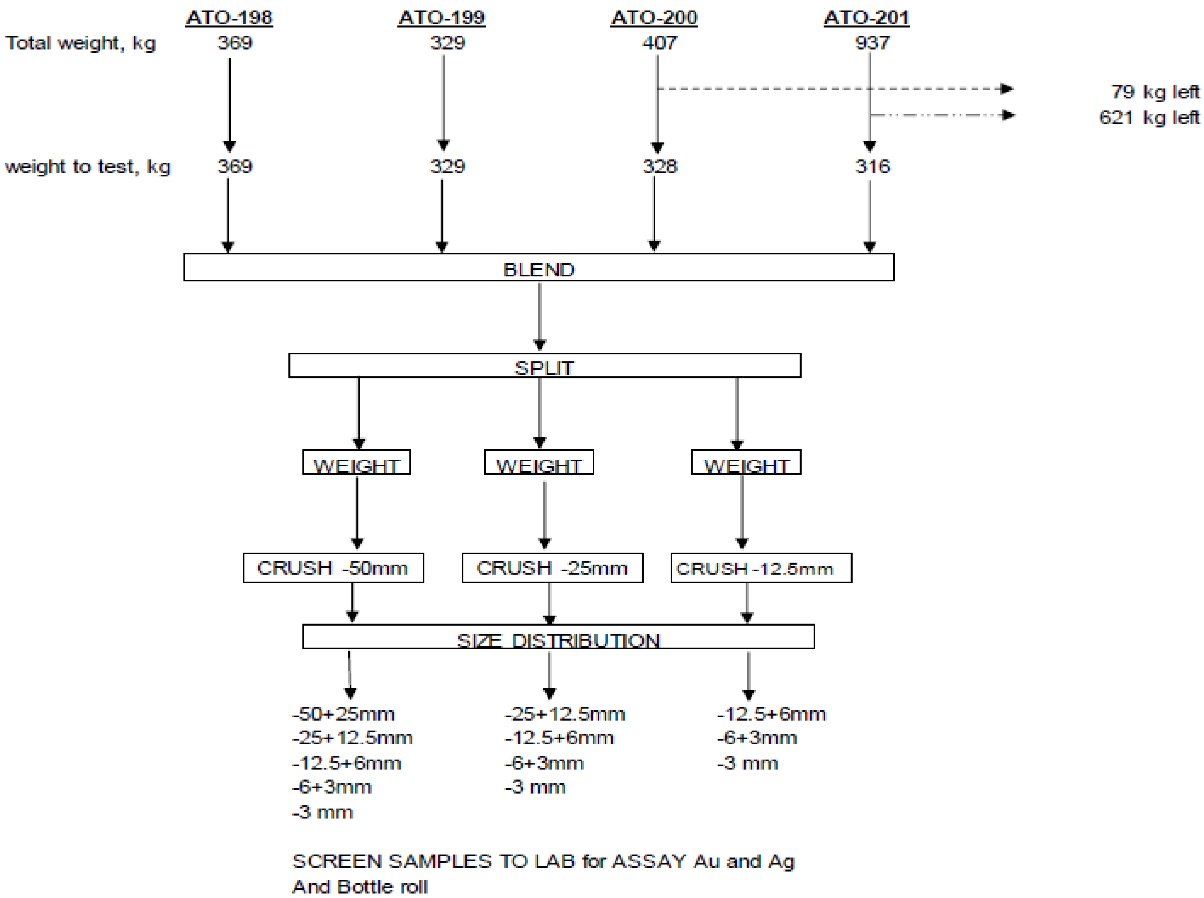


Figure 55 Large scale column testing process

Table 43 Large column test results

Test	Feed grade (g/tn)	Recovery (%)		Ratio	Cyanid in solution, mg/l	pH
		Bottle roll 24 h	Column test			
-12.5 мм	1.25	36.8	72.65	2.5	370	10.53
-25 мм	1.34	58.1	72.23	2.6	488	10.75
-50 мм	1.12	42.0	58.47	2.38	628	10.86

Table 44 Recovery of large column test

Test	Recovery % (Day)						Average recovery %
	5	15	25	35	45	57	
-12,5 мм	39.83	66.69	70.61	71.73	72.58	72.65	72.65
-25 мм	54.01	66.78	69.80	71.15	71.91	72.23	72.23
-50 мм	39.44	51.93	55.32	56.71	57.99	58.47	58.47

Table 45 Recovery of large column test

Test	Recovery %	Time (Day)	Percolation Rate, (L/h/m²)	Recovery %	Time (Day)	Percolation Rate, (L/h/m²)
	Solution/Solid ratio 1 : 1			Solution/Solid ratio 2 : 1		
-12,5 мм	70.59	23	0.21	72.58	46	0.2
-25 мм	69.80	24	0.2	71.91	45	0.22
-50 мм	55.32	24	0.2	58.23	47	0.2

Table 46 Au & Ag Recovery in ore classification

Class	Before testing		After testing		Recovery % (Ore)	
	Au g/t	Ag g/t	Au g/t	Ag g/t	Au %	Ag %
	Test: -50мм					
-50мм +25мм	0.6	5.3	0.2	3.2	68.3%	39.6%
-25мм +12.5мм	1.1	6.3	0.5	3.9	52.3%	38.1%
-12.5мм +6мм	1.5	10.5	0.5	3.5	69.3%	66.7%
-6мм +3мм	1.9	11.9	0.7	3.5	62.4%	70.6%
-3мм	5.0	15.5	0.9	4.0	83.0%	74.2%
Class	Test: -25мм					
-25мм +12.5мм	1.2	7.3	0.3	3.9	73.5%	46.6%
-12.5мм +6мм	1.7	14.5	0.3	5.0	80.4%	65.5%
-6мм +3мм	1.8	19.0	0.6	6.3	68.0%	66.8%
-3мм	3.1	19.1	0.4	5.3	88.3%	72.3%
Class	Test: -12.5мм					
-12.5мм +6мм	1.7	14.6	0.3	4.9	80.1%	66.4%
-6мм +3мм	2.1	16.4	0.4	5.6	80.8%	65.9%
-3мм	5.0	20.4	0.2	5.5	95.6%	73.0%

Table 47 Column test result (Ag)

Test	Before testing Ag, g/t	After testing Ag, g/t	Recovery, Ag, %
-12,5 мм	16.8	5.4	68.15%
-25 мм	13.8	4.9	64.24%
-50 мм	8.1	3.6	55.65%

Table 48 Reagent consumption

Test	Lime, kg /t	NaCN, kg/t
-12,5 мм	3.45	1.48
-25 мм	2.71	1.34
-50 мм	2.75	1.10

Figure 56 Gold recovery curve (Testing for 12.5mm)

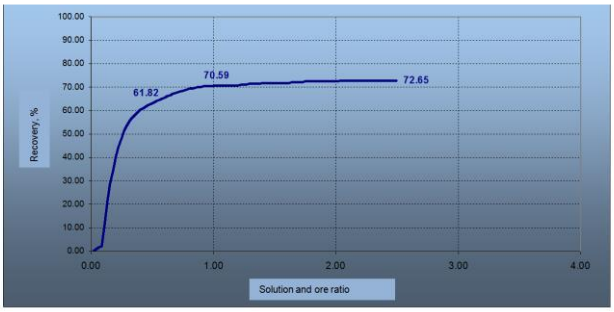


Figure 57 Gold recovery curve (Testing for 25mm)

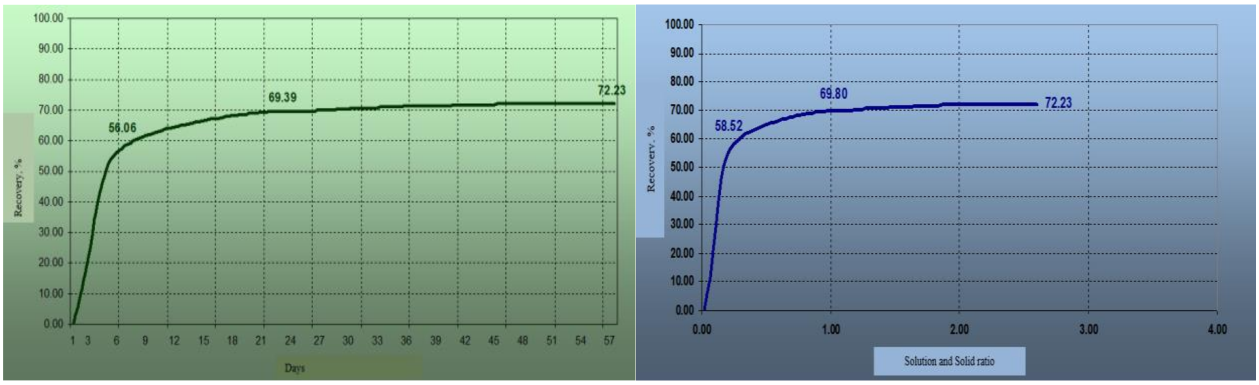
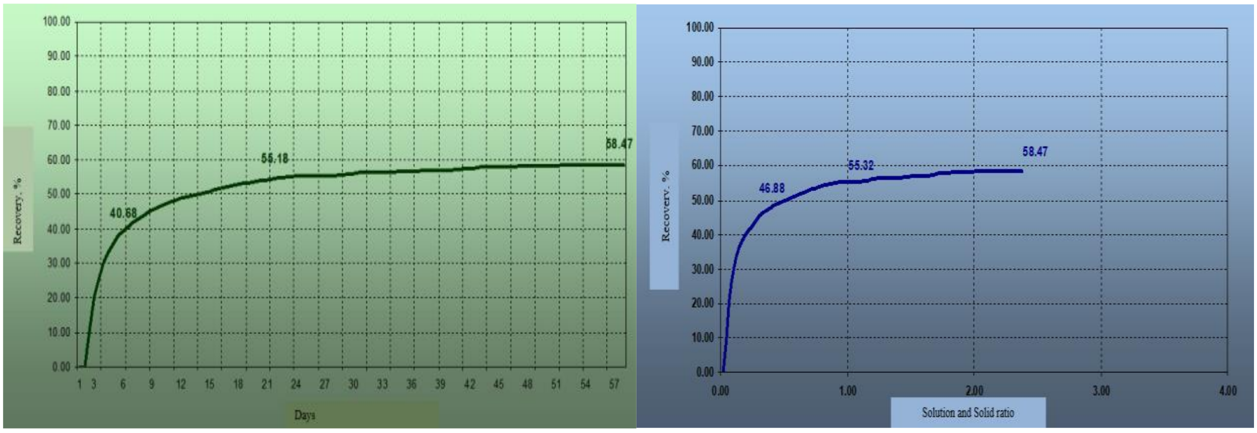


Figure 58 Gold recovery curve (Testing for 50mm



13.1.18 Conclusions

A preliminary assessment metallurgical test program aimed to investigate ore characteristics and cyanidation response of gold mineralized composites from the ATO deposit was undertaken. The composites tested in this program were constructed from half core samples.

The gold grade for the Master Composite 1 was 1.45 g/t, whilst the silver grade was 27 g/t.

Mineralogy, conducted on MC 1, indicates the sulphide mineral content was 1.5 percent by weight of the feed, with pyrite representing about 61 percent by weight of the sulphide minerals. The liberation data indicates between 20 and 45 percent of the sulphides were liberated.

Bond ball and rod mill work index tests indicated the MC 1 had values of 15.6 kWh/t and 13.0 kWh/t, respectively. The Bond abrasion index returned a value of 0.2802.

The initial bottle roll cyanidation tests indicated the gold extraction was insensitive to grind size, being approximately 80 percent after 48 hours. However, silver extraction increased markedly, from about 50 percent to 69 percent, when the feed size to the cyanidation was decreased from 3,350µm K100 to 299µm K80. Below this sizing, there was no significant improvement in silver extraction. A preliminary heap leach amenability test work program was undertaken on the Column Leach Composite at a crush size 12.5mm.

The natural percolation rate of the composite, 10,689 L/h/m2, indicated that agglomeration was not necessary. The gold extraction after 40 days of column cyanidation leaching was excellent at 81.9 percent, whilst the silver extraction was good at 61.5 percent.

Large-scale column tests result / Boroo gold /: Elements of oxide ore production are gold and silver. Results of the Large-scale column tests Boroo gold mining recovery have 72.23% for gold and 64.24% for silver metal. The chemical reagent is 1.34 kg of sodium cyanide and 2.71 kg of lime for 1 t mineralized material.

14 MINERAL RESOURCE ESTIMATE

The Section discusses and details the methodology and results of the Consultant/QP's 2020-2021 estimation of gold and related precious and base metal Mineral Resources in ATO's four deposits for this Report. These new Resources supersede the previous ones published for the three deposits in the 2017 NI 43-101 Report[40] (Pipe 1, 2 and 4) and provide the initial Resources on the fourth (Mungu).

Resource estimation is described in terms of:

- Introductory statements and certifications – qualifying the Author QP, reporting codes and source of data.
- Background – emphasising that this is a re-estimate off the Pipe 1, 2 and 4 deposits and an initial estimate of the Mungu deposit.
- Raw data supplied – listing the old and new raw data used in the estimate.
- Software used.
- Methodology – the data manipulation, analysis, interpretation, modelling and reporting process.
- Data pre-processing – the steps in treating the data from raw to fully modelled.
- Drill hole databasing.
- Geological interpretation – of deposit shapes and oxidation levels.
- Wire-frame modelling – of individual deposits.
- Surface modelling – of topography and oxidation levels.
- Simple statistics – of sample grades, and the derived data limits to use in geo-stats and grade estimation.
- Geo-statistics – 3D analysis, and the derived continuity.
- Resource block model – details.
- Block grade estimation – parameters and typical cross-sections.
- Block gold equivalent grade calculation.
- Bulk density.
- Resource classification.
- ATO 2021 Resources.
- Reconciliation of Resources with other estimates.

INTRODUCTORY STATEMENTS

This 2021 Resource estimation was independently undertaken by the Author QP / CP. He makes the following Statements as to his competency under the JORC and NI 43-101 Codes. He also states the CIM equivalence of JORC (accepted as a foreign Code by NI 43-101) reporting terms used in the Resource classification (as set out previously in the Terms of Reference, Section 0).

JORC (2012) Competent Person (CP) Statement: The Consultant's Competent Person (CP) Statement accompanying these Mineral Resources is given below to meet the JORC code requirements.

> ***Source data***: All source data was supplied by the Client and was taken at face value by the Consultant. The Consultant performed validation of the drill hole data to the extent thought possible and believes that validation to at least be to the level required for JORC Mineral Resource estimation and reporting. Although the Consultant validated the data to his satisfaction, he nevertheless provides this Mineral Resource estimate and the following Competent Person Statement for it on the basis that the Client takes responsibility to a Competent Persons level for the integrity of the source data.
>
> ***Statement***: The information in this report that relates to ATO 2021 Mineral Resources is based on information compiled by Robin Rankin, a Competent Person who is a Member (#110551) of the Australasian Institute of Mining and Metallurgy (MAusIMM) and accredited since 2000 as a Chartered Professional by the AusIMM in the Geology discipline (CP(Geo)). Robin Rankin provided this information to his Client Steppe Gold Limited as paid consulting work in his capacity as Principal Consulting Geologist and operator of independent geological consultancy GeoRes. He and GeoRes are professionally and financially independent in the general sense and specifically of their Client and of the Client's project. This consulting was provided on a paid basis, governed by a scope of work and a fee and expenses schedule, and the results or conclusions reported were not contingent on payments. Robin Rankin has sufficient experience that is relevant to the style of mineralization and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore

[40] 2017 NI 43-101. Section 14, pp118 onwards

Reserves' (the JORC Code). Robin Rankin consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

NI 43-101 Qualified Person (QP) certification:

Certification: Robin A Rankin certifies, that in relation to his reporting of ATO 2021 Mineral Resources in this Technical Report, he is and a "Qualified Person (QP)" for the purposes of and as defined in Canadian National Instrument 43-101 (NI 43-101) of 24th June 2011. He fulfils that definition by reason of his education (geoscientist with BSc and MSc degrees), professional association affiliation (MAusIMM), association membership designation (Chartered Professional in the Geology discipline (CP(Geo)), and experience. He also certifies that this Technical Report has been prepared in compliance with that instrument and Form 43-101F1.

CIM definition standards reconciliation:

Statement: In compliance with Canadian NI 43-101 the Consultant states that the JORC Code (an acceptable foreign code in terms of NI 43-101) Mineral Resource categorisation used in this Technical Report is directly equivalent to the CIM categorisation.

ESTIMATION BACKGROUND

The background to this estimate is the previous 2017 estimate of Mineral Resources in Pipes 1, 2 and 4 by GSTATS (see Section 0). At that time the Mungu deposit was either not appreciated or had too little drilling for estimation. These current 2021 estimates therefore represent a re-estimation of Pipes 1, 2 and 4 (incorporating more drilling) and an initial estimate of Mungu. In practice the Pipe 1, 2 and 4 deposits were modelled together because of their close lateral proximity to each other. And the Mungu deposit area was modelled on its own as it existed as a distinctly isolated deposit.

RAW DATA SUPPLIED

Raw data supplied is described in terms of:

- 2017 data – used for the previous estimate.
- 2021 data – new data added to the 2017 data for this estimate.

2017 DATA

Drill hole data: The 2017 GSTATS drill hole data base for Resource estimation contained 265 diamond drill holes[41]. In the Pipe 1, 2 and 4 deposit area there were in 238 diamond drill holes for a total of 44,284.2 m. That data included 32,791 assays. Thus 27 holes were outside the estimated deposits.

Density data: A total of 226 bulk density determinations were made in 2010 and 2011. That data was used to determine average density for oxide, transitional and fresh material. Those density averages were used for the 2021 estimation reporting here.

2021 RAW DATA

Project reports: The 2017 NI-43-101 report prepared by GSTATS was supplied to describe the Project and all previous work on it. Aspects of that report are included in this (particularly concerning background, history and geology).

Drill hole data: All drill hole data collected on the Project up to 2021 was supplied in MS Excel format. Data was supplied separately for collar, down-hole survey, assay and lithology data types. Later 2020 assaying was supplied incrementally as it became available. Collar data dip not contain hole collar azimuth and dips – they were loaded from the down-hole survey data.

Channel/trench data: Data from channel sampling from trenches was supplied in MS Excel format in a format for them to be treated as drill holes just below topography surface and following along the surface slope. This data was simply supplied along with the drill dole data.

[41] 2017 NI 43-101. Section 14.1.1, pp 118

Map data: Data on topography was supplied as 1 m interval surface contours in a DXF file.

Interpretations: No geological interpretations were supplied. All interpretations mentioned here were done by the Author QP.

Reporting parameters: During the course of the Consulting various parameters were sought from and supplied by Steppe. The principal ones were the lower grade cut-offs to use in Resource reporting.

SOFTWARE

Drill hole data manipulation was mostly performed using MS Excel spreadsheet software. Mapping data was manipulated using Global Mapper. All geological interpretation, modelling, analysis and estimation was done with Minex geological and mining software. Reporting was done in MS Word.

ESTIMATION METHODOLOGY

The 2021 Resource estimation process described in following sub-sections follows the flow of the processing, interpretation and estimation – the estimation methodology.

The estimation methodology used was:

- Data processing and consolidation.
- Drill hole databasing – storage of drill hole and trench data.
- Map databasing – storage of CAD data and deposit outline interpretations.
- Geological interpretation.
- Topography surface modelling.
- Oxidation surface interpretation and modelling.
- Statistics – simple analysis of sample assays; and data limit determination.
- Geo-statistics – 3D analysis; and interpretation of grade continuity directions and distances.
- Block modelling – creating a geological block Resource model.
- Block grade – estimation and validation.
- Resource classification – of grade blocks into JORC reporting classes.
- Resource reporting.
- Reconciliation – of Resources with past estimates.

DATA PRE-PROCESSING

Raw data was pre-processed to some degree to prepare it for use in the geological interpretation and grade estimation.

Drill hole data pre-processing: Raw data in the MS Excel spreadsheets was essentially formatted into flat column and row tabulations for export to ASCII and loading into the Minex geological software. Each data type (collar, survey, assay and lithology) was treated individually.

A primary edit to the Steppe data was to remove the "-" characters (a mathematical operator) from drill hole names (eg ATO-01 was changed to ATO01). Otherwise, the principal editing was formatting most numerical data to two decimal places.

Part of the processing included iteratively and retroactively incorporating the geological interpretations into the spreadsheets so that they could be seen alongside assays or lithology. This essentially marked the down-hole intercepts of the mineralised deposit intersections against assay intervals. This process was also used to create a new data type – population domains. A similar process happened with the oxidation level interpretations.

Topography data pre-processing: The raw 1 m interval surface contour data strings were all supplied as closed polygons (see Figure 68). These were edited in Global Mapper software to remove the closures.

DRILL HOLE DATABASE

Data source: All drill hole and trench data were sourced from Steppe (see above) and pre-processed (see above for formatting and export to flat ASII files) before being loaded into a Minex drill hole database.

Databasing: A Minex drill hole database was loaded with the collar, survey, and assay data types ASCII extracts from the raw data. The latest version of the Minex database for estimation was ATO_Gold_20210205_GR2104.B3*. The load process included gross error checking. Only trivial errors were found, and they were rectified in the raw data before being reloaded.

Subsequent interpretations of the deposits (and therefore data populations) and oxidation levels were entered as new raw data in the spreadsheet and then loaded into Minex.

Holes (and trenches): Number and lengths of drill holes and trenches (pseudo drill holes) were given above in Table 15 and Table 16.

Collar surveys: Collar data loaded included hole names, location, depth and drilling dip and azimuth. As the hole collar dip and azimuth was missing from the raw data all holes were loaded as vertical by default. This would be updated by the correct data in the down-hole survey data.

A hole type variable was added to enable holes selection on drilling method (diamond – DDH, reverse circulation – RC, and trench – TR). This type could also have been set on drilling year – but the Author QP was not familiar enough with the eras of drilling or aware if this would be useful.

Down-hole surveys: Down-hole surveys were loaded for all holes, and these included the azimuth and dip at the collar. Surveys were generally at 50 m intervals down-hole.

Some trenches had the sign of their dips obviously incorrect as they were seen in cross-section not running parallel to surface. This generally happened to trenches which ran up-hill from the start/collar end. These were corrected and reloaded. An example of a trench (ATOTR130) is shown on cross-section 2,270N at Mungu (Figure 62). The collar starts on surface and then the trench follows a few metres below topography.

Assays: Raw assay data was available for a wide range of elements. After a review of the data the Author QP loaded a limited selection of elements though to be best reflective of the expected gold and associated base mental mineralisation. Those elements included:

- Gold (Au)
- Silver (Ag)
- Lead (Pb)
- Zinc (Zn)
- Copper (Cu)
- Arsenic (As)
- Iron (Fe)
- Phosphorus (P)
- Sulphur (S)

Assays were provided in ppm units. The elements lead, zinc, copper, phosphorus, iron and sulphur were also loaded in % units (by dividing ppm by 10,000).

Geological logging: Lithology logging data was not loaded into the database as the raw data had not segregated the different aspects of the descriptive logging (mineralogy, alteration, fractures, recovery etc) apart from the basic rock type. These variables were simply presented as long strings.

Consequently, lithology was not used in the mineralisation interpretation. It was however used, in the raw spreadsheet, for the oxidation level interpretation.

Density: No density raw data was supplied. Default bulk density was applied by oxidation level during the Resource reporting.

Domains: Population domains (whole numbers) were loaded from the mineralisation interpretations. This was done on a deposit basis (Table 49.

Table 49 Deposit domains

Domain number	Deposit
1	Pipe 1
2	Pipe 2
4	Pipe 4
5 - 11 and 15	Mungu layers

At Mungu the individual lenses were segregated by domain, hence the multiple domains. Other domains were interpreted (12,13 etc) but were too sparse to model.

Oxidation: Interpretations of the oxidation levels were loaded as layer intercepts from the raw lithology data. The codes for the three intercepts (from surface down) were:

- OX – oxidised material.
- TR – transitional material.
- FR – fresh material.

MAP DATABASING

A map database was created to store CAD type data such as geological deposit outline interpretation strings and topography contour strings. This would also be used to store cross-section definitions. The latest version of the Minex map database was ATO_Gold_20210105_GR2104.GM3.

GEOLOGICAL INTERPRETATION

Geological interpretation was carried out to:

- Define the outlines (shape) of the mineralised deposits.
- Determine the base of oxidation and the top of fresh rock.

DEPOSIT SHAPE INTERPRETATION

Basis: The basis for the geological deposit interpretation here was taken solely as mineralisation. A number of factors influenced this decision:

- The previous 2017 estimation was based on "grade shells" (see below).
- Lithological logging appeared too complex to deal with.
- Mineralisation appeared reasonably continuous over long sections of holes, and correlated with similar sections in adjacent holes.
- These mineralised intersections were clearly concentrated in contiguous shapes.
- The shapes could represent practical mineable deposits.

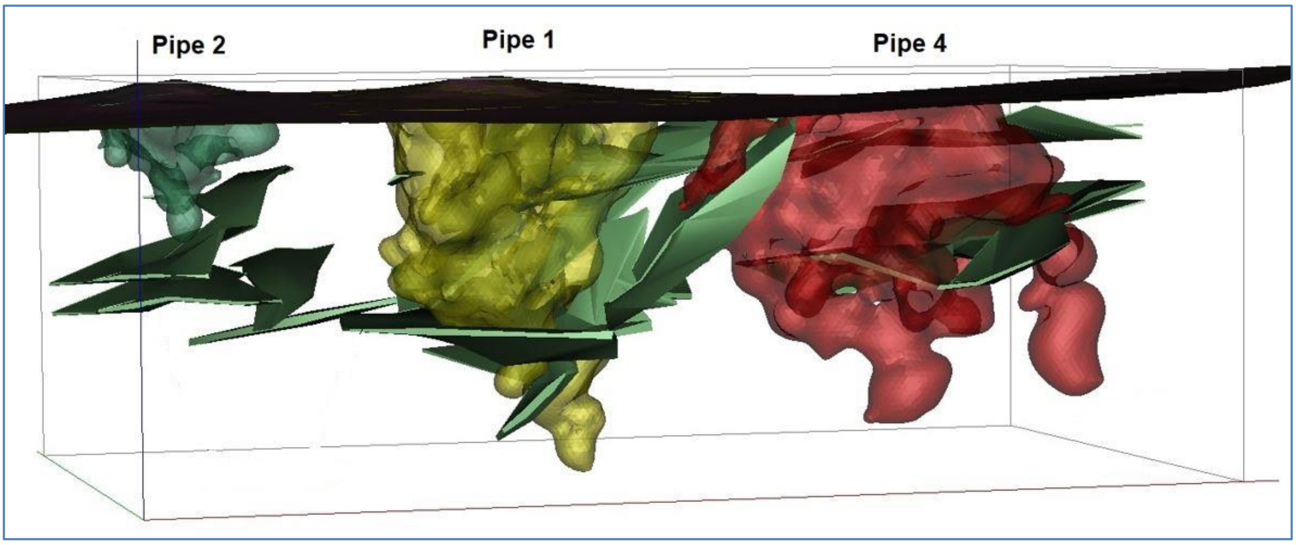
Previous 2017 deposit model: The previous 2017 GSTATS estimation was based on "grade shells" created in Leapfrog software using a lower 0.1 g/t gold threshold (Figure 59). The three differently coloured Pipes are shown looking NNE. The green tabular shapes are diorite dykes.

GSTATS justification of this was similar to that here – that the logged lithology was overly complex (24 different codes, and even when rationalised there were 10). They also commented that the "ore body was not significantly controlled by lithology"[42].

Although GSTATS also modelled the base of the surface sediments, cross-cutting diorite dykes, and two types of faults (low angle thrusts and semi-vertical faults bounding the Pipes) they still used the grade shells as the basis for their block model.

[42] 2017 NI 43-101. Section 14.2.1, 2nd paragraph, pp119.

Figure 59[43] Previous 2017 grade shell models of Pipes



The grade shell models in Figure 59 seen to be fairly complex and tortuous in shape.

Sectional interpretation method: The Author QP chose not to continue with a grade shell approach to modelling but to base 2021 deposit modelling on manual deposit outline interpretation on cross-sections. Those outlines would then be connected together into a standard "wire-frame" model.

Advantages of this approach were:

- Ability to consider multiple elements when interpreting an outline (see below).
- Ensure the ultimate outlines were reasonable contiguous and practical for mining.
- Allow the lower cut-off (see below) to be relatively dynamic and not reliant on only one element.

The method involved:

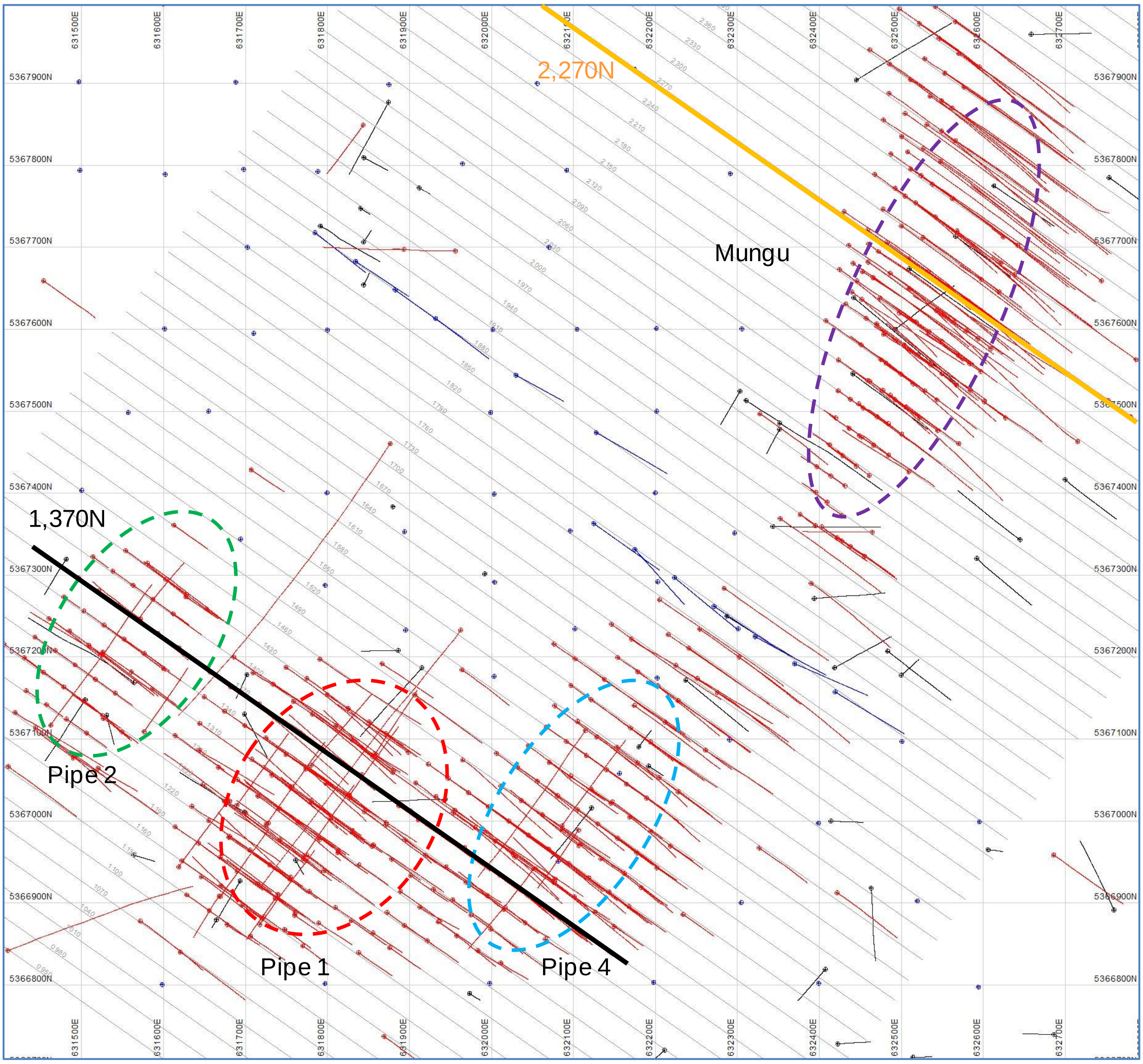
1. Creating a series of parallel vertical cross-sections through the drill holes (Figure 60). These followed the drilling directions and so were oriented at 125° and were 30 m apart.
2. Plotting the drill holes projected onto the sections from 15 m either side (example in Figure 61). Gold and silver assays were annotated, and colour coded to help identification of mineralised zones.
3. Digitising a deposit outline (or several) around mineralised intersections (Figure 61 and Figure 63) using a "dynamic" lower grade cut-off (see further below) based initially on gold and silver. Outlines were named for the Domain number for the deposit (Table 49).
4. Identifying the mineralised intersections in the holes in the raw assay spreadsheet (Figure 64). This step was iteratively combined with the outline digitising as more practical shapes emerged. It was also done to ensure the deposit assays were flagged with the domain number for the deposit (to be used during block grade estimation).

Cross-sections: The vertical cross-section lines at 125° are shown in grey and labelled in Figure 60. They are 30 m apart and each is seen to be close to the original drilling cross-sections (i.e. they line up with the red diamond drill hole traces). Naming of the cross-section was based on arbitrarily starting a southern one at 1,000N.

The locations of the deposits (dashed ovals) in the Figure are approximate. Pipe 2 (left oval) is shown green, Pipe 1 is red, Pipe 4 is blue (to match the outlines in Figure 61), and Mungu is shown purple. The coordinate grid is at 100 * 100 m spacing. The thicker black line traversing Pipes 1, 2 and 4 mark cross-section 1,370N as shown in the following Figure 61.

[43] 2017 NI 43-101. Section 14.2.1, Fig 14.2, pp120.

Figure 60 Drill hole & trench locations – deposit area 2021



Outline interpretation: Interpretation involved digitising an outline around mineralisation on a particular cross-section. The position of the line was based on enclosing material above lower gold and silver grade cut-offs (see below). This approximate cut-off was not applied in an absolute way as lower grade material would be included (internal dilution) if a more realistic body was created (see examples below). The outlines aimed to create large singular bodies where possible. Interpretation was performed on ~50 cross-sections.

Figure 61, of vertical cross-section 1,370N (location shown by the thick black line in Figure 60), shows outlines through Pipes 2 (left, green), 1 (centre, red) and 4 (right, cyan). Pipes 1 and 4 have single outlines; Pipe 2 has two outlines. The vertical levels are at 100 m spacing. Pipe 1 and 4 outlines here are 350 m and 250 m deep respectively. The Figure also shows the oxidation level surface models. Surface topography is marked by a green line, base of oxide by a black line, and top of fresh (or base of transition) by a red line.

Figure 61 Pipe 1, 2 and 4 outlines interpreted on cross-section 1,370N

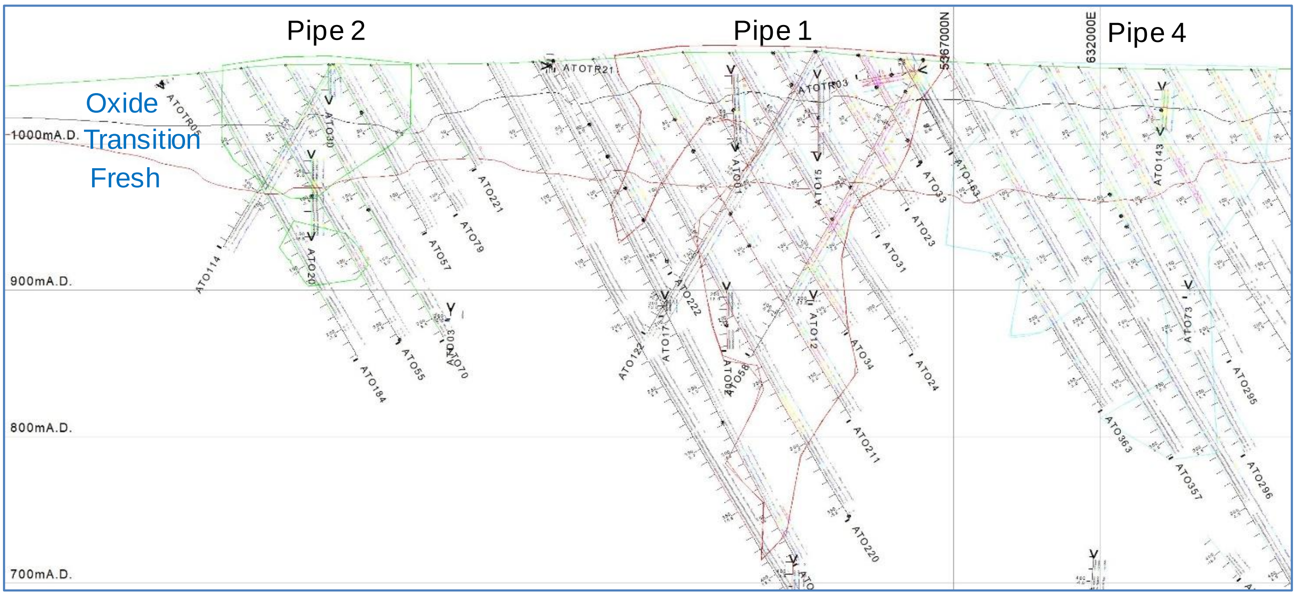
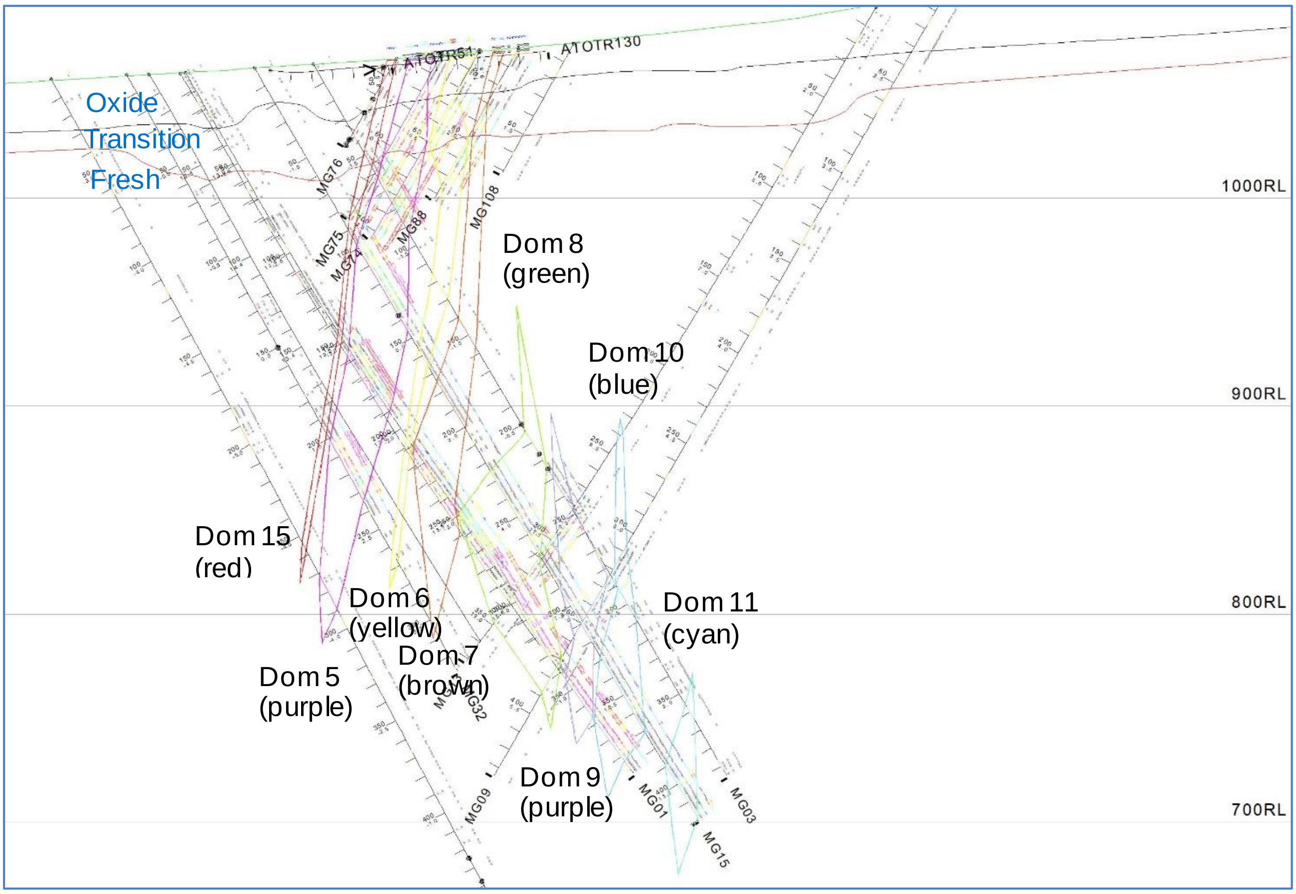


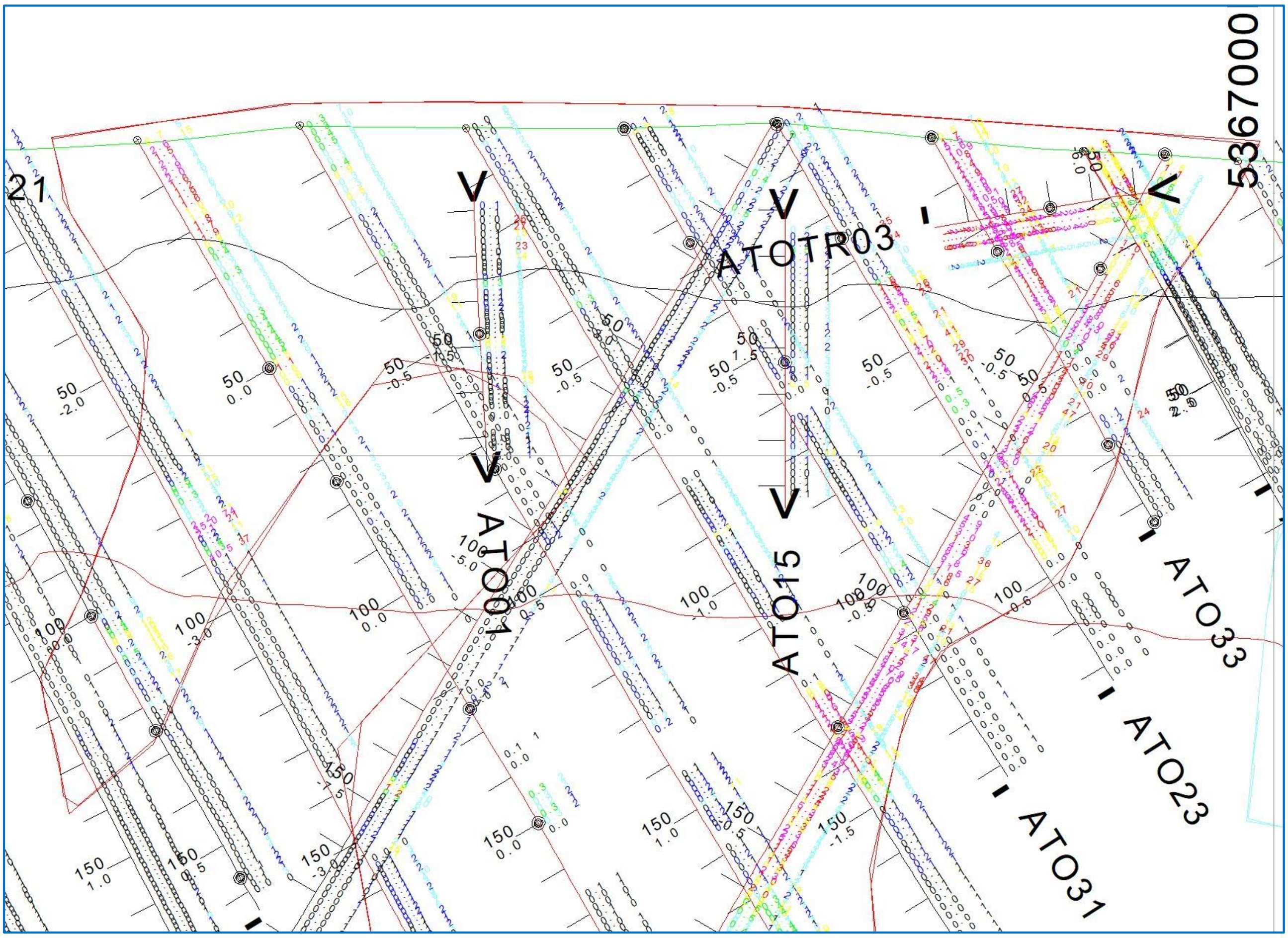
Figure 62 shows Mungu outlines on central vertical cross-section 2,270N (location shown by the thick orange line in Figure 60). This cross-section shows all 8 domain outlines (domain 5 to 11, and 15) interpreted at Mungu. The domains are tall and thin, nearly vertical, sub-parallel and strike 035° (see Figure 67) normal to the cross-sections. The Figure also shows the oxidation level surface models near surface.

Figure 62 Mungu outlines interpreted on cross-section 2,270N



Deposit outline grade cut-offs: Figure 63 shows the central Pipe 1 on cross-section 1,370 in close-up with the red outline marking the upper part of the boundary of the interpreted deposit. It aims to illustrate the boundary in relation to the colour-coded gold and silver grades in the drill holes.

Figure 63 Close-up of hole ATO23 (Pipe 1) on cross-section 1,370N



After inspecting grades on multiple cross-sections the Author QP settled on a lower grade cut-offs at approximately >0.15 g/t gold and >1.0 g/t silver. These were chosen because of their observed coincidence in most mineralised intersections. Increasing grades above these values in Figure 63 are plotted cyan/green/yellow/red/purple (and are mostly inside the outline). Grades below are dark blue or black (and are mostly outside the outline).

However the cut-off was also decided based on a decision as to whether the hole intercept was "generally" mineralised. This brought other elements into play – and necessitated analysis of the assay spreadsheet data (Figure 64) during the cross-sectional interpretation. The Author QP observed that mineralised zones also often (or usually) carried elevated values of the base metals lead, zinc and copper as well as of arsenic (typically associated with gold) and iron. This is well illustrated in the Figure's snap-shot of spreadsheet colour-coded assays in hole ATO23. The two zones (<49.2 to 57.6 m and 75.3 to 96.9 m) of elevated gold assays (5th column from left, colours yellow/red/purple) are adjacent to similarly elevated values of lead and zinc and to a lesser extent copper (columns right to gold).

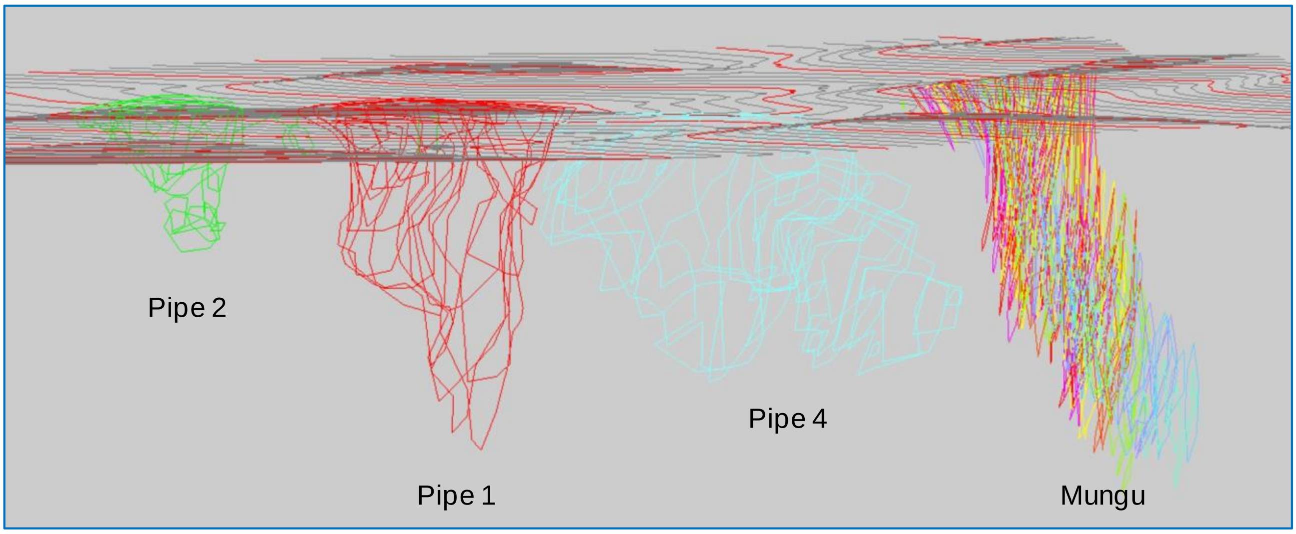
Figure 64 Hole ATO23 colour coded assay spreadsheet data

BOREID	FROM	TOASSAY	DOM	AU	AG	PB_PCT	ZN_PCT	CU_PCT	AS	FE_PCT
ATO23	49.20	50.25	1	1.69	14.7	2.37	4.71	0.16		
ATO23	50.25	51.30	1	2.03	41.0	6.39	11.86	0.74		
ATO23	51.30	52.35	1	1.22	17.1	2.39	4.79	0.30		
ATO23	52.35	53.40	1	0.96	17.0	3.25	7.64	0.29		
ATO23	53.40	54.45	1	1.99	28.7	7.43	10.69	0.34		
ATO23	54.45	55.50	1	1.06	7.1	0.93	1.39	0.09		
ATO23	55.50	56.55	1	2.18	21.8	4.12	4.85	0.30		
ATO23	56.55	57.60	1	2.55	29.6	6.52	8.11	0.32		
ATO23	57.60	60.10	1	0.08	0.6	0.04	0.79	0.00		
ATO23	60.10	62.60	1	0.46	0.7	0.04	0.07	0.01		
ATO23	62.60	65.10	1	0.34	0.5	0.04	0.06	0.01		
ATO23	65.10	67.60	1	0.05	0.2	0.01	0.08	0.00		
ATO23	67.60	70.10	1	0.09	0.3	0.00	0.08	0.00		
ATO23	70.10	72.70	1	0.15	0.3	0.00	0.02	0.00		
ATO23	72.70	75.30	1	0.09	0.4	0.01	0.33	0.00		
ATO23	75.30	76.30	1	2.63	7.2	1.22	1.52	0.12		
ATO23	76.30	77.30	1	2.88	6.7	0.58	0.77	0.07		
ATO23	77.30	78.30	1	6.96	11.3	1.25	1.23	0.18		
ATO23	78.30	79.30	1	0.61	3.0	0.27	0.34	0.05		
ATO23	79.30	80.30	1	2.73	7.0	0.55	0.56	0.07		
ATO23	80.30	81.30	1	1.67	3.3	0.26	0.23	0.03		
ATO23	81.30	82.30	1	8.13	21.9	3.31	2.21	0.30		
ATO23	82.30	83.30	1	6.13	16.8	1.63	1.24	0.37		
ATO23	83.30	84.30	1	6.10	15.4	3.33	3.08	0.21		
ATO23	84.30	85.30	1	2.78	10.3	0.94	1.38	0.26		
ATO23	85.30	86.30	1	2.36	6.5	0.63	0.87	0.06		
ATO23	86.30	87.30	1	1.70	5.6	0.38	0.47	0.12		
ATO23	87.30	88.30	1	2.30	12.9	0.42	0.48	0.27		
ATO23	88.30	89.30	1	2.03	4.9	0.16	0.10	0.08		
ATO23	89.30	90.30	1	1.71	11.0	0.19	0.28	0.31		
ATO23	90.30	91.40	1	1.96	26.8	4.22	4.93	0.54		
ATO23	91.40	92.50	1	1.12	4.6	0.14	0.10	0.06		
ATO23	92.50	93.60	1	0.82	3.2	0.24	0.33	0.04		
ATO23	93.60	94.70	1	0.63	3.4	0.15	0.09	0.03		
ATO23	94.70	95.80	1	0.74	10.4	1.55	2.13	0.21		
ATO23	95.80	96.90	1	0.67	3.5	0.21	0.11	0.05		
ATO23	96.90	99.20		0.04	0.2	0.01	0.02	0.00		
ATO23	99.20	101.50			0.3	0.00	0.01	0.00		
ATO23	101.50	103.80		0.01		0.00	0.01	0.00		
ATO23	103.80	106.10			0.3	0.00	0.01	0.00		
ATO23	106.10	107.70		0.03	0.4	0.00	0.01	0.00		
ATO23	107.70	109.30		0.02	0.4	0.00	0.01	0.00		
ATO23	109.30	110.70		0.03	0.4	0.00	0.01	0.00		
ATO23	110.70	111.70		0.05	0.3	0.00	0.01	0.00		
ATO23	111.70	114.70		0.03	0.3	0.00	0.01	0.00		

The inclusion or exclusion of areas based on the gold and silver cut-offs (and the other elements) was decided with the aim of creating realistic and practical shapes. In Figure 63 there are clearly areas below the cut-off included within the outline. Some appear trivial, others are because grades on adjacent cross-sections are better. Hole ATO23 in Figure 64 appears on the right in cross-section Figure 63. It seemed logical to include the low-grade intersection 57.6 to 75.3 m (in Figure 64) because it was generally surrounded by high grades in adjacent holes.

Pipe 1, 2 and 4 and Mungu outlines: Figure 65 shows all outline interpretations of all deposits below contoured topography. The view is looking 012° and down 2° (approximately the same way as the 2017 model in Figure 59).

Figure 65 Outline interpretations of all deposits



OXIDATION LEVEL INTERPRETATION

Interpretation of the degree or level of oxidation at the deposits was done in all drill holes from the lithological logs. A column for an oxidation code was added to the lithological data spreadsheet. From surface the hole interval was interpreted as oxidised (code OX), then as partly oxidised or transitional (code TR), then as un-oxidised or fresh (code FR).

Interpretation relied upon the logging descriptions. Logging over the period of drilling was variable and hence not all oxidation had been logged. Where missing the Author QP used other clues, such as the rock type summary, fracturing and weathering comments.

Interpretations were modified and improved iteratively after the interval data was loaded, modelled and viewed in cross-section.

WIRE-FRAME MODELLING OF DEPOSITS

Once fully interpreted the cross-sectional outlines for each deposit (domain) were connected together with wires to form solid wire-frame models. Figure 66 shows the wire-frame models of all deposits below contoured topography. The view is looking towards 012° and down 2° (approximately the same way as the 2017 model in Figure 59 and the 2021 outlines in Figure 65).

Figure 66 Wire-frame models of all deposits – looking ~north

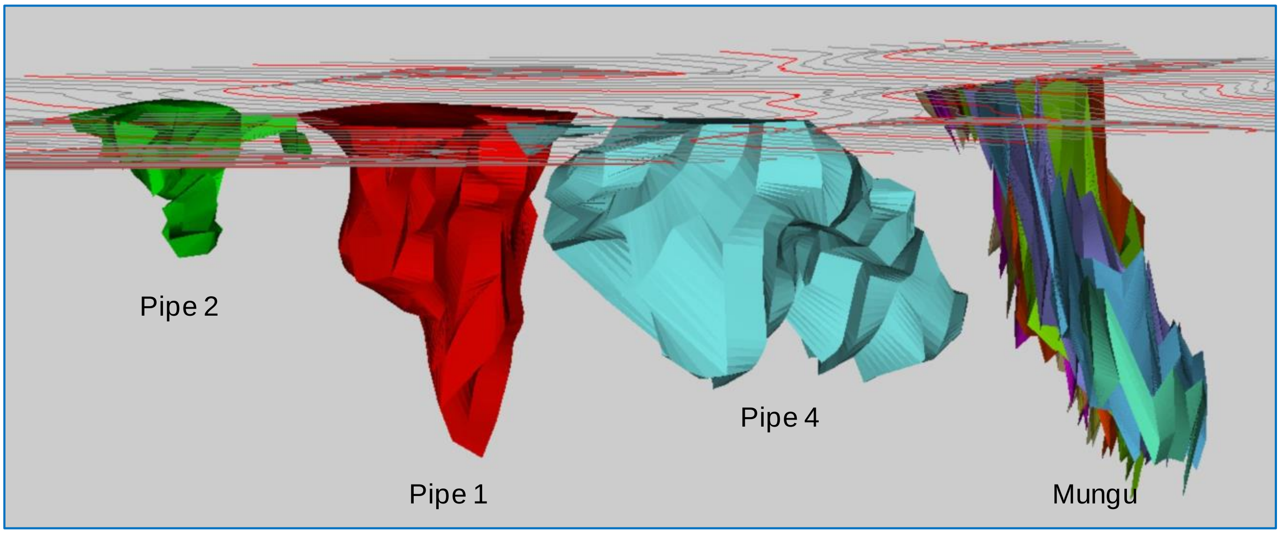
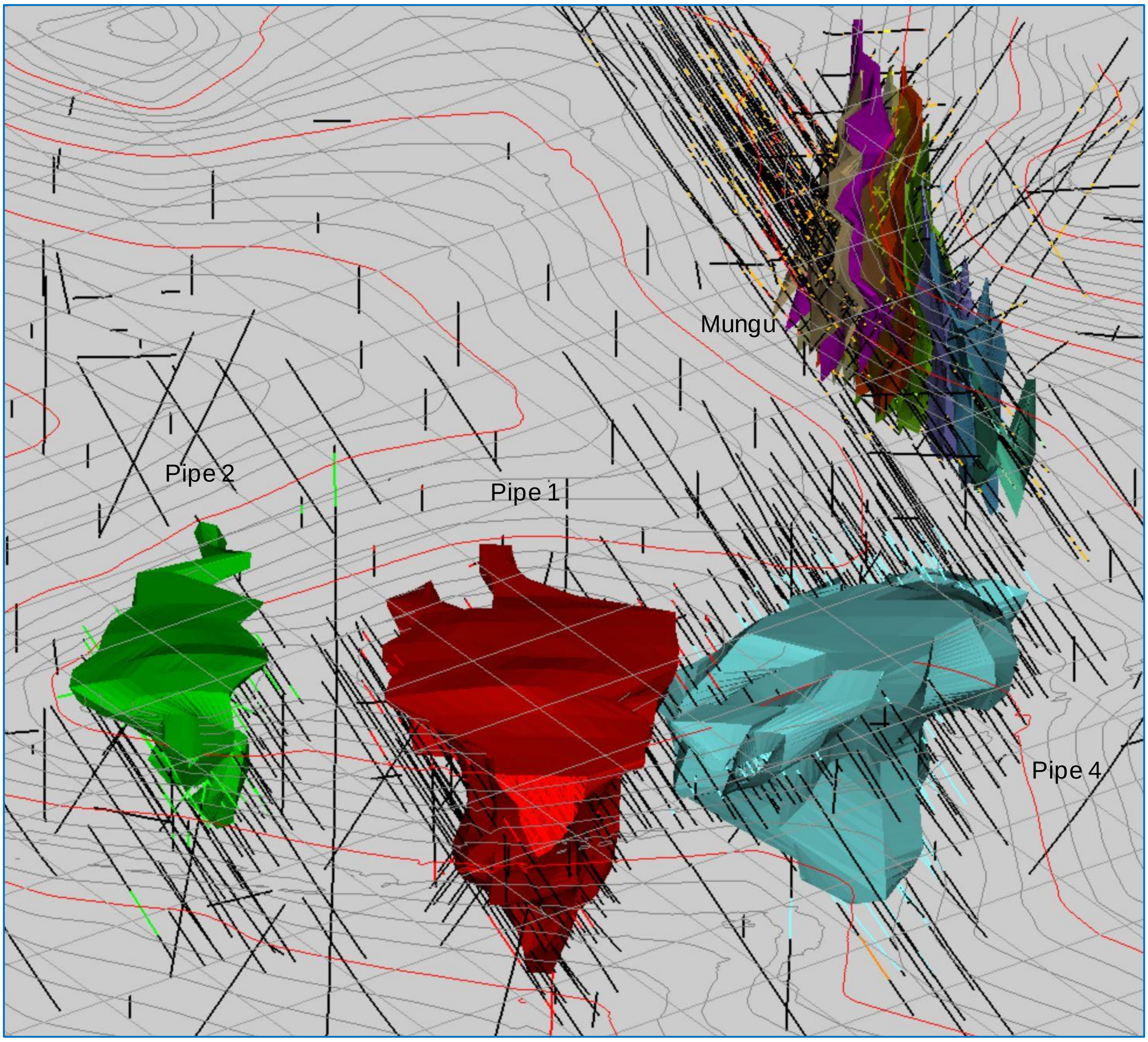


Figure 67 shows all of the deposits looking towards 035° and down 35° - the view normal to the cross-sections and along strike. The Figure also shows the drill holes in 3D. The deposits are seen to be thinnest in this view as they are elongated along strike. And the multiple sub-parallel and sub-vertical Mungu lodes are very clearly parallel to this strike view direction.

Figure 67 Wire-frame models of all deposits – looking 035°



SURFACE MODELLING

Surface modelling was undertaken to produce digital terrain model (DTM) surfaces for topography over the area and for the two oxidation levels (base of oxidised rock and top of fresh rock) below surface.

TOPOGRAPHY SURFACE

Topography data was supplied at 1 m interval horizontal contour strings (Figure 68).

As all strings were supplied as closed polygons with their ends joined the data required pre-processing to break these connections.

Strings were loaded into the Minex map database.

Modelling the topography surface was done using triangulation (creating triangle file TOPO.tr5).

For subsequent use in Resource reporting and display the topography triangle surface was converted to a regular 5 * 5 m gridded surface (grid TOPO).

Figure 68 Topography raw 1 m contour string data

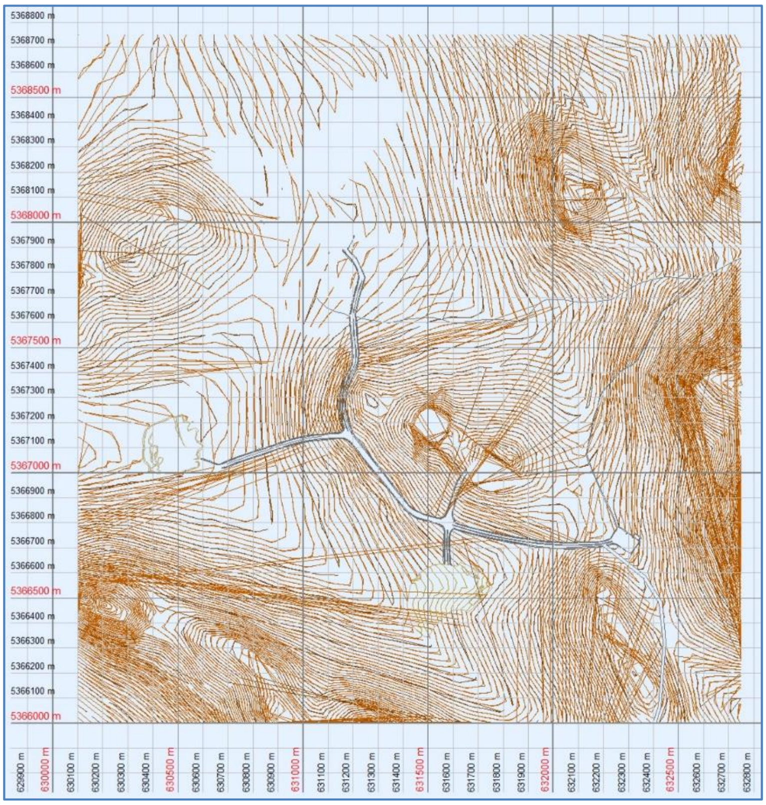
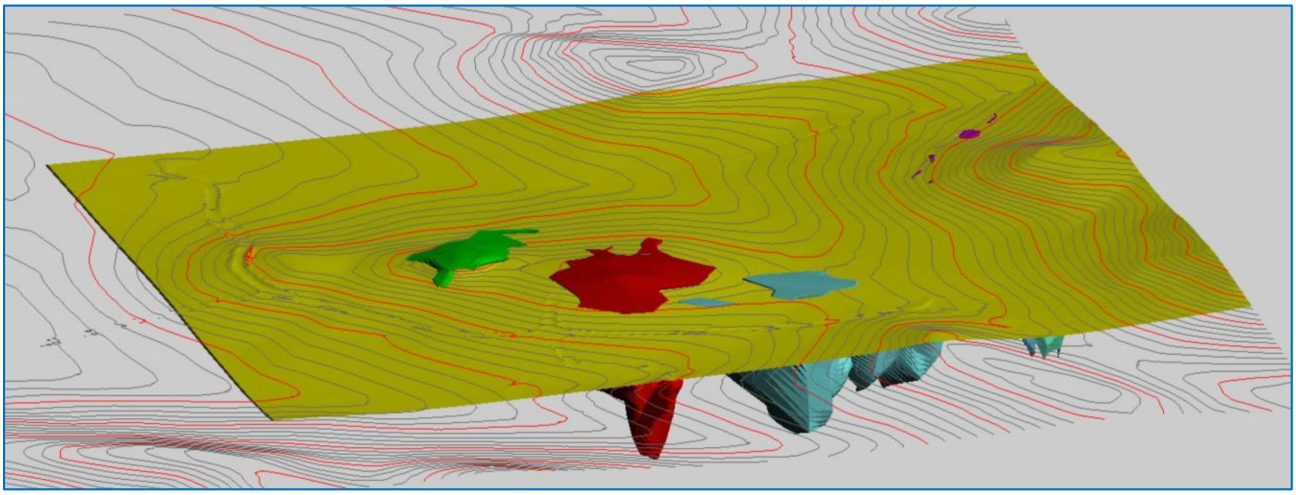


Figure 69 shows the topography gridded surface as a yellow solid above the wire-frame deposit models. The surface is also contoured at 2 m intervals in grey and 10 m intervals in red. The view is towards 015° and down at 20°. Lighting is from the south-east.

Figure 69 Topography surface model

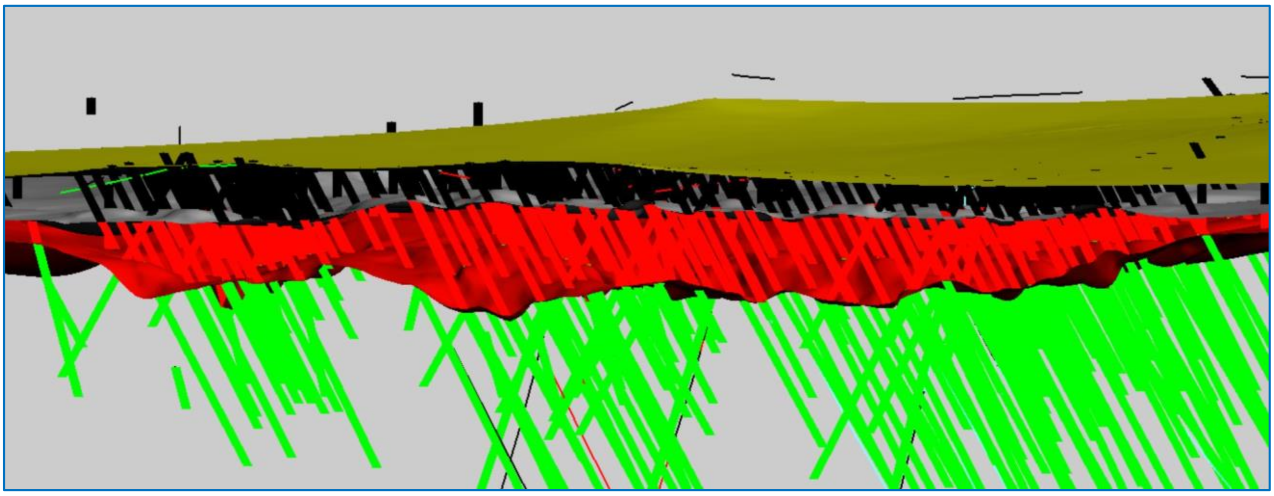


OXIDATION LEVEL SURFACES

Oxidation level surfaces were interpolated in 3D from the interpretations (OX, TR and FR) loaded in the drill hole database. Interpolation used a DTM growth algorithm. Surfaces were interpolated for the base of oxidation (grid OX_SF) and for the base of transition (grid TR_SF). The base of transition was equivalent to the top of fresh.

Figure 70 illustrates the oxidation (grey) and fresh (red) surfaces below topography (yellow). The view is through the middle of Pipes 1, 2 and 4, is looking ~north and slightly downwards, and a clipping plane has cut off the southern half of the lodes. The drill holes are shown, with the upper oxided parts in black, the transitional parts red and the lower fresh parts green.

Figure 70 Oxidation surface models



Oxidation levels were also shown on the cross-sections above (Figure 61, Figure 62 and Figure 63).

SIMPLE SAMPLE GRADE STATISTICS

Simple statistical analysis was performed briefly (as they had been studied in some detail for the 2017 estimation[44]) to determine the variation and character of values for the different elements. In particular it looked at anomalous upper and/or lower data values to evaluate what clipping or cutting of grade values might be required during further statistical analysis and block grade estimation. Only the statistics for gold (the dominant mineralisation) are given here.

Gold: Table 50 tabulates simple raw (un-composited) gold statistics for all samples and then for Pipes 1, 2 and 4 (domains 1, 2 and 4). Very few gold samples were shown to be highly anomalous, which in itself is unusual for gold deposits. Of all 52,515 samples (which included samples inside and outside the deposits) only 128 (0.2%) were >20 g/t. For Pipes 1 and 4 values >10 g/t accounted for ~1% of samples, and with Pipe 2 that proportion applied to values >5 g/t.

Table 50 Gold statistics

Element	Domain	Limits	Samples number	diff	%	Length (m)	Max (g/t)	Min (g/t)	Av (g/t)	Med (g/t)	SD	Variance	CV
Au	All		52,515			65,591.9	382.00	0.00	0.62	0.09	3.72	13.84	6.03
	All	<20	52,387	128	0.2%	65,460.6	19.59	0.00	0.49	0.09	1.31	1.71	2.65
	All	0.01<<20	44,782	7,733	14.7%	54,275.8	19.59	0.02	0.58	0.14	1.40	1.95	2.43
Au	1		12,050			14,840.0	71.08	0.00	1.02	0.31	2.25	5.05	2.21
	1	<10	11,938	112	0.9%	14,725.3	9.90	0.00	0.87	0.30	1.36	1.76	1.53
	1	0.01<<10	11,774	276	2.3%	14,457.8	9.90	0.02	0.88	0.31	1.33	1.77	1.52
Au	2		3,663			4,566.0	183.00	0.01	0.35	0.07	3.56	12.65	10.09
	2	<5	3,635	28	0.8%	4,532.9	4.88	0.01	0.19	0.07	0.42	0.17	2.16
	2	0.01<<5	3,487	176	4.8%	4,332.7	4.88	0.02	0.20	0.07	0.42	0.18	2.11
Au	4		12,599			14,652.1	382.00	0.01	0.82	0.19	5.73	32.87	6.96
	4	<10	12,467	132	1.0%	14,514.0	9.92	0.01	0.49	0.08	0.95	0.90	1.93
	4	0.01<<10	12,059	540	4.3%	13,981.3	9.92	0.02	0.51	0.20	0.96	0.92	1.89

From these results (minimal anomalous values) the Author QP chose not to cut input grades during block grade estimation. This decision was at odds with the 2017 estimation where grades were cut.

Figure 71 to Figure 75 show gold histograms for Pipes 1, 2 and 4. Normal histograms are on the left, log histograms on the right. Gold is seen to be log normal in distribution. The log histogram for Pipe 1 indicates several populations are present.

44 2017 NI 43-101. Section 14.4, pp122-131

Figure 71 Gold histogram Pipe 1 - normal

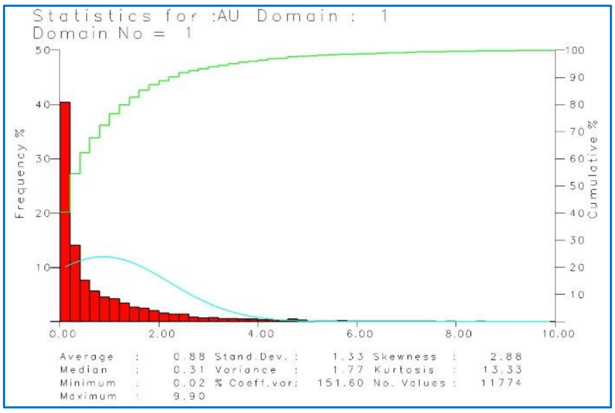


Figure 72 Gold histogram Pipe 2 - normal

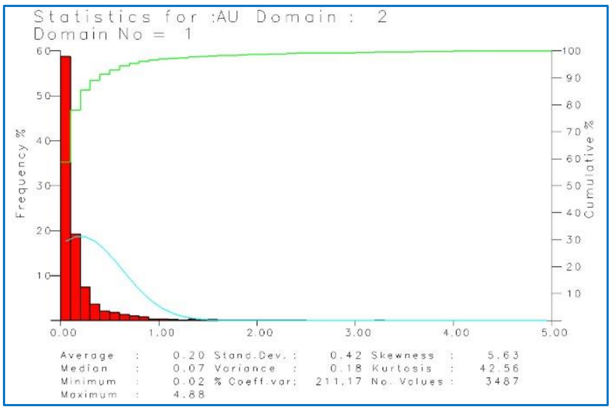


Figure 73 Gold histogram Pipe 1 - log

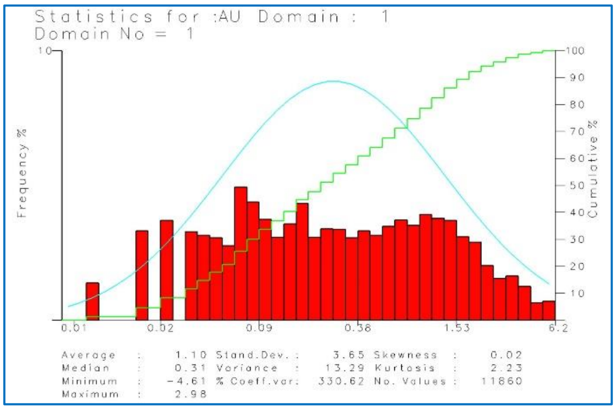


Figure 74 Gold histogram Pipe 4 - normal

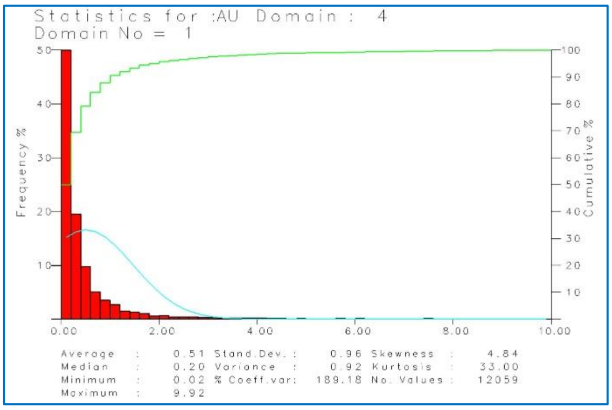


Figure 75 Gold histogram Pipe 4 - log

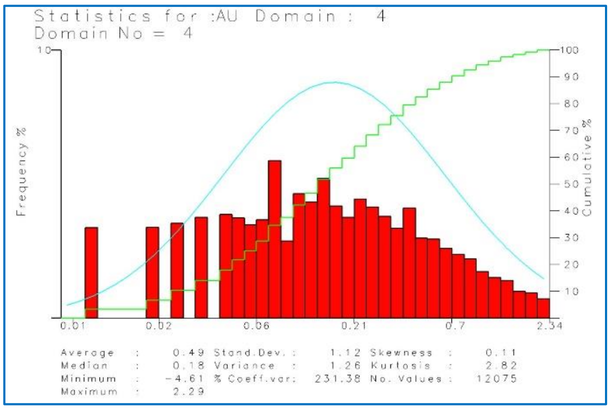
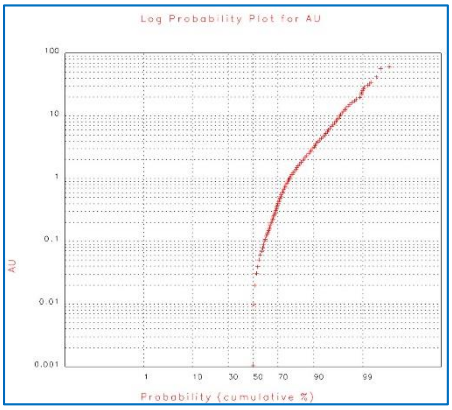


Figure 76 Gold lop prob Pipe 1



The gold log probability plot for Pipe 1 (Figure 76) indicates several populations are present, with a change in slope at ~1.0 g/t.

GEO-STATISTICAL GRADE ANALYSIS

Geo-statistical analysis was only performed very briefly to attempt to determine grade continuity directions and distances. This was because most variograms studied initially gave ranges of at least ~25 m. In other words, the same order of magnitude or longer than the typical 30 * 30 m drill hole spacing. This implied that the ranges were approaching the same dimensions (50-100 m) observed of the well mineralised parts of the interpreted deposits – and that it was less necessary to perform a detailed analysis as drill hole samples essentially fully filled the interpreted shapes.

Variograms: The >25 m ranges determined are illustrated in several variograms for gold in Pipe 4 with directions fairly randomly chosen. Figure 77 is in the horizontal E/W direction – and has a maximum range of ~25 m. Figure 78 is dipping 45° up towards the east (or 45° down towards the west) and has a maximum range of 45 m.

Figure 77 Gold Pipe 4 variogram 0°@090°

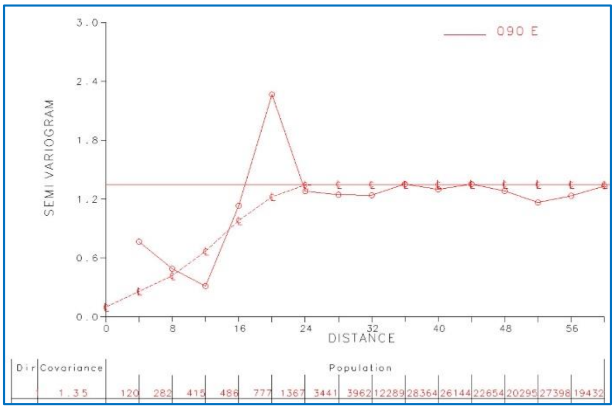
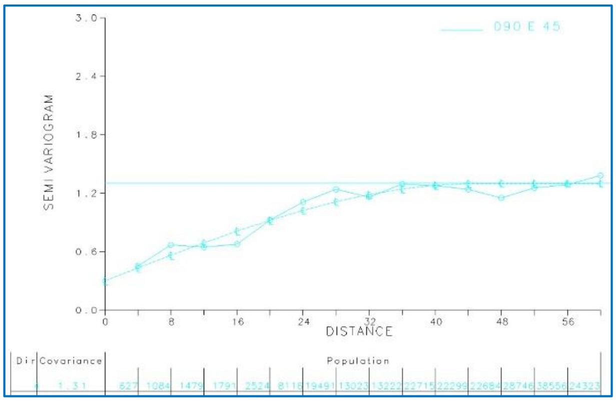


Figure 78 Gold Pipe 4 variogram +45°@090°



A fairly detailed geo-statistical analysis was performed for the 2017 estimate and those findings were partly used to confirm the approach taken here. Gold ranges then ranged from ~20 m to ~60 m[45].

Continuity: The Author QP's approach to selecting data continuity distances took his brief results, with confirmation of reasonable ranges from the 2017 work, to assume that the sample density was sufficient to cover all expected distances within the deposit models (and well short of the selected 75 m estimation scan distance). This was eventually proved accurate when the average sample estimation distances (D, used in the Resource classification, see Section 0) proved to be only ~28 m in Pipes 1,2 and 4 and ~31 m at Mungu.

The Author QP's approach to selecting continuity directions was not to use Variography but to base it on the clear mineralisation directions evident during the deposit cross-sectional interpretation. At Pipe 1 this was a steep 80°W dip. At Pipes 2 and 4 it was an intermediate 45°W dip. And at Mungu it was a vertical dip with the lodes striking 033°. Those directions are tabulated in Table 53.

RESOURCE BLOCK MODEL

Block models: Separate block models were built for the southern Pipe 1, 2 and 4 deposits (model ATO_D124_V1_555_20210108_M5.G3*) and for the northern Mungu deposit (model ATO_MUNGU_V2_255_20210201_GRADE_STR_033_M5.G3*). The reason for the separate block models, apart from practicality, was that the Mungu model would use tall thin blocks to better represent the deposit shapes.

Build: Each block model was built (the blocks created) from the deposit wire-frame models. Any blocks above topography would be excluded during reporting by the use of the topography surface model as a vertical limit.

Block size: A basic block size of 5 m was chosen to suit the typical 30 * 30 * 2 m sampling. Drill holes were ~30 m apart on cross-section (X direction; cross-sections were 30 m apart (Y direction); and sampling down-hole was ~1-2 m (Z direction). Taking into account also the typical 60° dip of the drill holes the choice of 5 m blocks was ~20% of the data spacing.

[45] 2017 NI 43-101. Section 14.5, Table 14.11, pp135.

A differentiating parameter of the block models was the choice of primary block size (without any further sub-blocking) to accommodate both the data spacing and the shapes of the deposits:

- Pipe 1, 2, 4 model: 5 * 5 * 5 m
- Mungu: 2 * 5 * 5 m

The tall (in Z direction) thin (in E/W or X direction) strike (Y direction) aligned lodes at Mungu was better modelled with smaller blocks in the X direction (hence 2 m).

Block model dimensions: Table 51 Table 52 and give the block model dimensions for the Pipe 1, 2 and 4 and Mungu deposits respectively. The origin and extents of each cover the full volume of the geological models. Both bock models are orthogonal to the coordinate system as neither were rotated (in contrast to the 2017 model which was rotated 55°[46] (?) to align the cross-sections parallel to an axis).

Table 51 Pipe 1, 2 and 4 block model dimensions

Parameter		Direction		
		X	Y	Z
Origin (m)	**From**	631,420	5,366,800	660
(UTM, WGS 84, Zone 49N)	**To**	632,400	5,367,450	1,080
Extent (m)		980	650	420
Rotation (°)		0	0	0
Primary block size (m)		5.0	5.0	5.0
Primary block numbers		196	130	84
Sub-block number		1	1	1
Total block number		36,628		

Table 52 Mungu block model dimensions

Parameter		Direction		
		X	Y	Z
Origin (m)	**From**	632,350	5,367,250	600
(UTM, WGS 84, Zone 49N)	**To**	632,770	5,367,920	1,095
Extent (m)		420	670	495
Rotation (°)		0	0	0
Primary block size (m)		2.0	5.0	5.0
Primary block numbers		210	134	99
Sub-block number		1	1	1
Total block number		96,259		

Block domains: The build process also tagged the blocks with the respective domain numbers (Table 49).

Block variables: Variables were created for:
- Grades: Au (g/t), AuEg (g/t), Ag (g/t), Cu (%), Pb (%), Zn (%)
- Classification: Au_D (average distance (m)), Au_P (number points), Au_CAT (class number)

Oxidation levels were not loaded into the blocks as this was accounted for dynamically in Resource reporting using the oxidation surface models as vertical limits.

BLOCK GRADES

Block grades in each deposit block model were estimated individually from assays in the drill hole database.

Block grades are described in terms of:
- Grade estimation
- Resource classification parameters
- Validation

[46] 2017 NI 43-101. Section 14.3.1, pp 121.

- Grade plotting – on cross-section.

BLOCK GRADE ESTIMATION

Domain control: Data population control within each deposit (or lode) was ensured by matching the block domains (loaded from the wire-frame models) with the sample domains (interpreted to match the deposit outlines).

Sample compositing: Sample compositing is done within domains. For the more massively shaped Pipe 1, 2 and 4 deposits the drill hole samples were composited down-hole to exactly 2.0 m with residuals included >1.0 m (50%). For the taller thinner lodes at Mungu the drill hole samples were composited down-hole to exactly 1.0 m with residuals included >0.5 m (50%).

Cutting / clipping input grades: No cutting or clipping was done of input or output grade data as none was considered necessary. The Author QP's justification of this was twofold. In the first place the consulting time precluded detailed statistical analysis (and therefore fine-tuning grade estimation). And secondly and more importantly he considered that the input mineralised data did not contain extremely anomalous values, and in fact was very mildly distributed between highs and lows. Given the large numbers of potential samples available to estimate each grade block single outlier grades would have very little influence. And the Author QP here wanted to allow those limited highly anomalous samples to have some limited influence.

Estimation algorithm & parameters: Block grade estimation was performed using a standard inverse distance squared algorithm (ID2). Parameters were applied slightly differently between the deposits to adapt to their orientations. The same parameters were applied to all elements estimated (gold, silver, copper, lead, zinc). Grade estimation parameters are given in Table 53.

Table 53 Grade estimation parameters

Parameter			Pipe 1		Pipe 2 & 4		Mungu	
Data limits			-		-		-	
Scan (m)			75		75		75	
Points	**Min sectors**		1		1		1	
	Max pts/sector		3		3		3	
Axes	**Rotation (°)**	**X**	0		0		0	
		Y	+10	Dip 80°W	+45	Dip 45°W	0	
		Z	0		0		+33	Strike 033°
	Weighting	**X**	1.5	Weaker E/W	1.5	Weaker E/W	1.5	Weaker E/W
		Y	1.5	Weaker N/S	1.5	Weaker N/S	1.0	Stronger N/S
		Z	1.0	Stronger vert	1.0	Stronger vert	1.0	Stronger vert

Pipe 1 parameters: These were to apply a steep 80° westerly down-dip continuity.

Pipe 2 and 4 parameters: These were to apply a 45° westerly dip and a stronger continuity down that dip.

Mungu parameters: These were to apply a 033° strike direction and stronger continuity in the vertical strike plane.

Grade estimation statistics: Table 54 and Table 55 give the raw block estimation statistics for all elements by deposit.

Table 54 Block estimation statistics - Pipes 1, 2 and 4

Domain	Element	Accessed				Interpolated							
		Pts	Max	Min	Av	Pts	Max	Min	Av	Med	SD	Variance	CV
1	**Au (g/t)**	24,717	195.95	0.00	0.54	62,279	17.46	0.01	0.86	1.74	1.04	1.07	1.20
2	**Au (g/t)**					13,286	30.54	0.01	0.43				
4	**Au (g/t)**					72,131	41.29	0.01	0.86				
1	**Ag (g/t)**	26,497	1,256.98	0.20	5.49	62,279	518.55	0.22	5.79				
2	**Ag (g/t)**					13,286	108.35	0.36	4.01				
4	**Ag (g/t)**					72,131	571.64	0.26	11.81				
1	**Pb (%)**	32,315	23.19	0.00	0.23	62,279	7.02	0.00	0.58				
2	**Pb (%)**					13,286	6.19	0.00	0.48				
4	**Pb (%)**					72,131	5.54	0.00	0.20				
1	**Zn (%)**	32,395	33.37	0.00	0.40	62,276	20.92	0.00	0.93				
2	**Zn (%)**					13,286	19.57	0.01	0.74				
4	**Zn (%)**					72,131	10.41	0.00	0.37				

Table 55 Block estimation statistics – Mungu

Domain	Element	Accessed				Interpolated							
		Pts	Max	Min	Av	Pts/Blocks	Max	Min	Av	Med	SD	Variance	CV
All	Au (g/t)	15,265	172.00	0.01	0.53	116,629	82.15	0.01	0.71	0.43	1.75	3.07	2.47
15	Au (g/t)	"	"	"	"	5,733	3.27	0.01	0.23	0.26	0.33	0.11	1.43
5	Au (g/t)	"	"	"	"	24,434	3.96	0.01	0.43	0.96	0.35	0.12	0.81
6	Au (g/t)	"	"	"	"	21,203	5.75	0.01	0.53	0.52	0.46	0.21	0.85
7	Au (g/t)	"	"	"	"	20,189	82.15	0.01	1.31	0.79	3.02	9.12	2.31
8	Au (g/t)	"	"	"	"	22,765	48.92	0.01	1.13	0.03	2.52	6.35	2.24
9	Au (g/t)	"	"	"	"	10,920	4.04	0.01	0.40	0.16	0.46	0.22	1.17
10	Au (g/t)	"	"	"	"	8,766	3.91	0.01	0.32	0.26	0.35	0.12	1.10
11	Au (g/t)	"	"	"	"	2,619	0.82	0.01	0.22	0.19	0.15	0.02	0.71
All	Ag (g/t)	17,137	1,500.00	0.20	16.33	116,626	684.97	0.20	24.64	16.34	37.06	1373.37	1.50
All	Pb (%)	32,971	1.82	0.00	0.00	116,631	0.936	0.000	0.007	0.004	0.019	0.00	2.82
All	Zn (%)	33,130	2.62	0.00	0.01	116,631	1.661	0.000	0.020	0.016	0.031	0.00	1.56
All	Au Eq (g/t)					116,631	84.50	0.01	1.07	0.53	1.94	3.74	1.81

RESOURCE CLASSIFICATION PARAMETERS

As part of the block gold grade estimation two other variables were also estimated for each block – which the Author QP would use as the basis to JORC classification. These variables were:

- AU_D – the average distance of samples used.
  - With the Pipes 1, 2 and 4 block model the resulting statistics were:
    - Average distance 28.3 m (mean 25.1 m)
    - Minimum distance 3.4 m
    - Maximum distance 68.4 m
  - With the Mungu block model the resulting statistics were:
    - Average distance 31.2 m (mean 25.0 m)
    - Minimum distance 1.9 m
    - Maximum distance 106.4 m
- AU_P – the number of samples used. In the ATO case this would range between 1 and 18.

BLOCK GRADE VALIDATION

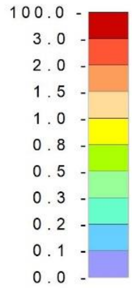
Estimated block grades were initially validated through comparison of the statistics of the source drill hole data and of the interpolated blocks (see estimation statistics Tables above). Thereafter they were checked with cross-sectional plots and through 3D visualisation.

The Author QP did not consider the raw data to have extreme statistics in the first place. Consequently the interpolated blocks were considered to be acceptable as the reflected the raw data fairly well.

BLOCK GRADE CROSS-SECTIONS

The following Figures illustrate typical vertical E/W cross-sections through the ATO deposits and the block models.

Figure 79 Gold



Blocks are colour-coded on gold grades according to the ranges and colours in Figure 79.

Drill holes are shown projected from up to 10 m either side of the sections.

Surface intersection are shown as coloured lines – topography in green, base of oxidation in black, top of fresh (or base of transition) in red.

Pipes 1, 2 and 4: Figure 80 to Figure 84 illustrates a series of east/west cross-sections, looking north, though Pipes 1, 2 and 4 (Pipe 2 on the left (e.g. Figure 84, west), Pipe 1 in the middle (e.g. Figure 82), and Pipe 4 on the right (e.g. Figure 80, east)). The sections are ordered from south to north. A full set of these cross-sections is provided in Appendix 2 – Pipe 1, 2 and 4 E/W cross-sections.

Figure 80 Pipe 1, 2 and 4 gold block cross-section 5,366,902N

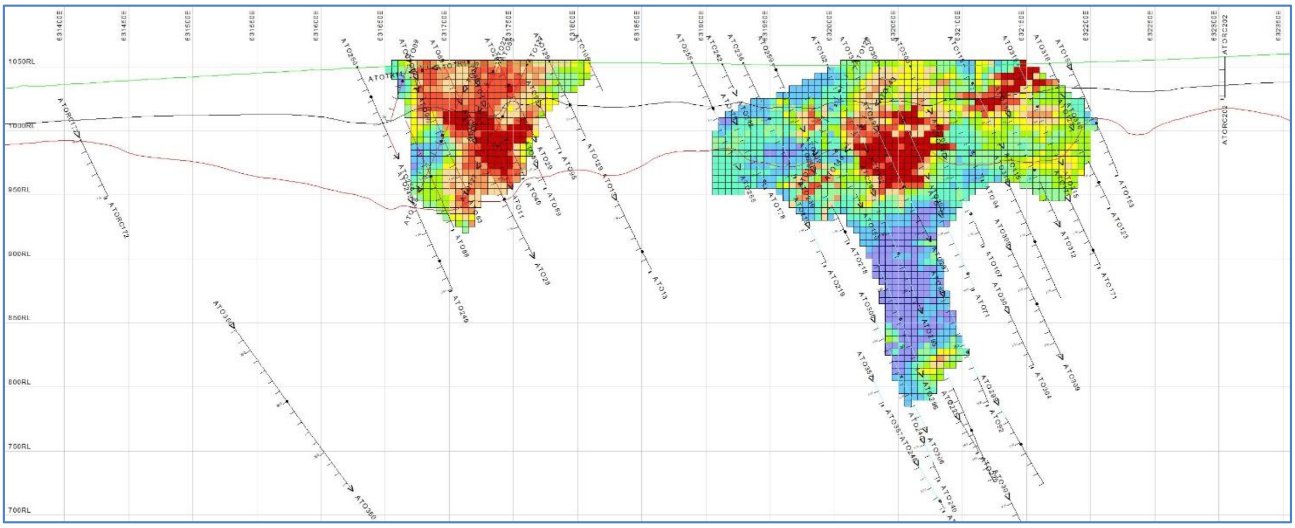


Figure 81 Pipe 1, 2 and 4 gold block cross-section 5,367,002N

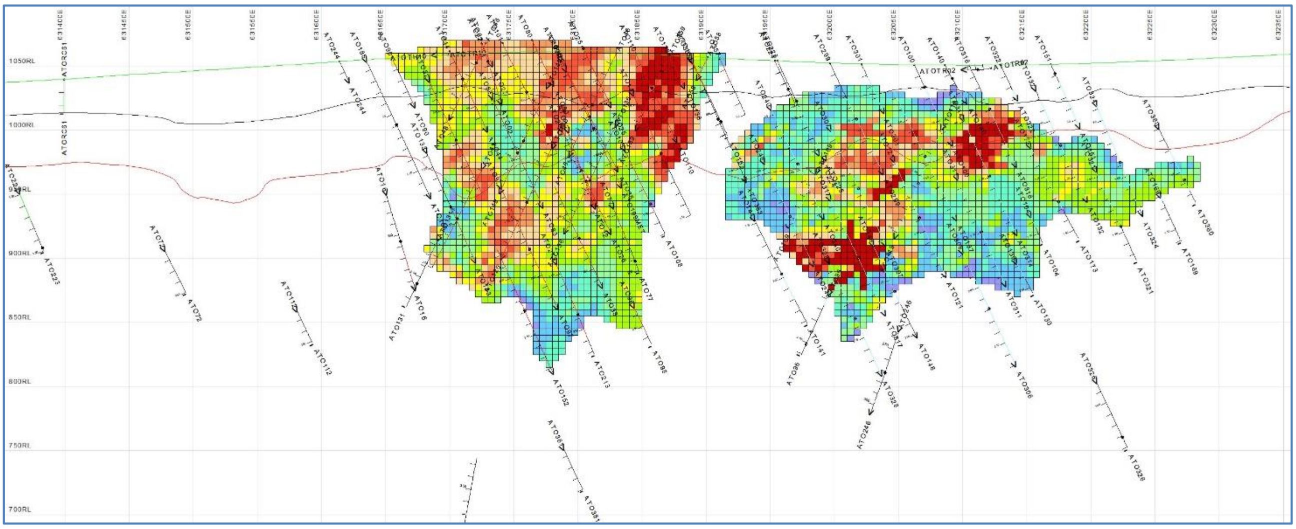


Figure 82 Pipe 1, 2 and 4 gold block cross-section 5,367,102N

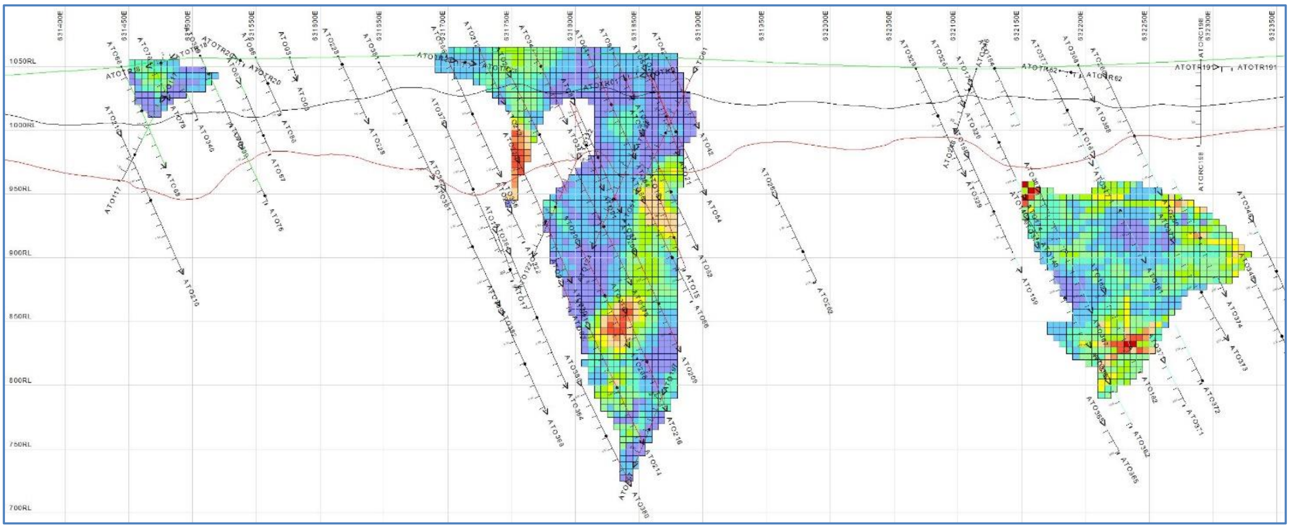


Figure 83 Pipe 1, 2 and 4 gold block cross-section 5,367,152N

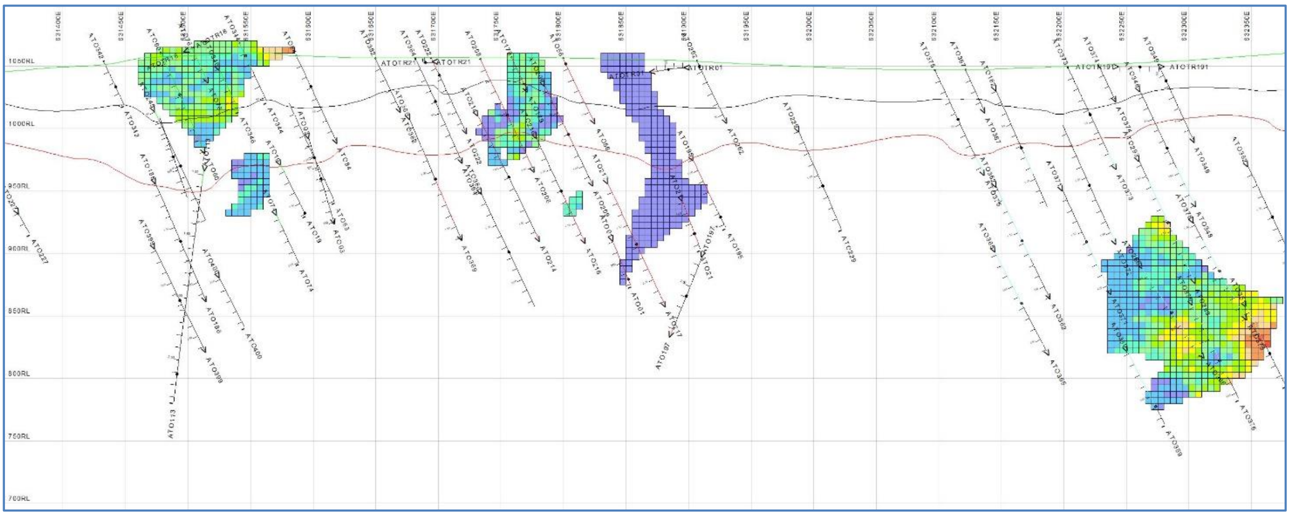
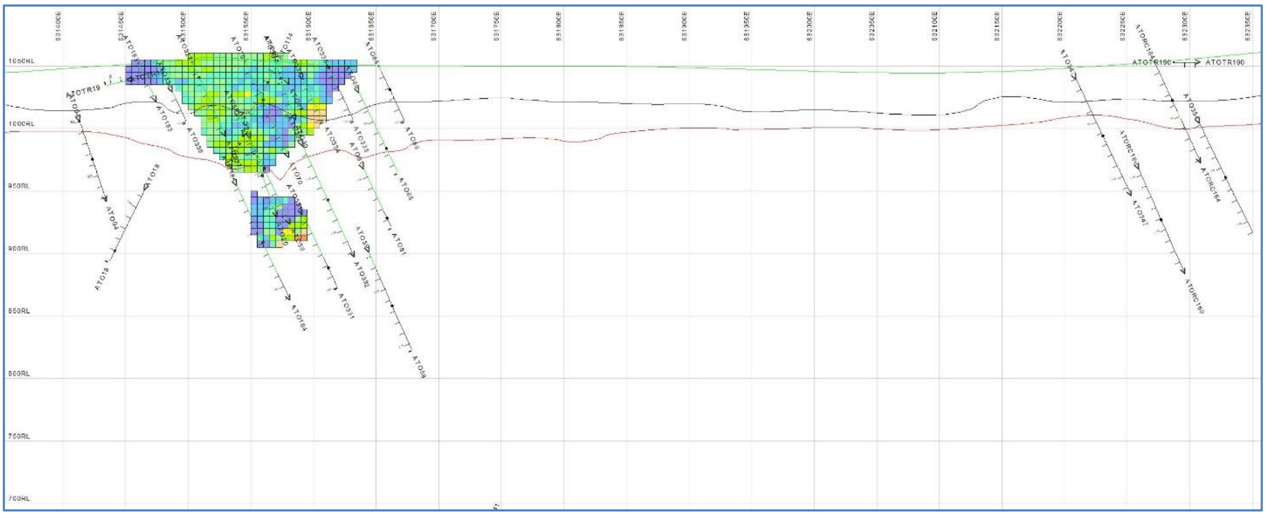


Figure 84 Pipe 1, 2 and 4 gold block cross-section 5,367,252N



Mungu: Figure 85 to Figure 88 illustrate a series of east/west cross-sections, looking north, though Mungu, showing colour-coded gold blocks. The sections are from south to north. A full set of these cross-sections is provided in Appendix 3 – Mungu E/W cross-sections.

Figure 85 Mungu gold block cross-section 5,367,502N

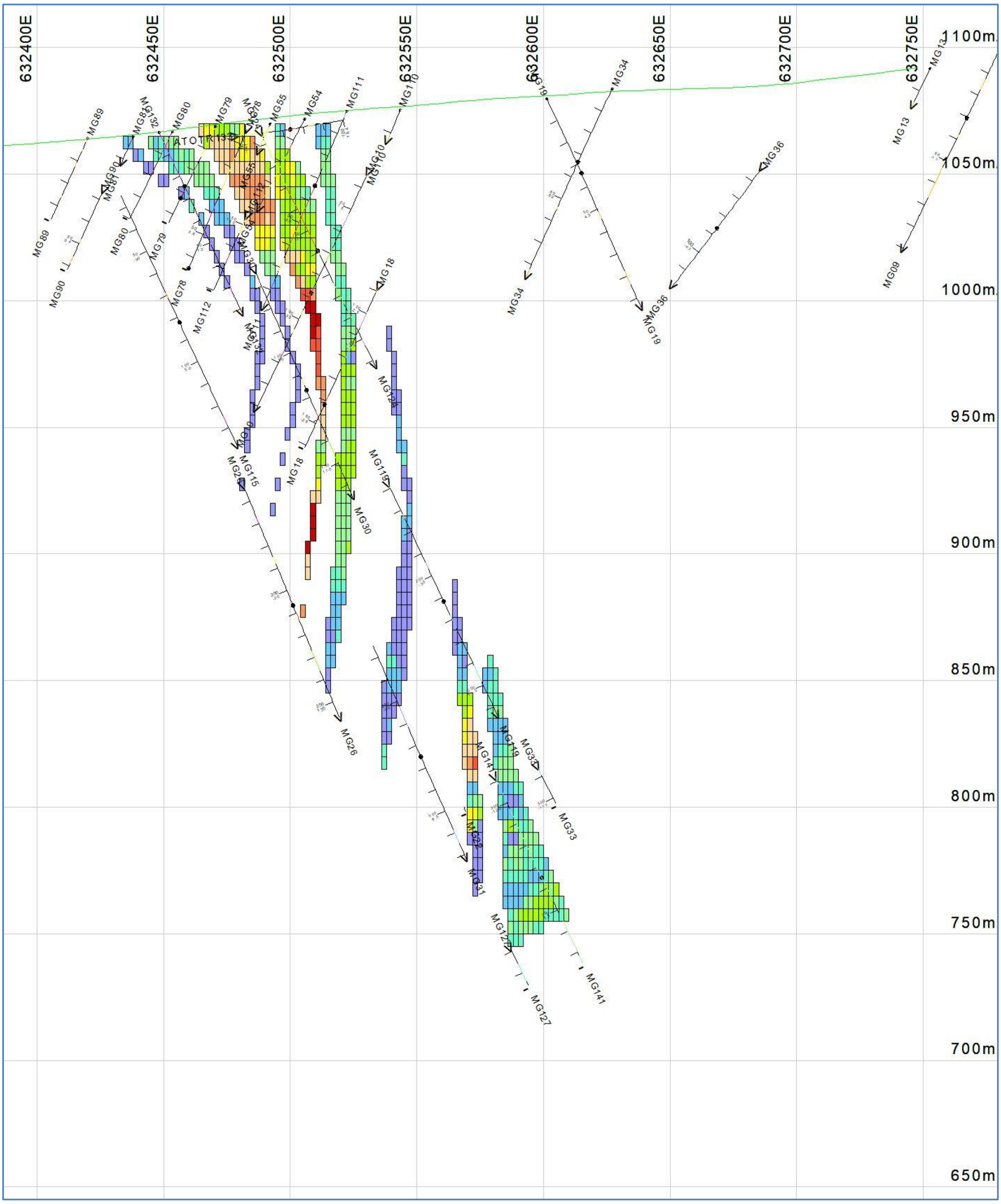


Figure 86 of cross-section 5,367,602N illustrates colour-coded block gold grades and the ~375 m vertical extent of the deposit and the ~100 m width east-west.

Figure 86 Mungu gold block cross-section 5,367,602N

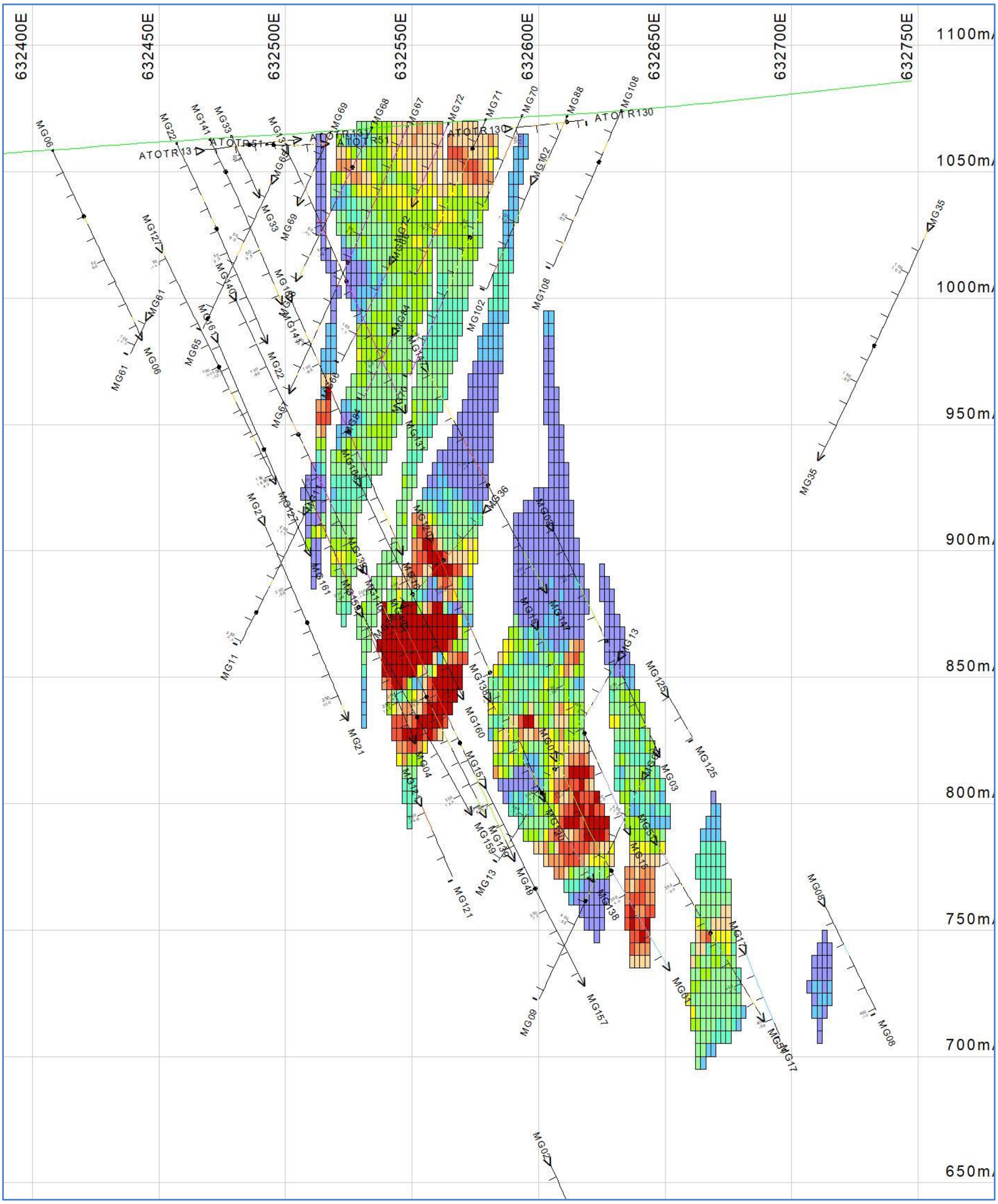


Figure 87 Mungu gold block cross-section 5,367,702N

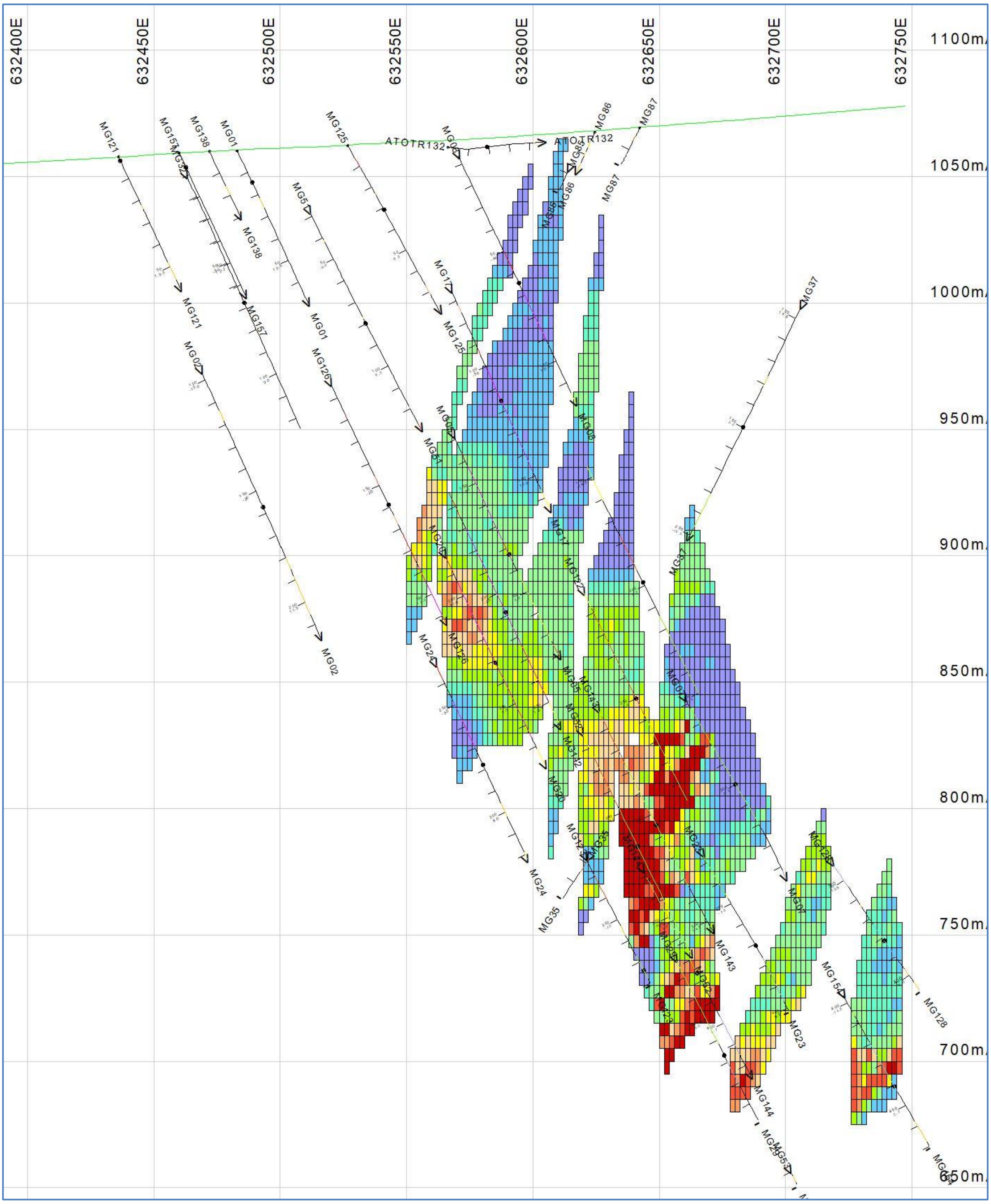
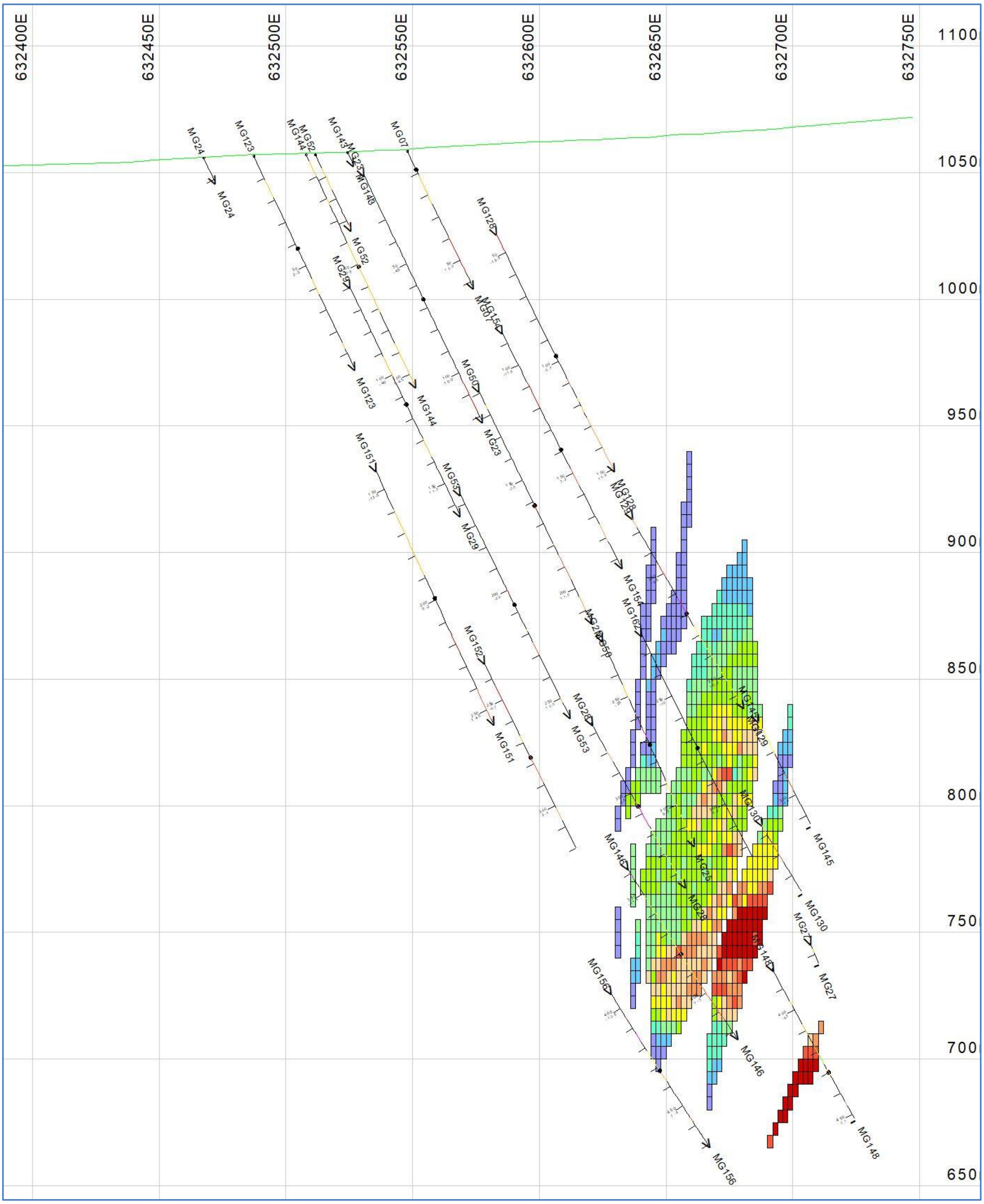


Figure 88 Mungu gold block cross-section 5,367,802N



Mungu: Figure 89 to Figure 91 illustrate a series of typical level cross-sections, looking vertically down, though Mungu, showing colour-coded gold blocks. The sections are top downward. A full set of these levels is provided in Appendix 4 – Mungu level cross-sections.

Figure 89 Mungu level 900RL

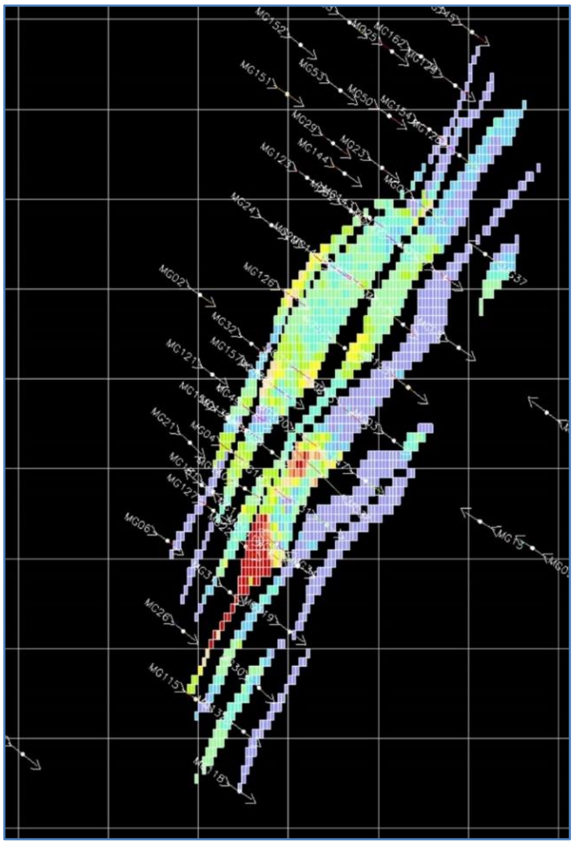


Figure 90 Mungu level 850RL

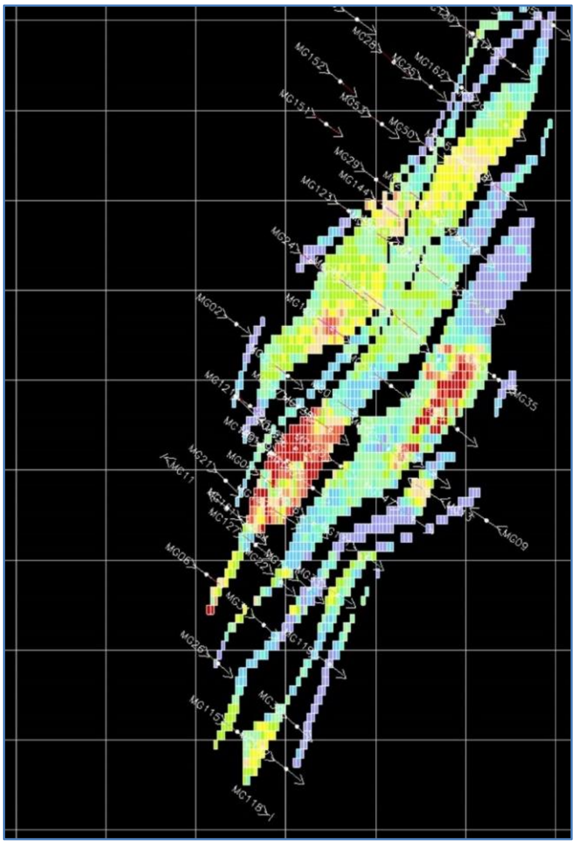
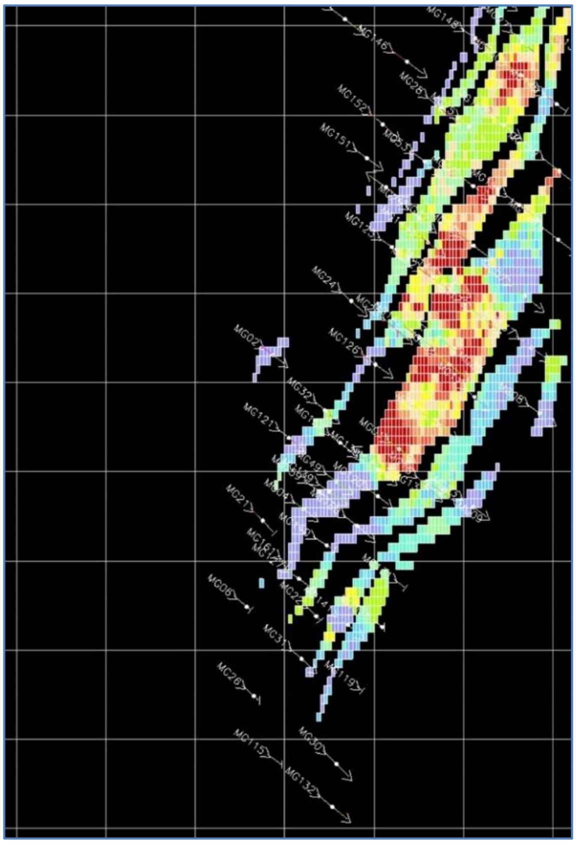


Figure 91 Mungu level 800RL



BLOCK 'GOLD EQUIVALENT' GRADE CALCULATION

A "gold equivalent" block grade (AuEq in g/t) was calculated to account for and add in the value of mineralisation other than gold at the Project. This variable was used as the lower grade cut-off in the Resource reporting.

The gold equivalent was calculated in each block from the individually estimated grades of the elements in the block. The formula was based on ~30 day averages of metal sales prices published on Kitco for the month before 11 January 2021. So the formula was effective mid-January 2021.

The AuEq formula was:

Au_Eq = Au + ((Ag * AgF) + (Pb * PbF) + (Zn * ZnF))

where the "F" for each element was the Price Factor (P) of the element relative to (divided by) gold (e.g. AgF = PAg/PAu).

So where a unit price of gold was reduced to 1.0 the factors for the elements were:

- Gold (Au) 1.000
- Silver (Ag) 0.014
- Lead (Pb %) 0.332
- Zinc (Zn %) 0.463

Copper (Cu %) was excluded because the grades were so trivial.

The factors (F) were based on the logic in Table 56:

Table 56 Price factors for gold equivalent calculation (effective mid-January 2021)

International price (Kitco)			Metric price			Convert to price for a single unit of grade (eg 1% or 1 g/t)				AuEq
Element x	Listed price	Units	Unit conversion	Metric price	Units	Grade units	Grade conversion	Unit price Px	Units	Ratio factor Fx (Px/PAu)
Zn	0.88	US$/lb	2204.62	1,940	US$/t	%	100	19.40	US$/1%	0.462
Cu	3.55	US$/lb	2204.62	7,826	US$/t	%	100	78.26	US$/1%	1.864
Pb	0.84	US$/lb	2204.62	1,852	US$/t	%	100	18.52	US$/1%	0.441
Au	1,306	US$/oz	31.1035	41.9888	US$/g	g/t	1	41.99	US$/g	1.000
Ag	21.6	US$/oz	31.1035	0.6945	US$/g	g/t	1	0.69	US$/g	0.017
Sn ???		US$/lb	2204.62	0	US$/t	%	100	0.00	US$/1%	0.000

This gold equivalent calculation was effectively the same as the 2017 Resource estimation[47] – with the exception that no metal recoveries were applied here and the formula was applied in the same way to all blocks (ie not differently to oxide and fresh rock).

BULK DENSITY

Bulk density was studied for the 2017 Resource estimation by determining values for 226 samples. Those same results were used here also. Average values were determined for the three oxidation levels as:

- Oxide 2.46 t/m^3
- Transitional 2.59 t/m^3
- Fresh 2.64 t/m^3

RESOURCE CLASSIFICATION (CIM/JORC)

JORC Resource classification required distilling geological and data factors into a decision on the potential classification level and then developing a scheme to implement that classification. To some extent this decision would require consideration of the past classification used for the 2017 estimate.

[47] 2017 NI 43-101. Section 14.8, pp140-141.

Classification is described in terms of:

- Level and justification – what classes the Author QP decided.
- Method – how to implement classification based on estimation distances and numbers of samples.
- Criteria – the values used to differentiate Resource classes.
- Cross-sections – through the classes to illustrate distribution.

CLASSIFICATION LEVEL AND THINKING

In the previous 2017 Resources a high 93% of estimated blocks by tonnage in the Pipe 1, 2 and 4 deposits were classified as Measured and Indicated, with Measured representing 64% and Indicated representing 36%. The Author QP would consider those proportions to have been relatively too high given:

- the mid-range exploration status of the Property at the time (not particularly developed and exposed);
- the arguably maiden status of the Resource reporting.
- and the Author's view that the geological model (based as it was on grade shells) took comparatively little account of geology.

Notwithstanding the Author's QP slightly negative view of the past classification his considered opinion here is that the bulk of material should still be partly classified as Measured[48] and partly as Indicated[49]. Resources but with a slightly higher proportion (than in the past) of Indicated (42%, Table 60) given the rigour required to meet the Measured status. Peripheral material (surrounding the other classes where drilling information declines) should be classified as Inferred[50] Resources.

With regard to classification decisions, he considers overall that:

1. The deposits are well, closely (~30 m), and fairly uniformly drilled.
2. In-fill drilling since the 2017 estimate has very largely confirmed the previous results, thus raising confidence.
3. Mineralised zones are very clearly continuous over multiple adjacent drill holes, thus giving confidence in the drill hole spacing and geological deposit interpretation.
4. The good continuity and compact nature (shape) of the deposit shapes (particularly at Pipe 1, 2 and 4) lends great support to allow detailed down-stream mine planning.
5. The mine planning mentioned above would no doubt be optimised after further exploration (particularly of the Mungu deposit with its deeper aspects) to fully 'close-out' the deposits.
6. The lack of bulk sampling from wide openings and/or physical access to the deposits at surface and depth are mitigated by the high-quality core drilling method overwhelmingly employed for exploration (which allows a reasonable visual appreciation of the rock as well as facilitating geotechnical analysis).

All points justify the Indicated Resource classification and points 4 to 6 further justify the Measured Resource classification.

CLASSIFICATION METHOD

The JORC classification used here differed from the method used in the 2017 estimate. That classification was based on reporting Measured Resources from a first pass grade estimate, Indicated Resources from a second and Inferred Resources from a third[51]. The passes differed in estimation parameter, essentially increasing scan distances relating to different components of the geostatistical variograms.

For JORC classification here the Author QP used combinations of the average sample distances (D) and number of samples/points (P) stored for each block during the single-pass block gold grade estimation. Ranges of these D and P values would then be decided based on statistics, distribution and concepts for the Resource. These ranges would then be combined to compute vales into a block categorisation (CAT) using an SQL macro.

The CAT block value would be set to 3 for Measured, 2 for Indicated or 1 for Inferred. This value would be used to subdivide the Resource reporting into classes.

[48] JORC Code (2012 Edition), point 23, pp13.
[49] JORC Code (2012 Edition), point 22, pp13.
[50] JORC Code (2012 Edition), point 21, pp12.
[51] 2017 NI 43-101, Section 14.9.1, pp 141.

CLASSIFICATION CRITERIA

Based on drill hole sample statistics, average drill hole spacing and inspection of the D and P values on cross-section, the criteria in Table 57 were developed. This process was adapted iteratively by seeing where the resultant classifications were distributed on cross-section – with the aim of developing combinations which would have a large degree of spatial continuity (and avoiding the 'spotted dog' pattern).

With the dense and fairly equi-spaced drill hole data by far the principal component of the classification was the distance (D) variable.

Table 57 JORC Classification criteria

Resource class	Average distance AU_D (m)	Number points AU_P (#)	Class AU_CAT
Measured	≤27.5	≥12	3
Indicated	≤35.0	≥6	2
Inferred	>35.0	≥1	1

It was decided not to refine the classifications further, based on physical location (such as by elevation of actual digitised areas), because the existing classification was considered adequate.

BLOCK CLASSIFICATION CROSS-SECTIONS

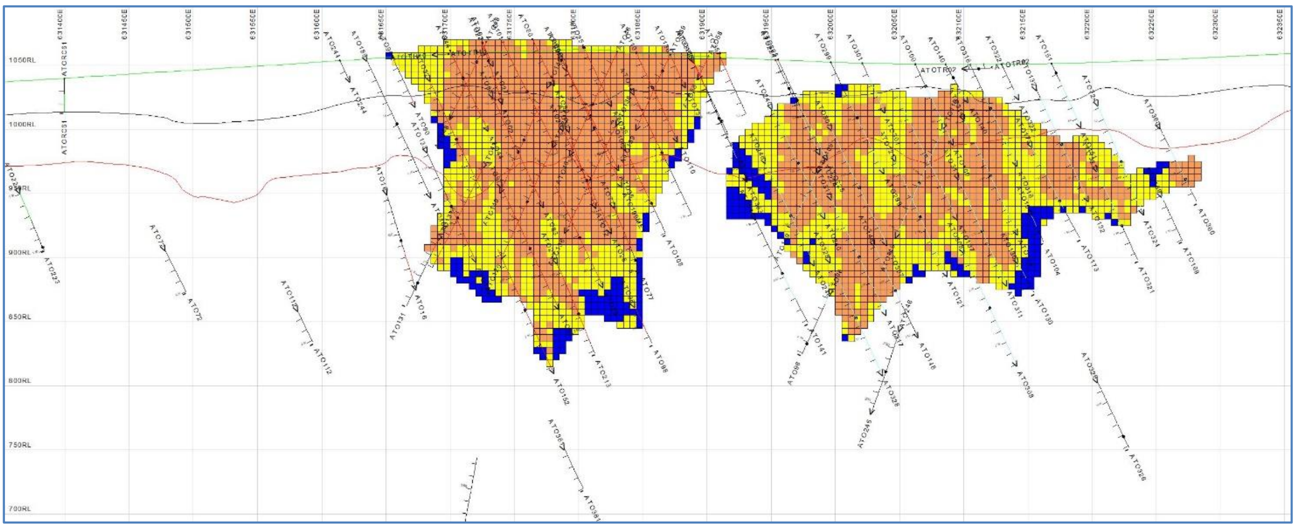
Pipes 1 and 4: Figure 92 to Figure 94 illustrate the distance (D), points (P) and eventual classification (CAT) on a typical block cross-section at the Pipes 1 and 4 deposits (Pipe 2 to the west is completely north of this cross-section).

In these plots the block colouring scheme is:

- Distance: ≤27.5 m orange (≈Measured) ≤35.0 m yellow (≈Indicated) >35m blue (≈Inferred).
- Points: ≥12 orange (≈Measured) ≥6 yellow (≈Indicated) ≥ blue (≈Inferred).
- Classification: 3 orange (Measured) 2 yellow (Indicated) 1 blue (Inferred).

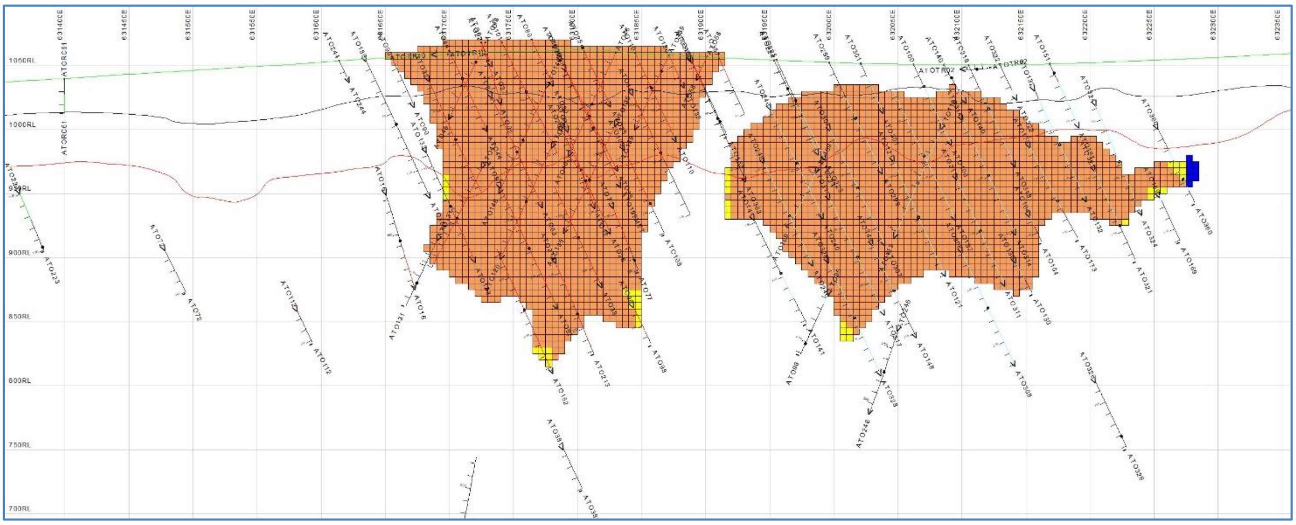
The distance plot Figure 92 clearly illustrates the preponderance of areas of close-spaced (<27.5 m) drilling (orange). It also illustrates that there are proportionately very few blocks where the average estimation distance is >35 m (blue).

Figure 92 Pipe 1 and 4 distance (D) block cross-section 5,367,000N



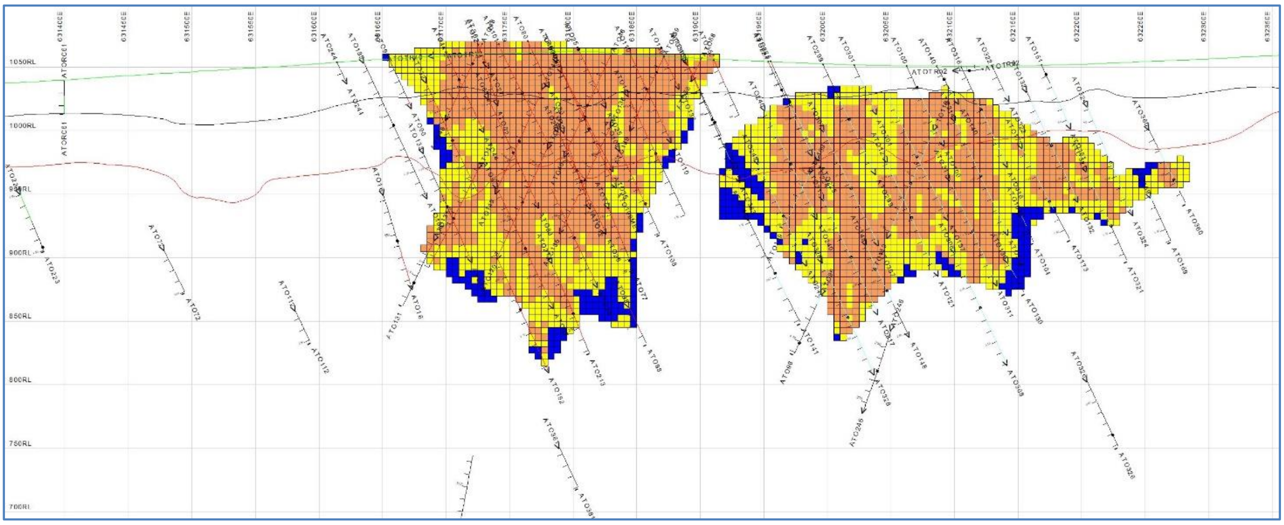
The points plot Figure 93 illustrates that virtually all blocks had at least 12 points (orange) in their estimation, even the blocks at the edge of modelled deposits.

Figure 93 Pipe 1 and 4 points (P) block cross-section 5,367,000N



The eventual classification Figure 94 is seen to virtually mirror the distance plot on this central cross-section to Pipes 1 and 4.

Figure 94 Pipe 1 and 4 classification (CAT) block cross-section 5,367,000N



Mungu: Figure 95 to Figure 97 illustrate the distance (D), points (P) and eventual classification (CAT) on a typical block cross-section at the Mungu deposit.

The comments made above for the plots for distance, points and classification in Pipes 1 and 4 also very largely apply to the Mungu plots below.

In terms of distance the lower deeper parts of Mungu were only drilled in a steeply dipping zone ~100 m wide and hence the deposit has zones with longer distances.

Figure 95 Mungu distance (D) block cross-section 5,367,600N

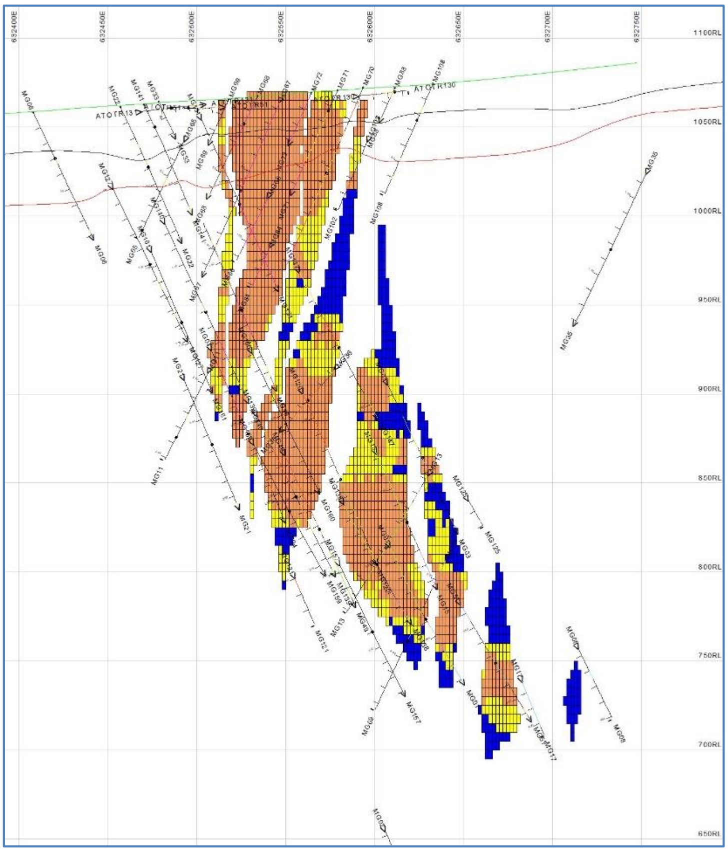


Figure 96 Mungu points (P) block cross-section 5,367,600N

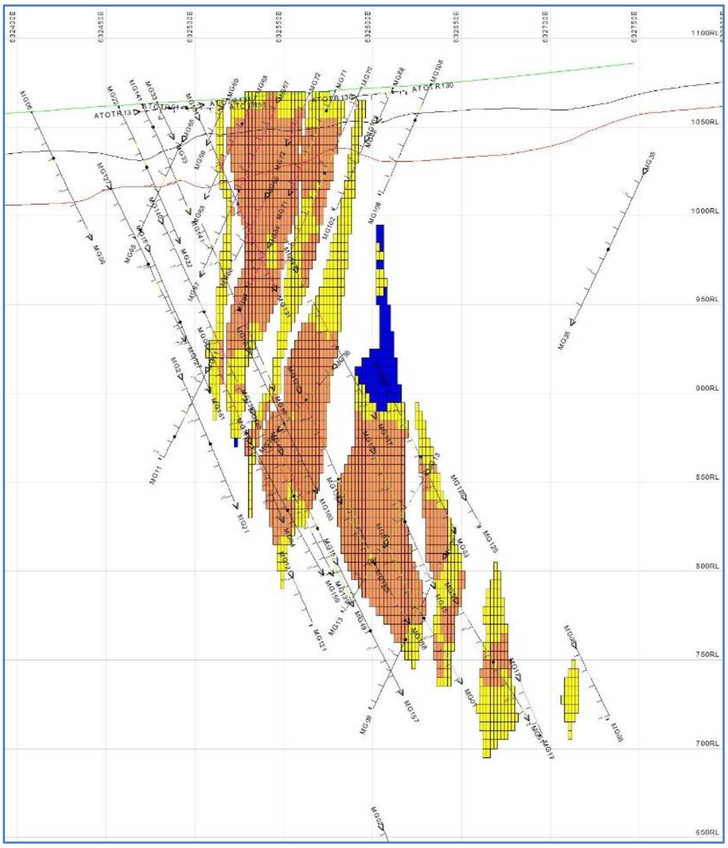
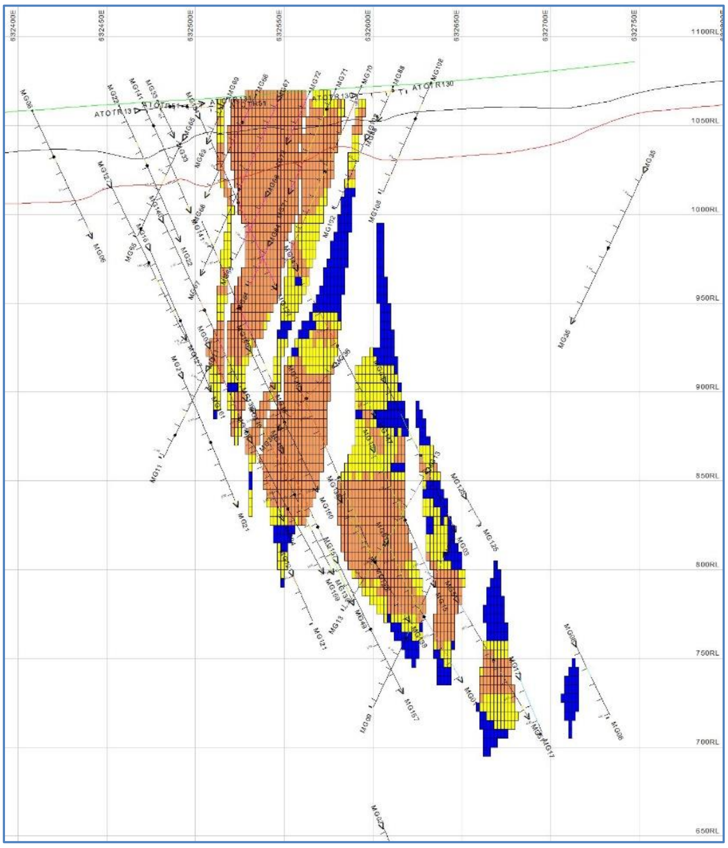


Figure 97 Mungu classification (CAT) block cross-section 5,367,600N



ATO 2021 JORC MINERAL RESOURCES

The Author QP reports here the Minerals Resources estimated in late 2021 and early 2021 for the ATO Project. The effective date of these reports is February 2021 when Steppe issued a press release[52].

Requisite statements, certifications and declarations by the Author QP are made above to satisfy the reporting codes governing these Resources. This JORC classification is directly equivalent to CIM categorisation, as stated in the Terms of Reference Section 0.

The basis for the JORC classification here is given above. The disclosure of Resource categories is specifically governed by NI 43-101 (in contrast to straight JORC reporting) and precludes the addition of Inferred Resources to Measured and Indicated Resources – hence they are reported separately below.

Cut-off grades: Lower cut-off grades to use in reporting were applied by oxidation level. Values used in the 2017 reporting[53] were 0.3 g/t AuEq for oxide material and 1.1 g/t AuEq for fresh material (it is not clear which level the transitional material was grouped with), considerably different to those used here.

Lower grade cut-offs used here were applied to the AuEq variable, were stipulated by Steppe, and were:

- Oxide 0.15 g/t AuEq
- Transitional 0.40 g/t AuEq
- Fresh 0.40 g/t AuEq

Bulk density: Bulk densities were applied by oxidation level, were describedabove, and were:

- Oxide 2.46 t/m^3
- Transitional 2.59 t/m^3
- Fresh 2.64 t/m^3

Reporting by oxidation level: JORC (2012 Edition) classified Measured and Indicated classes of in-situ Global Mineral Resources of gold and related precious and base metals are reported by oxidation level for the ATO Project, as at February 2021, in Table 58. These Resources supersede any previously reported. Here the deposit names ATO1, ATO2 and ATO4 are interchangeable with names Pipe 1, Pipe 2 and Pipe 4 mentioned in the Report and in the past. Bulk densities were applied by oxidation level, as were lower gold equivalent grade cut-offs (both given above). Numbers have been rounded and may not sum exactly.

[52] Steppe, 24 February 2021. Press release through Newsfile Corp.
[53] 2017 NI 43-101. Section 14.9.4, pp145.

Table 58 ATO 2021 Measured & Indicated in-situ Mineral Resources - by oxidation level

ATO - JORC Classified Resources by oxidation surface level. Reported 18 February 2021 (V3).													
CLASS BY OXIDATION LEVEL	Deposit	Cut-off AuEq (g/t)	Bulk density (t/m^3)	Tonnes (M t)		Grades					Metal		
						Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)	AuEq (g/t)	Au (k oz)	Ag (k oz)	AuEq (k oz)
MEASURED													
Oxide	ATO1	0.15	2.46	2.6		1.22	9.34	0.59	0.33	1.70	103	786	143
(above OX_SF)	ATO2	0.15	2.46	1.1		0.46	3.58	0.40	0.33	0.79	17	130	29
	ATO4	0.15	2.46	0.7		0.99	20.49	0.17	0.28	1.46	23	471	34
	Mungu	0.15	2.46	0.3		0.66	25.21			1.01	7	258	10
	TOTAL	**0.15**	**2.46**	**4.8**	**20%**	**0.97**	**10.71**	**0.44**	**0.30**	**1.40**	**149**	**1,645**	**216**
Transition	ATO1	0.40	2.59	3.4		1.45	6.46	0.72	1.16	2.31	160	712	255
(between OX_SF	ATO2	0.40	2.59	0.4		0.33	4.07	0.64	1.40	1.25	4	55	17
and TR_SF)	ATO4	0.40	2.59	2.4		1.41	17.24	0.21	0.39	1.90	111	1,356	149
	Mungu	0.40	2.59	0.4		0.69	39.49		0.01	1.25	8	448	14
	TOTAL	**0.40**	**2.59**	**6.6**	**28%**	**1.32**	**12.03**	**0.49**	**0.83**	**2.04**	**283**	**2,570**	**435**
Fresh	ATO1	0.40	2.64	3.8		0.78	5.25	0.75	1.52	1.80	94	635	218
(below TR_SF)	ATO2	0.40	2.64	0.1		0.42	5.64	1.07	2.73	2.12	2	21	8
	ATO4	0.40	2.64	4.4		1.32	8.53	0.36	0.63	1.85	185	1,197	260
	Mungu	0.40	2.64	4.3		1.41	45.16	0.01	0.03	2.06	194	6,206	283
	TOTAL	**0.40**	**2.64**	**12.5**	**52%**	**1.18**	**20.03**	**0.36**	**0.71**	**1.91**	**475**	**8,058**	**768**
MEASURED	**TOTAL**			**23.9**	**58%**	**1.18**	**15.95**	**0.41**	**0.66**	**1.84**	**907**	**12,274**	**1,419**
INDICATED													
Oxide	ATO1	0.15	2.46	1.1		0.84	8.80	0.50	0.25	1.25	30	314	45
(above OX_SF)	ATO2	0.15	2.46	1.0		0.44	3.55	0.33	0.26	0.72	15	118	24
	ATO4	0.15	2.46	0.9		0.85	20.28	0.13	0.22	1.28	25	587	37
	Mungu	0.15	2.46	0.2		0.43	15.30			0.65	3	99	4
	TOTAL	**0.15**	**2.46**	**3.2**	**18%**	**0.69**	**10.72**	**0.31**	**0.23**	**1.05**	**72**	**1,118**	**110**
Transition	ATO1	0.40	2.59	1.3		1.04	5.96	0.64	1.08	1.83	45	256	79
(between OX_SF	ATO2	0.40	2.59	0.3		0.44	4.67	0.64	1.35	1.34	4	46	13
and TR_SF)	ATO4	0.40	2.59	1.9		1.26	21.78	0.13	0.29	1.74	79	1,359	109
	Mungu	0.40	2.59	0.1		0.55	24.55		0.01	0.90	2	75	3
	TOTAL	**0.40**	**2.59**	**3.7**	**21%**	**1.09**	**14.67**	**0.35**	**0.66**	**1.72**	**129**	**1,737**	**203**
Fresh	ATO1	0.40	2.64	3.0		0.66	4.54	0.69	1.44	1.62	63	433	154
(below TR_SF)	ATO2	0.40	2.64	0.1		0.54	5.96	1.14	2.98	2.38	3	29	11
	ATO4	0.40	2.64	5.3		0.86	12.06	0.27	0.49	1.35	147	2,060	231
	Mungu	0.40	2.64	2.3		0.93	37.85	0.01	0.03	1.47	70	2,830	110
	TOTAL	**0.40**	**2.64**	**10.8**	**61%**	**0.82**	**15.48**	**0.34**	**0.69**	**1.46**	**282**	**5,351**	**506**
INDICATED	**TOTAL**			**17.7**	**42%**	**0.85**	**14.44**	**0.34**	**0.60**	**1.44**	**483**	**8,206**	**819**
MEASURED + INDICATED													
Oxide	TOTAL	0.15	2.46	8.0	19%	0.86	10.72	0.39	0.27	1.26	221	2,763	325
Transition	TOTAL	0.40	2.59	10.3	25%	1.24	12.97	0.44	0.77	1.92	412	4,307	638
Fresh	TOTAL	0.40	2.64	23.3	56%	1.01	17.93	0.35	0.70	1.70	757	13,409	1,274
MEAS + IND	**TOTAL**			**41.6**		**1.04**	**15.31**	**0.38**	**0.63**	**1.67**	**1,390**	**20,479**	**2,238**

JORC classified Inferred Resources of in-situ Global Mineral Resources of gold and related precious and base metals are reported by oxidation level for the ATO Project, as of February 2021, in Table 59.

Table 59 ATO 2021 Inferred in-situ Mineral Resources- by oxidation level

ATO - JORC Classified Resources by oxidation surface level. Reported 18 February 2021 (V3).													
CLASS BY OXIDATION LEVEL	Deposit	Cut-off AuEq (g/t)	Bulk density (t/m^3)	Tonnes (M t)		Grades					Metal		
						Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)	AuEq (g/t)	Au (k oz)	Ag (k oz)	AuEq (k oz)
INFERRED													
Oxide	ATO1	0.15	2.46	0.2		0.45	6.10	0.28	0.22	0.73	2	32	4
(above OX_SF)	ATO2	0.15	2.46	0.3		0.28	3.26	0.21	0.24	0.51	2	27	4
	ATO4	0.15	2.46	0.2		0.73	10.83	0.10	0.16	0.99	5	74	7
	Mungu	0.15	2.46	0.1		0.37	9.41			0.50	1	22	1
	TOTAL	**0.15**	**2.46**	**0.7**	**13%**	**0.46**	**6.83**	**0.17**	**0.19**	**0.70**	**11**	**155**	**16**
Transition	ATO1	0.40	2.59	0.1		1.16	6.49	0.63	1.24	2.03	4	23	7
(between OX_SF	ATO2	0.40	2.59	0.1		0.39	8.12	1.17	2.21	1.91	1	26	6
and TR_SF)	ATO4	0.40	2.59	0.1		0.66	16.15	0.08	0.23	1.02	1	36	2
	Mungu	0.40	2.59	0.1		0.45	14.84		0.01	0.66	1	25	1
	TOTAL	**0.40**	**2.59**	**0.3**	**6%**	**0.71**	**10.34**	**0.58**	**1.12**	**1.56**	**8**	**110**	**17**
Fresh	ATO1	0.40	2.64	0.9		0.44	3.88	0.58	1.36	1.32	12	109	37
(below TR_SF)	ATO2	0.40	2.64	0.1		0.17	9.45	1.45	3.27	2.29	1	31	8
	ATO4	0.40	2.64	2.0		0.59	15.30	0.20	0.37	1.04	38	989	67
	Mungu	0.40	2.64	1.6		0.85	26.11	0.01	0.02	1.23	44	1,339	63
	TOTAL	**0.40**	**2.64**	**4.6**	**82%**	**0.64**	**16.75**	**0.23**	**0.50**	**1.19**	**95**	**2,468**	**175**
INFERRED	**TOTAL**			**5.6**		**0.62**	**15.13**	**0.25**	**0.50**	**1.15**	**113**	**2,732**	**208**

Reporting by class: Table 60 reports similar Measured and Indicated Resources to those in Table 58 – except summarised by class.

Table 60 ATO 2021 Measured & Indicated in-situ Mineral Resources - by class

ATO - JORC Classified Resources by Deposit. Reported 18 February 2021 (V3).											
CLASS BY DEPOSIT	Deposit	Tonnes (M t)		Grades					Metal		
				Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)	AuEq (g/t)	Au (k oz)	Ag (k oz)	AuEq (k oz)
MEASURED	ATO1	9.8		1.13	6.76	0.70	1.08	1.95	357	2,133	616
	ATO2	1.7		0.42	3.84	0.51	0.76	1.00	23	205	53
	ATO4	7.5		1.32	12.50	0.29	0.52	1.83	319	3,024	443
	Mungu	4.9		1.31	43.47	0.01	0.03	1.93	208	6,912	308
	TOTAL	**23.9**	**58%**	**1.18**	**15.95**	**0.41**	**0.66**	**1.84**	**907**	**12,274**	**1,419**
INDICATED	ATO1	5.4		0.79	5.77	0.64	1.11	1.60	138	1,003	278
	ATO2	1.5		0.45	4.02	0.48	0.76	1.02	22	193	49
	ATO4	8.2		0.95	15.28	0.22	0.41	1.44	250	4,006	376
	Mungu	2.6		0.88	35.63	0.01	0.03	1.39	74	3,004	117
	TOTAL	**17.7**	**42%**	**0.85**	**14.44**	**0.34**	**0.60**	**1.44**	**483**	**8,206**	**819**
MEAS + IND	ATO1	15.2	37%	1.01	6.41	0.68	1.09	1.83	495	3,137	893
	ATO2	3.1	8%	0.44	3.93	0.49	0.76	1.01	44	398	102
	ATO4	15.7	38%	1.13	13.95	0.26	0.46	1.62	569	7,029	819
	Mungu	7.6	18%	1.16	40.75	0.01	0.03	1.74	282	9,916	424
MEAS+IND	**TOTAL**	**41.6**		**1.04**	**15.31**	**0.38**	**0.63**	**1.67**	**1,390**	**20,479**	**2,238**

Table 61 reports similar Inferred Resources to those in Table 59 – except summarised by class.

Table 61 ATO 2021 Inferred in-situ Mineral Resources - by class

ATO - JORC Classified Resources by Deposit. Reported 18 February 2021 (V3).										
CLASS BY DEPOSIT	Deposit	Tonnes (M t)	Grades					Metal		
			Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)	AuEq (g/t)	Au (k oz)	Ag (k oz)	AuEq (k oz)
INFERRED	ATO1	1.1	0.51	4.44	0.54	1.19	1.30	19	164	48
	ATO2	0.5	0.28	5.70	0.70	1.34	1.21	4	84	18
	ATO4	2.3	0.61	14.91	0.19	0.35	1.03	45	1,098	76
	Mungu	1.7	0.82	25.05	0.01	0.02	1.18	45	1,386	65
INFERRED	**TOTAL**	**5.6**	**0.62**	**15.13**	**0.25**	**0.50**	**1.15**	**113**	**2,732**	**208**

RECONCILIATION – OF RESOURCES WITH OTHER ESTIMATES

Reconciliation of these 2021 Resources could only be done for the three deposits al reported in the 2017 estimate (Pipes 1, 2 and 4). No data existed to reconcile the Mungu deposit against. Reconciliation was approximated to account for differences in estimate reporting parameters (principally cut-off grade) between 2017 and 2021.

The 2017 report used lower AuEq cut-off grades of 0.30 g/t in Oxide and 1.10 g/t in Fresh as opposed to the 0.15 g/t in Oxide and 0.40 g/t in Transition and Fresh here. And the actual Oxide/Fresh interface surface models would have differed to some degree in interpretation. However, a reasonable approximation was made by excluding material reported below 0.30 g/t from the 2017 Resources reported with a lower cut-ff of 0.1 g/t (by using the 2017 Resources broken-down by Grade Group[54]). As the 2017 reporting omitted some elements (AuEq, Pb and Zn) grade comparisons were only possible for Au and Ag.

Comparable Measured and Indicated Resources for equivalent deposits (Pipes 1, 2 and 4) and similar lower AuEg cut-offs (~0.3 g/t) are given in Table 62 for 2017 reporting (light blue) and 2021 reporting (light green).

Table 62 Comparable Resource reconciliation 2017 / 2021

Estimate	Resource Class	Tonnes (M t)		Au (g/t)		Ag (g/t)		Au metal (k oz)		Ag metal (k oz)	
GSTATS 2017	Measured	16.2	60%	1.14		7.35		592		3,835	
GSTATS 2017	Indicated	11.0	40%	0.91		9.76		319		3,431	
GSTATS 2017	**Total**	**27.2**		**1.04**		**8.32**		**911**		**7,266**	
GeoRes 2021	Measured	19.0	56%	1.14		8.78		698		5,362	
GeoRes 2021	Indicated	15.1	44%	0.85		10.75		409		5,201	
GeoRes 2021	**Total**	**34.0**		**1.01**		**9.65**		**1,108**		**10,564**	
2021 difference	Measured	2.8	17%	0.01	1%	1.43	19%	107	18%	1,527	40%
2021 difference	Indicated	4.1	37%	-0.06	-7%	0.99	10%	90	28%	1,771	52%
2021 diff	**Total**	**6.9**	**25%**	**-0.03**	**-3%**	**1.33**	**16%**	**197**	**22%**	**3,298**	**45%**

This 2021 Resource contained 25% more tonnes (34.0 Mt vs 27.2 Mt) at a 3% lower Au grade (1.01 g/t vs 1.04 g/t) and a 16% higher Ag grade (9.65 g/t vs 8.32 g/t). These combined to give the 2021 Resource 22% more contained Au metal (1.11 M oz vs 0.91 M oz) and 45% more contained Ag metal (10.56 M oz vs 7.27 M oz).

The QP considers that the 2017 and 2021 Resources can be well reconciled. Whilst the tonnage differences are notable, they are considered to be almost wholly due to the different deposit modelling approaches of the two estimates. And further drilling at the deposit since 2017 was also thought to have increased its volume.

The 2017 estimate used Leapfrog's gold grade shells to define the Resources; this 2021 estimate used detailed section-by-section multi-element mineralisation interpretation. This 2021 estimate better integrates geological deposit shape interpretation with practical mining shapes (essentially more contiguous shapes). They include greater internal low-grade dilution than in 2017 – which increases the volume and reduces the gold grade (albeit by a trivial amount which is almost fully within the Indicated sections). The greater consideration of elements other than gold during the deposit shape interpretation, particularly of silver, had the consequence of including more silver mineralisation and raising the silver grade.

POTENTIAL IMPACT ON RESOURCES BY OTHER FACTORS

The Author QP was not aware of any other factors (excluding those specifically mentioned below here), including environmental, title, economic, market or political, which could generally or in-particularly influence the Resources reported here for the ATO Project.

***Grade cut-off*:**

- In the Author QP's experience the cut-offs used here are comparatively low.
- Raising cut-offs would reduce the Resources. The Author QP has not studied the relationship between cut-off and Resources – but does not believe that raising the cut-off slightly (say to 0.5 g/t AuEq) would reduce Resources significantly.

[54] 2017 NI 43-101. Section 14.9.3, Tables 14.13 and 14.14, pp143-144.

- However, the Author QP accepts the lower grade cut-offs supplied by Steppe believing that the down-stream mining and extraction analyses performed by Steppe justify the values economically.

Bulk density:
- The Author QP is satisfied with the number (226) of bulk density determinations carried out for the 2017 Report and assumes that they were taken correctly.
- He notes that this number (226) is considerably more than many other advanced Projects achieve.
- However actual densities could prove to be different and could thus alter Resources.
- However, the Author QP does not consider that density could be significantly different to that used here, and therefore would not have a significant influence on Resources.

Gold equivalent:
- The gold equivalent calculation was based on international metals prices to mid-January 2021.
- The calculation is most susceptible to changes in the price of gold.
- Metals prices vary with time, and therefore the gold equivalent value would change – which would alter the Resources very slightly because the lower grade cut-off was based on gold equivalent.
- The Author QP has not studied the relationship between prices, gold equivalent and Resources – but does not believe that the scale of price changes normal within the recent past (say a year) would have a significant effect on Resources.

Geological model:
- The volume of the geological deposit model obviously directly influences the Resource tonnage.
- So, a reduction in model volume would reduce the Resources.
- However, the Author QP does not consider that the current model is over optimistic in size.

JORC classification:
- The Author QP has previously expressed the opinion that the 2017 reporting of Measured and Indicated Resources as 93% of the total estimated blocks was relatively too high, given the mid-range exploration status of the Project at that time and the comparatively little account of geology in the interpretation.
- Furthermore the 2017 report had Measured as 64% of the total Measured and Indicated Resources.
- Here the Author QP's classification has the Measured and Indicated Resources as being a lower (albeit slightly) 88% of all blocks.
- And here the Measured is a lower 58% of the total Measured and Indicated Resources.
- The Author QP regards the latest class proportions to be more realistic than the 2017 proportions.
- However, the Author QP also considers that the proportion of Measured and Indicated is well supported by the compact and clos drill hole and sample spacing.

Mining method and depth:
- The Author QP believes the low cut-off grades used reflected relatively shallow mining of predominantly oxidised material and a bulk low-cost extractive process.
- These assumptions may not apply to deeper mining of fresh rock (say at Mungu).
- The Author QP's opinion would be that reporting of deep mineralisation should use a higher cut-off grade (with attendant lower Resources in those deep areas) to reflect potential underground mining and a different more costly extractive process.
- The Author QP does not know at what depth this consideration should apply from.

15 MINERAL RESERVE ESTIMATES

The Mineral Reserves for the ATO project include the Pipe 1, Pipe 2, and Pipe 4 oxide zones only. The Mineral Reserves were estimated as of February 18th, 2021 by the Mining QP using economic parameters and ultimate pit design by DRA Global.

Mining, geotechnical, and hydrological factors have been considered in the estimation of the Mineral Reserves, including the application of dilution and ore recovery factors, where appropriate. The QPs notes that other modifying factors (such as metallurgical, environmental, social, political, legal, marketing, and economic factors) have also been considered to the required standard, and that they each demonstrate the viability of Mineral Reserves in their own regard.

The Mineral Reserve definition is done by first identifying ultimate pit limits using economic and geometrical parameters with pit optimization techniques. The resulting optimized pit design was then used for guidance in pit design to allow access for equipment and personnel.

PIT OPTIMIZATION

Pit optimization was done using Hexagon MS3D Project Evaluator software (version 15.8) by DRA Global to define pit limits with input for economic and slope parameters. Optimization used only Measured and Indicated Resources for oxide ore processing. All material under 0.4 g/t AuEq ore was considered as waste. Material between 0.4 g/t AuEq and 0.5 AuEq was treated as marginal ore to be processed at the end of the LOM plan. Varying gold prices were used to evaluate the sensitivity of the deposit to the price of gold as well as to develop a strategy for optimizing project cash flow.

ECONOMIC PARAMETERS

Economic parameters for pit optimizations were used based on the current information from the mining operation. The recoveries are based on the metallurgical test works. Only oxide mineral resources were considered for Mineral Reserves. Economic parameters are provided in Table 63.

Table 63 Pit optimization Economic Parameters

Description	Unit	Value
Reference Mining cost Ore	$/t Mined	2.88
Reference Mining cost waste	$/t Mined	2.45
Processing Cost	$/t processed	8.65
G&A	$/t processed	3.29
Throughput Rate for oxide ore processing	t/year	1,200,000
Days per Year of Processing	Days/year	330
Gold royalty	% of gold price	5.0
Silver royalty	% of silver price	5.0
Refining charge of Gold	$/oz	2.00
Refining charge of Silver	$/oz	1.00
Sales Price, Gold	$/oz	1300
Sales Price, Silver	$/oz	21.5
Gold recovery	%	70
Silver recovery	%	40
Ore loss	%	2.0
Ore dilution	%	3.0
Cut-off Grade (oxide ore zone AuEq)	g/t of oxide ore	0.5
Marginal Cut-off Grade (oxide ore zone AuEq)	g/t of oxide ore	0.4

Mining, processing and General and administrative (G&A) costs are reflective of the Q4 2020 actual costs from Steppe Gold ATO mine.

A base price of **$ 1,300 per ounce of gold and $21.5 per ounce of silver** was used for cut-off grade calculations and MS3D project evaluations. Other gold prices were also used for sensitivity analysis.

CUT-OFF GRADES (COG)

Gold equivalent (AuEq) Cut-off grades were calculated for the deposit and Mineral Reserves were estimated and reported using this cut-off. The AuEq Cut-off was calculated as follows:

$$Cut\ Off\ AuEq\ (g/t) = \frac{(Mining + Processing + G\&A)\ [\$/t]}{(Au\ [\$/g] x\ Au\ recovery) + (Ag\ [\$/g] x\ Ag\ Recovery)}$$

Where:

$$Au[\$/g] = (Au\ Price - Au\ Refining\ Cost - Au\ Price * Au\ Royalty)$$

$$Ag[\$/g] = (Ag\ Price - Ag\ Refining\ Cost - Ag\ Price * Ag\ Royalty)$$

Table 63 shows the input parameters used in the Cut-off grade calculations for the Mineral Reserve estimates.

The COG is used to determine whether the material being mined will generate a profit after paying for the mining, processing and administrative costs and is the basis for defining the economic pit. The Marginal COG is used to identify after a material is mined if it has enough value to go to the plant and make a profit or if not, will go to the waste stockpile. Material that is mined below the Marginal COG is always sent to the waste stockpile. Material between the COG and Marginal COG can either be sent directly to the process plant or sent to a lower grade stockpile for future processing or blending.

In this report 0.4 g Au/t marginal cut-off is used for pit definition, scheduling, and Proven Reserve and Probable Reserve statement.

SLOPES PARAMETERS

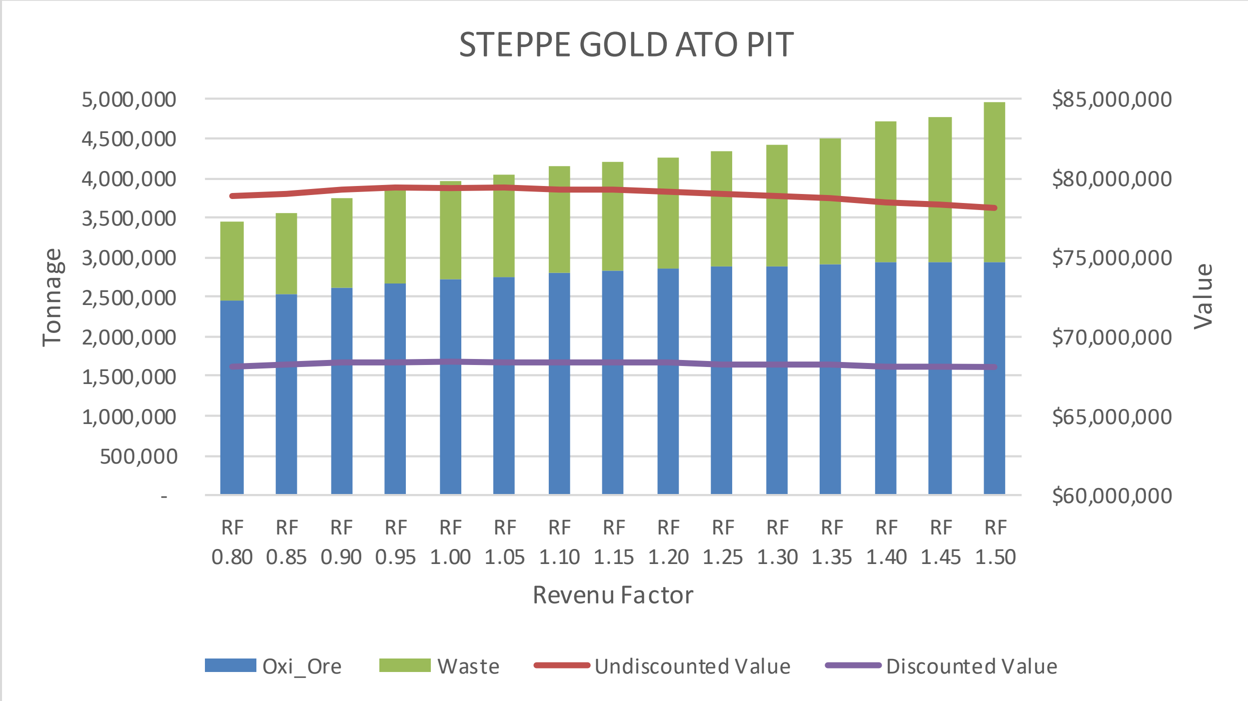
Pit slope recommendations were provided by geotechnical assessment of ATO slopes study report in 2011 by Victor Vdovin, the Corporate Geotechnical Engineer, Centerra Gold Inc., Technical Development Group. DRA Global used these recommendations to develop parameters for pit design and pit optimization.

These recommendations were used to develop parameters for pit design and pit optimization. The recommendations allow for up to a 50-degree inter-ramp angle.

PIT OPTIMIZATION RESULT

MS3D Project Evaluator for pit optimizations were run using the economic and slope parameters described in previous sections. Pit optimizations were completed using a minimum revenue factor of 0.8 and a maximum revenue factor of 1.5 in increments of 0.05 to analyse the deposit's sensitivity to gold and silver prices. A graph of the MS3D Economic planner results is shown in **Figure 98**.

Figure 98 Pit optimization results – Revenue Factor

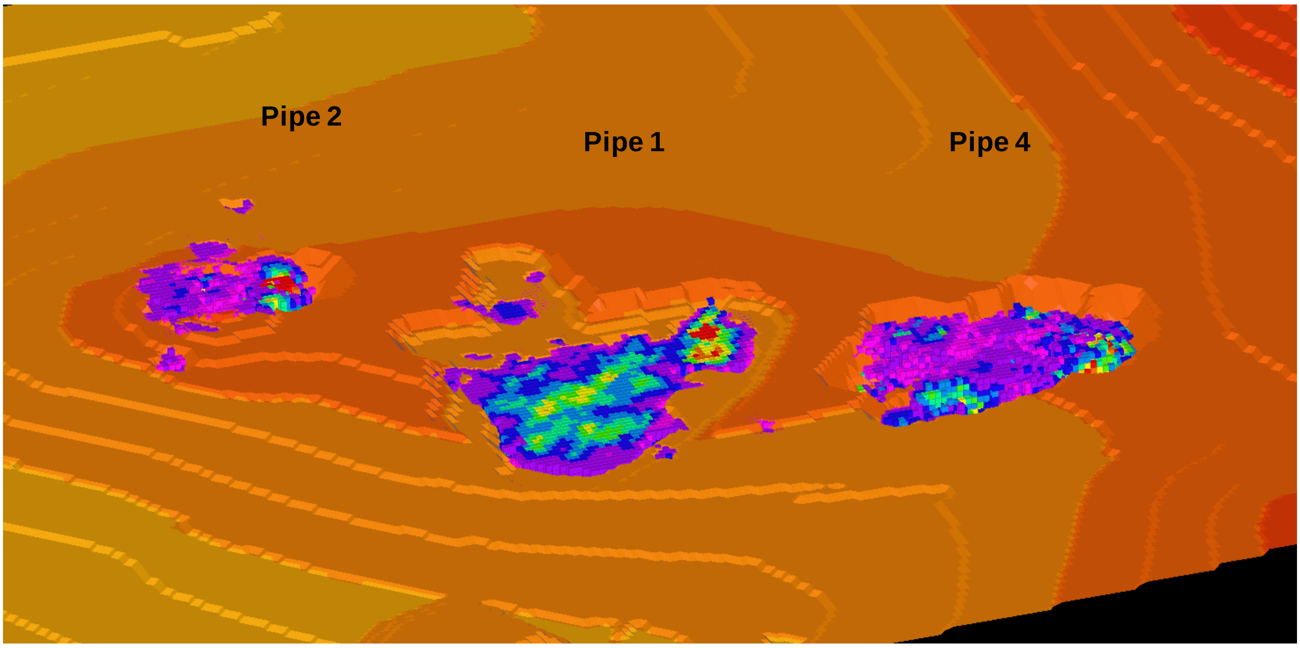


ULTIMATE PIT LIMIT SELECTION

The pit optimisation has been performed for the ATO Pipe 1, Pipe 2 and Pipe 4 using the parameters as defined in Table 63 Pit optimization Economic Parameters.

An optimised pit shell containing 2.7 Mt of ore at an average AuEq grade of 1.63 g/t was selected (revenue factor 1.00) which provides a mine life of approximately 2.3 years from November 2020.

Figure 99 Ultimate MS3D Project Evaluator pit shell and pipes



PIT DESIGN

The ultimate pit was designed to allow mining of economic resources identified by MS3D Project Evaluator pit optimization while providing safe access for people and equipment.

BENCH HEIGHT

Pit designs were created to use 5.0 meters benches for mining. This corresponds to the resource model block heights, and DRA Global believes this to be reasonable with respect to dilution and equipment used in mining.

PIT DESIGN SLOPES

Slope parameters were provided in a report by geotechnical assessment of ATO slopes study report in 2011 by Victor Vdovin, Corporate Geotechnical Engineer, Centerra Gold Inc., Technical Development Group.
Slope recommendations for the pit design are as follows:

- Up to 50 degree inter-ramp slope angles;
- Up to 70 degree bench face angles;
- Up to 5.0 meter high benches; and
- Minimum 2.5 meter catch benches.

HAULAGE ROAD

Ramps are designed to have a maximum centreline gradient of 10%. Ramp width was determined as a function of the largest truck width to be used in the pit. Design criteria accounts for 3.5 times the width of the truck for running room in areas using two-way traffic. An additional width is added to the ramp for a single safety berm at least half of a tire height inside of the pit. For roads designed outside of the pit, and additional safety berm is accounted for in the road widths. Haul road width – 12m.

ULTIMATE PIT DESIGN

As discussed in previous sections, the ultimate pit limit was design with MS3D. Figure 100 and **Figure 101** show the ultimate pit design.

Figure 100 Ultimate pit design (MS3D mine design)

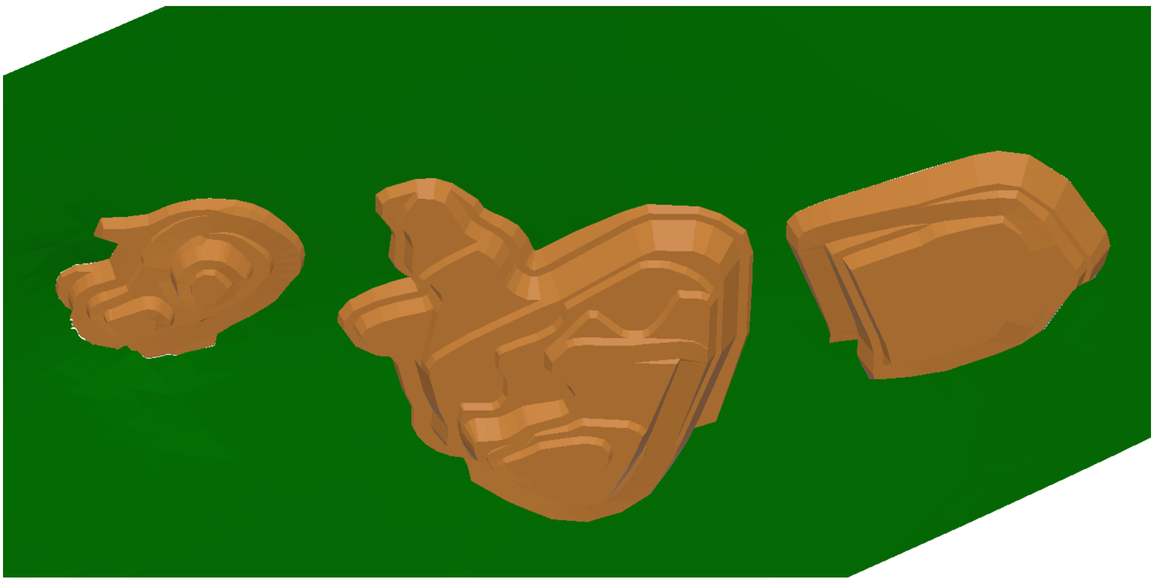
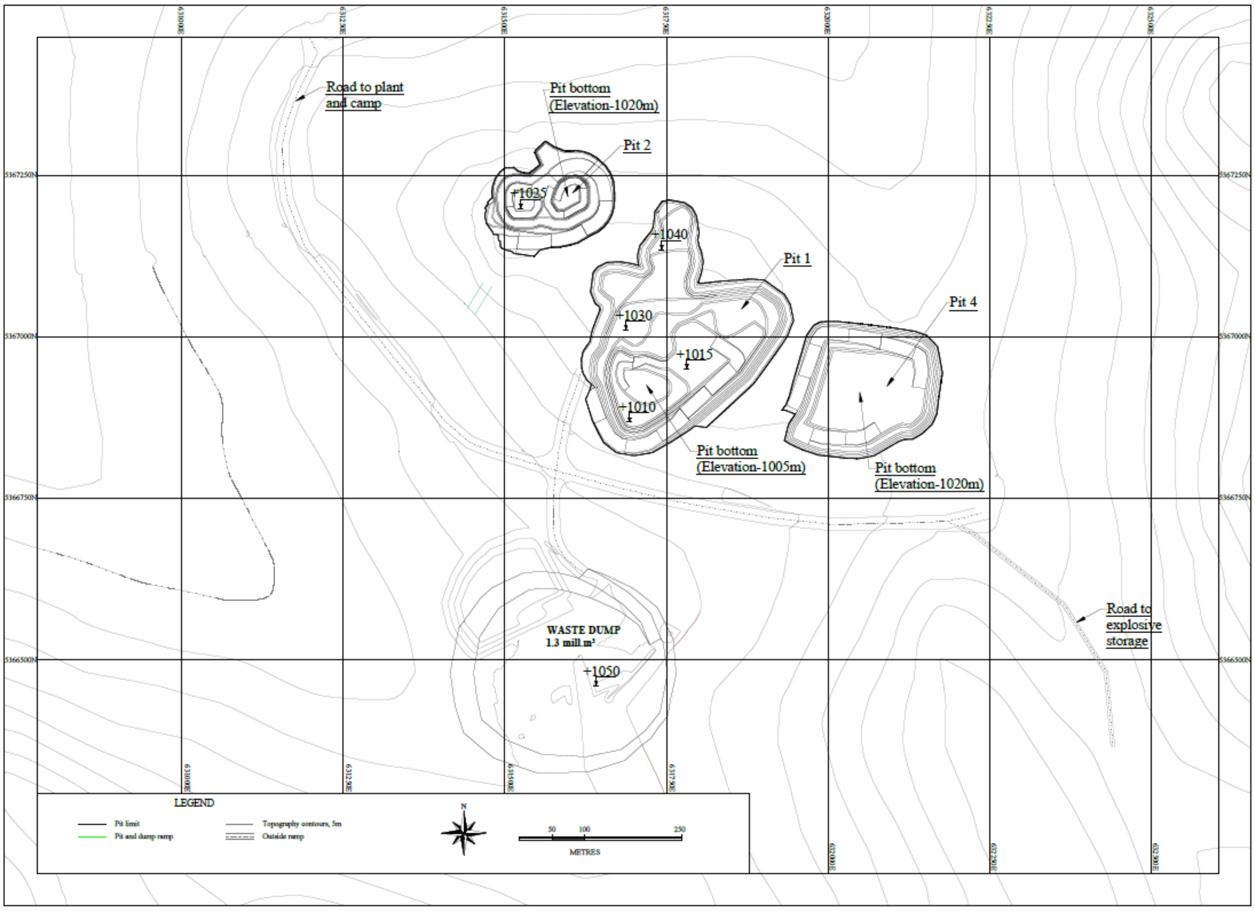


Figure 101 Ultimate pit design – General Plan view



DILUTION AND LOSS

The Author QP's grade model with block sizes of 5 m by 5 m by 5 m was used to estimate resources. The model was estimated based on this block size, and this model was used to define the ultimate pit limit and to estimate Proven Reserves and Probable Reserves.

DRA Global believes that the block size is reasonable with respect to a selective mining unit, and it is not more than 3% for dilution and 2% for mining loss. DRA Global further believes that this represents an appropriate amount of dilution for statement of reserves for the ATO deposit.

MINERAL RESERVE ESTIMATE

Mineral Reserves for the ATO mine were developed by applying relevant modifying factors to define the economically extractable portions of the resource. The QPs estimated and reviewed the Mineral reserves based on the Cut-off grades by DRA Global calculation and the Mineral Reserves meet NI 43-101 standards. The NI 43-101 standards rely on the 2014 CIM Definition Standards on Mineral Resources and Mineral Reserves adopted by the CIM council. CIM standards define modifying factors as:

Modifying Factors: Modifying Factors are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.
CIM standards define Proven and Probable Mineral Reserves as:

Probable Mineral Reserve: A Probable Mineral Reserve is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.

Proven Mineral Reserve: A Proven Mineral Reserve is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the Modifying Factors.

MINERAL RESERVE ESTIMATE

Table 64 reports the Proven and Probable Reserves within oxide ore based ultimate pit designs discussed above. Note that there is some fresh (or transition) material above cut-off grade of 0.4 g/t AuEq inside of the ultimate oxide pits reported as oxide pit reserve in Table 64.

Table 64 ATO Deposit Mineral Reserves for Oxide Pits

Classification	Tonnage	Au	Ag	Contained Metal	
				Au	Ag
	(mt)	(g/t)	(g/t)	(koz)	(koz)
ATO (0.5 g/t AuEq Cut-off)					
Proven	1.5	1.62	13.48	78.2	652.4
Probable	0.8	1.26	17.79	33.5	471.6
Total	2.3	1.46	14.81	109.3	1109.2
Marginal ore ATO (0.4 g/t AuEq Cut-off)					
Proven	0.1	0.38	6.79	1.5	27.4
Probable	0.1	0.37	7.80	1.2	25.7
Total	0.2	0.38	7.51	2.8	55.0
Total Reserve – ATO	**2.6**	**1.36**	**14.15**	**111.9**	**1,163.3**

Table 65 represents the Proven and Probable Reserves including mining dilution and ore loss. The total ore tonnage before dilution and ore loss is estimated at 2.6 Mt at an average grade of 1.36 g/t Au for 112 thousand oz. The dilution tonnage 0.1Mt represents 3% of the ore tonnage before dilution.

Table 65 Mining dilution and ore loss Reconciliation for ATO Deposit Mineral Reserves

Classification	Tonnage	Au	Ag	Contained Metal	
				Au	Ag
	(mt)	(g/t)	(g/t)	(koz)	(koz)
Ore before ore loss and dilution	2.6	1.36	14.15	111.9	1,163.3
Less: Ore loss – 2%	0.1	1.36	14.15	2.2	23.3
Ore before mining dilution	2.5	1.36	14.15	109.7	1140.0
Add: Mining dilution – 3%	0.1	0.19	3.09	0.5	7.5
Total Reserve – ATO	**2.6**	**1.33**	**13.83**	**110.1**	**1147.5**

The final ATO Deposit Mineral Reserves represents in the Table 15.5. The total ore tonnage is estimated at 2.6 Mt at an average grade of 1.33 g/t for 79 thousand oz of recovered Au and at an average grade of 13.83 g/t for 813 thousand oz of recovered Ag.

Table 66 ATO Deposit Mineral Reserves Statement - Effective February 18, 2021

Classification	Tonnage	Au	Ag	AuEq	Contained Metal		Recovered Metal		
					Au	Ag	Au	Ag	AuEq
	(mt)	(g/t)	(g/t)	(g/t)	(koz)	(koz)	(koz)	(koz)	(koz)
ATO (0.5 g/t AuEq Cut-off)							**70%**	**40%**	
Proven	1.5	1.57	13.18	1.70	76.9	643.7	53.8	450.6	61.3
Probable	0.8	1.23	17.36	1.40	33.0	464.5	23.1	325.2	28.3
Total	2.4	1.42	14.47	1.56	107.5	1,093.9	76.9	775.8	89.7
Marginal ore ATO (0.4 g/t AuEq Cut-off)							**70%**	**40%**	
Proven	0.1	0.38	6.69	0.44	1.5	27.2	1.1	19.0	1.4
Probable	0.1	0.37	7.66	0.44	1.2	25.5	0.9	17.8	1.2
Total	0.2	0.37	7.38	0.44	2.8	54.5	1.9	36.9	2.5
Total Reserve –	**2.6**	**1.33**	**13.83**	**1.46**	**110.1**	**1,147.5**	**78.8**	**812.7**	**92.3**

Notes:

1. Estimate of Mineral Resources has been estimated by the Resources QP.
2. ATO Mineral Reserves are as at February 18, 2021.
3. Mineral Reserves are included in Mineral Resources.
4. Mineral Reserves are reported in accordance with CIM 43-101 guidelines.
5. Mining dilution factor is 3% and Ore loss factor is 2%.
6. Contained gold estimates have been adjusted for metallurgical recoveries.
7. The open pit Mineral Reserves are estimated using a cut-off grade of 0.5 g/t AuEq for oxide material.
8. The open pit Minera Reserve include marginal ore at a cut-off of 0.4 g/t Au for the Oxide material.
9. Mineral Reserves are constrained within an optimized pit shell based on a gold price of $1,300 per ounce.
10. A conversion factor of 31.103477 grams per ounce 453.59237 grams per pound are used in the reserve and resource estimates.
11. AuEq has been calculated using assumed metal prices ($1,300/oz for gold, $21.5/oz for silver).
12. Oxide ore calculation: AuEq(g/t) = Au(g/t) + (Ag(g/t) x 21.5 x 0.0321507 x 0.4) / (1,300 x 0.0321507 x 0.7)
13. Totals may not match due to rounding.
14. The Mineral Reserves are stated as dry tonnes processed at the crusher. All figures are in metric tonnes.

The QPs are not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Reserve estimate.

IN-PIT INFERRED RESOURCES

Inferred Resources were not used in the economic analysis. Note that CIM standards define inferred resources as:

An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.

Table 67 shows the Inferred Resources inside of the pit designs for each pipe.

Table 67 In-Pit Inferred Resources

Classification Inferred Resources	Tonnage	Au	Ag	Contained Metal	
				Au	Ag
	(mt)	(g/t)	(g/t)	(koz)	(koz)
ATO (0.5 g/t AuEq Cut-off)					
Inferred	0.2	0.96	11.73	5.1	62.5
Marginal ore ATO (0.4 g/t AuEq Cut-off)					
Inferred	0.0	0.35	10.57	0.2	7.3
Total Inferred – ATO	**0.2**	**0.89**	**11.59**	**5.4**	**69.8**

16 MINING METHODS

Material was broken into ore and waste categories for the purpose of scheduling. Waste consists of material that is not included into Proven and Probable Reserves. Ore is categorized by grade, classification, and metallurgical type.

MATERIAL TYPES - WASTE

Waste material is to be placed into the waste dump immediately. Initial material will be built up around the crusher to provide a stockpiling area. Excess waste will expand the dump to the west to an elevation of approximately 1040 meters to provide for additional stockpiling areas.

MATERIAL TYPES – ORE

Measured and Indicated material above cutoff grade and inside of the pit was classified by both grade and metallurgical domain. The minimum cut-off grades were based on cut-off grades determined for oxide ore type of 0.5 g/t AuEq and marginal oxide ore type of 0.4 g/t AuEq.

All ore material is considered to be economic and is either feed directly to the crusher or in stockpiles near the crusher.

MINING METHOD

The ATO mine is an open-pit truck and shovel operation. The truck and shovel method provides reasonable cost benefits and selectivity for this type of deposit.

MINE WASTE FACILITIES

The waste dump is designed as a flat surface extending through the valley to the north. The dump height is not expected to exceed 10 m between the dumping crest to the underlying topography. Waste material is dumped against a berm on the dump face, and dozers are used to maintain the dumping face.

The waste dump has a total capacity of more than 20 million tons of the required 2,846 thousand tons of waste, though there is suitable space to expand the dump to the north or upward.

MINE PRODUCTION SCHEDULE

Proven and Probable Reserves were used to schedule mine production, and Inferred Resources inside of the pit were considered as waste. The final production schedule uses trucks and shovels as required to produce the ore to be fed into the process plant and maintain stripping requirements for each case.

Table 68 shows the mine-production schedule for the ATO oxide ore.

Table 68 ATO Mine Production Schedule

Years	Total rock tonnage	Oxide ore tonnage, ROM	Waste tonnage	Au (g/t)	Ag (g/t)	Au Eq (g/t)	Contained Metal	
							Au, k Oz	Ag, k Oz
2021	2,372,660	1,160,303	1,212,357	1.55	8.56	1.63	57.7	319.2
2022	3,104,549	1,236,000	1,868,549	1.23	19.78	1.42	48.7	785.9
2023	201,988	184,819	17,170	0.37	7.14	0.44	2.2	42.4
Total	**5,679,197**	**2,581,121**	**3,098,075**	**1.31**	**13.83**	**1.44**	**108.6**	**1,147.5**

Figure 102 ATO Oxide - Mine Production plan

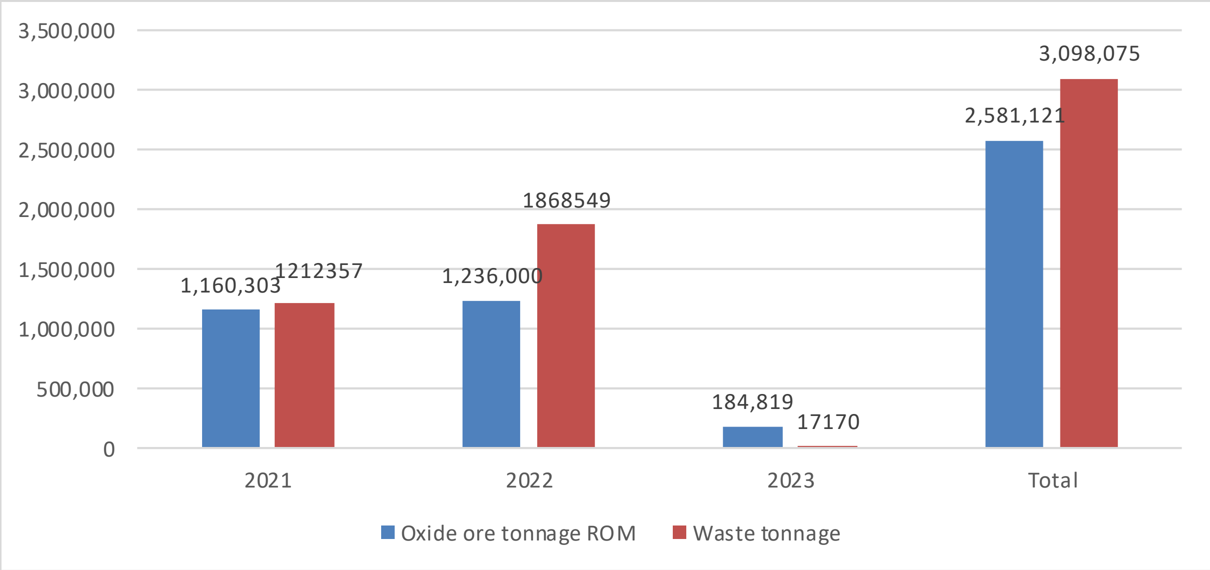
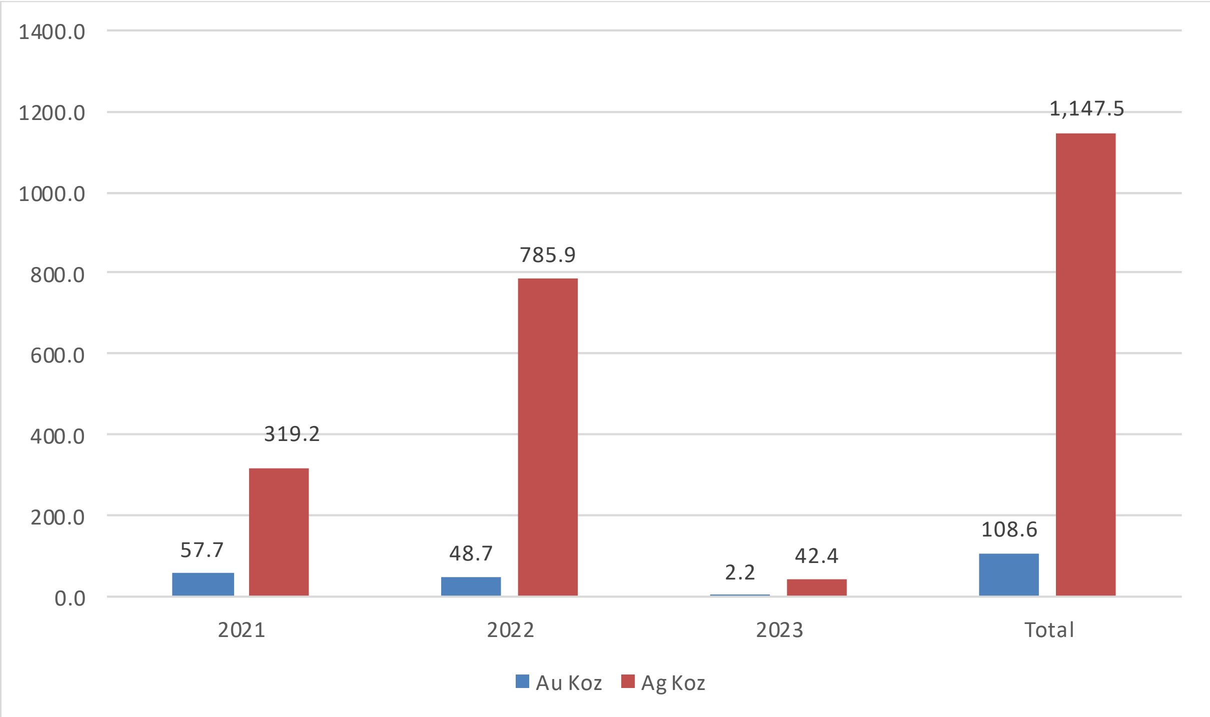


Figure 103 ATO Oxide - Gold and Silver in ROM ore



MINING EQUIPMENT

The following Section contains the equipment fleet at the mine to carry out the mine plan for the open pit. The mine is operated with a Contractor fleet which is presented in **Table 69**.

Table 69 Mining Equipment Fleet

Equipment's and production segment	Equipment Specification	Fleet size
Hydraulic Excavator	Hyundai (500LC-7A)	1
Hydraulic Excavator	Hyundai (450LC-7A)	1
Hydraulic Excavator	CAT-320	1
Hydraulic Excavator	CAT-349	1
Dozer	CAT D8R	1
Dozer	CAT D6R	1
Dump truck	Howo 336	6
Grader	LG4180	1
Water truck	Howo 336	1
Fuel truck	Hyundai Mayti II	1
Light tower	Night-Lite Pro II	3
Generator	Olympian GEP50-7	1
Light vehicle	Landcruiser 76	3
Mini van	Hyundai Grandstarex	1
Bus	Hyundai Country	1

MINING OPERATIONS

The mine production schedule is based on a 7 day per week schedule, with two 12 hour shifts per day. There are four crews to cover the rotating schedule. Each 12-hour shift contains a half-hour down for blasting and miscellaneous delays, a half-hour for shift start up and shutdown and an hour for lunch breaks for a total of 10 effective working hours.

Each year contains unscheduled time for nine holidays and two non-productive weather shifts, equivalent to 330 days of mine operation per year.

Figure 104 Picture of the ATO pit. shows the ATO Pipe 1 and Pipe 4 open pit in production.

Figure 104 Picture of the ATO pit.

DRILLING AND BLASTING

Production drilling is covered in the mine contract, while a separate blasting sub-contract under the contract miner is in place at ATO. STEPPE is responsible for diesel fuel as it is applied to ammonium nitrate and fuel oil (ANFO) blasting agents.

LOADING AND HAULING

The main loading units at ATO are 2.3 m3 hydraulic shovel and 1.5 m3 front-end loader. 32 metric ton haul trucks are the main hauling units; the loaders require 4 to 5 passes to load the trucks.

HAULING ROAD

Ramps are designed to have a maximum centreline gradient of 10%. In areas where the ramps may curve along the outside of the pit, the inside gradient may be up to 11% for short distances. Ramp width was determined as a function of the largest truck width to be used during mining. Design criteria accounts for 3.5 times the width of the truck for running room in areas using two-way traffic. An additional width was added to the ramp for a single safety berm at least half of a tire height inside of the pit. For roads designed outside of the pit, an additional safety berm is accounted for in the road widths. Contract mining has been assumed, using 32 ton capacity trucks. The operating width of the trucks was assumed to be 4.5 m. Ramps are designed to allow 3.5 times the operating width of the trucks along with room for sufficient safety berms. The ramp width used for design is 15 m.

MINE PERSONNEL

Mine personnel include both operating and mine-staff personnel for contractor. Operating personnel are as the number of people required to operate trucks, loading equipment, and support equipment to achieve the production schedule. Mine staff is based on the people required for supervision and support of mine production. The number of contract mine operating personnel at the mine is shown in Table 16.3 while the mine-staff are shown in **Table 70**.

Table 70 Contractor's mine operating personnel

Workforce	#
Driller	3
Blaster	10
Excavator Operator	9
Loader Operator	9
Truck Driver	17
Dozer Operator	6
Water truck Operator	2
Grader Operator	1
Mechanic	2
Maintenance worker	5
Welder	2
Labourer	5
Bus driver	2
Janitor	1
Staff & Admin	7
Surveyor	2
Total work force	**80**

Table 71 Steppe Gold mine-staff

Workforce	#
Mine manager	1
Superintendent	1
Mine planner	1
Senior geologist	1
Mining geologist	1
Resource geologist	1
Mine foreman	3
Assistant geologist	4
Total work force	**13**

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17 PROCESSING RECOVERY METHODS

17.1 Overview

This ATO oxide project process employs a conventional oxide heap leach flowsheet including Crushing, Heap leach and Process facilities. The process flowsheet was designed on the basis of leaching 1.2 Mt of ore per year at an average gold grade of 1.13 g/t at 70% gold recovery and average silver grade of 9.25 g/t at 40% silver recovery.

The three-stage crushing plant was designed to operate at a nominal throughput of 5860 t/d for 275 days per year (75% utilization). There were some supply chain and parts issues with the main crusher in the first and second quarters of 2020. These issues were resolved in the third quarter of 2020 and higher crushing plant throughout rates are being achieved. A new crushing plant was purchased in the third quarter of 2020 which will increase crushing rates above design. This has not been installed on site as of the 31st of March 2021.

The process plant is located near and down-gradient from the heap leach facility (HLF) which minimizes the pumping and pipeline requirements for pregnant and barren solutions and operates 365 days per year. The pregnant solution is designed to flow to the plant at a nominal rate of 200 m3/h and design flowrate of 250 m3/h.

The plant processes 5 tonnes of carbon per strip using the ADR process - adsorption (CIC), desorption (elution) and Recovery (Electrowinning and Gold room) process to extract gold from the pregnant solution to produce gold doré.

17.2 Production Summary

The ATO Gold Mine achieved commercial production effective April 2020. For the fourth quarter ending December 31st, 2020, 1,531,790 tonnes of ore have been mined from the pit and 1,068,462 tonnes crushed and stacked ore under irrigation at a gold grade of 2.03 g/t Au on the heap leach pad (Cells 1 and 2) for 69,734 gold ounces stacked. The Company commenced stacking of Cell 1 in the fourth quarter of 2019 and Cell 2 in June 2020. Gold produced as of the 31st of December 2020 were 33,154 ounces or 47.5% recovered. An additional 170,130 tonnes were mined in the fourth quarter of 2021 for a total of 1,701,920 tonnes and 189,283 tonnes crushed, stacked and under irrigation at a grade of 1.91 g/t Au for a total of 1,257,745 tonnes at 81,357 ounces. No additional gold was recovered in the first quarter of 2021 giving an overall reconciled gold recovery of 40.8%.

Ultimate gold recoveries above 70% are expected upon completion of irrigation. Production figures for 2019, 2020 and Q4 2021 are presented below n Table 72 and
Table 73.

Table 72 Production Summary 2020

December 31, 2020 (USD)		Q4 Dec 31, 2020	Q3 Sep 30, 2020	Q2 Jun 30, 2020	YTD Dec 31, 2020	YTD Dec 31, 2019
Waste Mined	bcm	119,969	109,862	68,811	318,591	8,999
Ore Mined	tonnes	291,455	362,750	330,325	1,138,209	393,581
Processed	tonnes	206,703	207,663	164,287	699,204	369,258
Grade (1)	g/t	2.26	2.21	1.67	2.03	-
Gold Recovery(2)	%	70.0%	70.0%	70.0%	70.0%	-
Gold Produced	oz	7,423	10,342	15,389	33,154	-
Gold Sold	oz	7,923	11,352	12,458	31,733	-
Silver Produced	oz	24,069	6,516	4,978	35,563	-
Silver Sold	oz	3,429	6,553	3,728	13,710	-

Table 73 Production Summary Q4 2021

Period Ending March 31, 2021 (USD)		Q1 Mar 31, 2021
Waste Mined	bcm	99,910
Ore Mined	tonnes	170,130
Stacked	tonnes	189,283
Grade (1)	g/t	1.91
Gold Recovery(2)	%	70.0%
Gold Produced	oz	-
Gold Sold	oz	945
Silver Produced	oz	-
Silver Sold	oz	861

The ore processing facilities includes the following unit operations:

Crushing and Ore Handling

- Primary crusher: a vibrating grizzly screen and jaw crusher in open circuit producing a final product P80 of approximately 190 mm;
- Secondary and tertiary crusher: a vibrating screen and cone crushers operating in reverse closed circuit producing a final product P80 of 25 mm; and
- Heap placement: crushed ore stacked to a 3,000 tonne capacity stockpile, reclaimed by a radial stacker.

Heap Leach Pad

- Crushed ore stacking;
- Ore leaching; and
- Barren and pregnant solution delivery and recovery piping systems.

ADR Plant

- Carbon-in-Column (CIC) Adsorption: adsorption of solution gold onto carbon particles;
- Desorption: acid wash of carbon to remove inorganic foulants, elution of carbon to produce a gold-rich solution, and thermal regeneration of carbon to remove organic foulants, carbon stripping to recover gold into solution; and
- Recovery - Refining: gold electrowinning (sludge production), filtration, drying, mercury retorting, and smelting to produce gold dore.

17.3 Production Rate and Products

A revised gold and silver production schedule for 2021 and 2022 and LOM reconciled are presented below in Table 74. Forecast gold production in 2021 is 49,795 ounces and 48,000 ounces in 2022 for total LOM gold produced of 130,949 ounces from a total of 3.75 million tonnes of ore mined. The increase in production in 2021 and 2022 over 2020 is associated with increased mining and crushing rates and an extended period of irrigation.

Table 74 Production Forecast

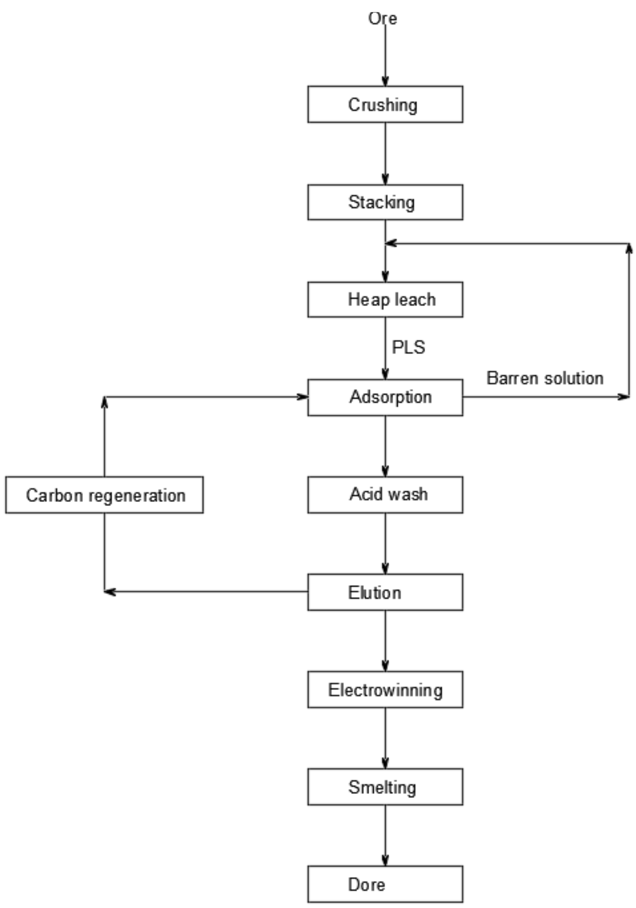
Mining Production /Million/				
Physicals- Mining	**LOM**	**2020**	**2021**	**2022**
Waste mined /bcm/	1.06	0.32	0.42	0.32
Ore processed /ton/	3.65	0.72	1.13	1.8
Total ore mined /ton/	4.04	1.14	1.1	1.8
Metal Produced, oz	-			
Gold, oz	125,904	33,154	40,750	52,000
Silver, oz	338,252	35,563	180,250	144,000
Metal sold, oz	-			
Gold, oz	124,484	31,734	40,750	52,000
Silver, oz	337,961	13,711	180,250	144,000

17.4 Process Description

A block flow diagram summarizes the plant and process flows in

Figure 105.

Figure 105 The plant and process flows



17.4.1 Crushing

A single crushing circuit will be utilized for preparation of the heap leach feed comprised of a conventional closed-circuit jaw / cone / cone crusher flow sheet.

Run-of-mine ore (ROM) will be trucked from the open pits and dumped directly into a primary feed hopper.

Primary crusher feed will be drawn from the feed hopper by a feeder discharging onto a vibrating grizzly screen. The grizzly screen oversize will feed the primary jaw crusher. The grizzly undersize and jaw crusher product are to be transported to the secondary screen by a secondary screen feed conveyor, which is equipped with a metal detector and magnet.

The crushing plant will operate 275 days per year. If the crushing plant is down, the mine haul trucks will dump onto the ROM stockpile. A FEL (Front end loader) will be used to reclaim the ROM material and deliver the material to the dump pocket. The ROM stockpile will also be used to feed the crusher if the mining operations are suspended.

Ore from the secondary screen feed conveyor will be transported to the secondary vibrating screen. Screen undersize material will be conveyed to the 3,000 tonne heap leach feed stockpile. Lime will be added to the stockpile feed conveyor from the 200 tonne lime silo by screw conveyor for pH control. Screen oversize material will be conveyed to the secondary cone crusher. The secondary cone crusher discharge and jaw crusher product combine on the secondary screen feed conveyor back to the secondary screen. The crushing circuit is designed to handle all ore types and comprises a primary jaw crusher, a secondary and an optional tertiary cone crusher operating in closed circuit with a final product screen.

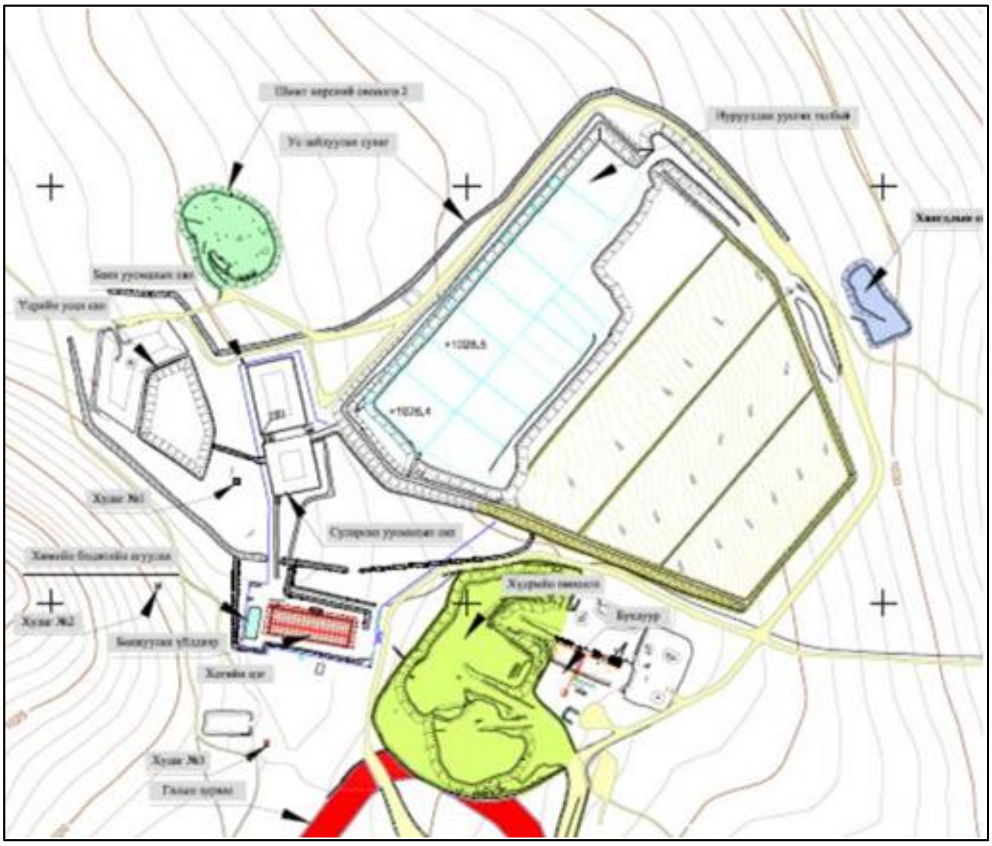
17.4.2 Heap Leach Facility

The heap leach facility (HLF) is designed to allow crushed ore stacking to a maximum height of approximately 24 m (measured vertically over the liner system), which results in a design capacity of 5.6 Mt. The HLF comprises the following:

- Conventional, three stage lift (nominally 8 m per lift), free-draining heap over a gently sloping heap leach pad (HLP) along the axis of the ridgeline west of the ADR plant.
- The leach pad will be graded and constructed in a nominally balanced cut-and-fill manner using locally borrowed (within the heap boundary) rock for structural fill, supplemented as needed by mine waste including waste rock and, if available, thaw-stable soil for lining the pad subgrade before placement of the liner system.
- Permanent and interim perimeter diversion channels and berms to manage surface water flows.
- Perimeter access and ore haulage roads.
- Leach pad liner system will be constructed in the steps described below:
    - Graded subgrade to provide a non-puncturing surface for the geosynthetic liner;
    - Leak detection using horizontal wick drains to operate as large-scale lysimeters;
    - Reinforced clay liner (500mm);
    - Primary geomembrane liner, 1.5 mm thick linear low-density polyethylene (LLDPE), bottom side aggressively textured, and
    - Drainage pipes installed to remove solution and minimize the hydraulic head directly over the geomembrane.

Gravity drainage from the leach pad to the pregnant tank at the ADR plant or (in the case of an upset) the events ponds in double-contained and buried pipes. Originally a single emergency pond was to be constructed for storm water collection. This will be replaced with 2 separate storm water ponds, the first of which has now been constructed. The second one will be constructed later in the mine life. The installed HLF and ponds layout is shown below in .

Figure 106 HLF and Ponds



17.4.3 ADR Gold Recovery Plant

Carbon Adsorption

The carbon adsorption circuit consists of a train of five cascading carbon columns. The pregnant or gold-enriched solution will be pumped to the carbon adsorption circuit across a stationary trash screen for removal of any debris from the heap leach pad. The solution will flow counter- current to the movement of carbon from column 1 to column 5. The solution overflow from the final column will discharge onto a screen in order to recover any carbon. The barren solution, which at this stage has had most of the gold in solution adsorbed, will discharge from the final carbon column and will be pumped to the barren tank.

Cyanide solution, caustic solution, antiscalant and make-up water are added to the barren tank as needed. Barren solution will be heated to increase solution temperature by 8oC before being pumped back to the leach pad in order to maintain the thermal integrity of the heap leach pad. On average, 5 ton of loaded carbon from the first carbon column will be pumped to the acid wash and stripping circuits each day. The carbon-in the second column will be advanced to the first and the process will be continued down the train. The carbon from the sixth column will advance to the fifth column and then freshly reactivated carbon will be added.

Desorption and Gold Refining

The loaded carbon will be transferred to the acid wash vessel and treated with 3% hydrochloric acid (HCl) solution to remove calcium, magnesium, sodium salts, silica, and fine iron particles. Organic foulants such as oils and fats are unaffected by the acid and will be removed after the stripping or elution step by thermal reactivation utilizing a kiln. The dilute acid solution will be pumped into the bottom of the acid wash vessel, exiting through the top of the vessel back to the dilute acid tank. At the conclusion of the acid wash cycle, a dilute caustic solution will be used to wash the carbon and neutralize the acidity.

A recessed impeller pump will transfer acid washed carbon from the acid wash tank into the strip or elution vessel. Carbon slurry will discharge directly into the top of the elution vessel. Under normal operation, only one elution will take place each day.

Carbon Stripping (Elution)

After acid washing, the loaded carbon will be stripped of the adsorbed gold using a modified ZADRA process. The strip vessel holds approximately 5.0 ton of carbon. During elution containing approximately 1 % sodium hydroxide and 0.1 % sodium cyanide, at a temperature of 140 °C and 450 kPa, will be circulated through the strip vessel. Solution exiting the top of the vessel will be cooled below its boiling point by the heat recovery heat exchanger. Heat from the outgoing pregnant solution will be transferred to the incoming cold barren solution. A diesel-powered boiler will be used as the primary solution heater to maintain the barren solution at 140°C. The cooled pregnant solution will flow by gravity to the electrowinning cells. At the conclusion of the strip cycle, the stripped carbon will be pumped to the carbon-regeneration circuit.

Carbon Regeneration

The stripped carbon from the strip vessel will be pumped to the vibrating carbon-sizing screen. The kiln-feed screen doubles as a dewatering screen and a carbon-sizing screen, where fine carbon particles will be removed. Oversize carbon from the screen will discharge by gravity to the 7.5 ton carbon-regeneration kiln-feed hopper. Screen undersize carbon will drain into the carbon-fines tank and then be filtered and bagged for disposal. A 250 kg/h diesel-fired horizontal kiln will treat 5.0 ton of carbon per day at 650°C, equivalent to 100% regeneration of carbon. The regeneration-kiln discharge will be transferred to the carbon quench tank by gravity, cooled by fresh water or with carbon-fines water, prior to being pumped back into the CIC circuit.

To compensate for carbon losses by attrition, new carbon will be added to the carbon attrition tank.
New carbon and fresh water are mixed to break off any loose pieces of carbon prior to being combined with the reactivated carbon in the carbon holding tank.

Refining

Pregnant solution will flow by gravity to a secure gold room. The solution will flow through one of two 3.54 m3 electrowinning cells. Gold will be plated onto knitted-mesh steel wool cathodes in the electrowinning cell. Loaded cathodes will be power washed to remove the gold-bearing sludge and any remaining steel wool. The gold-bearing sludge and steel wool will be filtered to remove excess moisture and then retorted to remove any mercury. The retort residue will be mixed with fluxes consisting of borax, silica and soda ash before being smelted in an induction furnace to produce gold doré and slag. The doré will be transported to an off-site refiner for further purification. Slag will be processed to remove prills for re-melting in the furnace. The gold bars will be stored in a vault located in the gold room prior to secure off-site transportation by aircraft.

Reagents

Sodium cyanide briquettes will be delivered to site in containers and in 1 tonne super sacks contained in a wood frame. The briquettes will be mixed in the cyanide mix tank and subsequently transferred to the cyanide solution storage tank. The concentrated cyanide solution will be added to the barren tank at a rate of 0.2 kg/t of ore. Cyanide will be used in the carbon strip circuit at a concentration of 0.1%.The principles and standards of practice for the transport to site and handling of cyanide on site will be in accordance with the guidelines set out in the International Cyanide Management Code (ICMC).

Sodium Hydroxide (caustic) will be supplied to site in 1 tonne totes. The caustic will be mixed and stored for distribution to the acid wash and strip circuits. The caustic will be used to neutralize the acid in the acid wash circuit. A solution of 1.0% caustic will be mixed with barren solution in the carbon strip circuit.

Hydrochloric acid and anti-scalant solutions will be supplied to site in 1 tonne totes. The solutions will be metered directly from the totes for distribution in the plant.

Hydrated lime will be delivered to the site in bulk by trucks and stored in a 200 ton lime silo. The lime will be delivered at a rate of approximately 2.7 kg/t of ore by screw feeder onto the heap leach feed conveyor during heap loading operations.

Laboratory

An on-site assay and metallurgical laboratory is equipped to perform sample preparation and assays by atomic absorption (AAS technology).. The laboratory facility supports minor environmental sampling, TSS monitoring and processing. The majority of the environmental samples will be sent off-site to an accredited laboratory for third party reporting. The laboratory has space available for process optimization and test program. All exploration drill samples, mine grade control and some process samples are sent off site.

18 PROJECT INFRASTRUCTURE

The ATO property is situated in the eastern side of Mongolia, which located in Tsagaan Ovoo soum of Dornod aimag. 660 km east of the Ulaanbaatar city, northwest of the Choibalsan city and 38 km east of Tsagaan Ovoo soum. The closest town, Tsagaan ovoo soum is located on shore of Hoovor nuur is a medium developed infrastructure.

Infrastructure and construction buildings have been designed and constructed for Mongolian harsh weather. The following facilities are installed at the site;

- Process plant building and laboratory;
- Fuel storage;
- Chemical storage;
- Power supply;
- Water supply;
- Heap leach facilities and ponds; and
- Camp.

18.1 Facilities

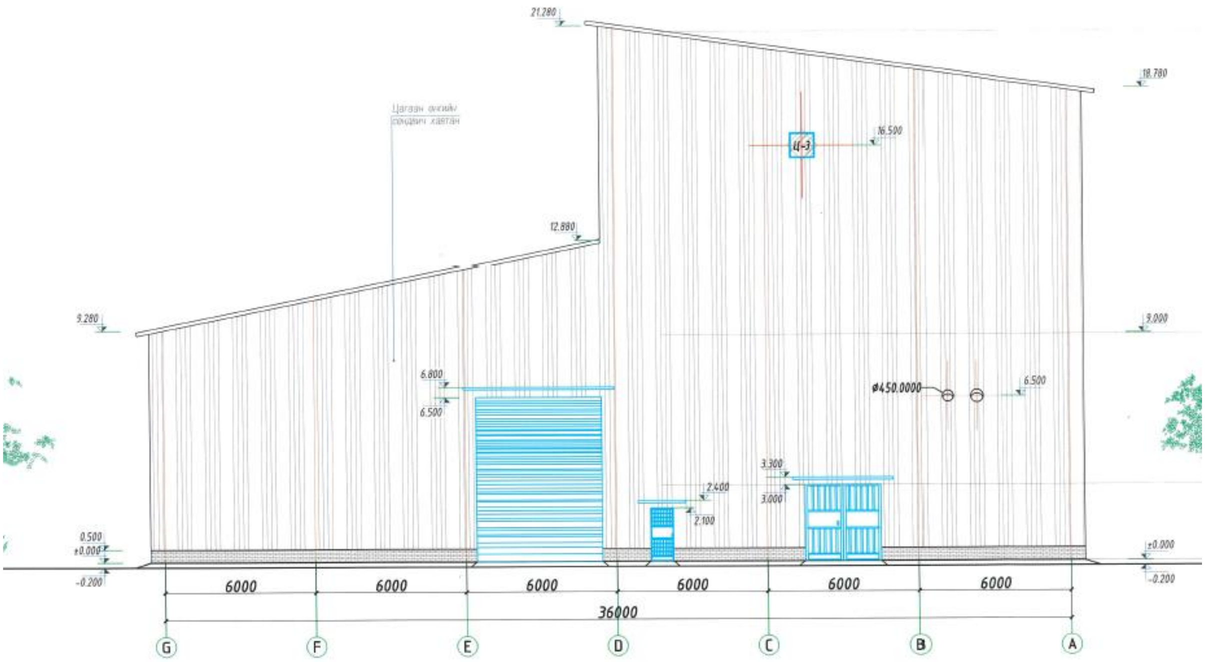
The following major facilities constructed at the project include:

18.1.1 Processing Plant Building

The process plant building has dimensions of 36 m wide x 90 m long x 20 m in high was built by sandwich technology and has a triangle top. The building contains the ADR facilities including CIC circuit, elution, electrowinning cells and goldroom. See and Figure 108 below.

Figure 107 Process Plant Building

Figure 108 Process Plant Elevation



18.1.2 Fuel depot

Diesel and gasoline are purchased in bulk and stored on site at 4 refuelling tanks. All 4 refuelling tanks are 50,000 L each and have been constructed with full containment systems in the event of tank rupture. Mining and on-site diesel powered mobile equipment are fuelled at the storage tanks.

18.1.3 Explosives

Since the start of mining operations in 2019, ANFO explosive is delivered straight to the hole for blasting. A new explosive storage will be installed in 2021 and will be located 3 km from open pit. All explosive, detonators and transfer wires will be in separate containers.

18.1.4 Camp

The mining camp constructed at the ATO project which has capable for 300 staff includes:

- Kitchen capacity for 250 people. Building space is also allocated for restroom, cold storage area and staff room;
- Laundry building;
- Heating plant; and
- Septic system.

18.2 WATER SUPPLY

Water resource studies and possible water use amounts approvals of following are complying with planned CIL plant water use as the phase 2 development and operations of ATO gold project.

18.2.1 PLANNED CIL PLANT WATER SUPPLY:

Hydrogeological exploration works have established sufficient groundwater storage across the exploration area to meet the forecast project demand by RPS Aquaterra LLC in 2011-2012. A programme of data assessment, field works, data analysis, numerical groundwater flow modelling, and reporting has been completed. Field works, completed over two phases, comprise drilling and installation of eight deep exploration bores, two shallow exploration bores, two test bores and aquifer testing of the test bores to establish reliable aquifer parameters.

Based upon the completed water resource study, Water Resource Committee of Mongolian Ministry of Environment and Tourism was approved and made a resolution “Possible water resource for the industrial water supply of Altan Tsagaan Ovoo gold project is 34.0 l/sec (691.2m3/day” dated on 30 May 2013.

Based upon the completed water resource studies and approved possible water resource approvals, Water Resource Department of Ministry of Environment and Tourism was issued an official “Possible water use conclusion of Altan Tsagaan Ovoo gold project’s processing plant is 9.9 l/sec” dated on 9 October 2017.

18.2.2 THE CURRENT HEAP LEACH OPERATIONS WATER SUPPLY

An additional hydrogeological study was undertaken by “Water Management” LLC in 2019 to assess the previously established mine inflow and identify short term water supply potential from the mine license area as close to operational facilities. The field investigations, comprising geophysical surveys, exploratory drilling, and construction of test production and monitoring bores and aquifer testing, improved understanding of the minesite. Summary findings of the 2019 hydrogeological investigation was as follows:

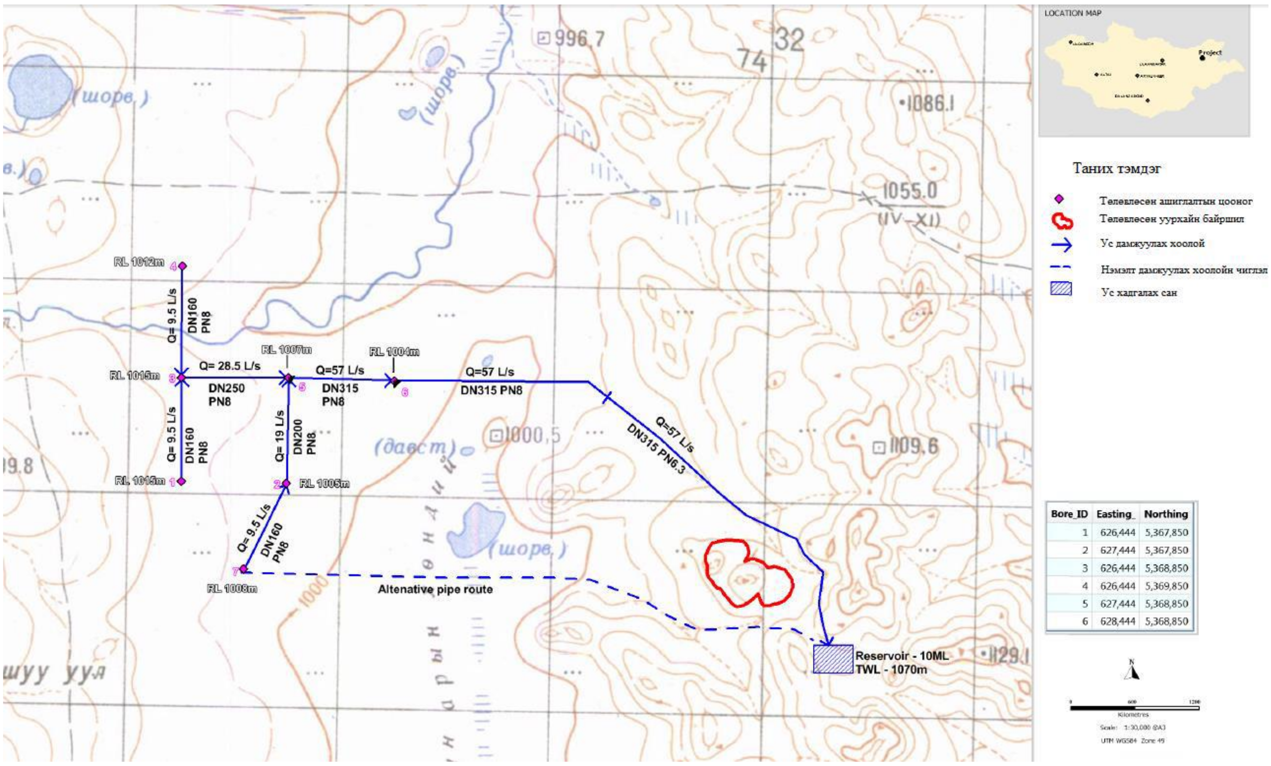
- ✓ Aquifer characteristics: Weathered zone thickness of the ore bearing formation reaches 40m and underlying water bearing fracture zone depth reaches 150m. Average aquifer Transmissivity is 7.8m2/day based on aquifer test results. Permeability is low in the eastern portion of the deposit and higher in the west. Water bearing zone primarily consists of fractured conglomerate, gravelstone and breccia.
- ✓ Potential mine inflow: Potential mine inflows has been estimated based use of previous stage hydrogeological study test results for final pit dimension. Pit inflow is estimated to be order of 16 L/s (57.61m3/hr).
- ✓ Short-term Supply Potential: A short term supply from potential was estimated by hydraulic method based on 2019 programme two (2) test-production bores. A potential supply potential in the order of 7.5L/s is indicated as follows:
    - o ATO19-MTB04: 5.5L/s (475.28m3/day) over 5 years; and
    - o ATO19-MTB03: 2.0L/s (172.8м3/day) over 5 years.

Based upon the completed above water resource study of 2019, Mongol Us (Water Resource Department) State owned enterprise of Ministry of Environment and Tourism was issued an official “Possible water use conclusion of Altan Tsagaan Ovoo gold mine operations and processing plant operations” dated on 10 July 2019.

Table 75 Water usage

No	User	Total usage	
		l/sec	м^3/hour
1	Camp	0.6	2.16
2	Open pit	2.65	9.54
3	Processing plant	7.77	27.97
Total		**11.02**	**39.67**

Figure 109 Water supply plan



18.3 POWER SUPPLY

The project's normal operating demand load averages 2.4 megawatts. The project utilises diesel power generators /CAT 3512B/ which produces a maximum of 3.6 MW. A breakdown of the power consumed is presented below in Table 76.

Table 76 Power usage

No	User	Eac unit power usage, кWт
1	Camp	425.67
2	Open pit	51.5
3	Processing plant	1,938
Total		2,415

18.4 ROADS

The mine access road connects the project site to Choibalsan city 120 km, approximately 660 km from the Ulaanbaatar city. The road is constructed as a gravel embankment.

18.5 COMMUNICATIONS

A communication system is on site to support internet, VOIP, and data communications necessary for daily operation of the mine, plant, and office. The mine site also has good cell phone coverage. Plant operators, survey crews, supervisors, and the mine contractor all have portable hand-held radios for operational communications. The closest town is Tsagaan Ovoo with a population of 3,800.

19 MARKET STUDIES & CONTRACTS

19.1 MARKET STUDIES

No market studies are currently relevant as the ATO Project is an operating site producing a readily saleable commodity in the form of doré. Doré is sent via secure transportation to a refinery for further refining.

Steppe Gold sells its gold production directly to the Mongolian government at spot price. Two types of dore are produced on site at the operation, the first is dore containing approximately 70% gold by weight and the remaining 30% is a mixture of silver, base metal and iron. The second type is silver dore produced and sold separately.

Dore is transported to the Bank of Mongolia (BOM). The BOM announces the official gold and silver rates for the day using the London Metal Exchange (LME) closing rate from the previous day.

The following deductions apply on the LME dore closing date which is BOM official rate for the day;

- Refining charge of US$2 per gold oz sold;
- Refining charge of US$1 per silver oz sold;
- 5% royalty on gross gold revenue; and

5% royalty on gross silver revenue (up to $25); otherwise as per below pricing

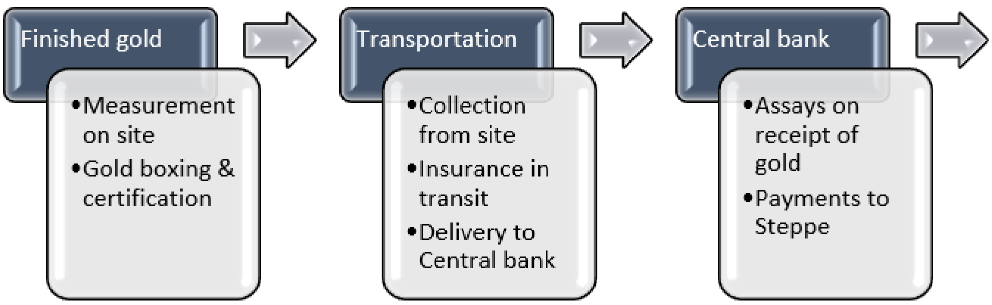
- Table 77

Table 77 Refining Costs

№	Product type	Unit	Market price level per ounce	Percentage to be added to the base rate depending on the level of processing of the product /Progressive rate/		
				Ore	Concentrate	Product
1	Silver	ounces	$0 - $25			0.00
			$25 - $30			1.00
			$30 - $35			2.00
			$35 - $40			3.00
			$40 - $45			4.00
			$45 and above			5.00

The Dore is sent to a refinery for smelting and sampling to determine gold and silver content. Once these assay grades are determined the proceeds from the sale are credited to the Steppe Gold account. A flowsheet for the receipt of income is shown below:

Figure 110 Flowsheet for Receipt of Income



19.2 COMMODITY PRICES

Commodity prices used in the Mineral Reserve estimates are set by Steppe Gold at the corporate level. The current gold price provided for Mineral Reserve estimation is US$1,300/oz.

19.3 MATERIAL CONTRACTS

Steppe Gold has a number of contracts, agreement and/or purchase orders in place for supply and services that are material to the operation. All contracts or agreements are negotiated with local vendors and have a contractual scope, terms and conditions. Contracts are negotiated and renewed as needed. Contract terms are considered to be within industry norms. A list of the material contracts currently in place is shown below in Table 78

Table 78 Material Contracts Currently in Place

Material contracts currently in place			
#	Product	Supplier	Status of contract
1	Heavy equipment (CAT) Parts and maintenance	Barloworld Mongolia LLC	Supply agreement
2	Diesel	PEC Mongolia LLC	Supply agreement
3	Plant reagents	Hebei Chengxin Co Ltd (Cyanide) Dow Chemical Mongolia LLC (other reagents)	Sales and purchase agreement
4	Power	Barloworld Mongolia LLC	Supply and service
5	Grinding media		
7	Open pit explosives	Special Mining LLC Ord Geo LLC	Service agreement
8	TMA construction	RES LLC Bazura Design LLC Erkhet Construction LLC Sukhjin LLC Gom Ilch LLC	Construction agreement
9	Camp and catering	Penin LLC	Service agreement
10	Heavy fabrication	Professional Supply Services LLC Ukhaa Sar LLC	
11	Heavy equipment (drills) parts and maintenance	Unitra LLC Professional Supply Services LLC Ukhaa Sar LLC Euro Khan LLC Wurth Mongolia LLC	Supply agreement
12	Tire supply	Bridgestone, Tavanbogd Mongolia LLC	Supply agreement
13	Laboratory service	ALS Group LLC	Service agreement
14	Hospital service	Biomedpharm LLC	Service agreement
15	Processing plant spare parts	Shangdong Xinhai Mining Technology &Equipment Inc	Supply agreement
16	Crusher, spare parts	Ikher Bar LLC	Supply agreement

19.4 COMMENTS ON MARKET STUDIES AND CONTRACTS

The QP notes the following:

- The doré produced by the mine is readily marketable. Metal prices are set corporately for Mineral Resource and Mineral Reserve estimation; and
- The QP has reviewed commodity pricing assumptions, marketing assumptions and the current major contract areas and considers the information acceptable for use in estimating Mineral Reserves and in the economic analysis that supports the Mineral Reserves.

20 ENVIRONMENTAL STUDIES, PERMITTING & SOCIAL IMPACT

Site visit

Ulzii Environmental LLC (licensed environmental consulting firm to conduct Environmental Impact Assessment #0000211) Principal Environmental Consultant Mr. Ulziibayar Dagdandorj MAusIMM (Member) Env (#335969) discipline of Environment), conducted an initial reconnaissance of the ATO gold mine Project site from April 25 to April 30, 2021. Senior Associate Dan V. Michaelsen FAusIMM (CP) Env (#200991) has supervised the preparation of ITEM 20 as 20. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL IMPACT with that instrument and form.

Project. There was, however, considerable evidence of ATO gold mine project development and operations phase 1 footprints. During the phase 1 of the project, Steppe Gold have been managing the Environmental and Social activities compliant with requirements of Mongolian Mining and Environmental Legislations.
In addition to information gathered during the site visit, ATO gold mine project's Environmental Permits and all relevant environmental and social plans and other documents was reviewed. In the past, Steppe Gold have been conducted Detailed Environmental Impact Assessments and Environmental Management Plan (for 5 years) in 2019 under the requirements of the Mongolian Environmental Legislation.

Information presented in this section is based on publicly available information, supplemented with environmental baseline studies conducted within the ATO gold project property boundary and surrounding area. Information included herein may require review and reassessment should changes to the scope, area, or design of the project occur as project planning and design progress.

ENVIRONMENTAL AND SOCIAL BASELINE

An Independent Environmental Baseline Assessment (EBA) for the Altan Tsagaan Ovoo gold mine project site and surrounding areas was conducted in 2019 by a Mongolian entity with professional certification for environmental impact assessments services granted by the government.

The Environmental baseline assessment is the ATO gold mine project's statutory study of relevant environmental and social baseline research.
Steppe Gold has conducted stakeholder and community participatory regular/routine environmental monitoring program at ATO gold project site and surrounding areas, and reporting to relevant authorities and local communities since 2019 to monitor and control impacts on air, water, soil and biodiversity.

Air: Air quality in the ATO gold project area is generally good due to the lack of emission sources. The only man-made emission sources affecting the area are dust from the use of local roads, including public traffic, and natural wind-blown dust because of local weather conditions. Steppe Gold periodically monitored air quality within the Project area in 2018, 2019, 2020 and 2021, which have provided an indication of the prevailing dust levels and emissions. Data collected showed relatively consistent conditions for rainfall, air temperature, humidity, wind speed and wind direction.

Water resource: Water network of the area belongs to the Pacific Ocean basin. Small local rivers with short-lived stream fed from eastern branch mountains of the Khentii Range flow into small lakes. Sizes of these rivers vary depending on their main source of water collection which is precipitation. Drinking water could only be taken from wells due to low density of water network. Lakes in the region such as Duut, Tsagaan, Ovoot, Eregtseg, Ukhaagiin Tsagaan, Davkhariin Tsagaan, and Khaichiin and many other small salt lakes are also fed by rainfall. In recent years, small rivers and streams have been dried up due to a global warming and decrease of precipitation. In the summertime, seasonal springs found from the melt of small patchy permafrost in small intermountain valleys and from seasonal thawing of frozen ground.
Drainage from the project area follows the gradient to the west into the northerly draining basin towards the Bayangol River. The basin to the east of the project area drains to the south. Regional drainage in the project area is to the east, interrupted by the 22km north-south trending elevated ridge where ATO gold project is located.

Land and Soil: The land surrounding the property is predominantly used for nomadic herding of goats, cows, horses, and sheep by small family units. Use is based on informal traditional Mongolian principles of shared grazing rights with limited land tenure for semi-permanent winter shelters and other improvements. The site area can be included in brown soil zone of steppe in terms of soil classification of Mongolia. Mainly dark brown and brown soil at the hillside looking north and brown and light brown soil at the hillside looking south can be found. Saltmarsh occurs in lowlands and salty soils prevail around them. Depending on ecological condition (fauna, sunken or raised land, moisture temperature mode and soil rocks etc.) of the soil layers, dominant in the project area.

Biodiversity: The project site is included in Mongolian Daurian landscape in terms of zoogeographic regions of Mongolia. Total of 32 bird species, 1 reptile species, 1 lagomorpha species, 1 Artiodactyla species, 6 rodent species and 3 carnivora species were registered during the environmental baseline studies at the site in 2017 and 2019. Rare and endangered animals were not found.
Project site is located at the border of forest-steppe and steppe zones. Constant warm period for plant growth is 150-170 days. Fertile and powdered carbonate, pale sandy, light muddy soil is common in the soil covers and salty pale muddy soils and brown muddy soils can be found near river, stream, and lakes, while rocky, gravel sandy and pale brown soils are common at the top or sidehill of mountains and hills. Total of 214 weed plants of 133 species of 41 families, 8 landscapes and 21 sub-groups of 12 groups have been identified during environmental baseline studies at the site in 2017 and 2019. Vegetation and grass cover the entire area and includes pasture plants such as khazaar grass, wormwood, stipa, brome-grass, and couch grass. Hoofed animals of steppe in the region include white gazelle. Carnivores are wolf, fox and corsac. Rodents include marmot, gopher, shrew-mouse, and stoat. Birds include lark, red nose, crane, bustard, scoter, and brown nose. Also, crawlers, locust, grasshoppers, mosquitoes and midges are abundant.

Currently, Steppe Gold is conducting biodiversity study and biodiversity offset management plan, started in September 2020, and will be completed in July 2021.

Cultural Heritage/Archaeology: Archeologists from Archeology and Antropology department of School of Arts and Sciences of National University of Mongolia carried out archeological exploration under the requirements of Article 17.10 of Law on Protection of Cultural Heritage of Mongolia.
As a result of the exploration, total of 51 monuments were found and they were ancient tomb burials and structures. Furthermore, archeological sites, including Bayan 1, Tumendelger 6, Salkhit 19, Naiman Khanat 23 and Maikhant 1 were found at the border of the licensed area. Archeological monuments are evenly distributed in the area and they can be mostly found in hillside and places, warmed by the sun. As evidenced by the archeological exploration, this area was inhabited by nomadic people since the Bronze ages.
Archeologists have concluded that these monuments would not be impacted by ATO gold project's mining activity, but advised to inform and cooperate with professional organizations, if any historical or archeological monuments found at the site, in conformity with corporate responsibility.

Population and Demography: The nearest settlement to the property is the central village of the Tsagaan Ovoo soum, which is settled at side of the Khuuvur Lake, with moderately developed infrastructure. The Tsagaan Ovoo soum consists of six subsections and has total population of 3800. Nationality consists of 80% Buryats and the rest of Khalkh people.

The community is mainly engages in domestic animal husbandry. Some of them run plantation and grow vegetable for their own household uses. The central village accommodates administrative offices, a cultural center, secondary schools, a hospital, a kindergarten, a communications center, cellphone stations, a gas station, and high-voltage sub-stations.

Tsagaan-Ovoo soum, where ATO gold project property is situated, is scarcely populated. Traditional and nomadic cattle-breeding is dominant at the area and there is only one licensed area, where mining exploration is carried out. Infrastructure development of the soum is not good compared to other soums of the province. Tsagaan-Ovoo soum is divided into six administrative units. Bag governor is elected by bag residents for a term of four years.

ENVIRONMENTAL IMPACT ASSESSMENT

Based upon completed Environmental baseline research report and approved Mongolian Feasibility Report of ATO gold mine project, General Environmental Impact Assessment (GEIA) was completed and approved by Ministry of Environment and Tourism of Mongolia.

Under the requirements of approved GEIA, An Independent Detailed Environmental Impact Assessments (DEIA) included 5 years Environmental Management Plan have been developed by Mongolian entity with professional certification for environmental impact assessments services granted by the government. The Detailed Environmental Impacts Assessments report was approved by Ministry of Environment and Tourism of Mongolia in 2019, which acts as ATO gold mine project's potential environmental and social impact assessments and included 5 years Environmental Management (mitigation) Plan acts as environmental and social impacts mitigation measures.

In addition, several technical environmental studies have been conducted as part of Altan Tsagaan Ovoo gold mine Project developments and operations of the phase 1. These studies are intended to provide direction for the environmental assessment process and guide the environmental authorities with the information required to determine the range of information and degree of detail needed in the formal impact assessment.

20.2.1 ENVIRONMENTAL AND SOCIAL IMPACTS AND ALTERATIONS

1) **Topography and Landform:** Temporary changes to the existing topography from mining operations include access and haul roads, laydown and hardstand area, topsoil stockpiles, process plant site, and support infrastructure. Permanent changes include open pit void; waste rock dumps; and tailings storage facilities.
2) **Flora and Vegetation:** Direct impacts on flora and vegetation communities **297.0** hectares of area will mainly occur through clearing for the mine, waste rock dumps, processing plant, tailings storage facility and associated infrastructure.
3) **Fauna:** The impact of mining on fauna can generally be described as either primary or secondary. The primary impact of mining on fauna is the direct destruction of habitats through land clearing and earthmoving activities. Secondary impacts relate to activities with varying degrees of disturbance beyond the immediate point where mining is taking place, such as access and haul roads, powerlines, pipeline corridors and other infrastructure, feral animals and general workforce activities.
4) **Surface Water Hydrology and Groundwater:** The development of the open pits, stockpiles, waste rock dumps, tailings storage facilities, processing plant and infrastructure often interrupt some of the natural drainage paths. Interference with drainage patterns may result in deprivation of water to drainage systems downstream of the mining developments or localized 'shadowing' effects on some vegetation which may be reliant on intermittent flows.
5) **Soil and Water Contamination:** Direct impacts on soil cover **297.0** hectares of area will mainly occur through clearing for the mine, waste rock dumps, processing plant, tailings storage facility and associated infrastructure. Chemical reactions in waste rock and tailings have the potential to be detrimental to plant growth and to result in contamination of both surface and groundwater. In addition, mining and processing operations transport, store and use a range of hazardous materials including fuels, process reagents, lubricants, detergents, explosives, solvents and paints. If these materials are not properly managed, they may have the potential to cause atmospheric, soil or water contamination and could potentially pose ongoing risks to human health and the environment.
6) **The Closure Phase Impacts:** The closure phase is expected to involve a decline in direct, indirect and induced employment, and potential contraction of the local economy. The impact on employment will be negative, direct and indirect. Job losses will occur along the supply chain as well as in induced employment because of the reduced demand for services.

20.2.2 ANNUAL ENVIRONMENTAL PLAN AND REPORT

Mining License holders are required (under the requirements of mining and environmental laws of Mongolia) to earn approval of Environmental Management Plans for operations planned each year. Performance is reported annually to the government. The ATO gold Project as Steppe Gold remains in compliance and in good standing with its annual environmental reporting requirements since 2018. ATO gold project's Annual EMPs implementation and performances have been resulted more than 90% and passed in 2018, 2019, and 2020. Steppe Gold has earned approval of Annual EMP from Ministry of Environment and Tourism for 2021 operations and productions of ATO gold project. Mongolian Annual Environmental Management Plan covers following listed items/activities.

1) Mitigation measures plan

2) Rehabilitation plan
3) Biodiversity offsetting plan
4) Community and resettlement plan
5) Heritage management plan
6) Risk management plan
7) Waste management plan
8) Environmental Monitoring Program

ENVIRONMENTAL PERMITS AND AGREEMENTS

20.3.1 ENVIRONMENTAL IMPACT ASSESSMENTS

The Detailed Environmental Impacts Assessments studies and reports of Altsan Tsagaan Ovoo gold mine project was approved by Ministry of Environment and Tourism of Mongolia in 2019, which acts as ATO gold mine project's potential environmental and social impact assessments and included 5 years Environmental Management Plan acts as environmental and social management plans.

In addition, Detailed Environmental Impacts Assessment report of ATO gold mine operational use chemicals was approved by Ministry of Environment and Tourism of Mongolia in 2019, which acts as ATO gold mine project's NaCN and other chemical's importing, transporting, storing and usage risk assessments and chemicals management plans.
Based on all completed environmental and social studies and assessments, Steppe Gold have been developing the

Annual Environmental management plans, implementing the planned environmental and social activities under the requirements of Mongolian Environmental Legislations since 2018.
The current approved EBA, GEIA, DEIA and EMP are covering ATO gold project's environmental and community impacts. A DEIA is a obligatory document for all Mining and minerals processing projects in Mongolia.

20.3.2 ENVIRONMENTAL AND SOCIAL PERMITS

Steppe Gold was conducted water resource studies from 2017 to 2019 and received water resource statements (possible usage amount of water resource) from the relevant authorities and received land use permits for mining, construction, other infrastructures sites from local authorities. List of completed and received environmental and social permits, and agreements that are already in place (under the requirements of Mongolian Environmental Legislations) documents are following:

Table 79 List of Environmental and Social Permits and Agreements

	Environmental Permit, Approval or Authorization Activity	Issuing Authority and Approval Agency	Status and comment
1	**Land**		
1	Land quality assessment	Authority of Land Affairs and Geodesy8 Ministry of Construction and urban Development	completed and approved in 2018
2	Land use certificate and land use agreement 1 -Mining area	Governor of Tsagaan Ovoo soum, Dornod province	issued and approved in 2018
3	Land use certificate and land use agreement 2-Accomodation's camp area	Governor of Tsagaan Ovoo soum, Dornod province	issued and approved in 2019

4	Land use certificate and land use agreement 3 - Heap Leach Pad area	Governor of Tsagaan Ovoo soum, Dornod province	issued and approved in 2019
5	Land use certificate and land use agreement 4-Water ponds and Drainage's area	Governor of Tsagaan Ovoo soum, Dornod province	issued and approved in 2018
6	Land use certificate and land use agreement 5 ADR and CIL Flotation plant area	Governor of Tsagaan Ovoo soum, Dornod province	issued and approved in 2019
7	Land use certificate and land use agreement 6-Fuel Farm area	Governor of Tsagaan Ovoo soum, Dornod province	issued and approved in 2018
8	Land use certificate and land use agreement 7-Explosives Storage area	Governor of Tsagaan Ovoo soum, Dornod province	issued and approved in 2019
2	**Heritages**		
1	Archaeological study report and conclusion of ATO gold mining project	Institute of History and Archeology (authorized/licensed entity)	completed and submitted in 2019
2	Paleontological study report and conclusion of ATO gold mining project	Institute of Paleontology (authorized/licensed entity)	completed and submitted in 2019
3	**Water**		
1	Water resource statement for possible water use	Mongol Us state owned enterprise (Water Resource Department) Ministry of Environment and Tourism	completed and approved in 2019
2	***Possible water resource statement*** "Possible water resource for the industrial water supply of Altan Tsagaan Ovoo gold project is 34.0 l/sec (691.2m3/day"	(Water Resource Department) Ministry of Environment and Tourism	dated on 30 May 2013.
3	***Possible water use conclusion*** "Possible water use conclusion of Altan Tsagaan Ovoo gold project's processing plant is 9.9 l/sec"	(Water Resource Department) Ministry of Environment and Tourism	dated on 9 October 2017.
4	***Possible water use conclusion*** "Possible water use conclusion of Altan Tsagaan Ovoo gold mine operations and processing plant operations"	Mongol Us state owned enterprise (Water Resource Department) Ministry of Environment and Tourism	dated on 10 July 2019.
5	Hydrogeology study report	Water Management LLC	completed and submitted in 2019
6	Water use permit (Annual)	Kherlen River Basin Authority	issued and approved in 2019, 2020..

7	Water use conslusion (Annual)	Mongol Us state owned enterprise	issued and approved in 2018, 2019, 2020..
8	Water use agreement (Annual)	Kherlen River Basin Authority	issued and approved in 2018, 2019, 2020..
4	**Waste and Chemicals**		
1	Special License for the importation, transport and use of NaCN	Ministry of Environment and Tourism	issued and and approved in 2019
2	Domestic solid waste transport and disposal agreement (valid for 2 years)	Dornod Public Service state owned enterprise (authorized/licensed entity)	signed in 2020
3	Domestic liquid waste transport and disposal agreement (valid for 2 years)	Dornod Public Service state owned enterprise (authorized/licensed entity)	signed in 2020
4	Medical/Clinic waste transport and disposal agreement (valid for 2 years)	Tsagaan Ovoo soum Health Clinic (authorized/licensed entity)	signed in 2020
5	Plastic waste transport and disposal agreement (valid for 2 years)	Mog Plastic LLC (authorized/licensed entity)	signed in 2020
6	Chemical's waste/packages transportation and disposal agreement (valid for 2 years)	Tsetsuukh Trade LLC (authorized/licensed entity)	signed in 2020
7	Waste oil transportation and disposal agreement (valid for 2 years)	Hi B Oil LLC (authorized/licensed entity)	signed in 2020
5	**EIAs and EMPs**		
1	DEIA & EMP-ATO gold mine operations project (valid for 5 years)	Completed by Make Green LLC (authorized/licensed entity) and approved by Ministry of Environment and Tourism	completed and approved in 2019
2	DEIA & EMP-ATO Chemicals Facility (valid for 5 years)	Completed by Ekhmongolyn Baigal LLC (authorized/licensed entity) and approved by Ministry of Environment and Tourism	completed and approved in 2019

3	Emergency Response Plan of ATO gold mining project	National Emergency Authoriruty of Mongolia	completed and approved in 2018, 2019, 2020.
4	Disaster Risk Assessment of ATO gold mining project	National Emergency Authority of Mongolia	completed and approved in 2019
5	Environmental Audit report of ATO gold mining project (valid for 2 years)	Environmental Compliance LLC (authorized/licensed entity)	completed and submitted in 2019
6	Regular/Routine Environmental Monitoring Report of ATO gold mining project (Annual)	Ulzii Environmental LLC (authorized/licensed entity)	completed and submitted in 2020
7	Annual EMPs of ATO gold mining project (Annual)	Ministry of Environment and Tourism	developed and approved in 2018, 2019, 2020, and 2021
8	Annual EMPs execution results (Annual)	Environment and Tourism Agency and Inspection Agency of Dornod Province	EMPs implements resulted more than 90% and passed in 2018, 2019, and 2020
6	**Social & Community**		
1	Local Development and Cooperation Agreement 1	Governor of Dornod Province and Governor of Tsagaan Ovoo soum of Dornod Province	consulted and signed in 2019
2	Community Resettlement Agreements (confidential)	ATO project indirect impact zone community (13 households)	consulted and signed in 2018, 2019, 2020

Above listed permits and agreements are being maintained and updated continuously on required deadlines.

COMMUNITY RELATIONS AND STAKEHOLDER ENGAGEMENT

Steppe Gold has a strong support for mining industry at all levels of government. The Company has been building a strong local support and relationships for many years, prior to commencing its exploration and production efforts.

20.4.1 LOCAL COOPERATION AND DEVELOPMENT AGREEMENT

Pursuant to Article 42 of the Law on Minerals of Mongolia, Minerals license holders are required to enter into a Local Cooperation and Development Agreement with the local government of the jurisdiction within which a given minerals license is located. In 2016, the Government of Mongolia approved model Local Cooperation Agreements for minerals license holders that commit companies to undertake environmental management in the course of operations and encourage public information sharing about the license holderls activities locally.

Steppe Gold has made successful consultation with Dornod Province level government officials and Tsagaan Ovoo soum level governmental officials in 2019, then Steppe Gold has in place a Local Cooperation Agreement with local government through the end of 2019. The current signed Local Cooperation and Development Agreement acts to support province level and sub province as Tsagaan Ovoo soum level social development activities. Key clauses of the local cooperation and development agreement are:

a. Mining local work force shall be no less than 75 percent
b. Company shall openly announce and procure from local areas and it shall be no less than 80 percent
c. Prioritize environmental protection and shall not create any non-standard pollution
d. Support local development fund

MINERALS WASTE MANAGEMENT

The intent of proposed minerals waste handling plan is to ensure that the management of mining activities and the implementation of environmental and social management plans, mine closure at the ATO and it will be conducted according to best practice methodologies to eliminate the potential for contamination of the surrounding soil and water resources from the generation of Acid Rock Drainage (ARD).

Steppe Gold will implement a predictive ARD operational management plan based on a data developed from a comprehensive waste rock and ore type characterization program that will commence prior to mining.
The characterization of waste rock and stockpiled ore during operations will be used to verify the predictive ARD model and will be accomplished using on-site testing methods combined with periodic laboratory analysis at a suitable facility.

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Management of the ATO gold project's significant environmental and social aspects and impacts is achieved through a suite of Management Plans. The following Management Plans will be developed and outline the expected Project performance.

Air Quality (included noise and vibration) Management Plan: The following mitigation and management measures are proposed:
- An Air Quality Management Plan will be prepared and implemented.
- Management of mining and transport activities to minimise dust emissions will include limiting vehicle speeds; dust suppression on stockpiles, haul roads and wind erosion sources; using sprays on conveyors and plant equipment; and enclosing plant equipment where possible.
- A Traffic Management Plan will be prepared and implemented (see also Transport impacts).
- A Noise and Vibration Management Plan will be prepared and implemented.
- Optimising, if possible, the number of heavy earth moving equipment to reduce the total noise levels.
- Selecting equipment with noise and vibration abatement technology, where possible.
- Regular maintenance of equipment to the manufacturer's specifications.
- Erecting, where required and feasible, noise shields around high noise generating equipment;
- Notifying community member and workers of the blasting schedule

Water Resources Management Plan: The following mitigation and management measures are proposed:
- Infrastructure will be designed to minimize interference with natural flow regimes.
- Where necessary, roads will be constructed with gutters to accommodate any stormwater runoff and maintain local hydrology.
- Stormwater will be diverted from operational areas at the Site and directed to natural downstream drainage in a way that prevents increased rates of sedimentation and erosion.
- Water Resources Management Plan (WRMP) will be prepared and implemented.
- Water Monitoring Plan (WMP) will be prepared and implemented.

Land and soil management plan: The following mitigation and management measures are proposed:
- A Land Disturbance and Rehabilitation Management Plan will be prepared and implemented.
- Soil Disturbance will be managed in accordance with a Topsoil Handling Procedure and Land Disturbance Procedure (LDP), including the planning, stripping, storage and use of topsoil.
- A Transport Management Plan will be prepared and implemented to mitigate impacts from vehicle movements on roads, including dust suppression and road maintenance. Off-road driving will be prohibited, and drivers will be required to adhere to sign-posted speed limits.
- In relation to soil contamination, a Hazardous Materials Management Plan and Waste Management Plan will be prepared and implemented, including measures such as spill kits, protective equipment, and other necessary equipment will be available onsite.
- All hazardous materials will only be transported by licensed operators. Wastes will not be sent off-site for disposal or treatment other than to licensed Contractors.

Biodiversity Management Plan: The following mitigation and management measures are proposed:
- Biodiversity Management Plan will be prepared and implemented.
- In all cases, the Project will implement a Land Disturbance Permit Procedure for areas to be disturbed.
- Rehabilitation and revegetation will occur for areas of temporary disturbance due to Project construction activities to the extent possible.
- Transport Management Plan will be prepared and implemented to mitigate impacts from vehicle movements along roads, including dust suppression and road maintenance. Off-road driving will be prohibited, and drivers will be required to adhere to sign posted speed limits.
- Traffic and potential areas with wildlife crossings are monitored, and records are kept of any collisions.

Waste Management Plan: The following mitigation and management measures are proposed:
- Hazardous Materials and Waste Management Plan will be prepared and implemented.
- No hazardous waste will be landfilled at the site - all hazardous wastes will be transported to licensed waste facilities.
- Disposal of wastes will primarily be managed through minimizing waste generation, recycling of waste and appropriate disposal.
- Waste will be segregated to allow appropriate handling, storage, treatment, and disposal by waste stream. These will be classified using national standards and international guidelines.
- waste inventory will be maintained including of quantities of waste generated per month.
- Where possible, recyclable materials will be made available for reuse, such as wood, tires, scrap metal, or cardboard, as per consultation with stakeholders.
- Wastewater treatment plant will be installed and commissioned for use.
- Wastewater will be treated in accordance with national standards prior to re-use for dust suppression or discharge to environment.

Hazardous Materials Management Plan: The following mitigation and management plans are proposed:
- Chemicals (Cyanide) Management Plan
- Waste Rock Management Plan
- TSF Management Plan
- AMD/ARD management plan

Occupational and Community Health, Safety and Security Management Plan: The following mitigation and management measures are proposed:
- An Occupational Health, Safety and Security Management Plan, Community Health, Safety and Security Management Plan, and Crisis and Emergency Response Management Plan will be developed and implemented.
- Dedicated measures for emergency response will deal with the potential for off-site incidents that may affect local communities and will include arrangements for prompt notification, communication, and evacuation as well as collaboration with the local authorities and communities to build capacity for emergency preparedness.
- The ATO will apply the principles of the International Cyanide Management Code for the manufacture, transport and use of cyanide to ensure good international industry practice.
- There will be barriers to public and livestock access to the mine site through use of stockproof fencing, and security personnel, armed with lethal and/or non-lethal weapons, will be on site to ensure that there is no unauthorized public access.

- Health screening will be conducted for employees and contractors, in addition to ongoing health-related awareness training. The workforce will be housed on site to minimize interactions with the community while working, in addition to the implementation of strict camp rules for employees and contractors.
- Consultation on traffic awareness with community and herder groups affected by the ATO and related traffic generation. Consultation with police, border and emergency services agencies is recommended to coordinate emergency response and preparedness.
- Ensure measures in place to mitigate any transport through community centers include speed restrictions and bypass routes where appropriate. Drivers should follow pre-determined routes that have been subjected to risk assessments.
- Maintaining or improving road sections, where feasible.
- Stipulations that all driving by mine and service personnel is to occur during day-time hours where possible to improve safety.

Stakeholder and Communications Management Plan: The following mitigation and management plans are proposed:
- Community grievance management plan
- Communications plan

Local Cooperation and Development Management Plan: The following mitigation and management measures are proposed:
- Local Cooperation Management Plan, and Stakeholder and Communications Management Plan will be developed and implemented, and include the following provisions to enhance beneficial impacts:
- Seek opportunities to leverage funds and build partnerships with Government, civil society groups, and other private companies working in the region.
- Target community development activities based on impacts, and specifically for those community members who are potentially adversely affected by the Project.
- Priorities of investment into human capital (rather than capital expenditure and infrastructure) for more sustainable outcomes. The Company's approach to community development will prioritize needs-based, participatory planning and implementation, which are critical for the success and sustainability of community-based development plans.
- Conduct community consultation to further define potential community development activities for support by the Company prior to finalization of the Local cooperation and development agreement.
- Steppe Gold will be obtaining feedback on how existing successful community development activities and programs may be further scaled-up consistent with local needs and participation (e.g., scholarship program, water stewardship activities).

MINE CLOSURE PLANNING

The Actual as Integrated Mine Closure Plan for the ATO gold project will be developed and implemented under the set of principles grouped under four key areas (Physical stability, Chemical stability, not long-term active care, and sustainable use of future) following.

a. **Physical Stability:** Steppe Gold remains after closure should be constructed or modified at closure to be physically stable, ensuring it does not erode, subside, or move from its intended location under natural extreme events or disruptive forces to which it may be subjected.
b. **Chemical Stability:** Steppe Gold remains after closure should be chemically stable; chemical constituents released from the project components should not endanger human, wildlife, or environmental health and safety, should not result in the inability to achieve the water quality objectives in the receiving environment, and should not adversely affect soil or air quality into the long-term.
c. **Not Long-Term Active Care Requirements:** Steppe Gold remains after closure should not require long-term active care and maintenance. Thus, post-closure environmental monitoring would be required for a defined period by third party contractor.
d. **Sustainable Future Land Use:** The ATO gold project site should be compatible with the surrounding lands and water bodies once closure activities have been completed. The selection of closure objectives at ATO mine site should consider: The rehabilitation and The cost estimate is based on previous plans and experience on similar projects and complies with the current guidelines and accepted practices within Newfoundland and Labrador.

The Actual as Integrated Mine Closure Plan for the ATO gold project will be described the process of rehabilitation for the project at any stage, up to and including closure. Rehabilitation is defined as measures taken to restore a property as close to its former use or condition as practicable, or to an alternate use or condition that is deemed appropriate and acceptable by Mongolian Ministry of Mine and Ministry of Environment and Tourism. There are three key stages of rehabilitation activities that occur over the life span of a mine, which include:

a. progressive rehabilitation
b. closure rehabilitation
c. post-closure monitoring and treatment

REFERENCES

1) Feasibility Study Report of Altan Tsgaan Ovoo mining project (MIDAS MINING-2019)
2) Feasibility Study Report of Altan Tsgaan Ovoo processing project (MIDAS MINING-2019)
3) Detailed Environmental Impacts Assessment report of Altan Tsagaan Ovoo project's mining and processing (MAKE GREEN-2019)
4) Detailed Environmental Impacts Assessment report of Altan Tsagaan Ovoo project's Chemicals usage (EMB-2019)
5) Annual EMPs and reports (STEPPE GOLD-2018, 2019, 2020)
6) Annual Environmental Monitoring reports (EHSM LLC- 2018, 2019, Ulzii Environmental -2020)
7) Conceptual Mine Closure Plan of Altan Tsagaan Ovoo gold project (Polaris Engineering Consulting LLC-2019)
8) NI43-101 Technical Report of Altan Tsagaan Ovoo gold project (GSTATS CONSULTING- 2017)
9) Water resource and hydrogeology study report of Altan Tsagaan Ovoo gold project site (Water Management LLC-2019)

21 CAPITAL & OPERATING COSTS

21.1 CAPITAL COSTS

21.1.1 CAPITAL COST SUMMARY

Commercial production was declared at the ATO Gold mine in April 2020. Property, Plant and Equipment of US$ 37.8 million was reported on December 31st, 2020 a reduction of US$ 3.5 million over December 31, 2019 due to depreciation.

Total capital expenditure for 2020 was US$ 1.8 million with US$ 0.3 million spent in the fourth quarter compared to USD1.5 million in third quarter which included the leach pad expansion for Cells 3,4 and 5 and exploration drilling at the ATO Project in the third quarter. A new primary jaw crusher was also acquired in the third quarter of 2020.

21.1.2 SUSTAINING CAPITAL

AISC is calculated using cash costs in addition to general and administration, asset retirement costs, and sustaining capital, less certain non-recurring costs to provide an overall company outlook on the total cost required to sell an ounce of gold. Refer to Table 80 below.

Table 80 All-in Sustaining Costs Summary 2020

Quarter Ending December 31, 2020 (USD)		**Q4 Dec 31, 2020**	**Q3 Sep 30, 2020**	**Q2 Jun 30, 2020**	**YTD Dec 31, 2020**
Cash Cost of Sales	000's	4,868	6,633	7,474	19,546
By-Product Credits	000's	(80)	(141)	(58)	(280)
Net Cash Costs	000's	4,788	6,492	7,416	19,266
Sustaining Capital Expenditure	000's	(182)	380	315	940
Corporate Administration	000's	2,403	1,849	1,682	6,353
Other	000's	81	289	(201)	147
All-in-Sustaining Costs	000's	7,090	9,010	9,212	26,706
Gold Sales	oz	7,923	11,352	12,458	31,733
Cash Cost	**US$/oz**	**604**	**572**	**595**	**607**
All-in-Sustaining Cost	**US$/oz**	**902**	**794**	**739**	**839**

(1) AISC excludes non recurring exploration expenditures, share based compensation and certain non-recurring items

21.2 OPERATING COST

21.2.1 Operating Cost Summary

Operating cost summaries for 2020 are presented below in Table 81. Costs are presented as US$ per tonne mined rather than per tonne crushed and stacked. The total cost for 2020 was US$ 13.82 per tonne mined

Table 81 Operating Costs for 2020

December 31, 2020 (USD)		**Q4 Dec 31, 2020**	**Q3 Sep 30, 2020**	**Q2 Jun 30, 2020**	**YTD Dec 31, 2020**
Mining Unit Cost	US$/t	5.40	6.34	5.04	4.31
Processing Unit Cost	US$/t	8.65	4.06	3.85	6.59
Site G&A Unit Cost	US$/t	4.77	2.48	1.93	2.92
Cash Cost	US/oz	604	572	595	607
All-in-Sustaining Cost	US/oz	902	794	739	839

21.2.2 Operating Cost Breakdown

The operating cost budget is shown below in Table 82. Sustaining Capex for 2021 and 2022 are budgeted to be US$ 1.44 Million for each year. An exploration drilling budget of US$ 3.84 Million has been allowed for 2021 and 2022.

Table 82 Operating Cost Budget

All in sustaining cost & cash cost per oz	unit	2020	2021	2022
Mining	m$	$ 4.90	$ 7.50	$ 10.71
Processing	m$	$ 7.50	$ 7.96	$ 9.43
G&A site	m$	$ 3.30	$ 6.57	$ 7.38
Cash cost	**m$**	**$ 15.70**	**$ 22.03**	**$ 27.52**
Royalties	m$	$ 3.86	$ 5.19	$ 6.51
G&A Corporate	m$	$ 9.16	$ 8.53	$ 7.65
Exploration costs	m$	$ 2.78	$ 1.92	$ 1.92
Sustaining capex	m$	$ 0.94	$ 1.77	$ 1.44
Cash cost per oz/sold	$	$ 607.00	$ 668.01	$ 709.05
All in Sustaining cost per oz /sold	**$**	**$ 839.00**	**$ 877.37**	**$ 868.44**

Operating cost ($/t)	($/t)	2020	2021	2022
Mining ($/t)	($/t)	$ 4.31	$ 6.80	$ 5.95
Process-Leaching ($/t)	($/t)	$ 6.59	$ 7.21	$ 5.24
Mine site G&A costs ($/t)	($/t)	$ 2.92	$ 5.96	$ 4.10
Corporate cost G&A ($/t)	($/t)	$ 8.04	$ 7.73	$ 4.25
Total Operating cost ($/t)	**($/t)**	**21.86**	**27.70**	**19.54**

21.2.3 Comments on Capital and Operating Costs

The QP notes that the costs for oxide processing are budgeted through to the end of 2022 when it is anticipated that fresh ore processing will commence.

22 ECONOMIC ANALYSIS

METHODOLOGY USED

The ATO Oxide operation was valued using a simple cash flow model excluding discounted cash flows. Estimates were prepared for all the individual elements of cash revenue and cash expenditures for ongoing operations. Cash flows are assumed to occur in the middle of each period.

Operating costs were prepared based on recent operating history and technical assumptions associated with the production profile. Capital costs were prepared based on engineering estimates, vendor quotes, maintenance strategies, or estimated long-term requirements based on recent operating history and current asset values.

The currency used to calculate the cash flow is American dollars (US$).

CASH FLOW MODEL PARAMETERS

22.1.1 Mineral Reserves and Mine Life

The mine plan is based on the Mineral Reserves in Section 15. The oxide operations have an estimated 3-year mine life from 2020 to 2022.

22.1.2 Metallurgical Recoveries

The metallurgical recovery assumptions and basis are outlined in Section 13. The average LOM recovery used in the economic analysis is 70% for gold and 40% for Silver.

22.1.3 Metal Prices and Exchange Rates

The gold price assumption used in the forecast revenue analysis below is USD $1800 per ounce.

The silver price assumption used in the forecast revenue analysis below is USD $20 per ounce.

An average exchange rate of 2,835 MNT$/US$ was used in the analysis.

22.1.4 Gross Gold and Silver Revenue

Gross gold and silver revenue consists of inflows from the sale of gold and silver before any refining and transport costs and royalties.

22.1.5 Transport and Refining Charges

Transport and refining charges are based on existing agreements.

22.1.6 Net Gold Revenue

Net gold revenue is gross revenue after transport and refining charges.

22.1.7 Capital and Operating Costs

The capital and operating cost estimates were included in Section 21.

22.1.8 Royalties

Royalties included in the analysis are 5% on gold and a sliding scale percentage on silver.

22.1.9 Taxes

The Company expects to pay minimal income tax in respect of the 2020 financial year due to COVID-19 pandemic related tax exemptions. The company's expectation is to pay income tax at the prevailing rate of 25% for 2021 and 2022.

22.1.10 Closure Costs and Salvage Value

Closure costs are based on reclamation schedule extending through to the next centuries up to the last expected year of operation. Progressive reclamation occurs throughout the operating period. Reclamation activities are broken down into active closure, passive closure/flooding of the mine pit, final closure/ active discharge, and post closure/passive discharge.

22.1.11 Financing

The base case economic analysis assumes 100% equity financing and is reported on a 100% project ownership basis. The company does maintain a working capital debt facility to support ongoing operations and to fund the development of fresh rock treatment facility (Phase 2).

22.1.12 Inflation

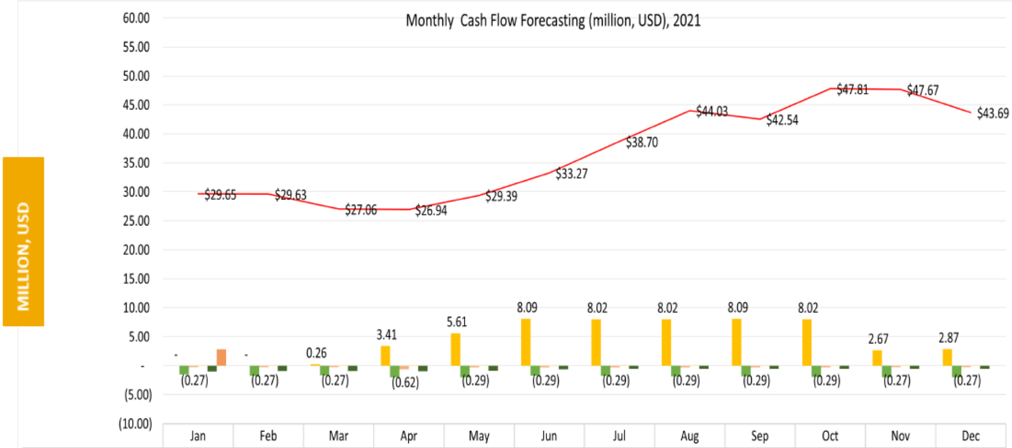
The base case economic analysis assumes constant prices with modest inflationary adjustments. Capital and operating costs are expressed in US dollars.

ECONOMIC ANALYSIS

Internal rate of return and payback period results are not relevant as the cumulative discounted after-tax free cash flows are never negative. This reflects the fact that the ATO Phase 1 is already in operation and that operating cash flows in 2021 and 2022 are sufficient to cover sustaining and growth capital requirements.

Figure **111** and Figure 112 show a summary of the operational cash flow models for 2021 and 2022.

Figure 111 Summary of the Operational Cash Flow Model for 2021



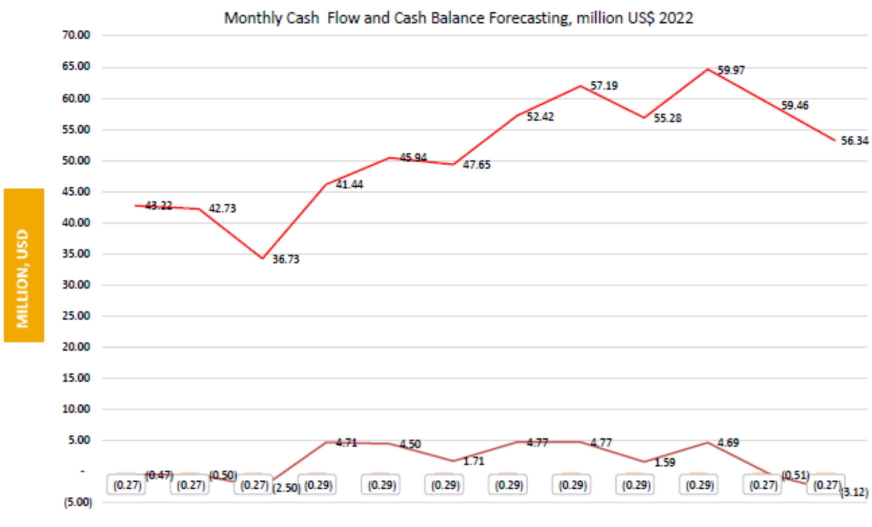
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NET REVENUE (M$)	-	-	0.26	3.41	5.61	8.09	8.02	8.02	8.09	8.02	2.67	2.87
Total OPEX	(1.54)	(1.73)	(1.67)	(1.98)	(2.00)	(1.70)	(1.76)	(1.86)	(1.85)	(1.95)	(1.99)	(1.99)
Total CAPEX	(0.27)	(0.27)	(0.27)	(0.62)	(0.29)	(0.29)	(0.29)	(0.29)	(0.29)	(0.29)	(0.27)	(0.27)
INTEREST	0.03	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.00	0.00
Total Corporate cost G&A	(0.98)	(0.90)	(0.90)	(0.94)	(0.88)	(0.63)	(0.55)	(0.55)	(0.55)	(0.55)	(0.55)	(0.55)
FINANCING M$)	2.85	-	-	-	-	-	-	-	-	-	-	-
Cash balance - closing	$29.65	$29.63	$27.06	$26.94	$29.39	$33.27	$38.70	$44.03	$42.54	$47.81	$47.67	$43.69

Annual Free Cash Flow Forecasting, US$

- Total revenue – **76.96 million**
- Total Stream – **16.7 million**
- Royalty, Areva - **5.19 million**
- OPEX – **22.03 million**
- Operating Profit – **33.02 million**
- Corporate cost G&A - **8.53 million**
- Pretax profit – **24.49 million**
- Taxes- **9.03 million**
- Profit after tax – **15.62 million**
- CAPEX – **3.69 million**
  - Exploration - 1.92 million
  - Sustaining capex - 1.77 million
- Cash cost – **668 US$/oz**
- AISC – **877 US$/oz**
- Operating cost – **29.7 US$/t**

Figure 112 Summary of the Operational Cash Flow Model for 2022 and 2023

OPERATIONAL CF MODEL 2022



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
TOTAL CAPEX (M$)	(0.27)	(0.27)	(0.27)	(0.29)	(0.29)	(0.29)	(0.29)	(0.29)	(0.29)	(0.29)	(0.27)	(0.27)
Financing												
Cash balance - closing	43.22	42.73	36.73	41.44	45.94	47.65	52.42	57.19	55.28	59.97	59.46	56.34
FREE CASH FLOW	(0.47)	(0.50)	(2.50)	4.71	4.50	1.71	4.77	4.77	1.59	4.69	(0.51)	(3.12)

Annual Free Cash Flow Forecasting, US$

- Total revenue – **96.48 million**
- Total Stream – **20.68 million**
- Royalty, Areva - **6.51 million**
- OPEX – **27.52 million**
- Operating Profit – **41.77 million**
- Corporate cost G&A - **7.65 million**
- Pretax profit – **34.12 million**
- Taxes - **11.46 million**
- Profit after tax – **23 million**
- CAPEX – **3.36 million**
  - Exploration - 1.92 million
  - Sustaining capex - 1.44 million
- Cash cost – **709.05 US$/oz**
- AISC – **868.44 US$/oz**
- Operating cost – **30.36 US$/t**

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23 ADJACENT PROPERTIES

The Author QP has not been supplied with any information by Steppe concerning any adjacent properties to ATO that Steppe may have interests in.

24 OTHER RELEVANT DATA & INFORMATION

The Author QP is not aware of any other data or information (additional to already included in this Report) which would make the Report more understandable and not misleading.

25 INTERPRETATION & CONCLUSIONS

GENERAL INTERPRETATION

The Author QP's overall interpretation of the estimation and resulting Resources was that it proceeded as expected, confirmed the 2017 modelling and results of Pipes 1, 2 and 4, and produced a more accurate second-generation result.

Interpretation of mineralisation at the new Mungu deposit showed it to be more complex and lode-like than the other deposits, with greater potential for increasing the Resource with targeted drilling. Its different shape gives encouragement for further regional exploration to find other deposits of its Measured and indicated resources for the Mungu deposit for the oxide, transition and fresh material are stipulated in the report. The interpretation of mineralisation at the new Mungu deposit showed it to be more complex and lode-like than the other deposits, with greater potential for increasing the Resource with targeted drilling. The operational mining site is performing additional metallurgical testwork that is in progress for the Mungu deposit for further information for the feasibility study.

CONCLUSIONS

Although not part of the original Project scope the Author QP nevertheless would share his positive views on the Resource resulting from the Consulting. Conclusions drawn about this 2021 Resource estimate were:

Measured and Indicated Resources:

- Pipes 1, 2 and 4 deposit:
  - The 2021 estimate confirmed the quantum of the 2017 estimate of Pipes 1, 2 and 4.
  - It increased the Resource tonnage significantly (by 25%), decreased the gold grade slightly (by 3%), increased the silver grade reasonable (by 16%), leading to an overall significant increase in metal contents (gold by 22%, silver by 45%). NB: This comparison uses equivalent reporting cut-offs between the two estimates.
  - The increase in deposit volume was not only because of additional drill holes but also because of more practical and geologically controlled deposit shape interpretation.
- Mungu:
  - The cross-sectional interpretations hung together and created a significant deposit.
  - This maiden Measured and Indicated Resource was significant at 7.6 Mt at 1.16 g/t gold (282 k oz gold metal) and 40.75 g/t silver (9,916 k oz silver metal).
  - Mungu now represents 18% by tonnage of the Resources, 20% of the gold metal and 48% of the silver metal (as the silver grade is 320% higher than for Pipes 1, 2 and 4).
- All deposits:
  - The total Resource for all deposits stands at 41.6 Mt at 1.04 g/t gold (1.4 Moz gold metal) and 15.31 g/t silver (20.5 Moz silver metal).
  - The absolute comparison (Table 83) of the 2017 Resource (reported at much higher cut-off grades) with the 2021 Resource shows increases of tonnage by 136%, decreases of average gold grade by 27%, and increases of average silver grade by 53%.
  - The absolute comparison of contained metal shows a 73% increase in gold metal (to 1.4 Moz) and a 262% increase in silver metal (to 20.5 Moz).

Table 83 Absolute Resource differences 2017 / 2021

Estimate		Cut-off AuEq (g/t)	Bulk density (t/m^3)	Tonnes (M t)		Au (g/t)		Ag (g/t)		Metal Au (k oz)		Metal Ag (k oz)	
GSTATS 2017	Oxide	0.30	2.46	5.3	30%	1.23		9.96		208		1,680	
	Fresh	1.10	2.64	12.4	70%	1.50		10.03		594		3,980	
	Total			**17.6**		**1.42**		**10.01**		**802**		**5,660**	
GeoRes 2021	Oxide	0.15	2.46	8.0	19%	0.86		10.72		221		2,763	
	Transition	0.40	2.59	10.3	25%	1.24		12.97		412		4,307	
	Fresh	0.40	2.64	23.3	56%	1.01		17.93		757		13,409	
	Total			**41.6**		**1.04**		**15.31**		**1,390**		**20,479**	
2021 difference	Oxide			2.8	53%	-0.37	-30%	0.76	8%	13	6%	1,083	64%
	Fresh			21.2	172%	-0.42	-28%	6.37	64%	575	97%	13,736	345%
	Total			**24.0**	**136%**	**-0.38**	**-27%**	**5.30**	**53%**	**588**	**73%**	**14,819**	**262%**

Adequacy of data & sources: The Author QP believes that all data supplied and used in the estimation was suitable for the purpose of Mineral Resource estimation and JORC classification.

Drilling data: The Author QP's overall pinion of the drilling, sampling and subsequent assaying (albeit without the benefit of a site visit to observe it) was that it was well performed, comprehensive, consistent (and extensive) and very adequate from a point of view of allowing a straight-forward interpretation of mineralisation at the deposits and of estimation of their Resources.

Compliance with JORC and Canadian NI 43-101 standards:

- To the best of his knowledge the Author QP believes that the Mineral Resource estimation Project, and the reporting of it, comply with the JORC (2012) and NI 43-101 (June 2011) standards.
- He notes that in order to comply with the CIM Definitions requirement of "reasonable prospects for eventual economic extraction" the 2017 Report[55] included details on pit optimisation studies (which incorporated metal recoveries, dilution etc) and pit design leading to the reporting of Mineral Reserves and made the assertion that the Resources met the requirement.
- The Author QP considers the results of that previous work to have been successful and therefore continue to demonstrate the "reasonable prospects for economic extraction".
- The fact that mining has commenced at the ATO Mine further reinforces this compliance with the Code.

POTENTIAL RISKS TO THE ESTIMATE

The Author QP does not consider that input data, geological interpretation or grade estimation parameters pose any significant risk to the quantum of the reported Resources.

Aspects which could alter the Resources slightly (not significantly) were discussed above. Of those mentioned the issue of mining method to apply to Mungu (given its greater depth than the other deposits), which could alter the economic cut-off grade, would seem to be the greatest risk to these Resources. However, that could only alter Resources for the lowest parts of Mungu and, as Mungu only represents 20% by tonnage of the overall Resources, that risk appears minimal.

26 RECOMMENDATIONS

Recommendations were outside the Scope of Work for the Author QP's Resource estimation. And with the ATO Mine now in operation and mine planning assumed to be at an advanced stage the capacity for recommendations is limited.

However, the Author QP sees the potential for further drilling to enlarge the defined deposits (particularly at Mungu) and for further exploration to find new ones.

So his simple recommendations would be to:

- Continue drilling around and nearby the deposits in a targeted way (particularly by using cross-sectional data provided in this Report). The drill spacing could be widened to ~45 m.
- Explore locally for other deposits of the Mungu type (as this style of mineralisation may have previously been overlooked).

[55] 2017 NI 43-101. Section 25.2, 4th paragraph, pp206.

27 REFERENCES

Canadian National Instrument 43-101 (NI 43-101):

- *Form F1*: British Columbia Securities Administrators (BCSC), 24th June 2011. *Form 43-101F1 Technical Report – Contents of the Technical Report*. Document setting out the specific structure (sections and content) of an NI 43-101 Technical Report.
- *Companion Policy CP*: British Columbia Securities Administrators (BCSC), 25th February 2016. *Companion Policy 43-101CP to National Instrument 43-101 – Standards of Disclosure for Mineral Projects*. Document sets out the views of the Canadian Securities authorities as to how they interpret and apply the NI 43-101 and the Form 43-101F1.

CIM (The Canadian Institute of Mining, Metallurgy and Petroleum), 10th May 2014. *CIM Definition Standards – for Mineral Resources and Mineral Reserves*. Prepared for the CIM Standing Committee on Reserve Definitions and adopted by the CIM Council on 10th May 2014. These definitions are incorporated into the NI 43-101 by reference.

JORC, 2012. Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition). Prepared by the Joint Committee of the Australasian Institute of Mining and Metallurgy, Australasian Institute of Geoscientists and Minerals Council of Australia (JORC).

Oyungeral Bayanjargal, 4 October 2017. *NI 43-101 Technical Report – Altan Tsagaan Ovoo Gold Project*. Report for Steppe Gold LLC by GSTATS Consulting LLC, Mongolia. Report reviewed by Qualified Persons Leonid Tokar (GSTATS), Tim Fletcher (DRA Americas Inc), David Frost (DRA) and Dr Martin Stapinsky (DRA). Referenced as the '2017 NI 43-101' or '2017 Report'

Steppe Gold Ltd., 24 February 2021. *Steppe Gold doubles the ATO Gold Mine Resource to 2.45 Moz gold equivalent*. Press release through Newsfile Corp., release 75306.

Matthew Wood (Executive Chairman), 27 August 2020. *Geological Consultant engagement letter*. Emailed letter to GeoRes from Steppe Gold Ltd.

APPENDIX 1 – DRILL HOLE LISTING & COLLAR SURVEYS

Drill hole	Easting (m)	Northing (m)	Elevation (m)	Depth (m)	Azimuth (°)	Dip (°)	Type
AT diamond holes							
ATO01	631,779.9	5,367,067.8	1,063.7	221.4	38	-60	DDH
ATO02	631,725.2	5,366,995.8	1,067.6	242.2	35	-60	DDH
ATO03	631,576.1	5,367,109.1	1,056.7	200.1	35	-60	DDH
ATO04	631,399.1	5,367,217.6	1,049.0	200.3	35	-60	DDH
ATO05	631,241.8	5,367,323.6	1,044.8	200.2	35	-60	DDH
ATO06	631,462.3	5,367,117.2	1,053.1	209.0	35	-60	DDH
ATO07	631,669.5	5,366,908.0	1,050.8	208.2	35	-60	DDH
ATO08	631,458.2	5,366,462.6	1,028.5	176.2	35	-60	DDH
ATO09	631,667.8	5,366,908.3	1,050.9	120.5	215	-60	DDH
ATO10	631,680.8	5,367,024.3	1,060.1	201.7	305	-60	DDH
ATO100	632,062.3	5,367,008.0	1,050.9	225.9	125	-60	DDH
ATO101	631,741.2	5,367,015.1	1,068.0	197.3	125	-60	DDH
ATO102	631,994.8	5,366,909.1	1,051.3	116.0	125	-60	DDH
ATO103	632,327.6	5,367,497.1	1,056.8	200.3	125	-60	DDH
ATO104	632,096.4	5,367,054.8	1,049.4	158.3	125	-60	DDH
ATO105	631,809.4	5,366,894.7	1,052.6	115.7	125	-60	DDH
ATO106	631,791.2	5,366,979.7	1,063.4	110.3	125	-60	DDH
ATO107	632,053.5	5,366,941.5	1,051.0	160.9	125	-60	DDH
ATO108	631,798.2	5,367,046.0	1,065.7	170.3	125	-60	DDH
ATO109	632,026.9	5,366,959.2	1,051.5	147.7	305	-60	DDH
ATO11	631,717.3	5,366,873.3	1,049.8	220.8	35	-60	DDH
ATO110	631,845.0	5,367,011.5	1,059.8	200.3	125	-60	DDH
ATO111	631,980.2	5,366,992.3	1,053.1	500.8	125	-60	DDH
ATO112	631,490.9	5,367,078.8	1,052.6	251.3	125	-60	DDH
ATO113	631,525.6	5,367,128.5	1,061.5	284.5	305	-80	DDH
ATO114	631,571.7	5,367,246.6	1,054.1	144.9	305	-60	DDH
ATO115	632,101.3	5,366,907.4	1,051.1	104.7	125	-60	DDH
ATO116	632,108.5	5,366,972.6	1,051.0	139.2	125	-60	DDH
ATO117	631,489.9	5,367,077.1	1,052.9	108.0	305	-60	DDH
ATO118	631,707.0	5,367,428.5	1,039.7	99.2	125	-60	DDH
ATO119	632,106.7	5,366,970.3	1,051.2	222.0	305	-60	DDH
ATO12	631,771.2	5,366,956.8	1,062.5	201.4	35	-60	DDH
ATO120	631,813.5	5,366,962.8	1,059.0	281.3	305	-60	DDH
ATO121	632,011.5	5,367,042.4	1,052.1	285.9	125	-60	DDH
ATO122	631,841.7	5,367,056.4	1,063.2	224.3	305	-60	DDH
ATO123	632,162.2	5,366,936.2	1,052.4	129.4	125	-60	DDH
ATO124	631,880.2	5,367,061.7	1,058.2	224.3	305	-60	DDH
ATO125	631,720.4	5,366,881.2	1,050.2	224.3	305	-60	DDH
ATO126	632,145.8	5,367,021.4	1,050.6	145.6	305	-60	DDH
ATO127	631,760.8	5,366,888.4	1,051.4	200.3	305	-60	DDH
ATO128	632,015.6	5,366,891.8	1,050.5	140.6	305	-60	DDH
ATO129	631,778.1	5,366,913.9	1,054.0	68.3	125	-60	DDH
ATO13	631,774.9	5,366,958.5	1,062.5	199.9	125	-60	DDH
ATO130	632,070.5	5,367,071.5	1,049.2	205.7	125	-60	DDH
ATO131	631,755.4	5,366,931.4	1,055.8	227.3	305	-60	DDH
ATO132	632,147.6	5,367,023.5	1,050.3	151.8	125	-60	DDH
ATO133	631,647.8	5,367,044.3	1,058.0	323.3	125	-60	DDH
ATO134	632,016.5	5,366,894.5	1,050.7	101.8	125	-60	DDH
ATO135	632,086.4	5,366,989.9	1,050.6	194.4	125	-60	DDH
ATO136	631,854.6	5,366,969.2	1,057.3	269.3	305	-60	DDH
ATO137	632,036.6	5,367,024.9	1,051.5	257.0	125	-60	DDH
ATO138	631,871.3	5,366,995.7	1,058.2	152.3	125	-60	DDH
ATO139	631,871.6	5,366,998.1	1,058.4	236.3	305	-60	DDH
ATO14	631,826.1	5,367,029.2	1,063.8	199.8	125	-60	DDH
ATO140	632,086.0	5,366,994.0	1,050.7	186.5	35	-45	DDH
ATO141	631,879.3	5,367,059.7	1,058.2	242.3	125	-60	DDH
ATO142	631,855.5	5,366,863.4	1,050.4	88.3	125	-60	DDH
ATO143	632,051.3	5,366,942.2	1,051.1	174.7	215	-45	DDH
ATO144	631,769.9	5,366,847.6	1,048.7	77.6	125	-60	DDH
ATO145	632,149.8	5,366,871.5	1,052.3	87.7	125	-60	DDH
ATO146	632,041.1	5,366,875.9	1,050.2	72.4	125	-60	DDH
ATO147	631,894.6	5,366,976.8	1,056.1	199.3	125	-60	DDH
ATO148	631,965.0	5,367,074.7	1,053.7	276.9	125	-60	DDH
ATO149	631,790.1	5,366,977.1	1,063.5	230.3	305	-60	DDH
ATO15	631,827.2	5,367,031.7	1,063.8	200.2	35	-60	DDH
ATO150	631,969.3	5,366,924.8	1,052.2	166.6	125	-60	DDH
ATO151	632,168.5	5,367,004.8	1,051.4	151.9	125	-60	DDH
ATO152	631,666.7	5,367,065.5	1,059.1	305.3	125	-60	DDH
ATO153	632,182.8	5,366,918.9	1,053.1	99.9	125	-60	DDH
ATO154	632,128.8	5,367,102.3	1,048.3	170.1	124	-60	DDH
ATO155	631,838.5	5,366,946.7	1,056.1	87.2	125	-60	DDH
ATO156	632,177.9	5,367,071.0	1,050.6	161.0	125	-60	DDH
ATO157	631,878.2	5,366,953.4	1,055.5	89.3	125	-60	DDH
ATO158	631,812.7	5,366,961.3	1,059.3	92.3	125	-60	DDH
ATO159	632,077.0	5,367,140.3	1,047.3	258.2	125	-60	DDH

ATO16	631,618.7	5,366,944.1	1,050.8	199.9	35	-60	DDH
ATO160	631,722.3	5,366,883.1	1,050.2	75.7	125	-60	DDH
ATO161	632,174.1	5,367,140.8	1,048.8	250.6	125	-60	DDH
ATO162	631,759.9	5,366,885.2	1,051.1	80.3	125	-60	DDH
ATO163	631,887.4	5,367,019.1	1,057.6	71.3	125	-60	DDH
ATO164	631,627.6	5,367,276.6	1,048.3	131.3	305	-60	DDH
ATO165	631,612.5	5,367,361.2	1,042.9	100.3	125	-60	DDH
ATO166	631,957.6	5,366,859.8	1,049.7	121.1	125	-60	DDH
ATO167	632,194.4	5,366,987.3	1,052.2	121.2	125	-60	DDH
ATO168	632,065.7	5,366,855.8	1,050.2	69.2	125	-60	DDH
ATO169	632,204.5	5,367,052.9	1,051.7	160.9	125	-60	DDH
ATO17	631,689.5	5,367,019.0	1,060.4	207.3	35	-60	DDH
ATO170	632,125.9	5,366,888.9	1,051.4	98.3	125	-60	DDH
ATO171	632,133.7	5,366,953.9	1,051.4	182.3	125	-60	DDH
ATO172	632,153.1	5,367,089.8	1,049.1	170.1	125	-60	DDH
ATO173	632,121.9	5,367,038.8	1,049.5	158.3	125	-60	DDH
ATO174	632,105.1	5,367,121.5	1,047.7	230.9	125	-60	DDH
ATO175	632,045.0	5,367,091.5	1,049.9	242.3	125	-60	DDH
ATO176	631,655.8	5,366,890.5	1,049.6	99.7	125	-60	DDH
ATO177	631,829.1	5,366,878.7	1,051.5	108.7	125	-60	DDH
ATO178	631,901.6	5,366,933.3	1,053.8	112.0	125	-60	DDH
ATO179	631,758.5	5,367,146.1	1,056.9	287.4	125	-60	DDH
ATO18	631,523.4	5,367,202.3	1,066.2	199.8	305	-60	DDH
ATO180	631,677.6	5,366,873.4	1,049.0	95.3	125	-60	DDH
ATO181	632,218.4	5,366,969.6	1,053.3	99.9	125	-60	DDH
ATO182	632,137.9	5,367,172.5	1,046.9	269.0	125	-60	DDH
ATO183	631,460.3	5,367,247.2	1,052.1	259.0	125	-60	DDH
ATO184	631,496.3	5,367,296.7	1,047.9	221.9	125	-60	DDH
ATO185	631,634.3	5,367,017.9	1,055.8	270.7	125	-60	DDH
ATO186	631,430.3	5,367,199.4	1,051.8	264.2	125	-60	DDH
ATO187	632,326.7	5,366,966.9	1,058.2	152.0	125	-60	DDH
ATO188	631,843.6	5,367,849.2	1,035.3	155.3	215	-60	DDH
ATO189	631,305.8	5,366,895.3	1,028.9	63.2	125	-60	DDH
ATO19	631,524.7	5,367,204.0	1,066.2	160.7	125	-60	DDH
ATO190	630,989.5	5,367,143.7	1,022.6	118.5	125	-60	DDH
ATO191	630,792.2	5,367,518.0	1,014.6	149.3	125	-60	DDH
ATO192	632,745.9	5,368,929.0	1,079.2	200.0	125	-60	DDH
ATO193	631,197.2	5,367,034.5	1,028.7	149.3	125	-60	DDH
ATO194	632,645.9	5,368,796.7	1,069.8	93.4	125	-60	DDH
ATO195	631,866.5	5,367,192.1	1,053.2	152.3	125	-60	DDH
ATO196	632,686.0	5,366,958.6	1,090.9	201.5	125	-60	DDH
ATO197	631,962.4	5,367,232.9	1,047.8	710.3	215	-60	DDH
ATO198MET	631,679.5	5,366,980.1	1,056.7	145.0	125	-60	DDH
ATO199MET	631,780.1	5,367,024.9	1,069.3	150.0	125	-60	DDH
ATO20	631,525.9	5,367,202.3	1,066.3	208.9	35	-60	DDH
ATO200MET	632,077.7	5,366,928.9	1,051.1	145.0	315	-60	DDH
ATO201MET	631,526.0	5,367,206.2	1,066.0	125.0	125	-60	DDH
ATO202	632,421.7	5,366,912.7	1,064.0	200.1	125	-60	DDH
ATO203	630,511.8	5,367,909.6	1,028.6	299.1	305	-60	DDH
ATO204	633,023.3	5,368,668.6	1,085.4	200.3	125	-60	DDH
ATO205	629,791.4	5,367,498.3	1,007.3	152.3	125	-60	DDH
ATO206	631,156.7	5,367,166.4	1,035.1	200.3	305	-60	DDH
ATO207	631,389.7	5,366,841.1	1,033.8	152.3	305	-60	DDH
ATO208	631,733.6	5,367,166.9	1,055.5	351.6	125	-60	DDH
ATO209	631,775.0	5,367,174.0	1,055.5	285.6	125	-60	DDH
ATO21	631,855.4	5,367,078.5	1,060.1	184.7	35	-60	DDH
ATO210	631,418.8	5,367,132.7	1,049.5	269.2	125	-60	DDH
ATO211	631,741.5	5,367,123.3	1,059.8	286.6	125	-60	DDH
ATO212	631,725.0	5,367,101.4	1,062.8	301.6	125	-60	DDH
ATO213	631,707.9	5,367,075.6	1,061.5	272.2	125	-60	DDH
ATO214	631,709.2	5,367,181.2	1,055.8	371.2	125	-60	DDH
ATO215	632,029.9	5,366,391.2	1,058.7	149.6	360	-90	DDH
ATO216	631,749.4	5,367,187.5	1,053.9	339.4	125	-60	DDH
ATO217	631,790.7	5,367,197.4	1,053.8	298.9	125	-60	DDH
ATO218	631,944.8	5,366,944.0	1,053.3	160.8	125	-60	DDH
ATO219	631,919.8	5,366,957.8	1,054.5	181.7	125	-60	DDH
ATO22	631,736.4	5,366,905.7	1,052.6	118.7	215	-60	DDH
ATO220	631,717.0	5,367,142.6	1,057.8	358.5	125	-60	DDH
ATO221	631,619.0	5,367,211.2	1,053.5	80.1	125	-60	DDH
ATO222	631,694.3	5,367,157.0	1,056.5	164.1	125	-60	DDH
ATO223	631,326.1	5,367,046.8	1,036.8	150.0	125	-60	DDH
ATO224	631,953.5	5,367,009.8	1,054.2	93.4	125	-60	DDH
ATO225	631,955.3	5,367,013.1	1,054.5	358.4	125	-60	DDH
ATO226	631,956.0	5,367,695.6	1,036.5	151.6	270	-60	DDH
ATO227	631,310.2	5,367,205.1	1,043.8	149.2	125	-60	DDH
ATO228	631,614.2	5,367,104.5	1,057.7	149.2	125	-60	DDH
ATO229	631,963.9	5,367,184.5	1,049.8	149.3	125	-60	DDH
ATO23	631,841.0	5,367,054.1	1,062.9	123.4	125	-60	DDH
ATO230	631,453.5	5,367,659.0	1,027.9	152.1	125	-60	DDH
ATO231	631,893.4	5,367,697.6	1,034.6	200.1	270	-60	DDH
ATO232	628,459.7	5,364,649.0	999.8	144.1	70	-60	DDH
ATO233	629,987.0	5,363,690.1	1,016.4	152.1	0	-60	DDH
ATO234	631,935.1	5,366,877.1	1,050.7	100.0	125	-60	DDH

ATO235	631,983.5	5,366,842.0	1,049.1	101.1	125	-60	DDH
ATO236	631,929.2	5,366,916.7	1,052.7	101.1	125	-60	DDH
ATO237	631,875.9	5,366,845.5	1,049.3	90.6	125	-60	DDH
ATO238	631,789.4	5,366,875.7	1,051.2	100.0	125	-60	DDH
ATO239	632,233.8	5,366,885.9	1,055.0	90.6	125	-60	DDH
ATO24	631,793.3	5,367,088.3	1,062.1	239.2	125	-60	DDH
ATO240	631,932.1	5,367,030.2	1,055.4	381.6	125	-60	DDH
ATO241	631,876.6	5,367,460.4	1,039.0	716.0	215	-60	DDH
ATO242	631,912.8	5,366,895.1	1,051.9	116.1	125	-60	DDH
ATO243	631,520.2	5,367,064.5	1,052.2	110.1	125	-60	DDH
ATO244	631,614.0	5,366,992.9	1,053.8	221.1	125	-60	DDH
ATO245	631,453.2	5,367,181.7	1,056.6	215.1	125	-60	DDH
ATO246	632,114.6	5,367,110.3	1,048.0	440.2	215	-60	DDH
ATO247	631,893.9	5,366,872.7	1,050.8	110.1	125	-60	DDH
ATO248	631,907.6	5,367,046.7	1,056.7	422.1	125	-60	DDH
ATO249	631,622.2	5,366,951.7	1,051.0	200.1	125	-60	DDH
ATO25	631,803.4	5,367,003.0	1,065.3	118.2	125	-60	DDH
ATO250	631,628.1	5,366,910.1	1,049.6	142.9	125	-60	DDH
ATO251	631,705.9	5,366,859.4	1,048.6	107.1	125	-60	DDH
ATO252	631,747.9	5,366,867.6	1,049.9	80.1	125	-60	DDH
ATO253	631,837.9	5,366,839.3	1,049.1	101.1	125	-60	DDH
ATO254	631,643.5	5,367,086.7	1,058.0	230.1	125	-60	DDH
ATO255	631,889.0	5,366,914.0	1,053.1	131.1	125	-60	DDH
ATO256	632,011.3	5,366,827.0	1,048.8	81.6	125	-60	DDH
ATO257	631,872.7	5,366,888.4	1,051.8	125.1	125	-60	DDH
ATO258	631,921.9	5,366,853.8	1,049.7	92.1	125	-60	DDH
ATO259	631,952.6	5,366,903.8	1,051.8	116.1	125	-60	DDH
ATO26	631,756.3	5,367,039.9	1,066.3	214.8	125	-60	DDH
ATO260	632,212.0	5,367,120.6	1,051.2	200.2	125	-60	DDH
ATO261	632,261.1	5,367,086.7	1,054.2	200.1	125	-60	DDH
ATO262	631,906.7	5,367,153.8	1,054.1	200.1	125	-60	DDH
ATO263	631,571.6	5,366,878.2	1,044.2	200.1	125	-60	DDH
ATO264	631,620.4	5,366,840.0	1,044.9	200.1	125	-60	DDH
ATO265	631,142.0	5,367,365.0	1,034.3	200.1	125	-60	DDH
ATO266	632,170.8	5,367,221.8	1,047.0	338.1	125	-60	DDH
ATO267	630,029.3	5,368,865.2	1,004.6	76.2	0	-90	DDH
ATO268	629,511.9	5,368,020.3	1,000.1	88.2	0	-90	DDH
ATO269	629,510.7	5,367,130.9	1,000.0	46.2	0	-90	DDH
ATO27	631,725.0	5,366,993.4	1,067.7	198.0	125	-60	DDH
ATO270	629,494.0	5,366,124.7	994.1	34.2	0	-90	DDH
ATO271	629,538.2	5,365,306.1	992.6	52.2	0	-90	DDH
ATO272	629,116.5	5,365,005.1	991.4	61.2	0	-90	DDH
ATO273	629,100.1	5,365,747.8	993.8	50.2	0	-90	DDH
ATO274	629,085.4	5,366,594.1	995.6	95.2	0	-90	DDH
ATO275	629,072.4	5,367,570.9	998.0	55.2	0	-90	DDH
ATO276	629,174.3	5,368,848.1	1,000.6	55.2	0	-90	DDH
ATO277	631,183.1	5,364,996.9	1,026.0	50.2	0	-90	DDH
ATO278	631,289.7	5,364,995.4	1,029.9	62.2	0	-90	DDH
ATO279	630,806.3	5,366,890.4	1,013.8	50.0	0	-90	DDH
ATO28	631,689.7	5,366,938.9	1,053.7	193.8	125	-60	DDH
ATO280	631,006.9	5,366,893.8	1,018.3	49.2	0	-90	DDH
ATO281	630,997.8	5,366,799.7	1,017.9	49.2	0	-90	DDH
ATO282	630,896.6	5,366,799.1	1,015.3	49.6	0	-90	DDH
ATO283	630,795.6	5,366,798.6	1,014.1	31.2	0	-90	DDH
ATO284	630,810.7	5,366,992.6	1,014.0	49.2	0	-90	DDH
ATO285	630,902.0	5,366,996.5	1,016.1	52.2	0	-90	DDH
ATO286	630,999.4	5,366,995.1	1,019.6	40.2	0	-90	DDH
ATO287	630,107.0	5,366,998.1	1,006.3	46.2	0	-90	DDH
ATO288	630,400.9	5,367,200.4	1,008.2	46.2	0	-90	DDH
ATO289	630,198.9	5,367,202.4	1,007.6	41.4	0	-90	DDH
ATO29	631,738.5	5,366,908.1	1,052.6	112.8	125	-60	DDH
ATO290	630,000.9	5,367,200.1	1,005.6	34.2	0	-90	DDH
ATO291	632,459.2	5,366,470.3	1,063.5	271.6	305	-60	DDH
ATO292	632,180.2	5,366,659.6	1,057.8	200.1	305	-60	DDH
ATO293	632,225.0	5,367,190.0	1,049.0	277.7	125	-60	DDH
ATO294	631,700.2	5,366,670.4	1,052.0	293.0	125	-60	DDH
ATO295	631,987.5	5,366,950.5	1,052.3	224.4	125	-60	DDH
ATO296	631,967.4	5,366,967.6	1,053.2	299.0	125	-60	DDH
ATO297	632,010.2	5,366,934.1	1,051.3	254.0	125	-60	DDH
ATO298	631,975.0	5,366,885.5	1,050.3	167.0	125	-60	DDH
ATO299	631,996.5	5,367,017.3	1,052.3	392.0	125	-60	DDH
ATO30	631,569.2	5,367,245.9	1,054.1	172.8	35	-60	DDH
ATO300	632,034.7	5,366,916.7	1,050.8	199.0	125	-60	DDH
ATO301	632,021.0	5,367,000.0	1,051.6	302.0	125	-60	DDH
ATO302	631,999.5	5,366,868.1	1,049.7	161.0	125	-60	DDH
ATO303	632,059.2	5,366,899.4	1,050.4	169.0	125	-60	DDH
ATO304	632,045.5	5,366,982.6	1,051.1	271.0	125	-60	DDH
ATO305	632,083.7	5,366,882.1	1,050.5	158.0	125	-60	DDH
ATO306	631,936.8	5,366,986.1	1,053.9	443.0	125	-60	DDH
ATO307	631,972.0	5,367,034.7	1,053.1	452.0	125	-60	DDH
ATO308	632,031.7	5,367,065.9	1,050.6	407.0	125	-60	DDH
ATO309	632,069.9	5,366,965.3	1,050.9	278.0	125	-60	DDH
ATO31	631,817.2	5,367,070.5	1,062.0	142.7	125	-60	DDH

ATO310	632,094.4	5,366,948.0	1,050.8	209.0	125	-60	DDH
ATO311	632,056.2	5,367,048.6	1,050.3	272.0	126	-60	DDH
ATO312	632,118.9	5,366,930.6	1,051.1	182.0	126	-60	DDH
ATO313	632,115.9	5,367,079.8	1,048.8	200.0	125	-60	DDH
ATO314	632,080.7	5,367,031.2	1,050.2	269.0	125	-60	DDH
ATO315	632,143.4	5,366,913.3	1,051.6	137.0	125	-60	DDH
ATO316	632,167.8	5,366,896.0	1,052.4	110.0	125	-60	DDH
ATO317	631,947.4	5,367,052.2	1,054.4	506.0	125	-60	DDH
ATO318	632,105.2	5,367,013.9	1,050.3	188.0	125	-60	DDH
ATO319	632,140.4	5,367,062.5	1,049.4	179.0	125	-60	DDH
ATO32	631,674.2	5,367,024.2	1,058.9	298.7	125	-60	DDH
ATO320	631,249.9	5,367,363.8	1,040.3	242.0	125	-60	DDH
ATO321	632,164.9	5,367,045.1	1,050.3	176.0	125	-60	DDH
ATO322	632,129.7	5,366,996.6	1,050.8	170.0	125	-60	DDH
ATO323	632,486.5	5,366,450.0	1,064.9	206.0	125	-60	DDH
ATO324	632,189.4	5,367,027.8	1,051.4	173.0	125	-60	DDH
ATO325	632,154.1	5,366,979.2	1,051.4	149.0	125	-60	DDH
ATO326	632,091.4	5,367,097.2	1,048.5	341.0	125	-60	DDH
ATO327	631,502.9	5,367,256.5	1,052.9	251.0	125	-60	DDH
ATO328	631,923.0	5,367,069.3	1,055.4	479.0	125	-60	DDH
ATO329	632,066.9	5,367,114.5	1,048.3	308.0	125	-60	DDH
ATO33	631,865.0	5,367,037.0	1,060.3	84.3	125	-60	DDH
ATO330	631,527.4	5,367,239.1	1,056.7	197.0	125	-60	DDH
ATO331	631,538.1	5,367,305.1	1,046.5	200.0	125	-60	DDH
ATO332	631,562.6	5,367,287.7	1,048.5	209.0	125	-60	DDH
ATO333	631,513.8	5,367,322.3	1,044.4	47.0	125	-60	DDH
ATO334	631,587.1	5,367,270.4	1,049.5	50.0	125	-60	DDH
ATO335	631,611.6	5,367,253.0	1,050.3	50.0	125	-60	DDH
ATO336	631,478.4	5,367,273.7	1,049.5	50.0	125	-61	DDH
ATO337	631,551.9	5,367,221.8	1,059.2	56.0	125	-60	DDH
ATO338	631,576.4	5,367,204.4	1,059.9	62.0	125	-60	DDH
ATO339	631,505.9	5,367,107.3	1,058.3	62.0	125	-60	DDH
ATO34	631,767.1	5,367,106.6	1,062.6	220.8	125	-60	DDH
ATO340	631,481.4	5,367,124.7	1,058.2	56.0	125	-60	DDH
ATO341	631,457.0	5,367,141.9	1,056.6	50.0	125	-60	DDH
ATO342	631,432.4	5,367,159.2	1,053.9	40.0	125	-60	DDH
ATO343	631,467.8	5,367,207.9	1,057.2	53.0	125	-60	DDH
ATO344	631,541.1	5,367,155.8	1,068.2	53.3	125	-60	DDH
ATO345	631,492.1	5,367,190.6	1,062.4	64.0	125	-60	DDH
ATO346	631,516.6	5,367,173.2	1,065.0	59.0	125	-60	DDH
ATO347	632,205.0	5,367,270.0	1,048.3	357.0	125	-60	DDH
ATO348	632,251.0	5,367,174.0	1,051.0	269.0	125	-60	DDH
ATO349	632,275.6	5,367,156.9	1,051.0	239.0	125	-60	DDH
ATO35	631,780.5	5,367,022.3	1,069.2	151.5	125	-60	DDH
ATO350	631,410.1	5,366,842.0	1,033.0	407.0	70	-55	DDH
ATO351	632,254.0	5,367,234.0	1,051.0	299.0	125	-60	DDH
ATO352	632,302.0	5,367,200.0	1,067.0	329.0	125	-60	DDH
ATO353	631,600.0	5,367,186.0	1,057.0	53.0	125	-60	DDH
ATO354	632,284.0	5,367,284.0	1,055.0	302.0	125	-60	DDH
ATO355	631,869.0	5,366,737.0	1,043.0	221.0	125	-60	DDH
ATO356	631,699.0	5,367,116.5	1,058.6	332.0	125	-62	DDH
ATO357	631,910.6	5,367,001.6	1,055.8	311.0	125	-61	DDH
ATO358	632,177.5	5,366,960.9	1,052.2	119.0	125	-60	DDH
ATO359	632,146.5	5,367,240.0	1,045.7	326.0	125	-61	DDH
ATO36	631,829.7	5,366,986.7	1,059.9	90.8	125	-60	DDH
ATO360	632,227.9	5,367,035.4	1,052.7	128.0	125	-60	DDH
ATO361	632,006.2	5,367,082.4	1,051.3	221.5	125	-60	DDH
ATO362	632,102.0	5,367,198.2	1,046.3	321.9	125	-60	DDH
ATO363	631,886.9	5,367,018.3	1,057.7	275.0	125	-60	DDH
ATO364	631,681.7	5,367,163.7	1,056.0	386.0	125	-60	DDH
ATO365	632,076.1	5,367,215.9	1,045.6	350.0	125	-60	DDH
ATO366	632,201.9	5,366,943.0	1,053.0	92.0	125	-60	DDH
ATO367	632,121.4	5,367,148.1	1,047.0	293.0	125	-61	DDH
ATO368	632,194.3	5,367,096.4	1,051.0	197.0	125	-61	DDH
ATO369	631,656.9	5,367,181.3	1,054.0	440.0	125	-62	DDH
ATO37	631,742.2	5,366,977.2	1,068.4	129.4	125	-60	DDH
ATO371	632,154.0	5,367,199.7	1,047.0	305.0	125	-60	DDH
ATO372	632,178.5	5,367,182.2	1,048.0	281.0	125	-60	DDH
ATO373	632,203.1	5,367,165.1	1,049.0	263.0	125	-60	DDH
ATO374	632,227.6	5,367,146.8	1,051.0	221.0	125	-60	DDH
ATO375	632,096.9	5,367,165.5	1,046.7	296.0	125	-60	DDH
ATO376	632,215.6	5,367,227.6	1,049.0	305.0	125	-60	DDH
ATO377	632,169.9	5,367,113.6	1,048.8	212.0	125	-60	DDH
ATO378	632,241.0	5,367,211.0	1,050.9	278.0	125	-60	DDH
ATO379	631,674.2	5,367,134.1	1,057.0	401.0	125	-60	DDH2
ATO38	631,731.9	5,367,055.9	1,063.7	229.7	125	-60	DDH
ATO380	631,685.5	5,367,200.0	1,053.5	461.0	125	-60	DDH2
ATO381	631,644.0	5,367,119.0	1,057.5	390.0	125	-60	DDH2
ATO382	631,649.7	5,367,151.5	1,056.2	494.0	125	-60	DDH2
ATO39	631,642.6	5,366,973.0	1,053.2	202.8	125	-60	DDH
ATO397	632,910.0	5,365,936.0	1,054.0	400.0	125	-60	DDH2
ATO398	630,720.0	5,367,546.0	1,015.0	400.0	125	-60	DDH2
ATO399	631,405.2	5,367,215.9	1,049.5	296.0	125	-60	DDH2

ATO40	631,715.4	5,366,923.2	1,053.5	103.8		125	-60	DDH
ATO400	631,443.2	5,367,224.6	1,051.9	245.0		125	-60	DDH2
ATO41	631,770.4	5,366,954.0	1,062.5	229.6		305	-60	DDH
ATO42	631,871.5	5,367,106.3	1,057.0	94.4		125	-60	DDH
ATO43	631,756.4	5,367,042.2	1,066.2	85.9		305	-60	DDH
ATO44	631,699.9	5,367,009.8	1,061.6	234.3		125	-60	DDH
ATO45	631,856.1	5,366,970.8	1,056.9	208.6		125	-60	DDH
ATO46	631,830.1	5,366,988.5	1,060.4	299.8		305	-60	DDH
ATO47	631,795.7	5,366,939.4	1,057.0	51.1		125	-60	DDH
ATO48	631,728.2	5,366,997.6	1,068.1	94.8		305	-60	DDH
ATO49	631,669.1	5,366,956.2	1,053.6	144.7		125	-60	DDH
ATO50	631,739.7	5,366,910.4	1,052.8	199.8		305	-60	DDH
ATO51	631,485.0	5,367,232.3	1,058.0	220.0		125	-60	DDH
ATO52	631,825.5	5,367,137.6	1,056.8	205.8		125	-60	DDH
ATO53	631,560.7	5,367,182.0	1,063.4	140.5		125	-60	DDH
ATO54	631,850.8	5,367,120.8	1,057.2	150.2		125	-60	DDH
ATO55	631,520.9	5,367,281.0	1,051.4	214.5		125	-60	DDH
ATO56	631,799.7	5,367,154.0	1,056.2	219.3		125	-60	DDH
ATO57	631,571.5	5,367,243.4	1,054.2	130.0		125	-60	DDH
ATO58	631,901.3	5,367,012.1	1,057.1	232.8		305	-60	DDH
ATO59	631,580.0	5,367,314.6	1,046.5	255.0		125	-60	DDH
ATO60	631,478.1	5,367,163.7	1,060.5	180.0		125	-60	DDH
ATO61	631,898.3	5,367,083.8	1,056.3	204.0		305	-60	DDH
ATO62	631,774.2	5,366,951.5	1,062.6	502.0		305	-80	DDH
ATO63	631,670.0	5,366,920.9	1,051.8	134.3		125	-60	DDH
ATO64	631,810.3	5,367,115.8	1,059.1	170.3		125	-60	DDH
ATO65	631,627.3	5,367,273.5	1,048.8	96.2		125	-60	DDH
ATO66	631,857.7	5,367,082.1	1,059.9	98.3		125	-60	DDH
ATO67	631,526.5	5,367,125.0	1,060.3	89.3		125	-60	DDH
ATO68	631,444.1	5,367,114.0	1,049.9	246.2		125	-60	DDH
ATO69	631,729.7	5,366,946.6	1,057.9	116.3		125	-60	DDH
ATO70	631,545.2	5,367,262.9	1,053.7	215.3		125	-60	DDH
ATO71	632,028.7	5,366,955.8	1,051.5	200.3		125	-60	DDH
ATO72	631,410.5	5,367,066.4	1,044.3	200.3		125	-60	DDH
ATO73	632,106.2	5,366,989.1	1,051.1	177.7		215	-60	DDH
ATO74	631,508.9	5,367,214.6	1,065.6	200.3		125	-60	DDH
ATO75	631,680.7	5,366,981.7	1,056.9	215.3		125	-60	DDH
ATO76	631,502.8	5,367,146.6	1,064.7	141.3		125	-60	DDH
ATO77	631,773.5	5,367,063.7	1,064.4	200.4		125	-60	DDH
ATO78	631,467.9	5,367,097.0	1,053.0	149.3		125	-60	DDH
ATO79	631,592.8	5,367,228.9	1,053.7	116.3		125	-60	DDH
ATO80	631,764.2	5,366,998.7	1,070.5	140.2		125	-60	DDH
ATO81	631,602.8	5,367,295.3	1,047.3	146.3		125	-60	DDH
ATO82	631,553.7	5,367,330.0	1,045.4	200.3		125	-60	DDH
ATO83	631,714.9	5,367,030.5	1,064.9	257.3		125	-60	DDH
ATO84	631,586.4	5,367,160.9	1,058.4	89.3		125	-60	DDH
ATO85	631,652.2	5,367,258.8	1,049.9	50.3		125	-60	DDH
ATO86	631,549.3	5,367,109.0	1,056.7	50.3		125	-60	DDH
ATO87	631,781.8	5,367,130.6	1,058.6	276.8		125	-60	DDH
ATO88	631,646.1	5,366,932.1	1,051.4	146.3		125	-60	DDH
ATO89	631,695.8	5,366,897.4	1,051.2	95.3		125	-60	DDH
ATO90	631,655.1	5,367,000.3	1,056.3	251.3		125	-60	DDH
ATO91	631,829.9	5,367,098.8	1,060.0	146.3		125	-60	DDH
ATO92	632,004.5	5,366,975.4	1,052.2	301.8		125	-60	DDH
ATO93	631,705.4	5,366,964.5	1,059.2	131.3		125	-60	DDH
ATO94	632,076.2	5,366,924.8	1,051.0	101.3		125	-60	DDH
ATO95	631,753.8	5,366,929.6	1,055.6	82.0		125	-60	DDH
ATO96	632,076.9	5,366,926.6	1,051.1	261.5		305	-60	DDH
ATO97	631,690.2	5,367,050.6	1,061.2	296.3		125	-60	DDH
ATO98	631,749.3	5,367,081.5	1,064.8	266.1		125	-60	DDH
ATO99	631,090.8	5,367,416.1	1,028.1	197.3		125	-60	DDH
At diamond holes	**385.0**		**Total**	**73,133.8**	**m**			
			Av	**190.0**	**m**			
AT RC holes								
ATORC01	630,692.2	5,368,197.0	1,014.3	20.0		0	-90	RC
ATORC02	630,890.6	5,368,198.1	1,015.8	14.0		0	-90	RC
ATORC03	631,095.5	5,368,199.3	1,020.9	26.0		0	-90	RC
ATORC04	631,295.2	5,368,200.1	1,022.5	20.0		0	-90	RC
ATORC05	631,496.0	5,368,201.2	1,026.4	28.0		0	-90	RC
ATORC06	631,695.7	5,368,201.2	1,033.3	30.0		0	-90	RC
ATORC07	631,400.3	5,367,999.6	1,022.9	24.0		0	-90	RC
ATORC08	631,197.9	5,367,999.6	1,019.9	26.0		0	-90	RC
ATORC09	630,999.3	5,367,998.8	1,017.3	20.0		0	-90	RC
ATORC10	630,798.9	5,367,999.5	1,016.9	18.0		0	-90	RC
ATORC100	630,395.4	5,365,799.4	1,011.3	40.0		0	-90	RC
ATORC101	630,146.3	5,366,203.0	1,019.2	32.0		0	-90	RC
ATORC102	631,032.8	5,364,598.9	1,025.3	54.0		0	-90	RC
ATORC103	630,604.0	5,364,592.1	1,012.1	85.0		0	-90	RC
ATORC104	630,369.8	5,364,200.6	1,010.1	45.0		0	-90	RC
ATORC105	629,947.4	5,364,199.7	999.3	48.0		0	-90	RC
ATORC106	629,744.8	5,363,805.4	998.4	16.0		0	-90	RC
ATORC107	628,821.6	5,360,597.4	988.3	35.0		0	-90	RC

ATORC108	629,044.3	5,361,011.2	987.8	64.0	0	-90	RC
ATORC109	628,662.6	5,360,198.4	985.7	52.0	0	-90	RC
ATORC11	630,498.2	5,367,785.1	1,025.5	16.0	0	-90	RC
ATORC110	628,861.9	5,359,798.9	1,002.9	35.0	0	-90	RC
ATORC111	629,378.0	5,360,996.9	999.3	15.0	0	-90	RC
ATORC112	629,225.7	5,360,599.5	995.6	56.0	0	-90	RC
ATORC113	629,619.4	5,360,601.6	1,006.0	37.0	0	-90	RC
ATORC114	630,066.1	5,360,602.7	1,020.4	29.0	0	-90	RC
ATORC115	630,344.7	5,360,194.3	1,030.2	18.0	0	-90	RC
ATORC116	630,132.0	5,359,804.1	1,028.4	19.0	0	-90	RC
ATORC117	629,882.6	5,360,196.9	1,010.5	34.0	0	-90	RC
ATORC118	629,424.2	5,360,197.6	1,019.6	14.0	0	-90	RC
ATORC119	628,458.6	5,359,801.2	981.1	45.0	0	-90	RC
ATORC12	630,697.8	5,367,792.1	1,019.7	20.0	0	-90	RC
ATORC120	629,043.7	5,359,400.1	1,018.6	20.0	0	-90	RC
ATORC121	628,655.3	5,359,399.5	991.9	34.0	0	-90	RC
ATORC122	628,856.1	5,358,998.4	1,004.7	15.0	0	-90	RC
ATORC123	628,467.1	5,358,998.2	987.6	17.0	0	-90	RC
ATORC124	629,046.4	5,358,601.3	1,015.0	20.0	0	-90	RC
ATORC125	628,681.0	5,358,598.3	999.3	43.0	0	-90	RC
ATORC126	628,864.0	5,358,201.8	1,010.0	51.0	0	-90	RC
ATORC127	628,492.6	5,358,198.2	997.4	46.0	0	-90	RC
ATORC128	627,557.0	5,358,404.8	977.9	14.0	0	-90	RC
ATORC129	627,295.0	5,358,027.8	971.7	16.0	0	-90	RC
ATORC13	630,897.4	5,367,793.8	1,017.2	22.0	0	-90	RC
ATORC130	627,418.1	5,357,803.1	974.8	23.0	0	-90	RC
ATORC131	627,989.1	5,357,800.8	994.6	19.0	0	-90	RC
ATORC132	628,338.1	5,357,804.8	994.1	39.0	0	-90	RC
ATORC133	628,515.6	5,357,398.8	1,004.6	29.0	0	-90	RC
ATORC134	628,072.0	5,357,397.0	989.1	57.0	0	-90	RC
ATORC135	628,302.3	5,357,001.2	996.6	53.0	0	-90	RC
ATORC136	628,104.1	5,356,601.7	988.8	55.0	0	-90	RC
ATORC137	627,916.6	5,356,201.4	985.1	62.0	0	-90	RC
ATORC138	627,723.6	5,355,797.9	980.1	74.0	0	-90	RC
ATORC139	627,548.8	5,355,397.8	969.8	48.0	0	-90	RC
ATORC14	631,094.9	5,367,794.6	1,020.3	24.0	0	-90	RC
ATORC140	626,234.9	5,355,401.3	967.2	40.0	0	-90	RC
ATORC141	625,844.1	5,355,406.1	971.3	37.0	0	-90	RC
ATORC142	625,709.4	5,356,004.6	970.2	25.0	0	-90	RC
ATORC143	625,504.3	5,356,396.3	972.5	26.0	0	-90	RC
ATORC144	627,437.9	5,359,399.7	972.9	20.0	0	-90	RC
ATORC145	627,236.1	5,359,803.9	975.3	27.0	0	-90	RC
ATORC146	627,647.6	5,359,796.8	994.4	15.0	0	-90	RC
ATORC147	627,829.5	5,360,199.3	990.6	17.0	0	-90	RC
ATORC148	628,198.5	5,363,798.0	989.8	32.0	0	-90	RC
ATORC149	627,970.7	5,364,194.1	994.9	26.0	0	-90	RC
ATORC15	631,296.9	5,367,793.1	1,023.3	24.0	0	-90	RC
ATORC150	628,236.5	5,364,596.3	998.6	41.0	0	-90	RC
ATORC151	630,456.7	5,368,597.8	1,011.3	29.0	0	-90	RC
ATORC152	630,887.2	5,368,600.5	1,017.9	27.0	0	-90	RC
ATORC153	631,288.6	5,368,598.9	1,023.9	20.0	0	-90	RC
ATORC154	631,697.0	5,368,597.1	1,035.0	13.0	0	-90	RC
ATORC155	631,510.4	5,369,000.7	1,034.8	16.0	0	-90	RC
ATORC156	631,687.4	5,369,203.0	1,038.6	13.0	0	-90	RC
ATORC157	631,349.7	5,369,192.5	1,033.3	27.0	0	-90	RC
ATORC158	631,784.8	5,367,718.2	1,031.6	180.0	129	-64	RC
ATORC159	632,175.1	5,367,331.5	1,046.2	204.0	138	-63	RC
ATORC16	631,497.8	5,367,793.8	1,025.3	24.0	0	-90	RC
ATORC160	632,223.3	5,367,296.8	1,049.6	199.0	129	-60	RC
ATORC161	632,419.3	5,367,157.4	1,063.7	200.0	121	-60	RC
ATORC162	632,370.1	5,367,192.2	1,060.4	200.0	114	-61	RC
ATORC163	632,321.8	5,367,224.9	1,057.2	199.0	119	-60	RC
ATORC164	632,271.8	5,367,261.8	1,053.4	200.0	124	-61	RC
ATORC165	632,127.9	5,367,474.2	1,043.2	199.0	120	-60	RC
ATORC166	632,030.0	5,367,544.1	1,038.5	137.0	119	-61	RC
ATORC167	631,932.0	5,367,613.1	1,034.9	165.0	127	-60	RC
ATORC168	631,882.5	5,367,648.1	1,034.0	200.0	126	-60	RC
ATORC169	631,834.2	5,367,682.8	1,032.9	155.0	123	-60	RC
ATORC17	631,697.7	5,367,795.0	1,029.5	32.0	0	-90	RC
ATORC170	632,124.9	5,367,363.1	1,043.1	200.0	125	-61	RC
ATORC171	631,342.9	5,366,964.7	1,034.4	100.0	123	-61	RC
ATORC172	631,391.8	5,366,929.5	1,036.1	100.0	122	-60	RC
ATORC173	631,001.0	5,366,995.8	1,019.6	22.0	0	-90	RC
ATORC174	630,907.8	5,366,894.0	1,015.9	70.0	0	-90	RC
ATORC175	630,811.6	5,366,994.0	1,014.0	37.0	0	-90	RC
ATORC176	630,615.5	5,366,993.6	1,010.9	32.0	0	-90	RC
ATORC177	630,500.5	5,367,110.3	1,009.4	56.0	0	-90	RC
ATORC178	630,305.7	5,367,108.7	1,007.2	65.0	0	-90	RC
ATORC179	630,296.7	5,367,286.3	1,009.0	56.0	0	-90	RC
ATORC18	632,091.8	5,367,793.9	1,042.6	20.0	0	-90	RC
ATORC180	630,496.3	5,367,296.9	1,009.3	47.0	0	-90	RC
ATORC181	630,385.8	5,367,784.1	1,030.3	17.0	0	-90	RC
ATORC182	630,495.0	5,367,699.4	1,022.9	35.0	0	-90	RC

ATORC183	631,398.3	5,367,310.9	1,043.6	16.0	0	-90	RC
ATORC184	631,308.7	5,367,398.5	1,037.5	16.0	0	-90	RC
ATORC185	631,500.0	5,367,403.4	1,032.3	49.0	0	-90	RC
ATORC186	631,398.1	5,367,500.0	1,039.3	36.0	0	-90	RC
ATORC187	631,999.1	5,367,498.5	1,037.2	42.0	0	-90	RC
ATORC188	632,104.4	5,367,600.1	1,040.7	64.0	0	-90	RC
ATORC189	631,702.4	5,367,699.9	1,029.3	18.0	0	-90	RC
ATORC19	632,291.5	5,367,790.0	1,048.3	16.0	0	-90	RC
ATORC190	631,788.2	5,367,792.3	1,032.5	14.0	0	-90	RC
ATORC191	631,688.2	5,367,901.6	1,030.5	10.0	0	-90	RC
ATORC192	631,602.0	5,367,788.8	1,027.0	18.0	0	-90	RC
ATORC193	631,496.8	5,367,902.2	1,024.7	19.0	0	-90	RC
ATORC194	631,305.2	5,367,901.5	1,022.3	30.0	0	-90	RC
ATORC195	631,300.9	5,368,099.7	1,021.5	26.0	0	-90	RC
ATORC196	631,498.1	5,368,102.2	1,025.8	28.0	0	-90	RC
ATORC197	631,599.7	5,367,997.1	1,028.1	19.0	0	-90	RC
ATORC198	632,290.4	5,367,099.0	1,054.7	66.0	0	-90	RC
ATORC199	632,500.8	5,367,096.9	1,068.7	36.0	0	-90	RC
ATORC20	632,201.2	5,367,600.9	1,045.9	36.0	0	-90	RC
ATORC200	632,595.4	5,366,999.3	1,077.9	46.0	0	-90	RC
ATORC201	632,398.9	5,366,997.7	1,061.7	38.0	0	-90	RC
ATORC202	632,304.6	5,366,900.7	1,057.5	32.0	0	-90	RC
ATORC203	632,519.5	5,366,902.3	1,072.8	28.0	0	-90	RC
ATORC204	632,315.1	5,366,499.8	1,062.9	40.0	0	-90	RC
ATORC205	632,519.9	5,366,501.9	1,068.3	42.0	0	-90	RC
ATORC206	632,410.3	5,366,397.3	1,063.2	44.0	0	-90	RC
ATORC207	632,195.6	5,366,396.8	1,072.2	56.0	0	-90	RC
ATORC208	632,318.8	5,366,301.4	1,073.5	42.0	0	-90	RC
ATORC209	632,531.1	5,366,298.5	1,062.8	40.0	0	-90	RC
ATORC21	632,002.0	5,367,599.6	1,036.8	28.0	0	-90	RC
ATORC210	632,420.2	5,366,200.3	1,069.8	72.0	0	-90	RC
ATORC211	632,542.1	5,366,095.2	1,062.7	48.0	0	-90	RC
ATORC212	632,305.4	5,367,600.7	1,051.8	50.0	0	-90	RC
ATORC213	632,201.8	5,367,500.1	1,047.7	46.0	0	-90	RC
ATORC214	632,070.1	5,367,699.8	1,040.0	46.0	0	-90	RC
ATORC215	631,964.7	5,367,802.0	1,038.8	40.0	0	-90	RC
ATORC216	631,874.9	5,367,898.3	1,037.8	56.0	0	-90	RC
ATORC217	632,055.8	5,367,900.0	1,046.7	48.0	0	-90	RC
ATORC218	631,956.1	5,367,998.8	1,046.4	36.0	0	-90	RC
ATORC219	631,840.6	5,368,096.3	1,040.9	54.0	0	-90	RC
ATORC22	631,799.9	5,367,599.0	1,031.9	22.0	0	-90	RC
ATORC220	631,926.0	5,368,200.9	1,049.6	40.0	0	-90	RC
ATORC221	632,308.2	5,366,098.8	1,071.4	46.0	0	-90	RC
ATORC222	632,434.4	5,366,002.3	1,069.9	44.0	0	-90	RC
ATORC223	629,514.2	5,360,602.0	1,001.8	29.0	0	-90	RC
ATORC224	629,719.3	5,360,596.5	1,009.5	28.0	0	-90	RC
ATORC225	629,821.6	5,360,598.6	1,012.6	29.0	0	-90	RC
ATORC226	628,963.7	5,359,797.8	1,011.7	28.0	0	-90	RC
ATORC227	628,763.6	5,358,198.2	1,007.5	46.0	0	-90	RC
ATORC23	631,601.3	5,367,600.7	1,030.9	36.0	0	-90	RC
ATORC24	631,400.9	5,367,599.7	1,028.1	26.0	0	-90	RC
ATORC25	631,200.8	5,367,599.6	1,025.1	20.0	0	-90	RC
ATORC26	631,001.7	5,367,601.4	1,019.7	22.0	0	-90	RC
ATORC27	630,800.1	5,367,598.6	1,015.8	20.0	0	-90	RC
ATORC28	630,599.7	5,367,600.0	1,016.6	24.0	0	-90	RC
ATORC29	630,401.0	5,367,599.7	1,018.9	24.0	0	-90	RC
ATORC30	630,201.4	5,367,599.4	1,019.6	26.0	0	-90	RC
ATORC31	630,091.2	5,367,386.3	1,013.9	24.0	0	-90	RC
ATORC32	630,289.7	5,367,388.0	1,011.4	22.0	0	-90	RC
ATORC33	630,490.6	5,367,387.2	1,010.2	16.0	0	-90	RC
ATORC34	630,903.0	5,367,386.6	1,018.3	22.0	0	-90	RC
ATORC35	631,396.3	5,367,398.3	1,037.5	28.0	0	-90	RC
ATORC36	631,799.3	5,367,400.6	1,041.5	30.0	0	-90	RC
ATORC37	631,694.0	5,367,344.1	1,044.4	26.0	0	-90	RC
ATORC38	631,797.0	5,367,287.5	1,048.0	32.0	0	-90	RC
ATORC39	631,895.5	5,367,233.1	1,050.1	30.0	0	-90	RC
ATORC40	631,894.0	5,367,353.2	1,043.9	26.0	0	-90	RC
ATORC41	632,003.7	5,367,291.5	1,044.1	30.0	0	-90	RC
ATORC42	632,301.2	5,367,234.5	1,055.4	18.0	0	-90	RC
ATORC43	632,296.7	5,367,351.7	1,055.9	34.0	0	-90	RC
ATORC44	632,199.8	5,367,400.7	1,047.7	53.0	0	-90	RC
ATORC45	632,003.5	5,367,398.8	1,040.1	32.0	0	-90	RC
ATORC46	632,096.3	5,367,353.9	1,042.0	44.0	0	-90	RC
ATORC47	632,202.8	5,367,292.2	1,048.1	40.0	0	-90	RC
ATORC48	632,202.2	5,367,174.7	1,049.2	54.0	0	-90	RC
ATORC49	632,102.0	5,367,234.5	1,044.8	46.0	0	-90	RC
ATORC50	632,003.2	5,367,176.7	1,048.1	24.0	0	-90	RC
ATORC51	632,594.1	5,366,797.6	1,082.0	18.0	0	-90	RC
ATORC52	632,599.9	5,366,599.3	1,077.8	18.0	0	-90	RC
ATORC53	632,509.9	5,366,702.0	1,069.8	32.0	0	-90	RC
ATORC54	632,399.3	5,366,802.2	1,062.6	32.0	0	-90	RC
ATORC55	632,400.7	5,366,599.6	1,062.1	42.0	0	-90	RC
ATORC56	632,081.7	5,366,951.2	1,051.0	30.0	0	-90	RC

ATORC57	632,156.1	5,367,058.2	1,049.7	32.0		0	-90	RC
ATORC58	631,710.1	5,367,595.2	1,031.5	24.0		0	-90	RC
ATORC59	631,655.1	5,367,499.8	1,035.4	30.0		0	-90	RC
ATORC60	631,556.9	5,367,498.5	1,035.1	28.0		0	-90	RC
ATORC61	631,399.5	5,366,999.6	1,039.5	26.0		0	-90	RC
ATORC62	631,598.4	5,366,800.4	1,042.1	30.0		0	-90	RC
ATORC63	631,797.0	5,366,801.4	1,046.2	24.0		0	-90	RC
ATORC64	631,997.9	5,366,802.2	1,047.8	20.0		0	-90	RC
ATORC65	632,198.1	5,366,803.0	1,052.9	46.0		0	-90	RC
ATORC66	632,311.9	5,366,702.6	1,056.5	30.0		0	-90	RC
ATORC67	632,200.3	5,366,601.0	1,063.9	42.0		0	-90	RC
ATORC68	631,904.5	5,366,593.0	1,043.5	18.0		0	-90	RC
ATORC69	631,702.2	5,366,593.8	1,036.0	22.0		0	-90	RC
ATORC70	631,503.8	5,366,595.2	1,030.8	18.0		0	-90	RC
ATORC71	631,398.6	5,366,401.3	1,026.8	20.0		0	-90	RC
ATORC72	631,198.8	5,366,401.3	1,027.8	22.0		0	-90	RC
ATORC73	631,303.8	5,366,590.8	1,024.2	18.0		0	-90	RC
ATORC74	631,101.2	5,366,594.5	1,019.5	20.0		0	-90	RC
ATORC75	631,199.1	5,366,802.1	1,024.1	22.0		0	-90	RC
ATORC76	630,999.8	5,366,800.4	1,018.0	22.0		0	-90	RC
ATORC77	630,797.1	5,366,799.9	1,014.1	18.0		0	-90	RC
ATORC78	630,598.5	5,366,801.9	1,015.4	16.0		0	-90	RC
ATORC79	630,903.9	5,366,997.8	1,016.1	22.0		0	-90	RC
ATORC80	630,705.0	5,366,999.5	988.9	22.0		0	-90	RC
ATORC81	630,504.1	5,366,998.2	1,009.8	10.0		0	-90	RC
ATORC82	630,305.0	5,366,997.2	1,008.5	12.0		0	-90	RC
ATORC83	630,797.4	5,367,199.9	1,013.6	22.0		0	-90	RC
ATORC84	630,599.3	5,367,201.5	1,009.6	22.0		0	-90	RC
ATORC85	630,398.9	5,367,200.0	1,008.2	14.0		0	-90	RC
ATORC86	630,196.6	5,367,202.2	1,007.7	16.0		0	-90	RC
ATORC87	629,998.7	5,367,200.0	1,005.6	12.0		0	-90	RC
ATORC88	630,691.6	5,367,388.0	1,011.8	20.0		0	-90	RC
ATORC89	630,104.7	5,366,997.7	1,006.5	16.0		0	-90	RC
ATORC90	629,904.0	5,366,996.9	1,004.5	12.0		0	-90	RC
ATORC91	631,676.8	5,364,999.9	1,036.3	38.0		0	-90	RC
ATORC92	631,236.5	5,364,996.5	1,028.1	24.0		0	-90	RC
ATORC93	630,828.2	5,365,000.4	1,015.2	45.0		0	-90	RC
ATORC94	630,395.4	5,365,002.3	1,006.1	68.0		0	-90	RC
ATORC95	629,966.6	5,365,005.0	999.4	82.0		0	-90	RC
ATORC96	628,110.9	5,365,004.9	993.9	74.0		0	-90	RC
ATORC97	631,023.6	5,365,391.5	1,029.7	22.0		0	-90	RC
ATORC98	630,617.4	5,365,399.4	1,012.5	43.0		0	-90	RC
ATORC99	630,199.1	5,365,395.5	1,002.1	51.0		0	-90	RC
AT RC holes	**227.0**		**Total**	**9,441.0**	**m**			
			Av	**41.6**	**m**			
Mungu diamond holes								
MG01	632,483.0	5,367,706.0	1,060.3	399.8		125	-60	DDH
MG02	632,430.3	5,367,743.6	1,057.1	501.4		125	-60	DDH
MG03	632,532.8	5,367,670.2	1,064.3	395.1		125	-60	DDH
MG04	632,446.0	5,367,659.1	1,059.3	370.2		125	-60	DDH
MG05	632,517.6	5,367,754.7	1,059.4	401.3		125	-60	DDH
MG06	632,408.0	5,367,610.5	1,058.4	300.5		125	-60	DDH
MG07	632,548.0	5,367,804.3	1,058.4	401.1		125	-60	DDH
MG08	632,567.9	5,367,719.9	1,063.8	400.8		125	-60	DDH
MG09	632,779.7	5,367,493.1	1,098.6	434.1		305	-60	DDH
MG10	632,544.4	5,367,476.3	1,079.4	170.2		305	-60	DDH
MG100	632,409.7	5,367,389.2	1,067.4	53.0		307	-62	DDH
MG101	632,427.9	5,367,373.0	1,070.3	47.0		305	-61	DDH
MG102	632,609.3	5,367,576.7	1,074.2	80.0		308	-62	DDH
MG103	632,596.8	5,367,548.7	1,075.8	113.0		304	-60	DDH
MG104	632,567.7	5,367,531.7	1,075.7	122.0		307	-62	DDH
MG105	632,395.2	5,367,360.3	1,066.9	31.0		306	-60	DDH
MG106	632,422.0	5,367,345.4	1,071.1	40.0		305	-61	DDH
MG107	632,438.0	5,367,334.8	1,074.5	52.0		303	-59	DDH
MG108	632,632.7	5,367,595.0	1,074.3	71.0		308	-61	DDH
MG109	632,455.3	5,367,323.2	1,076.4	68.0		304	-60	DDH
MG11	632,584.3	5,367,525.7	1,077.5	251.2		305	-60	DDH
MG110	632,543.5	5,367,514.2	1,075.4	107.0		307	-63	DDH
MG111	632,522.3	5,367,492.5	1,075.0	95.0		307	-62	DDH
MG112	632,500.6	5,367,472.1	1,073.8	80.0		308	-61	DDH
MG113	632,484.7	5,367,446.3	1,073.7	77.0		308	-61	DDH
MG114	632,461.3	5,367,421.6	1,072.5	100.0		308	-60	DDH
MG115	632,423.0	5,367,525.0	1,063.0	302.0		125	-60	DDH
MG116	632,546.0	5,367,955.0	1,062.6	368.0		125	-60	DDH
MG117	632,497.6	5,367,991.2	1,062.0	346.0		125	-60	DDH
MG118	632,449.0	5,367,470.0	1,062.0	230.0		125	-60	DDH
MG119	632,475.0	5,367,563.0	1,065.0	291.0		125	-60	DDH
MG12	632,509.4	5,367,425.8	1,079.5	182.0		305	-60	DDH
MG120	632,486.4	5,367,668.3	1,061.6	356.0		125	-61	DDH
MG121	632,436.0	5,367,702.7	1,057.9	329.0		125	-60	DDH
MG122	632,538.0	5,367,777.0	1,058.7	401.0		125	-60	DDH
MG123	632,487.4	5,367,814.0	1,056.5	380.0		125	-60	DDH

MG124	632,486.3	5,367,519.3	1,070.7	146.0	125	-60	DDH
MG125	632,526.7	5,367,712.0	1,062.3	290.0	125	-55	DDH
MG126	632,477.9	5,367,746.6	1,058.2	404.0	125	-60	DDH
MG127	632,432.0	5,367,631.0	1,059.0	386.0	125	-60	DDH
MG128	632,566.1	5,367,829.9	1,061.8	408.0	125	-60	DDH
MG129	632,561.8	5,367,870.0	1,061.0	335.0	125	-60	DDH
MG13	632,752.6	5,367,513.1	1,091.7	371.2	305	-60	DDH
MG130	632,553.3	5,367,912.6	1,060.9	348.0	125	-60	DDH
MG131	632,498.0	5,367,620.0	1,063.9	296.0	125	-60	DDH
MG132	632,448.2	5,367,509.0	1,066.5	335.0	125	-60	DDH
MG133	632,488.3	5,368,204.1	1,062.7	287.0	125	-50	DDH
MG134	632,352.2	5,367,369.1	1,062.7	300.0	125	-60	DDH
MG135	632,595.0	5,367,920.1	1,063.0	305.0	125	-60	DDH
MG136	632,566.0	5,367,975.4	1,066.0	332.0	125	-60	DDH
MG137	632,562.8	5,367,759.3	1,061.3	410.0	125	-60	DDH2
MG138	632,472.0	5,367,694.8	1,060.0	453.0	125	-60	DDH2
MG139	632,452.8	5,367,670.6	1,059.5	452.0	125	-60	DDH2
MG14	632,464.7	5,367,352.4	1,076.7	120.0	270	-45	DDH
MG140	632,451.9	5,367,636.6	1,060.4	305.0	125	-60	DDH2
MG141	632,470.3	5,367,606.3	1,062.8	375.6	125	-60	DDH2
MG142	632,504.8	5,367,762.4	1,058.4	392.0	125	-60	DDH2
MG143	632,524.4	5,367,787.7	1,058.0	431.0	125	-60	DDH2
MG144	632,508.0	5,367,816.5	1,057.0	443.0	125	-60	DDH2
MG145	632,576.6	5,367,895.4	1,062.6	314.0	125	-60	DDH2
MG146	632,485.6	5,367,923.3	1,058.7	470.0	125	-60	DDH2
MG147	632,509.7	5,367,649.6	1,063.6	287.0	125	-60	DDH2
MG148	632,528.5	5,367,929.9	1,060.7	452.0	125	-60	DDH2
MG149	632,522.2	5,367,973.1	1,062.1	389.0	125	-60	DDH2
MG15	632,509.4	5,367,685.8	1,062.6	420.0	125	-60	DDH
MG150	632,542.0	5,367,993.9	1,063.7	381.0	125	-60	DDH2
MG151	632,478.3	5,367,855.4	1,056.1	446.0	125	-60	DDH2
MG152	632,485.0	5,367,888.2	1,057.4	473.0	125	-60	DDH2
MG153	632,473.1	5,368,008.9	1,060.9	560.0	125	-60	DDH2
MG154	632,549.4	5,367,841.9	1,060.1	470.0	125	-60	DDH2
MG155	632,402.9	5,367,359.3	1,067.8	207.0	125	-60	DDH2
MG156	632,461.5	5,367,941.3	1,058.1	491.0	125	-60	DDH2
MG157	632,460.0	5,367,703.9	1,059.5	419.0	125	-60	DDH2
MG158	632,427.2	5,367,341.9	1,071.4	161.0	125	-60	DDH2
MG159	632,441.2	5,367,680.5	1,058.7	329.0	125	-60	DDH2
MG16	632,474.1	5,367,638.1	1,061.7	266.2	125	-60	DDH
MG160	632,465.8	5,367,663.0	1,060.5	332.5	125	-60	DDH2
MG161	632,439.7	5,367,645.3	1,059.3	293.0	125	-60	DDH2
MG162	632,549.4	5,367,878.9	1,060.3	478.0	125	-60	DDH2
MG163	632,390.0	5,367,290.0	1,065.7	257.0	125	-60	DDH2
MG164	632,555.0	5,368,020.0	1,066.9	500.0	125	-60	DDH2
MG165	632,376.7	5,367,374.2	1,064.5	201.0	125	-60	DDH2
MG17	632,541.4	5,367,737.2	1,061.4	407.2	125	-60	DDH
MG18	632,570.2	5,367,460.5	1,082.0	161.2	305	-60	DDH
MG19	632,601.3	5,367,511.6	1,079.8	179.2	125	-60	DDH
MG20	632,492.5	5,367,772.0	1,057.3	401.1	125	-60	DDH
MG21	632,424.7	5,367,673.0	1,057.8	314.1	125	-60	DDH
MG22	632,457.0	5,367,613.4	1,061.4	302.1	125	-60	DDH
MG23	632,527.0	5,367,820.7	1,057.4	401.1	125	-60	DDH
MG24	632,467.6	5,367,789.1	1,055.8	371.1	125	-60	DDH
MG25	632,535.1	5,367,884.7	1,059.5	371.1	125	-60	DDH
MG26	632,423.5	5,367,562.5	1,061.4	302.1	125	-60	DDH
MG27	632,570.0	5,367,936.6	1,062.3	374.1	125	-60	DDH
MG28	632,511.1	5,367,904.7	1,058.3	389.3	125	-60	DDH
MG29	632,500.6	5,367,834.9	1,056.5	448.0	125	-60	DDH
MG30	632,461.6	5,367,536.6	1,066.8	419.7	125	-60	DDH
MG31	632,451.0	5,367,580.8	1,063.4	371.5	125	-60	DDH
MG32	632,458.7	5,367,721.1	1,059.3	328.2	125	-60	DDH
MG33	632,478.6	5,367,593.8	1,064.1	302.7	125	-60	DDH
MG34	632,627.1	5,367,492.1	1,083.7	290.5	305	-60	DDH
MG35	632,786.5	5,367,563.1	1,096.8	398.1	305	-60	DDH
MG36	632,715.4	5,367,462.9	1,089.9	355.6	305	-45	DDH
MG37	632,744.6	5,367,659.1	1,080.8	371.0	305	-60	DDH
MG38	633,000.0	5,367,900.0	1,080.0	419.1	305	-60	DDH
MG49	632,459.6	5,367,682.1	1,059.9	380.4	125	-60	DDH
MG50	632,531.2	5,367,849.8	1,057.8	434.4	125	-60	DDH
MG51	632,500.1	5,367,726.0	1,060.3	458.0	125	-60	DDH
MG52	632,511.7	5,367,795.6	1,057.0	485.0	125	-60	DDH
MG53	632,504.7	5,367,863.4	1,057.2	476.0	125	-60	DDH
MG54	632,505.7	5,367,505.0	1,071.8	68.0	305	-58	DDH
MG55	632,492.1	5,367,514.4	1,069.9	47.0	305	-61	DDH
MG56	632,477.5	5,367,525.6	1,068.1	41.0	305	-60	DDH
MG57	632,459.5	5,367,537.4	1,066.5	53.0	304	-60	DDH
MG58	632,528.5	5,367,525.3	1,072.8	56.0	303	-59	DDH
MG59	632,514.5	5,367,533.7	1,070.5	83.0	305	-60	DDH
MG60	632,499.4	5,367,545.3	1,068.5	38.0	305	-60	DDH
MG61	632,481.6	5,367,558.6	1,066.8	104.0	307	-59	DDH
MG62	632,549.7	5,367,546.2	1,072.6	104.0	304	-60	DDH
MG63	632,536.3	5,367,556.6	1,070.5	80.0	308	-62	DDH

MG64	632,520.6	5,367,568.8	1,068.4	32.0		307	-61	DDH
MG65	632,503.9	5,367,580.4	1,066.5	89.8		302	-62	DDH
MG66	632,570.3	5,367,568.1	1,072.3	113.0		302	-60	DDH
MG67	632,549.0	5,367,585.6	1,069.3	137.0		304	-62	DDH
MG68	632,534.1	5,367,596.6	1,067.5	110.0		306	-59	DDH
MG69	632,518.0	5,367,609.1	1,065.7	56.0		305	-61	DDH
MG70	632,593.5	5,367,588.7	1,072.3	116.0		303	-63	DDH
MG71	632,579.1	5,367,598.1	1,070.6	95.0		306	-61	DDH
MG72	632,564.4	5,367,608.3	1,069.0	57.0		304	-62	DDH
MG73	632,542.9	5,367,623.1	1,066.8	65.0		302	-59	DDH
MG74	632,597.1	5,367,622.8	1,070.5	104.0		308	-60	DDH
MG75	632,582.0	5,367,633.9	1,068.9	90.0		304	-61	DDH
MG76	632,564.3	5,367,645.7	1,067.1	48.0		306	-60	DDH
MG77	632,619.7	5,367,645.5	1,070.4	44.0		308	-62	DDH
MG78	632,484.1	5,367,485.2	1,070.7	65.0		305	-63	DDH
MG79	632,470.6	5,367,493.2	1,068.9	44.0		302	-60	DDH
MG80	632,453.5	5,367,503.9	1,066.7	40.0		305	-59	DDH
MG81	632,437.9	5,367,514.3	1,064.8	39.1		307	-61	DDH
MG82	632,597.8	5,367,661.2	1,068.1	62.0		302	-60	DDH
MG83	632,638.5	5,367,666.5	1,071.0	35.0		306	-62	DDH
MG84	632,583.9	5,367,558.0	1,074.4	131.0		304	-61	DDH
MG85	632,621.4	5,367,681.2	1,069.1	28.0		303	-62	DDH
MG86	632,624.5	5,367,712.5	1,067.5	35.0		307	-60	DDH
MG87	632,642.2	5,367,702.6	1,069.3	17.0		304	-59	DDH
MG88	632,611.3	5,367,610.7	1,072.0	83.0		306	-61	DDH
MG89	632,420.0	5,367,492.1	1,064.2	36.5		302	-62	DDH
MG90	632,436.5	5,367,478.8	1,066.4	62.0		305	-61	DDH
MG91	632,451.6	5,367,468.5	1,068.2	44.0		308	-59	DDH
MG92	632,466.5	5,367,458.3	1,070.4	47.0		304	-62	DDH
MG93	632,412.9	5,367,459.2	1,064.7	50.0		303	-61	DDH
MG94	632,428.8	5,367,445.4	1,066.8	49.0		307	-59	DDH
MG95	632,445.2	5,367,433.1	1,069.9	88.0		306	-62	DDH
MG96	632,397.0	5,367,432.7	1,064.3	44.0		301	-59	DDH
MG97	632,414.1	5,367,420.8	1,066.5	53.0		304	-61	DDH
MG98	632,431.3	5,367,408.9	1,069.0	41.0		305	-63	DDH
MG99	632,395.9	5,367,401.2	1,065.7	41.0		303	-60	DDH
Mungu diamond	**155.0**		**Total**	**37,745.5**	**m**			
holes			**Av**	**243.5**	**m**			
Trenches								
ATOTR01	631,915.2	5,367,187.2	1,049.0	114.0		221	-2	TR
ATOTR02	632,122.2	5,367,015.8	1,048.3	80.0		218	-6	TR
ATOTR03	631,943.5	5,367,026.7	1,052.3	89.0		269	-2	TR
ATOTR04	631,034.8	5,367,324.8	1,023.3	80.0		264	-4	TR
ATOTR05	631,481.3	5,367,319.5	1,041.9	51.0		214	-3	TR
ATOTR06	631,114.7	5,367,284.4	1,030.4	48.0		220	-2	TR
ATOTR07	631,208.2	5,367,398.2	1,036.8	50.0		221	-1	TR
ATOTR08	631,530.3	5,366,569.8	1,027.7	58.6		219	-3	TR
ATOTR09	631,886.2	5,367,208.2	1,050.9	45.0		269	-1	TR
ATOTR10	631,698.8	5,367,011.0	1,058.8	93.0		300	-3	TR
ATOTR11	631,693.6	5,366,927.1	1,049.5	52.0		211	-5	TR
ATOTR110	632,390.5	5,364,409.0	1,078.4	54.2		347	-6	TR
ATOTR110add	632,398.1	5,364,374.8	1,083.1	34.5		348	-9	TR
ATOTR111	632,211.2	5,364,341.0	1,091.3	76.0		347	-14	TR
ATOTR112	632,452.3	5,364,301.7	1,086.7	42.0		147	-12	TR
ATOTR116	632,063.2	5,366,069.0	1,050.0	19.0		83	-4	TR
ATOTR117	632,442.3	5,365,050.0	1,099.7	105.0		4	-11	TR
ATOTR117add	632,443.5	5,365,049.5	1,098.6	56.0		181	-7	TR
ATOTR118	628,456.1	5,364,638.8	1,001.0	30.0		82	-2	TR
ATOTR119	628,509.3	5,364,468.7	1,006.3	31.0		75	-2	TR
ATOTR12	631,664.7	5,366,879.5	1,051.7	11.0		211	-8	TR
ATOTR120	631,189.8	5,367,114.0	1,031.8	101.5		167	-5	TR
ATOTR121	631,238.6	5,367,266.5	1,043.1	127.0		65	0	TR
ATOTR122	632,152.5	5,364,382.6	1,082.1	50.5		170	-7	TR
ATOTR123	632,296.1	5,364,368.7	1,083.0	27.0		183	-11	TR
ATOTR123add	632,294.9	5,364,368.8	1,083.0	21.0		4	-9	TR
ATOTR124	632,425.5	5,364,235.3	1,080.2	76.0		333	-7	TR
ATOTR125	632,165.6	5,364,190.8	1,096.0	76.0		161	-4	TR
ATOTR126	631,925.3	5,364,013.9	1,113.3	25.4		162	-11	TR
ATOTR127	632,496.7	5,365,003.6	1,109.7	101.5		7	-16	TR
ATOTR128	633,788.7	5,368,993.4	1,040.2	133.0		144	-1	TR
ATOTR129	633,119.4	5,369,173.2	1,073.7	63.0		332	-3	TR
ATOTR13	630,560.6	5,366,424.6	1,042.3	95.0		214	-2	TR
ATOTR130	632,510.0	5,367,674.0	1,061.3	133.0		125	-4	TR
ATOTR131	632,442.0	5,367,638.7	1,058.1	167.0		130	-5	TR
ATOTR132	632,566.4	5,367,713.5	1,061.7	84.0		126	-4	TR
ATOTR133	632,441.0	5,367,545.6	1,062.7	115.0		126	-2	TR
ATOTR134	632,343.2	5,367,359.6	1,058.9	135.0		91	-6	TR
ATOTR135	632,613.0	5,367,774.8	1,060.2	89.0		124	-13	TR
ATOTR136	632,393.7	5,367,271.6	1,063.6	88.0		85	-3	TR
ATOTR137	631,991.8	5,367,301.5	1,041.2	2.0		65	-32	TR
ATOTR138	631,879.8	5,367,383.3	1,040.5	2.0		65	-3	TR
ATOTR139	632,483.3	5,367,207.7	1,070.4	99.0		129	-2	TR

ATOTR14	632,351.6	5,367,478.2	1,056.2	35.0	208	-2	TR
ATOTR140	632,592.1	5,367,320.4	1,096.1	89.0	134	-1	TR
ATOTR141	632,700.1	5,367,416.5	1,091.3	80.0	130	-3	TR
ATOTR142	633,131.2	5,369,514.9	1,083.9	88.0	130	-6	TR
ATOTR143	633,204.2	5,369,615.1	1,090.3	97.0	131	-5	TR
ATOTR144	633,296.1	5,369,695.6	1,084.3	82.0	130	-7	TR
ATOTR145	632,658.5	5,367,960.1	1,067.6	74.0	90	0	TR
ATOTR146	632,686.3	5,366,739.7	1,093.1	38.0	270	-5	TR
ATOTR147	633,088.4	5,369,404.3	1,080.7	98.0	130	0	TR
ATOTR148	633,721.2	5,369,458.9	1,065.9	80.0	136	-7	TR
ATOTR149	633,764.8	5,369,580.7	1,058.6	133.0	133	-2	TR
ATOTR15	632,655.1	5,366,614.6	1,081.6	35.0	234	-3	TR
ATOTR150	633,125.8	5,369,127.8	1,072.2	69.0	131	-5	TR
ATOTR151	632,418.5	5,367,186.9	1,062.6	80.0	61	-3	TR
ATOTR152	633,526.0	5,369,850.5	1,066.2	39.0	311	-3	TR
ATOTR153	633,752.5	5,370,577.6	1,053.5	67.0	131	-2	TR
ATOTR154	633,096.4	5,366,509.0	1,067.7	35.0	116	-2	TR
ATOTR155	633,830.4	5,369,627.5	1,050.8	152.0	127	-1	TR
ATOTR156	634,043.4	5,369,462.0	1,034.6	33.0	122	-5	TR
ATOTR157	633,908.7	5,368,632.9	1,018.8	53.0	88	-1	TR
ATOTR158	633,158.4	5,371,936.4	1,058.1	92.0	87	-3	TR
ATOTR159	633,714.1	5,368,935.7	1,034.8	52.0	51	-3	TR
ATOTR16	632,407.3	5,366,819.0	1,060.4	52.0	221	-4	TR
ATOTR160	633,885.6	5,368,623.6	1,019.0	144.0	39	-2	TR
ATOTR161	633,966.3	5,368,703.7	1,024.9	56.0	131	-6	TR
ATOTR162	633,876.5	5,368,820.6	1,034.6	35.0	35	-1	TR
ATOTR163	631,348.3	5,367,069.7	1,036.5	70.0	138	-3	TR
ATOTR164	631,844.4	5,367,809.7	1,032.2	34.0	120	-1	TR
ATOTR165	631,791.1	5,367,726.0	1,029.9	86.0	117	-1	TR
ATOTR166	632,130.8	5,368,248.9	1,066.2	34.0	119	-6	TR
ATOTR167	631,912.0	5,367,772.5	1,033.2	16.0	120	-1	TR
ATOTR168	631,840.6	5,367,747.3	1,030.8	14.0	122	-1	TR
ATOTR169	631,844.0	5,367,706.7	1,031.4	17.0	34	-3	TR
ATOTR17	631,361.4	5,367,180.5	1,043.1	15.0	216	-2	TR
ATOTR170	631,844.1	5,367,654.0	1,031.4	16.0	26	-8	TR
ATOTR174	632,631.8	5,366,310.3	1,063.8	44.0	90	-2	TR
ATOTR18	631,504.5	5,367,148.2	1,064.9	92.0	213	-15	TR
ATOTR180	634,040.4	5,368,793.4	1,025.0	73.0	148	-4	TR
ATOTR181	634,057.7	5,368,710.9	1,022.4	38.0	92	-6	TR
ATOTR182	633,819.8	5,368,720.5	1,025.4	86.0	185	-5	TR
ATOTR183	632,765.6	5,366,616.2	1,097.6	48.0	21	-8	TR
ATOTR184	632,458.3	5,365,077.2	1,095.6	55.0	93	0	TR
ATOTR185	633,119.8	5,371,556.9	1,077.5	160.0	88	0	TR
ATOTR186	632,534.8	5,364,963.8	1,109.9	28.0	51	0	TR
ATOTR187	632,357.8	5,365,090.1	1,082.3	74.0	42	0	TR
ATOTR189	632,119.0	5,366,618.8	1,055.9	40.0	93	0	TR
ATOTR19	631,564.0	5,367,169.0	1,060.2	154.0	307	-11	TR
ATOTR190	632,287.2	5,367,250.2	1,052.9	96.0	122	0	TR
ATOTR191	632,237.2	5,367,171.8	1,049.3	99.0	129	0	TR
ATOTR192	633,865.3	5,369,684.3	1,041.5	102.0	140	0	TR
ATOTR193	633,954.1	5,370,337.7	1,034.6	107.0	125	0	TR
ATOTR194	632,242.5	5,366,067.5	1,064.0	28.0	243	0	TR
ATOTR20	631,530.7	5,367,128.8	1,058.8	38.0	166	-10	TR
ATOTR202	631,039.0	5,367,221.8	1,024.8	54.0	140	0	TR
ATOTR203	630,896.1	5,367,129.5	1,014.6	39.0	133	0	TR
ATOTR204	632,414.1	5,366,999.9	1,059.8	40.0	92	0	TR
ATOTR205	632,422.7	5,366,728.1	1,060.7	41.0	87	0	TR
ATOTR206	632,409.7	5,366,369.1	1,062.5	41.0	87	0	TR
ATOTR207	632,422.7	5,365,944.1	1,067.0	44.0	96	0	TR
ATOTR208	632,410.3	5,365,603.8	1,063.7	47.0	90	0	TR
ATOTR209	632,514.1	5,366,711.9	1,068.3	24.0	89	0	TR
ATOTR21	631,701.8	5,367,178.7	1,053.1	32.0	205	-1	TR
ATOTR210	632,606.1	5,366,965.3	1,078.2	19.0	99	0	TR
ATOTR211	632,188.8	5,366,305.5	1,067.9	32.0	43	0	TR
ATOTR212	632,428.0	5,366,099.3	1,070.9	31.5	200	0	TR
ATOTR213	631,849.2	5,365,724.6	1,056.5	22.0	221	0	TR
ATOTR214	632,052.0	5,365,776.8	1,055.2	20.0	205	0	TR
ATOTR215	632,553.1	5,366,377.4	1,065.8	7.0	84	0	TR
ATOTR216	632,500.2	5,367,177.9	1,070.6	29.0	48	0	TR
ATOTR218	628,558.2	5,364,271.9	1,029.6	28.0	44	0	TR
ATOTR22	631,344.5	5,366,795.5	1,028.4	17.0	175	-3	TR
ATOTR23	631,698.7	5,367,130.6	1,055.3	60.0	152	-4	TR
ATOTR231	632,753.6	5,367,785.1	1,067.2	62.0	126	-3	TR
ATOTR232	632,508.3	5,368,160.7	1,065.9	90.0	123	-1	TR
ATOTR233	632,760.1	5,368,052.2	1,075.0	33.0	116	-5	TR
ATOTR234	633,043.7	5,368,750.0	1,083.2	90.0	118	-5	TR
ATOTR235	633,035.1	5,369,317.4	1,073.9	75.0	124	-5	TR
ATOTR235add	633,097.1	5,369,276.7	1,076.5	86.0	124	-2	TR
ATOTR236	633,421.2	5,369,946.0	1,060.9	44.0	133	-2	TR
ATOTR237	633,851.8	5,370,488.4	1,051.3	82.0	129	-8	TR
ATOTR238	632,793.8	5,364,449.8	1,082.3	89.0	157	-3	TR
ATOTR239	631,471.1	5,364,156.5	1,095.6	38.0	177	-15	TR
ATOTR24	631,761.2	5,366,952.0	1,059.5	21.0	151	-14	TR

ATOTR240	631,841.3	5,364,281.3	1,080.7	46.0		158	-6	TR
ATOTR241	631,540.2	5,364,183.7	1,095.8	42.0		156	-10	TR
ATOTR241add	631,540.2	5,364,183.7	1,095.8	10.0		339	-12	TR
ATOTR242	631,730.2	5,364,214.1	1,080.2	4.0		175	-25	TR
ATOTR243	630,152.1	5,367,857.7	1,025.9	43.0		57	0	TR
ATOTR244	633,515.5	5,368,482.0	1,037.8	66.0		120	0	TR
ATOTR38	633,391.6	5,369,799.5	1,088.5	65.0		111	-4	TR
ATOTR39	632,703.5	5,368,965.0	1,076.8	182.0		119	-1	TR
ATOTR40	629,511.1	5,360,681.5	1,004.7	58.0		310	0	TR
ATOTR48	632,644.9	5,367,343.7	1,099.7	97.5		305	-1	TR
ATOTR49	632,759.5	5,366,891.6	1,106.1	95.0		336	-10	TR
ATOTR50	632,463.3	5,366,918.2	1,063.4	90.0		176	-1	TR
ATOTR51	632,492.6	5,367,599.9	1,060.8	90.2		53	-2	TR
ATOTR52	631,563.5	5,366,958.6	1,046.5	28.0		107	-2	TR
ATOTR53	631,396.6	5,366,870.4	1,031.4	60.0		285	-3	TR
ATOTR54	632,377.6	5,368,118.8	1,057.1	101.0		267	-2	TR
ATOTR55	631,874.5	5,367,876.8	1,035.3	100.0		209	-2	TR
ATOTR56	631,002.6	5,367,828.2	1,018.5	15.0		127	0	TR
ATOTR57	630,711.5	5,367,511.4	1,014.1	19.0		122	-4	TR
ATOTR58	631,973.4	5,366,789.5	1,045.7	16.0		122	0	TR
ATOTR59	633,035.7	5,368,517.5	1,090.2	82.9		270	-5	TR
ATOTR60	632,211.5	5,366,720.4	1,051.3	27.0		229	-2	TR
ATOTR61	632,366.6	5,366,615.7	1,057.5	25.0		250	-4	TR
ATOTR62	632,179.8	5,367,090.4	1,046.5	26.0		37	-5	TR
ATOTR63	632,023.7	5,366,670.0	1,046.2	18.5		57	-3	TR
ATOTR64	632,303.3	5,367,524.6	1,051.7	48.2		210	0	TR
ATOTR65	631,059.1	5,367,110.4	1,024.8	17.0		225	-4	TR
ATOTR66	632,310.7	5,367,512.9	1,052.8	46.8		122	-4	TR
ATOTR67	632,655.1	5,368,756.3	1,066.6	28.0		218	-2	TR
ATOTR68	632,725.7	5,368,854.0	1,075.7	28.0		53	-2	TR
ATOTR69	632,174.6	5,367,917.6	1,049.2	32.0		123	-1	TR
ATOTR70	631,969.1	5,368,007.4	1,046.5	30.0		219	-5	TR
ATOTR71	632,019.6	5,368,059.3	1,056.2	22.2		225	-13	TR
ATOTR72	632,191.7	5,367,066.8	1,048.2	22.0		122	-2	TR
ATOTR73	632,653.3	5,368,809.1	1,069.2	64.0		128	-1	TR
ATOTR74	630,529.8	5,367,897.4	1,024.0	56.0		100	-1	TR
ATOTR75	630,518.1	5,368,405.6	1,008.2	61.2		209	0	TR
ATOTR85	632,445.3	5,367,904.2	1,052.5	136.0		60	-3	TR
ATOTR86	631,300.9	5,367,234.6	1,041.2	90.0		109	-1	TR
ATOTR87	632,351.7	5,367,485.7	1,054.6	152.0		122	6	
ATOTR90	632,388.2	5,366,624.4	1,057.9	24.1		260	0	TR
Trenches	**167.0**		**Total**	**10,184.3**	**m**			
			Av	**61.0**	**m**			

APPENDIX 2 – PIPE 1, 2 AND 4 E/W CROSS-SECTIONS

The following Figures show east/west vertical cross-sections through the Pipe 1, 2 and 4 2021 deposit block model. They are spaced 50 m apart and are presented from south to north.

Figure 113 Pipe 1, 2 and 4 gold block cross-section 5,366,852N

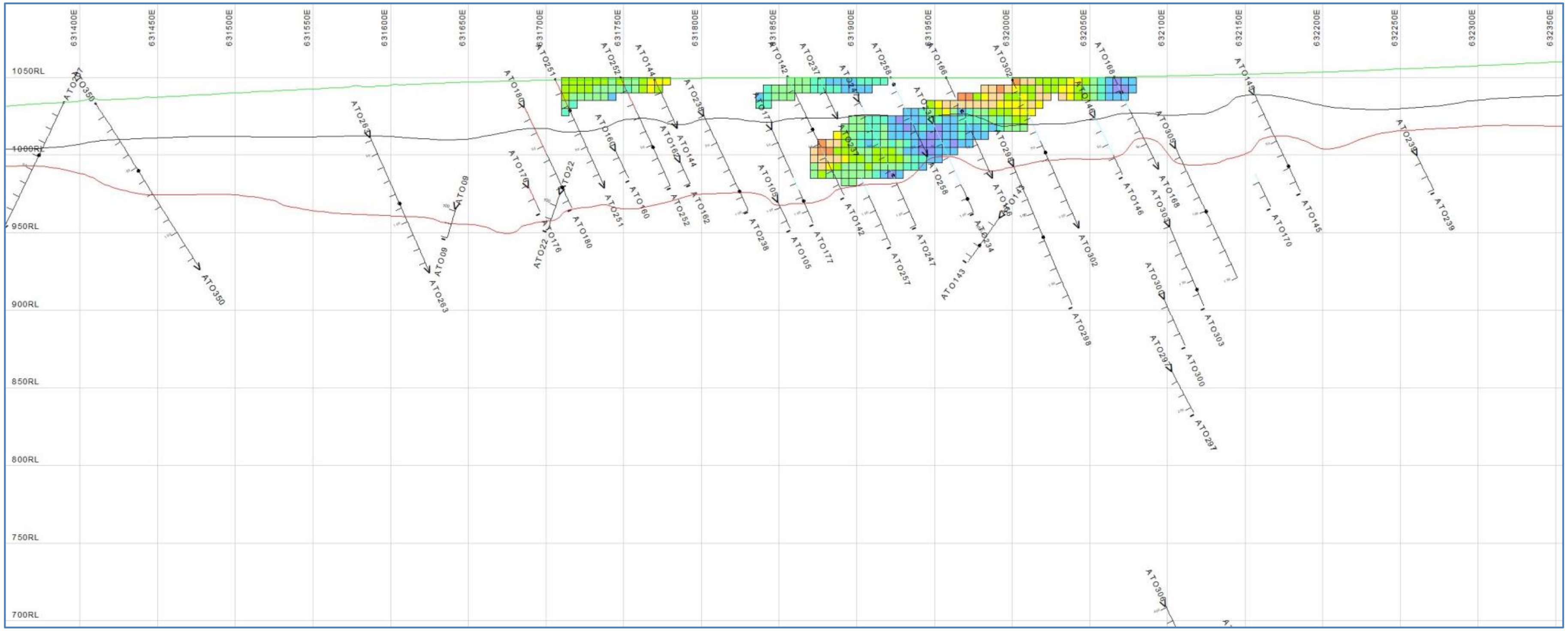


Figure 114 Pipe 1, 2 and 4 gold block cross-section 5,366,902N

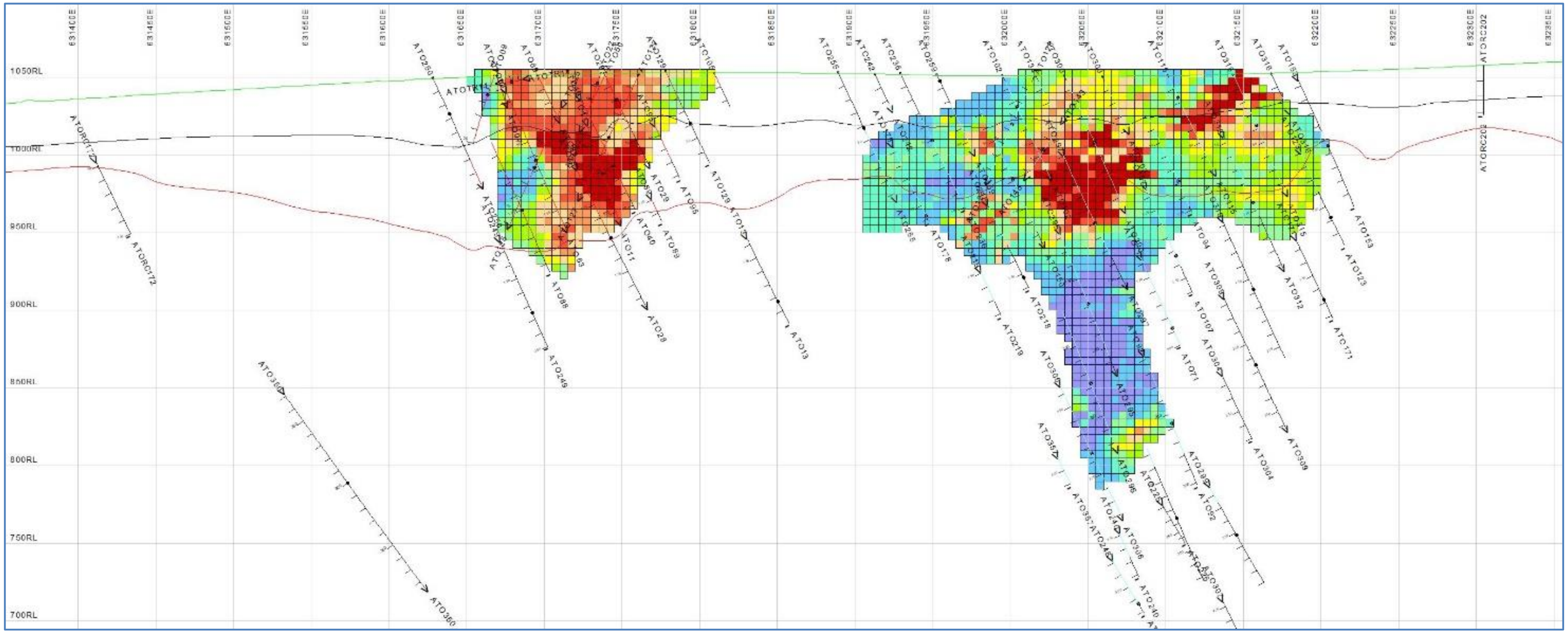


Figure 115 Pipe 1, 2 and 4 gold block cross-section 5,366,952N

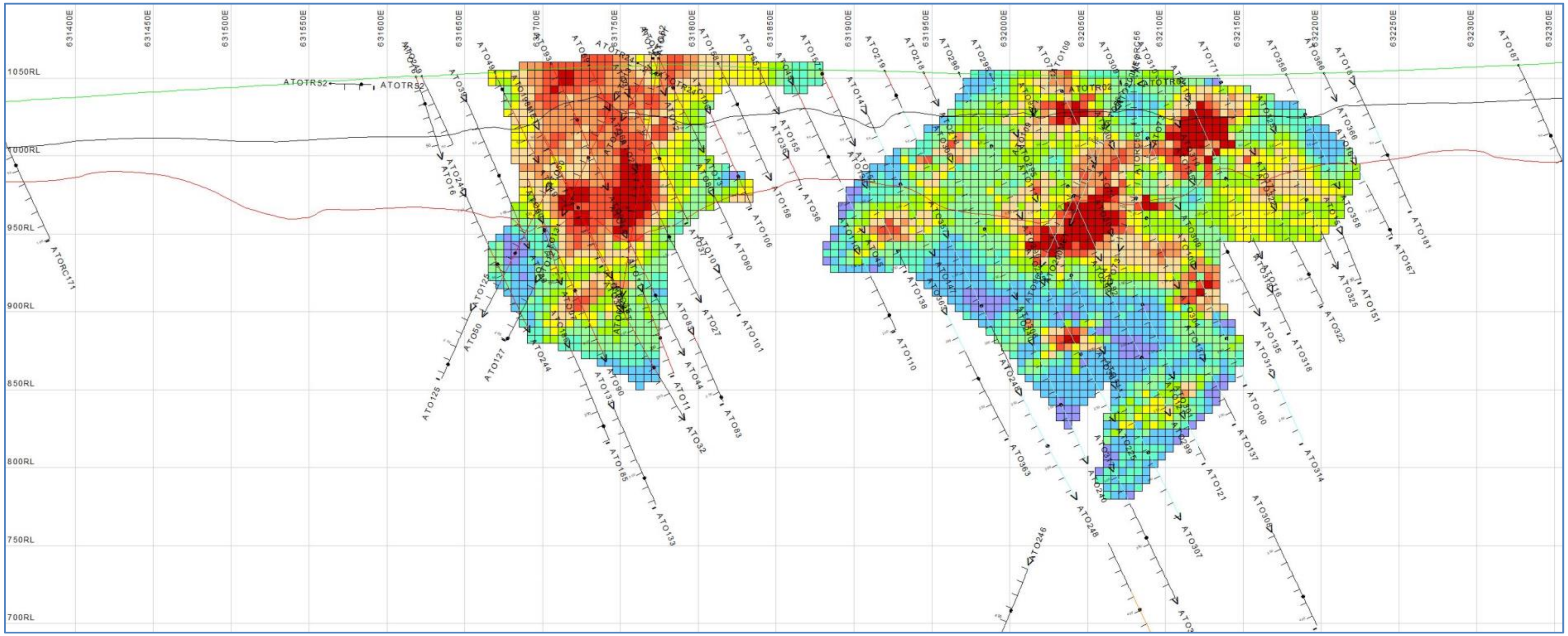


Figure 116 Pipe 1, 2 and 4 gold block cross-section 5,367,002N

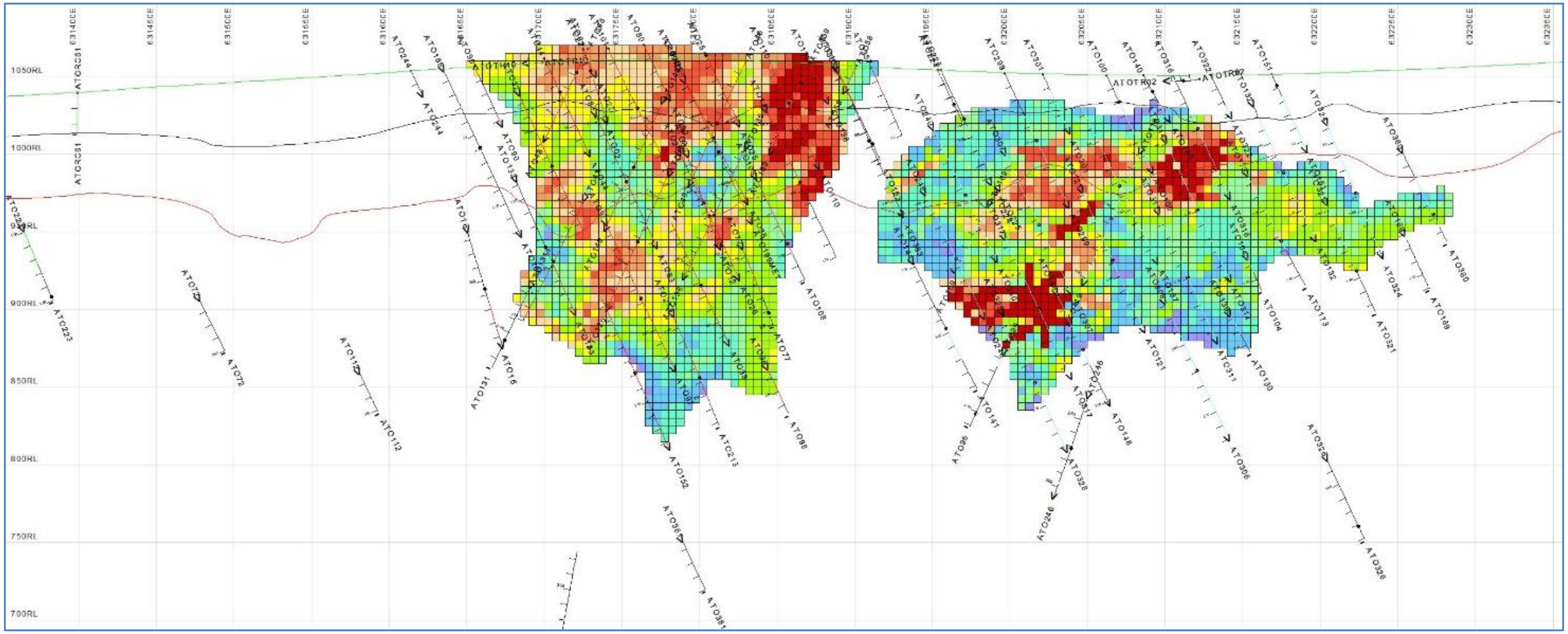


Figure 117 Pipe 1, 2 and 4 gold block cross-section 5,367,052N

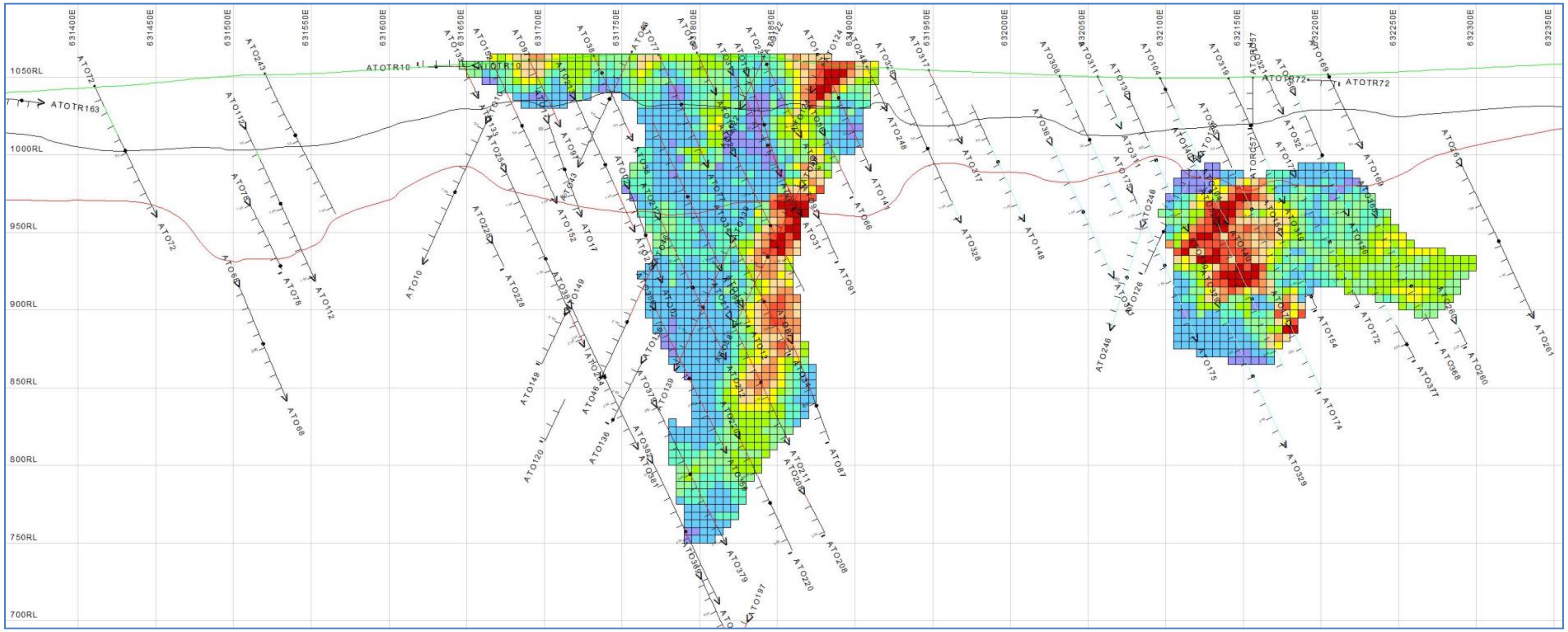


Figure 118 Pipe 1, 2 and 4 gold block cross-section 5,367,102N

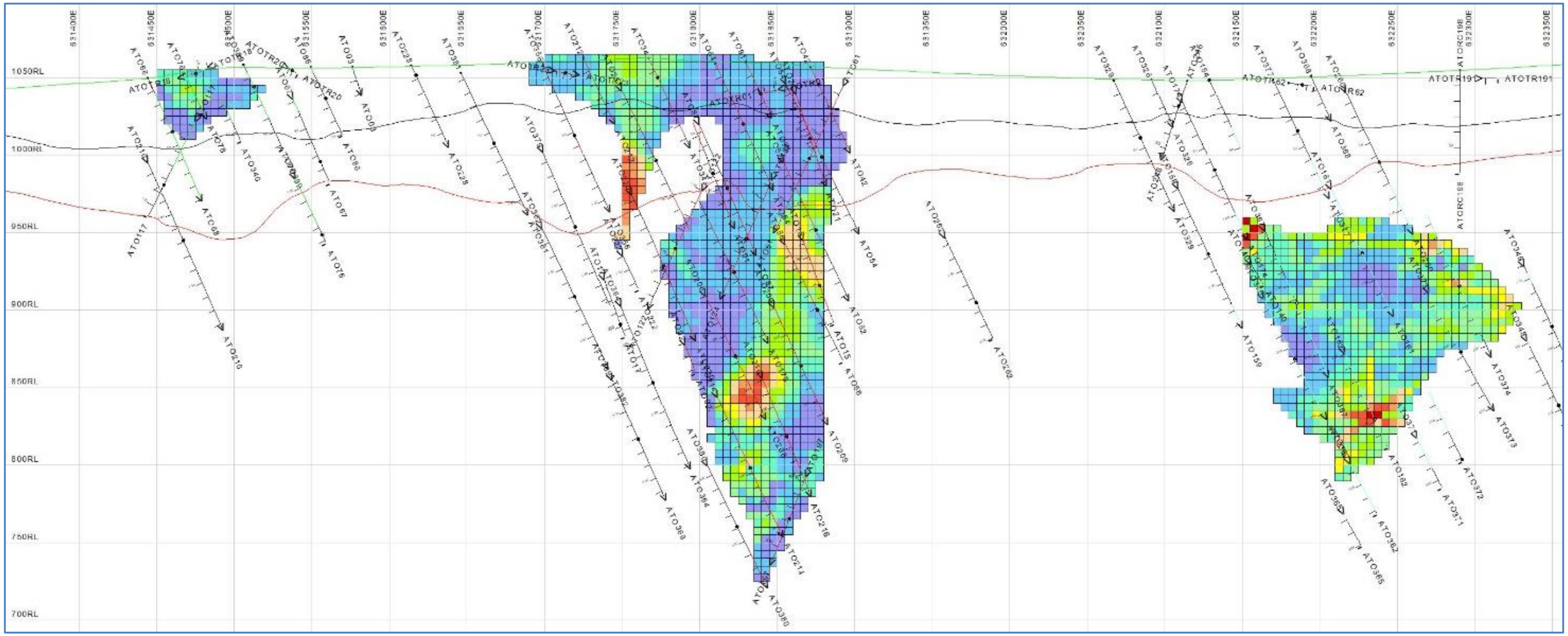


Figure 119 Pipe 1, 2 and 4 gold block cross-section 5,367,152N

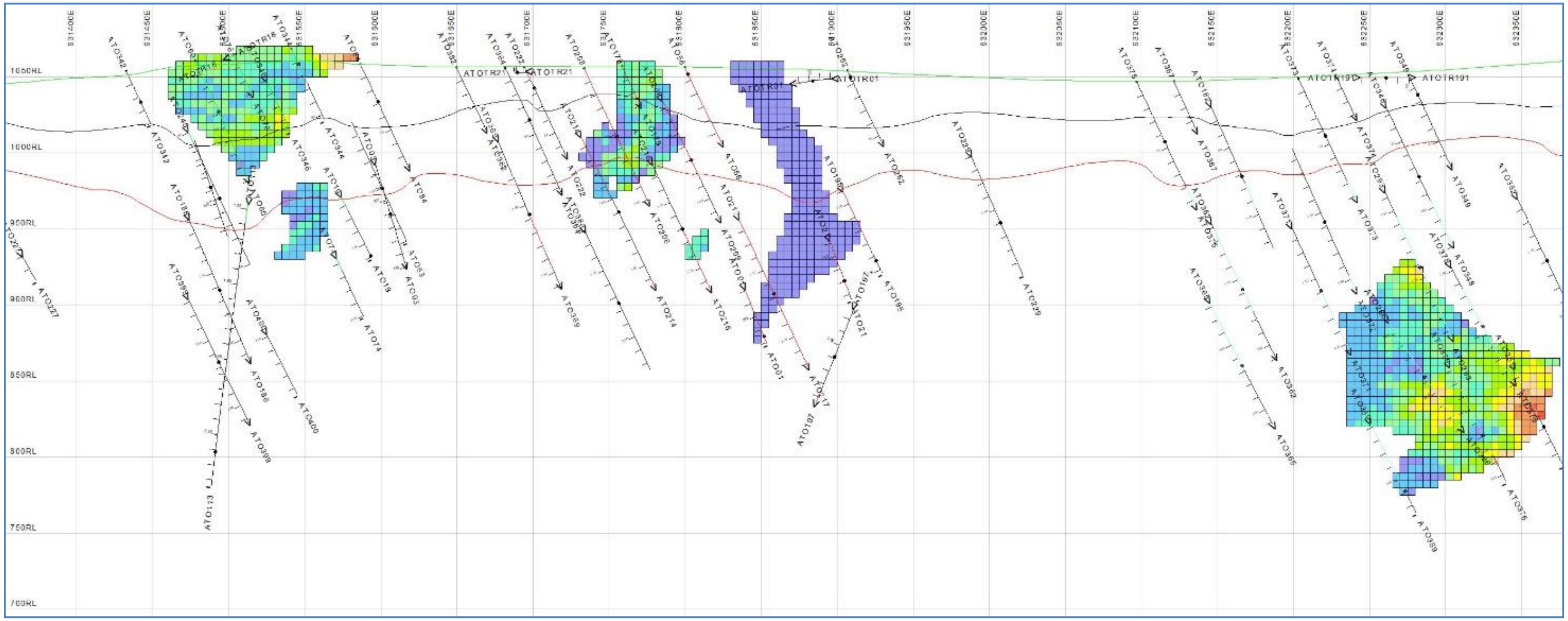


Figure 120 Pipe 1, 2 and 4 gold block cross-section 5,367,202N

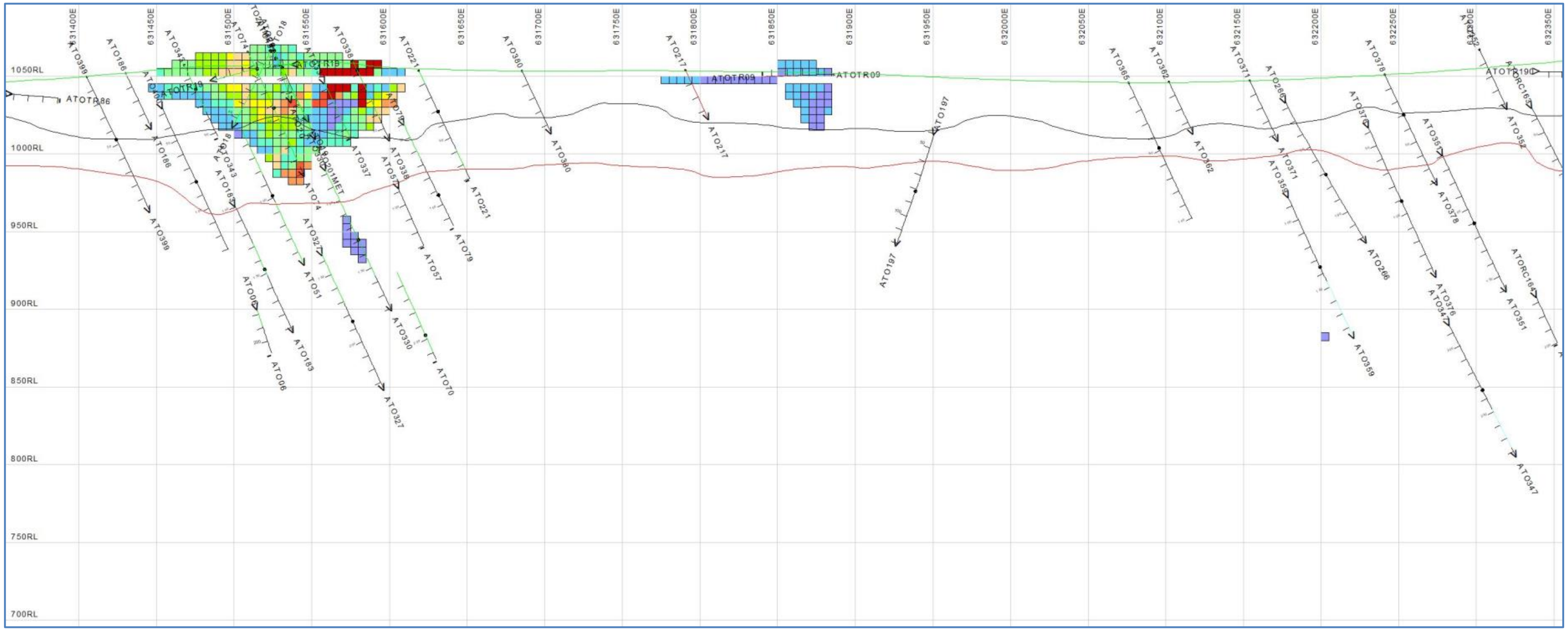


Figure 121 Pipe 1, 2 and 4 gold block cross-section 5,367,252N

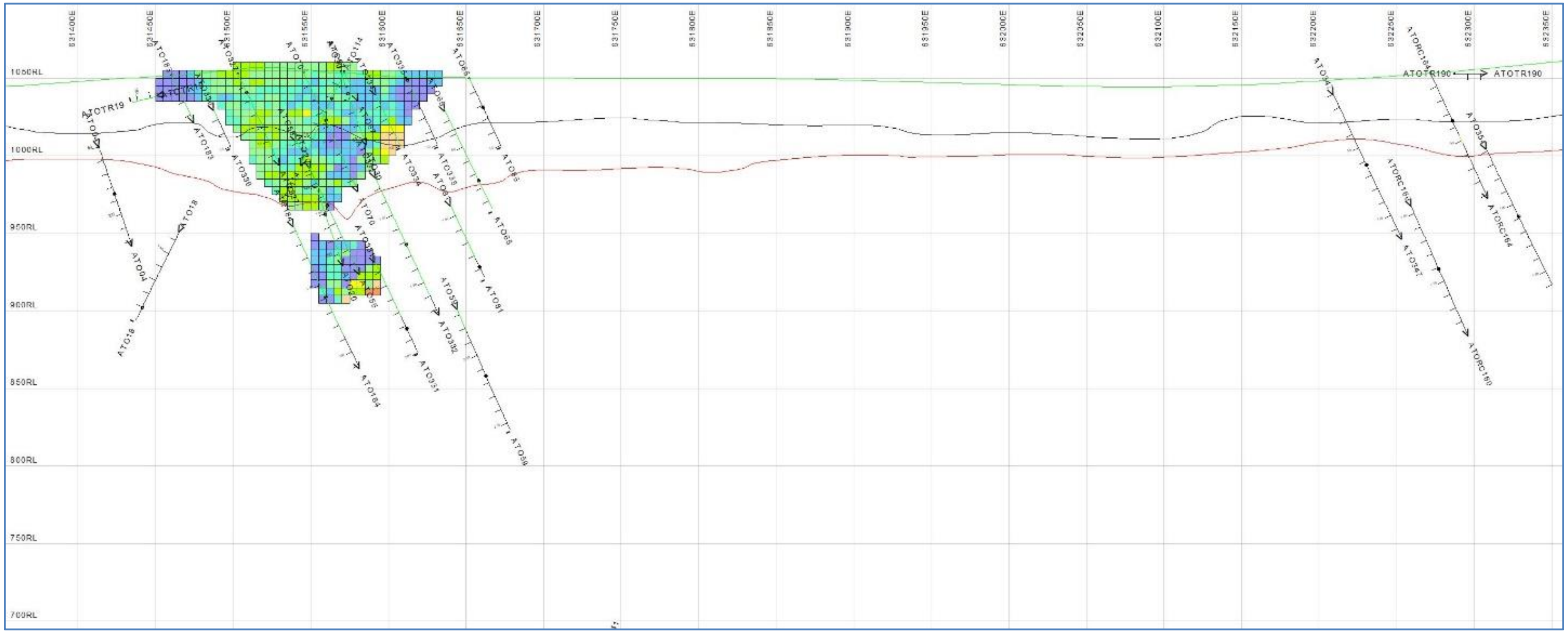
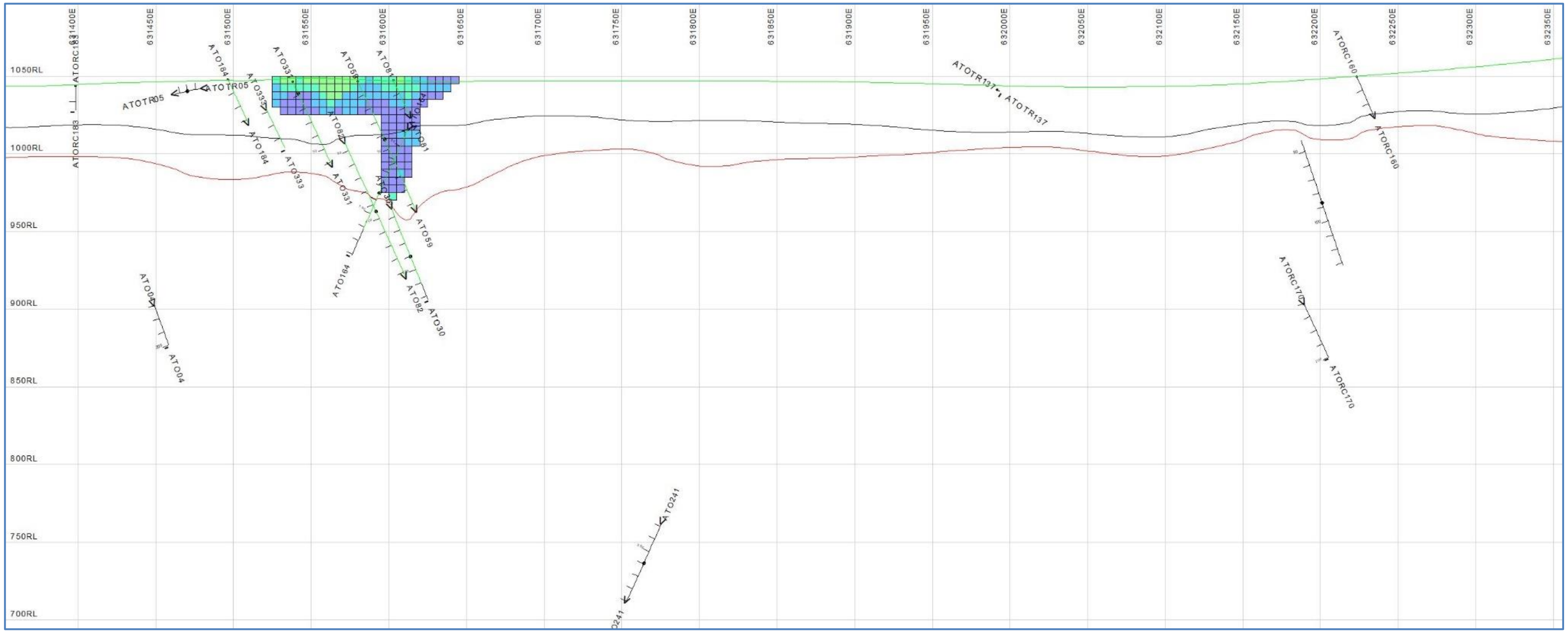


Figure 122 Pipe 1, 2 and 4 gold block cross-section 5,367,302N



APPENDIX 3 – MUNGU E/W CROSS-SECTIONS

The following Figures show east/west vertical cross-sections through the Mungu 2021 deposit block model. They are spaced 50 m apart and are presented from south to north.

Figure 123 Mungu gold block cross-section 5,367,402N

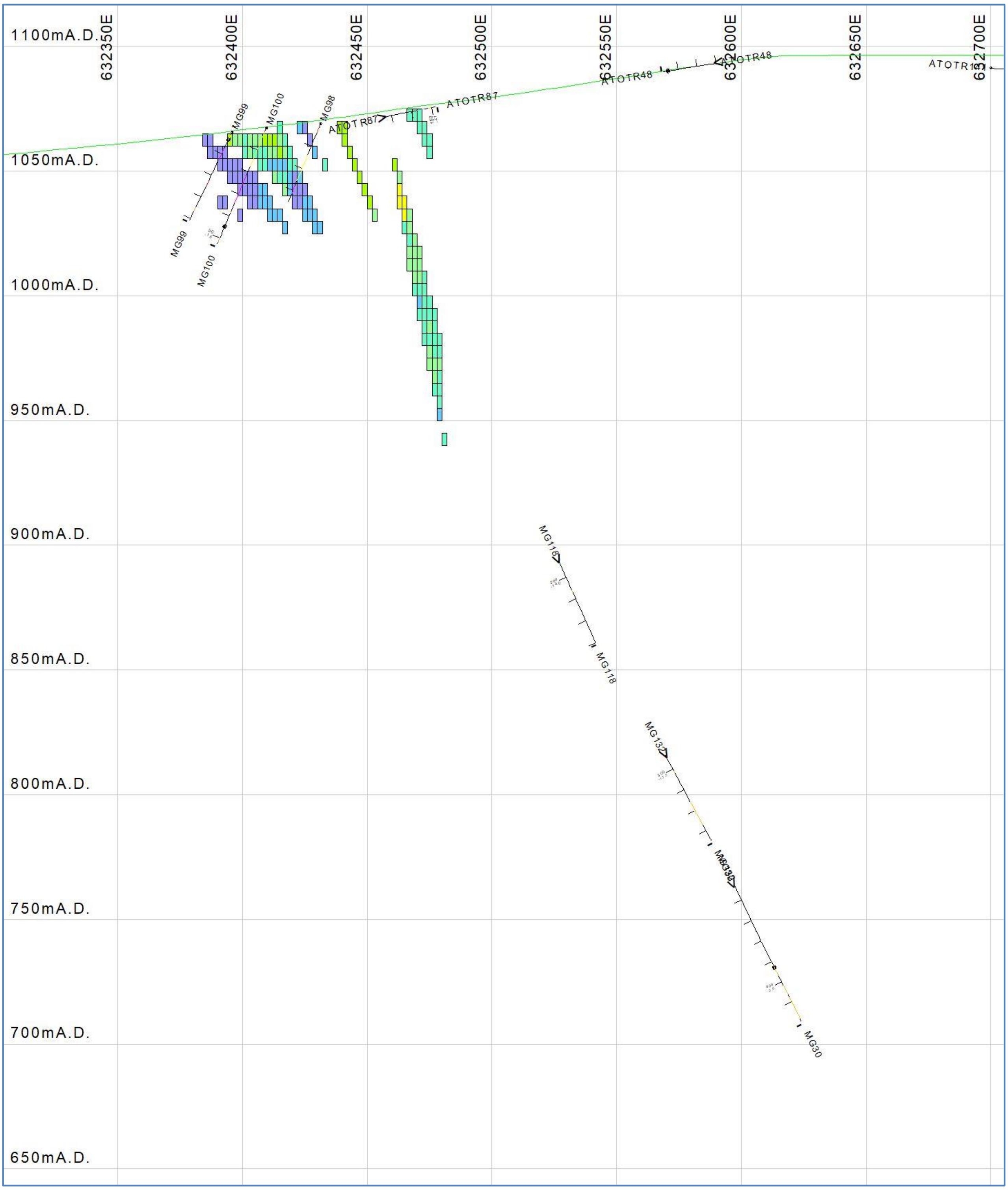


Figure 124 Mungu gold block cross-section 5,367,452N

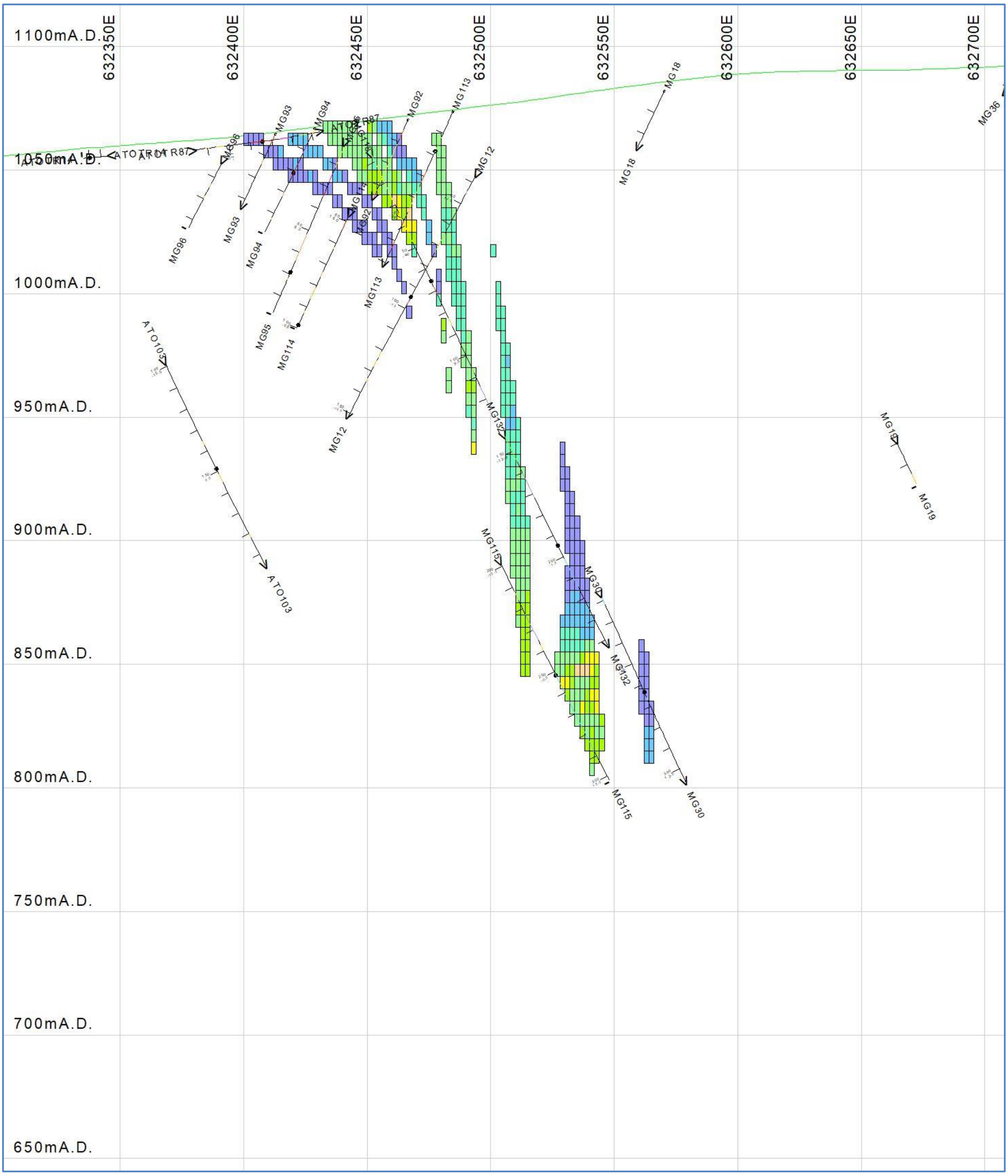


Figure 125 Mungu gold block cross-section 5,367,502N

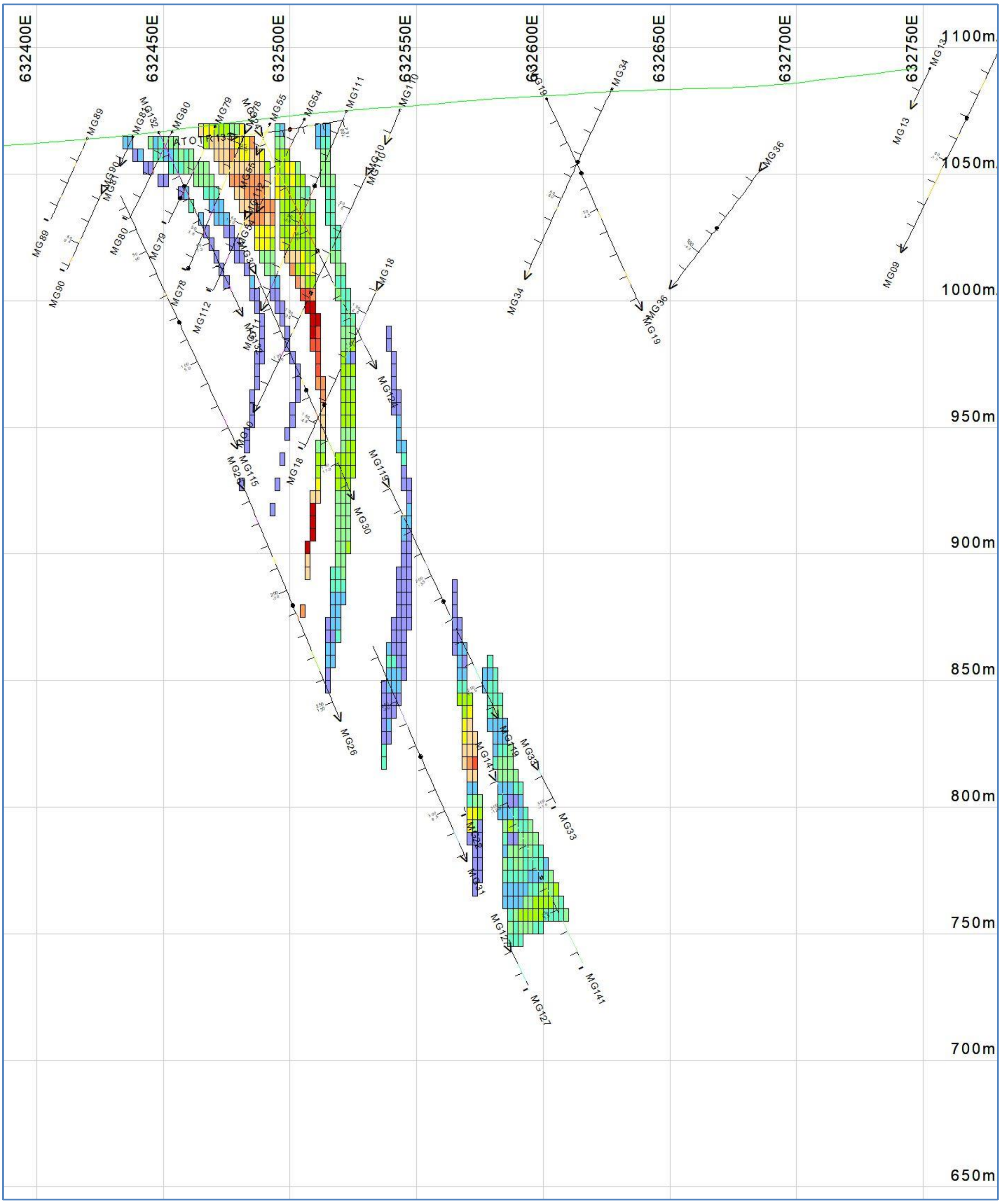


Figure 126 Mungu gold block cross-section 5,367,552N

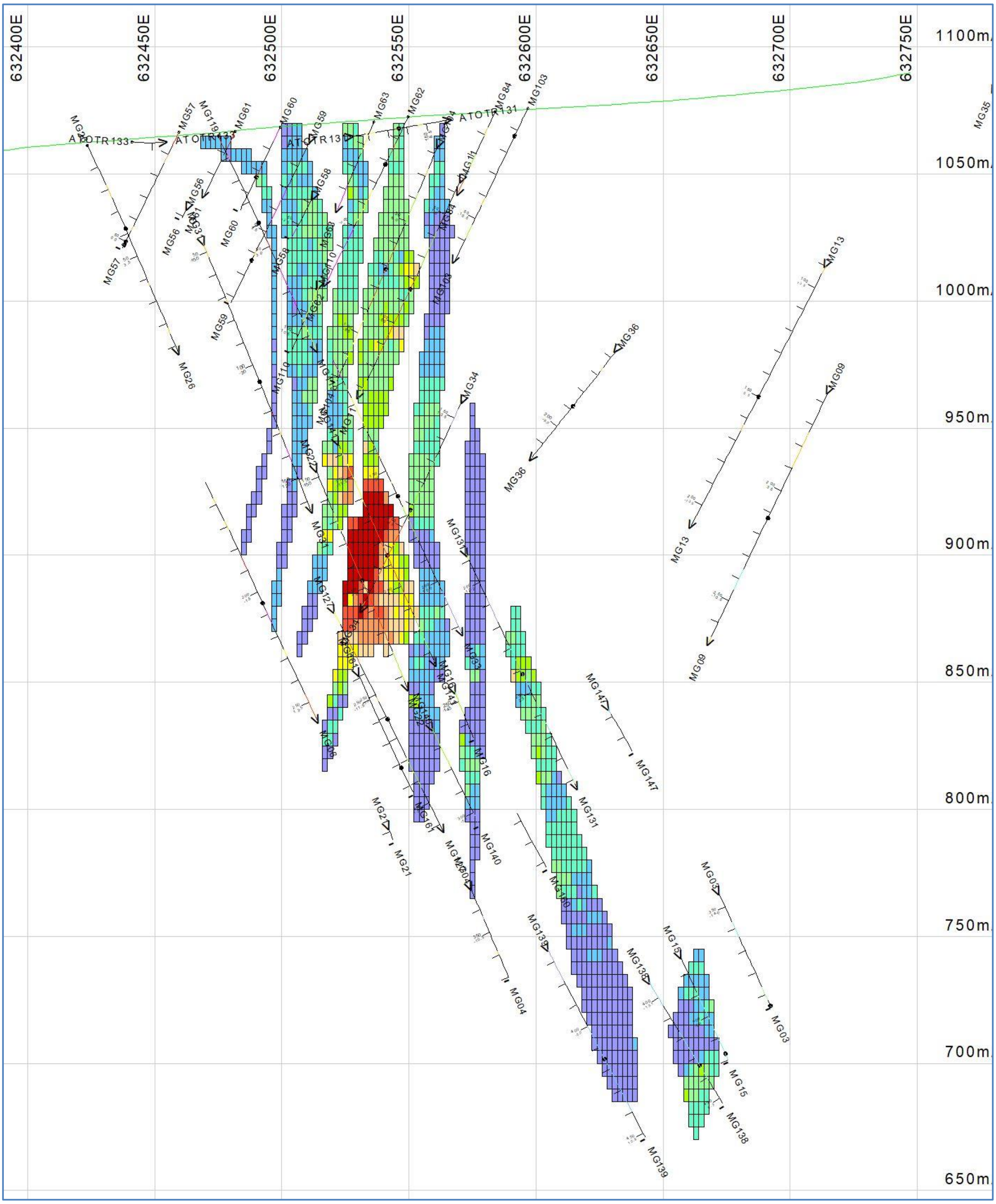


Figure 127 Mungu gold block cross-section 5,367,602N

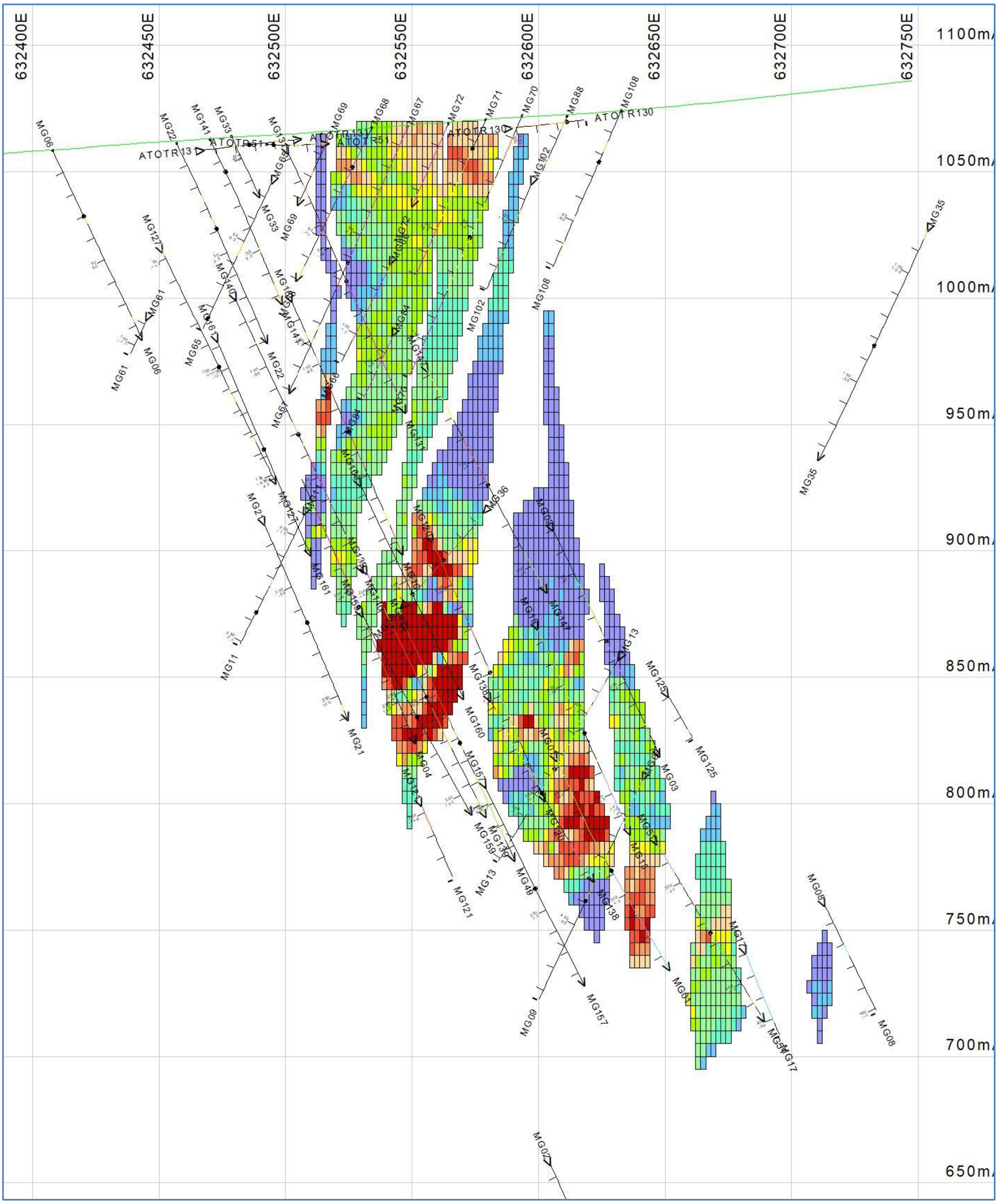


Figure 128 Mungu gold block cross-section 5,367,652N

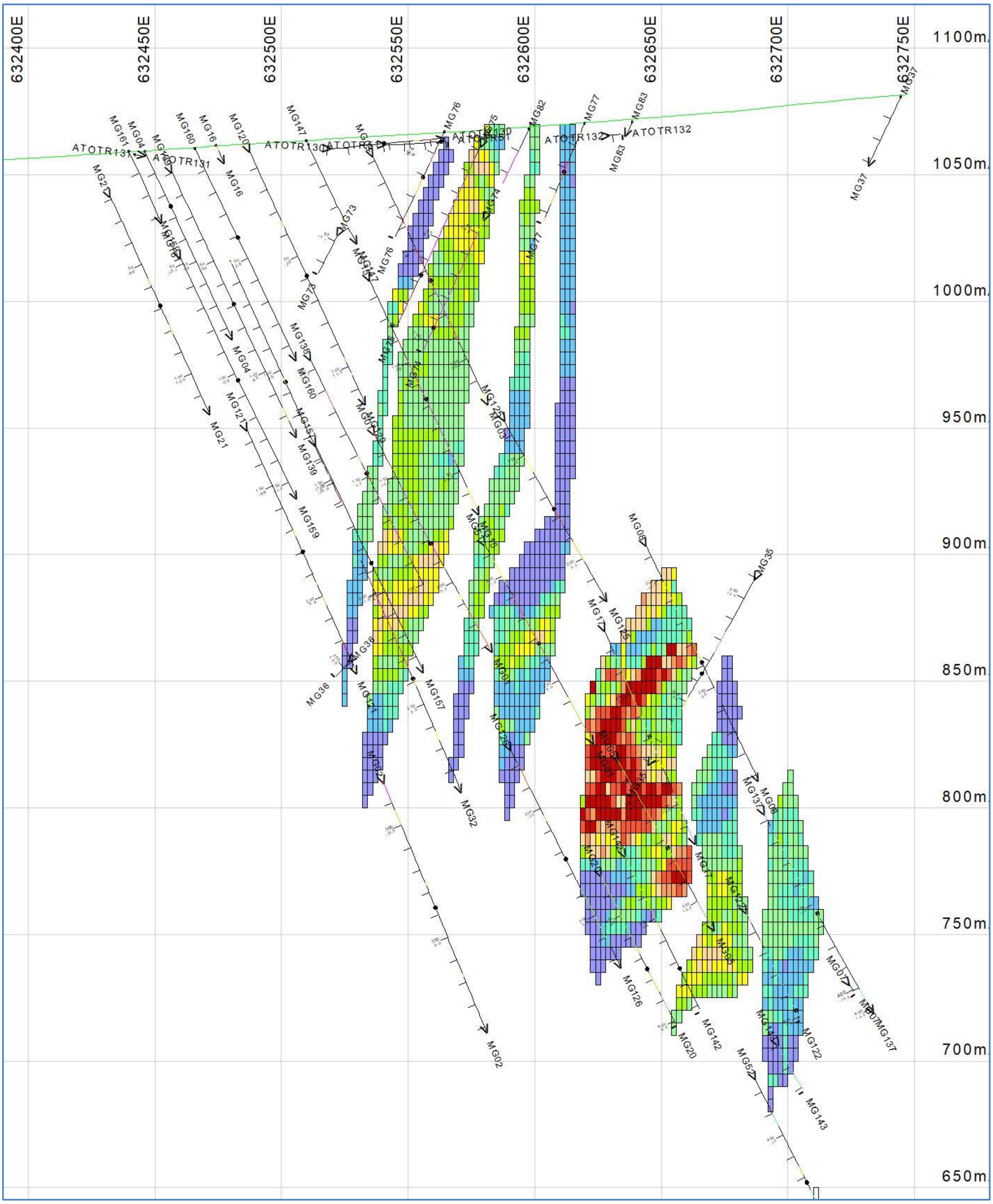


Figure 129 Mungu gold block cross-section 5,367,702N

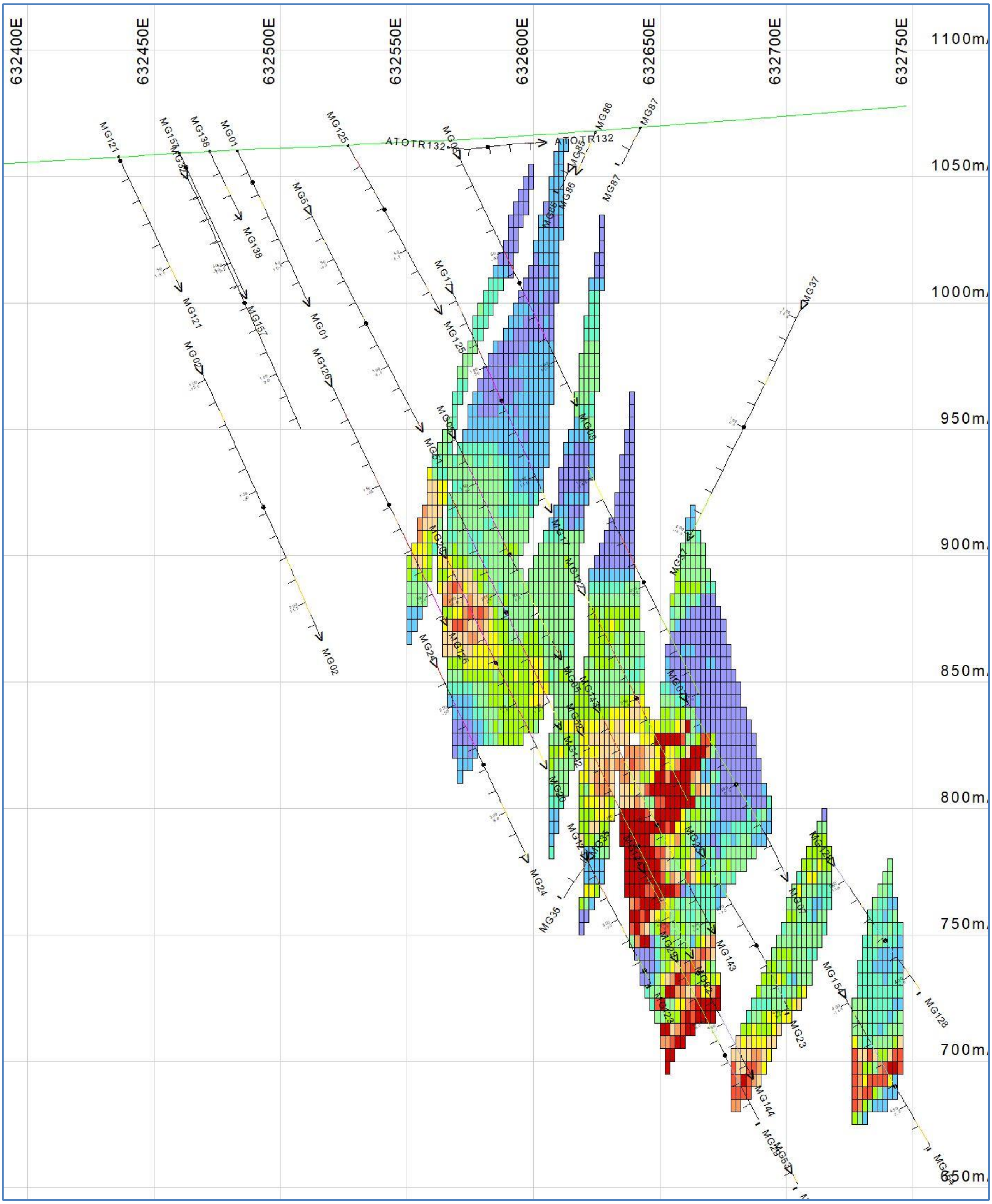


Figure 130 Mungu gold block cross-section 5,367,752N

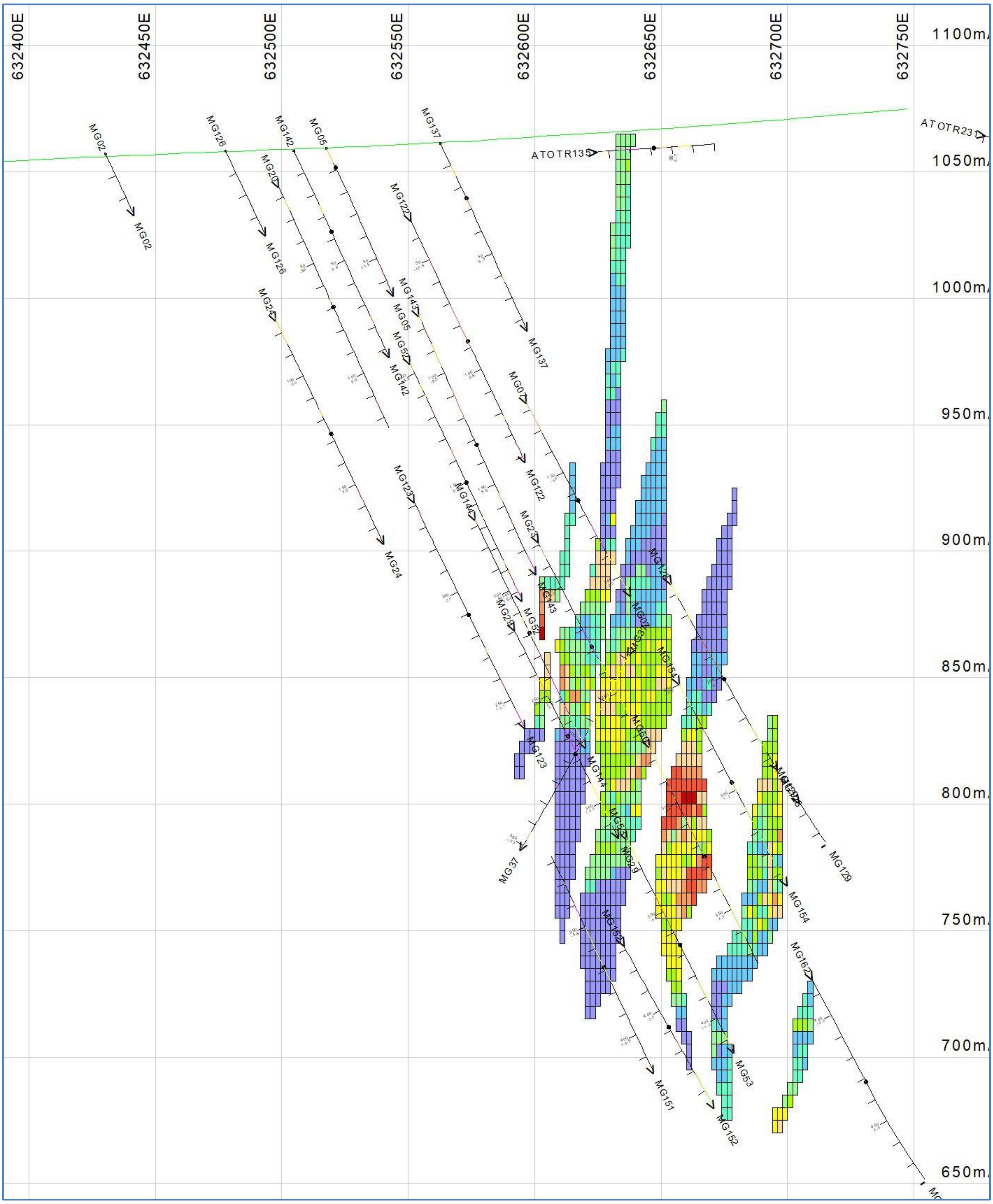


Figure 131 Mungu gold block cross-section 5,367,802N

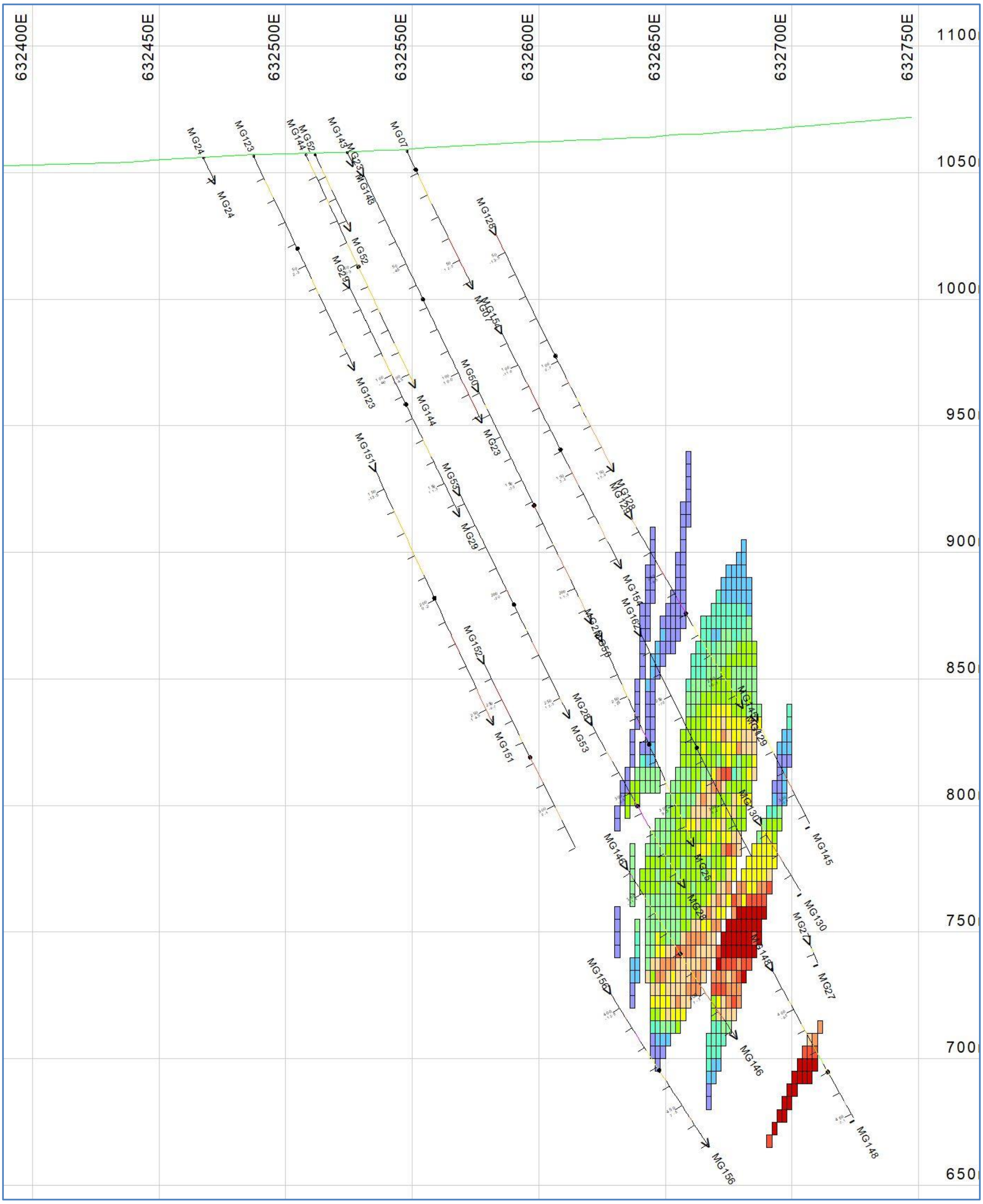
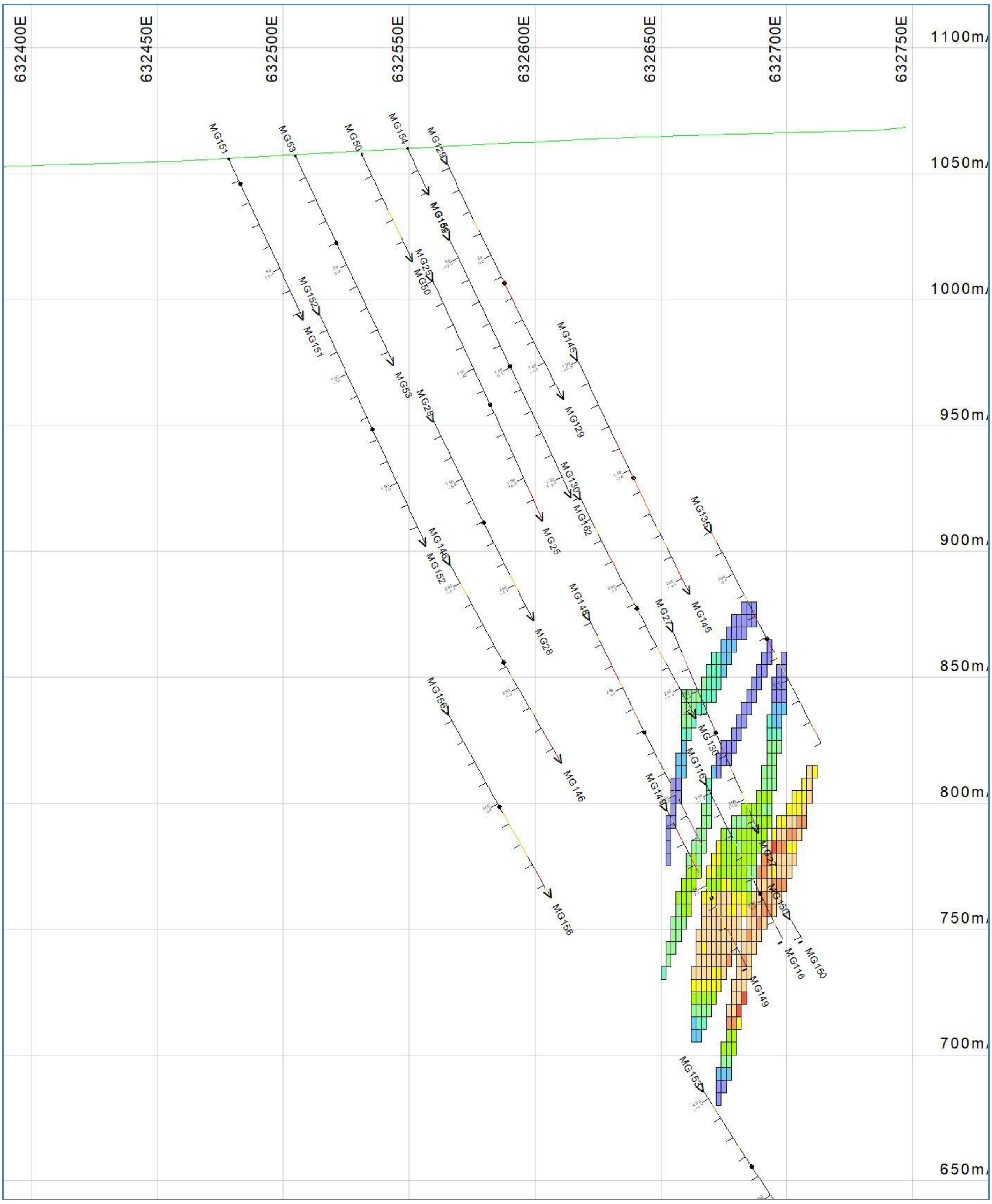


Figure 132 Mungu gold block cross-section 5,367,852N



APPENDIX 4 – MUNGU LEVEL CROSS-SECTIONS

The following Figures show horizontal cross-sections through the Mungu 2021 deposit block model. They illustrate colour-coded gold block grades. Levels are spaced 50 m apart vertically and are presented from top downwards. North is at the top.

The view remains the same – illustrating the shift of the discovered deposits eastwards and northwards with depth.

Figure 133 Mungu gold block level 1,050RL

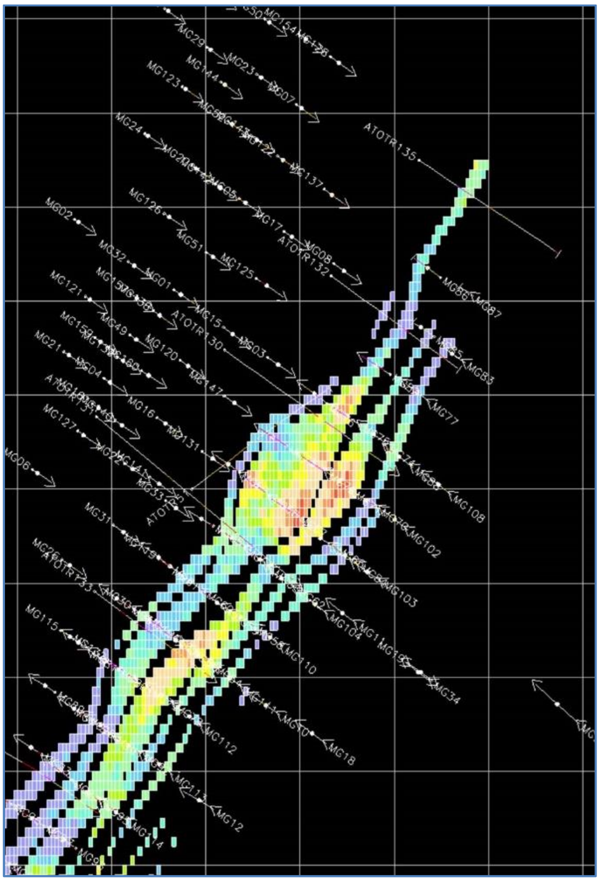


Figure 134 Mungu gold block level 1,000RL

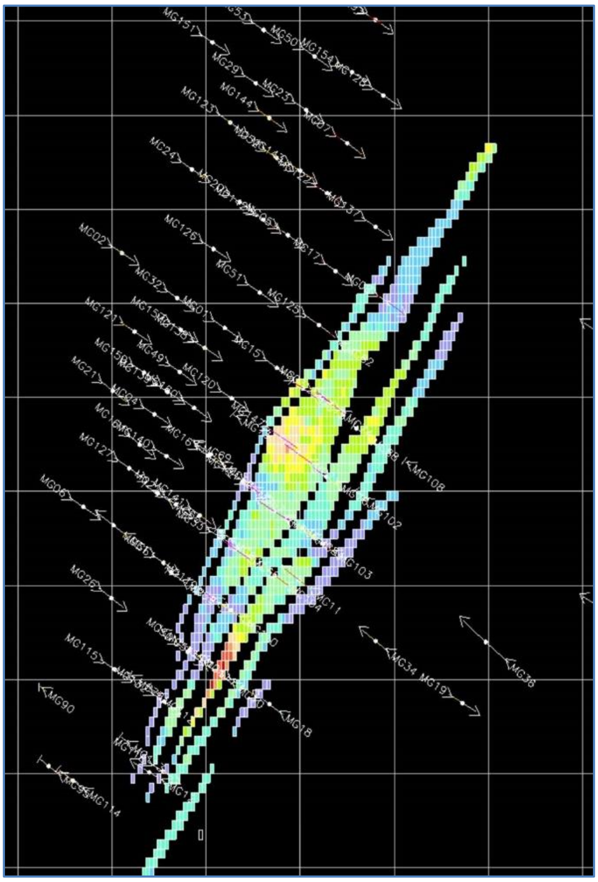


Figure 135 Mungu gold block level 950RL

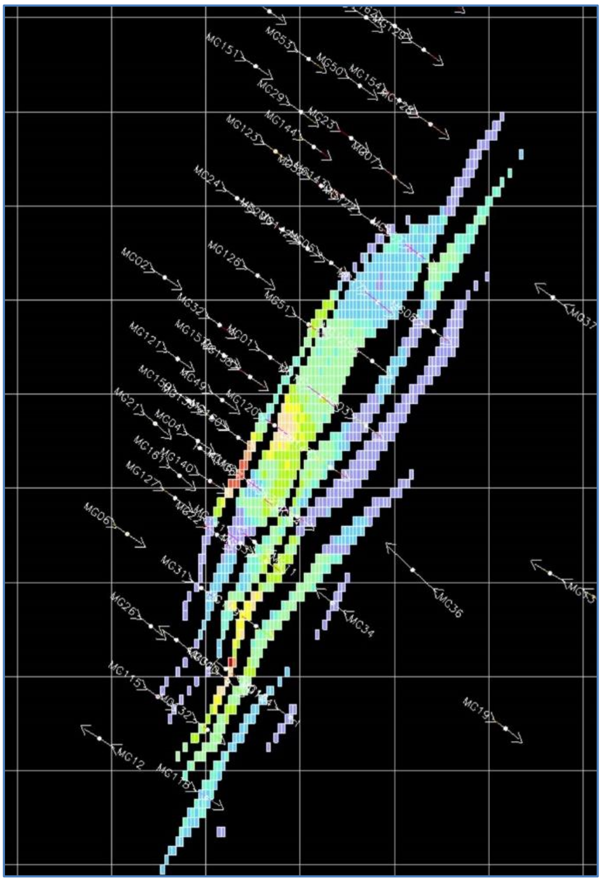


Figure 136 Mungu gold block level 900RL

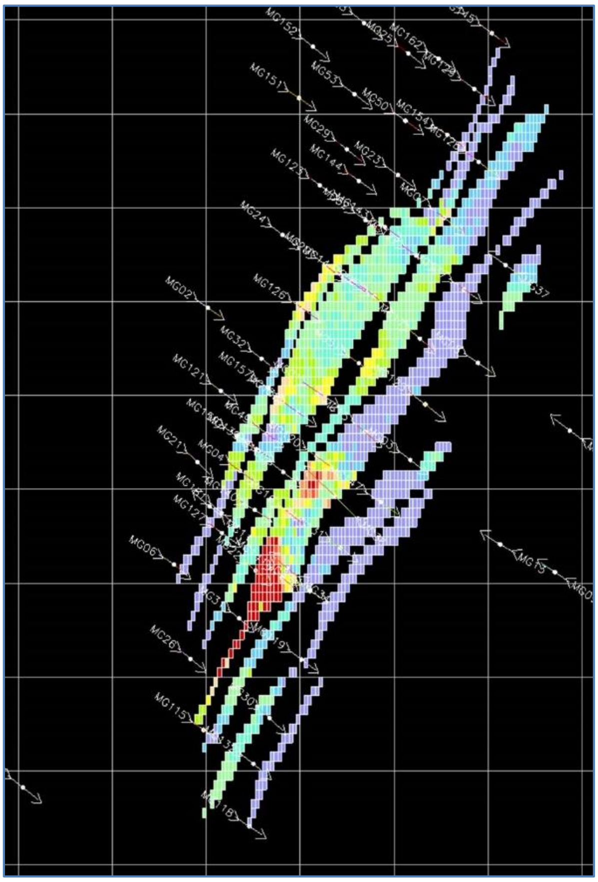


Figure 137 Mungu gold block level 850RL

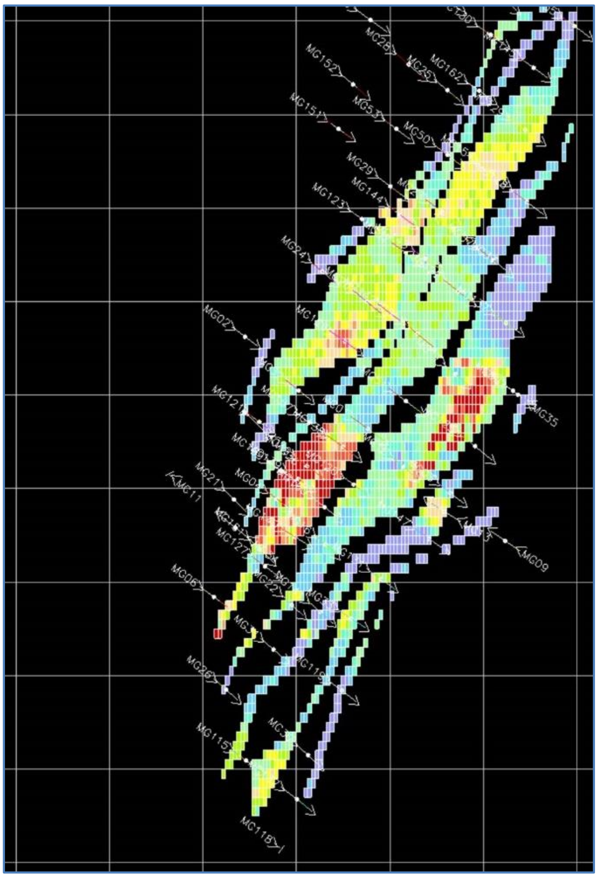


Figure 138 Mungu gold block level 800RL

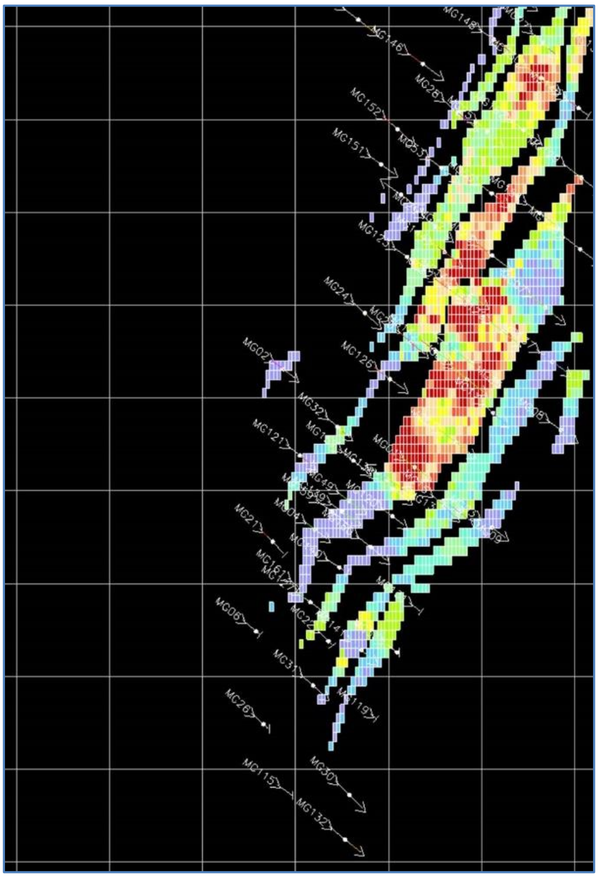


Figure 139 Mungu gold block level 750RL

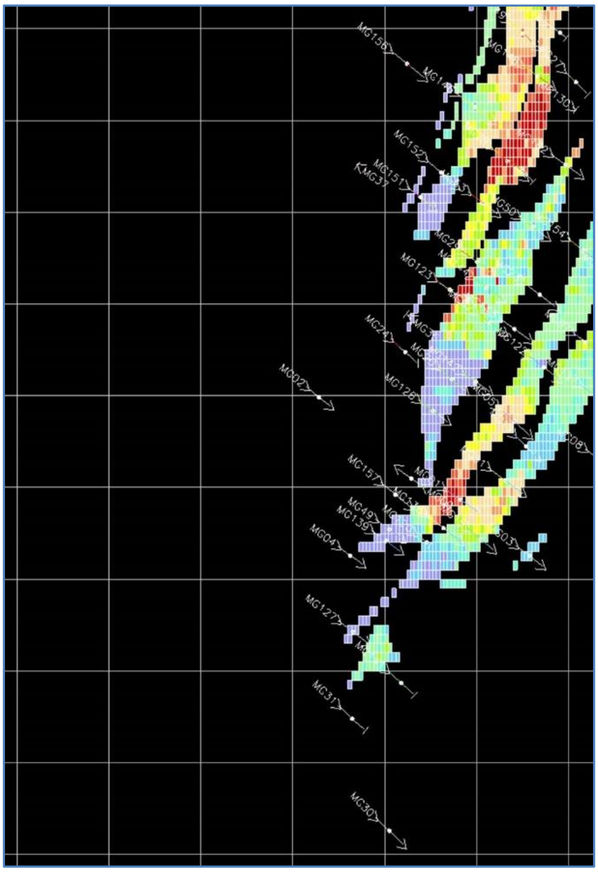
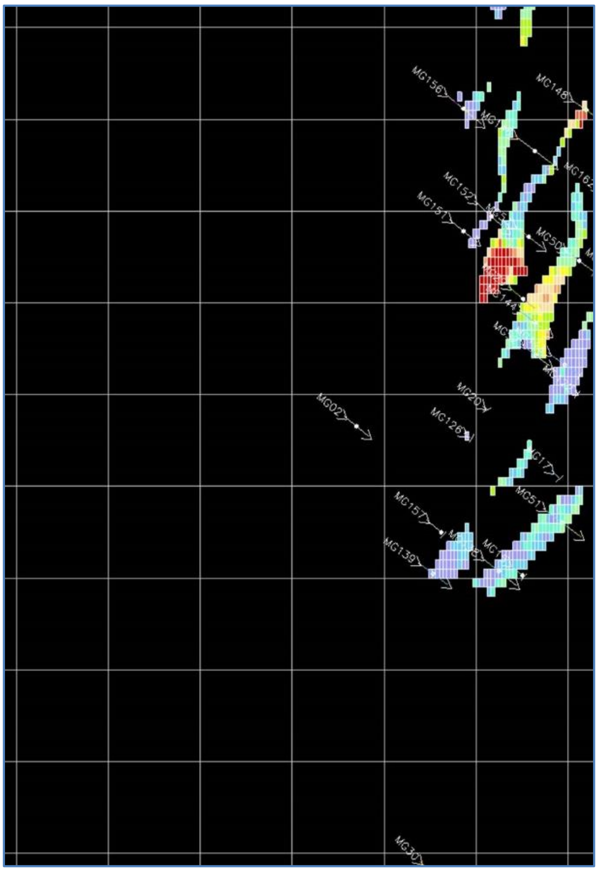


Figure 140 Mungu gold block level 700RL



APPENDIX 4 – ABBREVIATIONS

Abbreviation	Meaning
AusIMM	Australasian Institute of Mining and Metallurgy
CIM	The Canadian Institute of Mining, Metallurgy and Petroleum
JORC	Joint Committee of the Australasian Institute of Mining and Metallurgy, Australasian Institute of Geoscientists and Minerals Council of Australia
NI 43101	Canadian National Instrument 43-101 *Standards of Disclosure for Mineral Projects*. Includes Form 43-101F1 *Technical Report* and Companion Policy 43-101CP to National Instrument 43-101.
Elements:	
Ag	Silver
Au	Gold
Cu	Copper
Pb	Lead
Zn	Zinc
AuEq	"Gold equivalent" (adding proportional value of other elements to gold as if they were gold, based on their relative metal value)
Units:	
%	Percent
k	Kilo (1,000)
M	Million (1,000,000)
Mt	Million tonnes
Mtpa	Million tonnes per annum
g/t	Grams per tonne (unit of grade)
t/m^3	Tonnes per cubic metre (unit of bulk density)

APPENDIX 5 – COMPUTERISED GEOLOGICAL MODELLING METHODS

Geological modelling is an activity undertaken largely for the purpose of estimating Mineral Resources. It may be done manually on plans and cross-sections or more usually now by using computers. Several methods are commonly used – and their purpose is primarily to interpret the shape of a mineral deposit, interpolate mineral grades throughout it (from drill hole samples), and then estimate the Mineral Resources. Some methods are used in combination.

GeoRes uses **Minex** geological and mining software.

Common geological modelling methods are:

- Polygonal
- Surface
- Wire frame
- Block

POLYGONAL METHOD

A polygonal method typically involves interpreting closed polygons around "ore" zones from the drill holes intercepting them. The polygons are interpreted on cross-sections traversing the deposit and regularly spaced the length of the deposit. Areas of polygons are estimated and average grades assigned to each by length weighting all the drill hole sample assays found within a polygon. Polygon influences are assumed to extend half way to the adjacent polygons, giving a width. Volumes are then calculated from polygon areas multiplied by their influence widths; and tonnages found by applying a density. The polygonal method is manual or computerised, and is generally a stand-alone method.

SURFACE METHOD

Surface modelling methods involve creating computerised surfaces of geological features. The features may be stratigraphic horizons, rock type interfaces, veins, weathering changes, faults or other structures easily characterised by an open surface. Surfaces are particularly suited to modelling thin bodies. Surfaces are created from drill hole intercepts and mapping strings.

Sub-horizontal surfaces are modelled relative to a horizontal datum. Steeply dipping surfaces are modelled relative to an inclined reference plane the orientation of which is chosen closest to closest to sub-parallel to the surface. This latter steep surface modelling is often applicable to "**vein**" deposits.

A collection of stratigraphically stacked surfaces readily models sedimentary or layered geology. If a regular sequence is present it should have to be honoured in every drill hole, consequently an interpretation stage is undertaken to ensure this (principally inserting missing intercepts in appropriate positions). If units are not in a sequence they are simply modelled individually, with cross cutting situations accounted for in various ways.

Surfaces themselves are either collections of **triangles** (where straight lines join the data points) or are **grids** (where the positions of regularly spaced points in space (forming a regular grid pattern or mesh) are interpolated from the surrounding data points. With grids an interpolation algorithm relevant to the type of surface is chosen, typically a growth or trending method, inverse distance weighting or kriged weighting. An advantage of grid surface modelling is the fully 3-dimensional interpolation used to estimate new values between data points. The rolling surfaces produced, particularly with trending algorithms, usually realistically simulate natural surfaces. Gridded surfaces are also amenable to manipulation and mathematical operations, which can enforce stratigraphic rules.

Surface modelling is computerised, may be combined with polygonal or wire frame methods, and the surfaces are usually combined into a 3D block model.

WIRE FRAME METHOD

Wire frame methods use computerised closed surfaces to represent geological volumes. The surface is the outside edge of the volume. Wire frame surfaces are extensions of triangle surfaces where the triangles are closed back on themselves. They are usually created from a series of closed cross-sectional polygon "outline" strings (the same starting point to the polygonal method) which are stitched together by "wires". Polygonal outline string digitising is usually based on coloured geological drill hole intercepts projected onto cross-sections, and on mapping strings. Wire frame models are computerised and are usually combined into a 3D block model.

BLOCK METHOD

Block models are minutely sub-divided representations of geological models in which individual mineral grades may be interpolated into each subdivision (a block) for the ultimate purpose of accumulating (for all blocks) a Mineral Resource. Various other variables may be estimated when interpolating an individual block grade, such as the numbers or distances of samples used, allowing determination of confidence and such things as JORC Resource classifications. Block models are computerised and are usually the source of data for computerised pit optimisation.

Block modelling methods typically involves constructing a framework of adjacent 3D blocks which cover the full volume of the deposit. The framework may simply be defined somewhere in space, or is often created within surface or wire frame models. Blocks are often all the same size, but the X, Y and Z dimensions may be different. They are made small enough to honour shapes and allow for spatial grade variations. Blocks may be reduced in size locally (termed "sub-blocking") to even better reflect geological boundaries. Block grades are calculated independently for each block from nearby drill hole sample assays, usually using an algorithm which proportions individual sample influences based on their distance and direction from the block. The ID algorithm proportions sample weighting in inverse relation to the distance and the distance is often further weighted (such as where it is squared and termed the ID2 algorithm). The Kriging algorithm introduces geostatistical information on sample variances into the distance weighting.

Where directional sample anisotropy exists (samples in some directions away from a block have different weightings to samples in other directions, say in a cross dip direction) then dynamic direction controlling block models may be used. These allow data searching to follow along (i.e. bend around) geological layers, and "**un-folding**" approach. These unfolding block models may also be used to control drill hole sample data searching during geostatistical analysis. Their very powerful control frequently allows good geostatistical analysis where otherwise it is very poor or impossible, and it produces very well controlled stratigraphic grade continuity.