NI 43-101 TECHNICAL REPORT ON THE UPDATED MINERAL RESOURCE ESTIMATE FOR THE MUNTANGA URANIUM PROJECT IN ZAMBIA

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Prepared For
GoviEx Uranium Inc

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NI 43-101 TECHNICAL REPORT ON THE UPDATED MINERAL RESOURCE ESTIMATE FOR THE MUNTANGA URANIUM PROJECT IN ZAMBIA

1 EXECUTIVE SUMMARY

1.1 Introduction

SRK Consulting (UK) Limited ("SRK") has been requested by GoviEx Uranium Inc ("GoviEx"), hereinafter also referred to as the "Company" or the "Client" to prepare a Technical Report to support the disclosure of an updated Mineral Resource estimate for the Muntanga Uranium Project ("Muntanga Project" or "the Project") located in the Southern Province of the Republic of Zambia ("Zambia") near the town of Siavonga. GoviEx holds several contiguous mining and exploration licences acquired from Denison Mines Corp. (Denison subsidiary DML Africa) ("Denison") and African Energy Resources Ltd ("AFR") that are now grouped as the Muntanga Project.

1.2 Property Description and Ownership

The Muntanga Project currently comprises three mining licences and three exploration licences (Figure ES-1) with a total combined area of 1,225.9 km^2. The three mining licences – Muntanga, Dibbwi and Chirundu – encompass 720.5 km^2. The mineral resources reported in this Technical Report are contained within these licences.

The Muntanga and Dibbwi mining licences, which comprise the Muntanga, Dibbwi and Dibbwi East deposits, were acquired 100% by GoviEx in a share purchase agreement from Denison Mines Corporation, wholly owned subsidiary Rockgate Capital Corporation ("DML Africa") on June 13, 2016. The Chirundu mining licence, which contains the Njame (north and south) and Gwabi uranium deposits, as well as the Kariba Valley (Chisebuka) exploration licence, were acquired 100% from AFR on October 31, 2017.

The names of the uranium deposits on the Muntanga Project (formally the Mutanga Project) have various different spellings that have been used historically and GoviEx considers them to be interchangeable.

1.3 Geology and Mineralization

The Project area is situated within the Karoo Supergroup, which comprises thick terrestrial sedimentary strata deposited during the Carboniferous to late Triassic and is widespread across much of southern Africa. Sediments were deposited in an extensive foreland basin where rifting is thought to be associated with the breakup of Gondwanaland during the Permian Period, followed by opening of the proto-Indian Ocean in the Jurassic and finally development of the East African Rift system in late Cretaceous and early Tertiary. During the Cenozoic, the East African Rift System propagated across the continent and led to reactivation of the Karoo rift basins and formation of new fault depressions, such as the south-eastern extension of the mid-Zambezi and Luangwa rift systems.

The Karoo Supergroup consists of the three Formations within the Lower Karoo and four Formations within the Upper Karoo. There are at least six regional depositional sequences that broadly reflect synchronous episodes of basin subsidence and climate change. These vary considerably in detail from one sub-basin to another. Karoo strata typically overlie Precambrian crystalline basement rocks. Many of the Karoo rift basins contain sandstone-hosted uranium mineral deposits typically within the Upper Karoo.

At the Muntanga Project, all of the known uranium mineralization occurs within the Escarpment Grit, a 400 m-thick series of continental arenaceous silici-clastic sediments with interbedded mudstones and fine-grained sandstones as well as grits and conglomerates. The Escarpment Grit consists of two informal members thought to represent a change in fluvial style; a lower “Braided Facies” member is interpreted as braided stream deposits and the overlying “Meandering Facies” is much more extensive and thought to represent point-bar and flood plain deposits. The Escarpment Grit unconformably overlies the Madumabisa Mudstone that appears to have acted as an impermeable barrier controlling the base of the mineralization.

Mineralization appears to have been introduced after sedimentation, weathered from the surrounding Proterozoic gneisses and plutonic basement rocks, transported in solution and then precipitated in siltstones and sandstones. Mineralization appears to be later (younger) than at least some of the normal faults that cut the Escarpment Grit Formation. This is evident from the good correlation of the radiometric logging data between adjacent holes within the Muntanga mineral deposit separated by interpreted faulting.

Within the Muntanga uranium deposit, the Escarpment Grit Formation comprises at least 120 m of sandstone and conglomerates with occasional mudstones and silts. It overlies the Madumabisa Mudstone Formation, which comprises silty mudstone, with a dark red hematised layer 2-3 m below the contact representing either oxidising groundwater or a sub-aerial surface. Dibbwi East occurs predominantly within the Escarpment Grit Formation and specifically, the uraniferous mineralization is hosted by the relatively un-faulted “Meandering Facies”. Generally, uranium mineralization occurs in four different associations: (i) as disseminated mineralization where grades vary considerably; (ii) associated with mudstones and siltstones; (iii) fracture hosted uranium mineralization and (iv) mineralization associated with pyrite.

The geology at Gwabi and Njame consists entirely of Escarpment Grit, ranging from thick coarse conglomerate beds to thinly bedded or cross-bedded fine to medium grained sandstones. Thin bands of shale and mudstone are intercalated in the sequence. Below the Grits are well-developed calcareous shale and siltstone layers, possibly representing the upper part of the underlying Madumabisa Mudstone. Uranium mineralization occurs at the interface between siltstones and sandstones at redox boundaries.

1.4 Exploration Status

The earliest known exploration for uranium in the area covering the Gwabi and Njame deposits was conducted by AGIP in the late 1970s to the mid-1980s. AGIP completed a major regional programme of ground radiometric surveying which identified numerous radiometric anomalies in the area along the northern shores of Lake Kariba. A number of these anomalies were evaluated with more detailed ground radiometric surveying and a small number were subsequently tested with rotary percussion drilling, wagon drilling and in some cases with diamond drilling.

1.4.1 Muntanga, Dibbwi and Dibbwi East

Omega Corp commissioned a detailed aeromagnetic and radiometric survey over the area, that revealed the extensional structures as well as the radiometric signature of the host formation. The aeromagnetic data was further processed by Denison in 2011, whereby better resolution was obtained from 2nd order derivatives of the aeromagnetic data.

During August and September 2013, Geotech Ltd. carried out a helicopter-borne geophysical survey over the Muntanga Project. Principal geophysical sensors included a versatile time domain electromagnetic (VTEMplus) system, and horizontal magnetic gradiometer.

Geological mapping of the Muntanga property was undertaken during August and September 2014 by Remote Exploration Services (RES) of Cape Town, South Africa. A total of 324 line kilometres of mapping traverses were completed including 1,815 mapping stations. Field mapping data were integrated with airborne geophysical data, satellite imagery and previous geological maps and interpretations to produce a revised geological map for the Muntanga property.

The Muntanga Project area was covered with soil geochemical and radon surveys from 2013 to 2015. The objective of the surveys was to delineate any significant exploration targets outside of the drill defined uranium deposits. Previous drilling had largely focused on testing airborne radiometric anomalies and the soil geochemical and radon approach allowed for possible detection of blind or buried mineralization, particularly in areas of thick or transported regolith.

In 2013 the AlphaTrack method was used, following successful orientation work conducted in 2011. AlphaTrack cups are 1 litre plastic cups with a small piece of special plastic film taped to the inside. The cups are buried in an inverted position so that any radon gas percolating upward will be trapped in the cup.

In 2014 and 2015 the RadonX™ method was utilized, following successful orientation work in 2012. RadonX is based on the Radon-on-Activated-Charcoal (ROAC) technique initially developed by the SA Atomic Energy Board but refined and enhanced by RES. Unlike other radon emanometry methods that rely on alpha-particle detection, RadonX measures the gamma emission from radon's daughter products, bismuth (214Bi) and lead (214Pb), following adsorption of the radon onto activated charcoal.

The soil geochemical and radon surveys produced numerous anomalies across the Muntanga Project area and new exploration targets were defined for follow-up. The soil geochemical and radon methods utilized adequately detected the drill-defined mineralization and showed reasonable correlation with radiometric anomalies, thereby confirming this exploration approach. The new exploration targets were defined based on combinations of anomalous soil uranium, soil uranium pathfinders, radon and soil radioactivity. In some cases, the targets corresponded with surficial cover (thicker soils) alluding to a buried source.

Trenching was undertaken to test for additional mineralized horizons outside of the drill-defined uranium deposits. The trenching provided a cost-effective follow-up methodology, prior to any drilling, to test targets generated from the soil geochemistry and radon surveying. Trenches provided a means of accessing the fresh bedrock, or otherwise saprock, for the in-situ determination of geology and mineralization.

1.4.2 Gwabi and Njame

AFR undertook a major exploration programme in 2006 to 2007, which included:

- drilling at the Njame deposit which identified additional uranium mineralization to that defined by AGIP;
- an airborne radiometric survey which identified a significant uranium anomaly at Gwabi; this was tested with surface radiometric surveying and soil sampling; and
- subsequent drilling at Gwabi which outlined uranium mineralization.

1.4.3 GoviEx Exploration Works

In 2021, GoviEx drilled 12 vertical DTH holes to a depth of 120 m each over the trenches at Muntanga East (MTD 4,5 and 6), as they are along strike from the Dibbwi East deposit. Unfortunately, the results were disappointing, and no uranium was encountered at depth.

In 2022, Rocketmine from South Africa were contracted to carry out a photogrammetry and LIDAR survey using a drone platform. The areas selected for surveying covered each of the deposit areas at Dibbwi, Dibbwi East-Muntanga, Njame and Gwabi. The LIDAR data have been used in the current MRE to define the ground surface.

1.5 Mineral Resource Estimate

The Muntanga Project contains Measured and Indicated Mineral Resources of 42.6 million tonnes at an average grade of 359 ppm U_3O_8, containing 33.7 million pounds of U_3O_8, and an Inferred Mineral Resource of 15.0 million tonnes at an average grade of 330 ppm U_3O_8, containing 10.9 million pounds of U_3O_8 in five deposits (Muntanga, Dibbwi East, Dibbwi, Gwabi, and Njame), located over 65 km strike.

The current MRE update is the result of extensive infill drilling, including 5,980 m drilled in 2021 and a further 27,634 m of drilling in 2022 (total of 33,614 m in 262 holes). The drilling was focused predominately on the Dibbwi East deposit, to further delineate the deposit and convert Inferred resources to the Indicated category. The MRE update included a comprehensive reassessment of previous work and a revised correlation between down-hole radiometric probe data and chemical assays used to convert down-hole radiometric data into equivalent uranium grades (eU_3O_8) for mineral resource estimation.

The Mineral Resource statement for the Muntanga Project with an effective date of March 31, 2023, is presented in Table ES-1 and the location of the deposits is shown in Figure ES-1. No Mineral Reserve has yet been determined for this Project.

Table ES-1: Mineral Resource Statement* for the Muntanga Project, Zambia, with an Effective Date of March 31, 2023

Category	Deposit	Quantity	Grade	Metal
		Mt	U_3O_8 ppm	U_3O_8 Mlbs
Measured	Gwabi	1.1	254	0.6
	Njame	2.2	374	1.8
Indicated	Muntanga	7.5	360	5.9
	Dibbwi	3.1	255	1.8
	Dibbwi East	25.2	374	20.8
	Gwabi	2.7	374	2.2
	Njame	0.8	321	0.6
TOTAL M&I		**42.6**	**359**	**33.7**
Inferred	Muntanga	4.0	319	2.8
	Dibbwi	0.6	250	0.3
	Dibbwi East	9.1	344	6.9
	Gwabi	0.2	279	0.1
	Njame	1.1	326	0.8
TOTAL INFERRED		**15.0**	**330**	**10.9**

*Notes
1) The effective date of the mineral resource statement is March 31, 2023. The QP for the estimate is Cliff Revering, P.Eng., an employee of SRK (Canada).
2) Mineral resources are prepared in accordance with CIM Definition Standards (CIM, 2014) and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (CIM, 2019).
3) Mineral resources are reported at a cut-off grade of 100 ppm U_3O_8.
4) Mineral resources are constrained within an optimized pit shell using a uranium price of US$70/lb U_3O_8, mining costs of US$2.90/t, processing costs of US$8.00/t ore, additional ore mining costs of US$0.50/t ore, G&A costs of US$1.50/t ore, and a royalty of 5% on U_3O_8 price.
5) Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the mineral resources will be converted into mineral reserves in the future.
6) All figures have been rounded to reflect the relative accuracy of the estimate.

1.6 Environmental and Social Considerations

The Project will be regulated through the Ministry of Mines and Minerals Development (“MMMD”), the Zambia Environmental Management Agency (“ZEMA”) and the Radiation Protection Authority (“RPA”). The international principles and standards developed for the uranium industry through organisations such as the International Atomic Energy Agency (“IAEA”), the World Nuclear Transport Institute (“WNTI”) and World Nuclear Association (“WNA”) provide guidance principles to the development and management of the Project.

The Muntanga Project is a greenfield exploration site with no history of previous development or industrial activity. As a result, there are no obvious environmental liabilities.

GoviEx has established a permanent exploration camp immediately adjacent to the Muntanga deposit. Should the project not progress to an active operating mine, the camp will have to be closed and any uranium bearing sample material appropriately disposed.

GoviEx current hold a hazardous waste management licence required for the ongoing exploration works. Other licences and permits will be applied for following the completion of the ESIA and engineering update studies. The more significant of these will be the Environmental Permit following the update to the ESIA and RAP.

Risks associated with resettlement, permitting schedule, access to water and general water management are being addressed as part of the ongoing feasibility study and ESIA process.

1.7 Recommendations

The following recommendations are provided to advance the understanding of the geology, mineralization controls and mineral resources for the Muntanga Project;

- Continue development of litho-structural models for the Muntanga Project deposits, incorporating major fault interpretations within the vicinity of the deposits or proposed future project infrastructure;
- Continue infill drilling to support conversion of Inferred to Indicated resources within the Dibbwi East deposit;
- Additional assay sampling to support further refinement of the Ra-Grade correlation used to convert down-hole probe data into equivalent uranium grades;
- Continue to assess for radon contamination within future drilling programs and correct down-hole gamma signatures accordingly to mitigate the potential for over-estimation of grade due to radon; and
- Additional density analysis should be conducted on future drill programs to refine tonnage estimates.

The total estimated cost to carry out the proposed recommendations is USD1.39M.

Table ES-2: Estimated Costs for Recommended Work Program

Proposed Activities		**Costs (USD)**
Resource drilling	DTH Drilling	488,000
	DDH Drilling	276,000
Assays		100,000
Downhole Logging		250,000
Camp and support cost		275,000
Total		**1,389,000**

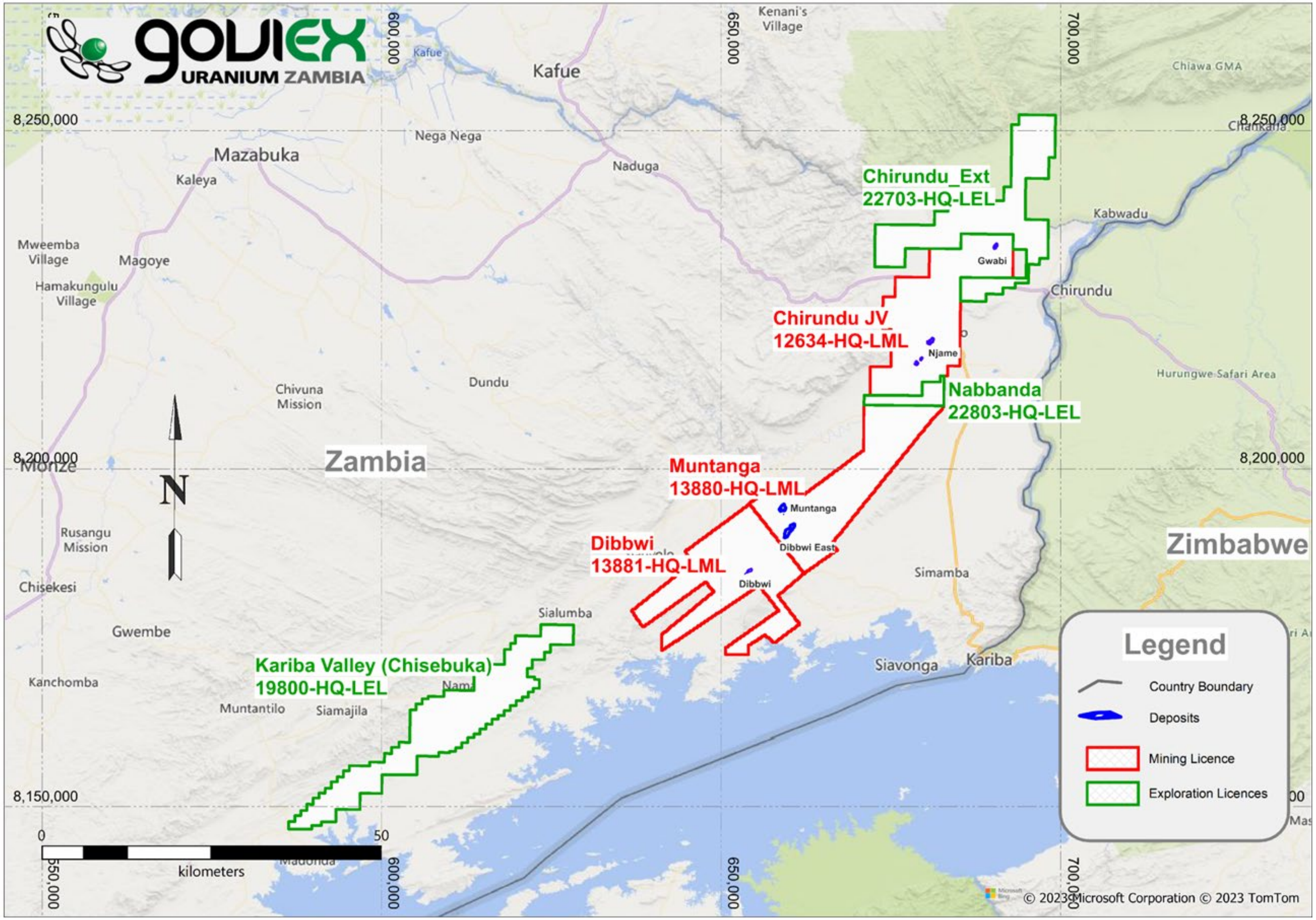

Figure ES-1: Location of Uranium Deposits in the GoviEx Muntanga Project

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2 INTRODUCTION

SRK Consulting (UK) Limited ("SRK") is an associate company of the international group holding company, SRK Consulting (Global) Limited (the "SRK Group"). SRK was requested by GoviEx Uranium Inc ("GoviEx"), hereinafter also referred to as the "Company" or the "Client", to prepare a Technical Report to support the disclosure of an updated Mineral Resource estimate for Muntanga Uranium Project ("Muntanga Project" or "the Project") in the Southern Province of the Republic of Zambia ("Zambia") near the town of Siavonga.

The names of the uranium deposits on the Muntanga Project (formally the Mutanga Project) have various different spellings that have been used historically and GoviEx considers them to be interchangeable.

The report is prepared in accordance with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 (2016) - Standards of Disclosure for Mineral Projects ("NI 43-101"), Companion Policy 43-101CP to NI 43-101, and Form 43-101F1 of NI 43-101.

SRK (including its directors and employees) does not have nor hold:

- any vested interests in any concessions held by GoviEx, or any adjacent concessions;
- any rights to subscribe to any interests in any of the concessions held by GoviEx either now or in the future; or
- any right to subscribe to any interests or concessions adjacent to those held by GoviEx either now or in the future.

SRK's only financial interest is the right to charge professional fees at normal commercial rates, plus normal overhead costs, for work carried out in connection with the investigations reported here. Payment of professional fees is not dependent either on project success or project financing.

The results of this Technical Report are not dependent upon any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings between GoviEx, SRK, and the authors.

This report includes technical information which requires subsequent calculations to derive subtotals, totals, and weighted averages. Such calculations inherently involve a degree of rounding and consequently can introduce a margin of error. Where these rounding errors occur, SRK does not consider them material.

The report has an effective date of August 31, 2023. Its conclusions and recommendations could alter over time depending on exploration results, commodity prices and other relevant market factors.

2.1 Qualifications of Consultants

This report has been prepared under the supervision of and by Dr Robert Bowell. The Mineral Resource estimation has been undertaken by Mr Cliff Revering. By virtue of their education, membership to a recognised professional association and relevant work experience, Dr Bowell and Mr Revering are Qualified Persons ("QPs") for this report as this term is defined by NI 43-101.

Robert J. Bowell, PhD, CChem, CGeol, FGS, EurGeol, FIMMM

Robert Bowell is a Principal Geochemist at SRK with 34 years of experience in applied geochemistry, data analysis and qualification, exploration, exploration management and mining project evaluation. He has had four years' direct experience with uranium exploration, geochemical analysis, mineralogy and evaluation of uranium deposits for project development. He is a registered professional geologist with the Geological Society of London and with the European Federation of Geologists. He is a Qualified Person for this report and in particular is responsible for Mineral Processing and Metallurgical Testing (Section 13). He is also responsible for Sections 1 – 6, and 15-22, and is the QP for the overall report.

Cliff Revering P.Eng.

Cliff Revering is a Principal Consultant at SRK, with over 28 years of experience in the mining industry related to exploration, mine operations and project evaluations. He specializes in mineral resource estimation, geological modelling, due diligence and project evaluation studies, production reconciliation, grade control, and exploration and production geology. Cliff has over 13 years' direct experience with uranium exploration, mine operations and project evaluations, and is a registered professional engineer with the Association of Professional Engineers and Geoscientists of Saskatchewan, Canada. He is a Qualified Person for this report and in particular is responsible for sections 7-12, 14, and 23-27.

2.2 Qualified Persons Site Visits

In accordance with NI 43-101 guidelines, the QPs have conducted personal inspections of the project site as detailed below.

Dr Bowell visited the Muntanga Project from May 8 to May 11, 2022. During the visit, he observed drilling, core and drill chip library, sample preparation, and data collection. He can confirm that the description of mineralization, exploration methods, storage and sample information.

Cliff Revering visited the Muntanga Project twice in 2022, from May 8 to May 11, and October 17 to October 20. During the site visits, he observed drilling and down-hole logging activities, core and drill chip logging and data collection, and assay sampling and chain of custody protocols. He can confirm that the description of the geology, mineralization and mineralization controls; and the drilling, logging, sampling and data collection techniques described are consistent with observations made in the field during these site visits.

2.3 Sources of Information

The work reported here has been accumulated by previous site owners within the last ten years. This has been subject to desk review by the QPs and deemed suitable for use for the purpose of this Technical Report.

The key sources of information reviewed and used for compilation of this report include CSA (2013), AFR, (2013), AFR (2008b) AFR (March 2008) and AFR (March 2009). A full list of documents reviewed is included in Section 27.

3 RELIANCE ON OTHER EXPERTS

The QPs for this technical report, Robert Bowell and Cliff Revering, have examined the historical and current data for the Muntanga Project provided by GoviEx with respect to resources, metallurgical test work, and other project information, and have relied upon that basic data to support the statements and opinions presented in this Technical Report. In the opinion of the authors, the project data is presented in sufficient detail to provide an accurate representation of the Muntanga Uranium Project.

It is the opinion of the QPs that there are no material gaps in the information for the Project. Sufficient information is available to prepare this report, and any statements in this report related to deficiency of information are directed at information, which in the opinion of the authors, should be sought as the project progresses. The QPs take responsibility for the content of this Technical Report; however, the QPs are not responsible for, nor have they undertaken any due diligence regarding the non-technical aspects of this report.

4 PROPERTY DESCRIPTION AND LOCATION

The Muntanga Project is located in the southeastern region of Zambia in the Siavonga and Chirundu Districts and is geographically centred at 16º22’03.31”S, 28º28’51.3”E. The northern extent of the Project, where the Gwabi and Njame deposits are situated, is located close to the town of Chirundu, near to the Zimbabwe border. The prospect areas extend south towards Siavonga and along the northern edge of Lake Kariba to Kariba Valley in the southernmost extent (Figure 4-1). The northernmost deposits of Njame and Gwabi are located approximately 100 km southeast of the Zambian capital, Lusaka. Chisebuka, further south, is approximately 180 km south of Lusaka.

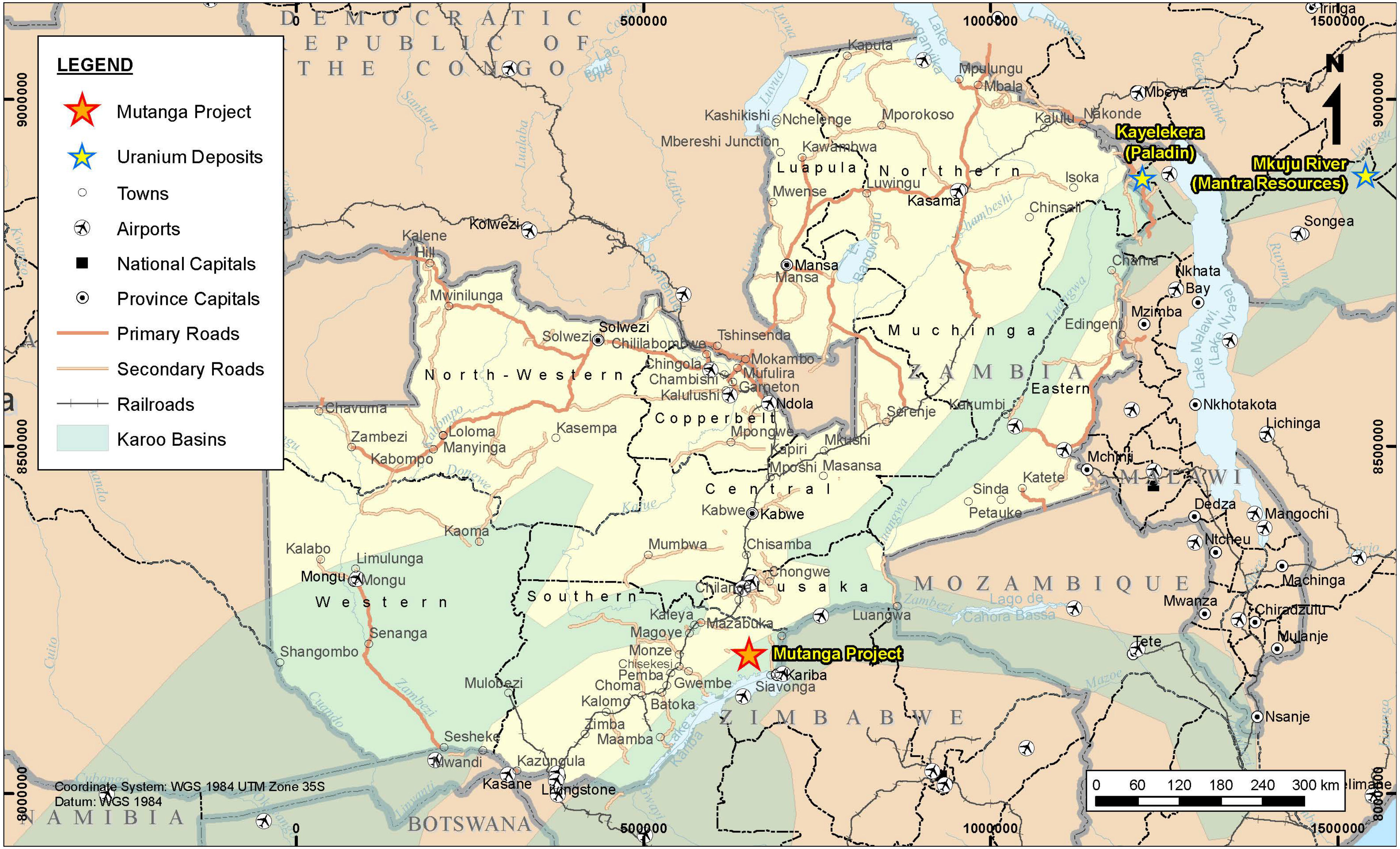


Figure 4-1: Project Location Map

4.1 Mineral Tenure

The Muntanga Project currently comprises three mining licences and three exploration licences (Table 4-1; Figure 4-2) with a total combined area of 1,225.9 km^2. The three mining licences – Muntanga, Dibbwi and Chirundu – encompass 720.5 km^2. The mineral resources reported in this Technical Report are contained within these licences.

The Muntanga and Dibbwi mining licences, which comprise the Muntanga, Dibbwi and Dibbwi East deposits, were acquired 100% by GoviEx in a share purchase agreement from Denison Mines Corporation, wholly owned subsidiary Rockgate Capital Corporation ("DML Africa") on June 13, 2016. The Chirundu mining licence, which contains the Njame (north and south) and Gwabi deposits, as well as the Kariba Valley (Chisebuka) exploration licence, were acquired 100% from African Energy Resources Ltd ("AFR"), on October 31, 2017.

The Nabbanda exploration licence was acquired by GoviEx on February 5, 2019, and renewal was approved in 2023. The Chirundu_Ext exploration licence (new GoviEx application) has been approved to be granted in 2023, and is still being processed by the cadastre department of the Ministry of Mines. The Kariba Valley exploration licence is pending renewal.

In 2008, the Zambian Government introduced the Mines and Minerals Development Act of 2008 to which all tenements are required to conform. In 2015, the Government repealed the 2008 Act and enacted the current Mines and Minerals Development Act of 2015, and according to the Act, which Exploration Licences can have a maximum size of 2,000 km^2 and licence corners must conform to a six arc-second graticular grid; each Company is allowed a total holding area of 10,000 km^2.

Table 4-1: Current Muntanga Project Mineral Tenements

Licence Name	Licence Number	Area (km^2)	Date First Granted	Date Expiry	Commodity Group	Current Status
Muntanga	13880-HQ-LML	234.3	26 March 2010	25 April 2035	Uranium, Coal, Sand, Clay, Gravel and Limestone	GRANTED
Dibbwi	13881-HQ-LML	238.2	26 March 2010	25 April 2035	Uranium, Coal, Sand, Clay, Gravel and Limestone	GRANTED
Chirundu	12634-HQ-LML	248.0	09 October 2009	08 October 2034	Uranium	GRANTED
Chirundu_Ext Nabbanda	22075-HQ-LEL 22803-HQ-LEL	230.0 24.4	5 Feb 2019	Renewal approved	Uranium, Coal Uranium, Coal, Sand, Clay, Gravel and Limestone	New Application, offered on 30th May 2023 Renewal granted on 30th May 2023
Kariba Valley	19800-HQ-LEL	251.0	23 Feb 2015	Renewal Submitted	Uranium	Submitted

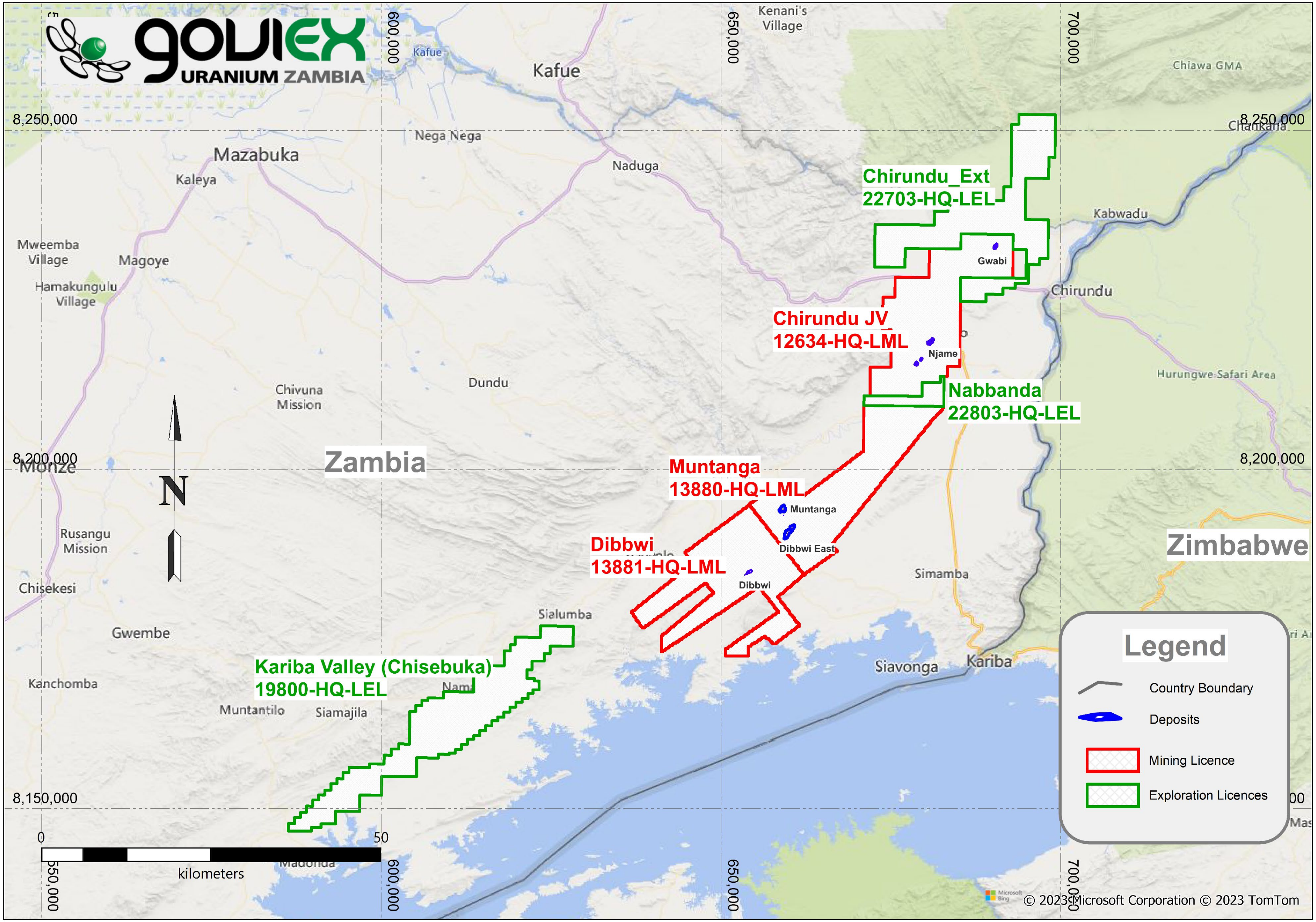


Figure 4-2: Muntanga Project Site and Licence Boundaries

4.2 Relevant Legislation, Permits and Approvals

The key legislation with regards to permitting a mining project in Zambia and the applicability and status with regards to the Project are detailed below:

4.2.1 The Mines and Minerals Development Act 2015

States that all mineral rights are vested in the President of Zambia on behalf of Zambia. This Act specifies how the rights to prospect, mine and dispose of minerals can be acquired and held. It confers on the holder exclusive rights to carry on mining and prospecting operations in the mining licence area. This includes erecting the equipment needed to mine, process and transport the minerals, disposal of mining wastes, stockpiling of minerals or waste products and prospecting within the licence area. It gives preference to Zambian products, contractors and services as well as employment of citizens from construction, operation through to decommissioning. Notable sections related to the Muntanga Project include:

- For the granting of an exploration licence, the following is considered; the applicant has the financial resources and technical ability to do the work; if the land is in a protected area, the applicant has written consent from the appropriate authority; and the exploration programme makes proper provision for environmental protection.
- An exploration licence is valid for four years and can be renewed for two further periods not exceeding three years each. The maximum period from initial grant of the licence shall not exceed ten years. At each renewal 50% of the exploration licence shall be relinquished. As such, it is understood that the Nabbanda exploration licence has one further renewal and expires in February 2029, the Chirundu_Ext exploration licence has two renewals remaining and will expire in 2033 and the Kariba Valley exploration licence is awaiting final renewal with the licence expiring in 2025/6.
- Exploration operations can only begin once the holder submits to the Mining Cadastre Office a decision letter in respect of the environmental project brief approved by the Zambia Environmental Management Agency (ZEMA).
- The holder of an exploration licence can apply, no later than six months before the exploration licence expiry, for a mining licence. A mining licence is required for Large-Scale Mining with the following requirements: the applicant has a mine plan, an environmental plan, a financial plan; a decision letter in respect of the environmental project brief or environmental impact assessment approved by ZEMA; a local business development plan and a proposal for the employment and training of citizens of Zambia; and the feasibility study is bankable.
- The environmental plan details the proposals for the prevention of pollution, the treatment of wastes and the rehabilitation of land and water resources. Conditions can be included in the mining right or imposed separately by means of written notice to ensure: the protection or conservation of the environment; the rehabilitation of land; the filling in or sealing of excavations, shafts and tunnels; and payment of a cash deposit into an Environmental Protection Fund (EPF) administered by the Environmental Protection Fund Committee appointed by the Minister.
- A Large-Scale Mining licences is granted for 25 years and the holder must maintain security and ensure no illegal miners in the licence area, provide annual audited financial statement to the Mining Cadastre Office, a return showing compliance with obligations,

annual mine plans, ore recovery and production costs and every two years ore resource and reserve statements.

- A mineral processing licence is required for mineral processing activities. However, the holder of a mining licence may construct and operate a mineral processing plant within their licence area without a mineral processing licence.
- For export of minerals, a mineral export permit issued by the Director of Mines is required. This is valid for one year and is limited to the quantities specified in the permit. For radioactive minerals, the applicant must comply with the requirements of the Ionising Radiation Protection Act 2005. GoviEx will comply with the requirements of the Act and apply for an export permit for the uranium product as the project progresses.
- Storage, transport, or mining of radioactive minerals must also be done in accordance with the provisions of the Ionising Radiation Protection Act 2005. This requires a licence issued by the Radiation Protection Authority. which GoviEx will apply for as the project progresses.
- In terms of surface rights, the holder of a mining licence shall not mine at a dedicated place of burial, land containing monuments defined in the National Heritage Conservation Commission Act, land within 90m of any building or dam owned by the State without written consent from the appropriate authority. In addition, the licence holder requires written consent of the owner or legal occupier of land within 180m of an inhabited, occupied or temporarily uninhabited house, within 45m of land used to farm crops, within 90m of any cattle dip tank, dam or private water as defined by the Water Resources Management Act 2011, upon land occupied by a village or other land under customary tenure without written consent of the chief or any land in a protected area without complying with the Zambia Wildlife Act 2015. The holder of the mining right who requires the exclusive use of the exploration or mining area may acquire a lease of the land or other right to use the land by agreeing terms with the landowner or occupier. GoviEx presently has no surface rights over the project area. GoviEx intends to secure the required surface rights as part of the resettlement planning and permitting process that will accompany the FS and ESIA. The process of obtaining surface rights in Zambia requires applicants to apply to the Ministry of Lands and in the case of traditional land, GoviEx will obtain approval and recommendation from the traditional leaders and Local Councils of Siavonga and Chirundu.

4.2.2 Water Resources Management Act 2011 (WRMA)

Establishes the Water Resources Management Authority and defines its function and powers. The Act provides for protection of Zambia's water resources and that the said resources should be used, developed, conserved, managed and controlled sustainably, beneficially, reasonably and equitably for the needs of the present and future generations. It also provides for management, development and utilisation of water resources to take into account climate change adaptation.

4.2.3 Ionising Radiation Protection Act 2005

An Act to establish the Radiation Protection Authority functions and powers, provide for the protection of the public, workers and the environment from hazards related to ionising radiation or release of radioactive material.

4.2.4 Zambia Wildlife Act 2015.

This Act makes provision for the management and conservation of wildlife in Zambia. It provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on Wetlands of International Importance especially as Waterfowl Habitat, the Convention on Biological Diversity, the Lusaka Agreement on Cooperative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora and other international instruments to which Zambia is party. It is implemented by the Zambia Wildlife Regulations 2016 and Zambia Wildlife Order 2016. As the Chirundu_Ext exploration licence is within the Chiawa Game Management Area, Part IV is of specific relevance as it relates to mining rights within Game Management Areas. Mining can occur in this area as long as prior written notice is given to the Director of National Parks and Wildlife and subject to compliance with any conditions the Minister may impose. These may relate to measures specified under an EIA approved by ZEMA.

4.2.5 Environmental Management Act 2011 (EMA)

The principal legislation governing environmental management in Zambia. ZEMA is mandated to ensure the sustainable management of natural resources and protection of the environment, and the prevention and control of pollution. The Act also provides for public participation in environmental decision-making and access to environmental information. In particular, section 29 of the Act states that “A person shall not undertake any project that may have an effect on the environment without the written approval of the Agency, and except in accordance with any conditions imposed in that approval”. The Act provides specific regulations for Pollution Control, Water, Air, Waste Management, Pesticides and Toxic Substances, Noise, Ionizing Radiation and Natural Resources Management.

GoviEx currently holds a licence for the management of hazardous waste, details of which are included in Table 4-2.

Table 4-2: Summary of GoviEx ZEMA Licences

Permit	Date Awarded	Duration	Expiry Date
Hazardous waste licence	9 August 2022	3 years	8 August 2025

Prior to commencing mining operations other licences granted by ZEMA that will need to be applied for include, but are not limited to air pollution monitoring permits, water effluent and discharge licences, waste management licence.

A summary of the relevant regulations and their subsidiary Statutory Instruments (SI) are shown in Table 4-3.

Table 4-3: Zambian Regulations (Source MDM, 2009)

Institution of Legislation	Act	Regulations
Mining	**The Mines and Minerals Development Act (Act No. 11 of 2015)**	The Mines and Minerals (Environmental) Regulations (SI No. 29 of 1997); The Mines and Minerals Development (Prospecting, Mining and Milling of Uranium Ores and Other Radioactive Mineral Ores) Regulations, 2008 (SI No. 7 of 2008); Mines and Minerals (Environmental Protection Fund) Regulations (SI No. 102 of 1998);
Environment	**The Environmental Management Act No 12 of 2011**	The Environmental Protection and Pollution Control (Environmental Impact Assessment) Regulations (SI No. 28 of 1997); Waste Management (Licensing of Transporters of Wastes and Waste Disposal Sites) Regulations (SI No.71 of 1993); Hazardous Waste Management Regulations (SI No. 125 of 2001); Water Pollution Control (Effluent & Waste Water) Regulations (SI No. 72 of 1993); Pesticides and Toxic Substances Regulations (SI No. 20 of 1994); Air Pollution Control (Licensing and Emission Standards) Regulations (SI No. 141 of 1996)
Ionising Radiation	**The Ionizing Radiation Protection Act, 2005 (SI No. 16 of 2005)**	
Energy	**The Energy Regulation Act, No 12 of 2019;** **The Electricity Act, No 11 of 2019** **The Petroleum Exploration and Production Act, No 10 of 2008**	
Wildlife and National Heritage	**The National Heritage Conservation Commission Act, 1989 (SI No 23 of 1989);** **The National Parks and Wildlife Act, 1991 (SI No. 10 of 1991);** **The Zambia Wildlife Act 2015(SI No. of 1998);** **The Pneumoconiosis Act (SI No. 124 of 1965 and amendments);** **The Forests Act No 4 of 2015**	
Health	**The Pneumoconiosis Act (SI No. 124 of 1965 and amendments);** **Public Health Act CAP 295**	
Employment	**The Employment Code Act No 3 of 2019;**	
Road Transport	**Roads and Road Traffic Act (Act No. 11 of 2002 and all amendments)**	
Taxes	**The Zambia Revenue Authority Act (SI No. 28 of 1993 and all amendments);** **Customs and Excise Act No 45 of 2021; and all amendments and subsidiary legislation);** **Value Added Tax Act (SI No. 4 of 1995 and all amendments)**	

4.2.6 International Agreements

The Republic of Zambia is a member of 44 international organisations, one of which is the International Atomic Energy Agency (IAEA). Some of the commitments made through these organisations are:

- The Rio Convention on Biological Diversity;
- The official Convention on Climate Change signed in Rio;
- The Climate Change Kyoto Protocol;
- International Convention on Desertification;
- The Ramsar Convention related to the Wetlands of International Importance and particularly recognized as habitats for wilderness;
- The International Convention for the Protection of Fauna and Flora in Africa;
- The Convention on Endangered Species;

- International Convention on the Protection of the Ozone Layer;
- The International Convention on Hazardous Wastes;
- The Law of the Sea; and
- The United Nations Framework Convention on Climate Change

4.3 Royalties and Agreements

The licences are wholly owned (100%) by GoviEx uranium Inc through its local subsidiaries GoviEx Uranium Zambia Ltd and Chirundu JV Ltd. There are no agreements or encumbrances on the permits currently held by GoviEx or its subsidiaries.

4.4 Environmental Liabilities

The Muntanga Project is a greenfield exploration site with no history of previous development or industrial activity. As a result, there are no obvious environmental liabilities.

GoviEx has established a permanent exploration camp immediately adjacent to the Muntanga deposit. Should the project not progress to an active operating mine, the camp will have to be closed and any uranium bearing sample material appropriately disposed. It is probable the camp infrastructure could be used by local communities. The main challenge will be the limited availability of ground water on the ridge where the camp is located.

4.5 QP Comment

The QP does not know of any significant factors or risks affecting access, title or the right or ability to perform work on the property.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Topography, Elevation and Vegetation

The Muntanga Project area is located within the Zambezi Rift System in southern Zambia. The Zambezi River flows to the east of the area, following the border between Zambia, Zimbabwe and Mozambique.

Surface runoff is predominantly contour controlled but occasionally fault controlled. Lake Kariba is situated at 485 m above mean sea level and the Project region varies between 500 m and 960 m above sea level.

Vegetation typically consists of forest, which is predominantly Miombo mixed with Munga and Mopane; there are also small areas of agricultural fields and degraded grassland. The dominant vegetation is as follows:

- Commiphora – Kirkia thicket on lower Karoo sands. Frequently occurs as lake basin chipya, semi-evergreen thicket or termite moulds.
- Colophospermum mopane woodland on heavy clay soils. Dominant vegetation type that is frequently pure or almost pure in mopane woodlands, mopane munga and mopane miombo. Also occurs on munga and mopane termitaria in deciduous thicket.
- Southern Isoberlinia – Brachystegia woodland on escarpment soils. Highly favoured for fuelwood production, especially charcoal.
- Acacia woodland on clay soils. Vegetation that favours dry areas; it is important for soil improvement, livestock and game, gum exudation, timber and traditional medicine.

The wild bushland experiences only minor disturbance including dry season fires, human cutting for building materials or fuel and human clearing for agriculture, grazing or settlements.

The north section of the Chirundu_Ext exploration licence is within the Chiawa5.4 Game Management Area. This area is known for its grassy plains, mature woodlands and numerous rivers, including the Zambezi. The Chiawa Game Management Area also contains species of conservation importance, including the Endangered Elephant and East Africa Wild Dog, as well as cheetah, leopard, lion and hippopotamus.

5.2 Access to Property

There are four local chiefs within the Project area, namely Chiefs Sinadambwe, Sikoongo, Simamba and Munyumbwe. Proximity to Chirundu and Siavonga means that the area is relatively well serviced with sealed roads and numerous gravel tracks, which lead to farms and villages.

Access to the Project is by the sealed main road running between Chirundu and Lusaka and the sealed road to Siavonga, then turning onto the sealed road leading to Munyumbwe, in Gwembe District. The main roads are in a fairly good condition, but the actual Project area is located east of the main roads and accessed via poorly maintained gravel roads that require a four-wheel drive vehicle (“4WD”). The nearest commercial airport is in Lusaka, located 144 km by road from Chirundu.

5.3 Climate

The Muntanga Project has a climate described as tropical wet and dry, with very distinct wet and dry seasons. Meteorological information is obtained from the nearest station at Lusitu, approximately 40 km north-east of Muntanga with a similar elevation and climate. The meteorological station operated from 1995 to 2005 and since 2005 weather data has been measured at site, but is not considered to be sufficiently reliable.

Annual rainfall is recorded as between 600 and 720 mm and the wet season occurs in the hottest summer months between November and March. Highest rainfall generally occurs in January/February. Maximum temperatures range from 22°C to 46°C and minimum temperatures range from 20°C to 38°C during the hottest months; highest temperatures typically occur just prior to the onset of the rains in October. Wind speeds are greatest during this period and can range from approximately 2.5 ms^{-1} to approximately 3.6 ms^{-1}, typically from an east-southeast direction. Lightning storms can be common during the hottest months and occasionally hailstones are experienced, associated with thunderstorms. During the wettest months of October to February, average daily sunshine hours can range from only 4.6 hours (February) to 8.8 hours (October).

During the cooler months of April to October, rainfall varies significantly spatially and temporally. Maximum temperatures range from 23°C to 40°C and minimum temperatures range from 6°C to 28°C, with lowest temperatures occurring in June and July. Winds are typically much calmer during the colder, dry months, particularly between April and August. On average, at least nine hours of daily sunshine is generally received during the drier months of May to September.

The highest maximum temperature recorded at the Project site was 46°C and the lowest minimum temperature that has been recorded is 6°C. Evaporation typically exceeds precipitation for most of the year. Monthly relative humidity generally ranges from a minimum of 46% in September to a maximum of 79% in December.

Weather data taken from Lusaka airport and corrected for the altitude difference at the Project site indicates that the mean station level barometric pressure for Muntanga is 951 hPa.

5.4 Local Resources

There are many small villages located around the Project area and approximately 10% of land is used for small-scale agriculture including millet and maize, sorghum, bananas, cotton and minimal animal husbandry. There are currently no industrial activities within the Project area.

According to the United States Department of Agriculture (“USDA”), the regional land classification indicates medium to low potential for sustainable development based upon extremely weathered and iron rich soils. The soils are typically nutrient deficient and not good at retaining water although they are easily worked.

5.5 Infrastructure

With the exception of the main road systems described in Section 5.2, there is limited to no infrastructure within the immediate Project area.

5.5.0 Roads

As described in Section 5.2, there are some sealed roads in the area which run between Lusaka, Chirundu, Siavonga and the bottom road to Munyumbwe in Gwembe District. Although they are in fairly good condition, access to the actual Project site is still via poorly maintained gravel tracks which require 4WD access. Local communities rely on bicycles or carts for transport.

5.5.1 Power Supply

There is currently an 88 kV substation at Chirundu which is supplied via 330 kV high voltage transmission lines from the Kariba North Bank Hydroelectricity Scheme. Power lines do transverse the Project area around Njame, although most of the local villages are not connected to the national power network and households near Muntanga and Dibbwi rely on wood for heating and cooking plus candles and kerosene lamps for lighting.

5.5.2 Local Villages and Towns

The region is sparsely populated; Chirundu, Siavonga, Kafue and Lusaka are the closest major urban areas. Lusaka has a population of 3.2 million (2023). Siavonga and Chirundu are small towns with local government and town council administration offices. The two towns have banking facilities, a post office, district hospitals and general stores. There are no defined commercial areas within the immediate vicinity of the Project and grocery stores are typically located along the sealed roads to Chirundu and Siavonga. The rural areas are administered by four Chiefdoms, which include Chief Simamba, Chief Sikoongo, Chief Munyumbwe and Chief Sinadambwe. Much of the housing in the villages is typically wooden structures covered with mud. Communities are predominantly rural, mostly seasonal peasant farmers producing maize, cotton, millet, sorghum and vegetables; the majority of crops grown are for household consumption. Charcoal is also produced for sale and used as a main fuel source alongside wood, for heating and cooking.

Water Supply and Sanitation

The Project area relies on wells and boreholes for potable water and the Kafue River is used as a source of irrigation; sanitation is crudely managed by way of pit latrines in some households. The Southern Water and Sewerage Company (“SWSCO”) has a treatment plant located on the Zambezi River that supplies piped water to Siavonga, but this does not reach to the Project site. GoviEx has provided thirteen water boreholes to local villages.

Education and Health Care Facilities

There are very few schools and health facilities in the Project area and typically they have insufficient staff and resources. The main challenges faced are long distances, poor staffing levels, inadequate funding and transport. The development of local health and school facilities through sustainable development projects carried out by the Project will benefit the local communities. To date GoviEx has provided clinics for the villages of Muntanga, Sikoongo, Syamwiinga and Chizilika, and Nurses’ houses at Muntanga Chizilika and Syamwiinga. A small school has been constructed at Muntanga, as well as providing classrooms for the schools at Hachibozu and Chizilika and Njaame villages. At Chaanga, two Laboratory classrooms were constructed leading to the upgrading of the school from Primary to the Secondary level. Staff houses for teachers have been constructed by GoviEx at Haachibozu, Chizilika and Muntanga.

In addition, GoviEx is supporting two educational support programs, namely.

- The Back to School Project is an adult education initiative run in partnership with the District Education Board Secretaries (DEBS) for the Siavonga and Chirundu Districts. It will focus on providing educational opportunities for adults who may not have had previous access to formal education, and.
- The Trainee Program which funds the tuition, boarding and upkeep of an initial six students from three communities in the areas around the Muntanga Project. The students started courses in Mechanics, Power Electrical and Plumbing at the Lusaka Vocational Training College this May. This is in addition to two Community Health Assistants students that GoviEx is currently sponsoring at Mwachisompola College of Health Sciences in Chibombo.

Telecommunications

Telecommunications are provided to the Muntanga area by Airtel, MTN and Zamtel Airtel and MTN provide 4G services for internet connectivity.

5.6 Physiography

The topography is defined by the geology and consists of gentle, low escarpment type hills with steep and/or craggy scarp northwest slopes and gently sloping southeast dip slopes.

6 HISTORY

6.1 Introduction

Uranium was first identified in the area in 1957 by ground survey which located five anomalous areas in the vicinity of Bungua Hill, west of Siavonga. In 1958 and 1959 Chartered Exploration found low grade uranium mineralization that could be followed for over 800 m of strike extent.

The main exploration took place between late 1970s and mid 1980s initially by the Geological Survey of Zambia (“GSZ”), followed by AGIP SpA (“AGIP”), an Italian petroleum company. The AGIP exploration campaign included a regional ground radiometric surveying programme which highlighted numerous radiometric anomalies along the northern shores of Lake Kariba including Dibbwi and Chisebuka. Several of the anomalies were investigated via more detailed ground radiometric surveying and subsequent drilling. Their campaign predominantly focused on the Muntanga and Dibbwi deposits; and in 1983/4 a small uneconomic resource was outlined at Njame but AGIP ceased work in 1985.

6.2 Property Ownership and Exploration Activity: Dibbwi East, Dibbwi, Muntanga

Known prior ownership and work undertaken in the Muntanga area are summarised below:

- Owner unknown – 1957: ground survey located five anomalous areas in the vicinity of Bungua Hill, west of Siavonga.
- Chartered Exploration – 1958 and 1959: found low-grade uranium mineralization that could be followed for over 800 m of strike extent.

- Chartered Exploration – 1974: confirmation of this uranium mineralization was further defined in two campaigns after regional airborne magnetic and radiometric surveys had been flown over the area by Geometrics.
- Zambian Geological Survey (GSZ) – 1973 to 1977: ground investigation.
- Italian oil company AGIP S.p.A. (AGIP) – 1974 to 1984: Exploration ground campaign, included investigation of the Muntanga and Dibbwi uranium deposits.
- Period of inactivity – 1984 to 2004.
- Okorusu Fluorspar Pty Ltd – 2004 to 2006: exploration unknown.
- OmegaCorp Minerals Limited acquired Okorusu Fluorspar exploration licence – 2006: 11 holes (649 m) at the Muntanga mineral deposit to confirm the uranium deposit identified by AGIP.
- Denison acquired OmegaCorp Limited in August 2007. Denison is a publicly owned, uranium exploration and development company listed on the Toronto (Canada) and NYSE MKT. OmegaCorp became a wholly owned subsidiary of Denison.
- The prospecting licence was converted to two mining licences in 2010 that were held by Denison's wholly owned subsidiary Denison Mines Zambia Limited.
- GoviEx acquired Denison Mines Zambia Limited in June 2016.

6.2.1 Historical Mineral Resource Estimates

Numerous historical mineral resource estimates have been prepared by a variety of companies and consultants using several different methodologies. Taking into account the successive exploration drilling completed at the project, all estimates in general compare favourably and demonstrate similar U_3O_8 grades and tonnages.

A summary of the historical mineral resource estimates is provided in Table 6-1 from 1970s through to 2012. Table 6-2 provides a summary of the most recent historical resources as at September 12, 2013. SRK does not consider the historical estimates to be relevant or reliable, as additional drilling and data analysis have been completed as part of the 2021 and 2022 work campaigns. The QP has not completed sufficient work to classify the historical estimates as current mineral resources and as such GoviEx is not treating these estimates as current.

Table 6-1: Historical Muntanga Mineral Resource Estimates

Company Name / Year of Resource Estimate	Category	Cut-Off	Tonnes	Grade	U_3O_8
		(ppm U_3O_8)	(Mt)	(ppm U_3O_8)	(Mlbs)
AGIP (1970s)	Unclassified*	700	2.40	1,000	5.30
AGIP (1970s)	Unclassified*	600	3.20	870	6.10
AGIP (1970s)	Unclassified*	500	4.30	740	7.00
AGIP (1970s)	Unclassified*	400	4.90	600	6.50
AGIP (1970s)	Unclassified*	300	7.80	530	9.10
AGIP (1970s)	Unclassified*	200	9.70	480	10.30
CRM Apr 2005 (Muntanga)	Unclassified*	200	7.00	400	6.20
CRM Apr 2005	Unclassified*	200	0.90	400	0.80
CRM Nov 2005 (Muntanga)		200	**6.50**	**375**	**5.40**
Muntanga East	Unclassified*	200	0.30	400	0.29
Muntanga West	Unclassified*	200	0.65	350	0.53
Dibbwi	Unclassified*	200	5.00	430	4.70
	Total		**12.45**	**396**	**10.92**
CSA (June 2006)					
Muntanga	Inferred**	200	7.00	400	6.20
Dibbwi	Inferred**	200	8.20	370	6.60
	Total		**16.40**	**380**	**13.70**
Denison-RPA (March 2012)					
Dibbwi East	Inferred	100	39.8	322	28.27

** Reported internally only, unclassified under CIM*

*** Reported to JORC (2004)*

Table 6-2: CSA 2013 Summary Resources (Source: CSA, 2013)

CIM Compliant Mineral Resource Inventory – Muntanga Uranium Project (as at September 12, 2013)										
Deposit	U_3O_8 lower cut-off	Measured			Indicated			Inferred		
		Tonnes (Mt)	U_3O_8 (ppm)	U_3O_8 (Mlbs)	Tonnes (Mt)	U_3O_8 (ppm)	U_3O_8 (Mlbs)	Tonnes (Mt)	U_3O_8 (ppm)	U_3O_8 (Mlbs)
Muntanga	100	1.88	481	2.0	8.40	314	5.8	7.20	206	3.3
Muntanga Extensions	200	-	-	-	-	-	-	0.50	340	0.4
Muntanga East	200	-	-	-	-	-	-	0.20	320	0.1
Muntanga West	200	-	-	-	-	-	-	0.50	340	0.4
Dibbwi	100	-	-	-	-	-	-	17.00	234	9.0
Dibbwi East	100	-	-	-	-	-	-	39.80	322	28.2
Total		**1.88**	**481**	**2.0**	**8.40**	**314**	**5.8**	**65.20**	**287**	**41.4**

6.3 Property Ownership and Exploration Activity: Gwabi and Njame

The earliest known exploration for uranium occurred in the late 1970s to the mid-1980s as part of the AGIP campaign. AGIP ceased its work in Zambia in 1985, and no further work for uranium was undertaken in this area until AFR commenced work in 2005.

In October 2005, Albidon Exploration Limited signed a joint venture agreement with AFR for them to explore the eastern part of the Mugoto PLLS250 tenament that had been previously acquired by Albidon as part of their Munali nickel project tenement holding. The area under exploration by AFR was named the Chirundu Uranium JV and covered the Gwabi and Njame deposits.

In 2006 and 2007 AFR carried out a major exploration programme at their Chirundu site and a pre-feasibility study (PFS) to evaluate the commercial viability of mining and processing uranium ores at Njame and Gwabi was undertaken in 2007 to 2008. Drilling at the Njame deposit led to delineation of an Inferred Resource that was larger than the one initially identified by AGIP, and an airborne radiometric survey conducted at Gwabi revealed a significant uranium anomaly that was subsequently investigated by surface radiometric surveying and soil sampling and outlined as an Inferred Resource. In March 2008 AFR's equity was increased to 70% when the PFS reported an Indicated Resource, and this was subsequently increased to a 100% interest in the Chirundu and Kariba Valley Projects in March 2011.

In October 2017 GoviEx acquired the Chirundu and Kariba Valley Projects from AFR.

6.3.1 Historical Mineral Resource Estimates

A mineral resource estimate for the Njame and Gwabi deposits and the Chirundu Project as a whole (now part of the Muntanga Project) was conducted in 2009 (Table 6-3). GoviEx is not treating the estimate as current because additional work has been undertaken as detailed in Section 14.6.

Table 6-3: Historical Mineral Resource Estimate, AFR Projects (Source: AFR, 2009)

Deposit	Resources							
	Measured		Indicated		Inferred		Contained U_3O_8	
	Tonnes (Mt)	Grade (ppm U_3O_8)	Tonnes (Mt)	Grade (ppm U_3O_8)	Tonnes (Mt)	Grade (ppm U_3O_8)	Tonnes	Mlb
Njame North	2.7	350	2.2	252	1.5	223	1,815	4.0
Njame East	-	-	0.6	291	0.5	233	305	0.7
Njame Central	-	-	0.9	222	0.2	219	240	0.5
Njame South	-	-	-	-	4.4	237	1,040	2.3
NJAME TOTAL	**2.7**	**350**	**3.7**	**252**	**6.6**	**233**	**3,400**	**7.5**
GWABI TOTAL	**1.3**	**237**	**3.6**	**313**	**0.8**	**178**	**1,575**	**3.5**
CHIRUNDU PROJECT TOTAL	**4.0**	**313**	**7.3**	**282**	**7.4**	**227**	**4,975**	**11.0**

Note: All reported using a 100 ppm U_3O_8 cut-off grade envelope with appropriate rounding applied

AFR JORC accredited resource statement as of 18th November 2009 (AFR, 2009)

6.3.2 Kariba Valley (Chisebuka)

Radiometric anomalies were previously identified in the Kariba Valley area by AGIP, but very limited follow-up exploration was undertaken.

AFR and Albidon Exploration established a second joint venture, the Kariba Valley JV which contained the Chisebuka and Namakande prospects. AFR had an initial 30% equitable interest which was later increased to 100% holding. Their investigations included ground radiometric surveys, geochemical assessments of soil and rock-chip plus RC percussion drilling which revealed significant uranium mineralization at Chisebuka and Namakande.

6.4 Production History

There has been no uranium production from any of the Muntanga Project licence areas.

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The Project area is situated within the Karoo Supergroup, which comprises thick, Carboniferous to late Triassic age, terrestrial sedimentary strata and is widespread across much of what is now southern Africa. The Karoo Supergroup was deposited within an extensive foreland basin created when compression and accretion along the southern margin of Gondwana resulted in formation of the Cape Fold Belt to the south. To the north, crustal extension due to thermal doming following the assembly of the Pangean supercontinent around 320 Ma, resulted in formation of a northeasterly trending series of rift basins (Yeo, 2010). The rifting is believed to have been associated with the breakup of Gondwanaland during the Permian Period, followed by opening of the proto-Indian Ocean in the Jurassic; with a final episode related to the development of the East African Rift system in late Cretaceous and early Tertiary times.

During the Cenozoic, the East African Rift System propagated south-westerly across the continent and led to reactivation of the Karoo rift basins as well as formation of new fault depressions, such as the Okavango Rift (Laletsang et al., 2007; Kinabo et al., 2007), the southeastern extension of the mid-Zambezi and Luangwa rift systems.

The Karoo Supergroup in the Project area consists of three formations within the Lower Karoo; the Siankondobo Sandstone Formation, overlain by the Gwembe Coal Formation, which itself is overlain by the Madumabisa Mudstone Formation (Figure 7-1). The Siankondobo Sandstone Formation consists of fine clastic sediments with a basal diamictite and conglomerate overlain by siltstones and sandstones. The Gwembe Coal Formation is comprised of carbonaceous mudstones and siltstones interspersed with coal seams and sandstones, while the Madumabisa Mudstone Formation consists of a thick sequence of non-carbonaceous grey mudstones with calcareous bands. The Madumabisa Formation is unconformably overlain by the Upper Karoo which consists of four formations; the Escarpment Grit overlain by the Interbedded Sandstone and Mudstone Formation, followed by Red Sandstone which is finally capped by the Jurassic Bakota Basalt Formation (Figure 7-1). The Escarpment Grit comprises a 400 m thick series of continental arenaceous silici-clastic sediments with interbedded mudstones. Although locally referred to as Escarpment Grits, this group is a correlative of the Beaufort Group elsewhere in the Karoo Supergroup and contains interbedded mudstones and fine-grained sandstones, as well as grits and conglomerates.

The Project is situated in the mid-Zambezi Rift Valley. In the region, known uranium mineralization typically occurs within the Upper Karoo whereas the Lower Karoo hosts much of the coal reserves of Zambia, Zimbabwe and South Africa. At the Muntanga Project all of the known uranium mineralization occurs within the Escarpment Grit. Similar sandstone-hosted uranium mineral deposits occur in many of the Karoo rift basins including Letlhakane in the Kalahari Basin of Botswana and Kayelekera in the Rukuru Basin of Malawi (Figure 4-1). The underlying Madumabisa Mudstone appears to have acted as an impermeable barrier controlling the base of the mineralization. The Escarpment Grit itself shows a wide variation in lithology which is typical of continental sediments. Uranium mineralization appears to have been introduced after sedimentation (epigenetic), and occurs as fillings into pore spaces, fractures, joints, coatings on sand grains and occasionally along steeply dipping cross beds.

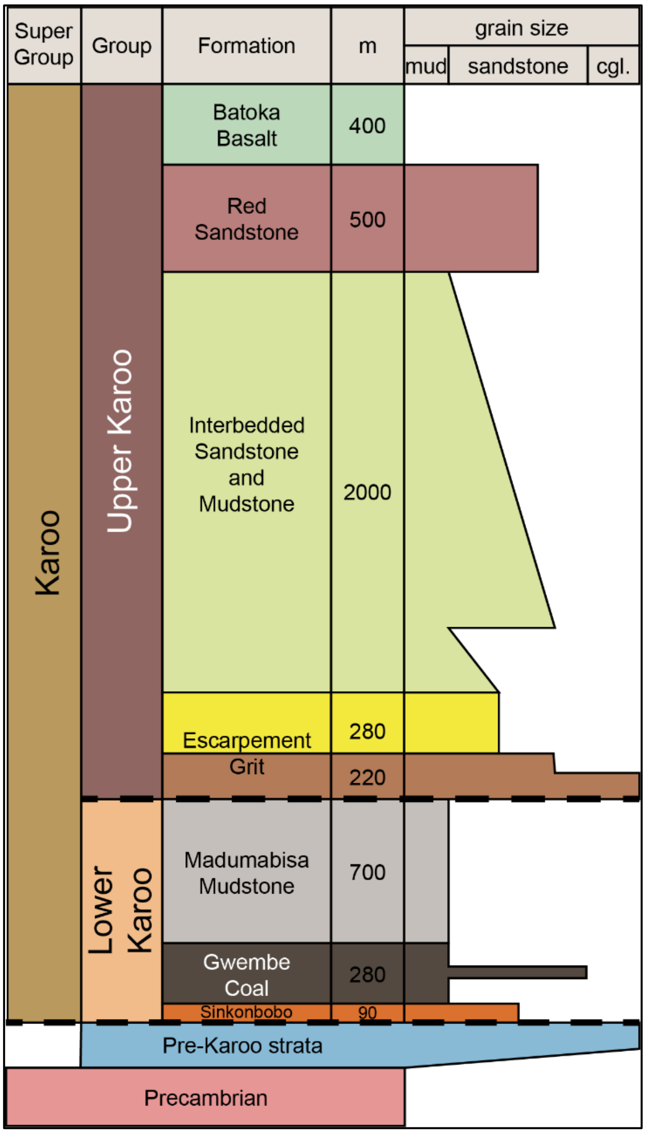


Figure 7-1: **Karoo Supergroup Stratigraphy in Southern Zambia (Source: Nyambe and Utting, 1997 within CSA, 2013)**

7.1.1 Madumabisa Mudstone

The Madumabisa Mudstone Formation in the mid-Zambezi Valley comprises up to 640 m of non-carbonaceous, alternating massive, poorly stratified, homogeneous mudstone and laminated silty mudstone and siltstone, with minor interbedded calcilutite, sandstone and irregular concretionary calcareous beds (Nyambe and Utting, 1997). The massive mudstone beds have a hackly conchoidal fracture and are predominantly grey to green, silty mudstone with minor, but common, concretionary cacilutite beds up to 1.2 m thick. The laminated mudstone/siltstone units comprise green to grey (greyish-white to khaki weathering) parallel laminated to small-scale cross-laminated mudstone and medium bedded siltstone/mudstone with minor calcilutite and sandstone interbeds. Pinkish grey to dark grey colours are common in the medium bedded (coarser) and thinly laminated (finer) units. Ellipsoidal concretionary calcilutite beds have variable lateral persistence and contain up to 30% ostracods, bivalves and fish scales. Thin, dark, bituminous calcilutites and mudstone conglomerate are locally present. Bioturbation is common.

7.1.2 Escarpment Grit Formation

The Escarpment Grit Formation, and its correlatives in the northern Karoo rift basins, lie immediately above the Permian-Triassic boundary and are characterized by extensive braided river deposits. Such deposits are typical of Precambrian fluvial basins, but uncommon in the Phanerozoic (Ward et al., 2000) suggesting that these widespread braided river deposits resulted from the die-off of plants during the Permian-Triassic extinction event.

The Escarpment Grit Formation consists of coarse to very coarse-grained sandstones that are locally conglomeratic and fine upwards into more fine-grained sandstones and intercalated mudstones. Silicified wood is abundant locally. AGIP geologists historically distinguished two informal members in the Escarpment Grit suggesting a change in fluvial style. A lower “Braided Facies” member is characterized by relatively poorly sorted sandstones and pebbly sandstones with mudclasts and thin discontinuous mudstones, and an overlying “Meandering Facies” member is characterized by well-sorted upward-fining sandstones (i.e., point bar deposits) with mudclasts and pebble-lag layers, interbedded with laterally extensive mudstones.

In areas of poor exposure, the “Braided Facies” can be distinguished from the “Meandering Facies” by the presence of abundant quartz pebbles at the surface. The thickness of these members is variable, and they appear to thin towards the rift axis. Paleocurrents in the “Braided Facies” are predominantly south-westerly, subparallel to the axis of the mid-Zambezi Rift, whereas paleocurrents in the “Meandering Facies” are highly variable.

A petrographic study of the Escarpment Grit (Prasad and Lehtonen, 1977) in the Bungua Hill area south of Dibbwi reported that the sandstones are texturally immature and range from arkosic to sub-arkosic and sublithic arenites and wackes. Arenites predominate. Feldspar content averages 22% (4 to 39%) and is mainly microcline, with minor oligoclase and albite. Both fresh and kaolinized feldspars may be present in the same sample, suggesting a mixture of fresh and weathered source material rather than diagenetic alteration. Rock fragments average 2.9% (0 to 12.2%), including quartzite, sericitic quartzite, siltstone, chert and jasper range up to 12% of the sandstones.

Muscovite is common and fresh looking, whereas biotite is less abundant and typically kaolinized and altered to iron oxides. Other accessory minerals comprise less than 0.5% of the sandstones. They include zircon, tourmaline, epidote, rutile, apatite, sphene, garnet and possible augite. Matrix (grains less than fine sand size) averages 9.1% (0 to 23.4%) and includes mica, feldspar, quartz and chlorite, recrystallized from clay. Cements include iron oxide, silica and carbonate. The sandstones range from moderately well to poorly sorted with an average porosity of 6.7%. They are interpreted to be derived from nearby gneisses and granitic rocks of the Katanga Supergroup and Basement Complex.

Stratabound uranium mineralization in the Escarpment Grit is known in the lower part of the “Meandering Facies” at Njame, and in the upper part at Dibbwi. Association with boundaries between sandstone-dominated stratigraphic units suggests that permeability contrast is a factor controlling uranium mineralization. Widespread soft-sediment folds suggest syn-depositional seismic activity and fault re-activation, with potential seismic pumping of diagenetic fluids contributing to the mineralization event.

7.1.3 Interbedded Sandstone and Mudstone Formation

The Interbedded Sandstone and Mudstone Formation in the mid-Zambezi Valley consists of typically upward-fining very coarse- to very fine-grained sandstone grading into mudstone (Nyambe and Utting, 1997). Mudclasts are a dominant feature in these sandstones. The sandstone to mudrock units are interpreted as mainly channel-fill deposits to overbank fines deposited during floods in braided streams transitional to meandering stream systems. The contact between this formation and the Escarpment Grit Formation is gradational and is placed at the base of a sandstone unit underlying the mudstone interbeds. There is approximately 10 m of greyish green muddy siltstone and silty mudstone overlain by 10 m of fining upwards sandstones. The mudstone/siltstone beds range from 8-12 cm thick and become thicker towards the top of the sequence. The thin beds are predominantly horizontally laminated with small-scale ripple lamination better developed in the thick beds towards the top of the unit. Kaolinite is abundant, but illite and mixed layer clays are present in minor amounts. Calcite is present in the lower part of the formation.

Prasad and Lehtonen (1977) interpreted the sandstones of the Interbedded Sandstone and Mudstone Formation to be less arkosic than those of the Escarpment Grit, but the average feldspar content of 25.6% (0.3% to 37.9%) reported is actually higher. Considering the wide range of values, the difference is probably not statistically significant (Yeo, 2011). Rock fragments average 4% (0% to 11.1%), which is also higher than in the Escarpment Grit. The major compositional difference between the sandstones of the Escarpment Grit and overlying Interbedded Sandstone and Mudstone formations appears to be in matrix content, which is twice as high in the latter at 19% (6.7% to 38.8%).

The Interbedded Sandstone and Mudstone Formation, which overlies the Escarpment Grit, contains a Scythian – Anisian age assemblage (Nyambe and Utting, 1997); hence the Escarpment Grit was deposited early in the Scythian epoch (very early Triassic). In the Muntanga area, the contact between the Escarpment Grit and the Madumabisa Mudstone is a paraconformity (Prasad and Lehtonen, 1977). Towards the mid-Zambezi rift margin, the Escarpment Grit oversteps the Lower Karoo to directly overlie basement gneisses, pegmatites and amphibolites. The known uranium mineral deposits in the mid-Zambezi Basin of southern Zambia are all restricted to the Escarpment Grit.

7.1.4 Depositional Sequences

The Karoo Supergroup comprises at least six regional depositional sequences (Catuneanu et al., 2005), which reflect broadly synchronous episodes of basin subsidence and climate change, but vary considerably in detail from one sub-basin to another. Karoo strata typically overlie Precambrian crystalline basement rocks.

1. Sequence 1: Comprises glacial deposits (for example, Dwyka tillite and equivalents) capped by post-glacial lacustrine mudstones laid down in a temperate climate.
2. Sequence 2: Comprises coal deposits and associated clastic strata accumulated in a warm humid climate (e.g. Gwembe Coal Formation in Zambia).
3. Sequence 3: Comprises fluvial sandstones deposited in semi-humid to arid conditions, overlain by lacustrine or marine mudstones and limestones (e.g. Lower Madumabisa Formation).
4. Sequence 4: Comprises lacustrine and fluvial deposits deposited under warm humid to semi-arid conditions (e.g. Upper Madumabisa Formation). A regional unconformity marks the Permian-Triassic extinction event at the boundary between sequences 4 and 5.
5. Sequence 5: Comprises fluvial sandstones deposited under warm, hyper-humid conditions capped by lacustrine or more fine-grained fluvial strata deposited under hot, semi-humid conditions (e.g. Escarpment Grit and Interbedded Sandstone and Mudstone formations). The different “Braided Facies” and overlying “Meandering Facies” observed within the Escarpment Grit marks a change in fluvial style from braided streams to meandering rivers where material was deposited at point-bars or flood plains; this likely reflects the re-establishment of riverbank stabilizing vegetation, following the Permian-Triassic extinction event, as suggested by Ward et al. (2000). The Interbedded Sandstone and Mudstone Formation has also been interpreted as deposition from a meandering river but the thickness and lateral continuity of the mudstone together with a lack of evidence for scouring and an absence of burrows or rootlet traces suggests that the mudstones may be shallow lake or lacustrine pro-delta deposits, rather than flood-plain deposits (Yeo et al., 2010). The sandstones have characteristics of point-bars; hence they may be delta distributary channel deposits.
6. Sequence 6: Comprises more fine-grained fluvial sandstones capped by Jurassic basalts (for example, Forest Sandstone and Batoka Basalt). Each sequence is punctuated by an episode of crustal extension and subsidence.

7.2 Regional Geological Structures

The mineralized zones are offset and impacted by various faults and fractures but the mineralization itself does not appear to have any significant structural controls.

Regionally, the Muntanga uranium deposit and other uranium occurrences in southern Zambia, lie near the northwest margin of the Mid-Zambezi Graben. This structure is essentially a half-graben, with its faulted footwall against the Precambrian crystalline rocks on the northwestern Zambian side, and passive onlap on crystalline basement rocks on the southeastern Zimbabwean side. The Mid-Zambezi Graben is subdivided into two major sub-basins by the northeast-trending Kamativi - Chizarira - Matusadona basement block. The north sub-basin is fault-bounded on both its margins and is, hence, a true graben. Cyclic upward fining of Karoo strata (Catuneanu et al., 2005) reflects episodic, fault-controlled subsidence in the graben.

7.2.1 Muntanga, Dibbwi and Dibbwi East

Northeast-trending faults likely controlled deposition of the Escarpment Grit "Braided Facies" and fault-related folds may control blind mineralization in the Dibbwi and Dibbwi East area (Yeo, 2011; Ullmer, 2010; Figure 7-3). The Muntanga area of the Mid-Zambezi Valley is characterized by a series of northeast-trending, fault-bounded cuestas or fault blocks, uplifted to the northwest and dipping to the southeast. Three major northeast-trending anastomosing fault systems can be distinguished in the Muntanga area: the Lusitu, Dibbwi and Bungua Mountain fault zones. There are numerous minor faults of limited extent trending northwest to north.

Lusitu Fault Zone

This fault zone roughly follows the valley along the base of the escarpment, where it is obscured by Quaternary and alluvial deposits of the Lusitu and Lusengesi rivers and their tributaries. Along the northwest side of this fault zone down-throw is clearly to the southeast, with Karoo strata at the base of the basement rocks exposed on the escarpment. Madumabisa rocks appear to onlap basement in the Chalala stream area, suggesting that fault offset locally post-dates deposition of the Madumabisa (late Karoo or younger).

Along the east side of the Lusengesi – Kayubila segment of the fault zone, downthrown is also interpreted to be to the southeast of the major fault trace. Younger rocks are exposed to the southeast of older. In the axial part of the Lusengesi – Kayubila segment, the major fault trace is interpreted to be downthrown to the northwest. The relative age of rocks across the fault is uncertain, but moderately to steeply dipping, north- to northwest-trending bedding on the downthrown side is truncated by moderately dipping, northeast-trending. A gentle syncline on the downthrown side is a drag fold.

Dibbwi Fault Zone

The Dibbwi Fault Zone extends through the area of Dibbwi village north. It is a relatively straight, northeast-trending structure, comprising two anastomosing strands along much of its length. Southwest of Dibbwi, both strands are interpreted to be downthrown to the northwest. On the northwest and southeast strand, younger strata are downthrown relative to older. A gentle syncline in the hanging wall of the northeast fault strand and parallel to it lie strikes south-southeast sub-parallel to the Lusengesi River. A dome-like feature interpreted to be a diatreme dome lies near Dibbwi village. A prominent linear magnetic high coincides with the westernmost strand of the fault. This may represent a concealed dyke of Batoka basalt intruded along the fault, as interpreted by Symons and Siegfried (2006).

A single fault strand to the north of Muntanga splits into two farther to the northeast. Along these, Madumabisa mudstone is uplifted against Escarpment Grit strata. Although northeast-trending fractures parallel to the cliff edge at Muntanga suggest a fault at the base of the cliff, up-dip projection of the Madumabisa – the Muntanga cliffs have likely eroded back from the Dibbwi Fault through undercutting of the mudstone below the sandstone.

North of Muntanga, the southeast fault strand is interpreted to be downthrown to the northwest (e.g. "Meandering Facies" and "Braided Facies" downthrown against Madumabisa mudstone). A gentle anticline lies immediately northwest of this fault strand with its axis parallel to it. A gentle syncline lies parallel and to the northwest of the anticline.

The Bungua Mountain Fault Zone

The Bungua Mountain Fault System comprises two northeast-trending anastomosing fault traces with numerous splays. The two main fault traces pass on either side of Bungua Mountain, join into a narrow zone northeast of Bungua Mountain, where the Lutele stream crosses the trace and splits again into two traces which extend on either side of another basement ridge north of Mbendele stream.

Southwest of Bungua Mountain, the east fault trace is interpreted to be downthrown to the northwest, consistent with the presence of younger strata to the northwest and older strata to the southeast. Gentle anticlines lie northwest of both the east and west fault traces with their axes sub-parallel to the faults. Along the northwest flank of Bungua Mountain, the west fault trace is interpreted to be downthrown to the northwest, with younger strata to the northwest and older basement rocks to the southeast. A gentle anticline with its axis subparallel to this fault trace lies just west of Bungua Mountain. Along the southeast side of Bungua Mountain, the east fault trace is interpreted to be downthrown to the southeast, with younger strata to the southeast and basement rocks to the northwest. Note that this sense of offset is opposite to the apparent displacement sense on the same fault trace southeast of Bungua Mountain.

Where the fault traces converge in the valley drained by Lutele stream, downthrow is interpreted to be to the northwest, but exposures are poor and lithologies are indicated to be uncertain. Gentle folds, with axes subparallel to the fault trace, lie northwest of it. The west fault trace which extends along the west side of the basement outlier north of Mbendele stream is downthrown to the northwest.

Prominent linear magnetic highs, comparable to that on the east fault trace of the Dibbwi Fault Zone in the Dibbwi village area, coincide with the main fault trace along the western base of Bungua Mountain and to the southwest, as well as the fault segment about 10 km northeast of Bungua Mountain that extends along the northwestern base of another crystalline basement block. These too, likely represent concealed Batoka basalt dykes intruded along the fault zone.

Minor Faults

North- to northwest-trending faults, with extents of less than four kilometres, crosscut the major fault systems. In contrast with the major faults, they appear to be normal faults. These minor faults likely formed in response to differential uplift on the major faults. One of these extends southerly into the Dibbwi East mineral deposit.

A striking feature of all three fault zones is the development of gentle folds on their hanging-wall side, whose fold axes lie subparallel to the faults. The close spatial association of folds with faults and their orientation indicates that the folding is related to fault movement. Hanging wall folds are commonly associated with normal faults. Depending on the shape of the fault plane, either rollover anticlines or synclinal drag folds (Khalil and McClay, 2002) may be developed. Synclinal drag folds may be formed on the fault-side of rollover anticlines (Yamada and McClay, 2004; Withjack et al., 1995).

As noted above, the extensive linear magnetic highs associated with the Dibbwi and Bungua Mountain fault zones are interpreted to result from Batoka basalt dykes, which are not exposed at surface. This suggests that these faults were initiated as extensional features following deposition of the Karoo strata, in a final phase of rifting.

Regional seismic studies indicate present-day northwest-southeast crustal extension in the Mid-Zambezi Basin (Dumisani, 2001). Hence, northeast-trending faults are likely to have been reactivated as normal faults. This is consistent with the apparent post-depositional normal offsets of the faults. Although there is no direct evidence for when fault reactivation began or what caused it, it seems likely that it is related to propagation of a little-studied southwest branch of the East African Rift System along the Karoo-aged Luangwa and mid-Zambezi rifts and further southwest along the Deka fault zone (Chorowicz, 2005; Dumisani, 2001).

Structural Geology – Dibbwi East (Yeo, 2011)

Historic AGIP geology maps of the Dibbwi East Zone 1 area show it to be cut by a series of east-northeast- to northeast-trending faults 1 to 6 km long. These faults are subparallel to the major regional fault systems, such as the Dibbwi and Bungua Mountain faults. This contrasts with the minor faults at Muntanga and Dibbwi East, which have predominantly northerly trends.

A series of cross-sections constructed roughly perpendicular to the northeast-trending faults show that most of the minor faults in the Dibbwi East area are normal faults dipping steeply and mainly downthrown to the northwest. The southeastern faults, however, dip and are downthrown to the southeast. Hence the fault block between the northwest- and southeast-dipping faults is a small horst.

All of the faults in the Muntanga deposit region are interpreted to be normal faults (Money and Prasad, 1977; Staley et al., 2009; Titley, 2009; Ullmer, 2009). Continuity of stratigraphic units and offset of stratigraphic boundaries across the faults indicate that most of the observed fault offsets post-date deposition. Thickness changes, occurrence of hanging wall folds and widespread occurrence of soft-sediment deformation features all suggest, however, that some fault displacement was syndepositional. Hence, two distinct structural events have affected the area. Extensional faulting, associated with subsidence of the Mid-Zambezi rift in Upper Karoo time was followed much later by renewed extensional faulting, associated with the southwest branch of the East African Rift System. Most of the mapped faults are related to the later event.

The change in thickness of the Escarpment Grit “Meandering Facies” across the Dibbwi Fault, from about 180 m west of the fault to about 195 m east of it, and thinning of the “Meandering Facies” southeast of Dibbwi, to about 70 m at Bungua Hill, suggests syndepositional subsidence, controlled by extensional faults. The faults likely propagated upwards as growth faults, since the two distinctive facies units of the Escarpment Grit are continuous across the faults without major thickness changes, except as noted above. The strong southwesterly orientation of Escarpment Grit “Braided Facies” paleocurrents, suggests deposition in stream systems draining southwest parallel to the axes of one or more half-graben, as noted by Money and Prasad (1977). The presence of numerous circular or elliptical structures, also commonly in the hanging walls of faults and interpreted by Ullmer (2009) as diatremes, and the widespread occurrence of soft-sediment deformation structures in the Escarpment Grit sandstones, are also consistent with syndepositional seismic activity and faulting.

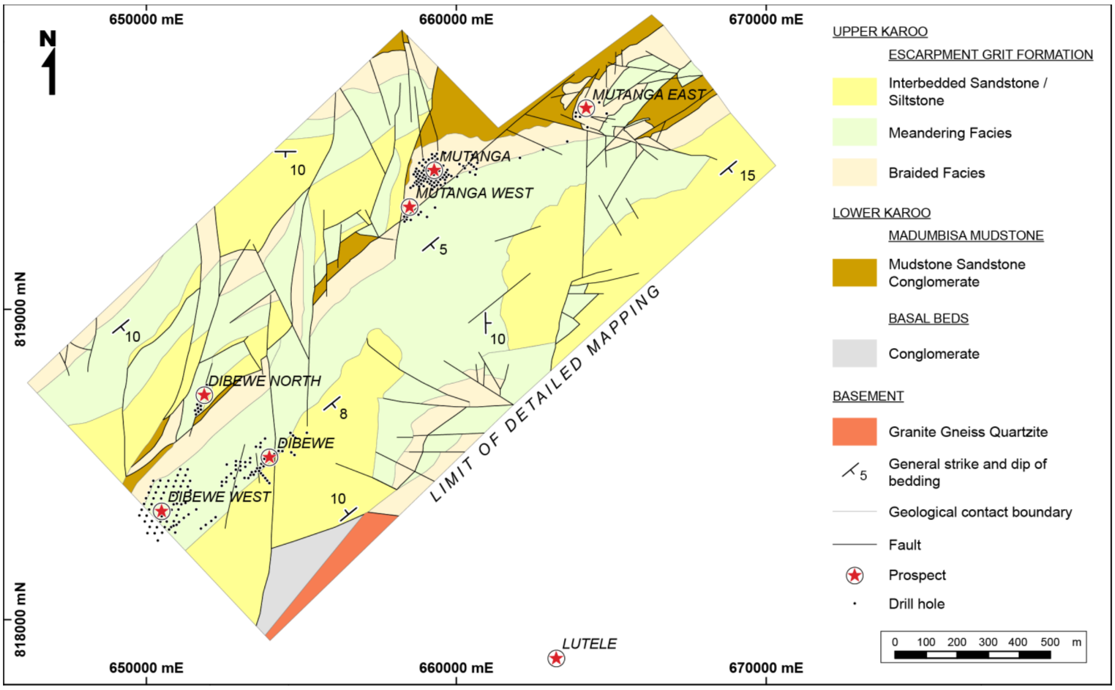


Figure 7-2: Geological Map of the Dibbwi-Muntanga Area (Source: CSA, 2013)

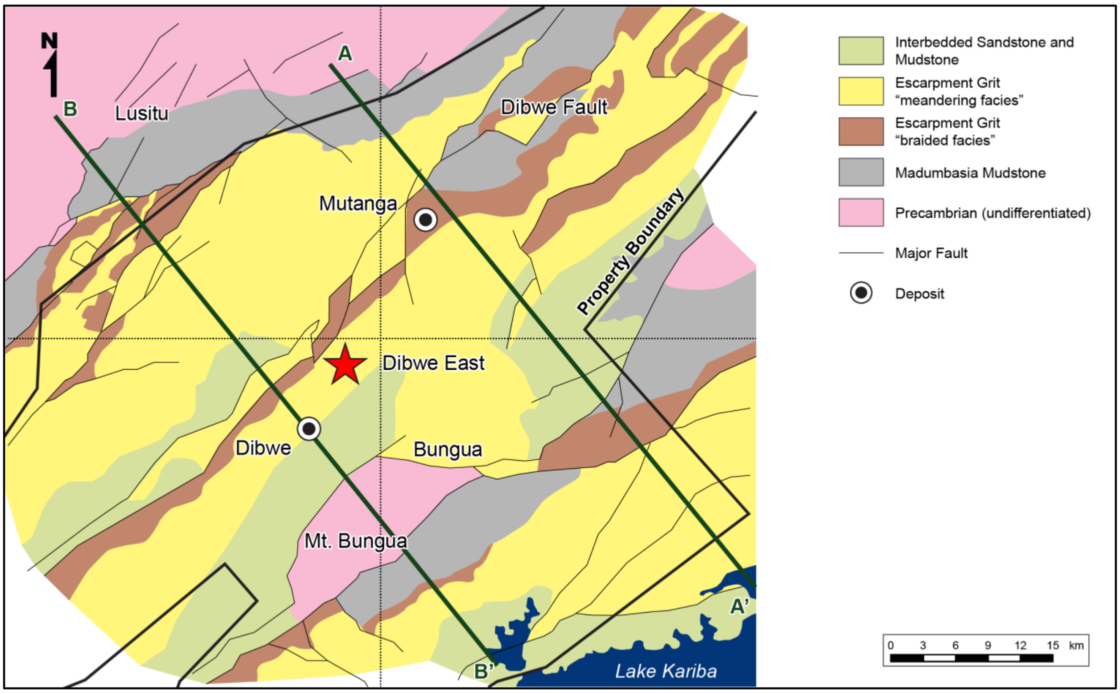


Figure 7-3: Geological Map of the Dibbwi-Muntanga Area (Source: simplified from Ullmer, 2010 in CSA, 2013)

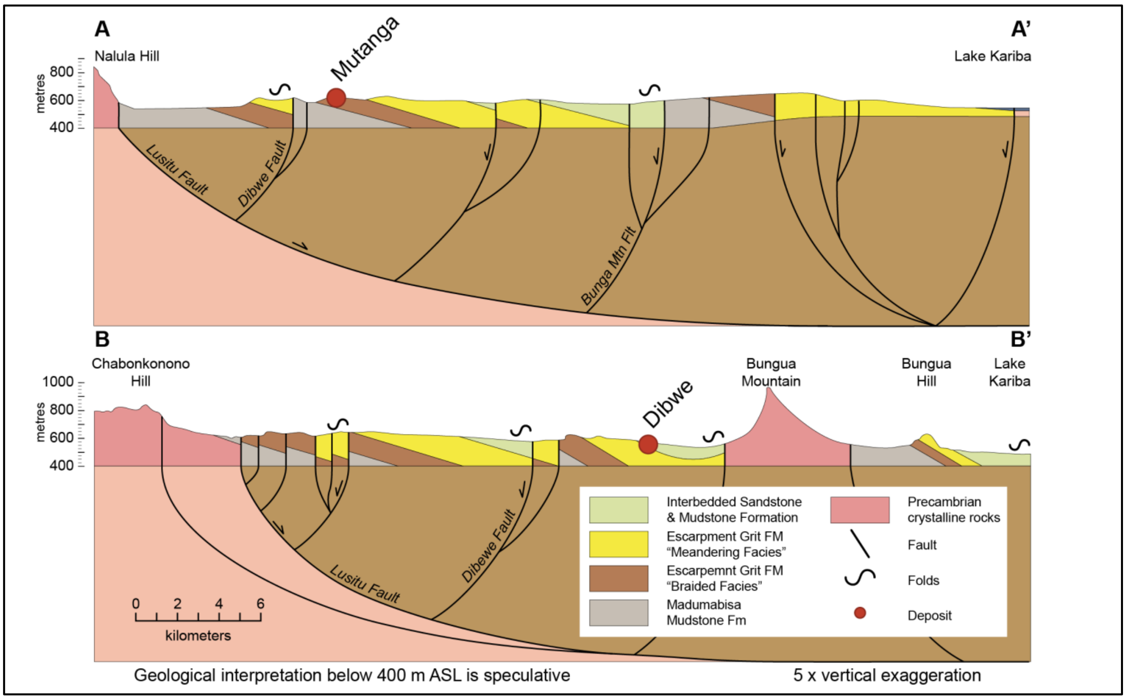


Figure 7-4: **Geological Cross-Section of the Dibbwi-Muntanga Area (Area of Cross-Section Shown on Figure 7-3) (Source: Simplified from Ullmer, 2010 in CSA, 2013)**

7.2.2 Njame and Gwabi

The Njame uranium deposit consists of Escarpment Grit exposed on a gentle dip slope which faces to the southeast (Figure 7-5). In the northwest, the slope is a much steeper scarp controlled by the position of a northwest dipping normal fault. This fault is downthrown several hundred metres to the northwest, representing one of a number of faults that has caused imbrication in the Kariba Rift. The sequence is also cut by several smaller strike-parallel normal faults, which have caused northwest block down displacements of up to 25 m. Similarly, the eastern limit of the Njame mineralization is a major southeast trending wrench fault that truncates the slope and the stratigraphy. The sequence is also cut by several smaller strike-parallel normal faults, which have caused down displacements of the northwest block.

Gwabi uranium mineralization forms a broadly tabular body that dips very gently to the southeast and occurs at very shallow depths of between 3 m and 29 m below surface. In the northwest, the slope is a much steeper scarp controlled by the position of a northwest dipping normal fault. Minor post-mineralization faulting has locally caused metre-scale offsets to the mineralization and may have truncated the mineralization along its southern boundary.

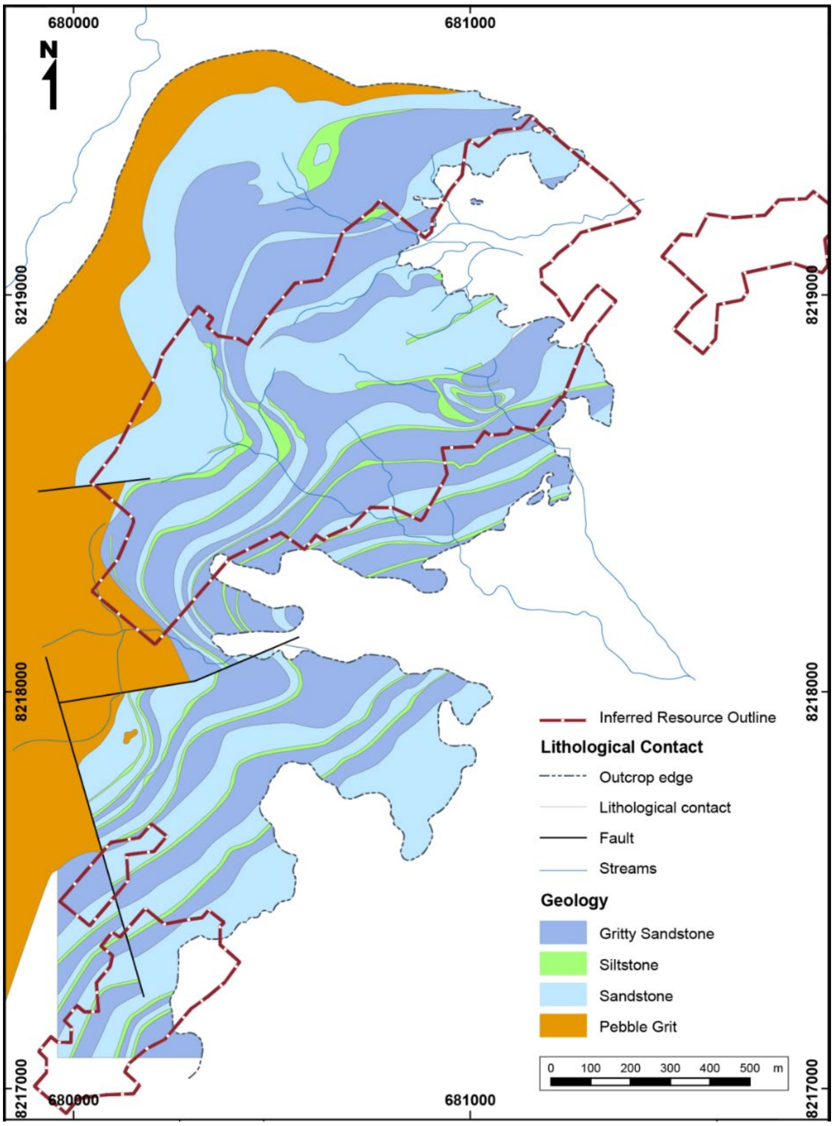


Figure 7-5: **Geological Map of the Njame Deposit (Source: AFR, March 2009 and June 2013)**

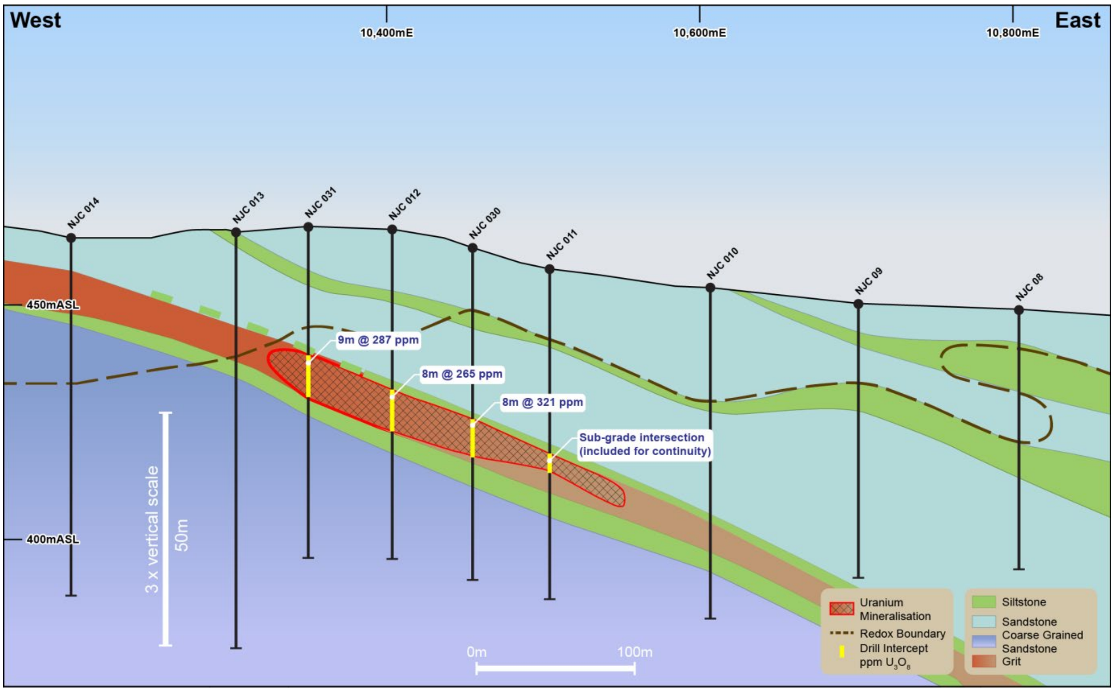


Figure 7-6: **Geological Cross-Section for Njame (Source: AFR, March 2009 and June 2013)**

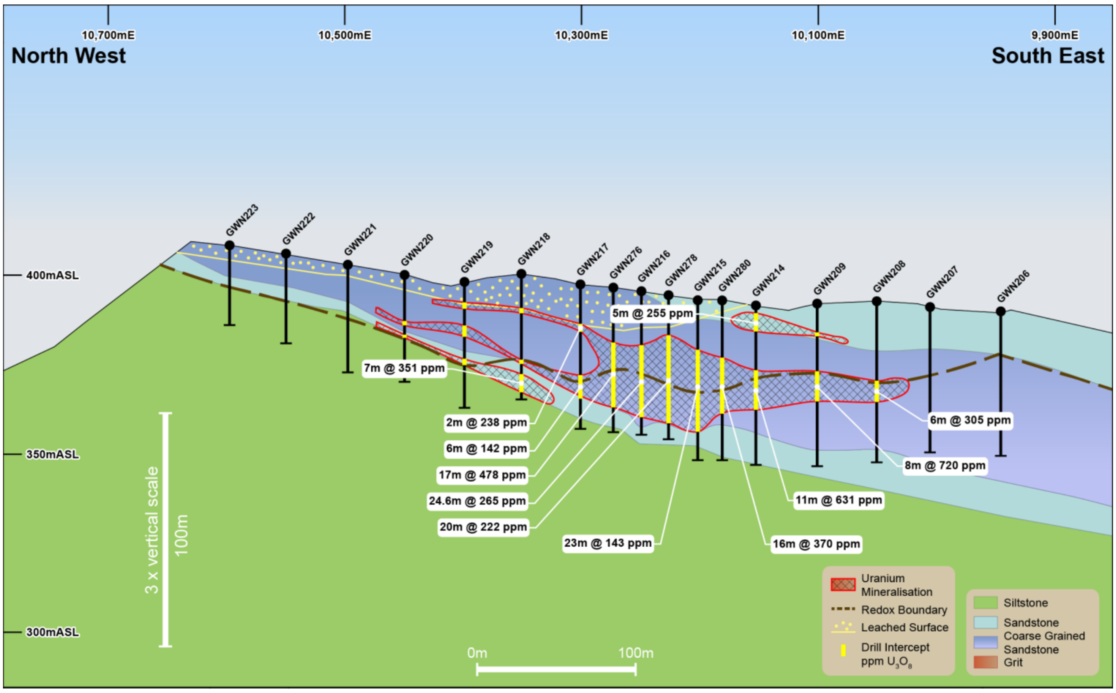


Figure 7-7: **Geological Cross-Section for Gwabi (Source: AFR, March 2009 and June 2013)**

7.3 Local Geology

7.3.1 Muntanga, Dibbwi and Dibbwi East

The Escarpment Grit Formation sequence at the Muntanga uranium deposit comprises at least 120 m of sandstone and conglomerates with occasional mudstones and silts. The Escarpment Grit Formation overlies the Madumabisa Mudstone Formation which comprises a grey to dark grey silty mudstone, with a dark red hematised layer representing either oxidising groundwater or a sub-aerial surface. The mudstone forms an impermeable unit and is thought to have prevented uranium mineralization from moving further down through the stratigraphy. The contact between the Madumabisa Mudstone Formation and overlying Escarpment Grit Formation is between two and three metres above the dark red hematised layer.

Muntanga Geology

The Muntanga uranium deposit is located 31 km northwest of Siavonga. Three stratigraphic zones ("Packages") were historically identified from core logging and utilised as geological boundaries during the resource evaluation phase at Muntanga. The stratigraphic sequence for these packages commences with Package A as the Basal Zone, overlain by Package B, and Package C at the top. The three Packages are detailed as follows:

Package A

'Package A' is approximately 24 m thick. Overlying the Madumabisa Mudstone Formation, it is a thick, dark grey mudstone coarsening upwards into pyritic, coarse grained sandstones. Small scale slump structures and occasional possible dewatering features are observed. Occasional iron oxides are noted. 'Package A' is capped by an approximately 5 m thick, coarse matrix-supported conglomerate. This conglomerate marks a sudden, high-energy event, possibly a channel. The sequence is thought to be representative of a prograding, possibly deltaic system.

Package B

'Package B' is approximately 70 m thick. Overlying 'Package A', it is a sequence of repeated fining up cycles that, as a whole, coarsen upwards. Each fining up unit starts with a very coarse-grained sandstone or conglomerate and fines up to a mudstone or siltstone. The units contain a variety of sedimentary structures including trough and tabular cross bedding and laminations.

The fining up cycles are thought to be representative of a fluvial, possibly meandering system, in which mudstones were laid down in calm lacustrine, bow lake or over bank deposits. The deposits laid down in such hiatal periods could give a series of laterally continuous deposits that could be used as marker bands. Their role in mineralization is discussed below.

Sulfides are observed to within an approximate depth of 50 m from surface. Above this depth oxidization and weathering are evidenced by reddish brown and orange iron oxides and breakdown of micaceous and feldspathic minerals. For drill hole logging purposes, the top of the Escarpment Grit Formation 'Package B' is taken as being the first down hole presence of mudstone.

Package C

‘Package C’ is approximately 25 m thick. Overlying ‘Package B’, it is interpreted from drilling as the uppermost unit within the Escarpment Grit Formation in the area. ‘Package C’, although possibly related to ‘Package B’, is distinguished by grain size and structural differences. ‘Package C’ comprises bedded, generally very coarse-grained sandstones with occasional conglomerates. Both sandstones and conglomerates contain less sedimentary structures than ‘Package B’ and display smaller variation in grain size with little or no cyclic variation (although individual beds can display sedimentary structures). Mudstones are generally absent, although conglomerates often contain mud balls. ‘Package C’ may represent a less ordered environment than Package ‘B’, possibly a braided channel system.

Dibbwi and Dibbwi East Geology

The Dibbwi uranium deposit is located approximately 10 to 15 km west of the Muntanga area. Mineralization in the Dibbwi area appears to be hosted by relatively un-faulted "Meandering Facies” units of the Escarpment Grit Formation.

The Dibbwi East mineral deposit is predominantly composed of Escarpment Grit Formation. The surface geology is characterised by a few scattered sandstone outcrops. Two major units can be distinguished in core, the “Braided Facies” member of the lower Escarpment Grit Formation and the “Meandering Facies” member of the upper Escarpment Grit Formation which appear to be transitional from one another. Most of the Dibbwi East mineralization occurs in the “Meandering Facies”. At Dibbwi East a clear interface can be observed between surface oxidation to a depth of approximately 40 m, where the sedimentary sequence is bleached with red iron oxide horizons, usually at the interface between mudstones and sandstones. Underlying this oxidised sequence, the sedimentary pile could be considered fresh, where the colour of the sandstone, mudstone and siltstones is dominantly grey to dark grey to green, with sulfides present in areas.

Strata dip at about 8^{o} to 15^{o} in the south-easterly direction and strike in the northeast-southwesterly direction. The sandstones are predominantly massive looking with cross beddings indicating that they are channel deposits. Cross-bed foreset orientations are variable suggesting high sinuosity (meandering) river deposition. Sandstone layers 10-50 m thick tend to alternate with 2-5 m thick mudstones and siltstones. Mudstones can be laterally continuous for hundreds of metres.

Manganese nodules are common at the surface. These manganese nodules are composed of pyrolusite and hollandite and usually contain uranium mineralization. The uranium is homogeneously distributed within the host manganese and phosphatic minerals. The manganese nodules are believed to have formed by compaction of wet sediments which led to the remobilisation and formation of manganese nodules at the aerated sediment-water interface, and uranium enriched phosphorite lenses below the interface in reducing conditions. Epigenesis occurred through the passage of solution fronts which recrystallised the manganese and phosphatic minerals and remobilised the uranium which was leached away. The mechanism of uranium uptake in manganese phases most probably involves adsorption of $((UO_2)_3.(OH)_5)^+$ complexes on precipitating minerals.

Mudballs are also present in drill core. These are rounded clasts of clay which bind sediments and minerals to their surfaces. Most are pyritic and sticky, which presumably facilitated preservation during transport over hundreds of metres in a river, with eventual disintegration.

7.3.2 Njame and Gwabi

Njame Geology

The geology of the Njame uranium deposit is relatively simple, consisting entirely of Escarpment Grit exposed on a gentle dip slope which faces to the southeast. In the northwest the slope is a much steeper scarp controlled by the position of a northwest dipping normal fault. This fault is downthrown several hundred metres to the northwest, representing one of a number of faults which has caused imbrication in the Kariba Rift.

The sequence is also cut by a number of smaller strike-parallel normal faults which have caused northwest block down displacements of up to 25 m. A south-east trending fault appears to have caused a rotational offset between the northern and eastern parts of the Njame deposit. Furthermore, a second series of faults with displacements less than the strike-parallel faults have offset the stratigraphy and the mineralized horizons.

A variety of clastic sediments are developed at Njame, ranging from coarse conglomerate beds several tens of metres thick to thinly bedded or cross-bedded fine to medium grained sandstones. Thin bands of shale and mudstone are intercalated in the sequence. AFR historically identified five facies packages (AFR, March 2008), numbered F1 to F5 from base to top, which showed a general fining upwards trend, often with a thin mudstone or shale horizon defining the top of the sequence and marking the base of the next cycle. Individual sequences also trend towards finer sediments down-dip, reflecting changes from proximal to distal environments. This interpretation is consistent with paleo-current indicators suggesting transport from between the northwest and northeast. The mudstone horizons, which represent quiescent phases in the sedimentation, comprise the most laterally continuous lithologies and are thus useful marker horizons.

Gwabi Geology

Similarly to Njame, the geology of the Gwabi uranium deposit also consists entirely of Upper Karoo Escarpment Grits exposed on a gentle dipping southeast facing slope. A variety of clastic sediments are developed at Gwabi, ranging from coarse conglomerate beds several tens of metres thick to thinly bedded or cross bedded fine to medium grained sandstones. Thin bands of shale and siltstone are intercalated in the sequence. Below the grits are well-developed calcareous shale and siltstone layers, possibly representing the upper part of the underlying Madumabisa Mudstone.

7.4 Mineralization

7.4.1 Muntanga, Dibbwi and Dibbwi East

Uranium mineralization appears to be later than at least some of the normal faults which cut the Escarpment Grit Formation. This is evident from the good correlation of the radiometric logging data between adjacent holes within the Muntanga deposit separated by interpreted faulting (Lusambo, 2011).

The source of the uranium is believed to be the surrounding Proterozoic gneisses and plutonic basement rocks. Having been weathered from these rocks, the uranium was dissolved, transported in solution and precipitated under reducing conditions in siltstones and sandstones. Post lithification fluctuations in the groundwater table caused dissolution, mobilization and redeposition of uranium in reducing, often clay-rich zones and along fractures.

Mineralization is not strictly associated with a particular unit in the stratigraphic section. It is observed to occur in both the fine-grained and coarser material and in mudstones, especially where fractures and mud balls occur. Some mineralization occurs in association with manganese oxide or disseminated with pyrite. Mineralization in some bore holes is seen to occur where there was grey alteration, limonite and feldspar alteration and in dark grey mudstones (Sakuwaha, 2011). The strata dip in the south-easterly direction and mineralization seems to occur along dip.

Uranium mineralization occurs in a number of different associations:

- Disseminated uranium mineralization.
    - Occurs in sandstones, conglomerates, and within mud layers, mud balls and mud flakes. Uranium is present as interstitial fine-grained crystals or small amorphous masses constituting less than 1% by volume. Grades vary considerably between zones of disseminations, from approximately 20 to 2000 ppm U_3O_8 in mineralization thought to be solely of a disseminated nature. The presence of sulfides alongside uranium oxides may indicate a transitional zone and/or preferential replacement/ reduction of uranium compounds by one chemical route over another (such as decaying organic matter over oxidation of sulfides) as uraniferous groundwaters moved through the lithologies.
- Uranium mineralization associated with mudstones and siltstones.
    - Muddy lithologies include mud balls (within sandstones), flakes and interbeds. In some cases, mud balls may be completely replaced by uranium mineralization. The degree of replacement varies from fully replaced mud balls to those with a thin selvage of mineralization, whilst others are unmineralized. This is attributed to different ground water chemistry, differing volumes of reducing matter within the mud (fully replaced material may have been a peat-like material), and porosity of the muddy lithology during the influx of uraniferous ground water.
- Fracture hosted uranium mineralization
    - Uranium mineralization is seen as crystal coatings on surfaces and as concentrations close to surfaces. Most notably at the Dibbwi-Muntanga-Dibbwi corridor, these fractures are coated with black Fe/Mn oxides which in turn may be coated with secondary uranium phosphate mineralization (Autunite, meta-Autunite and selenite).
- Primary uranium mineralization
    - Outside of the overlying oxidised zone, the mineralization is associated with redox fronts within sandstone layers, where the interface can clearly be seen by a change in colour from pale grey-white to darker grey and the presence of pyrite. It is interpreted that mineralized fluids move along the layers as opposed to the Oxidised zone, where fluid movement is vertical. Other controls on mineralization appear to be the permeability differences where finer-grained sediments and “dirty” sandstone are

better hosts to uranium due to the presence of reductants such as organic matter or sulfides, but also reduce the flow rate of groundwater such that reduction reaction can happen. The mineralization is considered primary and consists mostly of Pitchblende, Uraninite or Coffinite.

7.4.2 Njame and Gwabi

At Njame the uranium mineralization occurs at the interface between siltstones and sandstones at redox boundaries. Approximately 25% of the Njame mineralization is siltstone hosted, with the balance in coarser-grained sandstones and grits.

Drilling conducted by AFR (AFR, March 2008; April 2012) identified two main mineralized horizons; the thickest, most consistent and highest grade is the lower horizon within the second sequence from the base. Drilling was carried out along the entire length of the 5 km long system, with uranium mineralization encountered along the entire length. Unlike the high energy sandstone and grit horizons, which show very rapid changes over several tens of metres, the siltstone horizons are generally laterally continuous for hundreds of metres, except where younger grit/sandstone channels have cut through them. There is a clear stratigraphic control on mineralization at deposit scale, although structural control may be present on a larger scale.

Similarly to Njame, the uranium mineralization at Gwabi is also related to the redox front; there is one main mineralized horizon which appears to be controlled by both lithology and the redox boundary. It is hosted by the coarse-grained sediments that are interpreted to be the along-strike continuation of the Escarpment Grits which host the Njame uranium mineralization. Uranium mineralization at the Gwabi deposit occurs in red, oxidised, coarse-grained sandstones, grits and pebble conglomerates which overlie a green, non-mineralized, reduced silty-shale horizon. This is interpreted to represent a major redox boundary and may in fact be the regional unconformity between the Upper and Lower Karoo.

8 DEPOSIT TYPES

8.1 Summary of Sandstone Uranium Deposits

The primary uranium mineralization in the Karoo rocks of the Muntanga Project conforms to a sandstone hosted fluvial channel type deposit (Nash et al., 1981; Turner, 1988). Sandstone uranium deposits are generally of three types:

- Roll-front type uranium deposits – arcuate bodies of mineralization that crosscut sandstone bedding, such as those that occur at the boundary between the up-dip and oxidized part of a sandstone body and the deeper down-dip reduced part of a sandstone body.
- Peneconcordant or Tabular sandstone uranium deposits – irregular, elongate lenticular bodies parallel to the depositional trend, also called Colorado Plateau-type deposits, most often occur within generally oxidized sandstone bodies, often in localized reduced zones, such as in association with carbonized wood in sandstone paleochannels incised into underlying basement rocks.
- Tectonic/Lithologic uranium deposits – occur in sandstones adjacent to a permeable fault zone; mineralization forms tongue-shaped mineralized zones along the permeable sandstone layers adjacent to the fault. Often there are several mineralized zones 'stacked' vertically on top of each other within sandstone units adjacent to the fault zone (McKay and Miezitis, 2001).

Sandstone uranium deposits are contained within medium to coarse-grained sandstones deposited in a continental fluvial or marginal marine sedimentary environment. Impermeable shale or mudstone units are interbedded in the sedimentary sequence and often occur immediately above and below the mineralized horizon (Dallenhamp, 1993). Uranium is mobile under oxidizing conditions and precipitates under reducing conditions, and thus the presence of a reducing environment is essential for the formation of uranium deposits in sandstones (Nash et al., 1981).

The Karoo basins of sub-Sahara Africa comprise what may be the world's largest sandstone-hosted uranium province (Figure 8-1). Compared to the well-known uranium-bearing sandstone basins of the western US, the area of the Karoo basins is about 30% greater, but their known uranium content as of 2003 was only about 7% of that in the US basins. Whereas both areas contain broadly similar, little deformed, predominantly non-marine strata, mainly of Mesozoic age, the order of magnitude lower apparent uranium content of the Karoo basins indicates that they are relatively underexplored (Roux, 1998; Bowell et al., 2009).

Figure 8-1: Surface Extent of Karoo Basins in Sub-Sahara Africa and Proximity of Known Uranium Deposits

Only one Karoo uranium deposit, Lotus Energy's Kayelekera deposit in Malawi, has been developed (but on care and maintenance at the time of writing), others have economic potential (Yeo, 2010). These deposits have some key features in common:

- All are hosted in fluvial arkosic sandstones that have undergone post-depositional faulting and uplift (tectonic inversion).
- All lie at or near the surface and hence, typically have strong surface radiometric expression.
- All appear to have tabular geometry; no classic roll-front deposits have been convincingly demonstrated.

- Most feature a range of mineralization styles, including primary uranium oxides and silicates in relatively reduced sandstones, secondary uranyl phosphates or vanadates in more strongly oxidized sandstones, and secondary mineralization remobilized into surficial calcretes.
- Mineralization is commonly associated with stratigraphic contacts indicative of a marked drop in stream energy.

9 EXPLORATION

9.1 Introduction

In addition to the drilling described in Section 10, extensive exploration work has been conducted on all of the deposits of the Muntanga Uranium Project by the former owners of the project. Minor exploration activity has been conducted by GoviEx. The following section describes the exploration activities completed by the former operators.

9.2 Muntanga, Dibbwi, and Dibbwi East

The earliest phase of exploration for uranium in the area covering the Muntanga and Dibbwi deposit areas was conducted by AGIP in the late 1970s to the mid-1980s.

AGIP carried out systematic exploration, comprising outcrop mapping, ground radiometric surveys, air-borne photographic and geophysical surveys, trenching and pitting. Regional exploration drilling was also carried out in the broad Muntanga-Dibbwi area. A summary of the regional mapping completed is shown in Figure 9-1.

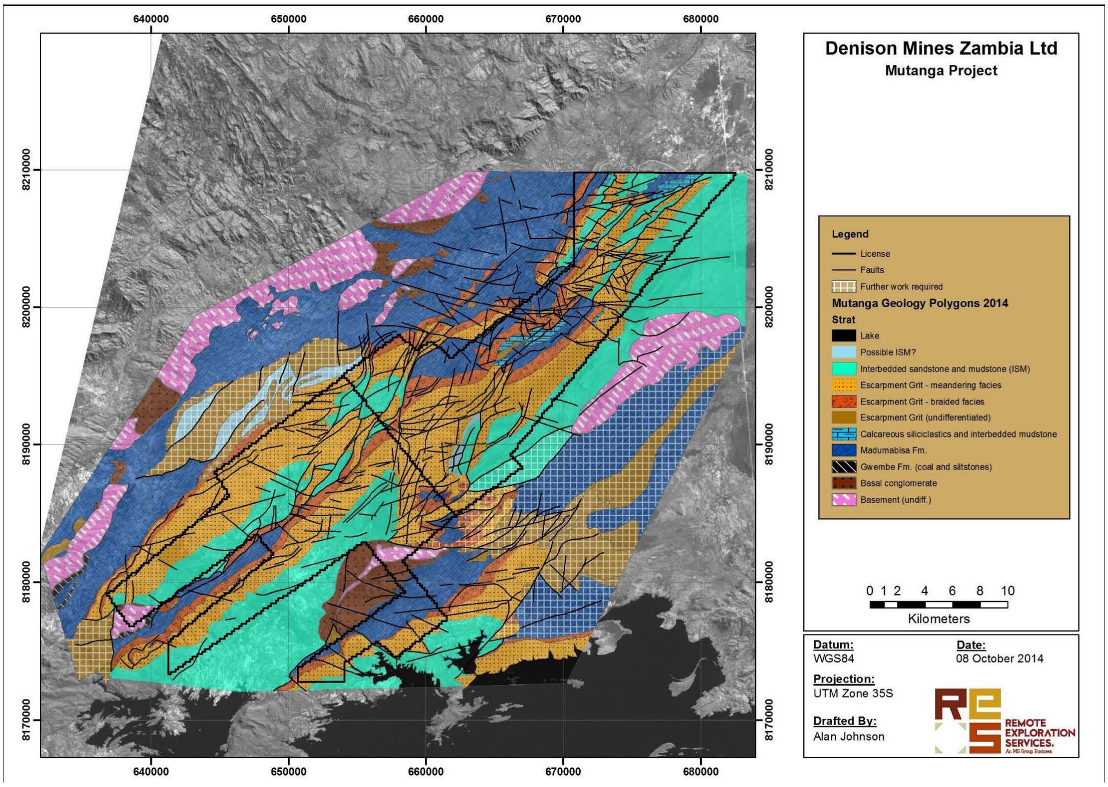


Figure 9-1: Dibbwi – Muntanga Geological Map (Source: RES, 2013)

During 2006, a detailed aeromagnetic and radiometric survey was carried out by OmegaCorp which confirmed the position and tenor of the existing uranium prospects and identified additional targets, based on interpreted radiometric signatures. Conclusions of the 2006 airborne survey noted the following:

1. The Escarpment Grit Formation appears to have two clear radiometric signatures as shown in Figure 9-2;
    a. A reddish brown ternary radiometric signature indicates the presence of potassium (“K”) in the Formation, consistent with description of the Escarpment Grit Formation as feldspathic sandstone. This part of the Escarpment Grit Formation was mapped and designated as D1 (Figure 9-3).
    b. The areas marked as D2 appear to have a similar K response but with additional uranium producing a white ternary radiometric signature.
2. The structures identified indicate an extensional half-graben regime with normal faults trending in a generally northeast direction. The movement on these faults appears to down throw blocks to the northwest. Later faulting in a northwest, west-northwest and north-northeast direction crosscutting the Karoo stratigraphy is also noted.

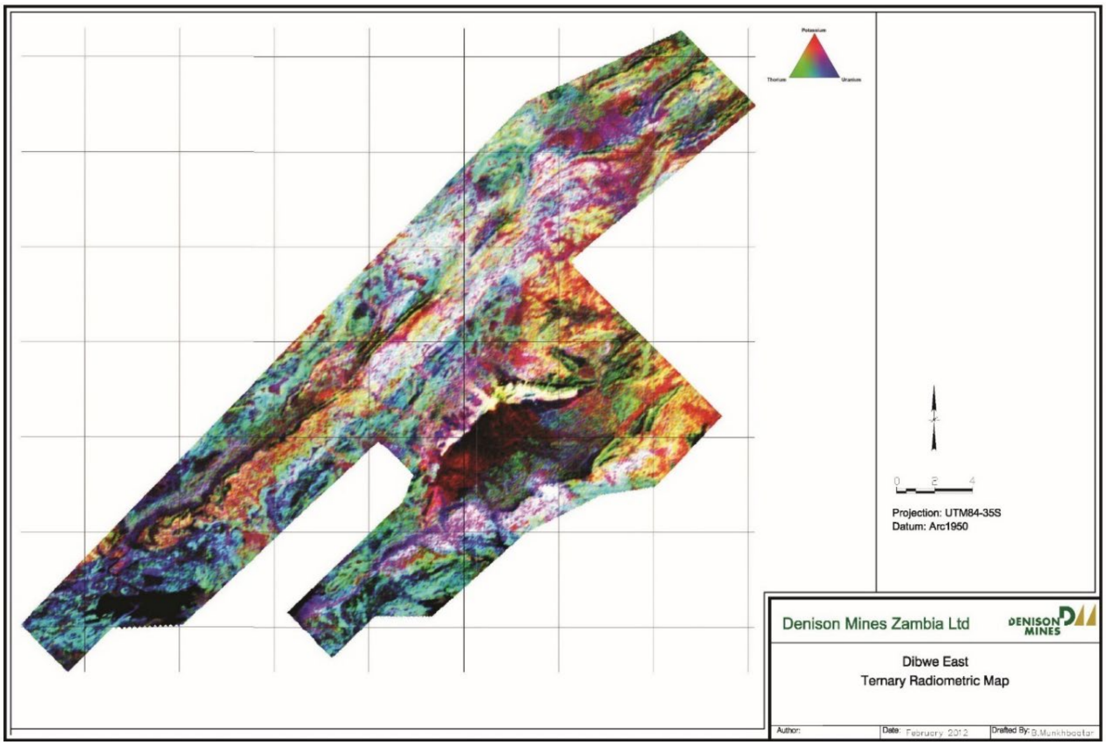


Figure 9-2: Ternary Radiometric Plot (Source: Denison-RPA, 2012)

In 2011, a Denison geophysicist noted some obvious errors in the magnetic data quality and derived products and subsequently had an external processor look at the 2006 data, who confirmed that the gridded data within this region was representative of their processing sequences. Assumptions were made that since the radiometric signal from the equivalent potassium was mapping the near surface expression of the Escarpment Grit Formation; this implied that the high frequency content from the magnetic signature (2nd vertical derivative grid) was also representative of geological variations within the Escarpment Grit Formation. Furthermore, by closely examining the potassium/magnetic datasets on larger formational trends an inverse relationship occurs between mudstones and sandstones. The units are clearly distinguishable with mudstones having a high mag/low potassium signature and the sandstones as a low mag/high potassium signature (Denison-RPA, 2012). Resolution of the magnetic dataset is much better at defining faulting, lineaments and/or edges of magnetic domains as evidence in a provisional interpretation of lineaments and offsets in the area (Figure 9-4).

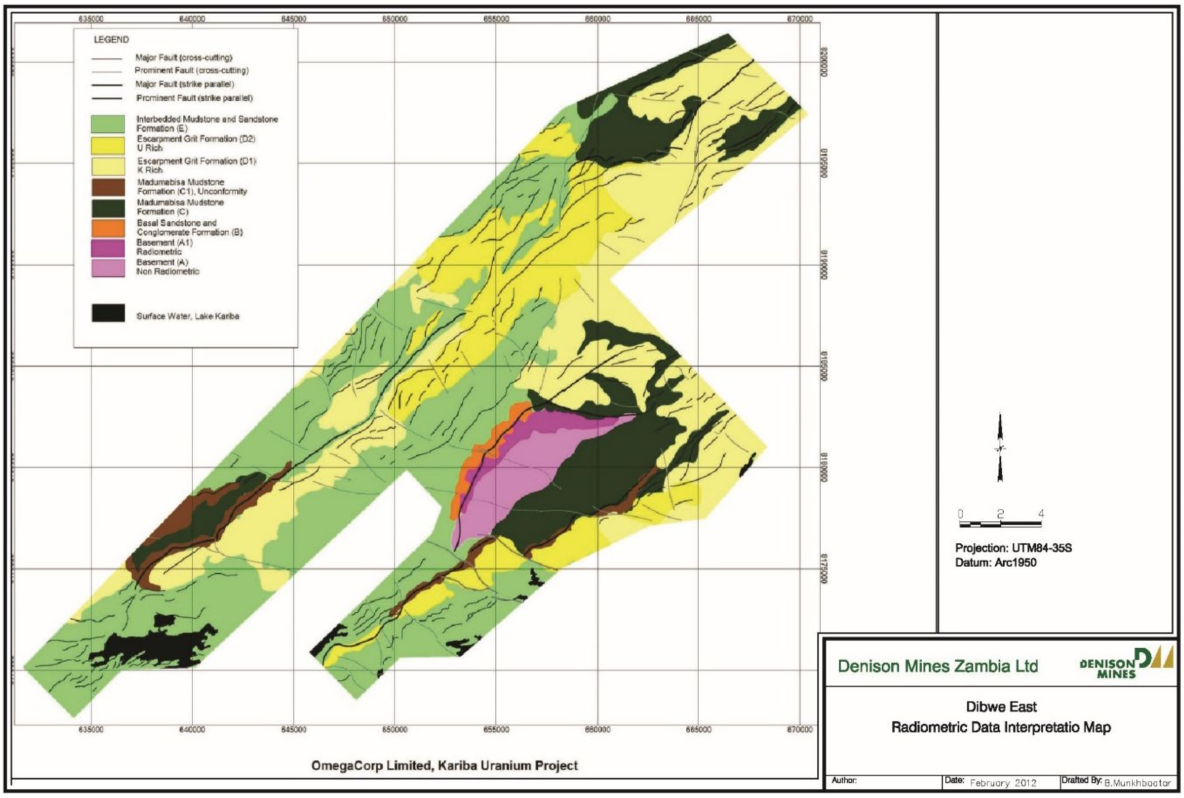


Figure 9-3: Interpretative Map, Based on Radiometric Data Shown in Figure 9-2

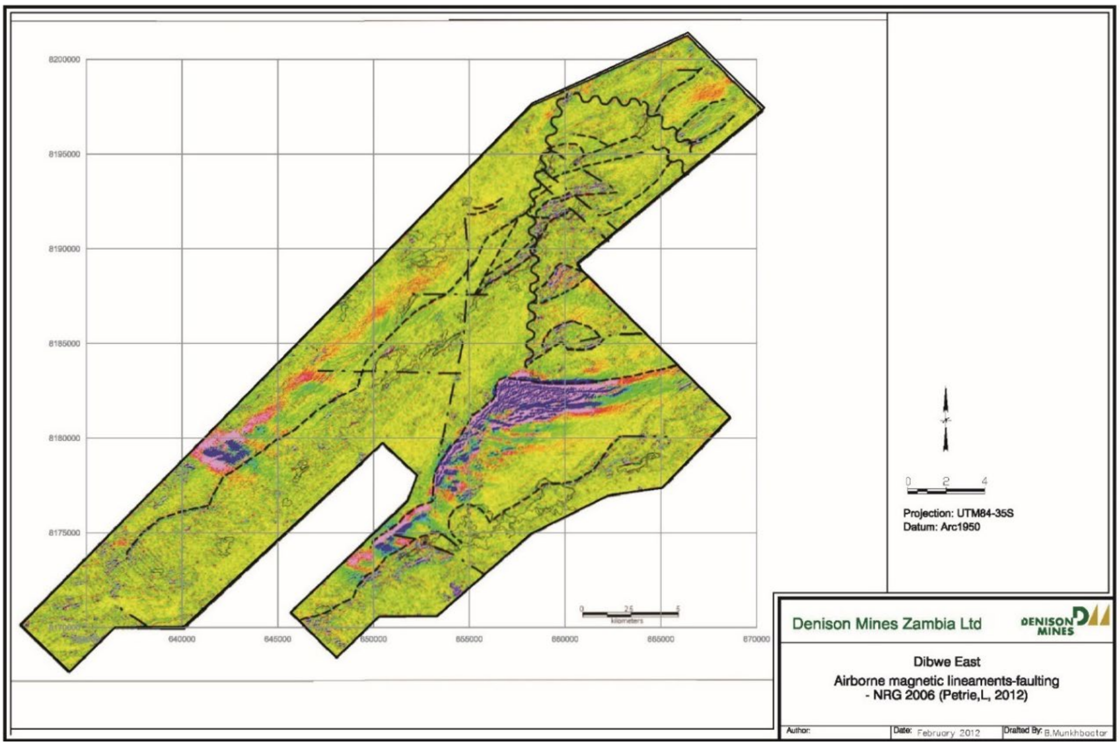


Figure 9-4: Airborne Magnetic Lineaments-Faulting (Denison-RPA, 2012)

During August and September 2013, Geotech Ltd. carried out a helicopter-borne geophysical survey over the Muntanga Project. Principal geophysical sensors included a versatile time domain electromagnetic (VTEMplus) system, and horizontal magnetic gradiometer. Ancillary equipment included a GPS navigation system and a radar altimeter. A total of 1,903 line-kilometres of geophysical data were acquired during the survey. In-field data quality assurance and preliminary processing were carried out on a daily basis during the acquisition phase. Preliminary and final data processing, including generation of final digital data and map products were undertaken from the office of Geotech Ltd. in Aurora, Ontario. The processed survey results are available as the following maps:

- Electromagnetic stacked profiles of the B-field Z Component;
- Electromagnetic stacked profiles of dB/dt Z Components;
- B-Field Z Component Channel grid;
- Total Magnetic Intensity (TMI);
- Fraser Filtered dB/dt X Component Channel grid;
- Magnetic Total Horizontal Gradient;
- Magnetic Tilt-Angle Derivative;
- Calculated Time Constant (Tau) with contours of anomaly areas of the Calculated;
- Vertical Derivative of TMI; and
- RDI sections are presented.

Digital data include all electromagnetic and magnetic products, plus ancillary data including the waveform. The survey report describes the procedures for data acquisition, processing, final image presentation and the specifications for the digital data set.

Geological mapping of the Muntanga property was undertaken during August and September 2014 by Remote Exploration Services (RES) of Cape Town, South Africa. A total of 324 line kilometres of mapping traverses were completed including 1,815 mapping stations. Field mapping data were integrated with airborne geophysical data, satellite imagery and previous geological maps and interpretations to produce a revised geological map for the Muntanga property (Figure 9-1).

The Muntanga Project area was covered with soil geochemical and radon surveys from 2013 to 2015. The objective of the surveys was to delineate any significant exploration targets outside of the drill defined uranium deposits. Previous drilling had largely focused on testing airborne radiometric anomalies and the soil geochemical and radon approach allowed for possible detection of blind or buried mineralization, particularly in areas of thick or transported regolith. Surveys were carried out in the dry months between May and November. Coincident soil and radon stations were 100 m apart on 800 m spaced northwest-southeast survey lines. Survey data and results have been stored in an Access database. A summary of the soil and radon samples collected from 2013 to 2015 is provided in Table 9-1 and shown in Figure 9-5. Prior to implementation of the surveys, calibration exercises were conducted over known mineralization to establish optimal methodologies.

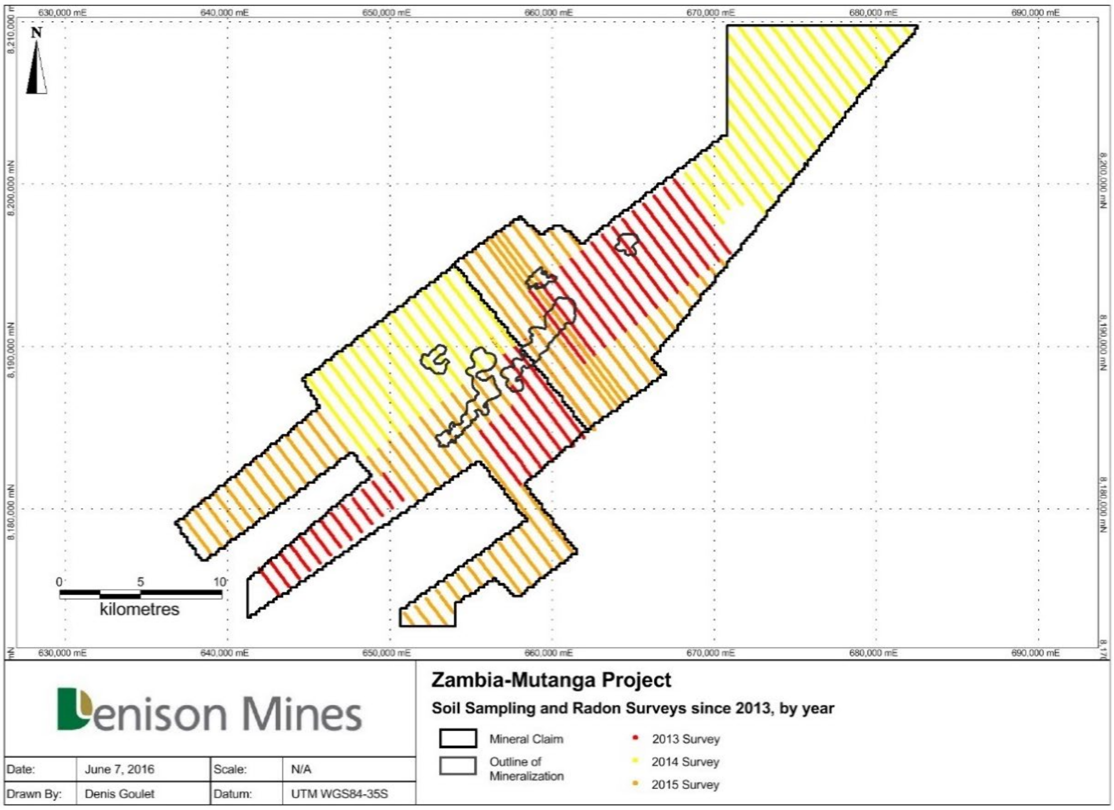


Figure 9-5: Soil Geochemical and Radon Maps, 2013-2015 (Denison-RPA, 2012)

Table 9-1: Summary of the Soil and Radon Samples Collected from 2013 to 2015

Year Date	Soil Samples	Soil Field Duplicates	AlphaTrack	RadonX
2013	1780	93	1680	0
2014	2029	105	0	2028
2015	2248	93	0	2247
TOTAL	**6057**	**291**	**1680**	**4275**

At each sample site a 300-gram unscreened sample was collected from the A-horizon. Sample site information and coordinates were recorded in field notebooks. Samples were sent to ACME Laboratories in Vancouver, Canada for analysis using Group 1F, aqua regia digestion ultra trace ICP-MS method. Quality control was monitored with field duplicate samples that were collected at a frequency of one duplicate in every 20 samples.

In 2013 the AlphaTrack method was used, following successful orientation work conducted in 2011. AlphaTrack cups are 1 litre plastic cups with a small piece of special plastic film taped to the inside. The cups are buried in an inverted position so that any radon gas percolating upward will be trapped in the cup. The cups are typically left in place for about 4 weeks. Radon gives off alpha particles which leave microscopic trackways on the film. The trackways can be counted in the lab to give a quantitative measurement of the amount of radon trapped in the cup. This in turn, gives an indication of the location and grade of subsurface uranium mineralization.

In 2014 and 2015 the RadonX^{TM} method was utilized, following successful orientation work in 2012. RadonX is provided by Remote Exploration Services (RES) of Cape Town, South Africa. RadonX is based on the Radon-on-Activated-Charcoal (ROAC) technique initially developed by the SA Atomic Energy Board but refined and enhanced by RES. Unlike other radon emanometry methods that rely on alpha-particle detection, RadonX measures the gamma emission from radon's daughter products, bismuth (214Bi) and lead (214Pb), following adsorption of the radon onto activated charcoal. This method of detection excludes the detection of thoron (220Rn) arising from thorium that may be contained in the bedrock, representing a significant advantage of the RadonX method. Radon gas is adsorbed onto activated charcoal contained within a cartridge fitted into the base of an inverted cup that is buried in the ground. Gamma radiation from the daughter products of the adsorbed radon is then measured using a field scintillometer. Background effects are reduced and corrected for through the use of a lead castle. During the 10-day cup burial period, weather is to be monitored. Rainfall and temperature are known to affect the ability of charcoal to adsorb radon. RadonX cartridges are subjected to stringent quality control measures from time of initial loading of activated carbon through field deployment up to the time of taking scintillometer readings.

The soil geochemical and radon surveys produced numerous anomalies across the Muntanga Project area and new exploration targets were defined for follow-up. The soil geochemical and radon methods utilized adequately detected the drill-defined mineralization and showed reasonable correlation with radiometric anomalies, thereby confirming this exploration approach. The new exploration targets were defined based on combinations of anomalous soil uranium, soil uranium pathfinders, radon and soil radioactivity. In some cases, the targets corresponded with surficial cover (thicker soils) alluding to a buried source. Targets located over prospective geology and structure were prioritized for follow-up. Figure 9-6 and Figure 9-7 show the gridded soil uranium and gridded radon results respectively.

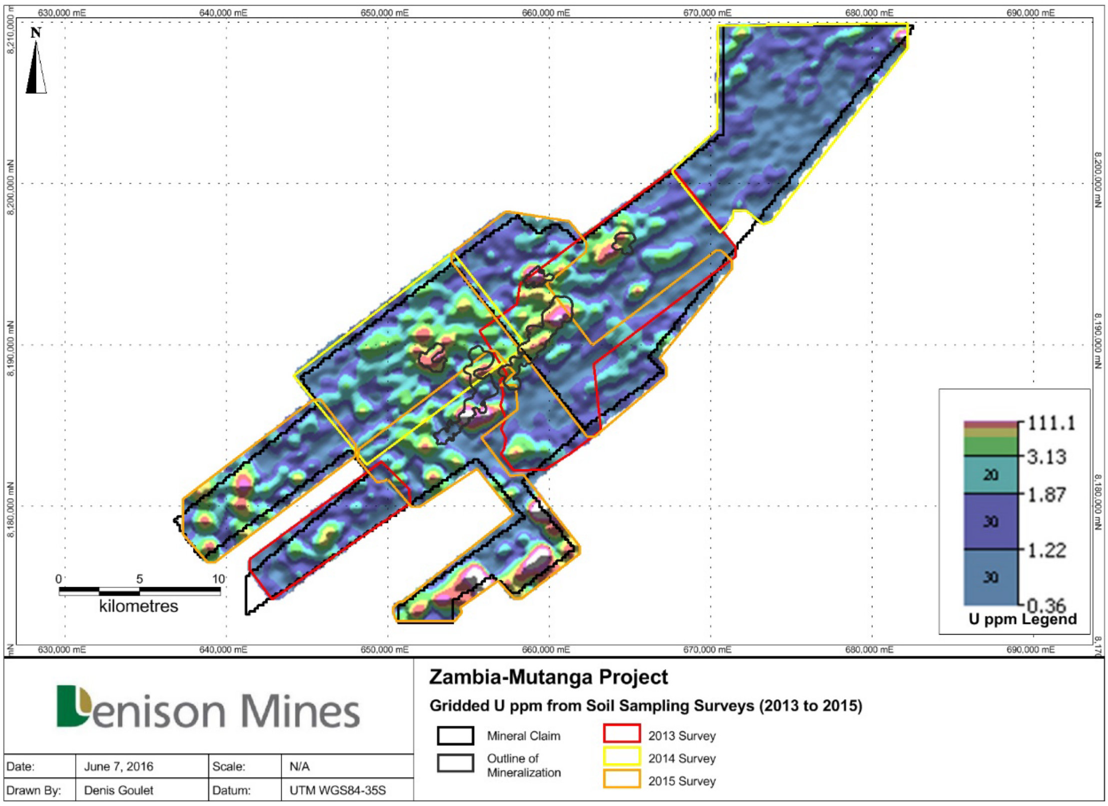


Figure 9-6: Gridded Soil Uranium Results

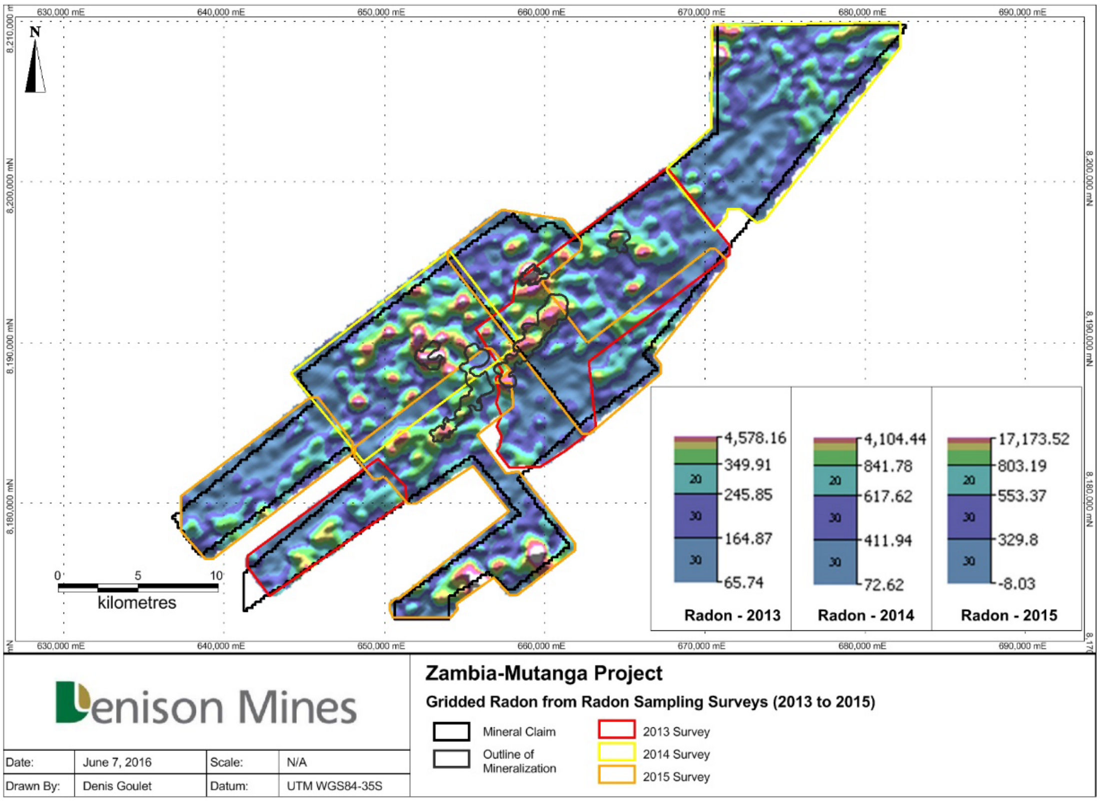


Figure 9-7: Gridded Radon Results

Trenching was undertaken to test for additional mineralized horizons outside of the drill-defined uranium deposits. The trenching provided a cost-effective follow-up methodology, prior to any drilling, to test targets generated from the soil geochemistry and radon surveying. Trenches provided a means of accessing the fresh bedrock, or otherwise saprock, for the in-situ determination of geology and mineralization.

Trenches were located over priority targets based on interpretation of the soil geochemical and radon results from 2013. 2014 and 2015. Targets also considered a combination of airborne or ground radiometric anomalies and 2014 geological mapping. Trenches were typically located along, and parallel to, the soil and radon survey lines which were roughly perpendicular to stratigraphic strike and known mineralization. The soil and radon anomalies tended to follow stratigraphic strike parallel trends. Trenches were designed to cover the entire anomaly and to extend into background by 1/3 to 1/2 of the anomaly width in each direction. A summary of the trenches excavated in 2014 and 2015 is provided in Table 9-2. Trench locations are provided in Figure 9-8.

Table 9-2: Summary of the Trenches Excavated in 2014 and 2015

Trench Number	Target Area	Year	Length (m)	Average Depth (m)
MCT1	Manchavwa	2014	900	1.3
MCT2	Manchavwa	2014	966	1.6
MCT3	Manchavwa	2014	853	2
MET4	Muntanga East	2014	708	1.5
MET5	Muntanga East	2014	707	1.2
MET6	Muntanga East	2014	698	2
A-1	Kanyanga	2015	242	1.5
A-2	Kanyanga	2015	200	1
C&D-1	Muntanga East	2015	274	1
C&D-2	Muntanga East	2015	202	1.5
E-1	Dibbwi Muntanga Corridor	2015	420	2
E-2	Dibbwi Muntanga Corridor	2015	146	2
F-1	Dibbwi North	2015	623	3
G-1	Dibbwi West	2015	182	2
G-2	Dibbwi West	2015	332	2.5
H-1	Dibbwi West	2015	900	3.5
H-2	Dibbwi West	2015	210	3
H-2a	Dibbwi West	2015	86	1
H-3	Dibbwi West	2015	216	2
I-1	Kanyanga	2015	192	1.5
I-2	Kanyanga	2015	74	1
	TOTAL		**9,131**	

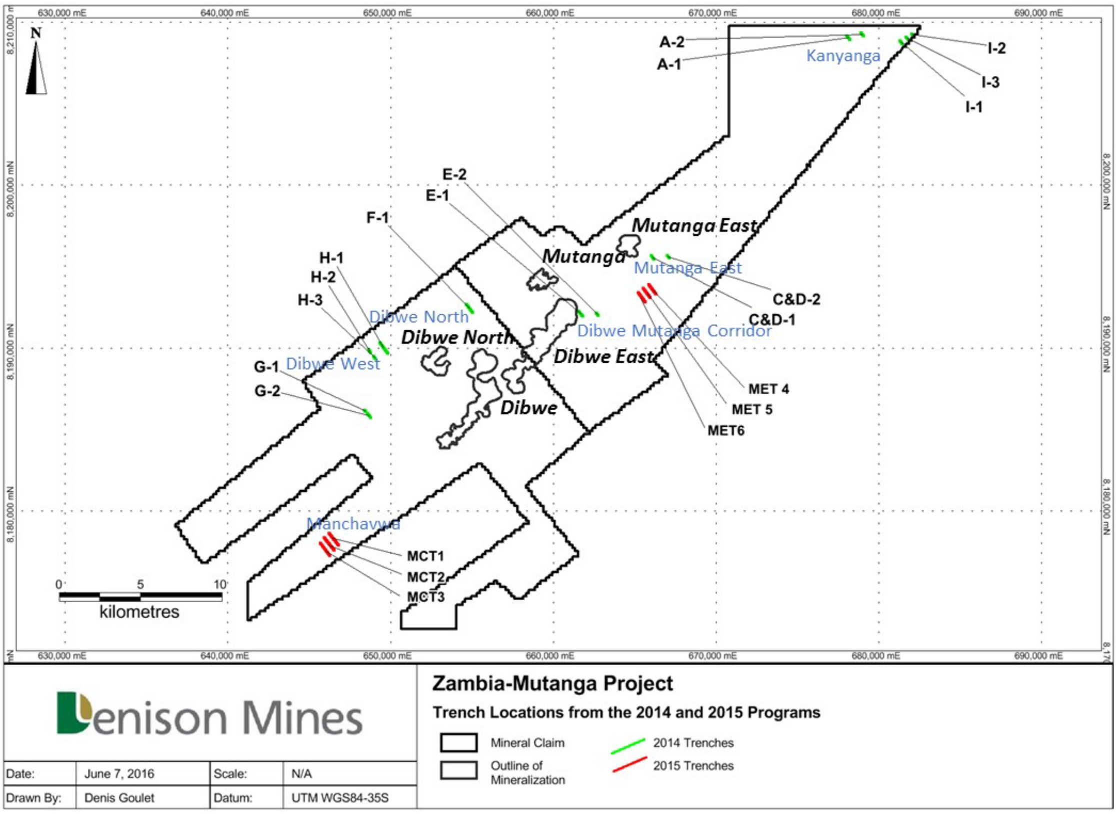


Figure 9-8: Trench Locations

Trenching was undertaken using an excavator and allowed sufficient width (approximately 1 m) to allow the geologist to work within the trench for mapping and sampling. Trenches were excavated into relatively fresh bedrock and roughly parallel to the regolith-bedrock contact. Where possible, bedrock in the sidewall of the trench was exposed to allow for structural geology measurements.

Trenches were viewed as ‘horizontal drill holes’ in terms of the information collected along them. A 100 m tape was laid out along the base of the trench as reference. Before commencing trench mapping and sampling the trenches were cleaned from excessive soil or rubble. Trench mapping utilized the same logging codes as used previously for Muntanga drilling in terms of lithology, structure, alteration and mineralization.

Continuous total gamma scintillometer readings were taken along the base of the trenches. The readings were visually averaged and recorded for every 2 m interval. The maximum total gamma reading and its location for the interval was also recorded.

Trench sampling was undertaken over intervals where elevated gamma readings were encountered. For each trench an elevated gamma threshold was established using log probability plots. Continuous-chip sampling was undertaken from the base or sidewall of the trench where bedrock was exposed. The sample intervals ranged from a maximum of 2 m to a minimum of 50 cm and were adjusted for geological contacts. At least 2 samples of 2 m each were collected on either side of elevated gamma zones as ‘shoulder samples’. Samples were approximately 1 kg in weight. A scintillometer reading was taken of the bagged sample away from other samples and in an area of low background. A field duplicate sample was collected every 20th sample (5% field duplicates) and a coarse crush blank inserted every 25th sample (4% blanks). Trenching data and results have been stored in an Access database.

Table 9-3: Summary Statistics of Trench Total Gamma and Uranium

Trench Number	Average Gamma (cps)	Maximum Gamma (cps)	Count of Assay Samples	Average U ppm	Minimum U ppm	Maximum U ppm	Standard Deviation U ppm
A-1	337	1750	1	30	30	30	
A-2	288	620	0				
C&D-1	254	500	0				
C&D-2	297	620	0				
E-1	527	1330	49	20	2	55	13
E-2	306	380	0				
F-1	474	2300	61	17	2	68	13
G-1	695	2630	45	27	2	124	23
G-2	428	1500	38	5	2	10	2
H-1	447	1850	73	13	2	49	9
H-2	371	850	2	6	6	7	0
H-2a	537	1030	13	19	6	32	9
H-3	378	1130	7	13	2	27	10
I-1	406	1200	4	11	8	17	4
I-2	418	1050	4	16	13	19	3
MCT1	336	1134	88	10	1	33	7
MCT2	348	2129	86	11	1	30	6
MCT3	367	1519	119	11	1	69	9
MET4	373	1334	112	7	1	39	5
MET5	435	2098	74	23	1	65	18
MET6	354	1549	66	13	1	52	11

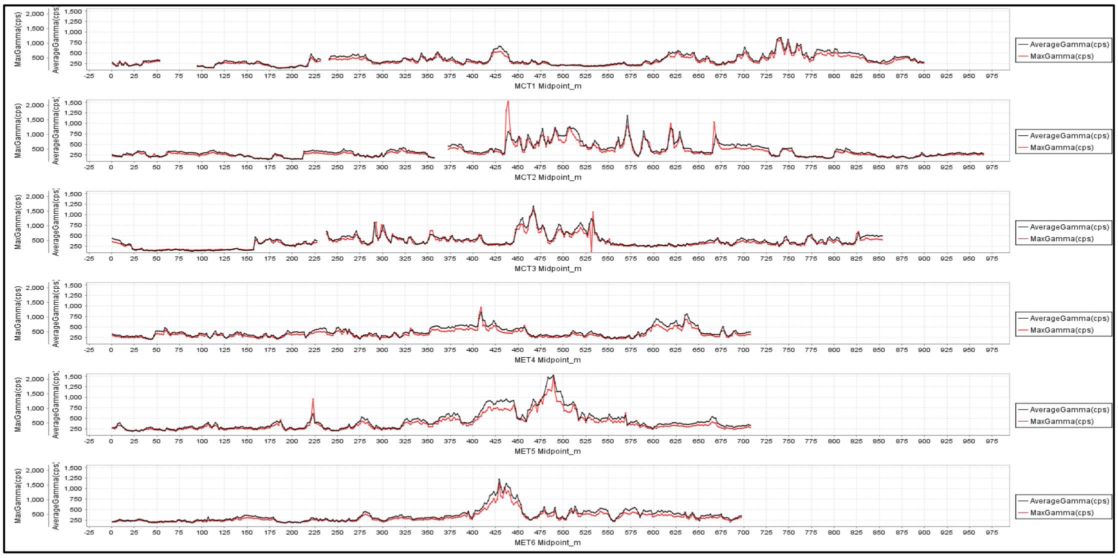


Figure 9-9: Average and Maximum Total Gamma Readings for 2014 Trenches (0 Metres Represents the Southern End of the Trench)

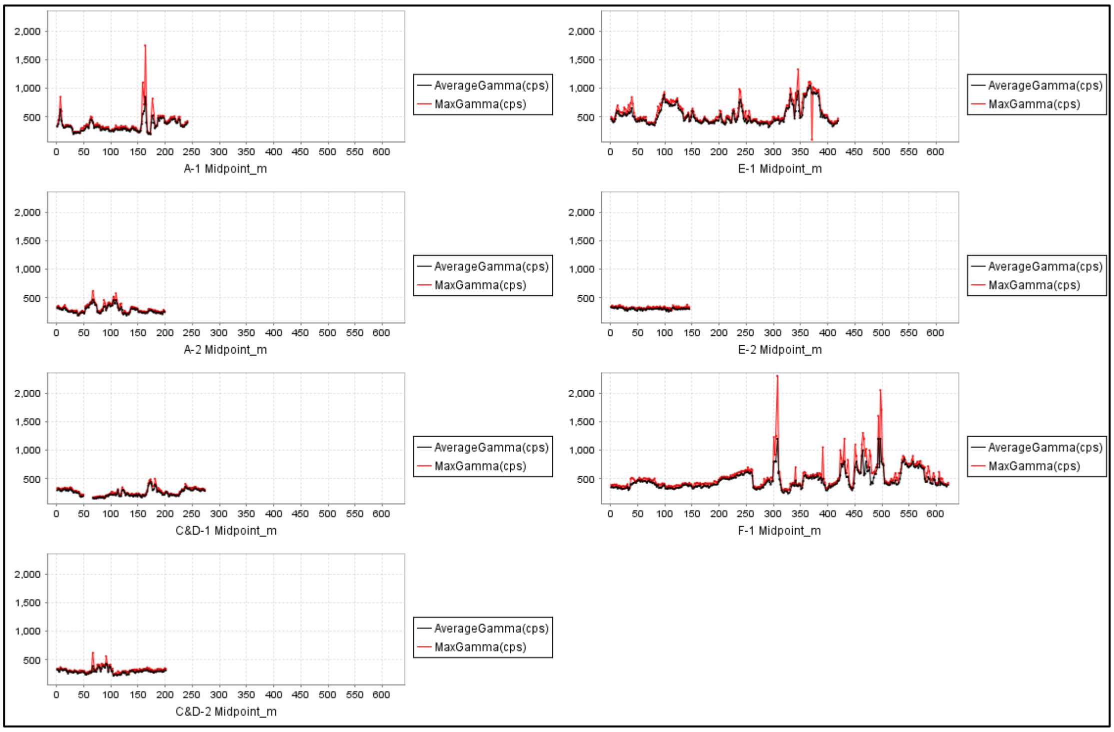


Figure 9-10: Average and Maximum Total Gamma Readings for 2015 Trenches (A, C&D, E and F Target Areas; 0 Metres Represents the Southern End of the Trench)

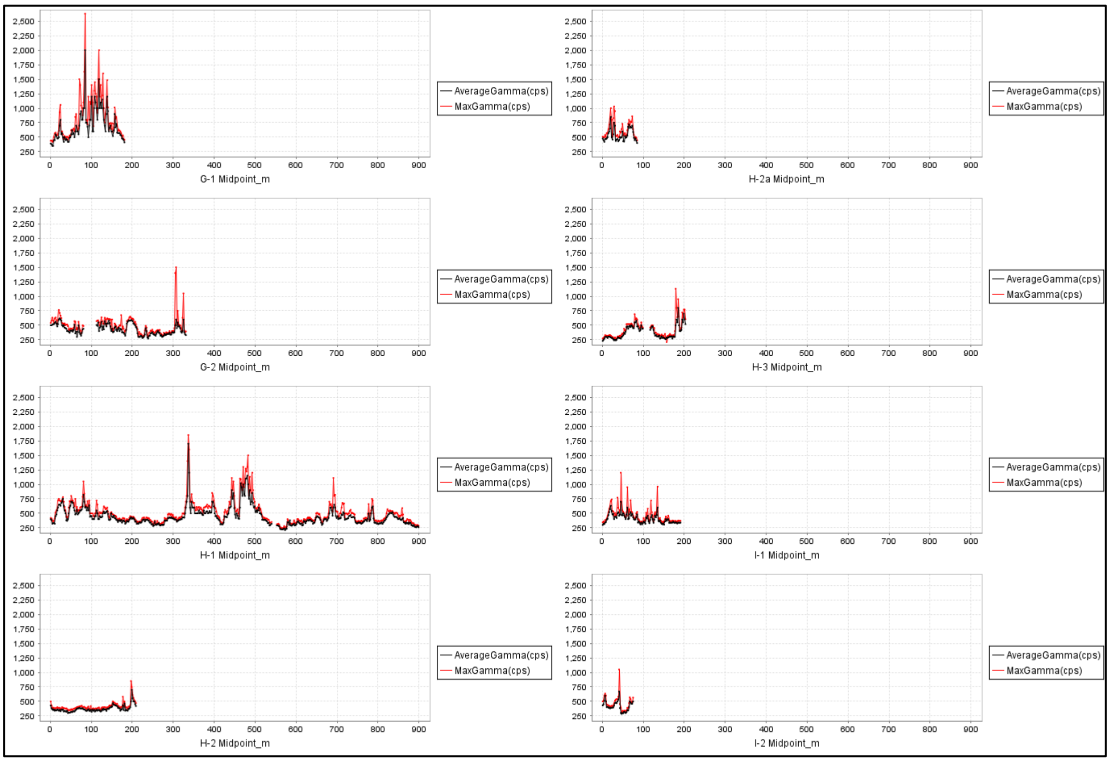


Figure 9-11: Average and Maximum Total Gamma Readings for 2015 Trenches (G, H and I Target Areas; 0 Metres Represents the Southern End of the Trench)

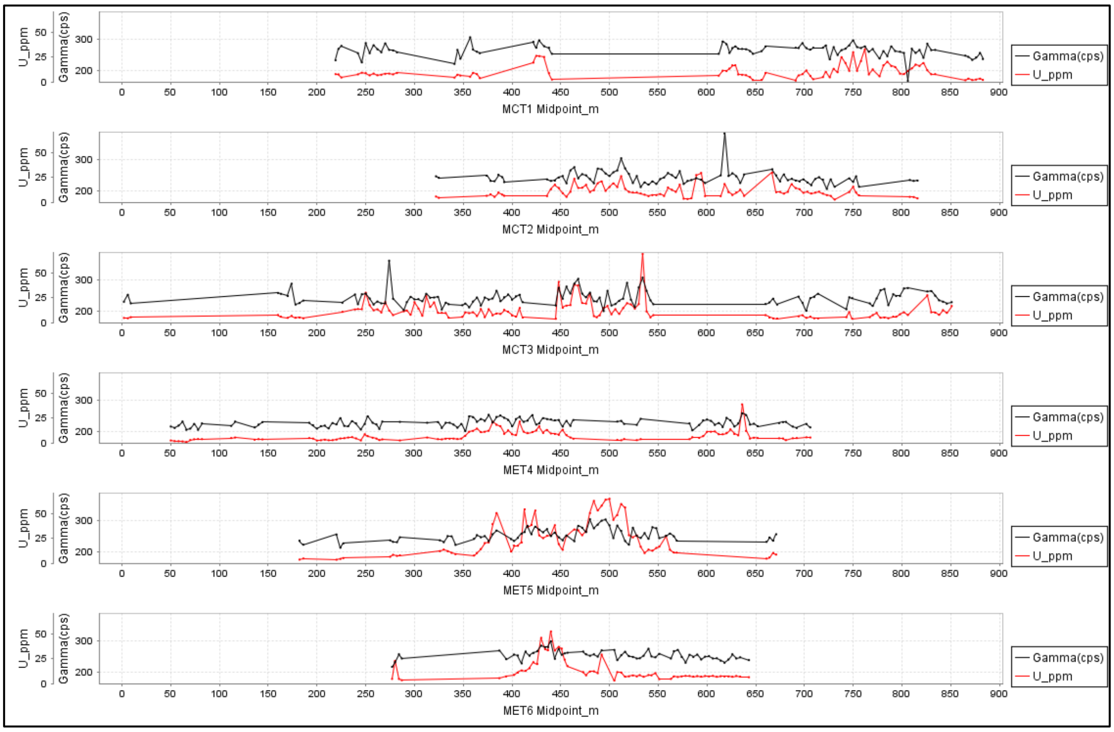


Figure 9-12: Uranium Assay and Sample Total Gamma Readings for 2014 Trenches (0 Metres Represents the Southern End of the Trench)

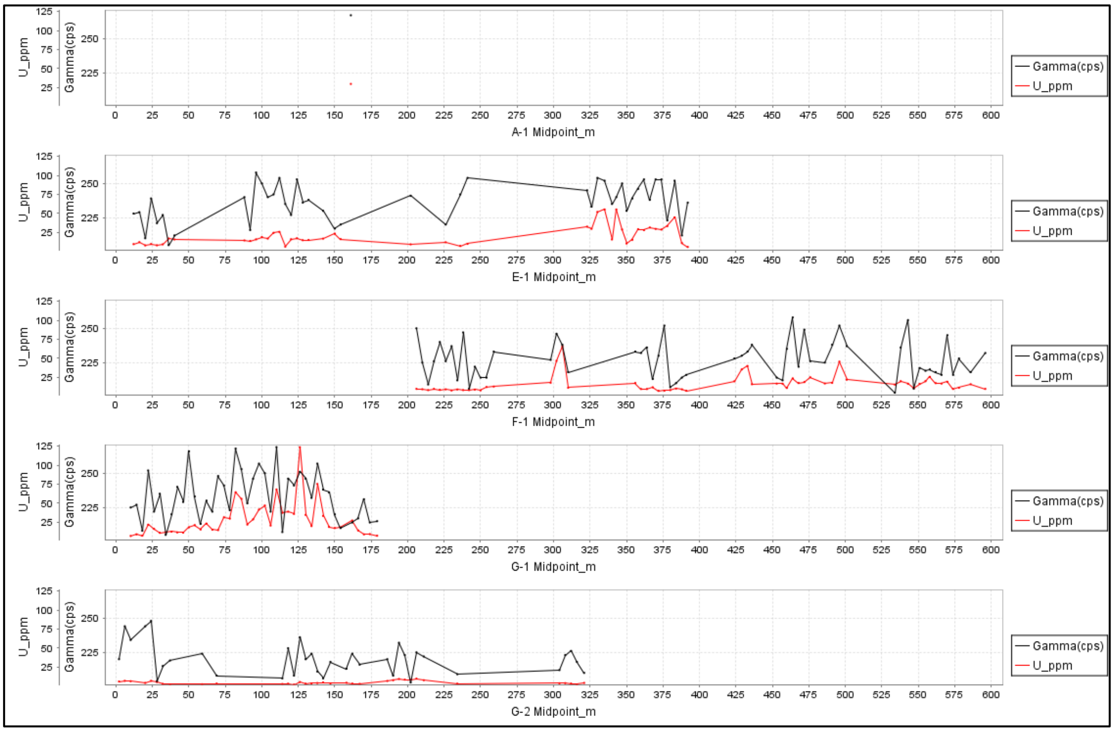


Figure 9-13: Uranium Assay and Sample Total Gamma Readings for 2015 Trenches (A, E, F and G Targets; 0 Metres Represents the Southern End of the Trench)

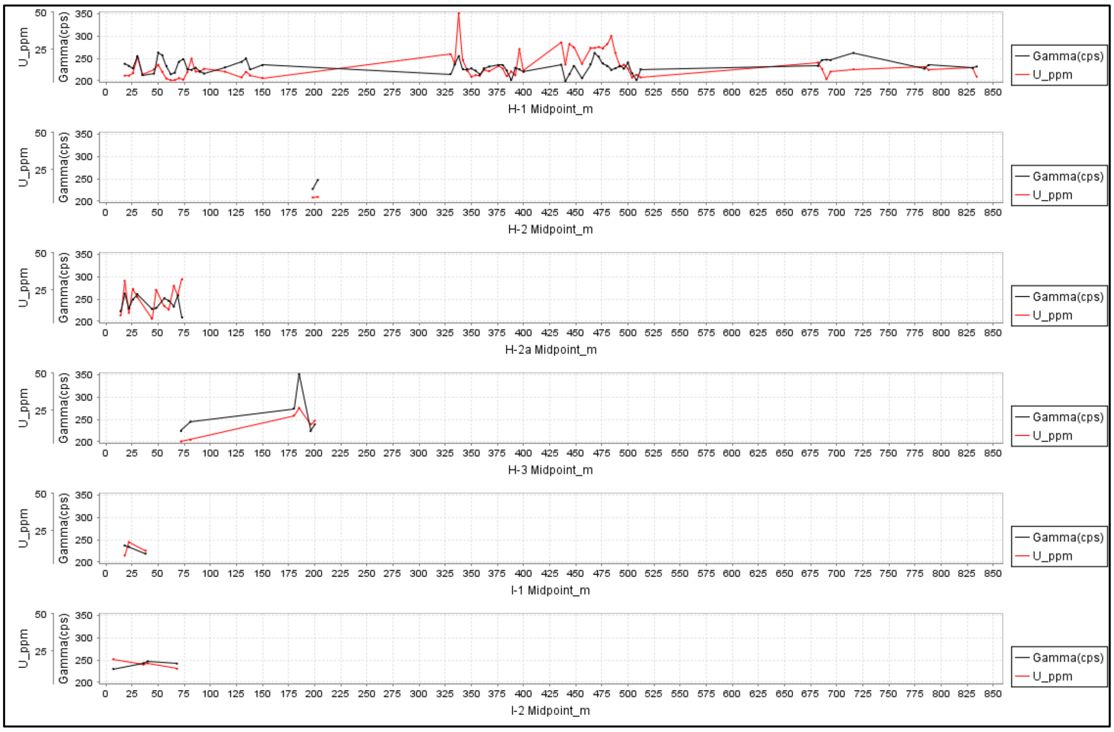


Figure 9-14: Uranium Assay and Sample Total Gamma Readings for 2015 Trenches (H and I Targets; 0 Metres Represents the Southern End of the Trench)

Weak mineralization was encountered in the majority of the trenches and a few distinct mineralized horizons were discovered (Table 9-3 and Figure 9-9 to Figure 9-14). Leaching at the regolith-bedrock interface where trench samples were collected may be the reason higher grades were not encountered.

In 2021, GoviEx drilled 12 vertical DTH holes to a depth of 120 m each over the trenches at Muntanga East (MTD 4,5 and 6), as they are along strike from the Dibbwi East deposit. Unfortunately, the results were disappointing and no uranium was encountered at depth.

The soil and radon anomalies generated from 2015 surveys warrant follow-up, either through additional trenching or percussion drilling. Geological mapping and ground-truthing is recommended prior to trenching or drilling.

Details of all drilling activities are described in Section 10.

9.3 Gwabi and Njame

The earliest known exploration for uranium in the area covering the Gwabi and Njame deposits was conducted by AGIP in the late 1970s to the mid-1980s. AGIP completed a major regional programme of ground radiometric surveying which identified numerous radiometric anomalies in the area along the northern shores of Lake Kariba. A number of these anomalies were evaluated with more detailed ground radiometric surveying and a small number were subsequently tested with rotary percussion drilling, wagon drilling and in some cases with diamond drilling.

AGIP ceased their work in Zambia in 1985, and no further uranium exploration was undertaken in the vicinity of the Gwabi and Njame deposit area until AFR commenced work in 2005.

Albidon (Zambia) Limited acquired the Mugoto PLLS.250 tenement in June 2005 as part of their Munali nickel project tenement holding. The tenement was subsequently transferred to Albidon Exploration Limited in 2006 with Ministerial approval. In October 2005, Albidon Exploration Limited signed a joint venture agreement with AFR under which the latter would explore the eastern part of the Mugoto PLLS for uranium, coal and coal bed methane. This is the area in which both the Gwabi and Njame deposits are located.

AFR undertook a major exploration programme in 2006 to 2007, which included:

- drilling at the Njame deposit which identified additional uranium mineralization to that defined by AGIP;
- an airborne radiometric survey which identified a significant uranium anomaly at Gwabi; this was tested with surface radiometric surveying and soil sampling; and
- subsequent drilling at Gwabi which outlined uranium mineralization.

Through 2008 and 2009, AFR then completed a series of infill drilling programs, comprising reverse circulation ("RC") and diamond drilling ("DDH") to define the extents of both the Njame and Gwabi deposits, as well as tighten the drilling patterns to improve confidence in the geological and Mineral Resource models.

In 2022, Rocketmine from South Africa were contracted to carry out a photogrammetry and LIDAR survey using a drone platform. The areas selected for surveying covered each of the deposit areas at Dibbwi, Dibbwi East-Muntanga, Njame and Gwabi. The LIDAR data have been used in the current MRE to define the ground surface.

10 DRILLING

10.1 Introduction

Drilling at the Dibbwi East, Dibbwi, and Muntanga deposits has been completed in three major phases. Historically, drilling was conducted by AGIP and the Zambian Geological Survey (1973-1984), followed later by OmegaCorp and Denison (2006-2012), and most recently by GoviEx in 2021 and 2022 which was predominately comprised of infill drilling at Dibbwi East and limited confirmation drilling at the Muntanga and Dibbwi deposits.

Drilling at the Gwabi and Njame deposits was managed by AFR and completed between 2006 and 2009. GoviEx conducted limited drilling at Njame and Gwabi in 2022.

Summaries of annual drilling completed on the main deposit areas are provided in Table 10-1 to Table 10-5. A summary of drilling completed on areas adjacent to the main deposits is provided in Table 10-6. Types of drilling techniques used on the Muntanga Project include diamond core drilling ("DD/DDH") and percussion style drilling which includes reverse circulation ("RC"), down-the-hole hammer ("DTH"), air core ("AC"), and percussive wagon drill ("WD").

Table 10-1: Dibbwi East Deposit Drilling Summary

Year	DDH	DDH Metres	Percussion Holes	Percussion Metres
1980	14	3,575	0	0
2008	49	3,602	27	2,009
2011	34	3,842	98	10,438
2012	29	4,151	29	3,792
2021	--	--	49	5,980
2022	35	4,699	158	21,725
Totals	**161**	**19,869**	**361**	**43,944**

Table 10-2: Dibbwi Deposit Drilling Summary

Year	DDH	DDH Metres	Percussion Holes	Percussion Metres
1980	33	3,300	40	5,266
2006	--	--	25	1,362
2007	27	1,682	1	110
2008	140	12,914	114	7,343
2010	9	495	--	--
2012	6	1,101	14	1,681
2022	3	300	--	--
Total	**218**	**19,792**	**194**	**15,762**

Table 10-3: Muntanga Deposit Drilling Summary

Year	DDH	DDH Metres	Percussion Holes	Percussion Metres
1980	47	4,406	180	6,621
2005	7	332	--	--
2006	32	1,788	70	2,052
2007	32	1,897	9	540
2008	207	11,391	263	14,168
2010	6	313	--	--
2012	1	293	2	300
2022	11	610	--	--
Total	**343**	**21,030**	**524**	**23,681**

Table 10-4: Njame Deposit Drilling Summary

Year	DDH	DDH Metres	Percussion Holes	Percussion Metres
2006	--	--	63	2,794
2007	28	1,412	255	14,617
2008	126	6,113	258	14,822
2009	--	--	80	3,540
2022	3	150	--	--
Total	**157**	**7,675**	**656**	**35,773**

Table 10-5: **Gwabe Deposit Drilling Summary**

Year	DDH	DDH Metres	Percussion Holes	Percussion Metres
2007	5	200	226	10,905
2008	34	1,168	54	1,628
2022	3	150	--	--
Total	**42**	**1,518**	**280**	**12,533**

Table 10-6: **Summary of Annual Exploration Drilling Campaigns Conducted in Areas Adjacent to the Main Deposits**

Year	DDH	DDH Metres	Percussion Holes	Percussion Metres
1980	56	5,495	214	14,276
2006	--	--	60	3,679
2008	18	1,352	330	19,924
2009	--	--	59	2,980
2010	--	--	18	775
2011	3	242	11	775
2012	24	2,936	36	4,245
Total	**101**	**10,025**	**728**	**46,654**

10.2 Muntanga, Dibbwi and Dibbwi East Deposits

10.2.1 Historical Drilling

Prior to 2006, AGIP and the Zambian geological survey undertook drilling across the Muntanga and Dibbwi licence areas (circa 1980). Several hundred drill holes were completed and the main known deposits were identified, along with a number of prospects. However, due to insufficient historical records being available to verify the reliability of these data, all drill hole information from the time frame has been excluded from the MRE process.

During the OmegaCorp/Denison tenure (2006 to 2012), RC and DD were the principal methods of exploration and delineation drilling after initial geophysical surveys. Drilling was generally conducted during the dry season. Well-established drilling industry practices were used in the drilling programs. Drill holes were numbered with a prefix of the project (DM), followed by type (C-rotary, D-diamond), followed by the hole number, with almost all drill holes being drilled vertically or at 70 degrees from surface to the target at depth.

In 2006, OmegaCorp drilled DDH to twin previous drilling at the Muntanga deposit. Results confirmed the broad tenor of the earlier mineralized intercepts.

During 2007 to 2008, Denison completed work on the Muntanga deposits, focussing on the Muntanga and Dibbwi areas in particular. The work included an appraisal of all available data (maps, plans, sections, limited geological interpretations, radiometrics, and AGIP historical resource estimates). From this information Denison produced several databases covering Muntanga along with other prospects.

Denison commenced drilling operations on July 16, 2008. The purpose of the drilling program was to:

- Provide first pass exploration data for the radiometric anomalies identified by the 2006 and 2008 airborne geophysics programs, and
- Provide bulk sample material for metallurgical test work.

After a two-year delay due to suspension of exploration activities, a two-phase drilling campaign resumed in April, 2011. Phase 1 drilling on Dibbwi East and Muntanga targets commenced in April and ended in July 2011. The results for Phase 1 confirmed the continuity of uranium mineralization identified in the 2008 drilling program at Dibbwi East, with a northeast-southwest strike length greater than 2.5 km.

Based on the encouraging results obtained with the Phase 1 drilling over the Dibbwi East area, a Phase 2 drilling program was completed between August-October 2011. This drilling program discovered primary mineralization at depth and also increased the strike length to 4.0 km.

In 2012, the primary targets for drilling were the Dibbwi East, Dibbwi and Muntanga deposit areas, to further delineate and infill within the deposit footprints.

The locations of historical drill holes completed between 1980 and 2012 across the Muntanga and Dibbwi licence areas are shown on Figure 10-1.

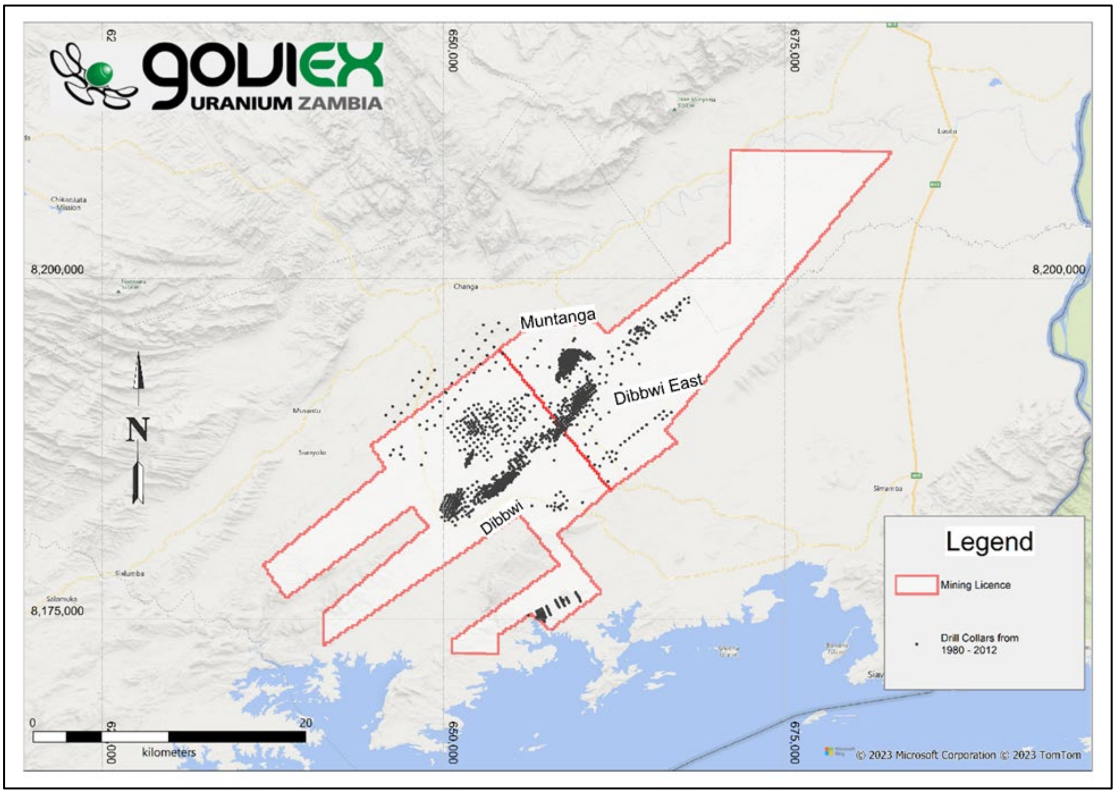


Figure 10-1: Historical Drill Hole Location Map

10.2.2 GoviEx Drilling

During the 2021-2022 drilling campaigns, GoviEx carried out drilling mostly on the Dibbwi East deposit with the purpose of infilling the existing drill pattern to a 100 m line spacing with drill holes at 50 m between holes. Selected areas were drilled at a closer spacing of 25x25 m to assess the continuity of mineralization for mineral resource estimation purposes. Most of these drill holes were drilled using an open hole DTH method as it is a cost effective and quick drilling technique. All uranium grade data for DTH holes were determined using downhole gamma probe. DDH made up approximately 10% of the total drilling meterage, with a number of holes drilled to collect metallurgical samples, and others drilled for the purpose of twinning historical holes for data validation purposes. DDH were drilled on all deposits by GoviEx during the 2021 and 2022 drilling campaigns.

Drill holes completed by GoviEx during the 2021-2022 campaigns are shown on Figure 10-2 to Figure 10-4.

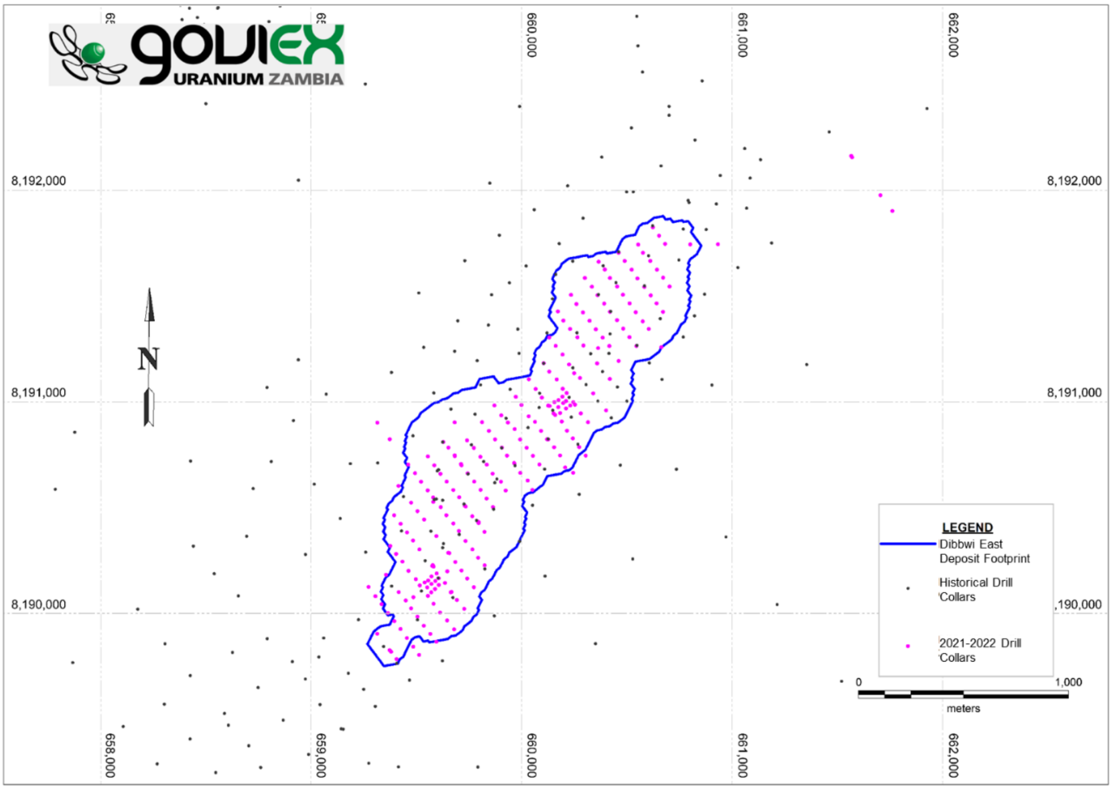


Figure 10-2: GoviEx Drill Hole Location Map for Dibbwi East

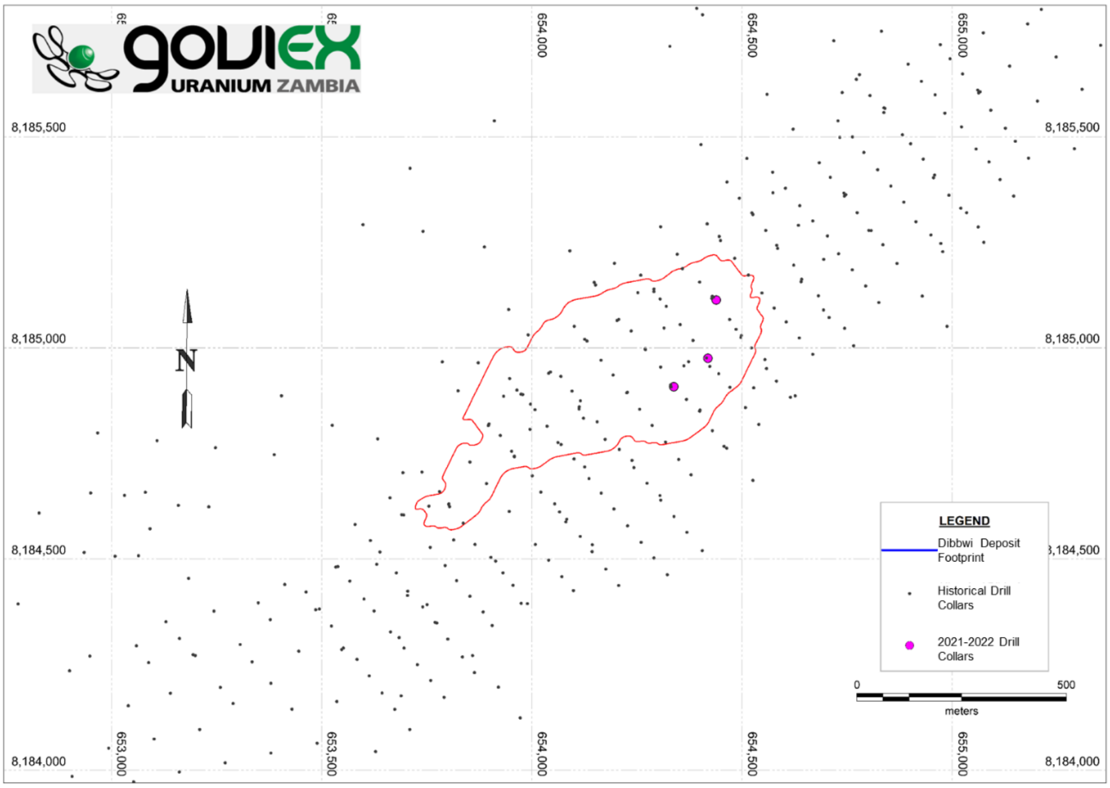


Figure 10-3: GoviEx Drill Hole Location Map for Dibbwi

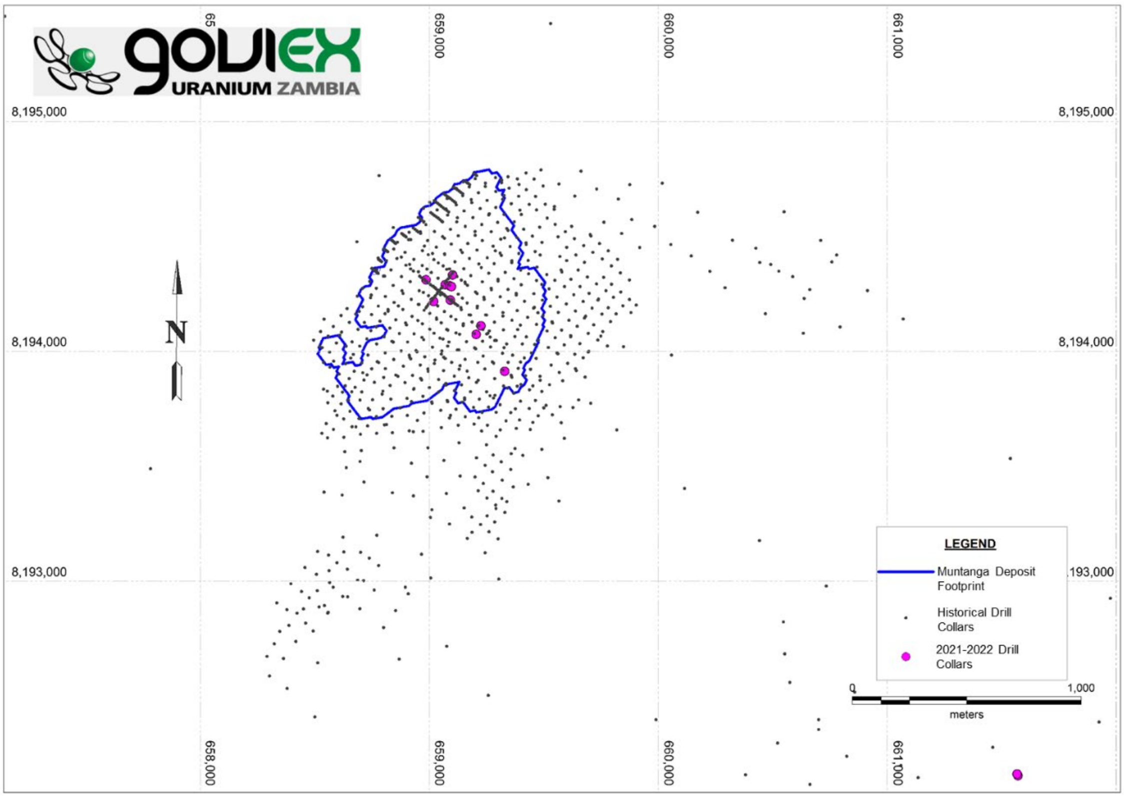


Figure 10-4: GoviEx Drill Hole Location Map for Muntanga

10.2.3 Down-hole Deviation Surveys

Historically, all holes were drilled vertically and no down-hole survey data are available for historic drilling prior to the 2006 OmegaCorp drilling campaigns. However, the amount of deviation is considered to be negligible as holes were relatively shallow, with depths averaging 40 m and ranging from 10 to 110 m; and stratigraphic bedding is relatively flat and rock competency low.

OmegaCorp drilling in 2006 and Denison's 2007-2012 drilling campaign consisted of DDH and RC drilling, predominately drilled vertically, along with some inclined holes. Limited checks on hole deviation demonstrated deviations of less than 2 degrees. All DDH were drilled at angles ranging from 55 to 80 degrees, and at a number of azimuths although dominantly towards 135 or 315 degrees. Down-hole survey measurements were taken using a single shot camera at 15 m down-hole intervals.

During the 2021 and 2022 GoviEx drilling campaigns, down-hole deviation surveys were conducted using a Boart Longyear Trushot digital survey tool. Deviation survey measurements were done at 5 to 10 m interval spacing depending on the total depth of hole.

Core orientation was conducted using a Boart Longyear Trucore UPIC orientation tool and down-hole spear. Orientation of drill core was completed on every drill run for the DDH.

10.2.4 Logging and Sampling

In general, the core logging and sampling methodologies used by GoviEx closely follow the practises used by Denison, with only minor changes to how data are collected and stored.

Scintillometer Logging

All drill core and chips were systematically logged with a Terraplus RS-125 Gamma-Ray Spectrometer/Scintillometer. The general concept behind the scintillometer is similar to the gamma probe except the radiometric pulses are displayed on a scale and the respective count rates are recorded manually by the technician logging the core or chips. The hand-held scintillometer provides a qualitative measurement of uranium mineralization only and cannot be used to calculate equivalent uranium grades. However, it does allow the geologist to identify uranium mineralization in the core and to select intervals for geochemical sampling. The scintillometer readings are also used by the geologists to depth match the core depth with the geophysical depths, to ensure alignment between assay grades and geophysical derived equivalent grades.

RC/DTH Logging and Sampling

Drill chip samples from RC and DTH drilling were laid out in piles next to the rigs for geological logging. They were logged for lithology, grain size, alteration, and colour. Representative samples were collected in chip trays for eventual relogging if required and storage at the Muntanga Camp core yard.

During Denison's tenure, all percussion chips were collected via a cyclone and split on site at the time of drilling. The cuttings for each metre were put through a riffle splitter to give an approximate 1.5 kg primary sample, an approximate 1.5 kg field duplicate and, depending on the hammer size, a residual bulk sample of approximately 15-20 kg. Approximately 10% of anomalous intercepts (more than twice background level of Counts Per Second as determined by a handheld scintillometer) in RC holes were selected for assay during 2012.

During the 2005-2007 drilling, approximately 1.5 kg primary samples representing anomalous intervals of RC holes that collapsed before they could be probed were also sent for pressed powder XRF analysis.

In 2021 and 2022, no samples were collected from the DTH drilling as this drilling technique is an open-hole technique and therefore does not provide appropriate representative sample material for assaying.

During the 2021 and 2022 campaigns, GoviEx used a similar logging format to that used by Denison, however Seequent's MX Deposit logging application was used for data entry in the field using tablets. This application stores the data in the Cloud such that it is readily accessible anywhere in the world. The data are regularly backed up onto the company's Cloud server.

Core Logging and Sampling

All DDH were logged for lithology, structure, alteration, mineralization and geotechnical characteristics. In 2009, data were entered into DHLogger software on laptops in the field and then transferred into a Fusion database. Hard copies of drill logs are stored at site.

Prior to core logging, down-hole geophysical probe information is reviewed, with the major lithological contacts, structures and mineralized horizons being inferred from the Gamma and conductivity readings. These inferences are then reviewed alongside the core.

Core is then measured and metre marked, and the core yard technician records core recovery, longest piece and scintillometer readings.

Once core is marked-up, a geologist records the following information directly into DHLogger:

Lithology (major and minor):

- Escarpment Grit Formation Package C → B boundary
- Escarpment Grit Formation Package B → A boundary
- Escarpment Grit Formation Package A → Madumabisa Mudstone boundary
- Correlation in the mudstone boundaries (in accordance with cross section information)
- Other significant, unusual or potential correlation lithologies

Alteration:

- Identify zones of limonite, hematite and goethite by colour

Structure:

- Alpha angles; Most core is too broken to permit orientation marks and lines so the collection of beta angles (i.e. angle of rotation against a line running down the bottom of the hole) is difficult – or not possible. Thus, record the alpha angles, i.e. the angle to the long core axis. Try to record at least one bedding plane per tray – as well as every measurable contact between the key lithologies.

Faults (other significant, unusual or potentially correlation in structures):

- Mineralization (in conjunction with WellCAD and Gamlog data)
- Confirm/refute high grade zones (i.e. +700 cps) as indicated by the scint data

- Attempt to identify uranium mineral species and habit
- Any other information or comments
- Core is then photographed wet and dry before being stacked in the core storage area.

At GoviEx in 2021 and 2022, the DDH core data were collected using tablets and the Seequent MX Deposit Application, with data stored directly to the Cloud. Local back up and back up to the company's Cloud server was also carried out on a regular basis. Most of the core mark-ups and photography is done on the drill pad, so that the quality of the core is not lost during transport to the core farm. The core is then logged geologically using the descriptions outlined above. The core is then marked-up for sampling.

10.2.5 Down-Hole Geophysical Logging

Exploration for uranium deposits in Zambia typically involves identification and testing of sandstones within reduced sedimentary sequences. The primary method of collecting information is through extensive drilling (both RC and DDH) and the use of down-hole geophysical probes. The down-hole geophysical probes measure the electrical properties of the rock from which lithologic information can be derived and natural gamma radiation, from which an indirect estimate of uranium content can be made. The down-hole geophysical probes measure the following parameters:

Conductivity

Conductivity logs measure the electrical conductivity of the soils or rock surrounding the borehole. They provide a detailed measure of changes in conductivity with depth, and are also termed electromagnetic *induction* (EM) logs. The electrical conductivity of soil or rock (and its reciprocal, electrical resistivity) depends on the porosity, groundwater conductivity, degree of saturation, clay content, and other bulk soil properties. Hence it is a useful tool in determining the changes with depth of any of these properties. These logs can be very useful in identifying zones of increased groundwater conductivity, often indicative of contaminant concentrations.

Resistivity

Resistivity logging is a method of characterizing the rock or sediment in a borehole by measuring its electrical resistivity. Resistivity is a fundamental material property which represents how strongly a material opposes the flow of electric current.

Self Potential

The self potential (SP) log is a measurement taken to characterize rock formation properties and is particularly useful in mapping sand/shale contacts. The log works by measuring small electric potentials (measured in millivolts) between depths in the borehole and a grounded voltage at the surface resulting from the flow of electrical current in the earth. The change in voltage through the well bore is caused by a buildup of charge on the well bore walls. Clays and shales (which are composed predominantly of clays) will generate one charge and permeable formations such as sandstone will generate an opposite one. There are many possible sources of these currents; the major source is the different salinity interfaces, such as the borehole fluid (drilling mud) and the formation water (connate water). Whether the mud contains relatively more or less salt compared to the connate water will determine which way the SP curve will go. SP cannot be used for quantitative interpretation.

SPR (Single Point Resistance)

SPR measures the electrical resistance (ohms) between a surface electrode and electrode in the down-hole probe. Single-point-resistance logs record the electrical resistance between the borehole and an electrical ground at land surface. In general, resistance increases with grain size and decreases with borehole diameter, density of water-bearing fractures, and increasing dissolved-solids concentration of borehole fluid. A fluid-filled borehole is required for single-point-resistance logs. SPR logs cannot be used for quantitative interpretation but are an excellent source of lithologic information.

Deviation

Deviation is a measurement made to determine the angle from which a hole drilled deviated from vertical during drilling. There are two basic deviation survey, or drift survey, instruments: one reveals the angle of deviation only, and the other indicates both the angle and direction of deviation.

Natural Gamma

The radiometric (gamma) probe measures gamma radiation which is emitted during the natural radioactive decay of uranium (U) and variations in the natural radioactivity originating from changes in concentrations of the trace element of thorium (Th), as well as changes in concentration of the major rock-forming element potassium (K).

Potassium decays into two stable isotopes (argon and calcium) which are no longer radioactive and emits gamma rays with energies of 1.46 MeV. Uranium and thorium, however, decay into daughter-products which are unstable (i.e. radioactive). The decay of uranium forms a series of about a dozen radioactive elements in nature which finally decay to a stable isotope of lead. The decay of thorium forms a similar series of radioelements. As each radioelement in the series decays, it is accompanied by emissions of alpha or beta particles or gamma rays. The gamma rays have specific energies associated with the decaying radionuclide. The most prominent of the gamma rays in the uranium series originates from decay of 214Bi (bismuth), and in the thorium series from decay of 208Tl (thallium).

The gamma radiation is detected by a sodium iodide crystal, which when struck by a gamma ray emits a pulse of light. This pulse of light is amplified by a photomultiplier tube, which outputs a current pulse which is known as “counts per second” or “cps”. The gamma probe is lowered to the bottom of a drill hole and data are recorded as the tool is withdrawn up the hole. The current pulse is carried up a conductive cable and processed by a logging system computer which stores the raw gamma cps data.

Since the concentrations of these naturally occurring radioelements vary between different rock types, natural gamma-ray logging provides an important tool for lithologic mapping and stratigraphic correlation. For example, in sedimentary rocks, sandstones can be easily distinguished from shales due to the low potassium content of the sandstones compared to the shales. However, the greatest value of the gamma ray log in uranium exploration is determining equivalent uranium grade.

Because there should be an equilibrium relationship between the daughter product and parent, it is possible to compute the quantity (concentration) of parent uranium (238U) and thorium (232Th) in the decay series by counting gamma rays from 214Bi and 208Tl respectively. If the gamma radiation emitted by the daughter products of uranium is in balance with the actual uranium content of the measured interval, then uranium grade can be calculated solely from the gamma intensity measurement.

Down-hole gamma data (measured in counts per second or “cps”) is subjected to a complex set of mathematical equations, considering the specific parameters of the probe used, speed of logging, size of bore hole, drilling fluids and presence or absence of and type of drill hole casing. The result is an indirect measurement of uranium content within the sphere of measurement of the gamma detector.

The basis of the indirect uranium grade calculation (referred to as "eU_3O_8" for "equivalent U_3O_8") is the sensitivity of the detector used in the probe which is the ratio of cps to known uranium grade and is referred to as the probe calibration factor. Each detector’s sensitivity is measured when it is first manufactured and is also periodically checked throughout the operating life of each probe against a known set of standards "test pits" with various known grades of uranium mineralization or through empirical calculations. In addition, certain boreholes (MTC51600-04) near the Dibbwi East deposit are cased and the probes are periodically checked for any instrument drift. Application of the calibration factor, along with other probe correction factors, allows for immediate grade estimation in the field as each drill hole is logged.

Denison Gamma Grade Determination (CPS to Equivalent U_3O_8 Grade Conversion)

Denison used an in-house developed computer program known as GAMLOG to convert the measured cps of the gamma rays into an equivalent percent U_3O_8 (eU_3O_8 %). GAMLOG was based on other “standard” grade calculation programs that were developed within the uranium industry using the Scott’s Algorithm developed in 1962.

GoviEx Gamma Grade Determination (CPS to Equivalent U_3O_8 Grade Conversion)

Down-hole gamma data collected by GoviEx were converted into eU_3O_8 using the ALT Wellcad software by external geophysical contractor, Terratec Geophysical Services. The final data were transferred to GoviEx as .csv format files for input into the master drill hole database maintained by GoviEx.

10.2.6 Drill Collar Survey

All historical data collected prior to 2006 were collected using the UTM Coordinate: Arc 1950 Map Datum, Zone 35S. Drill collar surveys were completed by Datum Surveying Consultants, from Lusaka, Zambia, using a high precision GPS system.

Post 2006, drill collar locations were spotted on a grid and surveyed by differential base station GPS using the WGS84 UTM zone 35S reference datum. Drilling was conducted on a nominal drill hole grid spacing of 200 m northeast-southwest by 100 m northwest-southeast. Drill collar elevations were estimated by the Denison DGPS system, which was on average approximately 8 m lower than the previously used elevation datum for historical holes drilled in the 1980’s. As a result, all historical data had been adjusted in elevation to fit the Denison elevation datum at that time.

The base station control points established by Denison and used for drill collar surveys are provided in Table 10-7.

Table 10-7: Differential GPS Base Station Control Points

Base Station ID	Easting	Northing	Height	Location
DM1	659,694.46	8,194,890.19	613.38	Muntanga Camp
DM2	659,634.44	8,194,801.19	606.79	Muntanga Camp
DM3	653,849.15	8,185,116.71	601.69	Dibbwi Camp
DM4	653,850.01	8,185,238.42	611.42	Dibbwi Deposit

For the 2021 and 2022 drilling campaigns completed by GoviEx, all drill collar locations were initially spotted using a handheld GPS and final collar surveys were performed by professional surveyors (Benchmark Geospatial Engineering Consultants) using DGPS systems using the WGS84 UTM Zone 35S reference datum. Base stations listed in Table 10-7 were used as control points for the 2021 and 2022 final surveys. Check surveys of historical collar locations were also performed during the 2021 and 2022 final surveys on all deposits.

10.3 Njame and Gwabi Deposits

10.3.1 Drilling

Drilling was carried out by a combination of DDH, RC and AC techniques. The AC method was only used at the early-stage exploration at Njame in 2006, and all subsequent drilling at the Njame and Gwabi deposits was completed by RC and DDH techniques. Figure 10-5 provides a drill hole location map for the Njame and Gwabi deposit areas.

The RC drilling technique was the primary method for obtaining suitable samples for Mineral Resource estimation at these deposits and was carried out along drill lines spaced between 25 and 50 m apart along prospective anomalies. All RC drilling at Njame and Gwabi was completed by Capital Drilling (Zambia) Limited using rig types typically similar to Schramm 450, medium sized truck mounted rigs with air capability of 1100 cfm/350 psi. All RC drilling was completed with a 5” face hammer.

The majority of the DDH drilling was completed in 2008 and was carried out by Capital Drilling (Zambia) Limited. A truck mounted LF-90 (Rig31) and a track mounted LF-90 (Rig26) rig were used. All DDH were completed using PQ and NQ wireline tools.

Collar positions for all holes were initially established using handheld GPS. Drill sites and access were cleared using a bulldozer when required and the drill position was re-marked using handheld GPS. Upon hole completion, each drill hole was left with a PVC collar tube cut at ground level. The collar coordinates were re-checked using handheld GPS. Subsequently, most drillhole collars were surveyed with a DGPS by a professional surveyor (Chris Kirchhoff) and Lusaka based Rankin Engineering.

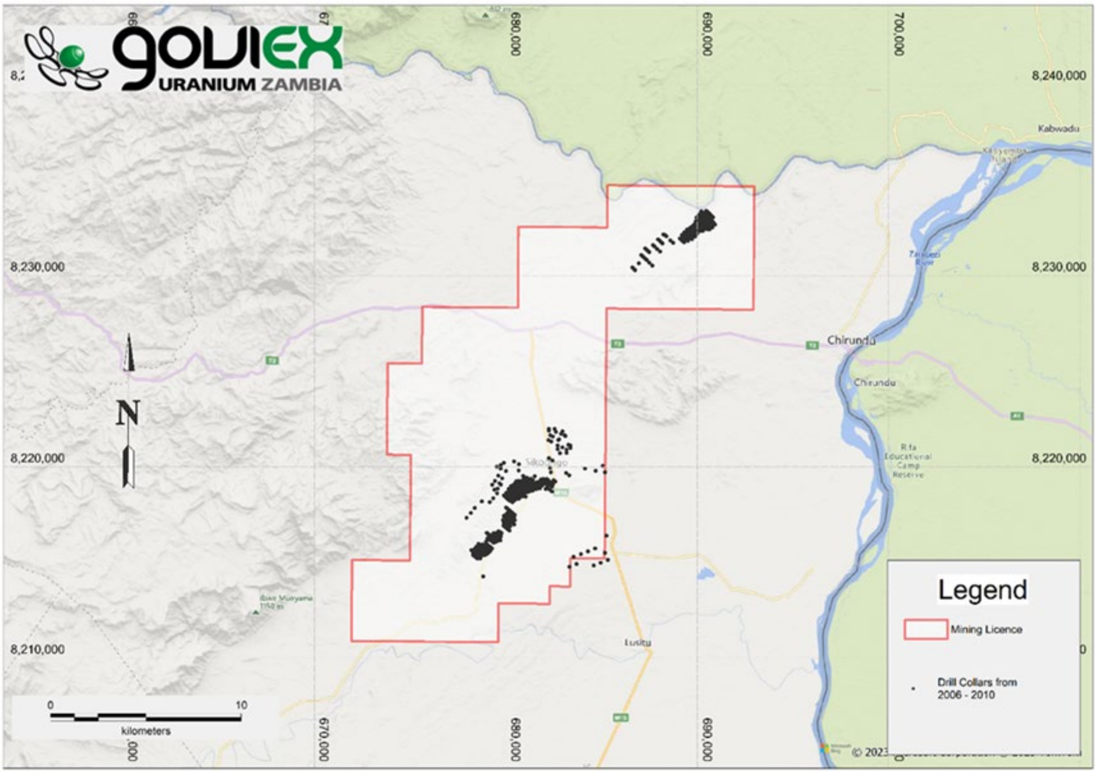


Figure 10-5: Drill Hole Location Map for the Njame and Gwabi Deposits

10.3.2 Logging and Sampling

AFR used well-documented procedures for RC and DDH sample logging. In general, RC chips were logged immediately after drilling whereas core was logged after being carefully joined up and marked on a V-trough. Information recorded included lithological, structural, geotechnical, weathering/oxidation and mineralogical logs. For cored holes, the mineralized zones of each were selected at the discretion of the logging geologist.

The RC samples were collected as follows:

- RC drill chips were collected at 1 m intervals down-hole using a cyclone into PVC bags prior to splitting.
- The collected samples were riffle split using multiple passes through a single stage riffle splitter; a final sample of approximately 2 kg was collected for submission to the laboratory for analysis.
- In wet holes, the samples were left to dry as best possible, and then homogenized and quartered by hand.

RC chip trays were systematically logged by collecting the sieved RC chips and storing them in a tray, with each labelled compartment of the tray containing the chips from 1 m.

The DDH sampling methodology was as follows:

- Sampling was preceded by radiometric scanning of the core whilst on the V-frame. Scanning was carried out using either a RS-125 spectrometer or an Exploranium GR-110G handheld scintillometer. Care was taken to ensure minimum influence from any possible source of ionizing radiation, thus scanning of the core on the V-trough was carried out at a minimum distance from any suspected ionizing radiation source.

- The maximum sample length was 1 m and the minimum sample length was 0.25 m.
- The total width of the sampled zone extended 2 m above and below the mineralized zone as determined by the scintillometer readings.
- The other guiding factor to sampling besides the scintillometer readings was the lithology. Sampling across lithologies was avoided where possible.
- NQ core was sampled using half-core samples, while PQ core was sampled using a core saw taking a 25 mm wide ‘fillet’ from the core width.
- The drill core was sampled by trained and supervised technicians. Each sample was taken from the left-hand half of each piece of core for that metre (leaving the half with the orientation line and/or metre marks in the tray) and placed into an appropriate sample bag.
- Calico sample bags with drawstrings were used for core sampling. Sample tickets were used in the sampling process with one half (identical halves) of each ticket, which had a printed sequence of sample numbers (six figures), placed in the calico sampling bag.
- The sample tickets were annotated with the drill hole number and the sample interval. As part of the quality control protocols, the technician verified that the metre interval marked on the core matched the metre interval written on the sample ticket, and also matched the metre interval on the sample form. The technician also verified that the corresponding sample number on the sample form, for that interval, matched the sample number of the sample ticket, and also matched the sample number written on the sample bag.

10.3.3 GoviEx Drilling

GoviEx completed three drill holes on each of the Njame and Gwabi deposits in 2022 for the purposes of data confirmation and geometallurgical sampling. The locations of these holes are provided in Figure 10-6 and Figure 10-7. Logging and sampling procedures used for these holes are consistent with the procedures used for drilling completed on the Muntanga, Dibbwi and Dibbwi East deposit drilling campaigns.

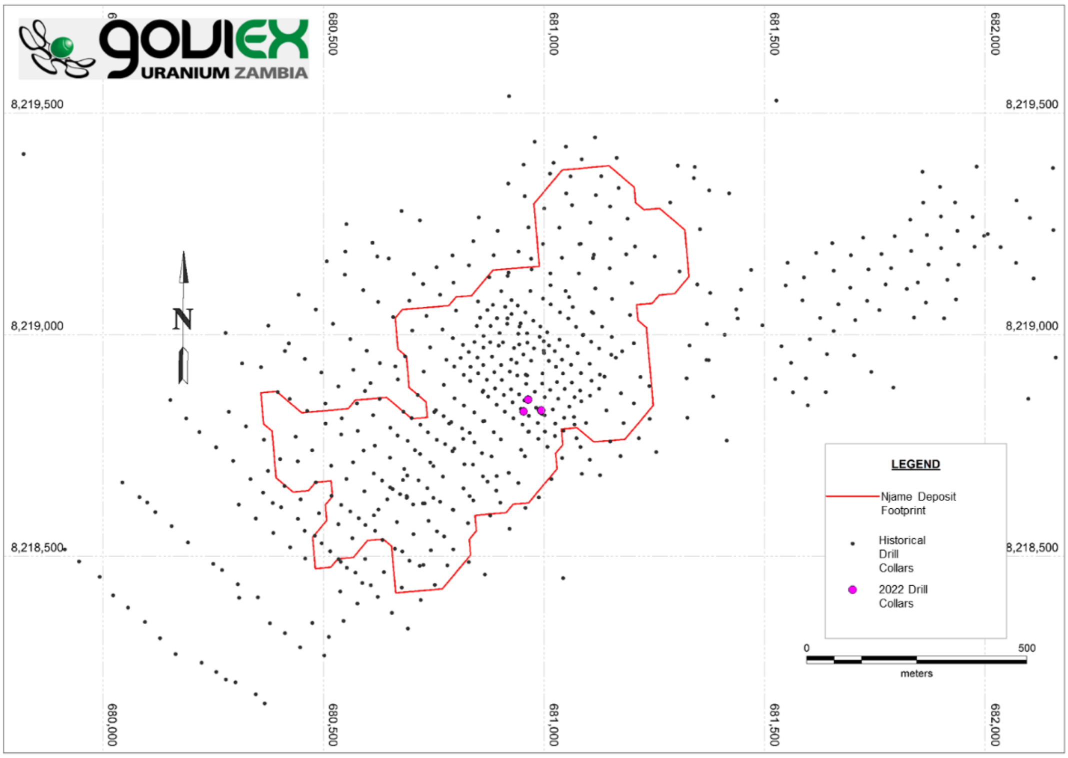


Figure 10-6: GoviEx Drill Hole Location Map for Njame

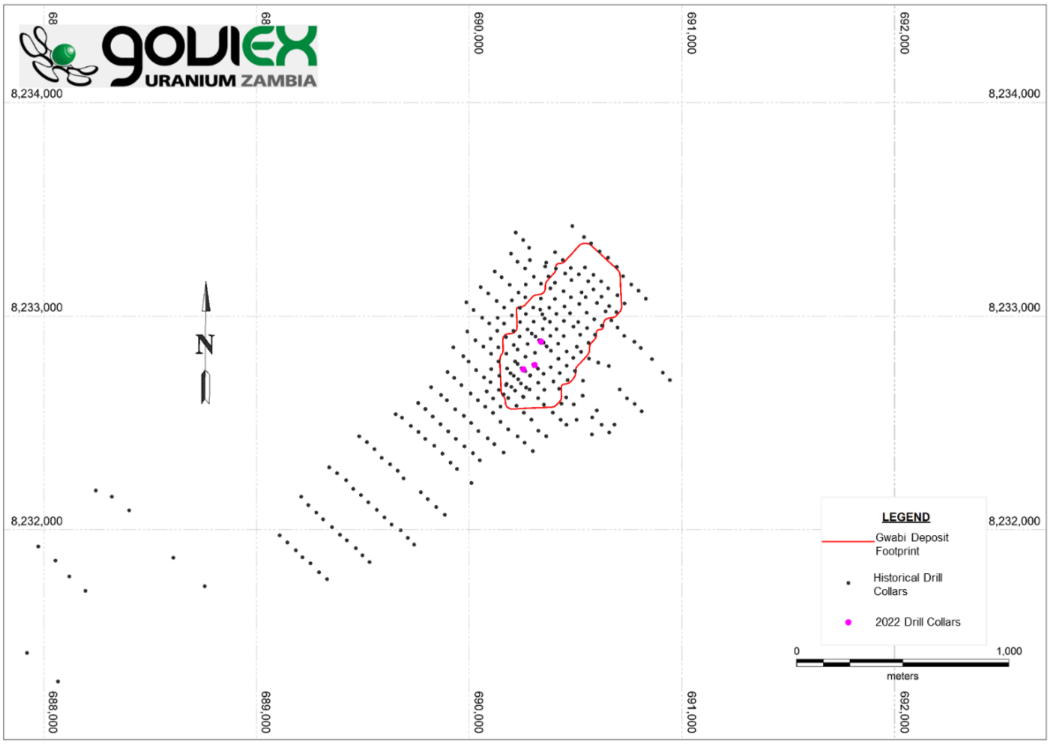


Figure 10-7: GoviEx Drill Hole Location Map for Gwabi

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Historical Sample Preparation, Analysis and Security for the Muntanga, Dibbwi and Dibbwi East Deposits

Records and details for drilling conducted on the Muntanga, Dibbwi and Dibbwi East deposits prior to 2006 (circa 1980) are not available to allow sufficient verification of data collected during this timeframe. Therefore, all drilling prior to 2006 has been excluded from the MRE process. The description of sample preparation, analysis and security for programs completed between 2006 and 2012 is taken from the Muntanga Project September 12, 2013, NI 43-101 technical report (CSA, 2013).

11.1.1 Sample Preparation, Dispatch and Security

Drilling conducted by OmegaCorp (2006) and Denison (2007 to 2012) included both percussion and diamond drilling. Drill core and/or chips were photographed, logged, marked for sampling, split, bagged, and sealed for shipment at their field logging facility.

From 2006 to 2008, the samples were transported in a dedicated truck from Zambia to Johannesburg, South Africa where Genalysis Laboratory Services (Genalysis) operates a dedicated sample preparation facility. Sample preparation was carried out via a process of drying, crushing and milling of RC and diamond core samples. Crushers were cleaned with a silica rock (waste rock) after every sample. Milling was done in a ring and puck pulveriser and contamination was avoided by cleaning with compressed air and silica rock (waste rock) after every sample. With every batch of 40 samples one waste rock blank was assayed, to monitor contamination. Following sample preparation, the assay pulps were forwarded by Genalysis to its Perth, Australia assay laboratory where the samples were held in secure, quarantined storage.

From 2009 to 2012, sample preparation was undertaken at ALS Chemex in Johannesburg. Received sample information was verified by ALS personnel and logged in the ALS tracking system; a sample receipt and sample list were generated and sent to the appropriate authorized Denison personnel. Sample preparation consisted of weighing and drying of each sample, followed by fine crushing of the entire sample to 70% passing -2 mm. A 250 g split was collected from each sample and pulverized to 85% passing 75 microns for analysis.

11.1.2 Laboratory Analysis Procedures

From 2006 to 2008, assay pulps were sent to Perth, Australia for analysis at Genalysis' laboratory by pressed powder XRF methods. Genalysis is an accredited NATA (National Association of Testing Authorities, Australia) laboratory (Number 3244). Genalysis has been approved by AQIS (Australian Quarantine and Inspection Service) for the receipt and treatment of samples from interstate and overseas. Genalysis is an Associate Member of the Association of Mining and Exploration Companies Inc. and a Member of the Standards Association of Australia.

Between 2009 and 2012, sample analysis was undertaken at ALS Minerals in Johannesburg, South Africa, using a combination of pressed powder XRF methods including ME-XRF05 and ME-XRF10.

Access to the assay laboratories premises was restricted by an electronic security system and sample results were stored using encryption and password protection.

11.1.3 Assay QA/QC 2006 to 2008

From 2006 to 2008, a total of 91 samples underwent assaying at SGS for QA/QC analysis. These were submitted as two sample batches for analysis in May 2008 from the 2007-2008 drilling campaign. They included field duplicates, field standards, field blanks and laboratory standards.

Table 11-1 summarises the numbers of samples submitted and their proportion as percentages and ratios of the total number of assays submitted.

Table 11-1: QA/QC Sample Summary

QA/QC Sample/Assay Type	Number of Samples*	% of Total Samples	Ratio
SGS Standard Samples	7	0.53%	1:190
Omega Standard Samples	19	1.43%	1:88
Omega Blank Samples	38	2.86%	1:35
Omega Field Duplicate Samples	27	2.03%	1:50

**QA/QC conducted on holes drilled in 2007-2008. Total number of samples from 2007-2008 drill holes was 1,327.*

Field Duplicates

There is a reasonable correlation between primary samples and their duplicates submitted by Denison as shown in Figure 11-1. There is a general trend towards the under reporting of duplicates relative to their primary value as can be seen from where the points plot relative to the x=y line. However, 93% of duplicate samples submitted were below 100 ppm U_3O_8 and therefore, moderate and higher grades are not well represented.

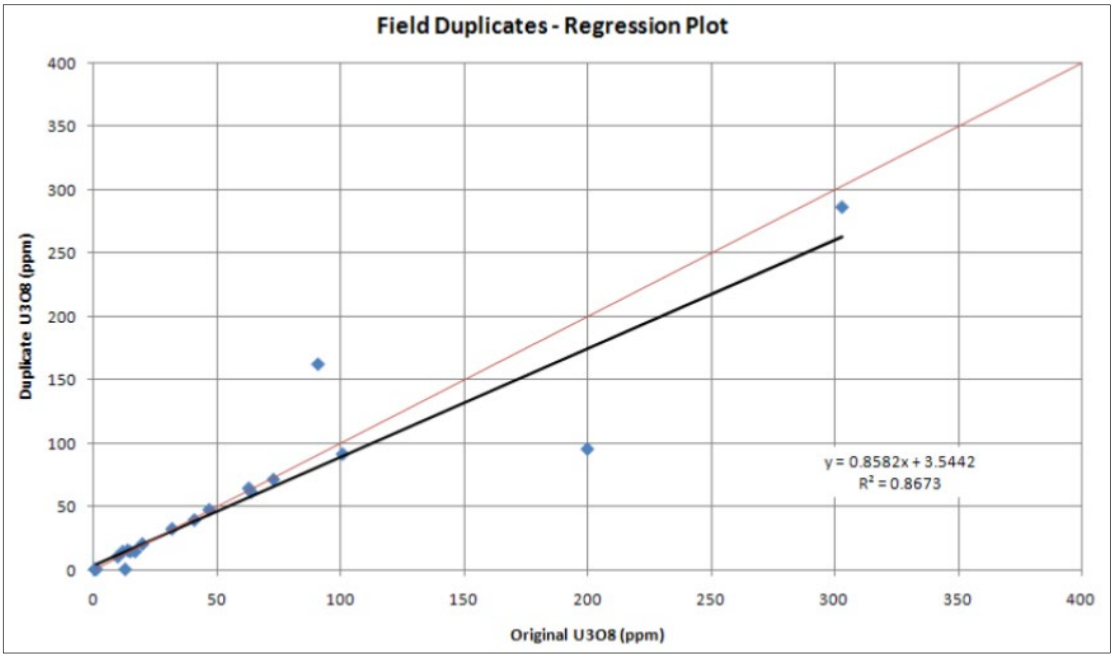


Figure 11-1: Field Duplicate Scatter Plot

It should be noted that the duplicate dataset contains few samples and as such, conclusions from statistical comparison are somewhat limited. In general, there appears to be no significant issues with duplicate repeatability. However, it was highly recommended that in future drilling campaigns the assay QA/QC database be significantly increased to a ratio of 1:20 rather than 1:50, and that QA/QC samples are selected to be representative of the grade distribution at each mineral deposit and that sampled material is spatially representative.

Field Standards

Four field standards (low grade, medium grade, high grade and very high grade) were submitted to SGS for analysis as part of samples batches submitted in May 2008 from the 2007-2008 drilling, to assess the level of confidence that could be applied to returned assay data from samples submitted. These were certified reference materials (CRM) of which expected values and 95% confidence limits (low, high) are listed in Table 11-2.

Table 11-2: List of Field Standards with Expected Values (U) and Action Limits

Name of Standard	Number of Samples	Expected Value (ppm)	Upper Action (ppm)	Lower Action (ppm)	Data	
					Between Action Limits	Beyond Action Limits
UREM 3	5	439	455	423	40%	60%
UREM 4	4	100	115	85	100%	0%
UREM 5	5	775	792	756	0%	100%
UREM 6	5	1,887	1,925	1,867	0%	100%
Total	**19**				**32%**	**68%**

UREM 3/SARM 23 is a moderate grade standard (expected value 439 ppm). The results of analysis suggested a trend towards over reporting of this standard. All five samples reported over the expected value, with three outside of the action limits.

UREM 4/SARM 24 is a low grade standard (expected value 100 ppm). Four samples were submitted and all performed well, returning values within the action limits close to the expected value. This is the grade range for which most duplicates were submitted.

UREM 5/SARM 25 is a moderate to high grade standard with an expected value of 775 ppm. Five samples were submitted and all were above the 95 % upper action limit, returning values that were on average 10% above the certified value.

UREM 6/SARM 26 (expected value 1,887 ppm) also performed poorly. Five samples of this standard were submitted and four over reported above the 95 % upper action limit and one under reported significantly by over 10 %.

Control plots were plotted against Batch ID and over time. In cases where cyclical patterns of assay results against time can be seen in the control plots for standards, it can commonly be attributed to analytical drift, where assays report closer to their expected values when the analytical equipment is re-calibrated and drift further from their true values between calibrations. However, without direct consultation with the laboratory addressing the reasons for cyclicity, this cannot be confirmed.

Table 11-3: List of Laboratory Standards with Expected Values (U) and Action Limits

Name of Standard	Number of Samples	Expected Value (ppm)	Upper Action (ppm)	Lower Action (ppm)	Data	
					Between Action Limits	Beyond Action Limits
UREM 3	2	439	455	423	0%	100%
UREM 4	2	100	115	85	50%	50%
UREM 5	2	775	792	756	0%	100%
UREM 6	1	1,887	1,925	1,867	0%	100%
Total	**7**				**10%**	**90%**

QA/QC Conclusions and Actions

Conclusions from the assay QA/QC analysis of the 2007-2008 drilling campaign were:

- The limited number of blanks submitted by Denison all performed well with all samples reporting below detection. This suggests that field sampling methods and contamination-limiting procedures at SGS were adequate.
- Results from the submission of external field standards were mixed. However, due to the limited number of samples submitted, future programs should aim to increase this number and to closely monitor the results.
- Results from internal standards (UREM standards) were poor overall. Six out of seven standards reported within ±10% of their certified values, but the average percentage error was 11% outside the expected value.
- Ongoing monitoring of internal laboratory control alongside external control was highly recommended as part of future drilling programs and should be implemented as a matter of course. A set of pulp duplicates should be submitted to an umpire laboratory which can then be analysed alongside SGS samples, also testing laboratory precision.
- The number of QA/QC samples submitted overall was low and it was advised that in future drilling campaigns, this number should be increased to be more representative. It was also advised that, as a matter of course, QA/QC data should be analysed concurrently with drilling. By doing this, if issues arise, it allows for the laboratory to be consulted, samples re-assayed and procedures reviewed if necessary, resulting in problems being resolved at the time and thus prevented for the rest of the campaign.

11.1.4 Assay QA/QC 2009 to 2012

Quality control samples (reference materials, blanks and duplicates) were included with each analytical run, based on the rack size associated with the method. The rack size is the number of samples including QC samples within a batch. A blank was inserted at the beginning, standards were inserted at random intervals, and duplicates were analysed at the end of the batch.

Denison used standards provided by ALS Chemex for uranium assays. ALS Chemex standards were added to the sample groups by ALS Chemex personnel, using the standards appropriate for each group. In addition, for each assay group, an aliquot of Denison blank material was also included in the sample run. In a run of twenty samples, at least one ALS Chemex standard and one Denison blank was included. A list of standards used is provided in Table 11-4.

Table 11-4: ALS Chemex Uranium Standards

Standard ID	Element	Method	Expected Value (ppm)
AMIS0029	U	XRF	890
AMIS0054	U	XRF	1472
AMIS0096	U	XRF	137
AMIS0097	U	XRF	543
AMIS0098	U	XRF	848
AMIS0114	U	XRF	550
SARM-98	U	XRF	205
UREM3	U	XRF	439
UREM4	U	XRF	100

At the time of the drilling campaigns, CSA conducted checks on QA/QC data and plotted returned standard assays against the certified values, as well as plotting duplicates against original samples for comparison. The precision for analyses was deemed acceptable, and for the most part the accuracy of the analyses for the six reference standards and blank used was within industry acceptability as shown in Figure 11-2. For standard AMIS0098 as shown in Figure 11-3, the low point during November, 2011 was due to a “blank” value being mislabelled as a “field standard”.

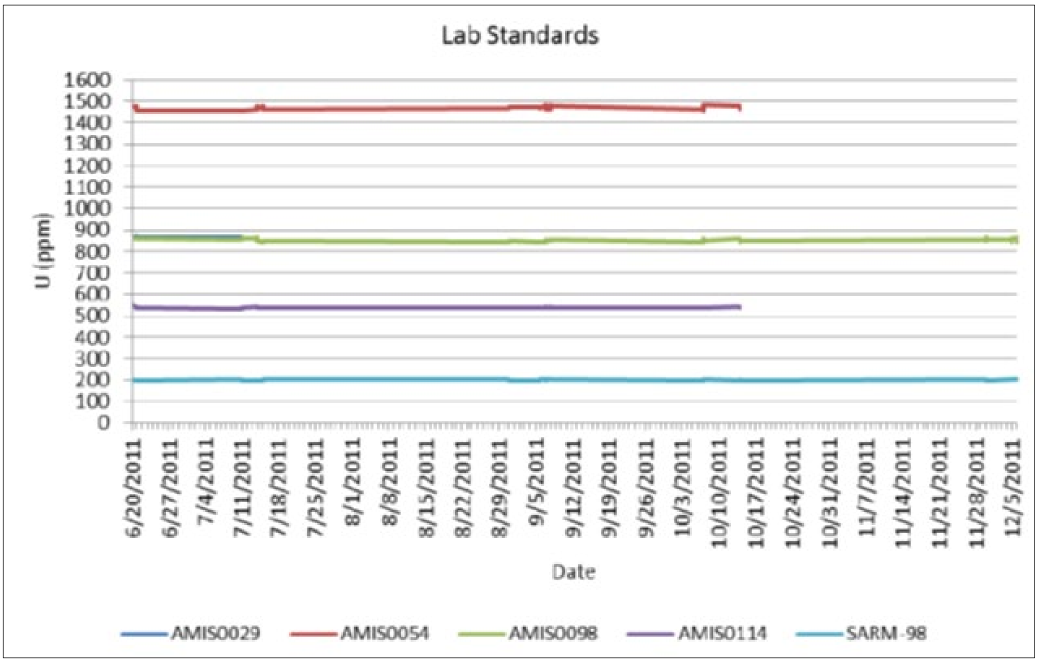


Figure 11-2: Control Chart for ALS Chemex Uranium Standards

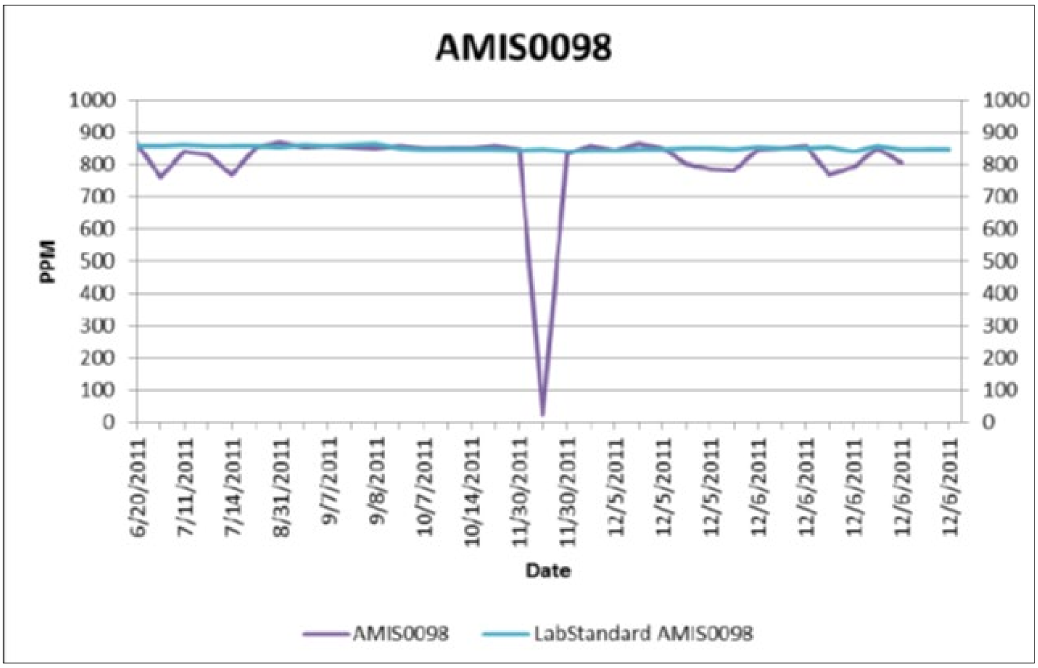


Figure 11-3: Control Chart for ALS Chemex Standard AMIS0098

11.1.5 Geophysical Probe Calibration, Down-hole Logging and QA/QC

Prior to 2021, probe calibration was undertaken initially in the USA using the Grand Junction DOE pits prior to delivery to site. Further periodic checks were undertaken using drill hole MTC51600-04 as a standard. If problems were detected in the probes during test hole logging, the equipment was sent back to the USA for repair and calibration.

Down-hole logging performed by Denison was conducted by trained and dedicated personnel devoted solely to this task. The tools, and a complete set of spares, were manufactured by Mount Sopris Instrument Company in Golden, Colorado and were shipped to Zambia in 2007. Drill hole logging data were stored on digital media in the logging truck at the exploration sites. The raw and converted logging data were periodically copied electronically to Denison's Lusaka, Toronto, Saskatoon and Denver offices, where all data were checked and reviewed.

Denison retained the services of a senior geophysical consultant to oversee training, implementation, and quality control protocols with the Zambian logging personnel. Denison's policy at the Muntanga Project was for trained technicians to probe every drill hole immediately upon completion of drilling. Initially all holes were probed 'open hole', but local bad ground conditions and water inflows necessitated probing to be completed inside the drill string and, depending upon ground conditions, also in the open hole. Representative chips or core from the anomalous sections of holes that collapsed prior to down-hole probing were sent for XRF analyses.

At the end of the 2011 drilling campaign, 14 holes were chosen to re-probe at the end of the season due to concerns of radon contamination and repeatability of probe results. Drill holes DMC1002, DMC1009, DMC1034, DMC1036, DMD1003, DMD1006, DMD1016, DMD1017, DMD1020, DMD1027, DMD1030, DMD1033, DMD1061, and DMD1077, were selected for re-probing and analysis. In some holes it was not possible to re-probe the entire hole length because a portion of the hole had collapsed. Figure 11-4 provides a comparison of the original and repeat probe results from the selected 2011 holes, demonstrating acceptable repeatability of the probing results.

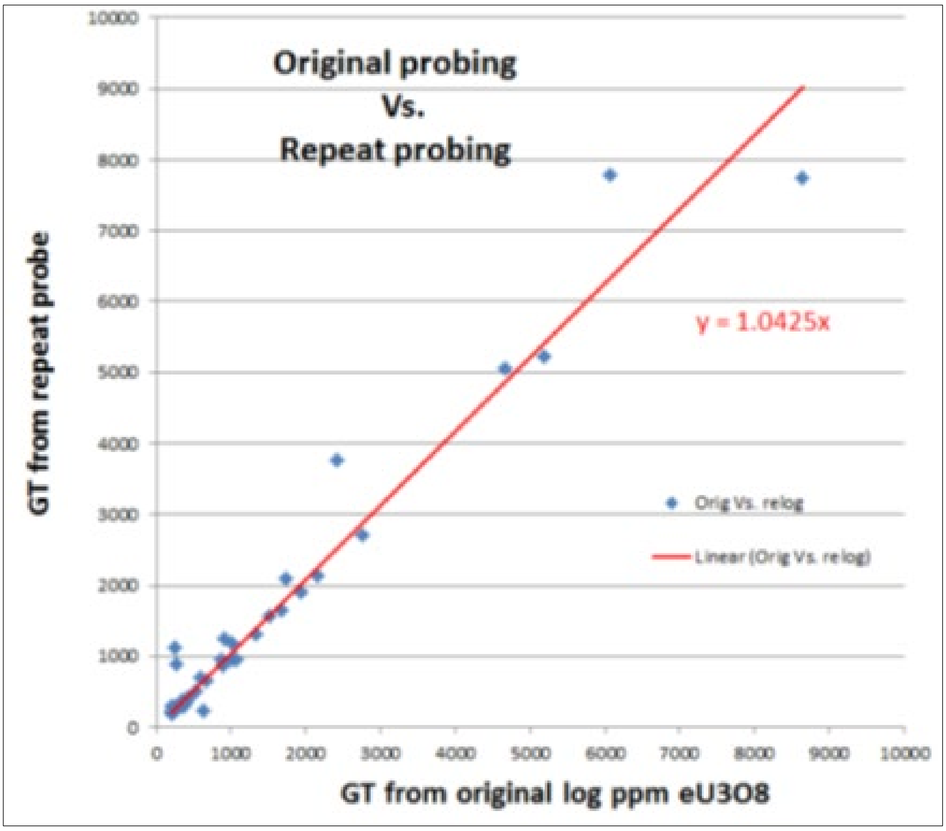


Figure 11-4: 2011 Repeat Logging Exercise

11.2 Historical Sample Preparation, Analysis and Security for the Njame and Gwabi Deposits

11.2.1 Sample Preparation, Dispatch and Security

Sample preparation on site was restricted to core logging and splitting. Once individual samples were placed in the calico bags, along with the sample ticket, the bags were closed and taped firmly. Quality control samples, including blanks and certified reference materials (CRM) were inserted at a rate of one blank and CRM per 50 samples.

Pool sand, obtained from an area north of Lusaka (Katuba), was put into sample bags and used as "blank" samples.

Three certified standards were also regularly inserted into the sample sequence as part of the quality control protocols. These samples were inserted on a rotating basis (Standard AMIS0004 or AMIS0045, alternating with Standard AMIS0029).

AFR drilling procedures required samples to be taped closed once taken from the RC sampling site or diamond core sampling facility. Samples were then transported directly to Lusaka, Zambia for air freight to ALS Chemex Johannesburg.

Reference material was retained and stored on site, including quarter-, fillet-core or RC chips and photographs generated by diamond and percussion drilling, and duplicate pulps and residues of all submitted samples. All pulps were stored at ALS Chemex Johannesburg storage facility for three months, after which they were returned to AFR in Lusaka.

11.2.2 Laboratory Analysis Procedures

ALS Chemex Ltd was used as the principal analytical laboratory company for U_3O_8 analyses. The sample preparation was completed at ALS Chemex Johannesburg, with analytical analysis (i.e. assaying) of the sample pulps completed at either the ALS Chemex analytical laboratories in Johannesburg or Vancouver, Canada. The ALS Chemex laboratories in Johannesburg and Vancouver are both ISO 9001:2000 accredited.

The analytical method used by ALS Chemex is ME-XRF 05. The method description for this is as follows:

"A pressed pellet is prepared and analysed by wavelength dispersive XRF for the selected elements. Uranium (DL – 2.5 ppm), converted to U_3O_8 (by ALS Chemex) using conventional conversion factors."

11.2.3 Specific Gravity Determinations

Specific gravity ("SG") determinations were carried out by AFR. The method applied to density collection included sun drying, weighing the core in air, followed by plastic wrapping and weighing in water. The bulk density was then determined as a ratio of weight in air over weight in water. The weighing was completed using high quality electronic scales which underwent regular calibration.

Samples were taken from the dominant rock types at both Njame and Gwabi. The average measured density per logged rock type for all samples weighing more than 1.0 kg are presented in Table 11-5 and Table 11-6 for the Gwabi and Njame deposits, respectively.

Table 11-5: Specific Gravity Measurements for Gwabi by Logged Rock Type (Samples greater than 1.0kg)

Rock Type	Number of Samples	Specific Gravity		
		Minimum	Maximum	Mean
GRIT	20	1.94	2.42	2.06
GSSTN	44	1.86	2.36	2.02
PGRIT	39	1.85	2.62	2.12
PSSTN	33	1.40	2.46	2.13
SLTSTN	2	1.96	2.14	2.05
SSTN	53	1.71	2.44	2.03

Table 11-6: Specific Gravity Measurements for Njame by Logged Rock Type (Samples greater than 1.0kg)

Rock Type	Number of Samples	Specific Gravity		
		Minimum	Maximum	Mean
CNGLM	1	2.26	2.26	2.26
GRIT	29	1.82	2.16	1.97
GSSTN	63	1.77	2.16	1.98
PGRIT	52	1.89	2.26	2.06
PSSTN	24	1.88	2.30	2.13
SLTSTN	66	1.84	2.31	2.06
SSTN	263	1.72	2.68	1.98

11.3 GoviEx Sample Preparation, Analysis and Security

11.3.1 Sample Preparation, Dispatch and Security

Since 2021, only diamond drill core has been sampled for assay by GoviEx. The core is marked for Geotech and photographed before being transferred to the core farm where it is logged, marked for sampling, split, bagged and sealed for transport to the Ndola, Zambia prep facility of ALS Global. Here the samples are crushed to >70% passing through a 2 mm screen, and a 250 g subsample is collected and pulverized to >85% passing through a 75 micron screen (Tyler 200 mesh). The pulverized sample is then bagged and dispatched to ALS Global's Johannesburg analytical laboratory.

11.3.2 Laboratory Analysis Procedures

Since 2021, sample analysis undertaken by ALS Global has used their ME-MS61 technique which involves a four-acid digest followed by ICP-MS and ICP-AES. Results are sent via email to be authorised by GoviEx personnel for incorporation into the master sample database.

11.3.3 Assay QA/QC

Quality control samples (reference materials, blanks and duplicates) were included with each analytical run. A total of 3,689 quality control samples underwent assaying at ALS for QA/QC analysis. These included field duplicates, field standards, field blanks and laboratory standards that were submitted at a rate of one duplicate, one standard and one blank within sample batches of 20 samples.

Table 11-7 provides details of the field standards (CRM) used during the 2021 and 2022 drilling campaigns.

Table 11-7: 2021 and 2022 CRM Details

Standard ID	Element	Method	Expected Value (ppm)
AMIS0106	U	M/ICP	114
AMISO106	U	XRF	122
AMIS0514	U	4A_MICP	329
AMIS0514	U	XRF	330
AMIS0514	U_3O_8	XRF	0.04%

Blanks

Typical QA/QC programs include the submission of blank sample material in order to confirm no sample contamination is occurring. A total of 184 blank samples were analysed for uranium. Blank samples were inserted into the sample stream at a rate of 1 in 12.5 samples (8 %) and the blank performance plot is provided in Figure 11-5. The results for the blank samples show that there is scatter in the blank sample data set, with periodic elevated values, and a slight progressive increase over time. Further investigation is warranted to determine the cause of the occasional data spikes and gradual increase in values over time of the blank sample results.

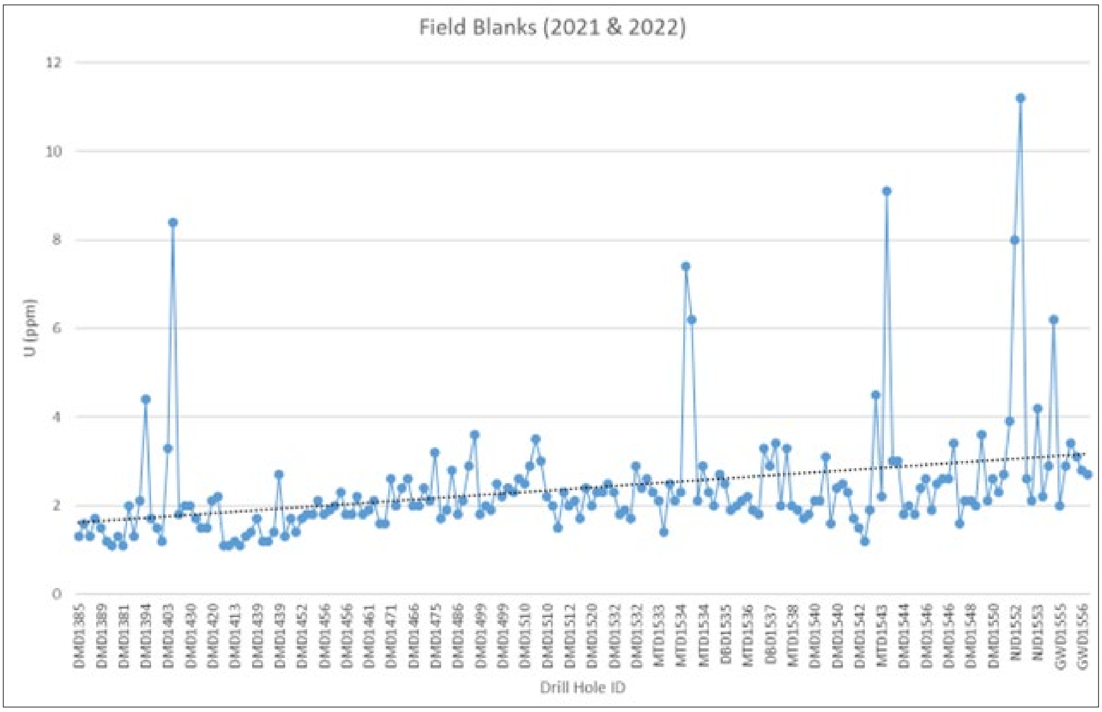


Figure 11-5: Blank Sample Performance Chart

Certified Reference Materials

A total of 184 CRM samples were submitted during the 2021 and 2022 drilling campaigns, at a rate of one in every 20th assay sample. A total of 92 samples of each CRM AMIS0514/257 and AMIS0106/633 were submitted for analysis and the results are provided in Figure 11-6. The performance plots for both the CRMs demonstrate that the analytical results fall within an acceptable range of typically ±2 standard deviations of the expected value. However, the performance of CRM AMIS0514/257 consistently falls below the expected value of 329 ppm U.

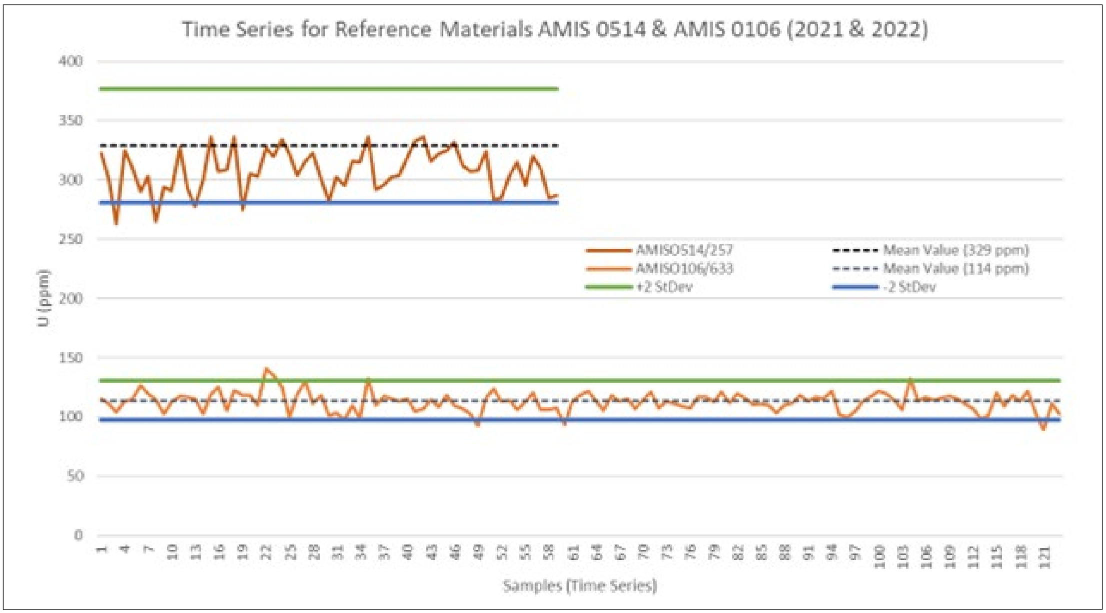


Figure 11-6: CRM Sample Performance Chart

Duplicates

A total of 184 duplicate field samples were collected during the 2021 and 2022 drilling campaigns at a rate of one duplicate every 20th assay sample. Field duplicates were collected by sampling the remaining half of the core interval selected for the original assay sample. Comparison of assay results between the field duplicates and original assay samples is provided in Figure 11-7 to Figure 11-9.

The results of the duplicate analysis demonstrate acceptable correlation between the original and field duplicate sample pairs, however an observed marginal bias towards under reporting of grade can be seen in field duplicate samples for higher-grade samples >300 ppm U.

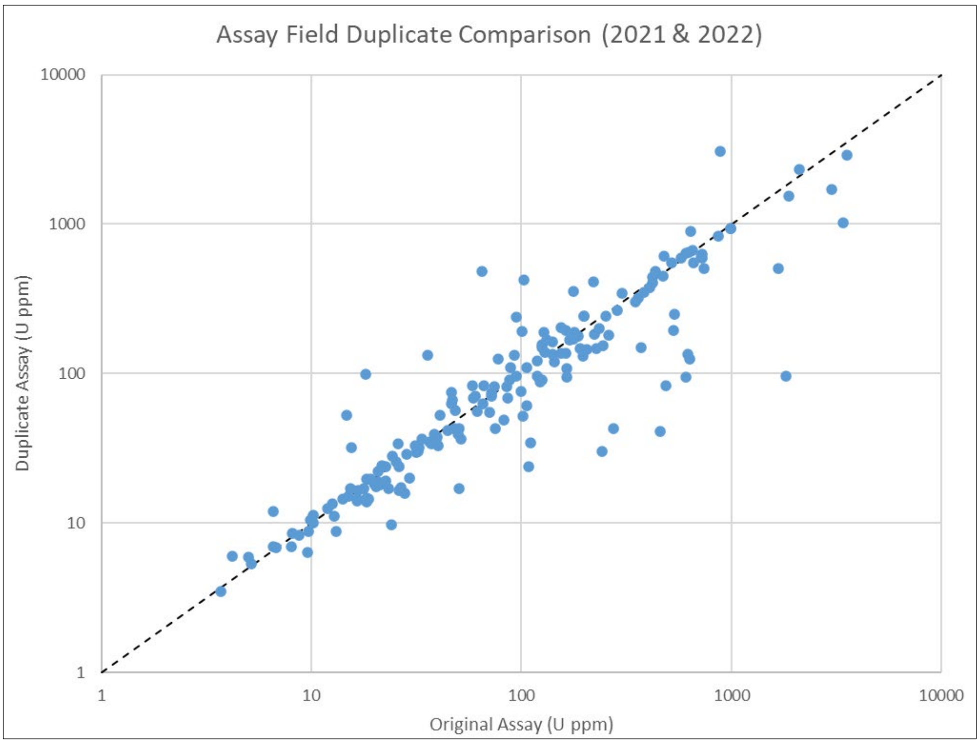


Figure 11-7: Scatter Plot of Original and Duplicate Assay Samples

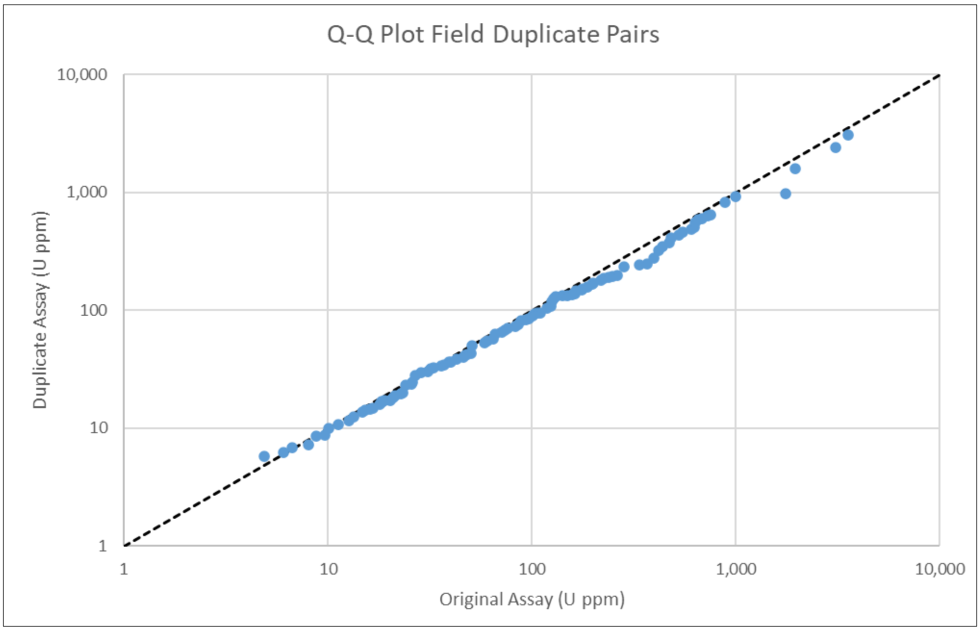


Figure 11-8: Q-Q Plot of Assay Duplicate Pairs

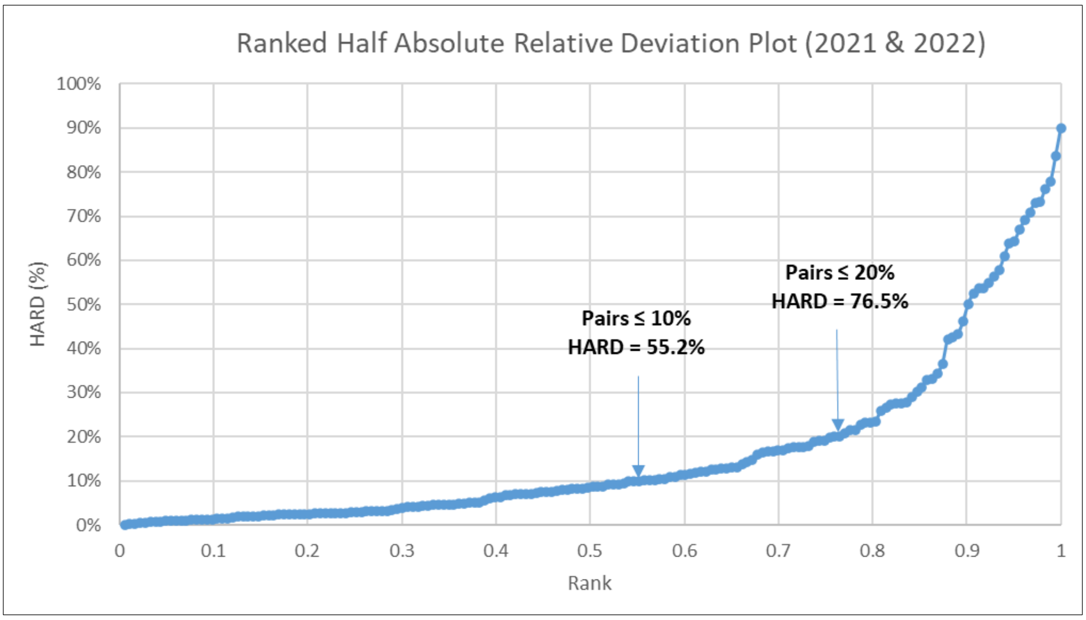
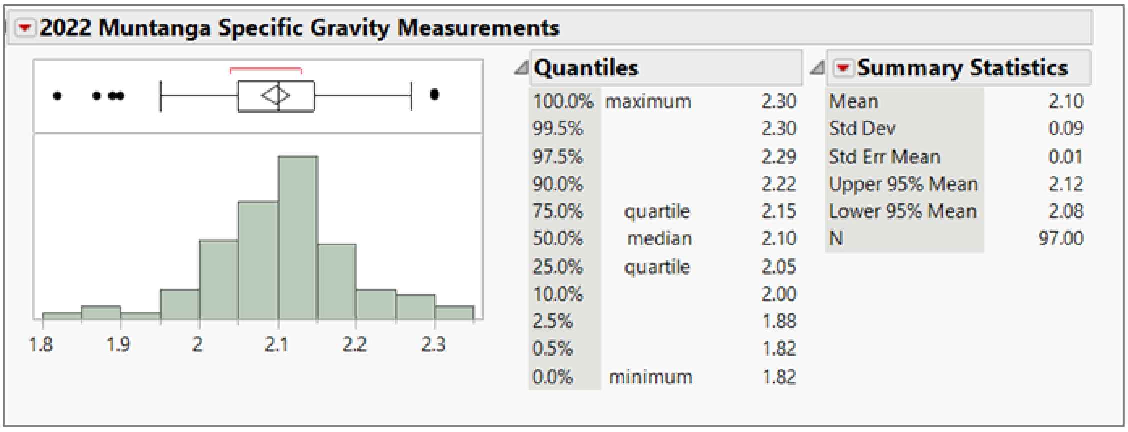


Figure 11-9: Ranked Half Absolute Relative Deviation Plot

11.3.4 Specific Gravity Determinations

A density determination program was completed from the PQ core available from the Muntanga metallurgical drill hole program. A total of 97 core samples from 12 holes were selected as being geologically representative of the material drilled. The core was dried and density determined by calculating the core volume which was then divided into the weighed dry mass to calculate the in situ dry bulk density.

The mean and median density values are 2.1 t/m^3 with a very low variance as summarized in Figure 11-10. There was no recognisable correlation between density and depth or lithology. A global density of 2.1 t/m^3 was used for the estimation of the Muntanga, Dibbwi and Dibbwi East Mineral Resources.



2022 Muntanga Specific Gravity Measurements

Quantiles

100.0%	maximum	2.30
99.5%		2.30
97.5%		2.29
90.0%		2.22
75.0%	quartile	2.15
50.0%	median	2.10
25.0%	quartile	2.05
10.0%		2.00
2.5%		1.88
0.5%		1.82
0.0%	minimum	1.82

Summary Statistics

Mean	2.10
Std Dev	0.09
Std Err Mean	0.01
Upper 95% Mean	2.12
Lower 95% Mean	2.08
N	97.00

Figure 11-10: 2022 Specific Gravity Sample Summary Statistics

11.3.5 Geophysical Probe Calibration, Down-hole Logging and QA/QC

During the 2021 and 2022 drilling campaigns, all down-hole geophysical logging services were provided by an external service provider. Terratec Geophysical Services Namibia was contracted to provide all down-hole logging equipment and personnel, conduct probe calibration and initial QA/QC of down-hole geophysical data.

Calibration of all down-hole probes was carried out at the Pelindaba test facility in South Africa prior to arriving on site.

In-field quality control measures consisted of weekly probe checks using drill hole MTC51600-04 to ensure consistent and reliable operation of the probe used for down-hole gamma logging. Figure 11-11 provides an example of repeat logging results showing consistent readings between logging runs. Only one gamma probe was used during the 2021 and 2022 drilling campaigns.

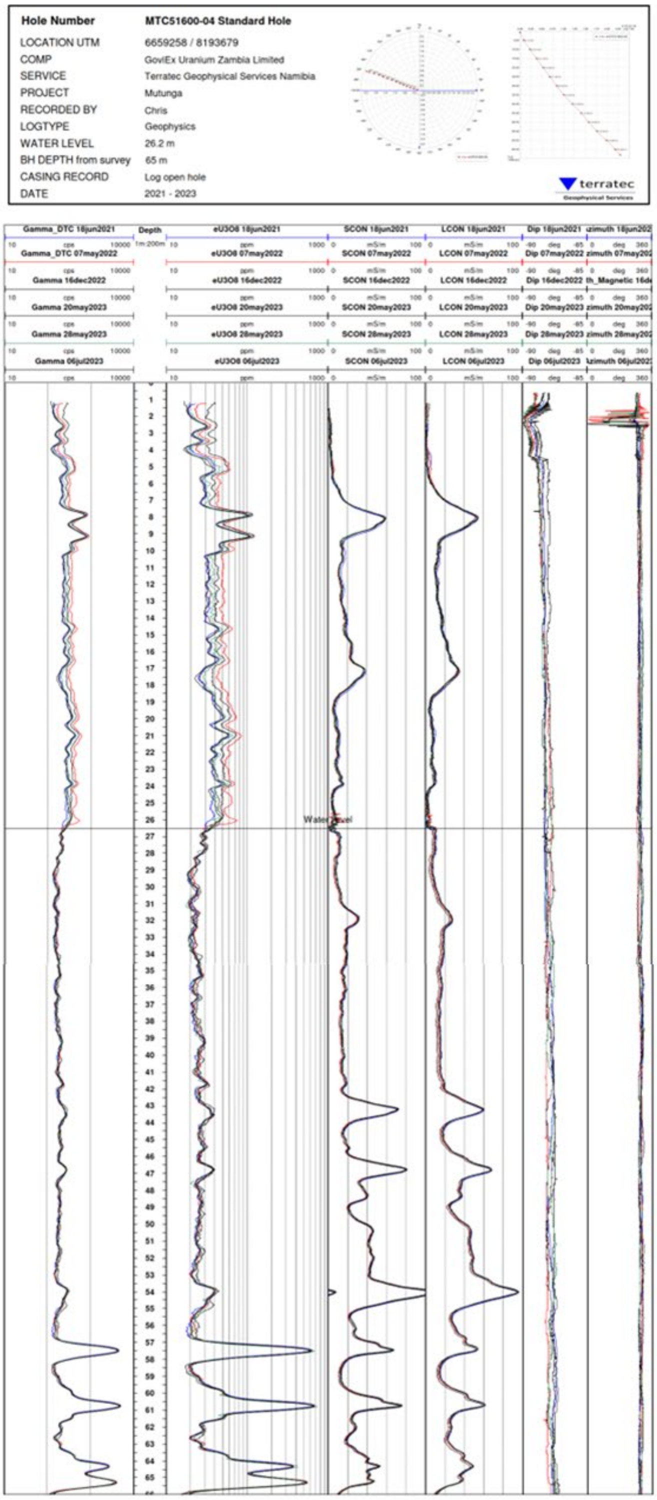


Figure 11-11: Example of Multiple Runs to Determine Repeatability of Logging at Test Hole MTCS51600-04

11.4 QP Comments on Section 11

In Mr. Revering's opinion the sample preparation, security, and analytical procedures meet industry standards, and the QA/QC programs, as designed and implemented by GoviEx and past operators, are adequate; consequently, the assay and down-hole probe data within the drill hole database are suitable for mineral resource estimation purposes.

12 DATA VERIFICATION

12.1 Data Verification by Previous Companies

12.1.1 Denison Down-hole Radiometric QA/QC

Limited down-hole radiometric QAQC data are available to support the historical drilling completed prior to 2006, however Denison's drilling campaigns, which represent the majority of historical data for the Muntanga, Dibbwi and Dibbwi East deposits, used a variety of systematic checks and standards for routine checking and calibration of down-hole radiometric logging tools.

Probe calibration was undertaken initially in the USA, using the Grand Junction DOE pits prior to delivery to site. Further periodic checks were undertaken using drill hole MTC51600-04 as a standard. If problems were detected in the probes in the test hole located at Muntanga, the equipment was sent back to the USA for repair and calibration.

An exercise of repeat down-hole probing was completed by Denison on 14 selected drill holes to review the repeatability of the results from the down-hole radiometric probe. Although the exercise was based on a relatively small eU_3O_8 database, results of the study suggested that the down-hole probe was performing within acceptable limits, as illustrated in Figure 12-1.

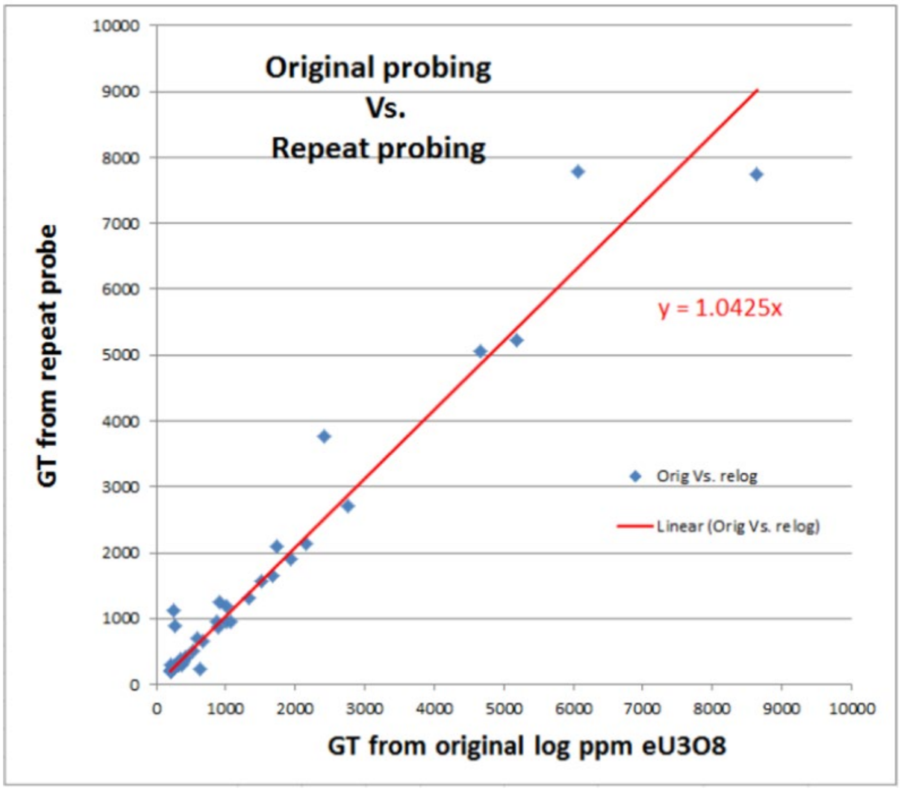


Figure 12-1: Repeat Radiometric Logging of Selected Drill Holes by Denison

12.1.2 Data Verification by CSA Global

CSA Global (“CSA”) conducted data verification exercises in 2009 and 2012 to support the historical MRE updates completed by CSA. The following items were included in their data verification process, including exploration protocols used by Denison:

- Core sampling, sample preparation and assaying;
- Quality assurance and quality control procedures;
- Drill hole collar and down-hole deviation surveys;
- Down-hole radiometric logging procedures and results; and
- Database validation.

No material issues were identified by CSA regarding data collected by Denison. For drill holes completed prior to Denison (circa 1980) on the Muntanga and Dibbwi deposits with collar prefixes ‘DDH’ and ‘DWD’, a number of data concerns were identified which could not be resolved due to insufficient information available. Therefore, these drill holes were excluded from use within the MRE process.

12.1.3 Data Verification by AFR

AFR completed twin hole drilling of RC and DDH to confirm AC holes, as well as DDH to confirm RC holes. A total of 23 twins were completed and compared versus the original holes during the exploration programs at Njame and Gwabi. Although some of the holes were not directly comparable due to extra sampling requirements, the results indicate that the comparison between twin holes is generally acceptable.

12.2 Data Verification by SRK

12.2.1 Site Visit

Mr. Revering visited the Muntanga project twice in 2022, from May 8 to May 11, and October 17 to October 20. During the site visits, he observed drilling and down-hole logging activities, core and drill chip logging and data collection, and assay sampling and chain of custody protocols. He can confirm that the description of the geology, mineralization and mineralization controls, and the drilling, logging, sampling and data collection techniques described are consistent with observations made in the field during these site visits.

12.2.2 Drill Hole Collar Coordinate Verification

As part of the 2021 and 2022 drilling campaigns, check surveys were conducted on a limited number of historical drill hole collars to verify the location and relative position of the historical collars to drill holes completed by GoviEx. Through this verification exercise, it was determined that the UTM WGS84 drill hole collar coordinates for the historical drill holes were on average approximately 7.25 m off in the easting coordinate and 0.15 m off in the northing coordinate. Therefore, all historical collar coordinates for drill holes located on the Muntanga, Dibbwi and Dibbwi East deposits were shifted to align with the 2021-2022 survey locations.

In addition, all drill hole collar elevations were adjusted to align with the 2023 LIDAR survey conducted on the Muntanga Project area in Q1 2023. All drill hole collar adjustments were completed in preparation for mineral resource estimation purposes.

12.2.3 Drill Hole Assay Database Review

SRK conducted a review of the Muntanga Project drill hole assay database, comparing database entries to the original Lab assay certificates. Approximately 10% of historical assay database entries and 75% of recent assay database entries were validated against the original Lab assay certificates, and no errors were noted.

No data validation was conducted on historical drill holes completed prior to 2006, as insufficient documentation and details were available for review. Therefore, SRK excluded all historical data collected prior to 2006 from the MRE process.

12.2.4 Radon Contamination

Radon is a naturally occurring radioactive gas that is generated during the normal radioactive decay of uranium into stable lead. Radon is produced by the radioactive decay of radium-226, which is a daughter product within the uranium decay chain found in uranium deposits. Because of its gaseous form, it can easily migrate through fractured rock masses and concentrate in catchment areas such as caves, underground mines, reservoirs and open drill holes.

During the 2021 and 2022 drilling campaigns on the Dibbwi East deposit, radon contamination was identified within some drill holes, causing inflated down-hole radiometric signatures and overestimated eU_3O_8 grades within those holes. Examples of identified radon contamination in 2021-2022 drill holes are provided in Figure 12-2. The down-hole location and extent of the radon contamination was found to be associated with the presence of fracturing within the drill hole and depth of the water table. Where fractures were encountered above the water table, radon contamination was generally limited to above the water, and vice versa.

SRK reviewed the down-hole radiometric and eU_3O_8 profiles for all 2021 and 2022 drill holes, and where radon contamination was identified, adjusted (corrected) the eU_3O_8 profiles to produce a more robust eU_3O_8 grade profile as illustrated in Figure 12-2.

SRK also reviewed the down-hole radiometric and eU_3O_8 profiles for all historical drill holes (circa 2006 to 2012), and where radon contamination was identified, adjusted (corrected) the eU_3O_8 profiles to produce a more robust eU_3O_8 grade profile as illustrated in Figure 12-3.

A total of 167 drill holes were identified as having variable degrees of suspected radon contamination and were adjusted accordingly to produce more robust eU_3O_8 grade profiles.

12.2.5 Down-hole Radiometric Probing vs Assay Comparison

SRK compared down-hole radiometric probe eU_3O_8 grade data to corresponding geochemical assays for drill holes located on the Muntanga, Dibbwi and Dibbwi East deposits. The comparison was conducted for each deposit separately and data were segregated into historical data collected by Denison and recent data collected by GoviEx. This analysis was completed to establish a radiometric-grade correlation to use for mineral resource estimation purposes, details of which are provided in Section 14.5.2.

12.3 Qualified Person Comment on Data Verification

Mr. Revering has reviewed and analysed the results of data verification programs conducted by previous companies and accepts the results of these programs. Based on this review and analysis, along with the additional data verification conducted directly by SRK, Mr. Revering is of the opinion that the Muntanga Project drill hole database is adequate to support the current geological interpretation of the Muntanga Project uranium deposits and to support the estimation of mineral resources.

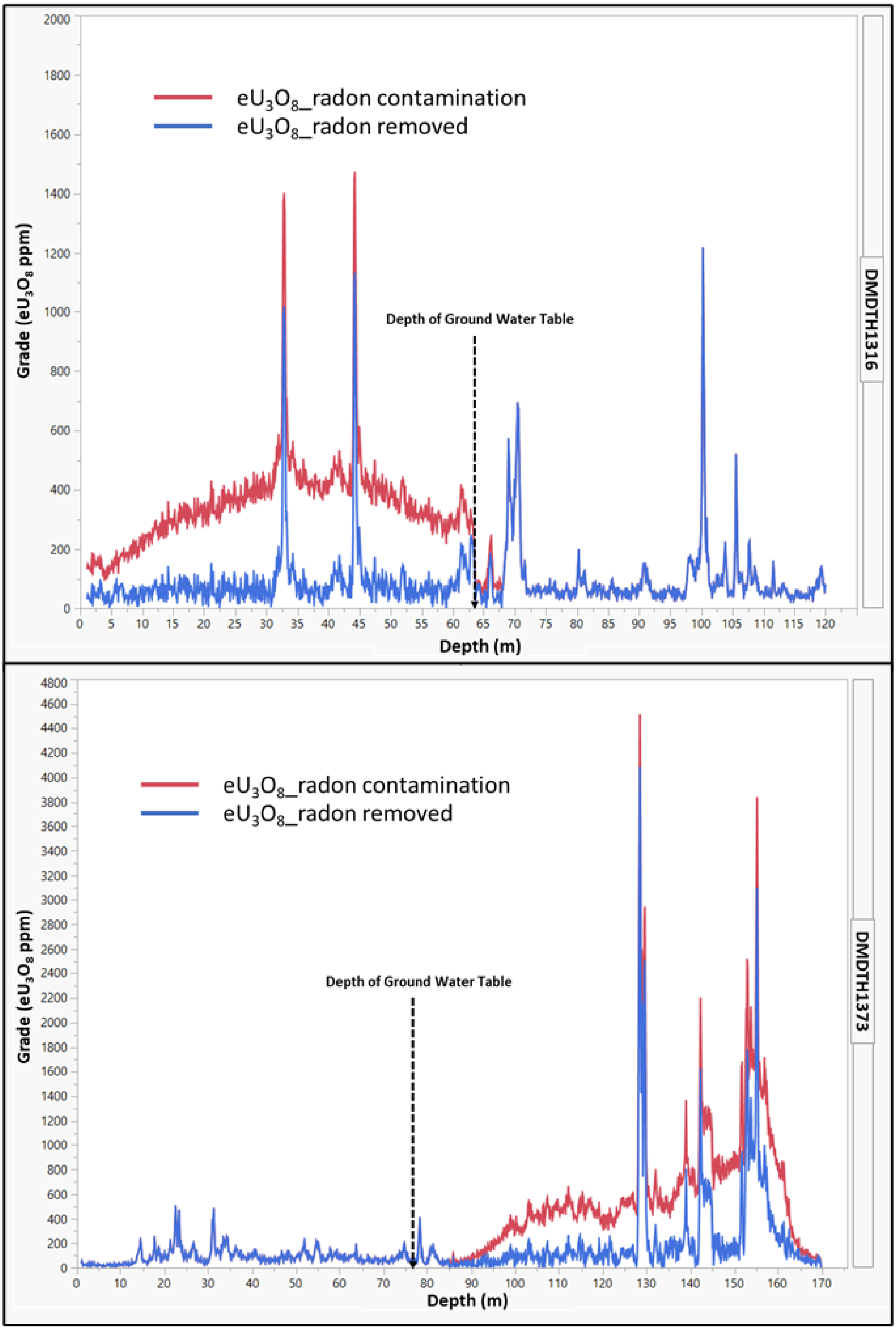


Figure 12-2: Radon Contamination and Correction of Down-hole eU_3O_8 Grades for 2021-2022 Drill Holes DMDTH1316 and DMDTH1373 (Dibbwi East deposit)

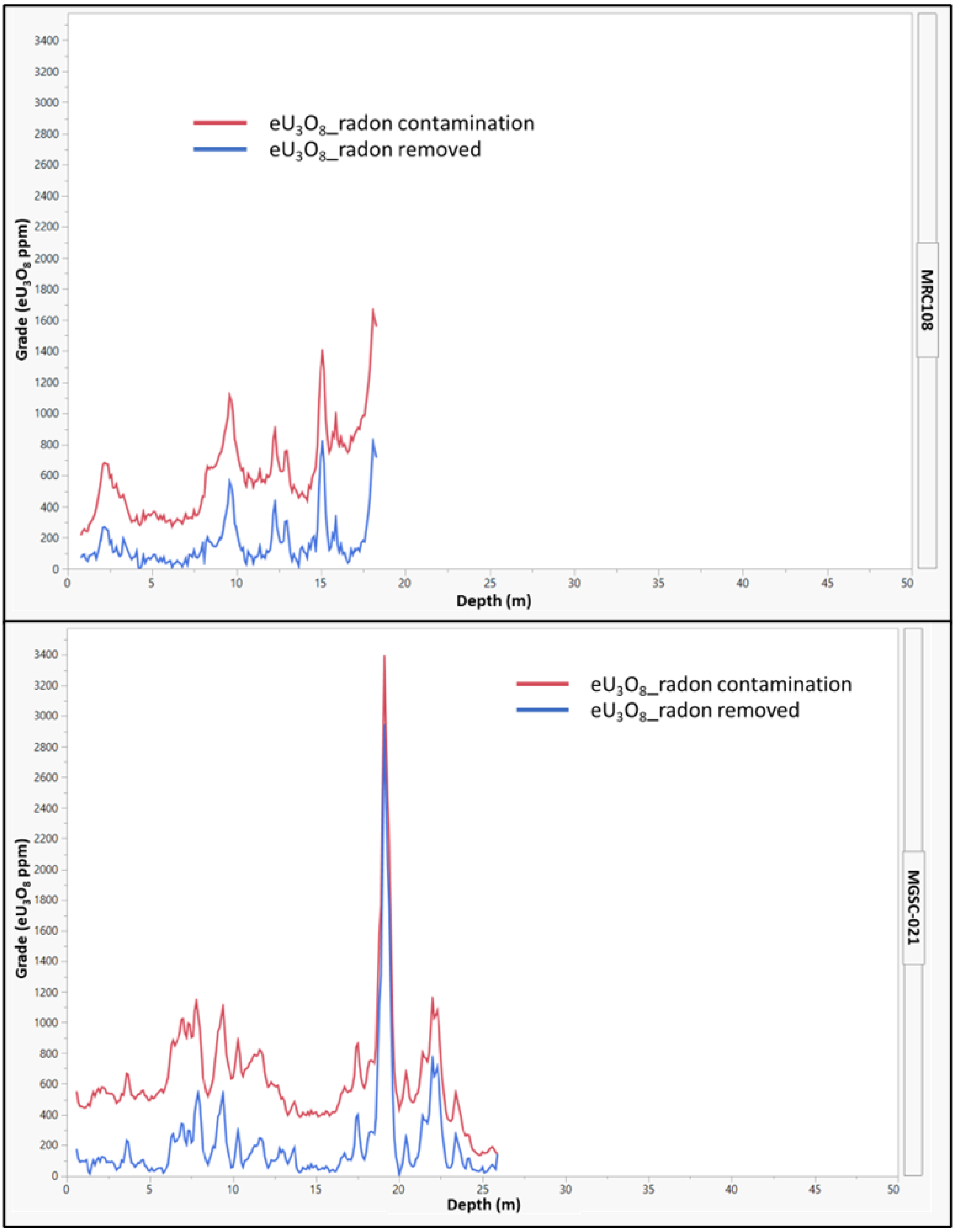


Figure 12-3: Radon Contamination and Correction of Down-hole eU$_3$O$_8$ Grades for Historical Drill Holes MRC108 and MGSC-021 (Muntanga deposit)

13 MINERAL PROCESSING AND METALLURGICAL TESTING

Several bench scale mineralogical studies and column testwork have been completed on the Muntanga and Chirundu deposits by the previous owners. The work is summarized in this section, with the majority of the information extracted from: NI 43-101 Technical Report prepared by CSA Global in 2013 (CSA, 2013) on the Muntanga Uranium Project; AFR Pre-Feasibility Report in 2008 (AFR, 2008) prepared for the Chirundu deposit; the report prepared by Mintek for the Chirundu deposit bankable feasibility study “Determination of Uranium Heap Leach Process Design Criteria for the Chirundu Project in Zambia” (Mintek, 2010); Muntanga Project Feasibility Study (MDM Engineering, 2009); and the Dibbwi East NI 43-101 Technical Report prepared by Denison Mines (USA) Corp and Roscoe Postle Associates (Denison Mines (USA) and Roscoe Postle Associates (RPA) Inc, 2012.

The previous mineral processing and metallurgical testing work is discussed below under the different prospects. GoviEx intends to build on considerable previous historic studies for each of the deposits to optimise the suitable process route for exploitation of the Muntanga and Chirundu deposits.

13.1 Muntanga, Dibbwi and Dibbwi East Deposits

13.1.1 Background

The Muntanga Project uranium mineralization identified to date appears to be restricted to the Escarpment Grit Formation of the Karoo Supergroup, which occupies the rift through the Zambezi Valley. The Muntanga, Dibbwi and Dibbwi East deposits historically averages around 287 ppm U_3O_8 at a cut-off of 100 ppm U_3O_8. A range of metallurgical tests were conducted by AGIP in the 1980s, of which selected reports were available for review. Reported AGIP results are sketchy and provide insufficient detail of metallurgical performance. Anecdotal evidence gained from past employees within the relevant department of the Zambian Government also report on a ‘pilot’ heap leach test that showed uranium recoveries up to 90% at low sulfuric acid consumption rates of less than 5 kg/t mineralized material leached had been achieved.

13.1.2 Geological Details of the Muntanga, Dibbwi and Dibbwi East Deposits with Relevance to Metallurgical Test Work

The Muntanga, Dibbwi, and Dibbwi East deposits are located in the Southern Province of the Republic of Zambia about 200 km south of Lusaka and immediately north of Lake Kariba. The licence is within the Zambezi Rift Valley which is hilly with large fault-bounded valleys filled with Permian, Triassic and possibly Cretaceous sediments of the Karoo Supergroup. Rocks of the Karoo Supergroup (Late carboniferous to Jurassic) occupy the rift trough of the Zambezi Valley. The Lower Karoo Group comprises a basal conglomerate, tillite and sandstone overlain unconformably by conglomerate, coal, sandstone and carbonaceous siltstones and mudstones (the Gwembe Formation), and finally fine grained lacustrine sediments of the Madumabisa Formation. The Upper Karoo sediments unconformably overlay the Lower Karro and comprise a series of arenaceous continental sediments overlain by mudstones capped by basalt.

The uranium mineralization identified to date appears to be restricted to the Escarpment Grit Formation of the Karoo Supergroup. Within the tenement area the Karoo sediments are in a northeast trending rift valley. They have a shallow dip and are displaced by a series of normal faults, which, in general, trend parallel to the axis of the valley. The Madumabisa Mudstones form an impermeable unit and are thought to have prevented uranium mineralization from moving further down through stratigraphy.

Mineralization is associated with iron-rich areas (goethite) as well as secondary uranium being distributed within mud flakes and mud balls as well as in pore spaces, joints, and other fractures.

It is probable that the uranium was eroded from the surrounding gneissic and plutonic basement rocks during weathering and deposition of the immature grits and sandstones. The uranium was transported together with this material in a presumably arid environment. Uranium was precipitated during reducing conditions in certain favourable units. Later fluctuations in the groundwater table caused remobilisation of this material; uranium was again dissolved and then re-deposited in reducing often clay-rich areas with a certain degree of enrichment.

13.1.3 Metallurgical Test Work Programme

Mineralized Samples Processed

During the metallurgical test work programme a variety of samples were used:

1. Samples from the November / December 2005 verification and in-fill drilling programme were exported from Johannesburg, South Africa in January 2006, to be subjected to leachability tests in Perth. These samples represented the remainder of material processed at SGS Johannesburg for uranium and other chemical analysis; the original samples were one-quarter diamond drill core selected by Geoquest geologists. The quarter core samples received from SGS Johannesburg were of very fine powder (required for sample preparation for analysis by X-ray and ICPOES techniques).
2. Additional half-core material of selected samples above a cut-off grade of 200 ppm U_3O_8 from the above programme were shipped from location in Zambia to Perth in April 2006 to perform further leach tests.
3. Additional samples of core were delivered to Perth in June 2006 to be used in comminution test work and subsequent leach tests.

Other Considerations

A preliminary assessment was performed on assay data received from SGS Johannesburg in January 2006. The objective was to determine any correlation of potentially deleterious chemical species or elements that occur with the uranium mineralization.

The key finding was that phosphates were strongly correlated with uranium and this is not deleterious to the process. This was expected on the basis of anecdotal evidence from earlier mineralogical assessments in the 1980s that phosphate-complexed uranium was the significant mineralization present in the mineralized material in the Muntanga area. Potentially deleterious elements like vanadium did not appear to correlate with other uranium values nor were present in gangue material.

Programme Outline

The metallurgical test work programme was developed to narrow down the options for processing of Muntanga deposit mineralized material, specifically:

- develop the optimal leach parameters;
- establish grindability characteristics of the plant feed;
- establish downstream process performance; for example, settling and filtration assessments; and
- establish ion exchange performance.

The results were to be used in selecting the appropriate flow sheet for processing the Muntanga deposit mineralized material, and used as the basis of further test work as well as scoping level project cost estimates and valuation.

Test Work Results

Test work programme overview

The test work programme designed was characterised by the need to amend the programme to cater for unexpected results, given the exploratory nature of the test work. In the end, a number of different tests were required to narrow down the range of optimal leach parameters.

Test work was conducted in two phases:

1. Phase 1 was designed to establish the most promising leach approach, assessing the performance of sulfuric acid vs. sodium carbonate-based alkaline leach options.
2. Phase 2 comprised of tests to narrow down sub-options of the alkaline leach route and compare to acid leach.

During Phase 1, specifically, the programme was designed to test two hypotheses:

- establish whether the alkaline leach methods can deliver expected results of a conventional acid method; and
- determine whether resin-in-pulp methodology can be employed, thus reducing capital and operating costs of the full scale plant.

Phase 2 test work was undertaken in the following context:

- alkaline leach approach was selected at the time in favour of an acid leach method;
- resin-in-pulp was dropped in favour of optimising conditions to achieve fast extraction of the uranium minerals; and
- mineralogy suggested that the quartzitic ‘scats’ in the host rock did not contain any uranium and could thus be rejected, thus reducing the volumes to be processed downstream of comminution.

Uranium Extraction

Table 13-1 summarises the extraction results achieved in Phase 1 of the test programme.

Table 13-1: Extraction Results Phase 1 Leach Test Work (Source: SGS, 2007)

Test Number	Feed Type	Particle Size (P_{80})	% Solids	Reagent Type	Na_2CO_3 Reagent Dose (kg/t)	pH Adjust $NaHCO_3$	Leach pH	Resin Charge (m?)	Resin Form	Sample Frequency	Leach Time (hours)	Temp (°C)	Other/ Results
1	High Compo	Bug Dust	30	H2SO4	24	#REF!	1.6	NIL			6	20	77.3%
2	High Compo	Bug Dust	30	H2SO4	29	0	1.6	NIL			6	20	81.7% 5kg/t MnO2 added
3	High Compo	Bug Dust	30	H2SO4	15	0	1.85	NIL			4	20	30.6%
4	High Compo	Bug Dust	30	H2SO4	19	0	1.9	NIL			4	40	76.2%
5	High Compo	Bug Dust	50	Na2CO3	2	2	8.7	NIL			6	20	43.6% RISING WITH TIME
6	High Compo	Bug Dust	50	Na2CO3	5	2	9.4	NIL			6	20	53.1%
7	High Compo	Bug Dust	50	Na2CO3	20	20	9.4	NIL			6	20	80.0%
8	High Compo	Bug Dust	30	H2SO4	23	0	1.66	50	SO4		4	40	84.0%
9	High Compo	Bug Dust	50	Na2CO3	20	12	9.7	80	CO3		6	20	76.2%
10	High Compo	Bug Dust	50	Na2CO3	20	8	9.7	80	CO3		6	50	83.8%
11	High Compo	Bug Dust	30	H2SO4	23		1.5	50	SO4		4	20	77.3% 5kg/t MnO2 added
12	High Compo	Bug Dust	50	Na2CO3	10	10	9.5	NIL			6	20	61.9%
13	High Compo	Bug Dust	50	Na2CO3	30	20	9.7	NIL			6	20	73.6%
14	HGC	425	30	H_2SO_4	?	?	1.5	?	?	0/0/30/60/120/360	6	20	76.7%
15	HGC	425	50	Na_2CO_3	20	Yes	10.2	?	?	0/0/30/60/120/360	6	50	84.2%
16	High Compo	Bug Dust	50	Na_2CO_3	30	Yes	10.2 (min)	50	CO_3	78.5% after 2 hours	2	50	
17	High Compo	Bug Dust	50	Na_2CO_3	30	Yes	10.8 (min)	50	CO_3	82.1% after 2 hours	2	50	
18	HGC	200	30	H_2SO_4	?	?	1.5	?	?	0/0/30/60/120/360	6	20	80.6%
19	HGC	200	50	Na_2CO_3	20	Yes	10.2	?	?	0/0/30/60/120/360	6	50	83.8%
20	LG Grab	Bug Dust	30	H_2SO_4	?	?	1.5	?	?	0/0/30/60/120/360	6	20	69.8%
21	LG Grab	Bug Dust	50	Na_2CO_3	20	Yes	10.2	?	?	0/0/30/60/120/360	6	50	66.1%
22	Super High Grade Conc	100	50	Na_2CO_3	40	Yes	10.8	100mL/kg	CO_3	0/0/30/60/120/360	6	30	88.5%
23	High Compo	Bug Dust	50	H2SO4	TBC	NIL	1.6	50	SO4	0/0/30/60/120/240	4	40	82.6%
24	High Compo	Bug Dust	50	H2SO4	TBC	NIL	1.6	50	SO4	0/0/30/60/120/240	4	30	78.1%
25	High Compo	Bug Dust	50	Na2CO3	30	Yes	10.8	50	CO3	0/0/30/60/120/360	6	30	77.2%
26	High Compo	Bug Dust	50	Na2CO3	30	Yes	10.8	50	CO3	0/0/30/60/120/360	6	40	81.1%
27	High Compo	Bug Dust	30	H2SO4	TBC	NIL	1.6	50	SO4	0/O/30/60/120/240	4	20	82.5%

The Phase 2 test work centred on optimising the conditions for an alkaline leach route. The following summarises the key results obtained for this phase:

- Effect of size distribution: Little additional extraction benefit appeared to be gained by grinding finer (provided the same leach conditions were maintained), reinforcing the notion that a relatively coarse grind may result in sufficient liberation and provide the opportunity for the rejection of the 'scats'.
- Effect of sodium carbonate / bicarbonate ratio and overall level of concentration: higher concentrations of sodium carbonate as well as a high ratio of this to the bicarbonate favoured extraction.
- Effect of temperature: increasing leach temperature to 60ºC increased extraction.
- Rate of dissolution: it was consistently found that uranium dissolution was extremely fast, and that leaching already appeared to commence in the grinding step, as shown in Figure 13-1.

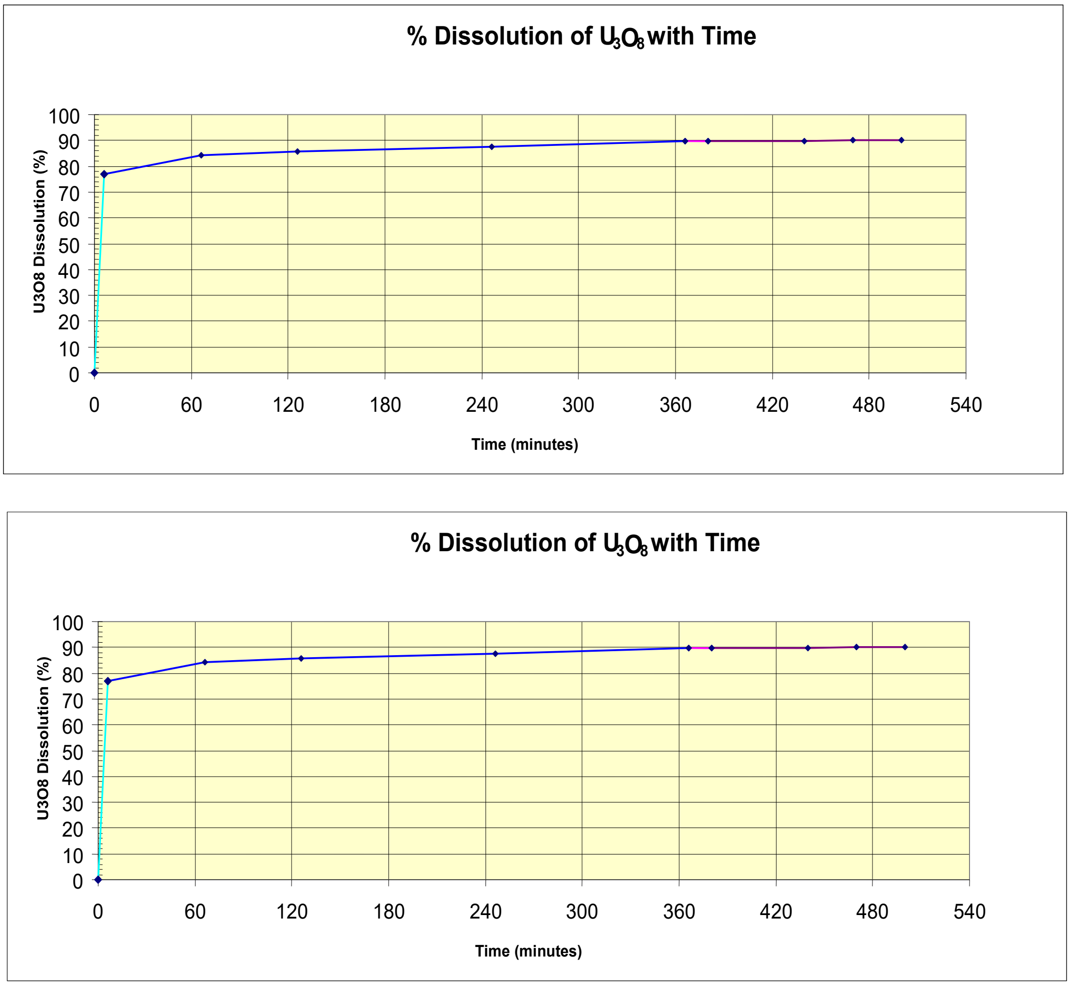


Figure 13-1: Alkali Leach - Dissolution of U_3O_8 with Time (Source: SGS, 2007)

13.1.4 Grindability

Standard Bond Work Index tests were performed on half-core samples received and both rod and ball mill work indices were determined; the results of which are shown in Figure 13-2 and Figure 13-3. In Figure 13-2, the specific work index for rod mill test was 4.9 kWh/t (F80 = 8240 micron; P80 = 864 micron). In Figure 13-3, the specific work index for ball mill test was 25.3 kWh/t (F80 = 998 micron; P80 = 87 micron).

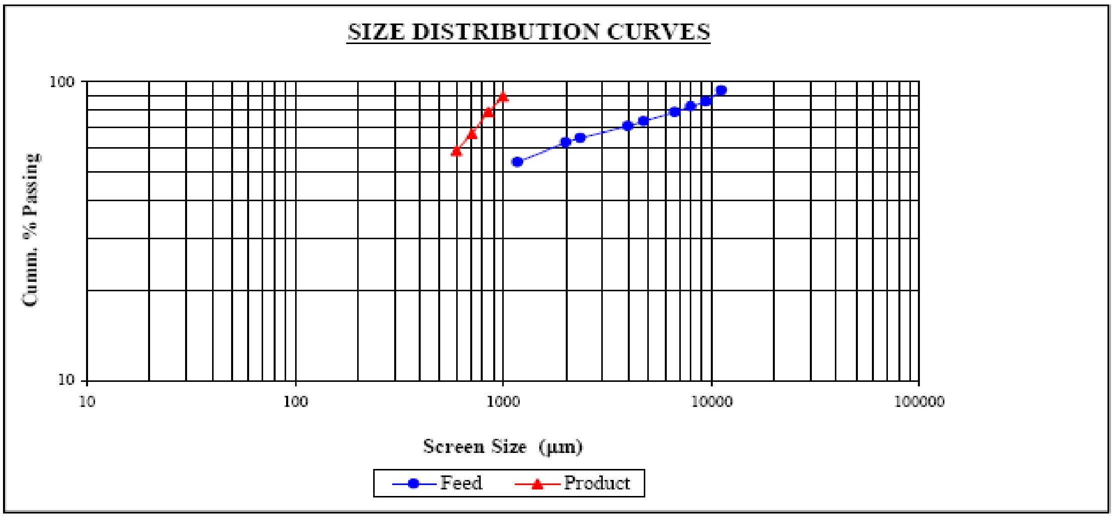


Figure 13-2: Rod Mill Work Index (Source: SGS, 2007)

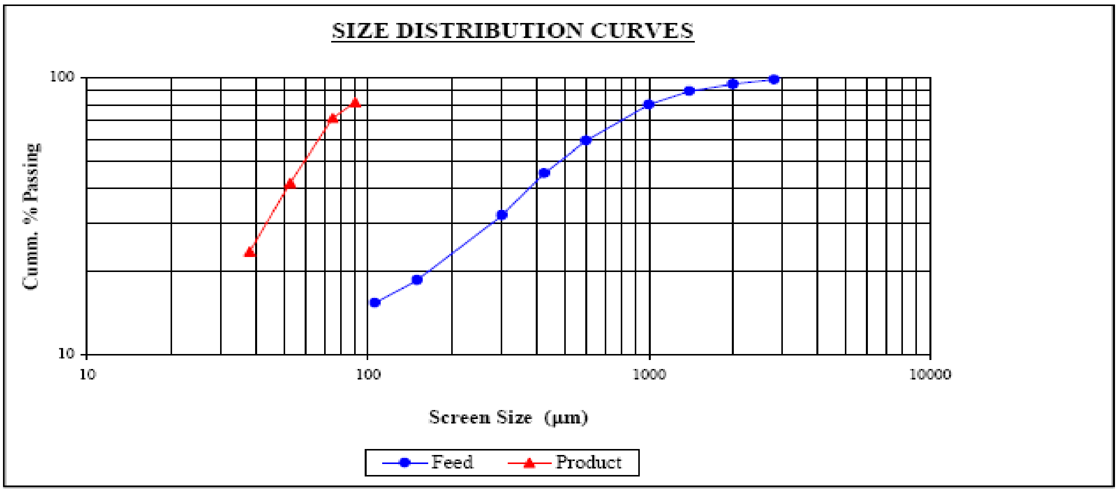


Figure 13-3: Ball Mill Work Index (Source: SGS, 2007)

Orway Mineral Consultants ("OMC") were contracted to oversee further modelling work as part of the Phase 2 leach test work. The objective of this test work was to establish an optimal liberation size of the sandstone host rock with respect to uranium extraction, and the associated specific energy requirement for the particle size distribution.

- Figure 13-4 represents the observed mill discharge size distribution achieved under varying energy inputs. The work index for this material was determined to be around 4 kWh/t for a P_{80} of 0.8 mm.
- Figure 13-5 reflects the uranium distribution by size class, for the feed and the mill products at varying energy input levels. Of note is that for the mill product for all energy input levels uranium is found predominantly in the particle size range <0.4 mm. This allows for a

relatively coarse grind and the rejection by screening of barren oversize material (or 'scats' reject).

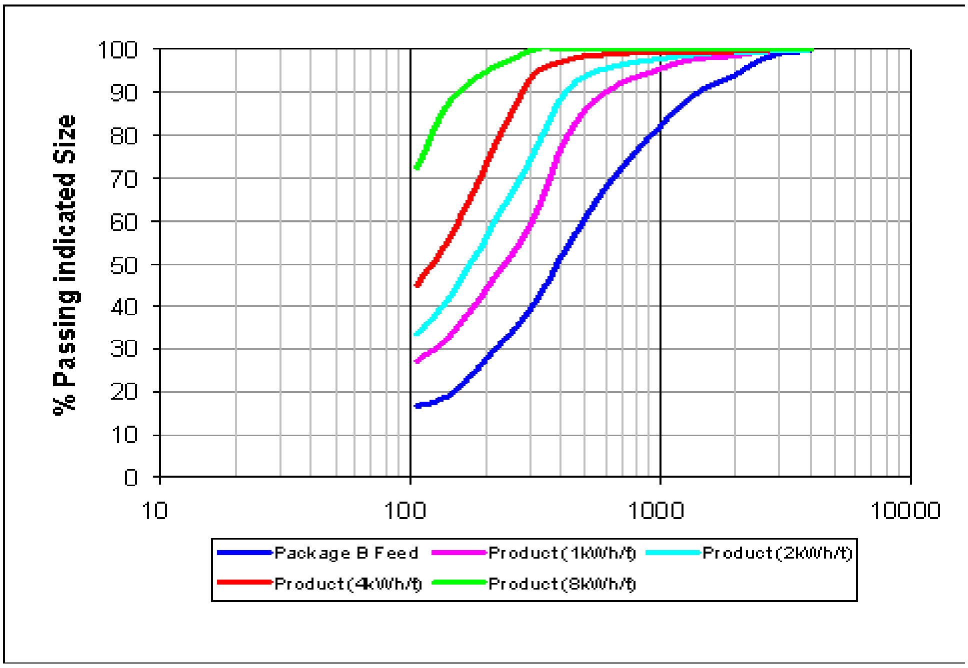


Figure 13-4: Mill Discharge Size Distribution (Source: SGS, 2007)

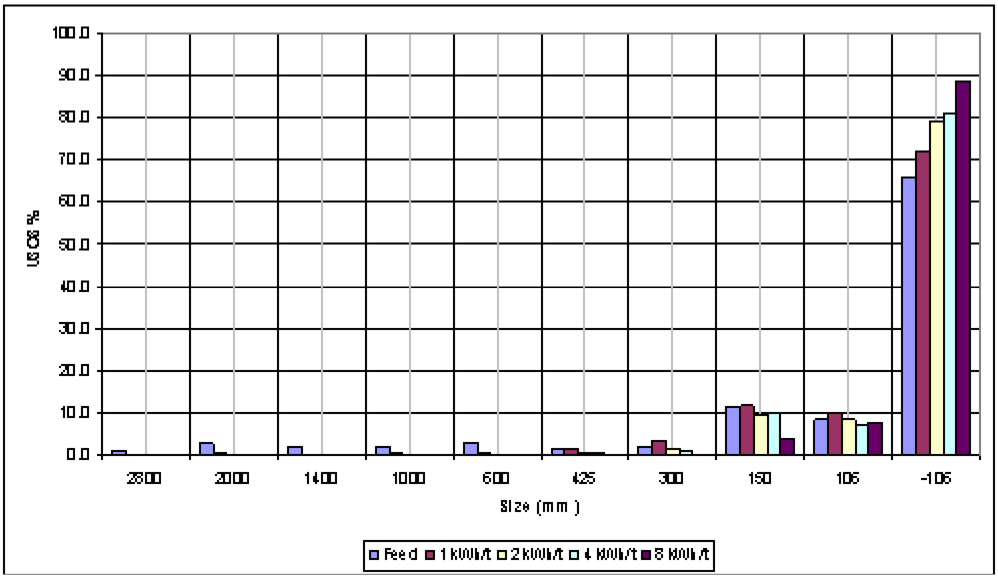


Figure 13-5: Uranium Granulometry (Source: SGS, 2007)

13.1.5 Settling and Filtration

Filtration tests were performed in accordance with ASTM methods. Figure 13-6 demonstrates the results from this test. Settlings tests were carried out to determine the performance of the material leached. Figure 13-7 represents a typical result from these tests.

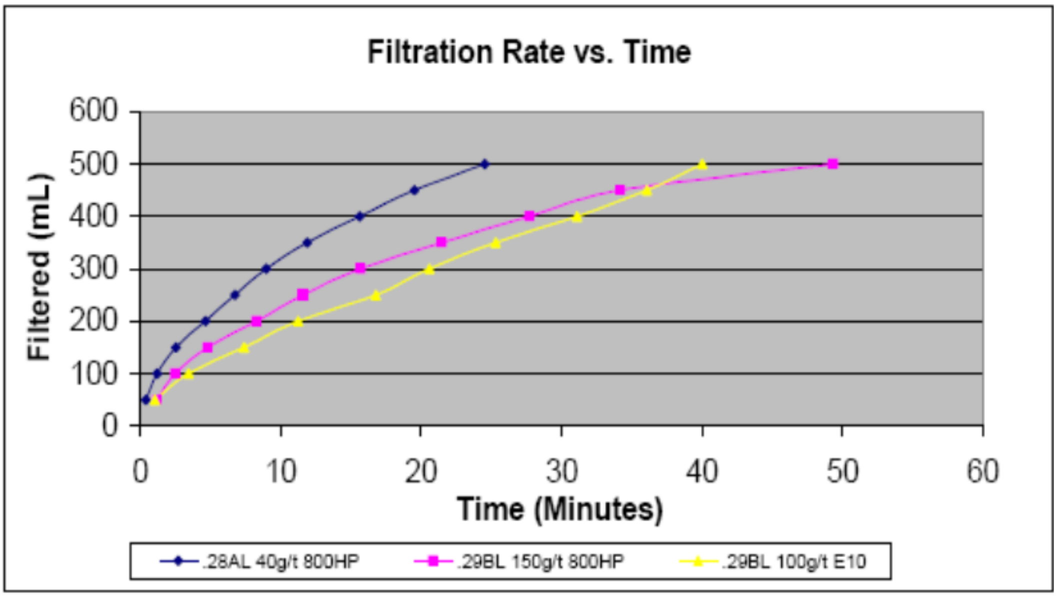


Figure 13-6: Filtration Rate (Source: SGS, 2007)

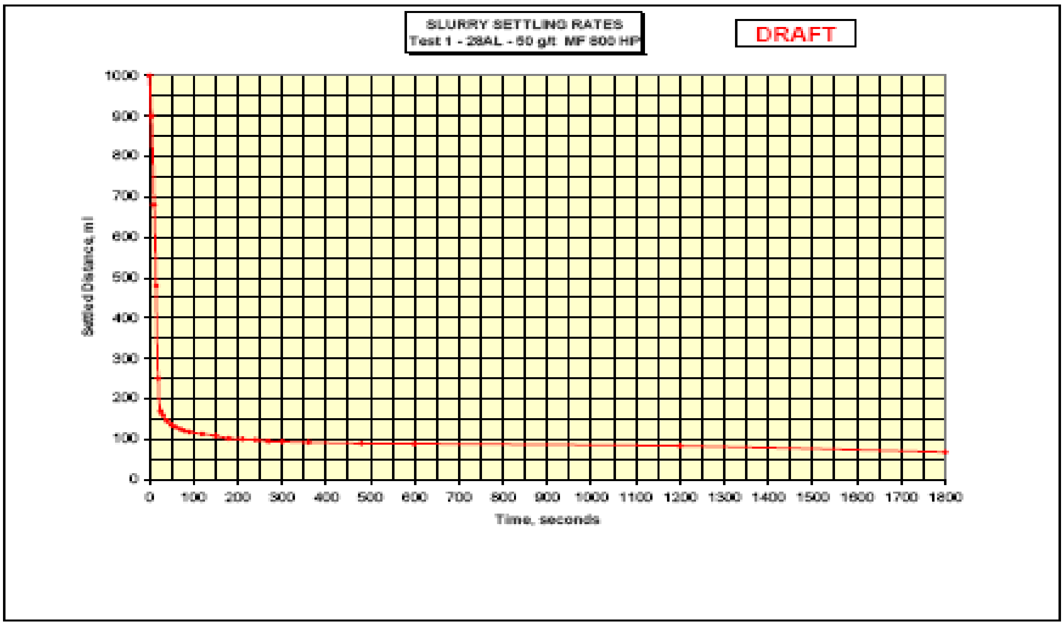


Figure 13-7: Settling Rate (Source: SGS, 2007)

13.1.6 Ion Exchange

The objectives of the ion exchange test work programme were as follows:

- determine loading capacity of resin using (1) Amberjet 4400 and (2) Lewatit K 6367;
- determine stripping capacity of different eluants; and
- understand likely issues associated with this process step.

Loading tests on both resin types indicated that resin loadings of up to 30 g/l U_3O_8 can be achieved. Phosphates are not generally absorbed by the resin, but chlorides will be and will necessitate downstream processes to reduce chloride in the final product. The latter is not expected to be a significant issue.

Elution tests in Figure 13-8 showed that sodium bicarbonate was an effective elution agent.

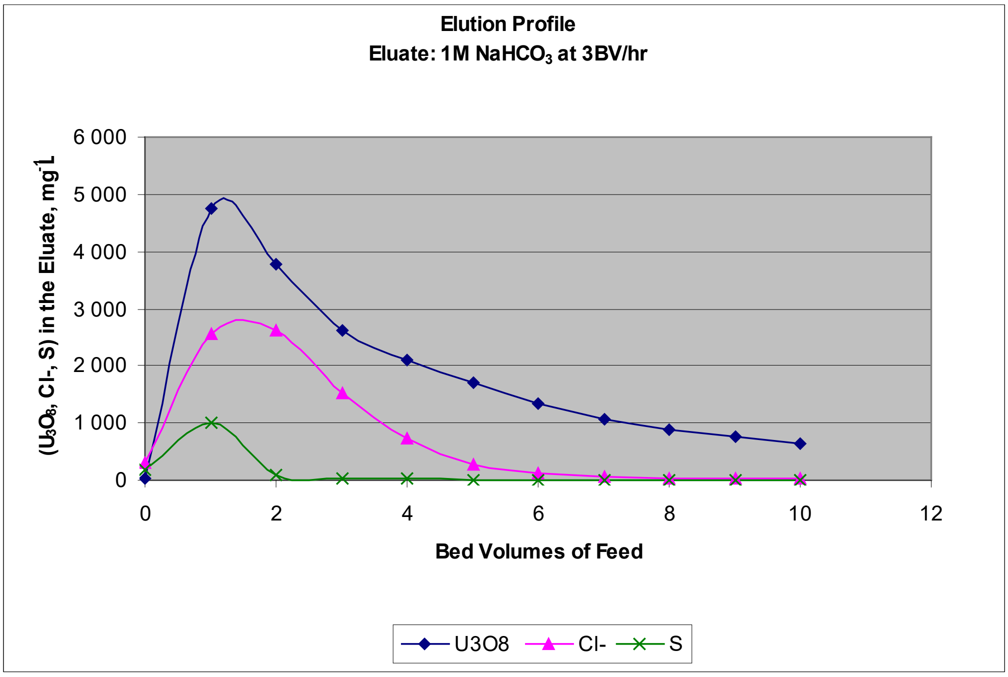


Figure 13-8: Elution Profile (Source: SGS, 2007)

A typical elution profile was simulated as represented in Figure 13-9. The actual elution of uranium complex begins only with the 9th bed volume when the sodium bicarbonate eluant is introduced. Noteworthy is the ratio of uranium concentration from that time relative to the impurities; this would signify that relatively small quantities of impurities are eluted with the resin.

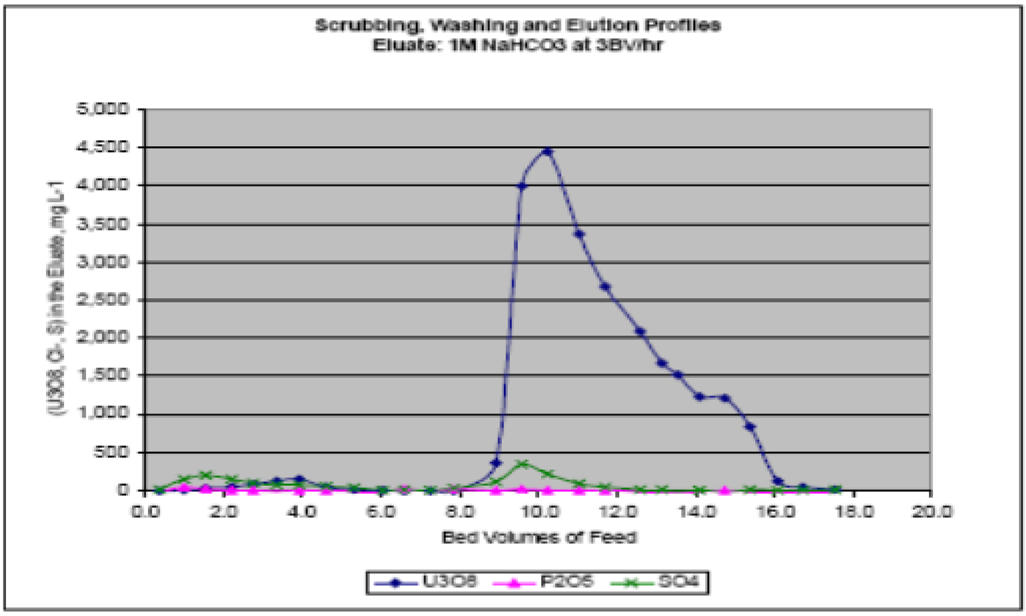


Figure 13-9: Elution Profile (Source: SGS, 2007)

13.1.7 Mineralogy

Selected uranium samples were evaluated by bulk mineralogical analysis (“BMA”) and trace mineral search (“TMS”) using QEMSCAN at SGS Lakefield Oretest in Brisbane, Queensland/ Australia.

The aims of the tests were to characterise the:

- natural liberation of quartz from the conglomerate phases; and
- The occurrence and mineralogy of uranium phases, including grain size, association and liberation.

Key findings from the evaluation:

1. The majority of the uranium (~95%) was contained in the U-Ca-P phase, nominally referred to as autunite. The ‘Other Minerals Group” (which makes up approximately 5% of the U elemental deportment) was comprised predominantly of brannerite and coffinite.
2. The vast majority (>90%) of the U-bearing mineral particles studied in the test programme were liberated to whilst <10% remained unliberated. The U-bearing minerals in the latter category were predominantly attached to the quartz boundaries.
3. The U-bearing minerals generally appeared to be discrete grains (not intergrown with other minerals), suggesting that it should be possible to achieve high levels of liberation of the U-bearing minerals.
4. Between 50-60% of the U-bearing particles in the test programme were associated with quartz, but the average grain size was small so that the proportion of the total deportment was low at ~2%. The dominant U-bearing mineral autunite was associated within the pores of the host rock (sandstone) not within the clay cement.
5. The U-bearing mineral autunite does not occur within the quartz grains. This suggests that it should be possible to upgrade the mineralized material by preferential removal of the quartz grains (~1 mm diameter and more).
6. The data suggests that the timing of the U mineralization was post depositional, which is supported by the low association between the U-bearing minerals and the quartz grains and clay cement.

13.2 Key Findings and Discussion

13.2.1 Extraction

Phase 1 leach test work findings:

- Extraction results from samples that had been ground to fine powder have slower kinetics than samples ground to coarser size, but there appears to be little difference in ultimate extraction levels. There is no immediate explanation for this phenomenon which will be investigated further in selective metallurgical testing but it indicates that very fine grinding, may not be necessary.
- Extraction kinetics appear very fast for coarse grain sizes, suggesting that little leaching capacity is required, potentially obviating the need for a leach circuit with leaching occurring in the grinding circuit.

- Higher temperatures result in faster kinetics and higher terminal extraction; however, increasing temperatures over 50ºC yielded diminishing returns and this will require further investigation.
- Acid medium process dissolves a wide range of elements and other chemical species potentially deleterious to downstream processes, whereas alkaline process yields a cleaner leachate: phosphates in particular were found to dissolve in significant quantities in the acid medium. Despite this, the more favourable leach kinetics and reagent cost led to acid leach being selected over alkaline leaching.

Phase 2 test work centered on repeating acid leach test results and refining specific economic sets of conditions. Key findings were as follows:

- It will be possible to commence the leach step in the grinding process, to exploit the extremely fast reaction of uranium once the appropriate leach conditions are established.
- Grinding energy will be an important heat source to support the fast reaction, but it will be required to heat some of the liquor streams to achieve an extraction level of around 90% at a temperature of 60ºC.
- ‘Scat’ removal will permit the removal of some 30% of the mill product, for negligible loss of uranium. This tonnage reduction will have favourable impact on downstream capital and operating costs.

13.2.2 Grindability

Rod mill work index is in line with expectations, while the considerably higher ball mill work index reflects the incremental energy required to grind the quartzite grit enclosed in the sandstone matrix. As the uranium mineralization is expected to be hosted in the matrix of the sandstone, rod milling appears to be a more economic proposal. A coarser grind will require a process step to separate +0.3 mm (approximately) particles from the fines to avoid downstream processing issues. Ball milling would only be justified if the incremental energy is offset by additional uranium recovery.

The comminution test work performed as part of the Phase 2 leach test work demonstrated the feasibility of rejecting the coarse barren ‘scat’ fraction with negligible uranium loss, achieved at relatively low grinding energy of around 4 kWh/t.

13.2.3 Settling and Filtration

Results were in line with expectations for materials of this type. Good settling and filtration results can be expected provided plant feed materials are not milled/ ground too fine. The test results suggest that high rate thickening is a viable alternative.

13.2.4 Ion Exchange

Resin elution by sodium bicarbonate appears both practical and economical; sharp peaks were recorded that allow separation of contaminants and uranium product within a specific elution sequence. Resin loading tests specifically were not performed, but mass balances performed during leach tests indicated that there appeared to be no barriers to uranium loading onto the resin from competing ionic species. Mineralogical work will give further insight into potential issues but no deleterious effects are anticipated that prevent resin-in-pulp (or alternatively similar processes) to be implemented.

13.2.5 Mineralogy

Mineralogical evaluation established that the uranium mineralization is predominantly secondary uranium, thus reinforcing the favourable acidic leach characteristics found during the Phase 2 test work.

13.3 Recommendations

In order to further improve the understanding of the flowsheet finalisation, the following recommendations are provided:

- continue the optimisation of acid leach conditions, to provide those to be used in the continuous testing part of the feasibility study that will be employed to prepare capital and operating cost estimates;
- continue the refinement of uranium recovery from the enriched liquors post-ion exchange to demonstrate acceptable product quality can be consistently achieved; and
- develop innovative ways of heat recovery and heating of the liquor streams to provide the environment required to support fast uranium dissolution.

13.4 Heap Leach Testwork – Muntanga and Dibbwi Samples

The following is summarised from information provided in a report prepared by Mintek, Randburg, South Africa (May 2013) titled "Heap Leach Feasibility Testwork on Muntanga and Dibbwi Ores".

Denison submitted to Mintek 1,170 kg and 1,400 kg of diamond drill core samples from the Muntanga and Dibbwi uranium deposits respectively. The drill cores were divided into groups according to the production periods planned for the two deposits. These were referred to as variability samples in Muntanga Uranium Project Denison Mines Corp Report No: R305.2013 107.

Composite samples were also prepared. Chemical head assays showed uranium contents (as U) of 200 ppm and 210 ppm for the Muntanga and Dibbwi composite mineralized samples.

Both mineralized samples were composed of mainly silica (86%) and alumina (8%) which are known to exhibit low reactivity to acid media. Iron at between 1.3 and 1.9% was found to be the main impurity in both mineralized samples.

A summary of testwork is given below:

- At a crush size of 100% <25 mm, both mineralized material types could be stacked to a height of 6 m and still be permeable to reagent (lixiviant) at an application rate of 10 L/m^2/h.
- Acid leach bottle roll tests indicated that uranium extraction rates for Muntanga mineralized material are reasonable, with final acid consumption of 3 kg/t and could be leached within three weeks yielding extraction of 88%.
- The optimum conditions to leach the Muntanga mineralized material were concluded to be the addition of 2.5 kg of concentrated sulfuric acid per ton of dry mineralized material during agglomeration, three days curing time and irrigation of the mineralized material with 3 g/L acid solution at an irrigation rate of 6 L/m^2/h.

- The Dibbwi composite sample exhibited higher acid consumption (12.3 kg/t) and required a longer period of time (80 days) for completion of the leach cycle. A maximum uranium extraction of 79% was achieved for the Dibbwi mineralized material.
- The Dibbwi sample was agglomerated with 10 kg/t of acid, followed by a curing period of 7 days and was then irrigated using leach solution containing of 3 g/L acid at an application rate of 15 $L/m^2/h$. Under these conditions, the uranium extraction was improved such that a maximum extraction of 82% was achieved, most of it in less than two weeks.
- The acid consumptions expressed in terms of kg acid consumed per pound of U_3O_8 extracted for the Muntanga and Dibbwi mineralized material were 3.7 kg/lb and 37.3 kg/lb, respectively.

13.5 Acid Leach Test Results

13.5.1 Results and Interpretation

The key results of the acid leach test program are:

- High uranium extractions, as presented in Figure 13-10.
- Low acid consumptions of 3-12.3 kg/tonne, based on total acid addition.
- Excellent response of the range of mineralized materials tested to dilute acid agglomeration as indicated by high flooded permeability rates, low to negligible “slump” (compaction under irrigation) retention of permeability through 60 days of irrigation leaching and retention of visual agglomeration in material dumped from the columns after leaching.
- Low coextractions of contaminant elements (thorium, vanadium) and elements which will accumulate in solution, thus requiring solution bleed and water treatment for removal to maintain a zero water discharge operation.
- High Eh values throughout the leach cycles of all column tests without added oxidant.
- The column leach test results are considered most valuable, since, except for the closed cycle irrigation procedure (no removal of uranium through the period of irrigation), they represent an accurate simulation of field performance of an acid heap.
- Figure 13-10 shows the column leach work, excluding hold-up. The overall recoveries were much higher, once the mass balance was closed and the recirculating solution was accounted for.

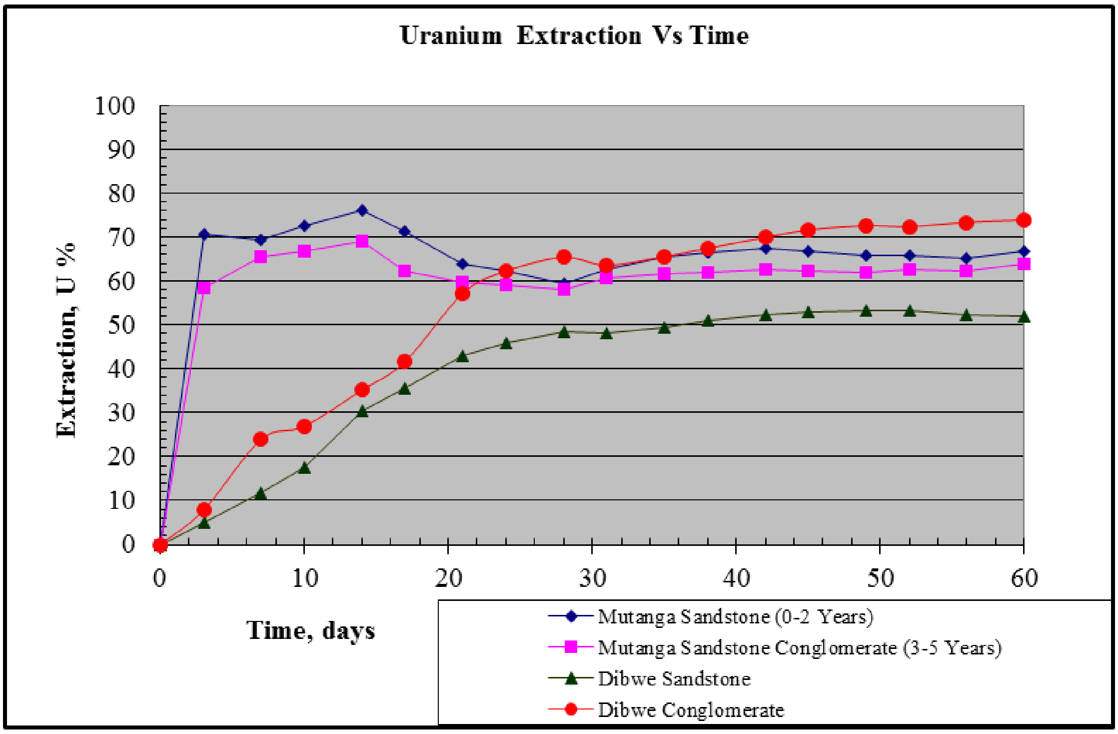


Figure 13-10: Muntanga Column Leach Uranium Extraction (Source: MDM, 2009)

Figure 13-10 illustrates that most of the Muntanga uranium extraction from this column was “prompt”, occurring within the first 2-3 days of irrigation. Further kinetic information cannot be derived from the results as the procedure followed involved recycle of leach solution without uranium removal. The shape of the graph appears to indicate (or is at least compatible with) some re-adsorption of initially dissolved uranium; however, the uranium extraction values for the column leach tests (84.7% for the Y1 Muntanga for example) are rigorously derived from solution recovered, including an acid rinse, which is effectively barren solution from ion exchange (IX) and the uranium content of the residue.

Graphed results for the Muntanga column leach tests appear to indicate (or are at least compatible with) ongoing extraction at the end of the 60 day leach cycle. This may be due to a less than optimal initial acid addition or to slow leaching. Additional testwork is required to determine ultimate extraction.

The bottle roll acid leach tests were conducted on material after further comminution, such extraction results are not considered to be reliable predictors of column (or actual heap) extraction from -25 mm material. The results presented in the SGS report, however, are informative with respect to acid consumption (generally predictive), maintenance of high Eh and relatively low coextraction values. The bottle roll results with added oxidant (manganese dioxide plus ferric sulfate) indicate that the Muntanga materials tested do not respond well to a high level of ferric iron in leach solution; extraction was actually inhibited by the >1 g/L ferric content, perhaps due to ferric phosphate precipitation on the surface of otherwise easily leachable autunite. Bottle roll results do indicate a favourable response of Dibbwi material to a higher level of ferric than is observed from leaching with only acid addition.

13.5.2 Acid Leach – Conclusions and Recommendations

The materials tested in columns represent the broad lithotypes of the Muntanga and Dibbwi resource materials. Additional testwork is required to optimize leach conditions and confirm extractions for composites of the mineralized materials, but results to date are considered to confirm the technical feasibility of acid heap leach technology for the Muntanga and Dibbwi resource materials.

Additional testwork is recommended to optimize the leach parameters (initial acid addition, lift height, etc) and to confirm leach performance on all scheduled resource materials.

Additional testwork is also required to better define the accumulation on coextracted metals as a basis for determination of the solution bleed and treatment which may be required to maintain zero water discharge, leach performance and uranium product quality.

13.6 Chirundu

13.6.1 Background

The Chirundu mining licence contains two uranium deposits, namely Njame and Gwabi, both of which have been explored by reverse circulation and diamond core drilling.

13.6.2 Geology

Drilling at Njame by AFR has identified two mineralized horizons which are generally parallel to geological/lithological boundaries. Drilling has occurred along the length of the 5 km long system, with uranium mineralization apparently encountered along the entire length; however, only at the northern and central sections of this system does the continuity and grade/thickness of the mineralization support the delineation of resources of sufficient size to support mining operations.

Uranium mineralization at the Gwabi deposit is stratabound, and occurs in red, oxidised, coarse grained sandstones, grits and pebble conglomerates which overly a green, non-mineralized, reduced silty-shale horizon. This is interpreted to represent a major redox boundary, and may in fact be the regional unconformity between the Upper and Lower Karoo. The mineralization forms a broadly tabular body, which dips very gently to the southeast, and occurs at very shallow depths between 3 m and 29 m below surface.

13.6.3 Bottle Roll Testwork

Acid leach bottle roll testwork on Njame and Gwabi mineralized samples have been conducted by Mintek in Johannesburg. The Njame and Gwabi samples were bottle rolled leached at 25°C at three pH ranges (pH 1.2-1.5, pH 1.5-1.8 & pH 1.8-2.0) for 7 days. Extractions of 89% to 91% were achieved during the first 24 hours for the Njame leaches. Sulfuric acid (as 100%) consumption was between 3 kg/t and 7 kg/t.

Extractions of 76% to 78% were achieved for the Gwabi leaches after 7 days of bottle rolling. The sulfuric acid (as 100%) consumption varied between 40 kg/t and 49 kg/t from the highest pH (1.8-2.0) to the lowest pH (1.2.-1.5) ranges, respectively. Modal mineralogy assessments by Mintek indicate that Gwabi contains higher levels of carbonates which consume acid (~2% calcite at Gwabi vs <0.1% calcite at Njame).

From the results obtained from the tests on the variability samples, the maximum uranium extraction from both the Njame and Gwabi samples can be seen to vary mostly between 70 and 90%, with some of the Njame samples yielding close to 100% extraction. The acid consumption figures were mostly around 40 kg/t, but some of the Gwabi samples were more acid consuming, up to 95 kg/t.

These tests were all conducted under the same set of leaching conditions, therefore the variability observed reflects variability in extractive metallurgical behaviour of the mineralized material from different locations (Figure 13-11 to Figure 13-13). Table 13-2 summarises the various extraction efficiencies for the Njame and Gwabi samples, as can be seen there is a significant range of extraction efficiencies from 62 – 97% and acid consumption from 33.5 – 99.5 kg/t.

Bottle roll testwork (broken down by mineralized material lithology), as shown in

Table 13-3, reveals that the majority of average extractions were in the range of 85 – 91% and the average acid consumption in the range of 37 – 48 kg/t. There were two outliers of 65% average extraction for the "Pebbly Grit" lithology for Gwabi and 86.5 kg/t average acid consumption for the "Siltstone" lithology at Gwabi.

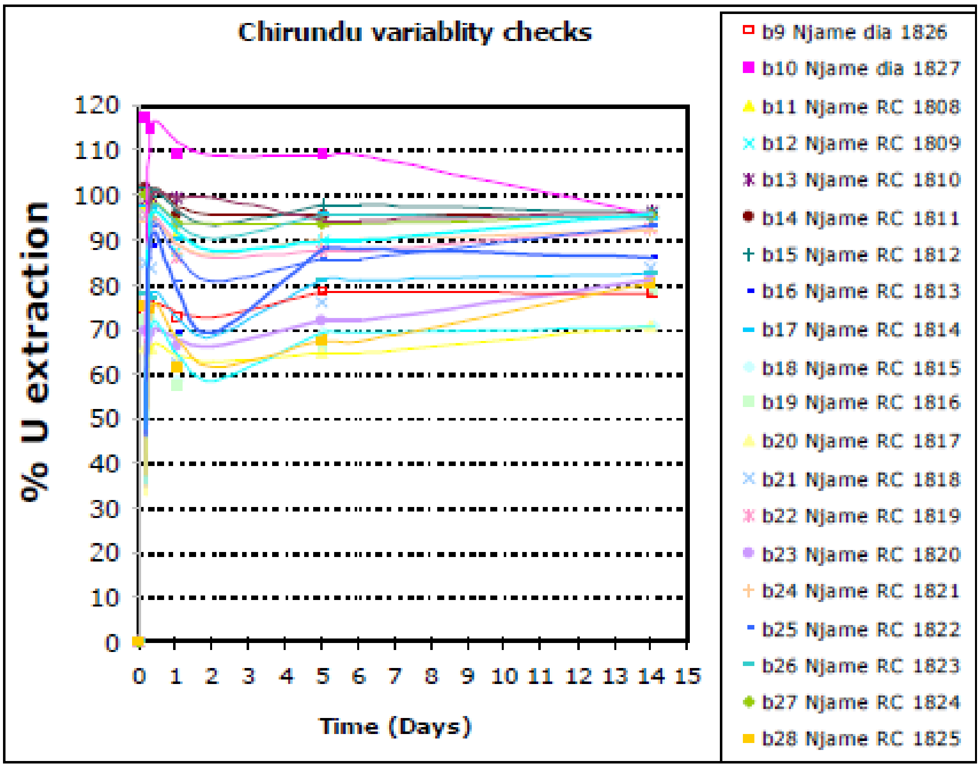


Figure 13-11: Chirundu – Njame - Variability Checks (Source: Mintek, 2010)

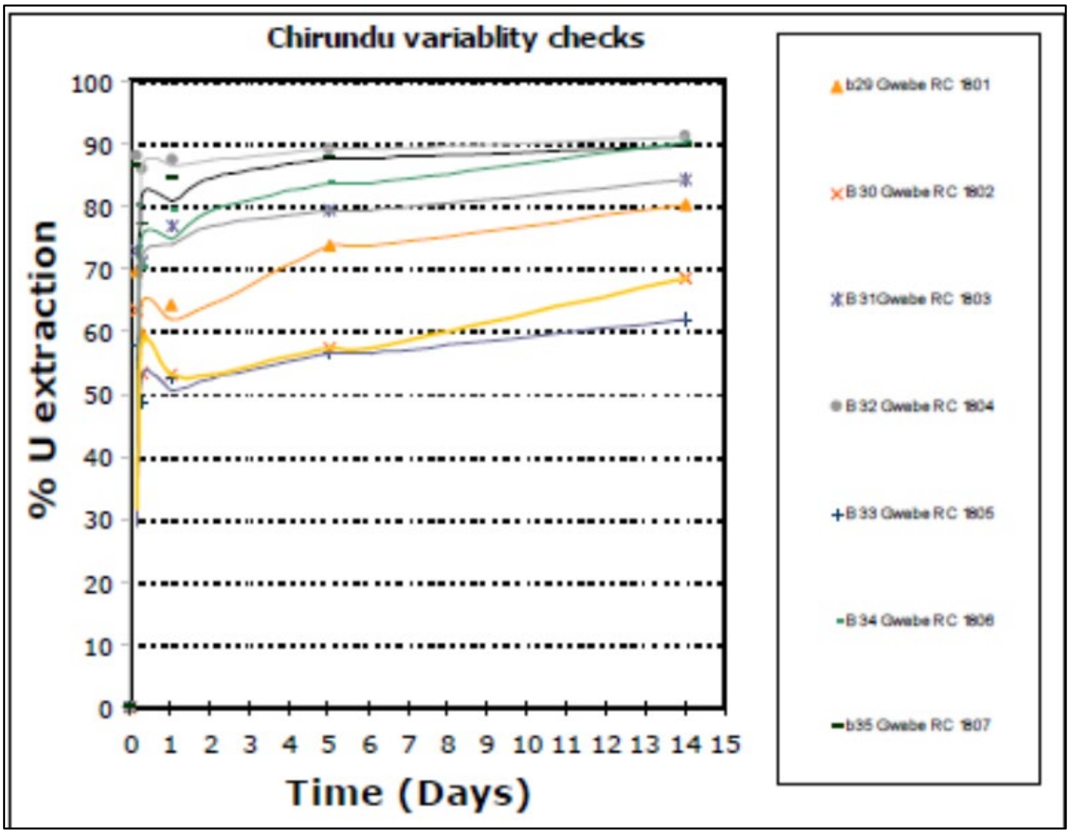


Figure 13-12: Chirundu Variability Checks – Gwabi - U Extraction over Time (Source: Mintek, 2010)

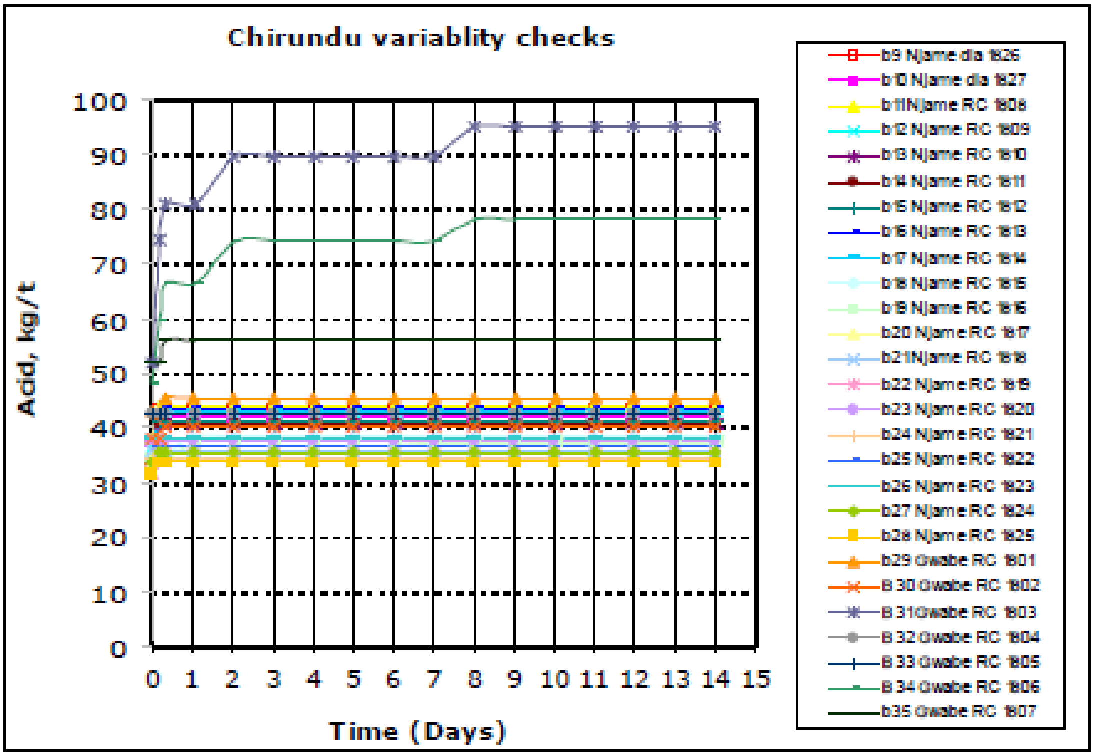
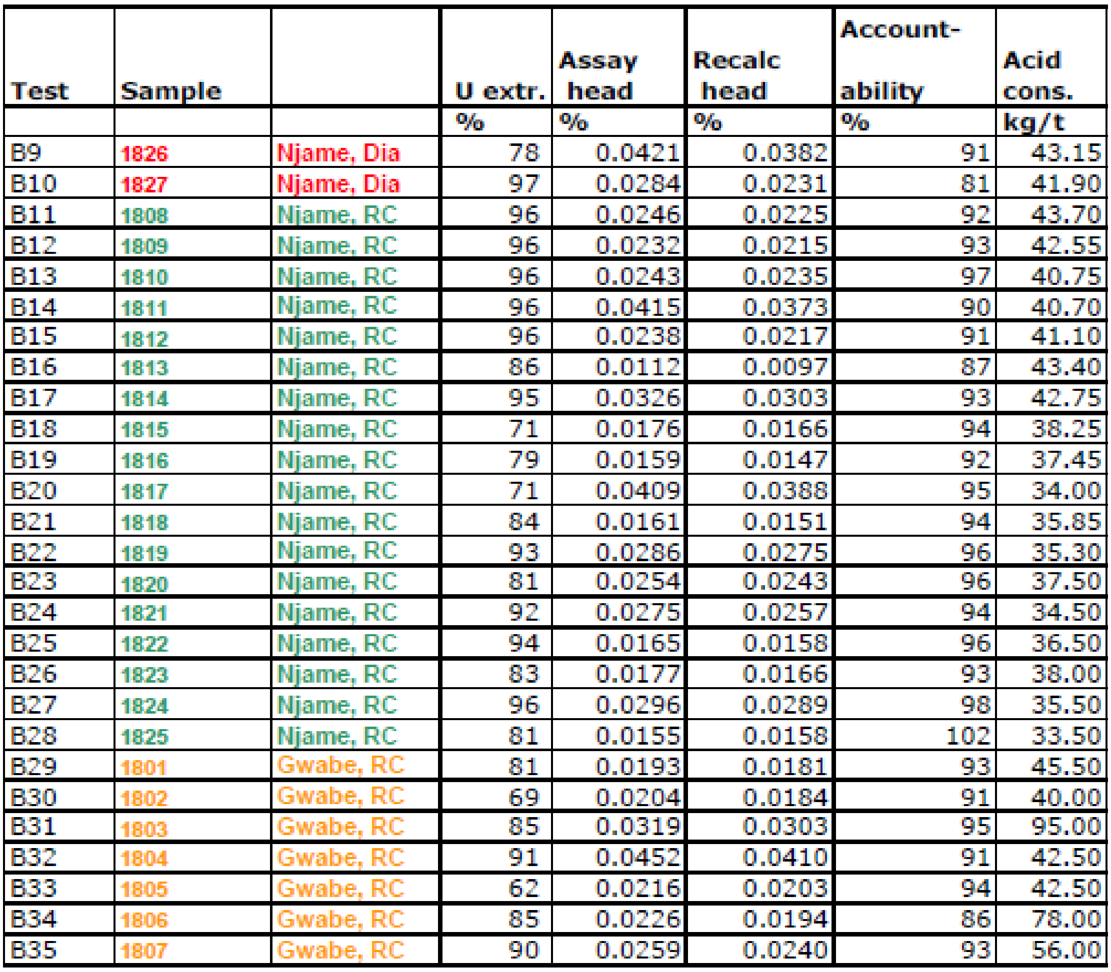


Figure 13-13: Chirundu Variability Checks – Acid Consumption (Source: Mintek, 2010)

Table 13-2: Summary of Variability Results (Source: Mintek, 2010)



Test	Sample		U extr.	Assay head	Recalc head	Account-ability	Acid cons.
			%	%	%	%	kg/t
B9	1826	Njame, Dia	78	0.0421	0.0382	91	43.15
B10	1827	Njame, Dia	97	0.0284	0.0231	81	41.90
B11	1808	Njame, RC	96	0.0246	0.0225	92	43.70
B12	1809	Njame, RC	96	0.0232	0.0215	93	42.55
B13	1810	Njame, RC	96	0.0243	0.0235	97	40.75
B14	1811	Njame, RC	96	0.0415	0.0373	90	40.70
B15	1812	Njame, RC	96	0.0238	0.0217	91	41.10
B16	1813	Njame, RC	86	0.0112	0.0097	87	43.40
B17	1814	Njame, RC	95	0.0326	0.0303	93	42.75
B18	1815	Njame, RC	71	0.0176	0.0166	94	38.25
B19	1816	Njame, RC	79	0.0159	0.0147	92	37.45
B20	1817	Njame, RC	71	0.0409	0.0388	95	34.00
B21	1818	Njame, RC	84	0.0161	0.0151	94	35.85
B22	1819	Njame, RC	93	0.0286	0.0275	96	35.30
B23	1820	Njame, RC	81	0.0254	0.0243	96	37.50
B24	1821	Njame, RC	92	0.0275	0.0257	94	34.50
B25	1822	Njame, RC	94	0.0165	0.0158	96	36.50
B26	1823	Njame, RC	83	0.0177	0.0166	93	38.00
B27	1824	Njame, RC	96	0.0296	0.0289	98	35.50
B28	1825	Njame, RC	81	0.0155	0.0158	102	33.50
B29	1801	Gwabe, RC	81	0.0193	0.0181	93	45.50
B30	1802	Gwabe, RC	69	0.0204	0.0184	91	40.00
B31	1803	Gwabe, RC	85	0.0319	0.0303	95	95.00
B32	1804	Gwabe, RC	91	0.0452	0.0410	91	42.50
B33	1805	Gwabe, RC	62	0.0216	0.0203	94	42.50
B34	1806	Gwabe, RC	85	0.0226	0.0194	86	78.00
B35	1807	Gwabe, RC	90	0.0259	0.0240	93	56.00

Table 13-3: Acid Bottle Roll Extraction Summary According to Mineralized Material Lithology (Source: Mintek, 2010)

Deposit	Lithology	Average Acid Consumption kg/t	Average Extraction %
Gwabi	Pebbly Grit	41.3	65.0
Gwabi	Gritty Sandstone	48.0	87.0
Gwabi	Siltstone	86.5	85.0
Average		**57.1**	**80.0**
Njame	Pebbly Sandstone	40.5	91.0
Njame	Sandstone	37.6	86.0
Njame	Siltstone	38.6	87.0
Average		**38.9**	**88.0**

13.6.4 Alkaline Leach Bottle Roll Testwork

Bottle roll tests using alkaline conditions (45 g/l Na_2CO_3 and 15 g/l $NaHCO_3$) have been conducted on both the Gwabi and Njame composite samples. The results were 71% recovery at Njame and 58.52% at Gwabi, respectively, after a 7-day bottle roll leach test. The extraction efficiencies were not as high as the acid bottle roll testwork, so the column leach testwork was conducted using an acid leach.

13.6.5 Column Leach Testwork

Column leach testwork was carried out at SGS Lakefield, Canada and Mintek.

SGS Testwork

For this phase of the testwork, 150 mm diameter columns with a height of 2 m were selected. Once optimum leach conditions were established, a second phase of work was undertaken in a 3 m column. Diamond drilling to provide representative core samples were used to create two composite samples for the column leach testwork, one each for Njame and Gwabi. Results after 21 days of leaching are presented in Table 13-4.

Table 13-4: Column Testwork Results after 21 Days of Operation (Source: SGS, 2009)

Column Reference	Days to Equilibrium	Relative Extraction[1] %	Acid Consumption kg/t	Acid Consumption at 80% Extraction kg/t	Fe $^{3+}$ Consumption kg/t	Fe 3+ Consumption at 80% Extraction kg/t
Njame no 1	Not Reached	37.6	44.45	N/A	0	N/A
Njame no 2	16	99.3	28.6	17.2	7.98	4.69
Njame no 3	Not Reached	27	47.5	N/A	0	N/A
Njame no 4	19	94.5	37.6	18	10.3	4.66
Njame no 5	15	166.3	47.25	<11.7	12.8	<2.3
Gwabi 1	19	115.6	56.7	31	9.6	2.61
Gwabi 2	Not Reached	16.5	49.14	N/A	0	N/A

[1] Relative Extraction - Reported extractions are based on the estimated content of uranium in the mineralized material (head assay multiplied by the mass of mineralized material) and the uranium in the liquor (concentration multiplied the volume of leachate). Extractions of greater than 100% indicate under reporting of the uranium content in the precursor mineralized material. Reconciliation of the extractions should have been taken on completion of the tests and based on liquor and residue assays.

The results indicate that the addition of an oxidant greatly enhances the rate of extraction (see Table 13-4 and Figure 13-14), leading to excellent leach dynamics. Columns in which oxidant was added all reached complete extraction or equilibrium within 20 days. Further testwork is required to establish the optimum level of oxidant addition. Acid addition was on the basis of pH control. Acid consumptions have been based on based on the quantity added to achieve 80% relative extraction.

The basis for the study has been set at 17 kg/t acid, 0.5 kg/t ferric sulfate, and 3.4 kg/t hydrogen peroxide (equivalent to 4.66 kg/t ferric sulfate). Hydrogen peroxide has been selected in preference to ferric sulfate as the primary oxidant for the commercial scale operation as it generates no residual metals that may require removal from the process. This will require further investigation in the next phase of testwork.

Figure 13-15 illustrates the fast uranium dissolution kinetics for the Gwabi column, with the majority of uranium amenable to leaching by this process leached within seven days.

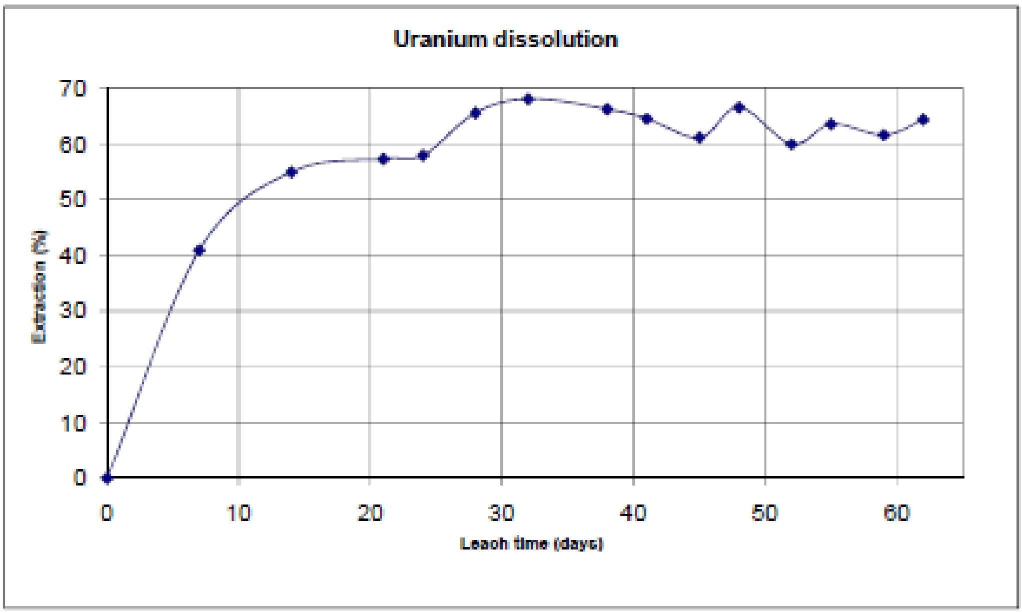


Figure 13-14: **Column Leach Tests for Njame 3 m Optimum Column after 62 Days Continuous Leaching (Source: SGS, 2009)**

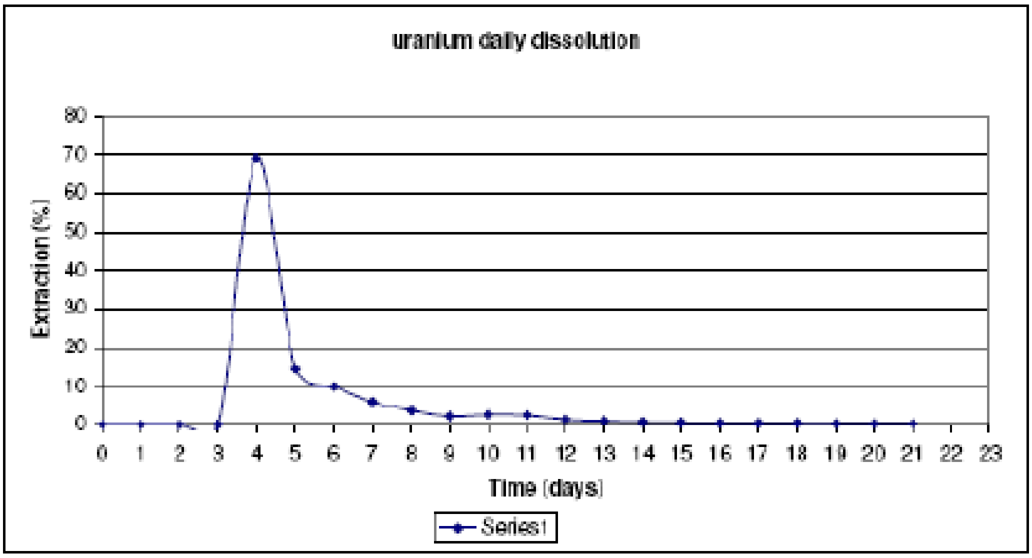


Figure 13-15: **Gwabi Column Daily U Dissolution (Ferric Sulfate and Acid Cure) (Source: AERL, 2008)**

Mintek Column Testwork

Two composite samples derived from several Njame drill cores were subjected to 2 m acidic column leach tests, one of the feed samples was scrubbed (“scrubbed mineralized material”) and one was unscrubbed (“unscrubbed mineralized material”).

The data for the column leach tests are indicated in the graphs below, with uranium extraction curves based on drainage solution assays and recalculated head. Leaching was complete after 25 days, or an irrigation ratio of 2 m^3/t mineralized material (Figure 13-16). At this point the extraction curve shows a decrease due to the recycle of fresh solution at 100 ppm U into the column as irrigation liquor. This does not reflect precipitation of uranium but rather it is due to the lag between the introduction of lower concentration solution into the column, and the time required for the pregnant leach solution to reach this concentration.

After completion of the irrigation, dye-penetration tests were performed, and the penetrant solution was collected and assayed for uranium, in order to account for additional uranium that was washed from the column during the penetration test. This is observed as an increase in extraction back to the same extraction levels that were observed prior to recycling of the 100 ppm solution, confirming that the uranium extraction had levelled off by day 30.

Columns were irrigated with solution at pH 1.5 (3 g/L sulfuric acid) and 0.5 g/L Fe, adjusted to 600 mV with hydrogen peroxide in the feed tank (Figure 13-17).

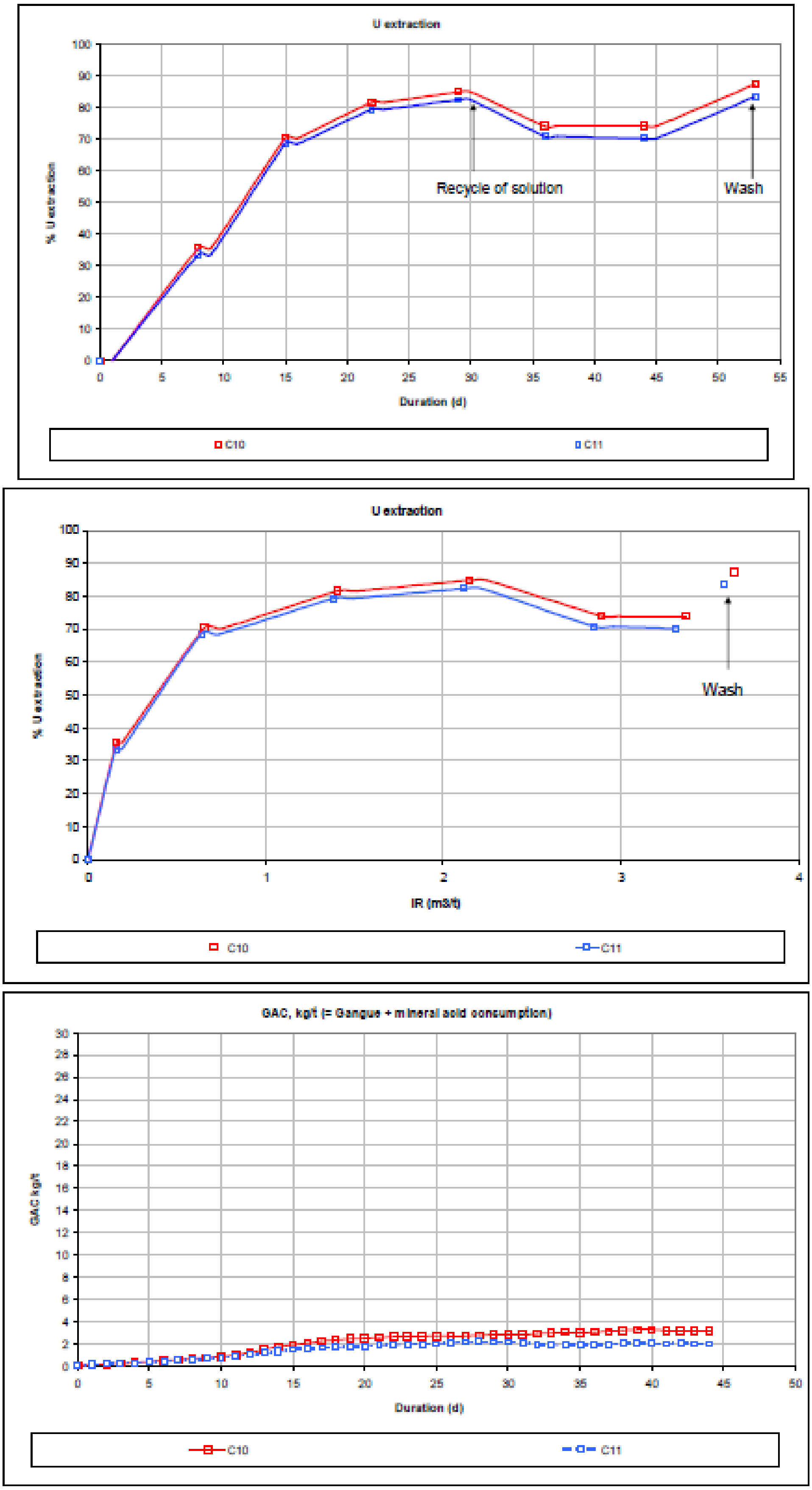


Figure 13-16: Extraction and Acid Consumption - Njame 2m Column (Source: Mintek, 2010)

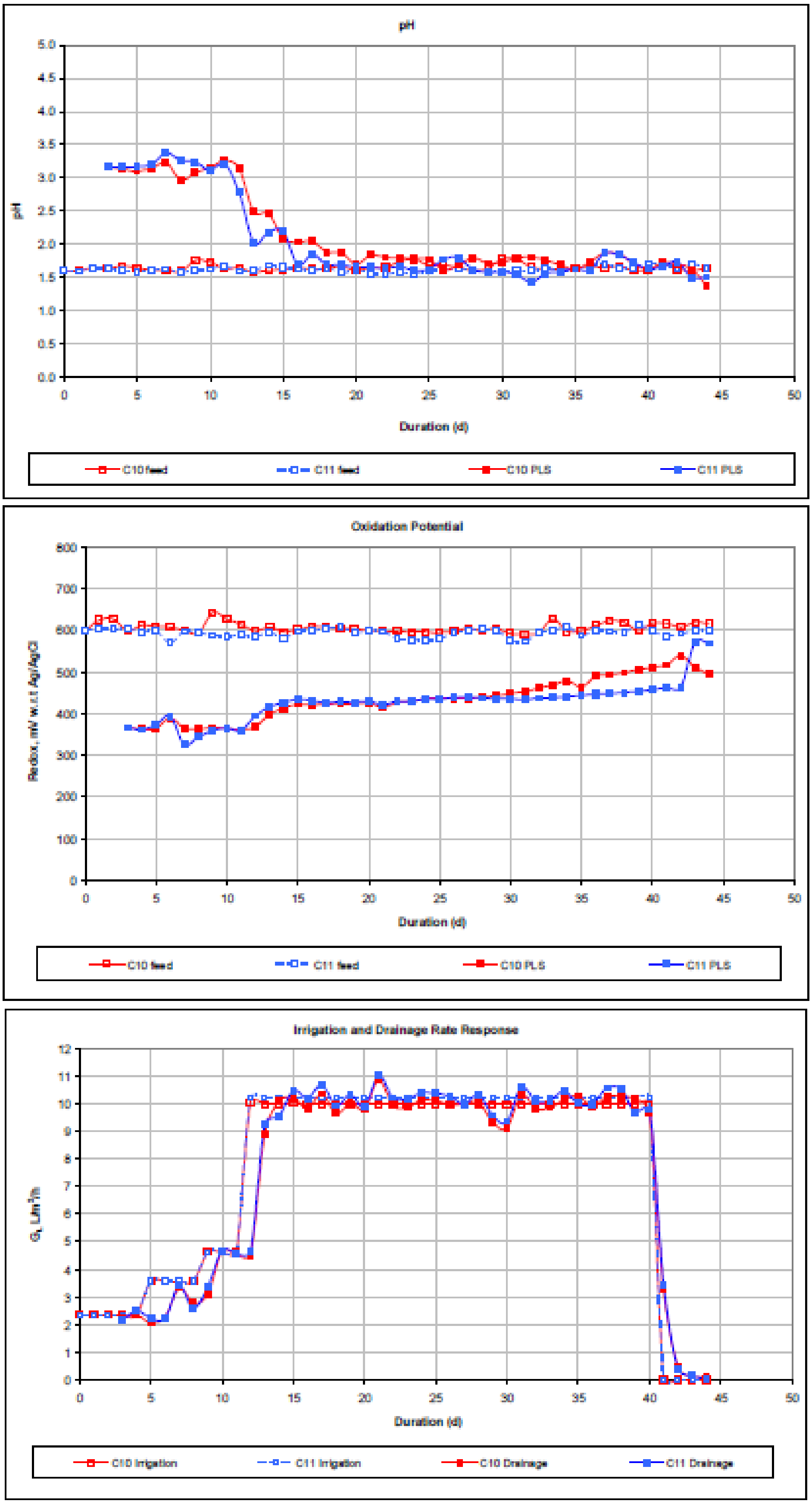


Figure 13-17: Test Conditions for Njame 2 m Mintek Columns (Source: Mintek, 2010)

The following conclusions can be drawn:

- The final uranium extraction obtained from the Njame mineralized material was around 85%, with the unscrubbed mineralized material (sample number C10) yielding slightly higher uranium extraction than the scrubbed mineralized material (sample number C11).
- At a stacking height of 2 m, uranium extraction is completed within 30 days, or an irrigation ratio of 2 m^3/t.
- Using irrigation liquor at pH=1.5, the final acid consumption was around a very low 3 kg/t.
- The mineralized material compacted within 5 days by 12 to 15% and then stabilised. The unscrubbed mineralized material actually compacted noticeably less than the scrubbed mineralized material.
- No benefit could be observed from the dry scrubbing of the mineralized material prior to leaching, thereby confirming earlier observations that fines occurring as hard lumps is not a significant problem with the Njame mineralized material.
- The final moisture hold-up in the mineralized material at steady state was a relatively high 20%, but ponding never occurred and the mineralized material seems to exhibit adequate permeability to irrigation liquor to sustain the irrigation rate of 10 L/h/m^2 applied.

13.6.6 Uranium Recovery

Mintek completed precipitation tests on the recovered uranium (Mintek, 2012), the following is summarised from their report. The U_3O_8 from the pregnant acid leach solution (“PLS”) from the Mintek column testwork (225 ppm U_3O_8) was recovered using a counter-current fluidised bed ion exchange in a NIMCIX column. The ion exchange bed was pre-fouled with sulfate and silica, of the two resins tested Rohm & Haas A4400 showed the better adsorption characteristics. The adsorption equilibrium isotherms for uranium loading onto the resin were influenced by sulfate concentration in the feed. Increasing sulfate concentration in the feed from ~6 g/L to ~17 g/L resulted in supressed U_3O_8 equilibrium loadings, at a barren equilibrium concentration of 100mg/L, the equilibrium U_3O_8 loading was ~51 g/L and 40 g/L respectively for A4400. A batch kinetic test indicated that >95% of equilibrium loading of U_3O_8 onto A4400 resin could be achieved within four hours.

A4400 resin was pre-loaded with ~35 g/L U_3O_8, McCabe Thiele construction indicated seven stages of stripping would be required to achieve a residual concentration <500 ppm U_3O_8 on the resin; 9 g/L U_3O_8 eluate was produced.

Precipitation of uranyl peroxide was carried out using hydrogen peroxide with caustic addition for pH control. The mass of yellow cake produced during the testwork was 9.1 g. Approximately 95% of the mass of yellow cake was UO_4, the rest being impurities.

13.6.7 Summary of Testwork

According to a mineralogical report completed previously at SGS, the uranium was observed as a combination of U-Ti oxides (presumably such as brannerite and betafite) and uraninite. The uranium content varies typically between 300 to 400 ppm U_3O_8. Successful leaching of uraninite would require oxidative leaching to oxidise the U(IV) to U(VI). The U-Ti oxides can be very refractory to leaching, but their leaching behaviour is difficult to predict and is best determined experimentally. The association with, and even occlusion of U-minerals in pyrite was mentioned in that report. The liberation of uranium from pyrite would require oxidation and solubilisation of the pyrite, but uranium locked in pyrite was not frequently observed and would therefore probably not be a major consideration for U extraction. During the testwork programme it was therefore considered important to include tests under both oxidising and non-oxidising conditions. The Gwabi deposit contains about 2% calcite and ankerite which, being carbonate minerals, are acid consuming. The Njame deposit contains virtually none of these carbonate minerals and would therefore be expected to be less acid consuming than the Gwabi mineralized material. For this programme of testwork, it was therefore considered important to include leaching tests under both acidic and alkaline conditions.

Both Gwabi and Njame mineral deposits occur at shallow depth with minimal dip, which permits mining by surface mining equipment. It is the intention to construct a heap leach pad at each of the deposits. Heap height of 10 m is currently envisaged, to be irrigated at 10 L/h/m^2 with mild acidic ferric liquor, being re-oxidised in the ponds using hydrogen peroxide if oxidising conditions are deemed to be required. Counter-current flow of the mineralized material with intermediate leach solution (“ILS”) and raffinate will be employed to increase the solution U-tenor. The current assumption has been that the resin can be loaded to 30 g/l U_3O_8.

From the results obtained by the programme of rolling bottle and column leach tests using acid described in this report, the following conclusions were drawn:

- The Ca content of the Njame mineralized material is mostly <0.1%, whereas the Gwabi mineralized material contains >0.1% Ca and variability samples containing up to 1% Ca have been found. This could indicate a higher acid-consuming calcite content in the Gwabi mineralized material, compared to the Njame mineralized material. Several silicates are also reactive to acid and could further increase the acid consumption of the Gwabi mineralized material, but the reaction of acid consuming silicates during heap leaching can often be controlled somewhat by manipulating the acid concentration in the irrigation liquor, highlighting the importance of continual testwork during operations.
- Because both mineralized materials contain siltstone, it was suspected there could be a risk of a large proportion of fines occurring as hard lumps which decompose upon wetting which can impair the permeability of the mineralized material during heap leaching. Several tests described in the report, however, indicated that this mineralized material does not exhibit that problem, and additional pre-treatment of the mineralized material like dry scrubbing would be unnecessary.
- It is concluded that the uranium that was extracted from both the Njame and Gwabi mineralized samples leached by chemical dissolution (be it in acid or alkaline medium), and oxidative leaching does not offer any advantage over non-oxidative leaching.
- During acidic leaching, the maximum uranium extraction from both the Njame and Gwabi mineralized material is independent of the acid strength, between pH values of 1.2 to 1.8.

- For both mineralized materials, the maximum uranium extraction is higher during acid leaching than during alkaline leaching. From the Njame mineralized material, a maximum of 80 to 90% extraction can generally be obtained by acid leaching (although individual variability samples yielded close to 100% extraction), but 70 to 80% by alkaline leaching. From the Gwabi mineralized material, a maximum of 70 to 80% extraction can be obtained during acid leaching, but about 60% by alkaline leaching.
- The acid consumption of blends of both mineralized materials increases with increasing acidity, increasing from 12 to 70 kg/t on Njame mineralized material and increasing from 75 to 140 kg/t on the Gwabi mineralized material as the pH is lowered from 1.8 to 1.2. On both mineralized sample blends, it was possible to keep the acid consumption in rolling bottle tests below 3 kg/t during acidic leaching at pH=1.8 under non-oxidising conditions.
- During alkaline leaching, both mineralized samples consumed zero alkali leach reagent.
- A comparison of the rolling bottle leach results on variability samples and their respective lithologies reveals that the Gwabi mineralized material exhibits greater variation in both acid consumption and uranium extraction amongst the different mineralized material lithologies than the Njame mineralized material.
- During acid column leaching of Njame mineralized material crushed to <20 mm, final uranium extraction of around 85% was obtained.
- At a stacking height of 2 m, uranium extraction during percolation leaching of Njame mineralized material with irrigation liquor at pH=1.5 is completed within 30 days, or an irrigation ratio of 2 m^3/t. Using irrigation liquor at pH=1.5, the final acid consumption was around a very low 3 kg/t. The mineralized material compacted within 5 days by 12 to 15% and then stabilised. The unscrubbed mineralized material compacted noticeably less than the scrubbed mineralized material. No benefit could be observed from the dry scrubbing of the mineralized material prior to leaching, thereby confirming that fines occurring as hard lumps is not a significant problem with the Njame mineralized material. The final moisture hold-up in the mineralized material at steady state was a relatively high 20%, but ponding never occurred and the mineralized material seems to exhibit adequate permeability to irrigation liquor to sustain the irrigation rate of 10 L/h/m^2 applied.

13.7 Dibbwi East

13.7.1 Geology

The Dibbwi East uranium mineralization is located in-between Dibbwi and Muntanga mineral deposits and is hosted by a number of relatively flat lying to gently southeast dipping units of Karoo sandstone interbedded with siltstone and shale. Exploration data suggests that the uranium mineralization is hosted within paleochannels in meandering stream depositional systems, with fine- to coarse-grained sands and silts containing some organic and pyrite material acting as a reductant for the precipitation of uranium.

A Colorado Plateau-type sedimentary uranium deposit has been discovered within the Dibbwi East area and has previously been explored by Denison. The results also suggest that diagenetic fluids have moved through the sedimentary rocks and were part of the process of emplacement of uranium mineralization in the area. The Dibbwi East deposit consists of three stacked mineralized horizons extending from surface to depths of 130 m. The A Horizon extends from surface to a depth of 45 m; B Horizon extends from 45 m to 80 m; and C Horizon extends from 80 m to 110 m. Coffinite is dominant at depth in the C Horizon while phurcalite (similar to autunite) is dominant in the A Horizon and B Horizon. The C Horizon is interpreted as primary mineralization from which the A and B Horizons are derived as secondary mineralization.

13.7.2 Mineralogical Testwork

The source of the uranium is believed to be the surrounding Proterozoic gneisses and plutonic basement rocks. Having been weathered from these rocks, the uranium was dissolved, transported in solution and precipitated under reducing conditions in siltstones and sandstones. Post lithification fluctuations in the groundwater table caused dissolution, mobilization and redeposition of uranium in reducing, often clay-rich zones and along fractures.

Mineralization is not strictly associated with a particular unit in the stratigraphic section. It is observed to occur in both the fine-grained and coarser material and in mudstones especially where fractures and mud balls occur. Some mineralization occurs in association with manganese oxide or disseminated with pyrite. Mineralization in some bore holes is seen to occur where there is grey alteration, limonite and feldspar alteration and in dark grey mudstones. The strata dip in the south-easterly direction and mineralization seems to occur along dip.

In 2011, Denison Mines Zambia Limited requested ALS Chemex Johannesburg to conduct a mineralogical analysis of four uranium samples shown in Table 13-5 to identify the uranium and gangue minerals present in the various strata, including both low and high grade zones. The samples were in the form of drill cores.

Table 13-5: Sample List for Mineralogical Study (Source: Denison and RPA, 2012)

Sample Number	Depth from (m)	Depth to (m)	Sample Type	Weight (kg)	U Grade (ppm)
F000988	96.85	96.95	SPOT	0.3694	2,988
F000989	93.7	93.8	SPOT	0.4562	1,958
F000990	54.3	54.4	SPOT	0.231	724
F000991	17.3	17.4	SPOT	0.2996	1,608

The mineralogical analysis, using an automated Mineral Liberation Analyzer (MLA), was used to determine the uranium minerals (Table 13-6 and Table 13-7) present along with the associated gangue (ALS Minerals, 2011).

The data indicates that the main uranium phase in sample F00988 was coffinite, which accounted for 97 Wt% of the uranium minerals in the sample. There was also some Ti-bearing coffinite in the sample.

Coffinite was also the most abundant uranium mineral in F00989, accounting for nearly 67 Wt% of the uranium minerals. It was predominantly Ti-coffinite (55 Wt%), with lesser coffinite (11 Wt%). Gastunite (28 Wt%) was also a major uranium mineral in this sample, which also contained a significant amount of Brannerite (6 Wt%). Despite having the second highest grade of the samples submitted, there was difficulty in finding the uranium minerals in this sample, hence the lower particle counts recorded.

Sample F00990 had less coffinite (26 Wt %) than the other two samples, with the most abundant uranium mineral being phurcalite (72 Wt%). There was also a small amount (2 Wt%) of gastunite present.

Phurcalite accounted for almost all of the uranium minerals in sample F00991, with minor coffinite and gastunite making up about 1 Wt% of the uranium minerals.

Table 13-6: Relative Uranium Mineral Abundance (Source: Denison and RPA, 2012)

Mineral	Relative Abundance (Wt%)				Particle Count			
	F00988	F00989	F00990	F00991	F00988	F00989	F00990	F00991
Brannerite	0.1	5.9	0.3	0.0	6	1	23	0
Coffinite	97.3	11.2	23.4	0.6	785	5	296	85
Ti-Coffinite	2.2	55.4	2.6	0.2	239	7	164	37
Phurcalite	0.1	0.0	71.8	98.9	4	0	556	427
Curite	0.0	0.0	0.0	0.0	1	0	0	0
Gastunite	0.4	27.5	2.0	0.3	79	10	134	57
Total	**100.0**	**100.0**	**100.0**	**100.0**				

Table 13-7: Uranium Distribution (%) (Source: Denison and RPA, 2012)

Mineral	F00988	F00989	F00990	F00991
Brannerite	0.03	4.74	0.15	0.00
Coffinite	98.23	15.47	22.53	0.59
Ti-Coffinite	1.33	45.69	1.46	0.09
Phurcalite	0.06	0.00	74.14	99.10
Curite	0.01	0.00	0.00	0.00
Gastunite	0.35	34.10	1.72	0.22
Total	**100.00**	**100.00**	**100.00**	**100.00**

13.7.3 Type of Mineralization

Disseminated Uranium Mineralization

Disseminated uranium mineralization occurs in sandstones, conglomerates, and within mud layers, mud balls and mud flakes. The uranium is present as interstitial fine grained crystals or small amorphous masses constituting less than 1% by volume, if visible at all.

Figure 13-18: Mineralization Associated with Mn Oxide (Black) (Source: Denison and RPA, 2012)

Grades vary considerably between zones of disseminations, approximately 20 ppm to 2052 ppm U_3O_8 (geochemical) in mineralization is thought to be solely of a disseminated nature, although mud replacement material may also have been contained within core and therefore not visible during logging leading to higher values.

Lithological units containing iron-oxide and uraniferous mineralization returned moderate to high assays, as did material containing sulfides (pyrite). Samples from MR05, MR08, MR09, MR10 and MR11 contain both sulfides and micas, and disseminated U_3O_8 and were expected to return low assays.

The presence of sulfides alongside uranium oxides may indicate a transitional zone and/or preferential replacement/reduction of uranium compounds by one chemical route over another (such as decaying organic matter over oxidation of sulfides) as uraniferous groundwaters moved through the lithologies.

Uranium Mineralization Associated with Mudstones and Siltstones

An association between uranium mineralization (as replacements and selvages) is evident at all prospects. The muddy lithologies include mud balls (within sandstones), flakes and interbeds. In some cases, mud balls may be completely replaced by mineralization (Figure 13-19).

The degree of replacement varies from fully replaced mud balls to those with a thin selvage of mineralization whilst others are unmineralized. This is attributed to:

- different ground water chemistry,
- differing volumes of reducing matter within the mud (fully replaced material may have been a peat like material), and
- the porosity of the muddy lithology during the influx of uraniferous ground water.

Figure 13-19: Mudclasts (Source: Denison and RPA, 2012)

Fracture Hosted Uranium Mineralization

Drilling intersected a number of fractures and fault rocks. The fractures intersected in core were generally steep (although several shallower angled fractures were logged). Mineralization is seen as crystal coatings on surfaces and as concentration close to surfaces (Figure 13-20). Most notably at the Dibbwi-Muntanga-Dibbwi corridor, these fractures are coated with black Fe/Mn oxides which in turn may be coated with secondary uranium phosphate mineralization (Autunite, meta-Autunite and selenite).

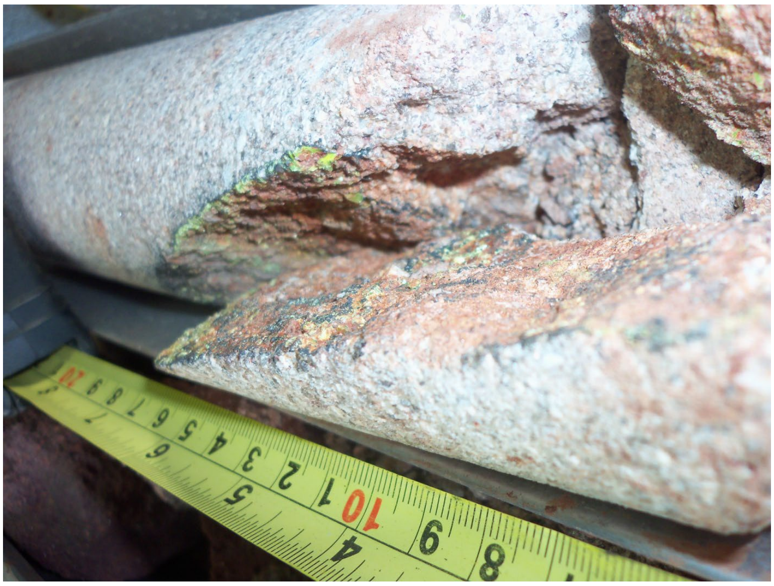


Figure 13-20: Mineralization in a Fracture with the Presence of Mn Oxide (Source: Denison and RPA, 2012)

Uranium Mineralization Associated with Pyrite

Grains and poorly defined blebs of pyrite occur throughout all the sedimentary lithologies of the Project area. Uranium mineralization may be elevated in some (relatively) pyrite rich zones.

The presence of sulfides in close proximity to uranium oxides may indicate a transitional zone and/or preferential replacement/reduction of uranium compounds by one chemical route over another (such as decaying organic matter over oxidation of sulfides) as uraniferous groundwaters moved through the lithologies.

13.7.4 Mineral Processing and Metallurgical Testing

The following information has been summarised from a report prepared by Mintek, Randburg, South Africa (November, 2012) titled "Preliminary Metallurgical Testwork on Dibbwi East Deposit Drill Core Samples".

Denison supplied Mintek with 18 drill core samples, which were sourced from three different zones of the Dibbwi East uranium-bearing mineral deposit, for metallurgical testing. The testwork included head sample characterization and preliminary bottle roll leach tests. Muntanga Uranium Project Denison Mines Corp Report No: R305.2013-106.

The samples averaged 275 ppm U_3O_8 for Zone 1,438 ppm U_3O_8 for Zone 2, and 1,043 ppm U_3O_8 for Zone 3, yielding an average grade of 586 ppm U_3O_8.

In Zones 1 and 2, uranium occurs mainly as U-phosphate and UAlSi-phosphate, with uranium as autunite, coffinite, Ti-coffinite, uraninite, U-phosphate and UAlSi-phosphate in Zone 3. The samples show similar bulk mineralogical compositions; for example, gangue minerals are dominated by albite, kaolinite, microcline, muscovite and quartz, as determined by X-ray diffraction (XRD), but with varying proportions.

Bottle roll leach tests yielded averaged uranium extractions of 85% (Zone 1), 88% (Zone 2), and 81% (Zone 3) on 100% passing 25 mm crushed mineralized samples, which are comparable to results achieved for Muntanga (85%) and higher than those obtained at Dibbwi (75%).

Leaching of fine milled material on six drill core samples achieved similar uranium extractions as for the -25 mm samples, except in the case of two samples (B4 and B5) which yielded higher extractions for the fine-milled material, namely: B4: 96% (fine-milled) vs 70% (-25 mm), and B5: 72% (fine-milled) vs 62% (-25 mm). It therefore seems that the uranium-bearing minerals of the Dibbwi East samples are reasonably accessible to leaching at a crush size of -25 mm.

Similar acid consumptions, ranging from 2 kg/t to 6.5 kg/t, were obtained for the samples from Zones 1 and 2. Zone 3 acid consumptions ranged from 5 kg/t to 9 kg/t for some samples and up to 39 kg/t for others, with the higher acid consumption in all likelihood as a result of carbonate present in the latter samples.

Analcime ($Na(Si_2Al)O_6 \cdot H_2O$), an acid consuming mineral, was also found to be present in r sample B17. The average acid consumption of 10 kg/t for the Dibbwi East samples is comparable to that of Dibbwi (12.3 kg/t); both being higher than for Muntanga (3 kg/t).

Acid (only) and acidic, ferric leaching (at a solution potential of 550 mV vs 3 M KCl, Ag/AgCl) yielded similar extents of uranium extraction. For example, for Zone 1, B2: 98% (acid only and acidic, ferric), B4: 96% (acid only) vs 95% (acidic, ferric), for Zone 2, B5: 72% (acid only and acidic, ferric), B13: 95% (acid only and acidic, ferric), and for Zone 3, B10: 89% (acid only) vs 91% (acidic, ferric), B17: 95% (acid only) vs 96% (acid ferric).

13.8 SRK Summary of the Metallurgical Testwork

The samples tested from each of the deposits indicates that the mineralized material is amenable to leaching using sulfuric acid and similar test conditions used by SGS and Mintek and can be treated in the same way with one processing method being applied.

Composite samples that are representative of the combined RoM that is outlined in Section 15 should be tested to ensure that the recoveries indicated by each of the individual deposits can be achieved from the likely RoM compositions.

Although mineralogically similar to Muntanga and Dibbwi, further metallurgical and mineralogical testwork is required on the Chirundu and Dibbwi East deposits to confirm factors that could affect U_3O_8 extraction and recoveries and to confirm the optimum extraction method.

Average acid leach uranium extraction was similar for each of the deposits, with some outliers resulting in higher acid consumption (up to 140 kg/t in one case) and/or lower extraction efficiency (as low as 30% in sub-optimal test conditions) due to varying mineralogy within some of the deposits; however, the extraction efficiency typically varied from 75 to 95%. An overall recovery and acid consumption for each deposit has been selected at this stage and is shown below in Table 13-8. There is further potential to optimise the test conditions to improve the acid consumption and extraction efficiency.

Table 13-8: Summary of Uranium Recovery and Acid Consumption for each Deposit

Deposit	U Recovery (%)	Acid Consumption (kg/t mineralized material)
Muntanga	85.4	3.86
Dibbwi East	93.3	6.37
Dibbwi	74.6	9.34
Njame	85.1	2.61
Gwabi	75.4	18.49

14 MINERAL RESOURCE ESTIMATES

14.1 Introduction

The Mineral Resource Statement presented herein represents an updated mineral resource estimate ("MRE") prepared for the Muntanga Project in accordance with the Canadian Securities Administrators' National Instrument 43-101. The project comprises the Muntanga, Dibbwi, Dibbwi East, Gwabi and Njame uranium deposits as depicted in Figure 14-1.

The mineral resource model prepared by SRK considers 2,366 historical drill holes drilled between 2005 and 2012, and 256 drill holes drilled by GoviEx in 2021 and 2022. The resource estimation work was completed by Cliff Revering, P.Eng., an "independent qualified person" as this term is defined in National Instrument 43-101. The effective date of the Mineral Resource Statement is March 31, 2023.

This section describes the resource estimation methodology and summarizes the key assumptions considered by SRK. In the opinion of Mr. Revering, the mineral resource estimates reported herein are reasonable representations of the global uranium mineral resources found in the Muntanga Project at the current level of sampling. The mineral resources have been estimated in conformity with generally accepted Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29, 2019, and "Definition Standards for Mineral Resources and Mineral Reserves" published May 10, 2014, and are reported in accordance with the Canadian Securities Administrators' National Instrument 43-101 standards of disclosure for mineral projects. Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the mineral resource will be converted into a mineral reserve.

The database used to estimate the Muntanga Project mineral resources was audited by SRK. Mr. Revering is of the opinion that the current drilling information is sufficiently reliable to interpret with confidence the boundaries for uranium mineralization and that the sample data are sufficiently reliable to support mineral resource estimation.

Seequent's Leapfrog Geo^{TM} (Leapfrog) and Edge^{TM} (Edge) software were used to review historical mineral resource estimates and conduct sensitivity analyses, construct updated geological solids, prepare sample data for geostatistical and variography analysis, construct the block models, estimate uranium grades, and tabulate mineral resources.

Figure 14-1: Location Map of the Muntanga Uranium Deposits

14.2 Resource Estimation Procedures

The resource evaluation methodology involved the following procedures:

- Database compilation and verification;
- Review of Njame and Gwabi historical and previous mineral resource estimates;
- Construction of grade shell wireframe models for the boundaries of uranium mineralization for the Muntanga, Dibbwi and Dibbwi East deposits;
- Data conditioning (compositing and capping) for geostatistical analysis and variography;
- Block modelling and grade interpolation;
- Resource classification and validation;
- Assessment of “reasonable prospects for eventual economic extraction (RPEEE)” and selection of appropriate cut-off grades; and
- Preparation of the Mineral Resource Statement.

14.3 Resource Database

The drill hole database for the Muntanga Project contains 2,622 drill holes totalling 172,101 m of drilling; 256 of these drill holes were drilled by GoviEx between 2021 and 2022 totalling 33,314m of drilling. The database contains 31,906 uranium (U_3O_8) assays and 95,311 m of down-hole radiometric probe data converted in equivalent U_3O_8 (eU_3O_8) grade data for mineral resource estimation purposes.

Table 14-1: Drill hole Database Summary

Deposit	Year	Number of AC Holes	Total Meters AC Holes	Number of Diamond Core Holes	Total Meters Diamond Core Holes	Number of RC Holes	Total Meters RC Holes	Total Number of Assay Samples Collected	Total Assay Sample Length (m)	Total eU3O8 Length (m)
Gwabe	2007	--	--	5	200	226	10,905	3,359	3,340	--
	2008	--	--	34	1,168	54	1,628	2,028	1,813	--
	2009	--	--	--	--	6	221	90	90	--
Njame	2006	63	2,794	--	--	--	--	1,650	1,650	--
	2007	--	--	28	1,412	255	14,617	6,202	6,095	--
	2008	--	--	126	6,113	258	14,822	8,344	7,627	--
	2009	--	--	--	--	80	3,540	1,660	1,660	--
Muntanga	2005	--	--	7	332	--	--	456	331	298
	2006	--	--	32	1,788	70	2,052	2,720	2,646	2,677
	2007	--	--	32	1,897	9	540	--	--	2,112
	2008	--	--	207	11,391	263	14,168	851	852	22,058
	2010	--	--	6	313	--	--	--	--	297
	2012	--	--	1	293	2	300	62	31	291
	2021/2022	--	--	11	610	--	--	--	--	569
Dibbwi	2006	--	--	--	--	25	1,362	679	679	679
	2007	--	--	27	1,682	1	110	36	37	1,569
	2008	--	--	140	12,914	114	7,343	297	297	15,009
	2010	--	--	9	495	--	--	--	--	454
	2012	--	--	6	1,101	14	1,681	337	244	2,344
	2021/2022	--	--	3	300	--	--	--	--	297
Dibbwi East	2008	--	--	49	3,602	27	854	--	--	3,505
	2011	--	--	34	3,842	98	8,855	2,103	1,361	11,447
	2012	--	--	29	4,151	29	300	--	--	290
	2021/2022	--	--	35	4,699	207	27,705	1,032	594	31,414
TOTALS		**63**	**2,794**	**821**	**58,303**	**1,738**	**111,004**	**31,906**	**29,347**	**95,311**

14.4 Njame and Gwabi MRE Review

Mineral resource estimates for the Gwabi and Njame deposits were originally developed by AFR in February and December 2009, respectively. SRK reviewed the drill hole databases, geological models, and mineral resource estimates for the Gwabi and Njame deposits and considers these mineral resource estimates to be reasonable representations of the global U_3O_8 mineral resources in these deposits at the current level of sampling and geological understanding. It is the opinion of the QP that the mineral resources have been estimated in conformity with generally accepted CIM, “Estimation of Mineral Resource and Mineral Reserve Best Practise Guidelines” and are reported in accordance with the Canadian Securities Administrators’ National Instrument 43-101 standards of disclosure for mineral projects.

The following sections describing the geological models, data used for mineral resource estimation purposes, and mineral resource estimation parameters have in part been summarized from the following reports:

- AFR resource report entitled: Mineral Resource Report for the Njame and Gwabe Uranium Deposits, Chirundu Project, Zambia (2009); and
- SRK PEA report entitled: NI 43-101 Technical Report on a Preliminary Economic Assessment of the Mutanga Uranium Project in Zambia (2017).

14.4.1 Mineralization Domain Modeling

Mineralization domains for the Gwabi and Njame deposits were generated using the 3D software package Gemcom Surpac® (Surpac). Uranium mineralization occurs in fine to coarse grained sedimentary units consisting of siltstone, sandstones, pebbly/gritty sandstones, and grits to pebble conglomerates. Mineralized lenses occur as sub-parallel layers with shallow dips of 2-5° to the southeast at Njame (Figure 14-2), and to the east-northeast at Gwabi (Figure 14-3) and were defined using a 100 ppm U_3O_8 cut-off grade.

At Njame, the main concentration of uranium mineralization occurs at the contact between sedimentary sequences where there is rapid change from fine to coarse sediments. At Gwabi, the main concentration of uranium mineralization is hosted in a 10-20 m thick coarse-grained sandstone located above a thick siltstone/mudstone unit.

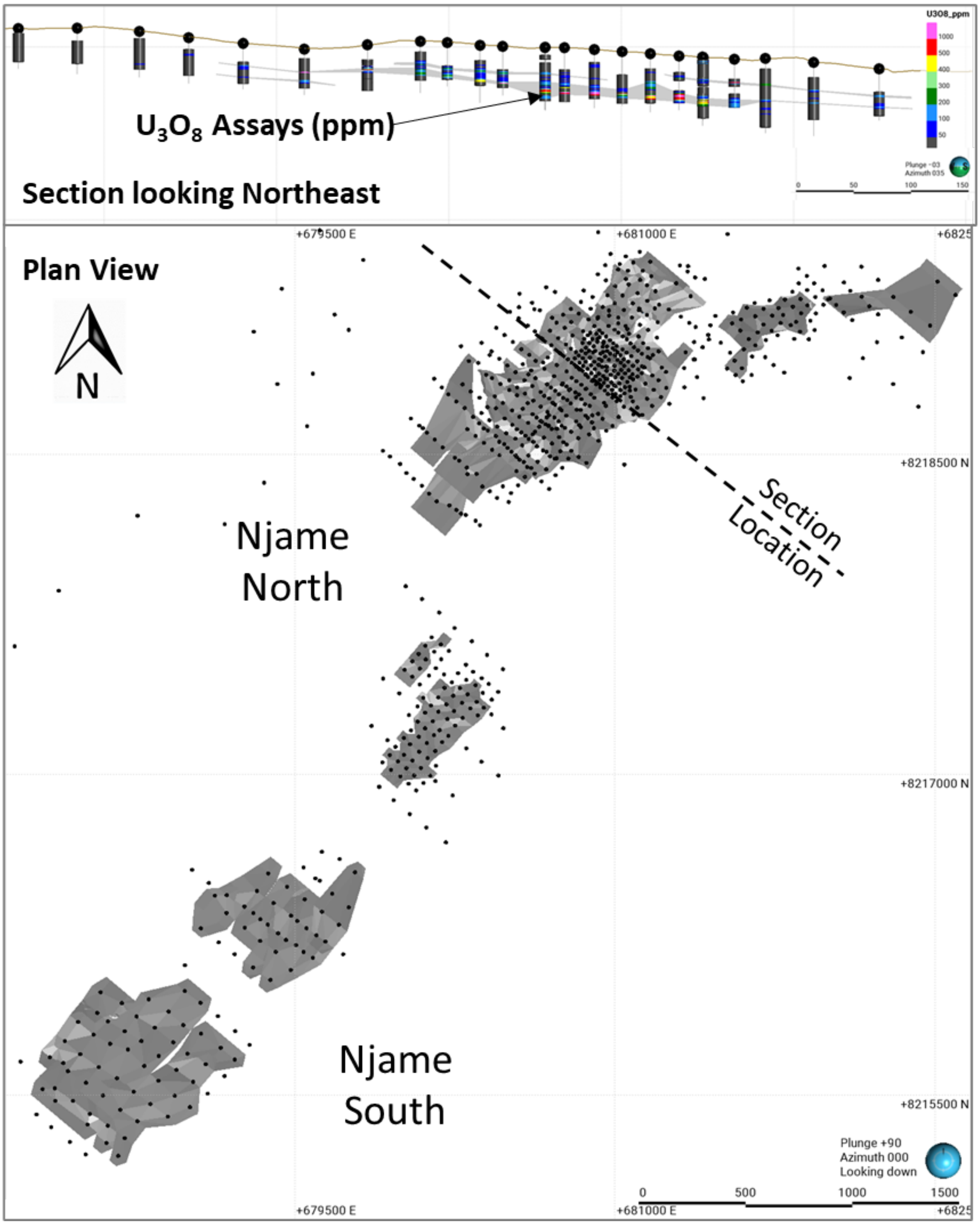


Figure 14-2: Njame Deposit Mineralization Domain Model

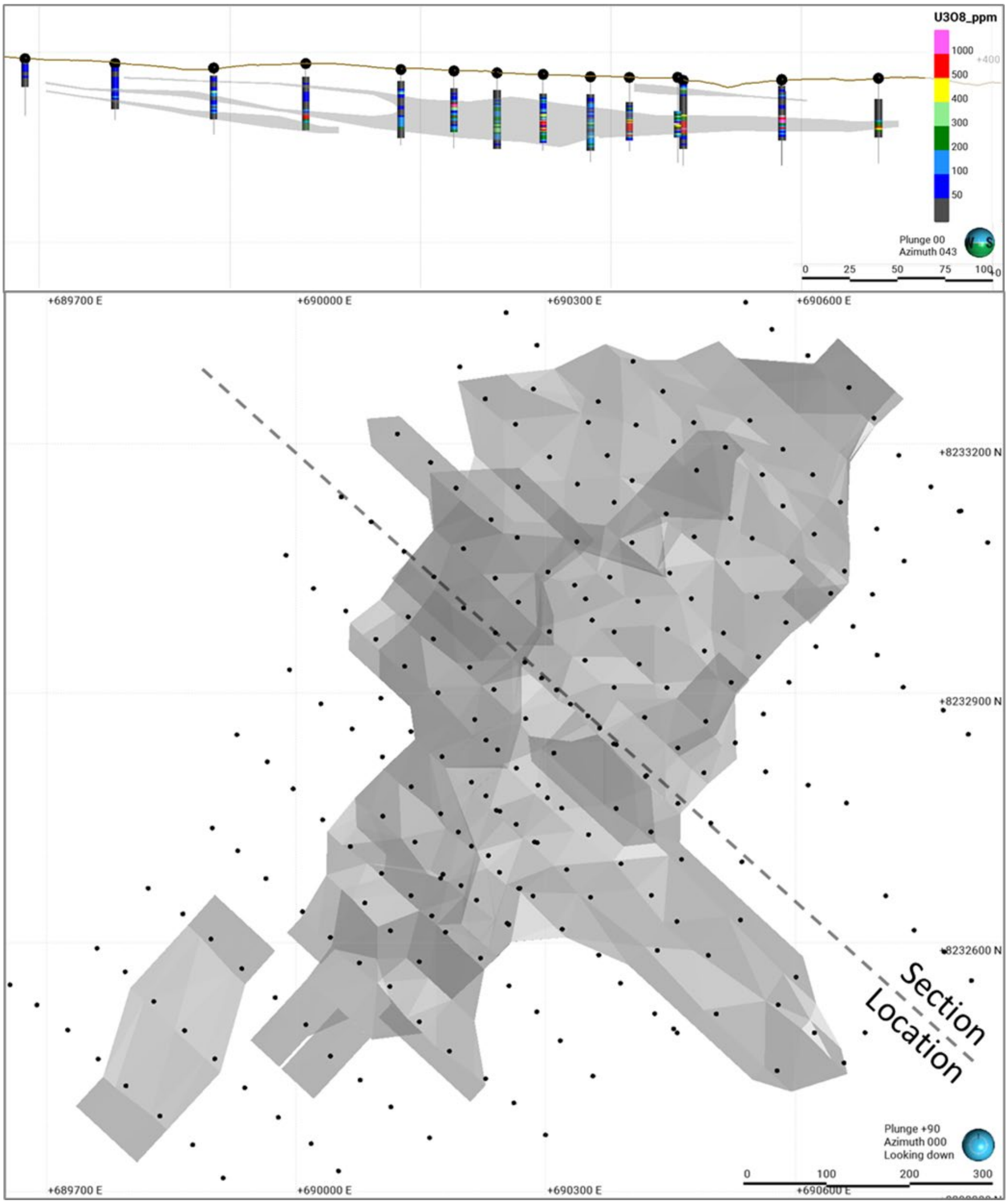


Figure 14-3: Gwabi Deposit Mineralization Domain Model

14.4.2 Bulk Density

Bulk density analysis conducted on drill core samples between 2007 and 2008 utilized the water submersion method, where samples were dried and weighed in air followed by plastic wrapping and weighing in water. The bulk density was then determined as a ratio of the weight in air over the weight in water.

Density samples collected at Njame and Gwabi by sedimentary lithology type are summarized in Table 14-2 and Table 14-3, respectively.

Table 14-2: Njame Density Sample Summary Statistics

Lithology Type	Number of Samples	Mean (t/m^3)	Std Dev	Minimum (t/m^3)	Maximum (t/m^3)
Grit	4	1.91	0.06	1.82	1.96
Gritty Sandstone	22	1.99	0.06	1.89	2.13
Pebbly Grit	32	2.05	0.09	1.89	2.26
Pebbly Sandstone	6	2.11	0.10	1.99	2.27
Siltstone	22	2.09	0.15	1.84	2.31
Sandstone	78	1.98	0.09	1.81	2.18

Table 14-3: Gwabi Density Sample Summary Statistics

Lithology Type	Number of Samples	Mean (t/m^3)	Std Dev	Minimum (t/m^3)	Maximum (t/m^3)
Grit	14	2.08	0.12	1.98	2.42
Gritty Sandstone	21	2.04	0.14	1.86	2.36
Pebbly Grit	22	2.12	0.16	1.85	2.50
Pebbly Sandstone	17	2.17	0.19	1.73	2.46
Sandstone	26	2.07	0.15	1.71	2.44

Based on the above sample data, mineralized lenses at Njame were assigned uniform densities ranging from 1.98 to 2.08 t/m^3 dependent on the dominant sedimentary lithology type hosting the mineralization. At Gwabi, a global density of 2.09 t/m^3 was used for mineral resource reporting.

14.4.3 Njame Compositing and Variography

The drill hole database was composited to 1.0 m down-hole composite intervals, within the modelled resource wireframes; 1.0 m was chosen as an appropriate composite length as more than 90% of samples, within the modelled mineralization, were 1.0 m length or less and the mining approach is assumed to be reasonably selective. Residual (partial) composites less than 40% of the 1.0 m interval were rejected from further study.

Basic statistics of the U_3O_8 composites within all of the modelled mineralization lenses are presented in Table 14-4. The composites have been grouped into two main modelled zones, Njame North and Njame South as many of the individual modelled lenses are small and contain statistically insignificant numbers of samples.

As presented in Figure 14-4 and Figure 14-5, the U_3O_8 grade distribution displays positive skew with moderate coefficient of variation. An assessment of the high-grade composites was completed to determine the requirement for high-grade capping. Upon review of the basic statistics and histogram charts, a grade cap of 2,500 ppm U_3O_8 for Njame was selected and applied before estimation.

Grade continuity was modelled using variography calculated and modelled within the geostatistical software Isatis, and in the mining package Surpac. Variography was generated for the U_3O_8 variable, based on the 1.0 m capped down-hole composites (Table 14-5).

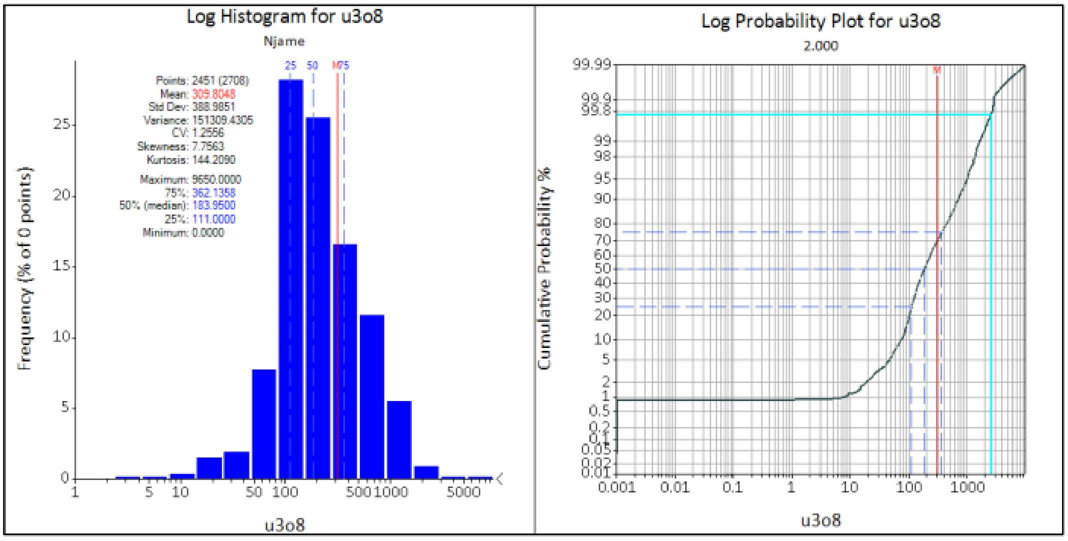
In summary, the key aspects of the variography are:

- the relative nugget has been modelled at approximately 35%;
- 40% relative variance is modelled to a range of 40 m; and
- the overall range of 120 m major, 90 m semi-major, and 8 m minor, is noted to be in excess of the current drill spacing.

The variography indicates that moderate levels of short-range variability exists, which is consistent with this mineralization style.

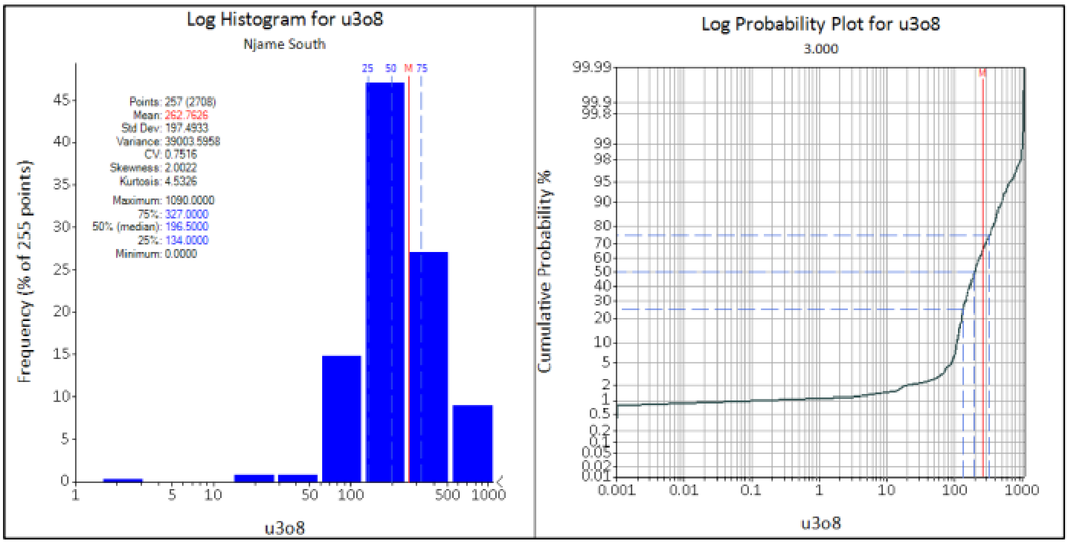
Table 14-4: Njame Composite Summary Statistics

Deposit	Samples	Mean U_3O_8 (ppm)	Std Dev	CV	Min U_3O_8 (ppm)	Max U_3O_8 (ppm)
Njame North	2,451	310	389	1.26	0	9650
Njame South	257	263	197	0.75	0	1090



Source: SRK 2007

Figure 14-4: Histogram and Log-Probability Plot of Njame North U_3O_8 (ppm) Composites



Source: SRK 2007

Figure 14-5: Histogram and Log-Probability Plot of Njame South U_3O_8 (ppm) Composites

Table 14-5: Njame Variogram Parameters

Deposit	Directions			Normalized Nugget	Structure 1					Structure 2				
					Normalized Sill	Structure	Range (m)			Normalized Sill	Structure	Range (m)		
	Strike	Pitch	Dip				Major	Semi-major	Minor			Major	Semi-major	Minor
Njame	70	0	0	0.35	0.4	Spherical	40	40	3	0.25	Spherical	120	90	8

14.4.4 Gwabi Compositing and Variography

The drill hole database was composited to 1.0 m down-hole composite intervals, within the modelled resource wireframes; 1.0 m was chosen as an appropriate composite length as more than 90% of samples, within the modelled mineralization, were 1.0 m length or less and the mining approach is assumed to be reasonably selective. Residual (partial) composites less than 40% of the 1.0 m interval were rejected from further study.

Basic statistics of the U_3O_8 composites within all the modelled mineralization lenses are presented in Table 14-6. The composites have been grouped as the main modelled lens comprises more than 95% of the total model volume and the smaller lenses contain statistically insignificant number of samples (<30 samples each).

As presented in Figure 14-6, the U_3O_8 grade distribution displays positive skew with moderate coefficient of variation. An assessment of the high-grade composites was completed to determine the requirement for high-grade capping. Upon review of the basic statistics and histogram charts a grade cap of 1,700 ppm U_3O_8 was selected and applied before estimation.

Grade continuity was modelled using the geostatistical software Isatis, and in the mining package Surpac. Variography was generated for the variable U_3O_8 based on the 1.0 m capped down-hole composites (Table 14-7).

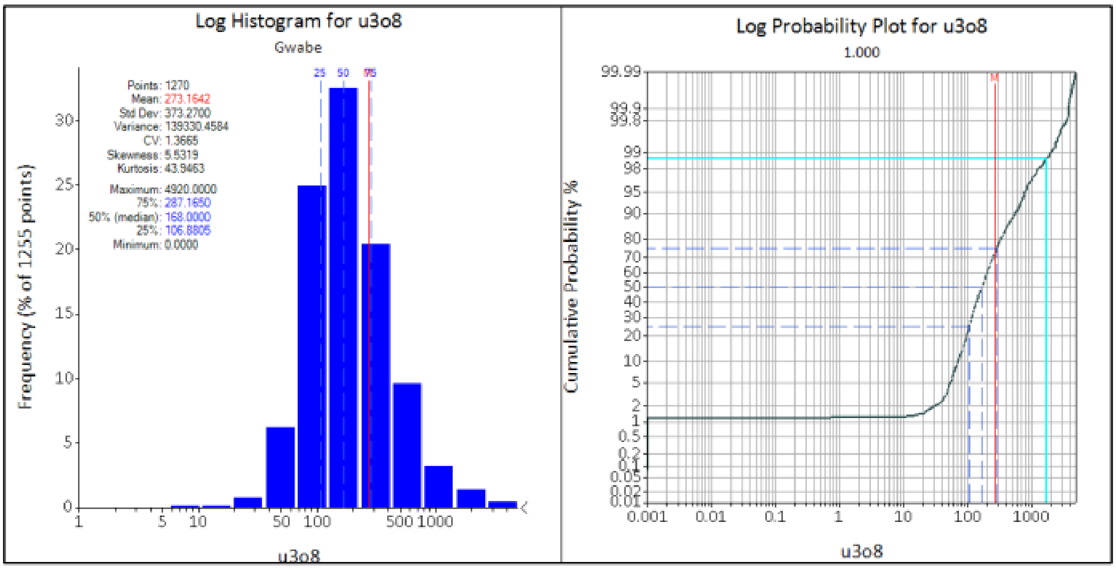
In summary, the key aspects of the variography analysis are:

- the relative nugget has been modelled from a down-hole variogram at approximately 25%;
- 30% relative variance is modelled to a range of 110 m; and
- the overall range of 350 m major, 170 m semi-major, and 8 m minor, is noted to be in excess of the current drill spacing.

The variography indicates that moderate levels of short-range variability exists, which is consistent with this mineralization style.

Table 14-6: Gwabi Composite Summary Statistics

Samples	Mean U_3O_8 (ppm)	Std Dev	CV	Min U_3O_8 (ppm)	Max U_3O_8 (ppm)
1,270	273	373	1.36	0	4,920



Source: SRK 2007

Figure 14-6: Histogram and Log-Probability Plot of Gwabi U_3O_8 (ppm) Composites

Table 14-7: Gwabi Variogram Parameters

Deposit	Directions			Normalized Nugget	Structure 1					Structure 2				
	Strike	Pitch	Dip		Normalized Sill	Structure	Range (m)			Normalized Sill	Structure	Range (m)		
							Major	Semi-major	Minor			Major	Semi-major	Minor
Gwabi	17	0	0	0.25	0.3	Spherical	110	60	2	0.45	Spherical	350	170	8

14.4.5 Block Model Configuration

Block model configuration details for Gwabi and Njame are summarized in Table 14-8. A parent block size of 25 x 25 x 2.0 m was sub-blocked for volumetric reporting. Grade interpolation was conducted at the parent block size of 25 x 25 x 2.0 m.

Table 14-8: Block Model Configuration Details for Gwabi and Njame

Deposit	Parameters	X (m)	Y (m)	Z (m)
Gwabi	Parent Block Size	25	25	2
	Sub-Block Size	6.25	6.25	0.5
	Base Point*	689,804	8,230,494	594
	Boundary Size	4025	2525	400
	Rotation	312		
Njame	Parent Block Size	25	25	2
	Sub-Block Size	6.25	6.25	0.5
	Base Point*	676,997	8,215,700	600
	Boundary Size	2525	6750	250
	Rotation	40		

14.4.6 Grade Estimation

Grade estimation was completed within an area encompassing all of the modelled Njame and Gwabi mineralized zones with block model geometry and extents as presented in Table 14-8. A parent block size of 25 x 25 x 2.0 m, sub-blocked to 6.25 x 6.25 x 0.5 m, representing the approximate drill spacing of the tightly infilled drilling area, was chosen for the model.

The resource estimation methodology was based on the following:

- 1 m capped composite data were used for the estimation;
- Hard boundary conditions were employed in the estimation;
- Only samples from within individual mineralization model domains were used to estimate blocks within those domains;
- U_3O_8 (ppm) was estimated by Ordinary kriging (OK), using the variogram parameters presented in Table 14-5 and Table 14-7 respectively;
- Estimation of U_3O_8 (ppm) grade was completed in multiple passes using search criteria and sample numbers as summarized in Table 14-9; and
- sub-block grades were assigned the grade of the parent block.

Table 14-9: Gwabi and Njame Mineral Resource Estimation Parameters

Deposit	Variable	Interpolant	Estimation Pass	Ellipsoid Ranges			Number of Samples		
				Maximum	Intermediate	Minimum	Min	Max	Max per Hole
Gwabi	U_3O_8	OK	1	75	50	25	8	24	5
			2	150	120	50	8	24	5
			3	500	400	50	8	24	5
Njame	U_3O_8	OK	1	37.5	37.5	9.375	8	24	5
			2	75	60	18.75	8	24	5
			3	150	120	37.5	8	24	5
			4	500	400	50	8	24	5

14.4.7 Model Validation

Block model validation conducted as part of the original estimation process included;

- review of the block estimate and the composite data in cross section, long section and plan views;
- comparison of the mean grade of the estimate versus the mean grade, subdivided by estimation domain; and
- comparison of composite grades and block model grades broken down into Northing and Reduced Level (RL) zones.

AFR's validation indicates that the mineral resource model replicates the source input data well in regions of higher density drilling. The regions where the data density is lower, smoothing is evident, however the estimates are considered appropriate.

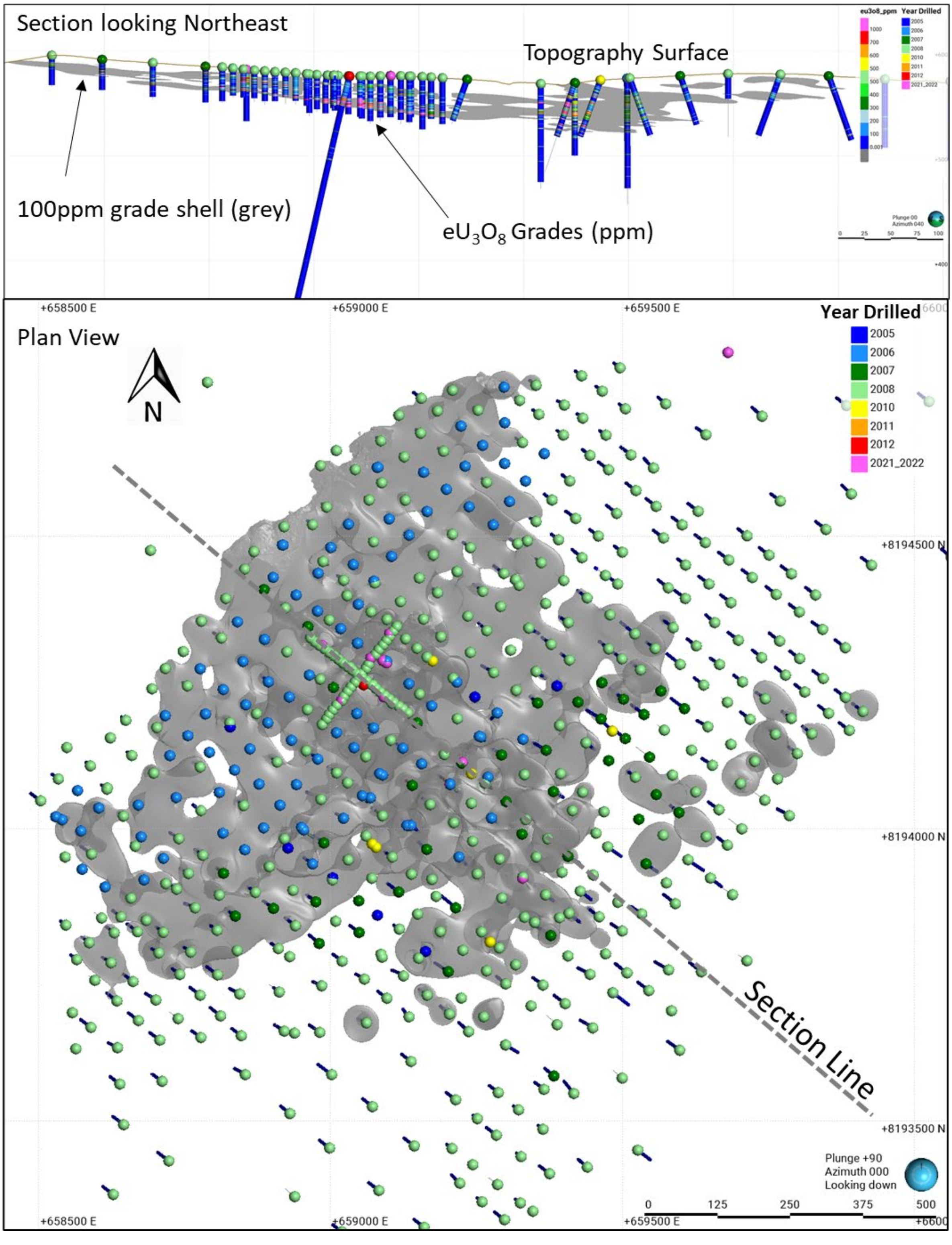
SRK validated the grade estimates for Gwabi and Njame by conducting independent estimates using alternative estimation parameters and found that the results agreed very closely to those achieved in the AFR models. In Mr. Revering's opinion, the AFR mineral resource models for the Gwabi and Njame deposits are reasonable representations of the global U_3O_8 mineral resources at the current level of sampling.

14.5 Muntanga, Dibbwi and Dibbwi East MRE Updates

14.5.1 Mineralization Domain Modelling

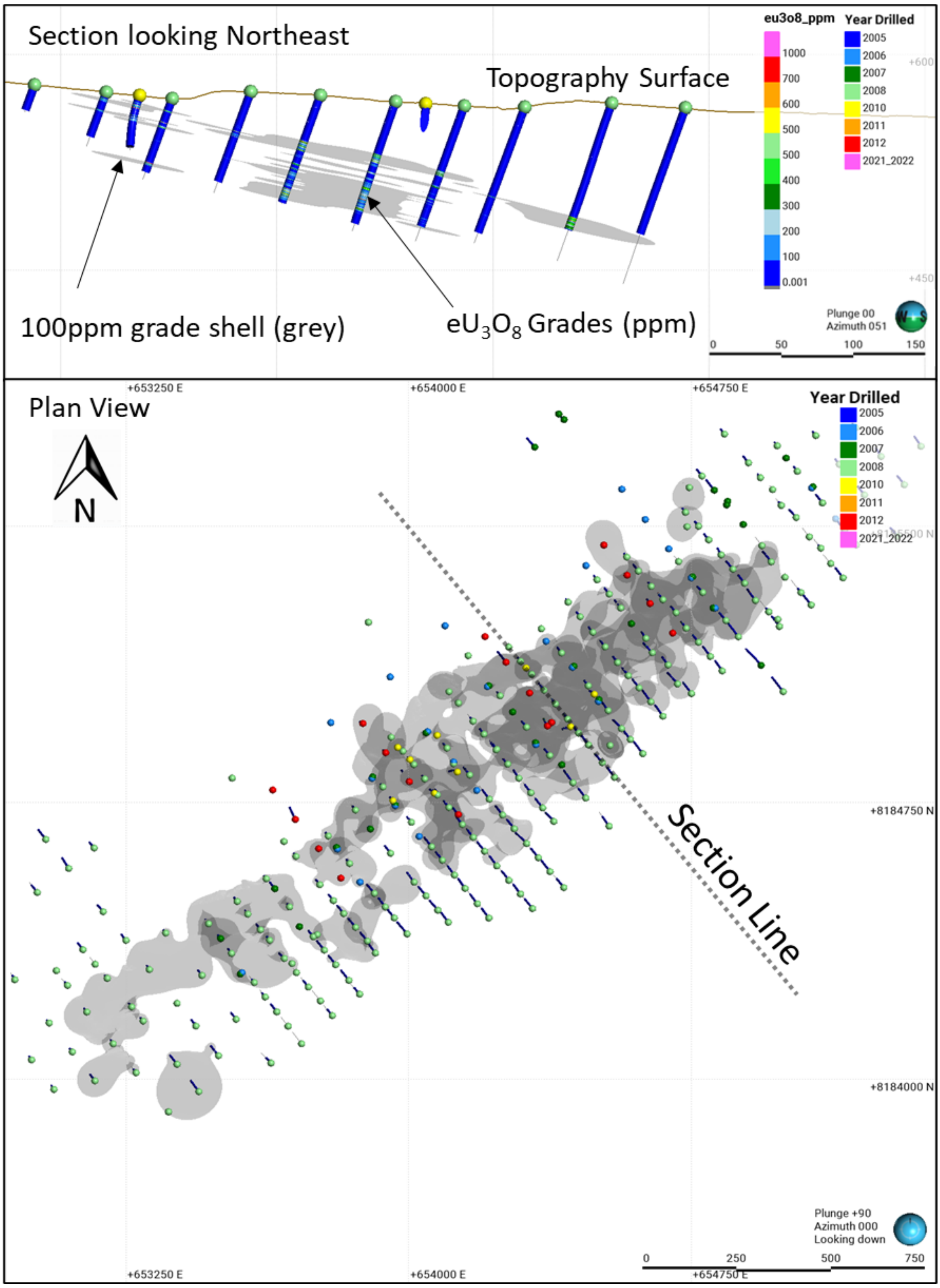
Mineralization domains used for resource estimation within the Muntanga, Dibbwi and Dibbwi East deposits have been defined based on grade shells generated using a 100 ppm eU_3O_8 cut-off. The updated mineralization domain models incorporate additional drill hole information and database QA/QC conducted since the previous MREs were completed in 2009 for Muntanga and Dibbwi (CSA, 2009) and in 2012 for Dibbwi East (RPA, 2012). Three-dimensional grade shells were generated using Leapfrog software predicated on equivalent uranium (eU_3O_8) grade data obtained from down-hole radiometric probing.

The updated mineralization domain models are shown in Figure 14-7 to Figure 14-9.



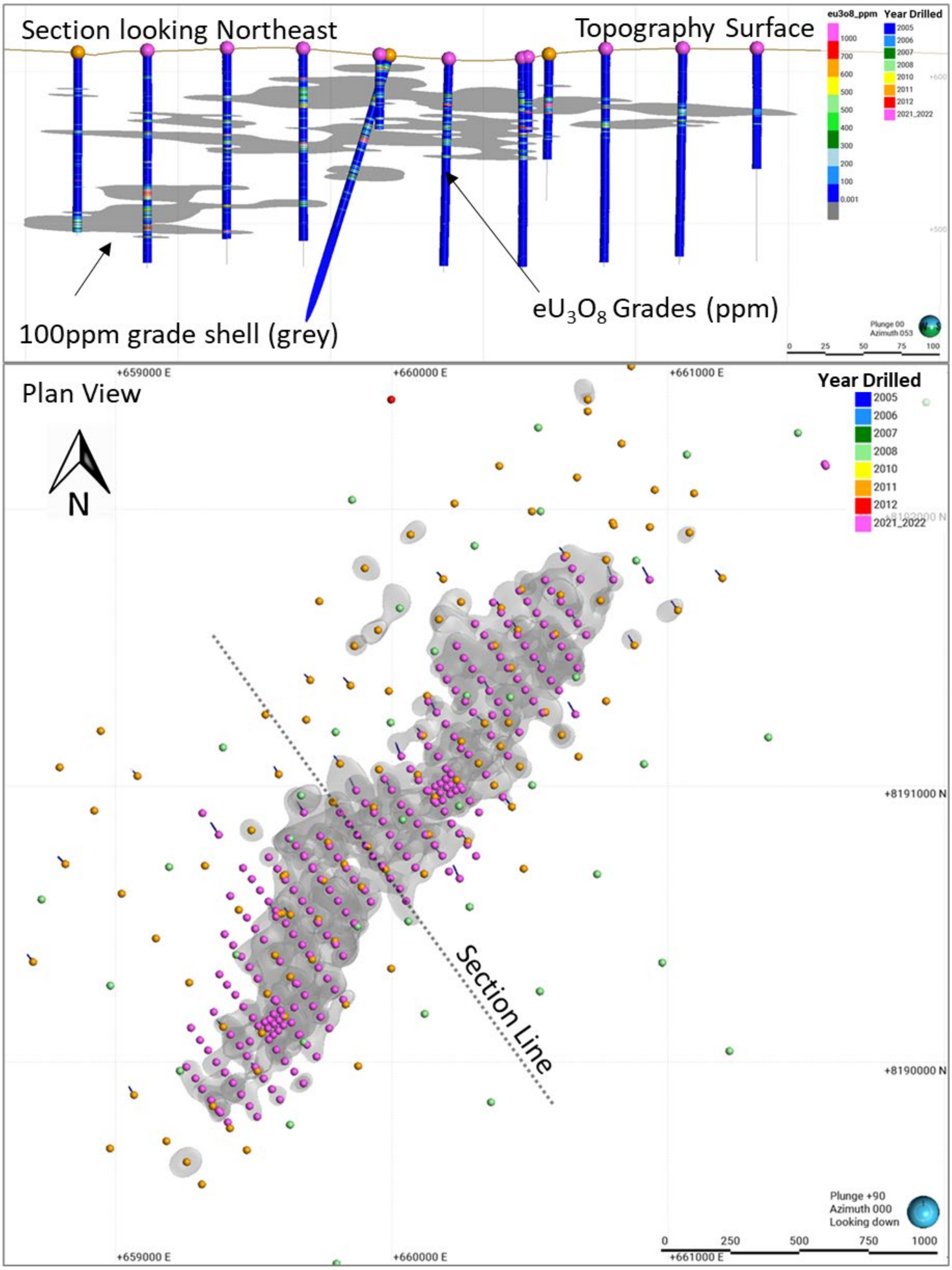
Note: Drill hole collars are colour coded by drilling campaign year

Figure 14-7: Muntanga Deposit Mineralization Domain Model



Note: Drill hole collars are colour coded by drilling campaign year

Figure 14-8: Dibbwi Deposit Mineralization Domain Model



Note: Drill hole collars are colour coded by drilling campaign year

Figure 14-9: Dibbwi East Deposit Mineralization Domain Model

14.5.2 Radiometric-Grade Correlation

To facilitate a reliable conversion of down-hole radiometric probe data into equivalent uranium eU_3O_8, a deposit/probe specific Radiometric-Grade (Ra-Grade) correlation must be established. However, prior to developing a Ra-Grade correlation, raw probe data must be adjusted to account for gamma signature attenuation associated with the logging environment, such as the size of the drill hole, fluid presence within the drill hole, casing/steel parameters and probe correction factors.

The Ra-Grade correlation was conducted by comparing geochemical sample assays to their corresponding probe data. Data were segregated into historical data comprised of down-hole gamma data predominately acquired by Denison from 2007 to 2012, and recent data collected by GoviEx during the 2021 and 2022 drilling campaigns.

Figure 14-10 to Figure 14-12 provide examples of drill hole profiles comparing assay results and radiometric probe profiles (preliminary eU_3O_8 ppm values) for intervals included within the correlation study.

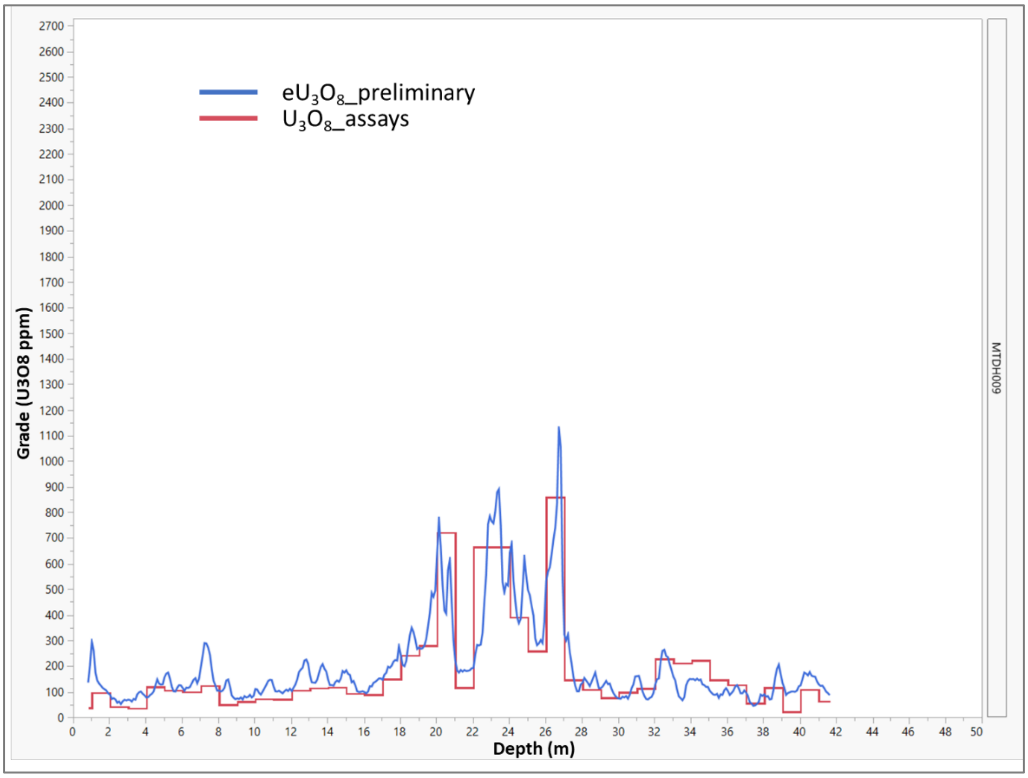


Figure 14-10: Muntanga Deposit, Drill Hole MTDH009: Comparison of Assay Results and Preliminary eU_3O_8 Profiles

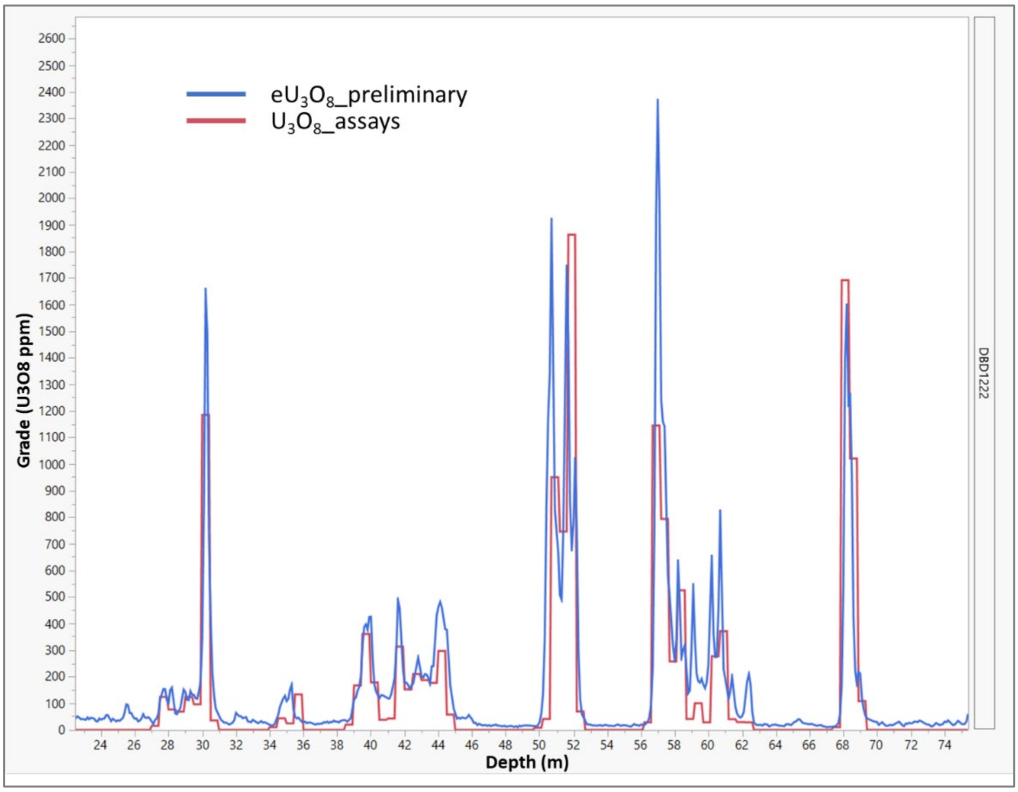


Figure 14-11: Dibbwi Deposit, Drill Hole DBD1222: Comparison of Assay Results and Preliminary eU3O8 Profiles

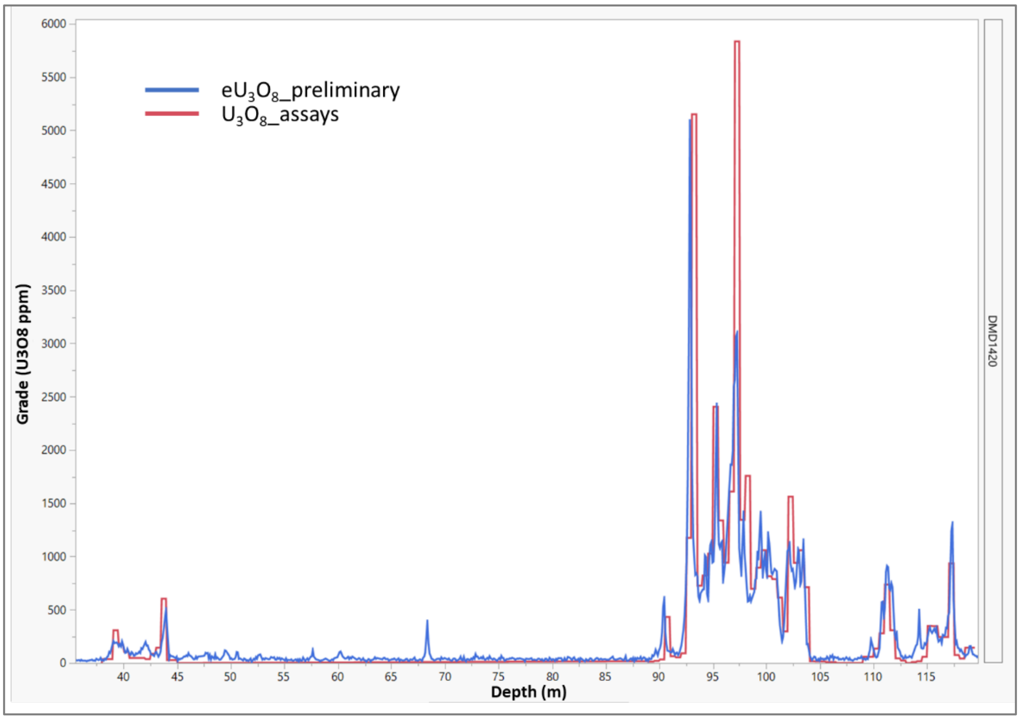


Figure 14-12: Dibbwi East Deposit, Drill Hole DMD1420: Comparison of Assay Results and Preliminary eU3O8 Profiles

In total, 76 mineralized intervals (grade * thickness or "GT" intervals, expressed in units of ppm * m) from Muntanga-Dibbwi historical drill holes, 119 mineralized intervals from Dibbwi East historical drill holes, and 49 mineralized intervals from Dibbwi East 2021-2022 drill holes were selected for the study.

The Ra-Grade correlations established for the above data sets are provided in Figure 14-13 to Figure 14-15.

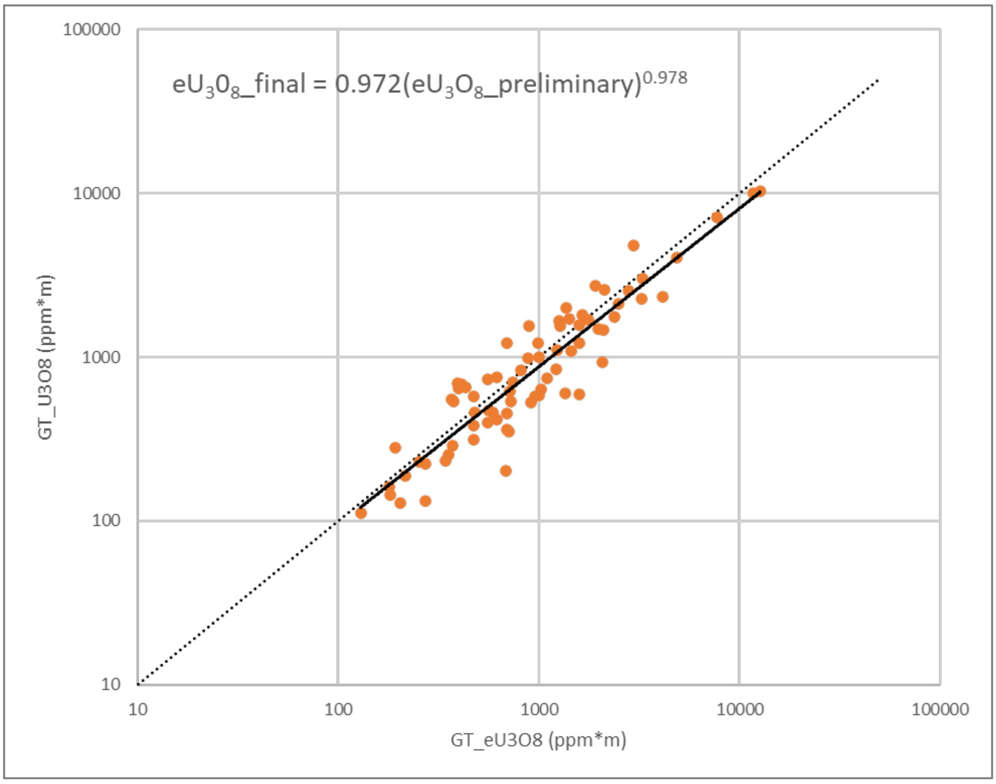


Figure 14-13: Muntanga-Dibbwi Ra-Grade Correlation (Historical Drill Holes)

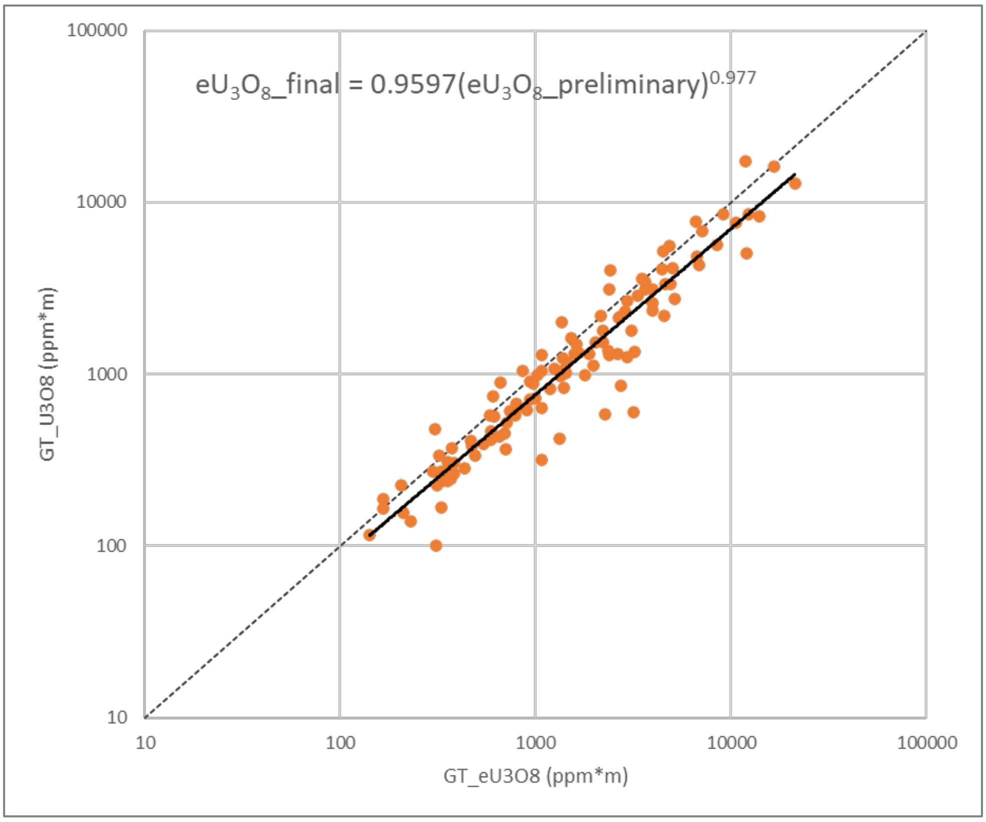


Figure 14-14: Dibbwi East Ra-Grade Correlation (Historical Drill Holes)

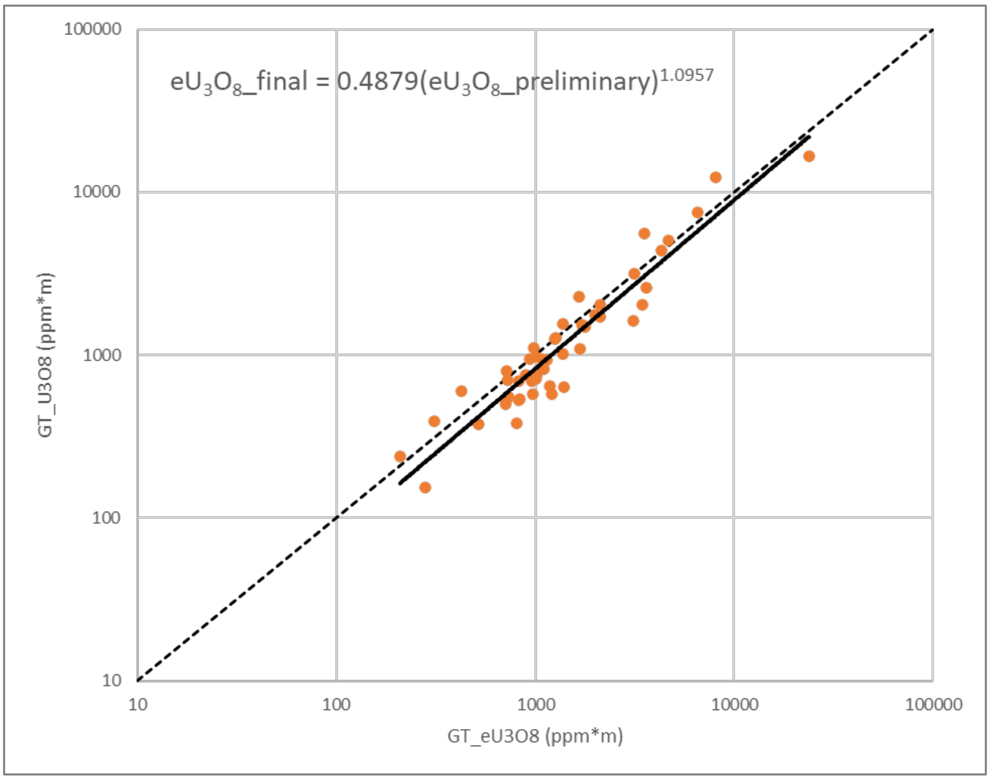
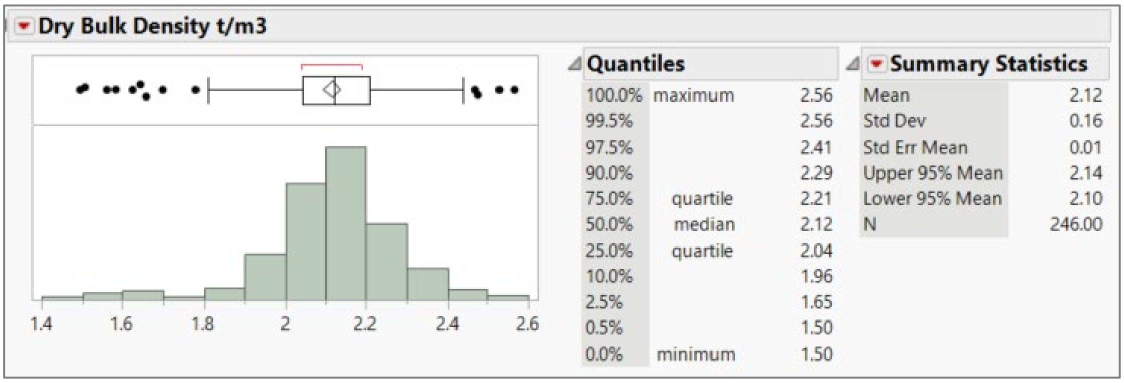


Figure 14-15: Dibbwi East Ra-Grade Correlation (2021-2022 Drill Holes)

14.5.3 Bulk Density

A total of 246 bulk density measurements have been collected across the Muntanga, Dibbwi and Dibbwi East deposits. Summary statistics for these sample are provided in Figure 14-16. A global dry bulk density of 2.10 t/m^3 has been assigned for tonnage reporting for all three deposits.



Dry Bulk Density t/m3

Quantiles

100.0%	maximum	2.56
99.5%		2.56
97.5%		2.41
90.0%		2.29
75.0%	quartile	2.21
50.0%	median	2.12
25.0%	quartile	2.04
10.0%		1.96
2.5%		1.65
0.5%		1.50
0.0%	minimum	1.50

Summary Statistics

Mean	2.12
Std Dev	0.16
Std Err Mean	0.01
Upper 95% Mean	2.14
Lower 95% Mean	2.10
N	246.00

Figure 14-16: Dry Bulk Density

14.5.4 Compositing

Uranium grade data were composited to 1.0 m lengths within the grade shell boundaries, with all residual composites smaller than 0.5 m in length added to the adjacent composite interval. Assay samples were predominately collected using a 1.0 m sample length and eU_3O_8 data from down-hole radiometric probing is collected at 1.0 m intervals.

Summary statistics of drill hole uranium grade data by deposit, for both raw sample intervals and composited samples are provided in Table 14-10 and Table 14-11. Total proportions of uranium grade data based on down-hole radiometric data vary within each deposit, but typically comprise the majority of the total grade data set (by drill hole mineralized length) for each deposit.

Table 14-10: Summary Statistics (Length-weighted) for Raw Sample Interval Uranium Grade Data (U_3O_8 ppm) by Deposit

Deposit	Proportion of Probe Data (by length)	Mean	Std Dev	Min	25th	Median	75th	Max
Muntanga	91%	394	273	1	112	171	335	41,255
Dibbwi	95%	255	81	2	113	171	292	4,921
Dibbwi East	88%	417	258	2	120	192	383	18,529

Table 14-11: Summary Statistics for Composited (Uncapped) Uranium Grade Data (U_3O_8 ppm) by Deposit

Deposit	# of Composites	Mean	Std Dev	CV	Min	25th	Median	75th	Max
Muntanga	2,767	417	638	1.53	30	140	213	418	10,685
Dibbwi	1,234	252	175	0.69	8	143	200	310	1,837
Dibbwi East	5,295	411	630	1.53	27	147	225	416	12,615

14.5.5 Evaluation of Outliers

Grade capping is a technique used to mitigate the potential effect that a small population of high-grade sample outliers can have during grade estimation. These high-grade samples are not considered to be representative of the general sample population and are therefore “capped” to a level that is more representative of the general data population. Although subjective, grade capping is a common industry practice when performing grade estimation for deposits that have significant grade variability.

Outlier analysis for was conducted on the 1.0 m composited data for all deposits. Histograms and normal quantile plots were generated for each data population and used to assess appropriate grade capping thresholds. Composites were capped prior to grade estimation. The grade capping thresholds and capped summary statistics are summarized in Table 14-12.

Table 14-12: Grade Capping Thresholds and Capped Uranium Grade (U_3O_8 ppm) Summary Statistics (by Deposit)

Deposit	Cap Value	Mean (uncapped)	Mean (capped)	Std Dev (capped)	CV (capped)
Muntanga	5,350	417	414	597	1.44
Dibbwi	725	252	246	146	0.59
Dibbwi East	5,000	411	405	559	1.37

14.5.6 Variography

Grade continuity analysis of uranium mineralization was conducted on capped composites for each deposit. Variogram analysis was conducted using Seequent’s Edge software. Variogram parameters used for grade interpolation are provided in Table 14-13.

Table 14-13: Muntanga, Dibbwi, Dibbwe East Variogram Parameters

Deposit	LF Directions			Normalized Nugget	Structure 1					Structure 2				
					Normalized Sill	Structure	Range (m)			Normalized Sill	Structure	Range (m)		
	Dip	Dip Azimuth	Pitch				Major	Semi-major	Minor			Major	Semi-major	Minor
Muntanga	5	160	160	0.2	0.52	Spherical	18	15	3	0.28	Spherical	60	40	12
Dibbwi	13	137	72	0.3	0.41	Spherical	23	58	4	0.29	Spherical	90	85	6
Dibbwi East	4	181	163	0.2	0.54	Spherical	18	14	3	0.26	Spherical	100	85	5

14.5.7 Block Model Configuration

Block model configuration details are summarized in Table 14-14. A parent block size of 20 x 10 x 2.5 m was sub-blocked for volumetric reporting. Grade interpolation was conducted at the parent block size of 20 x 10 x 2.5 m.

Table 14-14: Block Model Configuration Parameters

Deposit	Parameters	X (m)	Y (m)	Z (m)
Muntanga	Parent Block Size	20	10	2.5
	Sub-Block Size	1.25	1.25	0.3125
	Base Point*	658,980	8,192,920	665
	Boundary Size	1700	1610	255
	Rotation	323		
Dibbwi	Parent Block Size	20	10	2.5
	Sub-Block Size	1.25	1.25	0.625
	Base Point*	653,980	8,182,190	640
	Boundary Size	4160	3420	250
	Rotation	323		
Dibbwi East	Parent Block Size	20	10	2.5
	Sub-Block Size	1.25	1.25	0.625
	Base Point*	659,315	8,188,545	665
	Boundary Size	3560	2760	255
	Rotation	323		

**Coordinates specified in UTM WGS84 Zone 35S reference datum*

14.5.8 Grade Estimation

Estimates of uranium grade (U_3O_8 ppm) were interpolated into the block model using OK, and a multiple pass estimation strategy with successively expanding search criteria in subsequent estimation passes. Outlier restrictions were used for the Muntanga and Dibbwi East deposits to mitigate the potential of over-estimation of grade due to the presence of a small number of high uranium grade composites. The estimation parameters used for the Muntanga, Dibbwi and Dibbwi East deposits are provided in Table 14-15.

Table 14-15: Muntanga, Dibbwi, Dibbwi East Mineral Resource Estimation Parameters

Deposit	Variable (ppm)	Interpolant	Estimation Pass	Ellipsoid Ranges			Number of Samples			Outlier Restriction	
				Maximum	Intermediate	Minimum	Min	Max	Max per Hole	Distance (% of Search)	Value Threshold to Clamp
Muntanga	U_3O_8	OK	1	60	40	12	9	20	3	66	1500
			2	90	60	12	9	20	3	44	1500
			3	120	80	24	3	10	3	33	1500
Dibbwi	U_3O_8	OK	1	90	85	10	9	20	3	N/A	N/A
			2	135	128	10	9	20	3		
			3	180	170	10	4	9	3		
			4	180	170	10	2	6	3		
Dibbwi East	U_3O_8	OK	1	100	85	10	9	20	3	60	1000
			2	150	125	10	9	20	3	40	1000
			3	200	170	10	4	9	3	30	1000
			4	200	170	10	1	9	3	30	1000

14.5.9 Model Validation

Block model validation was conducted using multiple techniques including;

- Visual inspection of estimated block grades relative to composite grades;
- Swath plot analysis of grade profiles between OK, inverse distance (ID2) and nearest-neighbour (NN) block estimates; and
- Statistical comparison of global average MRE estimated block grades and declustered composite grades (NN).

Cross-sectional comparisons of interpolated block grades versus drill hole sample grade data for Muntanga, Dibbwi and Dibbwi East are provided in Figure 14-17 to Figure 14-19, respectively. Reasonable visual correlation between the block estimates and composite data can be observed.

Swath plot comparisons of interpolated U_3O_8 grades from the OK, ID2 and NN models for Muntanga, Dibbwi and Dibbwi East are provided in Figure 14-20 to Figure 14-22, respectively. Reasonable correlation between the OK, ID2 and NN estimates is observed on these plots, with the OK estimates showing slightly lower grade profiles for all three MREs. The lower grade profile seen in the OK estimate is associated with the secondary high-grade restrictions used in the estimation workflow (i.e., Muntanga and Dibbwi East) and sample weighting scheme derived from the OK algorithm.

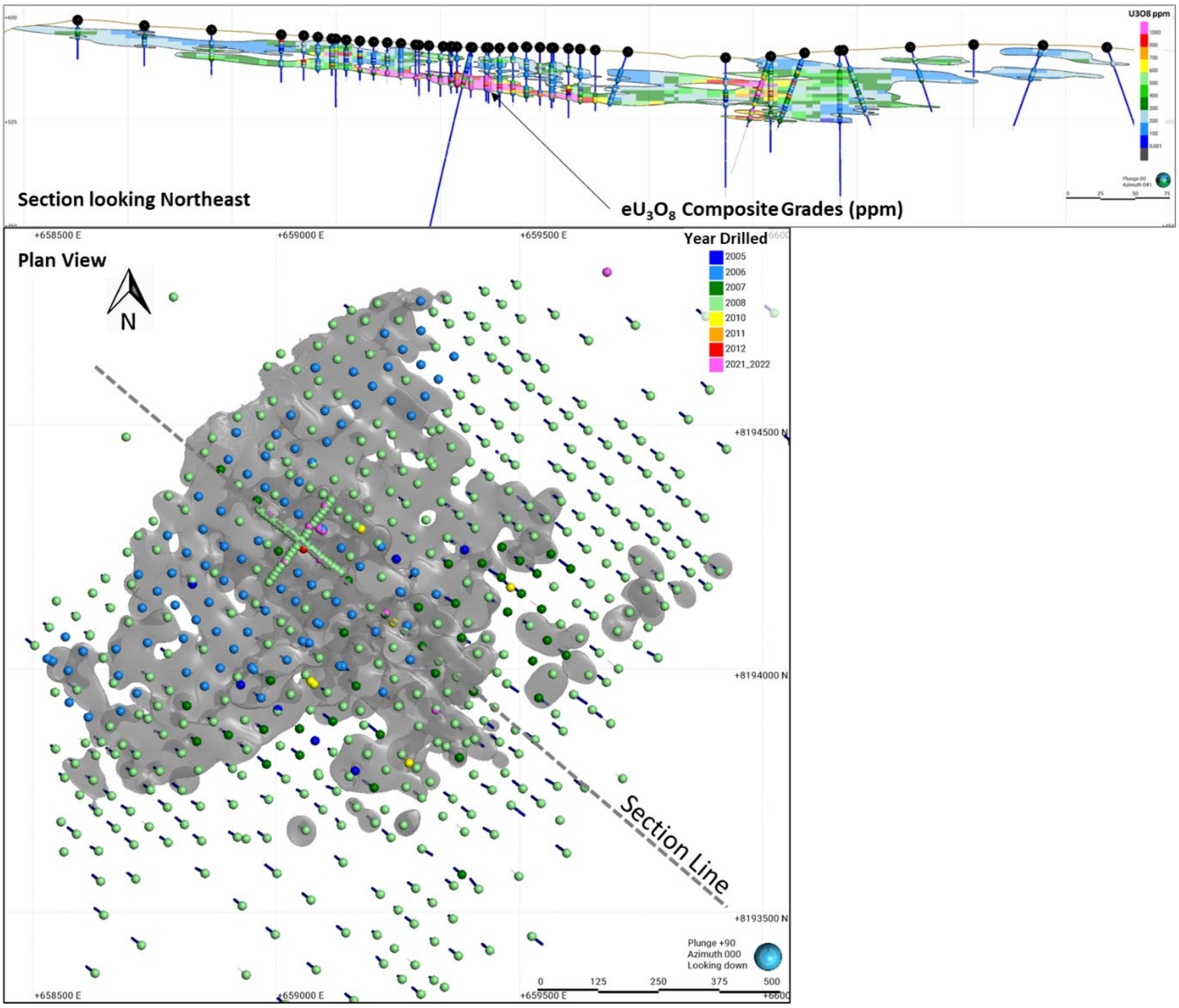


Figure 14-17: Muntanga Deposit, Cross-section Comparison of Interpolated U_3O_8 (ppm) Grades vs eU_3O_8 (ppm) Composites (looking Northeast)

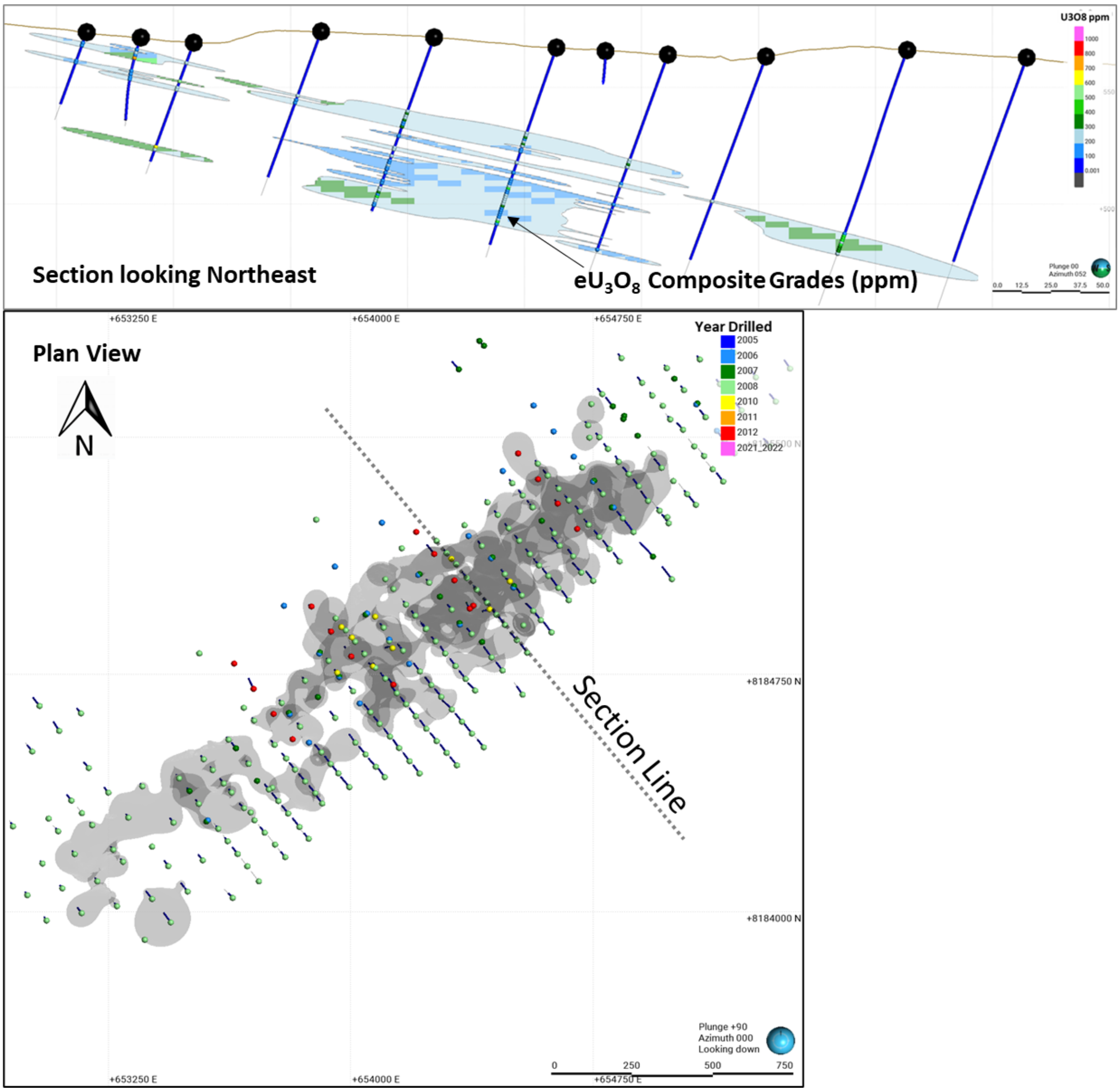


Figure 14-18: Dibbwi Deposit, Cross-section Comparison of Interpolated U_3O_8 (ppm) Grades vs eU_3O_8 (ppm) Composites (looking Northeast)

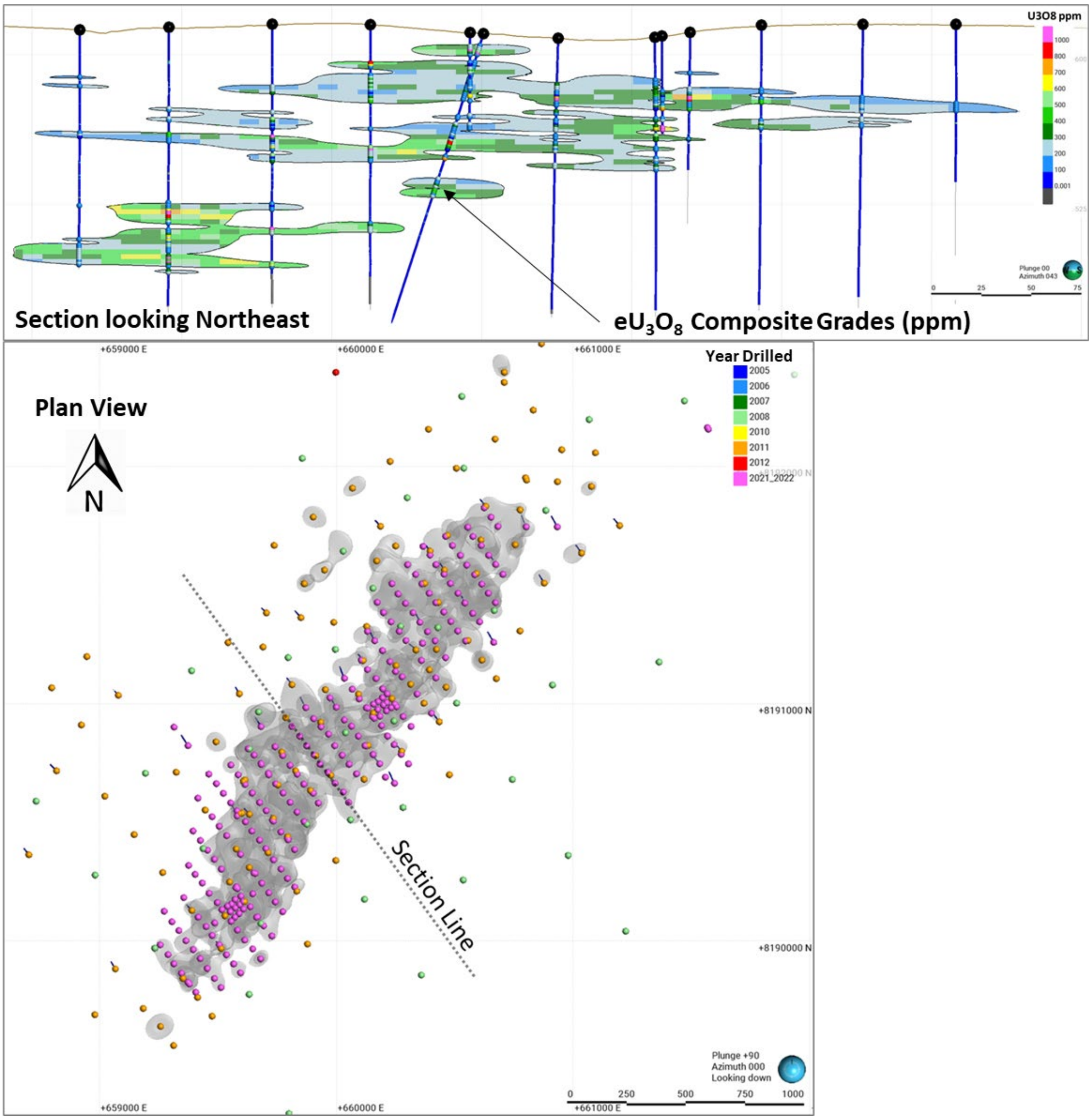


Figure 14-19: Dibbwi East Deposit, Cross-section Comparison of Interpolated U_3O_8 (ppm) Grades vs eU_3O_8 (ppm) Composites (looking Northeast)

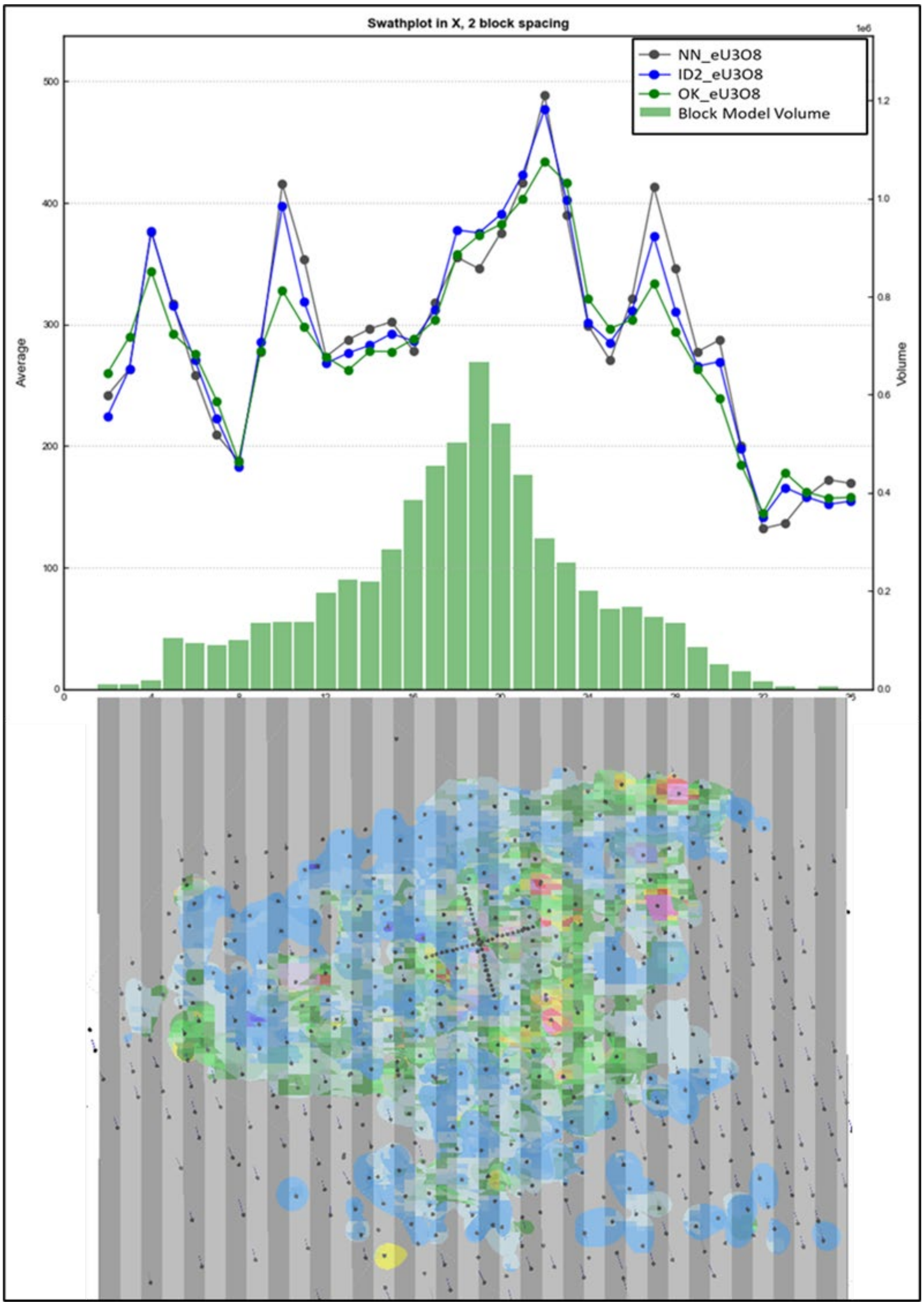


Figure 14-20: Muntanga Deposit, Swath Plot Comparison of U_3O_8 (ppm) Grade for OK, ID2 and NN Block Model Estimates

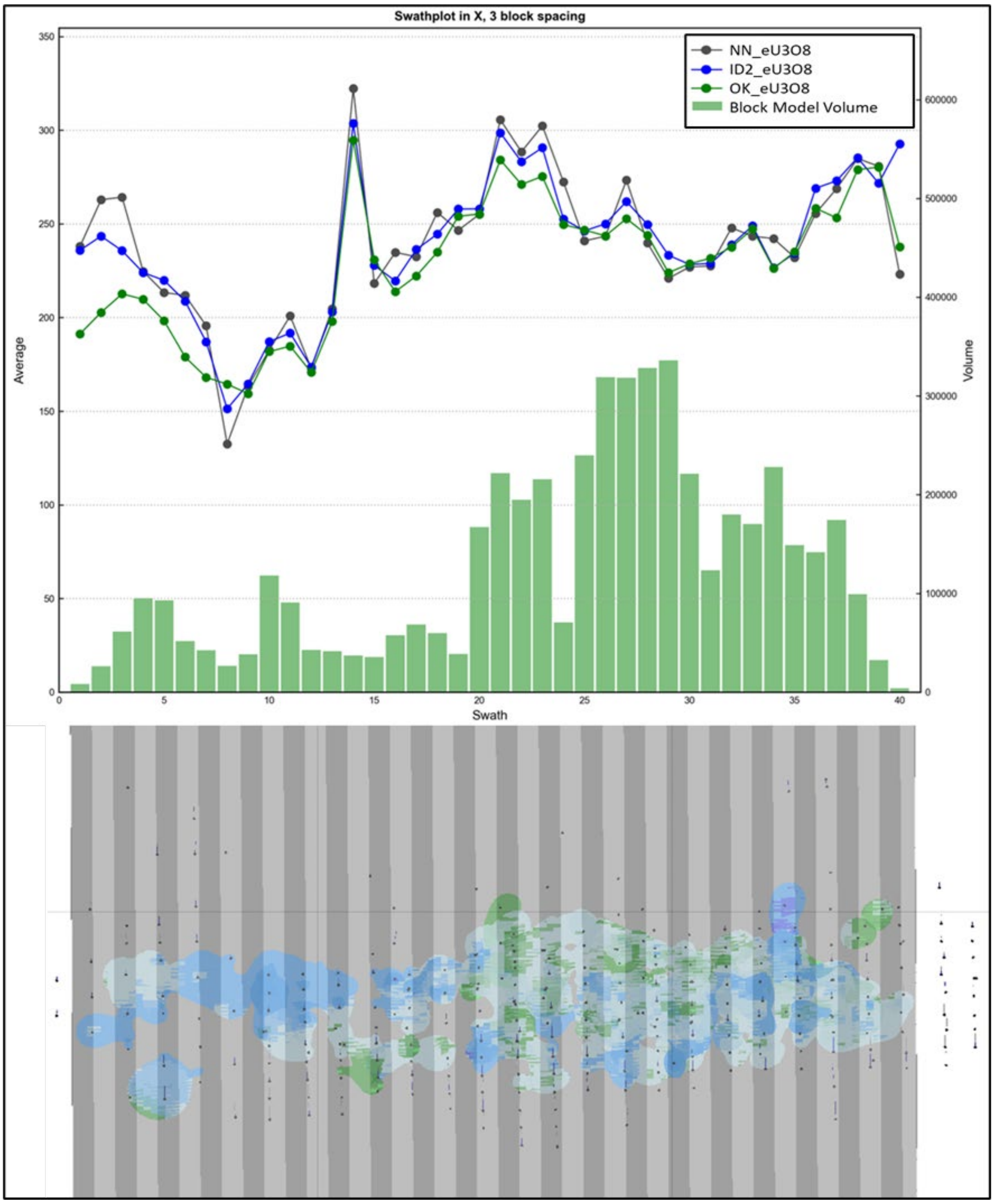


Figure 14-21: Dibbwi Deposit, Swath Plot Comparison of U_3O_8 (ppm) Grade for OK, ID2 and NN Block Model Estimates

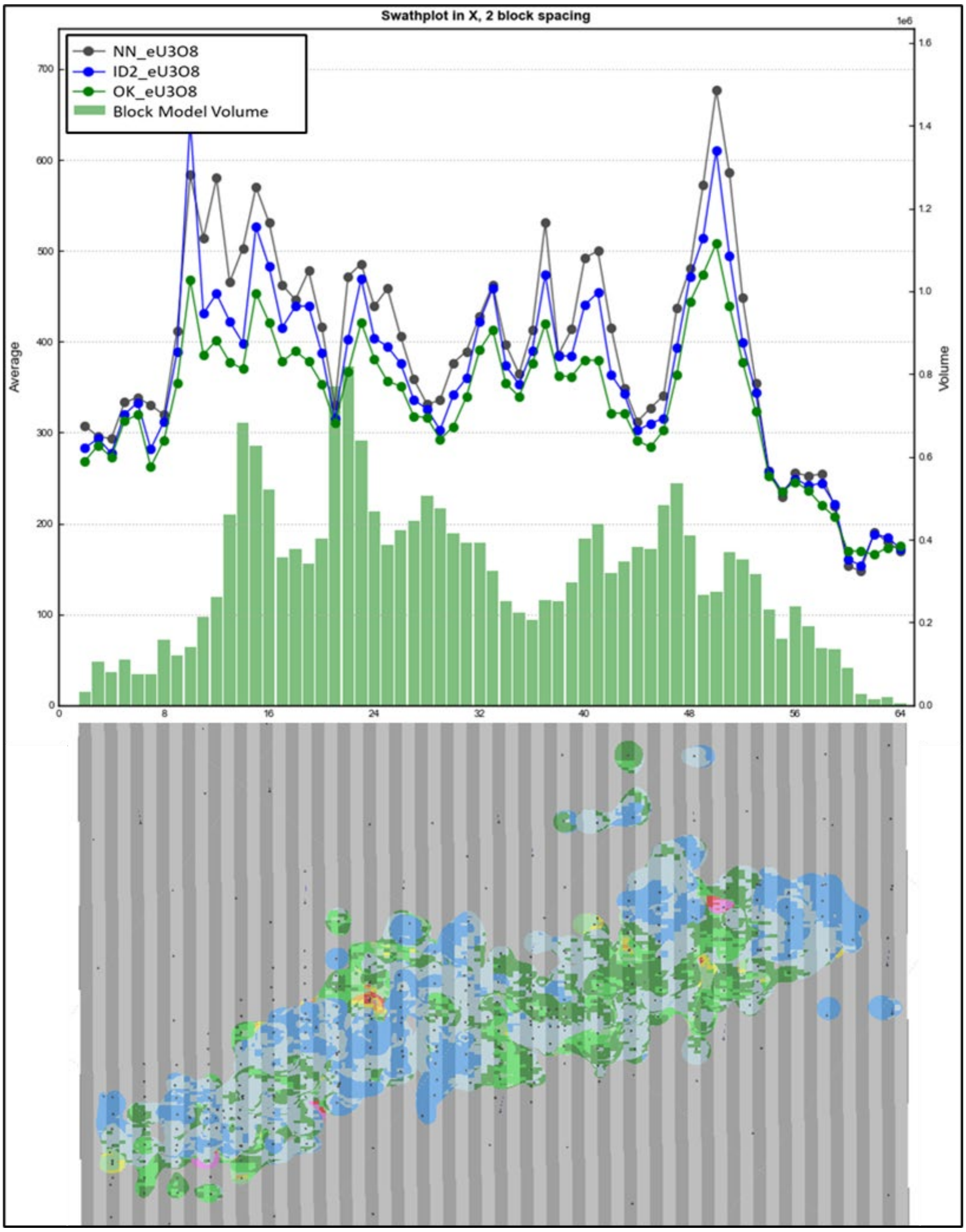


Figure 14-22: Dibbwi East Deposit, Swath Plot Comparison of U_3O_8 (ppm) Grade for OK, ID2 and NN Block Model Estimates

Figure 14-23 provides a comparison of the global average estimated U_3O_8 (ppm) grades between the OK, ID2 and NN models for each deposit. Generally, there is reasonable agreement between the estimates, however as observed in the swath plot analysis, the OK estimates produce slightly lower global average grades compared with the ID2 and NN models for all three deposits.

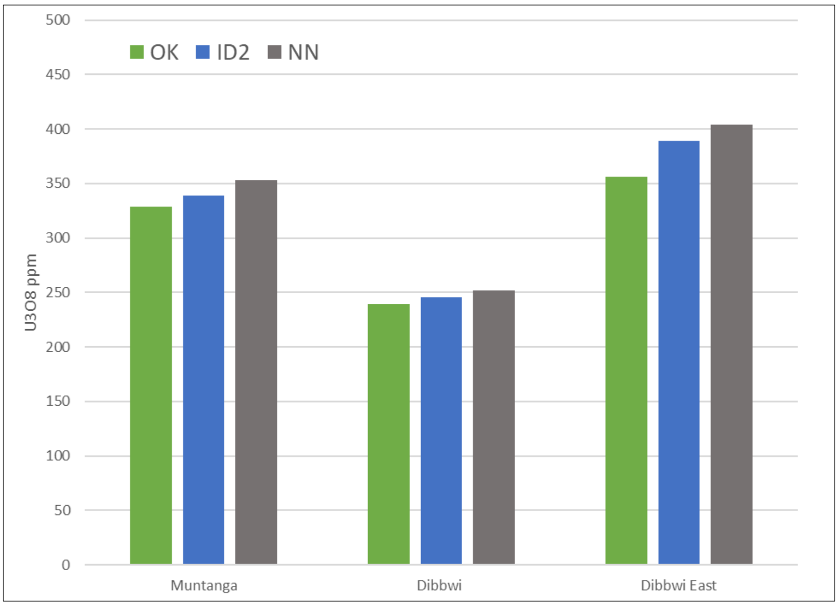


Figure 14-23: Global Average Grade (U_3O_8 ppm) Comparison between OK, ID2 and NN Estimates

14.6 Mineral Resource Classification

Block model estimates for the Muntanga Project were classified according to the CIM Definition Standards for Mineral Resources and Mineral Reserves (May 2014) by Cliff Revering, P.Eng., an independent qualified person for the purpose of National Instrument 43-101.

Mineral resource classification is typically a subjective concept, and industry best practices suggest that resource classification should consider both the confidence in the geological continuity of the mineralized structures, the quality and quantity of exploration data supporting the estimates and the geostatistical confidence in the tonnage and grade estimates. Appropriate classification criteria should aim at integrating these concepts to delineate semi-contiguous areas of similar resource categories. Mr. Revering is satisfied that the mineralization domain models honour the current geological understanding of the project area, and the location of the drill hole data and quality of uranium grade data are sufficiently reliable to support resource evaluation. Mineral resource classification criteria considered the following components:

- Quality of the data used to support mineral resource estimation;
- Confidence in the interpretation of the mineralized zones;
- Average drill hole spacing within the deposits; and
- Estimation parameters including the number of drill holes and assay composites used to estimate a block.

The Gwabi and Njame deposits have been classified as Measured mineral resource where the drill hole spacing is less than 50 x 25 m. Indicated resources have been classified where drill hole spacing is less than 50 x 50 m spacing, with all remaining resources classified as Inferred resources.

The Muntanga deposit has been classified as Indicated resources where the average drill hole spacing is less than 50 m and blocks were estimated by pass 1 or pass 2 estimation parameters (Table 14-15). Inferred resources were classified where the average drill hole spacing was less than 75m. No Measured resources were classified at the Muntanga deposit.

The Dibbwi and Dibbwi East deposits have been classified as Indicated resources where the average drill hole spacing is less than 80 m and blocks were estimated by pass 1 estimation parameters (Table 14-15). Inferred resources were classified where the average drill hole spacing was less than 150 m and blocks were estimated by pass 1 or pass 2 estimation parameters. No Measured resources were classified at the Dibbwi or Dibbwi East deposits.

Block model quantities and grade estimates were also reviewed to determine the portions of the MREs having “reasonable prospects for eventual economic extraction” (RPEEE) from an open-pit mine, based on parameters summarized in Table 14-16.

Table 14-16: Assumptions Considered for Conceptual Open Pit Optimization.

Parameter	Value	Unit
U_3O_8 Price	$70	US$ per pound
Mining Cost	$2.90	US$ per tonne mined
Processing	$8.00	US$ per tonne of feed
General and Administrative	$1.50	US$ per tonne of feed
Mining Dilution	10	percent
Mining Loss	10	percent
Average Pit Slope	40	degrees
Process Rate	4,000,000	tonne feed per year
Royalty	5	Percent on U_3O_8 price
In Situ Cut-Off-Grade	100	Parts per million (ppm)

Mr. Revering considers that the blocks located within the conceptual pit envelopes show RPEEE and can be reported as a mineral resource.

Table 14-17: Mineral Resource Statement* for the Muntanga Project, Zambia, with an Effective Date of March 31, 2023

Category	Deposit	Quantity	Grade	Metal
		Mt	U_3O_8 ppm	U_3O_8 Mlbs
Measured	Gwabi	1.1	254	0.6
	Njame	2.2	374	1.8
Indicated	Muntanga	7.5	360	5.9
	Dibbwi	3.1	255	1.8
	Dibbwi East	25.2	374	20.8
	Gwabi	2.7	374	2.2
	Njame	0.8	321	0.6
TOTAL M&I		**42.6**	**359**	**33.7**
Inferred	Muntanga	4.0	319	2.8
	Dibbwi	0.6	250	0.3
	Dibbwi East	9.1	344	6.9
	Gwabi	0.2	279	0.1
	Njame	1.1	326	0.8
TOTAL INFERRED		**15.0**	**330**	**10.9**

*Notes

1. The effective date of the mineral resource statement is March 31, 2023. The QP for the estimate is Cliff Revering, P.Eng., an employee of SRK (Canada).
2. Mineral resources are prepared in accordance with CIM Definition Standards (CIM, 2014) and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (CIM, 2019).
3. Mineral resources are reported at a cut-off grade of 100 ppm U_3O_8.
4. Mineral resources are constrained within an optimized pit shell using a uranium price of US$70/lb U_3O_8, mining costs of US$2.90/t, processing costs of US$8.00/t ore, additional ore mining costs of US$0.50/t ore, G&A costs of US$1.50/t ore, and a royalty of 5% on U_3O_8 price.
5. Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the mineral resources will be converted into mineral reserves in the future.
6. All figures have been rounded to reflect the relative accuracy of the estimate.

14.7 Grade Sensitivity Analysis

The mineral resources of the Muntanga Project are sensitive to the selection of the reporting cut-off grade. To illustrate this sensitivity, the block model quantities and grade estimates within the conceptual pit used to constrain the mineral resources are presented as grade tonnage curves in Figure 14-24 to Figure 14-28. Only classified mineral resources have been included in the grade tonnage curves.

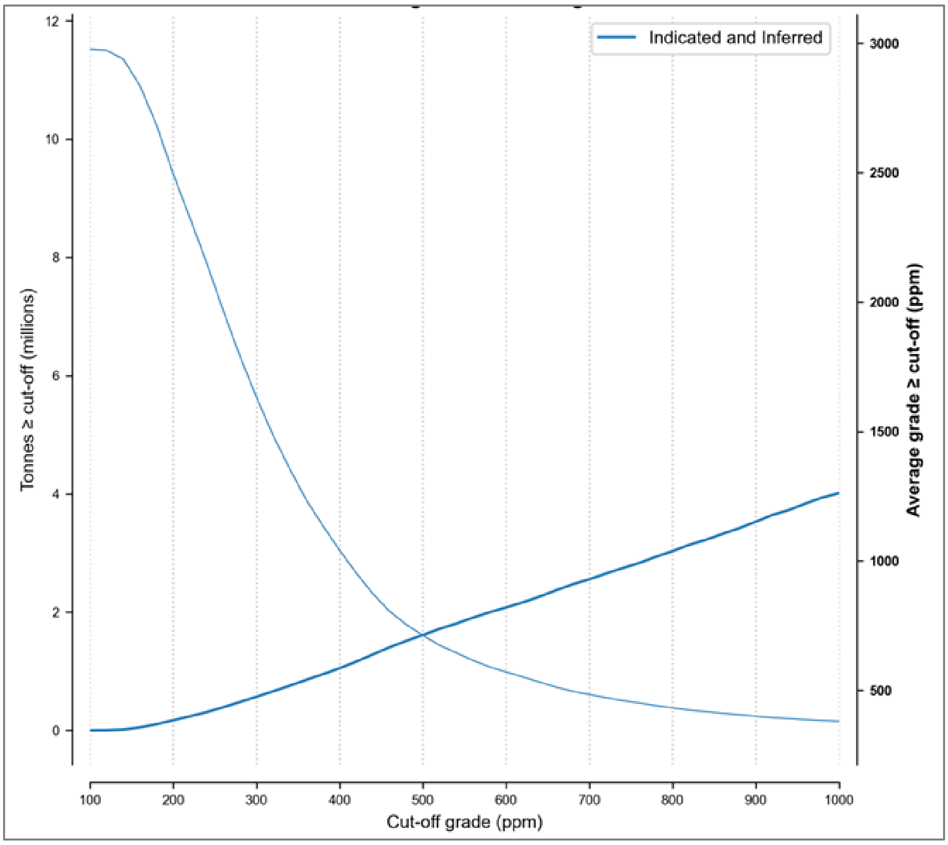


Figure 14-24: Grade (U_3O_8 ppm) Tonnage Curves for the Muntanga Deposit

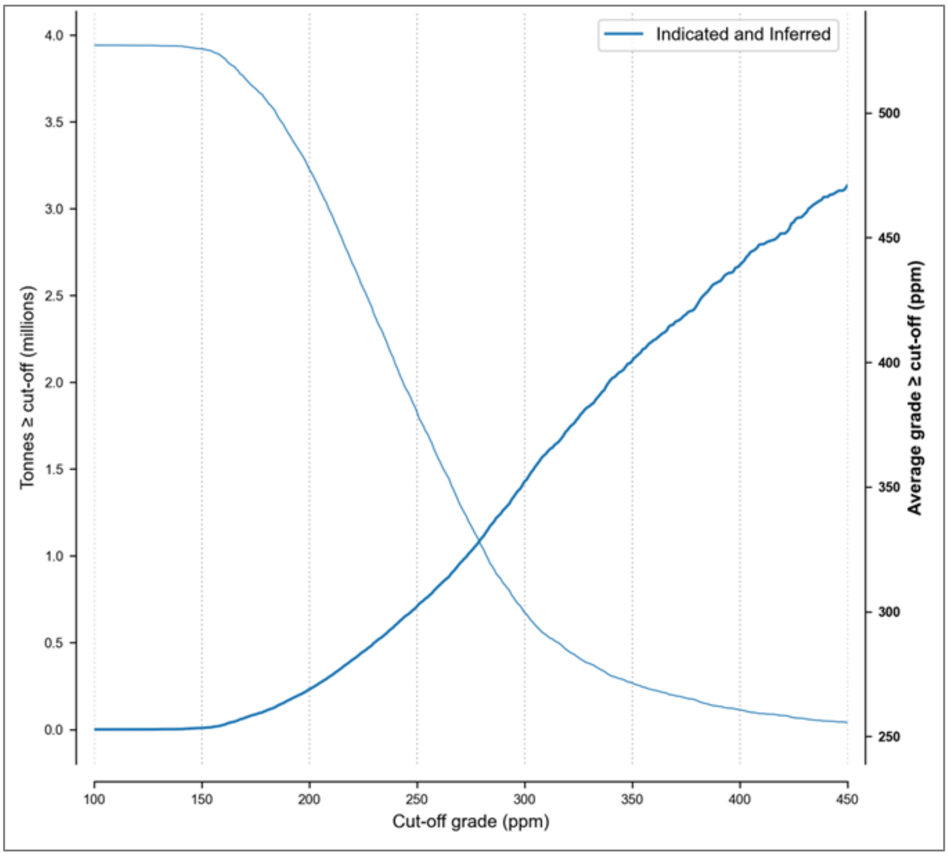


Figure 14-25: Grade (U_3O_8 ppm) Tonnage Curve for the Dibbwi Deposit

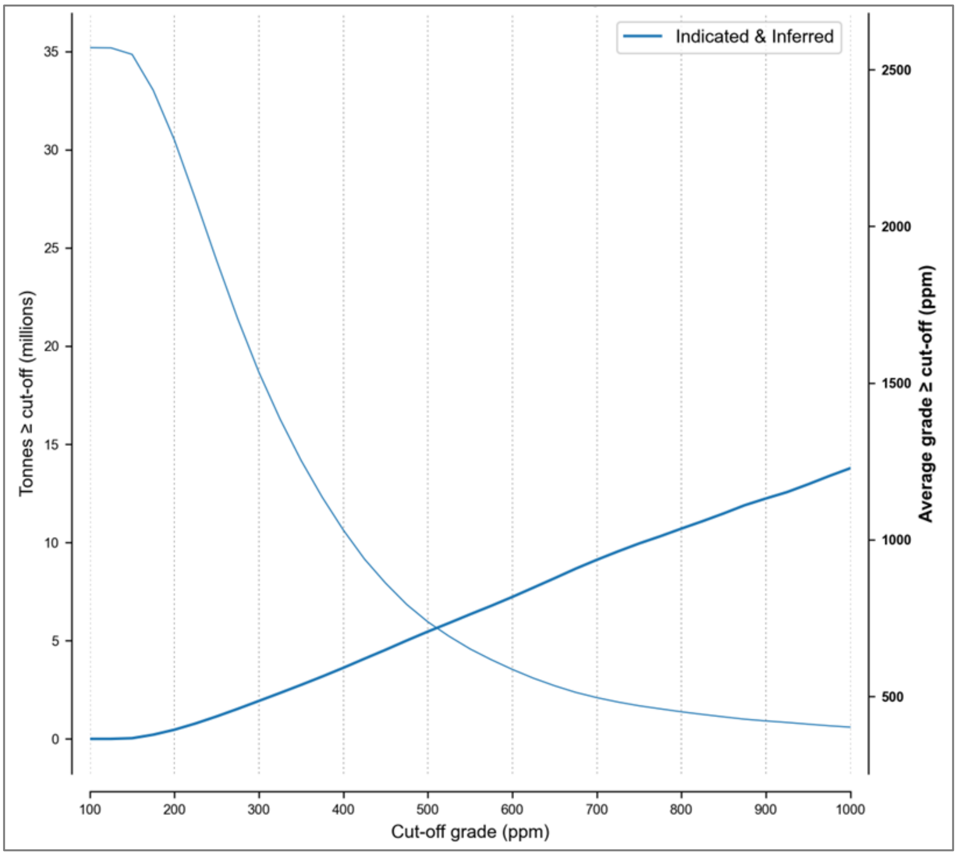


Figure 14-26: Grade (U_3O_8 ppm) Tonnage Curve for the Dibbwi East Deposit

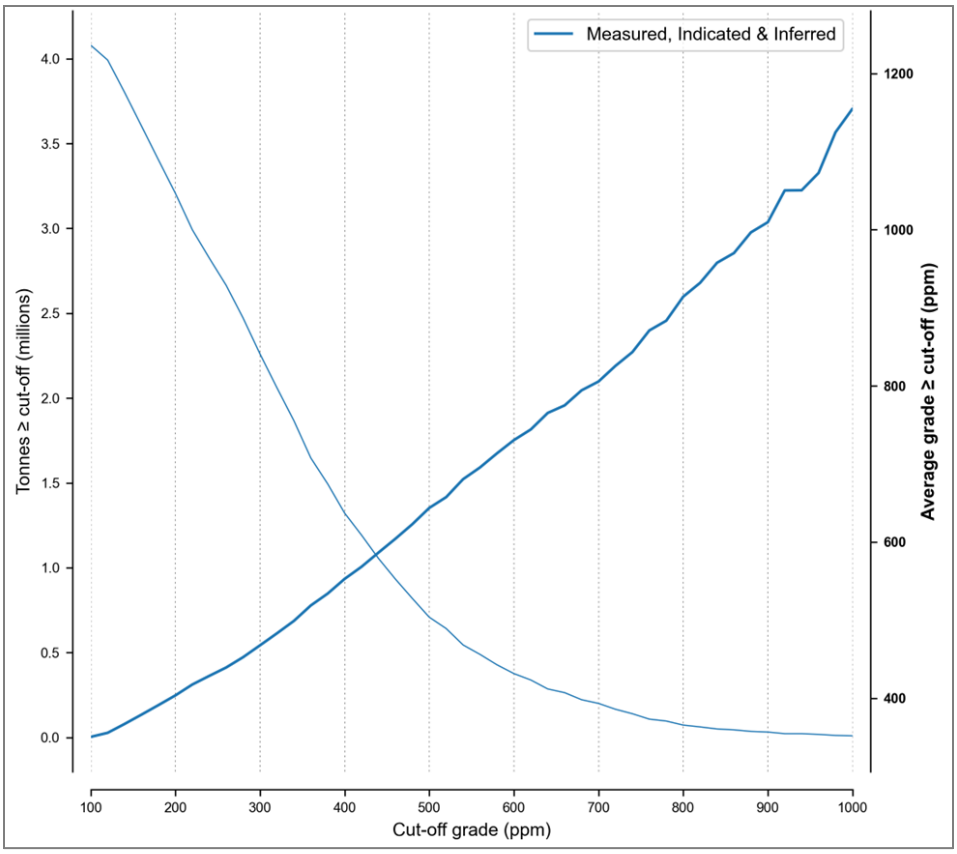


Figure 14-27: Grade (U_3O_8 ppm) Tonnage Curve for the Njame Deposit

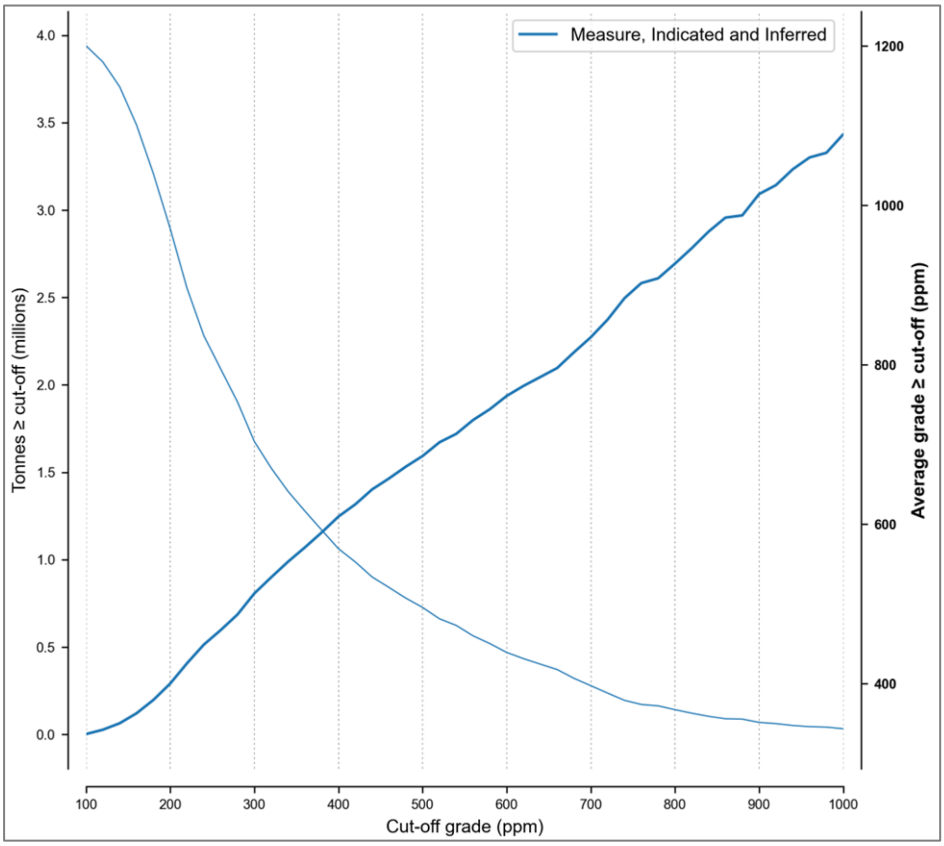


Figure 14-28: Grade (U_3O_8 ppm) Tonnage Curve for the Gwabi Deposit

14.8 Previous Mineral Resource Estimates

The previous MRE for the Muntanga Project was reported by SRK with an effective date of November 20, 2017 (SRK, 2017). A comparison of the current and previous mineral resource estimates is provided in Table 14-18. It should be noted that the previous 2017 MRE has been constrained using the same RPEEE pit shell used to constrain the current MRE, to facilitate a more direct comparison of the two MREs.

Table 14-18: Summary Comparison of the Current and Previous MRE

M&I Mineral Resource	*November 20, 2017 MRE	March 31, 2023 MRE
Tonnes Mt	16.2	42.6
U_3O_8 Grade (ppm)	353	359
Contained U_3O_8 (Mlb)	12.6	33.7
Cut-off Grade (U_3O_8 ppm)	100	100

Inferred Mineral Resource	*November 20, 2017 MRE	March 31, 2023 MRE
Tonnes Mt	38.8	15.0
U_3O_8 Grade (ppm)	294	330
Contained U_3O_8 (Mlb)	25.2	10.9
Cut-off Grade (U_3O_8 ppm)	100	100

**The November 20, 2017 MRE is constrained by the same RPEEE pit shell generated from the March 31, 2023 MRE.*

Comparison between the two MREs highlights the substantial conversion of previous Inferred resources to the Indicated category, particularly within the Dibbwi East deposit, based on the 2021 and 2022 drill programs and analysis completed as part of the 2023 MRE update.

14.9 Recommendations

The following recommendations are provided to advance the understanding of the geology, mineralization controls and mineral resources for the Muntanga Project;

- Continue development of litho-structural models for the Muntanga Project deposits, incorporating major fault interpretations within the vicinity of the deposits or proposed future project infrastructure;
- Continue infill drilling to support conversion of Inferred to Indicated resources within the Dibbwi East deposit;
- Additional assay sampling to support further refinement of the Ra-Grade correlation used to convert down-hole probe data into equivalent uranium grades;
- Continue to assess for radon contamination within future drilling programs and correct down-hole gamma signatures accordingly to mitigate the potential for over-estimation of grade due to radon; and
- Additional density analysis should be conducted on future drill programs to refine tonnage estimates.

15 MINERAL RESERVE ESTIMATES

No Mineral Reserves have been defined as part of this report.

16 MINING METHODS

This section is not applicable.

17 RECOVERY METHODS

This section is not applicable.

18 PROJECT INFRASTRUCTURE

This section is not applicable.

19 MARKET STUDIES AND CONTRACTS

This section is not applicable.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

This section presents the current status of environmental studies, GoviEx’s environmental management system and the environmental and social risks to the project.

20.1.1 Current Status of Environmental Studies

An Environmental Impact Assessment was prepared for the Chirundu (Njame and Gwabi) operations in 2008, including an assessment of baseline conditions and identification of potential impacts to the surrounding environment (AFR, 2008). Data were collected over a nine month period from March 2007 to February 2008. Similarly, an Environmental Impact Study was prepared for the Muntanga Project in 2009 by African Mining Consultants (“AMC”) for the Denison Feasibility Study (MDM, 2009). Data were collected between January 2007 and March 2009.

GoviEx supported by AMC is currently updating the ESIA as well as the EMP and RAP to bring these studies to International Finance Corporation (“IFC”) standards and to account for the addition of the Dibbwi East deposit and changes in population and settlement since 2009. The potential impacts described in the following sections are drawn from the original reports but also include changes arising from the ongoing updates and engineering studies.

The potential environmental impacts of the Project have been systematically assessed using the source-pathway receptor framework. An Environmental Management Plan (“EMP”) was prepared for the Chirundu (Njame and Gwabi) operations and an EMP and Resettlement Action Plan (“RAP”) were both developed for the Muntanga Project. The documents detail the actions that will be taken during the various phases of the Project to mitigate the potential adverse environmental impacts that have been identified.

20.2 Approach to Social and Environmental Management Systems

20.2.1 Approach

GoviEx is committed to the application of policies, strategies and practices that treat people and the environment with respect while pursuing the underlying business objective of creating value. GoviEx’s commitment to sustainable development is captured in its Statement of Values and Responsibilities, from which its policies, strategies, and management system frameworks originate. These documents and commitments are available on the GoviEx corporate website .

GoviEx has developed the following corporate policies:

- Environmental policy;
- Socio-economic development policy;
- Stakeholder engagement policy; and
- Human rights policy.

GoviEx has recently started using the ONYEN ESG reporting software to record and track its ESG performance at a corporate and site level to ensure transparency, improve alignment with the IFC PS and report against the Sustainability Accounting Standards Board (SASB) and Global Reporting Initiative (GRI) reporting requirements.

20.2.2 Environmental and Social Management System

A management system framework was prepared by GoviEx in 2021 to support the development of its internal governance structures for the management of environmental, social, health and safety matters and facilitate the achievement of its stated corporate values and responsibilities.

The framework describes the expected structure and content of an environmental and social management system (ESMS) and an occupational health and safety management system (OHSMS) that meet the requirements of the following standards:

- International Standards Organisation (ISO) 14001 Standard (ISO 14001:2015) and 45001 Standard (45001:2018);
- International Finance Corporation (IFC) Performance Standard 1; and
- Towards Sustainable Mining (TSM).

GoviEx intends to develop the management systems steadily over time, in parallel with project and exploration development timelines and preparation of the supporting management plans as identified in the ESIA and ESMP.

The impacts identified in the ESIA report will be managed through the implementation of appropriate management measures captured in the ESIA report and the ESMP. GoviEx recognises the management measures will need to be implemented such that they reach and benefit all levels of society so existing inequalities are not exacerbated, community dependency on the project is minimised and support is given to social transitioning at closure.

The robustness of the supporting management plans, along with implementation, assurance and continual improvement functions of the ESMS, are fundamental to enabling the successful implementation of management measures by the GoviEx, its contractors and sub-contractors. A key part of the ESMS is the ongoing monitoring to confirm whether the impacts identified in the ESIA materialise and evaluate the effectiveness of control measures and determine if any additional measures are required to ensure continuous improvement.

20.3 Environmental and Social Management Plans

The following environmental and social management plans will be implemented for the Project and reviewed on an annual basis:

- Resettlement Action Plan – The initial RAP was developed in March 2009 to identify all of the communities that will be affected by relocation, and is in the process of being updated as part of the update to the ESIA and to link with the on-going feasibility study;
- Occupational Health and Safety Plan – This plan describes the measures to manage all aspects of employee health and safety during mining activities.
- Environmental Monitoring Plan – This plan describes measures to monitor air, soil, surface water, groundwater, vegetation that may be affected by the Project.
- Radiation Management Plan – This plan consists of a series of plans required by the Zambian government to control and manage all aspects of radiation associated with a uranium project. These plans include Radioactive Waste Management, Storage and Transport, Accidental Spills Management, Community and Worker Training, Hazard and Safety Assessments.
- Water Management Plan – This plan identifies all aspects related to water management for the Project. It focuses on identifying methods of conservation, re-use and re-cycling to minimise consumption of water resources by the Project.
- Handling and Storage Plan – This plan deals with management actions for handling and storage of all materials onsite as well as spills management activities.

- Waste Management Plan – The plan describes the types of waste that will be generated onsite and the management of these wastes. Waste management principles involved in the plan are minimisation, re-use or recycle.
- Emergency Response Plan – The plan identifies the original structure of the ERP which will be updated by GoviEx during construction. The plan will identify all emergencies that may occur onsite and identify measures for their management.
- Conservation and Vegetation Plan – This plan focuses on the development of conservation areas and a sustainable program with the local communities to manage their local resources.
- Preliminary Progressive Revegation and Rehabilitation Plan – The plan will identify and schedule all areas that are likely to require revegetation through the mining operations. The plan will also monitor the progress on these activities.
- Sustainable Development Plan – The plan is designed to identify social development projects that can be integrated into a schedule of activities for GoviEx to provide assistance with.
- A Mine Decommissioning and Closure Plan - This describes the activities that are foreseen to require management prior to development of the Project and the activities that GoviEx will implement.

20.4 Plans for Waste Disposal, Water Management and Closure

Potential locations of the heap leach, waste rock and processing facilities are part of the scope of the Feasibility Study currently underway. The selected option will be based on environmental, social, financial and technical considerations.

A Closure plan is also being developed as part of the Feasibility Study and ESIA.

20.5 Risks to the Project

Subject to obtaining the required approvals, SRK has not identified any social and environmental factors that prevent the declaration of a resource. As the project moves forward towards reporting of Mineral Reserves, the following risk factors have the potential to become Modifying Factors. These are being assessed and addressed as part of the environmental impact assessment process and feasibility study.

The concept of double materiality is applied, with potential ESG impacts **from** the project considered equally to impacts posed by the ESG setting **to** the project. According to double materiality, companies must report both on how their business is impacted by sustainability issues (“outside-in”) and how their activities impact society and the environment (“inside-out”).

Material issues are assumed to be factors that could:

- Stop the project, affect the continuation of operations or obtaining of approvals;
- Pose major concern to stakeholders and/or could affect the social licence to operate;
- Are out of alignment with corporate strategies or policies; and/or
- Result in the need for additional studies or costs that could affect the proposed design and/or operation of the Project and thus the value of the assets (e.g., design changes,

operational management requirements, cash flow restrictions, rehabilitation/closure demands).

The potential for materiality has been identified on the basis of:

- Experience of ESG reviewers;
- Understanding of the location; proposed operation; regulatory and governance structure; socio-political situation; environmental and social setting; and
- Understanding client and audience, in particular current expectations from investors around ESG factors and the requirements of international standards representing good international industry practice for a uranium project.

20.5.1 Resettlement:

The project requires the physical and economic resettlement of several small villages. Resettlement can have a long lead time and can delay project development. GoviEx has appointed a Zambian based consultant (AMC) with previous resettlement experience. AMC has completed the bulk of the baseline data collection and is in the process of defining a compensation framework. This will be used to negotiate final settlement agreements with affected parties. Land for resettlement has been identified adjacent to the project areas.

20.5.2 Permitting Schedule

The project is conducting a full ESIA process on the basis of the updated project. To complete this to IFC standards and then get approval from the Zambian government will take time and needs consideration in terms of the overall project schedule. Additional permits for management of waste will also be required prior to construction. Although consultation and review timeframes are stipulated for approval of EIAs and other permits, there is a threat that the approval process could be protracted. The risk also exists of regulators including unrealistic conditions of approval in the permit resulting in cost implications for the project and/or the need to renegotiate permit conditions within a timeframe over which the client has limited influence. The client can manage these risks by maintaining a positive relationship with the ZEMA and other government ministries.

20.5.3 In-Migration

A development of this significance in a relatively remote area is likely to attract job seekers who will put pressure on accommodation and other resources in the local area. This will be addressed as part of the ESIA and will require coordination of HR and recruitment procedures by GoviEx and its various contractors to avoid secondary social and environmental impacts.

20.5.4 Water Resources

The project will require access to water in a setting where water is seasonally scarce. Both surface water quantity and quality will need to be managed carefully taking into consideration other water users in the catchment. In addition, climate change adaptation will need to be considered in mine design (e.g. increased mean annual temperatures, reduced water availability and more intense flood events should be considered in mine planning and water management infrastructure sized appropriately). Obtaining permits to abstract and discharge water will also be key along with water treatment systems to achieve discharge standards. This is being addressed as part of the feasibility study and ESIA.

20.5.5 Biodiversity

In line with global standards, major projects will need to demonstrate no net loss (NNL) to biodiversity, or a net gain in areas considered critical habitat under IFC PS6[1][1]. As a portion of the project is located within a Game Management Area that contains species of conservation concern, there is a chance the project will need to achieve a net gain for biodiversity. The area is also known to provide ecosystem services through fire wood and charcoal to the local population. Further studies being undertaken as part of the EIA will confirm whether the company needs to achieve NNL or a net gain for biodiversity. Implementing successful biodiversity and ecosystem services initiatives require extensive coordination and buy-in from both local communities and regulators, as well as requiring both financial and technical resources.

21 CAPITAL AND OPERATING COST

This section is not applicable.

22 ECONOMIC ANALYSIS

This section is not applicable.

23 ADJACENT PROPERTIES

This section is not applicable.

24 OTHER RELEVANT DATA AND INFORMATION

There is no additional information or explanation necessary to make this Technical Report understandable and not misleading.

25 INTERPRETATION AND CONCLUSIONS

This Technical Report documents an updated MRE for the Muntanga Project as a result of extensive infill drilling, including 5,980 m drilled in 2021 and a further 27,634 m of drilling in 2022 (total of 33,614 m in 262 holes). The drilling was focused predominately on the Dibbwi East deposit, to further delineate the deposit and convert Inferred resources to the Indicated category. The MRE update included a comprehensive reassessment of previous work and a revised correlation between down-hole radiometric probe data and chemical assays used to convert down-hole radiometric data into equivalent uranium grades (eU_3O_8) for mineral resource estimation.

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[1] [1] International Finance Corporation: Performance Standard 6 (IFC PS6) on Biodiversity Conservation represents international best practice for biodiversity management.

Table 25: Mineral Resource Statement* for the Muntanga Project, Zambia, with an Effective Date of March 31, 2023

Category	Deposit	Quantity	Grade	Metal
		Mt	U_3O_8 ppm	U_3O_8 Mlbs
Measured	Gwabi	1.1	254	0.6
	Njame	2.2	374	1.8
Indicated	Muntanga	7.5	360	5.9
	Dibbwi	3.1	255	1.8
	Dibbwi East	25.2	374	20.8
	Gwabi	2.7	374	2.2
	Njame	0.8	321	0.6
TOTAL M&I		**42.6**	**359**	**33.7**
Inferred	Muntanga	4.0	319	2.8
	Dibbwi	0.6	250	0.3
	Dibbwi East	9.1	344	6.9
	Gwabi	0.2	279	0.1
	Njame	1.1	326	0.8
TOTAL INFERRED		**15.0**	**330**	**10.9**

*Notes

1) The effective date of the mineral resource statement is March 31, 2023. The QP for the estimate is Cliff Revering, P.Eng., an employee of SRK (Canada).
2) Mineral resources are prepared in accordance with CIM Definition Standards (CIM, 2014) and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (CIM, 2019).
3) Mineral resources are reported at a cut-off grade of 100 ppm U_3O_8.
4) Mineral resources are constrained within an optimized pit shell using a uranium price of US$70/lb U_3O_8, mining costs of US$2.90/t, processing costs of US$8.00/t ore, additional ore mining costs of US$0.50/t ore, G&A costs of US$1.50/t ore, and a royalty of 5% on U_3O_8 price.
5) Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the mineral resources will be converted into mineral reserves in the future.
6) All figures have been rounded to reflect the relative accuracy of the estimate.

The previous MRE for the Muntanga Project was reported by SRK with an effective date of November 20, 2017 (SRK, 2017). A comparison of the current and previous MREs is provided in Table 14-18. It should be noted that the previous 2017 MRE has been constrained using the same RPEEE pit shell used to constrain the current MRE, to facilitate a more direct comparison of the mineral resource estimates.

Comparison between the two MREs highlights the conversion of previous Inferred resources to the Indicated category, particularly within the Dibbwi East deposit, based on the 2021 and 2022 drill programs and analysis completed as part of the 2023 MRE update.

No Mineral Reserve has yet been determined for this Project to date.

Table 25-1: Comparison of Current and Previous Mineral Resource Estimates

M&I Mineral Resource	*November 20, 2017 MRE	March 31, 2023 MRE
Tonnes Mt	16.2	42.6
U_3O_8 Grade (ppm)	353	359
Contained U_3O_8 (Mlb)	12.6	33.7
Cut-off Grade (U_3O_8 ppm)	100	100
Inferred Mineral Resource	***November 20, 2017 MRE**	**March 31, 2023 MRE**
Tonnes Mt	38.8	15.0
U_3O_8 Grade (ppm)	294	330
Contained U_3O_8 (Mlb)	25.2	10.9
Cut-off Grade (U_3O_8 ppm)	100	100

**The November 20, 2017 MRE is constrained by the same RPEEE pit shell generated from the March 31, 2023 MRE.*

26 RECOMMENDATIONS

The following recommendations are provided to advance the understanding of the geology, mineralization controls and mineral resources for the Muntanga Project;

- Continue development of litho-structural models for the Muntanga Project deposits, incorporating major fault interpretations within the vicinity of the deposits or proposed future project infrastructure;
- Continue infill drilling to support conversion of Inferred to Indicated resources within the Dibbwi East deposit;
- Additional assay sampling to support further refinement of the Ra-Grade correlation used to convert down-hole probe data into equivalent uranium grades;
- Continue to assess for radon contamination within future drilling programs and correct down-hole gamma signatures accordingly to mitigate the potential for over-estimation of grade due to radon; and
- Additional density analysis should be conducted on future drill programs to refine tonnage estimates.

Estimated costs to carry out the proposed recommendations are summarised in Table 26-1.

Table 26-1: Estimated Costs for Recommended Work Program

Proposed Activities		Costs (USD)
Resource drilling	DTH Drilling	488,000
	DDH Drilling	276,000
Assays		100,000
Downhole Logging		250,000
Camp and support cost		275,000
Total		**1,389,000**

For and on behalf of SRK Consulting (UK) Limited

Bowell

Rob Bowell *PhD, CChem, CGeol, FGS, EurGeol, PGeo (NL) FIMMM*
Corporate Consultant (Geochemistry)
Project Director
SRK Consulting (UK) Limited

Effective Date: March 31, 2023

Report Date Issued: August 31, 2023

Cliff Revering *P.Eng.*
Qualified Person, Resource Estimation
Principal Consultant (Geological Engineering)
SRK Consulting (Canada) Inc.

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GLOSSARY, ABBREVIATIONS, UNITS

Glossary

Term	Definition
Assay:	The chemical analysis of mineral samples to determine the metal content.
Capital Expenditure:	All other expenditures not classified as operating costs.
Composite:	Combining more than one sample result to give an average result over a larger distance.
Concentrate:	A metal-rich product resulting from a mineral enrichment process such as gravity concentration or flotation, in which most of the desired mineral has been separated from the waste material in the ore.
Crushing:	Initial process of reducing ore particle size to render it more amenable for further processing.
Cut-off Grade (“CoG”):	The grade of mineralized rock, which determines as to whether or not it is economic to recover its metal content by further concentration.
Dilution:	Waste, which is unavoidably mined with ore.
Dip:	Angle of inclination of a geological feature/rock from the horizontal.
Fault:	The surface of a fracture along which movement has occurred.
Footwall:	The underlying side of an orebody or stope.
Gangue:	Non-valuable components of the ore.
Grade (“G”):	The measure of concentration of uranium within mineralized rock.
Hangingwall:	The overlying side of an orebody or slope.
Haulage:	A horizontal underground excavation which is used to transport mined ore.
ICP-MS	Inductively coupled plasma – mass spectrometer; standard analytical technique
ICO-OES	Inductively coupled plasma – atomic emission spectroscopy
Kriging:	An interpolation method of assigning values from samples to blocks that minimizes the estimation error.
Level:	Horizontal tunnel the primary purpose is the transportation of personnel and materials.
Lithological:	Geological description pertaining to different rock types.
LoM Plans:	Life-of-Mine plans.
Material Properties:	Mine properties.
Milling:	A general term used to describe the process in which the ore is crushed and ground and subjected to physical or chemical treatment to extract the valuable metals to a concentrate or finished product.
Mineral/Mining Lease:	A lease area for which mineral rights are held.
Mining Assets:	The Material Properties and Significant Exploration Properties.
Ore Reserve:	See Mineral Reserve.
RoM:	Run-of-Mine.
Sedimentary:	Pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks.
Stratigraphy:	The study of stratified rocks in terms of time and space.
Strike:	Direction of line formed by the intersection of strata surfaces with the horizontal plane, always perpendicular to the dip direction.
Sulfide:	A sulfur bearing mineral.
Tailings:	Finely ground waste rock from which valuable minerals or metals have been extracted.
Thickening:	The process of concentrating solid particles in suspension.
Uranium units	1.0 per mil = 1000 ppm = 0.10 % eU. And 0.1000 % eU = 0.1179 % eU_3O_8
Variogram:	A statistical representation of the characteristics (usually grade).

Abbreviations and Units

Abbreviation / Unit	Unit or Term
%	percent
AA	atomic absorption
ANFO	ammonium nitrate fuel oil
Au	gold
AuEq	gold equivalent grade
°C	degrees Centigrade
CCD	counter-current decantation
cfm	cubic feet per minute
CIL	carbon-in-leach
CIX	Continuous ion exchange circuit
CoG	cut-off-Grade
cm	centimetre
cm^2	square centimetre
cm^3	cubic centimetre
cfm	cubic feet per minute
ConfC	confidence code
Crec	core recovery
CSS	closed-side setting
CPS	counts per second
CTW	calculated true width
°	degree (degrees)
dia.	Diameter
€	Euro
eU	Equivalent uranium assay value; determined radiometrically
eU_3O_8	Equivalent U_3O_8; determined radiometrically
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
ft	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)
G&A	General and administrative project costs
g	gram
gal	gallon
g-mol	gram-mole
gpm	gallons per minute
gpt	grams per tonne
GWe	giga Watts electricity
ha	hectares
HDPE	Height Density Polyethylene
hPa	hectopascals
HPS floodlights	High pressure sodium floodlights
ICP	induced couple plasma
ID^2	inverse-distance squared

Abbreviation / Unit	Unit or Term
ID^3	inverse-distance cubed
IFC	International Finance Corporation
ILS	intermediate leach solution
IX	Ion exchange
JORC	Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Mineral Council of Australia
kg	kilograms
kg/m^3	kilograms per cubic metre
kg/t eU	kilograms per tonne of equivalent uranium metal
km	kilometre
km^2	square kilometre
koz	thousand troy ounce
kt	thousand tonnes
ktpa	Kilotonnes per annum
ktpd	thousand tonnes per day
ktpy	thousand tonnes per year
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
kWh/t	kilowatt-hour per metric tonne
L	litre
Lps	liters per second
lb	pound
LLDDP	Linear Low Density Polyethylene Plastic
LOI	Loss On Ignition
LoM	Life-of-Mine
m	metre
m^2	square metre
m^3	cubic metre
M lcm	Million loose cubic metres
m/month	Metres per month
masl	metres above sea level
MDA	Mine Development Associates
mg/l	milligrams/litre
Mlb	million pounds
mm	millimetre
mm^2	square millimetre
mm^3	cubic millimetre
MME	Mine & Mill Engineering
MMMD	Ministry of Mines and Minerals Development
MoM	Ministry of Mines
Mt	million tonnes
MTW	measured true width
m_{vert}/m_{hor}	Vertical metres per horizontal metre
m.y.	million years

Abbreviation / Unit	Unit or Term
MWe	Mega Watts electricity
NGO	non-governmental organization
NI 43-101	Canadian National Instrument 43-101
oz	troy ounce
%	percent
PLC	programmable logic controller
PLS	pregnant liquor solution
PMF	probable maximum flood
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
RC	rotary circulation drilling
RO	Reverse osmosis
RoM	Run-of-Mine
SCADA	Supervisory control and data acquisition
s	second
SG	specific gravity
st	short ton (2,000 pounds)
t	tonne (metric ton) (2,204.6 pounds)
t eU	Tonnes of equivalent uranium metal
t/doh	Tonnes per direct operating hour
tph	tonnes per hour
tpd	tonnes per day
tpy	tonnes per year
t_{waste}:t_{RoM}	Tonnes of waste per tonne of run-of-mine
µ	micron or microns
U	uranium
U_3O_8	Uranium expressed as an oxide; common units by which uranium is sold
USD/kg	US dollars per kilogram
USD/kg U	US dollars per kilogram of equivalent uranium
USD/lb U_3O_8	US dollars per pound of U_3O_8
USD/t	US dollars per tonne
USD/t_{metal}	US dollars per tonne of uranium metal
USD/t_{RoM}	US dollars per tonne of run-of-mine
USDk	Thousand US dollars
USDm	Million US dollars
eU_3O_8	Equivalent Uranium as determined by gamma log derivations
V	vanadium
V_2O_5	Vanadium expressed as an oxide; common units by which vanadium is sold
W	watt
XRD	x-ray diffraction
yr	year