

CSA Global
Mining Industry Consultants

NI 43-101 TECHNICAL REPORT

DASA Uranium Project - Mineral Resource Update

For
Global Atomic Corporation

CSA Global Report: N° R343.2019
Report Date: 31 July 2019
Effective Date: 1 June 2019

www.csaglobal.com

Qualified Person
Dmitry Pertel, MAIG



Contents

	Report prepared for.....	II
	Report issued by	II
	Report information	II
	Author/Qualified Person Signature	II
	CSA Global Internal Reviewer and Authorization Signature	II
1	SUMMARY	1
	1.1 Introduction.....	1
	1.9 Interpretation and Conclusions	5
	1.9.1 Risks.....	6
	1.9.2 Opportunities.....	7
	1.10 Recommendations.....	7
2	INTRODUCTION	9
	2.1 Issuer.....	9
	2.2 Terms of Reference.....	9
	2.3 Qualified Person Property Inspection.....	10
	2.4 Sources of Information	10
3	RELIANCE ON OTHER EXPERTS.....	11
4	PROPERTY DESCRIPTION AND LOCATION	12
	4.1 Location of Property	12
	4.2 Mineral Tenure	13
	4.3 Other Significant Factors and Risks.....	15
5	ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY	16
	5.1 Accessibility.....	16
	5.2 Climate.....	17
	5.3 Physiography.....	17
	5.4 Local Resources and Infrastructure	18
6	HISTORY.....	20
	6.1 Introduction	20
	6.2 Regional Exploration by the French Nuclear Energy Commission (1957 to 1981)	20
	6.3 Regional Exploration by PNC and ONAREM (1981 to 1990)	21
	6.4 Exploration Activity from 2007 Onwards.....	21
	6.5 Historical Mineral Resource Estimates	22
	6.5.1 2009 GEOEX Isakanan and Dajy Historical Mineral Resource Estimate	22
	6.5.2 2013 SRK Consulting (Canada) DASA Project Historical Mineral Resource Estimate	22
	6.5.3 2017 CSA Global DASA Project Historical Mineral Resource Estimate (CSA Global, 2017).....	23
	6.5.4 2018 CSA Global DASA Project Historical Mineral Resource Estimate (CSA Global, 2018).....	23
	6.7 Production from the Property	28

7	GEOLOGICAL SETTING AND MINERALIZATION.....	29
7.1	Introduction.....	29
7.2	Regional Geology.....	29
7.3	Structural Setting.....	33
7.3.1	N130–N140°E and N70–N80°E Conjugate Fault System.....	34
7.3.2	Fold-Like Structures.....	34
7.4	Property Geology.....	35
7.4.1	Precambrian.....	38
7.4.2	Cambro-Ordovician Undifferentiated.....	38
7.4.3	Upper Ordovician.....	38
7.4.4	Silurian.....	38
7.4.5	Devonian.....	39
7.4.6	Carboniferous.....	39
7.4.7	Permian.....	39
7.4.8	Triassic.....	39
7.4.9	Jurassic.....	40
7.4.10	Cretaceous.....	43
7.5	Structural Geology of the Property.....	46
7.5.1	Adrar Emoles Flexure.....	46
7.5.2	Azouza Fault.....	46
7.5.3	North-Northwest to South-Southeast Faults and Folds.....	46
7.5.4	Shearing Fractures and Veins.....	47
7.5.5	East-West Strike-Slip Faults.....	47
7.6	Uranium Mineralization.....	47
7.6.1	Regional.....	47
7.6.2	DASA Project.....	48
8	DEPOSIT TYPES.....	50
9	EXPLORATION.....	52
9.1	Data Compilation and Old Drillhole Locations.....	52
9.2	Radiometric Ground Survey and Geo-Structural Mapping.....	53
9.3	Topographic Survey.....	55
9.3.1	Ground Control.....	55
9.3.2	Aerial Survey.....	55
10	DRILLING.....	57
10.1	Geological Exploratory Drilling.....	57
10.1.1	Drilling Procedures.....	61
10.1.2	Drilling Monitoring.....	61
10.2	Downhole Survey.....	62
10.2.1	Gamma-Ray Logging.....	63
10.2.2	Radiometric Determination.....	64
10.2.3	Downhole Survey.....	66
10.2.4	Drillhole Diameter Measurements.....	66
10.2.5	Prompt Fission Neutron Logging.....	66
10.3	Rotary Chips and Core Logging.....	66

10.3.1	Rotary Chip Logging	67
10.3.2	Core Logging.....	67
10.4	Sampling	69
11	SAMPLE PREPARATION, ANALYSES AND SECURITY	71
11.1	Sample Preparation and Analyses	71
11.2	2018 Sampling Program.....	71
11.3	Core Depth Adjustment.....	72
11.4	Bulk Density Data.....	74
11.5	Quality Assurance and Quality Control Programs	75
11.5.1	Pre-2018 Sampling Programs	75
11.5.2	2018 Sampling Program.....	78
11.6	Review of 2017–2018 Downhole Probe Quality Assurance and Quality Control Programs	83
11.7	Radioactive Equilibrium Factor	84
11.8	CSA Global Comments	86
12	DATA VERIFICATION.....	87
13	MINERAL PROCESSING AND METALLURGICAL TESTING	88
13.1	Mineralogy.....	88
13.2	Beneficiation and Comminution.....	89
13.3	Roll Bottle and Agitated Leaching.....	90
13.3.1	Column Leach Tests	94
13.4	Solid-Liquid Separation.....	96
13.5	Uranium Recovery from Pregnant Leach Solution.....	96
13.5.1	Solvent Extraction	96
13.5.2	Ion Exchange	96
13.5.3	Resin-in-Pulp	97
13.6	Uranium Precipitation.....	98
14	MINERAL RESOURCE ESTIMATES.....	99
14.1	Software Used.....	99
14.2	Database Compilation.....	99
14.3	Data Validation	100
14.4	Exploratory Data Analysis – Statistical Analysis	100
14.5	Lithological Model	102
14.6	Interpretation of Mineralized Bodies	102
14.7	Wireframing.....	105
14.8	Drillhole Data Selection and Compositing	105
14.9	Dynamic Search	106
14.10	Geostatistical Analysis	108
14.11	Block Modelling	111
14.12	Grade Interpolation	111
14.13	Bulk Density Values.....	112
14.14	Mineral Resource Classification Strategy.....	112
14.15	Block Model Validation	115



14.15.1	Visual Validation	115
14.15.2	Statistical Validation	115
14.15.3	Comparison with Alternative Interpolation Methods	115
14.15.4	Swath Plots	116
14.16	Reasonable Prospects of Economic Extraction	118
14.16.1	Open Pit Input Parameters	118
14.16.2	Open Pit Optimization Process	119
14.16.3	Underground Resources	120
14.16.4	Summary.....	120
14.17	Mineral Resource Statement	121
14.18	Factors that May Affect the Mineral Resource Estimate.....	123
14.19	Grade-Tonnage Sensitivity Report	123
14.20	Difference from Previous Resource Estimate	127
15	MINERAL RESERVE ESTIMATES	128
16	MINING METHODS.....	129
17	RECOVERY METHODS.....	130
18	PROJECT INFRASTRUCTURE	131
19	MARKET STUDIES AND CONTRACTS.....	132
20	ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT	134
20.1	Location, Climate and Terrain.....	134
20.2	Hydrology and Hydrogeology	134
20.3	Soil, Subsoil and Micro-Environment.....	135
20.4	Wildlife, Plant Life and Vegetation	135
20.5	Population and Demographics.....	136
20.6	Radiological Studies	136
20.7	Social and Community Impact	136
21	CAPITAL AND OPERATING COSTS	138
22	ECONOMIC ANALYSIS.....	139
23	ADJACENT PROPERTIES.....	140
24	OTHER RELEVANT DATA AND INFORMATION.....	142
25	INTERPRETATION AND CONCLUSIONS	143
25.1	Risks	144
25.2	Opportunities.....	145
26	RECOMMENDATIONS.....	146
27	REFERENCES.....	148

Figures

Figure 4-1:	Location plan of the AE3 and AE4 concession areas of GAFC	12
Figure 4-2:	AE3 and AE4 Exploration Permits and location of the DASA deposit	14
Figure 5-1:	Road N25, just north of Agadez.....	16
Figure 5-2:	GAFC's Dajj exploration camp	17
Figure 5-3:	Typical terrain at DASA Project area	18
Figure 6-1:	Processing cost breakdown	27
Figure 7-1:	Regional geology map	30
Figure 7-2:	Major structures in the Tim Mersoï Basin, shaping it in a succession of ridges and basins	31
Figure 7-3:	Stratigraphic column of the series and formations in the southern part of the Tim Mersoï Basin and including the DASA Project and Property	32
Figure 7-4:	Northwest-southeast profile in the Arlit area (see Section A-B in Figure 7-2)	33
Figure 7-5:	Stratigraphic column of the DASA Project area	36
Figure 7-6:	DASA structural map (Figure 7-7 section line in red).....	37
Figure 7-7:	DASA schematic geological section (see red section line on Figure 7-6)	38
Figure 7-8:	Cross-beds in coarse grained to micro-conglomeratic sandstone, Tchirezrine 1 Formation	40
Figure 7-9:	Massive analcimolite, Abinky Formation	41
Figure 7-10:	Tchirezrine 1 sandstone covered in the foreground by analcimolite of the Abinky Formation	41
Figure 7-11:	Cross-bed figures in the Tchirezrine 2 unit, northern outcrops at DASA	42
Figure 7-12:	North-south structures in sandstone, Tchirezrine 2 unit, eastern outcrops DASA	42
Figure 7-13:	Siltstone outcrop, Assaouas Formation, southern outcrops.....	43
Figure 7-14:	Irhazer Formation, limestone strata within argillite, crosscut by east-west transform faults, north-eastern outcrops	44
Figure 7-15:	Heavily quartz veined Tegama sandstone; mount inside the Assouza Graben	45
Figure 7-16:	Conjugate fracture veined in quartz in coarse cross-bed Tegama sandstone	45
Figure 7-17:	Looking southwest, Azouza Graben	46
Figure 7-18:	DASA Project uranium mineralization controlled by zones of formation of oxidation (Section 360000mE, looking west).....	48
Figure 9-1:	Radiometric sampling points at the DASA Project, AE3 Concession	54
Figure 10-1:	DASA drillholes location map	59
Figure 10-2:	DASA Project schematic drill section – geology (Section 360000mE, looking west – see Figure 10-1)	59
Figure 10-3:	DASA Project schematic drill section – uranium mineralization controlled by zones of formation of oxidation (Section 360000mE, looking west – see Figure 10-1)	60
Figure 10-4:	DASA Project schematic drill section – geology (Section 359000mE, looking west – see Figure 10-1)	60
Figure 10-5:	DASA Project schematic drill section – geology (Section 360900mE, looking west – see Figure 10-1)	61
Figure 10-6:	Diamond core photograph example	62
Figure 10-7:	GAFC data collection and handling system/CAE Mining FUSION	67
Figure 11-1:	Hole DADH390, RadYey (blue) vs Probe (red) depth before rescaling	72
Figure 11-2:	Hole DADH390, RadYey (blue) vs Probe (red) depth after rescaling	73
Figure 11-3:	Average bulk density determination from core samples	75
Figure 11-4:	Comparison of the original samples and duplicates for the DASA Project	77
Figure 11-5:	Duplicates correlation plot for U, ME-MS61r.....	79
Figure 11-6:	Duplicates correlation plots for U, ME-XRF05.....	79
Figure 11-7:	Duplicates correlation plots for U, ME-XRF10.....	80
Figure 11-8:	HARD plot for ME-MS61r.....	81
Figure 11-9:	HARD plot for ME-XRF05.....	81
Figure 11-10:	HARD plot for ME-XRF10.....	82
Figure 11-11:	Comparison of probed eU ₃ O ₈ vs assayed U ₃ O ₈	85
Figure 11-12:	Distribution of REF in assayed intervals.....	85
Figure 13-1:	Beneficiation scrubbing – performance graphs	89
Figure 13-2:	Individual sample uranium extraction	91

Figure 13-3:	Individual sample acid consumption.....	91
Figure 13-4:	Uranium extraction vs Time 138 micron	92
Figure 13-5:	Uranium extraction vs Time.....	92
Figure 13-6:	Two-stage leach flowsheet	93
Figure 13-7:	Uranium extraction vs Time 138 µm with PL	94
Figure 13-8:	Irrigation rates vs uranium extraction	95
Figure 13-9:	Resin loading vs Barren concentration	97
Figure 13-10:	Uranium concentration in barren vs time	97
Figure 14-1:	Log histogram for unrestricted uranium grades	101
Figure 14-2:	Log histogram for uranium grades within mineralized envelopes	101
Figure 14-3:	Lithological model and faults, Section 23 (359,900mE)	102
Figure 14-4:	Schematic example of interpretation of the DASA deposit – Section 360,000mE.....	104
Figure 14-5:	Oblique view of the wireframed uranium mineralized envelopes and fault planes for the DASA deposit (looking northwest)	105
Figure 14-6:	Strings along the deposit strike (plan view)	106
Figure 14-7:	Strings for the plunge of the bodies (section view looking northwest)	107
Figure 14-8:	Strings for the dip of the bodies (section view looking northeast).....	108
Figure 14-9:	Downhole absolute semi-variogram model for uranium	108
Figure 14-10:	Semi-variogram map (plan view)	109
Figure 14-11:	Relative semi-variogram models for uranium (three main directions).....	110
Figure 14-12:	Resource classification strategy, Section 360050mE.....	113
Figure 14-13:	Summary diagram of indicated and inferred blocks in relation to the optimized open pit (looking southeast).....	114
Figure 14-14:	Visual comparison of eU ₃ O ₈ grades in the model vs assays (Section 360,000 mE, looking west).....	115
Figure 14-15:	Swath plot for 50 m easting sections.....	116
Figure 14-16:	Swath plot for 50 m northing sections.....	117
Figure 14-17:	Swath plot for 20 m flitches.....	117
Figure 14-18:	Ultimate pit shell and mineralization wireframes (looking southeast)	120
Figure 14-19:	Distribution of open cut and underground mineral resources above the selected cut-offs (looking southeast)	122
Figure 14-20:	Grade-tonnage curve for DASA showing eU ₃ O ₈ grades – Indicated category	125
Figure 14-21:	Grade-tonnage curve for DASA showing eU ₃ O ₈ grades – Inferred category	125
Figure 14-22:	Grade-tonnage curve for DASA showing eU ₃ O ₈ metal – Indicated category	126
Figure 14-23:	Grade-tonnage curve for DASA showing eU ₃ O ₈ metal – Inferred category	126
Figure 19-1:	UxC U ₃ O ₈ spot and long-term prices.....	132
Figure 19-2:	UxC U ₃ O ₈ historical uranium prices.....	133
Figure 19-3:	Nymex U ₃ O ₈ uranium prices for 2017–2019	133

Tables

Table 1-1:	DASA Mineral Resources with an Effective Date of 1 June 2019.....	5
Table 1-2:	Next phase budget estimate.....	8
Table 4-1:	AE3 and AE4 Exploration Permits.....	15
Table 6-1:	Mineral Resource statement*, DASA Uranium Project, Republic of Niger (SRK Consulting (Canada) Inc., 20 September 2013).....	22
Table 6-2:	DASA Mineral Resources as at 1 January 2017 (CSA Global)	23
Table 6-3:	DASA Mineral Resources as at 1 June 2018 (CSA Global).....	23
Table 6-4:	2018 historical PEA summary – standalone underground operation.....	25
Table 6-5:	Operating costs – DASA PEA Standalone Scenario	27
Table 6-6:	NPV and internal rate of return (IRR) summary for the historical 2018 PEA at different uranium prices.....	28
Table 9-1:	PNC significant drillholes	52
Table 9-2:	First rock samples of DASA area	53
Table 10-1:	GAFC DASA Project drilling statistics.....	57



Table 10-2:	Select mineralized drill intervals from new DASA deposit zones	58
Table 10-3:	Gamma-ray probes parameters	63
Table 10-4:	Codes of geological formations	68
Table 10-5:	Codes of colour	68
Table 10-6:	Codes of sediments/rocks.....	69
Table 10-7:	Codes of alteration and mineralization	69
Table 11-1:	Depth rescaling and core new depth (from GAFC report, 2019)	74
Table 11-2:	Comparison of ordinary assays of CRM samples with passport parameters	76
Table 11-3:	Compilation of HARD % per assaying method (Christophe, 2019)	80
Table 11-4:	Parameters of the standards and blanks used	82
Table 13-1:	Column leach testwork results	94
Table 14-1:	Summary of supplied and used data.....	99
Table 14-2:	Classical statistics for uranium grades (weighted on length)	102
Table 14-3:	Number of interpreted wireframes at the DASA deposit.....	105
Table 14-4:	Semi-variogram characteristics	111
Table 14-5:	Block model characteristics	111
Table 14-6:	Interpolation parameters	112
Table 14-7:	Comparison of global block model grades by OK and IDW methods	116
Table 14-8:	Pit optimization parameters.....	118
Table 14-9:	Input parameters for underground mining.....	120
Table 14-10:	DASA Mineral Resources for open pit and underground mining with an Effective Date of 1 June 2019	121
Table 14-11:	DASA grade-tonnage report	123
Table 25-1:	DASA Mineral Resources with an Effective Date of 1 June 2019.....	143
Table 26-1:	Next phase budget estimate.....	147

Appendices

Appendix 1:	Certificate of Qualified Person
Appendix 2:	Abbreviations and Units of Measurement

1 Summary

1.1 Introduction

In May 2019, CSA Global Pty Ltd (CSA Global) was commissioned by Global Atomic Fuels Corporation (GAFC), a wholly owned subsidiary of Global Atomic Corporation (GAC) to update a Mineral Resource estimate (MRE) and to prepare a Technical Report for the DASA Uranium Project (DASA or “the Project”), located in the central part of the Republic of Niger, West Africa. The Report is reported in accordance with National Instrument 43-101 (NI 43-101 – 30 June 2011), companion policy NI 43-101CP, and Form 43-101F1 (Standards of Disclosure for Mineral Projects). The Mineral Resource update has been prepared in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves (10 May 2014). Only Mineral Resources are estimated – no Mineral Reserves are defined.

The DASA Project lies within the Adrar Emoles 3 Exploration Permit, which with the contiguous Adrar Emoles 4 Exploration Permit, are 100% owned by GAFC and form part of a larger package of properties in Niger in which GAFC has an interest.

The MRE update and NI 43-101 Technical Report were commissioned by GAFC to support the continued development of the Project and to update the resources to account for new chemical analyses from 36 drillholes completed in 2017–2018. The previous estimate was based on eU_3O_8 values for the 36 holes. These new data have provided additional data that has also enabled improvements to the structural and lithology model of the Project. This 2019 Mineral Resource is an update to the 2018 Mineral Resource (CSA Global, 2018a) that was the basis for a Preliminary Economic Assessment (PEA) reported in the previous NI 43-101 Technical Report filed on SEDAR on 4 December 2018 (CSA Global, 2018b).

The 2019 Mineral Resource update differs materially from the 2018 Mineral Resource and as such GAFC and CSA Global no longer consider the 2018 PEA current. Qualified Persons have not done sufficient work to update the 2018 PEA with results of the 2019 MRE; GAFC and CSA Global are not treating the 2018 as a current PEA. GAFC has commenced a Prefeasibility Study (PFS) on the DASA Project.

GAC, the parent company of GAFC, is listed on the Toronto Stock Exchange (TSX) and as such, this document will be published and available to third parties or the general public.

1.2 Property Description and Location

GAFC’s DASA Project exploration operations are located in the north central part of the Republic of Niger, West Africa, approximately 120 km north of the city of Agadez. The centre of the DASA Project is positioned at longitude 7.8° East and latitude 17.8° North.

1.3 Land Tenure

The DASA Project is located in the southwest of the Adrar Emoles 3 (AE3) Permit which has a total area of 121.2 km². Under NI 43-101 guidelines, the Adrar Emoles 4 (AE4) Permit, which is contiguous with the southern boundary of the AE3 Permit and has a total area of 122.4 km², is considered to be the same Property as it would reasonably share common infrastructure should a mineral deposit be developed on either concession.

The Exploration Permits for AE3 and AE4 were granted on 8 February 2008 for the first three-year period on perimeters defined to include approximately 488.7 km² and 492.5 km², respectively. On 16 November 2010, the Exploration Permits for the AE3 and AE4 Mining Agreements were extended by the Minister of Mines.

The first three-year renewals of the AE3 and AE4 Exploration Permits were received on 17 January 2013, concurrent with the required 50% reduction in area to approximately 243.7 km² and 246 km², respectively. The second renewal was granted on 29 January 2016, reducing the AE3 and AE4 areas to approximately 121.2 km² and 122.4 km², respectively. Both AE3 and AE4 Exploration Permits were extended on 17 December 2018 for an additional two years, extending from 17 January 2019 to 17 January 2021.

1.4 Existing Infrastructure

The Project area is accessible by an all-weather road connecting Agadez, Niger's second largest city, located 120 km south of the Project with the mining town of Arlit some 100 km north of the area of interest and the capital, Niamey some 1,000 km to the west.

There are two airports serving the general area: Agadez, Niger's second largest city has a major airport, Mano Dayak, with a paved 3,000 m runway and recently significantly upgraded infrastructure. It is connected to the airport in Niamey, some 720 km to the west, via charter flights or daily scheduled connections and at one time also handled international tourist flights from Europe.

1.5 History

Systematic uranium exploration in the area started in 1959 after the first uranium mineralization was noted during geological reconnaissance missions on surface in the Air Mountains in 1956 by CEA. In the late 1960s, Cogema completed wide spaced drilling spacing of several kilometres to test the stratigraphy of the area and to investigate how closely the geology resembled that of the Arlit area further north where uranium mineralization was already known since the mid 1960s.

The Japanese company, Power Reactor and Nuclear Fuel Development Corporation (PNC) took over the landholdings in 1981 and worked on them until 1990. PNC completed multiple drilling programs during this period, along with mapping and geophysics. This work resulted in several discoveries – none of which were deemed as economic.

In September 2007, the AE3 and AE4 blocks were granted to GAFC totalling about 1,000 km² located some 50 km southeast of Orano's proposed large Imouraren open pit. The AE3 block includes the Dajy prospect where uranium mineralization was known within a 10 km-long x 2 km-wide zone. Dajy is situated along a northwest-southeast trending major lineament, the Azouza fault along which the Azelik deposit (37 million pounds – MIb) is situated, owned by CNNC, a Chinese government agency.

A resource estimate by GEOEX was reported in accordance with NI 43-101 in 2009. This estimated 27.9 million tonnes (Mt) at a grade of 821 ppm eU₃O₈ (or 50.5 MIb eU₃O₈) was present within the Adrar Eroles concessions (Isakanan area and Dajy).

In 2011, GAFC announced new uranium discoveries at the AE3 concession, now known as DASA (**Dajy Area Surface Anomaly**).

In 2017–2018, GAFC commenced a new drilling program targeting various parts of the deposit. Thirty-six holes from this program (completed in the first half of 2018) and additional 22 holes drilled by the end of 2018 have been included in this resource update targeting the southern flank zone of the graben which previously had ambiguous interpretation. This additional drilling has allowed more confident interpretation in this area of the deposit and an upgrading of its classification.

1.6 Geology and Mineralization

The rocks present within the GAFC property range in age from Cambrian to lower Cretaceous age. They are mostly clastic sediments (sandstone, siltstone and shale) with some minor carbonates. They originated from the Air Massif which has been continuously eroded since at least the Mesozoic. The sediments were laid down in a continental setting and are generally the result of fluvial and deltaic deposition. In this environment, large shallow rivers meander across flat topography and create complex flow patterns where the coarse-grained sands and gravel are concentrated in the channels with the highest flow energies, while low energy flow regimes on the floodplains and tidal areas create silt and mudstone-type sediments.

Carboniferous sedimentary formations are the major host rocks for uranium mineralization, particularly in the northern part of the basin.

Uranium mineralization in Niger is located exclusively in sediments of the Tim Mersoï Basin and occurs in almost every important sandstone formation, however not always in economic concentrations and tonnage.

The uranium in many of the deposits of the Tim Mersoï Basin is generally oxidized. Among the primary tetravalent minerals, coffinite is dominant and accompanied by pitchblende and silico titanates of uranium. Uranium hexavalent minerals such as uranophane and meta-tyuyamunite are present in the Imouraren and TGT-Geleli deposits.

1.7 Exploration Status

In September 2007, the government of the Republic of Niger granted GAFC the AE3 and AE4 permits. Ongoing exploration work and metallurgical studies have confirmed that most of the significant uranium mineralization is located around the DASA area within the AE3 permit. Other uranium occurrences also exist within the AE3 and AE4 permits.

GAFC has undertaken exploration activities on the DASA Project since 2010. The DASA Project area covers an area measuring approximately 10 km along the strike of the Azouza graben by about 2 km. However, drilling has only focused on a small portion of this area.

GAFC has undertaken multiple phases of exploration and evaluation programs. These programs have included:

- Exploration and resource evaluation drill programs
- Mapping
- Geophysical investigations
- Downhole geophysical logging
- Geotechnical analysis of drill core
- Metallurgical sampling and analysis
- Hydrological studies
- Baseline environmental work.

However, the main focus of this Report is on the diamond drilling program commenced in January 2017 through to June 2018 and the impact it has had on the MREs.

In 2011, drilling efforts were realigned to achieve two goals: expand mineral resource, particularly the deeper higher-grade uranium mineralization, and to understand the geological controls on the distribution of the uranium mineralization.



In June 2012, the Dajy exploration camp was opened, enabling easier access to the entire concession area and drilling sites.

The recent 2017–2018, 58-hole drill program has successfully delineated higher-grade mineralization within 300 m of the surface. The drilling was focused in areas of faulting associated with a graben structure – known as the Flank Zone and has improved the understanding of the distribution of mineralization within the deposit and confidence in the geological model. This has resulted in an improved classification of resources in the Flank Zone from Inferred to Indicated, and also the development of a lithological and structural model of the deposit to support the mineralization model.

1.8 Mineral Resources

The DASA Project Mineral Resources were first estimated and reported by CSA Global in April 2017, and then updated in June 2018 and again in June 2019 (as reported in Section 14 of this Report). The Mineral Resources were estimated by Ordinary Kriging (OK) using a geological model and a 100 ppm eU_3O_8 edge grade on the mineralized envelope. All mineralized intervals were flagged and composited to 0.5 m and estimated into 10 m x 10 m x 4 m blocks approximating half the drill density in the central parts of the deposit. The estimate has been completed by CSA Global's Principal Resource Geologist, Dmitry Pertel (MAIG) who is the Qualified Person for this Report.

The updated Mineral Resource has considered information from all main phases of exploration and evaluation and the results of quality assurance/quality control (QAQC) analysis to develop this updated Mineral Resource.

Dmitry Pertel, Principal Geologist for CSA Global, visited the DASA Project area in March–April 2017 at the request of GAFC. The purpose of the visit was to examine resource definition drilling practices used at DASA, collect QAQC data, and to inspect the sample preparation laboratory in Niamey.

Review and analysis of both the historical and recent QAQC data, procedures and protocols indicate that the quality of data is acceptable to allow Mineral Resources to be reported in accordance with the CIM guidelines. The risk associated with the quality of the data is believed to be low.

The most recent exploration programs at the deposit were run by the GAFC exploration team. GAFC provided CSA Global with all exploration results completed to date and an updated project database. The databases included drillhole collar coordinates, lithological codes and analytical information for uranium. Most uranium grades used for estimating resources were calculated from the gamma-logging results (eU_3O_8 values). In addition to the downhole logging results, mineralized intersections from the drill core were sampled and sent for analysis by fused disc x-ray fluorescence (XRF) at SGS Lakefield in Canada. There were minor areas where downhole logging was not completed and, in these areas, the XRF analyses were used. The topographic surface was provided in form of a digital terrain model (DTM) based on light detection and ranging (LiDAR) data.

Geological interpretation and wireframing were updated and completed by CSA Global. It included interpretation of the main mineralized bodies based on a nominal cut-off grade of 100 ppm U_3O_8 . The interpretation was based on the current understanding of the deposit geology and a full lithological model of the deposit, which included wireframe models for all main lithological units as well as the major recognized faults within the Project. Closed wireframe models were generated for each modelled mineralized body.

The OK method was chosen to interpolate uranium grades into a block model. A dry bulk density value of 2.36 tonnes per cubic metre (t/m^3) was calculated following exploration programs and directly assigned to the model.

The Mineral Resources have been classified and reported in accordance with the CIM guidelines. Mineral Resource classification is based on confidence in the adopted sampling methods, geological interpretation, drillhole spacing and geostatistical measures.

Mineral Resources were reported in two parts; those that have potential for extraction by open cut mining methods, and the deeper higher-grade material outside of the open pit that may be amenable to underground mining. The open pit Mineral Resources are the parts of the deposit above a cut-off of 320 ppm eU₃O₈ that fall within a conceptual optimized pit shell. Higher-grade material above a cut-off grade of 1,200 ppm outside of the optimized pit shell was considered for underground mining.

The Mineral Resource statement is shown in Table 1-1.

Table 1-1: DASA Mineral Resources with an Effective Date of 1 June 2019

Category	Tonnes (Mt)	eU ₃ O ₈ (ppm)	Contained eU ₃ O ₈ (Mlb)
Indicated open pit	25.59	1,711	96.5
Indicated underground	0.71	3,250	5.1
Total Indicated	26.30	1,752	101.6
Inferred open pit	18.93	1,357	56.6
Inferred underground	3.38	4,151	31.0
Total Inferred	22.31	1,781	87.6

Notes:

- Mineral Resources are classified according to the CIM Definition Standards for Mineral Resources and Mineral Reserves (10 May 2014).
- The MRE was prepared by Dmitry Pertel, MAIG, (CSA Global).
- The Effective Date of the MRE is 1 June 2019.
- Mineral Resources for open pit mining are estimated within the limits of ultimate pit shell.
- Mineral Resources for underground mining are estimated outside the limits of ultimate pit shell.
- A cut-off grade of 320 ppm eU₃O₈ has been applied for open pit resources.
- A cut-off grade of 1,200 ppm eU₃O₈ has been applied for underground resources.
- A bulk density of 2.36 t/m³ has been applied for all model cells.
- Rows and columns may not add up exactly due to rounding.
- No Measured Resources or Mineral Reserves of any category were identified.
- Mineral Resources are not Mineral Reserves and by definition do not demonstrate economic viability. This MRE includes Inferred Mineral Resources that are normally considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves.

The current 2019 MRE differs in several key areas compared to the previous MREs. The current Mineral Resources were interpreted within a more robust geological and structural model reflecting information collected from the recent drilling programs. All mineralized envelopes were interpreted and controlled by the developed lithological model of the deposit and clipped to the interpreted and modelled known fault planes. Additionally, significant additional XRF chemical analyses (4,983 analyses) were completed on the mineralized intercepts to refine the reliability of the gamma logging results. This process has provided greater confidence in both the eU₃O₈ results and the geological confidence, which has enabled a higher classification in several areas of deposit, especially those within the Flank Zone.

1.9 Interpretation and Conclusions

CSA Global has updated modelling methodology and the MRE for the Project in the Indicated and Inferred categories.

The author/Qualified Person and CSA Global conclude the following:

- The data and work completed to date is of a high standard, allowing the estimation of a reliable Mineral Resource for the Project.
- The current MRE is a reliable estimate of the uranium deposits intersected to date at DASA, based on the full lithological model of the deposit.
- The Mineral Resource model classified as Indicated is sufficiently reliable to support engineering and design studies to evaluate the economic viability of a mining project.
- Infill drilling in critical areas would significantly reduce any potential risk in future Mineral Resource updates and further economic assessment of the Project, particularly at the deeper parts of the deposit that may be amenable to underground mining.
- GAFC should consider progressing additional exploration to expand resources at DASA, along strike in the Flank Zone and at depth within the graben.
- Initial conceptual optimization analysis for the purpose of determining reasonable prospects for economic extraction indicates that parts of the Mineral Resource could potentially be extracted economically using open cut methods, and the remaining areas could be mined by underground method. The Project should progress towards a higher level of engineering studies, initially at the PFS level.

1.9.1 Risks

A review of the Project risks identified the following:

- Environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant issues could potentially affect this MRE; however, the author is not aware of any such factors as of the Effective Date.
- Technical factors which may affect the MREs include:
 - Potential future conceptual study assessments of mining, processing and other factors.
 - eU_3O_8 price and valuation assumptions.
 - Changes to the assumptions used to estimate eU_3O_8 content (e.g. bulk density estimation, grade model methodology).
 - The Radioactive Equilibrium Factor was defined based on comparison of chemical assays with gamma logging. There is no investigation of radon degassing factor which may influence the gamma activity to some extent. The effect of this issue on the entire project is not likely to be material to the Project but may have local effects. The available number of chemical assays for uranium grades supports the reliable calculation of uranium equivalent grades, that were the basis of the modelled grades, as well as the estimation of the uranium equilibrium factor, which is believed to be close to 1.0. Comparison of gamma logging with radium assays in closed cans as well as radium assays in closed cans with uranium assays could assist to define reliably the radiological factors.
 - Geological interpretation (revision of lithologic contacts, mineralization domains, modelling of internal waste domains, etc.).
 - Changes to design parameter assumptions that pertain to the resource constraining conceptual pit shell.
 - Changes to geotechnical and mining assumptions, including the maximum pit slope angle; or the identification of alternative mining methods.
 - Changes to process recovery estimates if the metallurgical recovery in certain domains is less or greater than currently assumed.

- Infill drilling in critical areas would significantly reduce geological risk in the resource estimation and allow increased classification of the Mineral Resources.
- Permitting: Prior to any mining occurring, GAFC will require an exploitation licence; should granting of this licence be delayed or not forthcoming for any reason, it would negatively impact the timely development of the Project. The AE3 and AE4 Exploration Permits granted to GAFC have each been renewed two times. The most recent renewal occurred in 2016, resulting in areas of 121.2 km² and 122.4 km² from the initial areas granted in 2007 of 488.7 km² and 492.5 km², respectively. Both AE3 and AE4 Exploration Permits were extended on 17 December 2018 for an additional two years, extending to 17 January 2021. GAFC intends to submit an application for a Mining Permit before that date. To meet permitting requirements, GAFC is targeting to deliver a PFS and Environmental Impact Study in 2020. GAFC expects the overall permitting process to take four to six months, consistent with the timeline of other uranium projects recently permitted in Niger.
- Environmental and social: Baseline studies have been commenced by GAFC to support permitting of the Project. The DASA deposit is located in a very arid and remote region, sufficient water access to water must be ensured.

1.9.2 Opportunities

Mineral Resource: The 2019 Mineral Resource model documented herein is sufficiently reliable to support engineering and design studies to evaluate the viability of a mining project at a preliminary economic analysis level and for the Indicated Resources, a higher study such as at prefeasibility level.

It is expected that significant parts of the deposit could potentially be mined using open pit mining techniques. However, some areas of the deposit could also be mined using underground methods, and some areas could also be considered for in-situ uranium leaching. However, this has not been assessed in this Report.

Results of the metallurgical testwork show the mineralogy and metallurgy of the DASA mineralization is readily amenable to acid leaching with conventional uranium recovery – similar to the Orano operation at Arlit, Niger.

Environmental and social: Baseline studies have been commenced by GAFC to support permitting of the Project. The DASA deposit is located in a very arid desert area with limited flora and fauna and with very limited population. These conditions may be favourable for mine development.

1.10 Recommendations

The author/Qualified Person and CSA Global recommend the following be completed to support ongoing exploration and a PFS:

- Current QAQC procedures should be maintained to ensure high-quality data is available for subsequent MREs.
- Further exploration and evaluation programs could upgrade the confidence of the extent and quality of mineralization at the deeper parts of the DASA deposit (inside the graben). Additional infill drilling (if successful) would allow an increase in resource classification.
- Conduct extension drilling targeting the main Flank Zone fault along strike.
- Consider logging the drillholes using a PFN tool to assist in mapping any disequilibrium within the deposit.
- Collect and analyse for radium using closed cans and uranium by XRF. Comparison of radium and uranium assays in this context allows the reliable assessment of the radium equilibrium factor.



- Review deeper parts of the Project for exploitation by *in situ* recovery.
- Complete an integrated assessment of the geometallurgy of the deposit to better define Mineral Resource domains and for improved metallurgical recovery should the Project proceed to mining.
- Additional metallurgical tests are recommended to assess the recovery of uranium of the deeper mineralization within the graben structure and the new high-grade Flank Zone and to optimize the processing route.
- More detailed assessment of the impacts of hydrology and hydrogeology for mining both open cut and underground.
- A geotechnical study to better understand the rock mechanics of the various lithologies within the deposit to support mine design (and mining).
- Commence more detailed environmental studies to support more detailed feasibility studies at the Project.

GAFC and CSA have discussed the above work program and GAFC intends to initiate recommended work by October 2019 with supervision and direction from CSA technical staff on site in Niger. The recommended infill drilling has not presently been finalized or budgeted for by GAFC.

A proposed budget for the work above is provided in Table 1-2 below.

Table 1-2: Next phase budget estimate

Work program	Approximate cost (CAD\$)
General, vehicles, camp	\$400,000
Metallurgical testwork and analysis	\$500,000
Geometallurgy modelling	\$100,000
Hydrological and hydrogeological work	\$600,000
Geotechnical work	\$800,000
Environmental impact assessment	\$500,000
Engineering studies (PFS, PEA)	\$800,000
Discretionary Expansion (and infill) Drilling	\$2,000,000
Total	\$5,700,000



2 Introduction

2.1 Issuer

Global Atomic Corporation (GAC) is a Toronto Stock Exchange (TSX) listed mineral exploration and development company based in Toronto, Ontario, Canada. Its wholly owned subsidiary, Global Atomic Fuels Corporation (GAFC) was founded in 2005. GAFC has been successfully investigating the uranium potential of six permits currently covering approximately 750 km² in the Agadez region of central Niger.

GAFC's mineral assets in Niger occur in two project areas; Adrar Emoles and Tin Negouran. Uranium mineralization has been identified on each of the permit areas, with the most significant discovery being the DASA deposit ("DASA Project" or "the Project") situated on the Adrar Emoles 3 concession, discovered in 2010 by GAFC geologists through grassroots field exploration. Exploration and evaluation programs completed to date are sufficient to estimate Mineral Resources and the DASA Project was the subject of a now historical Preliminary Economic Assessment (PEA) reported in 2018. Other tenement areas have also been explored and have demonstrated potential for uranium mineralization which may result in additional Mineral Resources for the Project with additional work.

CSA Global Pty Ltd (CSA Global) is a geological, mining and management consulting company with more than 30 years' experience in the international mining industry. Headquartered in Perth, Western Australia, the company has 10 offices located in Australia, Canada, the United Kingdom, South Africa, Indonesia, Singapore and Dubai. CSA Global services cover all aspects of the mining industry from project generation to exploration, evaluation, development, operations and corporate advice. CSA Global has undertaken the geological assessment and resource estimation for the DASA Project, including the site inspection.

2.2 Terms of Reference

GAFC engaged CSA Global to prepare this Independent Technical Report on the DASA Project. This Technical Report is based on the outcomes of the exploration programs completed by GAFC at the Project up to and including 1 June 2019 (the "Effective Date"). The Report is based on information known to the author and CSA Global at that date.

The primary purpose of this document ("the Report") is to report the updated estimate of the Mineral Resources of the DASA Project.

The Report is specific to the standards dictated by National Instrument 43-101 (NI 43-101) (30 June 2011), companion policy NI 43-101CP, and Form 43-101F1 (Standards of Disclosure for Mineral Projects). The Mineral Resource update has been prepared in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves (10 May 2014) and reported as per NI 43-101 requirements. Only Mineral Resources are estimated – no Mineral Reserves are defined.

CSA Global acted independently as GAFC's consultant and was paid fees based on standard hourly rates for the services provided. The fee was commensurate with the work completed and was not contingent on the outcome of the work. Neither CSA Global, nor any of its staff rendering the services in connection with this Report, had any material, financial or pecuniary interest in GAC or its subsidiaries, or in the Project.



2.3 Qualified Person Property Inspection

The CSA Global Qualified Person, Dmitry Pertel has undertaken a site visit to the DASA exploration camp and the deposit between 25 March and 6 April 2017, spending five days at the deposit site and the exploration camp, and also several days in the office in Niamey. The Qualified Person inspected core logging and storage facilities, quality assurance/quality control (QAQC) protocols and procedures, local geology of the deposit, reviewed sample preparation techniques and visited the laboratory in Niamey.

The author considers his 2017 site visit to be current under Section 6.2 of NI 43-101. Another visit was not warranted as the same procedures were in place and there was no material changes or new areas under investigation.

2.4 Sources of Information

This Report partly relies on information provided by GAFC and others, including documents, data and reports compiled by GAFC management, consultants, contractors and their own technical staff. CSA Global was supplied the results of previous work completed by GAFC during the course of exploration and evaluation of the Project, which included geological reports, the results of drilling in a digital database including both probe results and chemical assays, geophysical surveys (surface and downhole) and the results of previous Mineral Resource estimates (MREs).

The primary data set used to inform the Mineral Resource is the digital drillhole database provided by GAFC at commencement of our engagement. The author has reviewed the data, completed relevant QAQC checks and is satisfied the data is adequate for estimation of Mineral Resources.

The author has taken reasonable steps to verify the information provided where possible.



3 Reliance on Other Experts

With respect to Section 4.2 of this Report, the author has relied on ownership information provided by GAFC. The information was provided to CSA Global via email. To the extent possible, the author and CSA Global have reviewed the reliability of the data but have not researched property title or mineral rights for the Project and express no opinion as to the ownership status of the Property.

4 Property Description and Location

4.1 Location of Property

GAFC's exploration operations are located in the north central part of the Republic of Niger (Figure 4-1), West Africa, and approximately 100 km north of the city of Agadez. The country is bordered by Algeria and Libya to the north, Chad to the east, Nigeria and Benin to the south, and Burkina Faso and Mali to the west.

The DASA Project is located in the southwest of the Adrar Emoles 3 (AE3) Permit which itself has a current total area of 121.2 km². The centre of the DASA Project is positioned at longitude 7.8° East and latitude 17.8° North. Under NI 43-101 guidelines, the Adrar Emoles 4 (AE4) Permit, which is contiguous with the southern boundary of the AE3 Permit and has a total area of 122.4 km², is considered to be the same Property as it would reasonably share common infrastructure should a mineral deposit be developed on either concession (Figure 4-2, Table 4-1).

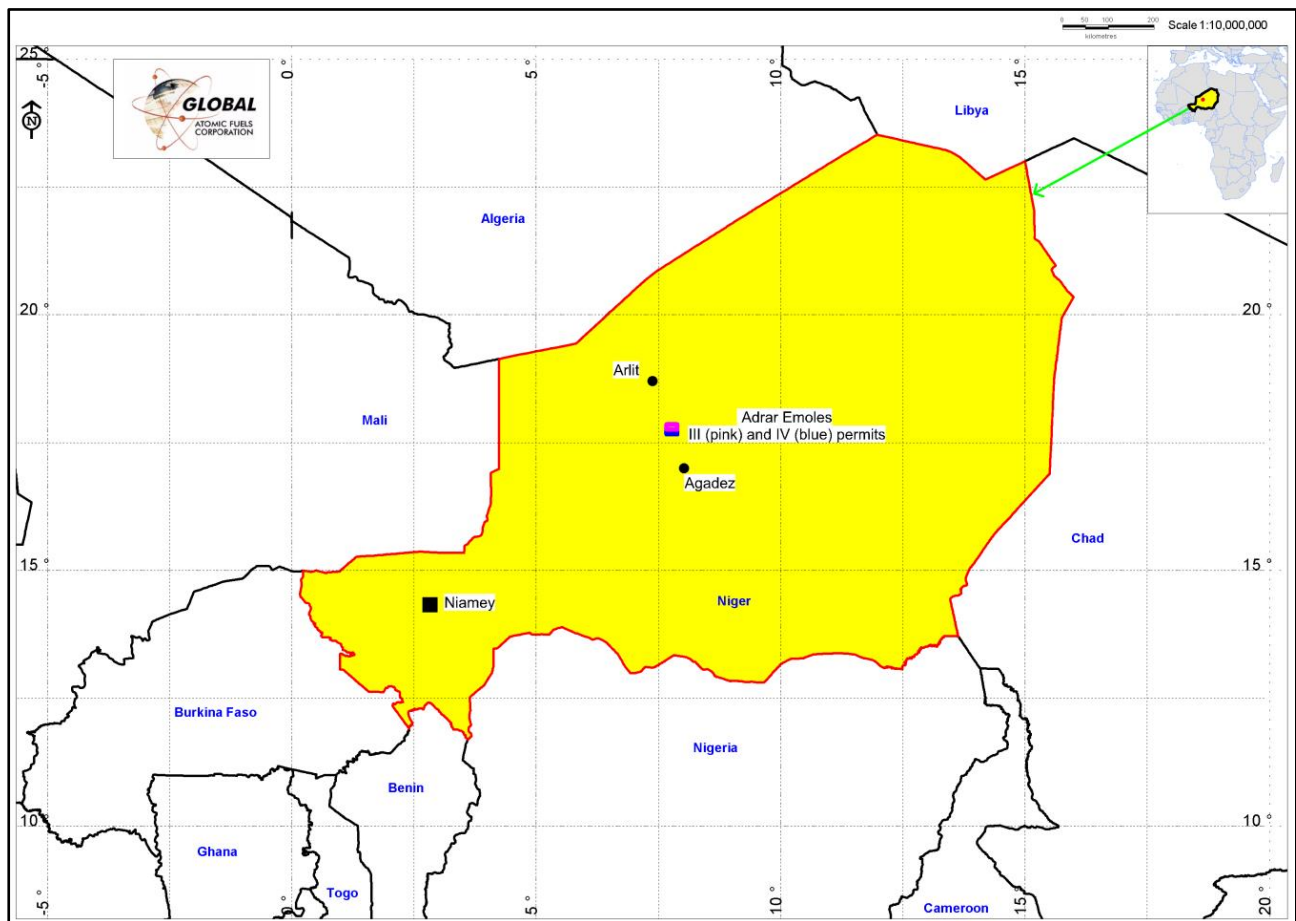


Figure 4-1: Location plan of the AE3 and AE4 concession areas of GAFC
Source: Global Atomic GIS

4.2 Mineral Tenure

Exploration Permits and Mining Permits are granted within the provisions of a Mining Agreement that is negotiated between the Ministry of Mines and the applicant. Such an agreement covers a period of up to 20 years, being the exploration period (three years plus two three-year renewals) and the first 10-year validity period of a Mining Permit. The Mining Agreement is then renegotiated at each renewal of a Mining Permit. The Mining Agreement can only be amended upon the mutual consent of both parties. The agreement must be approved by a Decree of the Council of Ministers and is then signed by the parties and stipulates rights and obligations of the parties during the validity period.

GAFC entered into and holds a 100% interest in two Mining Agreements named AE3 and AE4 on 25 September 2007 (Figure 4-2). Each Agreement initially covered an area of approximately 500 km².

The Exploration Permits for AE3 and A4 were granted on 8 February 2008 for the first three-year period on perimeters defined to include approximately 488.7 km² and 492.5 km², respectively. On 16 November 2010, the Exploration Permits for the AE3 and AE4 Mining Agreements were extended by the Minister of Mines. The first three-year renewal of the AE3 and AE4 Exploration Permits were received on 17 January 2013, concurrent with the required 50% reduction in area to approximately 243.7 km² and 246 km², respectively. The second renewal was granted on 29 January 2016, reducing the AE3 and AE4 areas to approximately 121.2 km² and 122.4 km², respectively.

Both the AE3 and AE4 Exploration Permits were extended on 17 December 2018 for an additional two years, extending from 17 January 2019 to 17 January 2021.

Upon completion of a feasibility study, the holder of a Mining Agreement may apply for a Mining Permit. A separate Niger mining company must be established to hold each Mine Permit. The Republic of Niger is granted a 10% carried interest in the share capital of the Niger mining company at the time of its formation and is entitled to its share of dividends that may arise.

The cumulative expenditures incurred to the date of formation of the Niger mining company and granting of the Mining Permit are calculated and GAFC must negotiate with the Republic of Niger the amount that is to be reimbursed to GAFC by the Niger mining company and the mechanisms for such reimbursement.

On the establishment of the Niger mining company, the Republic of Niger has the option to subscribe to an additional 30% in the share capital of the Niger mining company. If the Republic of Niger fails to exercise the option at that time, then it permanently loses the option.

If the Republic of Niger exercises some or all its option to the additional 30%, the Republic of Niger is obligated to contribute its proportionate share of cash, financial commitments, capital contributions, shareholder advances, bank and other loans for the duration of the Niger mining company.

A large-scale Mine Permit is valid for 10 years and may be renewed for five additional five-year periods. At the time of renewal of a Mine Permit, the Mine Agreement is also renegotiated.

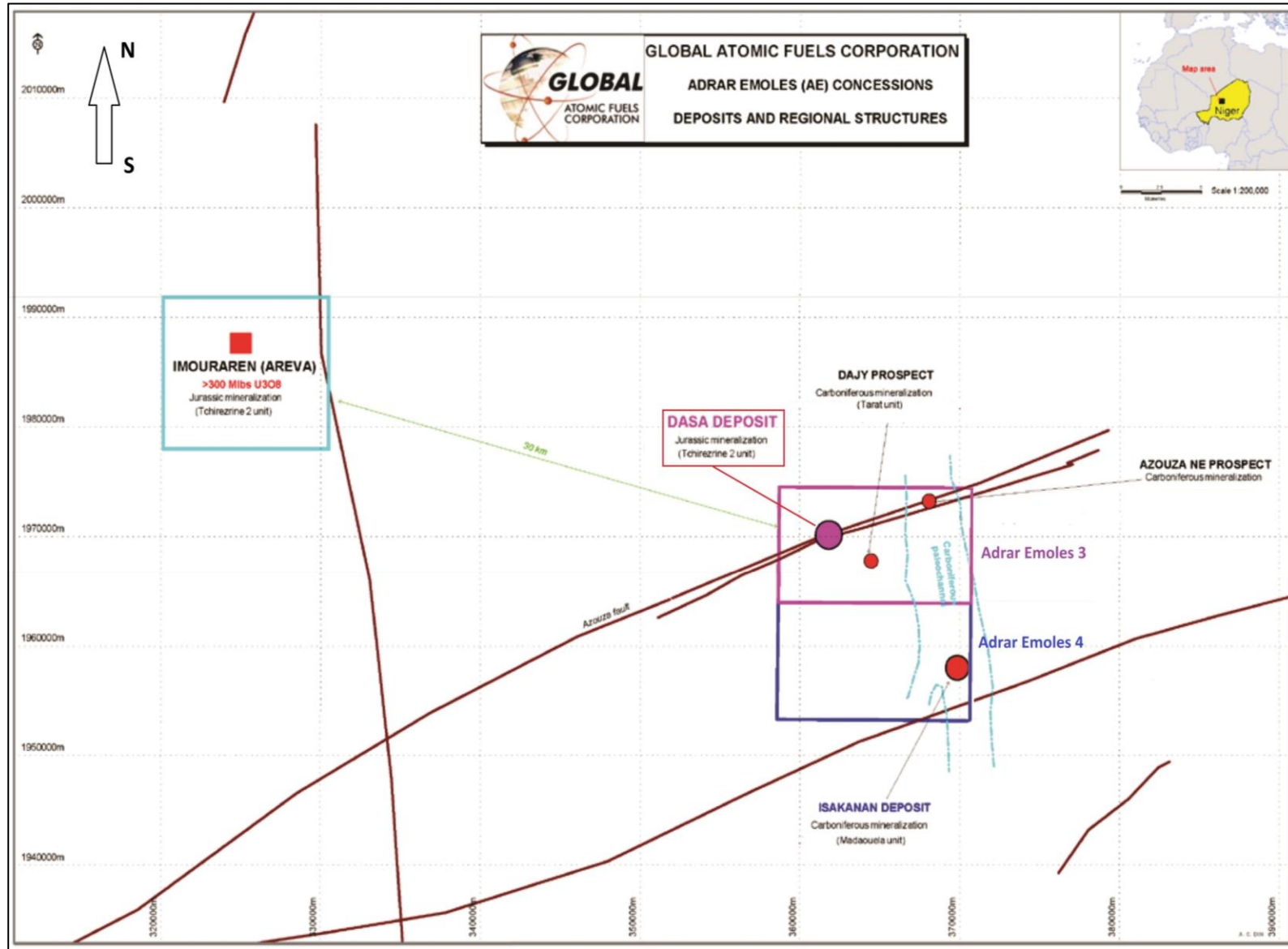


Figure 4-2: AE3 and AE4 Exploration Permits and location of the DASA deposit
 Source: GAFC

The area and geographic coordinates for the AE3 and the adjacent AE4 permits are summarized in Table 4-1.

Table 4-1: AE3 and AE4 Exploration Permits

Adrar Emoles 3			Adrar Emoles 4		
Tenement type: Exploration Company: GAFC Date granted: 17/12/2018 Valid: 2 years (third period) to 17/01/2021 Area: 121.2 km²			Tenement type: Exploration Company: GAFC Date granted: 17/12/2018 Valid: 2 years (third period) to 17/01/2021 Area: 122.4 km²		
Point	Longitude east	Latitude north	Point	Longitude east	Latitude north
A	7°40'00"	17°51'14"	A	7°40'00"	17°45'30"
B	7°46'28"	17°51'14"	B	7°46'28"	17°45'30"
C	7°46'28"	17°45'30"	C	7°46'28"	17°39'43"
D	7°40'00"	17°45'30"	D	7°40'00"	17°39'43"

The Project is not subject to any royalties or claw-back provisions. The current tenure provisions are adequate to conduct exploration and evaluation activities required to evaluate the Project. At the time of writing, the author is not aware of any environmental liabilities on the Project or any other factors that would affect access or the rights to work on the Project.

4.3 Other Significant Factors and Risks

Environmental, permitting, legal, title, taxation, socio-economic, marketing, and political or other relevant issues could potentially materially affect access, title or the right or ability to perform work on the Property. However, as of the Effective Date of this Report, the author and Qualified Person is unaware of any such potential issues affecting the Property.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Accessibility

The Project area is accessible by an all-weather road (N25) approximately 120 km north from Agadez, Niger’s second largest city and the final 10 km by unsealed sand piste (track) east from highway N25. The mining town of Arlit is some 100 km north of the Project and Niamey (the capital of Niger) is some 775 km to the southwest. The main sealed road N25 (Figure 5-1) is also known as the Routed d’Uranium as it is on this road that all the yellow cake from the two Orano uranium mines near Arlit is transported by truck to the port of Cotonou in Benin, West Africa.

The road continues north from Arlit as a sand piste to the Algerian border and from there as a bitumen road via Tamanrasset, all the way to Algiers and the Mediterranean coast.



Figure 5-1: Road N25, just north of Agadez
Source: GAFC

The GAFC exploration “Dajy” camp (Figure 5-2), is located some 120 km north of Agadez and 10 km straight east of the N25 highway, easily accessible via a sand piste. Its coordinates are 17°47’54” north and 7°43’33” east.

With a few exceptions of rough, rocky terrain the whole Project area is easily traversed by all-terrain vehicles or 4WD cars.



Figure 5-2: GAFC's Dajj exploration camp
Source: Pertel (2017)

There are two airports serving the general area: Agadez has a major airport, Mano Dayak, with a paved 3,000 m runway and recently significantly upgraded infrastructure. It is connected to the airport in Niamey some 720 km to the west, via charter flights or daily scheduled connections and at one time also handled international tourist flights from Europe.

Arlit also has an airport with a much shorter unpaved runway; however, nearly all flights operating from here are charters for Orano's mining operations.

5.2 Climate

The region is characterized by an arid intermediate climate of the Sahelian desert type with two distinct main seasons: the dry season between October and May and the wet season from June to September.

The temperatures can vary between 0°C at night in January and more than 55°C in May or June during the day.

The mean annual precipitation is less than 200 mm and up to 90% of it occurs during the wet season. The rainy season provides sufficient precipitation to allow local basic agricultural activities. Flash floods are frequent inside alluvial dry riverbeds originating in the Aïr Mountains and can quickly turn into torrential streams, making local roads temporarily impassable. Much of the sparse vegetation grows around the riverbeds.

Year-round exploration activities at the Project are possible; however, off-road accessibility within the Project area may be hampered at times during the rainy season. Mine operations in the region operate year-round with supporting infrastructure. CSA Global believes that the climate of the Project area presents no risk to the development of the Project.

5.3 Physiography

The exploration permits are located between the western foreland of the Aïr Mountains and the N25 highway connecting Agadez to Arlit on the eastern edge of the Tim Mersoï Basin. The terrain is generally flat (Figure 5-3), monotonous sandy peneplain with an average elevation of some 500 m above sea level (ASL) with elevations decreasing to the west. The highest elevation is in the Azouza hills, 553 m ASL, whereas the Aïr Mountains located some 30 km to the east may reach over 1,800 m ASL.



Figure 5-3: Typical terrain at DASA Project area
Source: Pertel (2017)

5.4 Local Resources and Infrastructure

The Project is located in the Department of Agadez which comprises 52% of the surface area of Niger but has only 322,000 inhabitants with a population density of 0.2/km².

The DASA Project area is traversed by a 132 kV powerline connecting the Sonichar power plant – located some 40 km south of the Project near the small city of Tchirezrine – with the two uranium mines near Arlit 120 km to the north. The power plant runs two 16 MW generators and is fed by coal which was discovered during the uranium exploration phase in the early 1970s.

Sonichar also supplies electricity to the city of Agadez and has considerable excess capacity for any industrial development in the area.

There are no permanent surface water sources available, but several underground aquifers exist at depths between 300 m and 500 m.

A large pool of mostly unskilled labour is available on short notice within the immediate Project area or from Agadez and Arlit. The Orano (ex Cogema) uranium operations have trained a local labour force over the years and able workers can be expected to be available. This includes technical personnel from supervisory levels upwards.

The labour code and the organization of labour are very much based upon the French system.

Mining equipment and most supplies need to be imported from outside Niger. Warehousing facilities exist to some extent in Agadez or Arlit.



Niger has a long history of resource extraction, and mining and exploration services are available on a local level reaching from drilling companies to environmental consultants and support services.

At this time, it appears that GAFC holds sufficient exploration permits necessary for the proposed exploration activities and potential future mining operations (including potential tailings storage areas, potential waste disposal areas, and potential processing plant sites) should a mineable mineral deposit be discovered at the Project.

6 History

6.1 Introduction

Uranium exploration commenced in Niger in the early 1950s following up on indications from spotty surface mineralization. The exploration for uranium has occurred over time in three phases dictated by the economics of the mineral at various times.

The following section is based on information sourced from the following reports:

- Périmètre In Adrar (Cogema, 1977a)
- Rapport des activités de la campagne de prospection d'uranium (Association Onarem PNC, 1983)
- Projet Sekiret, Programme des Travaux de la 3eme Campagne 1983-1984 (Association Onarem PNC, 1984)
- Projet Sekiret, Programme des Travaux de la 4eme Campagne 1984-1985 (Association Onarem PNC, 1985)
- Projet Sekiret, Programme des Travaux de la 5eme Campagne 1985-1986 (Association Onarem PNC, 1986).

6.2 Regional Exploration by the French Nuclear Energy Commission (1957 to 1981)

Systematic regional uranium exploration in the area started in 1959 after the first uranium mineralization was noted during geological reconnaissance missions in the Aïr Mountains in 1956 (J.R. Leconte mission) and in 1957–1958 near Azelik just west of the DASA Project area during an exploration program for copper in the Teguida n'Adrar- Assaouas region.

The French Nuclear Energy Commission (Commissariat à l'Énergie Atomique – CEA) was responsible for all the work. From 1957 to 1967, an intensive geological exploration program was implemented, which resulted in the discovery of the uranium deposits of Azelik (1960), Madaouela (1964), and finally Arlit-Akouta (1966–1967).

Airborne radiometric and magnetic surveys located a large number of surface anomalies which were quickly followed up on the ground. The CEA later merged into Cogema which became AREVA and is now called Orano.

In the late 1960s, Cogema completed wide-spaced drilling (several kilometres apart) to test the stratigraphy of the area and to investigate how closely the geology resembled that of the Arlit area further north where uranium mineralization had been known since the mid 1960s.

In addition to the drilling, other exploration techniques such as geological mapping, rock and water well sampling, ground radiometric surveys and airborne surveys such as magnetic, electromagnetic and radiometric were employed.

A 250 m-line spaced airborne radiometric survey delineated a large number of anomalies which were confirmed on the ground and consequently drilled. Much of this drilling was rotary, “wild cat” spaced at several kilometres and stratigraphic in nature. The spacing was reduced to 800 m and 400 m in more encouraging areas. Core drilling was used to confirm the geology and lithology as needed.

The first holes were completed in 1960 and continued until 1972 within the “In Adrar” concession including the Dajy area of current AE3 concession (Figure 4-2). A total of 652 holes were completed all over the concession, of which 12 were in the closer ranges of Dajy. No holes were drilled within the actual DASA area.

The drilling confirmed that the area was underlain by stratigraphy that closely resembled that of the Arlit region.

All holes were probed by radiometric and electric methods using Cogema's own logging systems.

Significant radiometric anomalies were discovered within the AE3 Exploration Permit in strata younger than the Upper Jurassic Orano's world class Imouraren uranium deposit, located only some 40 km northwest of the AE3 Exploration Permit and the DASA deposit.

6.3 Regional Exploration by PNC and ONAREM (1981 to 1990)

In 1981, Cogema dropped major parts of their landholdings due to the suppressed uranium market at that time. A joint venture between Power Reactor and Nuclear Fuel Development Corporation (PNC) based in Japan and ONAREM (Niger National Geological Survey) acquired a large exploration permit called Sekiret which covered an area of some 4,200 km², including the current AE3 and AE4 concession areas. PNC conducted stratigraphic drilling on 800 m x 800 m and 400 m x 400 m centres.

In 1982, 4,686 m were drilled on several kilometre-wide spaced grids exploring a number of ground anomalies. A much larger program was completed in 1983; 36 holes totalling 11,000 m as a combination of rotary and cored drilling. Drillhole spacing was 2.5 km x 2.5 km over western and eastern sections of the Property. All drillholes were probed for natural gamma, resistivity sonic and calliper using Japanese-made equipment.

In 1984, encouraging results were noted in 13 drillholes (6,266 m) in the Dajy area (Figure 4-2), 13 core holes (1,848 m) in the Sekiret area and five drillholes (2,672 m) near the Arlit fault in the west.

In 1985–1986, 27 drillholes (10,702 m) were completed, of which 7,808 m were core and 2,894 m were rotary. Some of the holes were over the northern sector while others were placed over Dajy and Isakanan. Additional drilling was done in 1987 (7,672 m), seven holes totalling 2,139 m in 1988, 11 holes in 1989 totalling 3,505 m and finally 12 drillholes totalling 3,466 m in 1990.

PNC's work confirmed that uranium was present in the Tarat, Madaouela and Guezouman formations and in a surface anomaly at DASA (Figure 4-2) in the sandstones of the Tchirezrine 2 Formation.

The drilling was successful in expanding the Dajy prospect within the current AE3 concession and discovering the Isakanan prospect within the current AE4 concession (Figure 4-2). The joint venture terminated in 1988.

From 1990 to 2007, the AE3 and AE4 concession areas remained unexplored and no known exploration activity was reported.

6.4 Exploration Activity from 2007 Onwards

In September 2007, the AE3 and AE4 blocks were granted to GAFC, totalling about 1,000 km² and located some 50 km southeast of Orano's proposed large Imouraren open pit (Figure 4-2).

Within the AE3 and AE4 concessions, mineralization was known to exist within the lower Carboniferous Guezouman and Tarat sediments and the lower Cretaceous Tchirezrine 2 sandstone. The AE3 block includes the historic Dajy prospect where uranium mineralization was known to occur within a 10 km-long x 2 km-wide zone. Dajy is situated along a northwest-southeast trending major lineament, the Azouza fault.

In 2011, GAFC announced new uranium discoveries at the AE3 concession, on the area current known as DASA (**Dajy Area Surface Anomaly**), named to differ from the historic Dajy prospect. The discoveries are located along the Azouza Fault and hosted in the Tchirozerine 2 lower Cretaceous sandstones. The mineralization is contained in a graben environment with down-faulted blocks. Intersections were:

- DASA 1 – 0.26% U₃O₈ over 8.8 m



- DASA 2 – 0.11% U₃O₈ over 8.6 m
- DASA 3 – 0.11% U₃O₈ over 76 m.

Additional exploration work located uranium grades from blowouts on surface as high as 30% U₃O₈ within the Tchirezrine 2 sandstone.

Later drilling confirmed that high-grade mineralization exists below the planned open pit with reported grades in hole ASDH 307 of 0.35% eU₃O₈ over 30 m and hole ASDH 248 at 0.21% eU₃O₈ over 25 m.

In June 2012, the Dajy exploration camp was opened which allows easier access to the whole concession area and the drill sites.

In 2017 to April 2018, GAFC drilled an additional 36 holes which targeted the southern Flank Zone of the graben.

6.5 Historical Mineral Resource Estimates

Although completed in accordance to CIM definition standards and reported in accordance with NI 43-101, the following MREs are considered historical estimates. A Qualified Person has not done sufficient work to classify the historical estimates as current Mineral Resources, and GAFC is not treating the historical estimate as current Mineral Resources.

These historical estimates of Mineral Resources (described below) differed in several ways; the numbers of drillholes available, the level confidence in the geological model at the deposits and the prevailing pricing environment for the uranium sector.

6.5.1 2009 GEOEX Isakanan and Dajy Historical Mineral Resource Estimate

A NI 43-101 MRE by GEOEX in 2009 yielded a total of 27.9 million tonnes (Mt) of resources at a grade of 821 ppm eU₃O₈ or 50.5 million pounds (Mlb) eU₃O₈ for the Isakanan and Dajy deposits within the AE3 and AE4 concessions.

6.5.2 2013 SRK Consulting (Canada) DASA Project Historical Mineral Resource Estimate

An MRE for the DASA Project was previously completed by SRK Consulting (Canada) in September 2013 (Table 6-1).

Table 6-1: Mineral Resource statement*, DASA Uranium Project, Republic of Niger (SRK Consulting (Canada) Inc., 20 September 2013)

Category	'000 tonnes	eU ₃ O ₈ ppm	eU ₃ O ₈ Mlb
Inferred (open pit) **	4,713	579	6.01
Inferred (underground) ***	19,396	1,797	76.84
Inferred – Total	24,109	1,559	82.86

* All figures rounded to reflect the relative accuracy of the estimates. Mineral Resources are not Mineral Reserves and have not demonstrated economic viability.

** Open pit Mineral Resources reported at a cut-off grade of 250 ppm of eU₃O₈ per tonne assuming: metal price of US\$70/lb of U₃O₈, mining cost of US\$5/t, processing and G&A cost of US\$5/t, processing cost of US\$24/t, process recovery of 90%, exchange rate of C\$1.00 equal US\$1.00, a mining rate of 10,000 tonnes per day and a pit slope angles of 45°.

*** Underground Mineral Resources reported at a cut-off grade of 600 ppm of eU₃O₈ per tonne assuming: metal price of US\$70 per pound of U₃O₈, mining cost of US\$71/t, processing and G&A cost of US\$5/t, processing cost of US\$24/t, process recovery of 95%, exchange rate of C\$1.00 equal US\$1.00 and a mining rate of 5,000 tonnes per day.

The 2013 SRK MRE was superseded by CSA Global's 2017 MRE (CSA Global, 2017).

6.5.3 2017 CSA Global DASA Project Historical Mineral Resource Estimate (CSA Global, 2017)

CSA Global completed a Mineral Resource estimation for the DASA Project in February 2017 (Table 6-2). Mineral Resources were reported using cut-off grade of 250 ppm U_3O_8 .

Table 6-2: DASA Mineral Resources as at 1 January 2017 (CSA Global)

Category	Tonnes (Mt)	eU ₃ O ₈ (ppm)	Contained eU ₃ O ₈ (Mlb)
Indicated	18.9	931	39
Inferred	42.0	940	87

Notes:

- Mineral Resources are based on CIM definitions.
- A cut-off grade of 250 ppm eU₃O₈ has been applied.
- A bulk density of 2.36 t/m³ has been applied for all model cells.
- Rows and columns may not add up exactly due to rounding.

The 2017 CSA Global MRE was superseded by CSA Global's 2018 MRE (CSA Global, 2018).

6.5.4 2018 CSA Global DASA Project Historical Mineral Resource Estimate (CSA Global, 2018)

CSA Global updated a Mineral Resource estimation for the DASA Project in June 2018 (Table 6-3). Mineral Resources were reported in two parts; those that have potential for extraction by open cut mining methods, and the deeper higher-grade material outside of the open pit that may be amenable to underground mining.

The open pit Mineral Resources are the parts of the deposit above a cut-off grade of 320 ppm eU₃O₈ that fall within a conceptual optimized pit shell. Higher-grade material above a cut-off grade of 1,200 ppm outside of the optimized pit shell was considered for underground mining.

Table 6-3: DASA Mineral Resources as at 1 June 2018 (CSA Global)

Category	Tonnes (Mt)	eU ₃ O ₈ (ppm)	Contained eU ₃ O ₈ (Mlb)
Indicated open pit	7.08	3,251	50.8
Indicated underground	2.50	2,553	14.1
Indicated – Total	9.59	3,068	64.8
Inferred open pit	0.26	1,135	0.7
Inferred underground	8.18	2,647	47.7
Inferred – Total	8.44	2,600	48.4

Notes:

- Mineral Resources are based on CIM definitions.
- Mineral Resources for open pit mining are estimated within the limits of an ultimate pit shell.
- Mineral Resources for underground mining are estimated outside the limits of ultimate pit shell.
- A cut-off grade of 320 ppm eU₃O₈ has been applied for open pit resources.
- A cut-off grade of 1,200 ppm eU₃O₈ has been applied for underground resources.
- A bulk density of 2.36 t/m³ has been applied for all model cells.
- Rows and columns may not add up exactly due to rounding.

The 2018 CSA Global MRE is superseded by CSA Global's 2019 MRE (Section 14 of this Report).

6.6 Historical 2018 Preliminary Economic Assessment

CSA Global completed a PEA of the DASA Project in 2018 (CSA Global, 2018b). The 2018 DASA PEA was based on CSA Global's 2018 DASA MRE which has now been replaced by the 2019 DASA Mineral Resource update presented in this Report.

The 2019 Mineral Resource update differs materially from the 2018 Mineral Resource and as such, GAFC and CSA Global no longer consider the 2018 PEA current. Qualified Persons have not done sufficient work to update the 2018 PEA with results of the 2019 MRE. GAFC and CSA Global are not treating the 2018 as a current PEA and the results should not be relied upon. The results of the 2018 PEA are presented herein for historical information purposes.

GAFC has commenced a Prefeasibility Study (PFS) on the Project and is due for completion in Q2 2020.

The 2018 MRE was used as the basis for GAFC's 2018 PEA. The PEA involved several iterations of the mining study design, which included the investigation of open pit and underground mining methods to exploit the resources. Based on this investigation the most attractive returns were generated from a stand-alone, underground, high-grade mining scenario which will operate for period of 15 years and will produce between 4 Mlb and 7 Mlb of U_3O_8 annually.

The objective of the PEA was to assess the potential economic and technical viability of uranium production at DASA as an integrated operating facility to mine and recover a uranium concentrate on the property.

The PEA was completed in accordance with NI 43-101 and CIM standards of disclosure. The PEA was preliminary in nature and included Inferred Mineral Resources that were too speculative geologically to have economic considerations applied to them that would enable them to have been categorized as Mineral Reserves. There is no certainty that PEA results would be realized. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

The PEA proposed the development of an underground mine using a sublevel blast-hole retreat and backfill mining method. The mining method proposed included the trackless short-hole development of the main decline, ramps, strike and crosscut drives as primary and secondary accesses to the orebody on a 24 m sublevel spacing and a 20 m collection drive spacing.

Standard trackless underground mining equipment was proposed and would comprise electro-hydraulic face drilling rigs and support drilling rigs. Proposed material handling equipment would comprise a diesel powered 7-tonne loader and 33-tonne trucks. Ancillary equipment would consist of diesel-powered modified charge-up vehicles, utility vehicles and other light vehicles. The longhole stoping operation proposed would utilize an electro-hydraulic longhole production jumbo capable of drilling accurate holes up to 35 m in a ring fired pattern and would be developed on a retreat basis. Blasted mineralized material would be mucked using a teleremote capable 7-tonne loader and loaded into either 33-tonne haul trucks or a mucking bay.

It was proposed that the depleted stopes would be backfilled using a combination of waste rock from development, classified tailings and binding agents. Broken material would be transported via the ramp and main decline system to surface in 33-tonne haul trucks for dumping at either run-of-mine (ROM) pad crusher feed bin, surface stockpile or waste dump storage facility.

The PEA considered the spatial distribution of the mining areas based on grade distribution and determined a two-stage phased approach is optimal for mining the DASA resource:

- Stage 1 (years 1 to 6): Optimize to grade by accessing high grade areas of the deposit as early as possible, maintaining high grade, 4,000 ppm U_3O_8 feed, at 900 kt per annum mining rate. Blending of mineralized material would be managed from stockpiles during this period to control feed grade to the processing plant.
- Stage 2 (years 7+): Based on the 2018 modelled resource, grades would be blended to provide a target feed grade of 1,800 ppm U_3O_8 at a mining rate of 1,200 kt per annum to the process plant. As additional drilling was completed, high-grades areas may have continued on strike and down dip.

Table 6-4: 2018 historical PEA summary – standalone underground operation

Input	Unit	Value
Mineralized Material Processed	Mt	15.9
Extraction Ratio	%	85
Dilution	%	34
Mill Head Grade	ppm	2,380
Mill Recovery	%	84.3
Total Recovered Uranium	Mlb	69.1
Mine Life	years	15
Annual Tonnage (Phase 1 – first six years)	kt per annum	900
Average Annual Production (Phase 1)	Mlb U₃O₈	7.0
Average Annual Production (Phase 2)	Mlb U₃O₈	4.0
CAPITAL COSTS		
Mine Development	US\$ M	\$49.5
Mill	US\$ M	\$141.2
Surface Infrastructure	US\$ M	\$45.4
Owner's Cost	US\$ M	\$8.7
Indirects/EPCM	US\$ M	\$11.1
Contingency (25%)	US\$ M	\$64.0
Total Construction Costs (including Contingency)	US\$ M	\$319.9
Sustaining Capital Costs	US\$ M	\$137.2
Reclamation	US\$ M	\$10.0
Total Capital Costs	US\$ M	\$467.1
OPERATING COST		
Mining	US\$/lb	\$12.26
Processing	US\$/lb	\$10.80
Transport and Marketing	US\$/lb	\$1.50
General and Administration (G&A)	US\$/lb	\$1.91
Total Operating Cost	US\$/lb	\$26.52
Sustaining Capital	US\$/lb	\$1.99
All-in Sustaining Cost	US\$/lb	\$28.51

The metallurgical workstream to support the PEA included comminution work, leach characteristics, settling tests and mineralogy studies. Based on the work completed on the samples selected from the deposit and the review of the performance during various tests and conditions, an acid leach/resin-in-pulp flowsheet was suggested for the processing of the DASA deposit.

The process plant was sized to process 1.2 Mt annually (3,500 tonnes per day) and to recover up to 8 Mlb U₃O₈ on an annual basis. The plant would be run from grid power and would require 7 MW of installed capacity. Mineralized material processed in Stage 1 production (years 1 to 6) would be limited to 900,000 tonnes per annum to support ~7 Mlb U₃O₈ product annually. Mineralized material processed in Stage 2 production (year 7 onward) would be limited to 1,200,000 tonnes per annum to support 4–5 Mlb U₃O₈ product annually.

Mineralized material from the mine would be crushed to 200 mm and then milled to a particle size of 106 um using a semi-autogenous grinding (SAG) mill. The slurry would be pumped to a series of leach tanks where sulphuric acid was then mixed with the slurry to leach the uranium. The slurry was then pumped to the resin



tanks where the uranium in solution was adsorbed onto the resin beads. Once the uranium was adsorbed onto the resin, the barren slurry was then neutralized with lime and pumped to a tailings dam for storage.

The slurry resin mixture was then screened so the loaded resin could be collected into an elution column where the uranium was removed, or eluted, from the resin using sulphuric acid. The acidic uranium-rich solution was then pumped to the refining stage where hydrogen peroxide was used to precipitate the uranium as final uranyl peroxide (UO_4) or “yellowcake” product. The mixture was filtered, dried and packaged in drums for export.

Acid would be generated on site; an acid consumption rate of 120 kg/t of material treated was assumed. Water would be supplied by local boreholes.

Overall process recovery was modelled at 84.3% and is expected to improve with additional testwork during a Feasibility Study.

Capital and operating costs for the PEA were estimated based on detailed mine designs and the associated mining schedule. Mine development included a 3,778 m-long x 6.5 m-wide x 4.5 m-high ramp as the main decline. The ramp was sized to potentially support a future conveying system alongside vehicle access. If no conveying system was needed, ramp dimensions will be reduced; a value opportunity that would be explored in subsequent study.

Power would be provided through existing electricity infrastructure. A cost of US\$4.5 million was assumed for connection to the grid which currently passes directly adjacent to the project and supplies power to Orano’s operations in Arlit.

Other surface infrastructure included basic infrastructure (US\$15.9 million), acid plant (US\$10.0 million), water purification (US\$5 million) and tailings management facility (US\$8.5 million).

A 25% contingency (US\$64 million) was added to Total Construction Costs.

Total construction costs in the DASA Standalone Scenario were US\$319.9 million, including contingencies.

Sustaining capital of US\$137 million was added for provisioning of mine development cost, major equipment replacement and refurbishment. These items would include mechanized mining equipment and major processing plant equipment components.

The mining costs for the PEA project were estimated to be US\$12.26/lb U_3O_8 (US\$53.25/t) based on an owner-operator model. Ramp and access development were capitalized prior to mineralized material production and expensed as a component of operating costs thereafter.

Process costs were calculated to be US\$10.80/lb based on US\$46.92/t of mineralized material treated with the largest consumable being reagents. The processing facility would be operated and maintained by a staff of 150 people working on 2 x 12-hour shifts, 365 days a year. A cost breakdown for operating costs is provided in Figure 6-1.

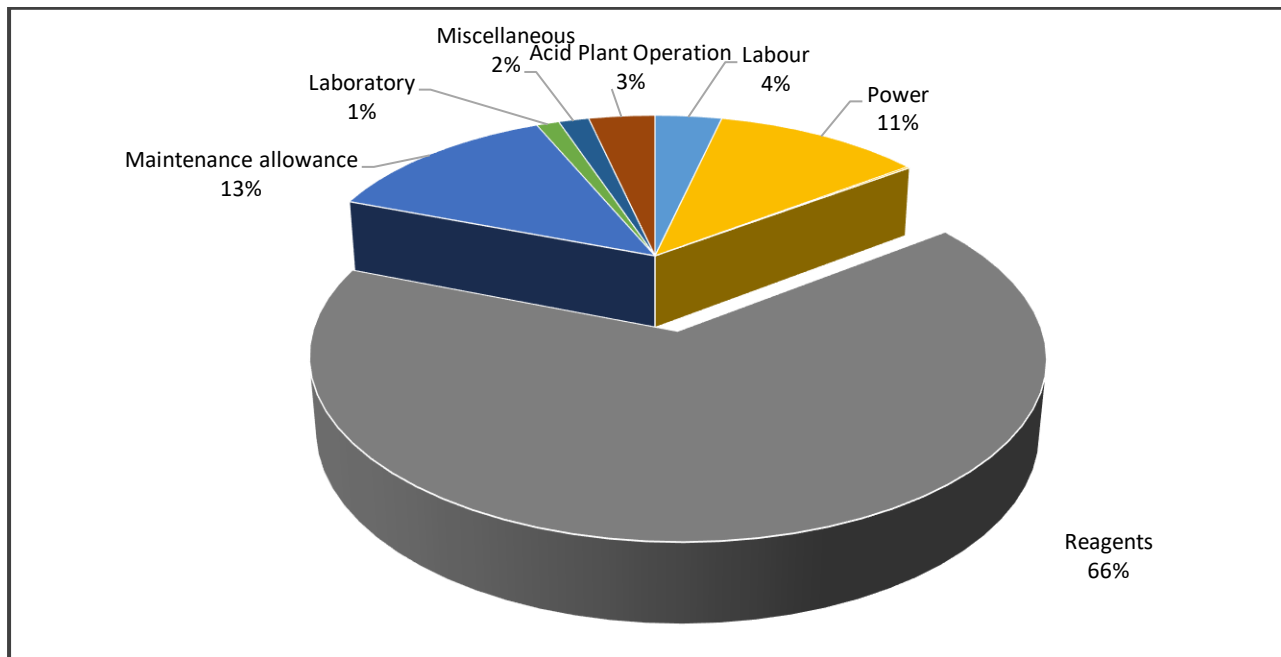


Figure 6-1: Processing cost breakdown

Table 6-5: Operating costs – DASA PEA Standalone Scenario

	US\$/t processed	US\$/lb U ₃ O ₈
Mining	\$53.25	\$12.26
Processing	\$46.92	\$10.80
Transport and Marketing	\$6.52	\$1.50
G&A	\$8.28	\$1.91
Cash Operating Cost	\$114.96	\$26.52
Sustaining Capital	\$8.63	\$1.99
All-in Sustaining Cost	\$123.59	\$28.51

Costs for G&A included a 450-person camp and facilities, camp staffing and head office costs. Cash operating cost totalled US\$26.52/lb U₃O₈ (US\$114.96/t). Including sustaining capital, all-in sustaining cost totalled US\$28.51/lb U₃O₈ (US\$123.59/t).

The economic analysis for the PEA was done via a discounted cash flow (DCF) model based on the mining inventory from the PEA mine plan. It included an assessment of the current tax regime and royalty requirements in Niger. Net present value (NPV) figures were calculated using an 8% discount rate and cash flows were discounted to the start of first construction.

Under Niger mining code, a Niger mining company must be established to operate the mine, of which the Republic of Niger is granted a 10% carried interest in the share capital. Cash flows calculated on an after-tax basis were considered attributable to the Project and were not adjusted for Niger mining company share interests.

Table 6-6: NPV and internal rate of return (IRR) summary for the historical 2018 PEA at different uranium prices

	Unit	Uranium price (US\$/lb U ₃ O ₈)		
		\$45.00	\$50.00	\$55.00
Pre-tax				
NPV @ 8%	US\$ M	\$342	\$539	\$735
IRR		27%	37%	46%
Post-tax				
NPV @ 8%	US\$ M	\$172	\$299	\$437
IRR		18%	25%	32%

An after-tax cash flow and NPV were calculated, based on the following tax calculations:

- The income tax rate in Niger is 30%, companies are provided a three-year tax exemption and benefit from accelerated depreciation on capital expenditures. All value-added tax (VAT) is recoverable.
- A sliding scale royalty is paid on revenues, based on operating margin percentages:
 - Operating margin <20%: Royalty = 5.5%
 - Operating margin of 20% to 50%: Royalty = 9.0%
 - Operating margin >50%: Royalty = 12.0%.

6.7 Production from the Property

There is no known production from the Property.

7 Geological Setting and Mineralization

7.1 Introduction

This section is prepared based on the following reports:

- Activation Lab (2007)
- Cogema (1977a, 1977b)
- Jean Martin von Siebenthal (2013)
- Cazoulat (1985)
- Gauthier (1972, 1974)
- Gerbaud (2006)
- https://www.uni-hohenheim.de/atlas308/startpages/page2/french/content_fr/conframe_fr.htm
- Guiraud (1981)
- Greigert and Pougnet (1967)
- Hirlemann and Robert (1977, 1980)
- Hirlemann and Faure (1978)
- Joulia (1957, 1959, 1963)
- Joulia and Obellianne (1976)
- Konaté et al. (2007)
- Lang et al. (1991)
- Molebale (2012)
- Sempéré (1981)
- Valsardieu (1971)
- Wright (1993, 2010, 2012)
- Yahaya (1992)
- Yahaya and Lang (2000).

7.2 Regional Geology

The DASA Project is located in north-eastern Niger inside the Tim Mersoï sedimentary basin (Figure 7-1). The basin covers an area of some 114,000 km² and is part of the much larger Iullemeden Basin (Palaeozoic-Tertiary) that stretches into Mali, Algeria, Benin and Nigeria.

In the north and east, the Iullemeden Basin (including Tim Mersoï Basin) is bounded by the Hoggar Massif in Algeria and the Aïr Massif in Niger forming part of the Central Saharan Massif (Figure 7-2). The basin gets deeper to the south and the west. During the early Palaeozoic, continental sediments were deposited into an open gulf to the south of the Central Saharan Massif. In the Mesozoic and Tertiary, marine transgressions invaded from time to time diminishing in thickness to the south and passing laterally into continental series. Uplifts commenced in the mid Eocene, filling the basin with fluvial and lacustrine sediments.

All uranium deposits currently known in Niger are located within the Tim Mersoï Basin in several areas (Figure 7-1 and Figure 7-3):

- Near the city of Arlit, two Orano mines, Somaïr – open pit (discovered in 1967) and Cominak – underground mine (discovered in 1974), with historical production of over 110,000 tonnes of uranium. Orano (2019a) reported production of 1,128 tonnes of uranium from Cominak and 1,783 tonnes of uranium from Somaïr during 2018.
- In the Teguida area, SOMINA/CNNC’s Azelik – open pit (producing since 2011, but presently closed).
- At Imouraren (Imouraren SA/Orano), construction started in 2009 and production was originally planned to commence in 2015); projected to be the largest open pit uranium mine in the world. This project is currently on standby.

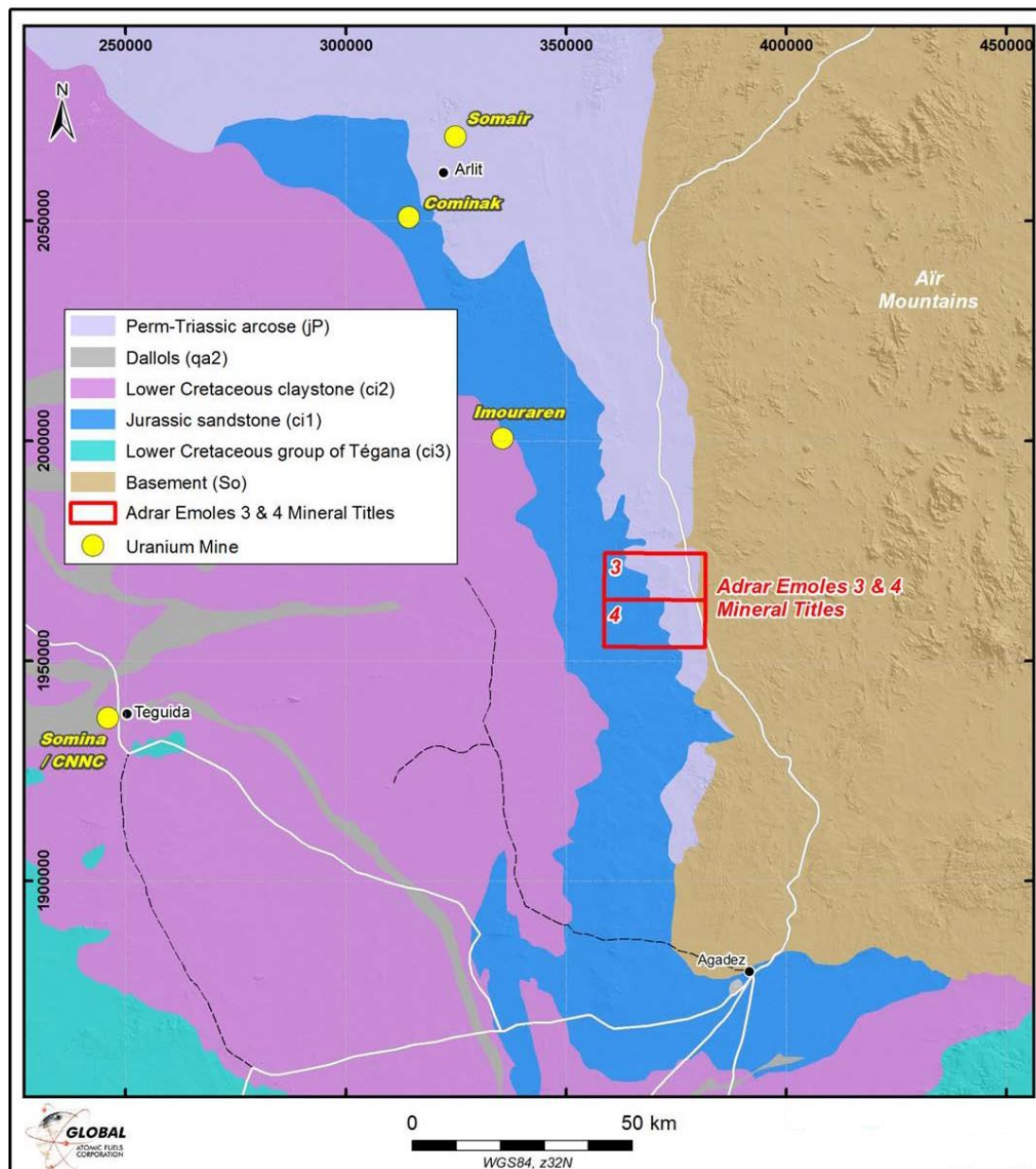


Figure 7-1: Regional geology map
 Source: After F. Julia (BRGM, 1963 at 1:500,000)

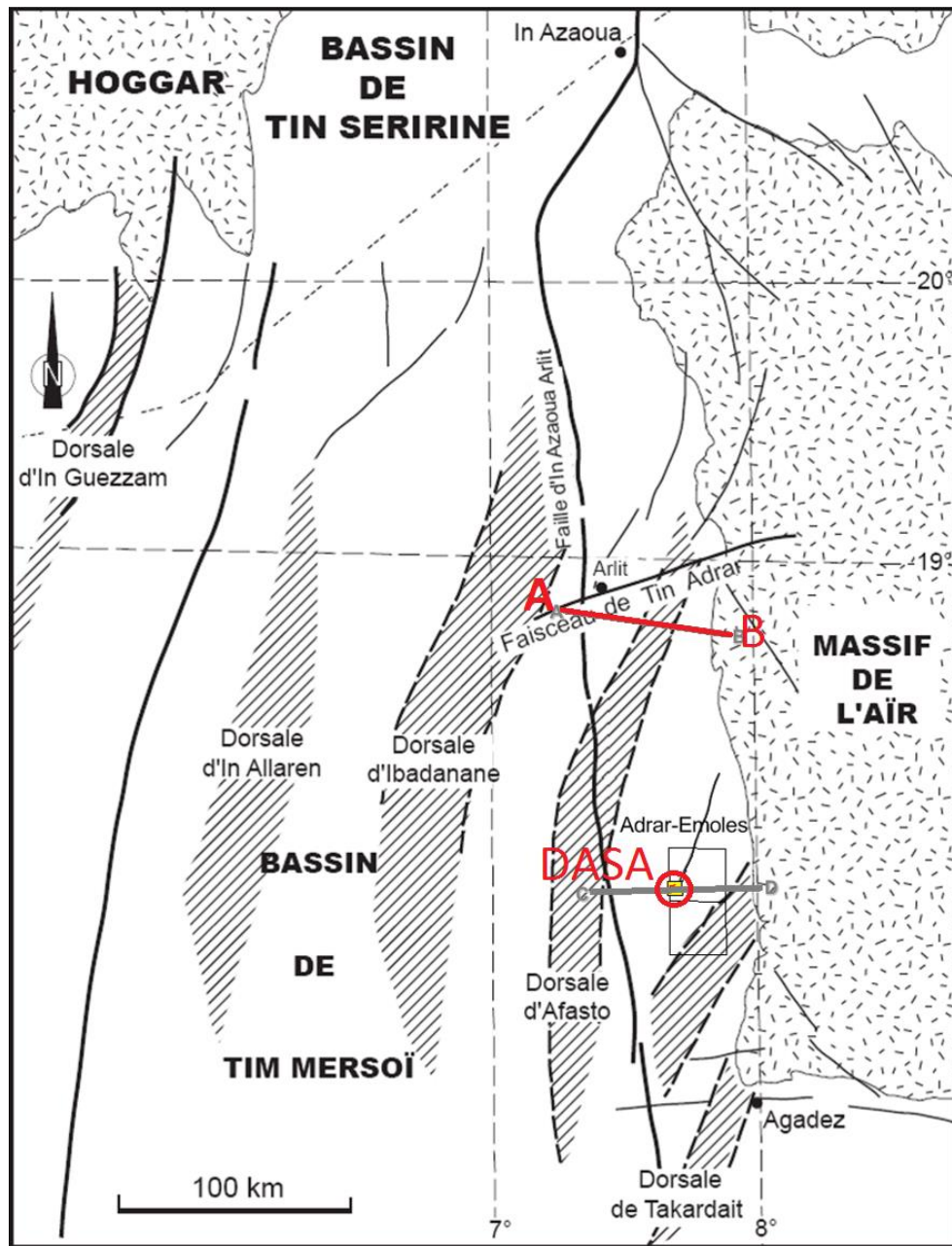


Figure 7-2: Major structures in the Tim Mersoï Basin, shaping it in a succession of ridges and basins
 Source: GAC website

To the east, the basin rests unconformably on the crystalline basement of the Air Massif, a Precambrian metamorphic terrain intruded by post Mesozoic felsic and mafic intrusives and in the north and northwest on the basement rocks of the Hoggar in Algeria. The Air Massif extends north into Algeria where it becomes the Ouzalian Craton also of Precambrian age. The Air Massif represents the source for all the clastic sediments that over time have filled the Tim Mersoï Basin and is probably also the source of at least some of the uranium found in the basin's clastic sediments.

The sediments of the basin range in age from Paleozoic to Cenozoic (Figure 7-3) and up to 1,500 m in total thickness deposited on a relatively stable platform.

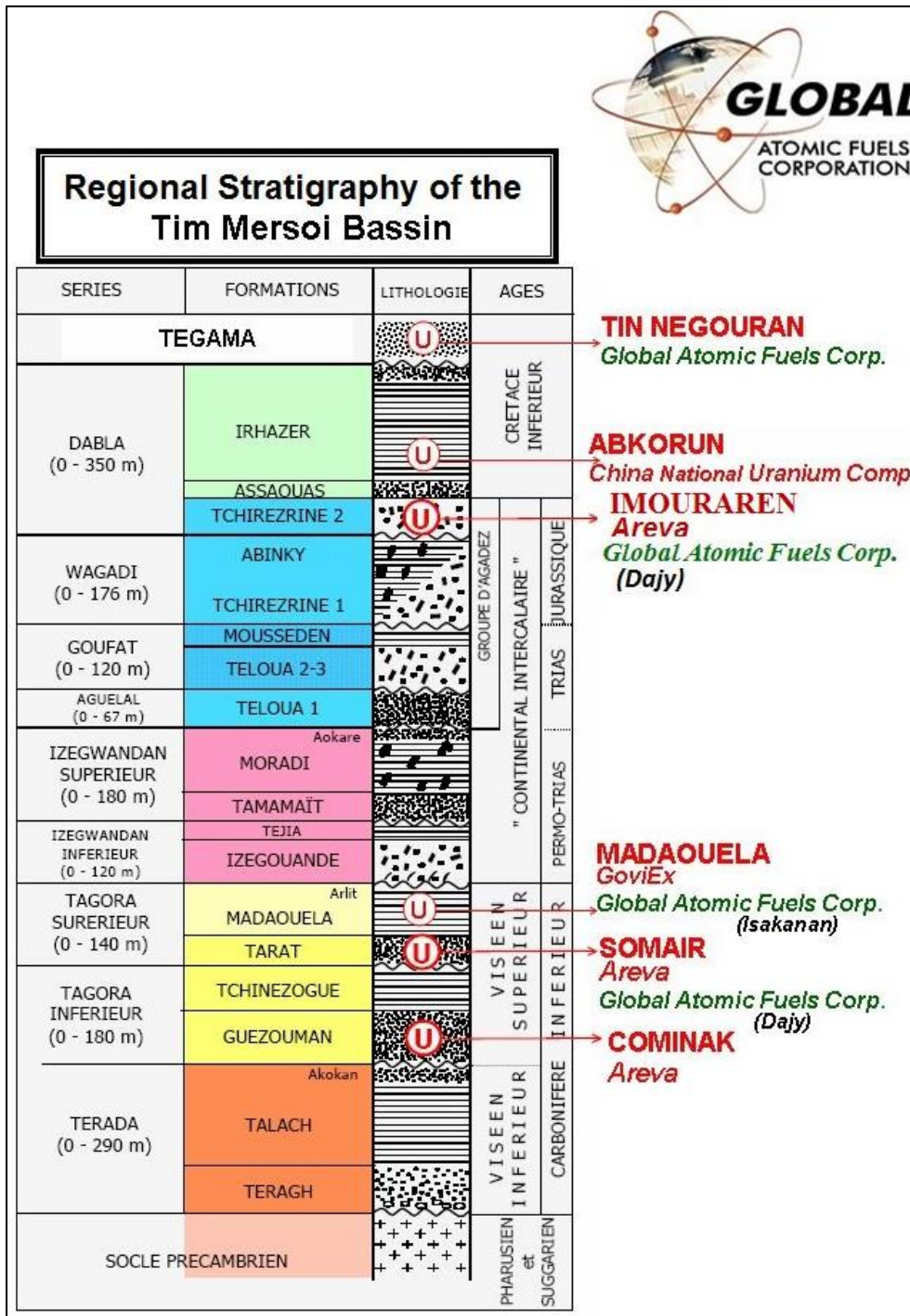


Figure 7-3: Stratigraphic column of the series and formations in the southern part of the Tim Mersoï Basin and including the DASA Project and Property
 Source: GAC website

There are a number of upward fining sedimentary cycles that have been identified, starting with coarse to conglomeratic sandstone at the base with minor intercalations of siltstone and clay fining upwards into fine-grained sandstone or argillite and clay before the next cycle starts. Each cycle is unique and reflects changes in climate, topography, tectonic events as well as changes in the source areas for the sediments.

The strata of the Tim Mersioi Basin have a shallow dip to the west caused by the uplift of the Air Massif (Figure 7-4). The basin deepens gradually to the west and north and shallows over the In Guezzam ridge in Mali. Since the lower Devonian, sedimentation is predominantly continental and marginal littoral comprising conglomerate, sandstone, siltstone and shale, deposited by large meandering rivers in fluvial and deltaic settings into a slowly subsiding foreland. Further to the west, a more marine environment existed (Jouliat et al., 1959).

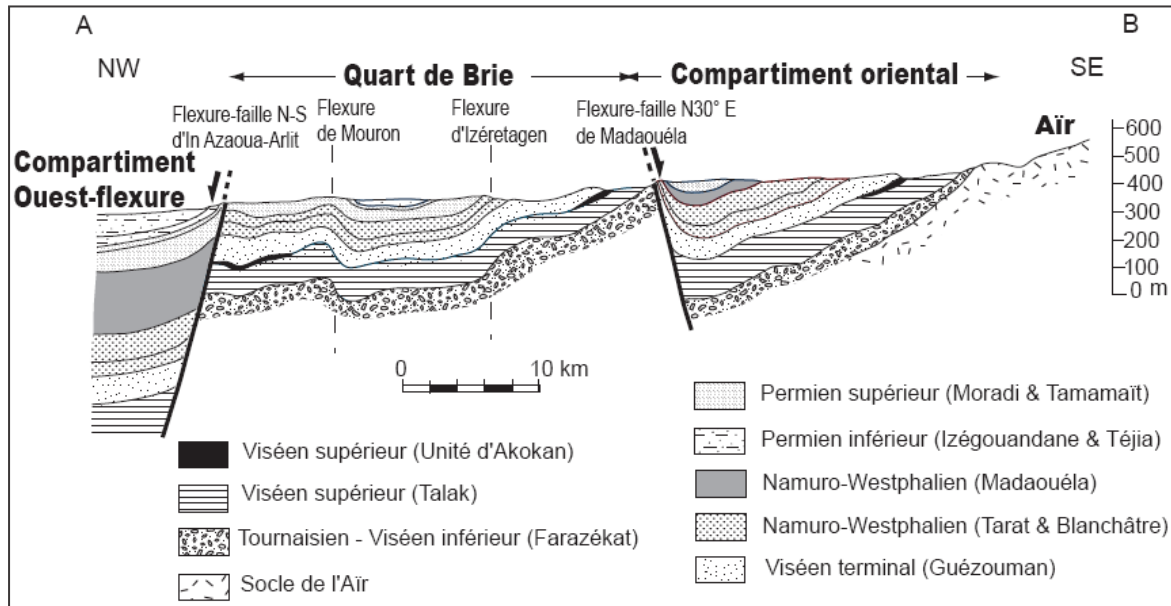


Figure 7-4: Northwest-southeast profile in the Arlit area (see Section A-B in Figure 7-2)
Source: Gerbaud, 2006 (modified from Cominak document, 1989)

The general direction of transport is assumed to have been from the east to the west, and within the Project area a more northeast to southwest direction of transport would have prevailed.

In general, it can be said that the sedimentary strata become younger from north to south, possibly a combination of uplift of the Air Massif and erosion and transport directions.

Obelliane et al. (1971) have identified three distinct sedimentary areas within the Tim Mersioi Basin with the main depositional areas moving slowly north to south over time:

- A Lower Carboniferous basin (the Tin Seririne synclinorium) of fluvial-deltaic marine and sediments. These strata are rich in organic matter and silicified trees are common in certain areas of the basin.
- A smaller Permo-Triassic basin with intercalations of volcano sedimentary and fluvial sediments.
- A lower Cretaceous basin with lacustrine deposits overlain by fluvial-deltaic sediments.

7.3 Structural Setting

The Tim Mersioi Basin occurs as a regional scale syncline with a fold axis trending north-south, affected by a combination of brittle faults, mixed flexure-faults, or low amplitude folds or flexures.

The Tin Seririne synclinorium was formed during the Pan African Orogenic event from 550 Ma onwards and forms the northern part of the Tim Mersioi Basin with sedimentation that began during the Cambrian (Jouliat et al., 1959).

The structural development of the Tim Mersoï Basin commences at the end of the Pan African Orogen event (1000 Ma). The basin develops by north-south and east-west compression with northwest to west-northwest sinistral shears caused by anti-clockwise rotation in the northeast of the basin. With the widening and deepening of the basin, its centre and the north-eastern edges see the development of sinistral shear zones and conjugate structures trending northwest-southeast and northeast-southwest. The intersections between these structures contain rotational deformation causing dome and basin structures.

Major movements are related to north-south zones which strike parallel to the eastern and the western edges of the Air Massif. The compressional sinistral strike slip movements have caused three main structural directions which are north-south; 40–80°; and 90–135°. Where these structures intersect, ideal pathways for circulating uranium-bearing fluids to form deposits are created – S fault system and N30°E associated structures.

The fold-fault of In Azaoua-Arlit comprises a major regional-wide north-south fault system. This family of structures is related to ancient late pan-African transform events. Its frequent re-activation, depending on the epochs, translates into faults, flexures and flexure-faults in the sedimentary cover.

The N30° family of structures are the most evident on surface in the Tim Mersoï Basin. They appear in the Air basement in the east and stop at the In Azaoua-Arlit lineament in the west, where they are truncated. They are linked to the In Azaoua-Arlit history (Sempéré, 1981).

In the sedimentary cover, the deformation is characterized by flexures (Gauthier, 1972; Hirlemann et Robert, 1977, 1980), creating in some instances a substantial vertical displacement in the order of 100–200 m. According to Hirlemann and Robert (1977, 1980), these flexures are linked with sinistral reverse-strike-slip faults activity of the basement structures in a compressive regime.

According to Guiraud et al. (1981), the compressive phase associated with the formation of the N30° flexures is of Upper Cretaceous age, with a shortening direction of N140°.

7.3.1 *N130–N140°E and N70–N80°E Conjugate Fault System*

A second grouping of faults occurs with orientations of N130–N140°E and N70–N80°. These brittle structures are the most important family in the Air Massif. They are of late-Panafrican origin according to Greigert and Pognet (1967).

The N70–N80°E faults are conjugate to the N130–N140°E directions. They are mainly present in the southern half of the Tim Mersoï Basin. During the Carboniferous, these structures controlled the sedimentation in the basin (Wright et al., 1993). These faults played a major structural role in the regional context of the basin, by localizing large scale dextrous strike-slip faults (Gauthier, 1972; Hirlemann and Robert, 1980).

7.3.2 *Fold-Like Structures*

Fold-like structures are common within the sediments. According to geological drilling data, the thickness and dip variations in some strata from west to east are linked with synsedimentary tectonic activity (Gerbaud, 2006).

Two families of fold-like structures are distinguished:

- Anticlines/Synclines, with fold axes roughly parallel to the N30°E structures
- Closed structures (domes), which generally appear at the intersection of the N30°E structures and N70–N80°E.

In the south, near the AE3 and AE4 permits, the north-south, east-west and sinistral shears combine to develop folding, the most obvious being a syncline, in which the Azouza structure is an integral part. The stratigraphy is also folded on approximately layer parallel axis which gives wider exposures and repetition of units. The layers are thickened by layer parallel shortening and on echelon structures develop (Wright, 2010, 2012).

7.4 Property Geology

The rocks present within the DASA Project area range in age from Cambrian to lower Cretaceous age (Figure 7-5). The schematic geological map is shown in Figure 7-1 and on the schematic cross-section in Figure 7-7 .

The rocks are mostly clastic sediments with minor carbonates. They originated from the Air Massif which has been continuously eroded since at least the Mesozoic. The sediments were laid down in a continental setting and are generally comprised of fluvial and deltaic settings. In this environment, large shallow rivers meander across flat topography and create complex flow patterns where the coarse-grained sands and gravel are concentrated in the actual channels with the highest flow energies, while low energy flow regimes on the floodplains and tidal areas create silt and mudstone-type sediments. Images of several outcrops are presented in Figure 7-8 to Figure 7-16.

GLOBAL ATOMIC FUELS CORPORATION		STRATIGRAPHIC COLUMN DASA AREA (Tim Merso Basin, Rep. of Niger)			
Age (Ma)	Formation	Uranium mineralization Project / Company	Lithology	Depositional Environment	Color code DHLogger
Lower Cretaceous (145 - 100 Ma) IRHAZER GROUPE	Tégama	Tin Negouran / Global	Coarse sandstones, ocre to reddish colour with fine grained lenses Conglomerats with white quartz pebbels	Fluvial	Series
	Irhazer	Abkorun / China National Uranium Co	Alternating carbonatic argillites, marls and clayish carbonates incl dolomitic, greyish layers of silt, mainly reddish colours Reddish argillites with intercallations of silt and sandstones	Lacustrine	
	Assaouas		Silt and argillitic silt greyish-greenish colours		
Triassic -Jurassic GROUP (250 - 145Ma)	Tchirezrine 2	Imouraren / Areva Dasa / Global	Alternating of medium - coarse grained arkosic sandstones with analcimolite, greenish to brownish colours , cross bedding, silicified wood	Fluvial/ lacustrine	Red
	Abinky		Analcimolite, very hard, red brown; massive banks; Argillites and analcimolitic sandstones partly arkosic, iron cement; med grained sandstones with microcline feldspar; blobs of altered analcimolite; frequent silicified wood in sandy layers	Lacustrine / acide fissure volcanism	
	Tchirezrine 1		Medium-coarse grained feldspatic sandstones with abundant analcimolitic cement; also siliceous cement	Fluvial and exhaustive volcanism	
	Mousseden		Reddish argillites with analcimolit; anacimolitic sandstones		
	Téloua 2-3		Equigranular sandstones with argillitic-siliceous cement, carbonatic Levels with reddish argillites and silts Carbonnatic cemented arkoses	Fluvial / lacustrine	
	Téloua 1		Fine grained equigranular sandstones sometimes without cement; qtz grains dull sheen and rounded		
Permian (298 - 250Ma) IZEGEGOUANDE SERIES	Aokare		Equigranular sandstones medium to conglomeratic with iron stains reddish argillites and very fine grained sand lenses carbonatic cemented	Lacustrine with fluvial intercalations	
	Moradi		Arkosic channels strongly oxidized Conglomerates with quart zand clay pebbels		
	Tamamaït		Medium - fine grained sandstones; carbonate cement; silts and very fine grained sandstones clayish matrix		
	Téjia		Reddish argillites and very fine grained sand lenses		
	Izegouande		Arkoses and feldsphatic sandstones with carbonate cement; reddish argillite lenses; conglomeratic intercalations with pebbles of quartz, rhyolite, silicified wood, cross bedding	Fluvial	
Carboniferous (Namurien 326 - 313 Ma) TAGORA SERIES	Madaouéla	Madaouéla / Govlex Isakanan & Dasa / Global	Silts and very fine grained carbonatic sandstones ; reduced fazies	Estuary / wetlands/eolian	Series
	Tarat	Somair / Areva Dasa / Global	Alternating argillites and very fine grained sandstones rich in organic matter; medium to coarse grained sandstones with organic matter and pyrite	Fluvial-Deltaic	
	Tchinzogue		Alternating black argillites and sandstones, generally abundant organic matter, silt layers	Marine-epicontinental lacustrine	
	Guezoumane	Cominak / Areva Dasa / Global	Alternating very fine grained kaolinitic sandstones and medium-coarse grained sandstones rich in organic matter and pyrite	Fluvial-Estuary	
Lower Carboniferous Visee (358 - 326 Ma) TERADA SERIES	Talak		Argillites dark brown to blueish green; cone in cone structures	Continental marin platform	Green
	Farazekat (Gabo)		Coarse grained sandstones with argillitic intercalations; well rounded distinct white quartz pebbels (pigeon eggs) at the base	Fluvial to fluvial-glacial	
Devonian ? (419 - 358 Ma) TERADA SERIES	Tindirenen		Alternating medium and fine grained sandstones with blackish/greyish argillite lenses; microconglomerate at the base with silica cement; horizontal strata	Fluviatil / lacustrine	Grey
	Teragh		Sandstone conglomeratic and feldspathic, kaolinitic	Fluvial	
	Basement Precambrian		Granitoids / Pink granite with biotite; some basic dykes		

Figure 7-5: Stratigraphic column of the DASA Project area
Source: GAFC

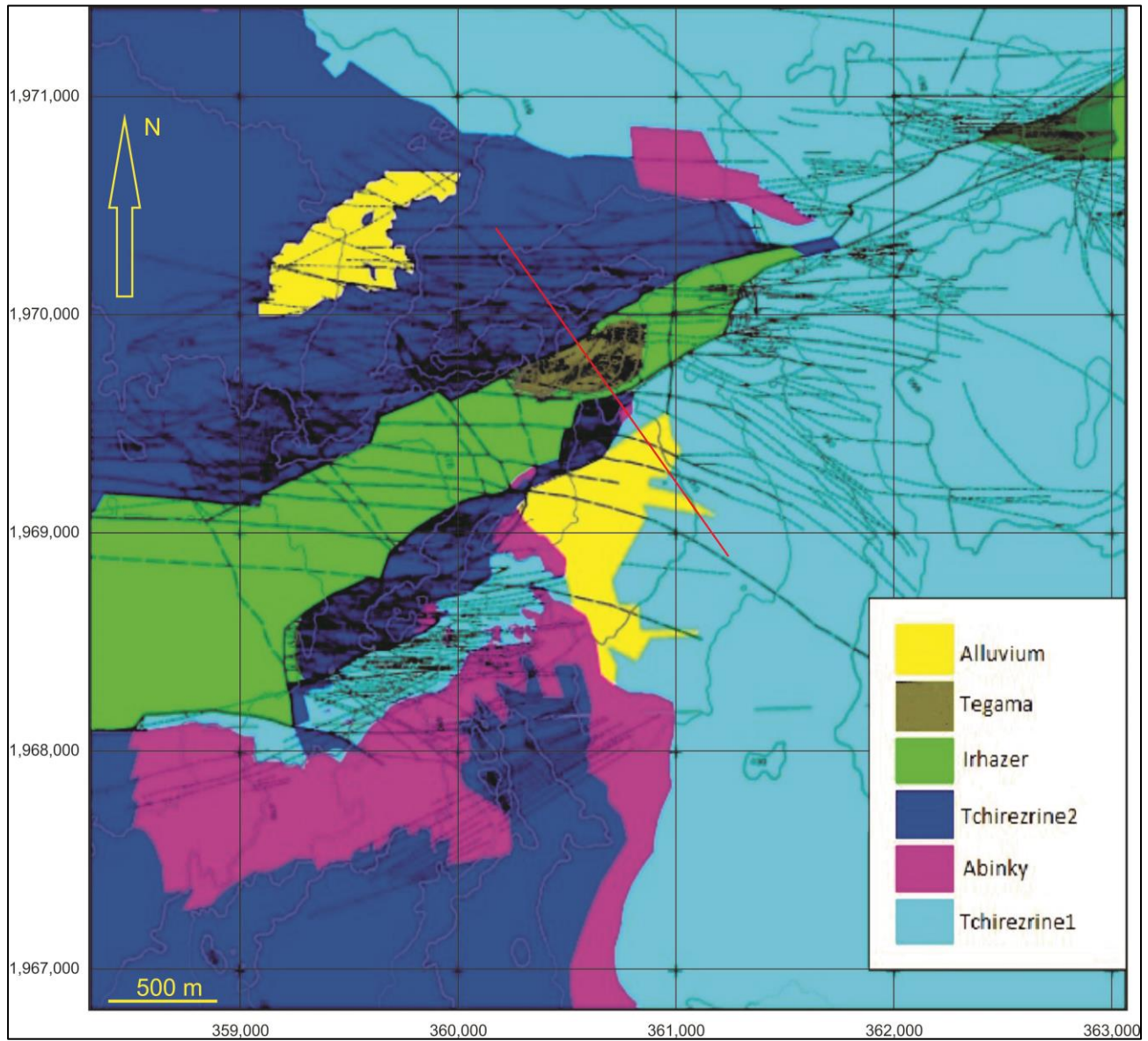


Figure 7-6: DASA structural map (Figure 7-7 section line in red)
Source: GAFC

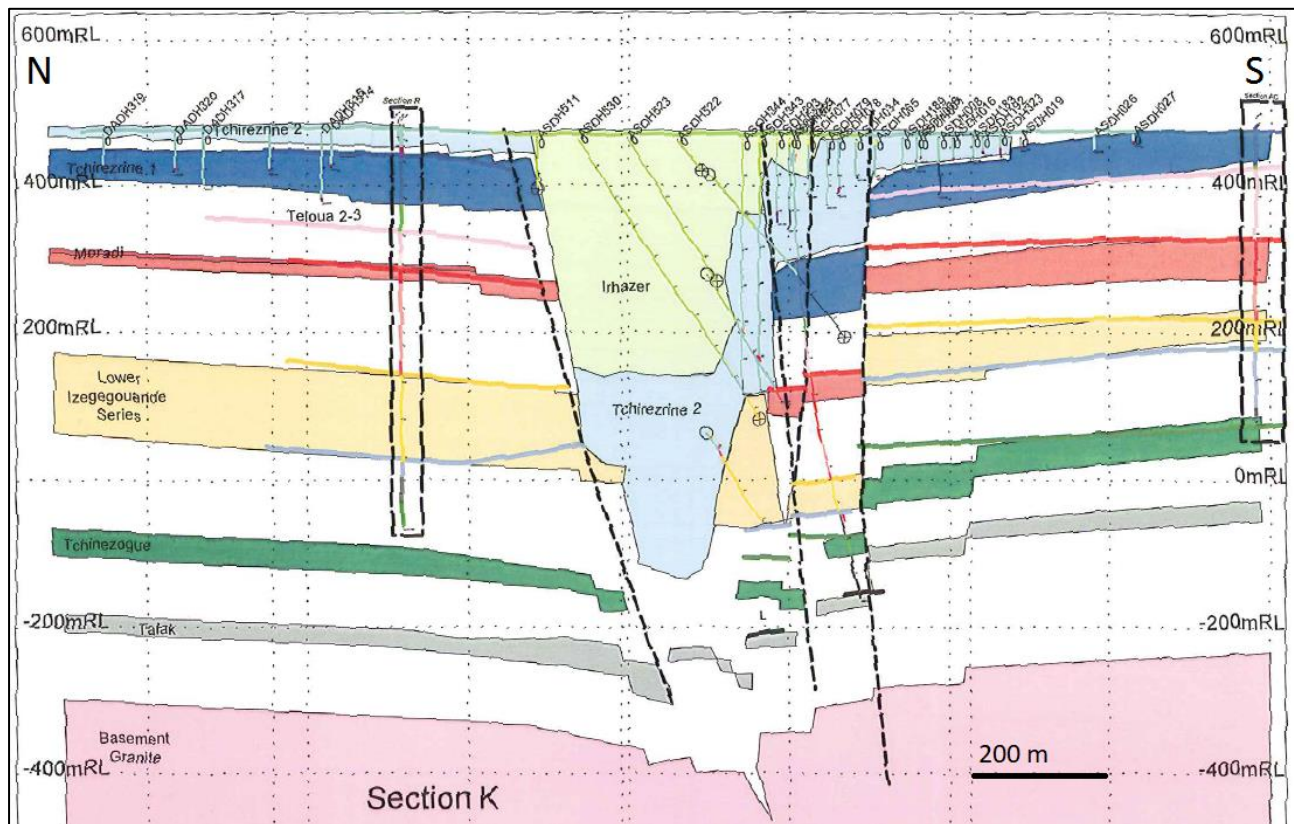


Figure 7-7: DASA schematic geological section (see red section line on Figure 7-6)
Source: GAFC

Subsections 7.4.1 to 7.4.10 (below) provide a brief summary of the lithologies of the Project recorded in drilling, surface mapping and geophysical surveys of the Project areas.

7.4.1 Precambrian

Metamorphic Basement is exposed in the Air Mountains to the east. Some of GAFC's drillholes inside the DASA graben terminated in altered and in fresh granite. Its position within the basement suites is unknown at this time.

7.4.2 Cambro-Ordovician Undifferentiated

Cambrian to Devonian rocks exist in this part of the Tim Mersoï Basin; however, they have not yet been positively identified by GAFC's work. A major discordance near the Air Massifs western boundary separates the basement from conglomerates and tillites of the Timesgueur Formation followed by In Azawa sandstone followed by another major discordance.

7.4.3 Upper Ordovician

The upper Ordovician consists of fine-grained sandstones with quartz pebbles and calcite.

7.4.4 Silurian

The Silurian consists of graptolite schists.

7.4.5 *Devonian*

The Lower Devonian starts with an unconformity followed by conglomerate with pebbles of schists and basalt, Idekel sandstone with silicified wood and is overlain by Middle Devonian Touaret sandstone, fossiliferous beds and the Akara schist. The Devonian is completed by Upper Devonian Amesgueuer sandstone.

7.4.6 *Carboniferous*

Carboniferous formations are major host rocks for uranium mineralization particularly in the northern part of the basin. The Carboniferous-Lower Visean begins with fossiliferous marine argillites which are overlain by the clastic terrestrial Terada Series which may reach thicknesses of up to 290 m. The Terada itself is made up of the Teragh Formation consisting of coarse-grained sandstones, which can contain coal beds, and is overlain by the siltstones and sandstones of the Aoulingen Formation. This passes laterally to the north into the marine Talach argillites.

The Carboniferous-Upper Visean continues with the important fluvio-deltaic Tagora Series which hosts uranium in the wider Arlit region of the basin. The Tagora is made up of two cycles:

- The first cycle is the lower Tagora up to 180 m thick – starting with the conglomerates of the Teleflak and continuing into the sandstones making up the Guezouman Formation. This is a major host for uranium mineralization in the Akouta area (Cominak underground mine – Orano) and which is overlain by the siltstones of the Lower Tchinezogue Formation which is a mega-sequence comprised of the whitish sandstones of the Middle and Upper Tchinezogue.
- The second cycle of the Tagora (0–140 m thickness) is often marked with a thin layer of conglomerate overlain by the sandstone of the Tarat Formation with intercalations of siltstone and argillite in an upward fining sequence. The uranium at Arlit (Somair open pit mines – Orano) is hosted in this second cycle. The top of the Carboniferous is completed by sandstones and siltstones of the Madaouela Formation (GOVIX Madaouela project).

The Carboniferous in the whole basin is characterized by reducing conditions displayed in predominantly greyish colours, pyrite and organic matter providing ideal conditions for the precipitation of uranium.

7.4.7 *Permian*

During the Permian, a major change in climatic conditions occurred and this is reflected in the rocks of that period. The Permian sediments are generally characterized by an abundance of arkosic sandstones containing significant volcanic debris. Reddish colours and abundant calcite are dominant for the Permian strata indicating oxidizing conditions. The sedimentation occurred mostly in interwoven channels with frequent and abrupt facies changes. Within the Project area, the thickness of the Permian strata can vary considerably and reach a thickness of some 300 m.

The Lower Izegouandane Series begins with coarse grained sandstones containing pebbles of rhyolite and quartzite. It is overlain by 5–10 m of a red claystone (equivalent to the Teja Formation) and followed by the sandstones of the Tamamaït Formation. Further up in the sequence, the red siltstone of the Moradi Formation is common. The latter two Formations belong to the Upper Izegouande Series.

7.4.8 *Triassic*

Initially, the Triassic shows a continuation of the Permian conditions beginning with the conglomerates of Anou Mellé that contain many pebbles shaped by aeolian actions (windkanter). These are covered by fluvio-deltaic sandstones belonging to the Teloua 1 Formation. This package may reach 60 m in thickness and

belongs to the Aguelal Series. In some areas, the Teloua 1 displays as reworked sediment with well sorted and rounded quartz pebbles reflecting the local paleo topography.

The following sediments of the Goufat Series contain masses of volcanic debris (origin volcanic tuffs?) and are called the Teloua 2 (some 70 m thick). The Teloua 2 appears as distinct poorly sorted sand lenses of the original sedimentation cycle. Analcimolite begins to appear as well. It is followed by the Teloua 3 Formation generally less than 80 m thick consisting of coarse grained to conglomeratic sandstone with frequent rhyolite pebbles. This can be intercalated with analcimolite beds and lenses. These sediments were deposited by very high energy torrential floods. Massive analcimolite intercalated with sandstone layers follows on top as the Mousseden Formation, reflecting a very active eruptive volcanic phase. This formation is generally around 80 m thick but may reach up to 150 m.

7.4.9 *Jurassic*

The Jurassic consists of the Wagadi Series with a thickness of 80–110 m. It commences with the Tchirezrine 1 Formation (Figure 7-8) representing the channel sedimentation of a large river flowing from north to south. Coarse-grained sandstones are intercalated with finer-grained portions or with siltstones containing much analcimolite. Graben synsedimentary tectonics have caused the variations in thickness as known from the drilling. In general, the Tchirezrine 1 is quite similar to the higher following Tchirezrine 2, except that it does not contain uranium mineralization.



Figure 7-8: *Cross-beds in coarse grained to micro-conglomeratic sandstone, Tchirezrine 1 Formation*
Source: GAFC

The top of Tchirezrine 1 is marked by the Abinky Formation (Figure 7-9) below a massive sequence of analcimolite partly silicified or sandy. It is testimony to a period of active volcanism. The formation can be strongly altered and mineralized with copper.



Figure 7-9: *Massive analcimolite, Abinky Formation*
Source: GAFC

The Dabla Series, up to 350 m thick, begins with the Tchirezrine 2 Formation which can reach thicknesses of 40–200 m in some parts. It lies unconformable on the Abinky Formation (Figure 7-10), showing local scouring. It was laid down in a fluvial-deltaic and lacustrine environment. The sediments are mostly coarse-grained sandstones and micro conglomerates with cross bedding at the base and with angular detritus pointing to a short and high energy transport path. This is also documented in local erosion of older sediments. The formation contains Orano’s Imouraren uranium deposit approximately 40 km northwest of the AE3 concession and much of the uranium discovered on the GAFC property. It is the most important target for uranium exploration in this part of Niger.



Figure 7-10: *Tchirezrine 1 sandstone covered in the foreground by analcimolite of the Abinky Formation*
Source: GAFC

In general, the Tchirezrine 2 is comprised of a several upward fining sandstone sequences with massive, poorly sorted sandstone beds at the base of each cycle formation with poor sorting, laid down in a high energy flow regime. each cycle fines upward into fine grained well sorted sandstone with analcimolite on the top and in lenses within the sandstone (Figure 7-11 and Figure 7-12). This sequence is repeated several times. The analcimolites are considered to represent a similar environment and occupy a similar position to the shale in the lower Carboniferous strata. The sandstone generally consists of over 80% quartz, 4–5% feldspar and rock fragments of the Abinky or reworked sandstone.



Figure 7-11: Cross-bed figures in the Tchirezrine 2 unit, northern outcrops at DASA
Source: GAFC



Figure 7-12: North-south structures in sandstone, Tchirezrine 2 unit, eastern outcrops DASA
Source: GAFC

The sandstones are generally poorly cemented. The analcimolite appears in two forms; blue, grey or green within a chloritic matrix or massive brownish in a hematite matrix. The formation was affected by syn-sedimentary tectonics and later shearing. This has contributed to the several hundred metre thickness reported in the drilling. The sediments are rich in organic matter which may include coal beds, providing a favourable environment for uranium precipitation.

7.4.10 Cretaceous

The Cretaceous starts with the Assaouas Formation (Figure 7-13), a transition facies to the more argillitic rocks stratigraphically above. The Assaouas reaches a thickness of up to 30 m and consists of reworked older quartz-rich sediments and is overlain by fine-grained sandstones and argillites.



Figure 7-13: Siltstone outcrop, Assaouas Formation, southern outcrops
Source: GAFC

Overlying the Assaouas Formation is the Irhazer (Figure 7-14), which covers much of the basin and is a testament to a period of little tectonic activity and low erosional regime. It is confined to the Azouza Graben. It represents a lacustrine transgression probably originating in the south or southeast and covers a vast plain affected by subsidence of fine-grained sediments.

Uranium exists here and is being mined at the Abkorun property by China National Uranium Corporation just to the west of the GAFC property.



Figure 7-14: Irhazer Formation, limestone strata within argillite, crosscut by east-west transform faults, north-eastern outcrops

Source: GAFC

The stratigraphic column of the Project area culminates in the sandstones of the Tegama Series which lie with a marked unconformity on the Irhazer sediments. Tegama sandstone is present in two large hills inside the Azouza Graben. The lithology here are sandstones which are cross-bedded and coarse to micro conglomeratic. The formation displays heavy quartz veining related to the faults and fractures bisecting it (Figure 7-15, Figure 7-16).



Figure 7-15: Heavily quartz veined Tegama sandstone; mount inside the Assouza Graben
Source: GAFC



Figure 7-16: Conjugate fracture veined in quartz in coarse cross-bed Tegama sandstone
Source: GAFC

7.5 Structural Geology of the Property

Structural control is important in the formation of most uranium deposits and the DASA deposit is no exception. The arid climate has prepared and well-preserved structural features, many of which can be observed at surface.

The DASA deposit site corresponds to a major structural intersection of the Adrar-Emoles flexure and the Azouza fault which resulted in the doming and creation of the Azouza Graben (Siebenthal, 2013). These are features that characterize other major uranium deposits in the Tim Mersoï Basin.

7.5.1 Adrar Emoles Flexure

The Adrar Emoles flexure-fault, one of the major northeast-southwest structures, intersects the Azouza fault at DASA. This intersection formed a dome, the opening of which created the Azouza Graben (Figure 7-17) moving the Cretaceous formations to the same topographic elevation as the surrounding Jurassic sandstones.



Figure 7-17: Looking southwest, Azouza Graben

Cretaceous Tegama sandstones in the foreground, resting on several hundred meters of Cretaceous Irhazer Formation to the left with Jurassic Tchirezrine 2 sandstone in the background. Displacement is in the order of several hundred metres.

Source: GAFC

7.5.2 Azouza Fault

Major northeast-southwest vertical faults are associated with the Azouza Graben, characterized by significant vertical displacement of several hundred metres.

The creation of the graben preserved the Tegama and Irhazer formations at depth, elsewhere found much farther to the west in the deeper areas of the Tim Mersoï Basin. It also preserved the rocks of the Tchirezrine 2 Formation which are much eroded on the sides of the graben.

This vertical displacement has had a major impact in the continuation of potential host rock geometry and has also provided feeder faults and mineralization traps for mineralizing fluids, as evidenced by veining within the sandstones.

7.5.3 North-Northwest to South-Southeast Faults and Folds

Of key interest are the north-northwest to south-southeast faults observed northwest of the graben. They cut the sandstone formations of the Tchirezrine 2 unit, inducing vertical displacement, with evidence of fluid circulation, enacting localized alteration and copper mineralization in analcimolite formation of the Tchirezrine 2 unit.

7.5.4 *Shearing Fractures and Veins*

Shearing fractures and veins appear in the limestone, particularly of Jurassic age, near the major faults that have a strike-slip component similar to the Azouza and its branches, and the east-west strike-slip faults.

7.5.5 *East-West Strike-Slip Faults*

Within the upper, northern termination of the Azouza Graben and elevated from the surrounding plain, a limestone outcrop of the Irhazer Formation displays strike-slip faults evidence. A closer examination of the satellite imagery reveals a set of roughly east-west oriented structures on both sides of the graben. These are most likely conjugate to the Azouza fault.

7.6 **Uranium Mineralization**

7.6.1 *Regional*

Uranium mineralization in Niger is located in sediments of the Tim Mersoï Basin and occurs in most of the thicker sandstone units described earlier; however, not always in economic concentrations and tonnage. Uranium is known in the Carboniferous Terada series, in the Carboniferous Tarat and Guezouman formations (Arlit mines), in the Permian Izegouande, the Jurassic Tchirezrine 2 Formation (Imouraren, DASA, Azelik deposits) and the Cretaceous Dabla Series as well as in the Tegama Series.

There are three areas in eastern Niger where uranium is presently being mined or could be mined in the near future:

- Arlit-Akokan (Akouta) hosting the Somair open pit and the Cominak underground mines (both mainly owned by Orano) which have produced so far over 110,000 tonnes of uranium since the early 1980s with considerable reserves remaining
- Azelik (Teguida open pit/underground mine) operated by CNNC, 160 km southwest of Arlit (presently not producing)
- Orano's large Imouraren deposit (300,000 tonnes of uranium – Cazoula, 1985) some 80 km south of Arlit and 40 km to the northwest of AE3, where an open pit mine is planned to be developed.

The Qualified Person has been unable to verify the information in the bullet points above and this information is not necessarily indicative of the mineralization on the Property that is the subject of the Technical Report.

The uranium in many of the deposits of the Tim Mersoï Basin is oxidized. Among the primary tetravalent minerals, coffinite is dominant and accompanied by pitchblende and silico titanates of uranium. Uranium hexavalent minerals such as uranophane and meta-tyuyamunite are present in the Imouraren and TGT-Geleli deposits.

The gangue is composed of quartz, feldspar, analcime and often illite, kaolinite and chlorite; with accessories such as some zircon, ilmenite, magnetite, tourmaline, garnet, anatase and leucosene.

The uranium minerals are frequently associated with copper minerals (native copper chalcocite, chalcopyrite, malachite, chrysocolla) and also with iron minerals such as pyrite, hematite and goethite. The organic plant substances are generally plentiful in un-oxidized facies of greyish-greenish colour.

7.6.2 DASA Project

The geometry and the distribution of the uranium mineralization as seen in the DASA drill core is to a large extent comparable with what has been reported from the uranium mines in the Arlit and Imouraren areas outside the Project:

- There is a strong control by stratigraphy and lithology – with mineralization mainly hosted within the Tchirezrine 2 sandstones, particularly in the coarser-grained micro-conglomeratic facies of greyish-greenish colour containing frequent sulphides and organic matter such as plant remains.
- The mineralized lenses are contained within northeast-southwest trending channels. The thickness of the mineralization may vary considerably between drillholes most likely an indication that channel stacking of favourable lithologies has increased the normal thickness of the sediment pile.
- There are strong indications that the mineralization is influenced by a tectonic control along late northeast and southwest faults where some leaching has been observed.
- Uranium mineralization is controlled by zones of oxidation – from surface (ground oxidation) and local/regional horizons at depth (Figure 7-18)
- Groundwater circulation has created over time discontinuities in the mineralization as a result of tectonic movements.

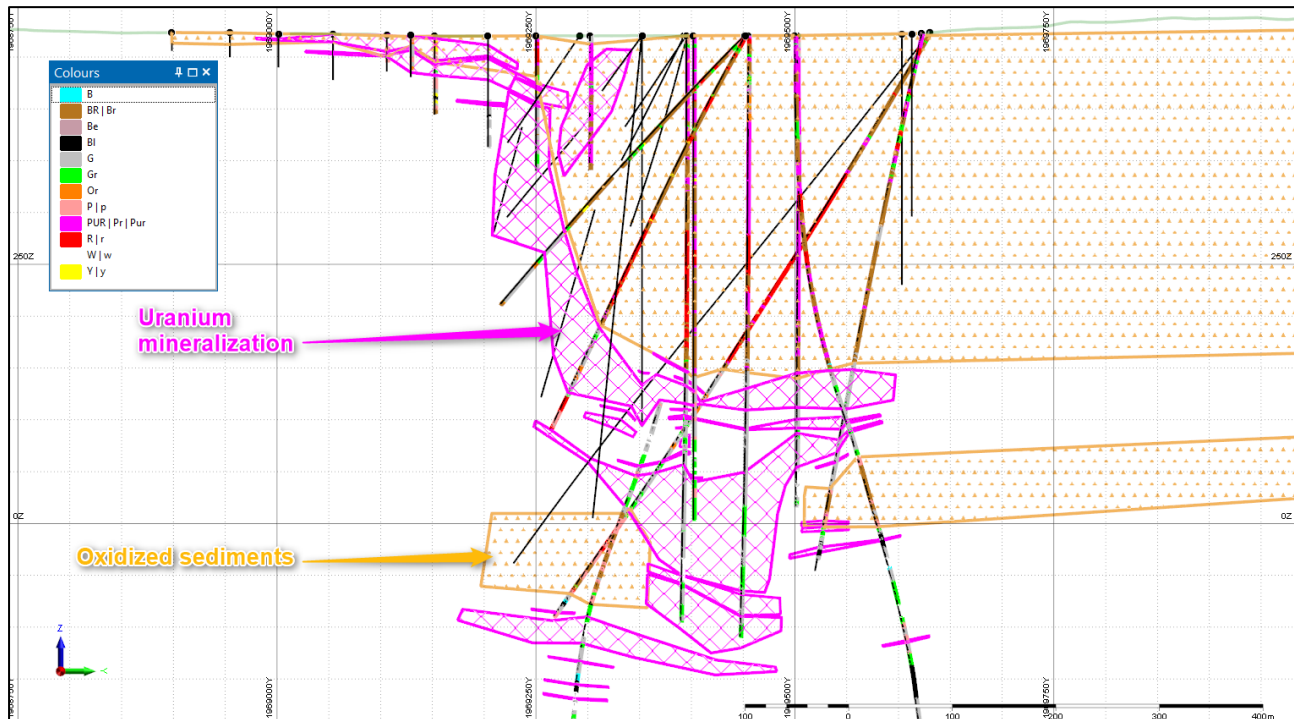


Figure 7-18: DASA Project uranium mineralization controlled by zones of formation of oxidation (Section 360000mE, looking west)
 Source: Pertel (2019)

Thin section work and petrographic studies by Activation Lab (2007) on DASA samples has revealed that the uranium host rocks are sandstone and wacke which are variably oxidized. The main component is angular quartz, some plagioclase and lesser orthoclase. They are cemented by goethite, amorphous iron-hydroxides and various secondary uranium-rich minerals.

The original cement between the grains of quartz and feldspar consisted of sericite and carbonate which were replaced during later stages by goethite and the amorphous iron-hydroxides. The quartz and the feldspar contain micro fractures partly filled with uranium-rich oxide. The latter also rim some of the silicates. Uranophane in form of radiating aggregates forms cement between the silicates and partly replaces them.

GAFC initiated a mineralogical study of the uranium mineralization on its property (Molebale, 2012). Five drill samples and five residue samples were submitted for analysis. The samples were from drillholes ASDH 351, 353, 354(1), 354(2) and one DADH sample. The samples were split into representative portions and polished sections were prepared. Subsamples were pulverized for x-ray diffraction (XRD).

Five uranium-bearing minerals have been identified in DASA samples (Molebale, 2012):

- Carnotite $K_2(UO_2)_2(VO_4)_2 \times 3H_2O$
- Uranophane $Ca(UO_2)_2SiO_3(OH)_2 \times 5H_2O$
- U-rich titanite $(U,Ca,Ce)(Ti,Fe)_2O_6$
- Coffinite $U(SiO_4)_{1-x}(OH)_{4x}$
- Torbernite $Cu(UO_2)_2(PO_4)_2 \times 11H_2O$
- Autunite $Ca(UO_2)_2(PO_4)_2 \times 12H_2O$.

Majority of the mineralization is comprised of carnotite, uranophane and uranium-rich titanite and contribute to most of the uranium in the ASDH samples in terms of mass %, while torbernite is dominant in the DADH sample. The average grain size for the observed uranium-bearing minerals is $\sim 38 \mu m$.

The source of the uranium is very likely leaching of the frequent volcanic tuff and ash blankets and intercalations now altered to analcimolite within the Wagadi and Dabla sediment packages. This has occurred over time in the geological history of the area and probably began as pre-uranium concentrations during the early sedimentation in favourable reducing environments such as organic matter-rich lower flow regimes and in favourable lithologies. The first stratiform mineralized bodies would have been formed during the early diagenesis. Later, structural deformation and ground water movement within coarser grained organic-rich sediments aided by fluid movements and influenced by faults and tectonic activity, initiated roll front like redistribution of the uranium thus giving the mineralized bodies their present shape.

8 Deposit Types

All known uranium occurrences and deposits in Niger are located in sandstones and conglomerates within the Tim Mersoï Basin. They are all classified to belong to the sedimentary tabular, paleo channel and roll-front or sandstone types.

Sandstone-hosted uranium deposits are marked by epigenetic concentrations of uranium in fluvial/lacustrine or deltaic sandstones deposited in fluvial continental environments frequently in the transition areas of higher to lower flow regimes such as along paleo ridges or domes. Roll-front type deposits contain impermeable shale or mudstones often capping or underlying or separating the mineralized sandstones and ensure that fluids move along within the sandstone bodies, thus imitating roll-front systems in Wyoming and Colorado in the western USA.

In the sandstone-type deposits, uranium was typically precipitated from oxidizing fluids by reducing agents such as plant matter, amorphous humate, sulphides, iron minerals and hydrocarbons. The oxidation and reducing facies display typical colours and can assist in exploration target selection. The fluid migrations and deposition of uranium leaves behind a distinct colour change from red hematitic (oxidized) to grey-green (reduced). The primary uranium minerals in most sandstone-type deposits are uraninite, pitchblende, coffinite and some secondaries.

Uranium deposits hosted in sandstone make up some 30% of the world's known uranium resources and contain up to 500,000 tonnes of uranium with average grades between 0.1% U and 0.5% U.

In general, it can be noted that in eastern Niger, from north to south the uranium mineralization seems to occur in younger and younger strata. This is most likely a combination of a change in source areas and delivery of uranium over time as well as the fact that to the south the younger strata are exposed on surface necessitating deeper and deeper drilling in southern areas to explore (e.g. for the Carboniferous-aged targets).

In the DASA deposit, characteristics more consistent with the paleo channel tabular type seem to prevail.

The best uranium grade and tonnage on GAFC's property found to date is hosted in sandstones of the Tchirezrine 2 Formation, the same formation that also contains Orano's large Imouraren deposit, located just 40 km to the northwest of AE3 (300,000 tonnes of uranium; Cazoula, 1985). GAFC's exploration work demonstrates that many of the characteristics of the Imouraren deposit may exist within GAFC's tenure. These include:

- Stratigraphy and sedimentology:
 - Uranium is primarily found in the Tchirezrine 2 Formation, especially in heterogranular sandstones with analcimolite pebbles.
- Palaeogeography:
 - Mineralization is found in the vicinity of the main channel, the formation of which was partly controlled by post- and syn-sedimentary tectonics while the Tchirezrine 2 was laid down.
- Tectonics:
 - Some remobilization of uranium along faults is known along east-northeast directions, which are post Tchirezrine 2 faults.



- Paleohydrology:
 - Groundwater circulation has affected an earlier concentration stage and has dissolved uranium in some parts of the deposit and re-concentrated it in other parts.
- Uranium mineralogy:
 - Contrary to the Carboniferous mineralization in the Arlit area, the uranium in the Tchirezrine 2 appears mainly as uranium hexavalent minerals in an oxidized environment. Uranophane is the most abundant mineral. It may form small aggregates or appear as continuous coating parallel to the stratification.
 - Uranophane is commonly associated with chrysocolla and in small quantity also associated with boltwoodite. Metatyuyamunite has also been found. Some coffinite exists in residual reduced zones along with chalcocite and native copper. Pitchblende was noted in small amounts.

The uranium mineralization occurs in two main types: Interstitial within the sandstones, and massive mineralization associated with sulphides in micro fissures with galena and blende.

Few other minerals have been found, but calcite seems to appear only at the periphery of the mineralized body.

9 Exploration

GAFC acquired the Tin Negouran 1, 2, 3 and 4 exploration permits in January 2007. Exploration work was initiated by resampling material residual from historical PNC exploration activities. This resampling confirmed high uranium values in the material.

In September 2007, the government of the Republic of Niger granted GAFC the AE3 and AE4 permits. Ongoing exploration work and metallurgical studies have confirmed that significant uranium mineralization is located around the DASA area within the AE3 permit. Other uranium occurrences exist within the AE3 and AE4 permits.

GAFC has undertaken exploration and evaluation activities on the DASA Project since 2010. The DASA Project area covers an area measuring approximately 10 km along the strike of the Azouza Graben by about 2 km. However, drilling has only focused on a small portion of this area.

In 2012, drilling efforts were realigned to achieve two goals: expand the Mineral Resource, particularly the deeper higher-grade uranium mineralization, and to understand the geological controls on the distribution of the uranium mineralization.

In 2017–2018, additional drilling was completed mostly in the central part of the deposit. Infill drilling in 2017–2018 targeted the southern Flank Zone of the graben to improve confidence in the geological model in this area. Additional drilling allowed more confident interpretation of that section of the deposit and an upgrading of its classification.

9.1 Data Compilation and Old Drillhole Locations

In 2008, GAFC started data compilation to physically locate historical drillholes, mainly from the previous operations of the Japanese company, PNC. This work was successful at locating many holes at the Azouza North East prospect (holes G030, G094, G097, G130...) and the Dajy prospect (G120 to G136) located south of the DASA deposit. Only peak radiometric value records were available (Table 9-1).

Table 9-1: PNC significant drillholes

Hole ID	Location X (UTM WGS84/32N)	Location Y (UTM WGS84/32N)	Peak radiometric value (c/s)	Depth (m)	Prospect	Location
G030	366591	1973277	6,600	174	Azouza North East	Northeast of actual DASA deposit
G034	361739	1968205	2,150	438	Dajy	South of actual DASA deposit
G067	361746	1970731	2,000	581.45		Northeast of actual DASA deposit
G094	364216	1971980	5,899	528.3	Azouza North East	Northeast of actual DASA deposit
G096	361165	1969340	4,467	412	Dajy	South of actual DASA deposit
G097	362183	1971953	2,811	474.7	Azouza North East	Northeast of actual DASA deposit
G120	361256	1969305	5,417	428	Dajy	South of actual DASA deposit
G129	362697	1970250	2,360	420.95	Azouza North East	Northeast of actual DASA deposit
G130	365843	1972250	2,327	275.5	Azouza North East	Northeast of actual DASA deposit
G132	361735	1969110	1,547	407.7	Dajy	South of actual DASA deposit
G133	361436	1969235	3,542	428	Dajy	South of actual DASA deposit
G134	361720	1970070	4,461	398	Dajy	South of actual DASA deposit
G135	360889	1969449	5,727	427.7	Dajy	South of actual DASA deposit
G136	360825	1968195	1,000	453	Dajy	South of actual DASA deposit

GAFC's first exploration activities were then concentrated on the above areas, and included:

- Radiometric ground survey
- Geology and structural studies
- Topographic 3D survey
- Drilling.

9.2 Radiometric Ground Survey and Geo-Structural Mapping

GAFC conducted a ground scintillometer survey on DASA area (DASA 1, DASA 2 and DASA 3 prospects) covering about 4 km² using a SAIC Exploranium GR-135 Plus radioisotope identification device. Natural gamma peak value was recorded for each sampling station.

The DASA 1 prospect was covered at a sampling density of 100 m x 100 m; 100 m x 50 m; to 25 m x 25 m locally for a total area of 1.5 km² covered, and 105 points surveyed. The objective was to delineate the surface anomaly of this area's Tchirezrine 2 sandstone.

The DASA 2 prospect was covered at a sampling mesh of 100 m x 100 m; 50 m x 50 m; to 25 m x 25 m locally for a total area of 1.39 km² covered, and 124 points surveyed.

The DASA 3 prospect was covered at a regular sampling mesh of 100 m x 100 m over a total area of 2.4 km²; 13 points were surveyed.

A total of 15 rock samples were collected on the highest radiometric count survey point for assays (Table 9-2).

Table 9-2: First rock samples of DASA area

Rock sample	Location X (UTM WGS84/32N)	Location Y (UTM WGS84/32N)	Peak radiometric value (c/s)	Prospect	Assay sample no.	% U ₃ O ₈	ppm	lb/t
DASA-1-001	360978	1970418	4,218	DASA 1	D1 – 1	0.447	4,470	9.85
DASA-1-002	361078	1970393	4,800	DASA 1	D1 – 2	0.554	5,540	12.21
DASA-1-003	361178	1970368	4,700	DASA 1	D1 – 3	0.025	250	0.55
DASA-1-004	361178	1970343	3,850	DASA 1	D1 – 4	1.92	19,200	42.32
DASA-1-005	361203	1970368	65,535	DASA 1	D1 – 5	24.3	243,000	535.57
DASA-2-001	360440	1970280	57,200	DASA 2	D2 – 1	1.43	14,300	31.52
DASA-2-002	360415	1970280	3,617	DASA 2	D2 – 2	0.042	420	0.93
DASA-2-003	360465	1970280	21,542	DASA 2	D2 – 3	0.056	560	1.23
DASA-2-004	360490	1970280	3,434	DASA 2	D2 – 4	0.01	100	0.22
DASA-2-005	360515	1970255	3,870	DASA 2	D2 – 5	0.013	130	0.28
DASA-3-001	360360	1969241	1,500	DASA 3	D3 – 1	0.028	280	0.62
DASA-3-002	360160	1969110	1,800	DASA 3	D3 – 2	0.008	80	0.18
DASA-3-003	360060	1969080	1,800	DASA 3	D3 – 3	0.012	120	0.26
DASA-3-004	359964	1969031	33,000	DASA 3	D3 – 4	0.836	8,360	18.43
DASA-3-005	359848	1968998	1,720	DASA 3	D3 – 5	0.003	30	0.07

The highest radiometric peak survey points were designated to be the first drill points in the year 2010 (Figure 9-1).

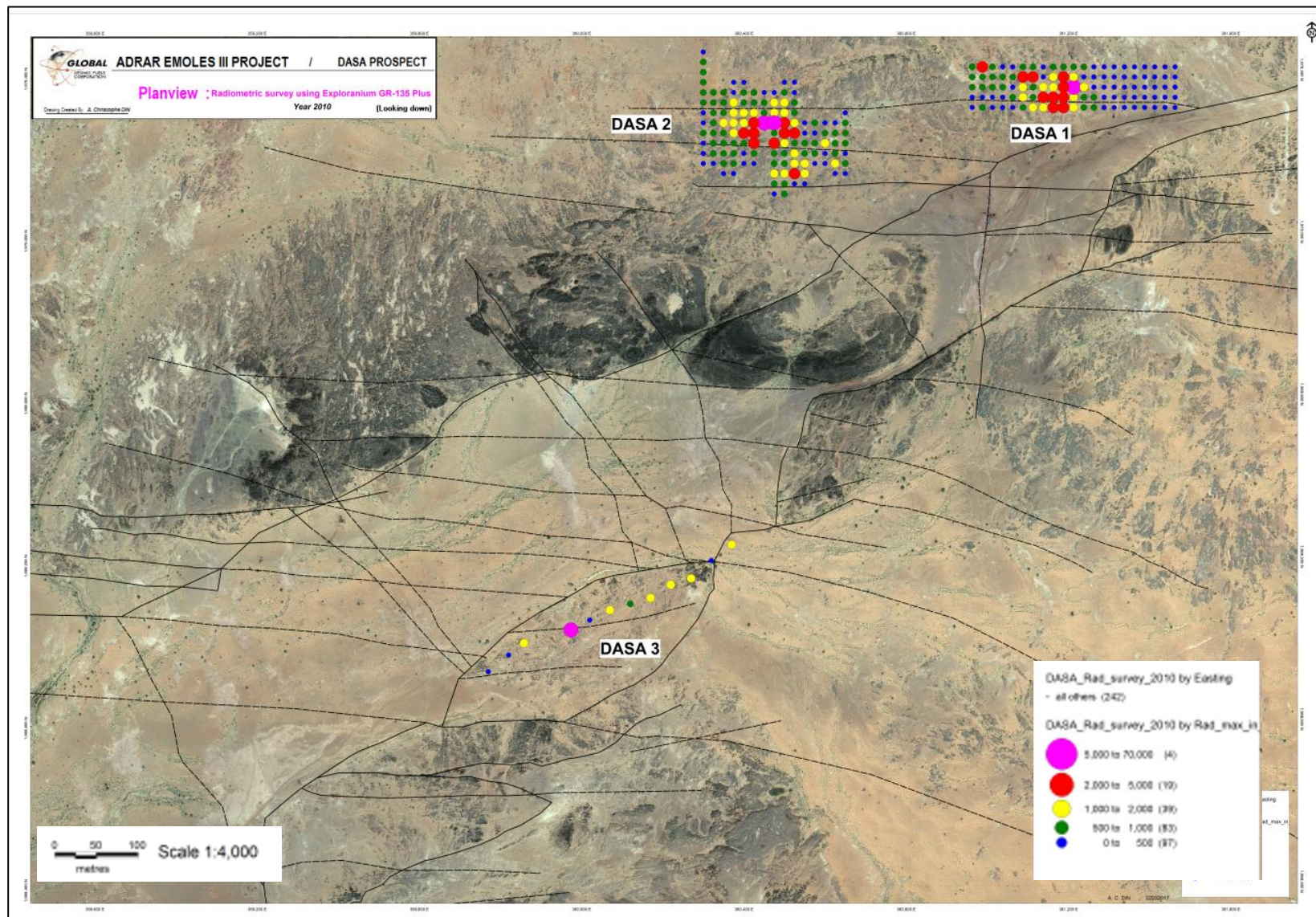


Figure 9-1: Radiometric sampling points at the DASA Project, AE3 Concession
 Source: GAFC internal report

Following this survey, Dr Leslie Wright from NewMines Management Services Ltd was hired to complete a study of the mineral potential of the concession. Dr Wright conducted an interpretation of the tectonic structures, their age and influence in the control of the uranium mineralization using the initial radiometric survey results and the earlier drilling results as mineralization evidence.

The study took place during May 2010, concluding that the DASA area was affected by a main N010 fault system crosscut by the N075 (Azouza fault). The intersection of the first N010 and N075 with the N090-110 structures appear to be key to creating higher grades which are strongly focused at the location of the prospect but are concentrated also at two areas to the south in this area and pretty much along the line of the main north-south UTM grid coordinate. DASA 1 and DASA 2 prospects are affected by a rotated continuation of the 120° trending faults axial planar to the dome structure which hosts the mineralization. DASA 3 shows a slightly different picture in terms of the definition of targets, with the fold/fault repetition of the mineralized layer appearing likely with the structure being faulted by a 160° trending fault set.

The 010° fault in the east of the DASA 3 area is only marginally deformed but the rotational interaction between the N045 (Adrar Emoles regional fault) and N010 in the middle of the prospect area creates a compressional environment which may focus mineral deposition.

9.3 Topographic Survey

In order to better define the topographic level of the DASA area, GAFC hired Terrascan airborne for the LiDAR survey and aerial photography totalling approximately 120 km². The detailed aerial survey was conducted in December 2013 by CK Aerial Surveys (CKAS) appointed as a sub-consultant on behalf of Terrascan airborne. The survey was conducted from a fixed-wing platform and consisted of three-dimensional (3D) laser scanning (LiDAR) and high-resolution aerial photography.

9.3.1 Ground Control

Ground control points were surveyed throughout the site using survey grade global positioning system (GPS) receivers. The surveying was done by means of baseline post-processing. All surveyed baselines had resolved integer ambiguities and therefore none of the surveyed baselines were rejected.

9.3.2 Aerial Survey

Following is a summary of the aerial data capture dates and equipment:

The survey was done on 31 December 2013 using Diamond DA42 MPP Aircraft equipped with a Leica ALS50-II Laser scanner and a 39-megapixel Leica RCD105, 60 mm lens Camera.

During the execution of the aerial survey, a GPS base station was operated in order to enable accurate differential processing of the aircraft trajectories. In addition to the position of the aircraft being determined along the flight trajectory, its orientation angles were determined at every point along the trajectory through the use of a state-of-the-art inertial measurement unit (IMU). Using the orientations and GPS-based positions of the aircraft, an accurate point cloud was generated from the continuous laser scanning and aerial photographs were also captured throughout the flight. The laser scanning data was fitted onto the ground control survey. Thereafter, the points were thinned to only include ground points in order to generate a digital terrain model (DTM).

The pixels from each individual photograph were projected onto the DTM to create rectified photos. Corresponding pixels on overlapping photographs were identified as so-called tie-points. The ground control points were also added as tie-points on the photos and the image orientations were adjusted by means of a



statistical least-squares adjustment in order to fit onto ground control and each other. Finally, the individual photos were adjusted to match seamlessly onto each other to form an orthophoto mosaic.

The final DTM is used as the topographic surface on which all the drillhole collars are now pressed to get the homogenized elevation (Z).

10 Drilling

10.1 Geological Exploratory Drilling

GAFC started drilling on the AE3 property in 2010. To date, 1,029 holes (Figure 10-1) including 873 rotary holes and 156 diamond drillholes were drilled for total of about 146,100 m on the Project area delineating the DASA deposit. Drilling of these holes were executed by local drilling companies including TIDIT, ENYSA, ESAFOR, LEGENI (owned and managed by Nigerians), ULC a small French geo-consulting company, and finally the West African branch of the French drilling company, FORACO. The drilling with detailed statistics is summarized in Table 10-1.

2010–2011 drilling was concentrated on the DASA surface anomalies with drill depths less than 300 m and mostly drilled by rotary (Table 10-1). These led to the discovery of the surface mineralization of DASA 1, DASA 2 and DASA 3 hosted in Tchirezrine 2 sandstone.

Table 10-1: GAFC DASA Project drilling statistics

Year	Rotary drillholes		Diamond drillholes		Total	
	Holes	m	Holes	m	Holes	m
2010	46	1,142	3	437	49	1,579
2011	607	38,381	18	986	625	39,367
2012	197	36,504	41	6,251	238	42,755
2013	17	10,734	28	16,621	45	27,355
2014	0	0	12	8,064	12	8,064
2015	0	0	1	501	1	501
2017–2018	6	3,632	53	22,846	59	26,479
Total	873	90,393	156	55,706	1,029	146,100

In 2012, a deeper drilling campaign (up to 754 m depth) below 350 m of Irhazer mudstone targeted the Triassic-Jurassic sandstones (Tchirezrine 2 which hosts Orano’s Imouraren deposit, and the Teloua formations) and even deeper, the Carboniferous formations hosting the Orano Cominak and Somair deposits at Arlit. During this program, the main Graben deposit was discovered at DASA. Figure 10-1 shows the drillhole locations.

Drilling during 2013 to 2015 focused on exploration of the central part of the deposit where the Graben Zone was discovered with high uranium grades.

In 2017–2018, GAFC drilled 59 holes in a combination of diamond (DD), rotary destructive (RD) and rotary destructive with diamond tails (RD + DD). The drilling targeted mineralization in the Flank Zone on the southern side of the graben structure at depths of less than 350 m and also extensions of mineralization to the northeast, southwest, and at depth, for a total of 26,479 m. The average drilling depth was 415 m.

The 2010 to 2018 drill programs at the DASA deposit have enabled GAFC’s geologic interpretation of the deposit and permitted the estimation of Mineral Resources within five major zones (Figure 10-2 and Figure 10-3):

- DASA 1, DASA 2 and DASA 3 zones – hosted in Tchirezrine 2 Formation rocks
- Graben Zone – hosted in Tchirezrine 2 Formation/Carboniferous rocks
- Flank Zone – (south side of graben structure) – hosted in Tchirezrine 2 Formation rocks.

The 2017–2018 drill program also identified five distinct areas of new mineralization which were incorporated into the 2019 MRE (Section 14 of this Report) and will continue to be followed up by future drill programs:

- Northeast Extension Zone – (extension of the Graben Zone) – hosted in Tchirezrine 2 Formation rocks
- Southwest Extension Zone 1 – hosted in Teloua Formation rocks
- Southwest Extension Zone 2 – hosted in Tchirezrine 2 Formation rocks
- Tegama Hill Main Zone – hosted in Carboniferous rocks
- Tegama Hill South Zone – hosted in Carboniferous rocks.

Selected mineralized drill intervals from these new zones are presented in Table 10-2.

Table 10-2: Select mineralized drill intervals from new DASA deposit zones

Zone	Hole	From (m) – To (m)	Length (m)	Grade (ppm/% eU ₃ O ₈)
Southwest Extension Zones 1 and 2	ASDH 556G	704.4 – 752.2	47.8	1,806
	including	704.8 – 706.2	1.4	13,511 (1.4%)
	ASDH 558	404.6 – 414.1	9.4	19,933 (2.0%)
	including	406.1 – 409.4	3.3	54,101 (5.4%)
	ASDH 574E	490.1 – 576.0	85.9	1,737
	including	497.7 – 576.0	3.6	5,597
	including	511.5 – 517.2	5.7	4,484
	ASDH 578F	717.0 – 768.7	51.7	2,425
	including	718.8 – 721.5	2.7	7,756
	including	731.7 – 734.5	2.8	5,536
	including	765.2 – 768.4	3.2	11,867 (1.4%)
	including	765.7 – 768.3	2.6	15,308 (1.5%)
Tegama Hill South Zone	ASDH 578G	786.7 – 799.4	11.8	1,478
	ASDH 559B	451.1 – 459.3	8.2	4,820
	including	453.2 – 455.1	1.9	20,538 (2.1%)
	ASDH 559I	661.0 – 677.2	16.2	2,098
	including	664.9 – 667.0	2.1	13,286 (1.3%)
Tegama Hill Main Zone	ASDH 577E	521.2 – 591.0	69.8	3,353
	including	552.9 – 557.5	4.6	38,653 (3.8%)
	DADH 388C	494.2 – 561.0	66.8	1,228
	including	511.7 – 513.4	1.6	8,380
	DADH 389D	492.1 – 589.1	97.0	2,348
	including	498.7 – 500.3	1.6	12,752 (1.3)
	including	543.2 – 544.3	1.1	21,285 (2.1%)
	including	546.3 – 550.0	3.7	13,875 (1.4%)
	including	585.2 – 587.6	2.4	8,465
	DADH 390A	420.6 – 437.5	16.9	1,175
	including	431.1 – 433.9	2.8	5,348
DADH 390B	505.6 – 525.3	19.7	1,017	
including	513.6 – 516.2	2.6	2,576	
DADH 390C	529.6 – 547.7	18.1	848	
including	539.4 – 541.4	2.0	2,393	
including	543.3 – 544.8	1.5	2,018	
Northeast Extension Zone	DADH 379C	430.5 – 435.5	5.0	1,454
	DADH 381 C	359.0 – 378.0	19.0	1,010
	including	360.5 – 363.5	3.0	1,863
	including	368.0 – 369.0	1.0	2,455

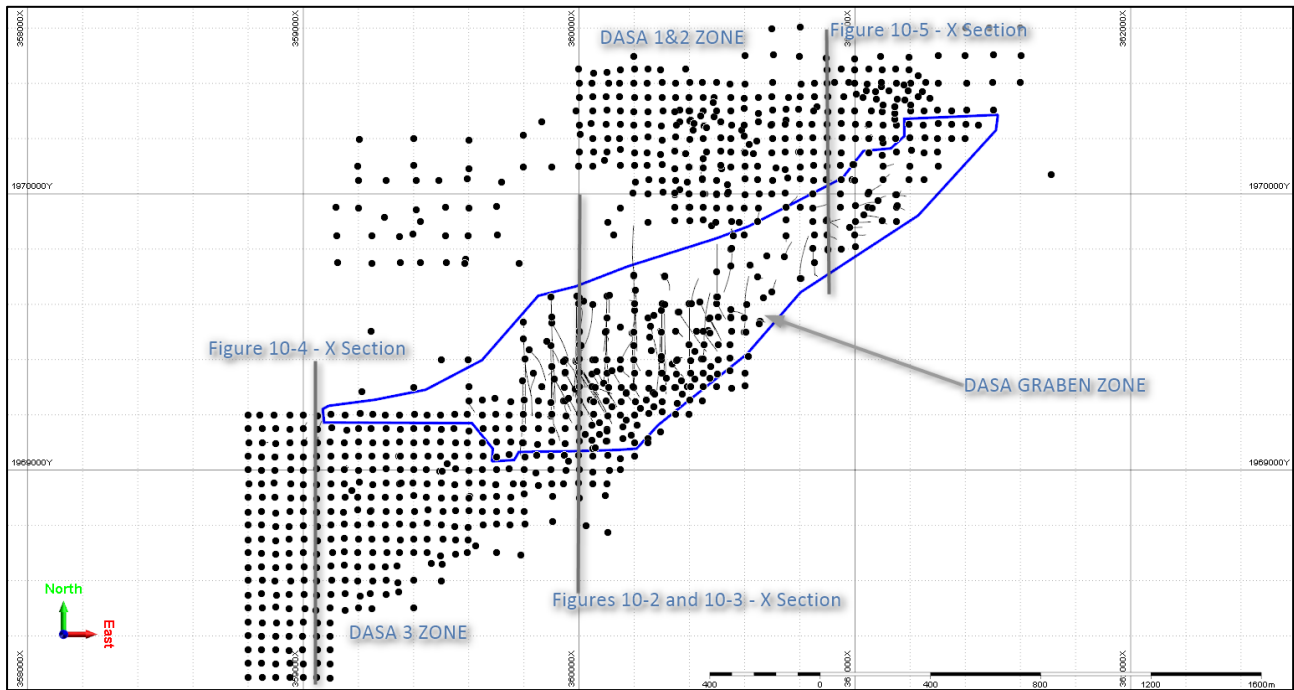


Figure 10-1: DASA drillholes location map
 Source: Pertel (2019)

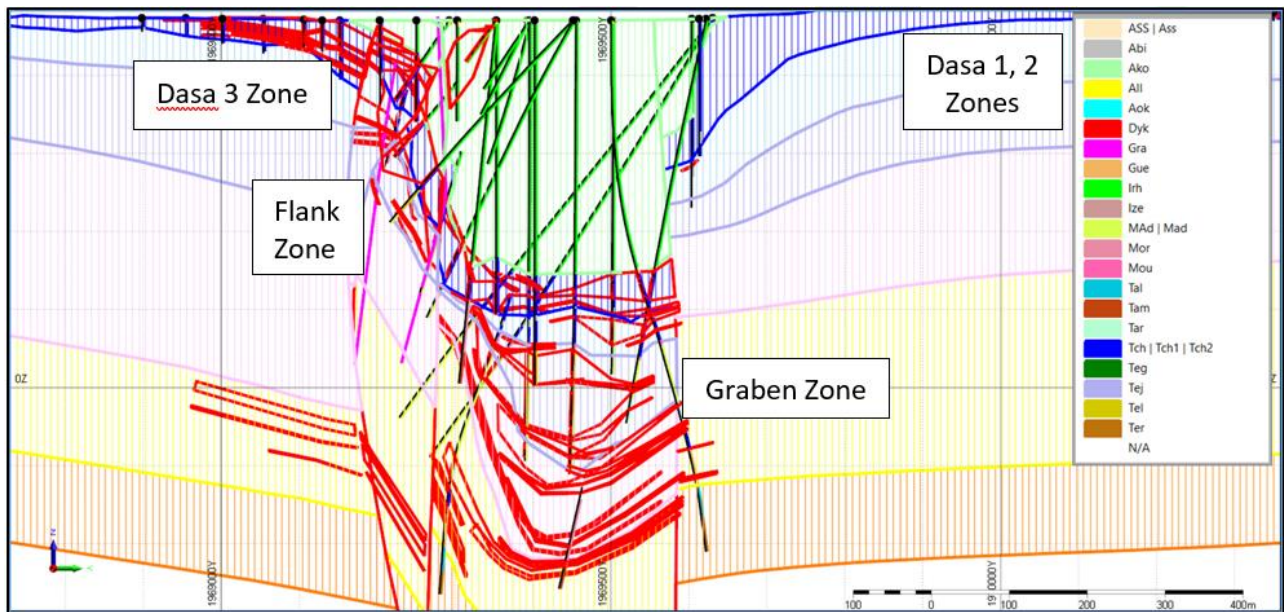


Figure 10-2: DASA Project schematic drill section – geology (Section 360000mE, looking west – see Figure 10-1)
 Source: Pertel (2019)

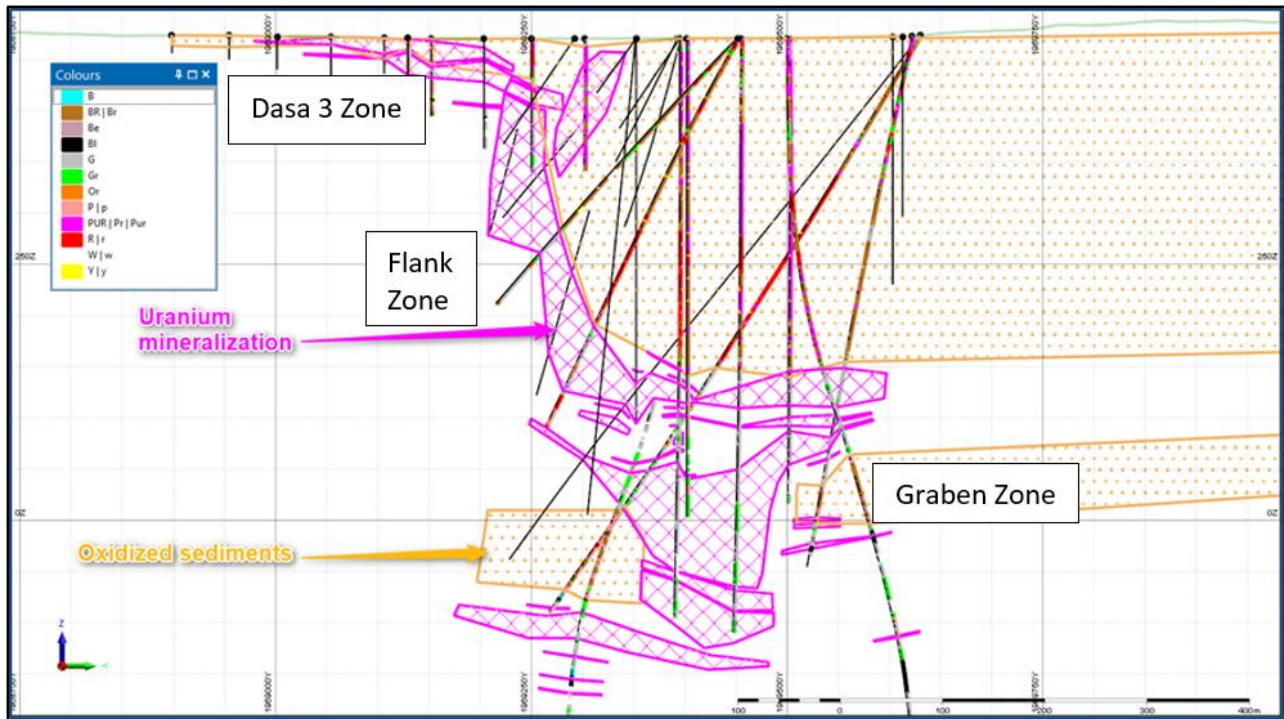


Figure 10-3: DASA Project schematic drill section – uranium mineralization controlled by zones of formation of oxidation (Section 360000mE, looking west – see Figure 10-1)
 Source: Pertel (2019)

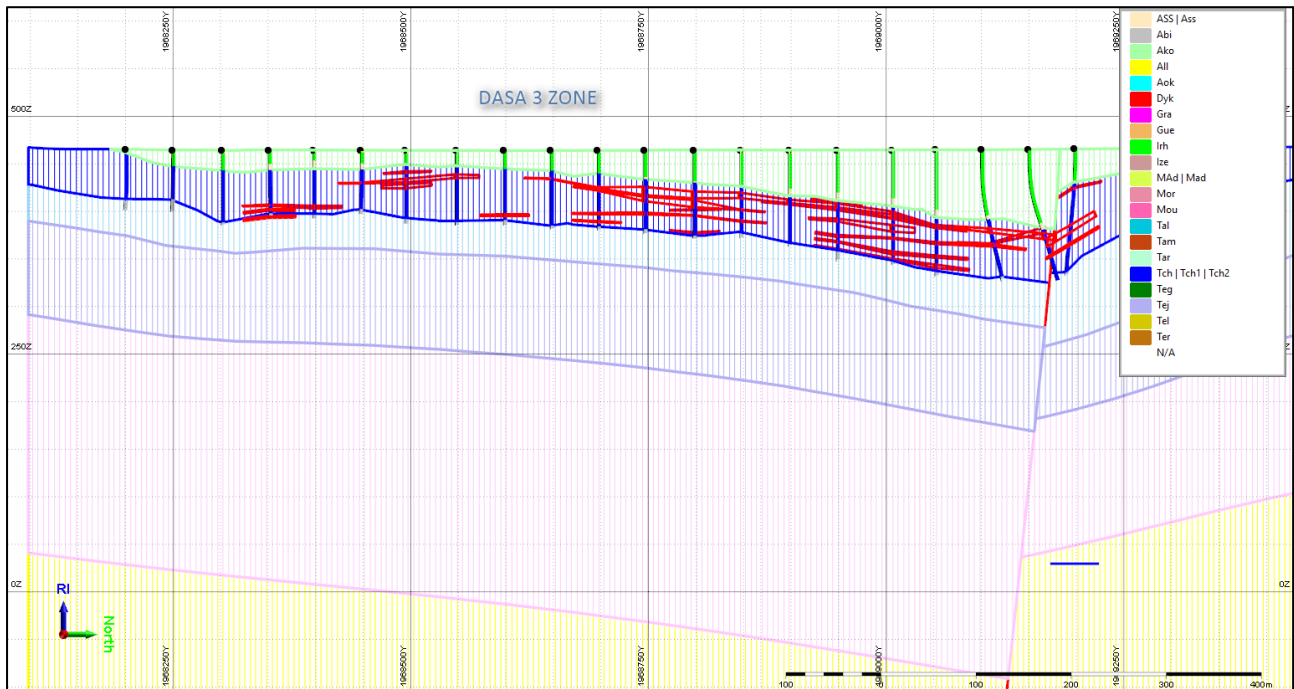


Figure 10-4: DASA Project schematic drill section – geology (Section 359000mE, looking west – see Figure 10-1)
 Source: Pertel (2019)

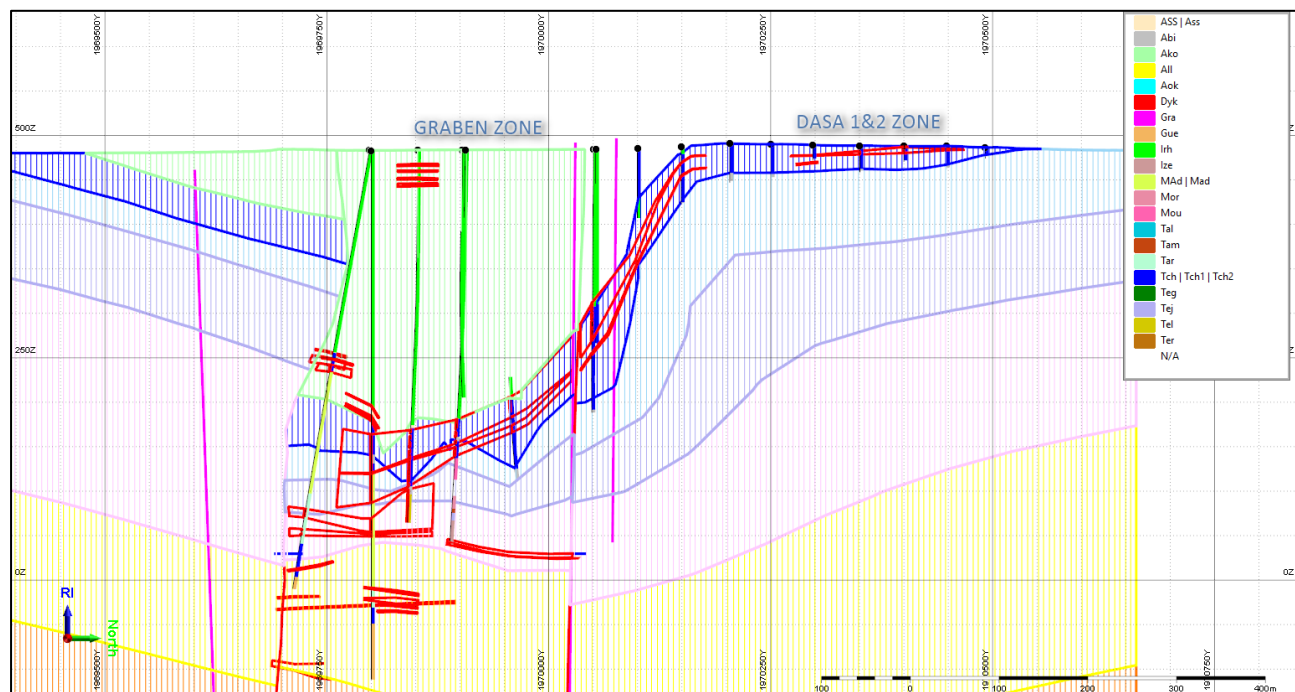


Figure 10-5: DASA Project schematic drill section – geology (Section 360900mE, looking west – see Figure 10-1)
Source: Pertel (2019)

10.1.1 Drilling Procedures

The drilling process through to the sampling is guided by the GAFC procedures validated by the author and Qualified Person. The drill programs were designed by GAFC staff in Toronto and implemented by the GAFC Exploration Manager based in Niger with the contribution of the Niger exploration team.

The planned holes locations were pegged by a surveying crew using appropriate surveying tools (Leica DGPS when available or simple GPS). The geologist in charge of drilling checks the hole location before the drilling commences. A subset of the drillholes collars was verified by the author and Qualified Person during the site visit and were found in the appropriate locations.

Each new drill setup on a hole requires a geologist to be present. The geologist checks the rig settings: azimuth and dip of the mast before leaving the drill monitoring technician to follow up on the drilling.

10.1.2 Drilling Monitoring

All drilling is monitored by a GAFC technician or geologist recording the drill time of each rod and any technical issue that may occur during the drilling.

During diamond drilling, a GAFC geologist supervises the drilling being physically present on drilling site.

Rotary Drilling

On a rotary drill rig, the rock chips come out with the mud. The drill company workers collect the drill chips from the drill pipe at the hole collar every metre and arranges them in individual piles for the lithological logging. Since 2014, a selection of the chips of each 1 m run are washed and put in the chip tray for further description and archived in the core shed at the GAFC base camp.

Each 1 m run is tested with the handheld radiometric scanner by GAFC workers. The depth and the radiometric counts are recorded. For earlier holes, these records were not always kept for further depth

corrections (lithology versus gamma probe depth). Comments are recorded on recovery and suspected contamination.

Diamond Drilling

For diamond drilling, it is GAFC procedure to have a geologist physically present for the drill supervision with at least one technician. For each run, the GAFC technician collects the core from the drillers. The core is cleaned and laid down in the core box on which the technician has prior written the hole ID and box number. Cores are arranged as they would be in situ. A wooden or plastic block is placed at the end of each run, recording the depth. The recovered core is measured to state the recovery percentage. Any detected core loss is recorded and marked with a tag indicating the length of core loss. The core depth is then marked on the core at 1 m intervals.

When an orientation survey is done, the core is marked by the geologist using a solid line with arrows pointing downhole as orientation survey marks. When the core orientation is not reliable, the core is marked using a broken line with arrows pointing downhole. All diamond drillholes from 2012 were oriented using an ACT II Reflex tool when ground conditions allowed it.

Each core run is scanned using a Thermo Scientific RADEye PRD-ER to record the radiometric response in counts per second (c/s). Measurements are taken at 10 cm intervals for 5–10 seconds duration. The exposure time can vary up to 10 seconds when the count rate is over 200 c/s.

The core is collected daily and transported to the core storage facility for detailed geological logging. The core is photographed (Figure 10-6) at the dedicated core photography facility.



Figure 10-6: Diamond core photograph example
Source: GAFC

10.2 Downhole Survey

During an investigation of uranium projects, the following list of downhole geophysical surveys are commonly used to help refine the geology of the deposit:

- Gamma-ray logging (GR);

- Electrical methods (resistivity logging (RL) and spontaneous polarization (SP) logging);
- Directional survey (DS);
- Calliper logging (CL);
- Prompt fission neutron logging (PFN).

During exploration and evaluation, GAFC has used some of these methods; the results and methods are discussed in the following sections.

10.2.1 Gamma-Ray Logging

GR was done routinely in the open hole conditions. In most holes (rotary or diamond core), the holes were filled with water or mud. In areas of problematic ground conditions, the logging was done inside the drill string or casing. It is very important that this method is done routinely and with precision with strong QAQC procedures, as it is used to derive the equivalent uranium oxide (eU_3O_8) values used in Mineral Resource estimation.

Several probes were used on the Project for the gamma logging. The parameters of each used before 2017 are summarized in Table 10-3. Five probes were used in the 2017–2018 program: UEP1805, DGGG1307, DGGG1734, DIL801 and DIL1125.

Holes DADH-081 and DADH-011 were used as calibration holes. Each hole was logged once a week to calibrate the gamma tool. In 2018, two deeper and high grade holes (ASDH264 and ASDH126B) were tested and validated with Orano master probes thus providing additional standard holes to honour the high grades now intersected.

The majority (97%) of downhole logs were interpreted in Germany by Terratec Geophysics Services; the remaining 3% of holes were interpreted by Semm Logging in France. The logging companies were based at the GAFC base camp and all logging was started within 30–60 minutes of completion of the drillhole. Terratec Geophysics, Semm Logging and their employees are independent from GAFC.

Table 10-3: Gamma-ray probes parameters

Probe ID	Probe K factor (U)	Probe diameter (mm)	Mud shielding factor (mm-1)	Probe dead-time (s)	Casing shielding factor (mm-1)	Probe length (mm)	CRISTAL reference
DIL38 #1125	0.1305	38	0.0047	0.000004	0.043	2,120	1" x 2" NaI crystal
DIL38 #1126	0.1305	38	0.0047	0.000004	0.043	2,120	1" x 2" NaI crystal
DIL38 #1250	0.1362	38	0.0047	0.000004	0.043	2,120	1" x 2" NaI crystal
DIL38 #80	0.126	39	0.0047	0.000004	0.043	2,120	1" x 2" NaI crystal
BDVG #735	0.1119	42	0.0047	0.000004	0.043	140	1" x 2" NaI crystal
DGGG1307, PM	0.8089	42	0.0047	0.000004	0.043	150	2 cm x 5 cm NaI
DGGG1304, PM	0.8089	42	0.0047	0.000004	0.043	150	2 cm x 5 cm NaI
DGGG9354, PM	0.8089	42	0.0047	0.000004	0.043	150	2 cm x 5 cm NaI

Prior to 2014, a logging protocol was not clearly defined. Based on investigation by CSA Global, most work comprised dual induction and gamma log measurements (DIL). The logging speed has been estimated at 3 m to 4 m per minute, which was deduced from the time spent on hole logging. Sampling intervals varied from 0.01 m; 0.05 m or 0.1 m.

Starting in 2014, Terratec geophysical services used the following logging methods:



- Dual induction and gamma log measurements of the rock conductivity; total count gamma was used for the determination of the equivalent radiometric grades of eU_3O_8 .
- Combination tool including verticality/focused electric resistivity/Natural Gamma (DGGG).
- The first measurement run was performed inside the fully cased borehole or drill string with the DGGG or DIL probe with an approximate logging speed of 4–6 m/min and a sampling rate of 0.1 m.
- After the rods were removed, the drillhole was filled with water and relogged using the Combined Verticality/Focused Electric Resistivity/Gamma Probe (as long as the drillhole was still open). The measurement speed of approximately 5 m/min was used in unmineralized intervals at a sampling rate of 0.1 m. Within the mineralized zones, the logging speed was decreased to approximately 1.5 m/min. One metre beneath the mineralized zones the logging speed would be increased again to 5 m/min.

Calculated eU_3O_8 was determined by GAFC consultants taking into account a steel correction factor when the logging was completed inside the casing or drill rods. A report in *.LAS format was sent to GAFC including the radiometric survey and the calculated eU_3O_8 .

For quality control and calibration control, the calibration holes were tested at least twice a month and always just before probing a new drillhole. Records are kept by the contractor and delivered to GAFC.

Terratec has indicated that all probes used on the Project were properly calibrated to a defined U-Standard. One calibration U-Standard used was located in Saskatoon-Saskatchewan/Canada and the second one was in Straz Pod Ralskem/Czech Republic. The September 2013 calibration report from Terratec returned good results and the calibration was performed at the Saskatchewan Research Council Uranium Test Pits in Canada.

CSA Global also received calibration certificates for the logging tools used for work completed in 2017–2018. These were tested at Orano’s calibration facilities at Bessines, France and also at Arlit, Niger. The calibrations for the instruments used were performing within specifications prior to commencing the work on site. The author reviewed the calibration results and was satisfied.

CSA Global believes that the applied GR procedures were correct and industry standard.

More detailed discussion about eU_3O_8 and Radioactive Equilibrium Factor (REF) is provided in Section 11.

10.2.2 Radiometric Determination

The basic analysis that supports the uranium grade reported in the DASA database of uranium grades and thickness of drill intercepts is the downhole gamma log created by the downhole radiometric probe. That data is gathered as digital data and composited to 10 cm data as the radiometric probe is extracted from a drillhole.

The downhole radiometric probe measures total gamma radiation from all-natural sources, including potassium (K) and thorium (Th) in addition to uranium-bearing minerals. In most uranium deposits, K and Th provide a minimal component to the total radioactivity, measured by the instrument as counts per second (c/s). At the DASA Project, the uranium content is high enough that the component of natural radiation that is contributed by K from feldspars in sandstone, and minor Th minerals is expected to be negligible. The conversion of c/s to equivalent uranium concentrations is therefore considered a reasonable representation of the in-situ uranium grade. Thus, determined equivalent uranium analyses are typically expressed as parts per million (ppm) eU_3O_8 (“e” for equivalent) and should not be confused with U determination by standard x-ray fluorescence (XRF) or inductively coupled plasma (ICP) analytical procedures. The conversion process can involve one or more data corrections; therefore, the process used for DASA is described here.



The gamma probes are either 42 mm (Geiger Muller [GM]) or 38 mm (DIL) in diameter and both about 1.5 m in length. The GM probe has a standard sodium iodide (NaI) crystal that is common to both handheld and downhole gamma scintillation counters. GAFC constructed GM probes include the scintillation counter and the GM, both of which function similarly to count natural radiometric emanation from uranium and its daughter products (the uranium decay series). GAFC initially used only PM DIL probe readings for uranium grade determinations. However, due to the high uranium grades encountered in this program, GAFC also used a GM probe which is considered more reliable at higher grades.

The logging system consists of the winch mechanism (which controls the movement of the probe in and out of the hole) and the digital data collection device (which interfaces with a portable computer and collects the radiometric data as CPS at defined intervals in the hole). Radiometric readings are collected digitally into WellCad software for correlation with geology and resistivity. Subsequently, data are transferred to Utime software for conversion to eU grade data (G), along with thickness (T), and accumulation (GT; Grade-thickness product).

Raw data can be viewed and plotted graphically from WellCad software, to provide a graphic downhole plot of CPS. The CPS radiometric data may need corrections prior to conversion to eU or eU_3O_8 data. Those corrections include: accounting for water in the hole (water factor) which depresses the gamma response, hole diameter variations, the instrumentation lag time in counting (dead-time factor), and corrections for reduced signatures when the readings are taken inside casing (steel-casing factor). The water factor and casing factor account for the reduction in CPS that the probe reads while in water or inside casing, as the probes are typically calibrated for use in air-filled drillholes without casing. Water factor, and dead-time factor corrections are made to the data at DASA; all instances of radiometric determination of eU_3O_8 mineralization in core holes are from inside casing at DASA.

Conversion of CPS to eU or eU_3O_8 was done by calibration of the probe against a source of known uranium (and thorium) concentration. Conversion was also done by determining the relationship of core to radiometric data for a set of core-hole sample intercepts and developing a correlation curve.

The procedure used by GAFC at DASA is to convert CPS per anomalous interval using a correlation curve developed by comparing core intervals with gamma-log intervals for the core hole intervals of 36 holes drilled at DASA. The process involved repositioning the core pieces for the whole-core interval of mineralization and determining the contacts and peak radiometric reading with a handheld scintillometer on the core. This is then matched with the radiometric curve developed from a downhole plot of CPS. The core was cut and analyzed for uranium content for the same interval as the radiometric interval. A best-fit line defines the relationship of GT as follows:

$$GT_{core} = U_{core} \times T_{core} = Factor(CPS \times T_{probe}) = GT_{probe}$$

The same can be done on composited grade (U%) versus (CPS) at a given composite interval for each; the relationships have been found to be like that for GT. The factor is then used to convert CPS to eU grade as parts per million stated as either ppm U or kg/t (%) U. Database conversions are to U rather than U_3O_8 ; however, resource tabulations are converted to U_3O_8 as the international standard for which uranium is reported and sold.

Melabar Geoconsulting has found that the coefficient of correlation between the chemical grades and 10 m calculated grade composites is 0.755, with a 2-sigma precision on the mean of 5.8%; a relatively close clustering of data along a linear relationship.

Melabar Geoconsulting provided CSA Global with detailed report describing the details of the uranium equivalent grades calculation based on GR results. The report was reviewed by CSA Global, and it was

concluded that the applied methodology of eU_3O_8 calculation is acceptable for Mineral Resource estimation purposes.

10.2.3 Downhole Survey

Prior to 2012, GAFC was drilling shallow vertical holes, and no deviation surveys were completed. Since 2012, all the holes drilled, especially in the graben area, were systematically measured for deviation (if the hole remained open).

Both Terratec and SemmLogging recorded the azimuth and the dip of the drillhole at the same time as gamma logging using a combination tool.

GAFC also owns a Ranger Explorer Mark II wireless magnetic multi-functional survey system that was used to measure azimuth and inclination for drillholes not surveyed during downhole logging.

GAFC also rented a Reflex tool EZTRAC (same system as the Ranger Explorer), operated by its rig monitoring technicians. Some holes were surveyed using this tool.

Each completed drillhole was marked on surface using a heavy cement concrete slab containing:

- The project company name: GAFC
- The hole name/number
- The hole type (DD, RD...)
- Total length (core length or the reconciled depth after comparing probe and handheld radiometric scanner depth when rotary drilling)
- The azimuth and dip
- The drill date (year).

The hole was then surveyed using the Leica DGPS or Total Station by the surveying crew or appointed technician/geologist.

10.2.4 Drillhole Diameter Measurements

Calliper logging (CL) was not routinely done. CSA Global recommends that all future downhole logging include this measurement to improve the gamma-logging interpretation. The interpretation of uranium grades from gamma-logging includes hole diameter. Cavities could influence the interpretation results and ultimately the calculated uranium grades.

10.2.5 Prompt Fission Neutron Logging

Prompt fission neutron (PFN) logging was not done. CSA Global recommends a selection of future drillholes be surveyed using this method to assess radiological disequilibrium.

10.3 Rotary Chips and Core Logging

GAFC uses CAE Mining's commercial data management software called Fusion. GAFC uses four main modules of Fusion for data capture and storage:

- FUSION ADMINISTRATOR: To manage user rights and data transfer instructions.
- DHLOGGER: For logging the geology, structure and geotechnical aspects; for both core and chip logging. It is also used to merge downhole logging and assay import and depth correction.

- FUSION CLIENT: To facilitate data transfer from the field to the office server (intermediate based in Niger and called Fusion Remote, and Central based in Toronto).
- QUERY BUILDER: To export stored data for external use.

The workflow for this system is summarized in Figure 10-7.

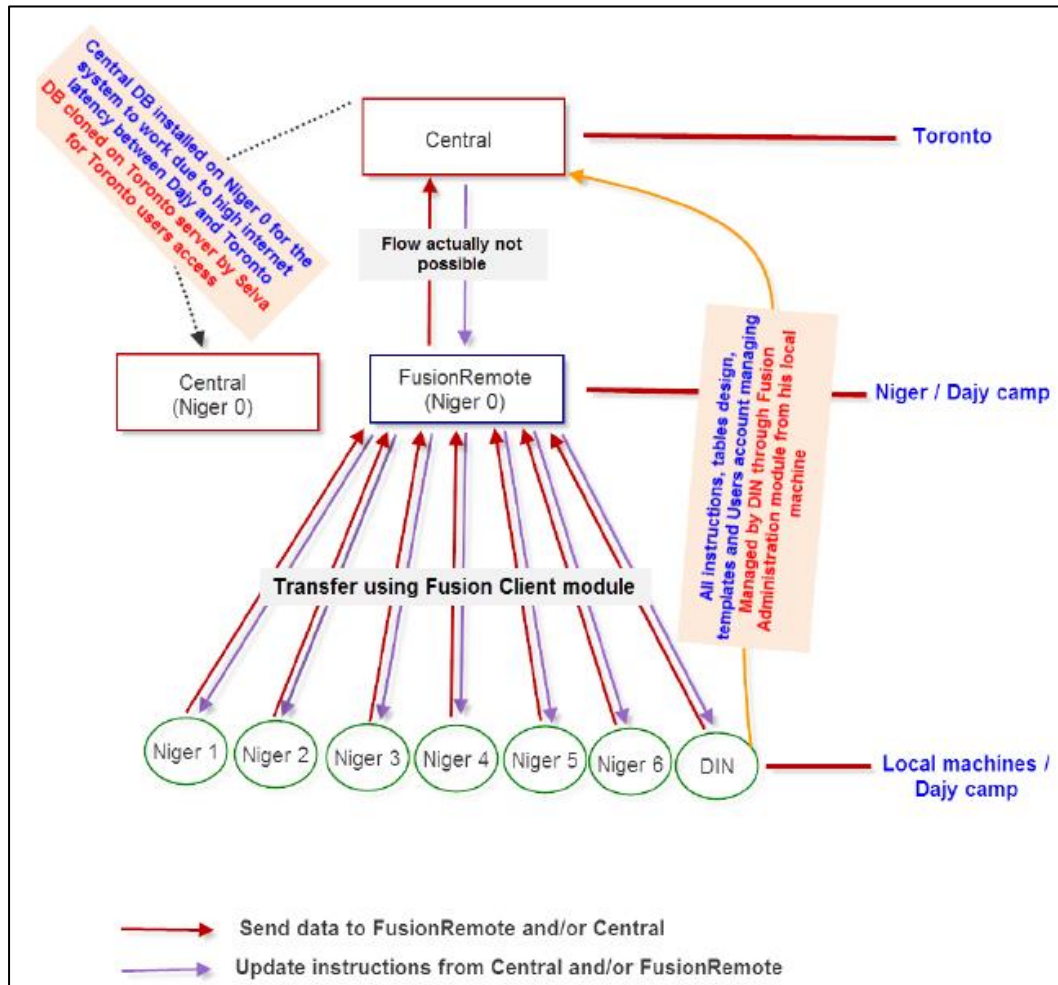


Figure 10-7: GAFC data collection and handling system/CAE Mining FUSION
 Source: GAFC

10.3.1 Rotary Chip Logging

All rotary drillholes have been geologically logged based on 1 m subsamples. Initially, these were based on piles of chips presented by the drillers or the GAFC technicians at the logging facility. However, more recently GAFC has collected washed reference samples into chip trays for logging and future reference. Initially, logging was completed on paper logs, but since the implementation of Fusion, all data capture has been done digitally.

10.3.2 Core Logging

A more detailed logging procedure is implemented by GAFC for core logging to ensure more detailed data was captured. The procedures used are outlined below:

- A geologist remained at the rig at all times during coring.

- All core was processed at site including depth measurement, recovery and core cleaning
- Core was then transported to the logging facility on a daily basis.
- A core library has been established at the base camp to aid in the identification of lithology and rock type aiming to ensure consistent descriptions by the logging crews.
- Special procedures were in place for the handling of radioactive core for logging and sampling. The procedures are available in hard copy in the logging facility.
- Radioactive core was hand scanned with a personal radiation detector to allow comparison with the downhole probing. The radiometric core was taken from the box and hand scanned every 10 cm on a table inside the core shed. Measurements were recorded in a Microsoft Excel spreadsheet.
- The core boxes were laid down on the logging table at the core shed and geologically logged using DHLOGGER. When geological logging was complete, the core was marked for geotechnical logs when the core was oriented.
- Each hole was then marked up for sampling by the geologist.
- All core was photographed wet and dry in a dedicated facility and transferred to the commercial TEC-CORIM software, allowing image manipulation including transfer to the Fusion database.
- Geological logging was completed for the following attributes:
 - Geological formations (Table 10-4)
 - Colour (Table 10-5), which is important for definition of initial reduced sediments and epigenetic oxidized rocks
 - Sediments/rocks (Table 10-6)
 - Alteration and mineralization (Table 10-7).

Table 10-4: Codes of geological formations

Formation	Code	Formation	Code	Formation	Code
Abinky	Abi	Izeguandane	Ize	Tchirezrine 1	Tch1
Akokan	Ako	Madaouela	Mad	Tchirezrine 2	Tch2
Aokaré	Aok	Moradi	Mor	Tegama	Teg
Arlit	Arl	Mousseden	Mou	Tejia	Tej
Assaouas	Ass	Talach	Tal	Teloua 1	Tel1
Farazekat	Far	Tamamaït	Tam	Teloua 2-3	Tel2-3
Guezouman	Gue	Tarat	Tar	Teragh	Ter
Irhazer	Irh	Tchinezogue	Tch	Tindirenen	Tin

Table 10-5: Codes of colour

Colour	Code	Colour	Code	Colour	Code
Beige	Be	Gray	G	Purple	Pur
Black	Bl	Green	Gr	Red	R
Blue	B	Orange	Or	White	W
Brown	Br	Pink	P	Yellow	Y

Table 10-6: Codes of sediments/rocks

Code	Lithology	Code	Lithology	Code	Lithology
1	Sand	12	Limestone	22	Granite
2	Alluvium	13	Marl	23	Diorite
3	Clay	14	Muddy sandstone	24	Amphibolite
4	Mudstone	15	Sandy mudstone	25	Gneiss
5	Siltstone	16	Calcareous sandstone	26	Schist
6	Fine sandstone	17	Carbonate mudstone	27	Organic matter sandstone
7	Medium-grain sandstone	18	Arkosic sandstone	28	Pyritic sandstone
8	Coarse-grain sandstone	19	Analcimolite	29	Coal
9	Very coarse-grain sandstone	20	Dolomite	30	Graywacke
10	Micro conglomerate	21	Muddy siltstone	31	Analcimolitic sandstone
11	Conglomerate				

Table 10-7: Codes of alteration and mineralization

Alteration	Mineralization
Carbonate: Ca	Uranium
Iron: Fe	Pitchblende: Pe
Chlorite: Cl	Uraninite: Ur
Sulphides: Su	Coffinite: Co
Manganese: Mn	Carnotite: Ct
Clay: Cy	Yellow products: Pj
	Others
	Pyrite: Py
	Organic material: Om

10.4 Sampling

No rotary chips were sampled for assaying.

For core sampling, a mineralized interval was established from the downhole logging. Prior to 2014 drilling, the eU₃O₈ results were composited at 100 ppm cut-off (allowing 3 m internal dilution of grade lower than 100 ppm). The mineralized interval was sampled from 1 m above and below the interval. Starting in 2014, the cut-off grade was changed to 300 ppm from the downhole gamma logging; sampling continued the same way as the 100 ppm cut-off.

After geological and geotechnical logging of the core, the designated mineralized interval was marked for sampling. Sampling was done to reflect the lithological contacts and then routinely at 1 m intervals, and during the most recent program holes this was reduced to 0.5 m intervals.

Sampling was lithological facies related: samples were taken in the same lithological unit (each texture of sandstone should be considered as separate lithological unit, mudstone etc.).

The sample number was written on each core sample using a red marker pen. The marked cores were sent to the splitting facility in the base camp where half core was sampled, bagged and sealed for mechanical preparation at the ISO 17025 certified Sahel Lab facility in Niamey. The remaining half core is kept in the core boxes at the base camp. Pulp was shipped from Sahel Lab to an assay facility in Canada.

According to Niger mining legislation, half of any core collected on mining/exploration project is dedicated to the Ministry of Mines, unless the company has a special authorization to use the entire core. GAFC has sought

such authorization for some of their sampling. Subject to the Ministry of Mines authorization, the full core of each marked length was broken and sampled.

A 5–10 cm piece of sample was taken for a specific gravity test prior to bagging and sealing of the to-be assayed sample.

Each sample was packed in dedicated plastic bag on which the sample number was marked on both sides. A GAFC-designed sample tag with the sample number printed on it was also inserted into the bag and sealed.

The sample numbering was designed to include 10% quality control material:

- Certified reference materials (CRMs) (from ORE Research & Exploration Pty Ltd, Australia) were inserted in the sampling at a rate of 5:100 samples
- Certified blank material (from ORE Research & Exploration Pty Ltd, Australia) was inserted at a rate of 2%
- Blank material sourced from rocks near Niamey was inserted at a rate of 1:100 samples
- Pulp duplicate samples taken from the same half core sample were made for two out of every 100 samples and submitted for analysis.

11 Sample Preparation, Analyses and Security

11.1 Sample Preparation and Analyses

Core sampling was undertaken by GAFC staff. Samples were collected from quarter (before 2013)/half core and appropriately bagged and labelled. Samples were sent by truck to the Sahel Laboratory in Niamey for preparation. Until April 2013, pulps prepared by the Sahel Laboratory were sent to ALS Geochemistry in Johannesburg, South Africa for analyses. From April 2013 onwards, pulps have been sent to ALS Geochemistry in North Vancouver, Canada for analyses.

The Sahel Laboratory in Niamey is accredited ISO 17025:2005 by Universal Registrars, Bangalore, India for sample preparation. Both ALS Minerals laboratories in Johannesburg and in North Vancouver are also accredited ISO-9001:2000 by QMI Management Systems and to ISO/IEC Guideline 17025:2005 by the Standards Council of Canada for conducting certain testing procedures. The scope of accreditation includes the procedures used for assaying of the samples submitted by GAFC. ALS laboratories also participates in a number of international proficiency tests, such as those managed by CANMET and Geostats. Sahel Laboratory, ALS Minerals and their employees are independent from GAFC.

At Sahel Laboratory samples were prepared using a standard rock preparation procedure. Quarter or half core was crushed using a jaw crusher until 95% of the material passed a 2 mm mesh. One-eighth of this was taken and pulverized until 90% of the material passed through a 75-micron mesh. One-hundred grams of the resulting pulp is sent to the ALS laboratory for assay. The remaining rejects were returned to GAFC and transported back to the field camp for storage.

Up until April 2013, prepared pulp samples were sent to ALS Geochemistry in Johannesburg and were assayed for a suite of elements (including uranium) using inductively coupled plasma - atomic emission spectroscopy (ICP-AES) (ME-ICP61) and XRF spectroscopy (ME-XRF05).

In April 2013, prepared pulp samples were sent to ALS Geochemistry in North Vancouver, where samples were assayed for uranium using XRF spectroscopy (ME-XRF05; ME-XRF10).

The switch between ALS laboratories was made primarily to gain access to the XRF10 method of assaying, which can measure more accurately the concentration of uranium exceeding 10,000 ppm. The XRF05 method used in South Africa is accurate to concentrations of uranium up to 10,000 ppm.

The SGS Lakefield laboratory in Lakefield, Canada was used as an umpire laboratory. The SGS laboratory in Lakefield, and Mintek laboratories in Randburg, South Africa were also used to conduct metallurgical testing on surface and core samples representative of the uranium mineralization found on the DASA Project. The SGS Lakefield and Mintek laboratories are accredited ISO-9001 and to ISO Guideline 17025 for the testing procedures undertaken on material from the DASA Project. SGS Lakefield, Mintek and their employees are independent from GAFC.

11.2 2018 Sampling Program

During the 2018 drilling program, the full core was sampled over every half metre. A total of 4,983 samples including 10% of control material (6% CRM, 2% field duplicates and 2% field blanks) were collected from 38 holes. The control percentages were doubled due to the importance of the expected high grades from the program holes.

The collected samples were all prepared at Sahel Lab in Niamey. Each whole sample (except the CRM) is crushed to 90% less than 2 mm, riffle split off 1 kg, pulverized split (250 g) to 90% passing 75-microns sieve.

A pulp of 30 g to 100 g was sent to the laboratory for assay and the remaining pulp is kept for further control.

The program samples were all sent to ALS Vancouver for assaying and results were reported through 28 job certificates.

11.3 Core Depth Adjustment

Once the handheld radiometric survey was achieved, the data were imported in WellCad software, and associated to those of the in-hole probe data. The significant peak values of the scintillometer and the probe data are identified and superimposed: the probe depth being the reference depths, only the scintillometer data are moved up or down to fit (Figure 11-1 and Figure 11-2).

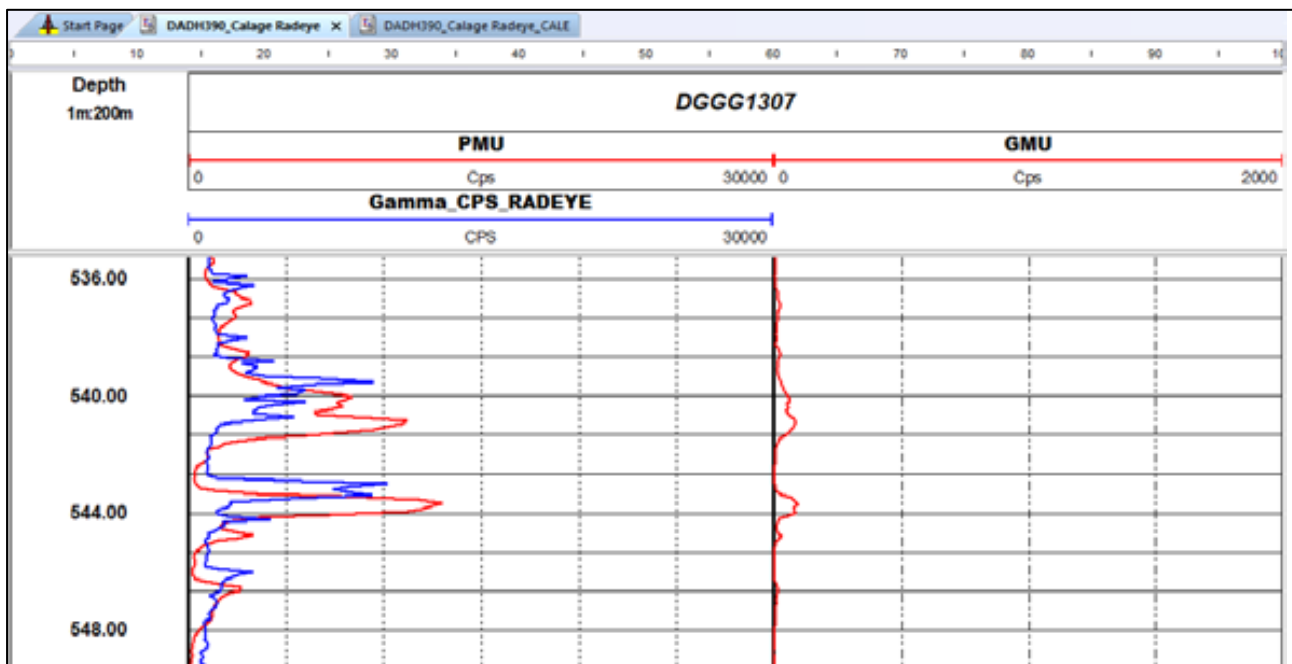


Figure 11-1: Hole DADH390, RadYey (blue) vs Probe (red) depth before rescaling
 Source: GAFC

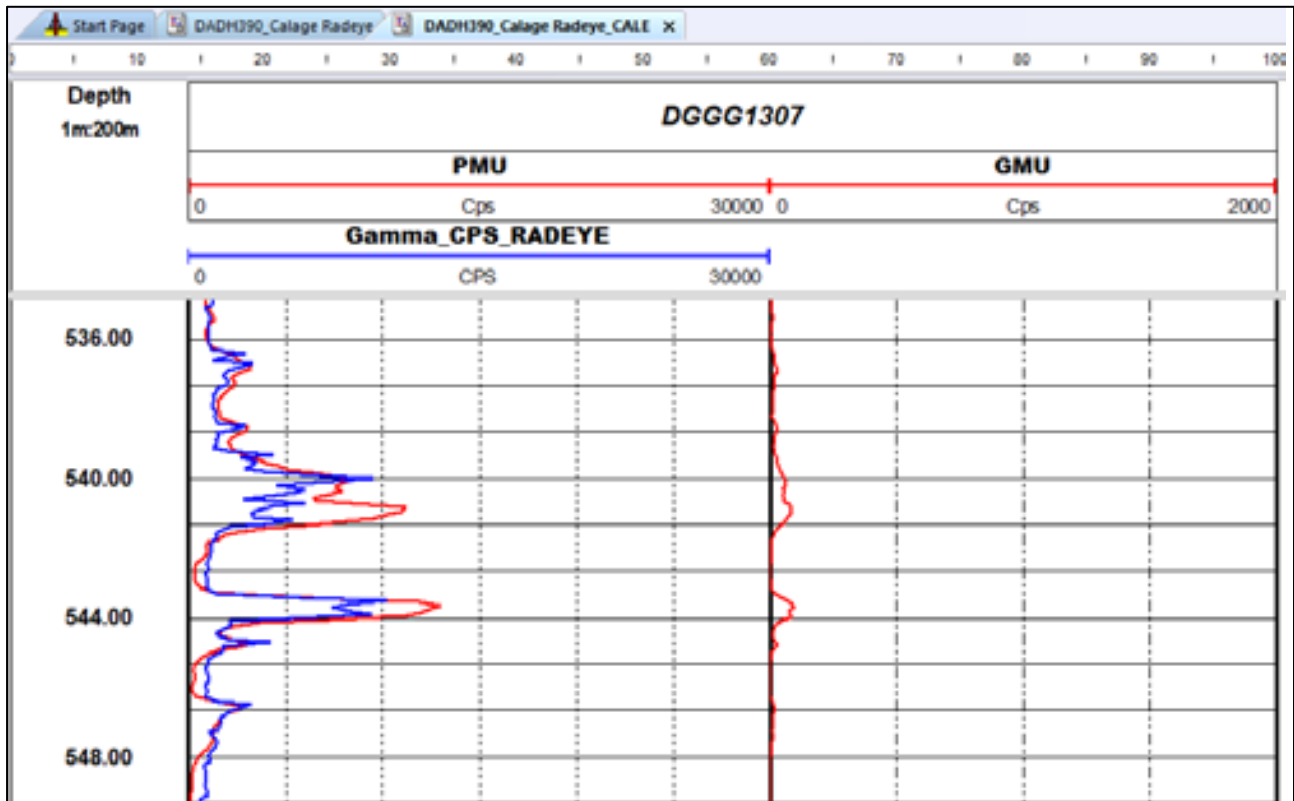


Figure 11-2: Hole DADH390, RadYey (blue) vs Probe (red) depth after rescaling
 Source: GAFC

The modified scintillometer data depths were the corrected depths of the core. The new corrected depths were then exported from WellCad and used for sampling (Table 11-1).

Table 11-1: Depth rescaling and core new depth (from GAFC report, 2019)

DADH390 RADEYE / PROBE RESCALING					
Core initial depths		Shift	Core depths after rescaling		Gamma
From	To		From	To	
(m)	(m)	(m)	(m)	(m)	CPS
536.00	536.10	0.50	536.5	536.6	108
536.10	536.20	0.50	536.6	536.7	69
536.20	536.30	0.50	536.7	536.8	178
536.30	536.40	0.50	536.8	536.9	143
536.40	536.50	0.50	536.9	537	112
536.50	536.60	0.50	537	537.1	99
536.60	536.70	0.50	537.1	537.2	101
536.70	536.80	0.50	537.2	537.3	113
536.80	536.90	0.50	537.3	537.4	108
536.90	537.00	0.50	537.4	537.5	81
537.00	537.10	0.50	537.5	537.6	82
537.10	537.20	0.50	537.6	537.7	71
537.20	537.30	0.50	537.7	537.8	74
537.30	537.40	0.50	537.8	537.9	69
537.40	537.50	0.50	537.9	538	69
537.50	537.60	0.50	538	538.1	71
537.60	537.70	0.50	538.1	538.2	77
537.70	537.80	0.50	538.2	538.3	73
537.80	537.90	0.50	538.3	538.4	79
537.90	538.00	0.50	538.4	538.5	82
538.00	538.10	0.50	538.5	538.6	159
538.10	538.20	0.50	538.6	538.7	118
538.20	538.30	0.50	538.7	538.8	80
538.30	538.40	0.50	538.8	538.9	84
538.40	538.50	0.50	538.9	539	77
538.50	538.60	0.50	539	539.1	82
538.60	538.70	0.50	539.1	539.2	71
538.70	538.80	0.50	539.2	539.3	107
538.80	538.90	0.50	539.3	539.4	233

The author and CSA Global accept that the depth adjustment is a required procedure so that the probe data could be directly compared with the assay data, and correct depths are used for the MRE. The applied depth correction methodology appears to be reasonable to the Qualified Person.

11.4 Bulk Density Data

During the 2012–2015 drilling campaigns, GAFC hired the ISO 17025 certified laboratory SAHEL Lab in Niger to perform bulk density tests on core samples. A total of 3,594 core samples sizing about 5 cm each were submitted during the 2012–2015 period and this gives an average bulk density value of 2.36 t/m³. The bulk density of 2.36 was thus used for the current study.

The SAHEL Lab bulk density test of these samples was determined by the water displacement method. This method consists of weighing the sample in air after covering it with wax, and then measuring its apparent volume through water displacement.

The water displacement is noted and the sample apparent volume determined (v). The bulk density is then calculated by bulk density = m/v. A relative error (E) is also calculated by Sahel Lab using this formula

$$E = |dm/m - dv/v|$$

Where:

- dm – the precision of the weighing scale used (0.001 g)
- dv – the precision of the cylinder used (1 ml).

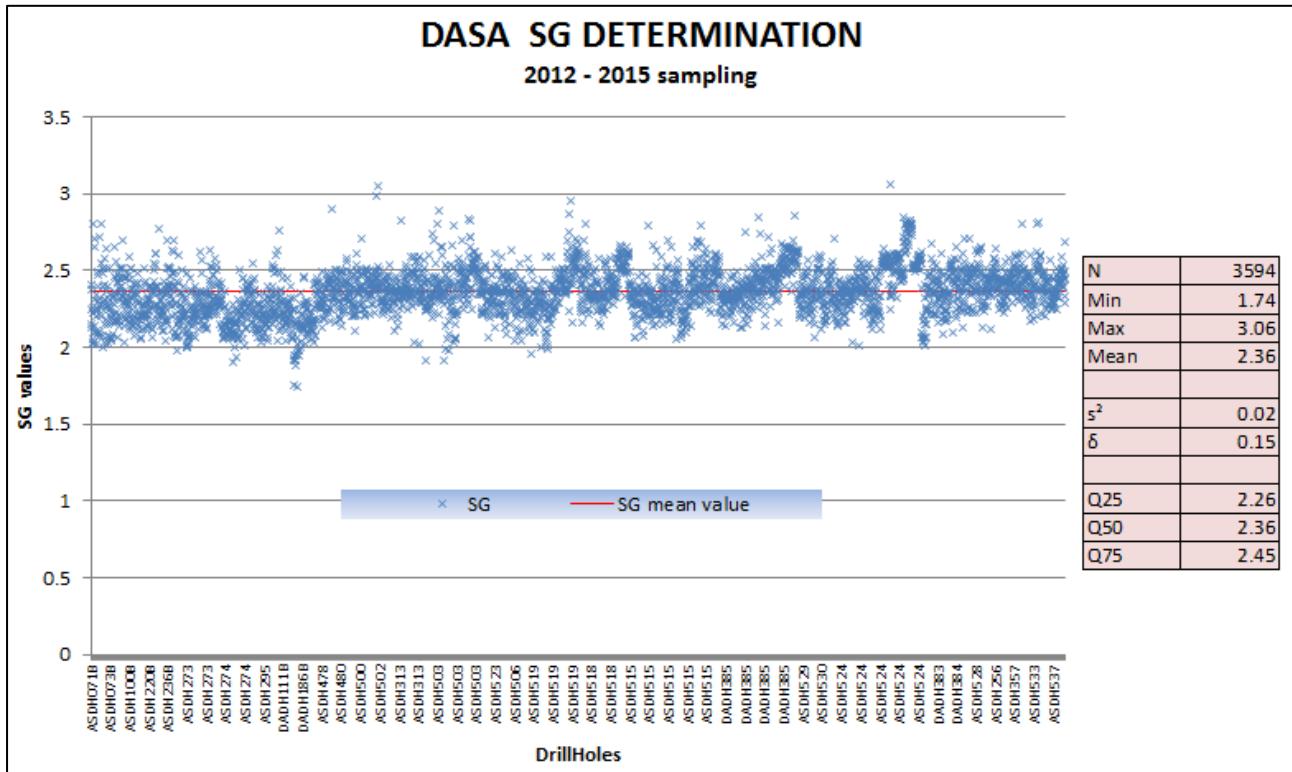


Figure 11-3: Average bulk density determination from core samples
 Source: GAFC

11.5 Quality Assurance and Quality Control Programs

11.5.1 Pre-2018 Sampling Programs

Quality assurance (QA) and quality control (QC) measures are typically put in place to ensure the reliability and trustworthiness of exploration data. The QA measures include written field procedures to ensure reliable and systematic performance during logging, drilling, surveying, sampling and, data management and database integrity. These QA procedures are just as important as the QC protocol to test the precision and accuracy of the data collected. Appropriate documentation of QA and QC measures and regular analysis of QC data are important as a safeguard to ensure the data collected during exploration is reliable and fit for purpose.

QC for analytical data typically involves internal and external laboratory control measures implemented to monitor the precision and accuracy of the sampling, preparation and assaying. They are also important to prevent sample mix-up and to monitor the voluntary or inadvertent contamination of samples.

Five different reference materials were employed and sent blind to the assay laboratory for analysis. Field duplicate and blank samples were also inserted into the assay stream. The QC programs also included a small check assaying program at the SGS laboratory in Lakefield, Canada, which is ISO/IEC 17025 accredited. Check assaying program is not undertaken on an ongoing basis.

Comparison of ordinary assays of CRM material samples with control limit parameters is shown in the Table 11-2. Results show that quality of sampling and assaying is acceptable. Comparison of original samples and duplicates is provided in the QAQC reports on DASA Project (GAFC 2012, 2013) (Figure 11-4).

Table 11-2: Comparison of ordinary assays of CRM samples with passport parameters

Number of CRM	Parameters of CRM			Ordinary assays of CRM samples			
	LL	Nom.	UL	NN	Minimum	Average	Maximum
ALS_JOHANNESBURG							
AMIS0028	4,200	4,670	5,150	5	4,220	4,382	4,590
AMIS0054	1,320	1,470	1,620	8	1,385	1,456	1,480
AMIS0090	809	903	997	4	880	884	889
AMIS0098	774	848	922	8	850	855	865
AMIS0114	491	550	609	9	521	538	542
GBM908-5	4	5	5	14	4	15	128
GEOMS-03	3	4	4	4	3	4	5
MRGeo08	5	6	6	19	4	6	9
SARM-98	181	205	230	12	198	200	205
UTS-1	44	49	54	10	36	45	52
ALS_VANCOUVER							
BL-1	210	220	230	89	200	216	231
BL-4a	1,241	1,248	1,255	88	1,205	1,238	1,290

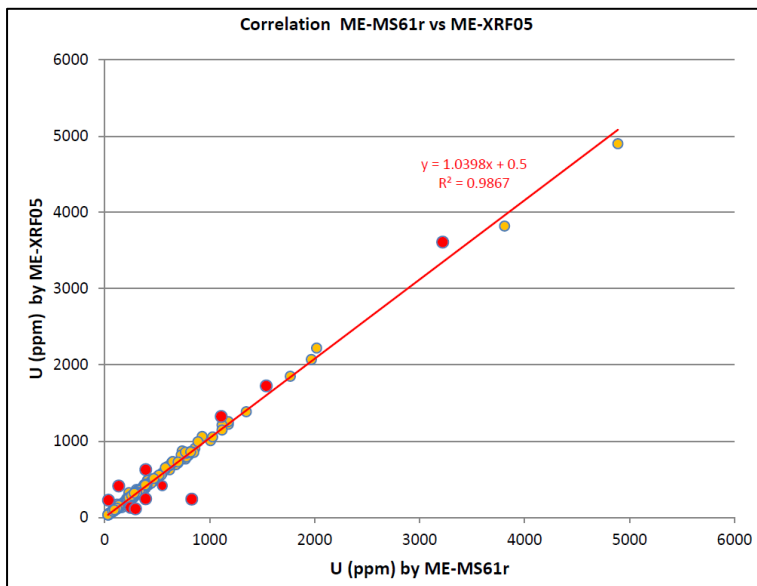
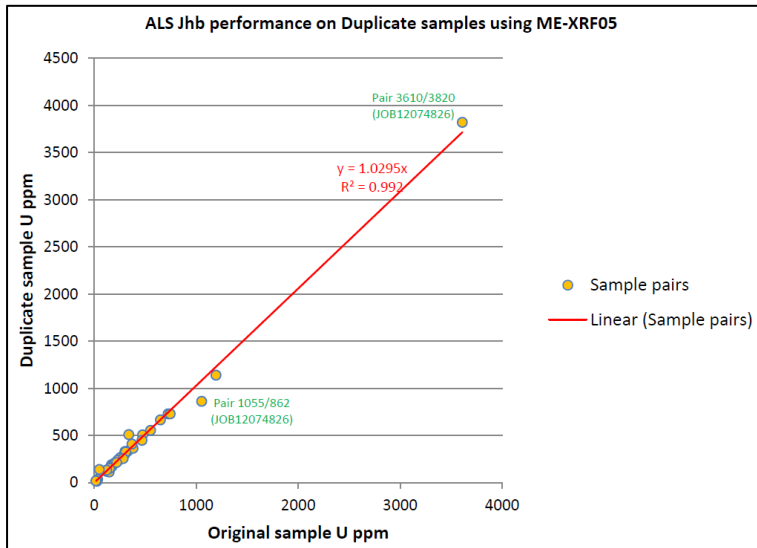
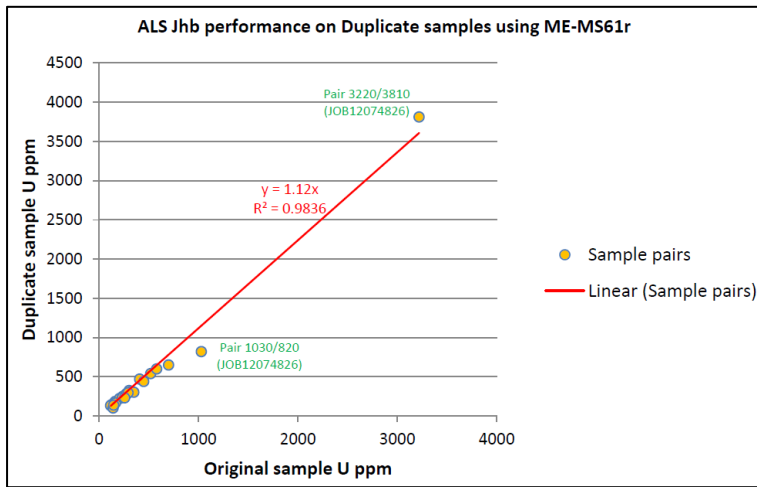


Figure 11-4: Comparison of the original samples and duplicates for the DASA Project
 Source: GAFC

11.5.2 2018 Sampling Program

Summary

GAFC prepared and provided CSA Global with a full QAQC report describing the applied methodology and all results (Christophe, 2019). The provided report was reviewed by CSA Global and the results are summarized in this section of the Report.

The 4,983 samples submitted to ALS for assay by XRF (Press pellet analyzed by wavelength dispersive XRF – ALS code ME-XRF05) for uranium then by fusion XRF method (coded ME-XRF10) for the samples grading above 1,500 ppm U. Selected hole samples were assayed for 48 elements plus rare earth elements (REEs) by four-acid digestions ICP (48 elements + REEs by HF-HNO₃-HClO₄ acid digestion, HCl leach followed by ICP-AES and ICP-MS analysis). The method is coded ME-MS61r by ALS.

As a result of the program, 4,731 samples were assayed by ME-XRF05, 900 samples by ME-XRF10 (252 directly and 648 of the 4,731 by ME-XRF05) and 1,571 by ME-MS61r.

Seven samples that were higher than the detection limit range after ME-XRF10 by ALS Vancouver were transferred by ALS to SGS Lakefield, Ontario to be assayed by a high-grade determination XRF method (coded GC_XRF76B by SGS) able to assay >15% U.

Blanks, Sample Preparation Control (Sahel Laboratory)

To control the sample preparation laboratory contamination level, a barren coarse quartz sample (collected south of Niamey in the granitic basement context) was inserted after every 40 samples of core to be crushed and pulverized. A total of 91 samples were inserted. The grade of the quartz is not certified but expected to not include significant U. Most of the samples returned grades below 50 ppm U, and nine sample grades were above this indicative value of 50 ppm U. This may suggest a level of contamination of these nine samples. Samples 16169, 16849, 17319 and 20850 were each following high-grade samples >1.5% U. It may mean that the crushers were not cleaned well before the blanks were processed. The contamination for these four samples was less than 1%, which CSA Global believes is still within the acceptable limits. GAFC investigated those samples and took measures to ensure that it does not happen in the future.

Pulp Duplicates at ALS

A total of 104 core samples were duplicated to check the sampling quality, the laboratory consistency but also the repeatability of the grades. The duplicates pairs results indicate very low variation of the grades both for the ICP and XRF assay. The correlation coefficients are close to one, with all assaying methods indicating a good performance of ALS on duplicates samples (Figure 11-5 and Figure 11-6).

With the assaying methods ME-MS61r and ME-XRF05, the ratio Original/Duplicate is relatively dispersive above 5,000 ppm U, this indicates that above this limit, the methods may not be suitable to assay accurately the relatively high grades. Therefore, GAFC re-assayed the grades above 1,500 ppm U using the method ME-XRF10 (Figure 11-7).

The duplicates were analysed by HARD (Half Absolute Relative Difference) plots in order to assess the sampling error and control the assay quality. Table 11-3 is a compilation of selected HARD values for the three assaying methods.

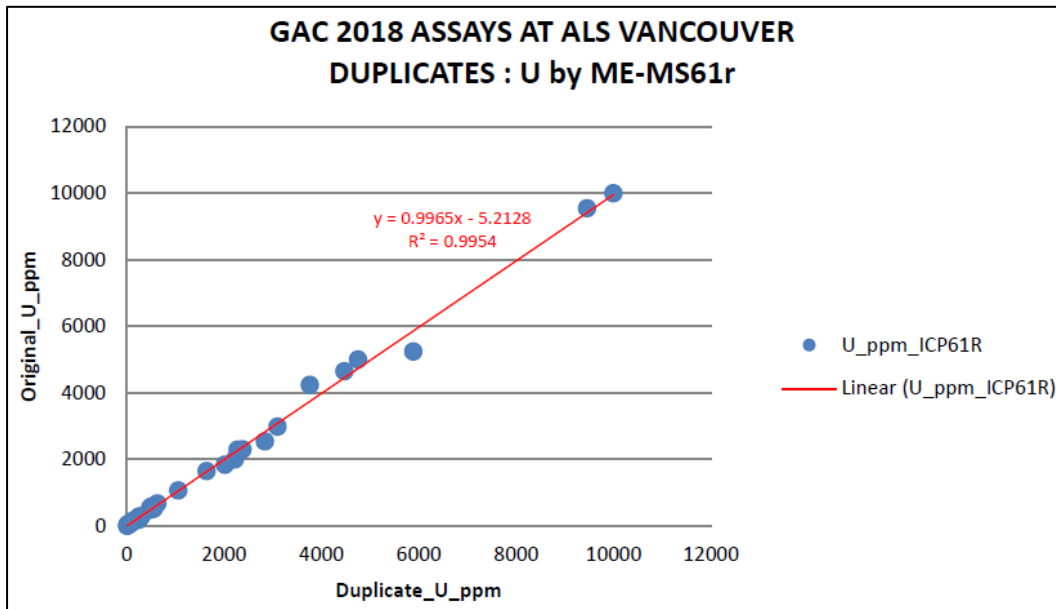


Figure 11-5: Duplicates correlation plot for U, ME-MS61r
 Source: Christophe (2019)

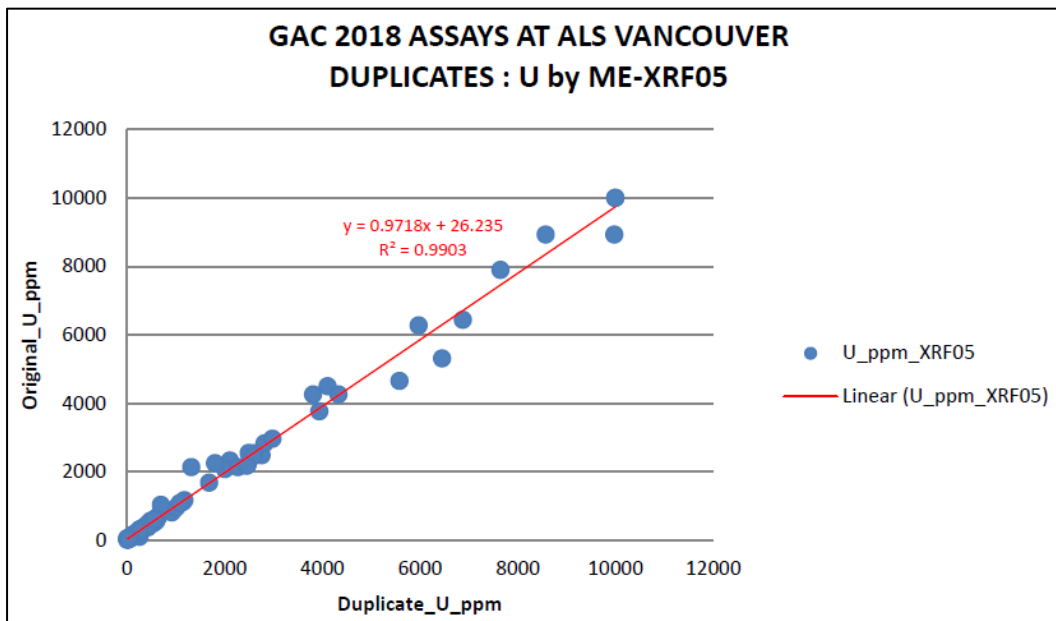


Figure 11-6: Duplicates correlation plots for U, ME-XRF05
 Source: Christophe (2019)

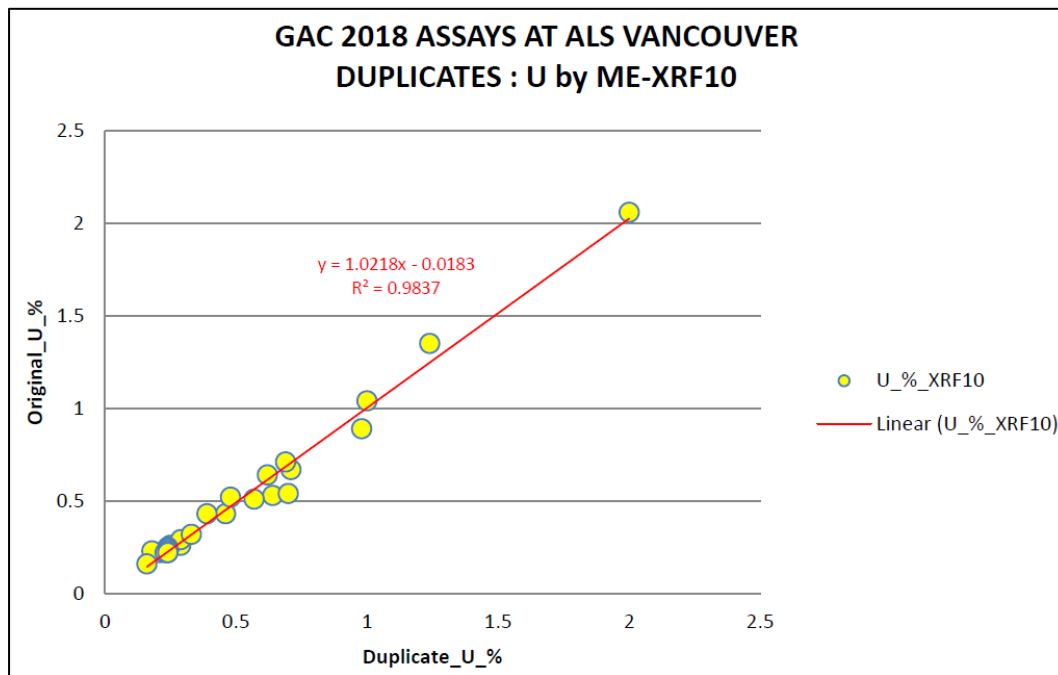


Figure 11-7: Duplicates correlation plots for U, ME-XRF10

Source: Christophe (2019)

Table 11-3: Compilation of HARD % per assaying method (Christophe, 2019)

	HARD %	Non-filtered data	Filtered data (Duplicate value <3DL is removed)
		Population proportion (%)	Population proportion (%)
U by ME-MS61r	10	66	
	25	90	
U by ME-XRF05	10	66	68
	22	90	90
U by ME-XRF10	10	81	
	14.2	90	

Long (1998) recommends that for coarse rejects, agreement of $\pm 20\%$ on 90% of pairs is desirable, whilst for pulp duplicates, agreement of $\pm 10\%$ on 90% of the pairs is required. The ranked Absolute Relative Deviation (ARD) is used by Long (1998) to monitor its precision. Applying this, the reference precision should be 20% as recommended by Long (1998).

For the method ME-MS61r, the HARD plot shows 90% of the data are within 25% error, which is close to the acceptable 20% (Figure 11-8).

Like for the correlation plots, one can observe that the errors are minimized with the assaying methods ME-XRF05 and XRF10 indicating these are increasingly better (Figure 11-9 and Figure 11-10). For the method ME-XRF05, the HARD plot shows 90% of the data are within 22% error: three Duplicate pairs inferior to the 3DL were removed from the dataset to minimize the small samples bias.

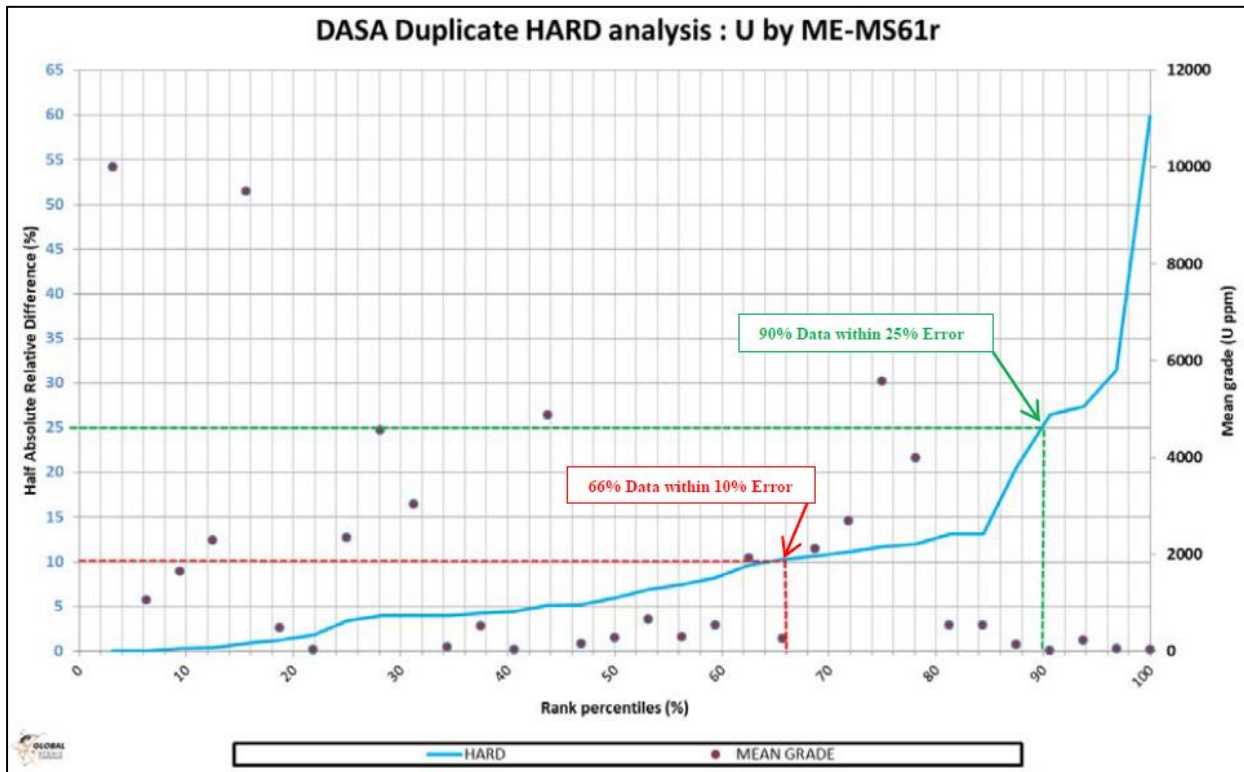


Figure 11-8: HARD plot for ME-MS61r
 Source: Christophe (2019)

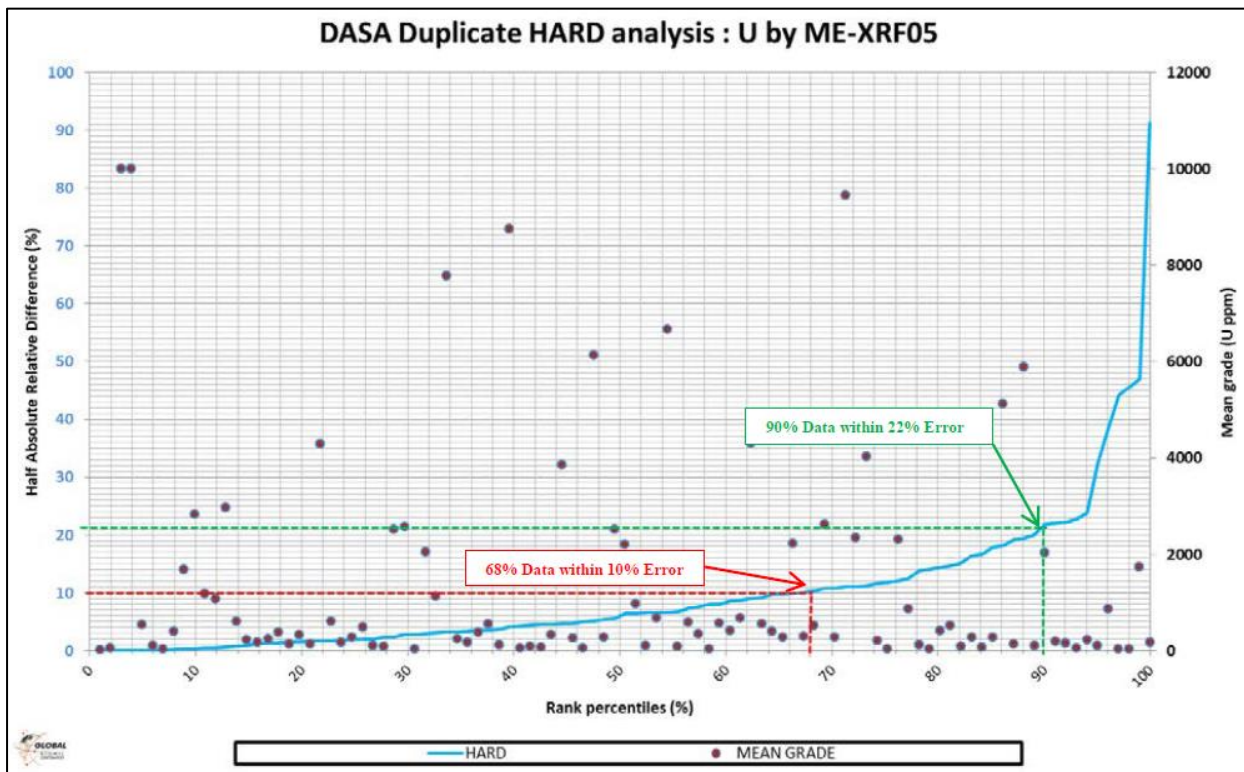


Figure 11-9: HARD plot for ME-XRF05
 Source: Christophe (2019)

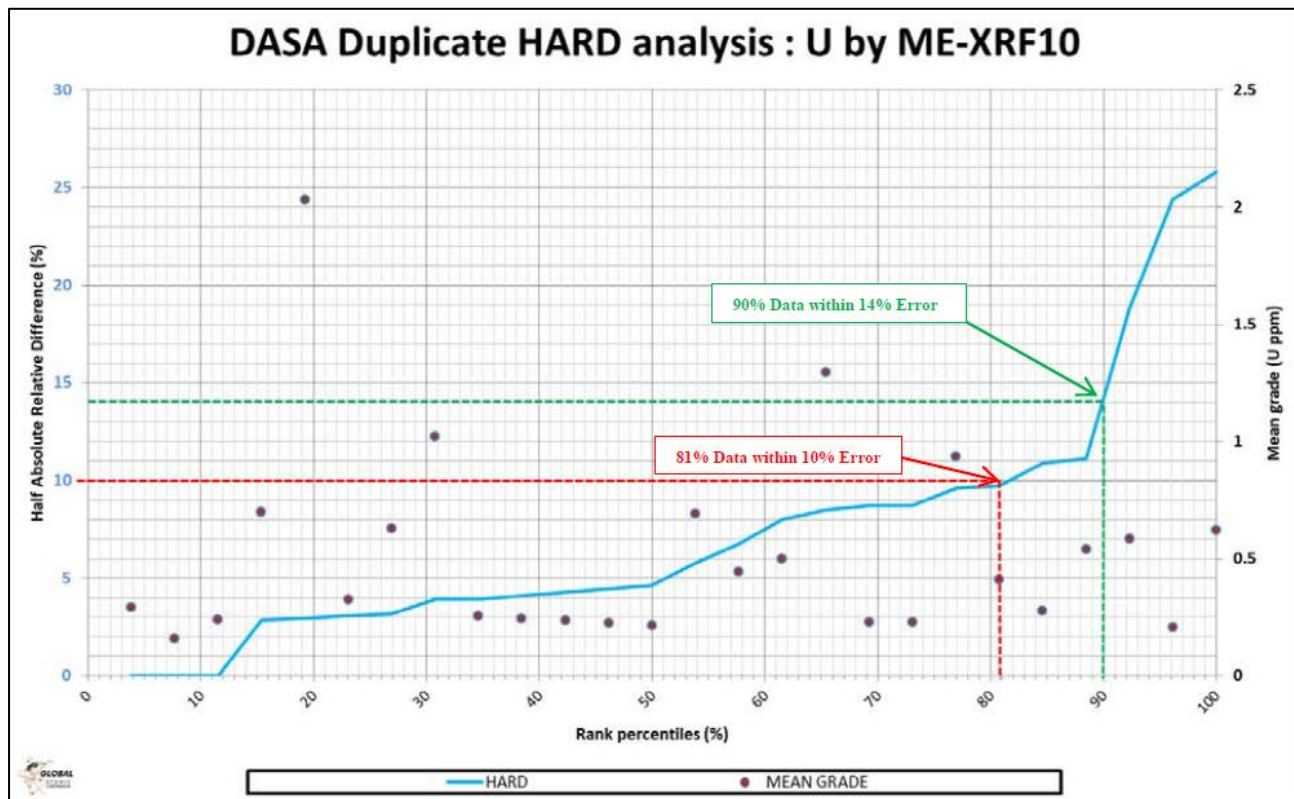


Figure 11-10: HARD plot for ME-XRF10
 Source: Christophe (2019)

The author and Qualified Person conclude that the results of the duplicate analyses are acceptable – the majority of the samples will have a high likelihood to reproduce their grade with minor error in case of re-assay, and the fusion XRF method is the best assaying method to honour the grades of the samples collected.

Certified Reference Materials and Blanks at ALS

GAFC used five different types of CRMs from the Australian company, Ore Research & Exploration Pty Ltd (ORE) as control material. Detailed parameters are in Table 11-4.

Table 11-4: Parameters of the standards and blanks used

Standard type	XRF fusion (ppm U)	XRF SD (ppm U)	ICP four-acid (ppm U)	ICP four-acid SD (ppm U)
Blank OREAS22e	0.13	0.04	0.13	0.04
Standard OREAS121	215	9.6	206	7.1
Standard OREAS122	423	13	407	13.4
Standard OREAS123	858	29.7	825	35
Standard OREAS124	1,845	40	1,779	89.7

Results of the blank analyses were presented for 35 batches for ME-MS61r and 36 batches for ME-XRF05 methods. The demonstrated level of contamination was acceptable. In addition, ALS internal blanks results were within the expected limits and did not indicate any instrument drift or calibration issues.

The GAFC report on QAQC analysis included all the performance charts for each standard (Christophe, 2019). CSA Global reviewed the results and charts.

Standard OREAS121 was inserted 53 times. Values returned for this CRM using the ME-MS61r method were all within the certified mean value plus or minus one standard deviation (SD), except for one sample. The assays values for this standard using the ME-XRF05 technique were almost always in the interval mean grade plus one SD value, thus demonstrating slight over-estimation of the standard value.

Standard OREAS122 was inserted 35 times. The grades returned by ALS using the ME-MS61r technique were mostly around the mean grade plus/minus one SD value. Only one sample was slightly over-estimated, 1 ppm U above the mean grade plus two SD value. With the exception of one sample, all the grades returned by ALS using the ME-XRF05 technique were mostly around the mean grade plus/minus one SD value.

Standard OREAS123 was inserted 56 times. For the ME-MS61r technique, the returned grades were erratic but all around the mean grade. With the ME-XRF05 method, the grades returned are slightly trending above the certified mean grade of the standard but always below the CRM mean grade plus one SD, except one sample where the grade is slightly above the CRM mean grade plus one SD but below the accepted mean grade plus two SD value.

Standard OREAS124 was inserted 54 times. All grades returned are more regularly around the mean grade with the ME-MS61r technique. U ppm grades returned with the ME-XRF05 technique were generally slightly above the CRM mean grade, but all below the mean grade plus one SD value.

Analysis of the CRMs and blanks demonstrated that an insignificant number of samples were outside of the upper or lower warning limits; however, the analysis of the results did not reveal any significant bias that could be introduced by the main laboratory. CSA Global believes that the results of CRM and blanks analyses are within acceptable limits.

11.6 Review of 2017–2018 Downhole Probe Quality Assurance and Quality Control Programs

GAFC provided detailed information on how the QAQC protocol was followed during the 2017–2018 exploration program (Christophe, 2019). CSA Global reviewed the procedures and has summarized them below:

- The probing (data collection) was done by a third party, using its own equipment. The eU_3O_8 was determined by another third party, different from the probing company.
- During the exploration campaign, all holes were to be probed using the following equipment:
 - A Geiger Muller (GM) probe
 - A DIL probe
 - The GYRO probe for downhole deviation.
- The probing started immediately at the end of drilling of each hole. There was minimal time gap between the completion of drilling and commencement probing. At the end of the last drilled metre, the drill fluid was renewed, and the hole was cleaned for about one hour before leaving the hole for the probing. The probing duration depended on the hole length: run in of DIL and GM is at 5–6 m/min and pull out is at 3 m/min for DIL, while the GM is 3 m/min with speed reduced to 1 m/min in the mineralized sections. The Gyro could go up to 20 m/min.
- Raw data were sent after preprocessing (depth matching) to the external consultant for eU_3O_8 determination. The necessary steel and mud correction were made by the consultant before returning grades based on the data provided by the probing contractor.

- QAQC logging included the following:
 - At the program beginning, the probes were calibrated on a certified calibration pit.
 - The probes were run on a third party external test pit (reference pit on Orano Niger project in Arlit); operation repeated once in the Quarter year.
 - The first hole of the program and some chosen holes were probed with all the available probes on the project for correlation between probes.
 - All the Project probes pass once a week on two standard holes. These standard holes of the Project were found to be lower grade with regards to the first hole's results, thus two high grade test holes were built for that purpose.
 - Third party is allowed to test the project test pits for more comparison, if required.
 - The amount of control samples reached 10% in 2018 exploration program is considered sufficient.

CSA Global and the author/Qualified Person are satisfied with the applied protocol.

11.7 Radioactive Equilibrium Factor

Geophysical gamma logging data is the primary information source used for uranium resources estimation. From these data, it is then possible to determine:

- Mineralized intervals based on gamma logging data
- Conversion of radium grade to uranium grade based on Radioactive Equilibrium Factor (REF) and probe results.

Radioactive Equilibrium Factor (REF) = $C(\text{radium}) / C(\text{uranium})$ should be estimated using uranium assays and radium assays sampled into closed cans. At this time, radium grades have not been determined. In this situation, comparison of the eU_3O_8 based on gamma logging and actual U_3O_8 based on assays can be used to estimate the REF. It is also possible to use the scintillometer readings made on the core to compare and to correct gamma logging data.

The provided database for chemical assays had 9,784 records in the file, out of which 9,772 records had U or U_3O_8 grades. All U grades were converted to U_3O_8 , and the file was then merged with the gamma logged intervals. It was found that 9,079 assayed intervals were also probed, and all other intervals did not have either the probe or the assays data and, therefore, were excluded from the analysis.

All probed intervals were length composited within the limits of each sampled interval, and the resultant grades were then directly compared to estimate the presence of uranium disequilibrium factor.

The average length weighted U_3O_8 grade for all chemical assays was 1,316 ppm while the composited eU_3O_8 grades for the same intervals that were assayed had an average length weighted value of 1,231 ppm. The global difference was 6.4% and, therefore, the REF = 0.94.

Comparison of eU_3O_8 based on gamma logging and aU_3O_8 based on assays shows acceptable correlation close to 1 (Figure 11-11), the coefficient of correlation is 0.88.

Generally, mineralization at the DASA Project is close to equilibrium (Figure 11-12), but it should be noted that the equilibrium could potentially be different in different parts of the deposit.

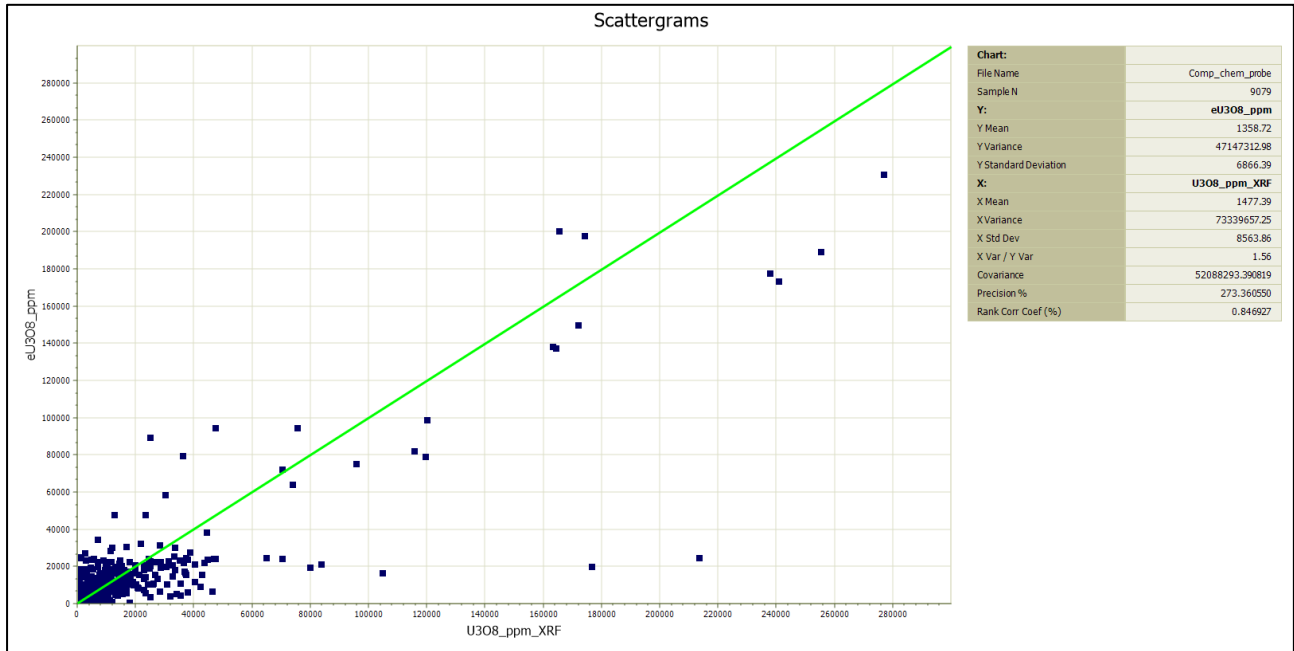


Figure 11-11: Comparison of probed eU_3O_8 vs assayed U_3O_8

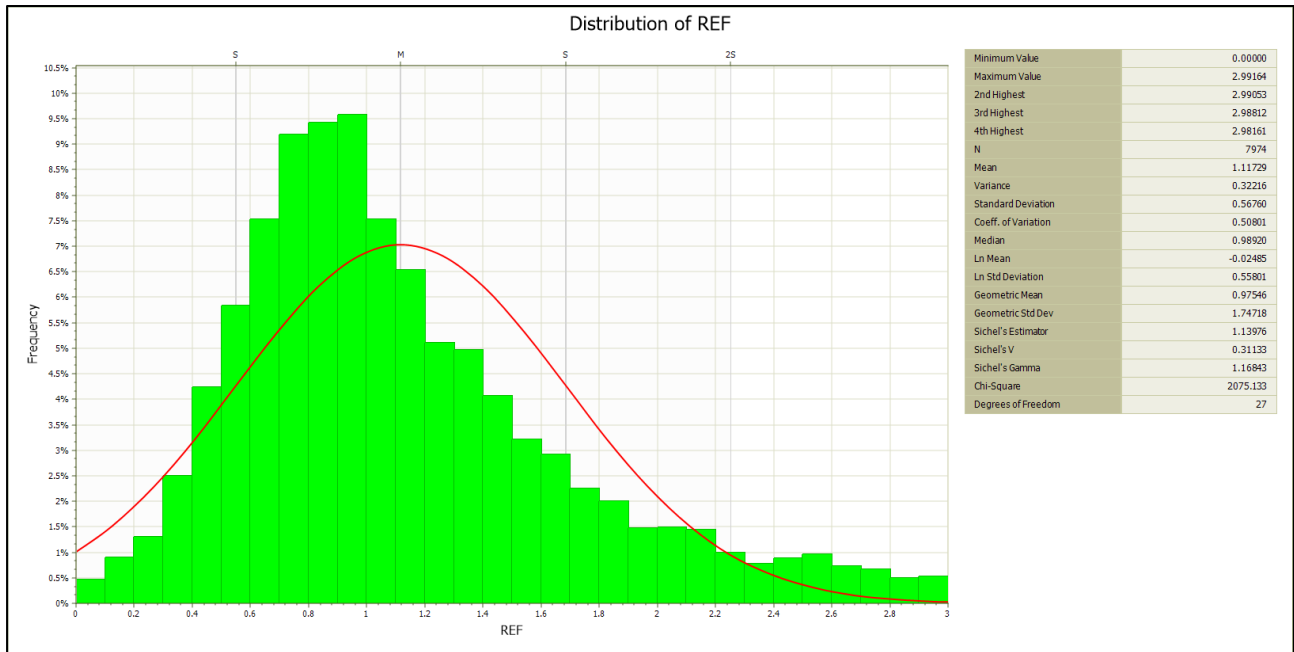


Figure 11-12: Distribution of REF in assayed intervals

Based on the available analytical chemical and gamma-ray logging information, the author concludes that the uranium equilibrium is close to 1 and equals to 0.94. That means the calculated eU_3O_8 grades are likely to be globally under-estimated by about 6.4%, and that the current MRE is likely to be therefore slightly conservative. However, 6.4% relative difference between chemical and probed assays is not believed to be material.

The author is satisfied that the number of chemical assays is sufficient to support the estimation of uranium equilibrium factor.



11.8 CSA Global Comments

In the opinion of the author, the sampling preparation, security and analytical procedures used by GAFC are consistent with generally accepted industry best practices and are therefore adequate for the purpose of Mineral Resource estimation.

Additional drilling programs completed in 2017–2018 in the most prospective and high-grade areas of the deposit, as well as an additional significant number of chemical assays analysed in 2018–2019, allowed more accurate calculation of eU_3O_8 grades, as well as more robust estimation of uranium equilibrium factor. All of which allowed development of more robust Mineral Resource model and upgrading of Inferred category to Indicated in some areas of the deposit, where the geological understanding and confidence in the model were supported by additional drilling.

Overall, the author is of the opinion that GAFC's QAQC programs provide adequate confidence in GAFC's collection and processing of the data.

Additional investigations are recommended to further support the estimated REF, including assaying of radium in closed cans and uranium by XRF. Comparison of radium and uranium assays allows more reliable definition of the REF and comparison of radium assays and gamma logging allows definition of a radon degassing factor. This factor may also influence the calculation of eU_3O_8 grades.

12 Data Verification

Dmitry Pertel (author and Qualified Person) visited the Project site from 20 March 2017 through to 6 April 2017, spending five days at the deposit site and exploration camp and several days in Niamey at GAFC's office. During the visit, Dmitry Pertel reviewed geological reports, drilling procedures and surveys, logging facilities and overall deposit geology. Geological exploration drilling procedure, core recovery methods and documentation and geophysical logging have been analysed from the provided reports.

During the site visit, the Qualified Person observed a number of drill collars, took their photographs and geographic coordinates. The measured coordinates were compared with those reported in the provided database. The difference between the measured and reported coordinates were within the acceptable limits.

From 2 to 4 April 2017, Dmitry Pertel visited the Sahel Laboratory in Niamey, and had an opportunity to interview the personnel there. The laboratory was in the middle of the relocation process, and therefore it was not possible to observe the working equipment which was all dismantled at the time of the inspection.

The author has reviewed the drill logs, cross sections, plan maps for the DASA geological database.

The author checked the analytical and geological database using macros and processes designed to detect the following errors as described in Section 14.3.

All work relating to geological exploration and leach testing was found to be of a high quality. The data is considered suitable for Mineral Resource estimation.

13 Mineral Processing and Metallurgical Testing

Section 13 was previously reported in the 2018 DASA PEA (CSA Global, 2018b) and is repeated below:

GAFC has conducted an extensive rotary circulation and diamond drilling programs in the DASA 1, DASA 2 and DASA 3 areas from 2012 to 2016 as well as trenching and surface sampling and shipped in core boxes or in rice bags secured with security seals to SGS Mineral Services, Lakefield, Ontario, Canada and Mintek, Randburg, South Africa.

The samples were used to help develop the process flowsheet discussed in this report, which included: mineralogical characterization work, ore sorting, comminution work, roll bottle and variability leach testing and heap leach work and geo-mechanical characterization.

This Report will discuss the key findings from each workstream, apply these findings to an operating flowsheet scenario with operating cost and capital for a preferred option and provide recommendations for future work required.

13.1 Mineralogy

Prior to the initiation of any metallurgical test campaigns, mineralogical characterization programs and geochemical (multi-element) analysis of rock samples from the DASA Project have been conducted by SGS Lakefield, ALS Johannesburg, ALS Vancouver and Mintek Johannesburg. Most of these analyses have been conducted by inductively coupled plasma – optical emission spectrometry (ICP-OES) and XRF. The aim of this initial investigation was to assess the mineral associations and speciation of the uranium minerals, together with any potentially deleterious minerals for a proposed leaching extraction process.

The key findings from the exercise were:

- The samples contain uranium mineralization hosted in arkosic sandstones. The most abundant gangue minerals were quartz and plagioclase followed by chlorite and mica.
- Uranium mineralization present consisted of medium to coarse-grained ferganite, titanite, carnotite, uranophane torbenite and autunite in addition to uranophane and uranium-rich titanite, uranocircite and brannerite grains located interstitial to the main silicate phases (usually quartz, but sometimes feldspars such as albite and microcline). The ferganite and uranocircite grains were generally present as individual grains within no immediate intimate association whereas the brannerite was observed in close association with rutile. In addition to these minerals, there were also some very fine-grained encapsulated grains of billietite. The billietite grains were encapsulated within quartz which will present a likely loss to the tailings from any conventional leaching process.
- Review of the multi-element analyses does not suggest any recoverable by-products.
- No potentially hazardous chemicals were present other than uranium.
- Potential contaminants, not removed in normal leaching process, that would report to the final concentrate are less than ASTM specifications for uranium concentrates.
- Deleterious mineral content was present in the form of calcite which will absorb some of the acid used during the leaching process. A further mineral is montmorillonite which is a swelling clay and has the potential to preferentially adsorb uranium from the pregnant solution which may therefore reduce

overall processing efficiency. The process option of resin-in-pulp will significantly reduce this effect and has been selected as the preferred flowsheet.

In summary, although there is some encapsulation of very fine-grained uranium minerals, the majority of observed uranium minerals were medium to coarse-grained and located in interstitial sites favourable to extraction by conventional leaching. The main points of concern are the presence of minerals such as brannerite which may be resistant to leaching due to its refractory nature. Calcite and to a lesser extent montmorillonite will be acid consuming and potentially preg robbing.

13.2 Beneficiation and Comminution

Beneficiation scrubbing work was conducted at Mintek (Figure 13-1). The aim of scrubbing is to dislodge loose soft coatings from more competent material by means of attrition. With scrubbing the optimum scrubber residence, time can be determined from the graph of new fines generated as a function of residence time. Typically, during scrubbing tests, a plateau region develops where no significant new fines are generated for a short range of residence times. This indicates that all of the loose coatings have been removed. The plateau region indicates the optimum scrubbing residence time. Following the removal of coatings, the graph of new fines generated as a function of residence time will start to increase again since the operation will move from scrubbing mode to autogenous grinding mode.

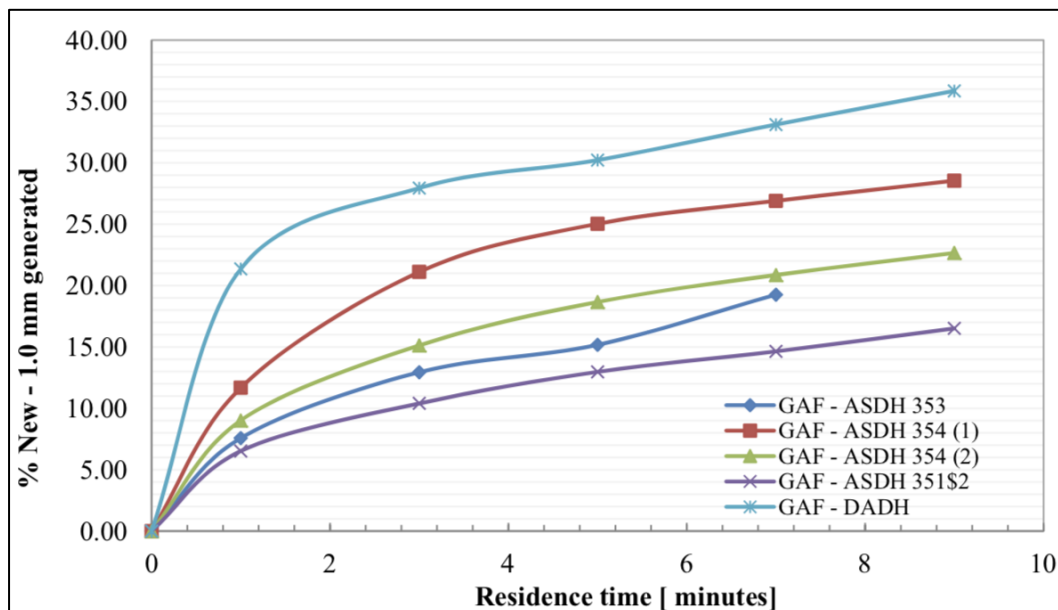


Figure 13-1: Beneficiation scrubbing – performance graphs
 Source: CSA Global (2018b)

What is evident from analysing the graph above is there is no such plateau region present. The quantum of new fines generated continues to increase as a function of residence time and this indicates that the unit is operating in autogenous grinding mode. It appears that scrubbing was not taking place. Not all ores are amenable to scrubbing since not all ore types contain surface coatings that can be preferentially removed.

In conclusion, it was noted that there was an increase in percentage of the U_3O_8 reporting to the fines fraction (<38 μm) for several of the samples; however, a significant proportion of the U_3O_8 remained in the coarse fractions (+12 mm). From the work done to date, it shows there is minimal opportunity to scrub and beneficiate. However, based on the feed grades relating to the current mine schedule the need to beneficiate to create a higher grade to the plant is not seen as a requirement to make the Project viable.

SGS conducted testwork on two samples from the DASA Project – one composite sample from DASA 1 and DASA 3 drillholes and one composite sample from DASA 3 area.

The first samples were tested for the entire suite of comminution tests including abrasion test, Bond work index (BWI) tests, high pressure grinding roll test, JK drop-weight, SAG mill comminution test, SAG power index, static pressure test and derivation of Comminution Economic Evaluation Tool (CEET).

The second samples were tested for BWI to confirm results from the lower grade testing. The results were consistent with other BWI results.

The crusher work index (CWI) test results show the mineralized material was moderately hard (11.5 kWh/t). The composite sample during ball mill sized testwork produced significantly harder results (BWI of 16.1 kWh/t) and classifies the mineralized material as moderate to hard material and was mildly abrasive (AI of 0.096 g). The results indicate the mineralized material is suitable for SAG.

13.3 Roll Bottle and Agitated Leaching

Extensive leach testing was conducted at SGS Mineral Services and Mintek including bottle roll, agitated leach, two-stage leaching, scrubbing and column leach testing with both acid and alkaline leach conditions. Intent of the testing was to understand the leach kinetics of the samples and develop potential leach flowsheets.

Leach conditions were varied to determine the effect of temperature, free acid concentrations, grind size, feed density and oxidant. In general, the extraction rates varied dependent on:

- Free acid concentration gave higher and quicker extractions
- An increase in temperature gave a higher and quicker extraction
- % solids had little effect
- Grind feed size did not show any significant effect on recovery
- Reaction rates were quick and plateaued after six hours
- The carbonate leach gave the lowest extraction rate of 68%.

The extraction efficiency varied between 78% and 86% for a period of 24 hours with the majority of the dissolution occurring within 18 hours. Bottle-roll tests confirmed the kinetics shown in the previous work, higher acid addition gave higher recoveries, but significantly longer time required, four days against 24 hours.

Leach shack flask work was done on 31 individual samples composited from five boreholes. The uranium extraction ranged from a low of 16.7% to a high of 95.4% and averaged 71% (Figure 13-2). It should be noted that for all the samples that had uranium extraction efficiencies, less than 50% had corresponding low uranium concentrations (<690 g/t calculated head) showing a correlation between recovery and head grade.

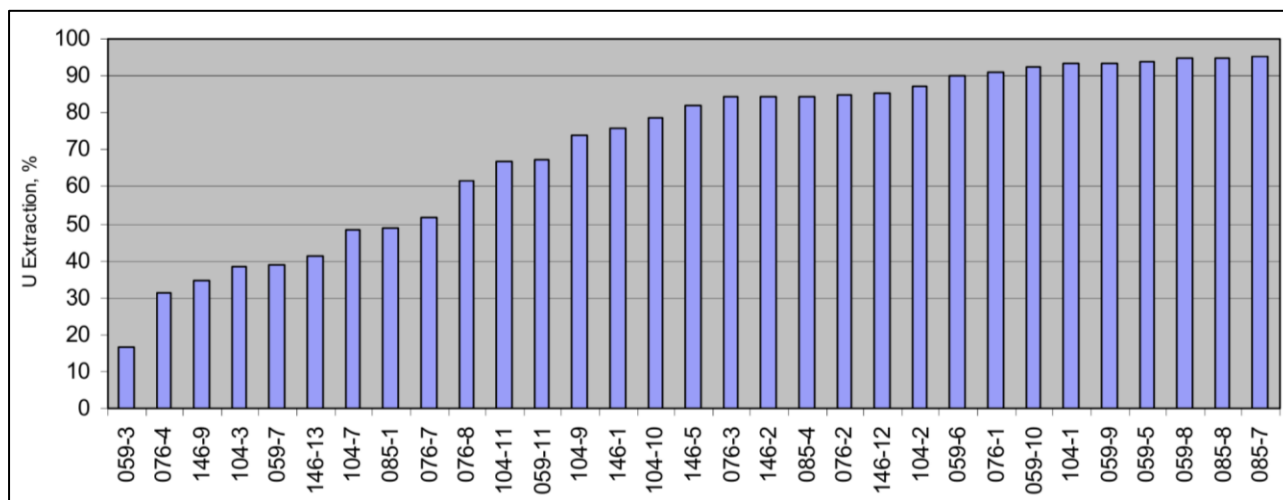


Figure 13-2: Individual sample uranium extraction
Source: CSA Global (2018b)

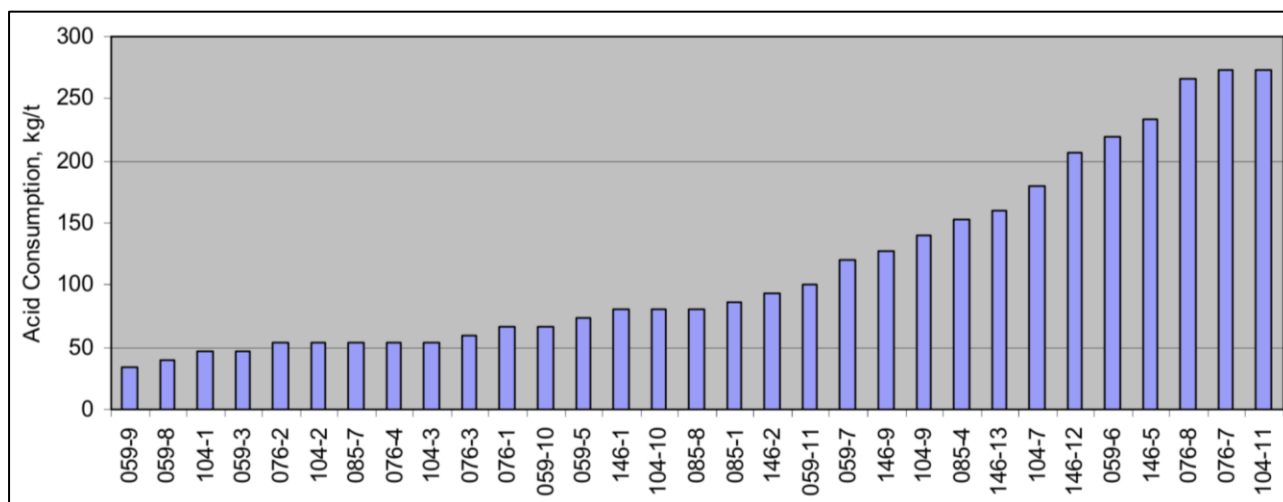


Figure 13-3: Individual sample acid consumption
Source: CSA Global (2018b)

Acid consumption ranged from a low of 33.3 kg/t to a high of 273.3 kg/t and averaged 115 kg/t for all samples tested (Figure 13-3). The results clearly show variability within the mineralized material and this needs to be further investigated in future work.

Carbonate leaching gave poor extraction of 68%. An alkaline leach test at Mintek indicated only 62% recovery after 73 days of leaching.

In addition to the leach work discussed, in 2018 a series of acid leach tests was performed on an overall composite prepared from 30 drill core samples. Each core sample was individually weighed and crushed to -10 mesh with a 100 g head sample submitted for whole rock analysis (WHA) by XRF, uranium by XRF, a 30-element scan by ICP-OES, uranium and thorium by ICP-MS (mass spectrometry), and sulphur and carbon by Leco. Head analyses of the composite (256 Overall Comp) indicated that it contained 0.16% uranium.

The first two tests on this composite were performed using feed at a P₈₀ of 138 µm under mild acid conditions (pH 1.5 to 2.5, 128 kg/t and 28 kg/t H₂SO₄ added, respectively) at 40°C and achieved fairly low uranium extraction (61% and 44%, respectively). These tests were followed by two tests at 70°C with acid targets of

pH 1.5 and 80 g/L free sulphuric acid (116 kg/t and 353 kg/t H₂SO₄, respectively) with all other conditions unchanged, achieving 62% and 95% uranium extraction, respectively (see Figure 13-4).

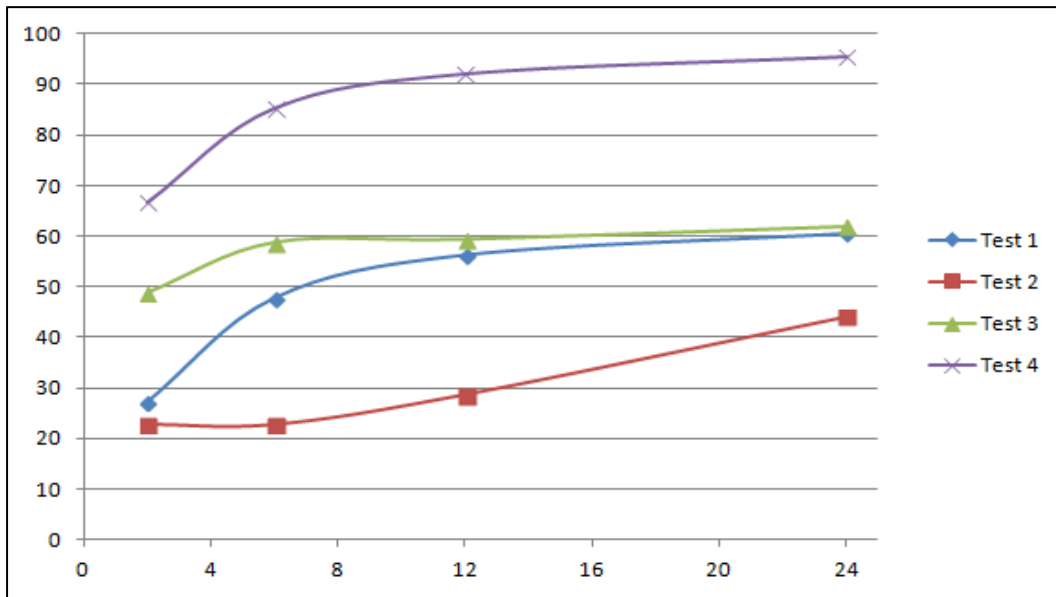


Figure 13-4: Uranium extraction vs Time 138 micron
 Source: CSA Global (2018b)

The remaining four single-stage leach tests investigated the effect of particle size, ranging from a P₈₀ of 80 µm in Test 6 to 808 µm in Test 7. In the five tests in which particle size was the only variable, uranium extraction was consistently in the range of 95–98% and required acid addition of 322–382 kg/t (Figure 13-5).

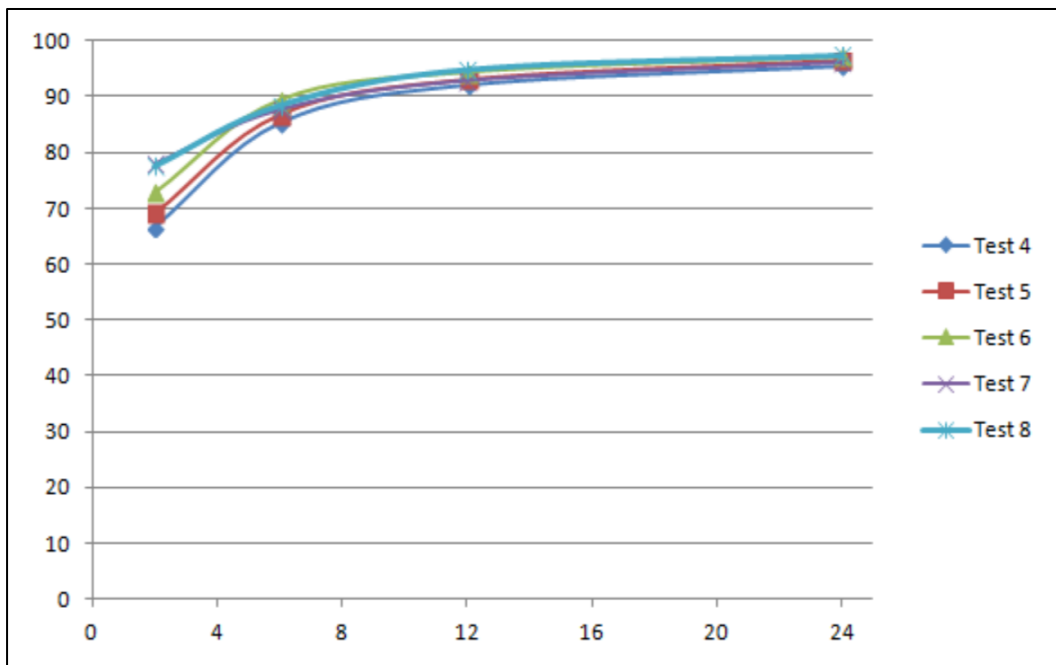


Figure 13-5: Uranium extraction vs Time
 Source: CSA Global (2018b)

The second set of leach tests were two-stage leaches in which the feed solids were first slurried in acid-containing pregnant leach solutions (PLS) that had been produced in the high acid single-stage leaches, while the second stage used a fresh stock of high-acid solution containing no uranium to leach the residue from the first-stage leach.

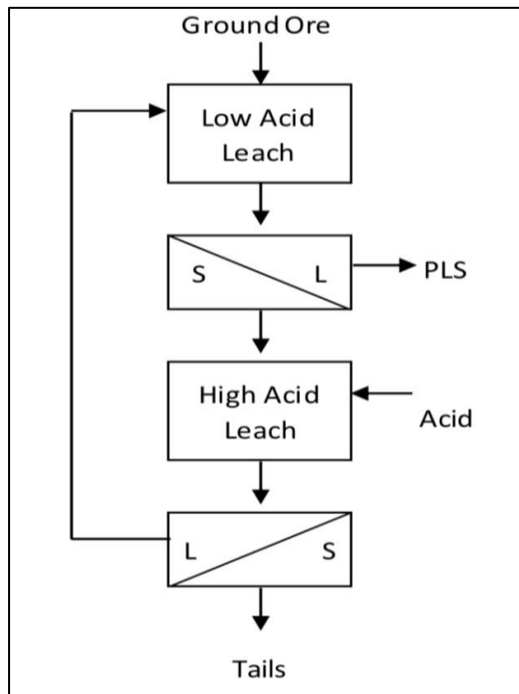


Figure 13-6: Two-stage leach flowsheet
 Source: CSA Global (2018b)

Two of the two-stage leaches compared the effect of the temperature in the pre-leach (PL) stage while the other two examined the effect of the acidity of the second stage high acid leach (HAL). Increased leach temperature and acidity resulted in greater extraction (while variation in the feed grind size (between 80 μm and 808 μm ,) had no observable effect in single-stage leaching. The high-temperature PL followed by a high-acid HAL (70°C and 80 g/L, respectively) resulted in 97% uranium extraction while recycling excess free acid found in the PLS after a single stage leach (or HAL in a counter-current operation).

All the two-stage leach tests were performed using feed ground to a P_{80} of 138 μm when the solids were subjected to the PL. The first two tests (Test 9 and Test 10) compared PL temperature of 40°C and 70°C and were followed by identical HALs and resulted in 96–97% final uranium extraction. The final two tests (Test 11 and Test 12) investigated varying the free acidity (targets of 70 g/L and 50 g/L H_2SO_4 , respectively) in the HAL after performing the PL at 70°C and resulted in 92% and 82% final uranium extraction, respectively. In these tests, between 89 kg/t and 106 kg/t sulphuric acid was consumed from the recycled PLS in the PL stage. Fresh acid addition to maintain 80 g/L H_2SO_4 was between 196 kg/t and 243 kg/t (compared to around 350 kg/t in single-stage leaching). Reducing the free acidity in the HAL to 70 g/L and 50 g/L likewise reduced sulphuric acid addition to 193 kg/t and 136 kg/t, respectively. Figure 13-7 shows extraction kinetics for the HAL second stage of these tests with PL extraction displayed at time zero.

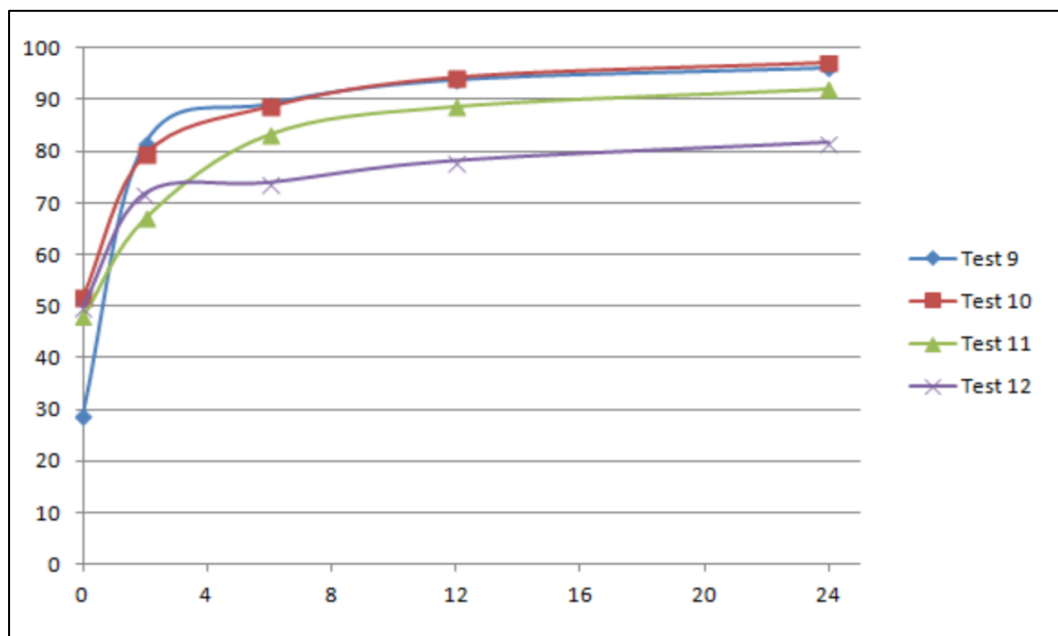


Figure 13-7: Uranium extraction vs Time 138 μm with PL
Source: CSA Global (2018b)

13.3.1 Column Leach Tests

Thirteen 1 m column leach tests were carried out by Mintek on five samples received from the DASA Project under different conditions (Table 13-1). Different crush sizes, reagent additions (including one alkali run), pH levels and redox values were explored. The samples were not amenable to scrubbing for the purpose of removing surface coatings since the quantum of new fines generated continued to increase with increased scrubbing retention time (i.e. autogenous milling), confirming previous findings conducted at SGS.

Bottle-roll leach tests showed that acid-in-agglomeration and curing had a positive effect on the initial kinetics and extent of overall uranium dissolution for leaching in acidic solutions.

Due to the heterogeneous nature of uranium mineralized samples, it is very difficult to obtain a truly representative sample for whole-rock assay. The definitive uranium extraction efficiencies (highlighted in yellow in Table 13-1 below) are therefore calculated by recalculating the concentration of uranium in the feed, by mass balancing all the uranium present in the leach solutions and in the residue, which then provides a recalculated head concentration that is representative and removes the potential sampling variability experienced at the respective laboratory.

Table 13-1: Column leach testwork results

Test ID	U _{in} (assayed)		U _{out}		Recalc. head		U dissolution			Out/In	Acid consumption		
			Solution	Residue			Assayed head and solution	Assayed head and residue	Recalc. head and residue				
	ppm	g	g	g	ppm	g	%	%	%		%	kg/t	kg/kg U
GF1	229	5.64	3.37	1.19	185	4.55	59.7	78.9	73.9	81	48.3	340	154
GF2		5.51	2.97	0.41	141	3.38	53.9	92.6	87.9	61	73.9	574	260
GF3	248	6.17	4.73	0.54	212	5.27	76.6	91.2	89.7	85	51.8	259	117
GF4	199	4.88	2.48	0.99	141	3.46	50.8	79.8	71.5	71	76.0	729	331
GF5	386	9.85	6.85	0.30	280	7.14	69.5	97.0	95.9	73	45.9	163	74

Test ID	U _{in} (assayed)		U _{out}		Recalc. head		U dissolution			Out/In	Acid consumption		
			Solution	Residue			Assayed head and solution	Assayed head and residue	Recalc. head and residue				
	ppm	g	g	g	ppm	g	%	%	%	%	kg/t	kg/kg U	kg/lb U
GF6		9.83	7.14	0.63	305	7.77	72.6	93.6	91.9	79	44.7	153	70
GF7		9.41	6.22	0.81	288	7.03	66.2	91.4	88.5	75	33.7	125	57
GF8		10.07	6.51	1.07	290	7.58	64.7	89.4	85.9	75	33.2	125	57
GF9	230	5.32	5.12	0.47	241	5.59	96.1	91.1	91.6	105	25.0	111	50
GF10		5.41	5.18	0.45	239	5.62	95.7	91.7	92.0	104	41.3	180	82
GF11		5.58	5.22	0.36	230	5.58	93.6	93.6	93.6	100	39.8	180	81
GF12		5.82	4.54	0.48	198	5.02	78.0	91.8	90.5	86	41.0	220	100
GF13		5.97	3.04	1.90	190	4.94	51.0	68.2	61.6	83			

The acid leached uranium extraction efficiencies varied between 71.5% and 95.9%. The alkali leach resulted in 61.6% uranium extraction compared to 90.5% to 93.6% for the acid leach. The water consumption during the testwork varied between 0.1 m³/t and 7.8 m³/t. The different crush sizes (6 mm, 10 mm and 20 mm) utilized during the testwork did not significantly influence the uranium extraction efficiencies obtained, with the highest uranium extractions achieved occurring at the 10 mm crush size.

The acid consumptions for GF2 and GF4 were significantly higher than the other samples tested, indicating the possible presence of acid consuming minerals in the samples. GF9 (DADH @ 30 kg/t) consumed less than 25 kg/t of acid whilst still resulting in an extraction efficiency of 91.6%. Crush size did not have a significant influence on acid consumption and the main influencing factor (after taking into account reagent mix) was the mineralogy of the different samples.

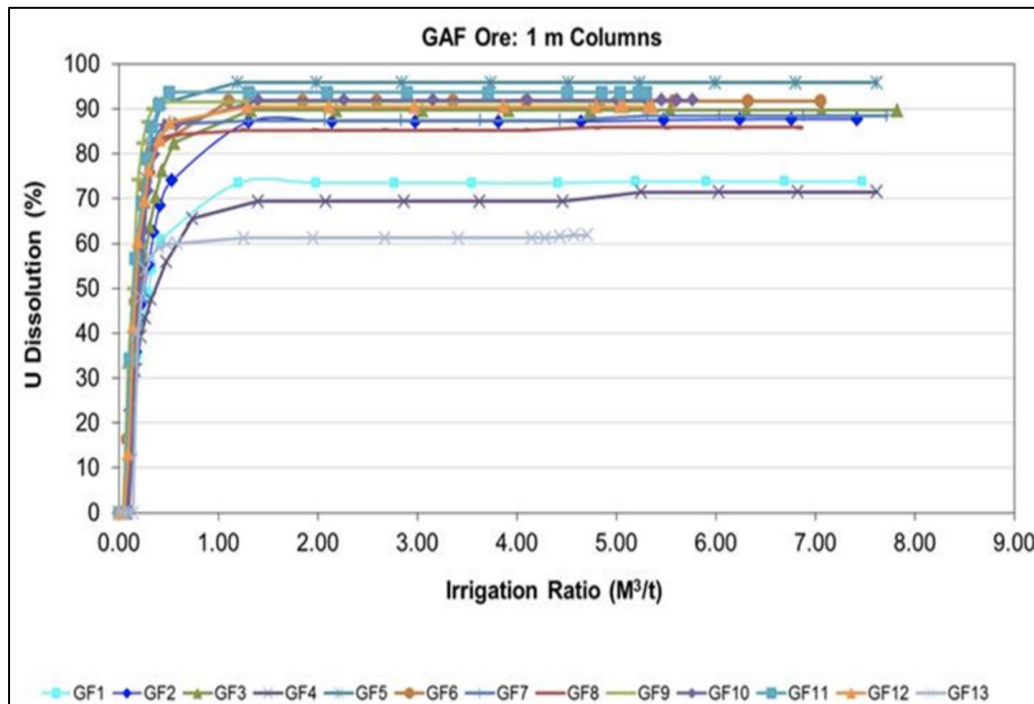


Figure 13-8: Irrigation rates vs uranium extraction
 Source: CSA Global (2018b)

Stacking tests were conducted to give an indication of whether the samples were still able to free-drain at simulated heap heights and hence were potentially amenable to heap leaching and indicate heap lift heights. All samples satisfied the saturated hydraulic conductivity design requirement of >1,000 Ks for stacking heights between 5 m and 7 m indicating the maximum lifts possible in a full-scale heap leach.

13.4 Solid-Liquid Separation

A bulk leach sample was generated from the uranium leach tests and subjected to flocculent selection, counter-current decantation modelling, vacuum filtration thickener and washed thickener underflow testing.

The optimum flocculent was Ciba Magnafloc 333 (a non-ionic flocculent) at a dose rate of 60 g/t and produced a 48% w/w solids underflow from a 6% w/w solids thickener feed. The resulting supernatant was clear after 10 minutes settling time. Settling rates of 1,135 m³ to 1,219 m³ per m² per day were measured.

Rheology testing indicated critical solids density was approximately 55% weight corresponding to 60 Pa yield stress value (unsheared) for the bulk leach pulp at -30 mesh.

Counter-current decantation scenario testing resulted in a water requirement of 1.59 m³ to 3.21 m³ freshwater per tonne of dry feed depending on the number of stages (5–7) and the wash efficiency required. The final stage discharge varied between 0.001 g and 0.007 g uranium per litre.

The direct filtration scoping tests conducted with, and without, a filter aid indicate the sample was not amenable to direct filtration.

13.5 Uranium Recovery from Pregnant Leach Solution

13.5.1 Solvent Extraction

SGS carried out solvent extraction and ion exchange testwork on a bulk leach solution sample to determine the recovery of Uranium from these solutions. Uranium was recovered from solution effectively using commercial tertiary amine extractant. A commercially available tertiary amine (Alamine 336) was used as the extractant, isodecanol (as the modifier) and Exxsol D80 (as the diluent). When aggressive leach conditions were used, the phase separation and clarity of phases suffered but efficient extraction was achieved. However, the phases separated reasonably well, with the initial break in just a few seconds and final disengagement in a few minutes. Aqueous and organic phases were generally clear and there was no co-loading of Fe during this test.

Countercurrent stripping of loaded organic with 400 g per litre H₂SO₄ was performed at O/A of 10/1 producing strip liquor containing 31 g uranium per litre.

13.5.2 Ion Exchange

Several suitable commercially available ion exchange resins were tested using a PLS feed with a uranium concentration of 306 mg/L. As can be seen A660 (at pH 3.0) and 920U performed the best with loadings in excess of 45 g/L uranium on the resin and they had the highest uranium loading kinetics. 920U was subsequently used for a column loading test, however after 30 BVs of PLS had passed through the resin bed the uranium concentration in the effluent gradually increased from 10 mg/l to >100 mg/l after 100BVs. Iron (68.9 mg/L) and zirconium (32.6 mg/L) were elevated in the eluate generated between BVs 2-5 from the acid resin elution.

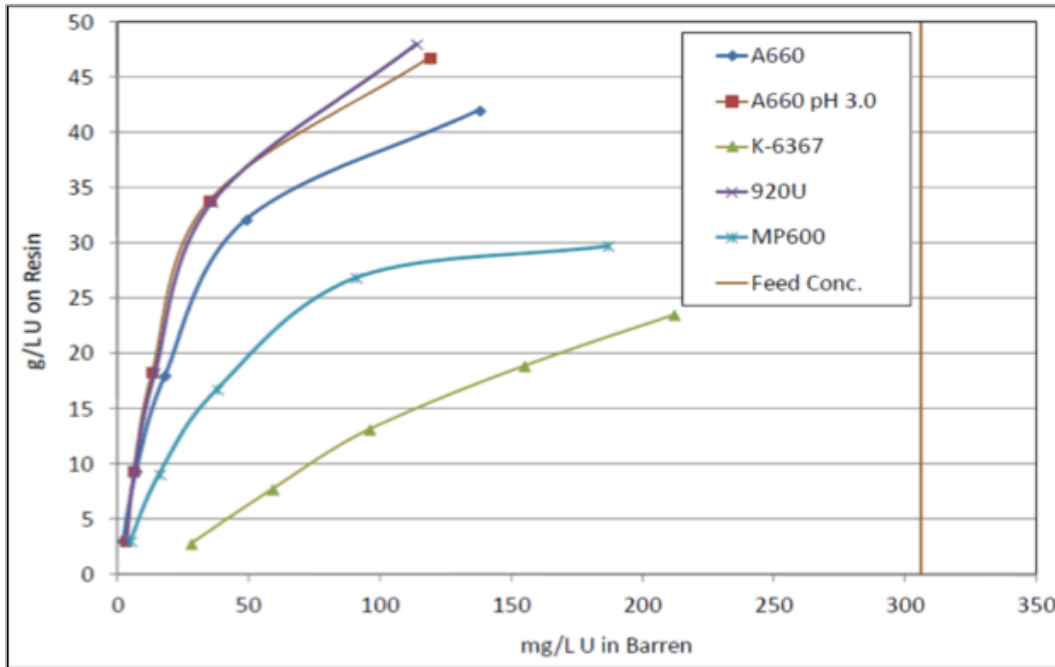


Figure 13-9: Resin loading vs Barren concentration
 Source: CSA Global (2018b)

13.5.3 Resin-in-Pulp

Resin-in-pulp (RIP) was tested as an alternative to leaching followed by solid-liquid separation. A single RIP test was conducted using Purolite’s A660 resin (Figure 13-10) on a feed sample with a uranium concentration of approximately 700 mg/L and 10 g/L H₂SO₄.

A660 resin performed well, loading to 40 g per litre and achieving 99.7% uranium recovery from solution after four contacts of two hours each.

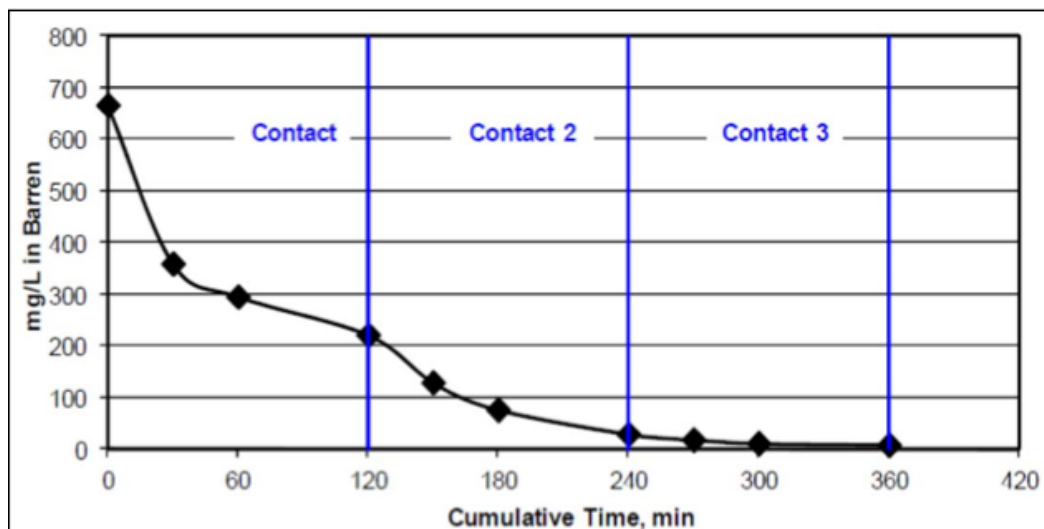


Figure 13-10: Uranium concentration in barren vs time
 Source: CSA Global (2018b)

The efficiency of the RIP is dependent on the feed particle size distribution (PSD) and would require the feed PSD to be significantly less than the PSD of the resin to ensure efficient separation of the pulp and resin (particle size dependent on the specific resin selected).

13.6 Uranium Precipitation

Strip liquors from SX testing were used for uranium precipitation testing. The strip liquors were neutralized with hydrated lime and advanced to precipitation using hydrogen peroxide. The final precipitate (yellowcake) contained 64.3% uranium, equivalent to 91% uranyl peroxide (UO_4).

14 Mineral Resource Estimates

14.1 Software Used

The DASA uranium deposit Mineral Resources were updated by the Qualified Person and other CSA Global geologists under Qualified Person supervision, using Micromine version 2018.6 (18.0.947.6 x64) software.

14.2 Database Compilation

GAFC supplied CSA Global with the updated database in Microsoft Excel format. The database included all the exploration results for all exploration stages, including all holes drilled in 2017–2018.

The main analytical database comprises estimated uranium equivalent grades (eU₃O₈) based on the gamma-logging of the drillholes. A separate file was supplied with all results of chemical assays.

The uranium oxide equivalent grades were calculated from the LAS files (gamma-logging results). LAS files included CPS values, which were converted to uranium oxide grades using standard corrections and coefficients that account for the probe type (K-factor), casing steel thickness, presence of water and other factors. All other correction factors and parameters are shown in Table 10-3.

The eU₃O₈ grades were calculated for each 10 cm interval using LAS files. Some historical holes were however not gamma-logged to the total depth but had results of the chemical assays which were also used for interpretation and modelling. The available data is summarized in Table 14-1.

Table 14-1: Summary of supplied and used data

Category	Supplied	Gamma-logged	Chemical assays	Used for MRE
Drillhole collars	1,028			
Drillholes		1,017	93	1,018
Metres drilled	150,399	138,230	6,333	138,844
Survey records	11,622			11,622
Records in assay data file		1,138,299	9,784	
Assayed/probed intervals for U ₃ O ₈		1,382,299	9,772	1,382,999 (including 700 chemical assays and 1,382,299 probed intervals)
Records in geology logging file	9,039			9,039

The databases consisted of several parts:

- Analytical database, including:
 - Drillhole collar coordinates
 - Drillhole survey data
 - Drillhole sampling database (results of the chemical assays)
 - Drillhole gamma-ray logging database (results with eU₃O₈ calculation)
 - Drillhole geological logging and codes.
- Topography data in the form of a DTM (supplied as a DXF file).

Import of the various datasets into Micromine proceeded without error.

14.3 Data Validation

The analytical and geological database was checked using macros and processes designed to detect the following errors:

- Duplicate drillhole names
- One or more drillhole collar coordinates missing in the collar file
- FROM or TO missing or absent in the assay file
- FROM > TO in the assay file
- Sample intervals are not contiguous in the assay file (gaps exist between the assays)
- Sample intervals overlap in the assay file
- First sample is not equal to 0 m in the assay file
- First depth is not equal to 0 m in the survey file
- Several downhole survey records exist for the same depth
- Azimuth is not between 0° and 360° in the survey file
- Dip is not between 0 and 90 degrees in the survey file
- Azimuth or dip is missing in survey file
- Total depth of the holes is less than the depth of the last sample.

It was found that 10 of GAFC's earlier holes do not have analytical information. All these holes were excluded from the resource estimation process.

No other errors have been identified in the databases, and no corrections were introduced to the database. Those intervals that were not gamma-logged, but assayed, were added to the combined data file with uranium grades.

14.4 Exploratory Data Analysis – Statistical Analysis

Classical statistical analysis was updated twice for the deposit. The first study was carried out to determine the distribution parameters of uranium grades.

Figure 14-1 summarizes the statistical properties of the unrestricted assay databases for uranium. The statistical parameters for all uranium grades are shown in Table 14-2.

The histogram for unrestricted uranium grade population has a positively skewed log distribution and demonstrates that there is no apparent mixing of grade populations. The histogram does not show an obvious cut-off grade that could be used for interpretation of uranium mineralization. A decision was made to employ the nominal cut-off grade of 100 ppm for the subsequent update of interpretation of mineralized bodies. The adoption of 100 ppm cut-off grade also reduces the residual effect of any radium halos by their exclusion.

Once the uranium mineralization was interpreted for all mineralized lenses and wireframed, classical statistical analysis was repeated for the composited samples within the interpreted envelopes to meet the following objectives:

- To estimate the mixing effect of grade populations for uranium within the interpreted mineralized bodies
- To estimate the necessity of separation of grade populations if more than one population was observed
- To reveal the possible top-cut grades for uranium for grade interpolation.

The input sample file was flagged to exclude those intervals that appeared outside the wireframed mineralized envelopes for uranium. The modelled histogram for the uranium grades restricted within mineralized envelopes does not demonstrate apparent mixing of grade populations for uranium (Figure 14-2).

The lognormal histograms and cumulative probability plots were analyzed to determine the top-cut grades to be applied to the input analytical data before the geostatistical analysis. The majority of the input intervals with uranium grades were determined from the gamma logging results for 10cm intervals. Thus, a decision was made that no top-cut grade values are applied on the analyzed intervals because deconvolving of uranium grades from gamma-logging results usually takes into account abnormally high grades and, therefore, top cutting is not required.

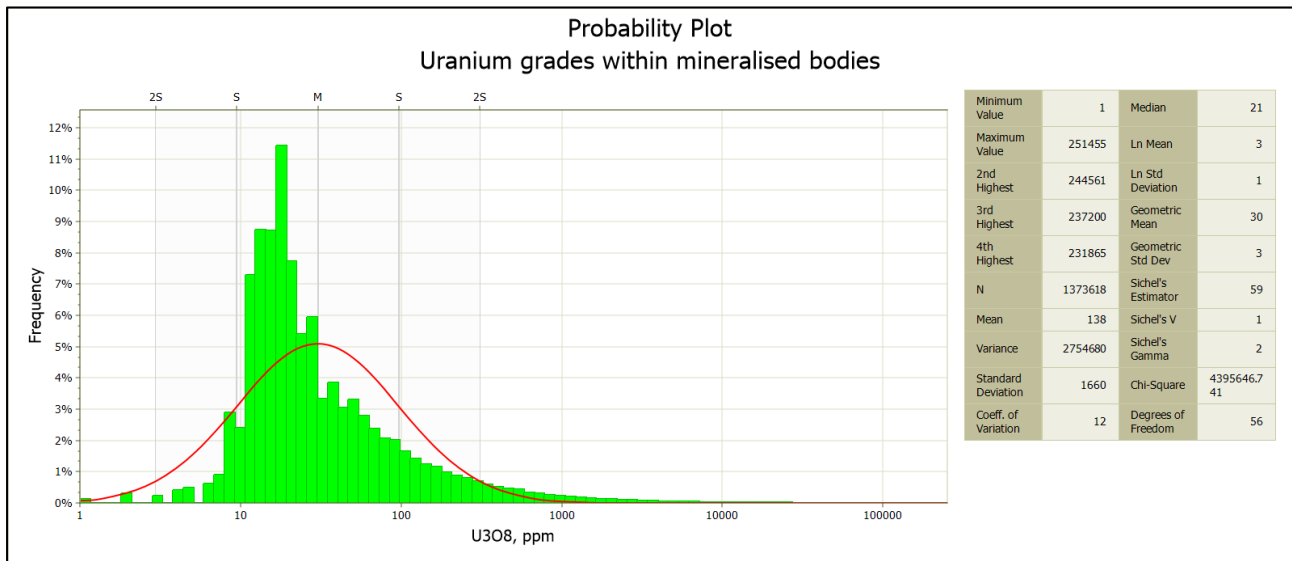


Figure 14-1: Log histogram for unrestricted uranium grades

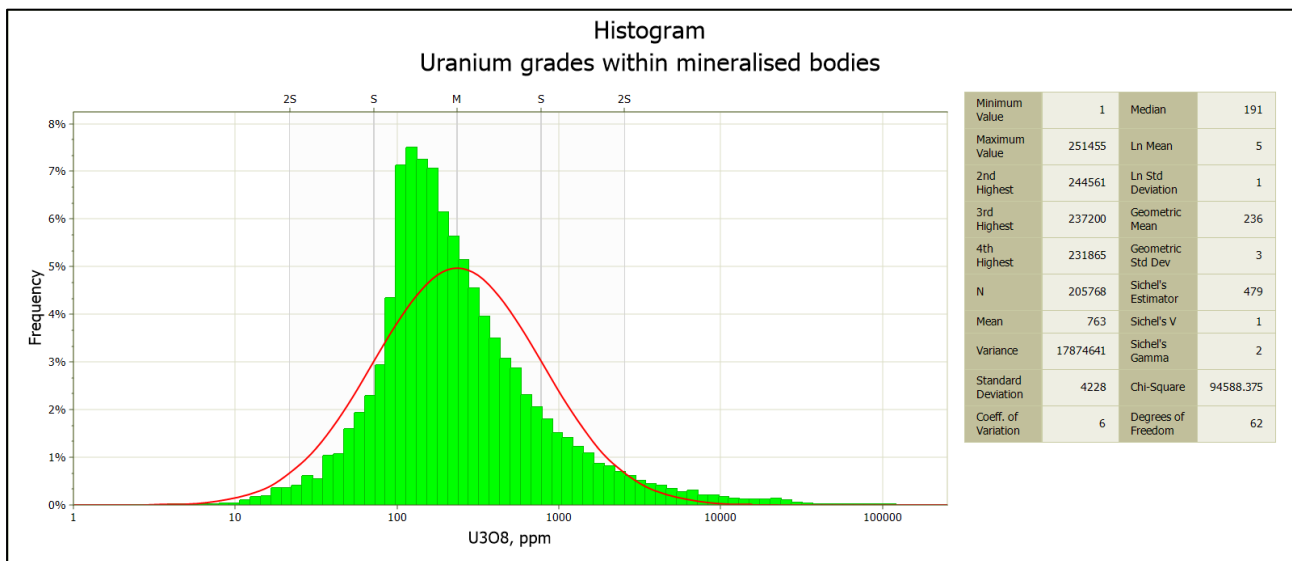


Figure 14-2: Log histogram for uranium grades within mineralized envelopes

The coefficient of variation for the composited uranium grades is relatively high, which indicates that the possibility of modelling robust semi-variograms is relatively poor.

Table 14-2: Classical statistics for uranium grades (weighted on length)

Element	Minimum (ppm)	Maximum (ppm)	No of points	Mean (ppm)	Variance	Standard deviation	Coefficient of variation	Median (ppm)
eU ₃ O ₈	Unrestricted sample intervals							
	0	251,455	1,382,999	137	2,728,214	1,652	12	21
	Intervals within mineralized bodies							
	0	251,455	205,804	761	17,711,245	4,208	5.5	191
0.5 m composites within mineralized intervals								
2	218,487	42,158	765	16,918,201	4,113	5.4	194	

14.5 Lithological Model

A full lithological model was developed for the DASA deposit using logged lithological codes in the supplied database. The geological data and all codes were imported into the Leapfrog software, where each main lithological unit was modelled along with the major known and logged faults. Firstly, four major fault planes were modelled, and subsequently the deposit was subdivided into five main fault blocks. All lithological units were modelled within each fault blocks separately, limited by the fault planes.

Example of the modelled lithology for one of the cross sections is shown on Figure 14-3.

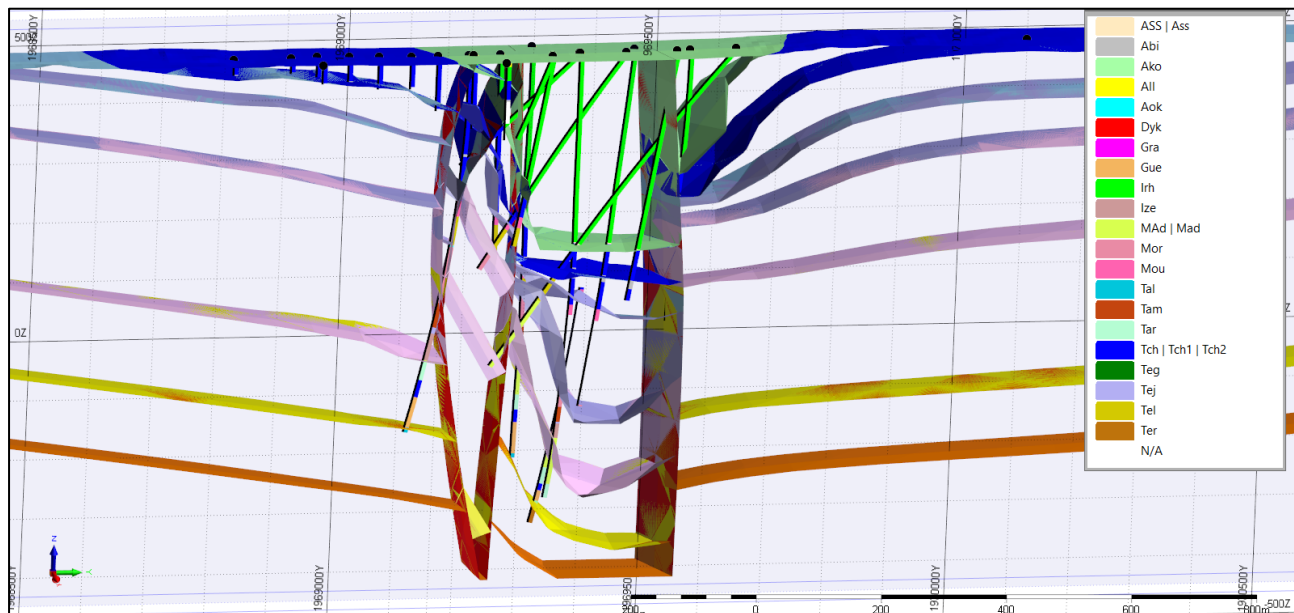


Figure 14-3: Lithological model and faults, Section 23 (359,900mE)

The developed lithological model was subsequently used to control the interpretation and wireframing of all mineralized bodies, which were digitized in line with the modelled lithological units and clipped to the modelled faults.

14.6 Interpretation of Mineralized Bodies

The grade compositing process was employed to calculate the mineralized intervals using a 100 ppm cut-off grade. The calculated grade composites were displayed along the drillhole traces to assist with interpretation only. The interpretation process involved correlation of identified mineralized intervals between the holes along exploration lines and also between the sections to make sure that the correct lens numbers would subsequently be assigned to the analytical data file.

The grade compositing process employed the following input parameters:

- Cut-off value: 100 ppm eU_3O_8
- Minimum composite length: 1 m
- Minimum grade of final composite: 100 ppm eU_3O_8
- Maximum consecutive length of internal waste: 0.5 m
- Minimum grade * length: 200 ppm*m eU_3O_8 .

Interpretation was updated interactively for 56 SN cross sections which were 50 m apart with some infilled holes within the Flank Zone. When uranium grades were interpreted, each section was displayed in Micromine's Vizex display environment together with drillhole traces, grade composites, interval grade values and a slice through the lithological model. A total number of 327 individual mineralized lenses were interpreted and modelled for the deposit. The following techniques were employed while interpreting and updating the uranium mineralization:

- Each cross section was displayed on screen with a clipping window equal to a half distance from the adjacent sections.
- All interpreted strings were snapped to the corresponding drillhole composited intervals, i.e. the interpretation was constrained in the third dimension.
- Internal waste within the mineralized envelopes was not interpreted and modelled. It was initially included in the composited grade intervals used for the resource estimation.
- The interpretation was extended perpendicular to the corresponding first and last interpreted cross section to the distance equal to a half distance between the adjacent exploration lines; In this case, the interpretation honoured the general direction of the structure and the tendency for changes of the form of the geological body.
- If a mineralized envelope did not extend to the adjacent drillhole section, it was projected halfway to the next section keeping its thickness and terminated. The general direction and dip of the envelopes was maintained.
- All interpreted strings were clipped to the fault planes, and all interpreted envelopes were digitized in line with the main lithological structures of the deposit.
- If a mineralized envelope did not extend to the next drillhole within the interpreted exploration line, it was interpolated halfway to the next drillhole keeping its thickness and terminated. The general direction and dip of the envelopes was maintained.
- If a mineralized envelope was at the topographic surface, it was extended above the topographic base. This was done to make sure there would be no gaps between the block model and the topographic base when the block model was built.

An example of an interpreted and updated section is shown in the Figure 14-4, where thick red lines along drillhole traces are grade composites, traces are colour coded according to lithology, red strings are interpreted mineralized bodies, purple lines are faults, and hatched areas are different lithological units.

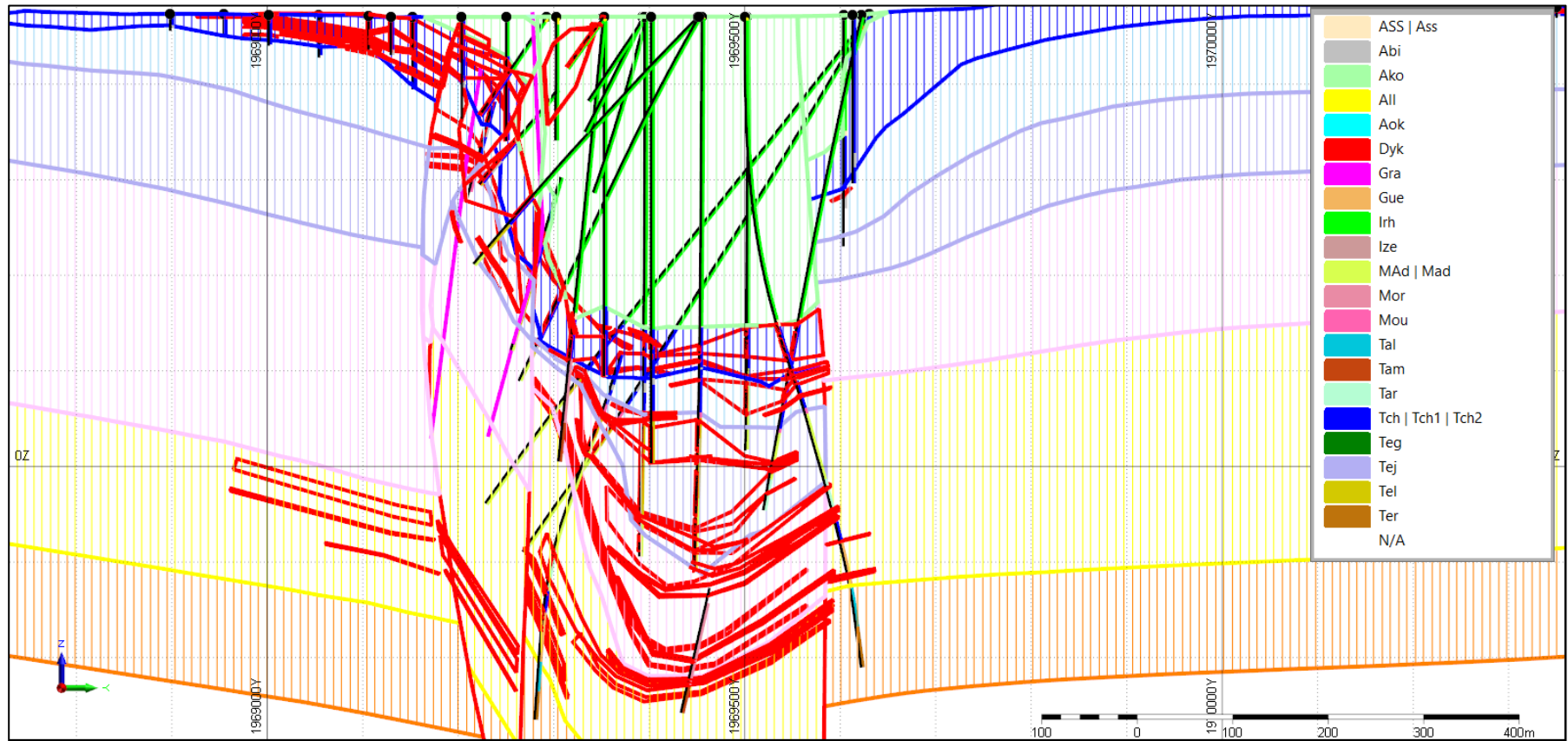


Figure 14-4: Schematic example of interpretation of the DASA deposit – Section 360,000mE

Note: Hatched areas – lithological units, red are mineralized envelopes, black is drillhole trace with red hatches on the left – grade composites.

14.7 Wireframing

The interpreted strings were used to update three-dimensional (3D) solid wireframes for the mineralized envelopes. Every cross section was displayed on the screen along with the closest interpreted section. If the corresponding envelope did not appear on the next cross section, the former was projected halfway to the next section, where it was terminated. Every mineralized envelope was reviewed and, where necessary, wireframed or updated separately and individually. Mineralized bodies were extended and projected to the interpreted sub-vertical fault planes, where it was possible, and then terminated. Internal waste was included within the interpretations where continuity would be improved by doing so.

Figure 14-5 is a 3D view of the modelled mineralized bodies. A total of 327 mineralized wireframes were modelled for the deposit. Each wireframed lens had a different colour, and steeply dipping faults are shown with dark red colour in Figure 14-4. The modelled mineralized bodies between the faults or steeply dipping bodies generally represent the graben structure, while all other bodies outside the graben are generally flat and relatively shallow mineralized lenses.

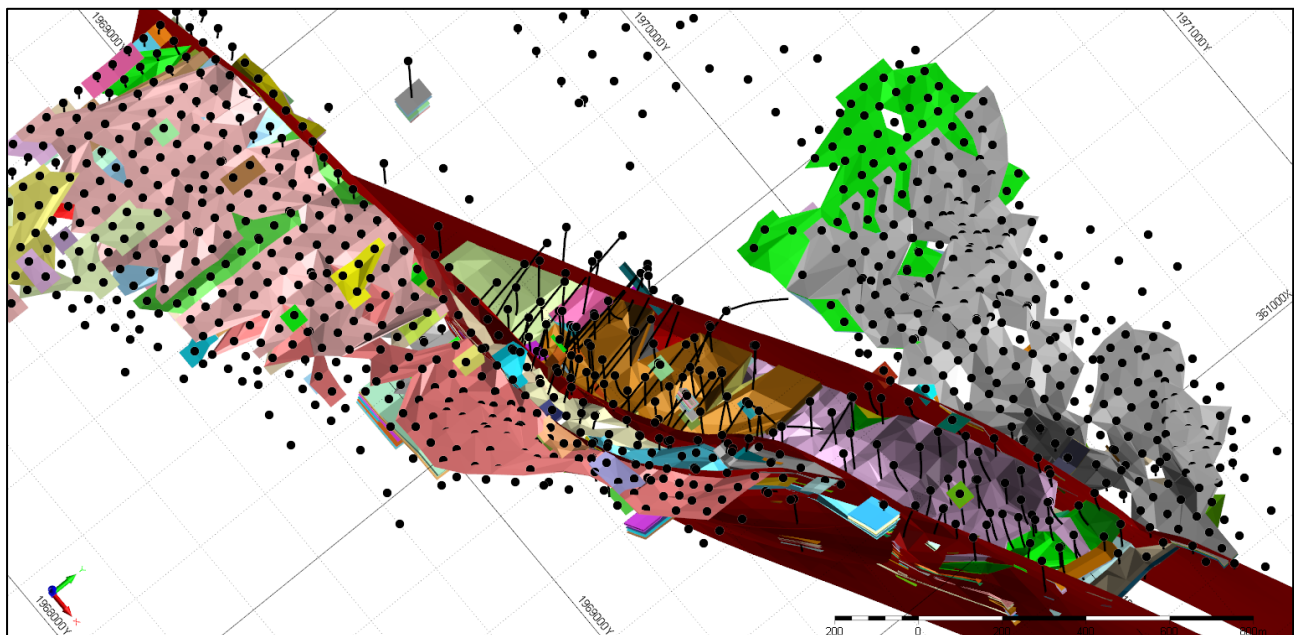


Figure 14-5: Oblique view of the wireframed uranium mineralized envelopes and fault planes for the DASA deposit (looking northwest)

All wireframe models were validated so that they are all solids (closed) and that they do not contain intersecting triangles.

Table 14-3: Number of interpreted wireframes at the DASA deposit

Number of wireframes	Volume (m ³)
327	79,027,830

14.8 Drillhole Data Selection and Compositing

Drillhole data selection is a standard procedure which ensures that the correct samples are used in classical statistical and geostatistical analyses and grade interpolation processes. For this purpose, the solid wireframes for each mineralized envelope were subsequently used to select the drillhole sample intervals.

Samples were selected for individual envelopes and flagged accordingly for each modelled mineralized envelope.

Visual validation of the flagged samples was carried out to make sure the correct samples were selected by the wireframes.

Classical statistical analysis was then repeated for those uranium grades within the mineralized envelopes.

Majority of intervals in the analytical data file were 10 cm based on gamma-logging. It was decided to composite all intervals to 0.5 m. Thus, the selected samples within each mineralized envelope were separately composited over 0.5 m intervals, starting at the drillhole collar and progressing downhole. Compositing was stopped and restarted at all boundaries between mineralized envelopes and waste material.

14.9 Dynamic Search

Recent drilling confirmed that the Flank Zone is a set of steeply dipping mineralized bodies with variable northeast dipping without any apparent “steps” and separated by fault planes. This improved the understanding of the deposit geology and helped to develop a more robust interpretation of mineralized lenses to update the model.

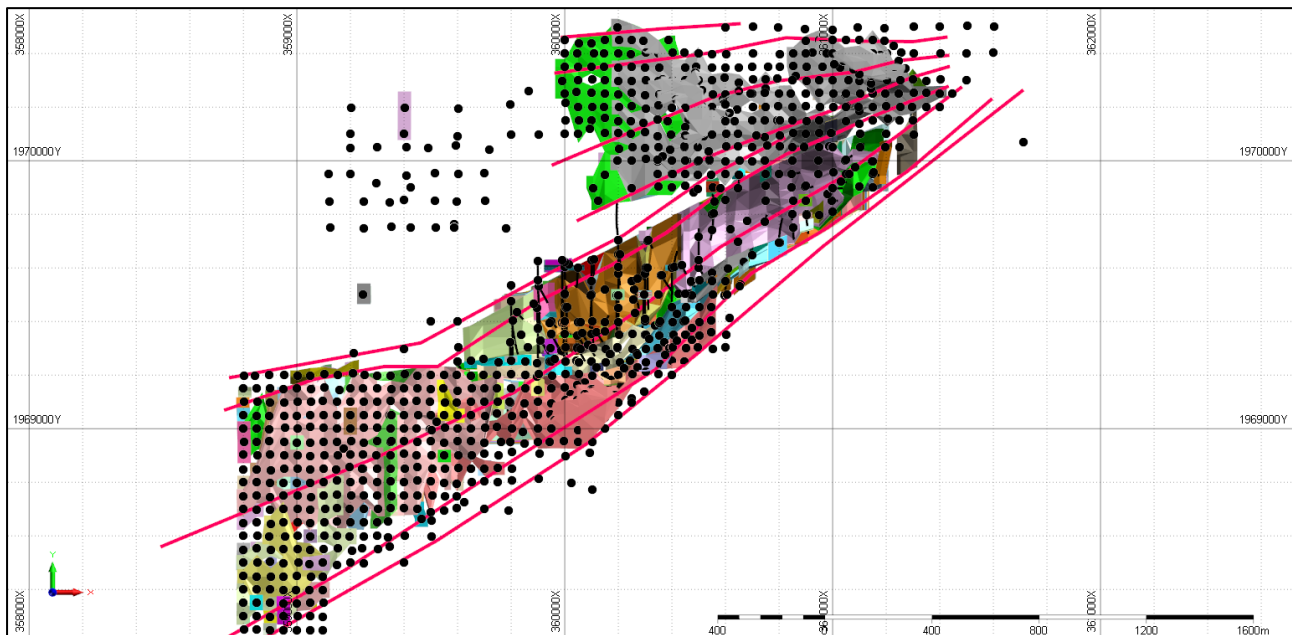


Figure 14-6: Strings along the deposit strike (plan view)

It was decided that a dynamic search would deliver most robust results for the deposit. To set up the dynamic search, it was necessary to assign azimuth, plunge and dip values to each cell in the block model. That was achieved using the following methodology:

1. A set of strings was digitized along the deposit strike in plan view as shown in Figure 14-6 (red lines).
2. A set of strings was digitized for every 50 m spaced section approximately parallel to the deposit strike. All strings were digitized through the central parts of the wireframe slices. These strings (Figure 14-7) represented general plunge for each modelled lens (purple lines).
3. A set of strings was digitized for every 50 m spaced section approximately perpendicular to the deposit strike. All strings were digitized through the central parts of the wireframe slices. These strings (Figure 14-8) represented general dip for each modelled lens (purple lines).

4. When all strings for azimuth, plunge and dip were digitized, they were “normalized”, i.e. points were inserted in such a way that the distance between points along strings would not be greater than 10 m.
5. Azimuth for each pair of points along strings was calculated and recorded in the string file which was digitized for the deposit strike.
6. Inclination for each pair of points along strings was calculated and recorded in the string file which was digitized for the lenses plunge.
7. Inclination for each pair of points along strings was calculated and recorded in the string file which was digitized for the lenses dip.
8. All calculated values for strings were checked to have correct positive or negative values and corrected if it was necessary.
9. The resultant strings were used to interpolate azimuth, plunge and dip values into each cell of the block model. Spherical search was employed for this process.

The resultant block model had assigned azimuth, dip and plunge values for each model cell, which represented the general directions of mineralized lenses.

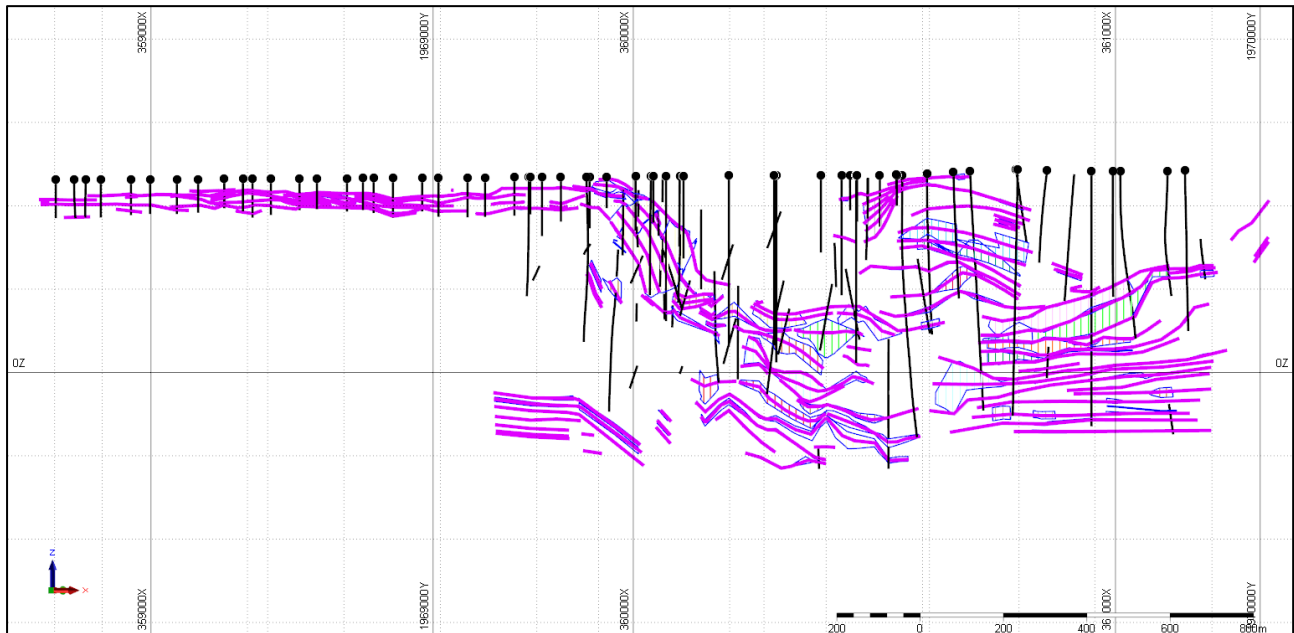


Figure 14-7: Strings for the plunge of the bodies (section view looking northwest)

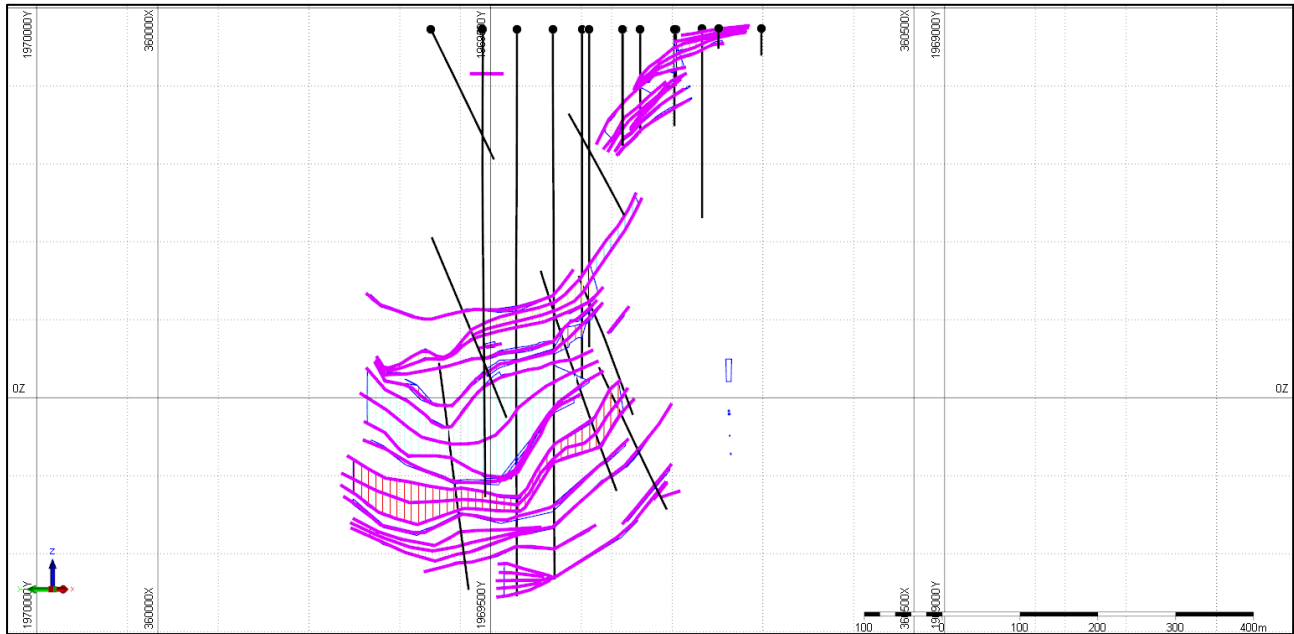


Figure 14-8: Strings for the dip of the bodies (section view looking northeast)

14.10 Geostatistical Analysis

The new analytical data was merged with the historical data, and the geostatistical analysis was repeated for the model update. It was found that the previously modelled semi-variograms did not significantly change their characteristics.

Downhole experimental variogram was modelled to estimate the expected nugget effect for uranium grades (Figure 14-9). The estimated nugget effect was then applied to model directional semi-variogram models.

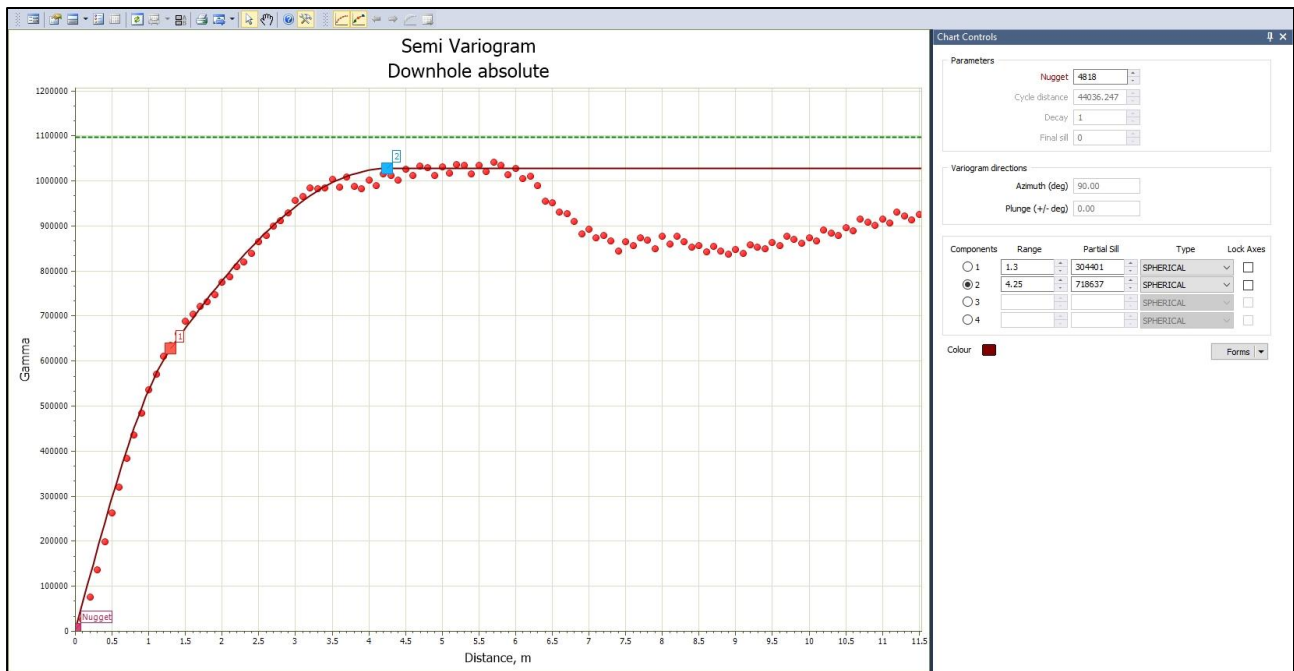


Figure 14-9: Downhole absolute semi-variogram model for uranium

A semi-variogram map was then generated in plan view to establish the direction of maximum grade continuity (Figure 14-10). The map clearly demonstrated that the azimuth of maximum continuity is 55°, which generally matches with the overall strike of the mineralized bodies. The directions for semi-variogram models were established as 55° azimuth, 0° dip; 145° azimuth, 0° dip; and vertical; but the grade interpolator with dynamic search applied variable directions to the semi-variogram models in line with the parameters estimated for each model cell.

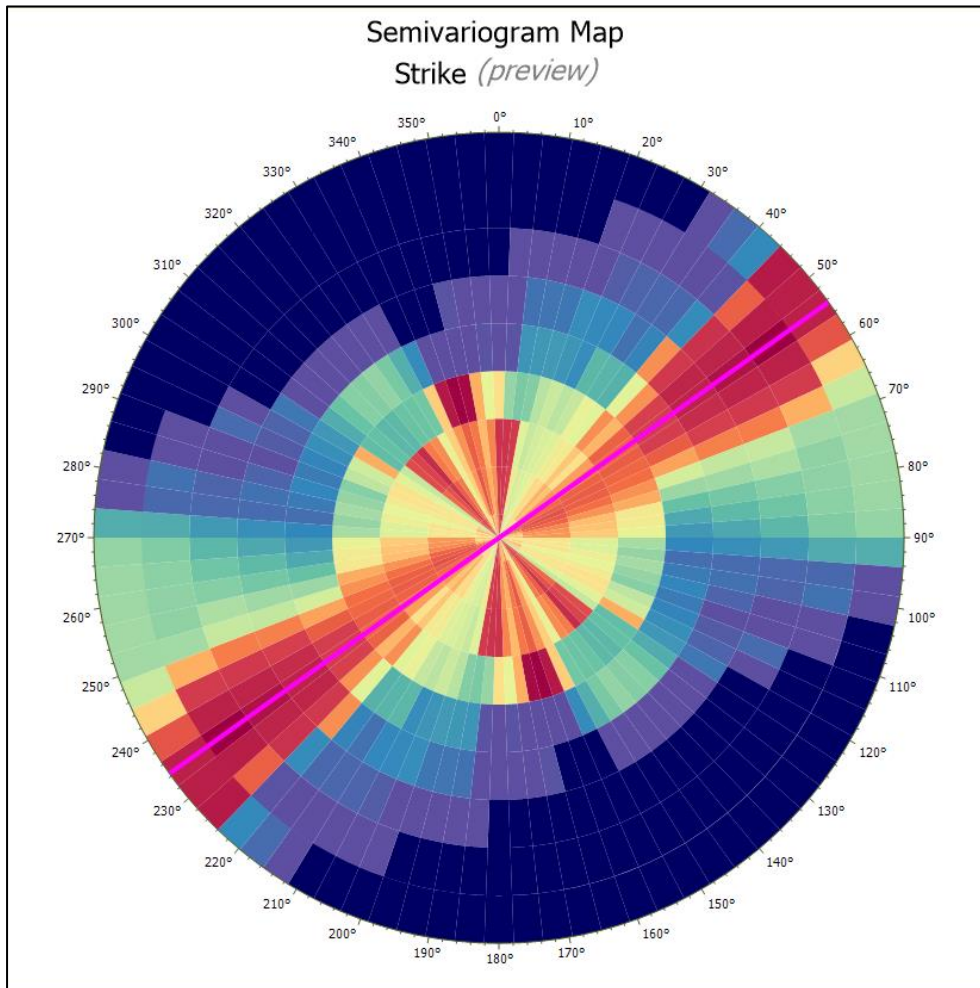


Figure 14-10: Semi-variogram map (plan view)

It was found that robust absolute semi-variograms are difficult to model most likely due to the high coefficient of variation of uranium grades. Therefore, relative semi-variogram models were calculated and modelled for the composited uranium sample file without applied top-cut grades (Figure 14-11).

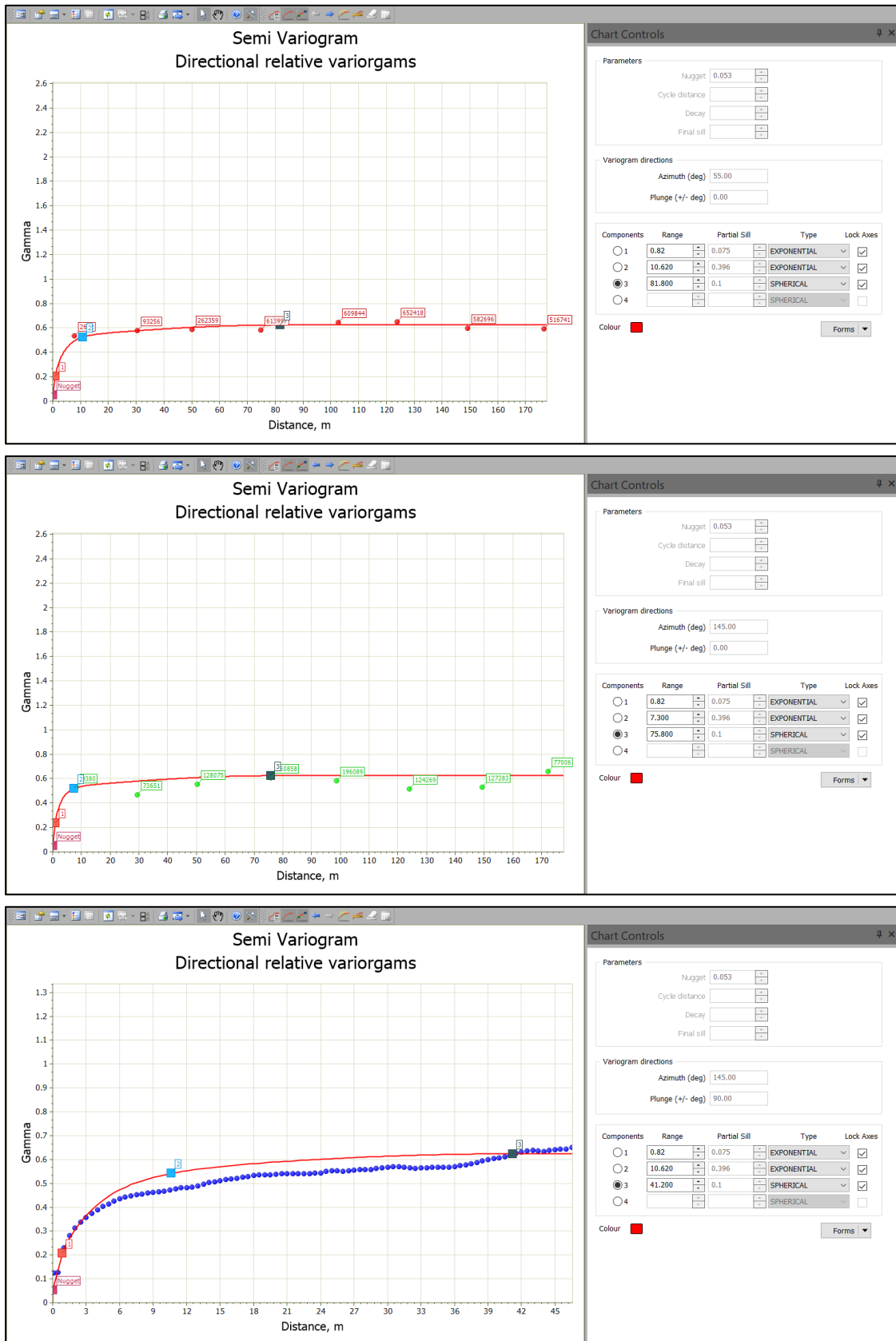


Figure 14-11: Relative semi-variogram models for uranium (three main directions)

All modelled experimental semi-variograms were exponential and spherical with three nested structures. The obtained semi-variogram ranges were used to determine the search radii. The latter were used in the grade interpolation processes.

Table 14-4: *Semi-variogram characteristics*

Element	Type	Axis	Azimuth	Dip	Nugget	Partial sills	Ranges
U ₃ O ₈	Relative Exponential and Spherical	Main	55	0	0.053	0.075, 0.396 and 0.1	1, 10.6 and 81.8
		Second	145	0			1, 7.3 and 75.8
		Third	145	90			1, 10.6 and 41.2

14.11 Block Modelling

An empty block model was created within the closed wireframe models for the mineralized envelopes. Each modelled lens was assigned a unique code in the model file. The block model was then restricted below the topography surface (i.e. all the model cells above the surface were deleted from the model file).

Block model parameters are shown in Table 14-5.

Table 14-5: *Block model characteristics*

Axis	Extent (m)		Block size (m)	Maximum sub-celling (m)	Number of parent blocks
	Minimum	Maximum			
Easting	358,435	361,615	10	1	318
Northing	1,968,065	1,970,755	10	1	269
RL	-486	502	4	1	247

The initial filling with a corresponding parent cell size was followed by sub-celling where necessary. The sub-celling occurred near the boundaries of the mineralization or where the model was truncated with the topographic surface. The parent cell size was chosen on the basis of the exploration grid and general morphology of the mineralized bodies and in order to avoid the generation of excessively large block model. The sub-celling size was chosen to maintain the resolution of the mineralized bodies. The sub-cells were optimized in the model where possible to form larger cells.

14.12 Grade Interpolation

Uranium equivalent (eU₃O₈) grades were interpolated into the empty block model using the Ordinary Kriging (OK) interpolation method. This was then rerun using Inverse Distance Weighted (IDW) method with the powers of two and three as cross checks. The search ellipse and semi-variogram models were oriented by the interpolator using the azimuth, plunge and dip values for each model cell accordingly.

The OK and IDW processes were performed at different search radii until all model cells were interpolated. The search radii were determined by means of the evaluation of the semi-variogram parameters. Each mineralized lens was estimated separately.

The first search radii for all lenses were selected to be equal to one third of the semi-variogram long ranges in all directions. Model cells that did not receive a grade estimate from the first interpolation run were used in the next interpolation with greater search radii equal to two thirds of semi-variogram long ranges in all directions. The third interpolation run employed radii equal to full semi-variogram ranges. The model cells that did not receive grades from the first three interpolation runs were then estimated using radii incremented by the full semi-variogram ranges until all model cells were informed with uranium grade.

When model cells were estimated using radii not exceeding full semi-variogram ranges, a restriction of at least three samples from at least two drillholes was applied to increase the reliability of the estimates. The general definition of the interpolation strategy is presented in Table 14-6 below.

“Parent estimation technique” was employed (i.e. all sub-cells within each parent cell were informed by the same grade).

Each modelled lens was estimated individually without mixing of data points between lenses. To do that, all lenses were separated vertically from each other by 1,000 m. The vertical search was 10 m to honour better the vertical variability of grades.

De-clustering was performed during the interpolation process by using four sectors within the search neighbourhood. Each sector was restricted to a maximum of four points for all the lenses, and the search neighbourhood was restricted to an overall minimum of three points from at least two drillholes for the interpolation runs using radii within the semi-variogram ranges. The maximum combined number of points allowable for the interpolation was therefore 16. Change of support was honoured by discretizing to 5-points by 5-points by 5-points. These point estimates are simple averages of the block estimates. The general definition of the interpolation strategy is presented in Table 14-6.

Table 14-6: Interpolation parameters

Interpolation method	Ordinary Kriging				
	Less or equal to 1/3 of semi-variogram ranges	Less or equal to 2/3 of semi-variogram ranges	Less or equal to semi-variogram ranges	2 semi-variogram ranges	Greater than 2 semi-variogram ranges
Search radii					
Minimum number of points	4	4	4	1	1
Maximum number of points	16	16	16	16	16
Minimum number of drillhole	3	3	3	1	1

14.13 Bulk Density Values

Dry bulk density values were obtained during previous and recent exploration programs on the deposit. Direct measurements of 3,594 core samples were taken and processed by GAFC. More information bulk density measurement procedures is provided in the previous sections of this Report (Section 11.4).

Bulk density values can be assigned to block model cells using the following methods:

- Direct assignment of the values to block model cells
- Calculation of values for each cell using regression formulas
- Interpolation of values
- Use of geological model to assign values into each model cell.

CSA Global used the first method, i.e. the density values were assigned to each model cell based on the average value from the density dataset collected and provided by GAFC.

Each model cell was assigned a density value of 2.36 t/m³.

14.14 Mineral Resource Classification Strategy

No changes were made to the previously adopted classification strategy. The classification of the model was updated for those areas of the deposit where the confidence in geological continuity of the mineralized bodies was upgraded with additional drilling, where the exploration grid density was increased, and where the understanding of the deposit geology was supported by the lithological model.

The Mineral Resource classification strategy utilized in this report is based primarily on; geological confidence, search and interpolation parameters, and exploration drillhole density. Kriging variance was also used to assist with the classification. The specific requirements concerning the minimum number of samples and minimum number of drillholes used for grade interpolation for each block were applied and are tabulated in Table 14-6.

The block model was displayed in Micromine's Vizex environment and colour coded according to interpolation runs. After visual inspection, it was decided that the classification of Mineral Resources could be based on exploration drillhole density and interpolation runs which were based on modelled semi-variogram ranges. It was decided that the exploration grid of at least 50 m by 50 m would support the Indicated Resource category if blocks were estimated from at least two drillholes by search ellipse not exceeding semi-variogram ranges. All the remaining model cells were classified as Inferred. No Measured Mineral Resource category was applied to the DASA model.

The resource classification strategy is illustrated below (colours: green – Indicated, blue – Inferred) in Figure 14-12.

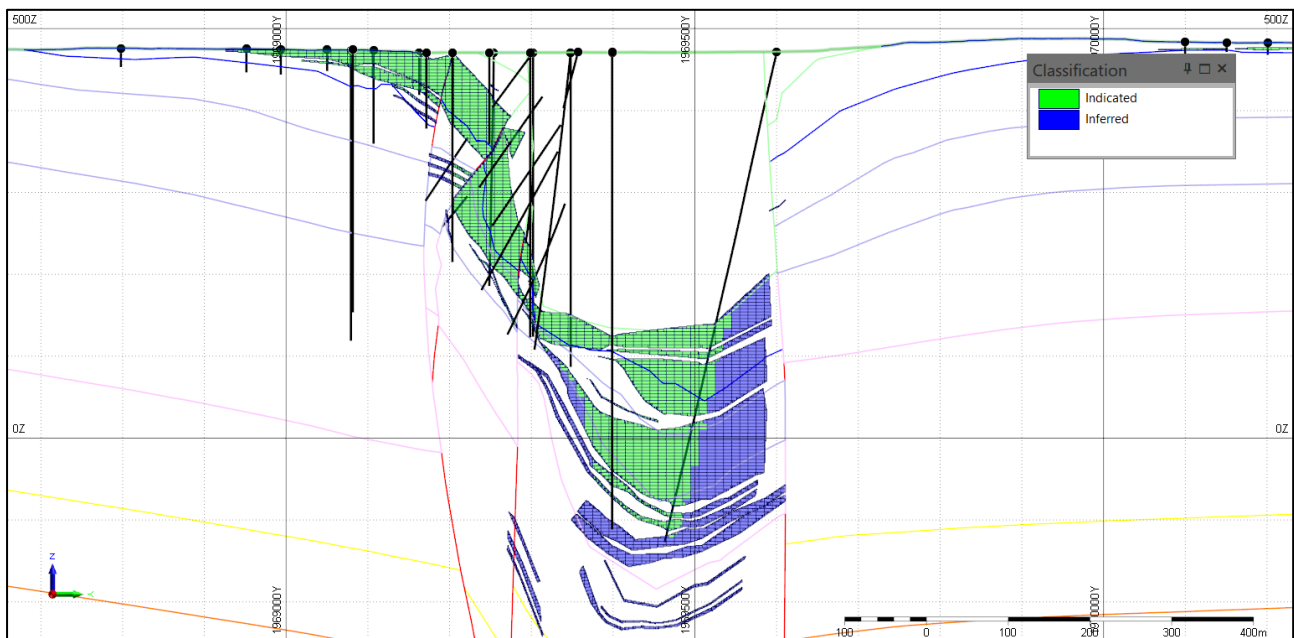


Figure 14-12: Resource classification strategy, Section 360050mE

A summary diagram showing the distribution of Indicated and Inferred blocks is shown in Figure 14-13.

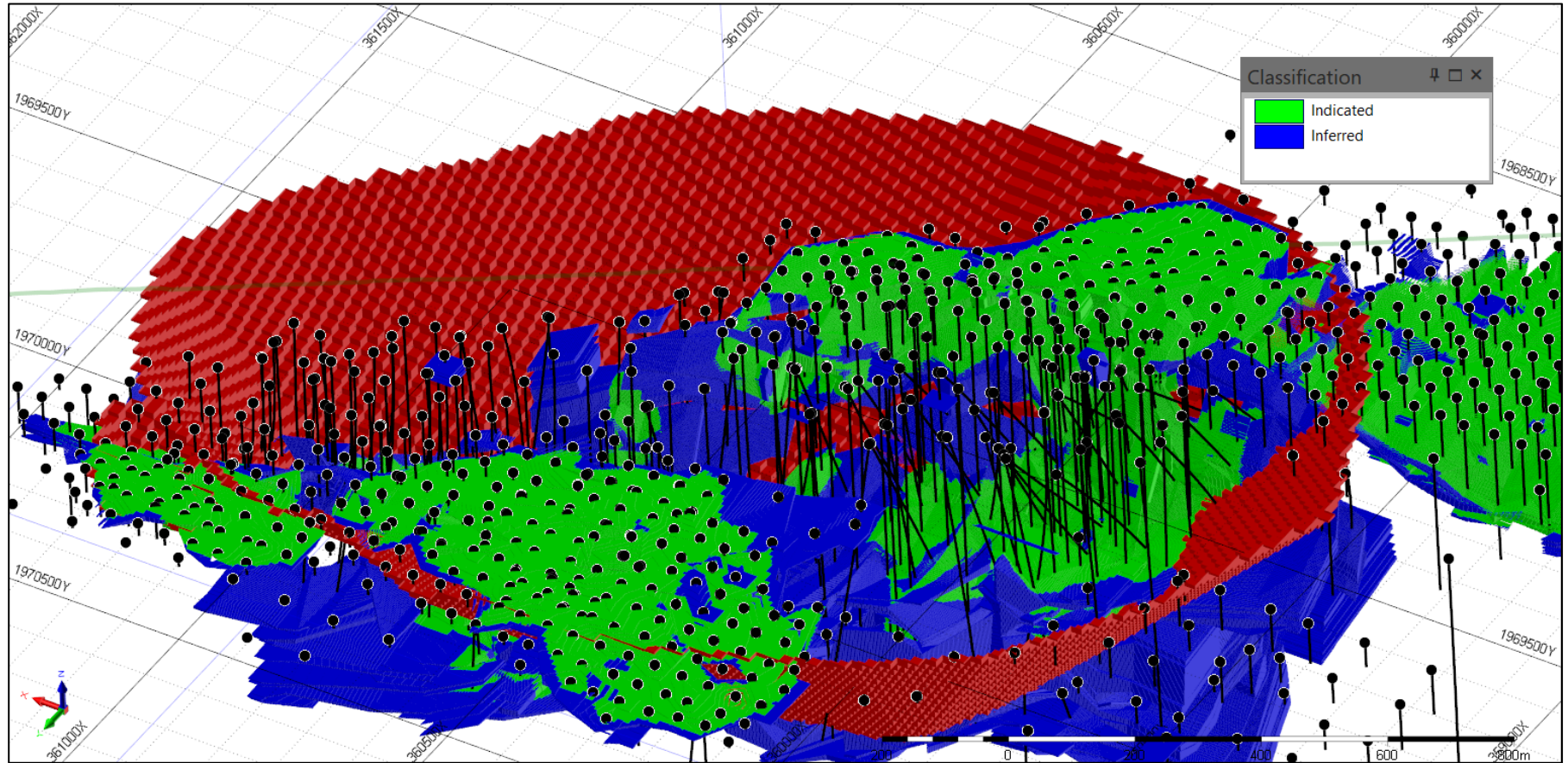


Figure 14-13: Summary diagram of indicated and inferred blocks in relation to the optimized open pit (looking southeast)

14.15 Block Model Validation

Validation of the grade estimates was completed by:

- Visual checks on screen in cross section and plan view to ensure that block model grades honour the grade of sample composites
- Statistical comparison of sample and block grades
- Alternative interpolation using IDW methods
- Generation of swath plots to compare input and output grades in a semi-local sense, by easting, northing and elevation.

14.15.1 Visual Validation

The block model with interpolated grades was displayed on screen along with the sample grades and colour coded. Visual validation demonstrated close correlation between modelled grades and composited samples (Figure 14-14).

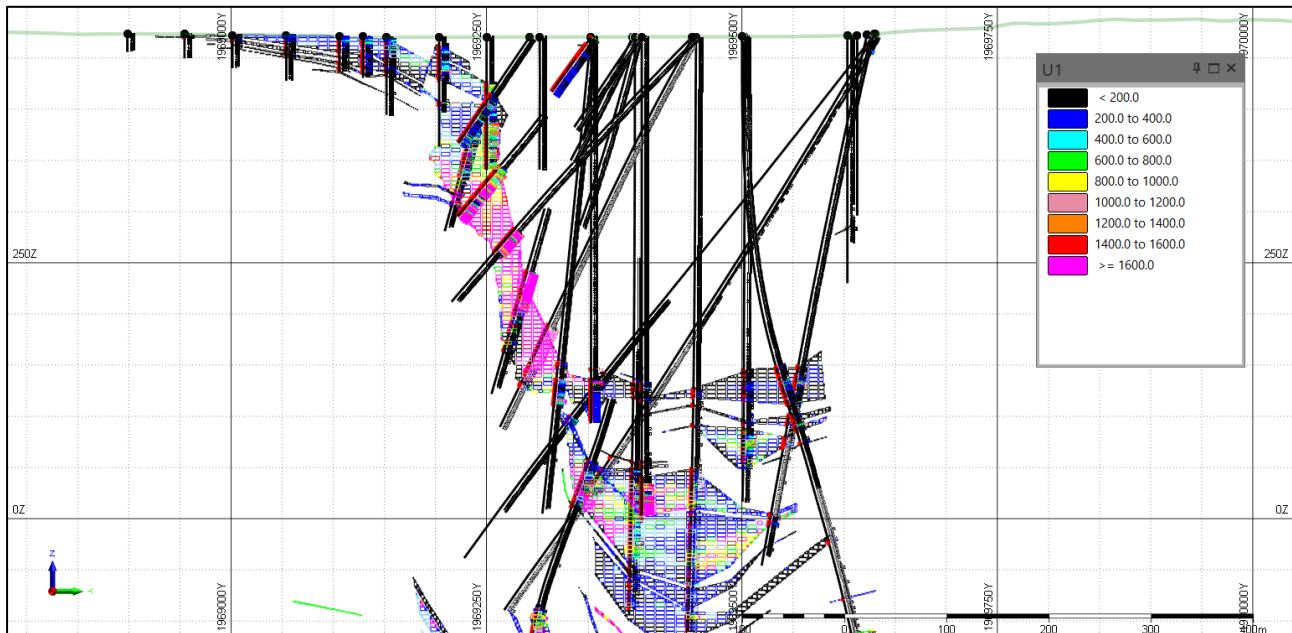


Figure 14-14: Visual comparison of eU_3O_8 grades in the model vs assays (Section 360,000 mE, looking west)

14.15.2 Statistical Validation

The average eU_3O_8 grades in the model were compared with the average grades in the composited sample files. It was found that the modelled grades were 17% relative lower than the grades in the composites (765 ppm eU_3O_8 in the composite file versus 631 ppm eU_3O_8 in the block model) for the combined categories. This difference is acceptable as it was expected due to the relative clustering of high-grade samples.

14.15.3 Comparison with Alternative Interpolation Methods

All grades were also interpolated using the IDW method with the power of two and three and then compared to the grades estimated by the OK method. A comparison of the grades and metal tonnage using OK versus IDW method at various cut-off grades is given in Table 14-7. OK returned generally more conservative grades and lower metal, but overall the grades differ within acceptable limits.

Table 14-7: Comparison of global block model grades by OK and IDW methods

Cut-off (U ₃ O ₈ , ppm)	Kriged model		IDWx2 model		IDWx3 model		Difference (%)			
	U ₃ O ₈ (ppm)	Metal (Mlb)	U ₃ O ₈ (ppm)	Metal (Mlb)	U ₃ O ₈ (ppm)	Metal (Mlb)	With IDWx2		With IDWx3	
							Grade	Metal	Grade	Metal
200	959	235	1,016	243	1,039	244	-5.9	-3.2	-8.3	-3.6
300	1,145	224	1,207	233	1,235	234	-5.4	-3.7	-7.8	-4.1
400	1,349	214	1,401	224	1,431	225	-3.9	-4.4	-6.1	-5.0
500	1,751	198	1,830	208	1,870	209	-4.5	-4.6	-6.8	-5.4
600	2,118	187	2,227	196	2,280	198	-5.2	-4.8	-7.7	-5.7
700	2,450	179	2,586	188	2,657	190	-5.5	-5.0	-8.4	-5.9
800	2,748	172	2,908	181	2,990	183	-5.8	-5.2	-8.8	-6.3
900	3,034	166	3,215	175	3,309	177	-6.0	-5.4	-9.1	-6.6
1,000	3,311	161	3,502	170	3,606	172	-5.8	-5.7	-8.9	-7.0
1,100	3,588	156	3,779	166	3,885	168	-5.3	-6.1	-8.3	-7.6
1,200	3,866	152	4,067	162	4,185	164	-5.2	-6.4	-8.3	-7.9
1,300	4,122	148	4,337	158	4,454	160	-5.2	-6.6	-8.1	-8.3
1,400	4,369	144	4,620	154	4,744	156	-5.8	-6.6	-8.6	-8.3
1,500	4,609	141	4,879	151	5,011	153	-5.8	-6.7	-8.7	-8.6

14.15.4 Swath Plots

Swath plots were generated for each 20 m bench and each 50 m vertical section in east-west and north-south directions. The results of this validation are shown from Figure 14-15 to Figure 14-17. The plots demonstrate close correlation between the modelled uranium grades and sample composites. It is apparent that the model has smoothed the composite grades, which is to be expected due to the volume variance effect. The Qualified Person was satisfied with the results of the model validation.

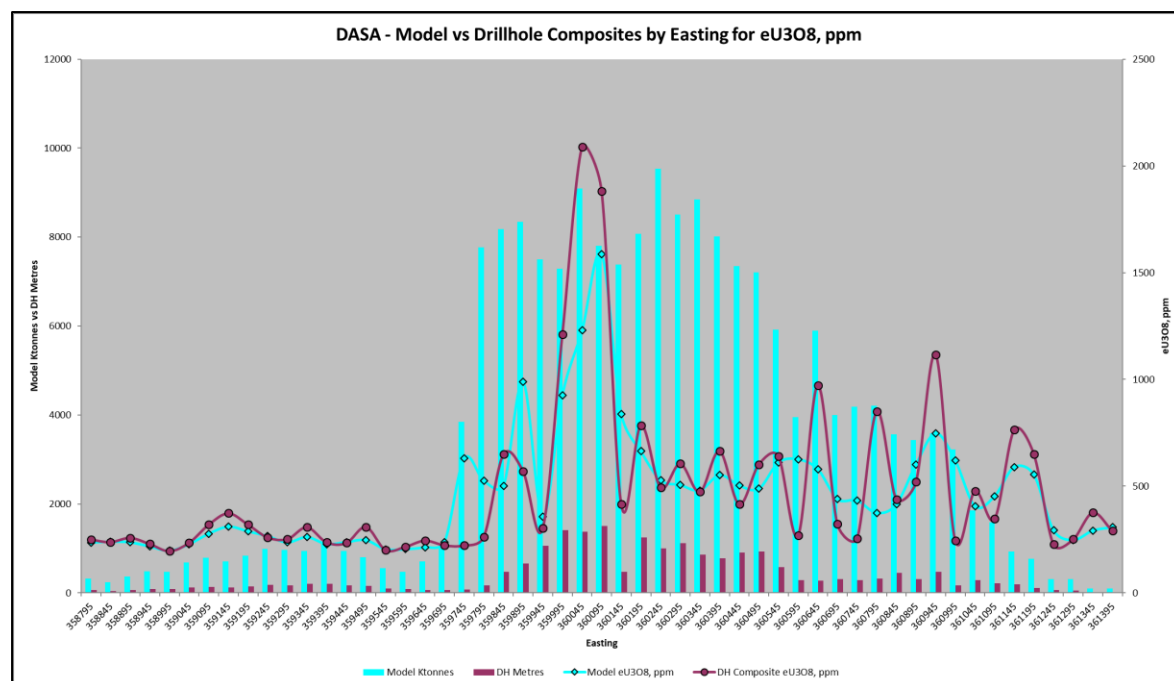


Figure 14-15: Swath plot for 50 m easting sections

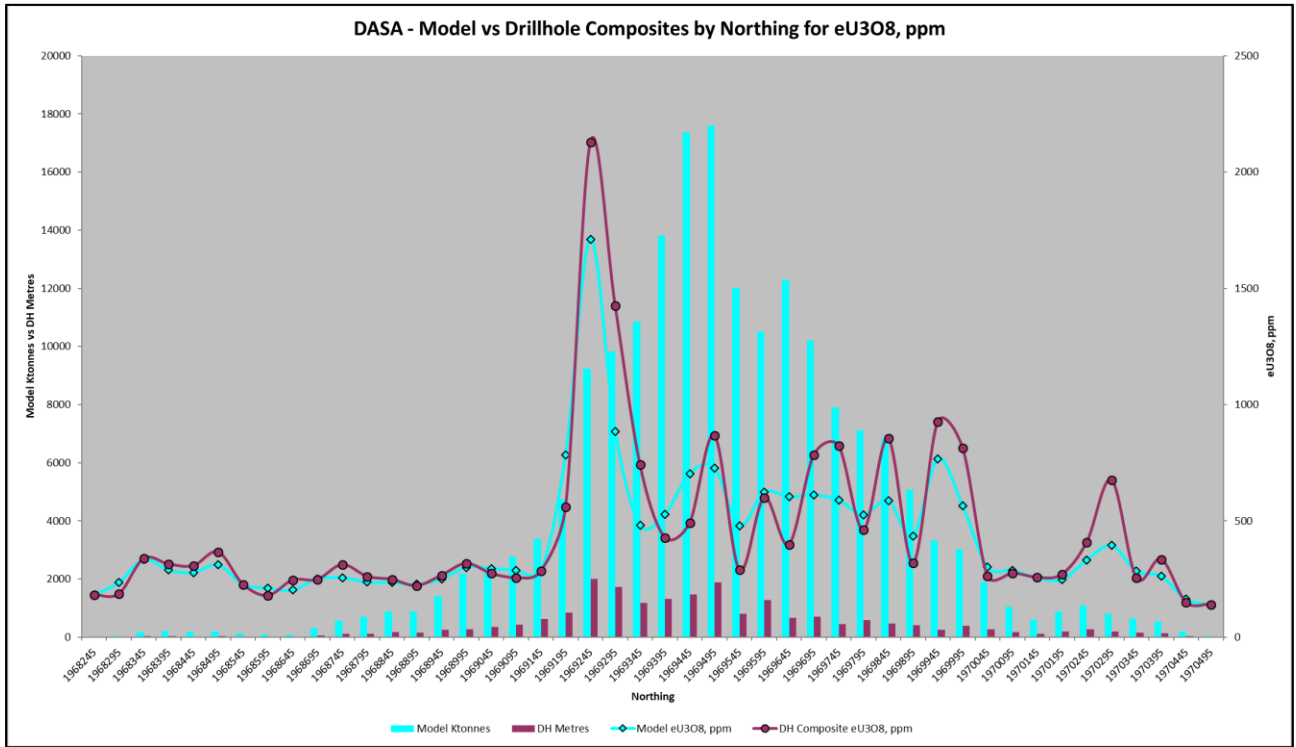


Figure 14-16: Swath plot for 50 m northing sections

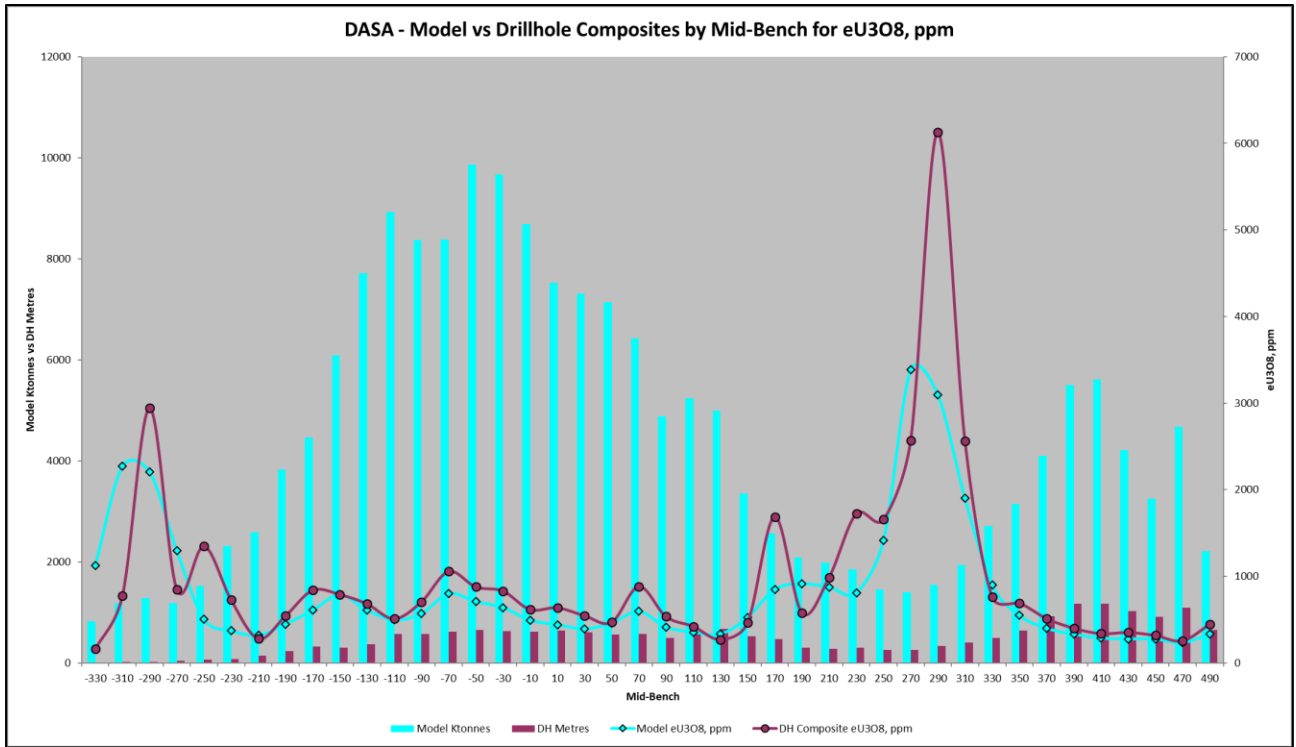


Figure 14-17: Swath plot for 20 m fitches

14.16 Reasonable Prospects of Economic Extraction

CIM Definition Standards for Mineral Resources and Mineral Reserves (CIM Council, 2014) require that resources have “reasonable prospects for economic extraction”. This generally implies that the quantity and grade estimates meet certain economic thresholds and that the Mineral Resources are reported at an appropriate cut-off grade taking into account possible extraction scenarios and processing recoveries.

To ensure that reported resources have a reasonable prospect of economic extraction, a conceptual pit shell was developed for the 2019 block model using the existing topographic surface provided by GAFC. Estimated block values and economic parameters provided by Avidian and deemed reasonable by Howe were used to generate a Whittle pit shell analysis that incorporates all available blocks. The results from the pit shell analysis were used solely for the purpose of reporting mineral resources that have reasonable prospects for economic extraction.

14.16.1 Open Pit Input Parameters

The conceptual pit shell study was based on the following information, provided by GAFC or generated by CSA Global:

- Classified block model (generated by CSA Global)
- Topographic surface (GAFC)
- Input economic parameters (provided by GAFC and CSA Global).

The input parameters for the base case are shown in Table 14-8 (all costs and prices are in US\$). The costs are considered reasonable estimates for a project of this type and scale but have not be informed by any kind of formal mining study of the Project. CSA Global has elected to use a higher uranium price than is in place today to reflect the uncertainty over when the Project will be developed and the likely pricing scenarios that could be in play in the future. Given the relatively early stage of investigation for the Project, the author believes selection of a higher price scenario is warranted.

Table 14-8: Pit optimization parameters

Parameters	Units	Values
1. Mining		
Mineralized material mining cost	\$/t	2.5
Waste mining cost	\$/t	2.5
Mining losses	%	5
Mining dilution	%	5
2. Processing		
Processing cost	\$/t	24
General and administration costs	\$/t	5
Processing recovery: U ₃ O ₈	%	95
3. Pricing		
Element price for U ₃ O ₈	\$/lb	45
Selling cost	\$/unit	0
4. Other		
Bulk density parameter	t/m ³	2.36
General pit slope	°	45



14.16.2 *Open Pit Optimization Process*

The pit optimization was carried out using the Mining module of the Micromine version 18.0 software application using the Lerch-Grossman algorithm.

The Lerch-Grossman algorithm is an industry-standard optimization technique used in mining and exploration. It is based on graph theory and is one of the widely used methods that guarantees the detection of the true optimum pit.

In the Lerch-Grossmann algorithm, directed arcs indicate which blocks need to be removed before a block can either be mined and processed, or be dumped as waste. Each block in the model is assigned a revenue value based on the grade of that block and metal price, and then all associated costs are subtracted from the revenue, so that all blocks are assigned a positive or negative dollar value. If the dollar value is positive, that block could potentially be mined profitably providing that all the blocks above do not make a loss if mined. The model pit slopes are specified in terms of the blocks that must be removed to provide access to each block within the block model.

Pit optimization requires that a fixed cost/value be associated with each block. The value of a waste block usually defines the cost of mining and disposal (dumping, reclaiming, etc.). A negative value indicates a loss. The value of a mineralized block is usually defined by the profit from the mineral sale, minus the costs associated with mining and processing. A block will have a negative value if the costs are greater than the profit. It makes sense to consider it a mineralized block if the loss is less than it would be if it was treated as a waste block. In general, the pit optimization process treats negative blocks as waste, and positive blocks as mineralized feed.

The pit optimization process determines the “ultimate pit”. The ultimate pit is a pit that gives the highest possible undiscounted surplus between revenue and summary of operating costs but does not consider some scheduling constraints and discounting. Capital costs are also not considered for the ultimate undiscounted pit.

The ultimate discounted pit shell for the base case scenario was 1,900 m-long by 670 m-wide and approximately 670 m-deep. It demonstrates that there may be viable open pit option but also there are significant resources outside of the open pit limits that may be suitable for underground mining or possibly for in-situ leach operation (Figure 14-18).

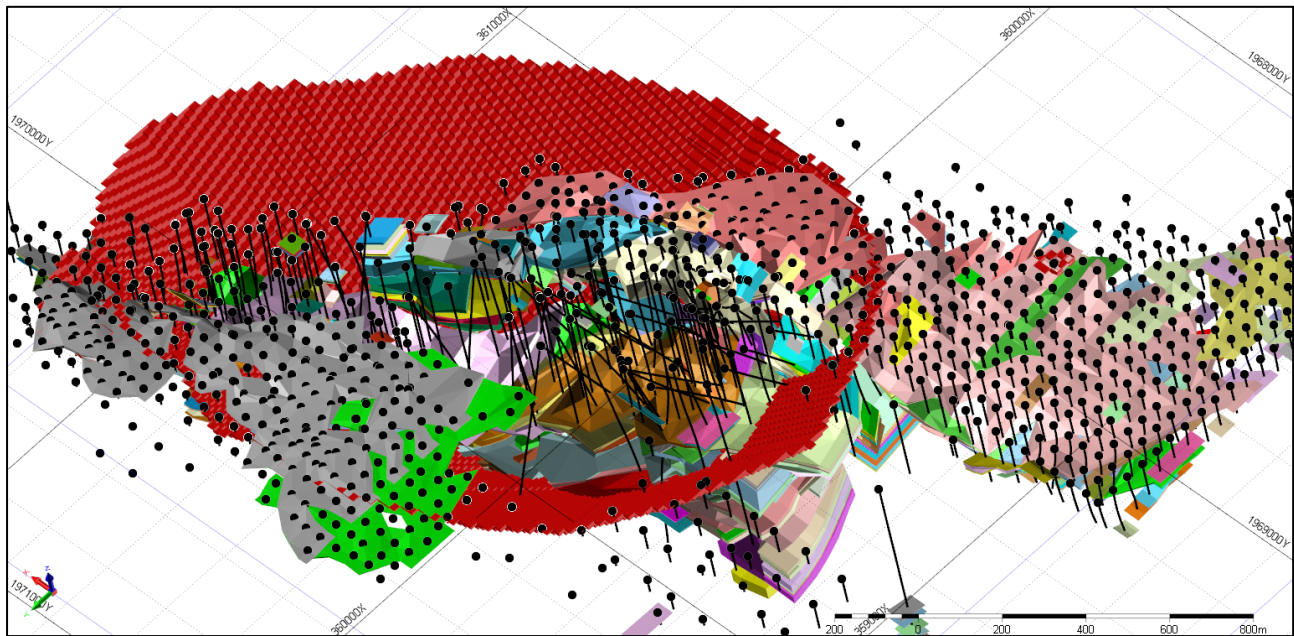


Figure 14-18: Ultimate pit shell and mineralization wireframes (looking southeast)

14.16.3 Underground Resources

Mineral Resources for underground mining were estimated outside of the limits of the pit shell and above the cut-off grade 1,200 ppm U_3O_8 . The cut-off grade was calculated using the economic parameters in Table 14-9 and a U_3O_8 price of 45 \$/lb.

Table 14-9: Input parameters for underground mining

Parameters	Units	Values
1. Mining		
Mining cost	\$/t	71
Mining losses	%	10
Mining dilution	%	15
2. Processing		
Processing cost	\$/t	24
General and administration costs	\$/t	5
Processing recovery: U_3O_8	%	95
3. Pricing		
Elements price for U_3O_8	\$/lb	45
Selling cost	\$/unit	0
4. Other		
Bulk density parameters	t/m ³	2.36

14.16.4 Summary

The pit optimization in this study was carried out to support the case for eventual economic extraction of deposit via open pit mining, and also to separate the Mineral Resources into those that are suitable for open pit and for underground mining methods.

The author and Qualified Person deems that there are reasonable prospects for eventual economic extraction on the following basis:

- There is substantial mineralization that is close to surface and therefore amenable to lower either cost open pit mining or potentially for in-situ leaching technology
- The cut-off grades adopted for reporting (320 ppm for open cut mining and 1,200 ppm for underground method mining) are considered reasonable, given the Mineral Resource is likely to be exploited by combined open cut and underground mining methods and processed using leaching techniques.

14.17 Mineral Resource Statement

Mineral Resources for the DASA deposit were estimated assuming that parts would be exploited by open cut mining and the deeper, higher-grade parts via underground mining.

Open pit Mineral Resources were estimated within the limits of conceptual ultimate pit shell and above the cut-off grade of 320 ppm U₃O₈. The cut-off was chosen based on the economic parameters in the Table 14-8 and U₃O₈ price of \$45/lb.

Mineral Resources for underground mining were estimated outside of the limits of pit shell and above the cut-off grade of 1,200 ppm U₃O₈. The cut-off grade was calculated using the economic parameters in the Table 14-9 and U₃O₈ price of \$45/lb.

The Mineral Resources for open pit and underground mining are shown in Table 14-10. The distribution of the Mineral Resources is displayed in Figure 14-19. It shows the material that occurs within the conceptual optimized pit and the distribution of potential underground resources outside of the constraining pit shell above the corresponding cut-offs (320 and 1,200 ppm U₃O₈).

Table 14-10: DASA Mineral Resources for open pit and underground mining with an Effective Date of 1 June 2019

Mineral Resource category	Tonnes (Mt)	eU ₃ O ₈ (ppm)	Contained eU ₃ O ₈ (Mlb)
Indicated open pit	25.59	1,711	96.5
Indicated underground	0.71	3,250	5.1
Indicated – Total	26.30	1,752	101.6
Inferred open pit	18.93	1,357	56.6
Inferred underground	3.38	4,151	31.0
Inferred – Total	22.31	1,781	87.6

Notes:

- Mineral Resources are classified according to the CIM Definition Standards for Mineral Resources and Mineral Reserves (10 May 2014).
- The MRE was prepared by Dmitry Pertel, MAIG, (CSA Global).
- The Effective Date of the MRE is 1 June 2019.
- Mineral Resources for open pit mining are estimated within the limits of ultimate pit shell.
- Mineral Resources for underground mining are estimated outside the limits of ultimate pit shell.
- A cut-off grade of 320 ppm eU₃O₈ has been applied for open pit resources.
- A cut-off grade of 1,200 ppm eU₃O₈ has been applied for underground resources.
- A bulk density of 2.36 t/m³ has been applied for all model cells.
- Rows and columns may not add up exactly due to rounding.
- No Measured Resources or Mineral Reserves of any category were identified.
- Mineral Resources are not Mineral Reserves and by definition do not demonstrate economic viability. This MRE includes inferred Mineral Resources that are normally considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves.

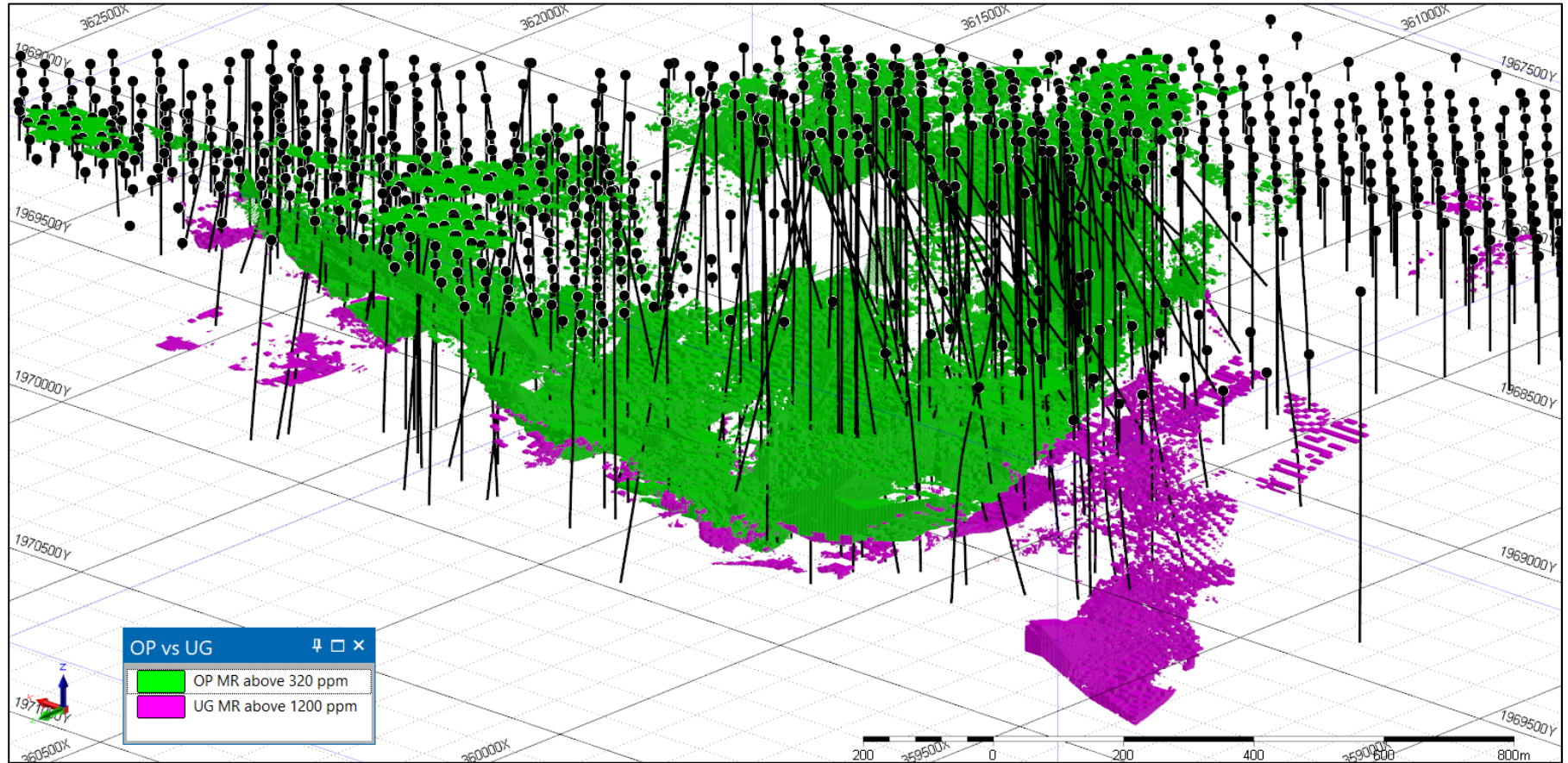


Figure 14-19: Distribution of open cut and underground mineral resources above the selected cut-offs (looking southeast)

14.18 Factors that May Affect the Mineral Resource Estimate

The author is not aware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant issues that could potentially affect this MRE.

Additional technical factors which may affect the MREs include:

- Potential future conceptual study assessments of mining, processing and other factors.
- eU₃O₈ price and valuation assumptions.
- Changes to the assumptions used to estimate eU₃O₈ content (e.g. bulk density estimation, grade model methodology).
- The REF was defined based on comparison of chemical assays with gamma logging. There is no investigation of radon degassing factor which may influence the gamma activity to some extent. The effect of this issue on the entire project is not likely to be material to the Project but may have localized effects. The available number of chemical assays for uranium grades supports the reliable calculation of eU₃O₈ grades, that were the basis of the modelled grades, as well as the estimation of the uranium equilibrium factor, which is believed to be close to 1.0. Comparison of gamma logging with radium assays in closed cans as well as radium assays in closed cans with uranium assays could assist to define reliably the radiological factors.
- Geological interpretation (revision of lithologic contacts, mineralization domains, modelling of internal waste domains, etc.).
- Changes to design parameter assumptions that pertain to the resource constraining conceptual pit shell.
- Changes to geotechnical and mining assumptions, including the maximum pit slope angle; or the identification of alternative mining methods.
- Changes to process recovery estimates if the metallurgical recovery in certain domains is less or greater than currently assumed.

14.19 Grade-Tonnage Sensitivity Report

The grade-tonnage sensitivity report for the DASA deposit is given in Table 14-11 at a range of cut-off grades between 200 ppm eU₃O₈ and 15,000 ppm eU₃O₈ and subdivided by adopted resource classification. The cut-off grades were applied to the eU₃O₈ values in the block model.

The grade-tonnage sensitivity curves for Indicated and Inferred Resource categories separately for eU₃O₈ grades and contained metal are shown in Figure 14-20 to Figure 14-23.

Table 14-11: DASA grade-tonnage report

Cut-off (eU ₃ O ₈ , ppm)	Category	Volume (Mm ³)	Tonnes (Mt)	Bulk density (t/m ³)	eU ₃ O ₈ (ppm)	Contained eU ₃ O ₈ (Mlb)
200	Indicated	22.2	52.3	2.36	1,035	119.3
	Inferred	25.0	59.0	2.36	893	116.2
250	Indicated	17.8	41.9	2.36	1,235	114.2
	Inferred	19.9	46.9	2.36	1,066	110.2
300	Indicated	14.6	34.4	2.36	1,446	109.6
	Inferred	15.9	37.6	2.36	1,260	104.6
320	Indicated	13.6	32.0	2.36	1,530	108.0
	Inferred	14.8	35.0	2.36	1,333	102.7

Cut-off (eU ₃ O ₈ , ppm)	Category	Volume (Mm ³)	Tonnes (Mt)	Bulk density (t/m ³)	eU ₃ O ₈ (ppm)	Contained eU ₃ O ₈ (Mlb)
400	Indicated	10.6	24.9	2.36	1,865	102.4
	Inferred	11.2	26.5	2.36	1,644	96.1
500	Indicated	8.2	19.4	2.36	2,265	97.0
	Inferred	8.8	20.7	2.36	1,979	90.4
600	Indicated	6.8	16.0	2.36	2,631	92.9
	Inferred	7.3	17.1	2.36	2,281	86.0
700	Indicated	5.8	13.7	2.36	2,971	89.6
	Inferred	6.3	14.8	2.36	2,541	82.7
800	Indicated	5.1	12.0	2.36	3,291	86.8
	Inferred	5.5	12.9	2.36	2,796	79.6
900	Indicated	4.5	10.6	2.36	3,598	84.3
	Inferred	4.9	11.5	2.36	3,044	76.9
1,000	Indicated	4.1	9.6	2.36	3,885	82.1
	Inferred	4.3	10.2	2.36	3,308	74.2
1,100	Indicated	3.7	8.6	2.36	4,198	79.9
	Inferred	3.9	9.2	2.36	3,553	71.9
1,200	Indicated	3.3	7.9	2.36	4,483	78.0
	Inferred	3.6	8.4	2.36	3,783	69.9
1,300	Indicated	3.1	7.3	2.36	4,771	76.3
	Inferred	3.3	7.7	2.36	3,992	68.1
1,400	Indicated	2.8	6.7	2.36	5,053	74.6
	Inferred	3.0	7.2	2.36	4,195	66.5
1,500	Indicated	2.6	6.2	2.36	5,328	73.1
	Inferred	2.7	6.3	2.36	4,563	63.7
2,000	Indicated	1.9	4.6	2.36	6,624	66.8
	Inferred	1.9	4.5	2.36	5,713	56.8
2,500	Indicated	1.5	3.6	2.36	7,849	61.9
	Inferred	1.4	3.4	2.36	6,838	51.4
3,000	Indicated	1.2	2.9	2.36	8,973	58.0
	Inferred	1.2	2.7	2.36	7,833	47.4
3,500	Indicated	1.0	2.5	2.36	10,036	54.7
	Inferred	1.0	2.4	2.36	8,490	45.0
5,000	Indicated	0.7	1.6	2.36	13,186	46.8
	Inferred	0.7	1.6	2.36	10,805	37.2
10,000	Indicated	0.2	0.6	2.36	24,401	31.1
	Inferred	0.3	0.8	2.36	14,598	25.3
15,000	Indicated	0.1	0.3	2.36	34,236	24.3
	Inferred	0.0	0.1	2.36	21,493	4.0

Note: Rows and columns may not add up exactly due to rounding.

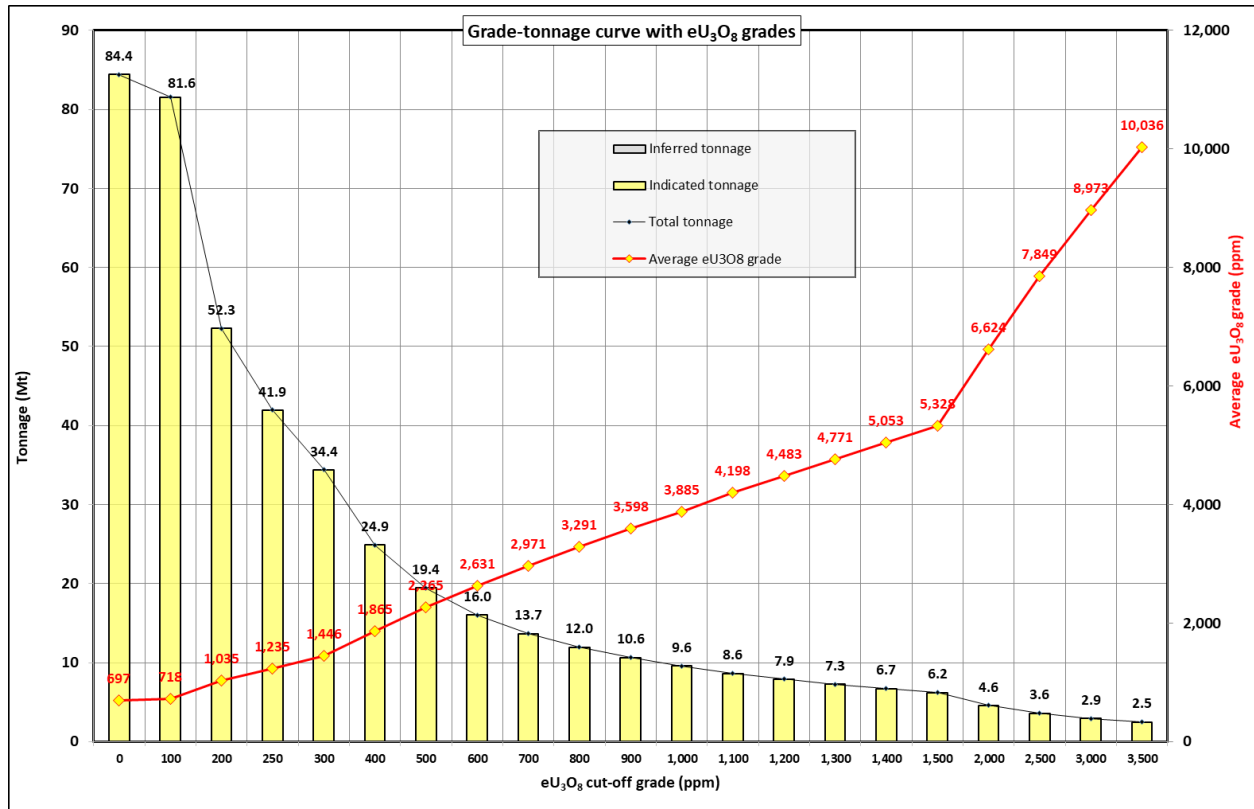


Figure 14-20: Grade-tonnage curve for DASA showing eU₃O₈ grades – Indicated category

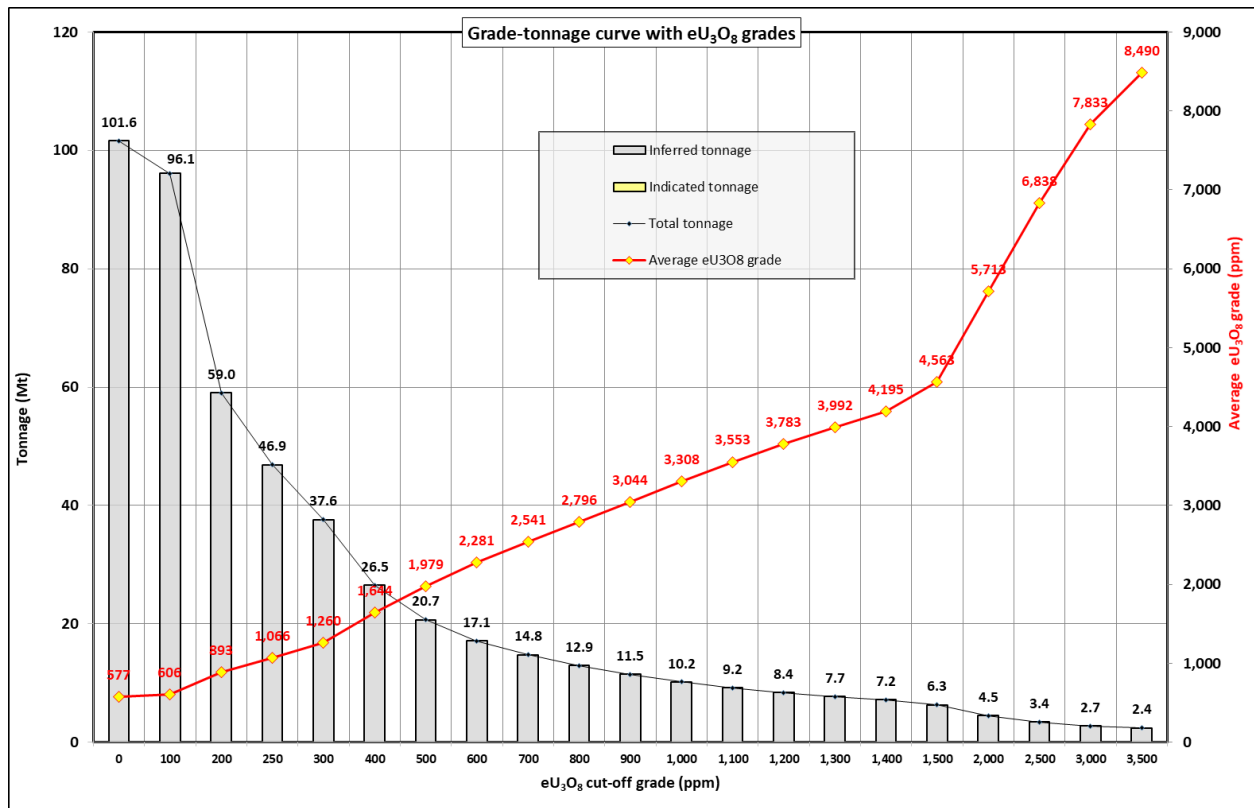


Figure 14-21: Grade-tonnage curve for DASA showing eU₃O₈ grades – Inferred category

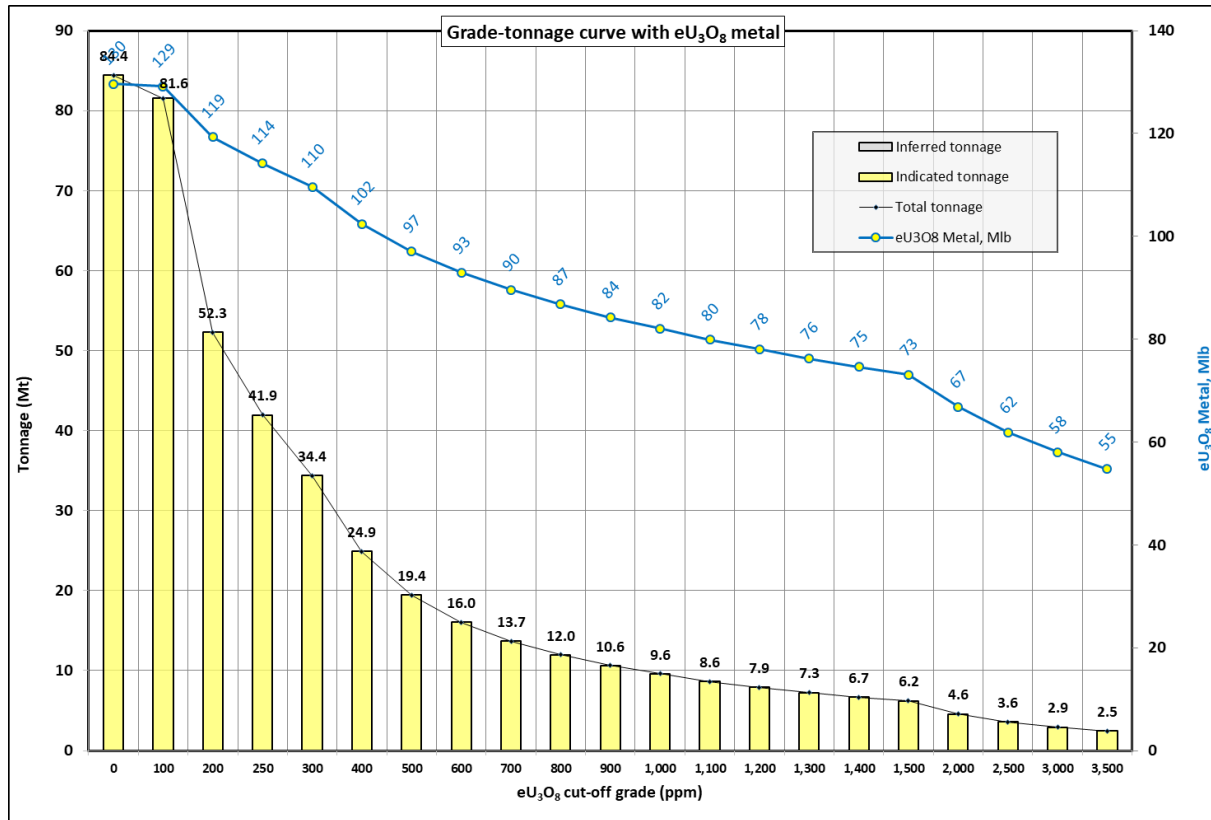


Figure 14-22: Grade-tonnage curve for DASA showing eU₃O₈ metal – Indicated category

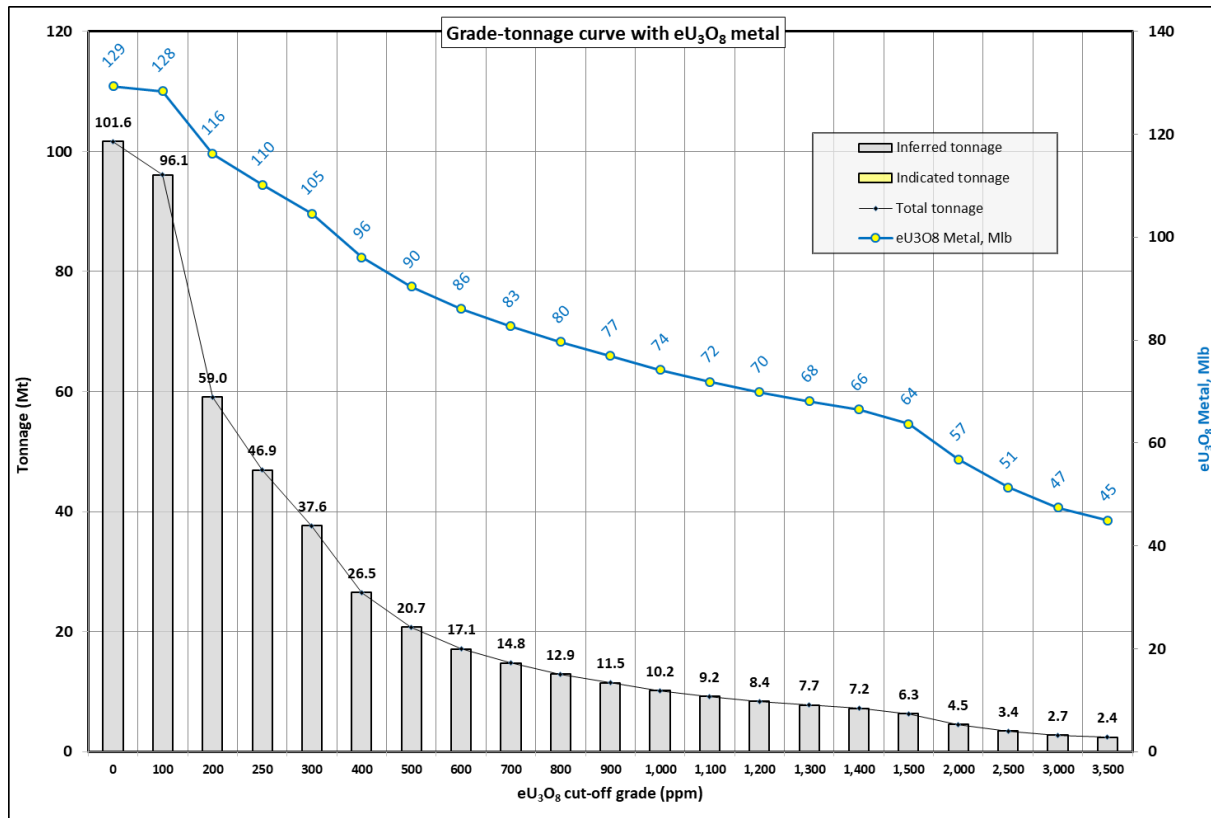


Figure 14-23: Grade-tonnage curve for DASA showing eU₃O₈ metal – Inferred category



14.20 Difference from Previous Resource Estimate

The Mineral Resource reported herein differs from the previous resources in 2017 and 2018 in several ways. The key difference has resulted from the successful 2018 drilling of the Flank Zone which intersected thick high-grade mineralization within the graben fault zone relatively close to surface (<300 m). This new zone of new near surface high-grade mineralization has resulted in a change of thinking in relation to how to potentially develop the Project. In 2017, it was perceived to be mostly an underground mining scenario whereas in this iteration of the MRE there is potential that the majority of material can be exploited by open cut mining methods.

Another key difference was the development of the full lithological model of the deposit and modelling the main fault planes. This permitted more accurate and robust interpretation and modelling of the mineralized envelopes, which were modelled accurately within the fault blocks, truncated by the fault planes, and also modelled in line with the lithological members of the deposit, which is believed to be particularly important within the graben structure of the deposit. This in turn provided additional confidence in interpretation and the grade continuity, which has allowed an upgrade in classification from Inferred to Indicated in the Flank Zone of the deposit.

Additionally, the significant sampling program with chemical analysis of core samples resulted in the more accurate estimation of the uranium equilibrium factor and also in a more robust calculation and justification of the eU_3O_8 grades. The Qualified Person is satisfied with the quality of the provided information related to both the grades calculations, and justification of the equilibrium factor. In addition, all chemical assays are supported by the results of the QAQC data, which are believed to be sufficient and accurate to support the MRE.

All the above changes have resulted in both increased tonnages and improved grades for the deposit.



15 Mineral Reserve Estimates

This section is not applicable to the current Report.

16 Mining Methods

This section is not applicable to the current Report. The 2019 Mineral Resource update differs materially from the 2018 Mineral Resource and as such, GAFC and CSA Global no longer consider its 2018 PEA current. Qualified Persons have not done sufficient work to update the 2018 PEA with results of the 2019 MRE; GAFC and CSA Global are not treating the 2018 PEA as a current PEA and the results should not be relied upon. GAFC intends to complete a PFS of the DASA Project in 2020.

17 Recovery Methods

This section is not applicable to the current Report. The 2019 Mineral Resource update differs materially from the 2018 Mineral Resource and as such, GAFC and CSA Global no longer consider its 2018 PEA current. Qualified Persons have not done sufficient work to update the 2018 PEA with results of the 2019 MRE; GAFC and CSA Global are not treating the 2018 PEA as a current PEA and the results should not be relied upon. GAFC intends to complete a PFS of the DASA Project in 2020.



18 Project Infrastructure

This section is not applicable to the current Report. The 2019 Mineral Resource update differs materially from the 2018 Mineral Resource and as such, GAFC and CSA Global no longer consider its 2018 PEA current. Qualified Persons have not done sufficient work to update the 2018 PEA with results of the 2019 MRE; GAFC and CSA Global are not treating the 2018 PEA as a current PEA and the results should not be relied upon. GAFC intends to complete a PFS of the DASA Project in 2020.

19 Market Studies and Contracts

CSA Global notes that the market for uranium has fluctuated during the past five years. Figure 19-2, copied from the Ux Consulting Company LLC (UxC) website, shows the trend in uranium pricing over the past two years.

The spot price quote listed by UxC on 23 December 2016 was US\$20.38/lb U₃O₈, and the spot price published by MiningNews on 22 June 2018 was US\$22.9/lb U₃O₈.

UxC used the following spot price as median: US\$23.6/lb U₃O₈ in 2020, US\$27.3/lb U₃O₈ in 2021, US\$31.9/lb U₃O₈ in 2022, US\$36.9/lb U₃O₈ in 2023, US\$40.8/lb U₃O₈ in 2024, US\$45.0/lb U₃O₈ in 2025, US\$49.3/lb U₃O₈ in 2026, and US\$53.7/lb U₃O₈ in 2027 thereafter. Average price is US\$33.6/lb U₃O₈.

Spot Price					
	2015	2016	2017	2018	2019
Jan	37.00	34.70	24.50	21.88	28.90
Feb	38.63	32.15	23.00	21.38	28.00
Mar	39.45	28.70	23.88	21.05	25.33
Apr	37.13	27.50	22.63	21.00	25.20
May	35.00	27.25	19.60	22.73	24.05
Jun	36.38	26.70	20.15	22.65	24.60
Jul	35.50	25.45	20.20	25.78	-
Aug	36.75	25.25	20.13	26.30	-
Sep	36.38	23.00	20.33	27.50	-
Oct	36.13	18.75	20.08	27.95	-
Nov	36.00	18.00	23.13	29.10	-
Dec	34.23	20.25	22.32	27.75	-

Long-term Price					
	2015	2016	2017	2018	2019
Jan	49.50	44.00	32.50	30.00	32.00
Feb	49.50	44.00	33.00	29.50	32.00
Mar	49.50	43.50	33.00	29.00	32.00
Apr	49.00	43.00	33.00	29.00	32.00
May	47.50	41.00	32.50	29.00	31.00
Jun	46.00	40.50	33.00	29.00	31.50
Jul	44.50	38.00	32.00	31.50	-
Aug	44.00	38.00	31.50	31.25	-
Sep	44.00	37.50	30.50	31.75	-
Oct	44.00	35.50	30.00	31.25	-
Nov	44.00	33.00	31.00	31.25	-
Dec	44.00	30.00	30.67	32.00	-

Figure 19-1: UxC U₃O₈ spot and long-term prices

Metal prices used for Mineral Resources are based on consensus, long-term forecasts from banks, financial institutions and other sources.

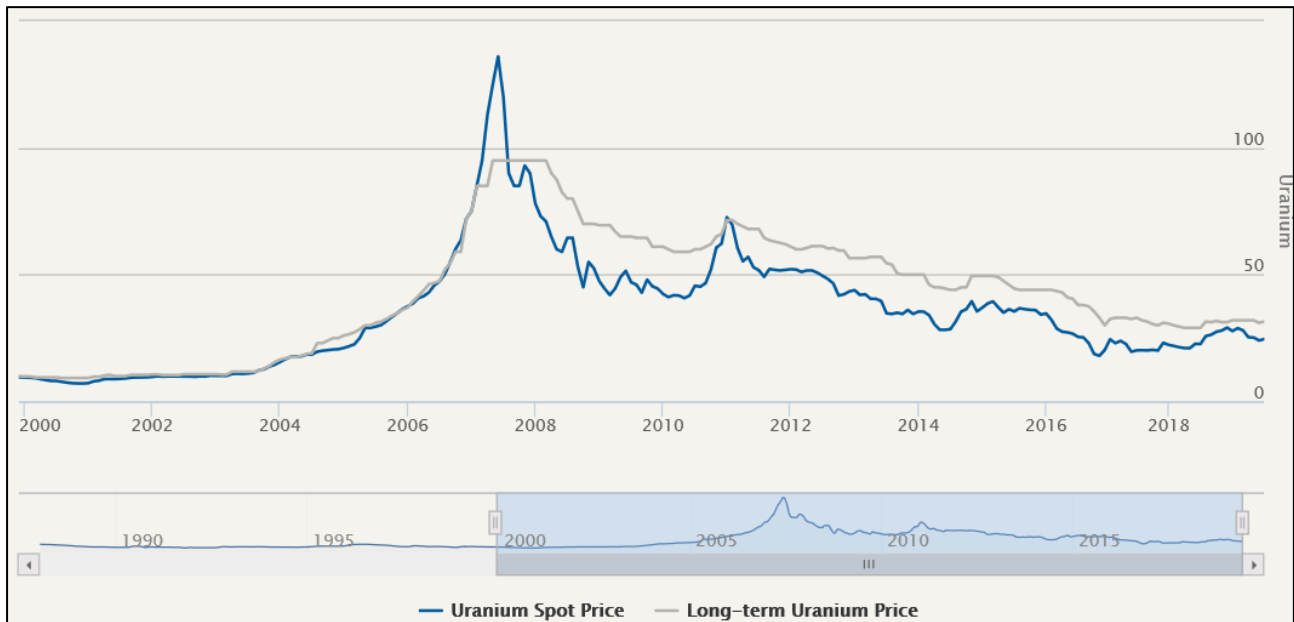


Figure 19-2: UxC U₃O₈ historical uranium prices

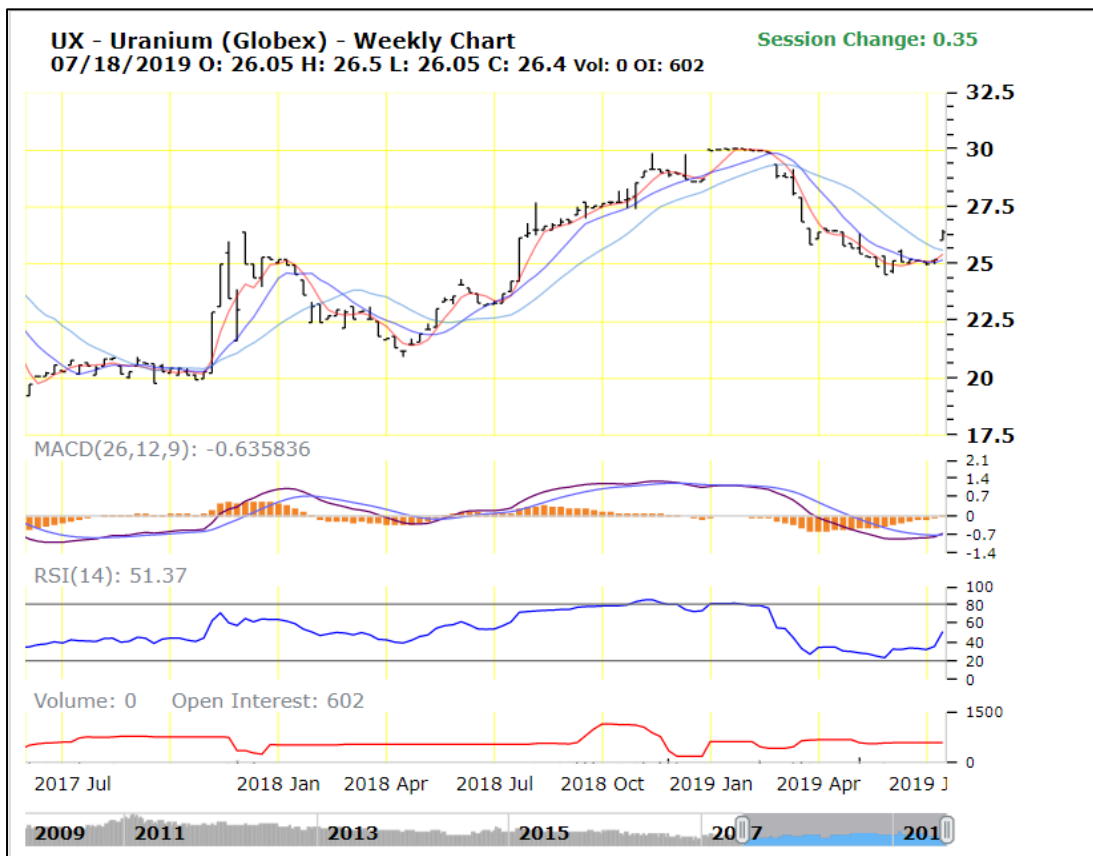


Figure 19-3: Nymex U₃O₈ uranium prices for 2017–2019

20 Environmental Studies, Permitting and Social or Community Impact

Section 20 has been extracted from CSA Global's NI 43-101 Technical Report and PEA (CSA Global, 2018b) and repeated in this Report. The reader is cautioned that the 2018 DASA PEA is based on CSA Global's 2018 DASA MRE which has now been replaced by the 2019 DASA Mineral Resource update presented in this Report. The 2018 DASA PEA reported in the following subsections has not been updated to reflect the changes in the DASA Mineral Resource.

GAFC has engaged local environmental consultants, Groupe Art & Genie to do baseline studies and collect data on the Project area to support the development of the Project. The area is remote with few permanent residents. The area is very arid with limited quantity or diversity of flora and fauna. As such, the impact of mining is likely to be limited.

As the Project progresses, GAFC will need to undertake more detailed studies to support mining studies and the mine permitting process.

Nigerien legislation and regulations will require GAFC to obtain an environmental compliance certificate before applying for a Mining Permit. This certificate will be issued after submission of an environmental and social impact study and approved by an interdepartmental committee established by the Ministry of the Environment.

At the start of exploration on the DASA Project, GAFC commissioned an environmental characterization study to establish an environmental baseline. This study was conducted by Groupe Art & Genie of Niamey, Niger in 2011.

The characterization study identified, classified and measured significant environmental characteristics of the exploration project. The study noted the following assessments:

20.1 Location, Climate and Terrain

The DASA area is desert, characterized by an arid climate with a rainy season from June to September. Average annual rainfall varies with an annual minimum of 10 mm and a maximum of 175 mm. Temperatures have a large daily variability between 9°C and 45°C.

The DASA area has little wind. Prevailing winds in the dry season are from the northeast followed by those from the northwest – the Harmattan winds. During the rainy season, prevailing winds are from the southwest with 50% of these winds greater than 9 km/h with a maximum of 35 km/h. Average annual velocity of the wind is 17.6 km/h. Sandstorms and windstorms occur primarily during the rainy season. Average annual maximum humidity is 34% and minimum 13%.

The DASA landscape is shaped by the faulting in the area notably the Azousa structure and the Adrar Eroles Flexure. Although fairly level, the area has ridges, plateaus, mesas and cuestas and significant erosion associated with the structures.

20.2 Hydrology and Hydrogeology

The hydrology and hydrogeology of the DASA area has been studied in detail by Groupe Art & Genie with a hydrology report completed in 2013. The hydrology of the DASA area is determined by the presence of koris (watercourses). Several koris traverse the DASA area, the most significant being the Solomi, Issakanan,

Elagozan and Agatara. Water flow is generally east to west and the koris are essentially dry outside of the rainy season. A phenomenon, characteristic of koris, is flash flooding during the rainy season and the flows may originate several kilometres upstream of the drainage basin. Extensive study and mapping of the basins and koris was conducted during the study to indicate suitable locations for the proposed plant and camp sites.

Hydrogeology studies were conducted by Group Art & Genie from 2012 to 2016. A total of five wells were drilled into the five aquifers identified in the DASA area – Tchi 2, Teloua, Izegwandane, Tarat and Guezouman. Reports established groundwater flows, 3D modelling of the hydrogeology and hydrodynamic characteristics of three of the aquifers, the Tchi 2 aquifer was not considered due to low flow.

Initially, the Tarat aquifer was selected as the most likely source of water and pump tests confirmed this. However, the Tarat aquifer has been severely depleted by the mining activities over the past 50 years at Arlit and it has been suggested that future industrial water usage will not be permitted from this aquifer. Testing has been concentrated on the Guezouman aquifer where substantial flow is available. Drawdown testing of the Guezouman aquifer well was not completed as steel casing was not available to withstand pump pressure in the over 300 m-deep well.

Drawdown and recovery testing of the wells confirm the understanding of the aquifers and the availability of adequate water resources. The groundwater flow regime, based on piezometric level mapping, indicate flow is controlled by the Azousa fault, which acts as a barrier. Within the proposed mining area, the permeability is typical of competent sandstones and examination of the core confirms this.

Chemical, bacteriological and radiological testing of the groundwater was conducted on all five wells indicating adequate groundwater is available in the DASA area for process water and minimal water treatment will be required.

20.3 Soil, Subsoil and Micro-Environment

The soil in the DASA area is composed of sand (from the Aïr Mountains and wind erosion of the Tenere), gravel (from erosion of the Aïr Mountains) and detrital clay elements (fine particles carried by the koris and from erosion of the Irhazer). Soil cover is typically 0.5 m thick.

The DASA area is sparsely occupied; the only habitation consists of nomad camps and small sedentary villages. There is no agriculture or gardening in the area.

The primary activity of the nomads in the area is following their livestock. Herds of camels, sheep, goats and donkeys can be seen throughout the area, particularly close to the koris. The area is essentially pastoral desert administered by a tribal community.

No seismic events or earthquakes have been recorded in the DASA area.

20.4 Wildlife, Plant Life and Vegetation

The presence of wild animals in the area is very limited. Most wildlife is confined to the Aïr and Tadress areas in Natural Reserves created by the Government of Niger. Species encountered in these nature reserves include:

- Mammals: jackals, monkeys, hares, squirrels, foxes and gerbils
- Reptiles and amphibians: vipers, snakes, lizards and African toads
- Birds: sandgrouse, babblers, larks, crows and shrikes
- Invertebrates: scorpions, locusts, beetles and galeodes.

Vegetation in the area is typically that of a desert terrain. Ligneous species include *A.ehrenbergiana*, *Bosciasenegalensis* and *Calotropisprocera*. The herbaceous layer is primarily *Panicum turgidum*. Vegetation is concentrated in the koris.

20.5 Population and Demographics

The Tchirozerine department, in which the DASA area is located, extends from the Mali border in the west, to the Air Mountains in the east, from Arlit in the north and south to Ingal in the Agadez region – an area of 154,746 km². The area is populated by more sedentary populations and nomadic tribes. The Tuareg people are the majority of the population.

The social group hierarchy remains very much intact with the Tuaregs. The elders and opinion leaders react, talk and make decisions on behalf of the group.

Economic activities are traditional and mostly based on livestock. The Tuareg are true nomads and follow their herds following source of browse, mostly in or near koris. Most Tuaregs live in tent camps near koris and move readily seeking pasture for their camels, sheep, goats and donkeys.

20.6 Radiological Studies

During the course of the exploration program at DASA, extensive radiation studies were conducted in the area. These were conducted by a third party, Sahel Lab, Niamey, Niger. Sahel Lab conducted radiation surveys to evaluate the dose due to exposure to external radiation and also the dose due to exposure to the radon emanating from drillholes.

In addition, Sahel Lab conducted radiation training with the field crews and staff.

Use was made of TLD dosimeters and spot measurements. TLD dosimeters were placed in the village of Tagaza (at the well) the camps and close to well 11. Environmental sampling was conducted at the drilling operations, the core storage area, the core logging area and the GAFC house in Niamey. Radon measurements were also made in seven drillholes.

Generally, the dose rate was below 120 nSv/h (the dose rate of the Agadez region published by the National Radiation Protection Centre). Higher dose rates were measured at a high-grade outcrop, the core logging facility and at the collar of a higher-grade hole. Maximum dose rate measured was 140 nSv/h. Access was restricted to these areas and work procedures were developed and implemented for the handling and logging of cores including the use of TLD dosimeters.

Continued monitoring of the dose rate at the village of Tagaza indicates an ambient dose rate of 120 nSv/h – typical of the Agadez region.

20.7 Social and Community Impact

A Mining Permit or “Mineral Title for Mining” will be required to develop the DASA deposit. The application for the Mining Permit will trigger a Notice of Project to the Ministry of Environment and an Environmental and Social Impact Assessment (ESIA) will be required. The “Bureau d’Evaulation Environmental et des Etudes d’Impact” (BEEEI) is responsible for: developing guidelines for an ESIA, the control, analysis and evaluation of an ESIA, validation of the ESIA through stakeholder meetings and recommendations to the Ministry of Environment for approval of the ESIA.

An ESIA includes the following aspects:

- Detailed description of the Project activities

- Project alternatives
- Legal environmental framework applicable to the Project
- Environmental baseline
- Socio-economic baseline
- Environmental aspects of air, soils, water, acid rock drainage, solid waste
- Hazardous waste
- Mitigation of environmental impacts.

GAFC will undertake the EISA upon application for a Mining Permit. Reclamation, remediation and other related costs will be determined at that stage.



21 Capital and Operating Costs

This section is not applicable to the current Report. The 2019 Mineral Resource update differs materially from the 2018 Mineral Resource and as such, GAFC and CSA Global no longer consider its 2018 PEA current. Qualified Persons have not done sufficient work to update the 2018 PEA with results of the 2019 MRE; GAFC and CSA Global are not treating the 2018 PEA as a current PEA and the results should not be relied upon. GAFC intends to complete a PFS of the DASA Project in 2020.



22 Economic Analysis

This section is not applicable to the current Report. The 2019 Mineral Resource update differs materially from the 2018 Mineral Resource and as such, GAFC and CSA Global no longer consider its 2018 PEA current. Qualified Persons have not done sufficient work to update the 2018 PEA with results of the 2019 MRE; GAFC and CSA Global are not treating the 2018 PEA as a current PEA and the results should not be relied upon. GAFC intends to complete a PFS of the DASA Project in 2020.

23 Adjacent Properties

There are no third-party properties currently in production adjacent to DASA.

The Imouraren uranium project is located approximately 40 km northwest of the AE3 Exploration Permit and the DASA deposit, and approximately 80 km south of Arlit and about 160 km north of Agadez. The operating license for the Imouraren project is held by Imouraren SA (66.65% owned by Orano Expansion, 10% by the Republic of the Niger and 23.35% by SOPAMIN). Orano (2019a) reports that the deposit area holds total (100% share) Reserves of 306,048,000 tonnes Probable ore grading 0.07% U (700 ppm U) for a total of 174,196 tonnes U after 82% recovery at December 31, 2018.

In 1963, the CEA discovered the uranium shows of Mont Imouraren. Development of the Imouraren uranium project between 1974 and 1977 by the Cogema-Conococonarem association led to the identification of three world-scale deposits (Imfout, Imatra, Imola) in an area of 40 km² (El Hamet and Idde, 2009). Orano (then Areva) was granted an exploration licence in 2006 for Imouraren. By 2006, more than 55 km of development drilling and bulk sampling had been completed (Kinnaird and Nex, 2016). The resumption of work in 2006 enabled the discovery of two other shallow deposits (Imca 25 and Imaren), situated 5 km from the previous ones in an area of 1.2 km² (El Hamet and Idde, 2009). Following a feasibility study completed at the end of 2007, Orano was awarded an operating permit to mine the deposit in early 2009 (Orano, 2019b). At Imouraren, the mineralization, located between approximately 100 m and 150 m below the surface, will be extracted by open pit operation and treated by heap leaching in an acidic environment, a first for a deposit of this size. The project has a proposed annual production capacity of 5,000 tonnes and lifespan of 35 years. However, since 2015, production startup work has been suspended and the site has been put “under cocoon”, pending more favourable market conditions (Orano, 2019b).

The following geological description of Imouraren is taken from El Hamet and Idde (2009).

The Imouraren licence is situated in the eastern part of the Tim Mersoï basin. The geological formations are Carboniferous to Cretaceous continental, terrigenous, detritic formations lying on the Pan African basement dipping gently to the west. The deposit lies within the Jurassic Tchirézrine 2 formation; this formation is confined at the top and bottom by two formations with very fine grain size distribution and low permeability, Irhazer-Assaouas and Abinky. The mineralization is concentrated in heterogranular sandstone facies of fluvial origin with intercalating levels of analcime. The sandstones of Tchirézrine are general poorly cemented; the cement is made up of secondary silica, greenish clay, analcime, kaolinite, limonite and haematite. The primary source of uranium seems to be in the Aïr volcanism, as indicated by analcimolite. In addition to the standard factors (stratigraphic, sedimentological, palaeogeographical and tectonic), mineralization control seems to be the result of two phenomena: dispersion by oxidation of a syngenetic mineralization and re-concentration of an epigenetic mineralization by roll-type phenomena.

The Imouraren mineralization is a special case, differing from other known deposits. It is 90% composed of hexavalent secondary uranium minerals (uranotile, meta-tyuyamunite) and 10% of primary minerals (coffinite, pitchblende), appearing in sandstone cement, at the centre of analcime grains and pebbles and in epigenized organic debris. Uranotile ($\text{Ca}(\text{H}_3\text{O})_2(\text{UO}_2)_2(\text{SiO}_4)_{23}\text{H}_2\text{O}$) is the most abundant mineral and is manifested in small fibroradiated clusters underlining the stratification or filling in the imprints of organic debris. These uranium minerals are often associated with copper sulphides and silicates (chalcocite and chrysocolla) and even with native copper; vanadium is present but often linked with chlorites in the form of montroseite.



Unlike the other deposits in the region, the Imouraren uraniferous mineralization is weakly carbonated (0.2% to 0.5% calcite). Iron minerals (pyrite, haematite, goethite), sulphates (gypsum, barytine) and phosphates (apatite) are not very abundant. Organic matter is rare or absent. The mineralization is spread vertically over three horizons in the whole sandstone facies of Tchirézrine 2 at a cumulative average thickness of 55 m at depths of between 105 m and 165 m. Laterally, the mineralization is subdivided into three zones from north to south: Imatra, Imfout and Imola. In the west Arlit-In Azaoua flexure area, two new average size and shallow (25–35 m) deposits, called Imca 25 and Imaren, were found during recent exploration activity.

The reader is cautioned that the Qualified Person has been unable to verify the information presented in this section and this information is not necessarily indicative of the mineralization on the Property that is the subject of this Technical Report.

24 Other Relevant Data and Information

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

25 Interpretation and Conclusions

CSA Global was retained by GAFC to update Mineral Resources for the DASA Project located in Niger, incorporating recent 2017–2018 drilling results. The Report describes previous work and the work done by CSA Global to estimate the 2019 Mineral Resources at the DASA Project as well as updated modelling methodology and results. The interpretation and modelling work have resulted in CSA Global updating a Mineral Resource for the Project in the Indicated and Inferred categories. The results of this Mineral Resource are summarized in Table 25-1 below.

Table 25-1: DASA Mineral Resources with an Effective Date of 1 June 2019

Mineral Resource category	Tonnes (Mt)	eU ₃ O ₈ (ppm)	Contained metal (Mlb)
Indicated – open pit	25.59	1,711	96.5
Indicated – underground	0.71	3,250	5.1
Indicated – Total	26.30	1,752	101.6
Inferred – open pit	18.93	1,357	56.6
Inferred – underground	3.38	4,151	31.0
Inferred – Total	22.31	1,781	87.6

Notes:

- Mineral Resources are classified according to the CIM Definition Standards for Mineral Resources and Mineral Reserves (10 May 2014).
- The MRE was prepared by Dmitry Pertel, MAIG, (CSA Global).
- The Effective Date of the MRE is 1 June 2019.
- Mineral Resources for open pit mining are estimated within the limits of ultimate pit shell.
- Mineral Resources for underground mining are estimated outside the limits of ultimate pit shell.
- A cut-off grade of 320 ppm eU₃O₈ has been applied for open pit resources.
- A cut-off grade of 1,200 ppm eU₃O₈ has been applied for underground resources.
- A bulk density of 2.36 t/m³ has been applied for all model cells.
- Rows and columns may not add up exactly due to rounding.
- No Measured Resources or Mineral Reserves of any category were identified.
- Mineral Resources are not Mineral Reserves and by definition do not demonstrate economic viability. This MRE includes Inferred Mineral Resources that are normally considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves.

The author/Qualified Person and CSA Global believes this Mineral Resource is a reliable estimate of the mineralization present at the DASA, as supported by the current lithological model, analytical data and geophysical logging results. The data used as inputs to the model have been collected and compiled at high standard and indicate that the Project is a high-quality mineral asset. Additionally, mineralization potential exists within the Project along strike to the north and south, as well as within the graben providing significant upside potential. As such, the author/Qualified Person and CSA Global concludes that additional exploration work is warranted at the Project to enlarge the resource and upgrade current Mineral Resource to a higher classification, particularly in areas suitable for the underground mining method.

Conceptual optimization analysis for the purpose of determining reasonable prospects for economic extraction indicates that parts of the Mineral Resource could potentially be extracted economically using open cut methods. The now historical PEA previously reported by GAFC indicated the remaining areas could be mined by underground mining methods. The Project should progress towards a higher level of engineering studies, initially at the PFS level.

25.1 Risks

A review of the Project risks identified the following:

- Environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant issues could potentially affect this MRE; however, the author is not aware of any such factors as of the Effective Date.
- Technical factors which may affect the MREs include:
 - Potential future conceptual study assessments of mining, processing and other factors.
 - eU_3O_8 price and optimization assumptions.
 - Changes to the assumptions used to estimate eU_3O_8 content (e.g. bulk density estimation, grade model methodology).
 - The REF is defined based on comparison of chemical assays with gamma logging. There is no investigation of radon degassing factor which may influence the gamma activity to some extent. However, the effect of this issue on the entire project is not likely to be material to the Project (but may cause local variations).
 - The available number of chemical assays for uranium grades supports the reliable calculation of uranium equivalent grades, that were the basis of the modelled grades, as well as the estimation of the uranium equilibrium factor, which is believed to be close to 1.0. Comparison of gamma logging with radium assays in closed cans as well as radium assays in closed cans with uranium assays could assist to further refine reliably the radiological factors.
 - Geological interpretation (revision of lithologic contacts, mineralization domains, modelling of internal waste domains, etc.).
 - Changes to design parameter assumptions that pertain to the resource constraining conceptual pit shell.
 - Changes to geotechnical and mining assumptions, including the maximum pit slope angle; or the identification of alternative mining methods.
 - Changes to process recovery estimates if the metallurgical recovery in certain domains is less or greater than currently assumed.
- Infill drilling in lower confidence resource areas would improve the reliability and classification of resources lowering potential risk in the resource estimation.
- Prior to any mining occurring, GAFC will require an exploitation licence; should granting of this licence be delayed or not forthcoming for any reason, it would negatively impact the timely development of the Project. The AE3 and AE4 Exploration Permits granted to GAFC have each been renewed two times. The most recent renewal occurred in 2016, resulting in areas of 121.3 km² and 122.4 km² from the initial areas granted in 2007 of 488.7 km² and 489.6 km², respectively. Both the AE3 and AE4 Exploration Permits were extended on 17 December 2018 for an additional two years, extending to 17 January 2021. GAFC intends to submit an application for a Mining Permit before that date. To meet permitting requirements, GAFC is targeting to deliver a PFS and Environmental Impact Study in 2020. GAFC expects the overall permitting process to take four to six months, consistent with the timeline of other uranium projects recently permitted in Niger.
- Environmental and social: Baseline studies have been commenced by GAFC to support permitting of the Project. The DASA deposit is located in a very arid and remote region; sufficient water access to water must be ensured.

25.2 Opportunities

The 2019 Mineral Resource model documented herein is sufficiently reliable to support engineering and design studies to evaluate the viability of a mining project at a preliminary economic analysis level and for the Indicated Resource areas a higher study such as a prefeasibility level.

It is expected that significant parts of the deposit could potentially be mined using industry standard open pit mining techniques, with no requirement for untried or untested technology. However, some areas of the deposit could also be mined using underground methods, and some areas could also be considered for in-situ uranium leaching. However, this has not been assessed in this Report.

Results of metallurgical testwork shows the mineralogy and metallurgy of the DASA mineralization is readily amenable to acid leaching with conventional uranium recovery – similar to the Orano operation at Arlit, Niger. There remain opportunities for further metallurgical study to optimize the recovery of uranium, by undertaking more variability testing, comminution testing and developing a geometallurgical model for the deposit.

26 Recommendations

The author/ Qualified Person and CSA Global recommends the following are completed to support ongoing exploration and a PFS:

- Current QAQC procedures should be maintained to ensure high-quality data is available for subsequent MREs.
- Further exploration and evaluation programs could upgrade the confidence of the extent and quality of mineralization at the deeper parts of the DASA deposit (inside the graben). Additional potential exists along strike to the north.
- Consider logging the drillholes using a PFN tool to assist in mapping any disequilibrium within the deposit.
- Collect and analyze for radium using closed cans and uranium by XRF. Comparison of radium and uranium assays in this context allows the reliable assessment of the radium equilibrium factor.
- It is recommended to consider some areas of the deposit for in-situ leaching techniques.
- Complete an integrated assessment of the geometallurgy of the deposit to better define Mineral Resource domains and for improved metallurgical recovery should the Project proceed to mining.
- Additional metallurgical tests are recommended to assess the recovery of uranium of the deeper mineralization within the graben structure and the new high-grade Flank Zone.
- More detailed assessment of the impacts of hydrology and hydrogeology for mining both open cut and underground.
- A geotechnical study to better understand the rock mechanics of the various lithologies within the deposit to support mine design (and mining).
- Commence more detailed environmental studies to support more detailed feasibility studies at the Project.
- The Indicated Mineral Resource areas of the Project should be the subject of PFS to better understand the economic possibilities for the Project, with some additional PEA-level studies completed on the underground portion of the deposit.
- It is recommended to generate nested pit shells for a subsequent analysis of the pit shells (i.e. to find the discounted optimal pit). Nested pit shells can be useful for metal price sensitivity analysis, which shows how the metal prices affects pit shells values (ore, waste, etc.).

GAFC and CSA have discussed the above work program and GAFC intends to initiate recommended work by October 2019 with supervision and direction from CSA technical staff on site in Niger. The recommended infill drilling has not presently been finalized or budgeted for by GAFC.

A proposed budget for the work above is provided in Table 26-1 below.

Table 26-1: Next phase budget estimate

Work program	Approximate cost (CAD\$)
General, vehicles, camp	\$400,000
Metallurgical testwork and analysis	\$500,000
Geometallurgy modelling	\$100,000
Hydrological and hydrogeological work	\$600,000
Geotechnical work	\$800,000
Environmental impact assessment	\$500,000
Engineering studies (PFS, PEA)	\$800,000
Discretionary Expansion (and infill) Drilling	\$2,000,000
Total	\$5,700,000

27 References

- Activation Lab., 2007. Petrographic study of rocks from a uranium prospect; internal study for Global Atomic Fuels Corporation.
- Association Onarem PNC, 1983. Rapport des activités de la campagne de prospection d'uranium, projet Sekiret, Document 1-6, Annual technical report
- Association Onarem PNC, 1984. Projet Sekiret, Programme des Travaux de la 3eme Campagne 1983-1984, Document 1-7, Annual technical report
- Association Onarem PNC, 1985. Projet Sekiret, Programme des Travaux de la 4eme Campagne 1984-1985, Document 1-4, Annual technical report
- Association Onarem PNC, 1986. Projet Sekiret, Programme des Travaux de la 5eme Campagne 1985-1986, Document 1-4, Annual technical report
- Cazoulat, M., 1985. Geologic environment of the uranium deposits in the carboniferous and Jurassic sandstones of the western margin of the Air Mountains in the Republic of Niger, IAEA-TECDOC-328, p 247-263
- Christophe, Din. A., 2019. 2018 Drilling Campaign, DASA Project, QAQC Report, June 2019, internal report for Global Atomic Corporation.
- Cogema, 1977a. Périmètre In Adrar, Dossier Technique, internal corporate report.
- Cogema, 1977b. Perimetre Tin Adradar; Dossier Technique, internal corporate report,
- CSA Global, 2017. NI 43-101 Technical Report - DASA Uranium Project, Central Niger, prepared for Global Atomic Corporation and with an Effective Date of 30 April 2017.
- CSA Global, 2018a. NI 43-101 Technical Report on the DASA Uranium Project, Mineral Resource Update, Central Niger, prepared for Global Atomic Corporation and with an Effective Date of 1 June 2018
- CSA Global, 2018b. NI 43-101 Technical Report on the Preliminary Economic Assessment - DASA Uranium Project, Central Niger, prepared for Global Atomic Corporation and with an Effective Date of 16 November 2018
- El Hamet, M.O., and Idde, Z., 2009. Uranium resources of Niger. In: Uranium Raw Material for the Nuclear Fuel Cycle : Exploration, Mining, Production, Supply and Demand, Economics and Environmental Issues (URAM-2009) ; Other Papers and Presented Posters – Session 3 (on CD), IAEA-TECDOC-1739, , International Atomic Energy Agency, Vienna (2014).
- Gauthier, J.M., 1972. Analyse tectonique du demi-degré carré (Nord) d'Afaste. CEA-GAM.
- Gauthier, J.M., 1974. Analyse tectonique du demi-degré carré (Nord) d'Afaste. C.E.A. - G.A.M.
- Gerbaud, O., 2006. Evolution structurale du bassin de Tim Mersoï : Déformations de la couverture sédimentaire, relations avec la localisation des gisements uranifères du secteur d'Arlit (Niger). Thesis, Université de Paris-Sud, U.F.R. Scientifique d'Orsay.
- Graef, F., 1999. Atlas des ressources naturelles et agronomiques du Niger et du Bénin. Universität Hohenheim. https://www.uni-hohenheim.de/atlas308/startpages/page2/french/content_fr/conframe_fr.htm. Accessed 2019.
- Greigert, J., and Pougnet, R., 1967. Essai de description des formations géologiques de la république du Niger. Publication Direction des Mines et de la Géologie, Niger, n°3, 273 p.
- Guiraud, R., Boureïma O., and Robert J.-P., 1981. Mise en évidence de déformations traduisant un raccourcissement dans le Mésozoïque de la périphérie de l'Air (Niger). Comptes-Rendus Académie des Sciences, Paris, t. 292, série II, p.753-756.
- Hirlemann, G., and Faure, H., 1978. Analyse structurale du secteur Afaste. CEA-GAM.

- Hirlemann, G., and Robert, J.P., 1977. Analyse structurale du secteur Arni. CEA-GAM.
- Hirlemann, G., and Robert, J.P., 1980. Analyse structurale du permis minier Imouraren. CEA-GAM.
- Joulia, F., 1957. Sur l'existence d'un important système de fractures intéressant le Continental intercalaire à l'Ouest de l'Aïr (Niger, A.O.F). Bulletin de la Société Géologique de France, p.137-143.
- Joulia, F., 1959. Les séries primaires au N et au NW de l'Aïr (Sahara central). Discordances observées. Bulletin de la Société Géologique de France, p. 192-196.
- Joulia, F., 1963. Carte géologique de reconnaissance de la bordure sédimentaire occidentale de l'Aïr au 1/500 000. Éditions du BRGM, Orléans, France.
- Joulia, F., and Obellianne, J.M., 1976. Levers géologiques à l'ouest de l'Aïr. COGEMA, inédit.
- Kinnaird, J., and Nex, P.A.M., 2016. Uranium in Africa. Episodes. 39. p. 335-359.
- Konaté, M., Denis, M., Yahaya, M., and Guiraud, M., 2007. Structuration extensive et transtensive au dévono-dinantien du bassin de Tim Mersoï (Bordure occidentale de l'Aïr, Nord Niger). Annales de l'Université de Ouagadougou - Série C, Vol. 005, juin 2007
- Lang, J., Yahaya, M., El Hamet, M. O., Besombes, J.-C., and Cazoulat, M., 1991. Dépôts glaciaires du Carbonifère inférieur à l'Ouest de l'Aïr. Geologie Rundschau 80 (3), 611-622.
- Molebale, I., 2012. U-mineral characterisation and bulk modal analysis of then composite samples from a sandstone hosted uranium deposit, Northern Niger. Mintek, internal report for Global Atomic Fuels Corporation.
- Orano, 2019a. Annual Activity Report 2018, 240 pages.
- Orano, 2019b. Niger mining sites - corporate webpage, web<https://orano.group/en/expertise/facilities/uranium-mines/niger/mining-sites>
- Sempéré, T., 1981. Le contexte sédimentaire du gisement d'uranium d'Arlit (République du Niger). Mémoire Thèse, Ecole Nationale Supérieure des Mines de Paris, 374 pages
- Valsardieu, C., 1971. Etude géologique et paléogéographique du Bassin de Tim Mersoï, région d'Agadès (République du Niger). Thèse, Nice, Rapport CEA-R-4115, 518 pages.
- von Siebenthal, Jean Martin, 2013: DASA Geology and structure, Global Atomic internal report, unpublished.
- Wright, L. I., Branchet, M., et Alisso, I., 1993. Notice explicative de la carte géologique du bassin houillier d'Anou Araren/Solomi. Ministère des Mines et de l'Énergie, Niger, 20 pages.
- Wright, L., 2010. The Field visit and Geological Interpretation of the Adrar Eroles Concessions, Niger. Global Atomic Fuels Corp. internal document.
- Wright, L., 2012. Re-Evaluation of the Dajy deposits in the light of the tectonic interpretation. Global Atomic Fuels Corp. internal document.
- Yahaya, M., 1992. Dynamique sédimentaire du Guézouman et des formations viséennes sous-jacentes en liaison avec la tectonique, le volcanisme et le climat. PhD Thesis Université de Bourgogne, 355 pages.
- Yahaya, M., and Lang, J., 2000. Évolution tectono-sédimentaire de l'Unité d'Akokan au cours du Viséen dans le bassin de Tim Mersoï (région d'Arlit, Niger). Journal of African Earth Science, vol. 31, No. 2, 415-431.

Appendix 1: Certificate of Qualified Person

Certificate of Qualified Person – Dmitry Pertel

I, Dmitry Pertel, Geologist, as author of this report titled “NI 43-101 Technical Report for the DASA Uranium Project Mineral Resource Update, Central Niger”, prepared for Global Atomic Corporation and with an Effective Date of 1 June 2019, do hereby certify that:

- I am a Principal Geologist with CSA Global Pty Ltd. My office address is Level 2, 3 Ord Street, West Perth, Western Australia 6005.
- I am a graduate of the Saint Petersburg Mining University in 1986 with a Master’s degree in Geology.
- I am a Member of Australian Institute of Geoscientists (AIG) and registered as a Professional Geoscientist, Certificate #2248. I have worked as a Geologist for a total of 33 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Development and reporting of Mineral Resource models
 - Review and report QA and QC procedures and protocols, site visits and laboratory inspections
 - Principal Geologist on a number of Mineral Resource studies and development of block models for the uranium industry in Africa, Australia and Asia.
- I have read the definition of 'Qualified Person' set out in National Instrument 43-101 ('NI 43-101') and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a 'qualified person' for the purposes of NI 43-101.
- I have visited the DASA Project between 25 March and 6 April 2017 with 5 days at the deposit site and exploration camp, and several days at the Global Atomic office in Niamey, Niger.
- I am responsible for preparation of all Sections of the Technical Report.
- I am independent of the Issuer applying the test set out in Section 1.5.(4) of NI 43-101.
- I have prior involvement in the DASA Uranium Project. I have:
 - Co-authored CSA Global’s report titled “NI 43-101 Technical Report on the Preliminary Economic Assessment - DASA Uranium Project, Central Niger”, prepared for Global Atomic Corporation and with an Effective Date of 16 November 2018,
 - Co-authored CSA Global’s report titled “NI 43-101 Technical Report on the DASA Uranium Project, Mineral Resource Update, Central Niger”, prepared for Global Atomic Corporation and with an Effective Date of 1 June 2018,
 - Co-authored CSA Global’s report titled “NI 43-101 Technical Report - DASA Uranium Project, Central Niger”, prepared for Global Atomic Corporation and with an Effective Date of 30 April 2017.
- I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
- At the Effective Date of this Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this 31 July 2019 at Perth, W.A.


Electronic signature not for duplication. Electronic signature not for duplication. Electronic signature not for duplication. Electronic signature not for duplication. Electronic signature not for duplication. Electronic signature not for duplication. Electronic signature not for duplication. Electronic signature not for duplication. Electronic signature not for duplication. Electronic signature not for duplication.

Dmitry Pertel, M.Sc., MAIG
CSA Global Principal Geologist

Appendix 2: Abbreviations and Units of Measurement

Abbreviation	Description
%	percent
°	degrees
°C	degrees Celsius
3D	three-dimensional
AE3	Adrar Emoies 3
AE4	Adrar Emoies 4
ARD	absolute relative difference
ASL	above sea level
BEEEE	Bureau d'Evaluation Environmental et des Etudes d'Impact
BWI	Bond work index
c/s	counts per second
CEA	Commissariat a l'Energie Atomique (French Nuclear Energy Commission)
CEET	comminution economic evaluation tool
CL	calliper logging
cm	centimetre(s)
CSA Global	CSA Global Pty Ltd
CWI	crusher work index
DCF	discounted cash flow
DS	directional survey
DTM	digital terrain model
ESIA	environmental and social impact assessment
eU ₃ O ₈	equivalent uranium oxide
g	gram(s)
GAC	Global Atomic Corporation
GAFC	Global Atomic Fuel Corporation
GR	gamma-ray logging
GT	grade thickness
h	hour(s)
HAL	high acid leach
HARD	half absolute relative difference
ICP-AES	inductively coupled plasma – atomic emission spectroscopy
ICP-MS	inductively coupled plasma – mass spectrometry
ICP-OES	inductively coupled plasma – optical emission spectrometry
IDW	inverse distance weighted
IMU	inertial measurement unit
IRR	internal rate of return
kg	kilogram(s)
km	kilometre(s)
km/h	kilometres per hour
km ²	square kilometres
Kt	kilo-tonnes (or thousand tonnes)

Abbreviation	Description
kV	kilovolt
L	litre(s)
lb	pound(s)
LiDAR	light detection and ranging (survey)
m	metre(s)
M	million(s)
ml	millilitre(s)
Mlb	million pounds
mm	millimetre(s)
MRE	Mineral Resource estimate
Mt	million tonnes
MW	Megawatt
NI 43-101	National Instrument 43-101
NPV	net present value
OK	ordinary kriging
ONAREM	Niger National Geological Survey
PEA	preliminary economic assessment
PFN	prompt fission neutron logging
PFS	prefeasibility study
PL	pre-leach
PLS	pregnant leach solution
PNC	Power Reactor and Nuclear Development Corporation
PSD	particle size distribution
QA	quality assurance
QAQC	quality assurance/quality control
QC	quality control
REF	radioactive equilibrium factor
RIP	resin-in-pulp
RL	resistivity logging
ROM	run-of mine
SAG	semi-autogenous grinding
SD	standard deviation
SP	spontaneous polarization
t	tonne(s)
t/m ³	tonnes per cubic metre
U	uranium
US\$	United States dollars
VAT	value-added tax
WHA	whole-rock analyses
XRD	x-ray diffraction
XRF	x-ray fluorescence



Australia • Canada • Indonesia • Russia
Singapore • South Africa • United Kingdom

csaglobal.com

