Technical Report with an Updated Mineral Resource Estimate for the Midwest Property, Northern Saskatchewan, Canada

Report Prepared by
Denison Mines Corporation

Effective date: March 26, 2018
Signature date: March 26, 2018

With Audited Mineral Resource Statement by

SRK Consulting (Canada) Inc.

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1 SUMMARY

1.1 Executive Summary

The Midwest Project is an advanced uranium exploration stage joint venture owned 25.17% by Denison Mines Inc. (DMI) a wholly owned subsidiary of Denison Mines Corp. (collectively, with its subsidiaries, “Denison”); 69.16% by Orano Canada Inc., formerly AREVA Resources Canada Inc. (“Orano”) and; 5.67% by OURD (Canada) Ltd. (“OURD”). Orano is the active project operator.

The Midwest Project is located within the eastern part of the Athabasca Basin in Northern Saskatchewan, Canada. The Midwest Project consists of three (3) contiguous mineral leases, containing the Midwest Main uranium deposit (formerly called the Midwest deposit) and Midwest A uranium deposit. The deposits are classified as ‘unconformity-type’ uranium deposits, and occur approximately 200 metres below surface and straddle the contact between overlying Athabasca Group sandstones and the underlying Paleo-Proterozoic and Archean basement rocks.

The Midwest Main and Midwest A deposits have seen several mineral resource estimates since their discoveries in 1977 and 2005 respectively. In 2005, Denison retained Scott Wilson RPA to provide an independent mineral resource estimate review for the Midwest Main deposit, the results of which are contained within the NI 43-101 report entitled "Technical Report on the Midwest Uranium Deposit Mineral Resource and Mineral Reserve Estimates, Saskatchewan, Canada" dated June 1, 2005 and revised on February 14, 2006 (Hendry, Routledge, & Evans, 2006). In 2007, Geostat was retained by Denison to complete an independent mineral resource estimate review of the Midwest A uranium deposit, the results of which are contained in the NI 43-101 report entitled “Technical Report on the Midwest A Uranium Deposit of Saskatchewan, Canada”, dated January 31, 2008 (Dagbert, 2008). Copies of these reports are available on Denison’s profile on the SEDAR website at www.sedar.com.

In November 2017, Orano completed an updated Mineral Resource estimate for the Midwest Main and Midwest A deposits in accordance with NI 43-101. Prior to the Mineral Resource estimation, Orano completed an extensive amount of work to improve the drill hole datasets and the geological and mineralization models for both deposits. This work included, but was not limited to; verification of grade data against historical records, digitization of historical downhole gamma probe paper logs (Midwest Main), depth correction of historical downhole gamma probe data (Midwest Main), creation of new probe to grade correlations, collection and analysis of samples for dry bulk density and derivation of a new grade to density regression formula (Midwest A), revised geological modelling based on the digitization and generalization of drill log descriptions and re-interpretation of geophysical surveys, and incorporation of 40 drill holes completed from 2007 to 2009 (Midwest A).

In January 2018, SRK Consulting (Canada) Inc. ("SRK") was retained by Denison to review and audit the updated Mineral Resource Estimates for the Midwest Main and Midwest A deposits in accordance with CIM Definition Standards (2014) in NI 43-101. The purpose of this Technical Report is to support the disclosure of the updated Mineral Resource estimate for the Midwest Main and Midwest A deposits and to update the total Mineral Resource estimate for the Midwest Project. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects.

1.2 Technical Summary

1.2.1 Property Description and Location

The Midwest Project is located within the eastern part of the Athabasca Basin in Northern Saskatchewan. The Midwest Project consists of three (3) contiguous mineral leases, containing the Midwest Main uranium deposit and Midwest A uranium deposit. The mineral lease dispositions are within the 1:50,000 National Topographic System (NTS) map sheet 74I/8. The Midwest Main deposit is centred approximately at 553,600 Easting and 6,462,800 Northing (UTM NAD 83; Zone 13 north). Access to the Midwest Project is by both road and air. Goods are transported to the site by truck over an all–weather road connecting with the provincial highway system. Air transportation is provided through the Points North airstrip about 2 kilometres from the project site.

1.2.2 Ownership

Denison holds a 25.17% interest in the joint venture project, with Orano holding 69.16% and OURD holding 5.67%. Orano is the active project operator. The property consists of three (3) contiguous mineral leases, covering 1,426 ha and contains both the Midwest Main and Midwest A deposits. The mineral lease containing the Midwest Main deposit (ML 5115) is 556 ha in size. The mineral lease containing the Midwest A deposit (ML 5264) is 446 ha in size. All claims are in good standing until at least December, 2031.

1.2.3 Geology and Mineralization

The Midwest property is within the Athabasca Basin of northern Saskatchewan, near its eastern margin, that overlies the Western Churchill Structural Province of the Canadian Shield. The sub-Athabasca bedrock geology of the area consists of Paleoproterozoic Wollaston Group metasediments and Archean orthogneiss, all part of the Wollaston-Mudjatik Transition Zone. The north-northeast-trending ductile to brittle structural trend that hosts the Midwest Main and Midwest A uranium deposits follows a steeply-dipping graphitic pelitic gneiss metasedimentary unit that is bounded by granitic gneisses and Hudsonian granite to the northwest and southeast, respectively.

These basement lithologies are unconformably overlain by the flat-lying, unmetamorphosed sandstones and conglomerates of the Athabasca Group. Extensions of basement fault zones generally extend over 100 metres into the overlying sandstone, act as hosts for uranium mineralization, and form the loci of the quartz dissolution and clay alteration zones that resulted in collapse of the property-scale conglomerate marker horizon.

The uranium mineralization on the Midwest project consists of two egress-style unconformity-type deposits: the Midwest A deposit and the Midwest Main deposit. This mineralization style resulted from a fluid-fluid mixing process involving oxidized basinal brine and relatively reduced fluid emanating from the basement and subsequent precipitation of uraninite (Hoeve and Quirt, 1984).

The Midwest Main deposit is approximately 920 metres long, 10 to 140 metres wide, and up to 33 metres in thickness, not including the basement roots which have been modeled to extend approximately an additional 90 metres below the unconformity. The bulk of the mineralization is in the lensoid Unconformity Zone that occurs at depths ranging between 170 and 205 metres below surface. Perched mineralization occurs as discrete lenses located above the Unconformity Zone and up to 100 metres above the unconformity.

The Midwest A deposit is approximately 450 metres long, 10 to 60 metres wide, and ranges up to 70 metres in thickness. It occurs at depths ranging between 150 and 235 metres below surface. The mineralization consists of near-massive mixtures of pitchblende/uraninite and Ni-Co-arsenides.

The mineralization of both Midwest Main and Midwest A consists of mixtures of pitchblende/uraninite and Ni-Co-arsenides. The minerals and their paragenetic order are similar to those present in other sandstone-hosted unconformity-type deposits, such as Cigar Lake, Key Lake, McClean Lake, Collins Bay B Zone, etc. (Ayres et al., 1983; Hoeve and Quirt, 1984; Wray et al., 1985). The diagenetic-hydrothermal host-rock alteration associated with mineralization comprises varying degrees of illitization, chloritization, hematization/bleaching, tourmalinization, and silicification/de-silicification, and local kaolinization (Hoeve and Quirt, 1984).

1.2.4 Exploration and Development

The Midwest property was intensely drilled following discovery of the Midwest Main deposit in 1978. This discovery resulted from follow-up of initial airborne and ground geophysical surveys, ground geochemical sampling, and boulder surveys, and was part of a property-scale drill-testing program.

At Midwest Main, the initial indication of the presence of sandstone mineralization was discovered in the 1977 drill hole D7721. The Midwest Main deposit itself was discovered the following year, during an extensive exploration campaign which focused on following-up the encouraging mineralized intercept. To date, the best uranium intersection from the deposit area was recorded in MW-574 with 16.42% U over 8.5 metres. Extensive drilling programs and additional geophysical surveys were subsequently carried out in the area during the 1978-1982 period.

The initial indication of the presence of the Midwest A sandstone mineralization was discovered in the 1979 drill hole MW-338. The Midwest A deposit itself was discovered during the 2005 exploration campaign that focused on following-up the historical MW-338 mineralized intercept. High-grade sandstone mineralization, along with several lower-grade zones, extending to the unconformity was encountered (e.g. MW-662), with the best intersection being 1.12% U over 32.2 metres (cut-off grade of 0.05% U). Extensive drilling programs and additional geophysical surveys were subsequently carried out in the area during the 2006 to 2009 period.

The Midwest Main deposit has previously undergone environmental assessment, but has not been developed. An underground test mine program was conducted at the Midwest Main site in 1988 and 1989 by Denison Mines. This work consisted of constructing a dam across a portion of the Mink Arm of South McMahon Lake that allowed dewatering of that part of the lake and sinking a 185 metre long shaft and a 180 metre long drift above the deposit for test work. A small amount of mineralization was extracted and submitted for metallurgical testing.

1.2.5 Mineral Resource Estimate

The Midwest uranium project is comprised of two primary deposits, Midwest Main and Midwest A. The mineral resource models for both Midwest Main and Midwest A were prepared by Orano in November 2017. In February 2018, SRK Consulting (Canada) Inc. (SRK) was retained by Denison to audit the mineral resource models constructed by Orano.

The review of the geology interpretation and the 3D model was performed by Mr. G. David Keller, PGeo (APGO#1235). The data and mineral resource model review was performed by Dr. Oy Leuangthong, PEng (PEO#90563867). Mr. Keller and Dr. Leuangthong visited the site on February 7 and 8, 2018. The mineral resource classification was reviewed and the audited Mineral Resource Statement was prepared by Mr. Keller and Dr. Leuangthong. Mr. Glen Cole, PGeo (APEGS #26003) was the senior reviewer of the mineral resource audit. Both Mr. Keller and Dr. Leuangthong are independent Qualified Persons as this term is defined in National Instrument 43-101. The effective date of the Mineral Resource Statement is March 9, 2018.

Orano completed the resource estimate using Vulcan V10.1.2 and V10.0.3 software in UTM NAD 83 coordinates for Midwest Main and Midwest A, respectively. The block model was constrained by a re-interpreted 3D mineralized envelope of the mineralization using the updated resource database, as of October 2, 2017 for Midwest Main and June 16, 2017 for Midwest A. DG (density x grade in %U) and density were estimated into the blocks using Ordinary Kriging (OK). Nearest Neighbour (NN) and Inverse Distance Squared (ID2) estimation was used for model validation. The resource estimate was internally validated by Orano through check estimations and peer reviews. The mineral resources do not include allowances for dilution and mining recovery.

SRK's audit of the mineral resource model included a review of the geological interpretation, data preparation and (geo)statistical analysis, block model estimation and validation, and resource classification.

For Midwest Main, the modelling of the perched and basement zones represents a new addition to the mineral resource estimation; they were modelled, but excluded in the 2006 reported estimate for Midwest Main. Given that uranium mineralization is present in these previously unreported areas and with the inclusion of additional probing data, SRK finds it acceptable that these areas are included in the current estimate. In general, SRK finds Orano's resource estimation methodology and workflow to be clear and reasonable for this type of unconformity-related uranium mineralization. SRK made two adjustments to the model received from Orano: (1) a typographical correction of search ellipsoid and variogram orientation for consistency with Orano's modelled variogram, and (2) revised high grade treatment for the DG attribute within the Unconformity Zone.

The interpretation for the Midwest A zone has changed significantly from the last publicly disclosed resource estimate in 2008. The main interpretational change is the combination of previous South and North pods have been combined to form the Low Grade Zone. This Zone now includes the intervening zone between the South and North Pods. In addition, the strike length of mineralization has changed from an approximate strike length of 350 meters to about 430 metres. Changes in the interpretation are largely based on the addition of 40 drillholes and related additions from reprocessed probe data including depth corrections, use of corrected low flux gamma values, removal of problematic probe data which allowed the use of a greater number of eU values, Mineralization in the basement was added to the Low Grade Zone. The reinterpretation comprises a volumetric increase of about 40%.

The resource estimation of Midwest A followed a similar methodology to Midwest Main. SRK made two modifications to the Midwest A resource model constructed by Orano: (1) grade and density continuity was re-oriented to be flat along strike and re-estimated accordingly; and (2) blocks below the unconformity surface were re-classified from Indicated to Inferred on the basis of estimation pass and data density.

With the two adjustments to Orano's mineral resource estimation for both the Midwest Main and Midwest A models, SRK considers the mineral resource model for Midwest Main and Midwest A to be a reasonable reflection of the local distribution of uranium grade and density.

Orano considers the use of an open pit extraction scenario for reporting, with a cut-off of 0.085% U (0.1% U_3O_8). This choice of cut-off grade is based on Orano's many years of mining experience at the nearby Sue open pits (Sue A, Sue B, Sue C, and Sue E) and at the McClean Lake site where a cut-off of 0.085% U was used during mining (AREVA Resources Canada Inc., 2009). Uranium mineralization at the former Sue A and B pits is similar in nature to Midwest Main and Midwest A in terms of depths, mineralization, distance to the mill, and host rocks. SRK finds this cut-off grade to be comparable to other Denison projects, and slightly higher than the historical 0.05% U cut-off for the 2008 Midwest A zone.

SRK is satisfied that the mineral resources were estimated in conformity with the widely accepted CIM *Estimation of Mineral Resource and Mineral Reserve Best Practices Guidelines*. The mineral resources may be affected by further infill and exploration drilling that may result in increases or decreases in subsequent mineral resource estimates. The mineral resources may also be affected by subsequent assessments of mining, environmental, processing, permitting, taxation, socio-economic, and other factors. The audited Mineral Resource Statement for the Midwest Uranium Project presented in Table 14-19 was prepared by Dr. Oy Leuangthong, PEng

(PEO#90563867), and Mr. G. David Keller (APGO#1235). Dr. Leuangthong and Mr. Keller are independent qualified persons as this term is defined in National Instrument 43-101.

The effective date of the audited Mineral Resource Statement is March 9, 2018.

Table 1-1: Audited Mineral Resource Statement*, Midwest Uranium Project, Saskatchewan, SRK Consulting (Canada) Inc., March 9, 2018

Deposit	Category	Zone	Tonnage (kt)	Grade (% U_3O_8)	Contained Metal (Mlb U_3O_8)	Denison Equity** (Mlb U_3O_8)
Midwest Main	Indicated	Unconformity	453	4.00	39.94	10.05
	Inferred	Unconformity	257	1.36	7.71	1.94
		Perched	513	0.32	3.59	0.90
		Basement	23	0.38	0.18	0.05
Midwest A	Indicated	Low Grade	566	0.87	10.84	2.73
	Inferred	Low Grade	43	0.40	0.38	0.09
		High Grade	10	28.76	6.35	1.60
	Total Indicated		**1,019**	**2.26**	**50.78**	**12.78**
	Total Inferred		**845**	**0.98**	**18.21**	**4.58**

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates. Reported at open pit resource cut-off grade of 0.085% U (0.1% U_3O_8) and at a uranium price of US$45 per pound.

** Denison's share of the project on an equity basis is 25.17%.

1.2.6 Conclusions

The uranium mineralization at the Midwest Main deposit consists of a higher-grade Unconformity Zone at the sandstone-basement contact (unconformity). Additional mineralization was defined in a zone of lower grade fracture-controlled basement mineralization associated with moderate to intense clay alteration and in 19 Perched Zones in the weakly to moderately altered sandstone above the Unconformity Zone. The mineralization is approximately 920 metres long, 10 to 140 metres wide, and up to 33 metres in thickness, not including the basement roots which have been modeled to extend approximately an additional 90 metres into the basement. The bulk of the mineralization (Unconformity Zone) occurs at depths ranging between 170 and 205 metres below surface. Perched mineralization occurs as discrete zones located above the unconformity lens and up to 100 metres above the unconformity below surface. The 3D interpretation was based on a cut-off of greater than or equivalent to 0.05% U over a two metre interval. The mineral resource was estimated using ordinary kriging (Unconformity Zone) and inverse distance squared (Perched and Basement Zones) interpolation methods with restrictions on the influence of higher grade samples. At the 0.085% U (0.1% U_3O_8) cut-off, the Midwest Main deposit contains an Indicated resource of 453,000 tonnes grading 4.00% U_3O_8 and an Inferred resource of 793,000 tonnes grading 0.66% U_3O_8.

The mineralization at the Midwest A uranium deposit consists of a high-grade mineralized core (High Grade Zone) in the sandstone at the unconformity, which is surrounded by the Low Grade Zone, a more dispersed, fracture-controlled mineralization in both sandstone and basement rocks. The high-grade mineralization forms a fairly steeply-dipping lensoid concentration which is enclosed within a lower grade envelope. The mineralization currently has dimensions of 450 metres in length and 10 to 60 metres in width and ranges up to 70 metres in thickness. It occurs at depths ranging between 150 and 235 metres below surface. At the 0.085% U (0.1% U_3O_8) cut-off, the Midwest A deposit contains an Indicated resource of 566,000 tonnes grading 0.87% U_3O_8 and an Inferred resource of 53,000 tonnes grading 5.81% U_3O_8.

Data verification of the drill hole database was carried out by Orano against the original drill logs and assay certificate information for Midwest Main. Drilling, sampling, analysis, security, and database procedures employed were deemed to meet industry standards at the time they were conducted. Denison performed additional QAQC and data verification of the drilling database including review of the QAQC methods and results, verification of assay certificates against the database assay table, review of downhole probe and eU% calculation procedures and standard database validation checks. The information used for the resource was deemed reliable and is believed to be accurate and suitable for mineral resource estimation.

1.2.7 Risks and Opportunities

All efforts were made to accurately represent and estimate the mineralization as well as minimize any risks that may exist. The most significant risks that remain are:

- The high-grade management methodology used at Midwest Main in this estimate differs from previous estimates, and the choice of a high grade threshold for limiting influence can have notable impact in the metal content of the Unconformity Zone. Changes to this strategy would have minimal effect on the Perched and Basement Zones.
- The orientation of the Perched Zones at Midwest Main appears to be along stratigraphic bedding planes (flat-lying) in the sandstone. Additional drilling would reduce the risk in misinterpretation of structural controls for this zone.
- Given the lower average grades of the Perched and Basement Zones at Midwest Main, changes to cut-off grade will some impact on these Inferred resources; however, the overall impact of cut-off grade on Midwest Main is not considered material up to a cut-off grade of 0.3% U.

1.2.8 Recommendations

1.2.8.1 Midwest Main

The following recommendations are made in order to reduce/remove some of the uncertainties associated with the current 2018 resource calculations:

- In future drill campaigns, it is recommended that additional multi-element measurements be collected, as the current dataset contains irregular and much smaller distributions for elements other than uranium.

- Given the age of the drilling (late 70's to mid-80's), it is recommended at least five of the historic holes be twinned to verify the location and grades of the mineralization in the Unconformity Zone. Total approximate cost of $400,000.
- Follow up drilling of at least five holes (for ~1,900 metres) should be conducted to address the potential for further basement-hosted mineralization, as the mineralized system is open at depth. Total approximate cost of $460,000.
- Resource estimation of other elements of interest (e.g. As, Ni, Co, Mo, Cu) should be conducted given that the deposit is known to contain relatively high levels of deleterious elements (As, Mo) and the possibility for by-products (Ni, Co, Cu).
- The remaining historical downhole probing logs should be digitized to complete the dataset and allow these data to be used in future resource estimates.
- The remaining dry bulk density data should be digitized and added to the database to make them available for future resource estimations, in preference to calculated values.
- SRK recommends that the database for dry bulk density should be comprised of actual density measurements where available, and with derived density at unsampled locations. This should yield a database that shows more local variability for estimation.
- For geological modelling, more data is needed to improve the understanding of the structural settings of the Midwest Main area. As few oriented structural measurements were available, there is some uncertainty on the fault orientations in the new 2017 structural model. Oriented core measurements are recommended in future drill campaigns.
- SRK recommends that significant additional drilling be considered in future to accurately locate and identify structural blocks and their relationship to mineralization. Identifying sub-vertical structures with inclined drilling should be a priority. SRK considers that grade estimation may require a series of hard and soft boundaries between structural blocks for the unconformity domain. The Perched Zone may benefit from using trend analysis software such as Leapfrog, to identify mid-grade mineralization. This analysis will also benefit from infill-drilling and identification of mineralization related to sub-vertical.
- Complete a 3D model of the historical underground test mine drift to make it available for future studies.
- It is recommended that the high-grade management strategy, be reviewed as more data becomes available.
- Drilling techniques, such as triple tubing, should be used to minimize the amount of core loss when drilling through the mineralization, as the amount of core loss has been high.

- The radiometric probe to grade correlations should be reviewed if additional probing data be digitized.
- Review any remaining occurrences of sandstone mineralization and model where possible, especially if the remaining downhole probing data are digitized.

1.2.8.2 Midwest A

The following recommendations are made in order to reduce/remove some of the uncertainties associated with the current 2018 resource calculations:

- Conduct additional drilling around the High Grade Zone with the aim of better delineating and understanding the controls of the mineralization in this area, as well as to upgrade the High Grade Zone to Indicated resources.
- Dry bulk density samples should be taken during any future drill campaigns to verify and/or update the density correlation that was used. A minimum of 50 additional samples is recommended.
- SRK recommends that the database for dry bulk density should be comprised of actual density measurements where available, and with derived density at unsampled locations. This should yield a database that shows more local variability for estimation.
- For geological modelling, more oriented core data are needed to improve the understanding of the structural settings of the Midwest A area. Few oriented structural measurements are currently available and thus there is some uncertainty on the fault orientations in the new 2017 structural model based on these data.
- A significant amount of low grade tonnage has also been interpreted in the Basement domain at elevations to 240 metres. This interpreted mineralization in the northeast of the Low Grade Zone may be optimistic and should be confirmed with exploration drilling.
- SRK recommends that significant additional drilling be considered in future to accurately locate sub-vertical geological structures for this deposit to determine their relationship to mineralization.
- Additional drilling should be carried out in the former Gap area (low drill hole density) to reduce/remove uncertainty and better delineate this mineralization.
- Follow-up drilling should be conducted to address the potential for further basement-hosted mineralization. The mineralized system is open at depth.
- Inferred mineralization in the southwest part of the deposit should be better-delineated by additional drilling.
- The mineralization at Midwest A is believed to be similar to that present in other deposits that have been processed at the McClean Lake mill (Cigar Lake, Caribou, Sue). During future drill campaigns, a small- to moderate-scale initial metallurgical test

of Midwest A mineralization should be conducted to confirm it can be milled with similar results.

- Drilling techniques, such as triple tubing, should be used to minimize the amount of core loss when drilling through the mineralization as the amount of core loss has been high in many Midwest A drill holes.

1.2.8.3 Work Program and Budget for 2018

A CAD$1.2 million budget has been approved for the Midwest project in 2018. The budget includes drilling of approximately 5,000 meters and will be utilized to test exploration targets on the Points North trend (approximately six drill holes), on the southern portion of the Midwest property, and undertake further testing of the Midwest Main deposit (approximately six drill holes). The drilling planned for Midwest Main will focus on data collection through the known unconformity-hosted mineralization, and testing for basement mineralization, in accordance with the recommendations outlined above. Denison's share is approximated at $302,000. Denison has reviewed the plans for 2018 and concurs with the program planned for the Midwest project.

2 INTRODUCTION

2.1 Denison Mines Corp.

Denison Mines Corp. ("Denison") is a uranium exploration and development company with interests focused in the eastern Athabasca Basin region of northern Saskatchewan, Canada (Figure 2-1). In addition to its 25.17% interest in the Midwest project (Midwest Main and Midwest A deposits, Figure 2-2), Denison has a 63.3% interest in the Wheeler River project, which hosts the Phoenix and Gryphon uranium deposits, and a 22.5% ownership interest in the McClean Lake joint venture, which includes several uranium deposits and the McClean Lake uranium mill. Denison's eastern-Athabasca interests also include a 64.22% ownership in the J Zone deposit and Huskie discovery on the Waterbury Lake property which lie along strike and within six kilometres of the Midwest Main and Midwest A deposits. Each of Midwest, Midwest A, J Zone and Huskie are located within 15 kilometres of the McClean Lake mill.

The McClean Lake mill is owned by Orano (70.0%), Denison (22.5%) and OURD (7.5%) under the McClean Lake Joint Venture ("MLJV"). Orano Canada is the operator/manager of the mill. The McClean Lake mill is specially designed and constructed to process high grade uranium ores in a safe and environmentally responsible manner. The mill uses sulphuric acid and hydrogen peroxide leaching and a solvent extraction recovery process to extract and recover the uranium product from the ore. In addition to the mill facility, other infrastructure on the site includes a sulphuric acid plant, a ferric sulphate plant, an oxygen plant, an electricity transmission line tied into the provincial power grid, a 14 megawatt back-up diesel power plant, warehouses, shops, offices and living accommodations for site personnel. In 2016, mill expansion, construction and licensing were completed and the licensed production capacity of the mill was increased to 24 million pounds U_3O_8 per year. This increased licensed capacity allowed for the processing of 100% of ore production from the Cigar Lake mine, expected to be 18 million pounds U_3O_8 per year, and the flexibility to mill ore from other sources.

Denison is also engaged in mine decommissioning and environmental services through its Denison Environmental Services division and is the manager of Uranium Participation Corp., a publicly traded company which invests in uranium oxide and uranium hexafluoride.

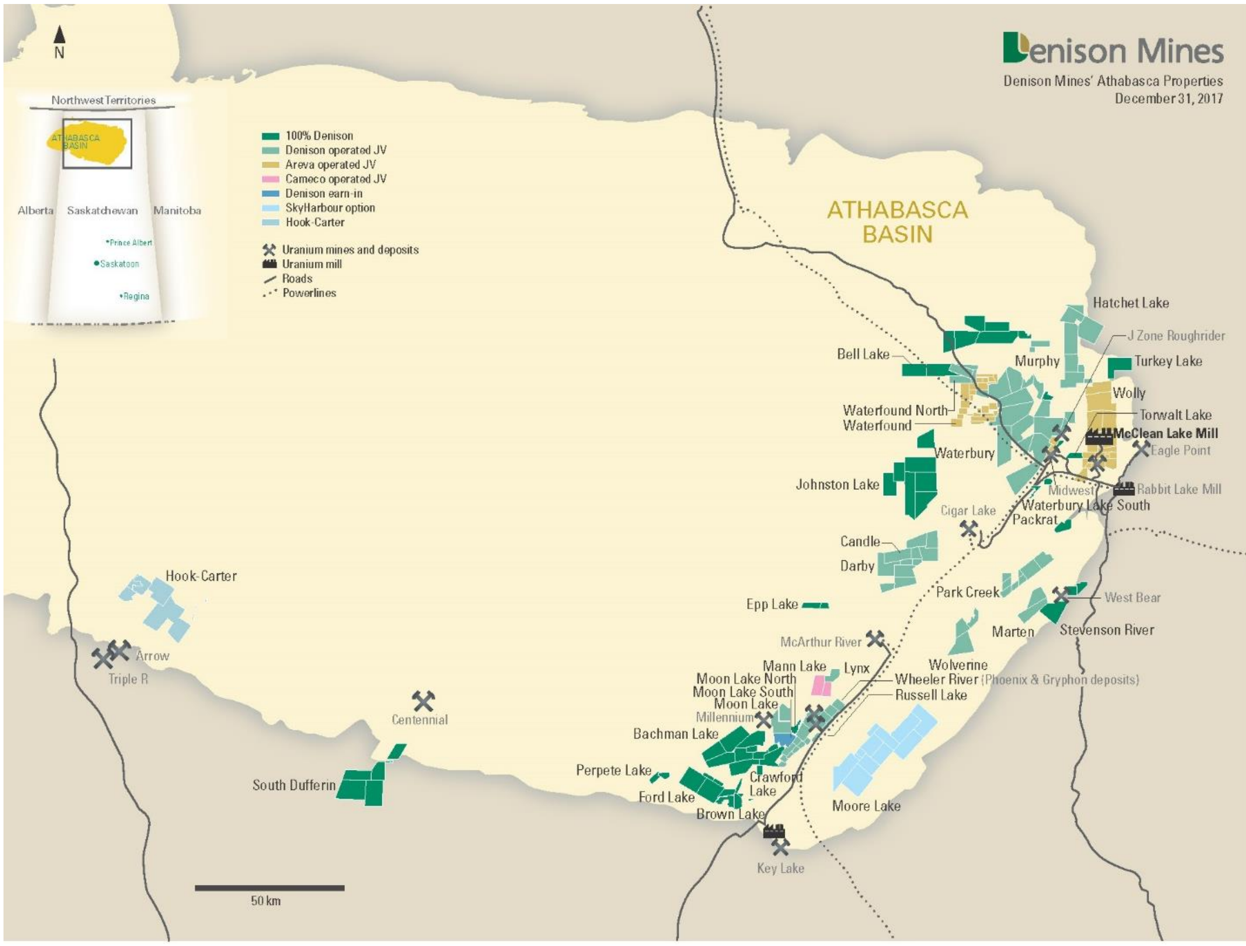


Figure 2-1: Location map of Denison's Athabasca Basin properties.

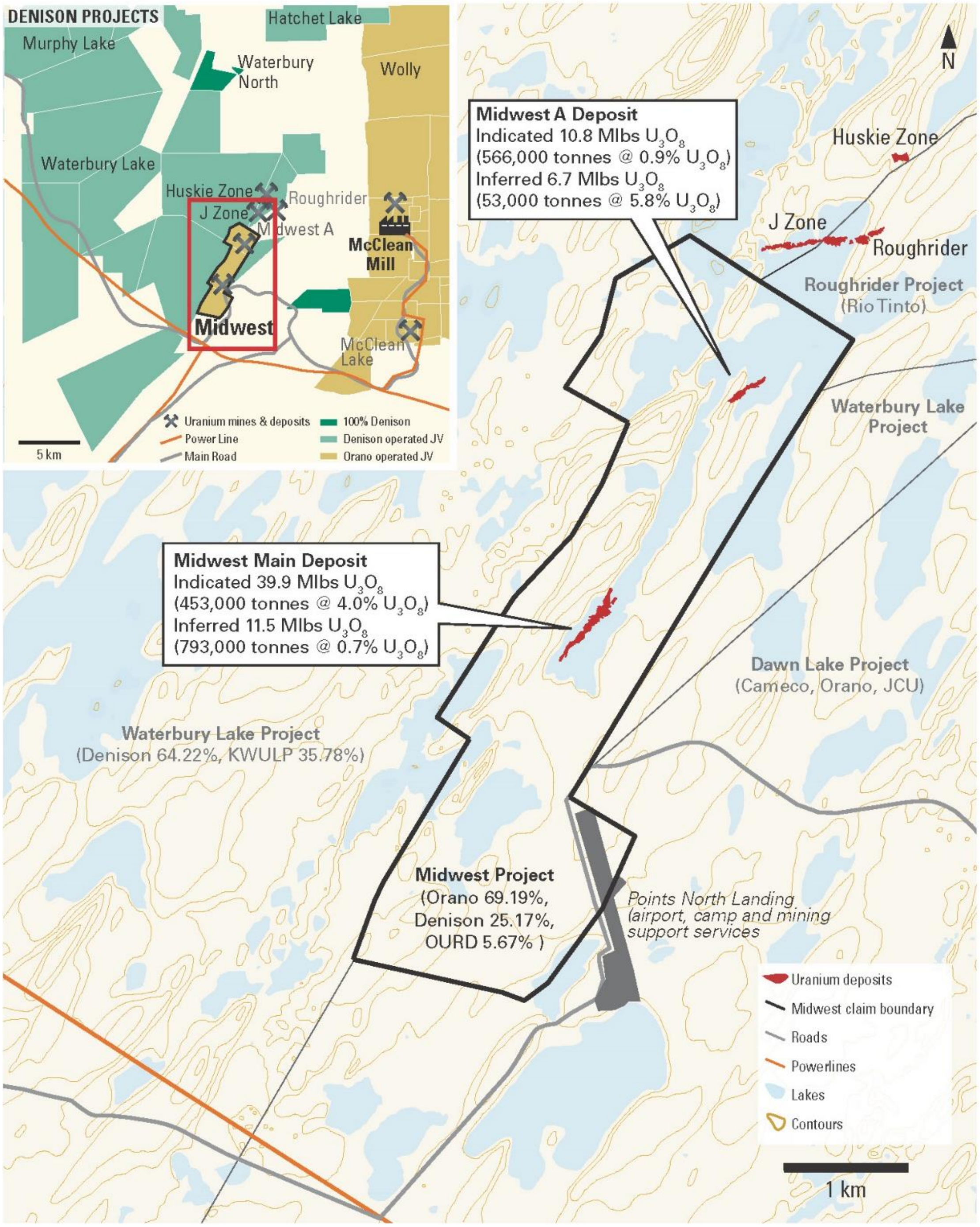


Figure 2-2: Location map of the Midwest Main and Midwest A uranium deposits.

2.2 Terms of Reference

This report is prepared using the industry accepted “*Best Practices and Reporting Guidelines*” for disclosing mineral exploration information (CIM, 2010), and the revised Canadian Securities Administrators guidelines for NI 43-101 and Companion Policy 43-101CP (CIM, 2014).

2.3 Purpose of the Report

The Midwest Main and Midwest A deposits have seen several mineral resource estimates since their discoveries in 1977 and 2005 respectively. In 2005, Denison retained Scott Wilson RPA to provide an independent mineral resource estimate review for the Midwest Main deposit, the results of which are contained within the NI 43-101 report entitled "Technical Report on the Midwest Uranium Deposit Mineral Resource and Mineral Reserve Estimates, Saskatchewan, Canada", dated June 1, 2005 and revised on February 14, 2006 (Hendry, Routledge, & Evans, 2006). Since this NI 43-101, an internal resource estimate and feasibility study was prepared in 2007 by ARC (AREVA Resources Canada Inc., 2007).

In 2007, Geostat was retained by Denison to complete an independent mineral resource estimate review of the Midwest A uranium deposit, the results of which are contained in the NI 43-101 report entitled “Technical Report on the Midwest A Uranium Deposit of Saskatchewan, Canada” dated January 31, 2008 (Dagbert, 2008). Informal resource estimate updates were prepared in 2008 and 2010 for ARC by SRK Consulting (Canada) Inc.

In November 2017, Orano completed an updated mineral resource estimate for the Midwest Main and Midwest A deposits in accordance with NI 43-101. Prior to completing the mineral resource estimate, Orano completed an extensive amount of work to improve the drill hole datasets and the geological and mineralization models for both deposits – with the objective of bringing the dataset and mineral resource estimates up to a more current and rigorous standard. This work included, but was not limited to; verification of grade data against historical records (Midwest Main and Midwest A), digitization of historical downhole gamma probe paper logs (Midwest Main), depth correction of historical downhole gamma probe data (Midwest Main), creation of new probe to grade correlations (Midwest Main and Midwest A), collection and analysis of samples for dry bulk density and derivation of a new grade to density regression formula (Midwest A), revised geological modelling based on the digitization and generalization of drill log descriptions and re-interpretation of geophysical surveys (Midwest Main and Midwest A), and incorporation of 40 additional drill holes completed between September 2007 and December 2009 (Midwest A).

SRK Consulting (Canada) Inc. (“SRK”) was retained by Denison to review and audit the updated Mineral Resource Estimate for the Midwest Main and Midwest A deposits. The purpose of this Technical Report is to support the disclosure of the updated Mineral Resource estimate for the Midwest Main and Midwest A deposits and to update the total Mineral Resource estimate for the Midwest Project.

2.4 Sources of Information

This report is based on information collected by SRK during a site visit performed by Oy Leuangthong, P.Eng and G. David Keller, P.Geo on February 7 and 8, 2018, and on additional information provided by Denison and Orano throughout the course of SRK’s investigations. SRK has no reason to doubt the reliability of the information provided by Denison and Orano. Other information was obtained from the public domain.

This technical report is based on the following sources of information:

- Discussions with Orano and Denison personnel
- Inspection of the Midwest project area, including outcrop and drill core
- Review of exploration data collected by Orano and Denison
- Additional information from public domain sources

Mr. Chad Sorba and Mr. Dale Verran of Denison Mines Corp., and have reviewed and co-authored this technical report apart from section 14 and related sub-sections. For much of this report, Mr. Sorba and Mr. Verran have compiled and reviewed data from Orano's technical reports that contain Orano's updated Mineral Resource estimates (Allen, Quirt, & Masset, 2017a) (Allen, Quirt, & Masset, 2017b). Information from Orano's exploration project reports, and annual reports have also been reviewed, as well as select published data cited in the reference list.

The authors believe such reports and other data to be reliable but disclaim any responsibility for inaccuracies or omissions that may be inherent to those reports and other data. From the information presented and reviewed the authors believe that all previous work has been conducted properly and have no reason to doubt the reliability of the information provided.

The opinions expressed in this report are based on an evaluation of data sets pertaining to the Midwest Project. The authors of the report have relied on that basic data to support the statements and opinions presented in this Technical Report. The authors have verified the veracity of the data to the extent the information allows, no material information relative to the Midwest Project has been intentionally neglected or omitted.

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

2.5 Inspection on Property

In accordance with National Instrument 43-101 guidelines, Dr. Oy Leuangthong and Mr. G. David Keller, of SRK, and Mr. Chad Sorba and Mr. Dale Verran of Denison, visited the Midwest property on February 7th and 8th, 2018 accompanied by Mr. Trevor Allen (Mineral Resources Geoscientist) and Ms. Odile Maufrais-Smith (Geologist) of Orano. The purpose of the site visit was to review exploration procedures, define geological modelling procedures, examine drill core located at the nearby Moffatt Lake core storage, interview project personnel, and collect all relevant information to audit the mineral resource model and the compilation of a technical report.

2.6 Abbreviations and Definitions

Abbreviations and acronyms commonly used in this report are presented in this section. Metric (SI System) units of measure are generally used in this report unless otherwise stated. All currency used in this report are in Canadian dollars (C$) unless otherwise stated.

Analytical results are reported as parts per million (ppm U) contained for uranium; however, they may be converted to U grades in the database. For the purpose of this report chemically analysed samples will be stated as percent (%) U. Uranium values derived from radiometric probe analysis will be stated in this report as equivalent percent uranium: eU%.

2.6.1 Abbreviations of units and names

%	percent
°	degree (degrees)
°C	degrees Celsius
µm	micron or micrometre
AVP	Appareillage Volant de Prospection
ARC	AREVA Resources Canada Inc.
C$	Canadian dollar
cm	centimetre
cm^2	square centimetre
cm^3	cubic centimetre
Denison	Denison Mines Corp.
eU	equivalent uranium
g	gram
ha	hectares
ICP	inductively-coupled plasma emission spectroscopy, an analytical procedure
ID^2	inverse-distance squared, an estimation methodology
ID^3	inverse-distance cubed, an estimation methodology
kg	kilograms
km	kilometre
kt	thousand tonnes
l	litre
lb	pound
m	metre
m^2	square metre
m^3	cubic metre
Ma	million years
mm	millimetre
mPa.s	millipascal seconds
MLJV	McClean Lake Joint Venture
MWJV	Midwest Joint Venture
NI 43-101	Canadian National Instrument 43-101
Orano	Orano Canada Inc.
ppm	parts per million
REE	Rare Earth Elements
RQD	Rock Quality Description
s	second

SG	specific gravity
t	tonne (metric ton) (2,204.6 pounds)
U	uranium
%U	percent uranium (% U x 1.179 = % U_3O_8)
U_3O_8	uranium oxide (% U_3O_8 x 0.848 = % U)
% U_3O_8	percent uranium oxide
UTM	Universal Transverse Mercator
XRD	x-ray diffraction, an analytical procedure

3 RELIANCE ON OTHER EXPERTS

Mr. Chad Sorba and Mr. Dale Verran of Denison Mines Corp., have relied upon expert information provided in Orano's technical reports (Allen, Quirt, & Masset, 2017a) (Allen, Quirt, & Masset, 2017b), as follows:

- Section 1.2.4 (Exploration and Development)
- Section 4.2 (Mineral Disposition and Tenure)
- Section 4.4 (Nature and Extent of Title)
- Section 4.5 (Royalties, Agreements, and Encumbrances)
- Section 4.6 (Environmental Liabilities)
- Section 6.1 (Prior Ownership)
- Section 6.2 (Discovery, Past Exploration and Development)

The authors believe such Sections of Orano's reports to be reliable but are not experts on these subjects and disclaim any responsibility for inaccuracies or omissions that may be inherent to those Sections.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Midwest property is located within the eastern part of the Athabasca Basin in Northern Saskatchewan (Figure 4-1). The mineral lease dispositions (Figure 4-2) are within the 1:50,000 NTS topographic sheet 74I/8. The Midwest Main deposit is centred approximately at 553,700 Easting and 6,462,935 Northing (UTM NAD 83; Zone 13 north). The Midwest A deposit is centred approximately at 555,000 Easting and 6,465,000 Northing (UTM NAD 83; Zone 13 north).

The northern portion of the property is located on South McMahon Lake, about one kilometre from the Points North Landing airstrip and about 25 kilometres west by existing roads from the Denison (22.5% owned) McClean Lake mill on the McClean Lake property. The north-western portion of the Points North Landing airstrip crosses the Midwest claims. The site is approximately 750 kilometres by air north of Saskatoon and about 420 kilometres by road north of the town of La Ronge.

4.2 Mineral Disposition and Tenure

The land disposition on the Midwest Project, as of December 2017, is shown in Table 4-1 and Figure 4-2, and is comprised of three (3) contiguous mineral leases, covering 1,426 ha. The Midwest Main deposit is located within mineral lease ML 5115. The Midwest A deposit is located within mineral lease ML 5264.

Each of the mineral leases is at an annual assessment rate of C$75.00 per hectare and has sufficient approved credits to maintain the ground in good standing until at least 2031. There is no current production from these mineral leases. Leases must be renewed every 10 years as part of an administrative process.

Table 4-1: Midwest Project – Land Status Summary

Lease	Size (ha)	Anniversary Date	Renewal Due	Lapse Date
ML 5115	556	1973-Dec-02	2023-Dec-02	2032-Mar-01
ML 5264	446	1978-Dec-02	2018-Dec-02	2031-Mar-01
ML 5265	424	1978-Dec-02	2018-Dec-02	2032-Feb-29

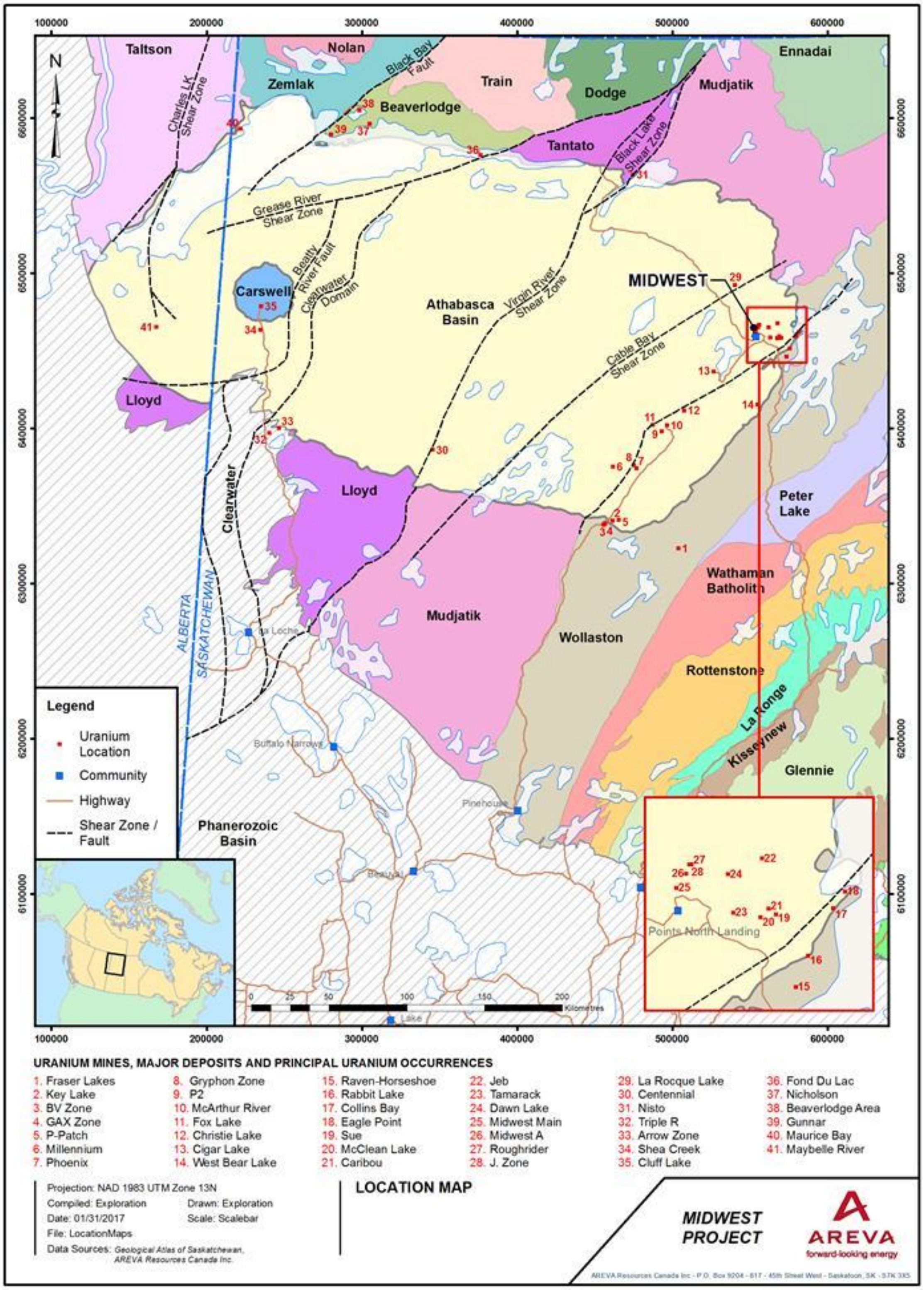


Figure 4-1: General Location Map

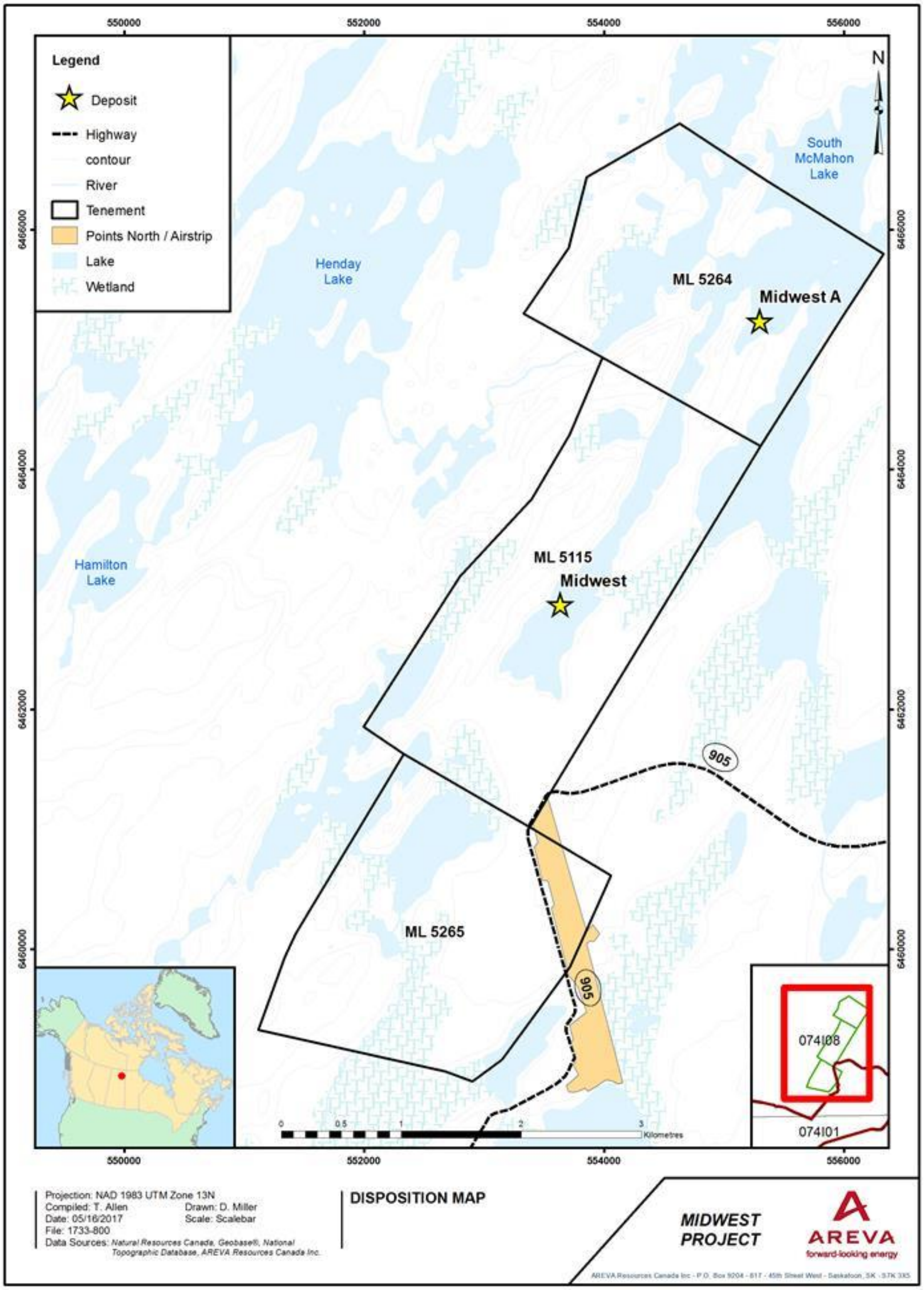


Figure 4-2: Location of Mining Leases

4.3 Ownership

The Midwest Project is an advanced uranium exploration stage joint venture owned 25.17% by Denison Mines Inc. (DMI) a wholly owned subsidiary of Denison Mines Corp. (collectively, with its subsidiaries, “Denison”); 69.16% by Orano Canada Inc., formerly AREVA Resources Canada Inc. (“Orano”) and; 5.67% by OURD (Canada) Ltd. (“OURD”). Orano is the active project operator. The relationship between the Midwest Joint Venture parties is governed by a Joint Venture Agreement that was executed on May 2nd, 1966, and as subsequently amended.

4.4 Nature and Extent of Title

The ownership of the Project is governed by Shareholder Agreements. A mineral lease grants the holder the exclusive right to explore for, dig, work, mine, recover, procure, and carry away the minerals within the lease area, subject to the payment of royalties. A mineral lease is issued for a term not exceeding ten (10) years and is renewable for further terms of ten (10) years, provided that certain regulatory requirements are met. The renewal process consists of a letter of intent to renew, and there is no fee involved for such renewal. The new renewal dates for the three mineral leases are 2018 for ML 5264 and ML 5265, and 2023 for ML 5115. To maintain the lease, exploration work or equivalent payment needs be applied on the non-producing leases, however, Orano has no obligation to perform work on the property in the following years as significant credits have accumulated from previous year’s exploration programs. These credits can be applied to cover the lease requirements of ML 5115, which contains the Midwest Main deposit and ML5264, which contains the Midwest A deposit, until 2031 and 2030 respectively.

The right to use and occupy the land was granted, in a surface lease agreement, with the province of Saskatchewan. The original surface lease agreement of 1988 was replaced by a new agreement in 2002. This new surface lease is valid for a period of 33 years. Obligations under the surface lease agreement primarily relate to annual reporting regarding the status of the environment, the land development, and progress made on northern employment and business development. The Midwest Main surface lease covers an area of approximately 556 hectares. The Midwest A surface lease covers an area of approximately 446 hectares.

4.5 Royalties, Agreements and Encumbrances

Two royalties, with identical terms, are payable on 20% of the production from the Midwest properties, declining to 12.5% after payout (revenue equal to capital, operating costs and royalties). Orano is responsible for 14.5% and Denison 5.5% (declining after payout). Each of the royalties has the following terms:

- 1% of revenue on the first 800,000 pounds of U_3O_8 and all other mineral substances produced, saved, processed, and marketed from the interest of Orano and Denison described above.

- 1.75% of revenue on the following 700,000 pounds of U_3O_8 production and all other mineral substances produced, saved, processed, and marketed from the interest of Orano and Denison described above.
- 2% of revenue on balance of U_3O_8 production and all other mineral substances produced, saved, processed, and marketed from the interest of Orano and Denison described above.

4.6 Environmental Liabilities

The Midwest Project has undergone environmental assessment and test mine project activities, both related to the Midwest Main deposit, but the project has not been developed. Environmental liabilities for this site are based on the decommissioning activities for the existing disturbed areas and remaining infrastructure.

An underground exploration program was conducted by Denison Mines in 1988 and 1989 on the Midwest project, specifically the Midwest Main deposit. This work consisted of constructing a dam across a portion of the Mink Arm of South McMahon Lake that allowed dewatering of that part of the lake and sinking a 185 metre shaft and a 180 metre long drift above the deposit for test work. Currently, on the Midwest Main site there are:

- Covered shaft and headframe (includes some underground workings);
- Inactive water treatment plant and pump house;
- Concrete ore pad;
- Settling ponds (x 2);
- Dam across the Mink Arm of the South McMahon Lake (that has been breached);
- Pipelines (on surface);
- Former core storage area;
- One auxiliary building;
- Groundwater monitoring wells;
- Associated access and site roads/trails.

These items are shown on Figure 4-3. Following this work, the test mine was allowed to flood and the dam was breached using a corrugated steel culvert. The site has been secured and is under an environmental monitoring and site security surveillance program that is conducted by Orano personnel.

All of the facilities used in the test-mining program and all of the existing surface facilities are located on lands owned by the province of Saskatchewan. The right to use and occupy the land was granted in a provincial surface lease agreement.

Preliminary decommissioning plans for all remaining infrastructure on the Midwest Main site, were developed and are included in the McClean Lake Operation Preliminary Decommissioning Plan and Financial Assurance (Version 8, Revision 2; AREVA, March 3, 2016). Financial assurances for the proposed decommissioning activities on Midwest Main site are part of the letters of guarantee provided to the province of Saskatchewan by the McClean Lake Joint Venture.

The authors are unaware of any further environmental liabilities concerning the Midwest Main or the Midwest A deposits, and their associated claims (Mineral Leases ML 5115 and ML 5264).

4.7 Work Permits

The required work permits are currently in place for the Midwest property for drilling planned in 2018, including:

Saskatchewan Ministry of Environment (SERM)

- 17PA216
- 1878I – (Forest Product Permit)

Saskatchewan Water Security Agency

- NW-E8-104054
- NW-E8-104055
- NW-E8-104181
- NW-E8-104182
- NW-E8-104189
- NW-E8-104183
- NW-E8-104274

Saskatchewan Ministry of Parks, Culture and Sport / Heritage Conservation Branch

- 17-1631

4.8 Other Significant Factors and Risks

There are no known significant factors or risks that may affect access, title, the right, or ability of the operator to perform work at/on the Midwest property.

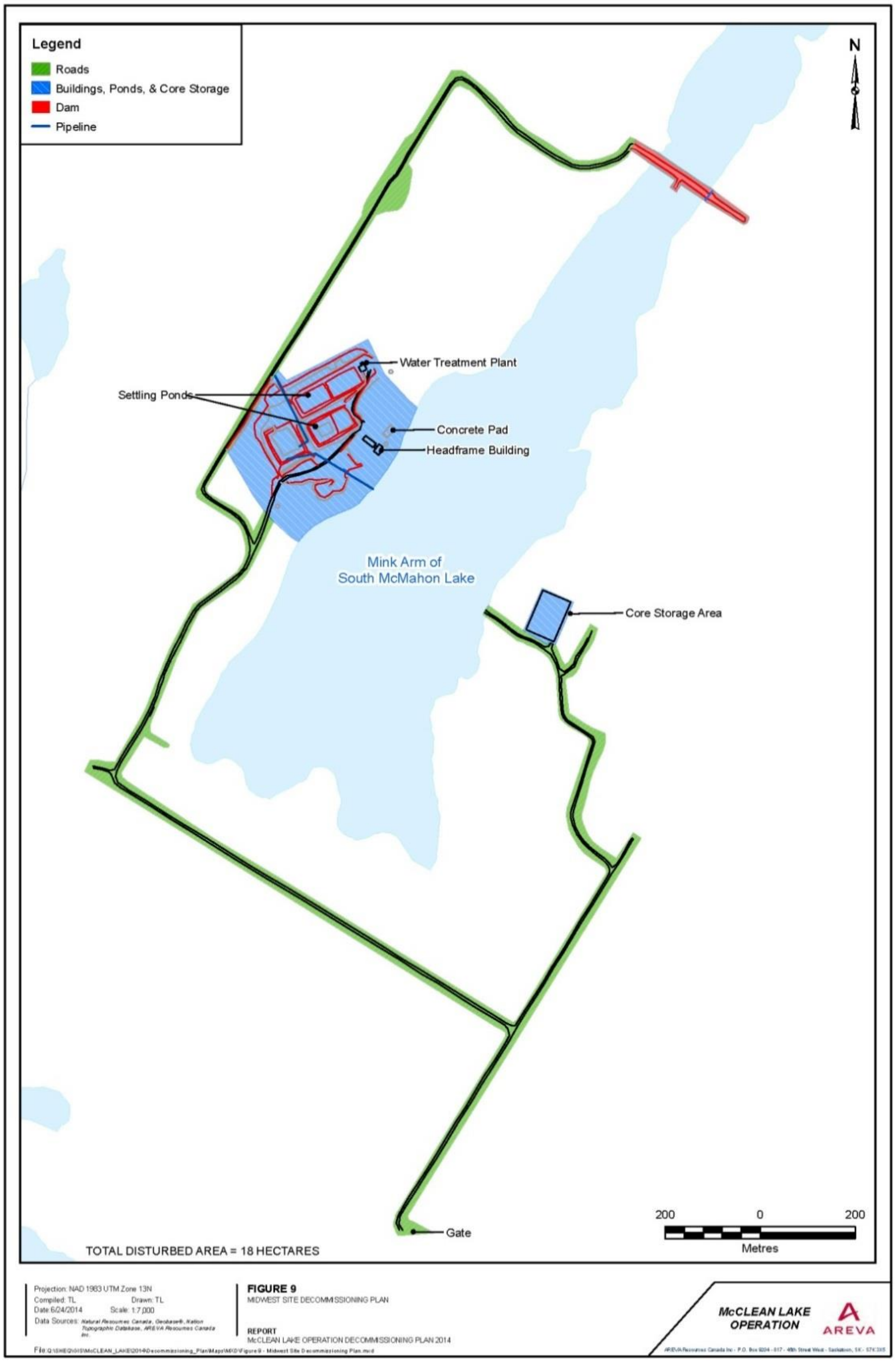


Figure 4-3: Midwest Site Infrastructure

5 ACCESSIBILTY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Topography, Elevation, and Vegetation

The elevation of the project area ranges from 450 to 540 metres above sea level, with maximum topographic relief of about 80 metres.

Topography of the project area is typical of the recently-glaciated terrains of northern Canada with sand or gravel moraines and drumlins that generally follow northeast- southwest trends. Most of the area is covered by sand and gravel ridges. The drainage is typical of relatively flat, recently glaciated regions, characterized by numerous lakes and wetlands, which covers approximately 25% of the region. Discontinuous muskeg is present throughout the area in topographic depressions and ranges in thickness from one to three metres.

Peat bogs, glacial drift, outwash, and lacustrine sands cover the bedrock. The vegetation is consistent with the Boreal Shield Ecozone, a region of extensive boreal forest lying on the Canadian Shield, with sub-tundra ground cover plants (Labrador Tea, moss, and lichen) and trees, such as black spruce, jack pine, white spruce, tamarack, birch, and trembling aspen.

5.2 Access to Property

Access to the Midwest property site is both by an all-weather gravel road (Highway 905) and air (both land and water landing).

Goods are transported to the site by truck over Highway 905, which connects to the provincial highway system. Access to the Midwest Main site from Points North Landing is by a two kilometre dirt road to the old Midwest exploration shaft and dam. An additional two kilometre long trail, through boreal forest on the peninsula separating two branches of McMahon Lake, is utilized to access the Midwest A site.

Air transportation is provided through the Points North Landing airstrip, about three kilometres from the Midwest Main deposit. There are regularly scheduled air services between Saskatoon and Points North Landing, provided by Transwest Air. Transwest Air also provides air charter services for the nearby McClean Lake Mill.

There is road access to the McClean Lake Mill, located about 10 kilometres to the east of Points North Landing. The Cameco Cigar Lake mine site is located approximately 50 kilometres to the southwest of Points North Landing, using Highway 905 and the Cigar Lake haul road.

5.3 Proximity to Population Centres and Transport

The nearest inhabited area is Points North Landing, located approximately three kilometres from the Midwest Main deposit, and partially overlaps the southern portion of the property (Figure 4-2). Points North Landing is comprised of camp accommodations, a 1,829 metre long airstrip, and lumber yard with bulk fuel, transportation, and equipment services. The next nearest population centre is the community of Wollaston Lake, approximately 85 kilometres by road and ferry, or winter road, east of Points North Landing.

Points North Landing is located approximately 840 kilometres northeast of Saskatoon, the largest city of the Province of Saskatchewan, accessible by provincial highway or by air. Saskatoon has a population of greater than 246,000 people (Statistics Canada, 2017).

The nearest larger population centre is the town of La Ronge (Statistics Canada, 2017a) and its three adjoining subdivisions comprising of the Village of Air Ronge (Statistics Canada, 2017b), Kitsakie (Statistics Canada, 2017c), and Lac La Ronge (Statistics Canada, 2017d) with a combined population of over 6,400 people. There are also a small number of seasonal remote cottages and fishing lodges located on lakes throughout the area. La Ronge is accessible by provincial highway or by air.

5.4 Climate and Length of Operating Season

Site activities can be carried out all year despite the cold weather during the winter months. Climatology, temperature, and precipitation information are collected by the Collins Bay weather station (Environment Canada, n.d.). The mean monthly temperatures are below 0°C for seven months of the year. The annual average monthly temperature ranges between -31°C and 16°C, with daily extremes as low as -45°C, indicating the severity of the winter. The mean annual temperature is -3.2° C and the area lies along the southern margin of the zone of discontinuous permafrost.

The precipitation in the region is relatively heavy (530 millimetres annually, with more than 330 millimetres falling as rain). The wettest period is from May to September, which accounts for approximately 60% of the total annual precipitation.

5.5 Local Resources and Infrastructure

5.5.1.1 Surface Rights

Surface rights to the Midwest Main and Midwest A deposits are covered by a surface lease issued by the Province of Saskatchewan. Additional permitting will be required for mining operations. All current Mineral Resources for the Midwest Main and Midwest A deposits are contained within lease ML 5115 and ML5264 respectively.

5.5.1.2 Power Source

Power is available to the property from the provincial electrical grid through a switch station at Points North Landing. This already supplies the needs of the McClean Lake mill and facilities.

5.5.1.3 Water Source

Water is readily accessible from the many lakes in the vicinity of the Midwest project.

5.5.1.4 Personnel

Mining personnel are not readily available in the vicinity and use will likely be made of the personnel camp at the McClean Lake Project site (McClean Lake mill), located approximately 10 kilometres away. At present, exploration and drilling staff are also housed there.

5.5.1.5 Tailings Storage

It is envisaged that no tailings will be stored on the Midwest property since all of the mined uranium mineralization will be transported to the McClean Lake mill site for processing.

5.5.1.6 Waste Disposal

It is envisaged that disposal of waste material will be at the nearby McClean Lake mill site.

5.5.1.7 Processing

It is envisaged that processing of Midwest Main and Midwest A uranium mineralization will be done at the nearby McClean Lake mill site. No heap leaching is envisaged for future mining operations.

6 HISTORY

6.1 Prior Ownership

The relationship between the Midwest Joint Venture parties is governed by a Joint Venture Agreement that was executed on May 2nd, 1966, and as subsequently amended. Table 6-1 summarizes the historical work that was performed on the Midwest property. The work history performed on the Midwest property was extracted from Mathieu et al. (2009).

Table 6-1: Historical work summary on the Midwest project.

Period	Operator	Summary
1969-1977	Numac Oil & Gas	Initial operator performed regional airborne radiometric surveys, lake sample surveys, radioactive sandstone boulder train surveys, ground reflection seismic, magnetic, VLF-EM, gravity, and AFMAG geophysical surveys, and drilling to unsuccessfully evaluate a mineralized boulder trend. The program generally used shallow drill holes which had a maximum depth of <50 metres and did not reach the sub-Athabasca unconformity.

1977-1988	Esso Resources	The new operator subsequently discovered the Midwest deposit during the 1977 drill program. Further geophysics and drilling to the NE and SW along the main EM-defined conductor were carried out to evaluate the unconformity-type U model.
1988-1993	Denison (PNC conducted exploration)	The project operator performed an EM-37 survey, geotechnical drilling on the Midwest deposit, as well as test mining in the vicinity of the deposit (1988-1989). Exploration drilling was conducted to the east (1988) and along the conductive trend to the north of main deposit (1989).
1993-current	COGEMA/AREVA	Active exploration on the Midwest property was resumed in 2005 and resulted in the discovery of the Midwest A (Mae) deposit within the northern lease (ML 5264). Additional geophysical programs were conducted, as was preliminary drill testing of the southern claim (ML 5265). Recent drilling activities associated with the Midwest Main deposit have been limited to geotechnical- and exploration-related drilling in 2004 and 2006 (11 holes total).

Historical drilling data within the current Midwest project disposition (ML 5515, ML 5264, and ML 5265) comprises 1,013 diamond drill holes (202,391.3 metres) as documented in the Orano Exploration database. Of this dataset, drilling on the Midwest Main target comprises 315 of these holes and drilling on the Midwest A target comprises 198 holes.

6.2 Discovery, Past Exploration and Development

6.2.1 Numac Oil & Gas Limited – operator 1969-1977

Numac Oil and Gas Limited ("Numac") was the acting operator of a joint venture between Esso Resources Canada Limited ("Esso"; 50%), Numac (10%), Bow Valley Industries Limited (20%), Mink Mining Corporation (10%), and Midwest Mining Corporation (10%). The Midwest project was part of a large land acquisition acquired by Numac in 1968, which stemmed from an exploration agreement signed in 1966 by Numac and Imperial Oil (parent company of Esso).

Exploration began in 1969 with hydro-geochemical surveys, mapping, and regional airborne radiometric surveys that resulted in the discovery of a well-defined, radioactive sandstone boulder train located at the south-west end of the Mink Arm of McMahon Lake. The source of the boulder train was inferred to be located under the Mink Arm portion of the lake. Some of the boulders in this 3.2 kilometre-long train returned grades of up to 5% U_3O_8 (approximately 4.2% U) (Simpson & Sopuck, 1983).

Exploration continued the following year with grid-based geophysical surveys, including reflection seismic, magnetic, gravimeter, magnetometer, and VLF-EM surveys in the Midwest Lake area. Additionally, 11 BQ drill holes totalling 1,231 metres were drilled as a follow-up to the boulder train discovery. Roughly 1,700 metres of drilling, in 91 shallow drill holes, were drilled in 1971 with no favourable results noted.

Additional surveys were conducted between 1972 and 1975, including analysis of soil, water, and lake sediment samples. No significant anomalies were returned from these surveys and, consequently, the land was greatly reduced to three small claim blocks. In 1975, 25 short inclined diamond drill holes totalling 800 metres were drilled into the upper part of the Athabasca sandstone. These shallow drill holes did not yield any favourable results.

6.2.2 Esso Resources Canada Limited – operator 1977 – 1988

Esso became the principal operator in 1977 at the request of the previous operator (Numac), with no changes in the Midwest Joint Venture. In 1977, further Quaternary studies and a magnetic survey were carried out, as well as a small drilling program consisting of three diamond drill holes totalling 931 metres. Based on the 1975 discovery of the new Key Lake unconformity-related uranium mineralization, and unlike the previous drilling program, these three drill holes were drilled into the sub-Athabasca basement. One of these holes was the Midwest (Main) deposit discovery hole (drill hole 77-2: radioactive core and sand from immediately above the unconformity (Kirwan, 1978)).

An ambitious drilling program was implemented in 1978, including 177 exploration holes and six geotechnical holes (totalling 38,861 metres). The first hole of this program (drill hole 78-1) intersected 8.73% U_3O_8 (7.40% U) over 1.2 metres at the sandstone-basement unconformity contact, confirming the discovery of the Midwest Main deposit. Another 161 exploration and delineation drill holes, as well as 27 geotechnical wells were drilled in 1979 for a total of 37,850 and 3,000 metres, respectively.

In 1980, Canada Wide Mines Limited ("CWML"), a subsidiary of Esso Resources Canada Limited, took over responsibility for work being carried out at Midwest. Exploration and delineation drill holes included 101 diamond drill holes for 23,872 metres and 13 geotechnical holes for 1,222 metres were drilled in 1980. Delineation drilling continued in 1981 with an additional 80 drill holes. In addition to drilling, various geophysical surveys and a geochemical survey (Dunn, 1980) were carried out, as was an environmental base-line study and a feasibility study pertaining to the mine site development.

The project was shelved by Esso in 1982 and, with the exception of various research projects (SRC projects and IAEA/NEA Test Area work: ((Hoeve & Quirt, 1984), (Hoeve, 1984), (Hoeve & Quirt, 1987), (Mellinger, Quirt, & Hoeve, 1987), (Quirt & Mellinger, 1988), (Sibbald & Quirt, 1987), (Simpson & Sopuck, 1983), (Mellinger, 1989), (Ramaekers, 1983), (Schreiner, 1983), (Sibbald, 1983)), it remained dormant until 1988.

6.2.3 Denison Mines Limited – operator 1988 - 1993

In 1988, a new joint venture was created, now comprised of Denison Mines Limited ("Denison"; 45%), Bow Valley Industries Limited (20%), Uranerz Exploration & Mining Limited (20%), and PNC Exploration (Canada) Co. Ltd. ("PNC"; 15%) and the project was reactivated. Evaluation of previous exploration data was undertaken by PNC to delineate possible targets outside of the main mineralized body. After several geotechnical testing programs, work began on site with an earth dam being constructed across the Mink Arm of South McMahon Lake, with the water from Mink Arm then being pumped into McMahon Lake. A test mine with a 185 metre shaft and a 180 metre long drift located 30 metres above the mineralization was completed. Four piezometer holes were drilled from this cross-cut to monitor the pressure in the surrounding rock. Further test mining was conducted the following year with the drilling of two blind bore holes in the fall of 1989. The mined material was used to confirm the results of the previous surface drilling programs and for metallurgical testing purposes.

In 1989, PNC initiated an exploration program based on the 1988 compilation work. This program comprised an additional gravity survey, a Geonics EM-37 survey, a magnetotelluric survey (CSAMT), and eight diamond drill holes, totalling 2,008 metres. Lithogeochemical analyses were performed on samples from the 1989 drill holes.

Although Denison was the acting operator at this time and conducted the test mine program, PNC conducted all exploration from 1988 to 1990. In 1991, OURD acquired PNC's 20% equity, while exploration remained dormant from early 1990.

6.2.4 Minatco – operator 1993-1994

In 1993, Denison sold part of its equity to Minatco (25.5%) and retained the remainder of their interest under its subsidiary, Tenwest (19.5%). OURD also sold part of its equity to Minatco (10.5%) and Bow Valley sold its entire interest to Minatco (20%). The joint venture equities became: Tenwest/Denison (19.5%), OURD (4.5%), Uranerz (20%), and Minatco (56%), with Minatco acting as project operator.

6.2.5 COGEMA/AREVA Resources Canada Inc. – operator 1994-present

In 1994, COGEMA Resources Inc. ("CRI") acquired the uranium assets of TOTAL (Minatco in Canada) and became the operator of the Midwest Project. By 1996, the Minatco entity was completely dissolved. CRI then acquired all of Uranerz's equity (20% - Cameco controlled as of August 1998), of which a portion was later acquired pro-rata by Tenwest/Denison.

Both CRI and Tenwest/Denison sold portions of their equity to Redstone Resources, who, in 2004, then sold back their equity pro-rata to Denison (Tenwest was dissolved earlier in the year). CRI became AREVA Resources Canada Inc. in 2006. The current partnership consisted of AREVA Resources Canada Inc. (69.16%), Denison Mines Ltd. (25.17%), and OURD (5.67%). Exploration activities remained dormant until 2004, when an initiative to bring the Midwest database up to date and to determine drilling targets was implemented. In addition to database entry, an inventory of available data was conducted, as was a cursory compilation of various geochemical and lithological data.

A winter drilling program of roughly 4,500 metres (15 holes) was completed in 2005, focusing on the area now called the Midwest A deposit (which was initially called the Mae Zone) following up on mineralization intersected in historical hole MW-338, and, to a lesser extent, the Josie Zone, both located approximately three kilometres to the north of the Midwest deposit (now called the Midwest Main deposit). Several holes encountered massive uranium/sulphide/arsenide mineralization at the Midwest A zone, whereas results from the Josie Zone were less encouraging.

In 2006, a drilling campaign totalling 11,132.3 metres was conducted at the Mae Zone (Midwest A), the Josie zone, and the Midwest Main deposit. Drilling consisted of 43 drill holes that included four holes drilled by the mining department at Midwest Main to conduct geochemical sampling of waste rock for the proposed open-pit. Additionally, a geophysical program was conducted over the Midwest project in 2006, comprising 45.5 kilometres of line cutting, 33.3 kilometres of Pole-Pole DC-Resistivity survey, and 21.5 kilometres of Small Moving Loop EM survey.

Fifty-one drill holes, totalling 14,275 metres, were completed in 2007 at Midwest A. The 2007 exploration campaign successfully discovered several high-grade intercepts to the north-east and two smaller new high-grade intercepts in the Midwest A south area.

During 2008, 48 diamond drill holes, totalling 12,028 metres, were completed. Drilling tested the northern and the southern extension of the Midwest A mineralization and the remaining open geochemical anomalies located approximately 600 metres to the north of the Midwest Main deposit (Dam Pod Zone). The drill holes over the Dam Pod Zone targeted the extensions of the anomalous and low-grade intersections at the unconformity that were discovered through the historical drilling in 1979. Several new medium- to low-grade mineralized lenses were discovered in this area. Interpretation of SWIR spectral mineralogical analyses on historical drill core identified possible targets in the Camille Zone, located 180 metres to the south of the Josie Zone. A ground resistivity survey was also carried out over the southern part of the property during the spring of 2008.

The 2009 winter drilling campaign consisted of 34 diamond drill holes, totalling 8,896 metres. Drilling was completed in the Josie, Camille, Dam Pod, and Points North Conductor zones. The 2009 drilling closed off the mineralization at the Dam Pod Zone to the south, but there still remains a 40 metre gap to the north-east where an extension of this mineralization may be still possible. The low- to medium-grade mineralization in the Camille Zone remains open to the southwest and northeast, although the 2009 campaign in the Josie Zone closed off the uranium mineralization to the southeast.

In brief, the Midwest Main deposit was intensively drilled in the late-1970's and 1980s. Drill holes defining the Midwest deposit include 615 drill holes, of which 362 are mineralized. By type, the drill holes include exploration, shallow reconnaissance (<100 metres), and geotechnical drill holes.

Only 11 drill holes have been completed on the Midwest Main deposit area since COGEMA/AREVA took over the project operation in 1994. The Mining Department drilled four inclined geotechnical holes in 2004 (MWG 04-01 to MWG-04-04) and four shallow geotechnical drill holes in 2006 (2006-WR-01 to 2006-WR-04). Three exploration drill holes were carried out within the deposit outlines in 2006 (MW-677, MW-678, and MW-685).

The mineral lease holding the Midwest A deposit (ML5265) had seen some drilling (54 holes) between 1978 and 1989 by previous project operators. Since COGEMA/AREVA took over the project operation in 1994, 144 holes were carried out on the mineral lease. Between all drill programs, 76 of these holes (20,794.9 metres) have intersected the mineralization associated with the Midwest A deposit.

6.3 Historical Resource and Reserve Estimations

6.3.1 Historical Resource and Reserve Estimations – Midwest Main

The Midwest Main deposit has had several historical mineral resource estimates performed, a historical mineral reserve estimate, as well as a historical, internal pre-feasibility study (AREVA Resources Canada Inc., 2007). The most relevant of these, for comparison purposes, is the NI 43-101 technical report that was prepared for Denison Mines Inc. by Scott Wilson RPA (Hendry, Routledge, & Evans, 2006). The 2007 pre-feasibility study did not include resource classifications and was therefore unable to be used.

The RPA study estimated the uranium resources in the Midwest Main deposit that were considered to be amenable to open pit mining and was designed to provide a resource block model in preparation for open pit optimization (Table 6-2). Presently, Denison is not treating this estimate as a current mineral resource.

Table 6-2: Summary of Midwest Main Mineral Resource estimate from Scott Wilson RPA, 2006.

Estimate	Reference	Resource Class	Cut-off grade (% U)	Tonnes	Grade (% U)	Tonnes Metal (Tonnes U)	Lbs U_3O_8 (000's)
RPA 2006	(Hendry, Routledge, & Evans, 2006)	Indicated	0.25	354,000	4.66	16,500	42,900
		Inferred	0.25	25,000	0.68	170	400

Notes:
1. Numbers have been rounded
2. Denison is not treating this as a current resource

6.3.2 Historical Mineral Resource Estimates – Midwest A

6.3.2.1 NI 43-101-Compliant Mineral Resources Estimate - Geostat

An earlier NI 43-101-compliant technical report on the Midwest A uranium deposit was prepared for Denison by Geostat International in 2008 (Dagbert, 2008).

The mineralized envelope (Low Grade Zone) was created using sections at 25 metre intervals, was based on an 0.05% eU grade, and was limited by using the halfway rule between a mineralized and an unmineralized drill hole. The Low Grade Zone was split into two pods, the South Pod (southwest) and the North Pod (northeast). These pods were not connected at that time. A small high-grade interior pod (High Grade Zone) was defined within the outline of the north pod mineralized envelope. This pod was created based on grades generally above 10% U. Although the interpreted contour of mineralization crosses the unconformity surface without any change of geometry from sandstone to basement, a special basement zone (LGB: Low-Grade Basement) with three intercepts in three holes was defined on two sections.

Grades were composited on one metre intervals with the geochemical data taking precedence over the radiometric data. Composites in the North and South Pods were capped at 6% U.

Estimation was done using ordinary kriging for the low-grade solids (south pod, north pod, and LGB) with soft boundaries; composites from one low-grade pod were not restricted from being used in the other low grade pods. Estimation for the High Grade Zone was not attempted; rather a fixed grade of 18% U (close to the average composite grade of 18.6% U) was assigned to all block fractions. No drill holes drilled prior to 2005 were used in the resource estimation.

At the time, there were no density measurements available from Midwest A core samples. The density distribution used was based on the density model previously defined for the nearby Midwest Main deposit. In this model, fixed densities (from 2.24 to 2.34 t/m^3) were assigned to material in specific uranium grade categories (from 0 to 6% U). As for high-grade material at Midwest A, a fixed density of 2.8 t/m^3 was used and it was also based on the Midwest Main density model.

All estimated resources in the low-grade solids of the model were categorized as an indicated resource, provided that actual density measurements on Midwest A core material confirm an average density of 2.25 t/m^3 +/-5% for that material. Statistics of composite grades and the various grade estimates from models in those solids confirmed an average grade around 0.5%U +/-10% for that material. With 89 intercepts in 56 holes, it was deemed unlikely that the volume of mineralized material around those intercepts would change by more than 20%. Those uncertainty levels were deemed compatible with an indicated classification.

All estimated resources in the high-grade solid were categorized as an inferred resource. Sensitivity analysis showed that the uranium metal estimate for that portion of the deposit can easily be more than twice the current estimate and with a more conservative outline around the same high-grade intercepts, it could be half of what it was estimated. It was deemed that the high uncertainty for the uranium metal estimate of the high-grade material was not compatible with a classification in the indicated category and more in-fill drilling would be needed to better delineate the geometry of that pod and to eventually move its resources into the indicated category.

The mineral resource was categorized using the terms ascribed by the CIM Definition Standards on Mineral Resources and Mineral Reserves (Table 6-3).

Due to subsequent drilling having been carried out on this deposit, this report is considered to be obsolete. New drilling, geological, and structural information, and dry bulk density data have since been collected.

Table 6-3: Summary of Midwest A Mineral Resource estimate from Geostat, 2008.

Estimate	Reference	Resource Class	Cut-off grade (%U)	Tonnes	Grade (% U)	Total Metal (Tonnes U)	Lbs U_3O_8 (000's)
Geostat 2008	(Dagbert, 2008)	Indicated	0.05	464,000	0.48	2,200	5,800
		Inferred	0.05	9,200	18.00	1,700	4,300

Note:
1. Numbers have been rounded
2. Denison is not treating this as a current resource.

6.3.2.2 Historical Non-NI 43-101-Compliant Mineral Resources Estimate - SRK

After 2008, additional drilling was conducted on the property and a non- NI 43-101-compliant follow-up report (Revering, 2010) updating the Midwest A resource estimation was prepared for ARC by SRK in 2010 (Table 6-4). The methodology for obtaining the mineralized envelopes and estimation parameters was largely the same as in the 2008 Geostat estimate, with a couple notable differences:

- Two new density correlation equations were produced: (1) based on the concentrations of uranium, arsenic, and nickel, (2) based on uranium only.
- A grade cap of 13% U was selected for the Low Grade Zones, much higher than the value used by Geostat (6% U).
- Inferred mineral resources comprise the entire High Grade Zone, as well as material located along the margins on the low-grade mineralization envelopes, based on the new drilling.

Table 6-4: Summary of Mineral Resources from previous SRK estimate, 2010.

Estimate	**Reference**	**Resource Class**	**Cut-off grade (% U)**	**Tonnes**	**Grade (% U)**	**Total Metal (Tonnes U)**	**Lbs U_3O_8 (000's)**
SRK 2010	(Revering, 2010)	Indicated	0.05	504,000	0.60	3,050	7,900
		Inferred	0.05	120,000	1.69	2,030	5,300

Notes:
1. Numbers have been rounded
2. Denison is not treating this as a current resource.

6.4 Historical Production

Test mining on the Midwest property was conducted between 1988 and 1989 at the Midwest Main deposit. A 3.7 metre diameter by 185 metre deep shaft was sunk on land along the west side of Mink Arm of South McMahon Lake. An approximately 3.0 x 3.5 metre-sized drift was driven 180 metres towards the east at a depth of 170 metres in sandstone beneath the lake and above the deposit. During drift excavation, at a distance of approximately 82 metres from the shaft, the drift passed through a narrow vein of mineralization with a grade of approximately 4.2% U (Midwest Joint Venture, 1991).

The mining method selected for the test mine program was blind hole boring. This method is a variation of the raise boring method which is commonly used underground. For the raise boring technique, first, openings are excavated above and below the area to be bored. A pilot hole is bored between the upper and lower levels and a large, rotating cutting head is drawn upward from the lower to the upper level, grinding up the rock in its path. Cuttings fall to the lower level from where they can be removed. Blind hole boring, on the other hand, only required the upper level. The large cutting head, with or without a pilot hole, is forced downward and the cuttings removed to the upper level by flushing the hole with either air or water.

The blind hole boring method provides maximum protection against radiation hazards since access to the mineralization section can be made remotely with the uranium mineralization being removed via metal pipes and separated from the transport fluid (water or air), in a closed system. In addition, cemented backfill was added to the mined cavity after boring, to minimize the size of unsupported sections (Midwest Joint Venture, 1991).

In the test mine, at the end of the drift, the height of the back (roof) was increased to approximately 9.5 metres in order to accommodate the blind hole boring rig. A short (approximately 15 metres) stub drift was driven near this blind hole chamber to accommodate the ancillary equipment. In total, two blind boring holes were completed from this crosscut through the orebody and into the basement rock. The blind bore holes were 1.2 metres in diameter and were drilled to 30.9 and 33.8 metres deep, with drilling completed to approximately 1.5 metres below the mineralization (Midwest Joint Venture, 1991). The program extracted approximately 245 kilograms of material, the majority of which was used for metallurgical testing (Melis, 1991).

7 GEOLOGICAL SETTING

The Midwest property is located in northern Saskatchewan, approximately 750 kilometres north of Saskatoon and 400 kilometres north of La Ronge, on the eastern side of the Athabasca Basin (Figure 4-1 and Figure 4-2). It is about 25 kilometres west of the McClean Lake mine site and mill and approximately 35 kilometres west of the Rabbit Lake mill which is located on the west shore of Wollaston Lake. The property area is within the Western Churchill Structural Province of the Canadian Shield, near the eastern margin of the Athabasca Basin (Figure 7-5). The bedrock geology of the area consists of Precambrian crystalline metamorphic rocks made up of Archean granitic gneisses, Paleoproterozoic metasedimentary gneisses, and Hudsonian intrusive rocks, all unconformably overlain by flat-lying, unmetamorphosed sandstones and conglomerates of the Athabasca Group.

7.1 Regional Geology

In north-western Saskatchewan, the crystalline metamorphic rocks of the Canadian Shield are divided into two chronotectonic units (Figure 7-1 and Figure 7-2), the Archean Western Churchill Province and the Proterozoic Trans-Hudson Orogen (THO). The Western Churchill Province is subdivided into the Rae Subprovince and the Hearne Subprovince, separated by the Snowbird Tectonic Zone (STZ; Figure 7-1). In this region, the Cree Lake Zone makes up the south-eastern margin of the Hearne Subprovince (Figure 7-6; (Annesley, Madore, & Portella, 2005)). This Zone is subdivided into the Virgin River Domain, the Mudjatik Domain, and the Wollaston Domain (Figure 7-2).

The basement rocks of the Cree Lake Zone were covered by Paleoproterozoic sediments and were then deformed and metamorphosed during the approximately 1,800 Ma continent–continent collision of the THO. The eastern half of the unmetamorphosed approximately 1,700 Ma Athabasca Basin overlies these metamorphic rocks. The Wollaston Domain fold and thrust belt forms the south-eastern part of the Cree Lake Zone (Figure 7-6). The dominant NE-trending strike-slip transpressional component of the fold–thrust belt has been described by (Annesley, Madore, & Portella, 2005). Peraluminous S-type granites and pegmatoids ("Hudsonian granites"), derived from partial melting of Wollaston Domain metasediments during the THO, also occur along major long-lived NE-trending structures (Annesley, Wheatley, & Cuney, 2010). The unconformity between Paleoproterozoic graphitic pelitic gneiss lithologies of the Wollaston Group and the Athabasca Group is the site of numerous unconformity-type uranium deposits (Hoeve & Sibbald, 1978); (Hoeve & Quirt, 1984); (Thomas, Matthews, & Sopuck, 2000); (Jefferson C. W., et al., 2007b) (Jefferson C. W., Thomas, Quirt, Mwenifumbo, & Brisbin, 2007c)).

The Athabasca Group fills the broad, oval, intracratonic Athabasca Basin that extends 425 kilometres in an east-west direction and 225 kilometres in a north-south direction (Figure 7-1, Figure 7-2, and Figure 7-3). The Athabasca Group has a maximum preserved thickness of approximately 1,500 metres and it consists of flat-lying Paleo- to Mesoproterozoic (Helikian) sandstone (orthoquartzite) with minor conglomerate and siltstone, and is dominantly quartz arenite (Ramaekers, 1990); (Ramaekers, et al., 2007)). It lies with a marked angular unconformity above the intensely deformed and metamorphosed Archean and Paleoproterozoic crystalline basement rocks. These sandstones were deposited in several second-order sequences by braided stream systems and typically show abundant cross-bedding and alternating coarser- and finer- grained units.

Mackenzie Swarm diabase dikes, dated at 1267 Ma, dominantly oriented northwest, and ranging from a few to a hundred metres in width, have intruded into both the Athabasca Group and the underlying basement ((Quirt D. H., 1993); (Hulbert, Williamson, & Thériault, 1993)). In addition, the 1107 Ma Moore Lakes gabbro-diabase complex has intruded the Athabasca sediments in the southeast corner of the basin.

The Athabasca area is mantled by glacial drift, outwash, and lacustrine sands, forming an undulating, lake-covered plain, with generally less than 30 metres of relief. Up to 40 metres, but generally 5 to 20 metres, of glacial materials covers the Midwest project area, resulting in extremely poor outcrop exposure.

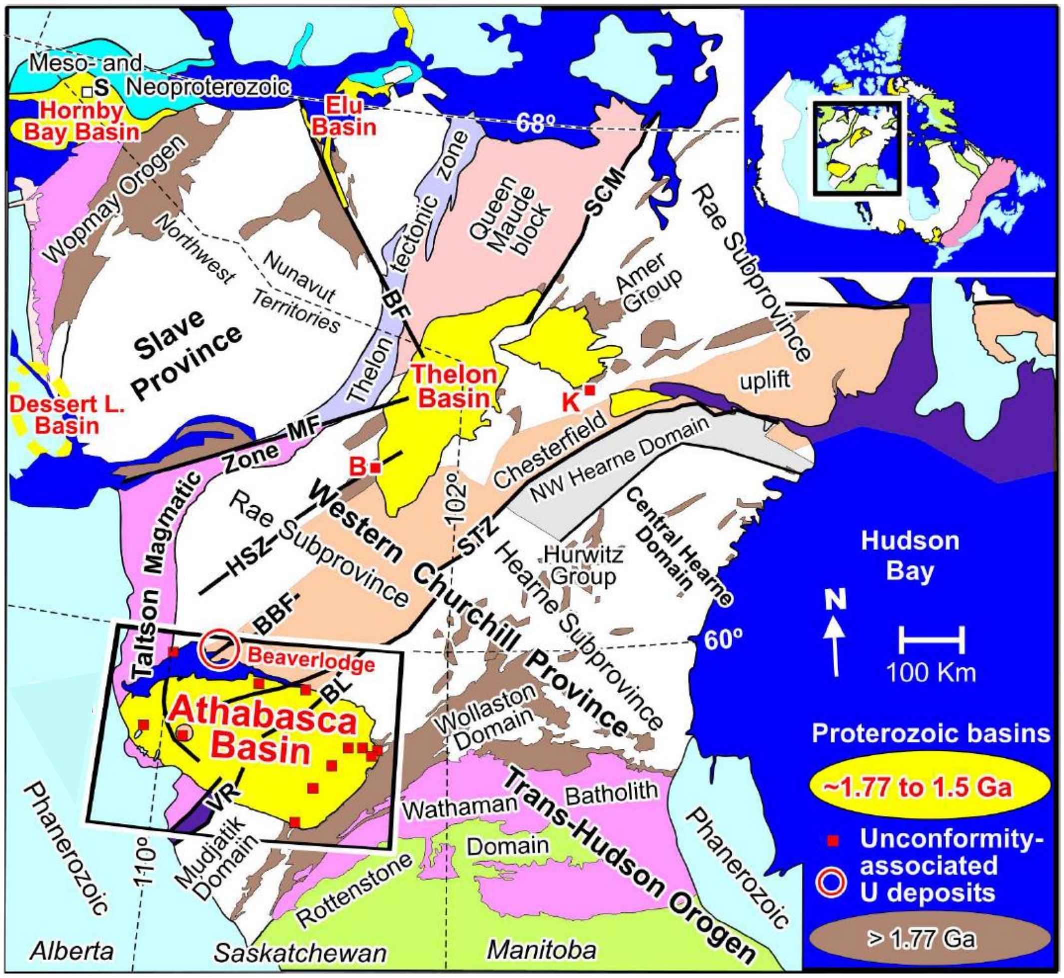
7.1.1.1 Sub-Athabasca Crystalline Metamorphic Basement

The basement in the eastern half of the Athabasca Basin is composed of rocks of the Wollaston and Mudjatik lithostructural domains, both being part of the Cree Lake Zone (Figure 7-2, Figure 7-3, and Figure 7-4). The Cree Lake Zone is bounded on the northwest by the Virgin River Shear

Zone and Black Lake Fault (STZ; (Hoffman, 1990)) and on the southeast by the Needle Falls Shear Zone.

The Wollaston Domain is a distinctly northeast-trending fold-thrust belt composed of Paleoproterozoic Wollaston Group metasediments overlying Archean granitoid gneisses. The Mudjatik Domain is a northeast-trending, shear-bounded belt consisting mainly of Archean felsic gneisses ((Annesley, Madore, & Portella, 2005); (Jeanneret, et al., 2016)). Both domains have undergone complex polyphase deformation and metamorphism during the THO, including intrusion of metaluminous and peraluminous granitic bodies.

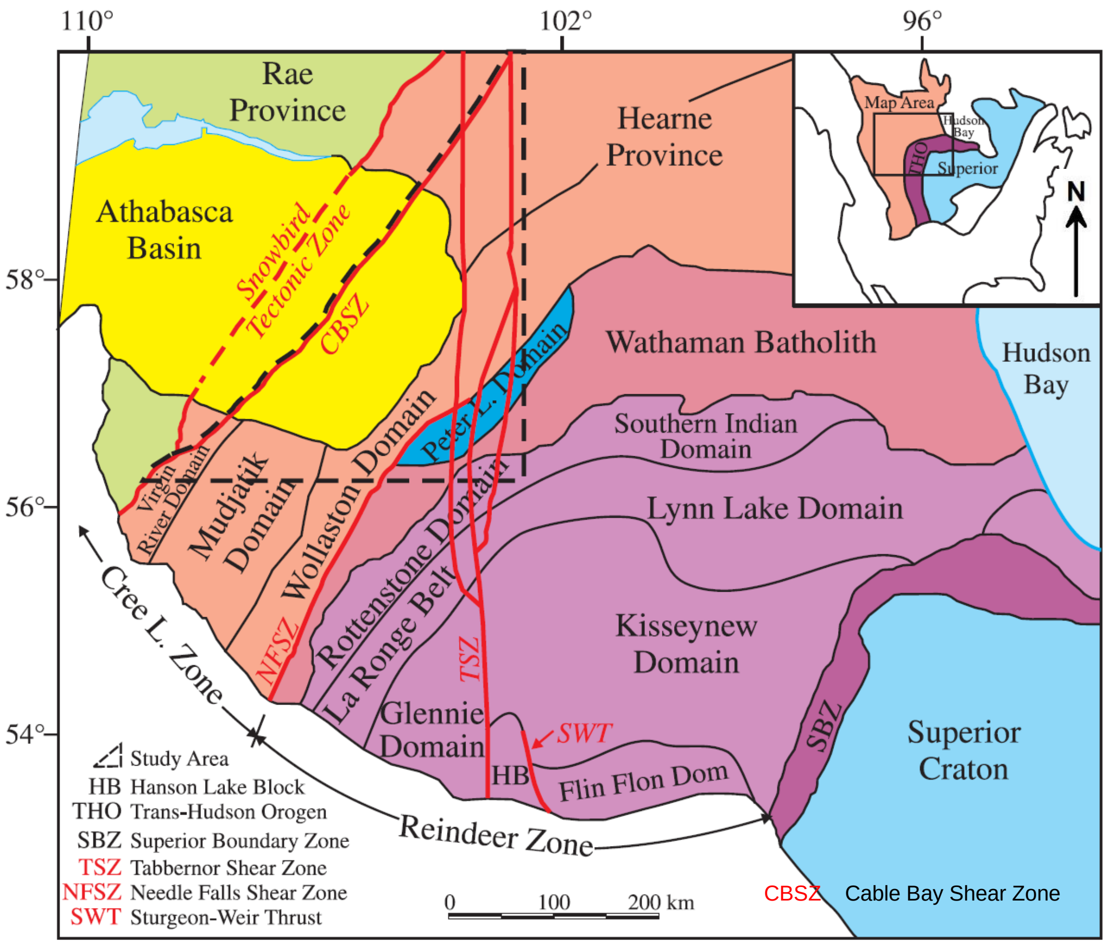
The Mudjatik Domain (Figure 7-2 and Table 7-1) consists of variably reworked Archean granitic orthogneisses, locally charnockitic, and numerous small remnants of polydeformed Aphebian metasedimentary rocks similar to Wollaston Group metasediments. This domain displays a mixed pattern of aeromagnetic highs and lows.



Jefferson et al. (2007b, c)

Figure 7-1: Location of the Athabasca Basin relative to the geology of the northwestern Canadian Shield.

Legend: Red squares - U deposits/prospects (K - Kiggavik, B - Boomerang). STZ, VR, BL, BBF, HSZ, MF, BF - crustal-scale fault zones (Snowbird Tectonic Zone, Virgin River, Black Lake, Black Bay Fault, Howard Shear Zone, McDonald Fault, Bathurst Fault).



Annesley et al. (2005)

Figure 7-2: Lithotectonic domains in northern Saskatchewan and Manitoba.

To the east, the metasedimentary rocks of the Wollaston Domain (Figure 7-8, Table 7-1) rest unconformably on Archean granitoid gneiss. This Domain comprises the Wollaston–Mudjatik Transition Zone (WMTZ), the western Wollaston Domain, and the eastern Wollaston Domain. The WMTZ forms a transition from the linear Wollaston fold and thrust belt to the dome and basin interference-folded Mudjatik Domain.

The metasedimentary lithologies in the Wollaston Domain comprise three metasedimentary supracrustal successions deposited in rift, passive margin, and foreland basin environments (Tran, Ansdell, Bethune, Ashton, & Hamilton, 2008). These rocks overlie and are locally intercalated with the Archean orthogneisses.

The Western Wollaston Domain and the WMTZ are structurally complex, consisting of elongated Archean granitoid domes (mega-boudins), dominant thrust- and strike-slip structures, and related duplex structures (Annesley, Madore, & Portella, 2005). The Western Wollaston Domain is characterized by an overall aeromagnetic low related to the dominant Paleoproterozoic Wollaston Group metasedimentary lithologies. The lower sequence of the Wollaston Group consists mainly of, from the bottom, graphitic pelitic gneiss, followed by garnetite, pelitic gneiss, calc-pelitic gneiss, psammopelitic gneiss, psammitic gneiss, and meta-quartzite. The Wollaston Group rocks are interpreted to occupy synclinal structures. They originally consisted of shelf to miogeosynclinal sediments. Following Hudsonian metamorphism and deformation, these rocks now overlie, and are locally intercalated with, the Archean orthogneissic basement.

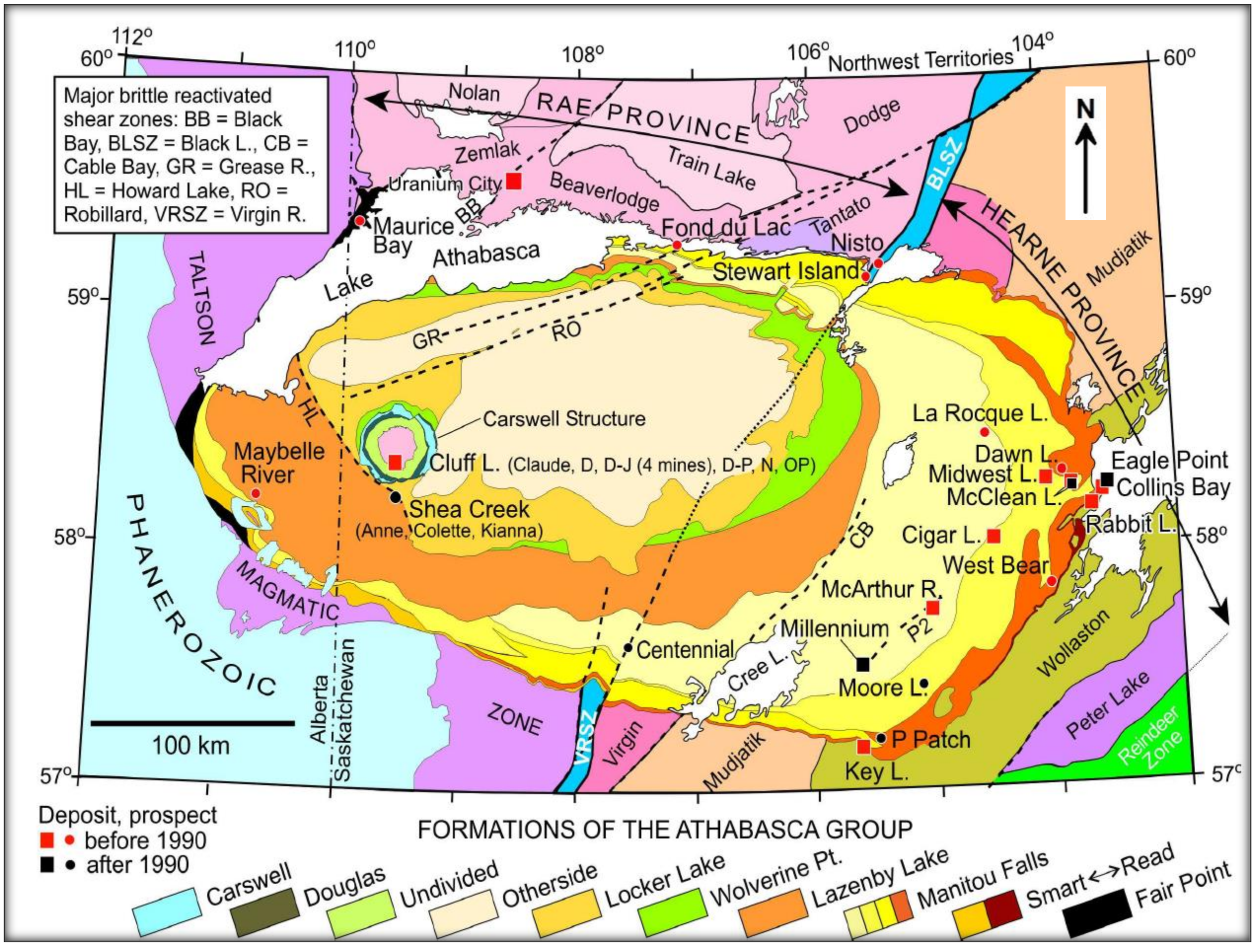
The eastern Wollaston Domain (Figure 7-2 and Figure 7-4) corresponds to an aeromagnetic high and is made up of the upper sequence of the Paleoproterozoic Wollaston Group. It consists of calc-silicate- and magnetite-bearing siliciclastic metasediments overlying a lower Wollaston Group sequence of magnetite-rich to magnetite-poor pelitic to psammitic gneisses. Archean orthogneisses are locally infolded.

The Midwest project area is interpreted to be within the Wollaston-Mudjatik Transition Zone (WMTZ).

Sub-vertical, north-northeast-trending ductile and brittle-ductile fault zones that developed during the Hudsonian Orogeny (Figure 7-4) are dominant structural features within the eastern Athabasca ((Annesley, Madore, & Portella, 2005); (Tourigny, Quirt, Wilson, Breton, & Portella, 2007)). These faults were commonly reactivated after the deposition of the Athabasca Group and are commonly associated with graphitic Wollaston Group stratigraphy. Post-Athabasca Group faulting, as recognized within the Wollaston Domain (Harvey & Bethune, 2007), is characterized as dominantly reverse (D_5; Table 7-2) with a later, dominantly strike-slip, component (D_6).

7.1.1.2 Hudsonian Granites/pegmatites

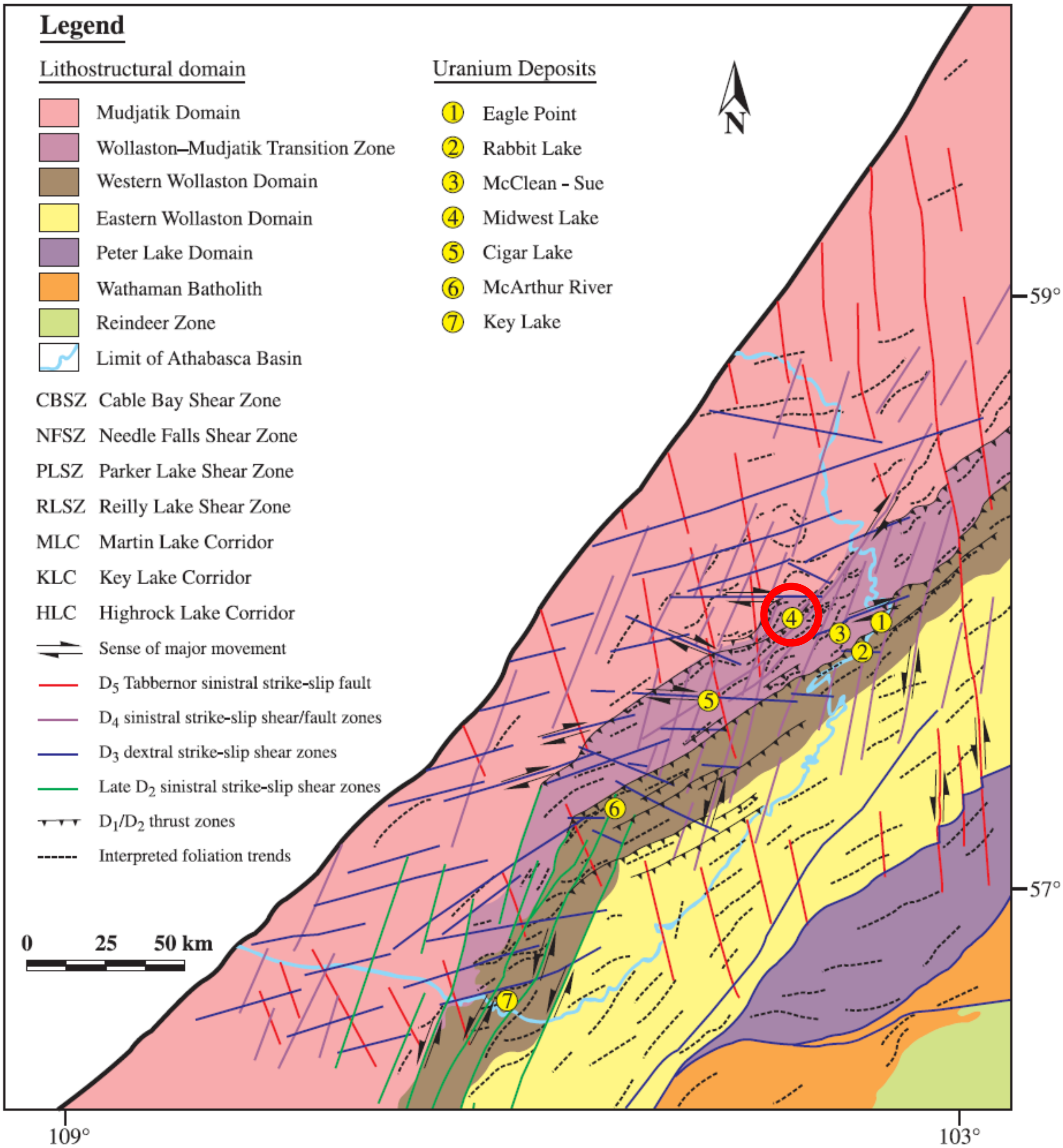
The basal Wollaston Group sequence of graphitic pelitic to psammopelitic gneisses contain a large volume of peraluminous [molecular Al_2O_3/(Na_2O+ K_2O+ CaO) > 1)] S-type granites that have been interpreted to be a partial (anatectic) melting phase of the metasediments near the thermal peak of the THO (Annesley, Madore, & Portella, 2005). These S-type granites developed mostly in zones of structural complexity, such as fold noses, sheared limbs, dilation zones, and fault intersections. It has been postulated that when the host metasediments were enriched in uranium, the anatectic crustal melts derived from partial melting were also enriched in uranium (Cuney & Friedrich, 1987). Syn-orogenic peraluminous granitoids are the most abundant and the best studied, however, there are also calc-alkaline granitoids and high-Sr–Ba granitoids (details on these lithologies in (Annesley, Madore, & Portella, 2005); (Jeanneret, et al., 2016)).



Jefferson et al. (2007c)

Figure 7-3: Geological setting of the Athabasca Basin and unconformity type U occurrences, northern Saskatchewan and Alberta.

The peraluminous granite (granitoid) suite comprises grey leucogranites, leucomicrogranites, granitic pegmatites, and very commonly observed peraluminous leucosomes (anatectic granite) in metasedimentary migmatites. The leucogranites and pegmatites are present as syn- to late-orogenic plutons, sheets, dikes, and network veins that are dominantly present in the hanging wall of thrust faults and in the footwall of normal faults. While the oldest leucogranites and granitic pegmatites belong to the grey granite suite (approximately 1840 Ma), younger (1820–1800 Ma) versions are more common, suggesting that there were pulses of leucogranite intrusion.



Annesley et al. (2005)

Figure 7-4: Lithotectonic geology of the eastern Athabasca region with locations of uranium deposits, including Midwest (circled in red).

Table 7-1: Summary of basement lithologies, East and Central Athabasca Basin.

METAMORPHOSED BASEMENT - HEARNE PROVINCE EAST - CENTRAL ATHABASCA BASIN ***Note:*** *Nomenclature and ages after Card et al. (2007)*	
MUDJATIK DOMAIN	**Distribution:** Underlies the central portion of the Athabasca Basin. Bounded in the west by the Virgin River / Black Lake Shear zone. **Lithologic Units:** Reworked Archean granitic orthogneisses, locally charnokitic and numerous small remnants of polydeformed Aphebian metasedimentary rocks (pelitic to psammo-pelitic gneiss) similar to Wollaston Group metasediments. **Metamorphism:** Granulite (approximately 2.9 – 2.8 Ga near Mudjatik/Virgin Domains; 2.64 -2.58 Ga near Mudjatik/Wollaston Domains) overprinted by amphibolite (1900 Ma) to upper greenschist grade. These retrograde events may also, in part, represent effects of the Trans-Hudson Orogen (ca. 1800 Ma). **Deformation:** Recumbent regional gneissosity (D_1), WNW striking upright folds (D_2), two sets of NNE to NE striking folds (D_3 and D_4).
WOLLASTON DOMAIN	**Distribution**: Underlies the eastern portion of the Athabasca Basin and bounded in the east by the Needle falls shear zone. Generally a tightly folded northeast trending belt of Paleoproterozoic metasedimentary rocks and Archean granitoids. **Lithologic Units:** The Wollaston Domain contains a significant proportion of Archean granitoid gneiss exposed in structural domes. The Wollaston Group lies unconformably upon the granitoid gneiss. The lower Wollaston Group consists of graphitic pelitic gneiss, followed by garnetite, pelitic gneiss, calc-pelitic gneiss, psammo-pelitic gneiss, psammitic gneiss, and meta-quartzite. The upper Wollaston Group consists of calc-silicate- and magnetite-bearing siliciclastic metasediments **Metamorphism:** upper greenschist to lower amphibolite facies along parts of the eastern margin of Wollaston domain, but increases abruptly westward to upper amphibolite. Age dates range from 2550 to 1770 Ga. **Deformation:** Foliation, isoclinal folding (D_1), tight-isoclinal folding (D_2), NE open and/or tight folding (D_3), NW open folding (D_4).

The grey granites form planar-layered bodies to dikes that are leucocratic, massive to well foliated, fine- to coarse-grained, and commonly equigranular. They are weakly to moderately peraluminous and contain quartz, Na-plagioclase, K-feldspar, and biotite, with lesser muscovite, garnet, cordierite, and locally sillimanite, and accessory monazite and zircon. Examples are present on Harrison Peninsula (Collins Bay to Eagle Point).

Table 7-2: Comparison of deformational events in the Wollaston Domain.

	Deformational Event	Harvey and Bethune (2007)	Harvey (1999)	Tran (2001)	Lewry and Sibbald (1980)	Portella and Annesley (2000)	Tourigny et al. (2001)
Postdates Athabasca Group	**Faulting (largely strike-slip)**	**D_6**	**D_5**	**D_5**	**ND**	**D_5**	**Post-D3**
	Faulting (largely reverse)	**D_5**	**D_5**	**D_5**	**ND**	**D_4**	**Post-D3**
Predates Athabasca Group	**NW close to gentle folds**	**D_4**	**D_4**	**D_4**	**Post-D_3**	**D_3**	**D_3**
	Faulting	**Late D_3**	**Post-D_3**	**Late D_3**	**ND**	**Late D_2**	**Post D_2**
	Upright NE folding	**D_3**	**D_3**	**D_3**	**D_3**	**D_2**	**D_2**
	Tight to isoclinal folds	**D_2**	**D_2**	**D_2**	**D_2***	**ND**	**D_1**
	Early ductile faulting	**Late D_1**	**Late D_1**	**Late D_1**	**ND**	**D_1**	**Late D_1**
	Isoclinal folds	**D_1**	**D_1**	**D_1**	**ND**	**D_1**	**D_1**
	Main regional foliation	**D_1**	**D_1**	**D_1**	**D_1**	**D_1**	**D_1**
	ND: not discussed by authors			***Not recognized in Wollaston Domain**			

Harvey and Bethune (2007)

Pink K-feldspar-dominant metaluminous porphyritic granites (for example, in the Rabbit Lake area) are massive to moderately well foliated, fine- to-coarse grained, inequigranular to porphyritic, and are locally xenolithic. They are characterized by K-feldspar phenocrysts up to six millimetres in size that are set in a fine- to medium-grained matrix of quartz, K-feldspar, biotite, subordinate plagioclase, and accessory allanite, epidote, apatite, monazite, zircon, fluorite, titanite, opaque minerals, and xenocrystic garnet. These calc-alkaline granites are highly-differentiated, are metaluminous to corundum normative, and are weakly peraluminous, containing elevated contents of K_2O+Na_2O, Ba, Ga, Rb, Th, U, LREEs, Y, and Zr.

Leucocratic microgranites, granitic pegmatites, and peraluminous anatectic leucosomes (remobilized partial melt material) in metasedimentary migmatites are ubiquitous in the Wollaston Domain. The leucogranites form syn- to late-orogenic plutons, sheets, dikes, and vein networks with variably concordant to discordant contacts, are typically metre-scale in thickness, and are very fine- to medium-grained, essentially equigranular, and are massive to well foliated. They are high-silica (70–78 wt.% SiO_2), extremely leucocratic rocks, containing low CaO and Sr.

Most granitic pegmatites intruding the basement rocks as sills and dikes are composed of predominant quartz and K-feldspar, subordinate plagioclase and biotite, and trace opaque minerals. Locally, the mafic mineral present is tourmaline, rather than biotite. Compositional zoning from feldspar-rich, near margins, to quartz-dominant, in the centre, is common in thicker examples. In general, they are highly variable in composition, ranging from alkali granite to granodiorite. They are larger versions of the leucosomes found in the migmatitic varieties of Wollaston Group pelitic and psammopelitic gneisses, and are compositionally similar to the grey granites, suggesting a common origin. Most of the S-type anatectic granitic pegmatites are strongly potassic (high K_2O/Na_2O) and peraluminous.

U-bearing pegmatites have been found in several areas, including Fraser Lakes (McKechnie, Annesley, & Ansdell, 2013), Kulyk Lake (McKeough & Lentz, 2011), and Moore Lakes (Annesley, Madore, Kusmirski, & Bonli, 2000). At Moore Lakes, the rock is composed mainly of quartz, grey feldspar, and biotite, minor amounts of pyrite, and accessory apatite, zircon, pyrite, ilmenite, and uraninite. The uraninite grains are cubic, range from 0.05 to 0.50 millimetres in size, and are found within biotite flakes. Mineralized pegmatites/leucogranites in the Fraser Lakes and Kulyk Lake areas range from simple granitic types (quartz, K-feldspar, plagioclase, with lesser biotite, amphibole) to more mineralogically-complex types with simple core and complex margins (plagioclase-dominant with K-feldspar, biotite, amphibole, magnetite/ilmenite, and little quartz; or Ca-pyroxene-dominant with tremolite/actinolite, biotite, and magnetite/ilmenite). These pegmatites are peraluminous and are variably enriched in U (± Th), with Th/U approximately 1 (containing uraninite, thorite, zircon, and allanite) or in Th and LREEs, with Th/U >2 (containing monazite, uranothorite, and zircon). Formation of the U-, Th-, and REE-enriched pegmatites is ascribed to partial melting of a metasedimentary rock-dominated source, entrainment of accessory minerals as xenocrysts, and assimilation-fractional crystallization (AFC) processes ((McKeough & Lentz, 2011); (McKechnie, Annesley, & Ansdell, 2013)).

7.1.2 Paleoweathering

The unconformable contact between the Paleoproterozoic Athabasca Group sandstone and the underlying crystalline basement rocks is typically marked by several metres of clay mineral-rich and colour- and mineralogically-zoned post-Hudsonian regolith (paleoweathering) that can range in thickness from 0 to >80 metres ((Hoeve & Quirt, 1984); (Macdonald, 1985)). The thickness of the profile is highly dependent on the composition of the parent rock, as well as the presence of relatively permeable basement structures. Below an upper clay-rich (kaolinitic) and hematitic red zone, there is an illitic to chloritic red-green zone that is transitional to a chloritic to illitic, variably light to dark green zone. The green zone material grades downward, generally over a few metres, into fresh or retrograde-metamorphic basement.

7.1.3 Athabasca Group Sandstone

The formation of the Athabasca Basin is interpreted to have started with the development of sedimentation into a series of northeast-southwest-oriented sub-basins with subsequent sedimentary coalescence into the greater Athabasca Basin (Armstrong & Ramaekers, 1985). The formation of the sub-basins was linked to movement on major northeast-southwest structures associated with the Trans-Hudsonian Orogeny and rooted in the underlying metasediments and granites (Cuney & Kyser, 2008). Sub-basin formation could have been initiated at circa 1750 Ma (based on timing of rapid uplift in the region of the THO; (Hiatt & Kyser, 2007)). Alternatively, (Rainbird, Stern, Rayner, & Jefferson, 2007) suggests the Athabasca Basin was formed as a result of a broad thermal subsidence mechanism based on the geometry, sequence architecture, east-west elongation, and dish-shaped outline. A depositional age of 1740-1730 Ma for the basal Athabasca Group was estimated by (Rainbird, Stern, Rayner, & Jefferson, 2007). However, actual sedimentary deposition may not have occurred until after circa 1710-1700 Ma (based on ages of greenschist facies retrograde mineral assemblages (Jeanneret, et al., 2016)).

The sub-Athabasca unconformity topography suggests a gentle inward slope from the east, moderate to steep slopes from the north and south, and a steeper slope from the west. Locally, pre-Athabasca fanglomerate (fault scarp talus deposits) is present below the basal Athabasca sandstone, for example, at Sue C, Read Lake, Wheeler River, and McArthur River (Quirt D. , 2000).

In general, the Athabasca Group sediments consist of unmetamorphosed quartz-rich pebbly sandstone (quartz arenite; orthoquartzite) (Ramaekers, 1990); (Ramaekers, et al., 2007), with intercalated conglomerate and minor siltstone intervals. There are four major fining-upwards sequences, separated by unconformities, that are recognized in the Athabasca Group ((Ramaekers, et al., 2007); Table 7-3)). Sequence 1 (Fidler deposystem) comprises the Fair Point Formation, Sequence 2 (Ahenakew, Moosonees and Karras deposystems) includes the Read, Smart, and Manitou Falls Formations, Sequence 3 (Bourassa deposystem) includes the Lazenby Lake and Wolverine Point Formations, and Sequence 4 (McLeod deposystem) includes the Locker Lake, Otherside, Douglas, and Carswell Formations.

Sequence 1 was deposited in the Jackfish Sub-basin during the latest stage of the THO (the final actions of Superior-Hearne cratonic collision), however, formation of this sub-basin may have been more related to movements associated with Taltson-Thelon structures. Sequence 2 may have been deposited in escape basins, while the upper sequences in the Athabasca Basin may reflect a continental-scale extensional event around 1.40 Ga (Ramaekers & Catuneanu, 2012).

The sandstone is poorly-sorted near the base of the Athabasca Group, where conglomerates form discontinuous layers of variable thickness. Minor shale- and siltstone-rich formations occur in the upper half of the succession. Locally, the rocks may be silicified and very well indurated (eg. upper Manitou Falls Formation – MF Dunlop member) or partly clay-altered and de-silicified.

Most of the Athabasca sandstone strata were deposited in alluvial fans and in braided streams with generally horizontally-bedded alternating coarser and finer units, with abundant cross-bedding observed. The strata are nearly flat-lying or dip only a few degrees, except within the Carswell Structure and near faults. No regional folds have been recognized. Fractures and faults trend mainly in east-northeast, north-northeast, north-south, and northwest directions. Fractures are more abundant in the Athabasca strata above buried faults in the basement, suggesting reactivation along these pre-Athabasca faults. Drilling at several uranium deposits has revealed local block faulting, where the unconformity has been fault-offset vertically by as much as 40 metres in a reverse sense. Thrust faulting has affected the sandstone along the eastern margin of the basin (eg. in the Collins Bay area).

The Manitou Falls Formation, which comprises most of the strata in the eastern half of the basin, is subdivided into four units from bottom to top ((Ramaekers, 1990); Table 7-3): MFa (poorly sorted sandstone and minor conglomerate); MFb (interbedded sandstone and conglomerate); MFc (sandstone with rare clay intraclasts); and MFd (fine- to medium-grained sandstone with abundant (>1 %) clay intraclasts). Further mapping has subdivided the original MFa unit into two new formations, the Read Formation and the Smart Formation (Ramaekers, et al., 2007). The Manitou Falls strata nomenclature was also reassigned: conglomeratic MFb (Bird Member), sandy MFc (Collins Member), and clay-intraclast rich MFd (Dunlop Member). The sandstone in the eastern portion of the Athabasca Basin ranges in thickness from 0 to over 900 metres.

Typically, the sandstone contains from 1% to 5% intergranular pore space that is filled with matrix clay. The matrix clay mineralogy is relatively consistent within sedimentary units and allows delineation of a clay mineral stratigraphy that is comparable to the lithostratigraphy (Hoeve & Quirt, 1984). The background (diagenetic) matrix clay mineralogy comprises kaolin (dickite and lesser kaolinite) and illite, ± hematite, and variable amounts of quartz overgrowth cement.

The sandstone ranges in thickness from 180 to 210 metres within the Midwest property and consists of the Manitou Falls Formation; MFb (Bird) Member (Table 7-3).

7.1.3.1 Quaternary Geology

The surficial deposits in the Midwest project area are of Quaternary age and consist largely of tens of metres-thick Pleistocene bouldery, silty-sand till plain resting directly on the sandstone bedrock. Locally, the upper half to one-metre of underlying sandstone bedrock is frost-heaved (felsenmeer). Drumlins, up to 15 metres in height, trace the latest ice advance from the northeast and are oriented NE-SW. The glacial till is locally overlain by glacio-fluvial sand and gravel, followed by deposition of recent sand and silt.

Table 7-3: Stratigraphy of the Athabsca Basin.

STRATIGRAPHY OF THE HELIKIAN ATHABASCA BASIN ***(Mirror, Cree, and Jackfish Sub-basins)*** ***NOTE:*** *Nomenclature after Ramaekers (1990); Ramaekers et al. (2007).*		
Sequence and Deposystem	**Environment**	**Brief Formation Descriptions**
Sequence 4 **McLeod**	Marine platform-intertidal	**CARSWELL Formation:** Dolomitic, basal Sandstone, Mudstone. dolarenites with x-beds & ripple marks. Stromatolites common. Oolites up to 3 mm diameter in beds up to 15 cm thick. -lower contact at lowest prominent carbonate bed.
***(Occurs only in the annular ring of the Carswell Structure)**	Fluviatile-marine	**DOUGLAS Formation:** Thinly bedded & laminated very fine grained Sandstone, Siltstone, Mudstone. -very friable. Variously calcareous and carbonaceous. -graded Sandstone beds (0.25-5 cm thick). -lower contact at first pebbly sandstone beds (base of 1st black mudstone).
	Fluviatile- Possible marine component at top	**OTHERSIDE Formation:** Sandstone, Siltstone (minor 5 cm to 3 metres thick). -bedding-parallel granules. -clay intraclasts common. -quartz pebbles at base of formation. -lower contact gradational.
	Fluviatile	**LOCKER LAKE Formation:** Pebbly to conglomeratic Sandstone (>16 mm diameter) and minor Siltstone (1-20 cm thick). -no clay intraclasts. -minor mudstone near base. -lower contact disconformable (Sequence 3 &4 boundary).
Sequence 3 **Bourassa**	Fluviatile and Playa lake	**WOLVERINE POINT Formation:** Sandstone, Siltstone (1 to >50 cm thick). -clay-rich, local hard red & green clay intraclasts

STRATIGRAPHY OF THE HELIKIAN ATHABASCA BASIN ***(Mirror, Cree, and Jackfish Sub-basins)*** ***NOTE:*** *Nomenclature after Ramaekers (1990); Ramaekers et al. (2007).*		
		-very friable locally. -clay intraclasts common. -local vitric tuff beds. -abrupt lower contact where common mudstone beds disappear.
	Fluviatile	**LAZENBY LAKE Formation:** Pebbly Sandstone, fine grained quartz arenite (isolated quartz pebbles 4-30 mm diameter). Mostly quartz arenite with low clay content; minor mudstone and hard, phosphatic beds in the upper part. -low angle cross-bedding, local slumped bedding lower in section. -Base of the Mirror Subbasin in SW Athabasca Basin. -lower contact disconformable (or correlative unconformity, seq. 2 & 3 boundary).
Sequence 2 **Ahenakew,** **Moosonees** **and Karras**	Fluviatile	**MANITOU FALLS Formation:** Quartz-pebble conglomerate, fine to coarse grained arenite, Siltstone and lesser Mudstone. -clay intraclasts common in some members. -bulk of sedimentation in the Cree Subbasin. -5 members; from top: Dunlop, Collins, Warnes & Raibl (southern & northern Cree Subbasin, respectively) and Bird. -lower contact unconformable on Smart and/or Read formations, where not directly lying on crystalline basement.
	Fluviatile	**SMART Formation:** Fine grained to coarse grained quartz arenite and lesser pebbly mudstone. -upper part at least two fining-up quartz arenite units. -fine to coarse grained. -lower part discontinuous pebbly mudstone. -T and/or Fair Point Formation. of the Jackfish Subbasin.
	Fluviatile with lesser Aeolian	**READ Formation:** Fine grained to coarse grained quartz arenite, quartz-pebble conglomerate and red, silty Mudstone.

STRATIGRAPHY OF THE HELIKIAN ATHABASCA BASIN ***(Mirror, Cree, and Jackfish Sub-basins)*** ***NOTE:*** *Nomenclature after Ramaekers (1990); Ramaekers et al. (2007).*		
		-discontinuous mudstone occurs at base overlain by quartz-pebble conglomerate with granule matrix and fine to medium grained ripple and cross-laminated quartz arenite at top. -distributed in the **eastern** Athabasca Basin. -lower contact unconformable on crystalline basement.
Sequence 1 **Fidler**	Fluviatile	**FAIR POINT Formation:** Pebbly sandstone with polymictic pebble conglomerate and quartz arenite. Minor mudstone. -distribution within the Jackfish Subbasin (western Athabasca Basin) and in the Carswell Structure at Cluff Lake. -lower contact unconformable on crystalline basement.

7.1.3.2 Uranium Mineralization

The uranium mineralization encountered in the eastern Athabasca region is of the diagenetic-hydrothermal unconformity type. The location of this mineralization type is around the unconformity between the basal Athabasca Group and the underlying crystalline basement, (Figure 7-6), particularly graphitic pelitic gneiss of the Wollaston Group (Hoeve & Sibbald, 1978); (Hoeve & Quirt, 1984); (Wallis, Saracoglu, Brummer, & Golightly, 1985); (Jefferson & Delaney, 2007); among others). See Section 8 for information on the unconformity-type deposit type.

7.2 Local Geology

7.2.1 Midwest Main

The local geology of the Midwest Main area is very similar to that described under Regional Geology (Section 7.1). It is depicted in plan view in Figure 7-5 and on schematic cross-sections in Figures 7- and 7-9. Lithologies present at Midwest Main are also essentially the same, as depicted in Figure 7-8.

7.2.2 Midwest A

The local geology of the Midwest A area is very similar to that described under Geological Framework (Section 7.1). It is depicted in plan view in
Figure 7-5 and on a schematic cross-section in Figure 7-8.

7.2.2.1 Sub-Athabasca Crystalline Metamorphic Basement

The basement lithologies of the Midwest project area consist of Paleoproterozoic Wollaston Group metasediments and Archean orthogneiss, all belonging to the Wollaston-Mudjatik Transition Zone (WMTZ; (Annesley, Madore, & Portella, 2005)). The north-northeast Midwest structural trend that hosts the Midwest Main uranium deposit follows a steeply-dipping graphitic pelitic gneiss unit that is bounded by granitic gneisses or Hudsonian granite (Figure 7-10C) to both the east and west. The general structure of the project area has been interpreted to be a tightly-folded synform with a northeast trending axial plane parallel to the regional structure.

The unconformity surface is relatively flat on a regional scale; however, there is a slight uplift along the NNE Midwest trend and a generally higher elevation to the east. Typically, the upper eight to ten metres of the basement, immediately below the unconformity, is paleo-weathered with zones of hematization, illitization, and chloritization.

The interpreted geology of the basement at the unconformity is presented in plan view in

Figure 7-5. Major geological features include the contacts between the granitic gneiss/pegmatite units and the rheologically-softer graphitic pelitic gneisses. Brittle-ductile fault reactivation along this NE-trending anastomosing graphitic corridor, combined with several cross-cutting structures, is a key element to uranium precipitation in the Midwest Main area. The strongly folded, steeply-dipping, pelitic gneiss unit is composed of psammopelitic to pelitic gneiss. Porphyroblastic garnets, cordierite, and sulphides, are present in the pelitic gneiss, as well as variable amounts of graphite, often remobilized and sheared with a lustrous sheen. Many quartzofeldspathic anatectic pegmatites are present (Figure 7-10C). They conformably intrude the metasedimentary gneisses and contain more or less chloritized biotite. Late shearing in the pelitic gneisses and contained breccias has occurred at the contacts with the pegmatites. Fault zones in the basement (Figure 7-8) are often characterized by brecciation and strong hydrothermal alteration with clay mineral development. These fault zones generally extend into the sandstone above.

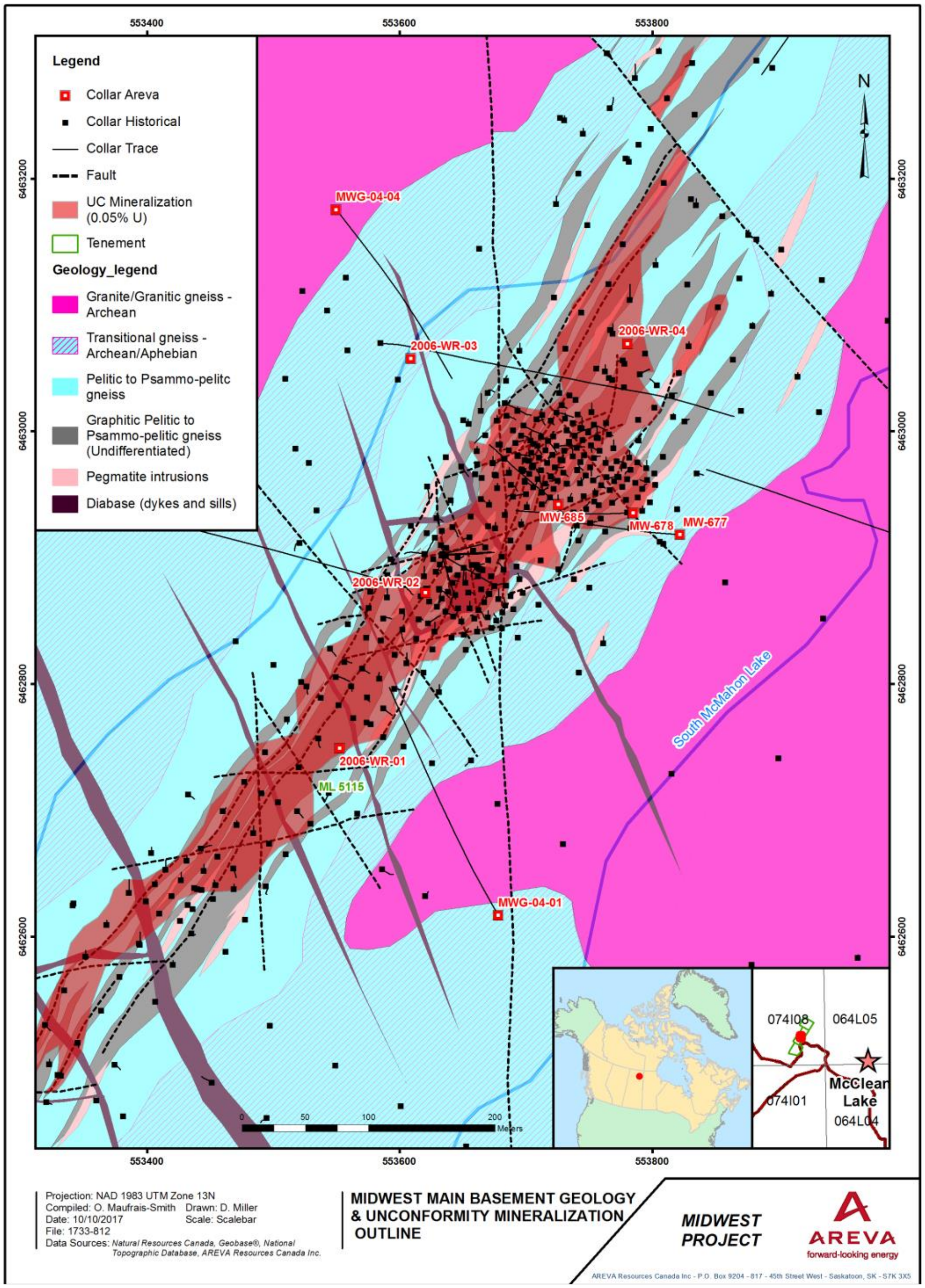


Figure 7-5: Midwest Main basement geology at the unconformity. The translucide red Envelope represent the unconformity mineralization outline at a 0.05% U cut-off.

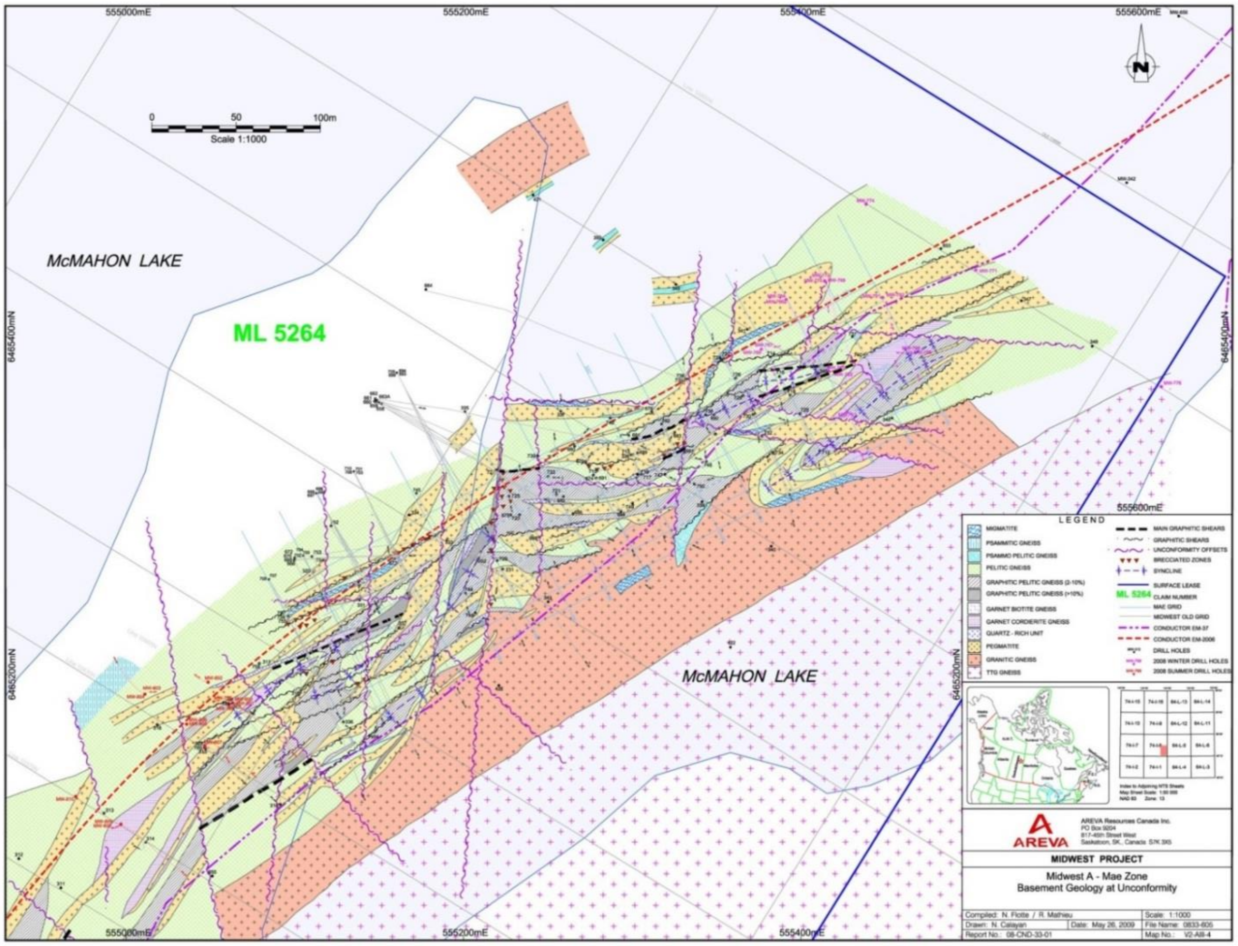


Figure 7-6: Midwest A basement geology at the unconformity.

7.2.2.2 Athabasca Group Sandstone

The Athabasca Group sandstone, ranging from 180 to 210 metres in thickness in the Midwest property area, is comprised of Manitou Falls Formation sandstones and conglomerates of the MFb (Bird) Member (Table 7-3, Figures 7-7, 7-9). The upper 100 to 140 metres of sandstone is typically bleached to a buff colored, and is medium- to coarse-grained, quartz-rich, and cemented by quartz overgrowths, clay minerals (kaolin, illite), and/or hematite (Figure 7-10A). Bleaching of the sandstone (removal of diagenetic hematite) is noted along much of the Midwest trend.

The lower portion of the sandstone column is more typically conglomeratic and contains less quartz cement. The conglomeratic beds contain quartz pebbles ranging from one to four centimetres in diameter, locally up to 30 centimetres (Figure 7-10B).

Illitic clay-rich zones are commonly associated with areas of intense hydrothermal alteration and uranium mineralization. These zones are generally present in the basal 20 metres of the sandstone, and associated with friable sand and conglomeratic beds.

Basement fault zones generally extend over 100 metres into the overlying sandstone, act as hosts for uranium mineralization, and form the loci of the quartz dissolution and clay alteration zones that resulted in collapse of the property-scale conglomerate marker horizon (Figures 7-9, 7-10B).

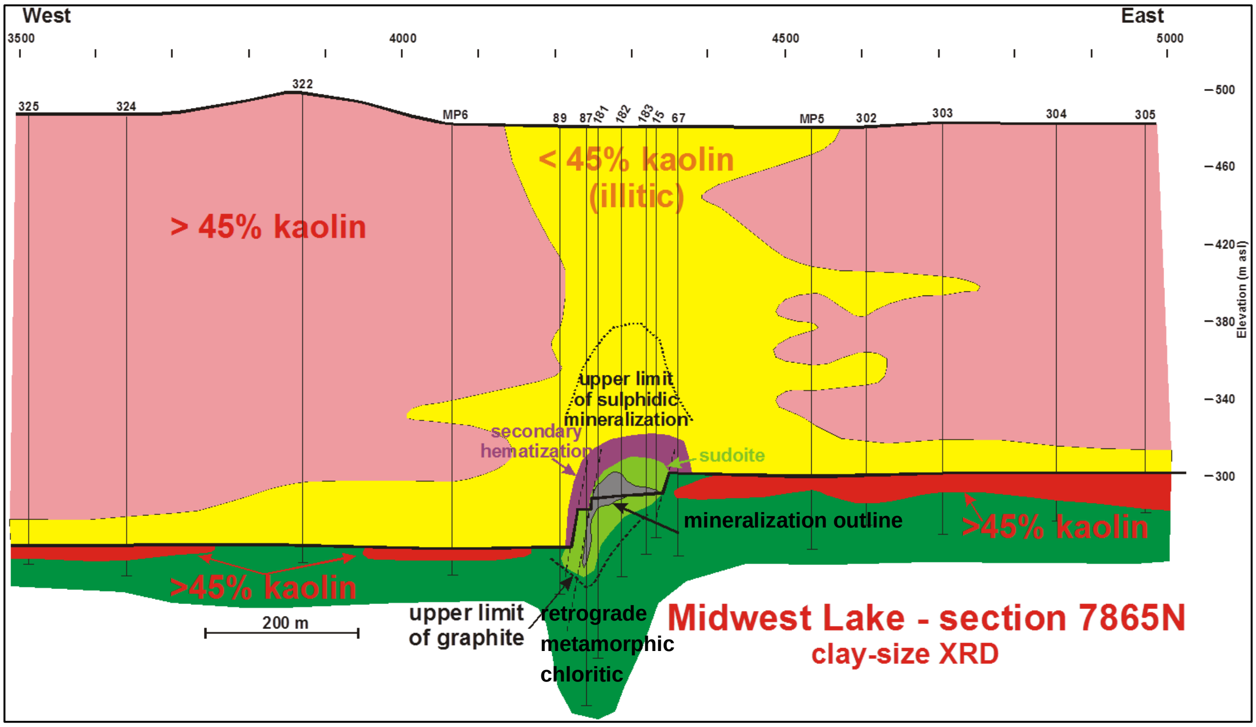
7.2.2.3 Quaternary Geology

The surficial sediments in the Midwest project area consist of a thin layer of Quaternary till and glaciofluvial sand and gravel. Low relief drumlins and eskers are the dominant surficial feature in the area. The till is typically brown, variably compact to dense and is composed of silt, sand, gravel, and boulders.

As defined by drilling, the thickness of this overburden typically ranges from two to four metres in the project area, but can be as thick as 15 metres.

7.2.2.4 Uranium Mineralization

The uranium mineralization present in the Midwest project area consists of two unconformity-type deposits: the Midwest Main deposit and the Midwest A deposit. See Section 8 for information on the unconformity-type deposit type. The larger Midwest Main deposit consists of a near-massive, high-grade mineralized core that straddles the unconformity; mostly in the sandstone with a lesser amount in the upper basement (Figure 7-8; (Hoeve, 1984); (Hoeve & Quirt, 1984); (Wray, Ayres, & Ibrahim, 1985)). The high-grade core is surrounded by lower-grade, more dispersed, fracture-controlled mineralization in both sandstone and, in minor amounts, in basement rocks. The high-grade mineralization forms a more-or less flat-lying lensoid concentration, with a root extending down into the basement along a steeply-dipping fault that is enclosed in an envelope, up to a few metres thick, of host-rock-altered clayey material that lacks diagnostic textures of either basement or sandstone.



Quirt (2003), after Hoeve and Quirt (1984)

Figure 7-7: Midwest (Main) deposit cross-section on L7865N, with host-rock alteration and mineralization.

The Midwest Main deposit is lens to cigar–shaped, 600 metres long with pods of higher grade mineralization separated by lower grade mineralization. The width ranges from 10 metres to over 100 metres. The zone thickness ranges from five metres to ten metres (Figures 7-8, 7-9).

Host-rock alteration at Midwest Main is dominated by bleaching and quartz dissolution in the sandstone, concentric illitic and chloritic clay mineral host-rock alteration haloes (Figure 7-8; (Hoeve & Quirt, 1984); Wray et al., 1985; (Quirt D. H., 2003)).

Unconformity mineralization is found directly at the unconformity contact, within conglomerates and coarse sandstones above the unconformity contact, and in minor amounts immediately below the unconformity in basement structures (Figure 7-9).

Host-rock alteration at Midwest Main is dominated by bleaching and quartz dissolution in the sandstone, illitic clay alteration, and development of grey zone chloritic alteration (Quirt D. H., 2012).

At Midwest A, unconformity mineralization is found directly at the unconformity contact, within conglomerates and coarse sandstones above the unconformity contact, and in minor amounts immediately below the unconformity in basement structures (Figure 7-8). Lithologies are similar to those present at Midwest Main. The mineralization located at the unconformity locally penetrates into the clay-altered basement units, but is mostly in the overlying sandstone. The thicker zones of sandstone mineralization are dominantly in conglomerate units at the base of the Athabasca sandstone. The Midwest A deposit is approximately 450 metres long, 10 to 60 metres wide, and ranges up to 70 metres in thickness. It occurs at depths ranging between 150 and 235 metres below surface.

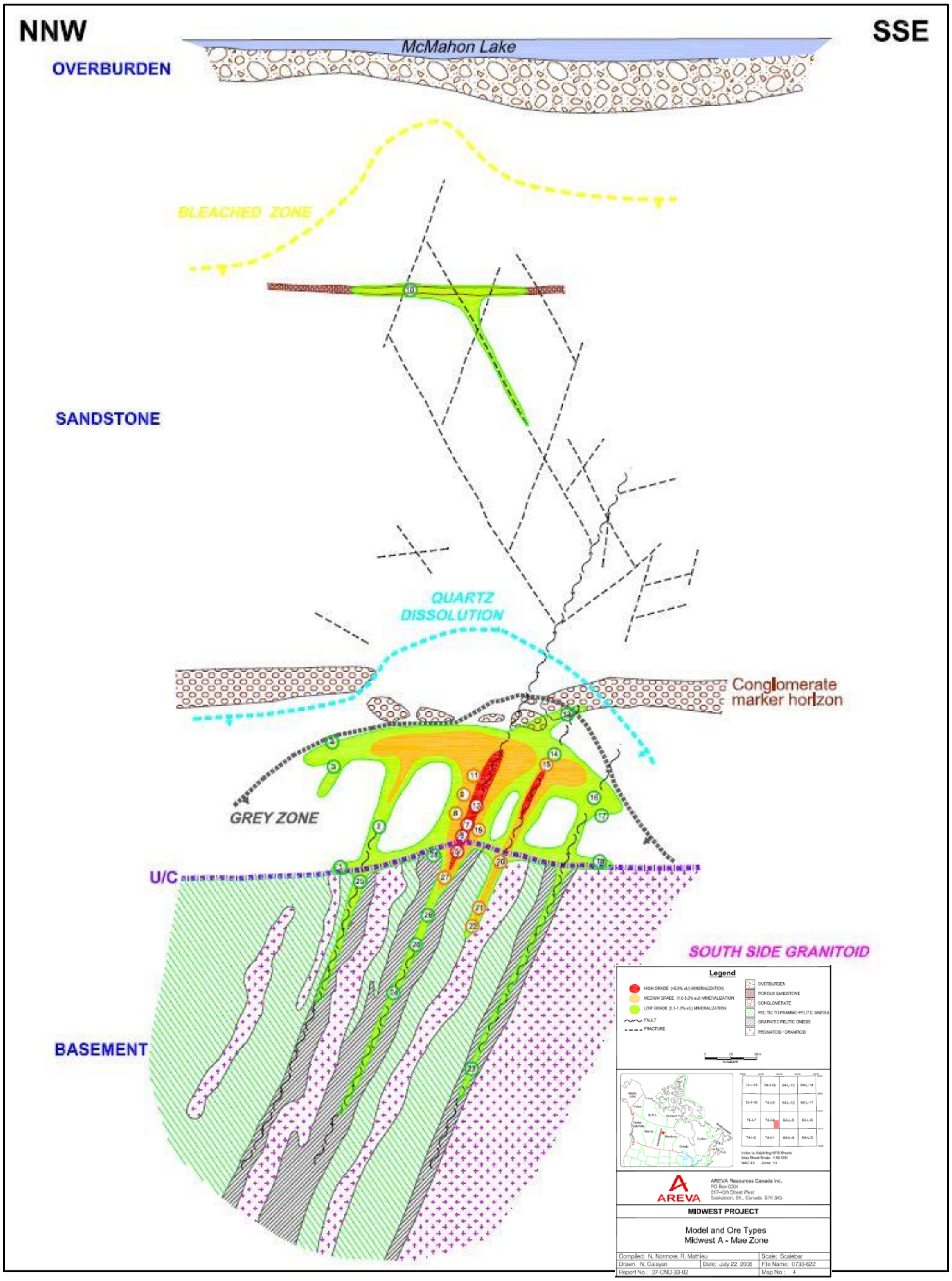


Figure 7-8: Schematic Geological Section for the Midwest A Deposit.

Host-rock alteration at Midwest A is dominated by illitic clay alteration, bleaching and quartz dissolution in the sandstone, and development of grey zone chloritic alteration (Quirt D. H., 2012).

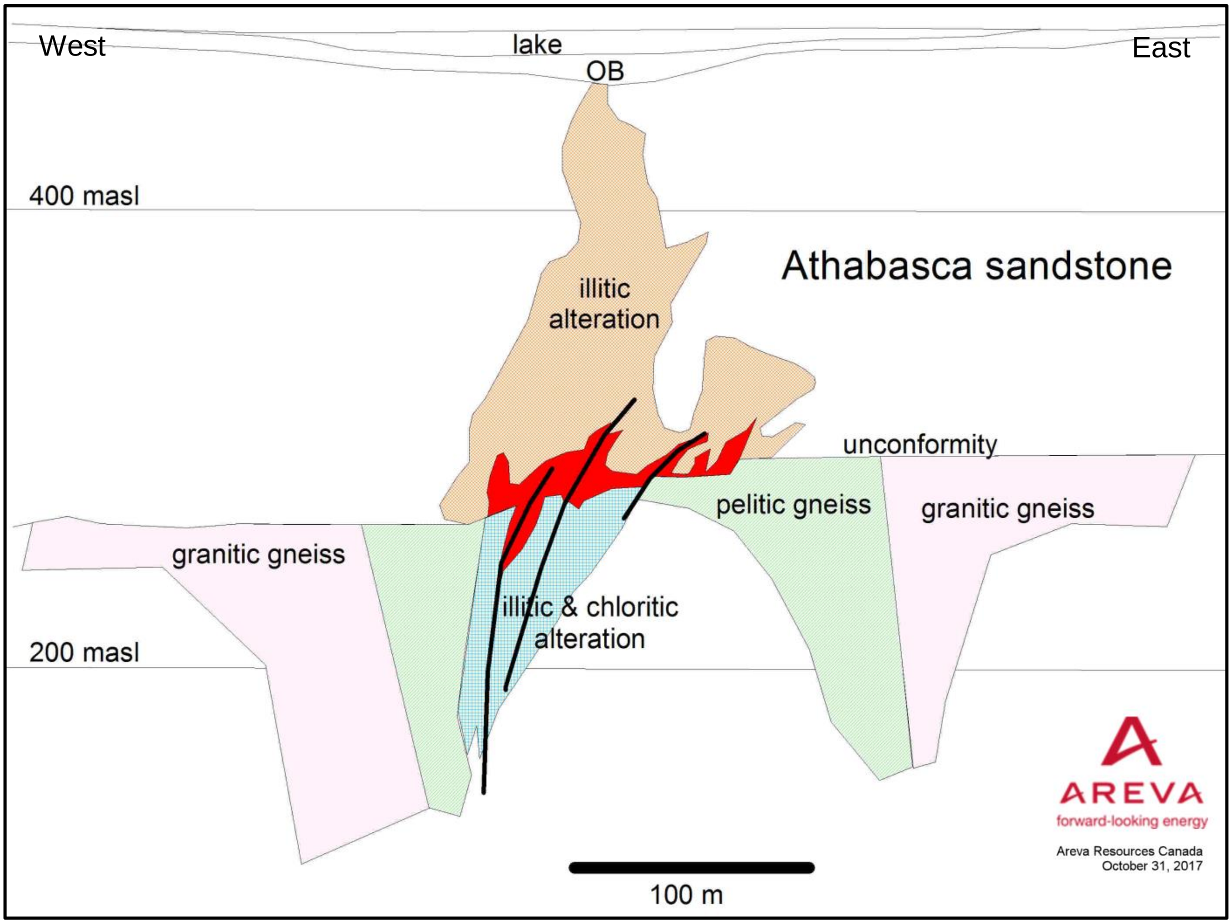
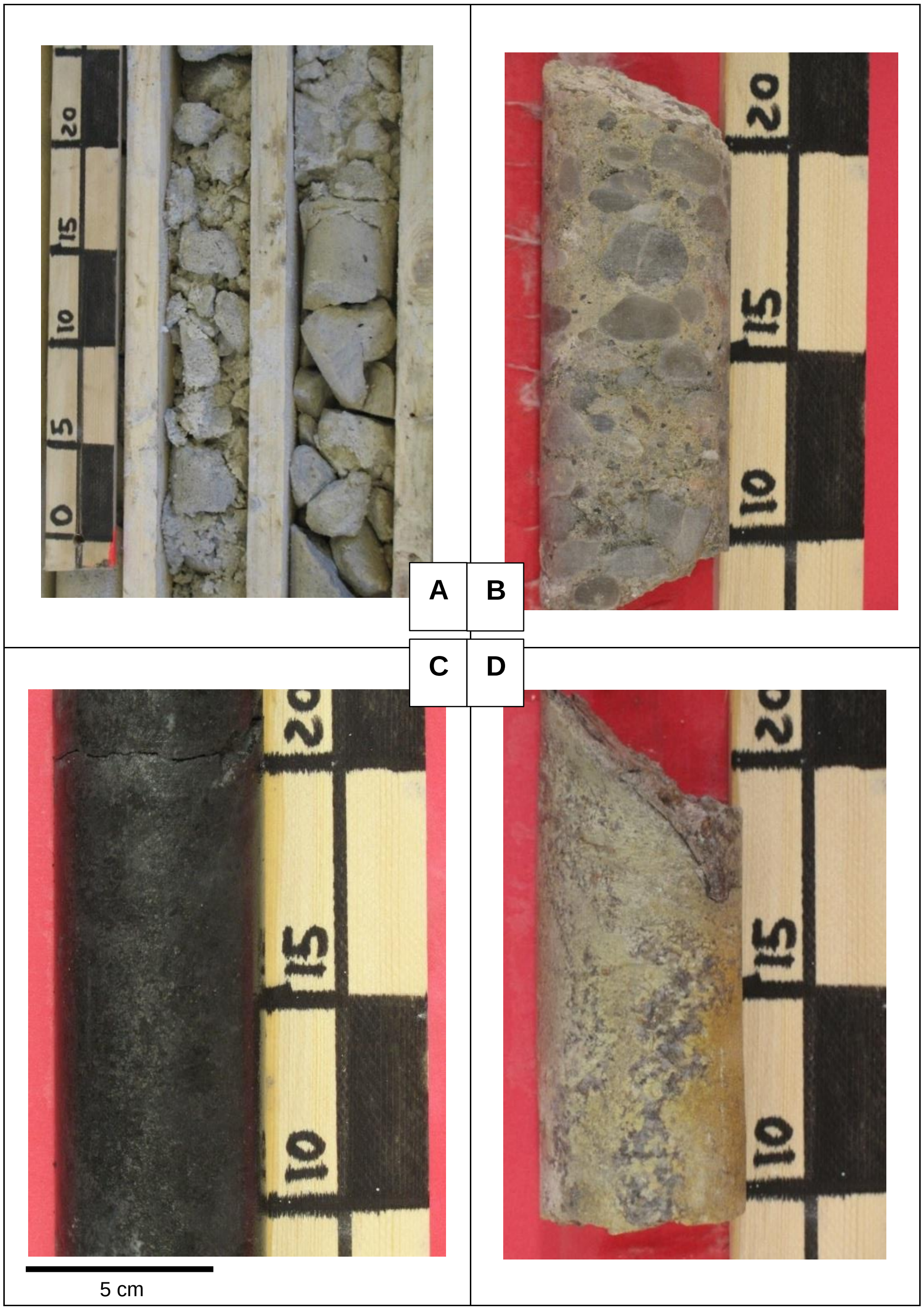


Figure 7-9: Schematic Geological Section for the Midwest Main Deposit.



(Mathieu, Bragg, Williamson, & Normore, 2008)

Figure 7-10: Typical lithologies from the Midwest project area: (A) bleached, desilicified, fractured Athabasca Group sandstone, (B) conglomerate marker horizon in Athabasca sandstone, (C) Graphitic gneiss, (D) clay-altered pegmatite. Scale in cm.

8 DEPOSIT TYPE

8.1 Uranium Deposit Type

The Athabasca Basin is one of the principal uranium producing districts in the world (Jefferson C. W., et al., 2007b) and it contains the world's largest high-grade unconformity-type (also called unconformity-related) uranium deposits (McArthur River and Cigar Lake). The Midwest uranium deposits (Midwest Main and Midwest A) are classified as typical egress-style unconformity-type uranium deposits (Figures 8-1, 8-2) that formed through diagenetic-hydrothermal basement-sandstone interaction (Hoeve & Sibbald, 1978); (Hoeve & Quirt, 1984); (Hoeve & Quirt, 1987). The IAEA definition of this type of deposit is: "Unconformity-related deposits comprise massive pods, veins, and/or disseminations of uraninite spatially associated with major unconformities that separate Paleoproterozoic metamorphic basement from overlying Paleoproterozoic-Mesoproterozoic siliciclastic basins" (IAEA, 2009).

Unconformity-type uranium deposits consist of pods, veins, and semi-massive replacements of pitchblende/uraninite resulting from diagenetic-hydrothermal basement-cover fluid-rock interactions and redox mineral reactions located close to unconformities between fluviatile conglomeratic sandstone and metamorphosed basement ((Hoeve & Sibbald, 1978); (Hoeve & Quirt, 1984) (Hoeve & Quirt, 1987); (Quirt D. H., 2003); (Jefferson C. W., et al., 2007b)). Complex redox-controlled reactions due to fluid-fluid and fluid-rock interactions resulted in precipitation of massive pitchblende, with associated hematite, and varying amounts of base and other metals.

A broad variety of deposit shapes, sizes, and compositions have been found (Figure 8-1). The deposits range from egress-style polymetallic lenses at and above the unconformity (Figures 8-1, 8-2), with variable Ni, Co, As, and Pb contents and elevated amounts of Cu, Mo, Zn, Au, S, Pt, and REEs, to ingress-style near-monometallic basement-hosted vein sets, with low base metal and REE contents. The ingress-style deposits are now generally recognized as "blind" deposits, having little to no expression in the overlying Athabasca sandstone and few direct clues for exploration (Hoeve & Quirt, 1984); (Quirt D. H., 1989); (Quirt D. H., 2003); (Jefferson C. W., Thomas, Quirt, Mwenifumbo, & Brisbin, 2007c).

The dominant location of egress-style mineralization can occur in the sandstone, directly above the unconformity (Cigar Lake, Sue A and B), straddling the unconformity (Collins Bay B Zone, Midwest Main, Midwest A, McClean North, Key Lake), or perched high above the unconformity (certain zones at McClean Lake, Midwest, Cigar Lake), or solely in the basement (Eagle Point, Sue C, Sue E, Millennium). The Millennium deposit contains mineralization both in the basement and at the unconformity, while the Shea Creek deposits contain mineralization in the basement, deep in the basement, at the unconformity, and perched in the sandstone. In some deposit areas, there is a plunge to the mineralized pods from sandstone-hosted to basement-hosted within deposit–scale strike lengths ((Rabbit Lake-Collins Bay-Eagle Point trend, Sue trend deposits, McClean North; (Quirt D. H., 2003)).

These mineralization types are also recognized based on fluid flow and varying interactions of fluid with fluid or rock, with two deposit/alteration styles (egress-style and ingress-style) being associated with mineralization (Figure 8-2). The egress-style formed through a fluid-fluid mixing process involving oxidized basinal brine and relatively reduced fluid emanating from the basement ((Hoeve & Sibbald, 1978); (Hoeve & Quirt, 1984); (Quirt D. H., 1989)). A Fe-U redox couple resulted in precipitation of pitchblende and hematite (plus Fe, Cu, Pb sulphide, and Co-Ni arsenide and sulph-arsenide minerals) at locations of relatively stable sites of this fluid mixing (Hoeve & Quirt, 1987). The presence of mobile hydrocarbons likely also aided in the mineralization process (Hoeve & Quirt, 1984). The ingress-style formed through a fluid-rock interaction process involving the oxidized basinal brine entering the basement along fault/fracture zones and interacting/reacting with ferrous iron-bearing wall-rock. This interaction also resulted in a Fe-U redox couple and precipitation of pitchblende and hematite.

The diagenetic-hydrothermal metallogenetic model (Hoeve & Sibbald, 1978); (Hoeve & Quirt, 1984); (Wallis, Saracoglu, Brummer, & Golightly, 1985); (Quirt D. H., 1989); (Quirt D. H., 2003); (Jefferson C. W., Thomas, Quirt, Mwenifumbo, & Brisbin, 2007c); among others) relates uranium mineralization to diagenetic processes within the Athabasca Group sediments. The model attributes the origin of uranium mineralization to fluid interaction between oxidized Athabasca basinal brines and variably reduced basement fluids in an intimate coupling of diagenesis, basin evolution, and formation of mineralization, particularly in periods of active tectonics. The source of metals in the unconformity-type deposits is still a contentious issue (Jefferson & Delaney, 2007); (Jefferson C. W., et al., 2007a); (Jefferson C. W., et al., 2007b); (Jefferson C. W., Thomas, Quirt, Mwenifumbo, & Brisbin, 2007c). Available evidence suggests that the constituents of the Athabasca unconformity-type uranium deposits were derived from both sandstone and basement sources.

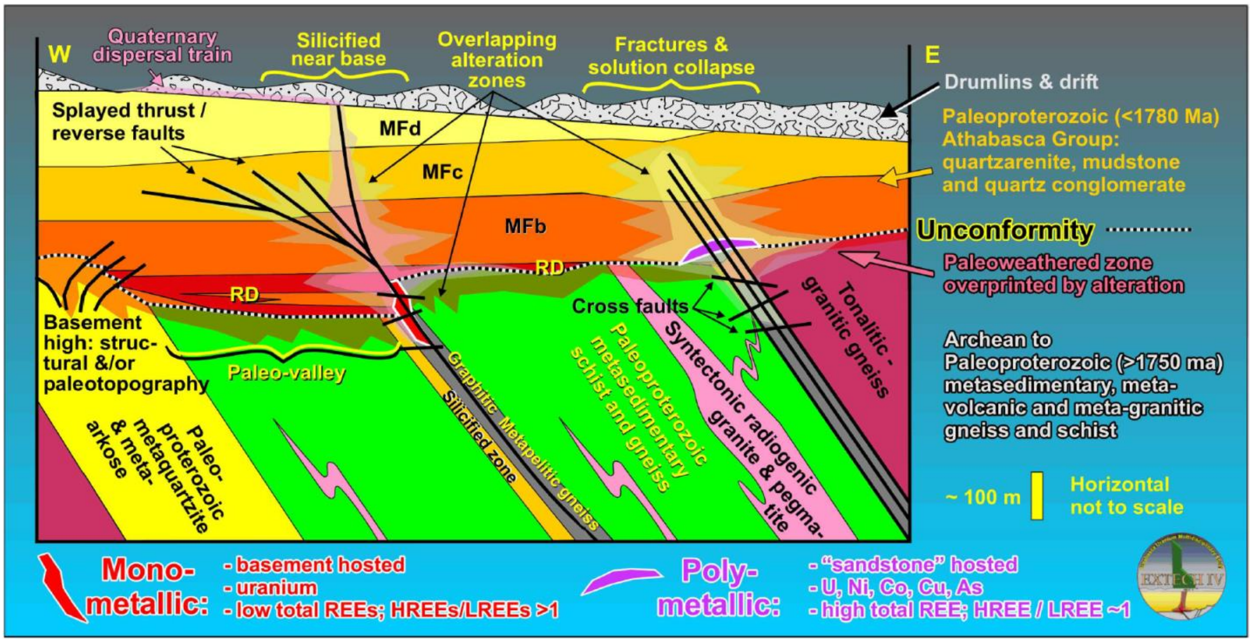
Diagenetic-hydrothermal systems of basement-sandstone interaction developed in many structurally-controlled locations along traces of graphitic basement rocks sub-cropping at the unconformity (Hoeve & Quirt, 1984). Significant mineralization precipitated only where local hydrodynamic conditions were conducive to the formation of a stationary redox front (Hoeve & Quirt, 1987).

8.2 Host-Rock Alteration

As noted above, the two main types of unconformity-type uranium deposit paragenesis in the Athabasca Basin are dictated by the form of fluid interaction and can be separated by deposit location ((Quirt D. H., 2003); Figure 8-2)):

1. **Sandstone-hosted** egress-style (e.g. McClean North, JEB, Sue A and B, Collins Bay, Midwest, Cigar Lake, Key Lake) involving mixing of oxidized sandstone brine with relatively reduced fluids issuing from the basement into the sandstone, and

2. **Basement-hosted** ingress-style (eg. Sue C, Sue D, Sue E, Eagle Point, Rabbit Lake, Millennium) involving fluid-rock reactions between oxidizing sandstone brine entering basement fault zones and the wall rock.



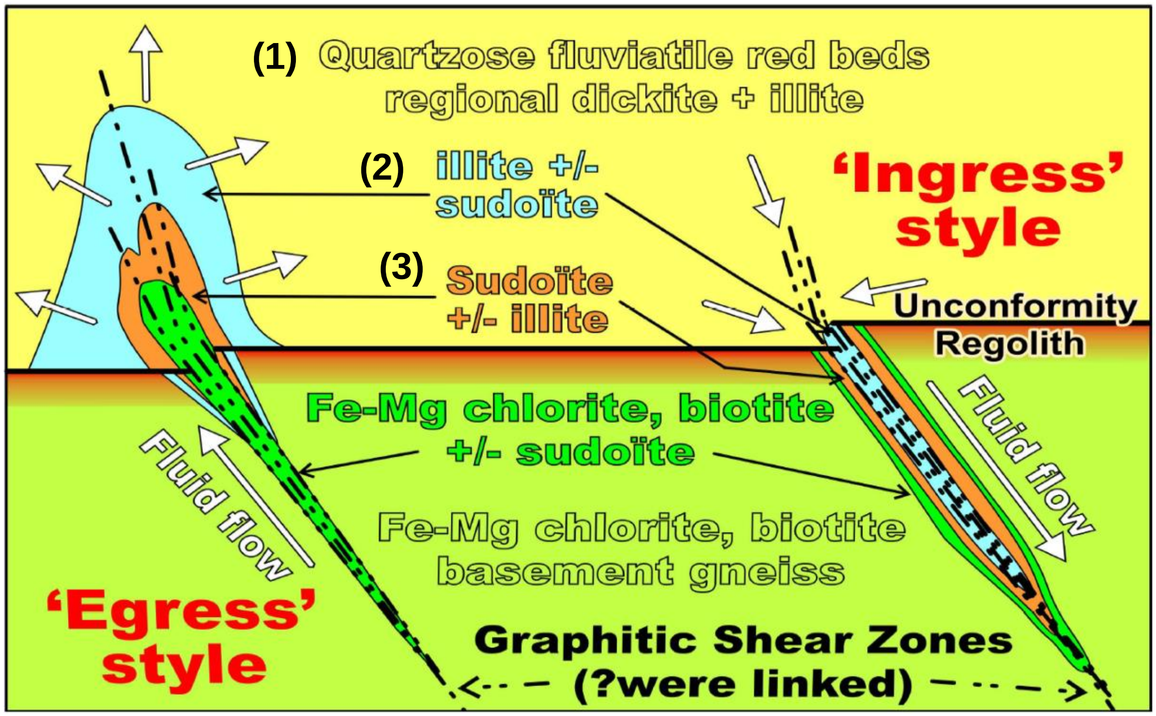
Jefferson et al. (2007b,c)

Figure 8-1: Geological elements of mono-metallic and poly-metallic unconformity-type uranium deposits.

Both styles of mineralization and associated host-rock alteration occurred at sites of basement-sandstone fluid interaction where a spatially-stable redox gradient/front was present. The mineralization-associated host-rock alteration is distinct from the diagenetic alteration in the sandstone, and overprints the paleoweathering profile commonly observed in the upper part of the crystalline basement (Hoeve & Quirt, 1984).

In the sandstone, the host-rock alteration halos have a plume-shaped expression in and above the hosting structure, forming a series of onion skin-like mineralogical zones (Figure 8-2). In the sub-Athabasca basement, host-rock alteration comprises extensive clay mineral alteration (chloritization, illitization) of original retrograde metamorphic and/or paleoweathering mineralogy, conversion of clay mineral species, quartz dissolution, and bleaching. The alteration associated with basement mineralization is tightly constrained to the fracture- and fault-hosted mineralization, forming a sharp funnel-shaped alteration feature.

The hydrothermal alteration associated with mineralization comprises varying degrees of chloritization, hematization, bleaching, tourmalinization, illitization, kaolinization, and silicification and/or de-silicification. The alteration types may affect the basement rocks, the overlying sandstone, or both.



Jefferson et al. (2007b,c), after Quirt (1989, 2003)

Figure 8-2: Egress versus ingress-style alteration zones for unconformity-type uranium deposits.

Visually, the most conspicuous aspect of sandstone alteration is bleaching, the chemical reduction of ferric iron shown by white and creamy, to locally olive-green, bleached colours resulting from the removal of hematite from the normally purple or pink sandstones of the lower Manitou Falls Formation (Hoeve & Quirt, 1984). Discontinuous, patchy, to locally abundant diagenetic bleaching occurs in the sandstone, but host-rock alteration-related bleaching is pervasive in alteration haloes. The sub-Athabasca paleoweathering profile is similarly bleached where affected by host-rock alteration. Frequently, the bleached rock is separated from the purple hematitic rock by a narrow zone of orange-red to brick-red coloration. Basement "bleaching" is a result of destruction (argillization) of ferromagnesian minerals. The bleaching is fracture- and permeability-controlled, forming haloes around micro-fractures, joints, and faults, and it laterally advances along zones parallel to lithological bedding/foliation.

Hematite alteration also occurs both as a diagenetic and a hydrothermal process. The diagenetic alteration occurs disseminated throughout the sandstone and in the paleoweathered basement, and is typically a purplish-red colour. Hydrothermal hematite occurs very close to the mineralization, usually within a metre, and where strongly developed is an ochre-red or brick-red colour. It is ubiquitous along well-developed redox fronts.

Most sandstone-hosted deposits display dominant desilicification features resulting from dissolution of quartz (overgrowths and detrital quartz grains in the sandstone and quartz crystals/grains in the basement) reducing the rock to rubbly semi- to unconsolidated material or to clay. It is a result of the interaction of the mineralizing fluids with the host rock and most commonly it occurs surrounding "perched" mineralization or above mineralization located at the unconformity. Desilicified material contains coincident abundant accumulations of clay minerals (resulting from the volume reduction), now dominantly illite, and detrital minerals like zircon and tourmaline.

Silicification (euhedral/drusy quartz) commonly surrounds or overlies desilicified zones around egress-style halos in the sandstone and likely represents deposition of silica obtained from the de-silicified zones. It usually occurs distal to the mineralization.

Illite, particularly the 1Mt polytype, is characteristic of the clay mineral alteration halo around both sandstone-hosted and basement-hosted deposits (Laverret, et al., 2006). Sudoitic chlorite is often found in the core of the altered and mineralized zones. Around basement-hosted deposits, however, the host-rock alteration is relatively tightly restricted to the proximity of the mineralized veins, unlike the massive to semi-massive alteration occurring around the egress-type deposits. The encompassing alteration is dominantly chloritic, at the expense of ferromagnesian minerals like biotite, cordierite, and garnet (Eagle Point, Sue C). The alteration grades from illite, present adjacent to the veins, to illite-sudoite, to sudoite, and then to background Fe-Mg chlorite plus biotite (Quirt D. H., 1989).

Tourmalinization (Na-Mg borosilicate) occurs as cream-coloured to light bluish-white "dravite" (alkali-deficient dravite) that both replaces country rock and occurs as vein fillings. Dravite can be porcelain-like in texture and it is common as a proximal alteration mineral.

The Midwest Main and Midwest A deposits are a typical 'egress-type' deposit, in which alteration zones (1), (2), and (3) extends into the sandstone (Figure 7-9; Figure 8-2).

9 EXPLORATION

The chronology of exploration on the Midwest property is described in Section 6. The drilling history of the Midwest Main and Midwest A deposits is described in Section 10.

The exploration tools of choice include airborne and ground geophysical surveys. Figure 9-1 shows a composite map of geophysical results from the early stages of exploration at the Midwest property, compiling seismic, gravity, magnetics and EM result interpretations from the 1970's Geoterrex survey. Figure 9-2 displays a colour-enhanced resistivity anomaly map of the lower sandstone bench (comprising the last 30 metres of sandstone above the unconformity) from pole-pole DC-resistivity surveys carried out in 2006 and 2008. The Midwest Main deposit (circled in red on Figure 9-2) occurs at the intersection of several cross-cutting low-resistivity features, related to faulting, with the NE-trending resistivity-low related to the graphitic pelitic metasediments and associated NE-striking faults.

Figure 9-1 shows a resistivity anomaly map at a depth of 250 metres (30 metres above the unconformity level) from a pole-pole DC-resistivity survey over the Midwest area. The survey was carried out in 2006 and involved 45.5 kilometres of line cutting, 33.3 kilometres of DC-resistivity, as well as 21.5 kilometres of small moving loop EM, along 21 lines spaced at 200 metre intervals (Figure 9-4). The known uranium occurrences in the area lie within a long resistivity low corresponding to the EM conductor associated with the graphitic pelitic gneiss units in the basement. The Midwest A deposit occurs at a jog/bend in the conductor trace where the conductor shifts directions (Bingham, 2007).

The other exploration tools of choice are rock geochemistry and clay mineralogy of drill hole core samples, mostly to define alteration haloes in the overlying Athabasca sandstone and vectors toward mineralization. Some historical drill holes on the property have been re-logged for that purpose. Through diagenetic processes, detrital and authigenic kaolinite transforms into well-crystallized dickite and then the kaolin is altered into diagenetic illite. Subsequent diagenetic-hydrothermal processes (Section 8) result in the formation of pervasive illitic and chloritic alteration in locations of basement-sandstone interaction, often with accompanying uranium mineralization.

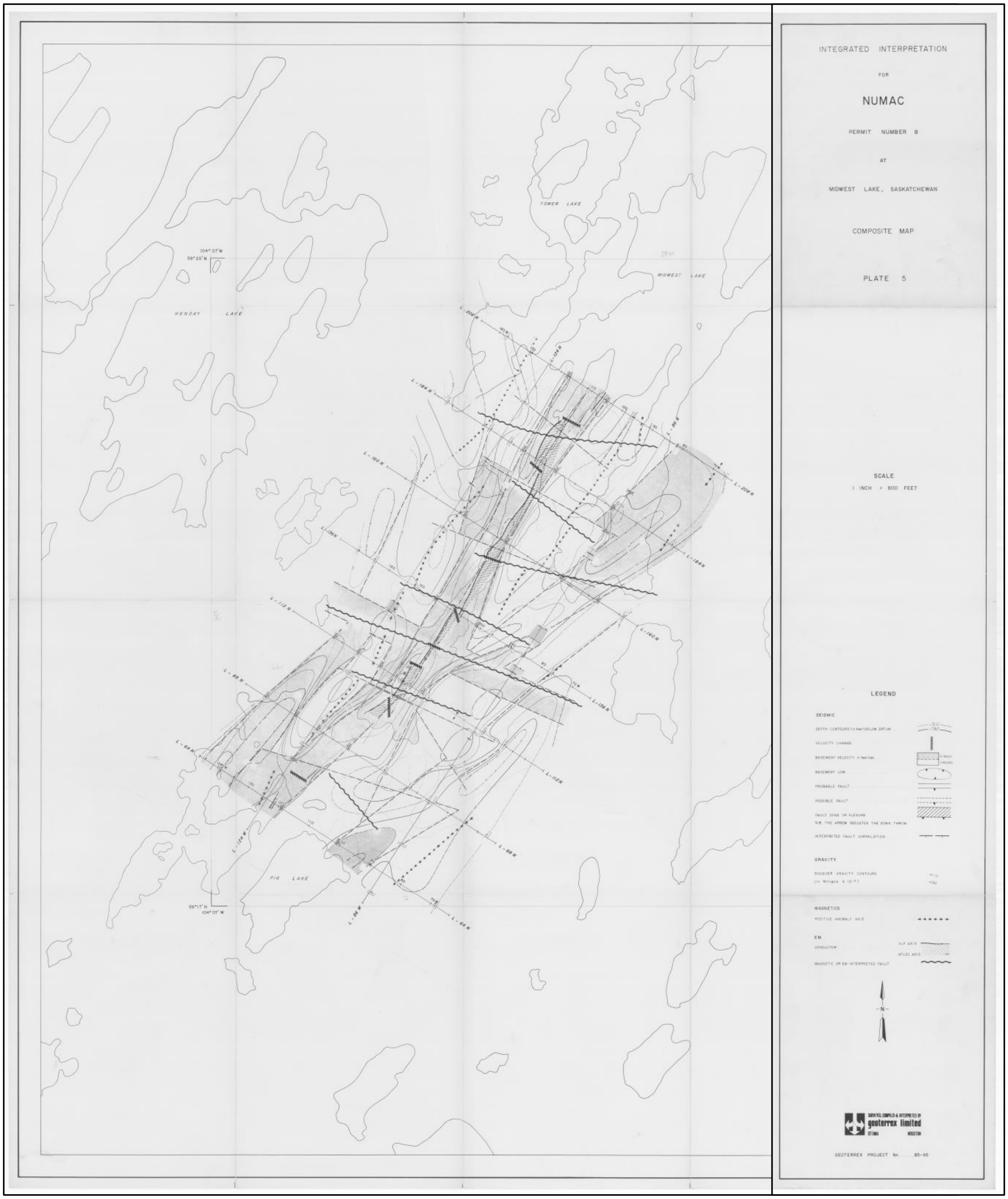


Figure 9-1: Composite map of geophysical interpretation of seismic, gravity, magnetics and EM results (GEOTERREX, 1970)

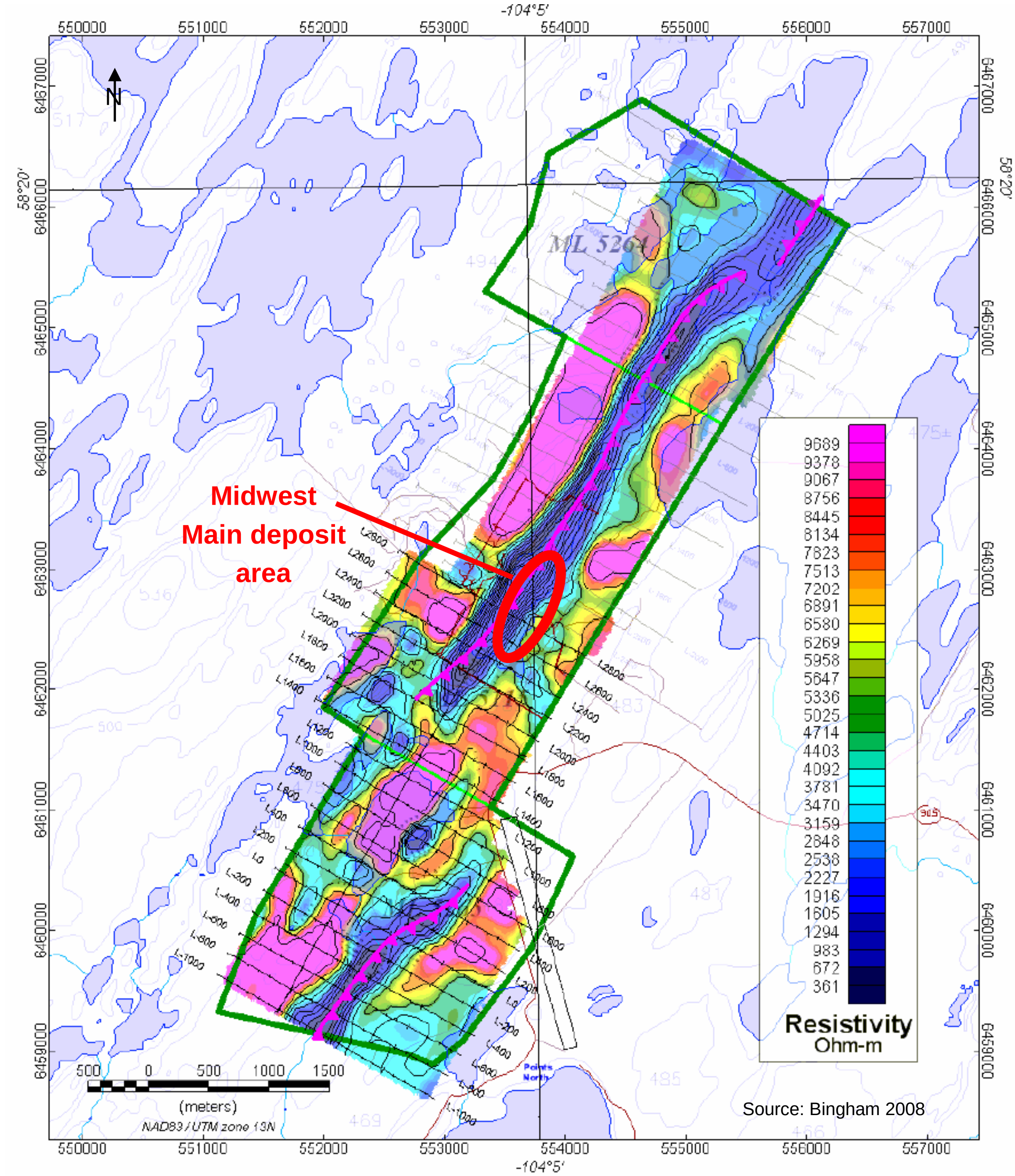


Figure 9-2: Inverted ground resistivity anomaly (colour enhanced) in the lower sandstone bench over the Midwest Project area (2006 and 2008 surveys).

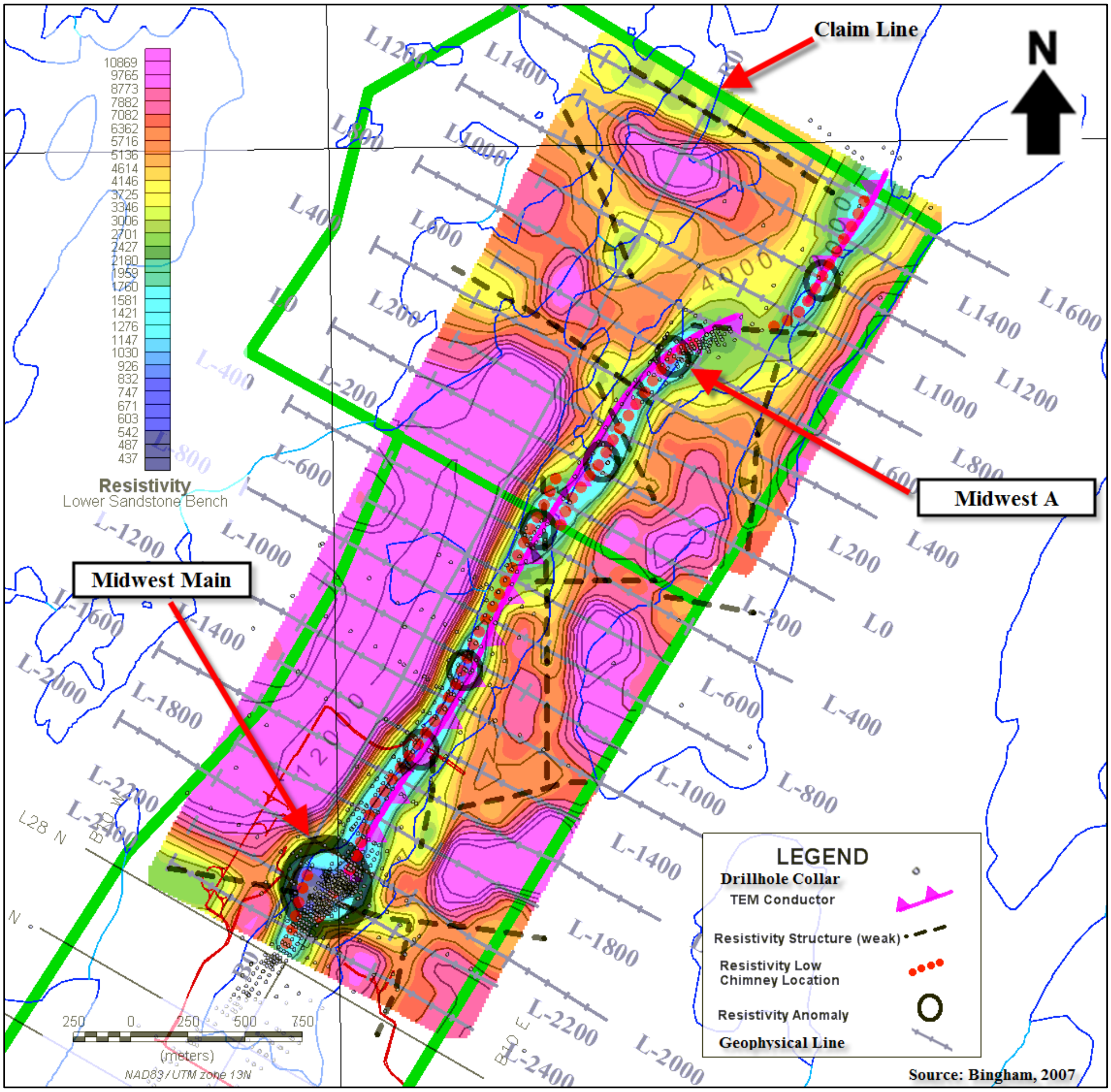


Figure 9-3: Ground resistivity anomaly at depth of 250 metres (30 metres above the unconformity) over the Midwest Project area

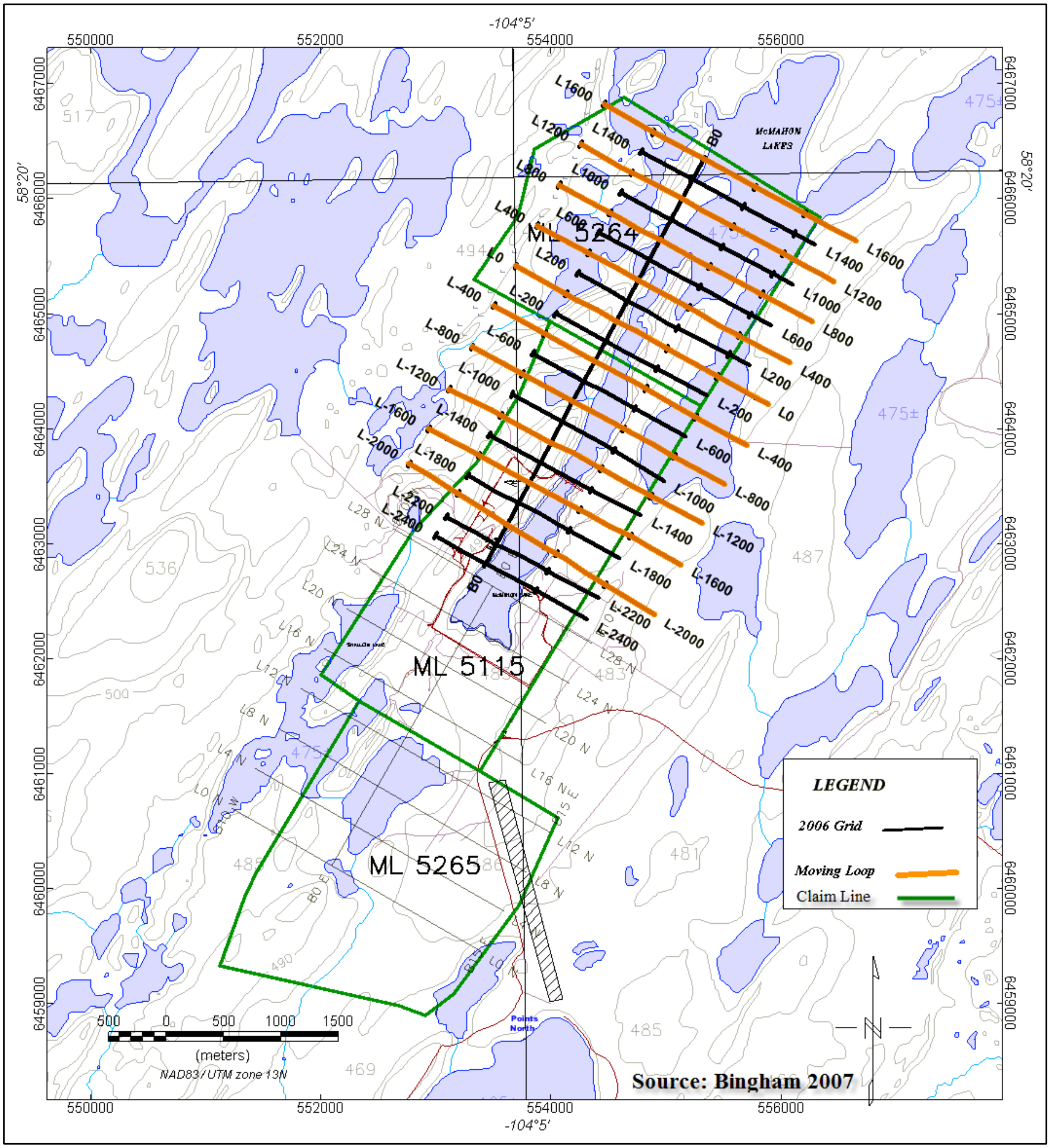


Figure 9-4: Geophysical lines from the 2006 exploration program

10 DRILLING

10.1 Type, Methodology, and Extent of Drilling

10.1.1 Midwest Main

Exploration and delineation diamond drilling of the Midwest Main deposit was primarily carried out through continuous NQ (47.6 millimetres diameter) and BQ (36.4 millimetres diameter) wireline coring for exploration holes, and PQ (85.0 millimetres diameter) coring for geotechnical holes. Most drill holes were vertical and extended between 10 to 100 metres below the unconformity. Definition drilling of the ore body has been completed at 7.5 metre drill spacing with drill sections positioned every eight metres.

Prior to 2005, nearly all the drill holes were drilled vertically, with the exception of some PQ-series drill holes that were drilled in 1982 for geotechnical purposes. Post-2005, the drill hole trajectories have included a mix of inclined and vertical drill holes. Inclined drilling techniques were used in part to obtain oriented structural measurements and in part when ice drilling locations were inaccessible due to climatic conditions and land drilling was required to test targets below the lake.

Table 10-1 provides the drilling extents, characteristics, and results of drill holes within the Midwest Main project area. Most pre-2005 drilling was carried out in the vicinity of the Midwest Main deposit area, while most 2005-2009 drilling was carried out in the vicinity of the Midwest A deposit and between the two deposits.

Table 10-1: Midwest Main Deposit Drilling summary

*Drilling results are based on a cut-off grade of 0.05% U (0.06% U_3O_8).

	YEAR	EXTENT OF DRILLING	DRILLING COMPANY	DRILLING INFO	DRILL HOLE PATH	RESULTS
	1970	(11 drill holes, 1231 m)	*Unknown*	*Unknown*	*Unknown*	Exploration drilling. No drill holes reached basement. No uranium mineralization was discovered.
	1971	71N-1 to 71N-91 (91 drill holes, 1700 m)	*Unknown*	BQ *Drill type unknown*	Vertical Inclined (71N-48 and 71N-52).	Exploration drilling. No drill holes reached basement. No uranium mineralization was intersected.

	YEAR	EXTENT OF DRILLING	DRILLING COMPANY	DRILLING INFO	DRILL HOLE PATH	RESULTS
	1975	75-1 to 75-25 (25 drill holes, 800 m)	*Wescore Drilling Ltd. (Invermere, BC)*	AQ	Inclined	Exploration drilling. No drill holes reached basement. No radioactivity higher than background was detected in the core.
Esso	1977	77-1 to 77-3 **(3 drill holes, 930.6 m)**	Midwest Drilling	NQ *Drill type unknown*	Vertical	Exploration drilling targeting the pre-Athabasca unconformity. Drill hole 77-2 intersected weak uranium mineralization in unconsolidated sand located in a steeply-dipping sheared zone above the unconformity.
Esso	1978	MW-1 to MW-175 series **(136 drill holes, 30,227.4 m)**	Midwest Drilling	NQ *Drill type unknown*	Vertical	Exploration drilling assessing the significance of the weak mineralization intersected in 1977 led to the **discovery of the Midwest lake deposit**. The first drill hole (MW-1) intersected two mineralized intervals: 9.5 m at 0.13% U_3O_8 and 1.2 m at 8.73% U_3O_8.
Esso	1978	**5001 to 5006 (6 drill holes, 1,361.1 m)**	*Unknown*	*Unknown*	Vertical and inclined	Geotechnical drilling (?) mostly drilled on the west shore of the lake. Hole 5005 was drilled on the east shoreline. Also known as the MP series (MP-1 to MP-6).
Esso	1979	MW-176 to MW-373 series **(98 drill holes, 20,788.6 m)**	Midwest Drilling	NQ *Drill type unknown*	Vertical	Delineation drilling for mineralized body detailing. 27 geotechnical drill holes included.

	YEAR	EXTENT OF DRILLING	DRILLING COMPANY	DRILLING INFO	DRILL HOLE PATH	RESULTS
Canada West Mine Ltd.	1980	MW-378 to MW-467 **series** **(86 drill holes, 19,530.6 m)**	Midwest Drilling	NQ *Drill type unknown*	Vertical	Delineation and exploration drilling.
	1981	MW-485 to MW-643 series **(156 drill holes, 33,686.3 m)**	Midwest Drilling	NQ *Drill type unknown*	Vertical	Delineation and exploration drilling. 6 holes were drilled for geotechnical purposes. This program includes the extension of drill hole 5003 (MP-3) originally drilled in 1978.
	1981	**PQ series (29 drill holes, 5,821 m)**	Midwest Drilling	PQ *Drill type unknown*	Vertical	Geotechnical drilling including 22 completed drill holes, 6 wedges and one abandoned hole.
Denison	1987/1988	**GT1 to GT-2** **(2 drill holes, 503.3 m)**	Groundation/Golder Associates	NQ Longyear HC-150 drill rig	Vertical	Two shaft test drill holes on the east and west shores of the lake. Hydraulic conductivity and grouting tests were performed.
	1988?	**88-1 to 88-13 Series** **(13 drill holes, 95.8 m)**	*Unknown*	*Unknown*	*Unknown*	Series of short drill holes (0.7 m to 16.4 m in depth). No information.
	1989	BB1 to BB4 (4 drill holes, approx. 140m) WRM1 to WRM4 (4 drill holes, 173 m)	Thyssen Schachtbau	Robbins RBM-7		Mine testing program. Underground geotechnical blind bore holes (BB Series) and extensometer holes (WRM Series). An additional 4 piezometers holes and 2 pump stations were mentioned in reports but no drilling records were found.

	YEAR	EXTENT OF DRILLING	DRILLING COMPANY	DRILLING INFO	DRILL HOLE PATH	RESULTS
Cogema/AREVA	2004	MWG04-01 to MWG04-04 (4 drill holes, 1,227 m)	*Unknown*/ Golder Associates	NQ LY-44	Inclined	Geotechnical drilling for pit slope design studies around the provisional open pit margins.
	2006	2006-WR-01 to 2006-WR-04 (4 drill holes, 339 m)	Boart Longyear Drilling (Saskatoon, SK).	NQ to BQ when warranted. LF-70 diamond drill.		Geotechnical drilling to determine waste rock pile geochemistry. Short drill holes.
	2006	MW-677, MW-678, MW-685 **(3 drill holes, 929.8 m).**	Boart Longyear Drilling (Saskatoon, SK).	NQ to BQ when warranted. LF-70 diamond drill.	Inclined	Exploration drilling focused on basement mineralization targets. MW-685 confirmed the presence of basement mineralization in the north-end of the Midwest deposit (2.4 m at 0.99% U_t with 3.3% U_t over 0.6 m).

Exploration diamond drilling on the Midwest property began in 1970, after the 1960's discovery of a well-defined radioactive boulder train at the southwest end of the Mink Arm of McMahon Lake (Simpson & Sopuck, 1983). The distribution of the uranium mineralization indicated some fracture control. Diamond drilling, aided by various geophysical and till geochemical surveys, was done during subsequent years in attempts to locate the location from which these boulders were derived.

The 1970 diamond drill program (11 BQ drill holes for 1,231 metres) was performed in an attempt to confirm the NE and NW-trending structural features indicated by geophysical surveys. They were not confirmed by the diamond drilling and no uranium mineralization was intersected.

The 1971 diamond drill program consisted of 91 short drill holes, totalling 1,700 metres, located to test for mineralization of the type discovered in the boulder train. Core was 1-7/16 inch diameter BQ wireline. Minor difficulties with caving and sanding were encountered when drilling in overburden. Mud drilling techniques were used. Drill holes 71N-1 to 71N-15 inclusive were drilled vertically to about three metres into bedrock. Holes 71N-48 and 71N-52 were drilled to approximately 100 metres into bedrock, at a dip of -48°. All other drill holes were drilled vertically to approximately six metres into bedrock. No mineralization was intersected.

In 1975, Numac contracted Wescore Drilling Ltd. to perform 25 inclined diamond drill holes totalling 800 metres on ML 5115 to test for uranium-mineralized structures striking parallel to the radon soil gas anomaly and the uranium mineralized boulder at Mink Arm. AQ wireline core was recovered and no radioactivity higher than background was detected in the core.

Following public reporting of the discovery of the Key Lake unconformity-type uranium mineralization in 1975, Esso, who became the project operator in 1977, carried out a small drill program during the winter of 1977 with three drill holes totalling 930.6 metres. Unlike all previous drill programs on the property, these drill holes were drilled to reach the sub-Athabasca basement. Intersection of the first mineralized occurrence on the Midwest project occurred in the second drill hole of the program (drill hole 77-2) within poorly-consolidated sandstone directly above the unconformity.

Extensive follow-up drilling was then conducted on the Midwest project by Esso/Canada West Mines Ltd. from 1978 to 1981, including exploration, delineation, and geotechnical drilling. The first drill hole of the 1978 program confirmed the discovery of the Midwest deposit with two mineralized intersections of 9.5 metres at 0.13% U_3O_8 and 1.2 metres at 8.73% U_3O_8. Esso contracted Midwest Drilling to conduct the mostly vertical drilling using NQ rods. A total of 352 drill holes (75,888.1 metres) were drilled on the Midwest property in 1978 and 1979, of which 240 drill holes (52,376.6 metres) were drilled within the Midwest Main deposit area. In 1978 and 1979, six drill holes (MP-series) and 27 drill holes, respectively, were drilled for geotechnical purposes. In 1980, Canada West Mines Limited, a subsidiary of Esso, took over responsibility for work carried out on the Midwest project. A total of 311 delineation and exploration drill holes (including geotechnical/piezometers holes) were drilled in 1980 and 1981 on the Midwest property by Midwest Drilling, totalling 67,847.3m. Of the 311 drill holes, 272 holes were drilled at the Midwest Main deposit (59,256.7 metres). The coring diameter of choice was mostly NQ, being reduced to BQ when warranted by ground conditions. Additionally, twenty-nine PQ drill holes were performed within the deposit area in 1981 for a bulk sampling program that was aimed to obtain material for use in metallurgical pilot plant testing.

During 1988 and 1989, the Midwest Joint Venture, then operated by Denison Mines, completed a test mine program under the Mink Arm of South McMahon Lake. The key objective of the test mining was to provide sufficient information on ground conditions, hydrogeology, and potential radiation hazards to be able to establish the mining plan for the Midwest deposit (Bharti Engineering Associates, 1989). In preparation for the test mine, two NQ test shaft holes were drilled in 1987-1988 on either side of the lake with a Longyear HC-150 drill rig under the supervision of Golder Associates. Hydraulic conductivity and grouting tests were performed. The west shore location was used for the construction of the shaft. In 1989, Bharti Engineering Associates (BEA) completed a geotechnical, groundwater, and blind boring evaluation during test mining in conjunction with Adrian Brown Consultants. Thyssen Mining Construction completed the blind boring of two 1.2 metre diameter holes in September and October 1989 in conjunction with MJV personnel. Blind boring was carried out to test the technical feasibility of obtaining high-grade mineralization from a mining station located roughly 25 meters above the mineralized body. A Robbins raisebore machine (RBM 7) with a modified drilling system was installed in the underground cross-cut to bore, without a pilot hole, a 1.2 metre diameter hole was drilled vertically downwards into the mineralization. Extracted cuttings were stored in a containment vessel for hoisting to surface. In conjunction with the blind bore test, methods of sampling, solids/liquids separation, and uranium mineralization containment were being tested for the first time.

In 1989, PNC conducted exploration drilling using Connors Drilling of Kamloops, B.C. to drill NQ diamond drill holes on targets outside the Midwest Main deposit area. Drilling activities then remained dormant until 2004, under Cogema/AREVA project operatorship.

In 2004, Golder was contracted by Cogema to drill four inclined NQ geotechnical holes (totalling 1,227 metres) to provide data and recommendations regarding pit slope design criteria. The drill holes were oriented using the Ball-Mark system and the drill core was geotechnically logged.

Exploration activities on the Midwest property resumed in 2005 and extended until 2009 under Cogema/AREVA operatorship. With the discovery of the Midwest A deposit in 2005, most of the drilling between 2005 and 2009 focused on areas outside of the Midwest Main deposit (Midwest A, Josie, Camille, and Dam Pod areas). In 2006, three drill holes (929.8 metres) were completed in the north end of the Midwest Main deposit to test a basement target identified by the Mining Department. The first two holes, MW-677 and MW-678, were mistakenly drilled magnetic west instead of mine grid west, and therefore did not test the target as planned. The third drill hole, MW-685, intersected the target mineralization. Additionally, four short geotechnical holes (totalling 339 metres) were completed to provide material for testing the geochemistry of planned waste rock regions. AREVA contracted Boart Longyear (Saskatoon, SK) to perform the extensive drilling programs occurring between 2005 and 2009. The drilling equipment consisted of LF-70 diamond drills with HW and NW casing, and HQ, NQ, and BQ rods. An enviro-shack was placed on site to collect drill cuttings if the hole produced return from near or within the mineralized zone.

No information has been found regarding the muds or lubricants used for historical drilling (pre-2005). Boart Longyear used NL165, 550X, 551X polymer, and bentonite maxi-gel. EZ mud was also used in clay-rich areas to avoid expansion. Viscosity and density of the slurry were not systematically measured. Viscosity and density of the slurry at outside temperature (roughly 15 degrees Celsius) were measured on site on October 16th, 2007. The dynamic viscosity ranged between 41 and 44 mPa.s (for comparison water is 1 mPa.s, oil is 57 mPa.s) and the density varied from 8.5 to 8.9 lb/gallons.

Most historical drill core material (1971-1989) was stored at the original Midwest project core storage located adjacent to the east side of Mink Arm of South McMahon Lake (the Mink Arm core storage area). In 1979, most of the non-mineralized sandstone core obtained the previous year was dumped into the lake. In the 1990’s, poor-condition core from zones of little interest was disposed of, thus not all the Midwest historical core is currently available for examination. From 2005, all core acquired during drilling campaigns was stored at the Moffatt Lake exploration camp on the McClean Lake property. During the summer 2009, the relocation of most of the historical core remaining at the old Midwest core storage to the Moffatt Lake camp was completed.

10.1.2 Midwest A

Exploration and delineation drilling of the Midwest A deposit was primarily carried out through NQ wireline coring, reducing to BQ when necessary. Drill holes were mostly drilled vertically prior to 2005; whereas post-2005 the drill hole paths are a mix of inclined and vertical drill holes. Inclined drilling techniques were used in part to obtain oriented structural measurements and when ice drilling was inaccessible due to poor weather conditions. Delineation drilling of the Midwest A prospect was completed at a 25 metre line-spacing with unconformity intercepts targeted to be spaced at 12.5 metre spacing.

Table 10-2 shows the drilling extent, characteristics, and results of drill holes within, or in the vicinity of, the Midwest A deposit.

Table 10-2: Midwest A deposit drilling summary

*Drilling results are based on a cut-off grade of 0.05% U (0.06% U_3O_8).

	YEAR	EXTENT OF DRILLING	DRILLING COMPANY	DRILLING INFO	DRILL HOLE PATH	RESULTS
Esso	1979	MW-313 to MW-320 **(8 drill holes, 1,795.4 m)**	Midwest Drilling	NQ *Drill type unknown*	Vertical	Exploration drilling. First mineralized occurrences in the Midwest A area were intersected in the 'South Pod'. Best results encountered in MW-315 (0.85% U over 2 m*).
		MW-331 to MW-336 **(6 drill holes, 1,285.8 m)**				Exploration drilling. Testing the northern extension of mineralization intersected in the previous drill hole series. Best results occurred in MW-331 (1.80% U over 12 m*).
	1980	MW-337 to MW-339, MW-341, MW-343, MW-345 to 346 **(7 drill holes, 1,645 m)**	Midwest Drilling	NQ *Drill type unknown*	Vertical	Exploration drilling. Follow-up to the north-east of the encouraging results from 1979. High-grade mineralization of what was later called the Mae Zone (now Midwest A deposit) intersected by MW-338 (6.51% U over 3.8 m*).
Denison	1989	MW-652 to MW654 **(3 drill holes, 726 m)**	Connors Drilling (Kamloops, BC)	NQ Nodwell mounted wire-line drill	Vertical	Exploration campaign testing the north-eastern continuation of the Midwest main orebody. Three drill holes were drilled within the Midwest A deposit area but no high grade mineralization was intersected. Weak mineralization was found in three holes, with best results encountered in MW-652 (0.05% U over 3 m*).

	YEAR	EXTENT OF DRILLING	DRILLING COMPANY	DRILLING INFO	DRILL HOLE PATH	RESULTS
Cogema / AREVA	2005	MW-658 to MW664; MW-666, MW-668, MW-670 and MW-672 **(12 drill holes, 3,516 m)**	Boart Longyear Drilling (Saskatoon, SK)	NQ to BQ when warranted. LF-70 diamond drill	Inclined	Exploration drilling focused in the “North End area” to follow-up sandstone mineralization encountered within historical drilling (MW-338). Intersection of high grade sandstone mineralization with several lower grade zones extending to the unconformity. Best results occurred in MW-662 (1.12% U over 32.2 m*).
	2006	MW-673 to MW-676, MW-679 to MW-684, MW-686 to MW-707, MW-709, MW-710. **(34 drill holes, 9,356.2 m)**		HQ, NQ and BQ. LF-70 diamond drills	Vertical and inclined.	Delineation drilling of 2005 results in the “North End area”, now called the Mae Zone in 2006. Several holes encountered significant uranium mineralization. Best results were encountered in MW-691 (3.42% combined U and eU over 43.7 m*).
	2007	MW-712 to MW-742, MW-744 to MW-750; MW-752 to MW-762. **(49 drill holes, 13,726.8 m)**		NQ LF-70 diamond drills	Inclined (rarely vertical)	Drilling focused on central and south-west portions of the Mae Zone. Several new high-grade intercepts were encountered in both zones. Three holes contained >10 m of U mineralization with grades locally in excess of 10% U. Best results occurred in MW-749 (6.06% combined U and eU over 57.9 m*).
	2008	MW-763 to MW-772, MW-790 to MW-792, MW-794, 796, MW-798 to MW-810. **(29 drill holes, 7,118.7 m)**			Vertical and inclined	Drilling focused on the north-eastern and south-western extensions of the Midwest A deposit, increasing the extensions of the low-grade envelope of the deposit. Only one hole (MW-766) intersected medium-grade mineralization (0.45% mixed U and eU over 4.6m*).
	2009	MW-811 to , MW-834 series **(29 drill holes, 7,118.7 m)**				Drilling focused on the north-eastern and south-western extensions of the Midwest A deposit, increasing the extensions of the low-grade envelope of the deposit. Only one hole (MW-766) intersected medium-grade mineralization (0.45% mixed U and eU over 4.6m*).

Following the discovery of the Midwest Main deposit, exploration was carried out throughout the property to test several geochemical and geophysical anomalies. Esso contracted Midwest

Drilling to conduct 14 exploration drill holes (3,081.2 metres) in 1980 within the present Midwest A deposit area. Several mineralized occurrences were encountered, with the best results occurring in MW-331 (3.27% U over 3 metres). All drill holes were vertical and extended from a few metres to approximately 25 metres into the basement rocks using NQ rods. In 1980, seven vertical drill holes (1,645 metres) were drilled in the present Midwest A area, following the encouraging results from 1979. High-grade mineralization was encountered in several drill holes, but the results were not deemed economical at the time by the operator and no further drill testing was done in the area until 1989.

In 1989, PNC contracted Connors Drilling of Kamloops, B.C. to drill NQ diamond holes to drill test targets outside and north-east of the Midwest Main deposit. Three drill vertical drill holes using a Nodwell-mounted wireline drill were drilled in the Midwest A zone, extending less than 50 metres below the unconformity contact. The 1989 exploration program did not result in the intersection of any high-grade mineralization. While only weak mineralization was encountered, further drilling in the vicinity of MW-652 and MW-653 was deemed merited by Denison (Lida, Hasegawa, & Ahuja, 1990). However, exploration remained dormant until 2005.

In 2005, Cogema, who became the operator in 1994, contracted BOART Longyear Drilling to drill NQ and BQ diamond holes, including 12 drill holes (3,516 metres) to follow-up sandstone mineralization encountered within the historical drilling (MW-338). This drilling led to discovery of high-grade sandstone mineralization with several lower-grade zones extending from the unconformity. Best results occurred in MW-662 (1.12% U over 32.2 metres). This discovery was called the Mae Zone (now Midwest A). Drilling equipment consisted of one LF70 diamond drill rig with HW and NW casing, and NQ and BQ drill rods (Bell, 2005). Due to poor ice conditions on McMahon Lake that winter, all drilling activities were conducted from land with inclined drill holes extending out to the east. Therefore, the sandstone could not be adequately tested to the east of main mineralized trend.

In 2006, ARC (name changed from Cogema in 2006) contracted BOART Longyear Drilling for an extensive drilling program over the winter and the summer in the Midwest A area. Drilling equipment consisted of LF70 diamond drills with HW and NW casing, and HQ, NQ and BQ drill rods. An enviro-shack was on site to collect cuttings if the hole was producing return near or within the mineralized zone. Due to the poor ground conditions in the quartz dissolution zone around the mineralization, vertical holes proved to be problematic. Numerous holes were prematurely lost before reaching the desired depth. Even with HQ rods the ground problems persisted, so drilling methods were switched again to steeply-inclined holes, and the completion ratio improved. The inclined holes also worked better for intersecting the mineralized zones that were newly interpreted as steeply-dipping to the north-west, rather than as flat-lying lenses. A total of 34 drill holes were drilled in 2006 within the Midwest A area (Wheatley, Gudmundson, & Williamson, 2006), (Wheatley, et al., 2006).

In 2007, BOART Longyear Drilling was contracted for winter and fall drilling programs focusing on delineating the Midwest A deposit. Drilling equipment consisted of LF70 diamond drills with HW and NW casing, and HQ, NQ, and BQ drill rods. An enviro-shack was on site to collect cuttings if the hole was producing return near or within the mineralized zone, although this was very rare to non-existent due to the dissolved zone present above the mineralized zone. Overall, the overburden was drilled with NW casing, followed by NQ coring of the sandstone column and basement (Mathieu, Bragg, Williamson, & Normore, 2008).

In 2008, BOART Longyear Drilling drilled 48 diamond drill holes in the Midwest A area for ARC (MW-763 to MW-810 series), totalling 12,028 metres, using LF70 diamond drill rigs with HW and NW casing, and NQ and BQ drill rods (Mathieu, Normore, Blain, & Heasman, 2009).

BOART-Longyear used NL165, 550X, 551X polymer and bentonite maxi-gel. EZ mud was also used in clay-rich areas to avoid expansion. Viscosity and density of the slurry were not systematically measured. Viscosity and density of the slurry at outside temperature (roughly 15 degrees Celsius) were measured on site on October 16, 2007, with the dynamic viscosity ranging between 41 and 44 mPa.s (for comparison water is 1 mPa.s, oil is 57 mPa.s) and the density varying from 8.5 to 8.9 lb/gallon.

10.2 Drill Hole Collar Locations

Drill hole collars prior to 2006 were located by conventional grid survey and the locations were then later updated using a differential base station GPS system. The local mine grid was rotated approximately 32° clockwise from the UTM NAD83 grid north.

A field survey was performed in 2010 to convert historical grid coordinates to UTM NAD83 (Zone 13) for holes not drilled on McMahon Lake (Mink Arm) and either adjacent or within the proposed pit outline (Miller, 2011). The survey used a Trimble 5700-5800 RTK rover unit with a Pacific Crest PDL4335 position data link transmitting radio with a base station. Twenty-one historical drill hole collars out of 113 were located, with the majority of the remaining holes being located on the lake.

UTM coordinates for historical drill holes drilled on the McMahon Lake were obtained by derivation from a conversion formula built on the historical coordinates and the results of the 2010 field survey. Derived collar coordinates are noted as LEGACY in the Midwest database.

After 2006, drill hole collar locations were first measured with a Leica GS20 differential GPS unit, and since 2009 with a Trimble R6 differential GPS unit. The coordinate system for all of the drill collars is UTM NAD83 (Zone 13).

All drill hole collar locations from 2005 onwards were measured by ARC personnel. See Figure 10-1, Figure 10-2 and Figure 10-3 for the location of the collar coordinates located on the Midwest property and the Midwest Main area respectively. The collars shown in red represent holes drilled by ARC that have not been included in the last publically announced resource estimates. This includes an additional 40 drill holes completed at Midwest A from September 2007 to July 2008 (Figure 10-3). Representative cross-sections are shown in Figure 10-4 and Figure 10-5.

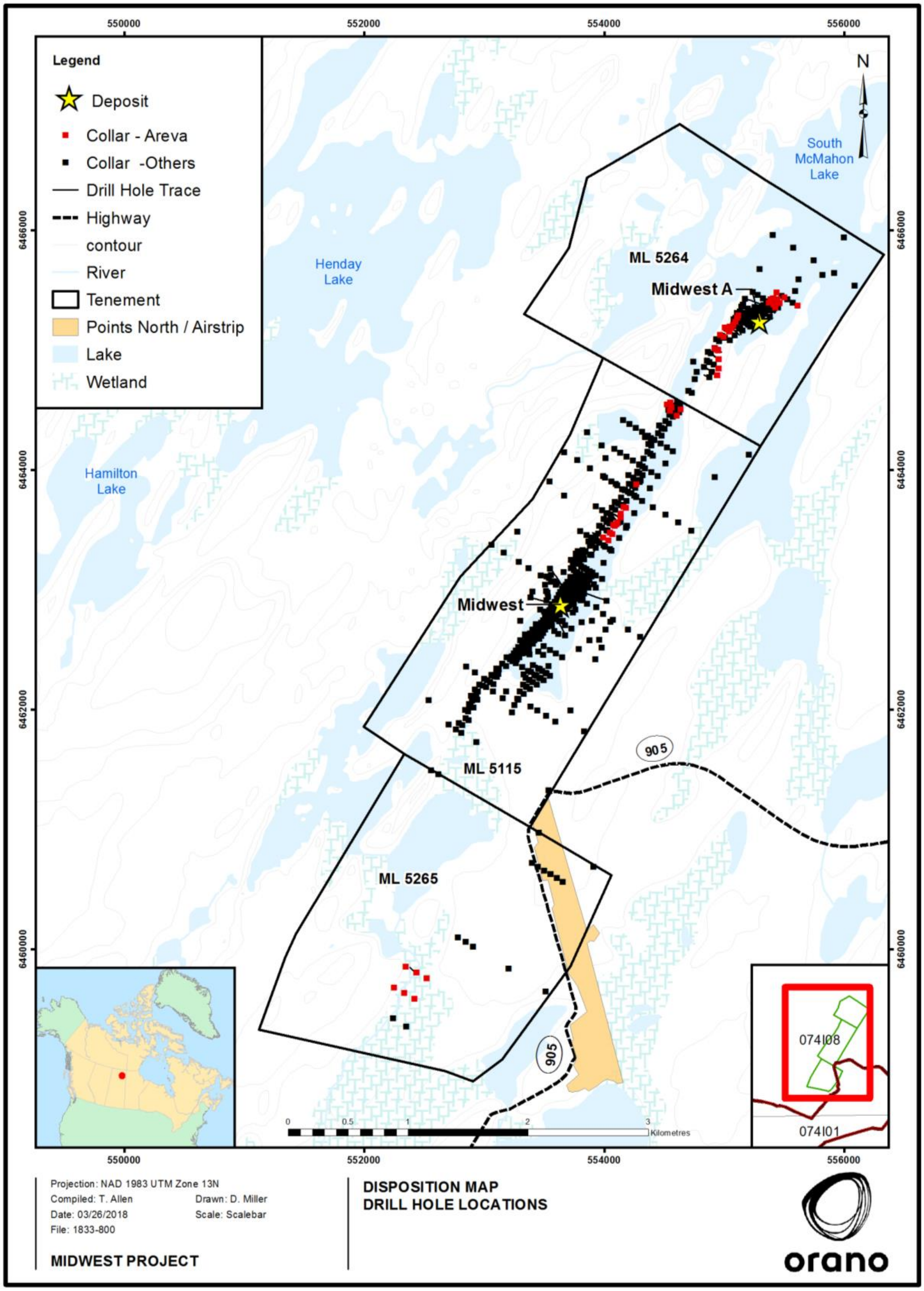


Figure 10-1: Drill hole collar locations on the Midwest Property

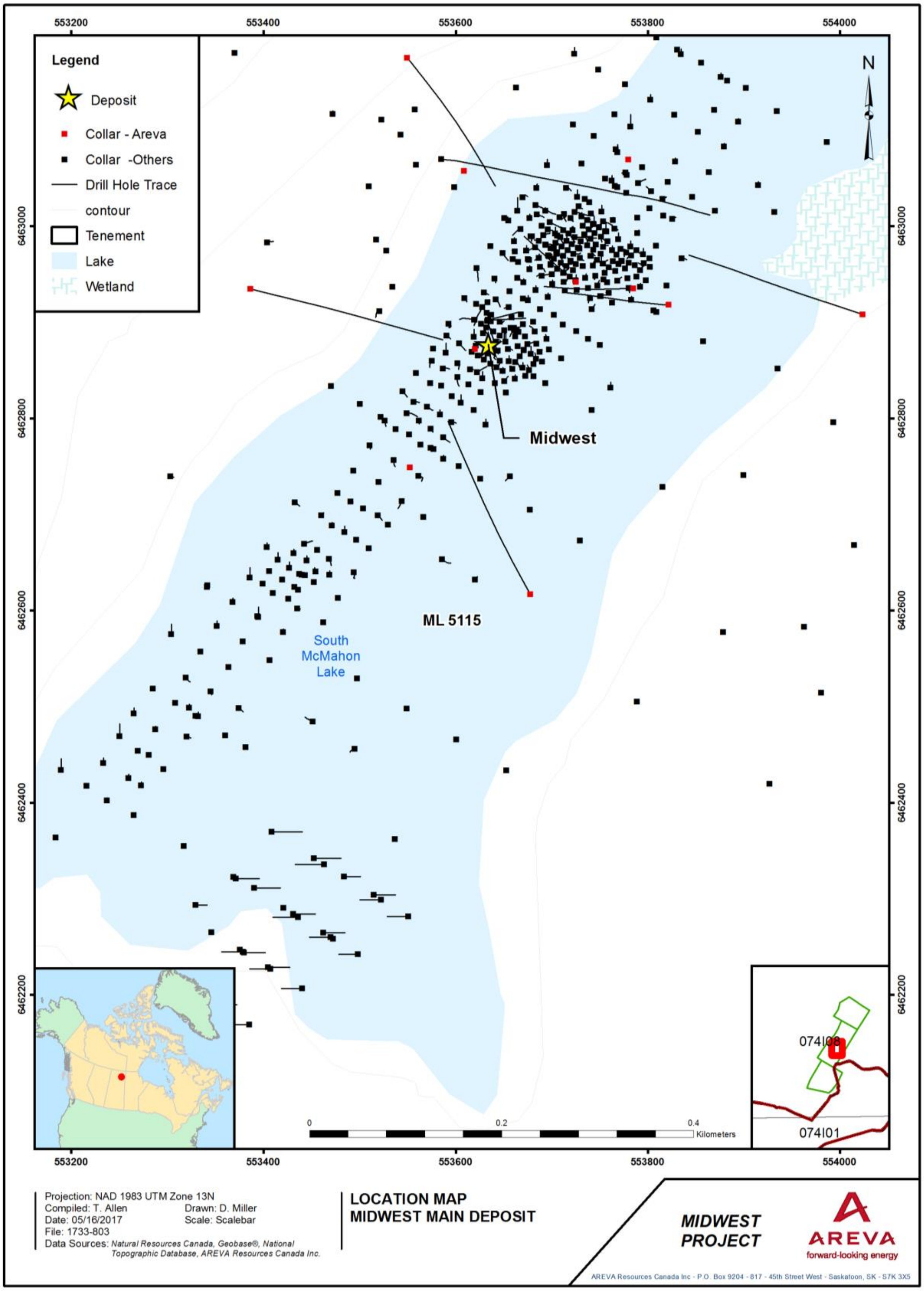


Figure 10-2: Drill hole collar locations in the Midwest Main area

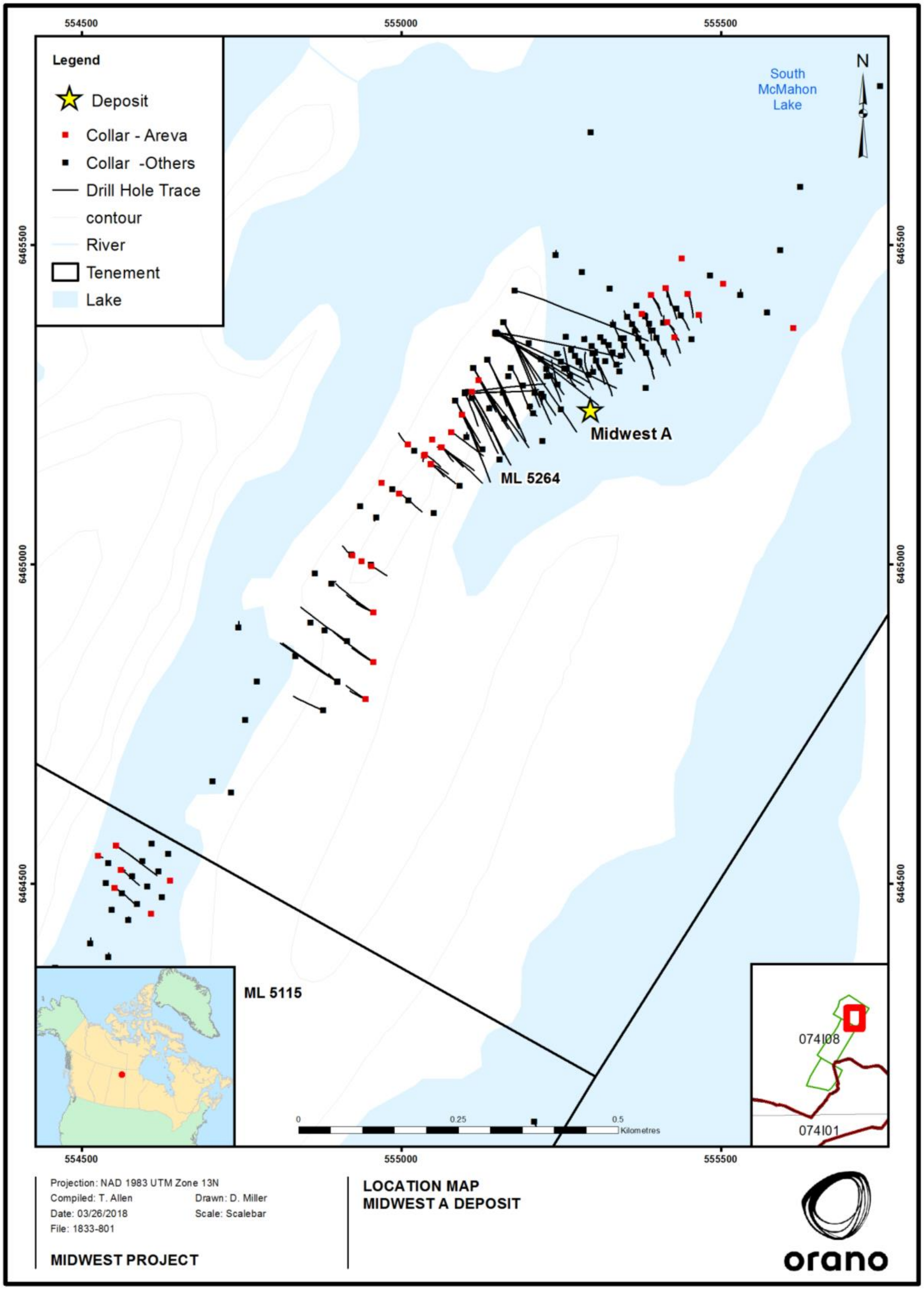


Figure 10-3: Drill hole collar locations in the Midwest A Area

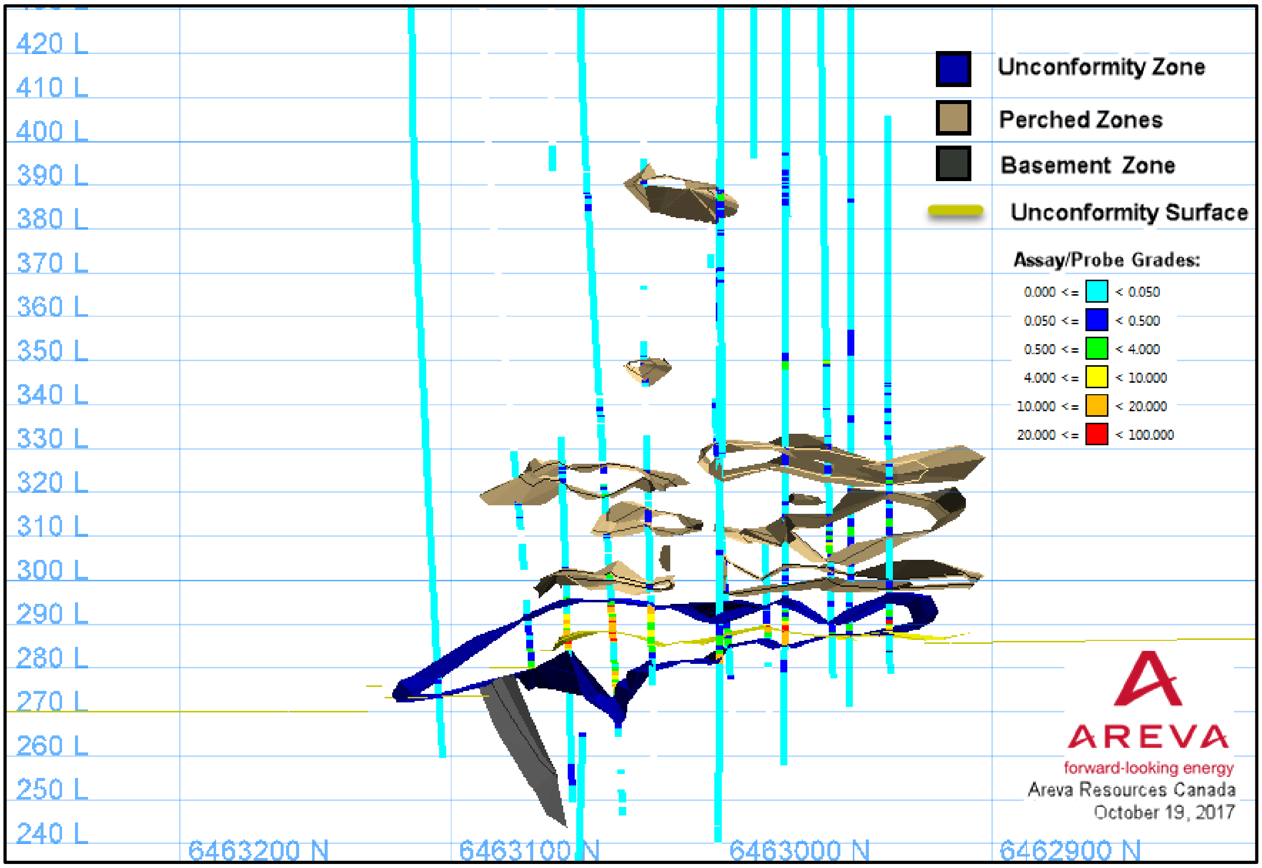


Figure 10-4: Midwest Main Cross-Section Looking Northeast.

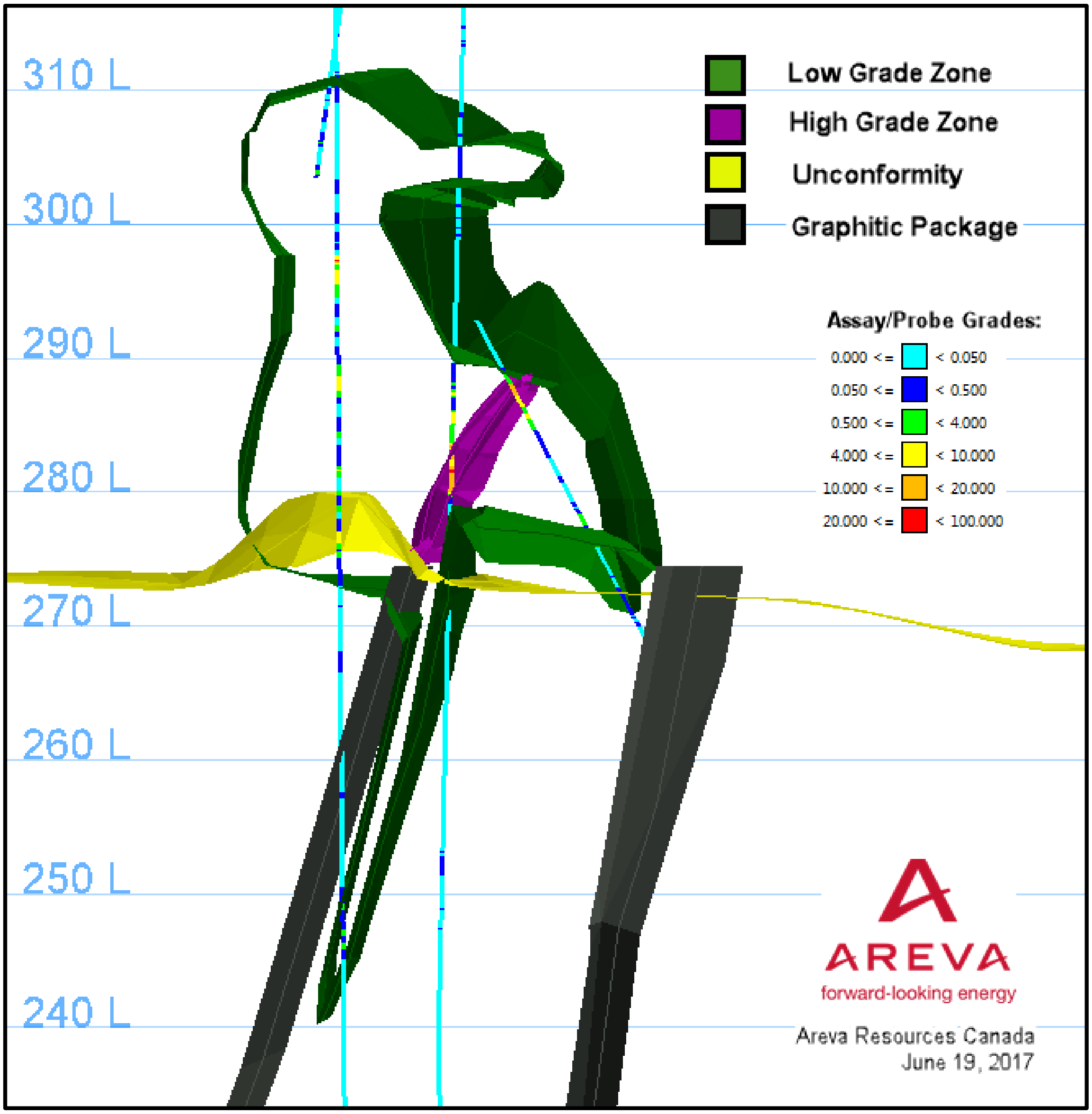


Figure 10-5: Midwest A Cross-Section with High Grade Zone Looking 60° Azimuth at 555,260 UTM East

10.2.1 Downhole Surveying

Downhole survey methodologies have varied during the years of exploration on the Midwest property.

In the early exploration campaigns, from 1971 to 1977, most drill holes were drilled vertically. No information has been found regarding downhole surveys or the type of tool that was used. Post-1977, but prior to 2005, drill hole deviation was measured every 30 to 50 metres using acid tests and with Tropari and Sperry Sun single-shot cameras (in 1981) during normal drilling operations.

Since 2006, drill hole deviation has been measured just below the drill casing and subsequently every 30 or 50 metres with a Ranger Survey or a Reflex EZ-single-shot probe during normal drilling operations. All of the drill hole surveys have been updated for variation in magnetic declination.

No borehole calliper surveys have been undertaken at Midwest.

10.2.2 Drilling Procedures

Little is documented concerning drilling procedures prior to 2005, as most of the drilling was conducted between 1977 and 1981. Drilling was mostly conducted on the lake (drilling on ice in the winter and on barge for summer holes), with the remainder drilled on land. Prior to 2005, Midwest drill holes were occasionally cemented. No information is available about the grouting procedure used at the time. However, Canada Wide Mines correspondence (Wray E. , 1980) stipulated that “all diamond drill holes at Midwest are to be cemented from the bottom up, to a point 30 metres above the orebody”.

The drilling methods used by ARC for drilling after 2005 depended on two factors: weather conditions (ice or land drilling; no barge drilling occurred) and ground conditions around the mineralization (extensive dissolution zone located in the sandstone above the Midwest Main deposit). In 2006, drilling of NQ or HQ vertical drill holes proved to be problematic due to poor ground conditions and numerous holes were prematurely lost before reaching the desired depth. Inclined drilling, which improved completion rates, was adopted thereafter. In general, the overburden was drilled with NW or HW casing, followed by NQ or HQ coring of the sandstone column and basement. When HQ was used, coring would switch to NQ coring once the hole was safely in the basement lithologies. BQ rods were also available when reducing from NQ to BQ was warranted.

All drill holes drilled by ARC (i.e. 2005-on), when possible, were grouted with cement to encompass the mineralized zone (usually 10 metres above and below) and from the overburden to 30 metres below. Many holes were entirely cemented. Casing was generally removed. Holes on land were marked with a tagged post.

10.3 Reliability

There is no known drilling, sampling, or recovery factors that could materially impact the accuracy and the reliability of the results. In most cases where core recovery was poor, sufficient probing data was available to represent these intervals.

For Midwest A, holes that were drilled prior to 2005, were not used for the purpose of this resource estimation. These holes do not have available down-hole radiometric probe data and they had been geochemically sampled using a different sampling protocol compared with the drilling completed since 2005. These drill holes however, were used wherever possible to help constrain the 3D interpretation of the mineralization.

11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 Drill Core Preparation

Core sampling is the last work done on the core, as it is a destructive process. Prior to sampling core is washed, core depths are verified, core recovery and radiometry is recorded, oriented core measurements are taken, geological and geotechnical logging is completed, and core photographs are typically taken for each hole.

Historically, the Midwest drill core was transported from the drilling site to the original Midwest project core logging and storage facility, located adjacent to Mink Arm, in standard sealed wooden core boxes. Once there, the core boxes were moved to the core logging and sample preparation room for core washing and core depth and recovery verification, and for core logging, radiometric scanning, and geochemical sampling. Historically, oriented core measurements were not taken due to the mostly vertical drilling and lack of core orientation tools. Also, core photography was carried out on a less regular basis than is presently done. Once processed, core boxes were stored in outdoor core storage with mineralized core boxes being lidded to further aid in preservation of the core. The core from the sub-Athabasca basement and mineralized sandstone, plus the basal several metres of Athabasca sandstone, was stored in covered core racks, while the remaining sandstone drill core boxes were cross-stacked. Mineralized samples were bagged and placed into sealed metal pails, while the non-mineralized sample bags were placed in plastic pails, all temporarily stored outside of the sample preparation room until shipped by truck to the analytical laboratory that carried out the analyses.

The core from the ARC drilling was transported from the drilling site to the Moffatt Lake core logging facility in standard sealed wooden core boxes. Once there, the core boxes were moved to the core logging and sample preparation rooms for digital photography, geological core logging, radiometric scanning, and geochemical and spectral sampling. Once processed, core boxes were stored in outdoor core storage with mineralized core boxes being lidded to further aid in preservation of the core. The entire length of drill core was stored in covered core racks. The mineralized bagged samples were placed into sealed IP-3 metal pails, while the non-mineralized sample bags were placed in plastic pails. All pails were temporarily stored outside of the sample preparation room until shipped by truck to the Saskatchewan Research Council (SRC) Geoanalytical Laboratory in Saskatoon, which was, and is, licensed by the CNSC to receive, process, and store radioactive materials.

All reasonable attempts were made to reassemble the recovered drill core to its original shape, as extracted from the drill hole, to allow the best estimate of drill core recovery and to provide better overall core logging. The core depths were then verified by the geologist before further work was conducted, as all depth measurements were based on the core depths recorded by the drilling contractor. Core recovery was documented (Section 11.5) and radiometry was measured (Section 11.2), with scintillometer cps data being marked on the box.

Geological and geotechnical logging was then completed on the core (Sections 11.3 and 11.7).

After core logging and radiometry determinations, core photos were taken systematically from top to bottom of the hole, with three to four boxes of core in each photo. Infrequent selective photos (close ups) were also taken when something of interest was observed in the core. The quantity of selective photos varied from several per hole to none depending on the complexity and mineralogy encountered. Detailed pictures were also taken of any mineralized intervals. Each individual photo covered approximately 30 centimetres of the box, such that five pictures were taken per box. Core photos exist for all drill holes post-2005, and several holes from the early drilling campaign (1979-1981). There are no core photos currently available for the holes drilled by Denison.

Core was sampled for geochemistry and mineralogy last, as detailed in Sections 11.9 and 11.10.

11.2 Radiometric Logging

Esso and PNC drill core logging practices were industry-standard for the time.

The drill core was measured to determine core recovery on a per metre basis. The core was then scanned, in 10 centimetre intervals, for radioactivity. Up to 2003, the core was scanned for radioactivity using a shielded SRAT SPP2 scintillometer (measuring between 10 to 15,000 cps) and Geiger-Müller instruments (GMT-3T or GMT-15, measuring between 0 to 5,000 cps AVP and 0 to 50,000 cps AVP, respectively) were then used to rescan core that produced elevated scintillometer counts. [AVP is a now-archaic unit created by the French Atomic Energy Commission (CEA); 1 cps AVP ≈ 10 cps SPP2 or SPPγ.] From 2004 onwards, the core was scanned for radioactivity using a shielded SPPγ scintillometer (measuring between 10 to 40,000 cps). A color code was used when writing radiometric values on the core box:

- from 0 to 3,000 cps SPP2 or SPPγ (“weakly mineralized”), a black marker was used;
- from 3,000 to 15,000/40,000 cps SPP2 or SPPγ (“moderately to strongly mineralized”), a red marker was used;
- with >15,000/40,000 cps SPP2 or SPPγ (“strongly mineralized”), a blue marker was used.

The radiometric readings over the measured intervals were documented and are recorded in the ARC drill hole database.

If a zone of anomalous radioactivity was intersected, the radiometric values over the length of core were recorded in 10 centimetre intervals. The measured intervals were documented and are recorded in the drill hole database.

The measured radiometric values on the core were compared to down-hole radiometric probe readings taken of the mineralized interval to determine the probe radiometry-depth correlations and to correct probe recording depths. The recording of down-hole probe depths can be affected by stretching of the small-diameter co-axial cable on which the probe is connected and/or by ice/grit build-up on the cable, especially for deep drill holes. Therefore, adjustments may have been required for the depth intervals of the downhole probe data to correct for this potential source of error and for possible driller error with respect to core depths. See Sections 11.6.1 and 14.4 for Radiometric Grade Correlation explanations.

The core radiometry data from the SPP2 and SPPγ scintillometer readings were used to define the mineralized intervals, if any ((AREVA, 2010), (Areva Resources Canada, 2012)). These intervals contain radiometric responses greater than 200 cps and were centered on the peak radiometric value(s), as much as is possible.

Radiometric gamma logging using scintillometers is conducted on the core to (1) define which part of the core will be sampled for chemical analysis, and (2) provide a core-based comparison with downhole gamma probe readings to allow correlation of the two data sets with the mineralized intervals and, if necessary, for depth correction of the downhole probing data.

Little is known about which types of scintillometers were used prior to 1990.

From 2005-2007, a SPP2 scintillometer was used. The SPP2 was incrementally replaced by the digital SPPγ scintillometer. The gamma radiometry of the drill core is measured over 10 centimetre intervals near mineralization, and more broadly in regions of background low gamma radiometry. The radiometry of the 10 centimetre intervals is measured by removing the core from the box and scanning it in an area of low background radioactivity. The reading, expressed in cps, is written on the core box and recorded in the database.

11.3 Geological Logging

During geological logging, lithological intervals were recorded for most drill holes on the Midwest property, with this data being stored in the database for all holes except the two Midwest Main shaft test holes (GT-1 and GT-2). The four underground piezometer holes (P-1 to P-4) into the Midwest Main deposit do not appear to have been logged for any lithological information.

Once the core was scanned for radiometry, the drill core was logged by geologists recording their observations on field log sheets at a scale of 1:100. Information captured during the core logging, carried out over one metre intervals, includes lithological descriptions, friability, sandstone grain size, fracture density, alteration features, colour, structural features relative to core axis, descriptions of mineralized intervals (graphite, pyrite, uranium, and other minerals of interest), a descriptive log of the core, and any other noted physical and geotechnical characteristics (recovery, maximum grain size in the sandstone, friability, and fracture count). All Athabasca Group sedimentary formations are distinguished based on grain size (MTG: Maximum Transported Grain-size) and interstitial clay content. These data were then transferred from the field log to computer and imported into the ARC drill hole database.

11.4 Oriented Core Measurements

Nearly all pre-2005 holes were drilled vertically with no core orientation possible and, if a hole was inclined, no oriented core measurements were obtained. The acquisition of oriented core measurements began in 2005 with the ARC exploration work.

A core orientation system (Ace Core Tool: A.C.T.™) was utilized to gather structural data. The A.C.T was utilized to determine the dip and azimuth of features in drill core by setting a reference mark at the lowest point of the drill core when a drill run is completed. More information about this tool can be found on the company's website http://www.acedrilling.com.au/. Measurements were collected from angled drill holes wherever possible from approximately 40 metres above the unconformity to the end of the drill hole. Structural features were measured with respect to the reference mark. Collected data was processed and interpreted using the Dips 6.0 program by Rocscience (https://www.rocscience.com/products/1/Dips). The Dip/Strike Right (right-hand rule) nomenclature is used when describing oriented structural measurements.

11.5 Drill Core Recovery

All drill core recovery completed by drilling contractors was performed using wireline (Q-line or equivalent) retrieval systems. The standard core diameter from recovery of HQ core is 63.5 millimetres, 47.6 millimetres for NQ core, and 36.4 millimetres for BQ core. Drill holes at Midwest have mostly been completed using BQ and NQ coring.

Core recovery in general was good, with most being greater than >90-95%. As part of ARC's logging methodology for the recent ARC drilling, core recovery is recorded and is reported on the field logging sheets and entered into the database.

However, occurrences of low drill core recovery are frequently encountered in unconformity-type uranium deposit alteration halos and mineralization due to high degrees of desilicification and clay-rich host-rock alteration, and to structurally-damaged rock with abundant fractures, breccias, and rubble present in faulted zones. The core recovery in the basement lithologies is generally superior to that in the sandstone, so core loss is less common and is typically associated with clay-rich fault zones. All instances of lost core are recorded on the logging sheets and drill core recovery percentages are calculated for each drill run and recorded in the Midwest database.

There are zones within the sandstone column in which desilicified sandstone is intersected, resulting in little to no recovery over one or more three metre drilling intervals. There can also be core loss within the zones of mineralization at the unconformity due to brecciation caused by syn- and post mineralization structural reactivation. It is ARC/Orano procedure to not assay-sample a mineralized interval if there is less than 75% recovery of the core over a 50 centimetre sample width if the hole was probed ((AREVA, 2010) and (Areva Resources Canada, 2012)). For mineral resource estimations, wherever core recovery was less than 75%, the radiometric equivalent uranium values are substituted for chemical assays where possible.

11.6 Downhole Probing

11.6.1.1 Gamma Probing

No information is available regarding the historical probing procedures prior to 1996.

At the completion of each drill hole, down hole radiometric surveys are performed using radiometric gamma probes to detect and record the total gamma count along the trace of the diamond drill holes at 10 centimetre intervals. Prior to probing, the drill hole is washed with a combination of water and drilling mud additives. The surveys are recorded through the drill rods and casing from the bottom of the hole upwards. The NGRS natural gamma probe is used in a first run. The Geiger-Muller probe tools are used in a second run only if the NGRS probe records counts >1,000 cps and only from 10 metres above to 10 metres below the radiometric anomaly.

For the drill holes used in the resource estimate, surveys were carried out predominantly by the previous operators and by ARC personnel for the few holes drilled after 2007. Down-hole probe radiometric readings are depth-adjusted through comparison with the drill core scintillometer readings and geochemical grades.

11.6.1.2 Radiometric Gamma Probes

The following down-hole radiometric gamma probes have been used on the Midwest project:

- 1978 to 1990: various undefined gamma probes were used from 1978 to 1982. Natural gamma 9067 logging tool from Century Geophysical Corp. was used post-1981
- 1996 to present: DHT27-LF (low flux) and DHT27-HF (high flux), manufactured by Mine Gamma Technology, and
- 2007 to present: NGRS (Natural Gamma Ray Spectroscopy), manufactured by GEOVISTA.

The DHT27-LF and DHT27-HF probes are equipped with Geiger-Muller detectors and are used to estimate equivalent uranium grades for mineralized intervals.

11.6.1.3 Probing Procedures

Prior to 2005, the information regarding the probing procedures used at the time is not known. They are likely similar to what was conducted by ARC (below):

Before radiometric probing begins, the probes are field tested to ensure they are reading properly. The probe is then placed in the drill hole and the depth is zeroed. Down-hole logging can be conducted from the below the mineralized zone of the hole up to the casing or from the casing to below the mineralized zone. Gamma values are measured at 0.1 metres (10 centimetres) intervals and are expressed in cps. Measurements are taken with the drill rods in the hole. As the probe is lowered/raised in the hole, the travel speed and the depth of the probe while it is in operation are measured at the winch which is equipped with a counting wheel. The probe sends a gamma pulse up the cable to the computer every 0.1 metres of travel and the data is recorded by the computer. Logging is typically done from the bottom of the hole upwards to the casing.

Natural gamma emission is measured in cps (counts per second) by a Mount Sopris HLP-2375 or Geovista NGRS scintillometer. Radiometric probing in mineralized intervals is done using the DHT27-LF GM (Geiger Muller) low flux counter.

11.6.1.4 Probe calibration and check

A calibration certificate from AREVA’s calibration facility in Bessines-sur-Gartempe (France) is provided with the purchase of the DHT27-LF and DHT27-HF probes. Radiometric probes used in drill holes are, as well, calibrated annually using the Saskatchewan Research Council (SRC) gamma-probe calibration facility in Saskatoon, Saskatchewan (AREVA, 2010). The handheld scintillometers are tested semi-annually using ^{137}Cs radioactive test sources (AREVA, 2010).

The radiometric gamma probes are also tested systematically before and after each run downhole using a radioactive source. In the event that the probe readings are inconsistent with the source reference value, the original run dataset is discarded and another probe survey is used to obtain the downhole radiometry.

11.6.1.5 Equivalent Uranium Grade

Radiometric data obtained from low flux and high flux gamma probes (i.e. DHT27) are converted into equivalent uranium (eU) values by first converting the raw probe counts (cps) into AVP (cps), adjusting the raw probe accounts for drill hole size, fluid type, casing parameters and probe correction factors. AVP (cps) are then converted into eU values based on a deposit-specific radiometric-grade correlation, which is based on comparing the AVP values to the chemical assay grades in areas of good core recovery.

11.6.1.6 Downhole Resistivity Probing

At the completion of each drill hole, a down-hole resistivity survey can also be performed, after the drill rods have been removed. However, very few resistivity surveys have been carried out on the Midwest project due to the instability of the ground and the resulting high risk of losing the probe equipment down the hole. The resistivity and natural gamma probes are stacked for the survey to allow for fitting the resistivity data at depth with the other probing runs and the core samples.

All surveys were carried out by ARC personnel.

11.7 Geotechnical logging

During some drill programs, RQD (rock quality designation) measurements were also taken on the core for geotechnical purposes. Geotechnical logging from the pre-1989 drilling was mainly comprised of fracture counts and fracture orientations.

11.8 Drill Core Sample Security

The currently-remaining historical drill core (varying portions of 113 drill holes) and all recent ARC drill core from the Midwest Main deposit area are stored in the core storage yard at the ARC Exploration Department camp at Moffatt Lake on the McClean Lake project land. Additionally, drill core from ten Midwest Main holes are stored in the Mineralized Core Collection at the Saskatchewan Geological Survey Precambrian Geological Laboratory in La Ronge, Saskatchewan.

Special security measures are in place on the McClean Lake Project to control access to the property, to authorized personnel only, through use of fencing and a manned security gate. In addition, access to the Moffatt Lake core storage and sample preparation area is also restricted (chain link fence and gate). The core logging facility is locked when unattended. Only ARC staff and drilling contractors are authorized to be at either the drill sites or the logging facility.

During the drilling process, as each hole was being drilled, the drilling contractor placed the drill core into wooden boxes at the drill site. The boxes were then secured with lids and transported to the Midwest or Moffatt Lake logging facility, depending on year, either by drill contractor personnel or project operator staff.

Historically, the Midwest drill core was transported from the drilling site to the original Midwest project core logging and storage facility, located adjacent to Mink Arm, in standard sealed wooden core boxes. Once there, the core boxes were moved to the core logging and sample preparation room for logging, radiometric scanning, and geochemical sampling. Once processed, core boxes were stored in outdoor core storage with mineralized core boxes being lidded to further aid in preservation of the core. The core from the sub-Athabasca basement and mineralization, plus the basal several metres of Athabasca sandstone, was stored in covered core racks, while the remaining sandstone drill core boxes were cross-stacked. Mineralized samples were bagged and placed into sealed metal pails, while the non-mineralized bagged samples were placed in plastic pails, all temporarily stored outside of the sample preparation room until shipped by truck to the analytical laboratory that carried out the analyses.

The core from the recent ARC drilling (post 2005) was transported from the drilling site to the Moffatt Lake core logging facility in standard sealed wooden core boxes. Once there, the core boxes were moved to the core logging and sample preparation rooms for digital photography, geological core logging, radiometric scanning, and geochemical and spectral sampling. Once processed, core boxes were stored in outdoor core storage with mineralized core boxes being lidded to further aid in preservation of the core. The entire length of drill core is stored in covered core racks. The mineralized bagged samples were placed into sealed IP-3 metal pails, while the non-mineralized bagged samples were placed in plastic pails. All pails were temporarily stored outside of the sample preparation room until shipped by truck to the SRC Geoanalytical Laboratory in Saskatoon, which was, and is, licensed by the CNSC to receive, process, and store radioactive materials.

11.9 Sampling for Chemical Analysis

1977 to 1981 - Esso Resources Canada Limited.

No technical drilling reports are available for those years that might include information on the sampling methodologies used. The original drill logs usually contain some data and information; i.e. assay number; sample width (depth from and depth to), length of core recovered, and assay values (in percent) for U_3O_8, and occasionally for some other elements like Ni, Co, As, S, and Fe, from the sampling of specific intervals.

From 1977 to 1980, sampling was only performed selectively and sample lengths and intervals were variable; from 0.3 feet (4 inches; approximately 9 centimetres) to usually less than 5 feet (approximately 1.5 metres).

In 1981, sampling was also performed selectively. Sampling intervals were generally quite variable, from 0.3 metres to about 3 metres, or occasionally in a more methodical manner; every 0.5 metres or 1 metre.

1988 to 1993 - PNC Exploration Canada Co / Denison Mines Limited

Only minimal records remain concerning sampling during this period. Resampling of historical core was carried out in 1988, as was sampling of then-current drill core from holes MW-650 to MW-657. Underground rod extensometer holes were drilled from the underground development and were also sampled and sent for analysis. Analytical data from the Saskatchewan Research Council for uranium, boron, and base metals (Pb, Ni, Co, Cu, and Zn) have been found for some of these holes and entered into the Midwest database. However, the assay certificates for these analyses were not located.

2005 to present - ARC

Samples were collected from all drill holes for geochemical, petrophysical, and SWIR spectral clay analysis. Table 11-1 presents the different sample designations and sampling methodology used at AREVA Resources Canada Inc. The ARC sampling procedure is presented in (Areva Resources Canada, 2012).

Table 11-1: Sample designations and methodology

Analyses Type	Sample Type	Description	Sample Methodology
Geochemistry	1SYS	Systematic sandstone	Chip sample taken from the start of every box row. 20 m samples until 100 m above the unconformity. 10 m samples in the basal 100 m sandstone. One metre sample taken directly above the unconformity.
	1SYB	Systematic basement	Chip sample taken from the start of every box row within individual lithological/alteration units (10 m samples). One metre sample taken directly below the unconformity.
	1SYSD/ 1SYBD	Duplicate	One sample is duplicated within the sandstone and the basement of each drill hole.
	1SEL	Selective sandstone	Split core sample taken every 0.5 m (or less) of intervals with SPPγ radiometry ≥ 200 cps or at points of interest.
	1BAS	Selective basement	

Analyses Type	Sample Type	Description	Sample Methodology
Spectral Clay	1TER	Sandstone TerraSpec	Chip sample taken at every 3 m at the run marker. Dark samples and silicified samples avoided. Extra sample taken where an unusual feature is noted.
	1TERB	Basement TerraSpec	
Petrophysics	1MAS	Petrophysical sample	Approx. 15 cm of unbroken and unfractured core taken. Extra analyses (geochemistry, mineralogy, petrography, etc.) may also be completed on these samples.
Petrography	TS	Thin Section	Approx. 10 cm whole core sample taken within each formation/lithology change.

Core samples were split by geologists or geological technicians (under supervision of geologist) using a hydraulic splitter. One half of the core was placed in a plastic bag and the other half was returned to the core box. Plastic bags containing the individual geochemical samples (selective) are grouped according to lithology (sandstone or basement). Non-radioactive samples were placed in white plastic pails, radioactive mineralized samples were placed into sealed IP-3 metal pails, and all were shipped to the Saskatchewan Research Council (SRC) Geoanalytical Laboratories in Saskatoon. The primary geochemical analysis methods used was ICP-MS (Inductively Coupled Plasma Mass Spectroscopy). Additional geochemical analysis for Boron was done by ICP-OES.

11.9.1 Analytical Laboratories

The majority of core samples collected and assayed between 1978 and 1981 were assayed at Loring Laboratories Ltd. of Calgary (the exceptions were samples from hole MP-3 and some samples from holes 235 and 278). Little is known about these analytical samples. Loring was an independent lab to the Midwest project operator at that time.

For 1988 and subsequent years, the Geoanalytical Laboratory of the Saskatchewan Research Council in Saskatoon, Saskatchewan was used. The quality management system at this laboratory operates in accordance with ISO/IEC 17025:2005 (CAAN-P-4E), General Requirements for the Competence of Mineral Testing and Calibration Laboratories; and is also compliant to CAN-P-1579, Guidelines for Mineral Analysis Testing Laboratories. The management system and selected methods are accredited by the Standards Council of Canada (Scope of accreditation # 537).

This laboratory has been visited and examined by the authors. The Geoanalytical Laboratory is an independent laboratory and no associate or employee of Denison or Orano is, or has been, involved in the sample preparation or geochemical analysis of samples from Midwest.

Prior to the 2006 summer drilling program, the primary geochemical analytical method used on the Midwest samples was ICP-OES (Inductively Coupled Plasma Optical Emission Spectroscopy) following near-total tri-acid digestion (total analyses) and by reverse Aqua Regia partial digestion (partial analyses). Additional geochemical analysis for Boron was also done by ICP-OES, following a Na_2O_2 fusion and subsequent dissolution in deionized water.

From the 2006 summer drilling program, the primary geochemical analytical methods used for uranium analysis, as well as a broad suite of additional elements ((SRC, 2007); (Areva Resources Canada Inc., 2013)), on the Midwest samples were ICP-MS (Inductively Coupled Plasma Mass Spectroscopy) for samples containing less than 1,000 ppm U and ICP-OES for samples determined to contain uranium concentrations greater than 1,000 ppm U. Both total and partial analyses, as well as ICP-OES analysis for Boron were carried out.

The samples are initially acid-digested using a 250 mg aliquot of sample pulp. For tri-acid total-digestion analysis, the aliquot is digested to dryness on a hot-block digestion system in a Teflon tube using a mixture of concentrated $HF:HNO_3:HClO_4$. The residue is dissolved in dilute HNO_3 (SRC, 2007). This solution is then analysed by ICP-MS (or ICP-OES). For partial-digestion analysis, the aliquot is digested in a mixture of nitric:hydrochloric acid ($HNO_3:HCl$) in a test tube in a hot water bath, then diluted using de-ionized water.

Uranium assay analysis by ICP-OES is used on samples in which the uranium concentration has been determined by ICP-MS to exceed 1,000 ppm U. The pulp already generated from the first phase of preparation and geochemical analysis is used. One gram of sample pulp is digested for one hour in an HCl: HNO_3 acid solution. The totally-digested sample solution is then made up to 100 mL and a 10-fold dilution is taken for the analysis by ICP-OES. Instruments are calibrated using certified SRM solutions. The instruments used are a Perkin Elmer Optima 300DV, Optima 4300DV, or Optima 5300DV. The detection limit for this method is 0.001% U_3O_8 (approximately 0.0008% U).

11.9.2 Disequilibrium analysis

Disequilibrium analyses have not been carried out on samples from the Midwest Main deposit. The good correlation between equivalent probing grades and chemical assays indicates that this deposit is in equilibrium. Historically, deposits of this age in the Athabasca basin have been found to be in equilibrium.

11.9.3 Mineralogical sampling

Short-Wave InfraRed (SWIR) spectrometer analyses were performed on many sandstone and basement samples from the post-2005 drilling. These were carried out on rock chips taken at approximately three metre intervals. Interpretation of spectral results provide the clay mineral and clay-sized mineral proportions (chlorite, dickite, dravite, illite, and kaolinite) in the samples. Prior to the post-2005 drilling, XRD analyses were carried out on selected samples for determination of the clay mineral suite.

A few whole core samples were also taken for petrographic analysis.

11.9.4 Accompanying elements and REE assays

Geochemical analyses prior to 2004 were not very extensive for other elements. Uranium content was routinely tested, with sporadic measurements of Ni, Co, As, Fe_2O_3, Cu, and Mo. The additional elements were typically tested for when something of interest was seen in the drill core by the geologist.

Between 1985 and 2005, 13 holes were drilled by Denison in the Midwest Main area (three MW series, four underground piezometer holes, four underground mineralogical holes, and two shaft holes). With the exception of the four piezometer holes, samples were analysed for uranium and a broad suite of additional elements for most samples. In addition to uranium, every sample was analysed using partial digestion for Ni, Fe_2O_3, Al_2O_3, Pb, Cu, Co, K_2O, MgO, and Zn. Detection limits are unknown. Additional elements were analysed for 39% of these samples, similar to the suite of elements in Table 11-2 and Table 11-3.

From 2005, the primary geochemical analyses included uranium, as well as a broad suite of major element oxides and trace elements, including the REEs (Table 11-2, Table 11-3; (SRC, 2007); (Areva Resources Canada Inc., 2013)).

11.9.5 Sample preparation

No information is available on the sample preparation used by the analytical laboratories prior to 1988.

Since 1988, sample preparation (drying, crushing, and grinding) has been done at the SRC in separate facilities for sandstone and basement samples to reduce the risk of sample cross-contamination. Crushing and grinding of radioactive samples are done in another, separate, radioactive sample preparation facility licensed by the Canadian Nuclear Safety Commission (CNSC). Following crushing to 60% -1/4 inch (-6 millimetres) size in a steel jaw crusher, a 100-200 g split is taken using a riffle splitter. This sample split is ground to powder form (pulp: 90% -106 µm [-150 mesh]) in motorized agate mortar and pestle equipment.

Table 11-2: Elements and detection limits for ICP-MS total digestion analysis.

Element	Sandstone DL	Basement DL	Element	Sandstone DL	Basement DL
Al_2O_3	*0.01%	*0.01%	MnO	*0.001%	*0.001%
Ba	*1ppm	*1ppm	Mo	0.02ppm	0.02ppm
Be	0.1ppm	0.1ppm	Nd	0.1ppm	0.1ppm
Bi	0.1ppm	0.1ppm	Ni	0.1ppm	0.1ppm
Cd	0.1ppm	0.1ppm	Nb	0.1ppm	0.1ppm
CaO	*0.01%	*0.01%	P_2O_5	*0.002%	*0.002%
Ce	*0.1ppm	*0.1ppm	K_2O	*0.002%	*0.002%
Cs	0.1ppm	0.1ppm	Pr	0.1ppm	0.1ppm

Element	Sandstone DL	Basement DL	Element	Sandstone DL	Basement DL
Cr	*1ppm	*1ppm	Rb	0.1ppm	0.1ppm
Co	0.02ppm	0.02ppm	Sm	0.1ppm	0.1ppm
Cu	0.1ppm	0.1ppm	Sc	0.1ppm	0.1ppm
Dy	0.02ppm	0.02ppm	Ag	0.02ppm	0.02ppm
Er	0.02ppm	0.02ppm	Na_2O	*0.01%	*0.01%
Eu	0.02ppm	0.02ppm	Sr	*1ppm	*1ppm
Gd	0.1ppm	0.1ppm	Ta	0.1ppm	0.1ppm
Ga	0.1ppm	0.1ppm	Tb	0.02ppm	0.02ppm
Hf	0.1ppm	0.1ppm	Th	0.02ppm	0.02ppm
Ho	0.02ppm	0.02ppm	Sn	0.02ppm	0.02ppm
Fe_2O_3	*0.01%	*0.01%	TiO_2	*0.001%	*0.001%
La	*1ppm	*1ppm	W	0.1ppm	0.1ppm
Pb	0.02ppm	0.02ppm	U	0.02ppm	0.02ppm
Pb 204	0.01ppm	0.01ppm	V	0.1ppm	0.1ppm
Pb 206	0.02ppm	0.02ppm	Yb	0.02ppm	0.02ppm
Pb 207	0.02ppm	0.02ppm	Y	0.1ppm	0.1ppm
Pb 208	0.02ppm	0.02ppm	Zn	1ppm	1ppm
Li	*1ppm	*1ppm	Zr	*1ppm	*1ppm
MgO	*0.001%	*0.001%			

Table 11-3: Elements and detection limits for ICP-MS partial digestion analysis

Element	DL	Element	DL	Element	DL
As	0.01ppm	Hf	0.01ppm	Se	0.1ppm
Ag	0.01ppm	Hg	0.01ppm	Sm	0.01ppm
Sb	0.01ppm	Ho	0.01ppm	Sn	0.01ppm
Be	0.01ppm	Mo	0.01ppm	Ta	0.01ppm
Bi	0.01ppm	Nb	0.01ppm	Tb	0.01ppm
Cd	0.01ppm	Nd	0.01ppm	Te	0.01ppm
Co	0.01ppm	Ni	0.01ppm	Th	0.01ppm
Cs	0.01ppm	Pb	0.02ppm	U	0.01ppm
Cu	0.01ppm	Pb 204	0.01ppm	V	0.1ppm
Dy	0.01ppm	Pb 206	0.02ppm	W	0.1ppm
Er	0.01ppm	Pb 207	0.02ppm	Y	0.01ppm
Eu	0.01ppm	Pb 208	0.02ppm	Yb	0.01ppm
Ga	0.01ppm	Pr	0.01ppm	Zn	0.1ppm
Gd	0.01ppm	Rb	0.01ppm	Zr	0.01ppm
Ge	0.01ppm	Sc	0.1ppm		

11.9.6 Quality Control Samples

During the late 1970's and early 1980's, the use of quality control samples was not common industry practice and only carried out within the analytical lab, and thus little of such information is available for analyses from these early drill programs. Some external laboratory uranium assay checks were conducted on 157 samples from the 1978 to 1981 drilling. The laboratories for check assays were X-Ray Assay Laboratories of Toronto during 1978 and 1979 and Bondar Clegg Laboratories of Vancouver in 1980 and 1981. Samples for check assays were divided into low and high grade groups based on a 5.0% U_3O_8 threshold.

The 73 high-grade samples showed the original analytical results (Loring Laboratories) to be 0.8% higher on average than the check analyses, with the majority of the check assays being within 5% of the original, with no significant bias. The 84 low-grade samples showed a much larger variation and were approximately 5% lower on average than the check analyses. The individual check analyses varied considerably, mostly within a +40% and -15% envelope. Almost all of the Loring assays reporting less than 0.7% U_3O_8 were approximately 10% to 50% lower than the check analyses. The higher-grade assays exhibited good reproducibility, and it is these assays that have the largest effect on the resource. The uncertainty, and possible negative bias, in the low-grade assays suggests that the mineralization envelope may be volumetrically conservative.

From the PQ series of holes, 30 check assays were taken on the original 300 assays. It indicated that the original assays could have over-reported the U_3O_8 grade by up to 10%. (Hendry, Routledge, & Evans, 2006). Given that the PQ composites make up only 12% of the resource intersections, and the small number of check assays analyzed, they may only contribute to a minor overstating of the global estimate. The high grade management will help further mitigate this.

The ARC sampling procedure used since 2005 includes quality control (Areva Resources Canada, 2012) and (Areva Resources Canada Inc., 2013). A series of quality assurance and quality control (QA/QC) checks were performed on all sample batches submitted to the Saskatchewan Research Council (SRC) laboratory. Since 2005, only three modern drill holes intersected the deposit, and thus the historical data have only had limited QA/QC checks (see above). The ARC QC comprises the following:

- Laboratory Repeat Samples: A laboratory replicate was performed in each batch at a minimum of one per every 35 analyses.
- Laboratory Standards: Two laboratory standard reference materials (SRMs) were inserted in each batch at a minimum of one every 20 analyses. Different SRMs were used for non-mineralized materials and for mineralized materials.

The quality control processes in the laboratory ensure at least one QC measure is applied to each batch of samples to assure the quality of the results generated. These measures include: sample preparation QC checks; analysis of Certified Reference Material (SRM) and/or in-house reference materials and standards; preparation and analysis of pulp duplicates, blanks, and replicates;

traceable calibration standards for instrumentation; spiking of samples to monitor process recoveries; and QC monitoring.

The laboratory uses an ISO/IEC 17025:2005 accredited method for the assay determination of U_3O_8 (reported in wt%) in geological samples. The selection of SRMs is based on the radioactivity level of the samples to be analysed. An additional certified Fe_2O_3 standard is analysed to correct for interference of iron with uranium in the analysis. Instruments are recalibrated after every 20 samples; multiple standards are analysed after and before each recalibration.

Between 2005 and 2009, 6,219 assay samples were collected and analysed with either ICP-MS, for samples containing less than 1,000 ppm U, and ICP-OES, for samples determined to contain uranium concentrations greater than 1,000 ppm U. As part of a routine check, 377 of those samples analysed for ICP-OES were sent for additional U_3O_8 check analysis. In 99% of cases a U ppm total to U_3O_8 calculated conversion was within 1% of the U_3O_8 analysis value as determined by uranium assay ICP-OES analysis.

The quality control measures applied to all methods within the SRC laboratory have been established to ensure they are compliant with the requirements of ISO/IEC 17025:2005. The quality control measures which are applied may vary from method to method and are selected on their suitability.

If results are found to be outside quality control limits, actions are taken to ensure that the samples are reprocessed and reanalysed, and the required quality limits are met.

11.9.6.1 Field Duplicates

At Midwest A, internal duplicates were collected by ARC using field duplicates. This comprised 57 field duplicates that were collected between 2007 and 2008. Of these 57 samples, 54 were analysed for uranium. The samples were collected as a mix of systematic and selective sandstone samples as well as systematic and selective basement samples. Systematic field duplicates are chip samples that have been split into two separate samples. Selective samples are ¼-core split samples.

The field duplicates showed reasonable reproducibility, as shown with an r^2 value of 0.89 for uranium with total digestion (Figure 11-1). There appears to be a bias with approximately 2/3^{rds} of the field duplicates returning a larger value than the original sample. This is most likely due to a bias in sampling.

Another important concept to consider that is not observed in the graphs is the difference in selective and systematic sampling methods. Systematic samples are made up of chip samples taken approximately once every 1.5 metres. Selective samples are split whole core with half the core being sampled. Systematic samples therefore are much cheaper for core characterization of a large interval, but are only a relatively small representation of the overall rock compared to selective samples.

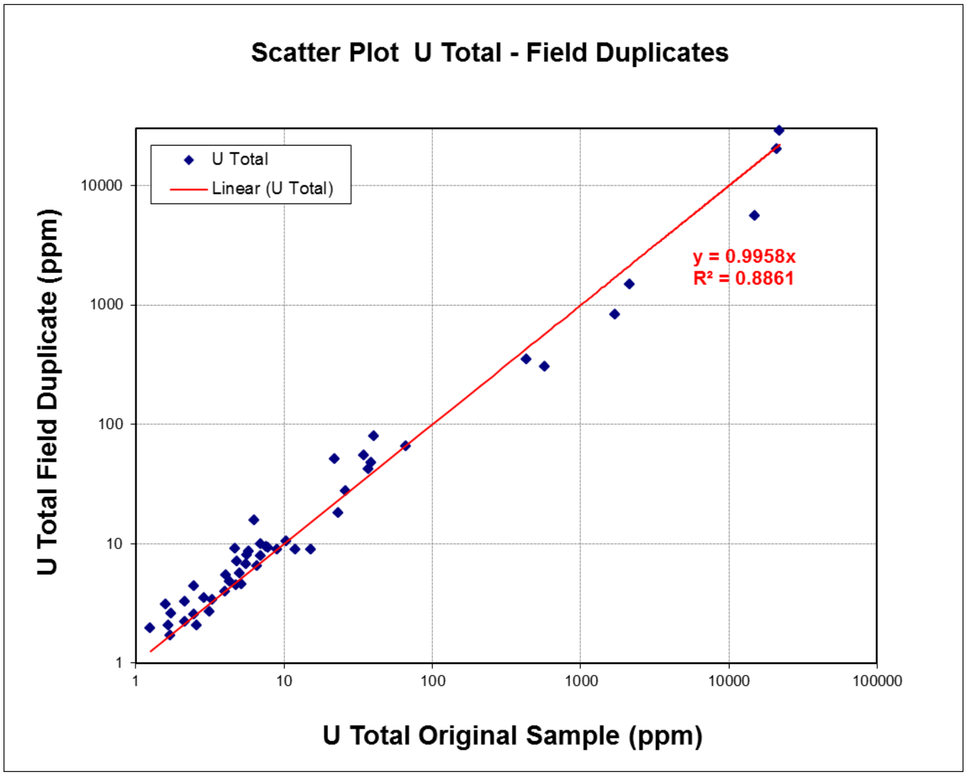


Figure 11-1: Scatter plot of uranium (total digestion) for field duplicates

11.9.6.2 Laboratory Repeats

11.9.6.2.1 Midwest Main

Laboratory repeat samples (replicates) are analysed once every 40 analyses. During the drilling on the Midwest Main deposit in 2006, six repeats were taken on both systematic and selective sandstone samples.

Overall, the correlation is very good with an r^2 value of almost 1 (Figure 11-4). The results are as expected with acceptable correlation.

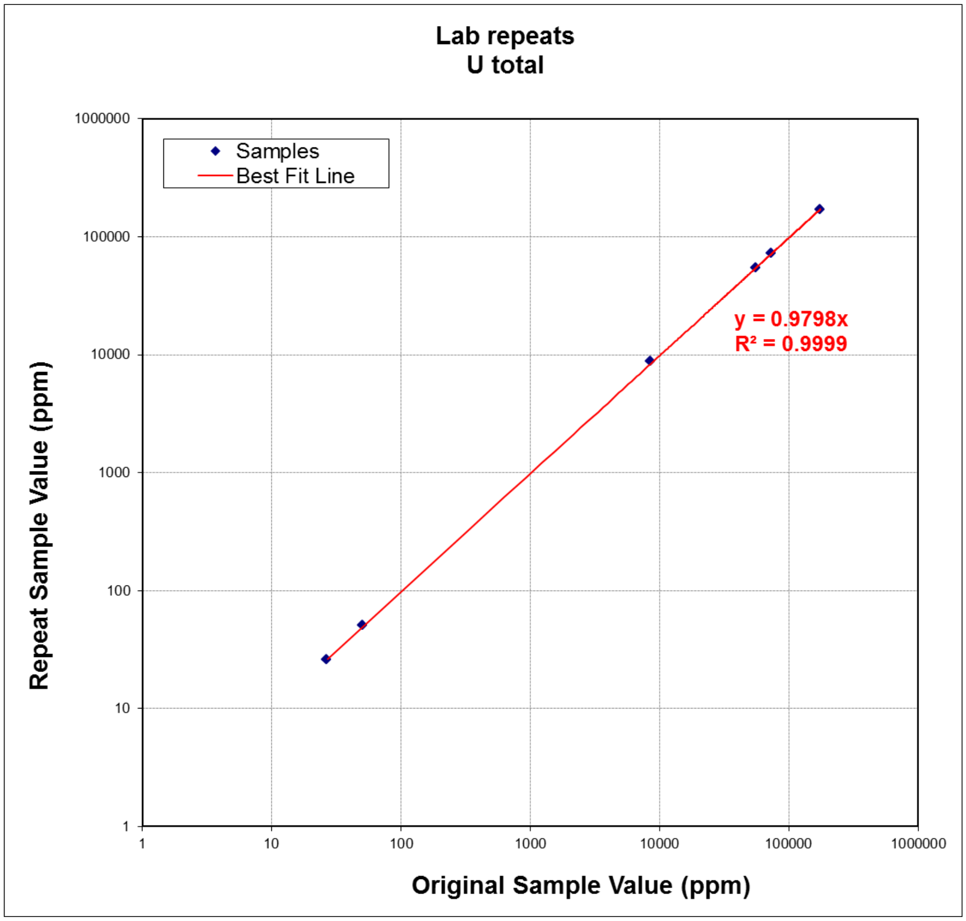


Figure 11-2: Lab repeat comparison

11.9.6.2.2 Midwest A

Lab repeats are done once every 40 analyses. Between 2005 and 2009, 277 repeats were taken over systematic sandstone, selective sandstone, systematic basement, selective basement samples, and samples selected for thin sections.

Overall, the correlation is very good with an r^2 value of almost 1 (Figure 11-2). The results are as expected with acceptable correlation.

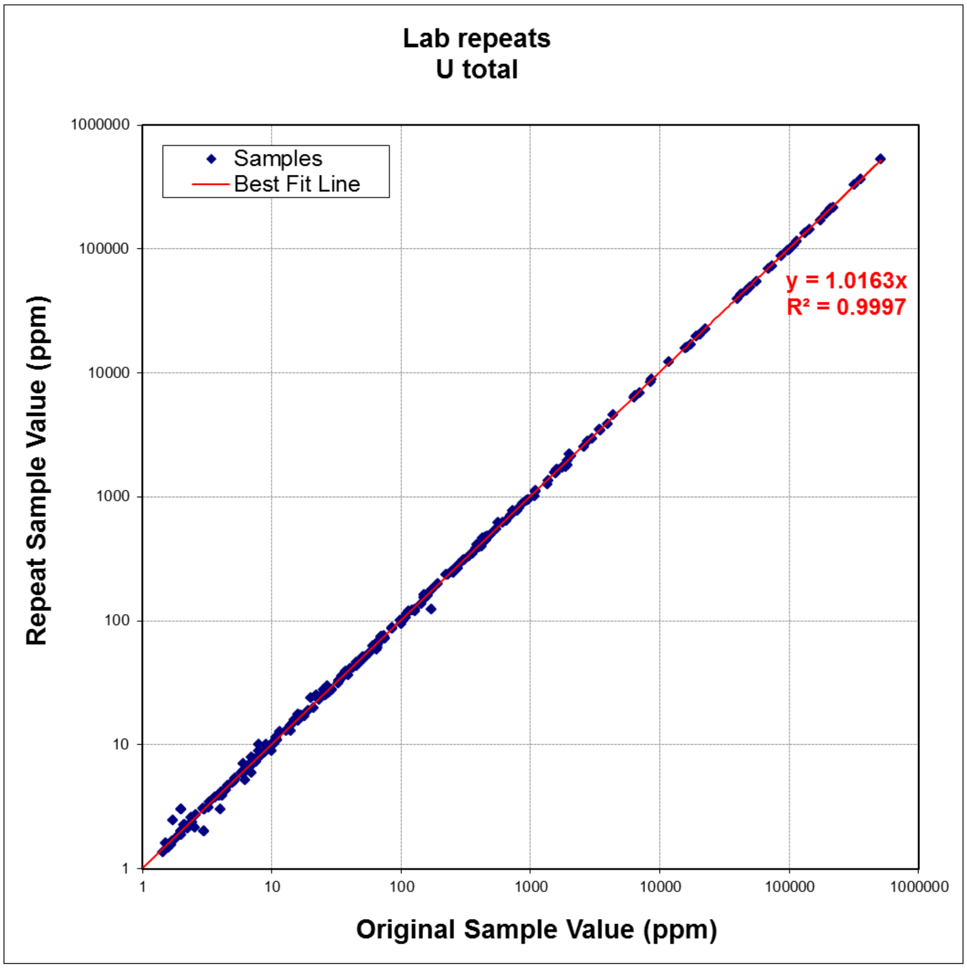


Figure 11-3: Lab repeat comparison

11.9.6.3 Laboratory Standards

11.9.6.3.1 SRC Sandstone Lab Standards

At the SRC, both the ASR1 and ASR2 lab standards were analysed with the geochemical data collected. The ASR1 and ASR2 standards provided a total of three values each (Figure 11-4 and Figure 11-5). The confidence limits are established at two standard deviations.

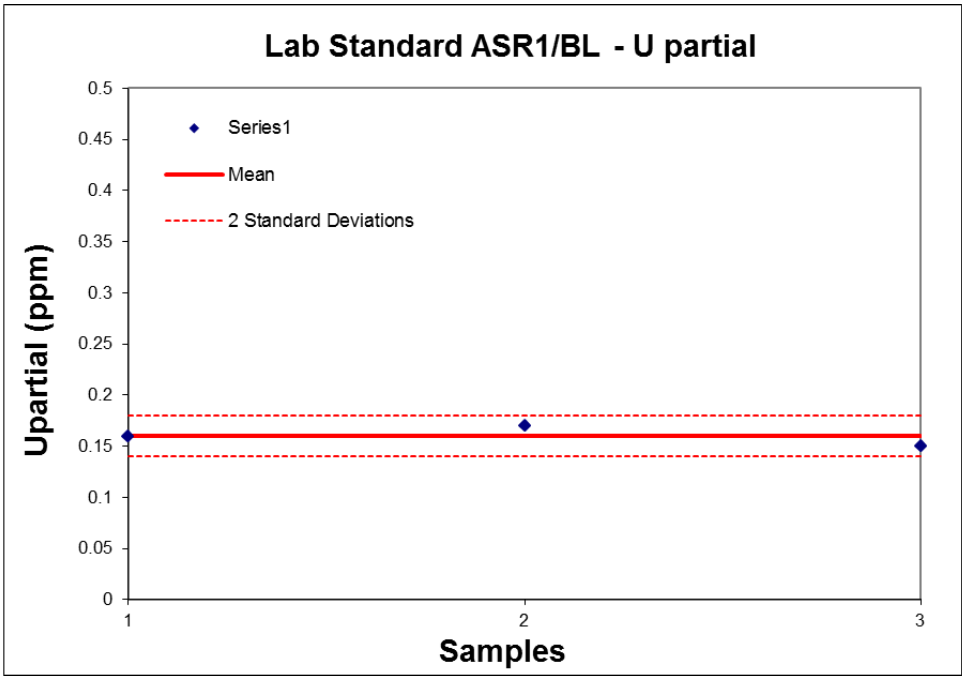


Figure 11-4: ASR1 Lab Standard control chart

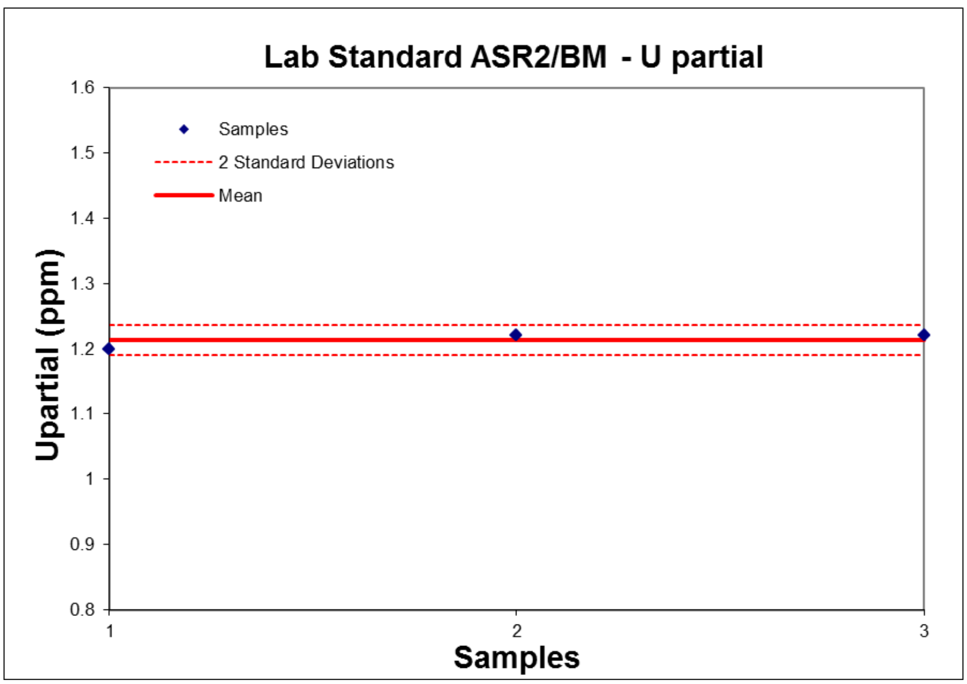


Figure 11-5: ASR2 Lab Standard control chart

11.9.6.3.2 Basement Lab Standards

Midwest Main

Two basement-rock lab standards were analysed which comprised of CG515/LS4/BH and CG515/LS4/BM (Figure 11-6 and Figure 11-7). Most samples fell within the expected range, with the exception of one sample which was just above the two standard deviation confidence limit. With the low expected grade of the CG515/LS4/BM standard, this was not unexpected. As previous, the confidence limit was set at two standard deviations.

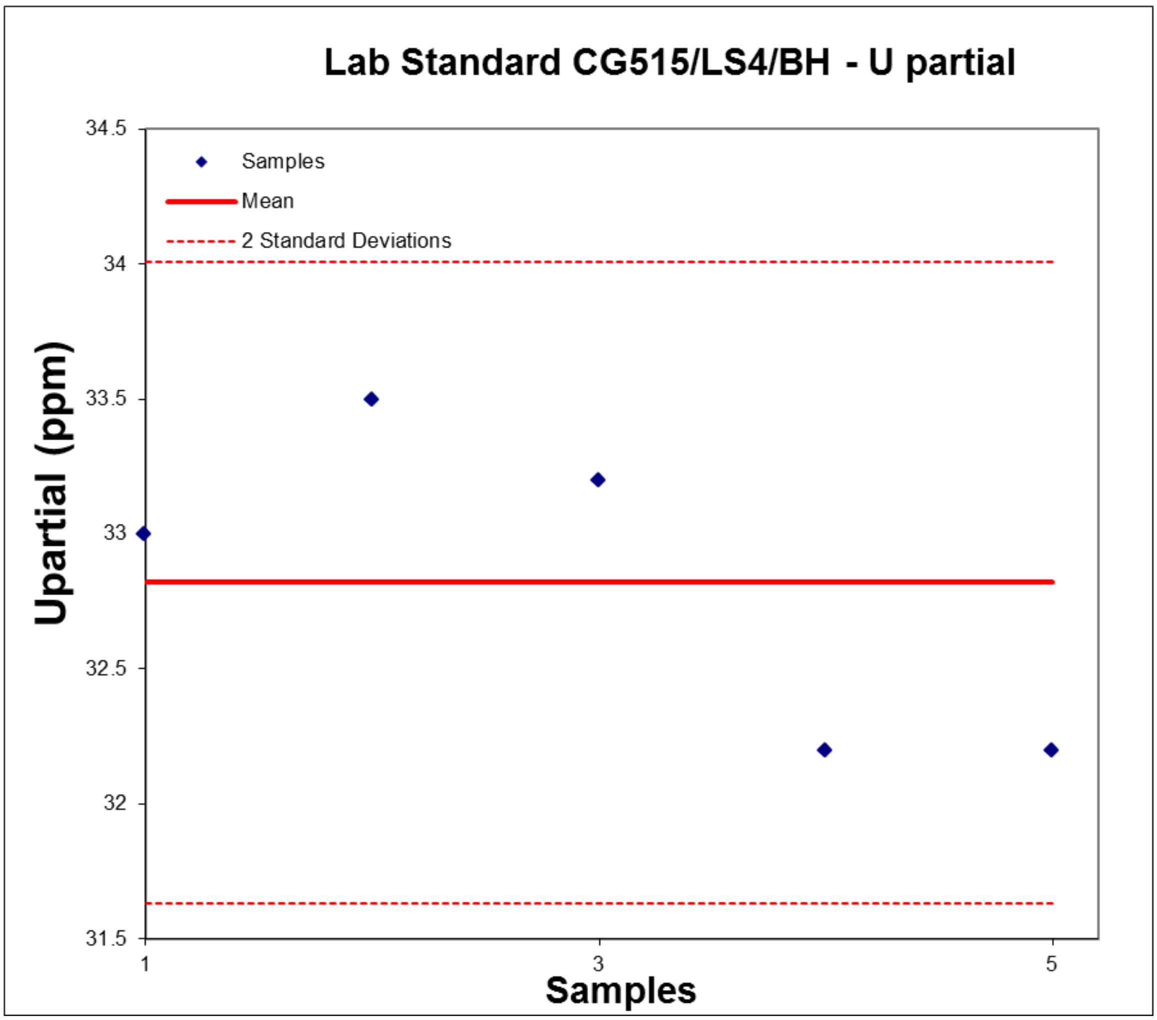


Figure 11-6: CG515/LS4/BH control chart

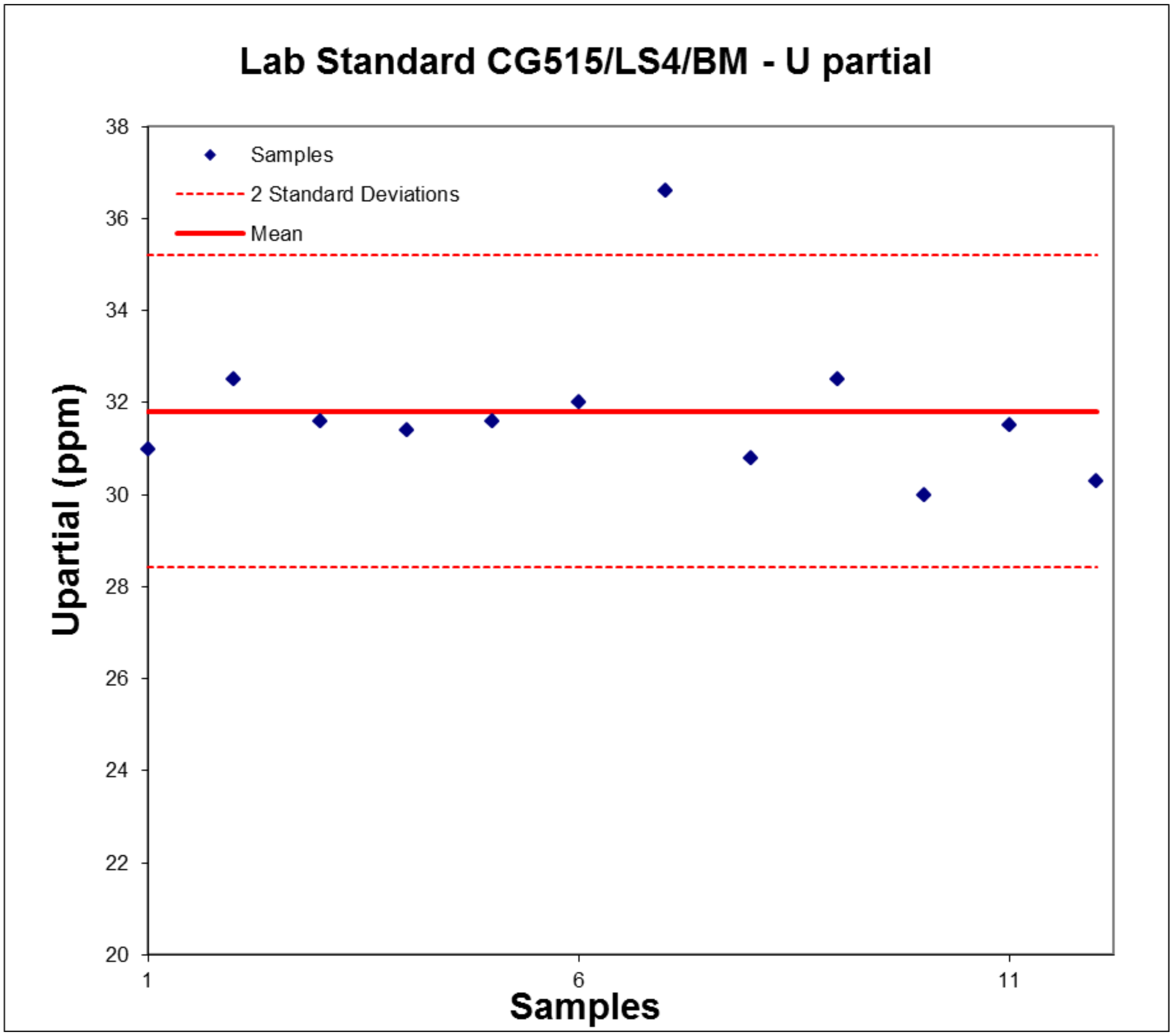


Figure 11-7: CG515/LS4/BM control chart

<u>Midwest A</u>

A series of basement lab standards were analysed and include CG515/LS4/BH, CG515/LS4/BL, CG515/LS4/BM, and CG509/LS3. Most samples fell within the expected range, with the exception of a few which resulted in values which were below the detection limit of 2 ppm U (Figure 11-6 to Figure 11-11). The values below detection limit in Figure 11-6 to Figure 11-10 were assigned a zero grade on the figures for purposes of illustration only. With the low expected grade of these standards, this was not unexpected. As previous, the confidence limit was set at 2 standard deviations.

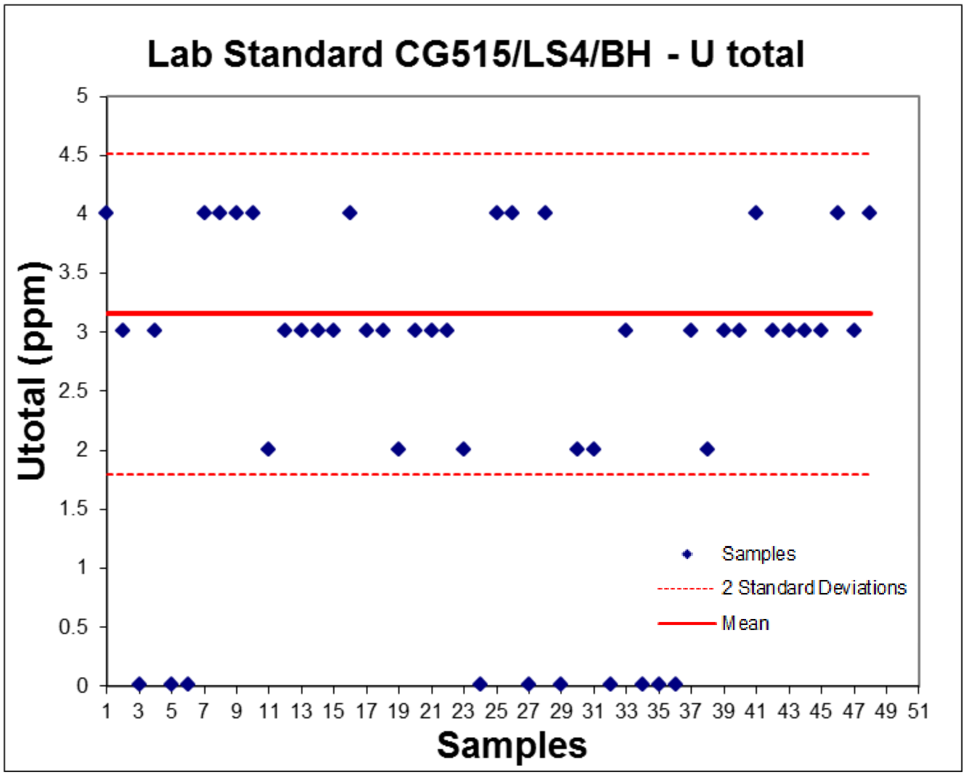


Figure 11-8: CG515/LS4/BH control chart

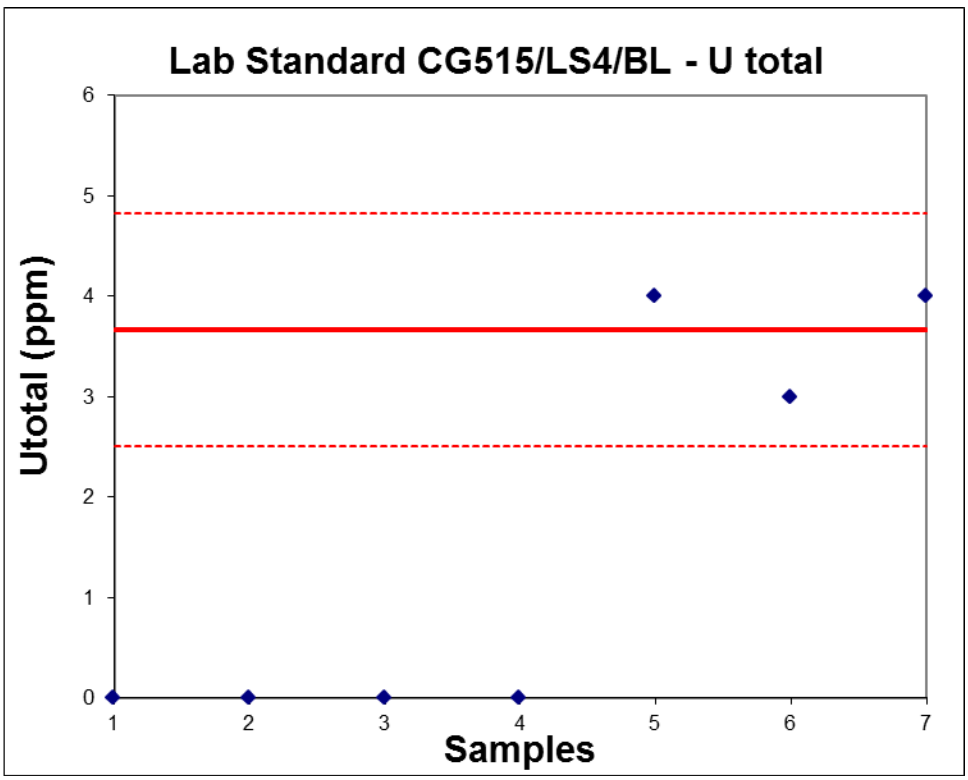


Figure 11-9: CG515/LS4/BL control chart

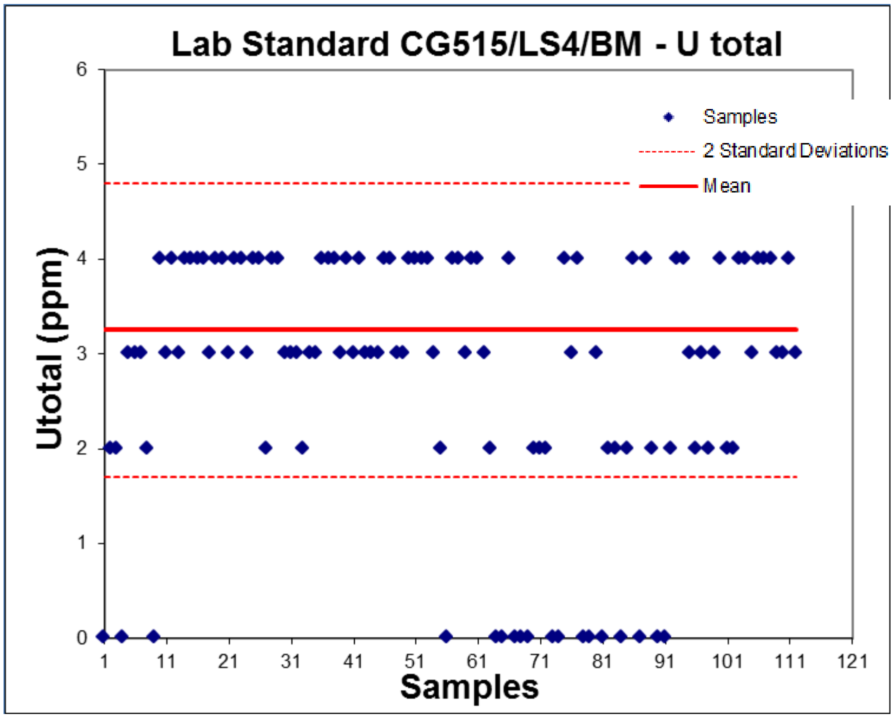


Figure 11-10: CG515/LS4/BM control chart

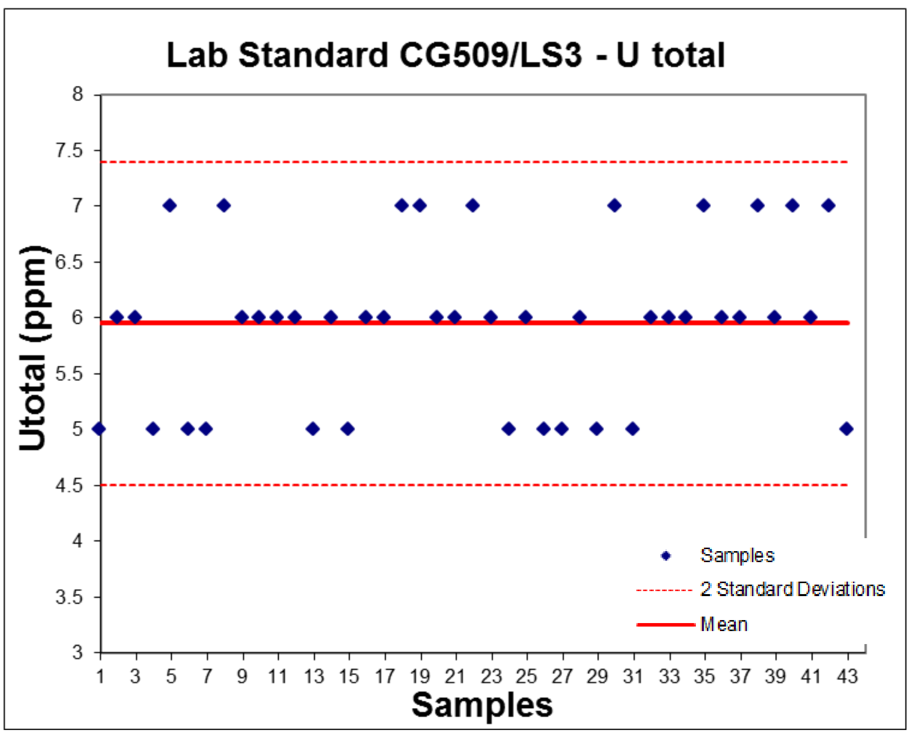


Figure 11-11: CG509/LS3 control chart

11.9.6.3.3 U_3O_8 Assay Standards

For Midwest A, five lab standards (BL1, BL-2A, BL3, BL-4A, and BL5) were used in U_3O_8 assays for quality control (Figure 11-12). A total of 34 samples were analysed. All samples show no noticeable differences, except for one BL4A sample. Given that the grades matched the BL2A expected (for Uranium and other elements); this was deemed to likely be a standard label mix up.

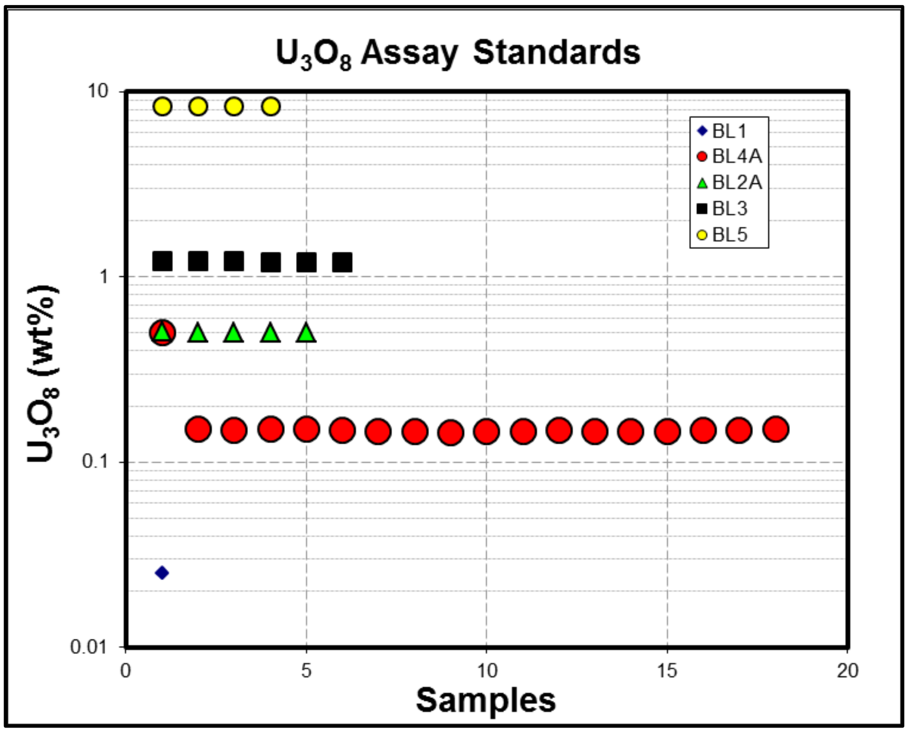


Figure 11-12: U_3O_8 Assay standard results

11.9.6.4 AREVA Sandstone Standard

For Midwest A, an AREVA “sandstone standard” was inserted in the non-mineralized batches at a minimum of one standard every 40 analyses (Figure 11-13). A total of 74 sandstone standards were analysed, with 4 of these samples barely falling outside of the 2 standard deviation confidence limit.

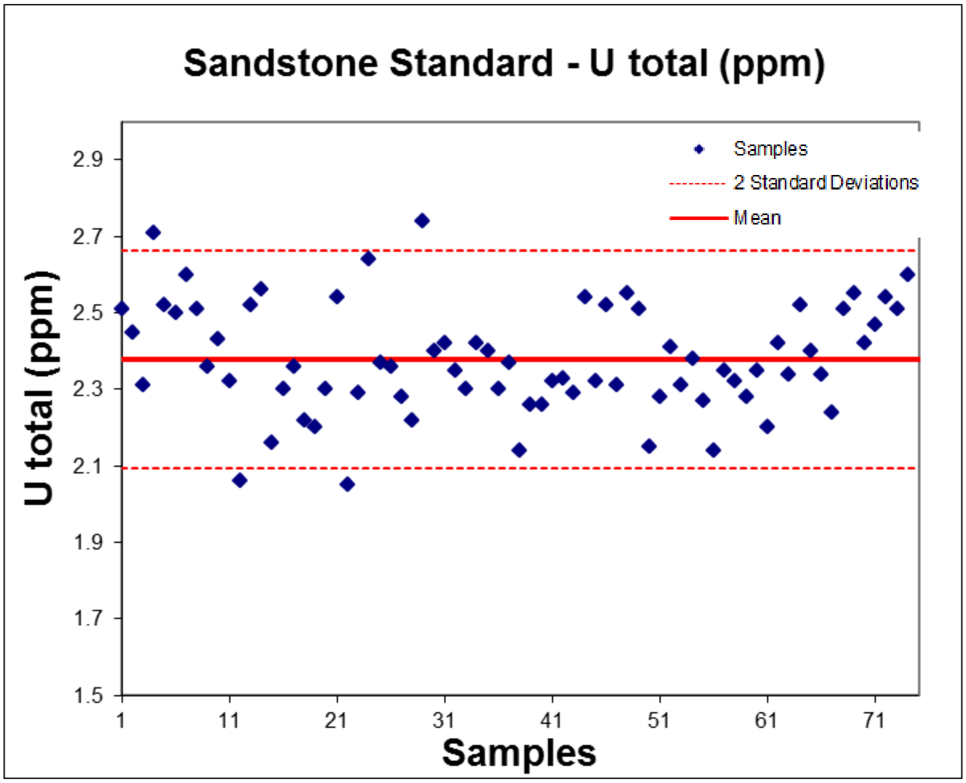


Figure 11-13: Sandstone Standard control chart

11.9.6.5 Analytical Blanks

For Midwest A, a Quintus silica sand analytical blank was inserted in every batch of non-mineralized sandstone and basement for a total of 19 samples (Figure 11-14). All samples returned values at or below the detection limit of 0.02 ppm U total, with the exception of one sample which returned a value of 0.97 ppm U total. The failed sample was part of a batch of petrographic samples for which the standards data did not undergo ARC QC evaluation, however, it was not used in the resource estimation.

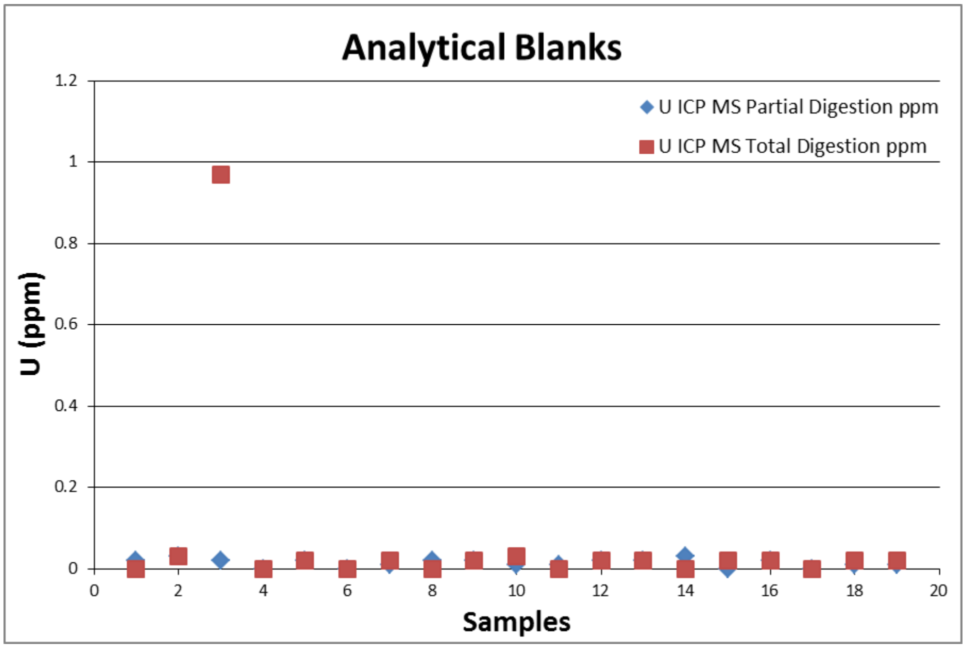


Figure 11-14: Analytical Blanks results

11.10 Dry Bulk Density and Specific Gravity Measurements

No information is available on the density measurement methodologies used prior to 1993. However, 3,776 dry bulk density and 207 specific gravity determinations were carried out on samples from the Midwest property between 1978 and 1982. Nearly all of these determinations were carried out on samples from the Midwest Main deposit. This data has been entered into the Midwest database.

No dry bulk density measurements were carried out in the field since 2005 using the procedure presented in (Areva Resources Canada Inc., 2011) on drill core from Midwest Main. Similarly, no other physical property measurements, such as density, porosity, resistivity, magnetic susceptibility, and acoustic velocities, have been determined in the laboratory (Areva Resources Canada, 2012) on drill core from Midwest A.

For the Midwest A area of the property, very few (3) dry bulk density and no specific Gravity (SG) determinations were made prior to 1993. Additional samples for dry bulk density, wet bulk density, and specific gravity measurements have been taken since 2005 around the time of the drill campaigns on the deposit. This consisted of 63 dry bulk density, 58 wet bulk density, and 381 SG measurements. No geochemical analyses were conducted on the density samples. Geochemical data were obtained on 324 of the SG samples.

Due to the absence of samples from the Midwest A area that contain both geochemical and dry bulk density data, an additional 27 samples were collected during a site visit in January 2017. Samples were sent to the SRC Laboratories in Saskatoon for processing. Of these 27 samples, 24 were processed at the SRC for both dry bulk density using wax immersion and specific gravity measurements using a pycnometer, as well as full geochemical analyses. The remaining three will be used for future studies before being analysed for these purposes.

11.11 Conclusions

In the authors' opinions, the procedures employed during sampling, shipping, sample security, analytical procedures, validation by different laboratory techniques, QA/QC protocol, and use of radiometric probe data conversion, comply with industry standard practices in place at the time they were collected. One minor discrepancy was noted in the data QA/QC concerning historical uranium assay check analyses, however, it is not expected to have material effect on the final resource calculations. The use of partial digestion, total digestion, and U_3O_8 assay analyses provides stringent QA control of the modern geochemical uranium data values.

The use of calibrated downhole radiometric probe data also allows for cross-checking validation of, and substitution for, geochemical uranium data. The probing methodologies and the currently-utilized calibration coefficients conform to industry standards.

12 DATA VERIFICATION

Orano provided Denison with a comprehensive Project database consisting of drill hole data, block models and wireframes for both the Midwest Main and Midwest A deposits. Prior to mineral resource estimation, Orano had performed detailed QAQC and data verification of all datasets, which in Denison's view are in accordance with industry best practice and consider them to be reasonable and acceptable for resource estimation. Denison has performed additional QAQC and data verification of the database as described in the sub sections below.

12.1 Database Validation

Denison conducted audits of select historic records to ensure that the grade, thickness, elevation, and location of uranium mineralization used in preparing the current resource estimates were accurate. Denison performed the following queries on the digital project database. No significant issues were identified.

- Header table: searched for incorrect or duplicate collar coordinates and duplicate hole IDs.

- Survey table: searched for duplicate entries, survey points past the specified maximum depth in the collar table, and abnormal dips and azimuths.
- Core recovery table: searched for core recoveries greater than 100% or less than 75%, overlapping intervals, missing collar data, negative widths, and data points past the specified maximum depth in the collar table.
- Lithology and Probe tables: searched for duplicate entries, intervals past the specified maximum depth in the collar table, overlapping intervals, negative widths, missing collar data, missing intervals, and incorrect logging codes.
- Geochemical and assay table: searched for duplicate entries, sample intervals past the specified maximum depth, negative widths, overlapping intervals, sampling widths exceeding tolerance levels, missing collar data, missing intervals, and duplicated sample IDs.

In addition, a review of selected drilling campaign reports and associated data appendices were reviewed to validate and support the drill hole database content. No inconsistencies or errors in the database were noted.

12.2 Independent Verification of Assay Table

The assay table contains 16,454 laboratory records. Denison has verified approximately 2,500 records representing 15% of the data for uranium values against laboratory certificates spanning drilling seasons from 1980 to 2009. No discrepancies were found.

Denison additionally carried out checks of the digital probe equivalent uranium database used for resource estimation by verifying the probe equivalent uranium database against original assay data. Denison verified that in instances were core recovery was less than 75%, radiometric data could be substituted for chemical assays and that the assay database was of sufficient quality for mineral resource estimation.

Based on Denison's validation of the Midwest project data, Denison is of the opinion that the assay and probe equivalent databases are of sufficient quality for mineral resource estimation.

12.3 Site Visit and Core Review

Mr. Chad Sorba and Mr. Dale Verran of Denison, visited the Midwest property on February 7th and 8th, 2018 accompanied by Mr. Trevor Allen (Mineral Resources Geoscientist) and Ms. Odile Maufrais-Smith (Geologist) of Orano. Denison reviewed exploration and geological modelling procedures with Orano personnel while on site. Drill core from both the Midwest Main and Midwest A deposits were examined while on site at the Moffatt Lake core storage facility. Denison visited several drill sites and verified the occurrence of high grade mineralization visually and by way of handheld scintillometer. Additional discussions were held in Saskatoon at Orano's exploration office with technical personnel on November 8th, 2017.

12.4 Opinion on Adequacy of Data

The Qualified Persons (Verran, Sorba) consider the Midwest Main and Midwest A data to be reliable and appropriate for the preparation of a Mineral Resource estimate.

Historic drill holes were not used in the Midwest A estimate, as they were deemed redundant with the modern drilling and there were some data quality concerns. The historic holes were assumed to have a larger degree of error (compared to the modern drilling conducted by Orano) as the downhole surveying techniques used at the time (acid test and tropari) did not have as high a degree of accuracy. Combined with the lack of downhole probing data, these holes were used only for interpretation and validation of the 3D model envelopes.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Mineral Processing

The Midwest Main and Midwest A deposits are not considered an advanced property at this time. It is anticipated that any uranium mineralization mined from the Midwest Main and Midwest A deposits will be processed at the nearby MLJV McClean Lake facilities (McClean Lake mill).

The McClean Lake mill, located on the McClean Lake property, has processed ores from several deposits on the property (JEB, Sue A, Sue B, Sue C, and Sue E), and is currently processing ore from the Cigar Lake mine. The main process operations include:

- SAG and ball mill grinding
- Slurry leaching
- Counter-Current Decantation (CCD)
- Pregnant solution clarification
- Solvent extraction
- Precipitation of Yellowcake
- Crystallization of ammonium sulphate
- Tailings neutralization and disposal
- Water treatment

The ore is stockpiled near the mill and fed into the SAG mill. The ground and slurried ore is stored in pachucas for a continuous feed into the leach circuit. Uranium is then leached from the ore slurry in two atmospheric pressure circuits using sulphuric acid, with hydrogen peroxide being used as the oxidizing agent. The first circuit operates at room temperature and the second at 50ºC. The total retention time is approximately 8 hours. The solids are separated from the uranium-containing solutions after leaching in a conventional 6-stage thickener CCD circuit. The overflow from the first thickener is clarified in a sand filter.

A solvent extraction (SX) circuit, employing extraction conventional technology and using an amine extractant in a kerosene organic solvent, includes uranium extraction, arsenic scrub, water wash, uranium stripping with ammonia, ammonia scrub, and organic regeneration stages. The raffinate is partially recirculated to the CCD circuit.

The pregnant strip solution contains the SX-extracted uranium, as well as a significant amount of molybdenum. Because the molybdenum concentration in the strip solution exceeds the rejection limit imposed by the uranium conversion facilities that treat the McClean Lake yellowcake product, carbon adsorption columns are used to remove approximately 75% of the molybdenum from the pregnant strip solution.

Yellowcake in the pregnant strip solution is precipitated with ammonia and the solids are separated from the liquid in thickeners and centrifuges. The precipitate is then dried and calcined in a rotary multiple hearth. The calcined yellowcake is discharged to an automatic packaging system which fills 208-litre drums.

Any excess ammonium sulphate produced when ammonia is used in the solvent extraction and yellowcake precipitation circuits, is removed by an ammonium sulphate extraction circuit. Lime is added to a mixture of the tailings and part of the raffinate to neutralize acid. Barium chloride and ferric sulphate are added to precipitate radium and arsenic. The thickened tailings received from the tailings thickener are sent to the JEB tailings disposal pit, which is made up of a subaerial pervious surround tailings disposal system.

Water pumped from the surface of the tailings pit and the tailings thickener overflow is treated in a three-stage water treatment plant. As for the tailings, the water has lime, barium chloride, and ferric sulphate is added to it to neutralize acid and to precipitate radium and arsenic. The output from the plant is sent into monitoring ponds and then the water is discharged after water analyses confirm that all regulatory guidelines have been met.

Uranium production from the McClean Lake project spanned the years 1999 to 2010 during which time the McClean Lake mill processed ore from five deposits: JEB, Sue C, Sue A, Sue B, and Sue E, with a total of just over 51 million pounds U_3O_8 (approximately 19,617,000 kg U) being produced. Since 2016, following mill upgrades, the mill has been toll-milling ore from the Cameco-Orano Cigar Lake mine.

13.2 Metallurgical Testing

Several programs of metallurgical testing have been carried out on Midwest Main mineralization. To date, no metallurgical test work has been carried out on the Midwest A deposit.

The two main studies on Midwest Main were by Melis Engineering in 1990 and by SEPA (AREVA laboratory in France) in 1998. Both studies show that excellent metallurgical recovery of uranium can be achieved ((Melis Engineering Ltd., 1990) and (SEPA, 1998)). It is not clear if the samples used in these studies are representative of the various types and styles of mineralization and the mineral deposit as a whole.

The current McClean Lake milling process differs from what was planned by Melis as a separate facility was planned in the study.

The leaching tests done by SEPA on the Midwest mineralization samples showed that 99.5% of uranium could be extracted using these conditions:

- Leach time 24 hours
- Acid addition 120 kg/tonne
- Free acid at end of test 25 g/l
- Oxidation, 02 at 2 bar pressure
- Redox 470 m.v.

The current process for Cigar Lake ore being processed at the mill requires an eight hour leaching time which is substantially less than what is proposed as optimal for Midwest Main (24 hours). As the mill has recently undergone upgrades, it is expected these leaching times will be reviewed.

The test work has demonstrated that a metallurgical recovery for uranium of 98% from Midwest Main uranium mineralization can be obtained.

13.2.1 Treatment of Arsenic

The Midwest Main deposit has a relatively high amount of arsenic (5-10% overall), which could affect the water quality discharge from the mill if not properly precipitated into the tailings. The SEPA study proposed using ferric sulphate to precipitate the arsenic in the tailings.

Currently the mill is addressing arsenic in the Cigar Lake ore, which also contains high levels of arsenic, using barium chloride and ferric sulphate to precipitate it from solution.

13.2.2 Nickel and Cobalt Recovery

Test work was conducted by Denison in 1992 at Lakefield Research to determine if the recovery of nickel and cobalt was feasible along with the extraction of uranium (Lakefield Research, 1992). Test work indicated that a precipitate with good grades of nickel and cobalt could be produced from a raffinate solution after the arsenic and radium are precipitated. It is estimated that an overall process recovery of 54% for both nickel and cobalt could be achieved.

13.3 Additional Testing

The McClean Lake mill has seen many recent upgrades and changes since the 1992 and 1998 studies were conducted. Review of the studies and additional metallurgical testing will likely need to be conducted prior to mining of Midwest Main.

14 MINERAL RESOURCES ESTIMATE

14.1 Introduction

The Midwest uranium project is comprised of two primary deposits: Midwest Main and Midwest A. The mineral resource models for both Midwest Main and Midwest A was prepared by Trevor Allen, P. Geo., Resource Evaluation Geologist, Orano, in November 2017. In February 2018, SRK Consulting (Canada) Inc. (SRK) was retained by Denison to audit the mineral resource models constructed by Orano.

Historically, the Midwest Main and Midwest A uranium deposits were reported separately. Given the two deposits comprise the Midwest uranium project, this is the first time they will be reported in the same audited Mineral Resource Statement. The audited Mineral Resource Statement presented herein represents the third and second mineral resource evaluation prepared for the Midwest Main and A deposits, respectively, in accordance with the Canadian Securities Administrators' National Instrument 43-101.

The geology interpretation and review of the 3D model was performed by Mr. G. David Keller, PGeo (APGO#1235). The data and mineral resource model review was performed by Dr. Oy Leuangthong, PEng (PEO#90563867). Mr. Keller and Dr. Leuangthong visited the site on February 7 and 8, 2018. The mineral resource classification was reviewed and the audited Mineral Resource Statement was prepared by Mr. Keller and Dr. Leuangthong. Mr. Glen Cole, PGeo (APEGS #26003) was the senior reviewer of the mineral resource audit. Both Mr. Keller and Dr. Leuangthong are independent Qualified Persons as this term is defined in National Instrument 43-101. The effective date of the Mineral Resource Statement is March 9, 2018.

This section describes the resource estimation methodology and summarizes the key assumptions considered by Orano, and audited by SRK on behalf of Denison. In the opinion of SRK, the resource evaluation reported herein is a reasonable representation of the global uranium mineral resources found in the Midwest uranium project at the current level of sampling. The mineral resources have been estimated in conformity with generally accepted CIM Estimation of Mineral Resource and Mineral Reserves Best Practices Guidelines and are reported in accordance with the Canadian Securities Administrators' National Instrument 43-101. Mineral resources are not mineral reserves and have not demonstrated economic viability. There is no certainty that all or any part of the mineral resource will be converted into mineral reserve.

The database used to estimate the Midwest Uranium project mineral resources was audited by SRK. SRK is of the opinion that the current drilling information is sufficiently reliable to interpret with confidence the boundaries for uranium mineralization and that the assay data are sufficiently reliable to support mineral resource estimation.

Orano completed the resource estimate using Vulcan V10.1.2 and V10.0.3 software in UTM NAD 83 coordinates for Midwest Main and Midwest A, respectively. The block model was constrained by a re-interpreted 3D mineralized envelope of the mineralization using the updated resource database, as of October 2, 2017 for Midwest Main and June 16, 2017 for Midwest A. DG (density x grade in %U) and density were estimated into the blocks using Ordinary Kriging (OK). Nearest Neighbour (NN) and Inverse Distance Squared (ID2) estimation was used for model validation.

The resource estimate was internally validated by Orano through check estimations and peer reviews. The mineral resources do not include allowances for dilution and mining recovery.

To audit the mineral resource models for Midwest Main and Midwest A, SRK used Gems Version 6.7.4 to review the block model and conduct estimation sensitivities. The Geostatistical Software Library (GSLib) family of software was used for geostatistical analysis and variography review.

14.2 Midwest Main

Subsections 14.2.1 to 14.2.9 detail the data preparation, analyses and assumptions made by Orano to support the construction of the mineral resource model. These descriptions are excerpts taken from an internal Orano report (Allen, Quirt, & Masset, 2017b). Subsection 14.2.10 describes the methodology and findings from SRK's audit of the mineral resource model for the Midwest Main deposit.

14.2.1 Drill Hole Database

Drilling for the Midwest Main Zone was undertaken from 1970 to 2006 and was comprised of 675 drillholes (119,485 metres). The database used for Midwest Main in previous geological modelling and mineral resource calculations has since undergone further QAQC data verification and fixes, updates to allow a more robust calculation for equivalent uranium probing grades, updates to the equivalent uranium correlation, and a more robust combination of equivalent and geochemical uranium grades based on core recovery. In addition to this, a large amount of downhole gamma probing information (218 holes) was digitized and used in the estimation.

14.2.1.1 Calculation of Equivalent Uranium Grades

A new radiometric grade correlation was developed for Midwest Main for several reasons:

1. Large amount of historic probing (218 holes) has been digitized and added to the database.
2. Additional depth shifting was completed for the down hole probing that was in the database (to more closely spatially-relate the probing grades to the geochemical grades).
3. Additional details for the historic probes such as K factors, dead times, and sizes have been added to the database (acQuire) to more accurately calculate AVP grades.
4. Previous correlation work was limited in nature.

14.2.1.2 Combination of Equivalent and Geochemical Uranium Grades

The most notable change to the database since the previous resource estimate was the large increase in the amount of available down hole probing data. Previously, the probing data was not used for estimation. A new database script was created that combines these datasets to allow small areas of poor core recovery (without usable assay data) to be represented by equivalent probing data. The culmination of equivalent probing and geochemical grades is prioritized by:

1. Assay results for samples in intervals with core recovery above 75%.
2. Equivalent probing results for areas that have poor core recovery (<75%) or were not able to be sampled for assay.
3. Assay results with core recovery below 75% if no probing data is available.

14.2.1.3 Radiometric Grade Correlation

Scintillometer and Geiger-Muller radiometric readings, from downhole radiometric probing, are corrected for the absorption caused by fluid, casing, and for various probe parameters (dead time; K factor). The K-factor is the coefficient transforming probe radiometric counts values (in cps) into corrected values (cps: eU_{RA}).

The equivalent uranium radiometric values (eU_{RA}) are calculated assuming that the mineralization is in radiometric equilibrium. If the in-hole mud density was not measured, this parameter value is considered to be as water (d=1).

The radiometric-grade correlation equation is used to derive equivalent uranium grades, in 10 centimetre intervals (i.e. at 10 centimetre support), or to a lesser extent 20 centimetre intervals, from the equivalent uranium radiometric values using the following formula:

$$eU\% = \alpha * eU_{RA}\beta$$

eU_{Ra} : equivalent Uranium grade (ppm)

α : alpha value derived in radiometric-grade correlation

β : beta value derived in radiometric-grade correlation

Two correlation equations were established based on the type of probe used; 1) Mount Sopris Scintillometer and Geiger Muller probes, and 2) Century Geophysics Scintillometer probes. The K factors for Mount Sopris Scintillometer and Geiger Muller probes were deemed to be reliable; however, there was some uncertainty in the K factor used for the Century Geophysics probes. As the K factor is constant, it was decided to develop a separate correlation to account for this uncertainty with the Alpha and Beta in the formula.

The first probe grade correlation was based on the Mount Sopris Scintillometer and various Geiger Muller probes using measurements from 31 intercepts in 18 drill holes, and is specific to the Midwest Main deposit for these probes:

$$eU\% = 0.0887 * {eU_{RA}}^{1.0042}$$

The second probe grade correlation was based on the Century Geophysics probe (serial number 9067) using measurements from 37 intercepts in 27 drill holes, and is specific to the Midwest Main deposit for this probe:

$$eU\% = 0.0466 * {eU_{RA}}^{1.1925}$$

Several of the PQ holes drilled at Midwest Main were noted to have higher than expected equivalent probe grades. Further review indicated that the holes were likely PVC lined and that no casing shielding factor should be used. Without the casing shielding factor being used, the equivalent grades were lowered and are considered to be in line with expected values.

To handle the high grades from the holes at Midwest Main, many holes were probed with more than one probe; one for the low grade areas and the other for the high grade zone (shielded to keep the probe from saturating). In most cases, these runs were separated in the database to allow calculation of equivalent probe grades with their probe specific parameters (K factor, deadtime, etc.). Data that was digitized previously had different probes mixed together in the database. These holes were identified and a dead time of 0 seconds was applied until they can be re-digitized from the original logs. This resulted in a conservative value for the equivalent probing with results approximately 2% lower than expected.

14.2.1.4 Density Data

Two density-grade correlations were used on Midwest Main based on (Demange, 2004); 1) a Nickel and Uranium correlation equation was used for samples that were geochemically assayed for both elements, and 2) a uranium-only correlation equation for samples that either were not geochemically assayed for Nickel, or for areas where equivalent probing grades were used.

The Nickel and Uranium multi-element density correlation equation was calculated using previously collected dry bulk density and available geochemical analyses. Only the two elements were used for the correlation because elements other than Uranium and Nickel were not systematically analysed for.

The multi-element density correlation is:

$$d = Density\ = 1/(0.487 - 0.0044 * \%U3O8 - 0.00833 * \%Ni)$$

The single element density correlation is:

$$d = \ Density = \ \ 1\ /\ (0.46 - 0.0084 * \%U3O8)$$

Where *d* represents the calculated dry bulk density.

14.2.2 Geological Model

Structural interpretations, along with the interpreted unconformity contact, were used during the interpretation of the mineralization. The structures relative to the mineralization are seen in Figure 14-1 and Figure 14-2.

Unconformity mineralization straddles the unconformity over the steeply-dipping graphitic pelitic gneiss basement lithologies (“Midwest trend”). A complex structural setting appears to control the mineralization location at Midwest Main:

- Several reactivation stages occurred within the northeast-trending belt of graphitic metasediments which was a key-element for Egress-style hydrothermal fluid circulation along the unconformity and into the Athabasca sandstone. These NNE faults are interpreted as extending into the sandstone, off-setting certain lithological markers.

- Series of N80° "EW" small-scale structural features (probable faults) appear to cross-cut the unconformity mineralization, locally off-setting and extending the mineralization. Additionally, these "EW" structures are limiting the extensions of certain perched mineralized lenses.
- Northwest-trending faults were also identified, but their control on the mineralization, if any, is not well understood at this point. These structures are very apparent on magnetic maps and seem to be the preferred hosts for post-mineralization diabase intrusions.
- North-South "Tabbernor"-style fault structures cross-cut the deposit and appear to control the extents of the high-grade mineralization at the unconformity. Additionally, the main mineralized basement root seems to follow this fault in the northern part of the deposit.

High-grade mineralization at Midwest Main is interpreted to be located in certain triple-point zones where the reactivated northeast-trending graphitic belt is intersected by cross-cutting EW and NS-trending fault systems.

The dominant control for perched mineralization in the sandstone appears to be the stratigraphic bedding planes. Mineralizing fluids are believed to have circulated through fault zones precipitating uraninite/pitchblende along bedding planes at the intersection of certain faults.

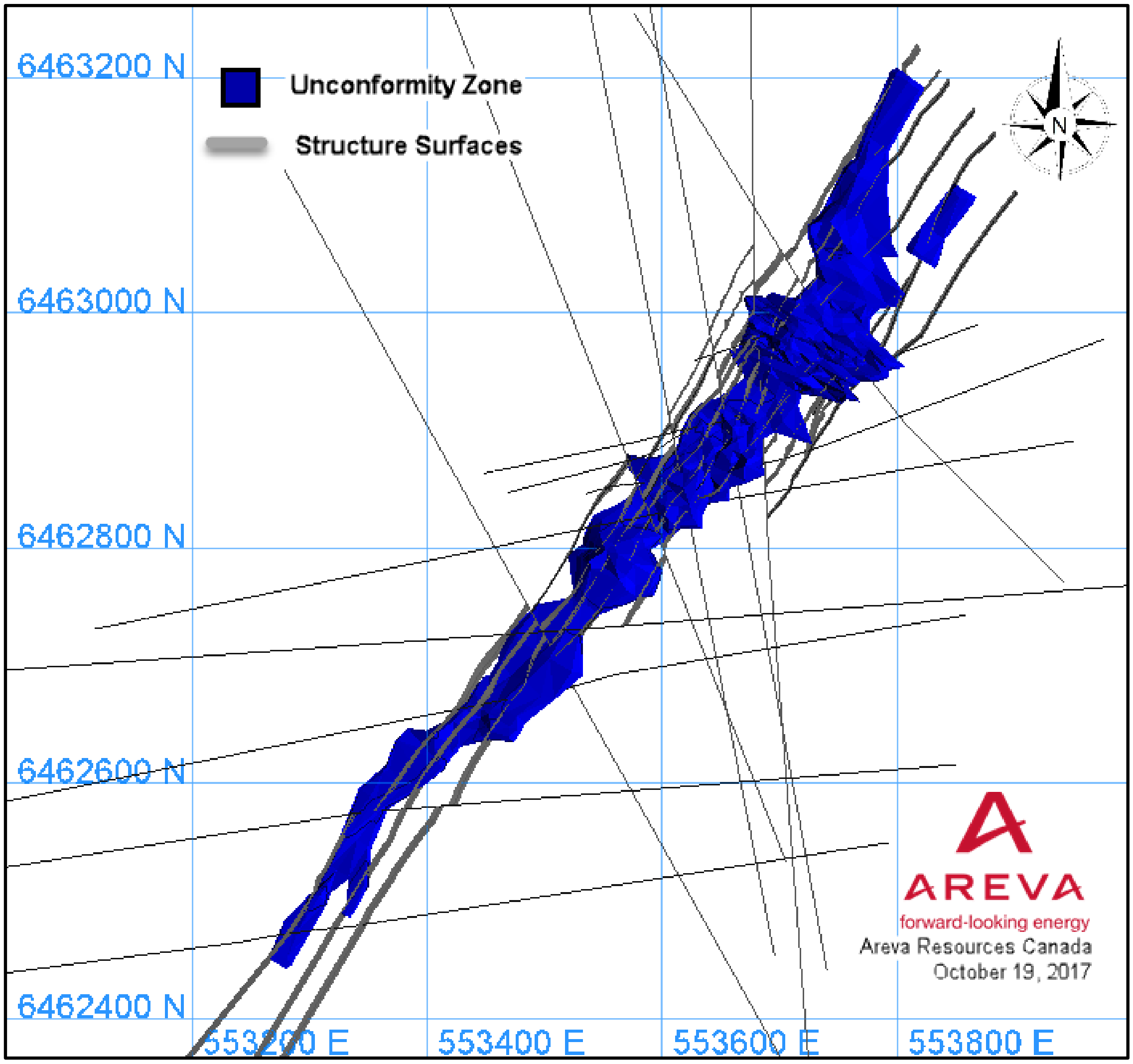


Figure 14-1: 25 m Plan Section with Structures Related to Midwest Main Mineralization

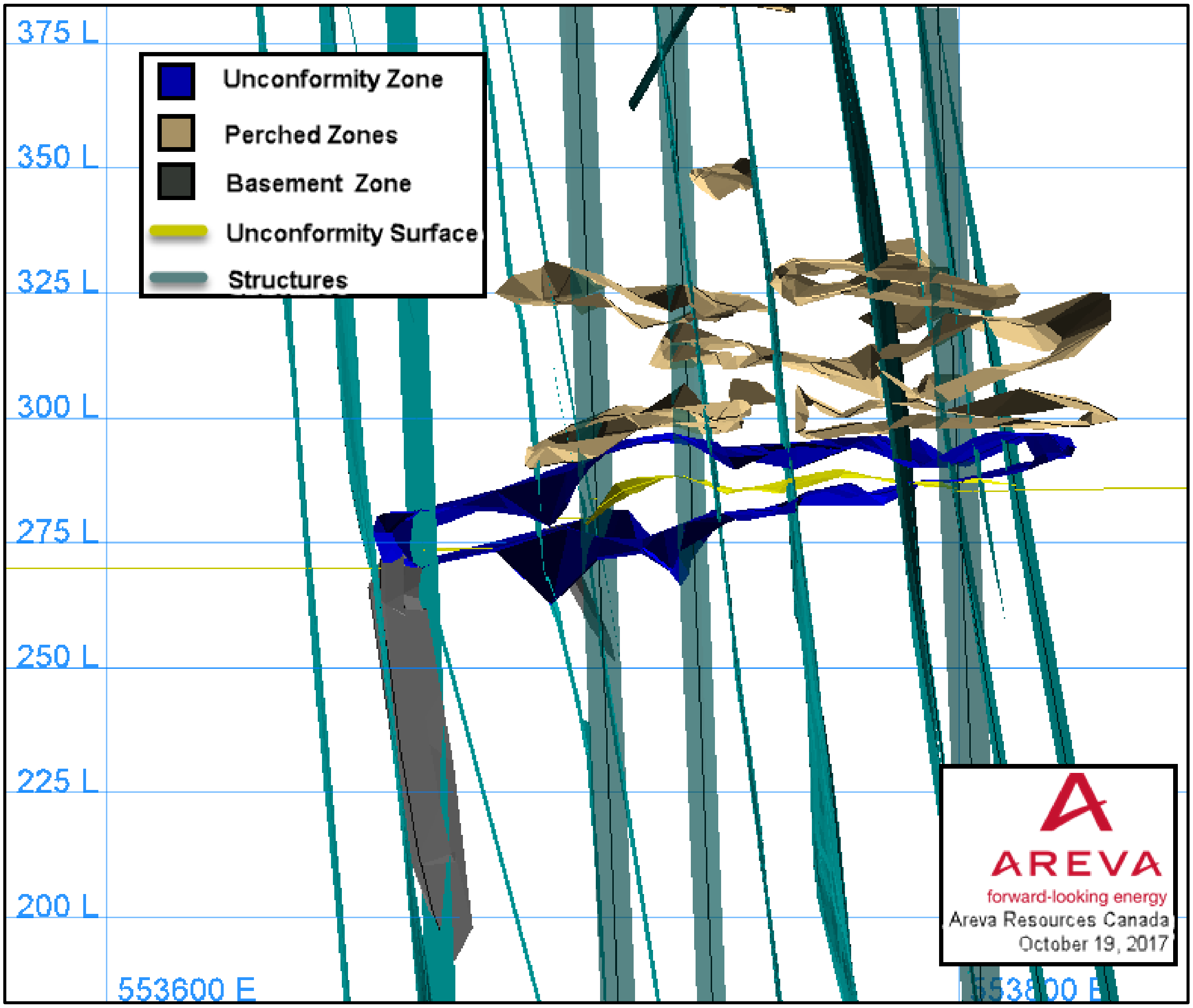


Figure 14-2: 10 m Cross-Section Looking 40° with Structures Related to Midwest Main Mineralization

The Midwest Main deposit has been approximately drilled on a 30 m x 30 m grid in the less-drilled areas (southwest and northeast) and on a 7 m x 7 m drill pattern in the high-grade area.

A 3D model of the Midwest Main deposit was created in Vulcan (version 10.1.2) using the updated drill hole database. The model was based on the uranium grade data as well as the updated lithological and structural models which gave additional information on the controls and constraints on the mineralization. The mineralization is interpreted to consist of a larger Unconformity Zone, a small Basement Zone, and 19 Perched Zones (Figure 14-3 to Figure 14-5).

The Unconformity Zone is approximately 920 metres long, 10 to 140 metres wide, and up to 33 metres in thickness, not including the basement roots which have been modeled to extend approximately an additional 90 metres into the basement. The bulk of the mineralization occurs in the Unconformity Zone at depths ranging between 170 and 205 metres below surface. Perched mineralization occurs as discrete lenses located above the Unconformity Zone and up to 80 metres below surface.

The Unconformity Zone was modelled using sections oriented perpendicular to the general trend of the mineralization (40° azimuth). Sections were generally spaced every 2.5 metres in the area of tight drilling and 10 metres throughout the rest of the deposit. The model was verified in 3D and in cross-section. The cut-off grade used for the Unconformity Zone was 0.05% U over 2 metres vertical width. The zone was interpreted to follow the unconformity along the northeast-trending structures with local influences from the other structures.

The Basement and Perched Zones were modelled using the same section orientation and were generally spaced every five to ten metres with a cut-off grade of 0.05% U over 2 metres vertical width. Based on current drilling, the Basement Zone was interpreted to be steeply-dipping and three to eight metres wide with limited strike extent. Drilling did not typically target this style of mineralization and the drill holes were often too short to properly test its extents, leaving it the least well-defined of the zones at Midwest Main. The Perched Zones were interpreted to be flat-lying, occurring along stratigraphic bedding planes in the sandstone.

Mineralization extents were extended from a mineralized drill hole halfway to the next un-mineralized drill hole, unless there was structural data to indicate that mineralization was cut off sooner. The 3D model was carried up to five metres past the last mineralized intercept for all zones.

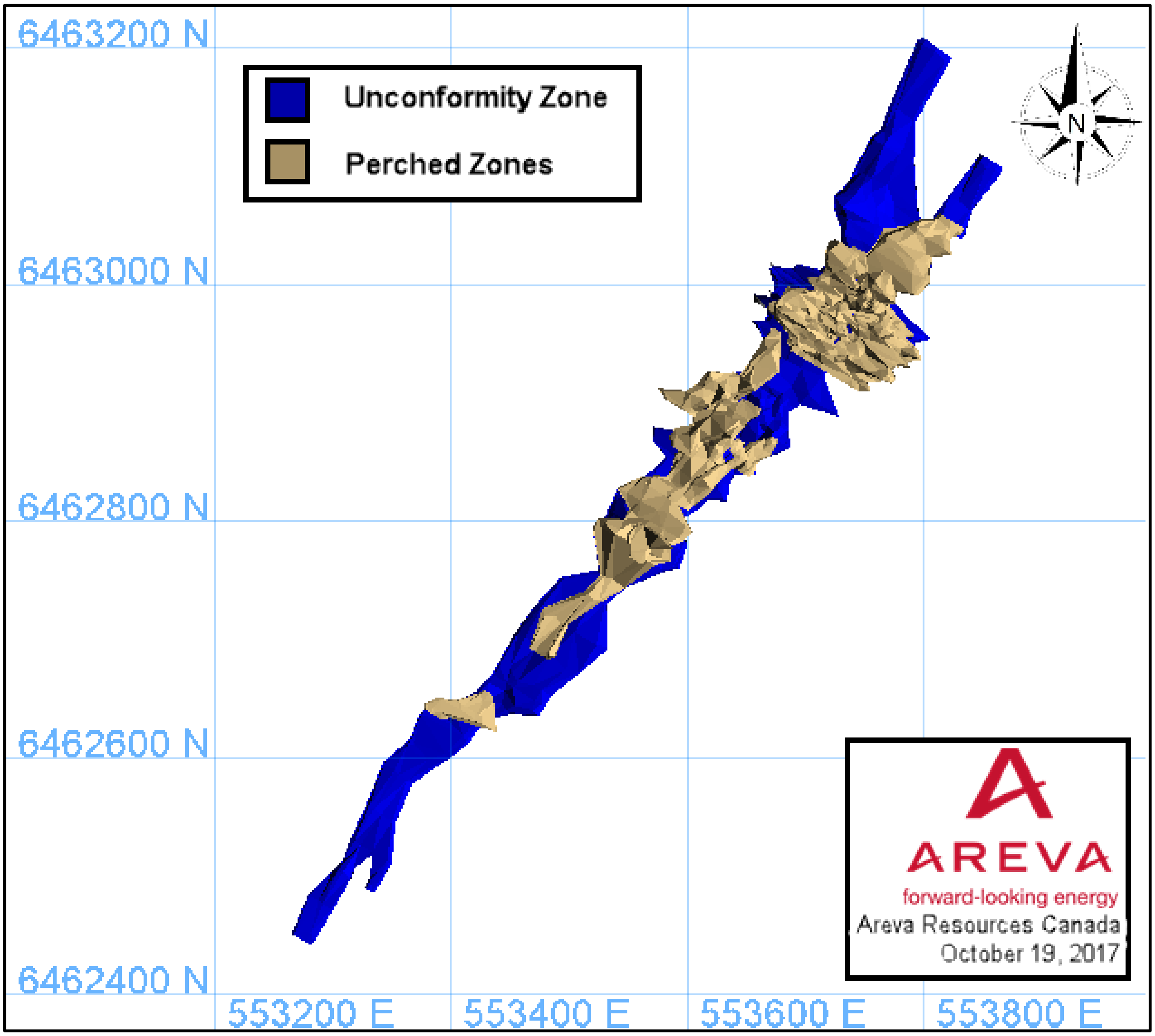


Figure 14-3: Plan View of Unconformity and Perched Zones

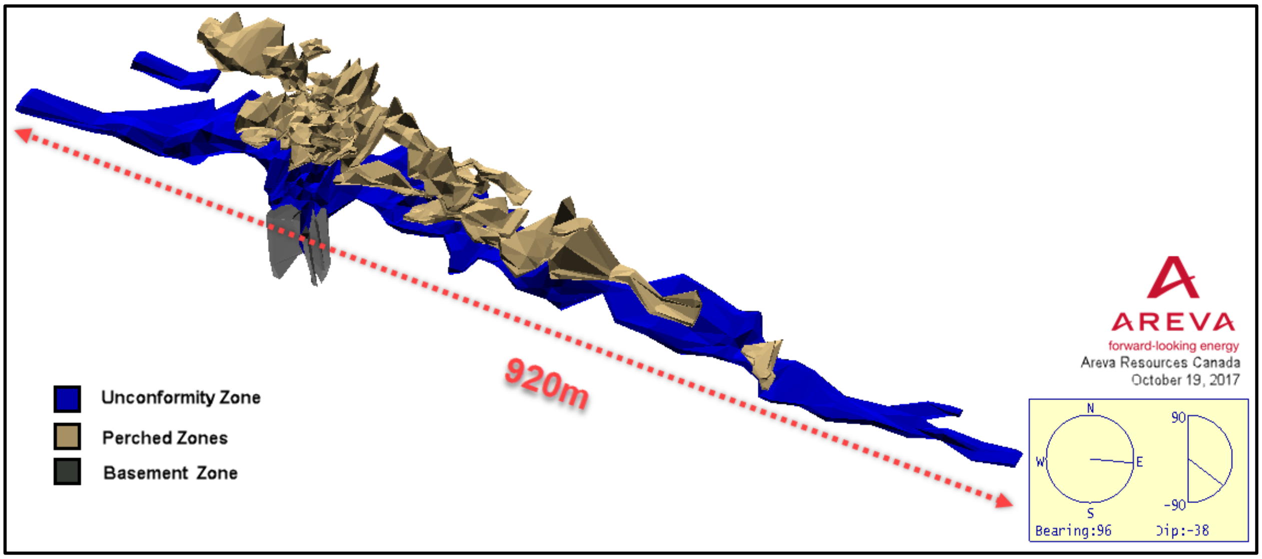


Figure 14-4: Isometric View of the Midwest Main Mineralized Zones

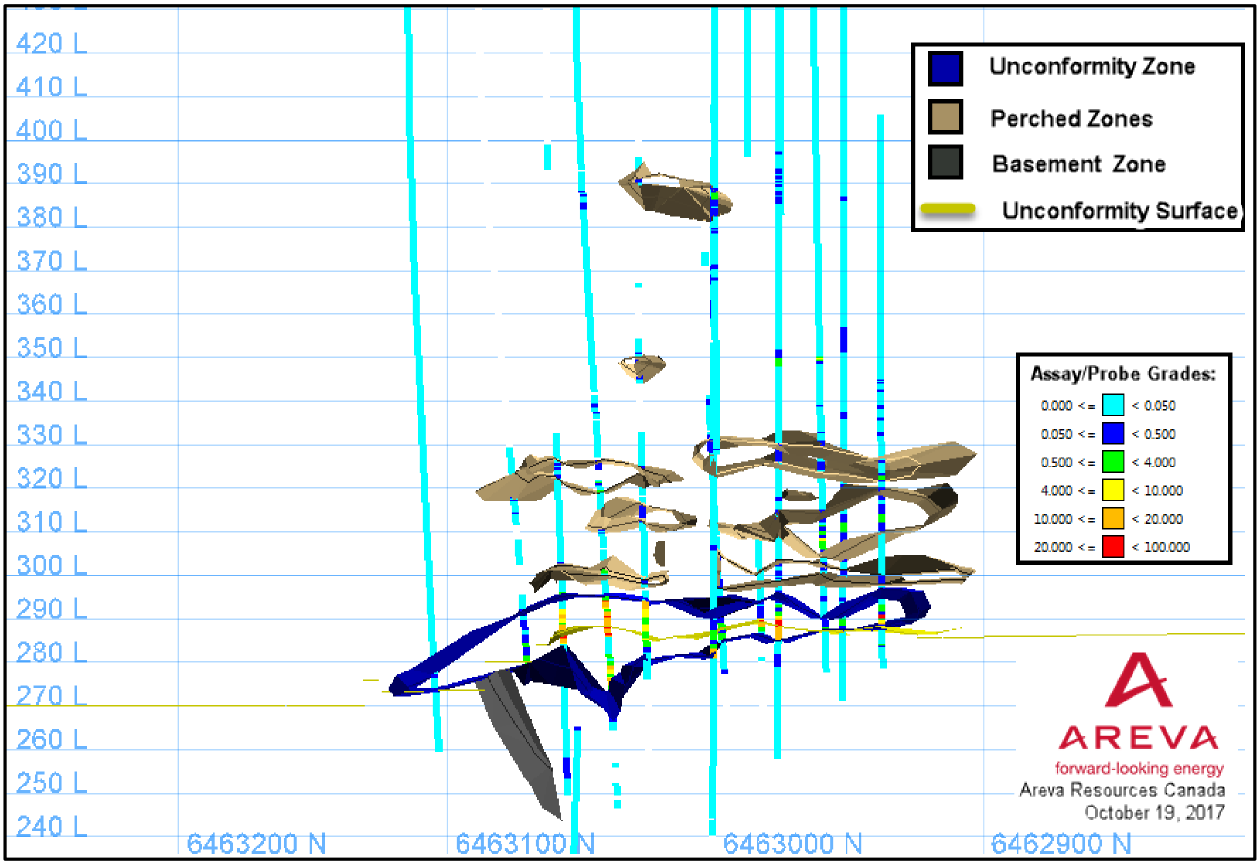


Figure 14-5: Vertical Section Looking N40° Showing Composites Relative to the Unconformity, Perched, and Basement Zones

14.2.3 Statistics and Data Analysis Study

The 2018 resource domains were intersected by a total of 315 drill holes. The majority of these holes were used in the resource estimation with the exception of ten holes which could not be used, leaving 305 holes available for resource estimation. The holes that could not be used are:

- DMIDWPZ11 to DMIDWPZ41 – Four underground piezometer holes. No uranium grade data were collected for these holes.
- DMIDWRM21 – Underground geotechnical hole with only sporadic assay sampling.
- MW-103 – Not drilled to completion due to rods getting stuck. Hole was re-drilled with another hole number.
- MW-4 – Large gaps in sampling in the Perched and Unconformity Zones.
- MW-532W – Does not appear to have been sampled or probed.
- MW-PQ184-1 – Gap in sampling, and no probe data was available. This hole was superseded by the parent hole (MW-PQ184) which is located immediately nearby with no gaps in sampling, so MW-PQ184 data were used instead.
- PQ-532 – Several missing samples with no probe data available. Hole was superseded by the nearby MW-PQ532-1.

Three additional holes were excluded from the Unconformity Zone composites (DMIDWRM11, MW-529, and MW-PQ396). These holes were excluded because they had a high amount of core loss, no probing data to fill these gaps, and were superseded by nearby holes.

Fourteen other holes were not able to be used in the Perched Zones due to lack of sampling and probing data. These were removed from the database composites prior to estimating.

Minor sampling gaps were noted in 14 holes from both the Perched and Unconformity Zones. These gaps were deemed minor and ignored for the purpose of estimation.

Between probing equivalent uranium grades and geochemical assays, there were a total of 15,950 samples available (Table 14-1). The data set used for resource estimation consisted of 84% geochemical assay data and 16% equivalent probing data. Some core loss was noted in the deposit, but core recovery is deemed to be relatively good. Core loss is typically associated with regions of higher grades and higher alteration (quartz dissolution and clay alteration).

Table 14-1: Sample Statistics by Zone

Zone	Count	Grade %U			Density g/cm^3		
		Min	Max	Avg	Min	Max	Average
UC	6,312	0.00	42.66	4.35	2.05	8.32	2.38
Basement	322	0.00	12.03	0.33	2.05	2.36	2.10
Perched - All	9,316	0.00	10.09	0.28	2.05	3.14	2.14

Composites for all zones were generated in Vulcan for Density and DG (Density x Grade). A composite length of one metre was chosen with the composites being length weighted. Composites less than 0.5 metres were merged with the preceding composite. Summary statistics for the density weighted composites are shown in Table 14-2, where grade is calculated by dividing DG by Density.

Table 14-2: Composite Statistics by Zone

Zone	Count	Grade %U			Density g/cm^3		
		Min	Max	Avg	Min	Max	Average
UC	2,573	0.00	40.56	4.19	1.29	5.99	2.37
Basement	137	0.00	7.08	0.33	1.31	2.29	2.09
Perched - All	2,765	0.00	6.90	0.28	1.70	2.58	2.14

14.2.3.1 Declustering

Given the multiple phases of drilling, along with a much higher concentration of drilling in the high-grade areas (Table 14-7), declustering was conducted on the data set to allow better comparison of the ordinary kriging results to the dataset. Statistics for declustering were obtained by conducting a spherical nearest neighbour model to avoid any bias of the data. Declustered statistics are detailed in Table 14-3. A notable difference is observed between the composite and declustered statistics, with a decrease in average grade from 4.19% U to 2.59% U for the Unconformity Zone. Given the high amount of drilling in the high-grade area compared to the rest of the deposit, this result was expected. Clustering is not a significant problem for the low-grade zones (Perched and Basement).

Table 14-3: Declustered Statistics

Zone	Grade %U			Density g/cm^3		
	Min	Max	Avg	Min	Max	Average
UC	0.00	40.56	2.59	1.69	5.52	2.33
Basement	0.00	7.08	0.36	1.30	2.29	2.08
Perched - All	0.00	6.90	0.25	1.70	2.58	2.14

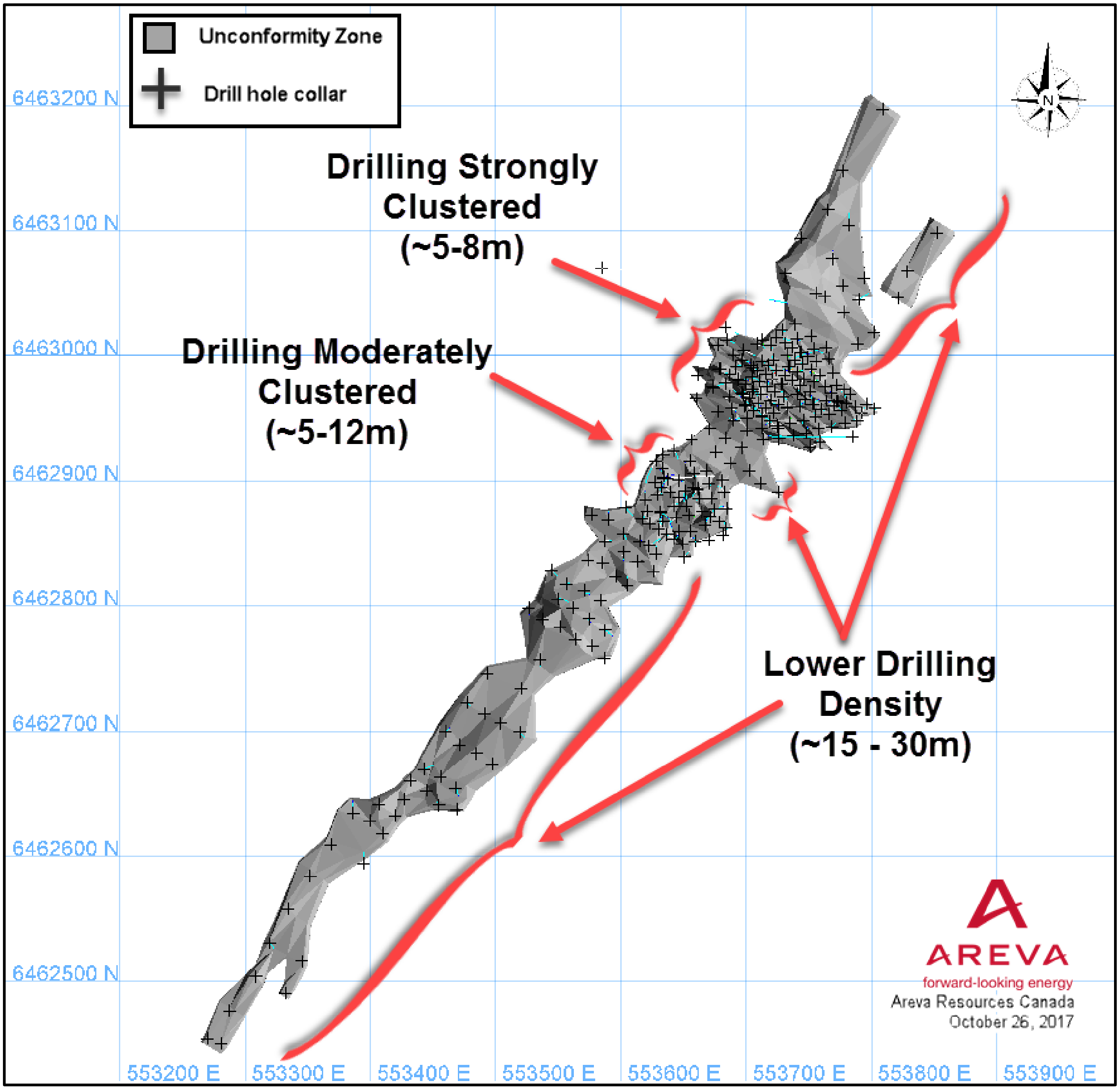


Figure 14-6: Plan View of Drill Hole Clustering on Unconformity Zone

14.2.4 Capping and High-Grade Restrictions

High-grade outliers were noted to exist in the Unconformity Zone and in the Perched/Basement Zones. They were not modelled (sub-domained) into separate zones at this time. Instead it was decided to restrict the influence of the high-grade mineralization to five metres. This was done for both DG and Density to better handle these outliers in the estimation. Based on the cumulative probability plots of DG and Density, the Unconformity Zone outliers were restricted based on a DG of 105 (approximately 25% U) and a density of 3.6 g/cm^3 (Figure 14-7and Figure 14-8). The Perched and Basement Zones were restricted based on a DG of 5.8 (approximately 2.3% U), which corresponds to a density of approximately 2.3 g/cm^3 (Figure 14-9 and Figure 14-10).

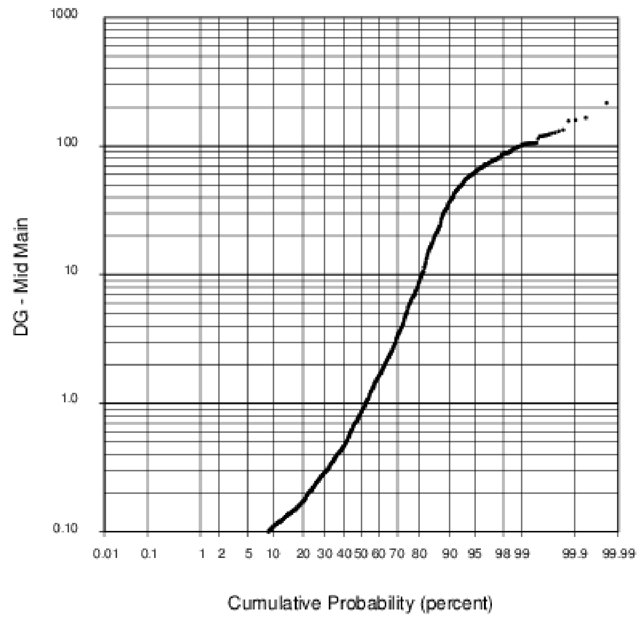


Figure 14-7: Unconformity Zone Cumulative Probability Plot of DG

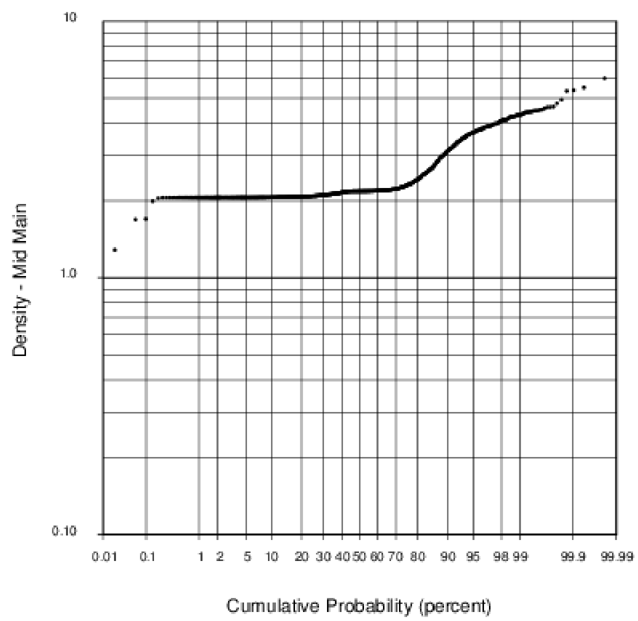


Figure 14-8: Unconformity Zone Cumulative Probability Plot of Density

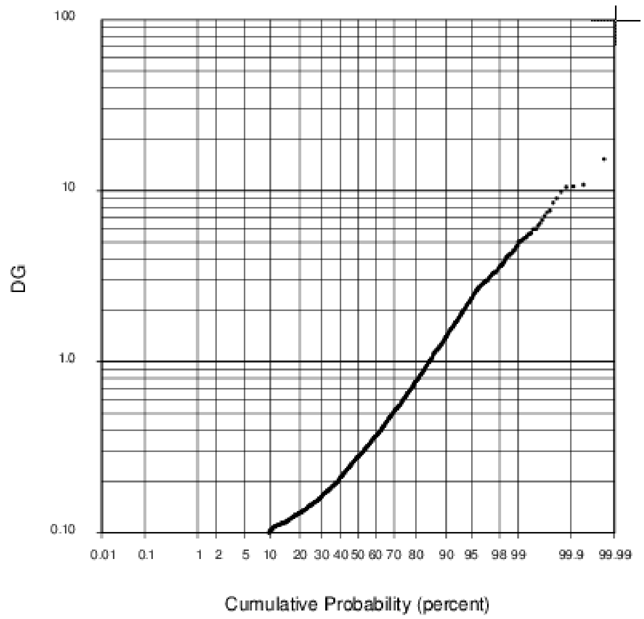


Figure 14-9: Perched and Basement Zone Cumulative Probability Plot of DG

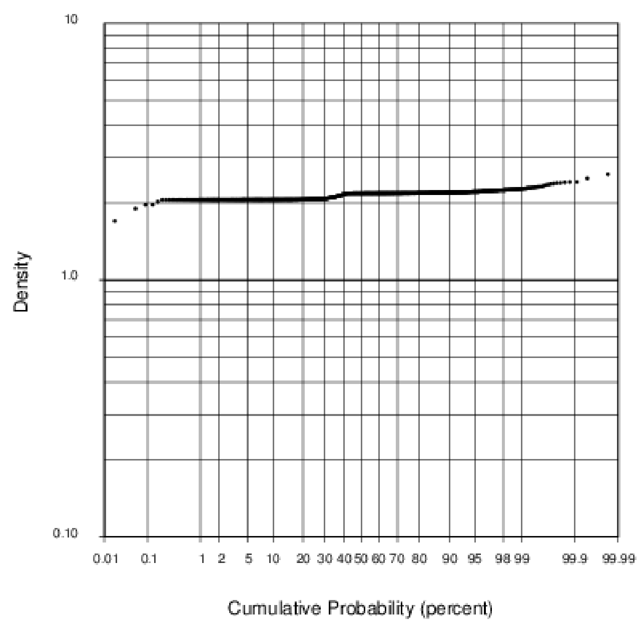


Figure 14-10: Perched and Basement Zone Cumulative Probability Plot of Density

14.2.5 Variogram Analysis and Modelling

A variogram analysis of DG and density was performed only for the Unconformity Zone. Given that the Perched and Basement Zones are relatively small in size (both volumetrically and amount of contained metal), variograms were not attempted. With small size of these zones, and limited drilling in the Basement Zone, it is not likely that good variograms would be achievable. The model generated for the Unconformity Zone was derived from an experimental correlogram (Figure 14-11 and Figure 14-12, and Table 14-4). Best variogram ranges were obtained along the strike of the deposit with variogram search directions of 40° x 10° x 0° for DG and 40° x 0° x 0° for density.

Table 14-4: Density and DG Variograms for Unconformity Zone (in Vulcan convention)

Variable	Nugget	Azm	Plunge	Dip	Sill	Type	Major	Semi-Major	Minor
Density	0.01	40	0	0	0.53	Spherical	7.7	10.0	5.0
		40	0	0	0.46	Spherical	45.0	25.0	9.5
DG	0.01	40	10	0	0.64	Spherical	14.2	14.5	6.3
		40	10	0	0.26	Spherical	45.0	20.0	10.0

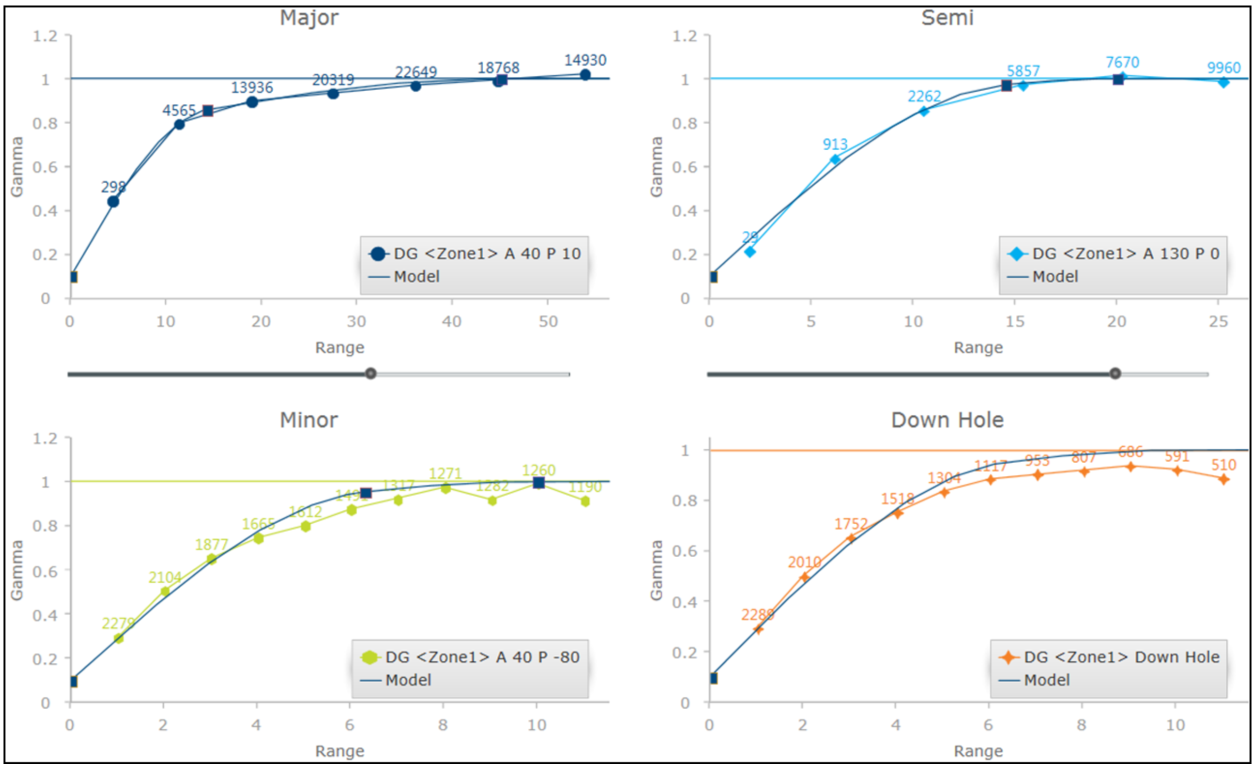


Figure 14-11: DG Variogram Models for Unconformity Zone

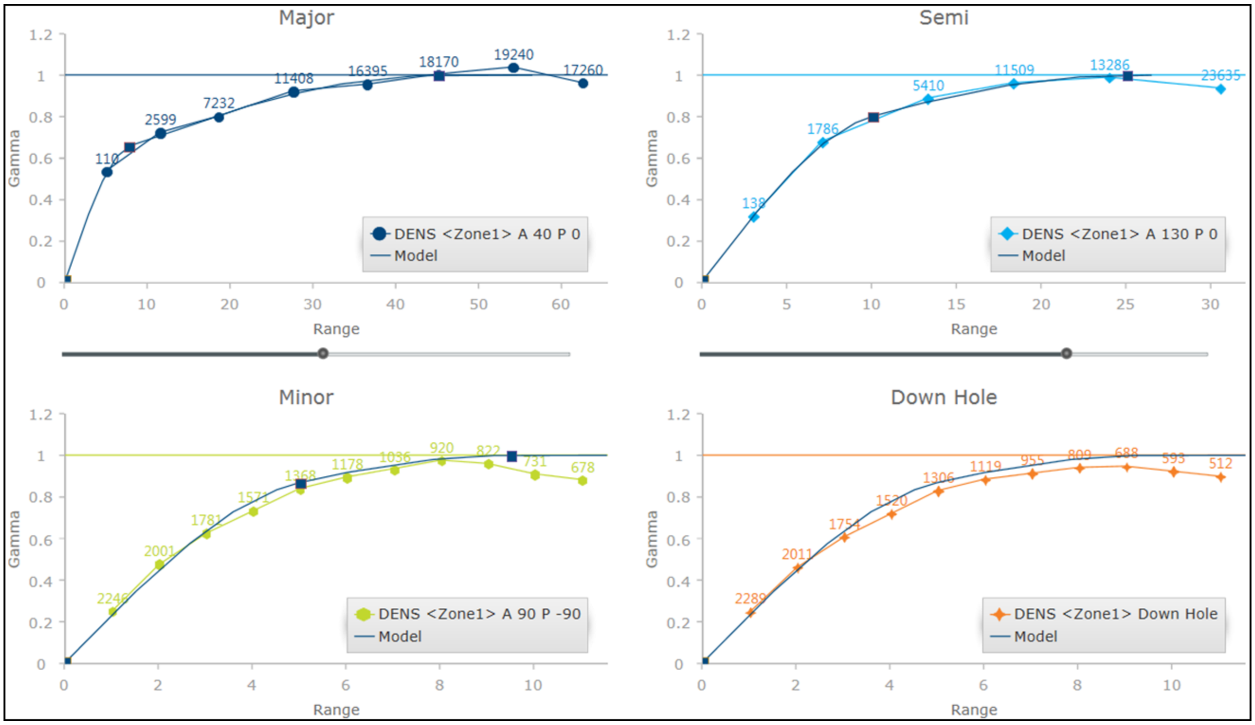


Figure 14-12: Density Variogram Models for Unconformity Zone

14.2.6 Block Model and Estimation Parameters

The mineral resource block model is comprised of blocks that are 5 m x 5 m x 2 m with sub-blocks that are 2.5 m x 2.5 m x 1 m, in X, Y, Z directions, respectively. The block model was rotated so that the blocks were approximately parallel to the strike of the mineralization, with a bearing of 135º (in Vulcan rotation angle convention). Each block contains a zone code as well as a DG and Density value that were calculated during inverse distance squared calculation. A grade value (%U) is then calculated from this by dividing DG by Density.

A three-run ordinary kriging estimate was conducted for the Unconformity Zone. The majority of the blocks were estimated with the first run. The second run filled in almost all of the remaining un-estimated blocks and a third run was conducted to fill in the few remaining blocks. Hard boundaries were used to prevent the use of composites between the Unconformity, Perched, and Basement Zones. The estimation parameters used are shown in Table 14-5. Kriging parameters used for the Unconformity Zone are shown in Section 14.2.5.1.

The Perched and Basement Zones were estimated using inverse distance squared (ID^2). All blocks were estimated in a single run. The Basement Zone was estimated using a spherical search, while the Perched Zones were estimated using an ellipse with a similar orientation to that of the 3D interpretation.

In order to manage the influence of high grades, it was determined that the best way to deal with this potential issue was to restrict the influence of the high-grade samples. In the Unconformity

Zone, samples with a DG of greater than 105 and a Density over 3.6 g/cm^3 were restricted to a maximum distance of 5 metres. In the Perched and Basement Zones, samples with a DG of greater than 5.8 were also restricted to a maximum distance of 5 metres. These values were chosen from examination of the cumulative probability plots and histograms.

Table 14-5: Estimation Parameters

Run	1				2		3	
Zone	Unconformity		Perched	Basement	Unconformity		Unconformity	
Type	DG	Density	DG and Density	DG and Density	DG	Density	DG	Density
Major Axis	45	45	60	40	90	90	90	90
Semi-Major Axis	20	25	30	40	40	50	40	50
Minor Axis	10	9.5	20	40	20	19	20	19
Nugget	0.10	0.01	-	-	0.10	0.01	0.10	0.01
Bearing	40	40	-	-	40	40	40	40
Plunge	10	0	-	-	10	0	10	0
Dip	0	0	-	-	0	0	0	0
Min. Number of Samples	10	10	3	3	7	7	3	3
Max. Number of Samples	30	30	12	12	30	30	30	30
Max. Samples per Hole	5	5	3	3	5	5	5	5
High Grade Restriction Threshold	105	3.6	5.8	5.8	105	3.6	105	3.6
High Grade Restriction (m^3)	5	5	5	5	5	5	5	5

14.2.7 Estimation Sensitivity

Several sensitivity tests were run to gauge how much of an impact the use of different estimation techniques and high-grade management strategies have on the resource estimate (Table 14-6).

Table 14-6: Summary of Sensitivity Analyses Conducted With Preferred Scenario Highlighted

Test	Zone		
	Unconformity	Basement	Perched
	KG U	KG U	KG U
ID^2 Declustered Estimate (105DG restricted)	18,811	N/A	N/A
NN Estimate (105DG and 5.8DG restricted)	19,365	56	1,363
OK Estimate (65DG restricted)	15,296	N/A	N/A
Current Estimate (105DG and 5.8DG restricted)	18,412	73	1,375

Notes:

a) A 0.085% U reporting cut-off was applied.
b) Numbers are rounded.
c) Preferred scenario in grey. All other scenarios are not being treated as a current resource.

The resource estimate was fairly insensitive to estimation technique, but it was sensitive to the management of higher grades. Notable differences can be seen between the restrictions of high grades at 65DG, as compared to 105DG (used in estimate) for the Unconformity Zone. The Perched and Basement Zones produced similar results between ID^2 and nearest neighbour estimates.

14.2.8 Validation of Resource Estimation

The block model was validated using several methods, including but not limited to: visual review of block grades relative to composites, statistical checks, spatial distribution plots of block grades relative to composite grades, peer reviews, and estimation via alternate estimation methods. Declustered grades compared very well to the Ordinary Kriged estimate on the Unconformity Zone and the ID^2 estimates on the Basement and Perched Zones (Table 14-7).

Table 14-7: Comparison of Declustered to Ordinary Kriged Estimate Statistics

	Declustered Statistics				Ordinary Kriged Estimate			
Zone	Grade %U			Density g/cm^3	Grade %U			Density g/cm^3
	Min	Max	Avg	Average	Min	Max	Avg	Avg
UC	0.00	40.56	2.59	2.33	0.085	24.19	2.60	2.25
Basement	0.00	7.08	0.36	2.08	0.085	3.70	0.32	2.08
Perched - All	0.00	6.90	0.25	2.14	0.085	3.25	0.27	2.14

Estimation by nearest neighbour and ID^2, with similar search parameters, was within 5% of the ordinary kriging resource estimate, with the kriging estimate the lowest of the three (Table 14-8).

Table 14-8: Comparison of Estimation Techniques

Test	Zone		
	Unconformity	Basement	Perched
	KG U	KG U	KG U
ID^2 Declustered Estimate (105DG restricted)	18,811	N/A	N/A
NN Estimate (105DG and 5.8DG restricted)	19,365	56	1,363
Current Estimate (105DG and 5.8DG restricted)	18,412	73	1,375

Notes:

a) A 0.085% U reporting cut-off was applied.
b) Numbers are rounded.
c) Preferred scenario in grey. All other scenarios are not being treated as a current resource.

The volumes of the mineralized shells were compared to the volumes represented by the block model and the difference was less than 1% overall, with some smaller Perched Zones having a difference of up to 3.6% (bigger).

Table 14-9: Comparison of Triangulation Volumes to Block Model Volumes

Zone	Surface Area	Volume	Block Model Volume	Difference
Unconformity	125,858	324,308	323,600	-0.2%
Basement	13,341	13,427	13,563	1.0%
Perched 1	2,533	2,011	1,956	-2.7%
Perched 2	1,307	1,502	1,556	3.6%
Perched 4	24,006	64,514	64,631	0.2%
Perched 5	2,302	4,641	4,613	-0.6%
Perched 6	2,210	5,074	5,063	-0.2%
Perched 7	5,464	11,141	11,294	1.4%
Perched 8	5,540	14,708	14,663	-0.3%
Perched 9	3,138	5,087	5,069	-0.4%
Perched 10	3,653	7,136	7,094	-0.6%
Perched 11	17,169	28,176	28,244	0.2%
Perched 12	11,315	18,394	18,438	0.2%
Perched 13	7,190	10,831	10,906	0.7%
Perched 14	5,446	9,530	9,625	1.0%
Perched 15	12,958	48,761	48,838	0.2%
Perched 16	1,323	2,287	2,325	1.7%
Perched 17	1,680	2,441	2,431	-0.4%
Perched 18	1,254	1,929	1,963	1.7%
Perched 19	12,074	28,836	28,781	-0.2%
Perched 20	719	519	519	-0.1%
Total:	**260,479**	**605,253**	**605,169**	**0.0%**

14.2.9 Resource Classification

The classification of mineral resources for Midwest Main is based on (1) Ordinary Kriging estimation run, and (2) geological confidence. Blocks estimated in the first kriging run were categorized as indicated resources, with the remaining blocks classified as inferred resources. In order to have contiguous blocks by resource category, an outline was created around the blocks selected to be indicated and inferred and all blocks contained within these outlines were then classified accordingly. The bulk of the mineralization in the Unconformity Zone is considered to be within the indicated category.

The controls on the Basement and Perched Zones are not as well defined, so these mineralized zones were placed into the inferred category (Figure 14-14). The extensions of the Unconformity Zone mineralization along strike, and across strike are also categorized as Inferred Resources (Figure 14-13 and Figure 14-14).

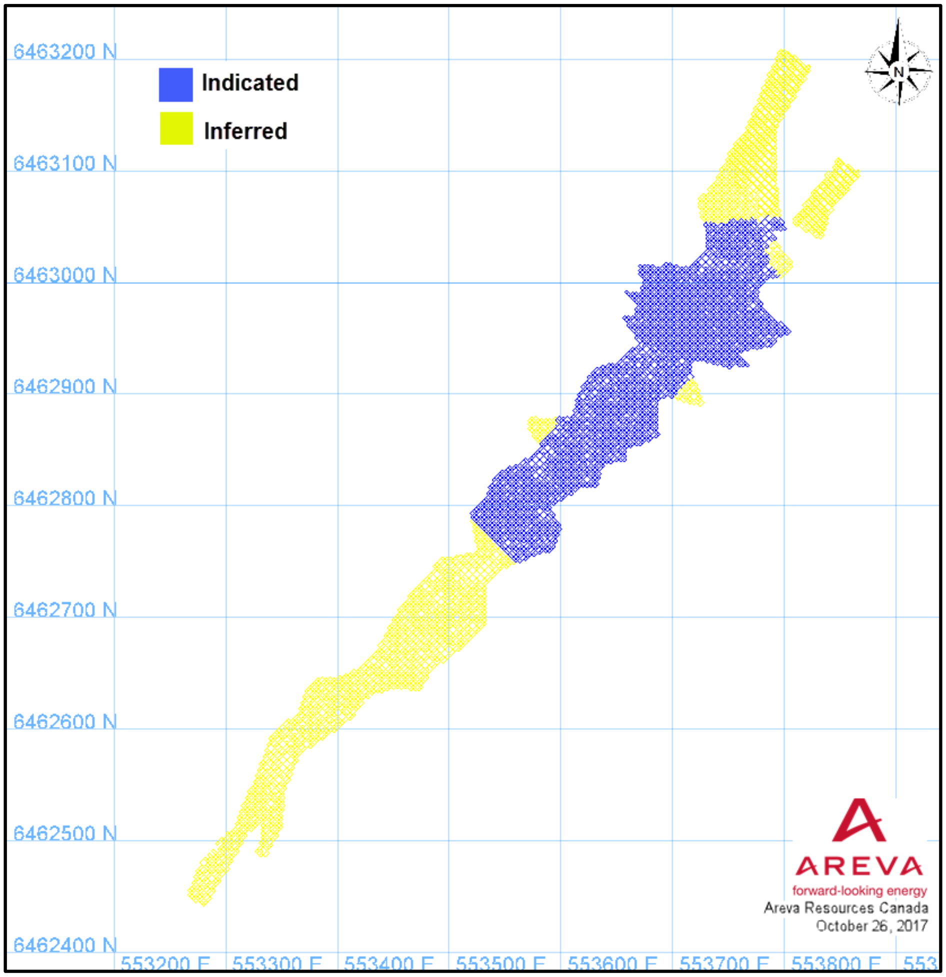


Figure 14-13: Plan View of the Classification of Unconformity Zone Mineral Resources

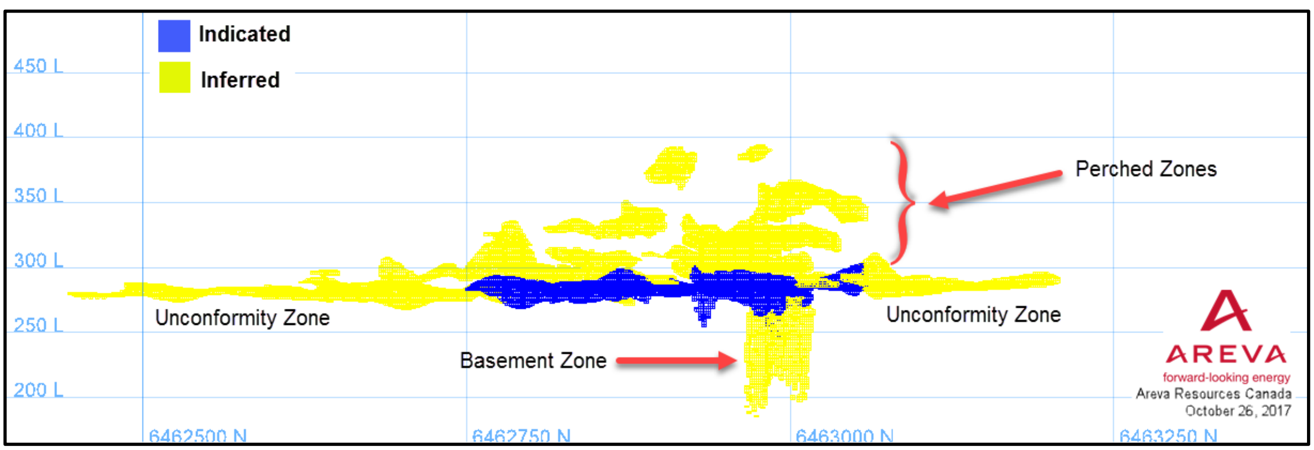


Figure 14-14: Longitudinal View of Resource Category Looking West for All Zones

14.2.10 SRK Audit Methodology and Findings

14.2.10.1 Geology Review and Interpretation

For this review SRK reviewed selected drill hole (best available) drill core, domain wireframes, provided, drill hole database and the block model this deposit. A limited amount of drill core was available for review.

Drill core for this deposit is generally in poor condition, which makes it difficult to observe or confirm geological structures. SRK examined the following drill holes intervals for the Midwest Main deposit:

Table 14-10: Drill Hole Intervals Examined for the Midwest Main Zone

Drill hole	Intervals Reviewed	Domains
MW677	154.1-187.4	Perched
MW678	168.4-182.69, 204.0-224.0	Perched, UC
MW685	150.1-186.0, 202.5-217.6, 230.7-239.2	Perched, UC, Basement

All three drill holes reviewed intersected the Perched domain. Core condition for these intervals within this domain consisted of some disaggregated sandstone and rubbly core intervals and significant intervals of intact core. Alteration for these intervals was predominantly weak to moderate with some secondary hematite at the contact with unmineralized contacts. Probable fault gouge with slickenside fragment in MW677. Structures with possible orientations not identified in core. Some cobalt oxide staining was observed.

The mineralized domain was modelled using a threshold value of 0.05% uranium over 2 metres. While consistently modelled occurrences of grades above this threshold do occur, significant variations in grade are common, usually typified by localized grades in the 0.5% to 2% uranium range grading to extended intervals of less than 0.2% uranium. Perched Zone uranium mineralization is understood to be influenced by bedding parallel mineralisation trends (possibly related to porosity) and vertical mineralization structures acting as conduits for mineralization fluids. It is likely that Perched Zone mineralization is related to a number of structural and lithology related factors. Higher grader mineralization appears to be localized with significant lower grade mineralization (less than 0.2% uranium) and much more extensive within the domain.

Two of the reviewed drill holes intersected the Unconformity domain. Drill core condition was generally poor with disaggregated sandstone intervals and somewhat rubbly core. Intense alteration and highly to moderately altered within the domain. Strong secondary hematite staining. Mineralization indicated by grey black uraninite mineralization and uranium oxides. Both high and lower grade intersections. Uranium mineralization follows north-east trending structures. Complex cross structures including northwest, north-south and east-northeast are observed.

Basement mineralization has been identified in a limited area below the unconformity. Drilling of this domain has been limited to the vicinity of the unconformity and has not been drilled at depth. Information for this zone is limited. Core from the drill hole reviewed was very rubbly and with some fractures sub-vertical to the core axis. Alteration of basement intervals was intense with most of the original rock altered to clay. This domain was defined using a threshold value of 0.05% uranium over 2 metres. Mineralization is variable from low grade material below 0.2% uranium to highs of grades of 2% and 5% uranium. Mineralization for this domain is related to the northeast faults and north-south faults but could not be confirmed from the drill core reviewed.

The delineation of unconformity and basement domains for Midwest Main zone is based on a review of a limited number of historical drill holes. However, these two domains have been found to be consistently characterized by:

- Threshold uranium values used for the delineation of domains.
- Alteration and mineralization observed in drill core.
- Complex set of geological structures that have been identified.

The Perched domains are similarly consistent but may be inherently more difficult to domain because of a complex relationship of mineralization controls and the predominance of vertical drilling where some of mineralization may follow sub-vertical structures.

The domains modelled for Midwest Main zone are considered appropriate for mineral resource estimation. However, the complexity of the unconformity zone will require significant additional drilling to accurately locate structural blocks and their relationship to mineralization. SRK considers that a series of hard and soft boundaries between structural blocks may be appropriate for grade estimation in this domain.

The Perched domain may benefit from using trend analysis software such as Leapfrog, to identify mid-grade sub-domains. This analysis will also benefit from additional drilling.

14.2.10.2 Resource Estimation Review and Findings

SRK reviewed the approach taken by Orano to construct the mineral resource model and finds it to be generally consistent with that undertaken for other similar deposits.

SRK's audit of the resource estimation model included a review of the sample assay and probe data, Orano's calculation of density and DG, and the compositing of density and DG used to generate the conditioning data for resource estimation. In collaboration with Orano and Denison, SRK also reviewed Orano's depth adjustment of probing data to correlate better with geochemical assays in various boreholes and found the adjustments made by Orano to be reasonable. The additional probing data is spatially distributed throughout the deposit, with no specific clustering noted. Since the unconformity hosts the bulk of the uranium mineralization from a volumetric and reporting perspective, SRK chose to conduct a detailed review of the estimation of the Unconformity Zone.

Orano reviewed the DG and density distributions for extreme values, and on the basis of probability plots, chose a threshold value of 105 DG which generally corresponds to a density threshold of 3.6 grams per cubic centimeter (g/cm^3). The composite data were not capped, rather these thresholds correspond to the high grade limited data whose influence were limited to within a 5 cubic metre volume. SRK reviewed the plots and finds that an alternate DG threshold at approximately 50 could have been selected for the Unconformity Zone (Figure 14-15). Consideration for this lower threshold may be warranted depending on the degree of high grade smearing that may present in the model.

For the Unconformity Zone, SRK was able to obtain a variogram that generally conforms to that modelled by Orano for both DG and density. Both variograms have a maximum direction of continuity that is generally flat and oriented along strike. SRK finds this to be a reasonable interpretation for the Unconformity Zone.

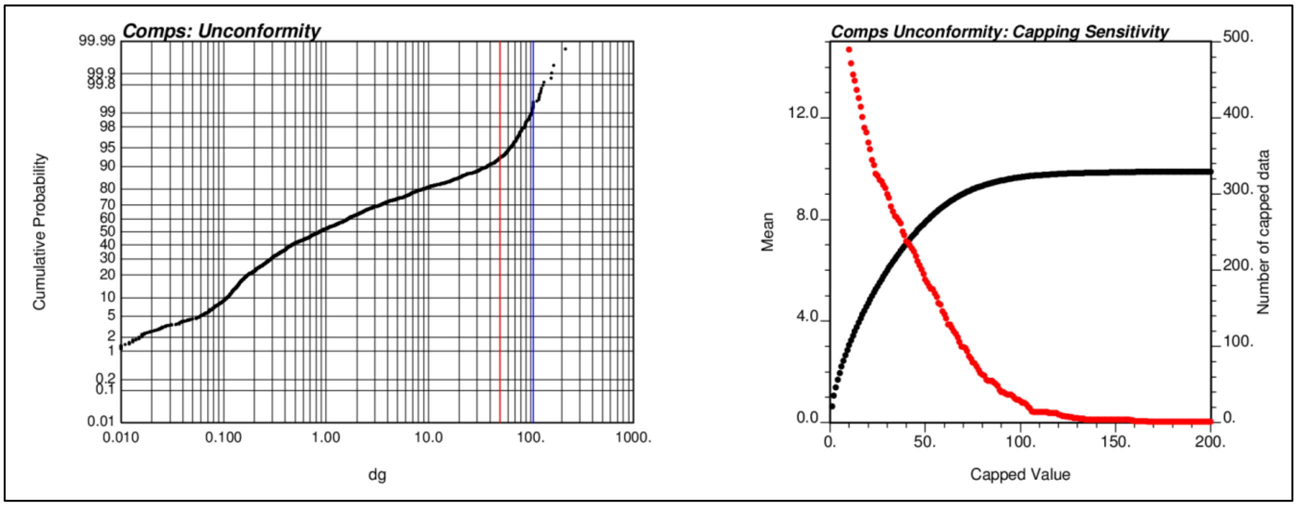


Figure 14-15: Probability Plot and Capping Sensitivity Plot for DG in the Unconformity Zone (red line is alternate high-grade threshold, blue line corresponds to Orano's selected threshold)

Using Gems software, SRK was able to reproduce the density estimation model using Orano's inputs. A similar effort was made to replicate the Orano grade estimation model, using the same inputs as Orano; however, results showed that the replicate model yielded 4% more pounds of uranium. Upon closer inspection, the northern area of the Unconformity Zone shows clearly different distribution of high grade estimated blocks (near borehole DMIDW50031). SRK confirmed with Orano that the orientation of the variogram and corresponding search ellipsoid was incorrectly entered during parameterization of the Vulcan block model. Specifically, the third rotation angle should be 0 in correspondence with documentation and expectations of the grade continuity for both density and DG; however, the current Orano model is based on a third rotation of -80º (in Vulcan rotation convention). Consequently, this results in an ellipsoid and continuity that has the semi-major and minor axes switched (see Figure 14-16, A vs. B, and C vs. D), resulting in narrower continuity in the intermediate (dip direction) axis and larger continuity in the minor or vertical axis (Figure 14-16). SRK corrected the orientation of the search ellipsoid for the DG attribute and re-estimated the model in Gems. A review of the Perched and Basement Zones shows that this issue seems to affect only the Unconformity Zone and for only the DG estimation.

Upon review of Orano's model, SRK finds some degree of high grade smearing is evident in areas of the Unconformity Zone where drill density is sparse. This is particularly noticeable in the northern part of the deposit near borehole DMIDW50031, where 12 metres of extremely high DG composites are encountered with DG values ranging from 30 to 82. SRK tested various high-grade treatments and found that a DG threshold of 50 with a limited radius of 10 by 10 by 5 metres yields reasonable results locally. This does not appear to impact the densely drilled areas, but should mitigate undue smearing of medium to higher DG values in the sparsely drilled areas. The use of a lower DG threshold than Orano, combined with a slightly larger horizontal area of influence, should generally avoid a too conservative mineral resource estimate. The impact of changing the high-grade treatment in the Unconformity Zone results in a 5% metal loss. This, combined with the orientation correction, gives an overall impact of slightly fewer tonnes at higher grade, to give less than 1% metal relative to that reported in Orano's report for the Unconformity Zone. SRK shared these results, along with visual validation comparisons, with Denison and Orano personnel.

SRK performed visual checks along section for the block model with the revised high grade treatment for the Unconformity Zone. A swathplot comparing the DG estimation from Orano's model, SRK's model and the informing composites shows both models are comparable, and generally matches well with the local informing composites (Figure 14-17).

Orano classified the mineral resources based on estimation pass, with Indicated blocks assigned only in the Unconformity Zone and in regions of tight borehole spacing up to a nominal spacing of 17.5 metres. SRK finds the classification to be reasonable and consistent with other similar projects in the Athabasca basin.

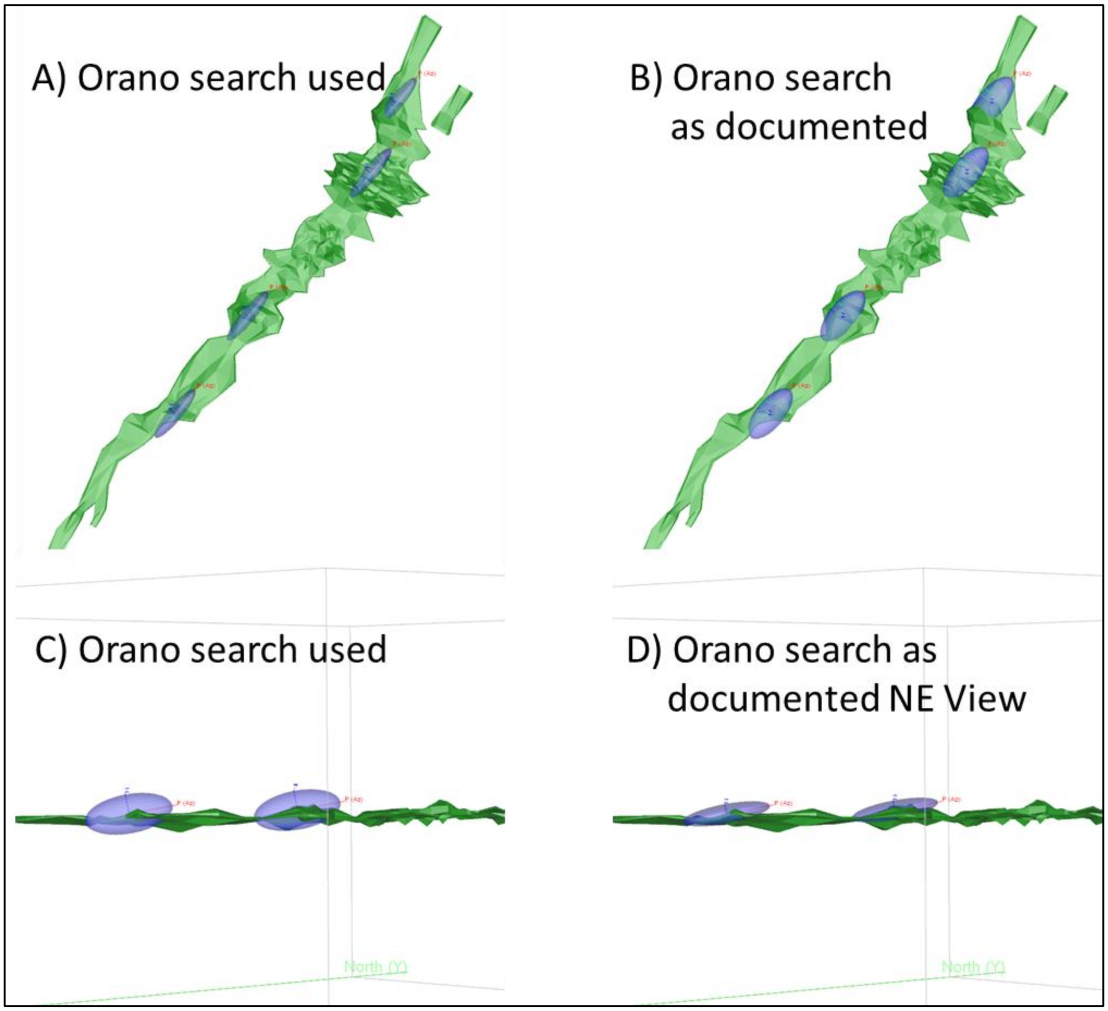


Figure 14-16: Comparison of DG Search Ellipsoid for Pass 1

A: Orano search in plan view

B: Orano-documented search in plan view

C: Orano search in northeast facing longitudinal view

D: Orano-documented search in northeast facing longitudinal view

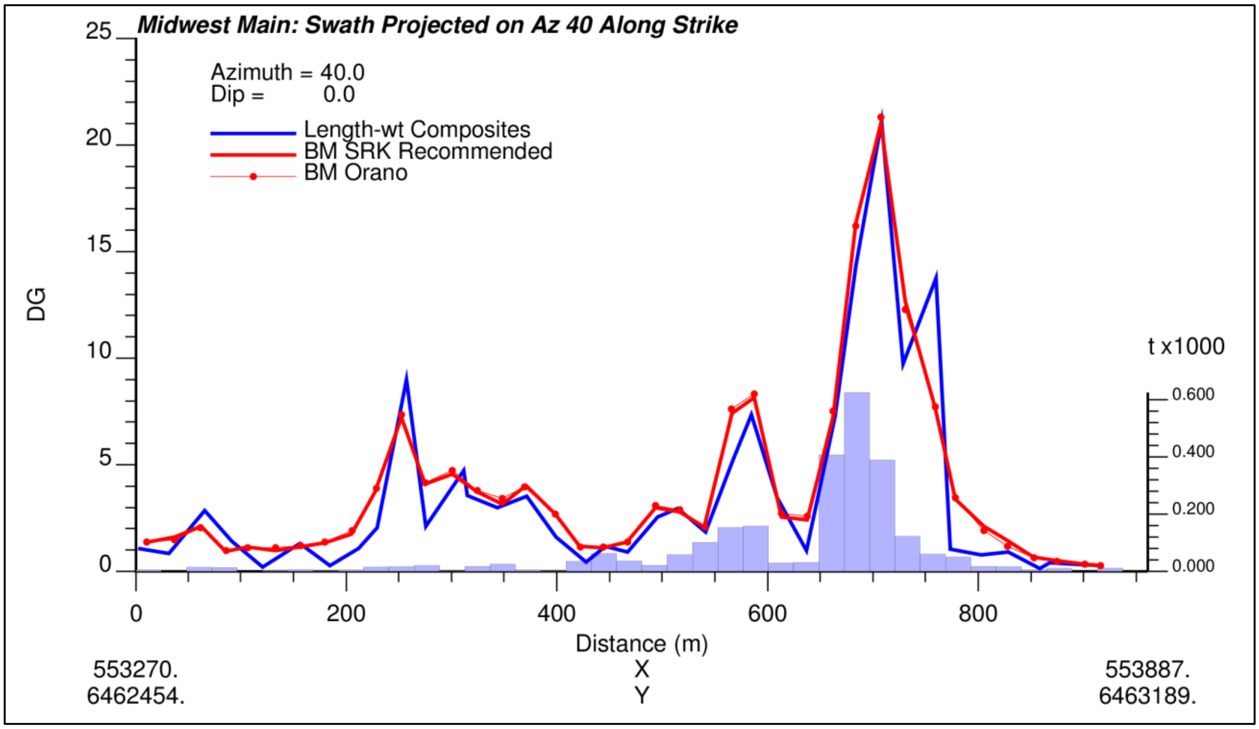


Figure 14-17: Swathplot Comparison of Orano Model, SRK Model, and Informing Composites for DG Estimation for Midwest Main

14.2.10.3 SRK Comments

The modelling of the Perched and Basement Zones represents a new addition to the mineral resource estimation; they were modelled, but excluded the 2006 reported estimate for Midwest Main. Given that uranium mineralization is present in these previously unreported areas and with the inclusion of additional probing data, SRK finds it acceptable that these areas are included in the current estimate.

SRK recommends that significant additional drilling be considered in future to accurately locate and identify structural blocks and their relationship to mineralization. SRK considers that grade estimation may require a series of hard and soft boundaries between structural blocks for the unconformity domain. The Perched Zone may benefit from using trend analysis software such as Leapfrog, to identify mid-grade mineralization. This analysis will also benefit from infill-drilling and identification of mineralization related to sub-vertical structures to identify sub-vertical geological structures.

Overall, SRK finds Orano's resource estimation methodology and workflow to be clear and reasonable for this type of unconformity-related uranium mineralization. With the two adjustments to the mineral resource estimation model, SRK considers the mineral resource model for Midwest Main to be a reasonable reflection of the local distribution of uranium grade and density.

14.3 Midwest A

Subsections 14.3.1 to 14.3.9 detail the data preparation, analyses and assumptions made by Orano to support the construction of the mineral resource model. These descriptions are excerpts taken from an internal Orano report (Allen, Quirt, & Masset, 2017a). Subsection 14.3.10 describes the methodology and findings from SRK's audit of the mineral resource model for the Midwest A depost.

14.3.1 Drill Hole Database

Drilling on the Midwest A deposit was started from 1979 through to 2009 comprising 177 diamond drillholes (302,338 metres).

The database used for Midwest A in previous geological modelling and mineral resource estimation has undergone further QA/QC data verification and fixes, updates to allow a more robust calculation for equivalent uranium probing grades, updates to the equivalent uranium radiometric-grade correlation, updated density-grade correlations, and a more robust combination of equivalent and geochemical uranium grades based on core recovery.

14.3.1.1 Database Changes

Depth corrections on drill hole low-flux probing data were conducted to ensure that zones of mineralization defined by downhole probing were correlated with observations made from drill core and geochemical assays. In total, 51 drill holes required low-flux probing run depth adjustments, with corrections ranging from 0.1 to 5.2 metres in magnitude, with the average adjustment being just over one metre. During this process three holes were identified to have unreliable low-flux probing data and they were discarded from the database and geochemical assays were used in this area regardless of core recovery.

Additionally, "noisy" low-flux gamma profiles were identified for a few drill holes where intervals of anomalous low-flux gamma readings were not supported by either SPP2 or Natural gamma profiles. The cause of the noisy low-flux data is uncertain, but may be attributable to probe malfunction or contamination of high-grade mineralization along the drill hole column or along the drill rod string. The noisy data were removed from the database to prevent future use in estimation.

The high-grade intercept in drill hole MW-660 (six samples) was identified as erroneous, when compared to probing. The interval was likely miss-sampled around an area of high core loss. These assays were flagged in the database to prevent them from being used for estimation, and probing grades were used instead.

Other small sampling errors were identified around areas of lost core, or due to typographical errors. These were reviewed and compared to core photos, drill logs, and radiometry data. Approximately 70 geochemistry sample records were corrected, added to the database, or were flagged as unreliable to prevent future use.

Radiometry (SPP2) errors were noted in six holes and were corrected in the database. The correlation between the probing and the radiometry data was checked to ensure that these holes did not require additional depth shifting.

14.3.1.2 Calculation of Equivalent Uranium Grades

A new radiometric-grade correlation was developed for the Midwest A mineralization for two reasons:

1. Additional depth shifting was completed for the down hole probing (more closely spatially relating the probing grades to the geochemical grades).
2. New database software (acQuire) was capable of a more accurate calculation of AVP grades. Previously, a universal K factor was used for simplification reasons, however, the K factors (Kf) are probe specific and vary over time.

For further discussion on the calculation of equivalent uranium grades, see Section 14.3.1.4.

14.3.1.3 Combination of Equivalent and Geochemical Uranium Grades

For Midwest A, equivalent and geochemical uranium grades were previously combined by merging two tables; 1) a one metre-support geochemistry (assay) composite table, and 2) a one metre-support equivalent probing (eU) composite table. This method is not ideal and lacks some selectivity using core recovery as a criterion.

A new acQuire database script was created that combines these datasets to allow small areas of poor core recovery (without usable assay data) to be represented by equivalent probing data. The culmination of equivalent probing and geochemical grades is prioritized by:

4. Assay results for samples in intervals with core recovery above 75%.
5. Equivalent probing results for areas that have poor core recovery (<75%) or were not able to be sampled for assay.
6. Assay results with core recovery below 75% if no probing data is available.

Based on the core recovery data and available assay and eU data, the samples used for resource estimation consisted of 36% geochemical assay data and 64% equivalent probing data. The relatively low percentage of geochemical assay data is due to the significant amount of core loss encountered when drilling through mineralization on the Midwest A deposit.

14.3.1.4 Radiometric Grade Correlation

Scintillometer and Geiger-Muller radiometric readings, from downhole radiometric probing, are corrected for the absorption caused by fluid, casing, and for various probe parameters (dead time; K factor). The K-factor is the coefficient transforming probe radiometric counts values (in cps) into corrected values (cps: eU_{RA}).

The equivalent uranium radiometric values (eU_{RA}) are calculated assuming that the mineralization is in radiometric equilibrium. If the in-hole mud density was not measured, this parameter value is considered to be as water (d=1).

The radiometric-grade correlation equation is used to derive equivalent uranium grades, in 10 centimetre intervals (i.e. at 10 centimetre support), or to a lesser extent 20 centimetre intervals, from the equivalent uranium radiometric values using the following formula:

$$eU\% = \alpha * eU_{RA}\beta$$

eU_{Ra} : equivalent Uranium grade (ppm)

α : alpha value derived in radiometric-grade correlation

β : beta value derived in radiometric-grade correlation

The following correlation equation was established using measurements from 35 intercepts in 25 drill holes, and is specific to the Midwest A deposit.

$$eU\% = 0.1166 * eU_{RA}{}^{1.0118}$$

Only drill holes that were drilled since 2005 (MW-658 and onward) were used to develop this correlation equation.

14.3.1.5 Density Data

In 2009, a total of 304 SG measurements from 28 drill holes were obtained from existing crushed mineralized sample material that was warehoused at the SRC facility in Saskatoon. This crushed sample material was remaining pulp material from nominal 0.5 metre length selective samples (both basement and sandstone selective samples) collected from the Midwest A deposit (Revering, 2010).

An additional 37 core samples (collected from 17 drill holes of the same 28 drill holes referenced above) of nominal 0.1 metre sample lengths were collected from drill core stored at the Midwest A core storage facility. These core samples were collected for the purpose of whole core bulk density measurements, however due to a communication error with the laboratory these samples were crushed and subjected to ICP analysis for trace element and major oxide content, as well as SG using the pycnometer method (Revering, 2010).

Two density-grade correlation equations were determined for the Midwest A deposit: (1) a multi-element correlation equation for samples that were geochemically assayed, and (2) a uranium-only correlation for intervals with only equivalent probing grades (Figure 14-18). The correlation equations were updated from previous results using the 24 new dry bulk density measurements, with corresponding assay grades, which were collected in January 2017 from drill core stored at the Moffatt Lake core facility.

The final multi-element density correlation equation was calculated using dry bulk density, U, Ni, Co, Pb, Cu, Zn, Mo, V, Fe_2O_3, and Al_2O_3 data. Arsenic was removed from the final correlation analysis because it has a co-linear relationship with Ni. The final multi-element density correlation equation is:

$$\begin{aligned} d = Density &= 2.31 + 2.3894E-06*U + 5.7817E-06*(Ni+Co) + 2.0915E-05*Pb \\ &+ 4.6616E-07*Cu - 7.5528E-06*Zn + 7.4952E-06*Mo - 1.8759E-05 \\ &*V + 1.0606E-02*Fe2O3 + 4.49694E-04*Al2O3 \end{aligned}$$

where:

- d represents the calculated dry bulk density
- U, Ni, Co, Pb, Cu, Zn, Mo, and V represents the elemental grade in ppm
- Fe_2O_3 and Al_2O_3 represent the major element oxide grade in %

The single element (Uranium-only) density correlation equation was also developed using the new 24 dry bulk density measurements as the basis.

The available specific gravity (SG) measurements were used to constrain both of the correlations in the high grade region (> ~34% U), as there were insufficient dry bulk density measurements in this region. The single element density correlation is:

$d = Density = e\text{^}(0.0000019738 * U) * 2.2845$ when Uranium is less than or equal to 34.3%
$d = Density = \mathrm{e}\text{^}(0.0000014694 * \mathrm{U}) * 2.7161$ when Uranium is greater than 34.3%

where:

- d represents the calculated dry bulk density
- e represents Euler's number (approximately 2.71828)
- U represents the grade in ppm

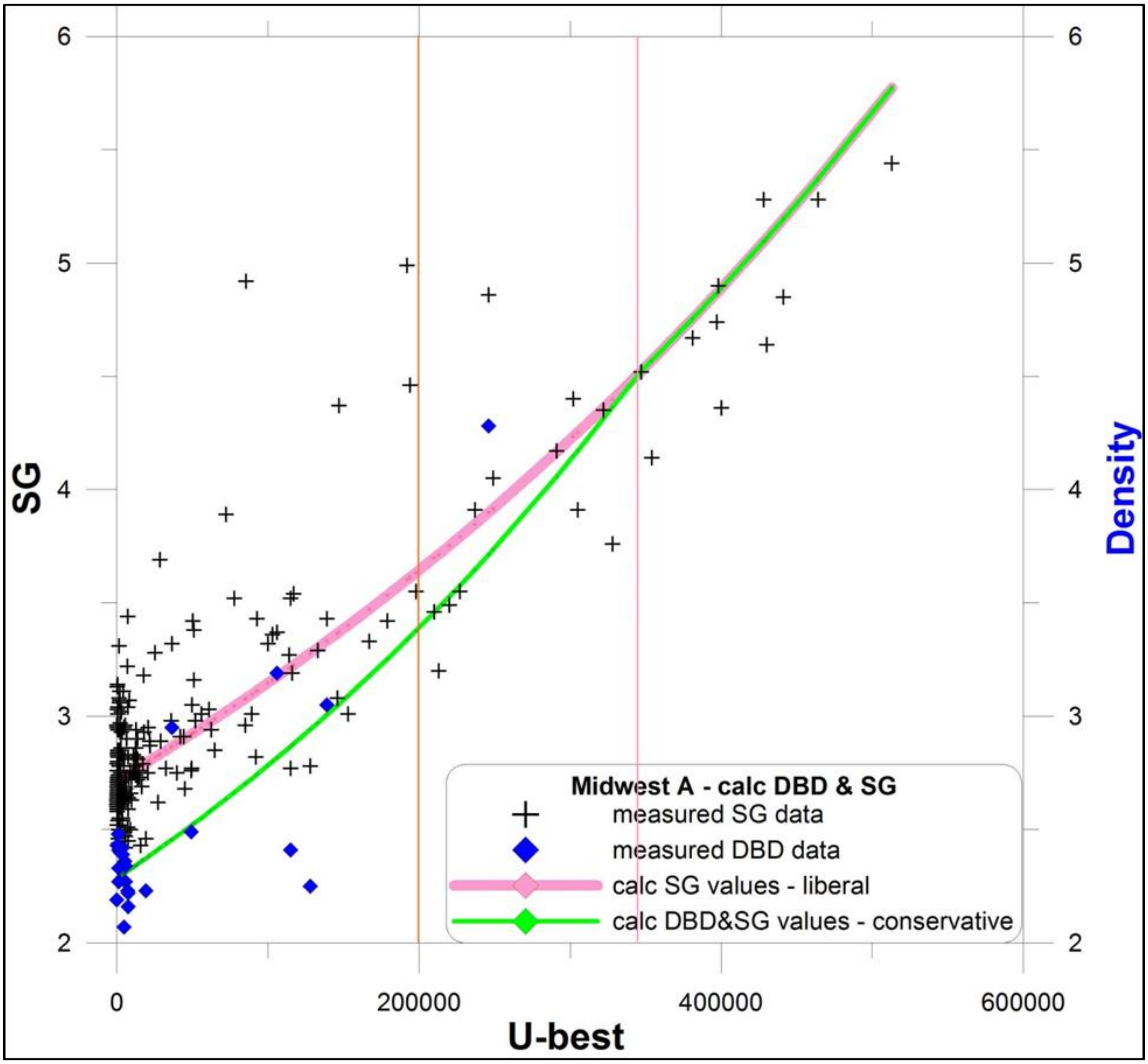


Figure 14-18: Single element density correlation for Uranium

14.3.2 Geological Model

Three sets of structural interpretations were used along with the interpreted unconformity, basement graphite packages, and quartz dissolution alteration halo during the interpretation of the mineralization envelopes. The structures relative to the mineralization are depicted in Figure 14-19.

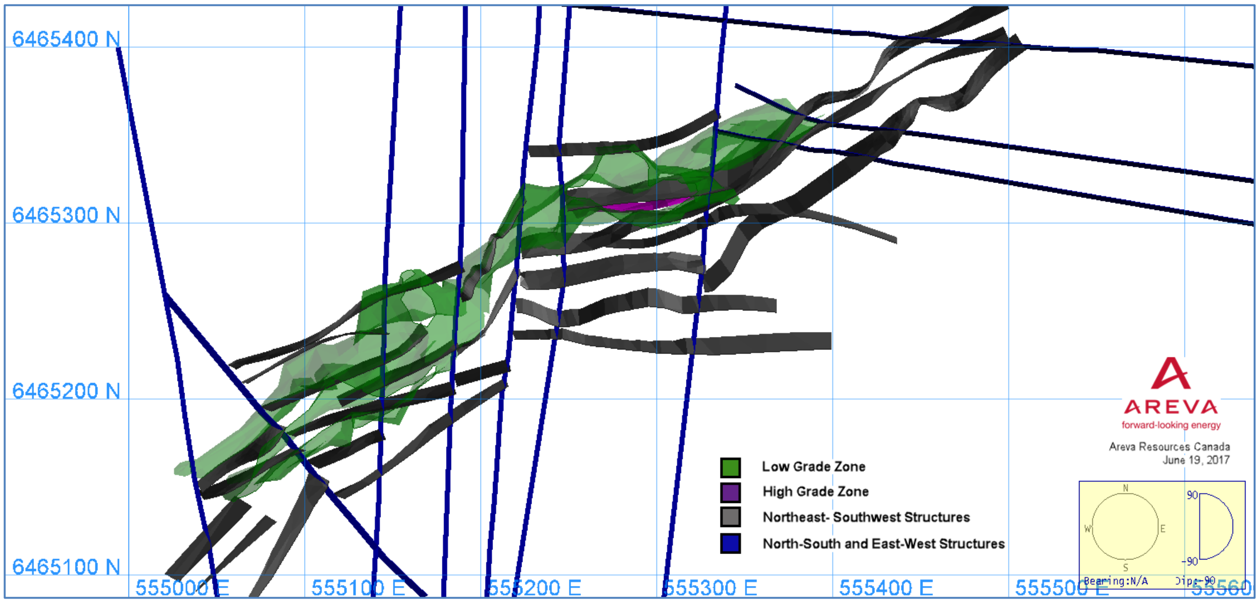


Figure 14-19: 30 m Plan Section With Structures Relative to Midwest A Mineralization

Uranium mineralization follows the northeast-southwest structures with some broader areas where the north-south structures cross-cut the mineralization. These north-south structures appear to limit the extent of the high-grade mineralization along strike, with the unconformity limiting its down-dip extents. The east-west structures do not appear to have a significant effect on the control of the mineralization.

Mineralization was also modelled to reflect the control by the basement graphitic lithologies (locations and contents), and the unconformity on the mineralization. The higher-grade material is generally interpreted to be associated with the graphitic packages and NE-SW structures (Figure 14-20). Some mineralization control is also provided by the unconformity. A relatively minor basement mineralized root was modelled and is interpreted to follow the steeply-dipping graphitic packages.

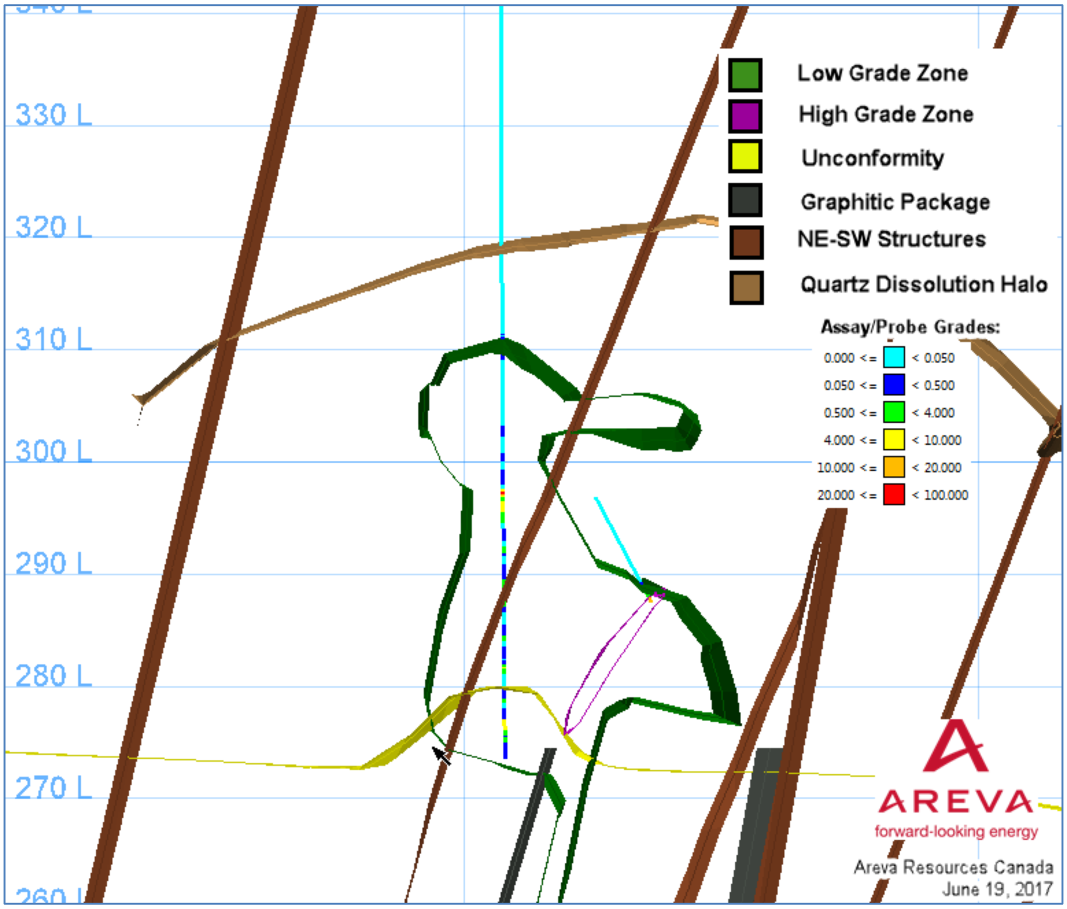


Figure 14-20: Vertical Section Looking N60° Showing Structures and Lithologies Relative to Mineralization at 555,250 UTM East

Midwest A is drilled on approximately 25 metre fences, with drill holes spaced at 15 metres along the fences.

A 3D model of the Midwest A deposit was created in Vulcan (version 10.0.3) using the updated drill hole database. The model was based on the uranium grade data as well, as the updated lithological and structural models that provided additional information on the controls and constraints on the mineralization. The mineralization is interpreted to consist of a larger Low Grade Zone encompassing an interior High Grade Zone (Figure 14-21 and Figure 14-22). The deposit is approximately 450 metres long, 10 to 60 metres wide, and ranges up to 70 metres in thickness. It occurs at depths ranging between 150 and 235 metres below surface.

The Low Grade Zone was modelled using sections oriented perpendicular to the general trend of the mineralization (60° azimuth) and spaced every 5 to 30 metres, averaging approximately 10 metres spacing. The model was verified in 3D and in plan section. The cut-off grade used for the Low Grade Zone was 0.05% U over 2 metres vertical width (Figure 14-23).

The High Grade Zone was modelled using sections oriented perpendicular to the general trend of the mineralization (60° azimuth) and spaced every 5 metres with a cut-off grade of 10% U over one metre. The zone was interpreted to be cut off at the unconformity, as there was only one intersection in the basement that was above the cut-off value (11.5% U over 0.5 metres).

Mineralization in a drill hole was extended half-way to the next non-mineralized drill hole, unless there were structural data to indicate it should be cut off sooner. The 3D model was carried up to 10 metres past the last mineralized intercept for the Low Grade Zone and 5 metres for the High Grade Zone.

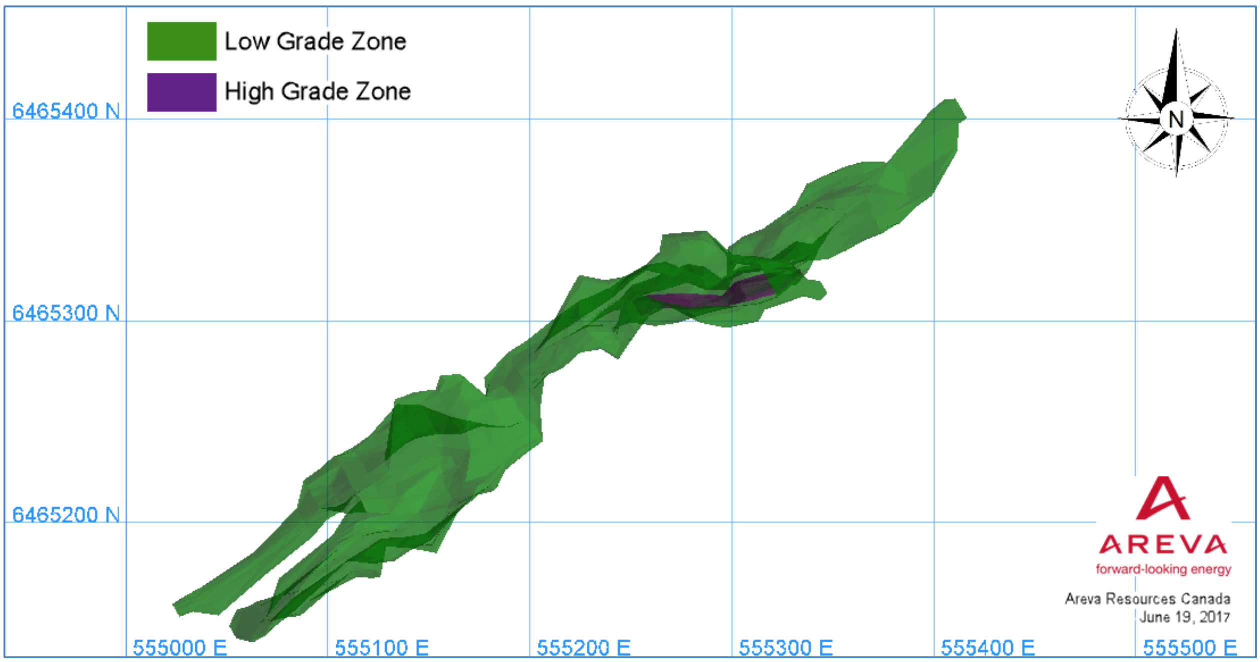


Figure 14-21: Plan View of Low Grade Zone (transparent) with interior High Grade Zone

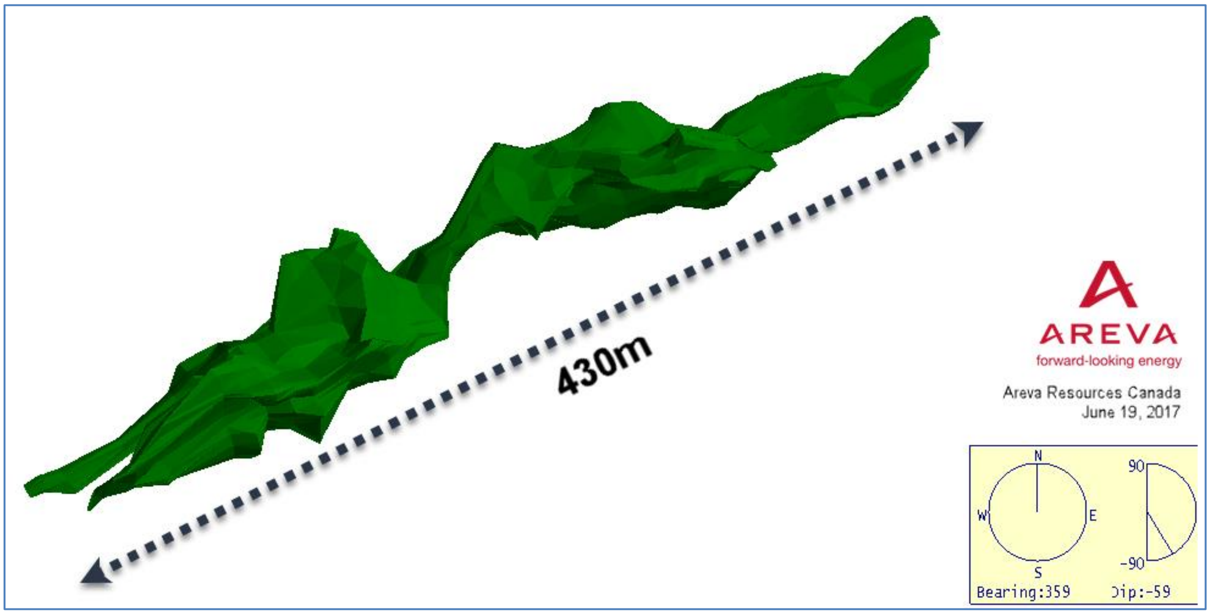


Figure 14-22: Isometric View of the Midwest Low Grade Zone

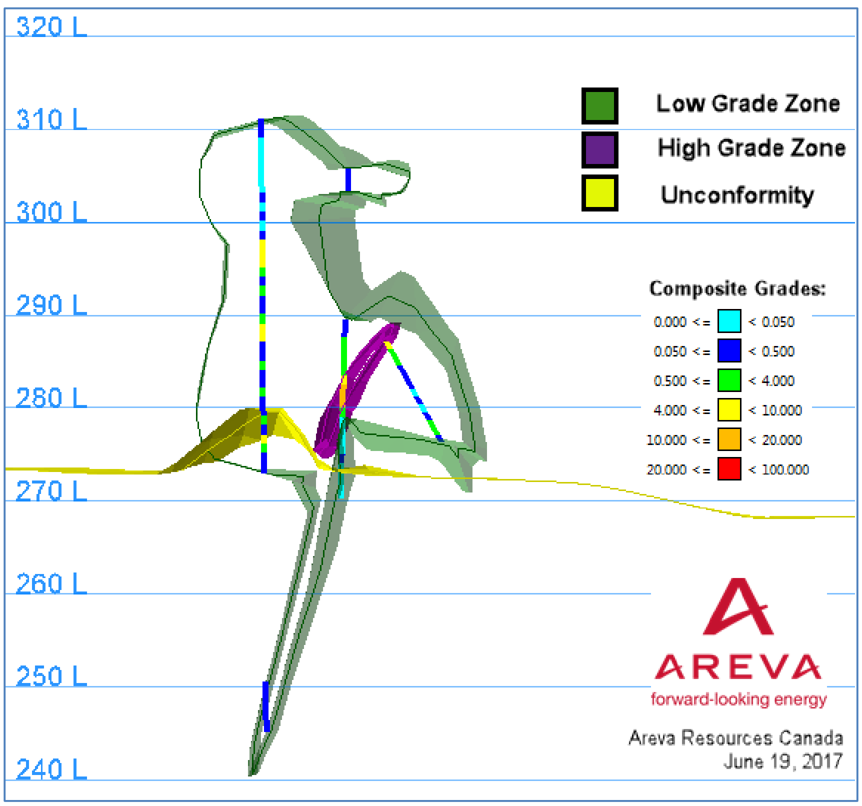


Figure 14-23: Vertical Section Looking N60° Showing Composites Relative to Low and High Grade Zones

14.3.3 Statistics and Data Analysis Study

The 2008 Geostat resource estimate was based on 113 holes (30,215) metres of drilling, including 29 holes drilled from 1979 to 1989, and 84 holes drilled from 2004 to 2007. Since the 2008 Geostat model, an additional 40 holes (9,834 metres) were completed by Areva between September 2007 and July 2008 (Revering, 2010) intersecting the Midwest A deposit. This represents the first time these additional drill holes will be included in a publicly disclosed mineral resource statement.

The 2018 resource domains for Midwest A was intersected by a total of 79 drill holes. It was decided to only use drill holes drilled since 2005 (MW-658 and onward), as the older holes were deemed to be redundant with the new drilling, and there were some data quality and quantity concerns. One of the newer holes was not used for the resource estimate because the hole was lost just into the interpreted mineralized zone. This left 69 holes that were used for resource estimation.

Between probing equivalent uranium grades and geochemical assays, there were a total of 8,488 sample points (Table 14-11). The data set used for resource estimation consisted of 36% geochemical assay data and 64% equivalent probing data. The relatively low percentage of geochemical assay data is due to the significant amount of core loss encountered when drilling through mineralization on the Midwest A deposit. Intense quartz dissolution and intense clay alteration haloes associated with the mineralization are responsible for the core loss.

Table 14-11: Sample Statistics by Zone

Zone	Count	Grade %U			Density g/cm^3		
		Min	Max	Avg	Min	Max	Average
LG	8,259	0.00	54.18	0.87	2.18	6.02	2.35
HG	226	0.14	54.41	25.70	2.46	6.04	3.66

Composites for both the Low and High Grade Zones were generated in Vulcan for Density and DG (Density x Grade). A composite length of one metre was chosen, with the composites being length-weighted. Composites less than 0.5 metres in length were merged with the preceding composite. Summary statistics for the density-weighted composites are shown in Table 14-2 where grade is calculated by dividing DG by Density.

Table 14-12: Composite Statistics by Zone

Zone	Count	Grade %U			Density g/cm^3		
		Min	Max	Avg	Min	Max	Average
LG	1,170	0.00	37.17	0.87	2.21	4.50	2.35
HG	38	5.85	51.39	25.70	2.74	5.78	3.66

14.3.3.1 Declustering

Given that the drilling data was fairly regularly spaced, no declustering was conducted

14.3.4 Capping and High-Grade Restrictions

Some high-grade inliers were noted to exist in the Low Grade Zone. These inliers could not be modelled through use of another interior high-grade domain because they were not continuous and defined by more than one or two drill holes. It was decided to restrict the influence of these high-grade composites to half of the drill spacing on section (7.5 metres). This was done for both DG and Density to better handle these inliers in the estimation. Based on the cumulative probability plots of DG and Density, they were restricted based on a DG of 20 (approximately 6.5% U) which corresponds to a density of approximately 3.0 g/cm^3 (Figure 14-24 and Figure 14-25).

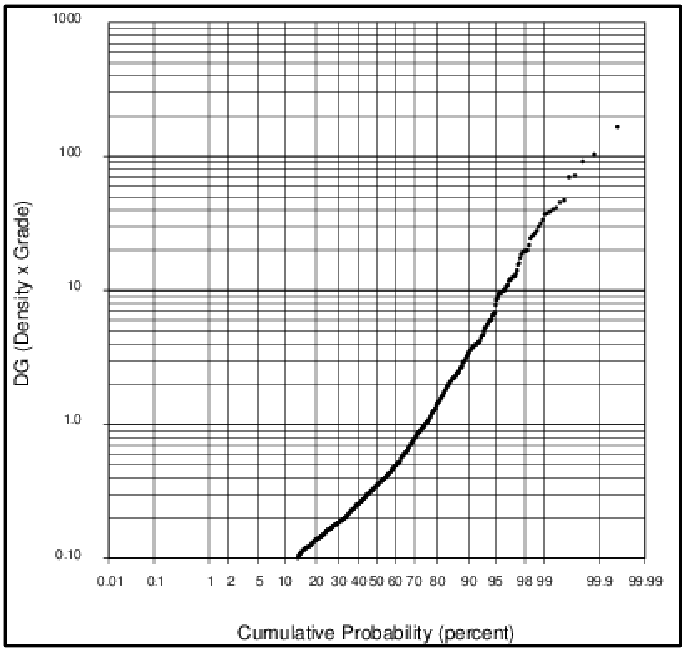


Figure 14-24: Cumulative Probability Plot of DG for the Low Grade Zone

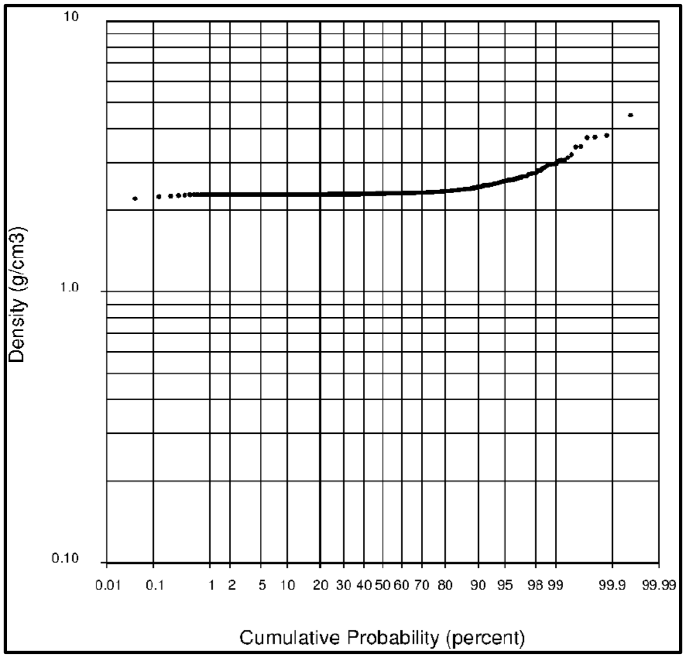


Figure 14-25: Cumulative Probability Plot of Density for the Low Grade Zone

14.3.5 Variogram Analysis and Modelling

Variogram analyses of DG and Density were performed on both the Low and High Grade Zones. The model generated for Midwest A was derived from experimental correlogram variograms for all but the High Grade Zone density, where a General Relative Semivariogram was used (Figure 14-26 to Figure 14-29).

Elliptical directional variograms were used for the Low Grade Zone, with the longest direction of continuity along strike. Given that reasonable directional variograms could not be generated due to the relatively sparse amount of drilling data, an omnidirectional spherical Variogram was used for the High Grade Zone.

Additional variography and trend analyses should be conducted, especially in the High Grade Zone, should additional drilling be conducted.

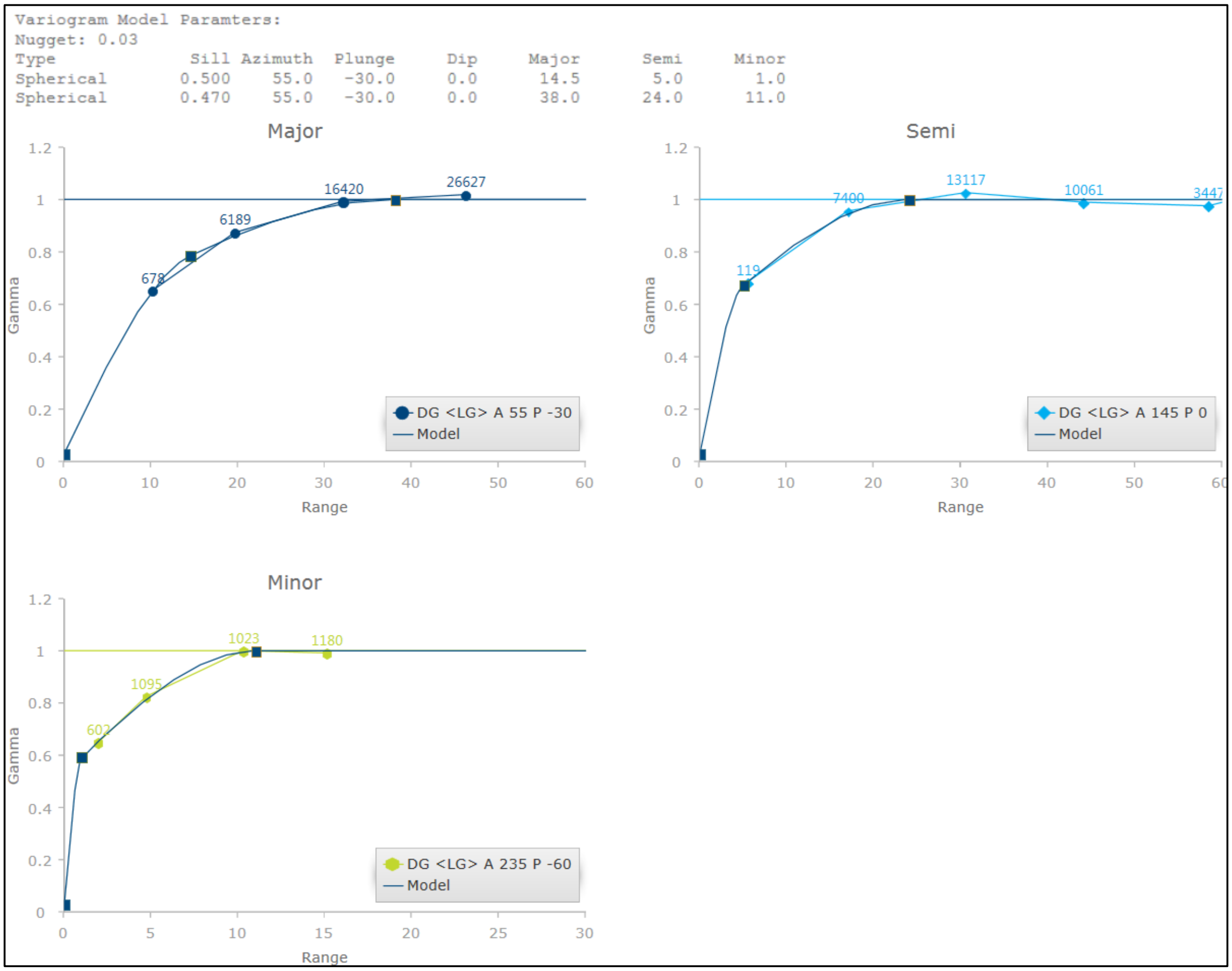


Figure 14-26: Directional Variograms and Models for Low Grade Zone for DG

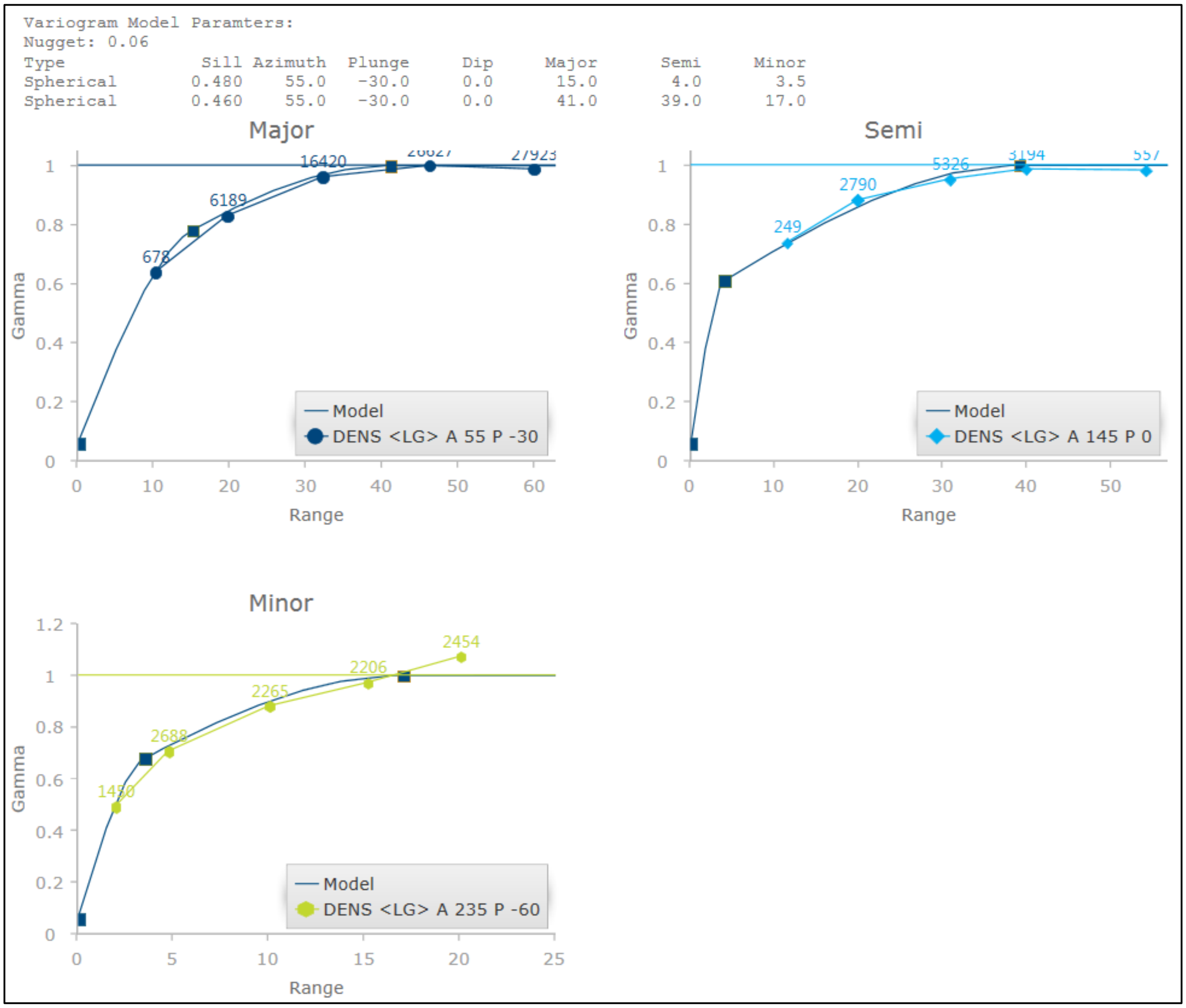


Figure 14-27: Directional Variograms and Models for Low Grade Zone for Density

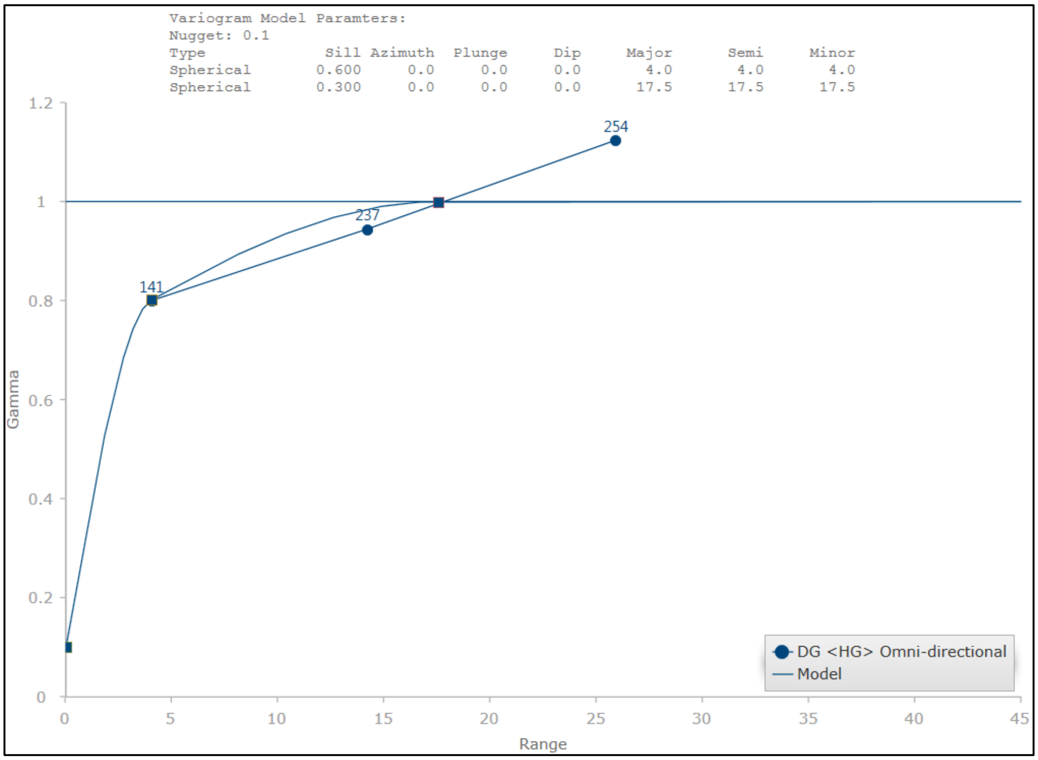


Figure 14-28: Omni Directional Variogram and Model for High Grade Zone for DG

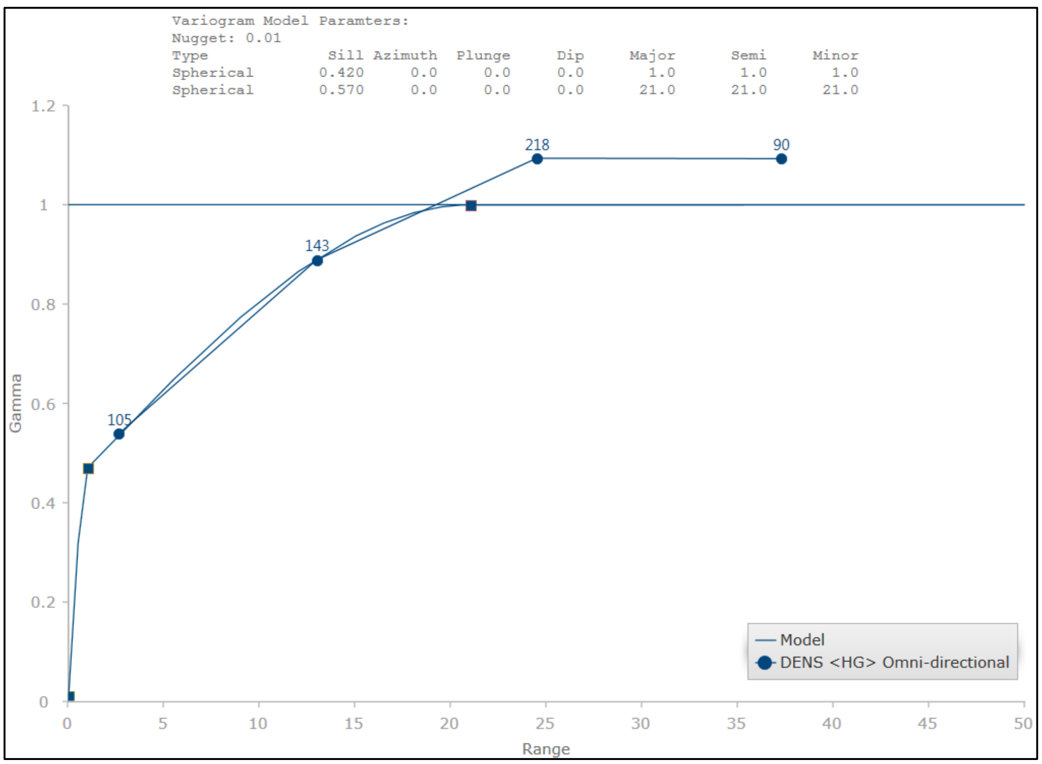


Figure 14-29: Omni Directional Variogram and Model for High Grade Zone for Density

14.3.6 Block Model and Estimation Parameters

The mineral resource block model is comprised of blocks that are 5 m x 5 m x 2 m with sub-blocks that are 2.5 m x 2.5 m x 1 m, in the X, Y, Z directions, respectively. The block model is rotated at a bearing angle of 145 degrees, in Vulcan angle convention, to be aligned with the strike of the mineralization. Each block contains a zone code (1 for the Low Grade Zone and 10 for the High Grade Zone), as well as DG and Density values that were calculated during ordinary kriging. A grade value (%U) is then calculated from this by dividing DG by Density.

A two-run ordinary kriging estimate was conducted for both the Low Grade and High Grade Zones. The majority of the blocks were estimated within the first run. The second run was used to fill in any remaining un-estimated blocks. Hard boundaries were used to prevent the use of composites between the Low and High Grade Zones. The estimation parameters used are shown in Table 14-13 below.

In order to manage the influence of high grades within the Low Grade Zone, high-grade management was required. It was deemed the best way to deal with this was to restrict the influence of samples with a DG of 20 or greater to a maximum distance of 7.5 metres. The 20 DG value was chosen based on statistics and from visual inspection of the higher grades and their apparent continuity.

Table 14-13: Midwest A Estimation Parameters

	Low Grade Zone		High Grade Zone	
Run 1:	**DG**	**Density**	**DG**	**Density**
Major Axis (m)	38	41	17.5	21
Semi-Major Axis (m)	24	39	17.5	21
Minor Axis (m)	11	17	17.5	21
Bearing	55	55	55	55
Plunge	-30	-30	-30	-30
Dip	0	0	0	0
Min. Number of Samples	10	10	10	10
Max. Number of Samples	30	30	30	30
Max. Samples Per Hole	5	5	5	5
High Grade Resitriction (m^3)	7.5	7.5	-	-
Run 2:				
Major Axis (m)	76	82	35	42
Semi-Major Axis (m)	48	78	35	42
Minor Axis (m)	22	34	35	42
Bearing	55	55	55	55
Plunge	-30	-30	-30	-30
Dip	0	0	0	0
Min. Number of Samples	7	7	7	7
Max. Number of Samples	30	30	30	30
Max. Samples Per Hole	5	5	5	5
High Grade Resitriction (m^3)	7.5	7.5	-	-

14.3.7 Estimation Sensitivity

Several sensitivity tests were run to gauge how much of an impact different estimation parameters have on the resource estimate (Table 14-14).

Table 14-14: Summary of Sensitivity Analyses Conducted With Preferred Scenario Highlighted

Test #	Details	Inferred Metal (tonnes U)	Indicated Metal (tonnes U)
1	Uncapped OK Estimate	2,900	6,200
2	Capped OK Estimate at 38DG and 3.1 Density	2,700	4,900
3	Capped OK Estimate at 38DG and 3.1 Density and Less Samples	2,600	4,900
4	Capped OK Estimate at 38DG and 3.1 Density Using 2010 Estimation Paramters	2,700	4,700
5	Capped OK Estimate at 38DG and 3.1 Density and Half the Range	2,800	4,900
6	Capped OK Estimate at 20DG and 3.0 Density	2,700	4,200
7	Restricted OK Estimate for Samples With 20DG and Above for 7.5m^3	2,600	4,200

Notes:

a) No cut-off was applied.
b) Numbers are rounded.
c) Preferred scenario in grey. All other scenarios are not being treated as a current resource.

The resource estimate was most sensitive to the management of relatively high grade samples within the Low Grade Zone. Significant differences can be seen between the uncapped and the capped or restricted estimates (test 1 compared to tests 6 and 7). Capping between 32 and 20 DG (test 2 compared to test 6) had a notable affect as well, but is not as pronounced.

Differences in ellipse size (test 5), Variogram direction (test 4), and number of samples selected (test 3) had a relatively minor affect.

A 20 DG cap (test 6) was investigated compared to a 20 DG restriction of 7.5 metres from the sample (test 7). The difference in contained uranium metal content was relatively small globally, but locally had notable high-grade smearing. It was decided to use a 20 DG restriction as it better represented the spatial distribution of the grades in the Low Grade Zone.

No restriction or capping was done for the High Grade Zone.

14.3.8 Validation of Resource Estimation

The block model was validated using several methods, including but not limited to: visual review of block grades relative to composites, statistical checks, spatial distribution plots of block grades relative to composite grades, peer reviews, and estimation via alternate estimation methods (inverse distance squared (ID^2) and nearest neighbour (NN)). Composite grades compared very well overall to the ordinary kriged estimate, especially in the High Grade Zone (Table 14-15). The estimated grades in the Low Grade Zone were somewhat lower than the composite grade, which is believed to be mostly due to the use of high grade restrictions in this Zone.

Table 14-15: Comparison of Composites to Ordinary Kriged Estimate Statistics

	Composites				Ordinary Kriged Estimate			
Zone	Grade %U			Density g/cm^3	Grade %U			Density g/cm^3
	Min	Max	Average	Average	Min	Max	Average	Average
LG	0.00	37.17	0.87	2.35	0.00	21.31	0.65	2.34
HG	5.85	51.39	25.70	3.66	15.12	33.14	24.85	3.65

Estimation by nearest neighbour and ID^2, with similar search parameters, was within 5% of the ordinary kriging resource estimate, with the kriging estimate the lowest of the three (Table 14-16).

Table 14-16: Comparison of Estimation Techniques

Test	Zone	
	Low Grade Kg U	High Grade Kg U
ID^2 Estimate (20DG restricted for Low Grade Zone)	4,499	2,576
Nearest Neighbour Estimate (20DG restricted for Low Grade Zone)	4,562	2,293
OK Estimate (20DG restricted for Low Grade Zone)	4,293	2,483

Notes:

a. A 0.085% U reporting cut-off was applied.
b. Preferred scenario in grey. All other scenarios are not being treated as a current resource.

Volumes of mineralized shells were compared to the volumes represented by the block model and were found to be within 1% (Table 14-17).

Table 14-17: Comparison of Triangulation Volumes to Block Model Volumes

Zone	Triangulation Volume (m^3)	Block Model Volume (m^3)	Difference
Low Grade Zone	285,147	283,238	0.7%
High Grade Zone	2,748	2,738	0.4%
Total	**287,895**	**285,975**	**0.7%**

14.3.9 Resource Classification

The classification of mineral resources for Midwest A is based on geological confidence and drill hole spacing. Where drill hole spacing was greater than 30 metres, mineralization was placed in the inferred category.

The bulk of the mineralization is considered to be within the indicated category. There are three areas that are the exception to this and are categorized as Inferred Resources (Figure 14-30). These areas are:

- The southwestern area of the Low Grade Zone. Limited drill hole data defines the extension of the mineralization in this area with drill spacing in excess of 30 metres.
- The center of the Low Grade Zone (the former Gap area). There is some uncertainty in the shape and continuity of the mineralization in this area due to (1) the possibility of a cross-cutting structural feature interpreted from geophysical data, and (2) a lower density of drilling.
- The High Grade Zone. The geometry and extents need further confirmation.

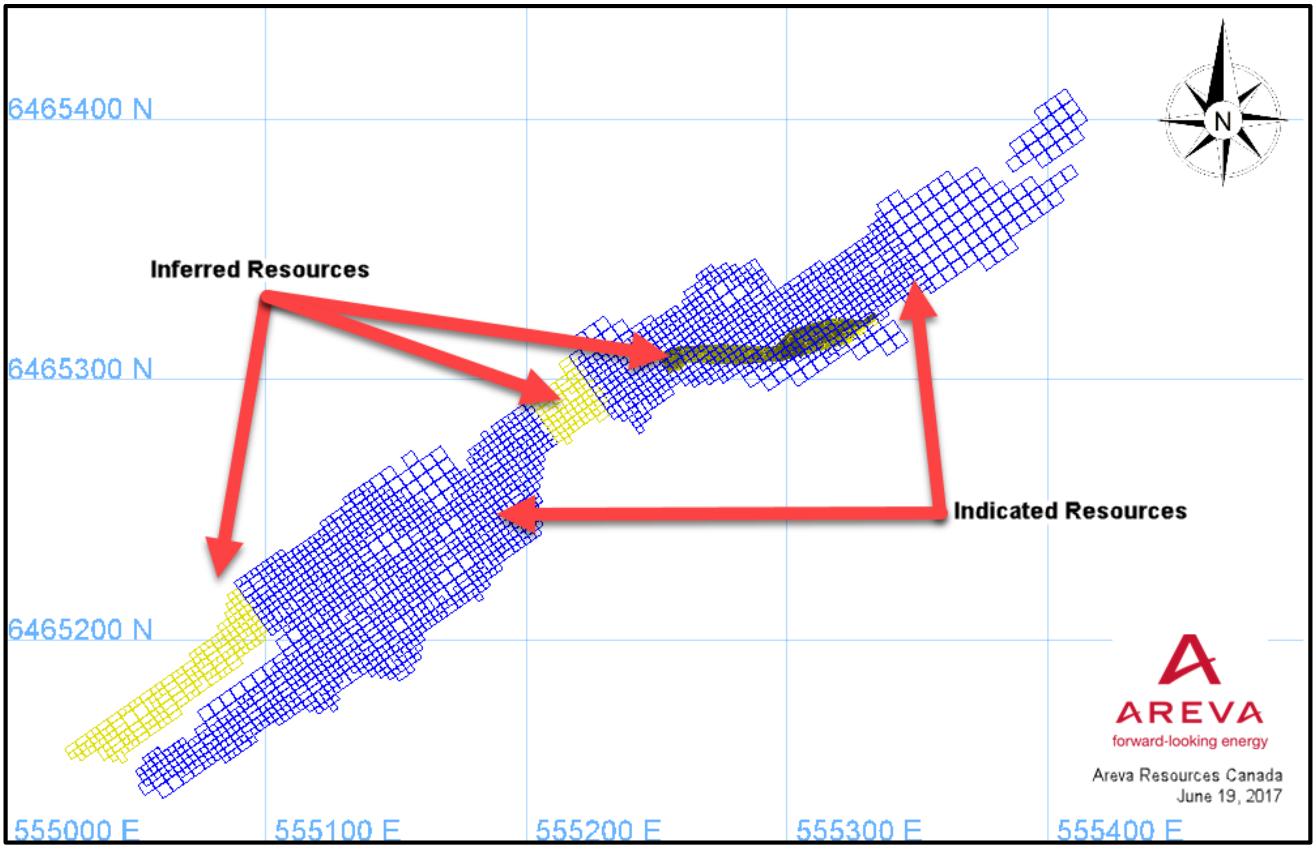


Figure 14-30: Classification of Mineral Resources for Midwest A

14.3.10 SRK Audit Methodology and Findings

14.3.10.1 Geology Review and Interpretation

SRK notes that drill core was generally in a condition that made it difficult to observe or measure structures. Core typically had significant rubbly intervals, disaggregated sands, and limited core recovery for some intervals.

SRK examined the drillholes intervals listed in Table 14-18 for the Midwest A zone. For this review, SRK reviewed selected drillhole core, domain wireframes, the provided drillhole database and the mineral resource model.

Table 14-18: Drillhole Intervals Examined for the Midwest A Zone

Drillhole	Intervals Reviewed	Domains
MW691	1560-209.8	Low grade, high grade
MW698	209.8-233.8	Low grade
MW725	171.2-194.2	Low grade
MW745	199.3-208.3	Low grade
MW749	156.6-217.9	Low grade, high grade
MW747	159.5-183.7, 184.6-198.5	Low grade, high grade

The drill core review confirms that the high-grade domain is dominated by high to intense alteration and is associated with high grade uranium mineralization in presence of uranium oxides and fine grained uraninite. As the core was predominantly rubbly with some intervals of disaggregated sandstone, structural information was limited.

The mineralized zone was modelled using a 10% uranium threshold over 1 metre. Highly altered basement rock was observed in the base of mineralization in drill hole MW749 which is consistent with drilling data and zone modelling. Grade boundaries for this zone are sharply defined by a sharp grade contrast over most boundaries. The mineralization trend is understood to follow one of the east-west faults, including the Basement Minx fault and East fault 5. Drill hole MW749 intersects this structure above the selected intervals for review.

All six drill hole core intervals reviewed intersect parts of the low-grade domain. Reviewed core display weak to moderate alteration with locally intense alteration. Secondary hematite is associated with some of the mineralization in this domain. Core is significantly rubbly with some disaggregated sandstone but some intervals are intact. Mineralization is generally less than 1% uranium with some localized mineralization ranging from 1% to 5% uranium. This range of mineralization appears to be supported by limited drill hole intersections. This domain is based on a threshold value of 0.5% uranium over 2 metres. The low-grade domain trends approximately parallel to the east-west fault and is cross cut by north-northwest to south-southeast faults. No strong mineralization breaks or trends appear to be related to the north-northwest to south-southeast structures

The high-grade and low-grade domains for the Midwest A zone is generally characterised by:

- Threshold uranium values used for the delineation of domains.
- Alteration and uranium mineralization observed in drill core.
- East-west fault structures appear to be parallel to mineralization trend for domains.

In consideration of these findings, the delineation of domains for the Midwest A zone is considered generally appropriate for mineral resource estimation. Classification of these domains should consider drilling density, the quality of core and the confidence in delineation of geological structures rather than domain definitions.

The low-grade domain that was defined below the unconformity was defined consistently using the threshold U_3O_8 for this domain. However, SRK finds that modelling this zone at depth of about 240 metres may be optimistic. Principally, modelling of the domain around an unmineralized interval from 260.5 to 239 metres in MW733 should be reviewed. While other low-grade intersections do exist in the depth range from 240 to 250 metres (MW684, MW662). SRK suggests that the probable structural complexity of basement rocks may preclude extending the low-grade domain from unconformity to these depths. SRK suggests modelling below unconformity should be limited to a depth range from 260 to 270 metres. A suggested approach to modelling deeper basement mineralization should be as a single narrow zone at depth. A schematic of suggested changes is outlined in Figure 14-31.

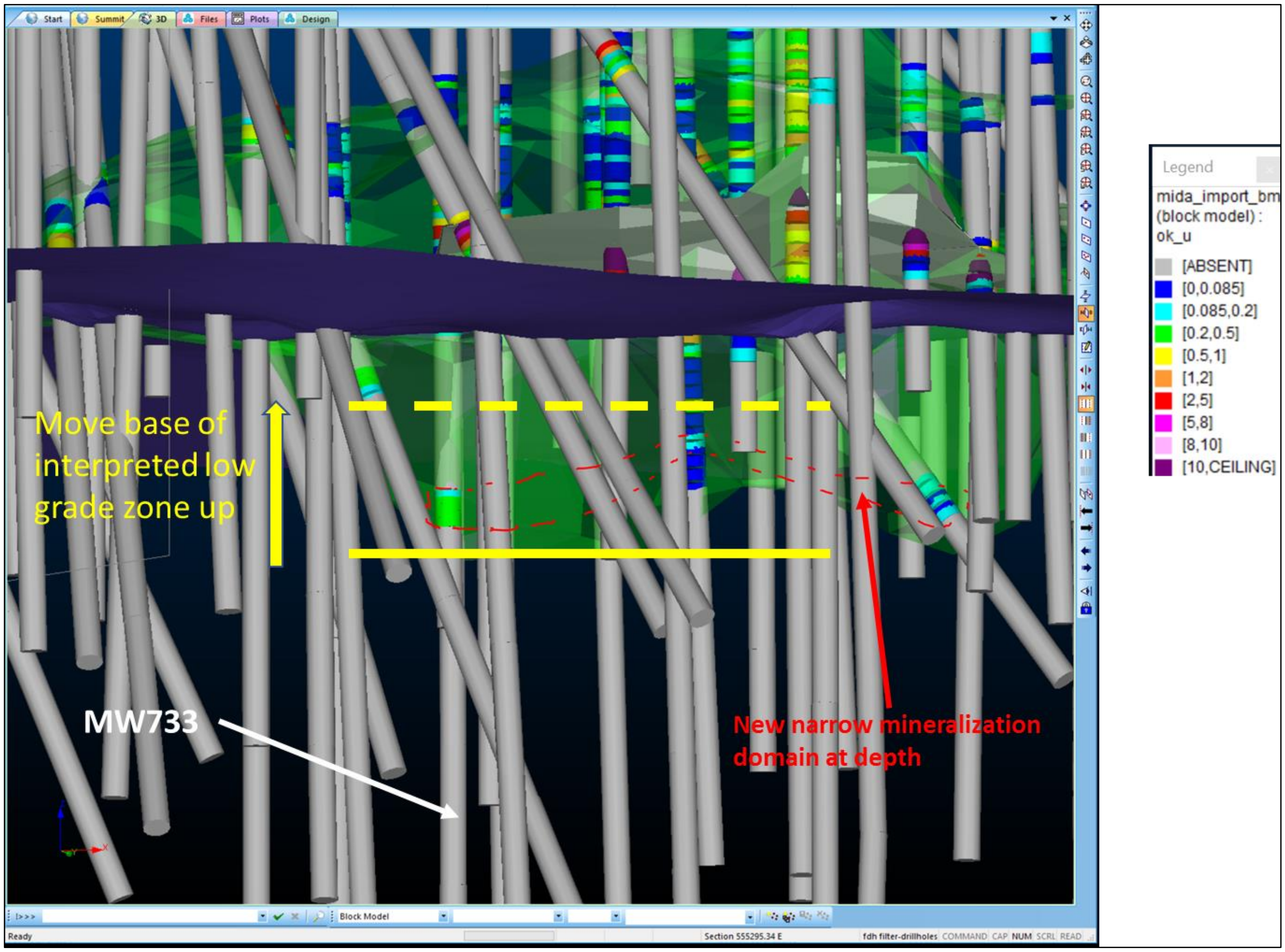


Figure 14-31: Midwest A Zone, Low Grade Domain Re-Interpretation Schematic

14.3.10.2 Resource Estimation Review and Findings

SRK reviewed the approach taken by Orano to construct the mineral resource model and finds it to be generally consistent with that undertaken for other similar deposits.

Similar to Midwest Main, SRK reviewed the sample assay and probe data, Orano's calculation of density and DG, and the compositing of density and DG used to generate the conditioning data for resource estimation. SRK also reviewed the impact of using only the single element density equation compared to the combined single and multi-element density relationships. The calculated average density values were comparable when considering only the use of a single element equation. SRK is satisfied with Orano's density relationships. SRK generated probability plots for the DG attribute in the Low and High Grade Zones to evaluate the reasonableness of the high-grade threshold selection made by Orano. SRK agrees with Orano's choice of a DG threshold of 20 for its low-grade domain; however, SRK considers that, despite its narrow and limited volume, estimation of the high-grade domain may be slightly optimistic as a result of having applied no capping, or any other high-grade treatment

Orano estimated all attributes, DG and density with the same estimation parameters shown in Table 14-13. Orano used an omnidirectional variogram and search to estimate the high-grade domain. Given its narrowness and the use of hard boundary estimation, this should be reasonable to use within the high-grade volume.

SRK also reviewed the search ellipsoid orientation and variogram used in the estimation of the low-grade domain, and finds that while the variogram structure and ranges appear to be reasonably modelled, its orientation appears to be too steep for this domain and its geometry. SRK expected a relatively flat ellipsoid, somewhat aligned to the unconformity surface, with the major axis oriented along strike. Figure 14-32 shows an oblique southeast looking view of the low-grade wireframe, informing composite data and the ellipsoid orientation used for estimation by Orano (1A), and a horizontal ellipsoid proposed by SRK (1B). Through discussions with Orano and Denison, SRK understands that there are no specific geological controls that might influence the grade distribution to be oriented as steeply as illustrated in Figure 14-32A.

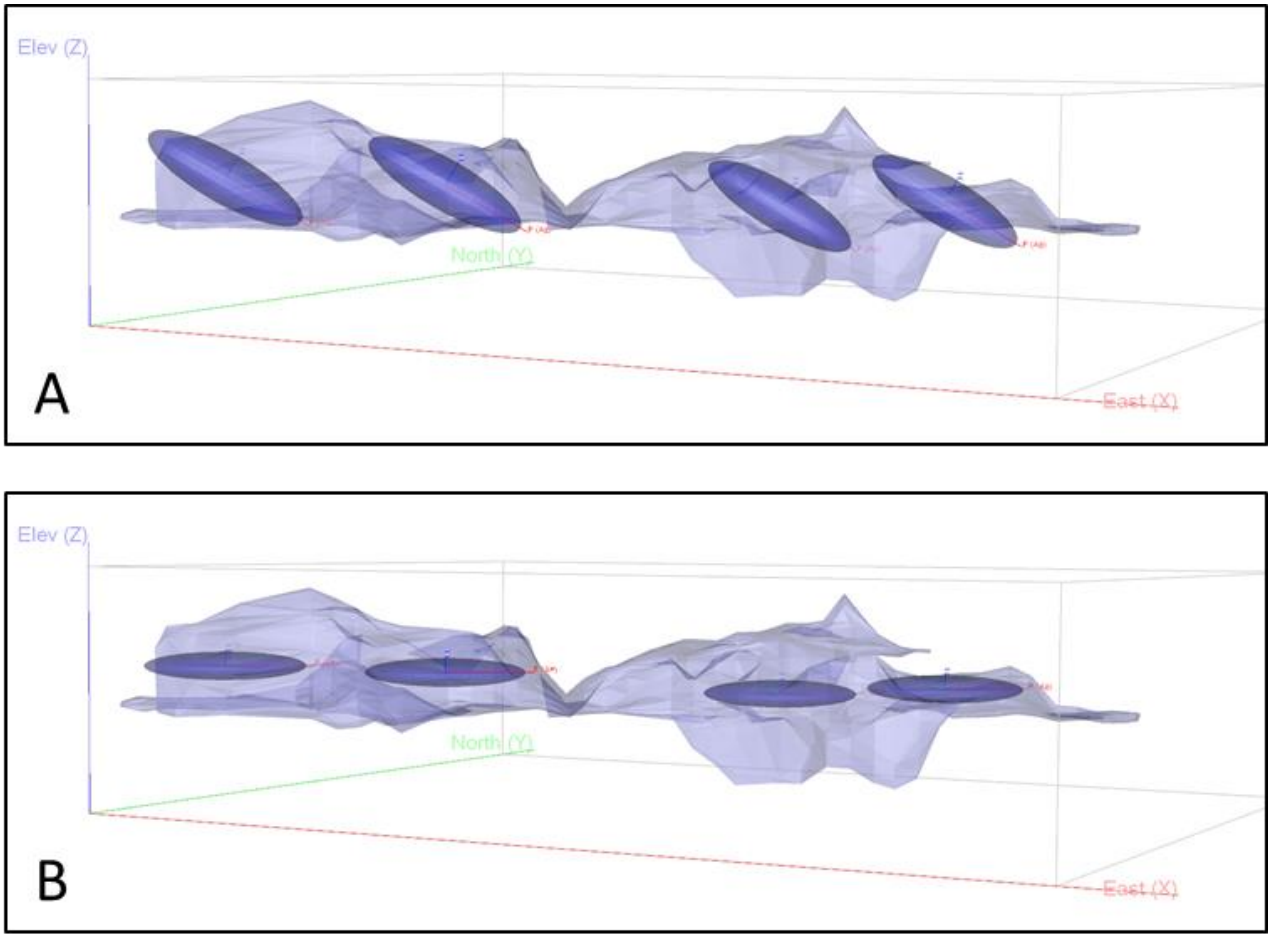


Figure 14-32 Oblique Northwest View of Low Grade Domain and Search Ellipsoid in Midwest A Zone
A: Orano Ellipsoid dipping -30 degrees at 055 azimuth
B: Proposed Ellipsoid dipping 0 degrees at 055 azimuth

SRK chose to recalculate and remodel the variogram for both density and DG (Figure 14-33) to have a flattened ellipsoid oriented along strike and generally aligned with the unconformity surface. In general, SRK obtained similar structure and ranges to that modelled by Orano, with the revised orientation. This was then used to re-estimate the low-grade domain using the same parameters as Orano.

Figure 14-34 shows a comparison of estimated DG blocks in the same northwest oblique view between the Orano model and the revised grade orientation model. Uranium and density show similar trends, with the latter being less pronounced due to the magnitude of the density distribution.

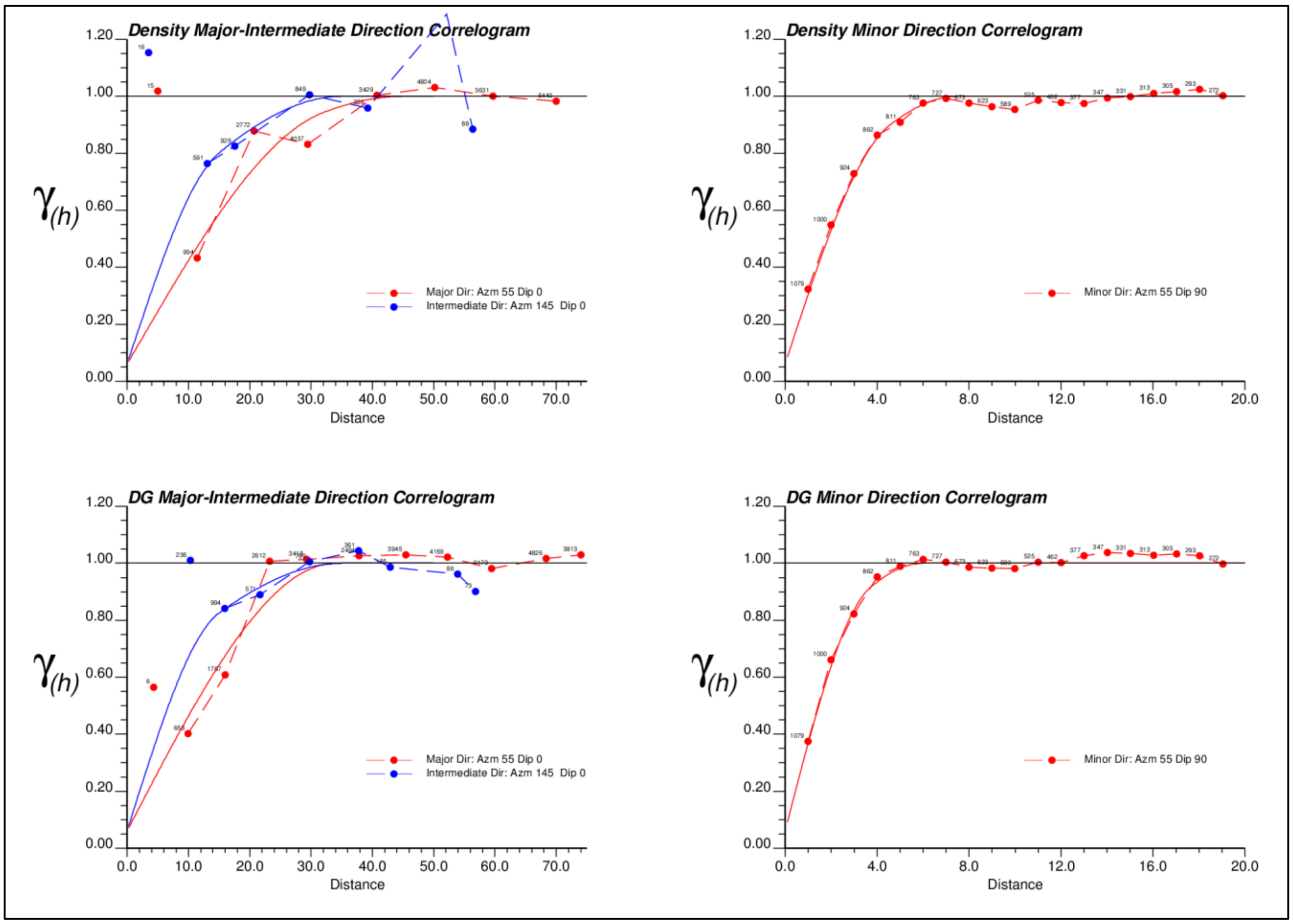


Figure 14-33: SRK Modelled Variogram for Density (top row) and DG (bottom row) for Midwest A Zone

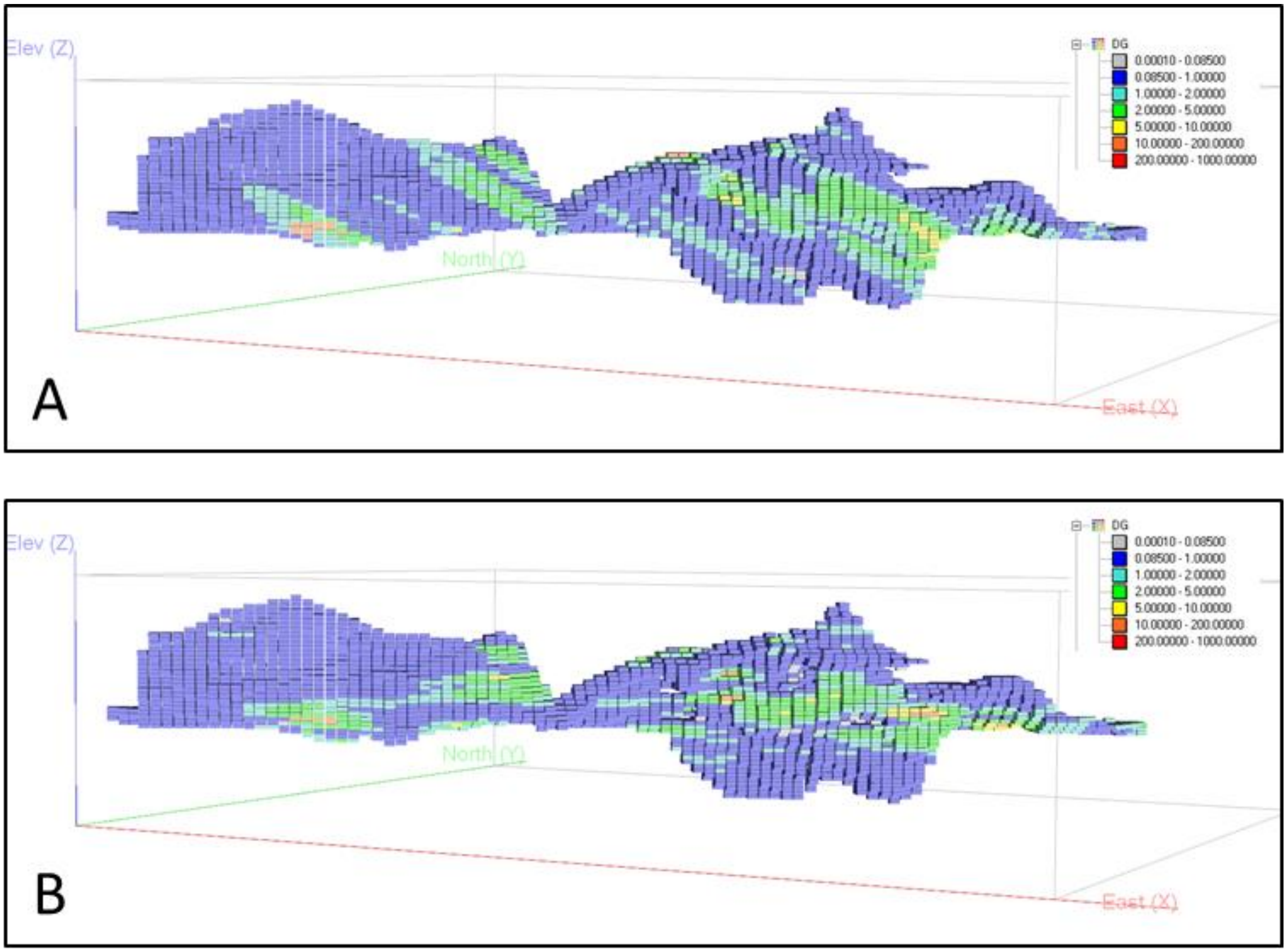


Figure 14-34: Oblique Northwest View of Estimated DG within Low Grade Domain of Midwest A Zone
A: Orano Variogram and Ellipsoid dipping -30 degrees at 055 azimuth
B: Proposed SRK Variogram and Ellipsoid dipping 0 degrees at 055 azimuth

SRK visually reviewed the low-grade domain re-estimated block grades against nearby informing data on vertical sections looking northeast, and also in longitudinal view. Generally, the estimated blocks compare well to the nearby data. SRK notes that the Orano model also compared well in vertical sections looking northeast; however, the longitudinal view clearly showed the impact of a relatively steeply dipping variogram on the estimation. Denison and SRK consider that the flatter continuity axis oriented along strike to be more reasonable for this type of unconformity deposit. The swathplot comparison of both the Orano and SRK model against the informing composites (Figure 14-35) shows that both models generally compare well to the data, with the expected smoothness of both models relative to the composite data distribution.

SRK also investigated the sensitivity of the high-grade domain to outlier treatment. SRK tested this by applying a high grade limited radial influence of DG composites greater than 200, within a 7.5 metre cubic volume, which is consistent with Orano’s radial choice in the low grade. The use of high grade restriction at a DG value of 200 resulted in a 2% lower average grade and 1% less contained metal in the high-grade domain. While SRK does not consider this to be material, SRK prefers the use of some form of grade restriction to avoid uncontrolled smearing of the extreme high-grade composites found within this zone.

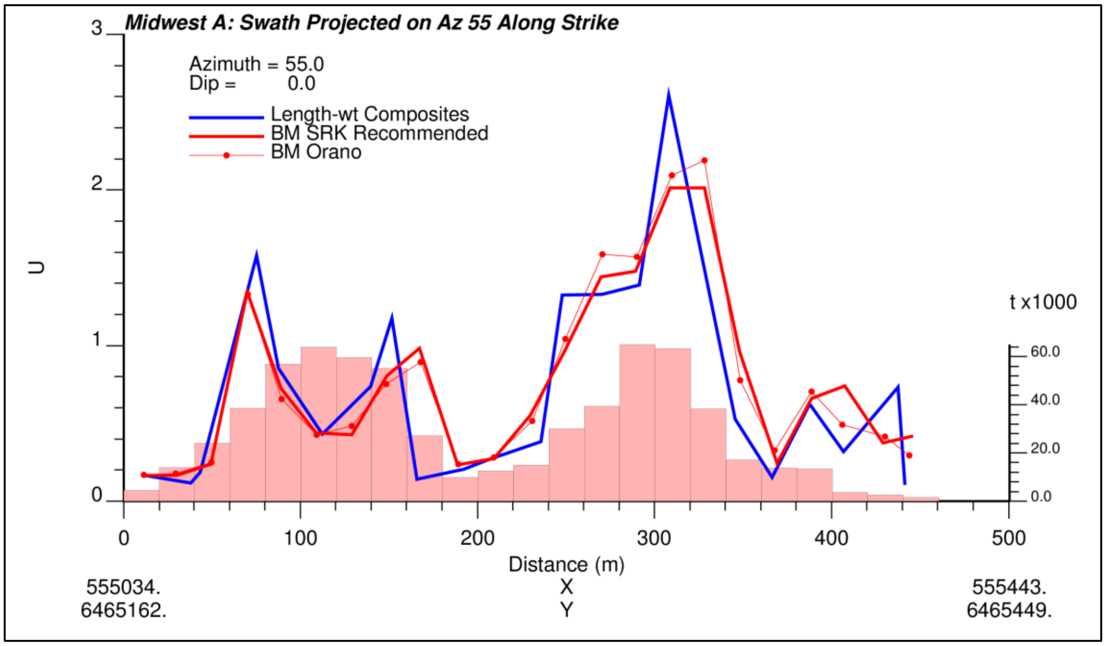


Figure 14-35: Swathplot Comparison of Orano Model, SRK Model, and Informing Composites Along Strike

14.3.10.3 Classification

SRK reviewed the classification criteria for the Midwest A Zone, along with classification criteria used in historical mineral resource models for Midwest A by SGS Geostat (2008) and SRK (2009 and 2010). Orano's classification criteria and regions are generally well aligned with those used previously and mostly capture those areas that are drilled within an approximate 30-metre spacing. There is, however, one area in the northern 'pod' that is interpreted below the unconformity surface and into the basement that merits closer inspection (see Figure 14-36A).

SRK reviewed the geological interpretation of the low-grade domain below the unconformity against the data density and finds that the region modelled in the basement is based on significantly less data than in the unconformity (Figure 14-36B). Figure 14-36C shows that most of these same blocks were estimated in the second pass (based on revised low-grade continuity as discussed in the previous section). On the basis of drill density and estimation pass, SRK chose to re-classify these blocks from Indicated to Inferred (Figure 14-36D).

Orano classified as Inferred those blocks in the high-grade domain, as well as the historic gap area between the north and south pods and the southwestern limb of the low-grade domain. SRK agrees with this classification.

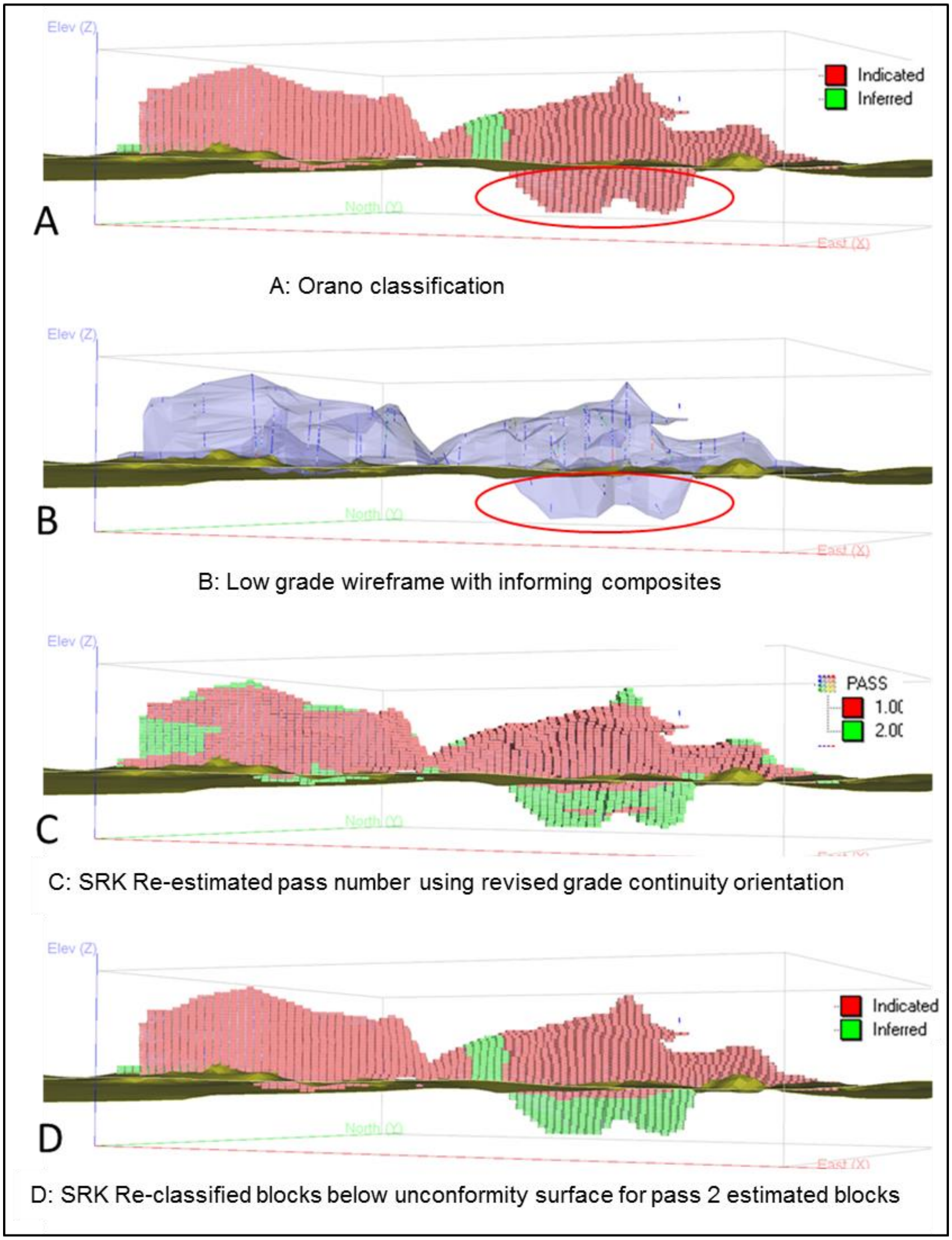


Figure 14-36: Midwest A Northwest Looking View

14.3.10.4 SRK Comments

The interpretation for the Midwest A Zone has changed significantly from the last publicly disclosed resource estimate in 2008. The main interpretational change is the combination of previous South and North pods have been combined to form the Low Grade Zone. This Zone now includes the intervening Zone between the South and North Pods. In addition, the strike length of mineralization has changed from an approximate strike length of 350 meters to about 430 metres. Changes in the interpretation are largely based on the addition of 40 drill holes and related additions from reprocessed probe data including depth corrections, use of corrected low flux gamma values, removal of problematic probe data which allowed the use of a greater number of eU values, Mineralization in the basement was added to the Low Grade Zone. The reinterpretation comprises a volumetric increase of about 40%.

SRK considers that domaining of the High Grade and Low Grade Zones have been undertaken consistently and are appropriate for the estimation of resources.

A significant amount of low grade tonnage has also been interpreted in the Basement domain at elevations to 240m. This interpreted mineralization in the northeast of the Low Grade Zone may be optimistic and should be reconsidered.

SRK recommends that significant additional drilling be considered in future to accurately locate sub-vertical geological structures for this deposit to determine their relationship to mineralization. Additionally, exploration drilling in this area should be completed to test the continuity of basement mineralization outlined in the Low Grade Zone.

Overall, SRK finds Orano’s resource estimation methodology and workflow to be clear and reasonable for this type of unconformity-related uranium mineralization. SRK made two modifications to the resource model constructed by Orano: (1) grade and density continuity was re-oriented to be flat along strike and re-estimated accordingly; and (2) blocks below the unconformity surface were re-classified from Indicated to Inferred on the basis of estimation pass and data density. SRK considers the resultant mineral resource model for Midwest A to be a reasonable reflection of the local distribution of uranium grade and density.

14.4 Audited Mineral Resource Statement

CIM *Definition Standards for Mineral Resources and Mineral Reserves* (May 2014) define a Mineral Resource as:

> *“[A] concentration or occurrence of solid material of economic interest in or on the Earth’s crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other*

geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling."

The "reasonable prospects for eventual economic extraction" requirement generally implies that quantity and grade estimates meet certain economic thresholds and that mineral resources are reported at an appropriate cut-off grade that takes into account extraction scenarios and processing recovery. Orano considers the use of an open pit extraction scenario for reporting, with a cut-off of 0.085% U. This choice of cut-off grade is based on Orano's many years of mining experience at the nearby Sue open pits (Sue A, Sue B, Sue C, and Sue E) and at the McClean Lake site where a cut-off of 0.085% U was used during mining (AREVA Resources Canada Inc., 2009). Uranium mineralization at the former Sue A and B pits is similar in nature to Midwest Main and Midwest A in terms of depths, mineralization, distance to the mill, and host rocks. SRK finds this cut-off grade to be comparable to other Denison projects, and slightly higher than the historical 0.05% cut-off for the 2008 Midwest A Zone.

SRK is satisfied that the mineral resources were estimated in conformity with the widely accepted CIM *Estimation of Mineral Resource and Mineral Reserve Best Practices Guidelines*. The mineral resources may be affected by further infill and exploration drilling that may result in increases or decreases in subsequent mineral resource estimates. The mineral resources may also be affected by subsequent assessments of mining, environmental, processing, permitting, taxation, socio-economic, and other factors. The audited Mineral Resource Statement for the Midwest Uranium Project presented in Table 14-19 was prepared by Dr. Oy Leuangthong, PEng (PEO#90563867), and Mr. G. David Keller (APGO#1235). Dr. Leuangthong and Mr. Keller are independent qualified persons as this term is defined in National Instrument 43-101.

The effective date of the audited Mineral Resource Statement is March 9, 2018.

Table 14-19: Audited Mineral Resource Statement*, Midwest Uranium Project, Saskatchewan, SRK Consulting (Canada) Inc., March 9, 2018

Deposit	Category	Zone	Tonnage (kt)	Grade (% U_3O_8)	Contained Metal (Mlb U_3O_8)	Denison Equity** (Mlb U_3O_8)
Midwest Main	Indicated	Unconformity	453	4.00	39.94	10.05
	Inferred	Unconformity	257	1.36	7.71	1.94
		Perched	513	0.32	3.59	0.90
		Basement	23	0.38	0.18	0.05
Midwest A	Indicated	Low Grade	566	0.87	10.84	2.73
	Inferred	Low Grade	43	0.40	0.38	0.09
		High Grade	10	28.76	6.35	1.60
	Total Indicated		**1,019**	**2.26**	**50.78**	**12.78**
	Total Inferred		**845**	**0.98**	**18.21**	**4.58**

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates. Reported at open pit resource cut-off grade of 0.1% U_3O_8 (0.085% U) and at a uranium price of US$45 per pound.

** Denison's share of the project on an equity basis is 25.17%.

14.5 Grade Tonnage Sensitivity

14.5.1 Midwest Main

Figure 14-37 shows the sensitivity of the tonnage and grade to the cut-off grade in the SRK mineral resource model for Midwest Main, while Figure 14-38 shows this sensitivity in terms of contained U_3O_8. In general, the contained U_3O_8 in the Indicated is insensitive to the cut-off grade, and the Inferred category is insensitive up to a cut-off grade of 0.2% uranium.

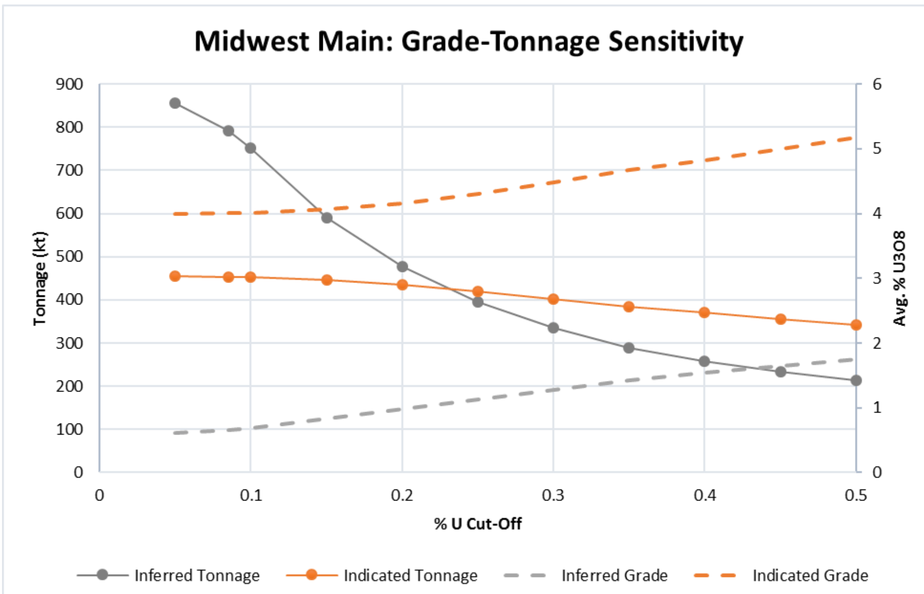


Figure 14-37: Midwest Main Grade-Tonnage Sensitivity Curve

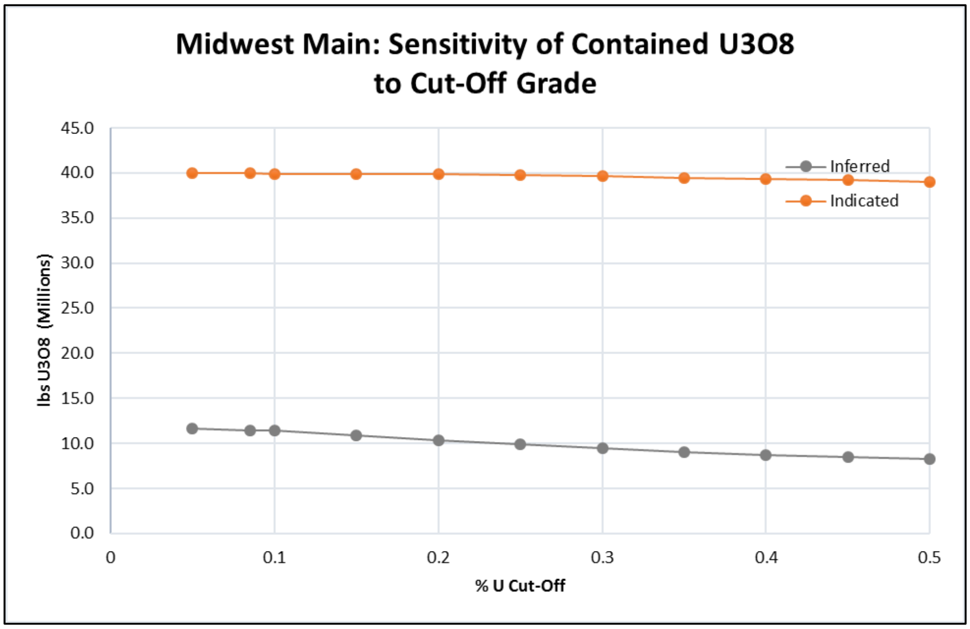


Figure 14-38: Midwest Main Sensitivity of Contained Pounds U_3O_8 to Cut-off Grade

14.5.2 Midwest A

Figure 14-39 shows the sensitivity of the tonnage and grade to the cut-off grade in the SRK mineral resource model, while Figure 14-40 shows this sensitivity in terms of contained U_3O_8. In general, the contained U_3O_8 in the Inferred category is insensitive to the cut-off grade. The contained U_3O_8 in the Indicated category is relatively insensitive up to a cut-off grade of approximately 0.15% uranium.

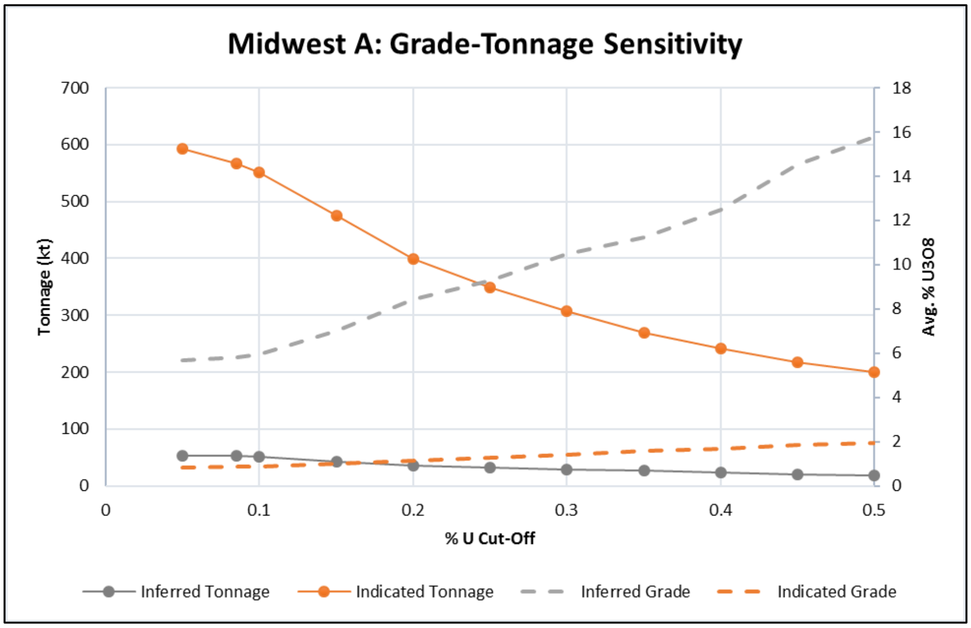


Figure 14-39: Midwest A Grade-Tonnage Sensitivity Curve

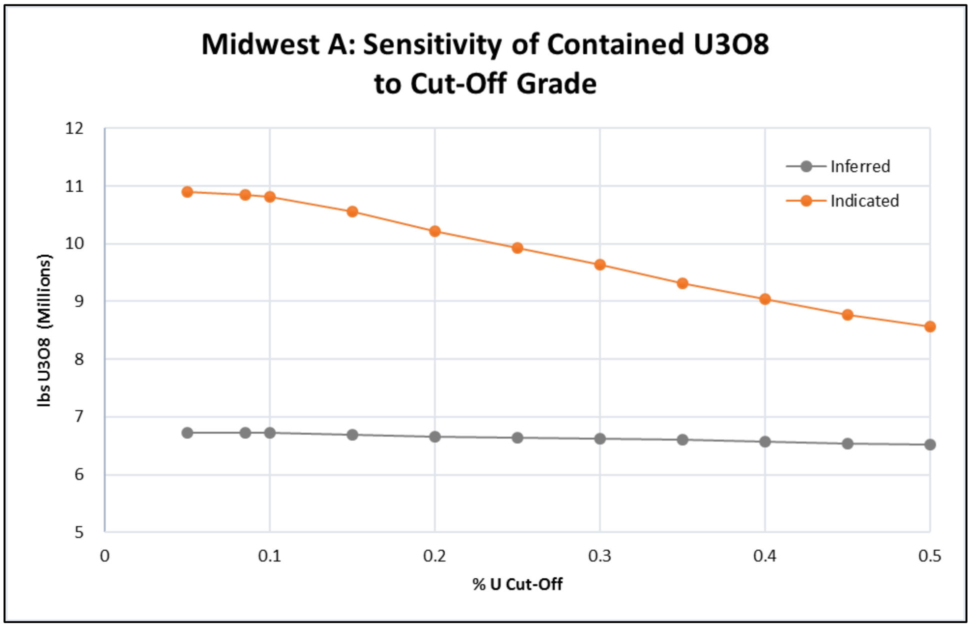


Figure 14-40: Midwest A Sensitivity of Contained Pounds U_3O_8 to Cut-off Grade

14.6 Reconciliation with Previous Estimate

Historically, mineral resources for Midwest Main and Midwest A were reported separately. As such, reconciliation of the current resource estimate to the previous estimate is separated for these two deposits.

14.6.1 Midwest Main

Table 14-20 shows the comparison of the current mineral resource to the previous mineral resource estimate by RPA (Hendry, Routledge, & Evans, 2006). Overall, there Indicated Resources have decreased by 2.96 million pounds U_3O_8 (7% decrease), while there is a significant increase in Inferred Resources contained metal.

Table 14-20: Comparison of Historic Resource Estimate to Current Resource Estimate for Midwest Main

Category	Zone	RPA 2006 MRS			2018 MRS			Change	
		Tonnage (kt)	Grade (% U_3O_8)	Contained Metal (Mlb U_3O_8)	Tonnage (kt)	Grade (% U_3O_8)	Contained Metal (Mlb U_3O_8)	Contained Metal (Mlb U_3O_8)	Denison Equity (Mlb U_3O_8)
Indicated	Unconformity	354	5.50	42.90	453	4.00	39.94	-2.96	-0.75
Inferred	Unconformity	25	0.80	0.40	257	1.36	7.71	7.31	1.84
	Perched				513	0.32	3.59	3.59	0.90
	Basement				23	0.38	0.18	0.18	0.05
Total Indicated		**354**	**5.50**	**42.90**	**453**	**4.00**	**39.94**	**-2.96**	**-0.75**
Total Inferred		**25**	**0.80**	**0.40**	**793**	**0.66**	**11.48**	**11.08**	**2.79**

Notes:

a) 2006 estimate is reported using a 0.25% U cut-off
b) 2018 estimate is reported using a cut-off grade of 0.085% U (0.1% U_3O_8).
c) Totals may not add up due to rounding.
d) Denison's share of the project on an equity basis is 25.17%.

The changes since the previous estimate were largely influenced by:

- Use of high-grade restrictions in the Unconformity Zone
- Inclusion of resources along strike in the Unconformity Zone
- Addition and expansion of the Basement and Perched Zones interpretation to resources
- Use of equivalent probing data in the estimation
- Reported at different cut-off grade

The estimation of the Unconformity Zone differed from the 2006 estimation, in which no high-grade management (grade capping or restricting) was conducted. With the high grades present in the deposit, Orano deemed it necessary to mitigate the potential of high-grade data smearing into the low-grade areas. SRK agrees that some form of high-grade treatment should be applied to the Unconformity Zone. The treatment of high grade data, along with the extension of the resources along strike in the Unconformity Zone, contribute to a reduction in the average grade, and thereby reducing the contained metal in this Zone. Additional inferred mineralization was added to the Unconformity Zone by extension of the 3D model further along strike.

The majority of the Perched and Basement Zones were excluded from the RPA resource estimate in 2006. A minor amount of perched mineralization was included within one zone in the previous resource. With the lower cut-off grade used for 3D modelling (0.05% vs. 0.25% U), and the newly available equivalent probing grades, Orano found there was greater continuity in the sandstone to yield the Perched Zone lenses and one in the basement.

The use of new radiometric probe-to-grade correlations and of newly-digitized probing data allowed the filling of gaps present in the assay data and in areas of poor core recovery. This new data affected the resource calculation for the Unconformity Zone and especially affected the resource calculation for the Perched Zones. SRK understands that previously the Perched Zones were not systematically assay-sampled, likely due to their relatively low grades as compared to the Unconformity Zone. The use of new probing data permitted these zones to be modelled, and thereby contributing to the significant increase in Inferred resource tonnage.

The 2006 and 2018 mineral resource statements are reported at different cut-off grade; the former is based on a cut-off grade of 0.25% uranium while the current resource is reported at a cut-off grade of 0.085% uranium (0.1% U_3O_8). While Figure 14-37 shows that the change in cut-off grade has a material impact on tonnage and average grade, Figure 14-38 shows that contained metal is rather insensitive up to a cut-off of 0.30% uranium for both Indicated and Inferred resources.

14.6.2 Midwest A

Table 14-21 shows the comparison of the current mineral resource statement and the 2008 Geostat mineral resource statement. While there have been internal updates to the resource model (see Section 6.3.2.2), the last publicly disclosed statement for Midwest A remains the one prepared by Geostat in 2008. Table 14-21 shows that Indicated resources have increased by 5.04 million pounds of U_3O_8 (87% increase relative to 2008), while Inferred resources increased by 2.42 million pounds of U_3O_8 (56% increase relative to 2008).

Table 14-21: Comparison to 2008 Geostat Estimate for Midwest A

Category	Zone	2008 Geostat MRS			2018 MRS			Change	
		Tonnage	Grade	Contained Metal	Tonnage	Grade	Contained Metal	Contained Metal	Denison Equity
		(kt)	(% U_3O_8)	(Mlb U_3O_8)	(kt)	(% U_3O_8)	(Mlb U_3O_8)	(Mlb U_3O_8)	(Mlb U_3O_8)
Indicated	Low Grade	464	0.57	5.80	566	0.87	10.84	5.04	1.27
Inferred	Low Grade				43	0.40	0.38	0.38	0.09
	High Grade	9	21.23	4.30	10	28.76	6.35	2.05	0.52
Total Indicated		**464**	**0.57**	**5.80**	**566**	**0.87**	**10.84**	**5.04**	**1.27**
Total Inferred		**9**	**21.23**	**4.30**	**53**	**5.81**	**6.72**	**2.42**	**0.61**

Notes:

a) 2008 mineral resource statement used a cut-off grade of 0.05% U
b) 2018 mineral resource statement is reported using a cut-off grade of 0.085% U (0.1% U_3O_8).
c) Totals may not add up due to rounding.
d) Denison's share of the project on an equity basis is 25.17%.

The changes since the 2008 mineral resource statement were largely influenced by:

- Additional core holes from the fall 2007 to summer 2008 drilling programme
- Volumetric increase in modelled mineralization
- Addition of density measurements that were collected in 2009
- Estimation of High Grade Zone
- New density correlation equations
- New probe radiometric-grade correlation equation
- Reported at different cut-off grade

Since the 2008, Geostat mineral resource statement, an additional 40 drill holes were drilled from September 2007 to July 2008. This has never been included in a publicly reported mineral resource statement. Further, Orano chose to use only the drill holes from 2005 onwards (33,440 metres) in the current resource model. The additional holes drilled from September 2007 to July 2008 accounts for approximately 30% of the current resource database.

The interpretation for the Midwest A zone has changed significantly from the last publicly disclosed resource estimate in 2008. The main interpretational change is the combination of previous South and North pods have been combined to form the Low Grade Zone. This Zone now includes the intervening zone between the South and North Pods. In addition, the strike length of mineralization has changed from an approximate strike length of 350 meters to about 430 metres. Changes in the interpretation are largely based on the addition of 40 drill holes and related additions from reprocessed probe data including depth corrections, use of corrected low flux gamma values, removal of problematic probe data which allowed the use of a greater number of eU values, and Mineralization in the basement was added to the Low Grade Zone. The reinterpretation comprises a volumetric increase of about 40%.

The majority of the increase in Inferred Resources is attributed to the estimation of the High Grade Zone. In 2008, an average grade (18% U) and density (2.85 g/cm^3) was applied to the entire Zone. This method was done rather than estimating at the time, as additional drilling was planned to be conducted on the Zone. In 2017, Orano chose to estimate the resources in this Zone using an omni-directional ordinary kriging estimate. Given that the High Grade Zone is tightly constrained within a narrow wireframe and it is classified as Inferred resources, SRK finds this change in estimation methodology to be acceptable. This leads to an overall higher average grade in this domain; some of this is in part due to the density and probe correlations discussed below.

The Low Grade Zone contributes some Inferred Resources and this is mostly related to the inclusion of interpreted mineralization in the drilling gap between what was previously known as the North and South Pods.

At the time of the 2008 Geostat mineral resource evaluation, no density measurements were available for the Midwest A deposit. In 2009, 341 SG measurements were collected from the Midwest A deposit (Revering, 2010). A density correlation was used in this current resource, while a constant density was applied to different grade ranges in 2008. The addition of density measurements and the use of a grade-density correlation contributes to an overall increase in density in both the Low Grade and High Grade Zones, which contributes directly to an increase in tonnage.

Orano estimates that the new probe radiometric-grade correlation equation, and updated methodology for calculating the equivalent probing grades, accounted for approximately a 5% increase in the estimated resource.

One other difference between the 2008 and 2018 mineral resource statements is the reporting cut-off grade. Previously, the resource was reported at 0.05% uranium, while the current resource is reported at 0.085% uranium (0.1% U_3O_8). As Figure 14-40 shows, this change in cut-off grade does not have a material impact on contained metal.

14.6.3 Midwest Project

This subsection reconciles the overall Midwest Project relative to the previous estimates. As above, the previous Midwest Main resource statement was prepared by RPA in 2006, while the previous Midwest A resource statement was prepared by Geostat in 2008. Table 14-22 shows the reconciliation of the previous and current resource statements for the Midwest Project, and indicates a minor overall increase in Indicated contained metal. The material change in the Inferred contained metal is explained in subsections 14.6.1 and 14.6.2 above.

Table 14-22: Comparison of Mineral Resource Statements for the Midwest Project

Category	Quantity ('000 t)	Grade %U_3O_8	Contained Metal (Mlb U_3O_8)	Denison Equity (Mlb U_3O_8)
Indicated Mineral Resource				
Previous MRS	818	2.70	48.70	12.26
2018 SRK Audited MRS	1,019	2.26	50.78	12.78
% Difference	**25%**	**-16%**	**4%**	**4%**
Inferred Mineral Resource				
Previous MRS	34	6.30	4.70	1.18
2018 SRK Audited MRS	845	0.98	18.21	4.58
% Difference	**2371%**	**-84%**	**287%**	**287%**

Notes:

a) Previous MRS for Midwest Main refers to 2006 RPA MRS using a cut-off grade of 0.25% U. For Midwest A, this refers to 2008 Geostat MRS using a cut-off grade of 0.05% U.
b) 2018 mineral resource statement is reported using a cut-off grade of 0.085% U (0.1% U_3O_8).
c) Totals may not add up due to rounding.
d) Denison's share of the project on an equity basis is 25.17%.

15 MINERAL RESERVE ESTIMATE

A feasibility study was completed in 2007 on the Midwest Main deposit by ARC (AREVA Resources Canada Inc., 2007). This report is now considered to be obsolete and no longer relevant for the conversion of mineral resources to mineral reserves. Consequently, no mineral reserves exist at the Midwest Main deposit at the present time.

In addition, no pre-feasibility or feasibility studies have yet been completed to allow conversion of the mineral resources to mineral reserves for Midwest A. Consequently, no mineral reserves exist at the Midwest A deposit at the present time.

16 MINING METHODS

The Midwest Main and Midwest A deposits are not part of an advanced property at this time. Mining methods have not yet been determined.

Other deposits in the area, such as JEB, Sue A, B, C, and E, have been successfully mined using open pit methods, however, recent test mining using the SABRE surface borehole mining method (Surface Access Borehole Resource Extraction; formerly called the MED (Mine Equipment Development) and the SABM (Surface Access Borehole Mining)) has been carried out at Pod 1 East of the McClean North deposit ((Quirt, Gudmundson, Cutts, & Demange, 2012); (AREVA Resources Canada Inc., 2014)) during the summers of 2009 to 2012. This mining method has strong potential for use at Midwest Main and Midwest A; however, it is still under testing and should be considered to be an alternative mining method.

SABRE is a mining method that utilizes surface drilling tools and methods to provide an access hole to the ore. Specially-designed mining tools utilizing high pressure water jet technologies are lowered into position using a customized surface drill rig. Mineralized rock is excavated using a water jet mining process which cuts and then carries the slurried material to surface, from where it can be hauled to the mill for processing.

17 RECOVERY METHODS

The Midwest Main and Midwest A deposits are not considered an advanced property at this time. It is anticipated that any uranium mineralization mined from the Midwest Main and Midwest A deposits will be processed at the MLJV McClean Lake facilities (McClean Lake mill). Details concerning recovery methods have yet to be determined.

The McClean Lake mill, located on the McClean Lake property, has processed ores from several deposits on the property (JEB, Sue A, Sue B, Sue C, and Sue E), and is currently processing ore from the Cigar Lake mine. The main process operations include:

- SAG and ball mill grinding
- Slurry leaching
- Counter-Current Decantation (CCD)

- Pregnant solution clarification
- Solvent extraction
- Precipitation of Yellowcake
- Crystallization of ammonium sulphate
- Tailings neutralization and disposal
- Water treatment.

18 PROJECT INFRASTRUCTURE

The Midwest project which contains the Midwest Main and Midwest A deposits is not an advanced property at this time. However, some project infrastructure from historical exploration and test mining still remains in place at the Midwest Main deposit site, including:

- Covered shaft and test mine headframe (includes some underground workings);
- Inactive water treatment plant and pump house;
- Concrete ore pad;
- Settling ponds (x 2);
- Dam across the Mink Arm of the South McMahon Lake (breached by a culvert);
- Pipelines (on surface);
- Former core storage area;
- One auxiliary building;
- Groundwater monitoring wells;
- Associated access and site roads/trails.

The nearby McClean Lake property includes the former mining sites of the JEB and Sue-series deposits, and the unmined Sue D, McClean and Caribou deposits. It consists of two sites: the McClean Lake mill site, and Sue open pit mine site. The JEB site, located in the north end of the McClean Lake property, was developed first, beginning with the mining of the JEB open pit and then construction of the McClean Lake mill and related facilities in 1995. The Sue site hosted the mining activities for the Sue C open pit (2000-2002) and the Sue A, B, and E open pits, between 2005 and 2008.

The main buildings and infrastructure at the JEB site are:

- McClean Lake Camp,
- McClean Lake mill and Administration Building,
- JEB Water Treatment Facility (WTF), and
- JEB Tailings Management Facility (TMF).

The main buildings and infrastructure present at the Sue Site are:

- Sue Site Maintenance, Engineering, and Storage buildings,
- Sue Water Treatment Plant,
- Sink Vulture Effluent Management Facility,

- JEB-Sue Haul Road, and
- Security Gate Entrance.

Electricity is supplied from the provincial grid, with diesel generator backup. The McClean Lake camp is a fully modern facility with dormitory accommodation, dining room, and support services. The camp accommodation was recently expanded with a new dormitory complex built in 2008 and has room capacity for 300.

19 MARKET STUDIES AND CONTRACTS

The Midwest Main and Midwest A deposits are not considered an advanced property at this time. No marketing studies or contracts are available at the present time.

20 ENVIRONMENTAL STUDIES, PERMITTING, SOCIAL AND COMMUNITY IMPACT

The Midwest Main and Midwest A deposits are not considered an advanced property at this time; however, some previous environmental and social studies have been carried out.

In April 1991, the governments of Canada and Saskatchewan announced a joint federal-provincial Environmental Assessment (EA) review to consider three uranium mine developments in northern Saskatchewan (Joint Federal-Provincial Panel, 1993). The reviews were conducted in accordance with The Environmental Assessment Act of Saskatchewan and the federal Environmental Assessment and Review Process Guidelines Order. A Joint Federal-Provincial Panel to review the Midwest Project proposal was appointed in August 1991. The Midwest Project was described in the 1991 Environmental Impact Study ((Midwest Joint Venture, 1988) and (Midwest Joint Venture, 1991)) and 1992 amendment. It was rejected by the federal and provincial governments as a result of a recommendation contained in a report by the Joint Panel in October 1993. The rationale for the recommendation was that the risks to worker and community health, and potential for environmental damage, were not seen to be balanced by the projected economic benefits of the project.

The operations on the McClean Lake property have been the subject of EAs. The original McClean Lake Project EA (Minatco, 1991) also underwent Joint Panel Review from 1991 to 1993. Based on the recommendations of the Joint Panel report, government approvals, with conditions, were issued in December 1993. This original EA included the mining and milling of the JEB, Sue A, Sue B, Sue C, and McClean North deposits, as well as the construction and operation of the McClean Lake mill and tailings management facility (TMF).

Between 1995 and 1997, the Joint Panel reviewed the project proposals for the processing of Cigar Lake and Midwest Project ore at the McClean Lake Operation. This assessment included the expansion of the McClean Lake mill, to receive and process Cigar Lake ore, and was based on an annual uranium production at the McClean Lake mill of 24 million pounds U_3O_8 equivalent from all ore sources (approximately 9,232,000 kilograms U). Based on recommendations by the Joint Panel, government approvals of the Cigar Lake and Midwest Projects were issued in 1998.

The Sue E EA (Cogema, 2004) was prepared for development of the Sue E mine, as this deposit was not part of the original 1993 McClean Lake Operation approval. The Sue E EA was subsequently approved. Under the Sue E EA, the fully developed project included the McClean Lake mill, and all ore sources identified in the 1995 environmental assessment, which was reviewed and approved by the Joint Panel, including the JEB, Sue A, Sue B, Sue C, and McClean North deposits, as well as the Midwest and Cigar Lake deposits, and the operation of supporting facilities and infrastructure associated with the McClean Lake Operation.

Currently, there is an Environmental Impact Statement in place for the Midwest Project (AREVA Resources Canada Inc., 2011).

The Midwest and McClean Lake project areas are located in a part of Northern Saskatchewan that has a rich cultural connection to First Nations in Canada. The mill processing area is located on the McClean Lake surface lease; lands that have been released to Orano and its predecessors for mining use by the Province of Saskatchewan via the surface lease. As a result, many of the potential impacts to First Nation and Métis groups by the McClean Lake activities are well understood and, to date, accepted by the Regulators.

Currently, there is an Impact Management Agreement (IMA), also called an Impact Benefits Agreement (IBA), in place which covers the entire McClean Lake operation. The IMA was signed with the First Nations of Hatchet Lake, Black Lake, and Fond du Lac, and the communities of Wollaston Lake, Stony Rapids, Uranium City, and Camsell Portage. The IMA covers environmental protection, employment, training and business development, and benefit sharing.

The employment, training, and business development commitments include preferential hiring for residents of northern Saskatchewan, access to training programs, and special consideration for northern businesses during the contracting process. Benefit sharing applies to education through student employment, scholarships, education awards and cultural camps; to skills training through work placements, special apprenticeships and supervisory development; health through community and family health initiatives and donations to health facilities; culture through language retention, Elder counsellors and related cultural events; and recreation and sport through facility development and regional sport and recreational events.

21 CAPITAL AND OPERATING COSTS

The Midwest Main and Midwest A deposits are not considered an advanced property at this time. A feasibility study was completed in 2007 on the Midwest Main deposit by ARC (AREVA Resources Canada Inc., 2007). The report is now considered to be obsolete and no longer relevant for estimating capital or operating costs.

22 ECONOMIC ANALYSIS

The Midwest Main and Midwest A deposits are not considered an advanced property at this time. A feasibility study was completed in 2007 on the Midwest Main deposit by ARC (AREVA Resources Canada Inc., 2007). The report is now considered to be obsolete and no longer relevant for estimating capital or operating costs.

23 ADJACENT PROPERTIES

The property that immediately surrounds the Midwest property on the west, north, and north-east sides is the Waterbury Lake project (Figure 23-1; tan colour region) of the Waterbury Lake Uranium Corporation, a limited partnership between Denison Mines (64.22%) and the Korea Waterbury Uranium Limited Partnership (35.78%). The property contains the J-Zone uranium deposit, which is classified as unconformity-related deposit and is located at the sub-Athabasca unconformity (Armitage & Sexton, 2013). The property is also host to the Huskie Zone of basement-hosted uranium mineralization discovered by Denison in 2017 (Denison Mines, 2017).

Lying to the east and south-east of the Midwest property is the Dawn Lake property (Figure 23-1; sky blue region), owned by a Joint Venture between Cameco, ARC, and JCU Exploration Canada Ltd., that hosts the Dawn Lake deposits and the Tamarack deposit. The Dawn Lake deposits (11 Zone, 11A Zone, 11B Zone, and 14 Zone) are hosted at the unconformity between the Athabasca sandstone and the uppermost basement rocks of the WMTZ within northeast-trending, steeply-dipping, strike-slip shear zones, with mineralization developed both in the basal sandstone and in the underlying basement rocks (Hirsekorn, Barker, & Milne, 2013). The Tamarack poly-metallic unconformity-related uranium deposit occurs at the intersection of a splay off of the east-west-trending Tent-Seal fault and the sub-Athabasca unconformity, with uranium mineralization present mostly within the basal sandstone and lesser amounts in the upper basement rocks.

The Roughrider property (Figure 23-1; purple region) is located immediately north-east of the Midwest property. It is owned and operated by Rio Tinto Canada Uranium Corporation. The property hosts the Roughrider uranium deposit that is composed of the Roughrider East, Roughrider Far East, and Roughrider West zones. The Roughrider West zone is centred on the same east-west trending structural corridor as the J-Zone and both prospects are likely part of the same mineralized system. The Roughrider East zone occurs at the intersection of the north-east-trending Midwest structural trend and the east-west trending structural corridor (Keller & Bernier, 2011). Uranium mineralization in these three zones is mainly developed at the unconformity and in the underlying basement rocks.

The authors have not verified by inspection all the above information about mineralization on adjacent properties around the Midwest property.

Although not directly adjacent to the Midwest property, the McClean Lake property is located immediately east of the Dawn Lake property. The McClean Lake project is a joint venture between Orano, Denison Mines Corp., and OURD Canada Ltd. The McClean Lake property hosts a number of uranium deposits, some mined out (JEB, Sue A, Sue B, Sue C, Sue E) and several not yet exploited (Sue D, McClean North, McClean South, Caribou). The McClean Lake mill, also located on the McClean Lake property, has previously processed the ores from these deposits and is presently processing ore from the Cigar Lake mine.

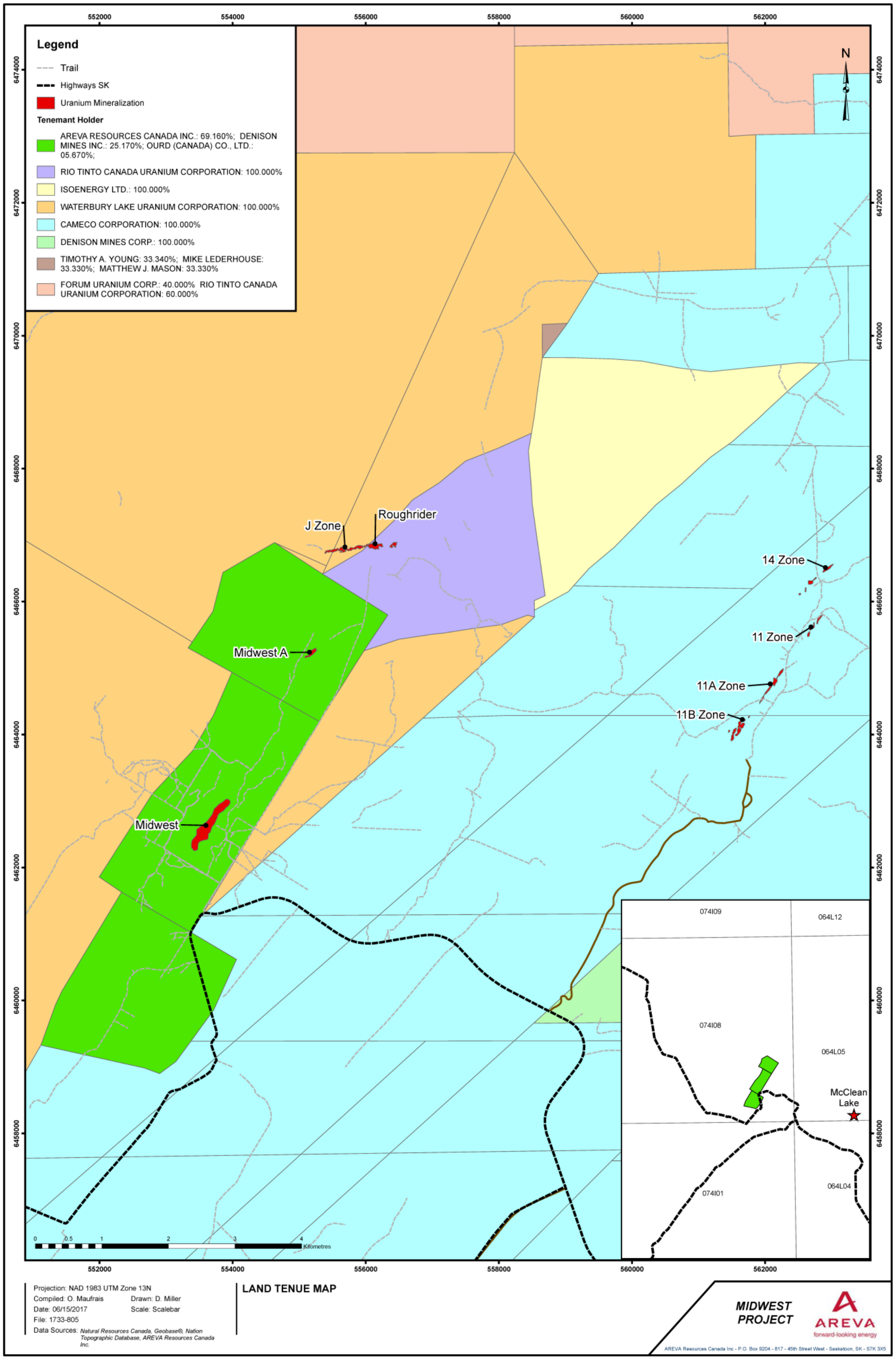


Figure 23-1: Properties Adjacent to the Midwest Main Deposit.

24 OTHER RELEVANT DATA AND INFORMATION

There is no other data or information for Midwest Main or Midwest A that is relevant to this report, although there are various historical Orano and Denison Mines mineral resource, pre-feasibility, and feasibility reports concerning the Midwest Main deposit (see Section 14.2).

25 INTERPRETATION AND CONCLUSIONS

25.1 Midwest Main

Exploration work began on the Midwest property in 1968 and accelerated with the discovery of the Midwest (now Midwest Main) deposit in 1977. The Midwest Main uranium deposit is a typical unconformity-type uranium deposit formed through diagenetic-hydrothermal basement-sandstone interaction. Nearly the entire envelope of mineralization is situated within the Athabasca Group sandstone, straddling the unconformity. A series of north-south (Tabbernor style), east-west, and northwest-southeast faults cross-cut the dominant northeast-trending geological and structural fabric of the (graphitic) pelitic gneiss in the pre-Athabasca basement. The intersection of NE, EW and NS faults is considered important for mineralization precipitation.

The mineralization at Midwest Main consists of a higher-grade Unconformity Zone at the sandstone-basement contact (unconformity). Additional mineralization was defined as a Basement Zone of lower-grade fracture-controlled basement mineralization and as 19 Perched Zones located in the sandstone above the Unconformity Zone. The mineralization envelope is approximately 920 metres long, 10 to 140 metres wide, and ranges up to 33 metres in thickness, not including the basement roots which have been modeled to extend down approximately an additional 90 metres into the basement. The bulk of the mineralization is in the Unconformity Zone that is at depths ranging between 170 and 205 metres below surface. Perched mineralization occurs as discrete lenses located above the unconformity lens, up to 80 metres below surface

Recent data verification of the drill hole database was carried out by ARC against the original drill logs and assay certificate information for Midwest Main. Drilling, sampling, analysis, security, and database procedures employed were deemed to meet industry standards at the time they were conducted. Denison performed additional QAQC and data verification of the drilling database including review of the QAQC methods and results, verification of assay certificates against the database assay table, review of downhole probe and eU% calculation procedures and standard database validation checks. The information used for the resource was deemed to be reliable and is believed to be accurate and suitable for mineral resource estimation.

The 3D interpretation was based on a cut-off value of greater than or equivalent to 0.05% U over a two metre interval. The mineral resource was estimated using ordinary kriging (Unconformity Zone) and inverse distance squared (Perched and Basement Zones) interpolation methods with restrictions made on the influence of the higher grades. Comparison estimates were made using inverse distance squared (Unconformity Zone) and nearest neighbour for all zones of mineralization. No significant discrepancies between the methods were observed.

SRK finds the geological interpretation to be reasonable and considers the inclusion of the Perched and Basement Zones to be acceptable in presence of the latest probing data in areas of poor recovery in the original geochemical data. SRK audited the methodology used by Orano and finds it generally conforms to the modelling approach used at other unconformity uranium projects in the Athabasca basin. In the Unconformity Zone, SRK modified Orano's model to reflect the orientation as documented by Orano, and the high grade treatment to reduce the undue influence of high grade samples as observed in areas of sparse drilling, particularly in the northeastern area of the Unconformity Zone.

At the 0.085% U (0.1% U_3O_8) cut-off, the Midwest Main deposit contains an Indicated resource of 453,000 tonnes grading 4.00% U_3O_8 and an Inferred resource of 793,000 tonnes grading 0.66% U_3O_8.

25.2 Midwest A

The Midwest A deposit was discovered during the 2005 drilling campaign during follow-up of low-grade mineralization that was intersected in 1979. The database includes 40 drillholes, that was unavailable at the time of the 2008 mineral resource model by Geostat, which was the last publicly disclosed mineral resource statement for Midwest A. Additionally, 341 density measurements were collected in 2009, which is also included in the current mineral resource model. The Midwest A uranium deposit is a typical unconformity-type uranium deposit formed through diagenetic-hydrothermal basement-sandstone interaction. Nearly the entire envelope of mineralization is situated within the Athabasca Group sandstone, straddling the unconformity. A series of regional faults cross-cut the dominant northeast-trending geological and structural fabric of the (graphitic) pelitic gneiss basement and these intersection locations spatially control much of the uranium mineralization.

The mineralization at the Midwest A uranium deposit consists of a high-grade mineralized core (High Grade Zone) in the sandstone at the unconformity, which is surrounded by the Low Grade Zone, a region of more dispersed, fracture-controlled mineralization in both sandstone and basement rocks. The high-grade mineralization forms a fairly steeply-dipping lensoid concentration which is enclosed within the lower grade envelope.

Data verification of the drill hole database was carried out by ARC against the original drill logs and assay certificate information for Midwest A. Drilling, sampling, analysis, security, and database procedures employed by ARC meet industry standards. Denison performed additional QAQC and data verification of the drilling database including review of the QAQC methods and results, verification of assay certificates against the database assay table, review of downhole probe and eU calculation procedures and standard database validation checks. The information used for the resource was deemed to be reliable and is believed to be accurate and suitable for mineral resource estimation. Orano measured dry bulk densities on 24 of the assay intervals and these were used to derive two density correlation equations based on either a multi-element regression or a uranium-only regression (for those samples with only uranium assay data or equivalent U data).

The 3D interpretation was based on a cut-off value of greater than or equivalent to 0.05% U over a two metre interval for the low-grade outer shell and 10% U for the high-grade internal zone. The mineral resource was estimated using nearest neighbour, inverse distance squared, and ordinary kriging interpolation methods with a restriction on the area of influence for the higher grade samples in the Low Grade Zone. No significant discrepancies existed between the methods and the ordinary kriging method was used for the resource estimation.

SRK reviewed the geologic interpretation of Midwest Aand finds that the interpretation has changed significantly from the last publicly disclosed resource estimate in 2008. The main interpretational change is the combination of previous South and North pods have been combined to form the Low Grade Zone. This Zone now includes the intervening zone between the South and North Pods. In addition, the strike length of mineralization has changed from an approximate strike length of 350 meters to about 430 metres. Changes in the interpretation are largely based on the addition of 40 drill holes and related additions from reprocessed probe data including depth corrections, use of corrected low flux gamma values, removal of problematic probe data which allowed the use of a greater number of eU values, Mineralization in the basement was added to the Low Grade Zone. The reinterpretation comprises a volumetric increase of about 40%.

SRK made two modifications to the Midwest A resource model constructed by Orano: (1) DG and density continuity was re-oriented to be flat along strike and re-estimated accordingly; and (2) blocks below the unconformity surface were re-classified from Indicated to Inferred on the basis of estimation pass and data density. These changes did not materially impact the contained metal, relative to the Orano model.

At the 0.085% U (0.1% U_3O_8) cut-off, the Midwest A deposit contains an Indicated resource of 566,000 tonnes grading 0.87% U_3O_8 and an Inferred resource of 53,000 tonnes grading 5.81% U_3O_8. The additional drill hole data and density data, since the 2008 mineral resource model, along with the estimation of the High Grade Zone, contributes to larger volumetric interpretation of the uranium mineralization; both of these changes in the database contribute to the increase in tonnage of the mineralization.

25.3 Risks and Opportunities

25.3.1 Midwest Main

All efforts were done to accurately represent and estimate the mineralization as well as minimize any risks that may exist. The most significant risks that remain are:

- The high-grade management methodology used in this estimate is more conservative than the previous estimate; however, changes in high-grade management can have a notable influence on the metal content of the Unconformity Zone. Changes to this strategy would have minimal effect on the Perched and Basement Zones.
- The orientation of the Perched Zones at Midwest Main appears to be along stratigraphic bedding planes (flat-lying) in the sandstone. Additional drilling would reduce the risk in misinterpretation of structural controls for this Zone.
- Given the lower average grades of the Perched and Basement Zones at Midwest Main, changes to cut-off grade may have some impact on these Inferred resources; however, the overall impact of cut-off grade on Midwest Main is not considered material up to a cut-off grade of 0.3% U.

25.3.2 Midwest A

All efforts were done to accurately represent and estimate the mineralization, as well as minimize any risks that may exist. The most significant risks that remain are:

- Insufficient dry bulk density measurements on the deposit, as there are currently only 24 measurements with an associated geochemical assay. This presents a higher degree of uncertainty and can have a direct impact on the tonnage and reported metal content (positive or negative).
- Dimensions of the High Grade Zone are not well constrained or defined by drilling. As the bulk of the inferred mineralization is comprised of the High Grade Zone, any variation in size or grade can have a large effect on contained metal. With the relatively sparse drilling in this Zone, a change in interpreted volume of greater than 25% (positive or negative) could be realized.

26 RECOMMENDATIONS

26.1 Midwest Main

The following recommendations are made in order to reduce/remove some of the uncertainties associated with the current 2017 resource calculations:

1) In future drill campaigns, it is recommended that additional multi-element measurements be collected, as the current dataset contains irregular and much smaller distributions for elements other than uranium.
2) Given the age of the drilling (late 70's to mid-80's), it is recommended at least five of the historic holes be twinned to verify the location and grades of the mineralization in the Unconformity Zone. Total approximate cost of $400,000.
3) Follow up drilling of at least five holes (for ~1,900 metres) should be conducted to address the potential for further basement-hosted mineralization, as the mineralized system is open at depth. Total approximate cost of $460,000.
4) A resource estimate for the other elements of interest (eg. As, Ni, Co, Mo, Cu) should be conducted given that the deposit is known to contain relatively high levels of deleterious elements (As, Mo) and the possibility for by-products (Ni, Co, Cu).
5) The remaining historical downhole probing logs should be digitized to complete the dataset and allow these data to be used in future resource estimates.
6) The remaining dry bulk density data should be digitized and added to the database to make them available for future resource estimations, in preference to calculated values.
7) SRK recommends that the database for dry bulk density should be comprised of actual density measurements where available, and with derived density at unsampled locations. This should yield a database that shows more local variability for estimation.
8) For geological modelling, more data are needed to improve the understanding of the structural settings of the Midwest Main area. As few oriented structural measurements were available, there is some uncertainty on fault orientations in the new 2017 structural model. Oriented core measurements are recommended on future drill campaigns.
9) SRK recommends that significant additional drilling be considered in future to accurately locate and identify structural blocks and their relationship to mineralization. SRK considers that grade estimation may require a series of hard and soft boundaries between structural blocks for the unconformity domain. The Perched Zone may benefit from using trend analysis software such as Leapfrog, to identify mid-grade mineralization. This analysis will also benefit from infill-drilling and identification of mineralization related to sub-vertical.
10) Complete a 3D model of the historical underground test mine drift to make it available for future studies.
11) It is recommended that the high-grade management strategy be reviewed as more data become available.
12) Drilling techniques, such as triple tubing, should be used to minimize the amount of core loss when drilling through the mineralization, as the amount of historical core loss has been high.
13) The radiometric probe to grade correlations should be reviewed if additional probing data are digitized.

14) Review any remaining occurrences of sandstone mineralization and model where possible, especially if the remaining downhole probing data are digitized.

26.2 Midwest A

The following recommendations are made in order to reduce/remove some of the uncertainties associated with the 2017 resource calculations:

1) Conduct an additional five angled drill holes for ~1,100 metres around the High Grade Zone. The aim of this drilling is to better delineate and further understand the controls on the mineralization in this area, as well as to upgrade the resources in this Zone to the Indicated classification. Total approximate cost of $260,000.
2) Dry bulk density samples should be taken during any future drill campaigns to verify and/or update the density correlations that were used. A minimum of 50 additional samples is recommended.
3) SRK recommends that the database for dry bulk density should be comprised of actual density measurements where available, and with derived density at unsampled locations. This should yield a database that shows more local variability for estimation.
4) For geological modelling, more oriented core data are needed to improve the understanding of the structural settings of the Midwest A area. Few oriented structural measurements are currently available and thus there is some uncertainty on the fault orientations in the new 2017 structural model based on these data.
5) A significant amount of low grade tonnage has also been interpreted in the Basement domain at elevations to 240m. This interpreted mineralization in the northeast of the Low Grade Zone may be optimistic and should be confirmed with drilling.
6) SRK recommends that significant additional drilling be considered in future to accurately locate sub-vertical geological structures for this deposit to determine their relationship to mineralization.
7) It is recommended that three additional drill holes for ~750 metres be carried out in the former Gap area, that presently has a low drill hole density, to reduce/remove uncertainty and better delineate this mineralization. Total approximate cost of $180,000.
8) Follow-up drilling on at least two historical holes for ~600 metres should be conducted to address the potential for further basement hosted mineralization. The mineralized system is currently open at depth. Total approximate cost of $140,000.
9) Inferred mineralization in the southwest part of the deposit should be better delineated by an additional three holes for ~650 metres. Total approximate cost of $160,000.
10) The mineralization at Midwest A is believed to be similar to that present in other deposits that have been processed at the JEB mill (Cigar Lake, Caribou, Sue). During future drill

campaigns, a small- to moderate-scale initial metallurgical test of Midwest A mineralization should be conducted to confirm it can be milled with similar results.

11) Drilling techniques, such as triple tubing, should be used to minimize the amount of core loss when drilling through the mineralization as the amount of core loss has been high in many drill holes.

26.3 Work Program and Budget for 2018

A CAD$1.2 million budget has been approved for the Midwest project in 2018. The budget includes drilling of approximately 5,000 meters and will be utilized to test exploration targets on the Points North trend (approximately six drill holes), on the southern portion of the Midwest property, and undertake further testing of the Midwest Main deposit (approximately six drill holes). The drilling planned for Midwest Main will focus on data collection through the known unconformity-hosted mineralization, and testing for basement mineralization, in accordance with the recommendations outlined above. Denison's share is approximated at $302,000. Denison has reviewed the plans for 2018 and concurs with the program planned for the Midwest project.

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28 CERTIFICATES OF QUALIFIED PERSONS

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CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: *Technical Report with an Updated Mineral Resource Estimate for the Midwest Property, Northern Saskatchewan, Canada,* effective date March 26, 2018.

I, Chad Sorba do hereby certify that:

1) I am Technical Manager, Exploration with Denison Mines Corp. (Denison) with a business address at 230 – 22nd Street East, Suite 200, Saskatoon, Saskatchewan, Canada;
2) I am a graduate of the University of Saskatchewan, Saskatoon, SK in 2008, where I obtained a BSc degree (Honours). I have practiced my profession continuously since 2008. My experience is in the areas of mineral exploration with a focus on uranium;
3) I am a professional geoscientist registered with the Association of Professional Engineers and Geoscientists of Saskatchewan - APEGS License No.: 100015552;
4) I have personally inspected the subject project on February 7th and 8th, 2018;
5) I have read the definition of qualified person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of National Instrument 43-101;
6) As an employee of Denison, I am not independent of the issuer as defined in Section 1.5 of National Instrument 43-101. Independence is not required pursuant to Section 5.3(1)(c) of National Instrument 43-101;
7) I am an author of this report and responsible for sections 1.2.3, 1.2.4, and 6 to 12, and reviewed sections 1.1, 1.2.1, 1.2.2, 2 to 5, 13, 15 to 24 and 27 and accept professional responsibility for these sections of this technical report;
8) I have had no prior involvement with the property, other than site visits and discussions with the personnel of the operator of the subject property;
9) I have read National Instrument 43-101 and Form 43-101F1 and this technical report, and confirm that this technical report has been prepared in accordance therewith;
10) Denison Mines Corporation retained SRK Consulting (Canada) Inc. to review and audit an updated Mineral Resource estimate for the Midwest uranium project. The preceding report is based on a site visit, a review of project files and discussions with SRK Consulting (Canada) Inc. and personnel of the operator of the project;
11) As at the effective date of the technical report, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

	["signed and sealed"]
Saskatoon	Chad Sorba
March 26, 2018	Technical Manager, Exploration, Denison Mines Corp.

CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: *Technical Report with an Updated Mineral Resource Estimate for the Midwest Property, Northern Saskatchewan, Canada,* effective date March 26, 2018.

I, Dale Verran do hereby certify that:

1) I am Vice President, Exploration with the firm of Denison Mines Corp. (Denison) with an office at 230 – 22nd Street East, Suite 200, Saskatoon, Saskatchewan, Canada;
2) I am a graduate of University of Cape Town (1996) and Rhodes University (2007) where I obtained a BSc (Honours) and MSc degree respectively. I have practiced my profession continuously since 1999. My experience is in the areas of mineral exploration, geology and geochemistry;
3) I am a professional geoscientist registered with the Association of Professional Engineers and Geoscientists of Saskatchewan - APEGS License No.: 34575;
4) I have personally inspected the subject project on February 7th and 8th, 2018;
5) I have read the definition of qualified person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of National Instrument 43-101;
6) As an employee of Denison, I am not independent of the issuer as defined in Section 1.5 of National Instrument 43-101. Independence is not required pursuant to Section 5.3(1)(c) of National Instrument 43-101;
7) I am an author of this report and responsible for sections 1.1, 1.2.1, 1.2.2, 2 to 5, 13, 15 to 24 and 27, and co-authored sections 1.2.6, 1.2.7, 1.2.8, 25 and 26 and accept professional responsibility for these sections of this technical report;
8) I have had no prior involvement with the property, other than site visits and discussions with the personnel of the operator of the subject property;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in accordance therewith;
10) Denison Mines Corporation retained SRK Consulting (Canada) Inc. to review and audit an updated Mineral Resource estimate for the Midwest uranium project. The preceding report is based on a site visit, a review of project files and discussions with SRK Consulting (Canada) Inc. and personnel of the operator of the project;
11) As at the effective date of the technical report, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

[“signed and sealed”]

Saskatoon
March 26, 2018

Dale Verran
Vice President Exploration, Denison Mines Corp.

CERTIFICATE OF QUALIFIED PERSON

To Accompany the report entitled: **Technical Report with an Updated Mineral Resource Estimate for the Midwest Property, Northern Saskatchewan, Canada**, **March 26, 2018**.

I, Oy Leuangthong do hereby certify that:

1) I am a Principal Consultant (Geostatistics) with the firm of SRK Consulting (Canada) Inc. (SRK) with an office at Suite 1500, 155 University Avenue, Toronto, Ontario, Canada;
2) I am a graduate of the University of Toronto in 1998 with B.A.Sc. (Honours) in Civil Engineering. I am a graduate of the University of Alberta in 2003 with a PhD in Mining Engineering (Geostatistics). My relevant experience includes research in resource modelling and geostatistics, teaching activities in mine planning, resource estimation and advanced geostatistics, and since 2010, geostatistical support and modelling for exploration projects in precious metals, base metals and uranium in the Americas, Australia, and West Africa;
3) I am a professional Engineer registered with the Professional Engineers Ontario (PEO#90563867);
4) I personally inspected the subject project on February 7 and 8, 2018;
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, I am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am the co-author of this report and responsible for sections 1.2.5 to 1.2.8, 14.1, 14.2.1, 14.2.3 to 14.2.9, 14.2.10.2 to 14.3.1, 14.3.3 to 14.3.9, 14.3.10.2 to 14.6, 25, and 26 and accept professional responsibility for those sections of this technical report;
8) I have had no prior involvement with the subject property;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) SRK Consulting (Canada) Inc. was retained by Denison Mines Corp. to conduct a mineral resource audit of updated mineral resource models for the Midwest A and Midwest zones of the joint venture, Midwest Uranium Project, which was completed by AREVA Resources Canada. Our audit was completed using CIM *Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines* and Canadian Securities Administrators National Instrument 43-101 guidelines. The contribution to the report is based on a site visit, a review of project files and discussions with Denison Mines Corp. and AREVA personnel;
11) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Midwest Uranium Project or securities of Denison Mines Corp; and
12) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

["Original signed and sealed"]

Toronto, Canada — Oy Leuangthong, PhD, PEng (PEO#90563867)
March 26, 2018 — Principal Consultant (Geostatistics)

CERTIFICATE OF QUALIFIED PERSON

To Accompany the report entitled: **Technical Report with an Updated Mineral Resource Estimate for the Midwest Property, Northern Saskatchewan, Canada**, **March 26, 2018**.

I, G. David Keller do hereby certify that:

1) I am a Principal Consultant (Resource Geology) with the firm of SRK Consulting (Canada) Inc. (SRK) with an office at Suite 1500, 155 University Avenue, Toronto, Ontario, Canada;
2) I am a graduate of the University of Alberta in 1986 with a B.Sc. in Geology. I have practiced my profession continuously since 1986, and been involved mineral exploration, mining operations, and mineral resource consulting for over 30 years. I have experience in precious metals, rare metals, base metals, uranium and industrial minerals.
3) I am a professional Geologist registered with the Association of Professional Geoscientists of Ontario (APGO#1235)
4) I personally inspected the subject project on February 7 and 8, 2018;
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, I am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am the co-author of this report and responsible for sections 1.2.5 to 1.2.8, 14.1, 14.2.2, 14.2.10.1, 14.2.10.3, 14.3.2, 14.3.10.1, 14.3.10.3 to 14.6, 25, and 26 and accept professional responsibility for those sections of this technical report;
8) I have had no prior involvement with the subject property;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) SRK Consulting (Canada) Inc. was retained by Denison Mines Corp. to conduct a mineral resource audit of updated mineral resource models for the Midwest A and Midwest zones of the joint venture, Midwest Uranium Project, which was completed by AREVA Resources Canada. Our audit was completed using CIM *Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines* and Canadian Securities Administrators National Instrument 43-101 guidelines. The contribution to the report is based on a site visit, a review of project files and discussions with Denison Mines Corp. and AREVA personnel;
11) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Midwest Uranium Project or securities of Denison Mines Corp; and
12) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

[“Original signed and sealed”]

Toronto, Canada — G. David Keller, P.Geo. (APGO#1235)
March 26, 2018 — Principal Consultant (Resource Geology)