Table 0.1: Compiled geochronological data for the Wollaston Domain (part 1). After cited sources.

Lithology	Crystallization age (Ma)	Metamorphic age (Ma)	Area	Reference
U vein	1805 ± 11 (Urn)*	1774 ± 9 (Urn)*	Hook Lake	Mercadier et al. (2013)
Pegmatite		1766 ± 1 (Mnz)	Dawn Lake	Annesley et al. (1997)
		1788 ± 4 (Ttn)	Karpinka Lake	Annesley et al. (1997)
	1819 ± 6 (Zrn)		Greenway Island	Annesley and Madore (1997)
	1811 ± 1 (Zrn)	1805 ± 5 (Mnz)	Yalowega Lake	Annesley et al. (1999b)
	1812 ± 2 (Mnz)		P-Patch	Annesley et al. (1999a)
	1810 ± 3 (Mnz)		McClean Lake	Annesley and Madore (1997)
	1822 ± 5 (Zrn)	1182 ± 7 (Zrn)	Close Lake	Madore et al. (1999)
	1819 ± 6 (Zrn)	1224 ± 6 (Zrn)	Epp Lake	Madore et al. (1999)
	1830 ± 5 (Mnz)†		Kulyk	McFarlane and McKeough (2013)
Granitic pegmatite	1816 ± 7 (Zrn)	1792.4 ± 1.2 (Mnz)	Millenium Deposit	Annesley et al. (2007)
	1.8–1.85 Ga (Urn)‡		Fraser Lake Zone B–Group A	McKechnie et al. (2012)
	2.05–2.25 Ga (Mnz)‡[1]		Fraser Lake Zone B–Group B	McKechnie et al. (2012)
	1814.6 ± 1.4 (Mnz)		McArthur River	Annesley et al. (2007)
Metasomatized Pegmatite		1808 ± 4 (Zrn)	East of Black Island	Annesley and Madore (1997)
Pelitic anatectites	1966–1858 (Urn)‡		Karin Lake	Parslow et al. (1985)
Peraluminos granite dike	1805 (Mnz)	1787 (Mnz)	Black Birch Lake	Orrell et al. (1999)
Granite pegmatitic dike	1805 ± 1 (Mnz)		Black Birch Lake	Orrell et al. (1999)
Calc-silicate vein		1789 ± 4 (Ttn)	Karpinka Lake	Annesley et al. (1992b)
Calc-silicate Gneiss		1796 ± 4 (Ttn)	Karpinka Lake	Annesley et al. (1997)
		1783 ± 4 (Ttn)	Karpinka Lake	Annesley et al. (1997)
Foliated leucotonalite		1752 ± 2 (Ttn)	McClean Lake–Collins Creek	Annesley et al. (1996)
Grey Granite (sheared)		1719 ± 1 (Zrn)	Hidden Bay	Annesley et al. (1992b)
Porphyritic Granite	1815 ± 2 (Zrn)	1788 ± 2 (Ttn)	Hidden Bay	Annesley et al. (1992b)
	1812 ± 3 (Zrn)		Harrison Peninsula	Annesley et al. (1995)
	1824 ± 3 (Zrn)		Wheeler River	Annesley et al. (1999b)

Notes: Unless otherwise indicated, all ages were obtained by TIMS or ID–TIMS. * SIMS. † LA–ICP–MS. ‡ Chemical age. | [1] Inherited age.
Uncertainties are omitted where not reported in the original source. Blank cells indicate no reported value.
Mineral abbreviations: **Zrn** = zircon; **Mnz** = monazite; **Ttn** = titanite; **Urn** = uraninite.

Table 0.2: Geochronological data for selected rocks of the Wollaston Domain (part 2). After cited sources.

Lithology	Crystallization age (Ma)	Metamorphic age (Ma)	Area	Reference
Foliated Grey Granite	1840 ± 11 (Zrn)	1790 ± 1 (Mnz)	Greenway Island	Annesley et al. (1997)
Foliated Granite	1818 ± 1 (Zrn)	1783 ± 2 (Mnz)	Wheeler River	Annesley et al. (1999b)
	2593 ± 5 (Zrn)	1819 ± 2 (Mnz)	Moore – Tomblin	Annesley et al. (1999b)
	2726 ± 3 (Zrn)		Fife Island	Annesley et al. (1997)
Leucogranite		1816 ± 1 (Mnz)	McArthur River	Annesley et al. (2007)
		1819 ± 10 (Zrn)[1]	McArthur River	Annesley et al. (2007)
	1804–1703 (Zrn)		Black Birch Lake	Orrell et al. (1999)
Foliated meta-tonalite	2612 ± 22 (Zrn)	1803 ± 1 (Mnz)	Russel Lake	Annesley et al. (2007)
Meta-gabbro	1820 ± 5 (Zrn)		Hidden Bay	Annesley et al. (1992b)
Monzogabbro	1828 ± 3 (Ttn)		Karpinka Lake	Annesley et al. (1993)
	1828 ± 3 (Zrn)	1795 ± 3 (Ttn)	Sandy Islands	Annesley et al. (1995)
Monzodiorite	1829 ± 1 (Zrn)		Kiteley Bay (Klemmer Lake)	Harper et al. (2006)
Grey Tonalitic Gneiss	1818 ± 1 (Zrn)	1801 ± 1 (Mnz)	Yalowega Lake	Annesley et al. (1998)
Migmatitic Pelitic Gneiss		1800 ± 2 (Mnz)	Wheeler River	Annesley et al. (1999b)
Migmatitic Tonalitic Gneiss		1814 ± 5 (Zrn)	Jeb	Annesley et al. (2007)
Metasomatized Orthogneiss		1803 ± 4 (Ttn)	Karpinka Lake	Annesley et al. (2007)
Pelitic Gneiss		1812 ± 2 (Mnz)	Hidden Bay	Annesley et al. (1992b)
Psammo pelitic gneiss		1730–1770 Urn	Karpinka Lake	Williams-Jones and Sawiuk (1985)
		1880 Urn	Karpinka Lake	Williams-Jones and Sawiuk (1985)
Granodioritic Gneiss		1792 ± 4 (Ttn)	Karpinka Lake	Annesley et al. (1997)
	2620 ± 10 (Zrn)	1798 ± 14 (Zrn)	SE Rabbit Lake	Annesley et al. (1992b)
Quartz Dioritic Gneiss	2638 ± 65 (Zrn)	1779 ± 2 (Ttn)	Ashley Peninsula	Annesley et al. (1992b)
Silicified granitic Gneiss	2594 ± 10 (Zrn)	1806 ± 2 (Mnz)	Karpinka Lake	Annesley et al. (1997)

Notes: Unless otherwise indicated, all ages were obtained by TIMS or ID–TIMS.
[1] Zircons display evidence of new growth as uraniferous tips formed during a 1680–1550 Ma thermal–hydrothermal event.
Uncertainties are omitted where not reported in the original source. Blank cells indicate no reported value.
Mineral abbreviations: **Zrn** = zircon; **Mnz** = monazite; **Ttn** = titanite; **Urn** = uraninite.

Table 0.3: Compiled geochronological data for the Wollaston Domain (part 3). After cited sources.

Lithology	Crystallization age (Ma)	Metamorphic age (Ma)	Area	Reference
Garnetiferous felsic rock	2565 ± 11 (Zrn)	1812 ± 7 (Zrn) 1776 ± 7 (Zrn)	Kendal Island Kendal Island	Harper et al. (2006)
Granitic Gneiss	2583 ± 14 (Zrn) 2592 ± 7 (Zrn) 2626 ± 15 (Zrn)	1821.9 ± 2 (Mnz) 1837 ± 34 (Zrn)[1]	Russel Lake McArthur River East of Black Island	Annesley et al. (2007) Annesley et al. (1999a) Annesley et al. (1997)
Tonalitic Gneiss	2689 ± 19 (Zrn) 2717 ± 12 (Zrn) 2706 ± 5 (Zrn) 2714 ± 12 (Zrn) 2780 Zrn	1778 ± 2 (Ttn) 1802 ± 2 (Mnz) 1804 ± 8 (Mnz) 1805.5 ± 1.4 (Mnz) 1806 ± 3 (Ttn) 1800 Zrn	Ashley Peninsula Collins Bay Collins Bay Close Lake Karpinka Lake Black Birch Lake	Annesley et al. (1992b) Annesley et al. (1997) Annesley et al. (1996) Annesley et al., 2003 Annesley et al. (1997) Orrell et al. (1999)
Mylonitic Tonalitic Gneiss	2733 ± 9 (Zrn)		Karpinka Lake	Annesley et al. (1992b)
Archean granitic gneiss	2731 ± 25 (Zrn)	1791.3 ± 8 (Mnz)	Millenium Deposit	Annesley et al. (2007)
Grey Orthogneiss	2786 ± 7 (Zrn)	1813 ± 6 (Zrn)	P-Patch	Annesley et al. (1999a)
Augen Gneiss	2660–2628 Zrn		Black Birch Lake	Orrell et al. (1999)
Qtz–Feldspar gneiss	2614–1977 Zrn	1804 Mnz	Black Birch Lake	Orrell et al. (1999)
Mafic gneiss	1802 ± 6 Zrn	1809 Zrn	Black Birch Lake	Orrell et al. (1999)

Notes: Unless otherwise indicated, all ages were obtained by TIMS or ID–TIMS.
[1] Hudsonian metamorphism. Blank cells indicate no reported value.
Uncertainties are omitted where not reported in the original source. Blank cells indicate no reported value.
Mineral abbreviations: **Zrn** = zircon; **Mnz** = monazite; **Ttn** = titanite; **Urn** = uraninite.

General Note: The correlation chart of the Trans-Hudson Orogen by Ansdell et al. (2005) provides an essential regional framework for interpreting the geochronological data compiled in Tables 0.3–0.5. It allows temporal and tectonic relationships among metamorphic, igneous, and detrital events within the Wollaston Domain to be understood in the broader context of the Manitoba–Saskatchewan segment of the Trans-Hudson Orogen. This chart serves as a key reference for integrating the evolution of the eastern Hearne Craton with the Paleoproterozoic history of the orogen.

Table 0.4: Compiled detrital zircon geochronological data for the Wollaston Domain. After cited sources.

Lithology	**Zircon ages (Ma)**	**Metamorphic age (Ma)**	**Area**	**Reference**
Biotite psammite	2686 – 2863	1816 ± 2	Wollaston Lake	Annesley et al. (1992b)
Cordierite–sillimanite pelite	2546 – 2792	1814 ± 2	Karpinka Lake	Annesley et al. (1992b)
Cordierite-Kfeldspar pelitic gneiss	2411 – 2612	1812 – 1764	Key Lake road – km 69	Annesley et al. (1992b)
Conglomerate	2830 – 2600 2600 – 2450 2100 – 2050 1920 – 1880	< 1880 (1840–1790 metamor-phism)	Daly Lake	Tran (2001)
Arkose	2600 – 2450 1920 – 1880	< 1880 (1840–1790 metamor-phism)	Daly Lake	Tran (2001)
Quartzite	2600 – 2450 1920 – 1880	< 1880 (1840–1790 metamor-phism)	Daly Lake	Tran (2001)
Quartzite	2620 – 2367	< 2367	Compulsion River	Hamilton and Delaney (2000)
Quartzite	2533 – 2450	< 2450	Duddridge Lake	Hamilton and Delaney (2000)
Quartzite–metapelite	2134–2580 (Zrn)	1 880–1769 (Mnz)	Black Birch Lake	Orrell et al. (1999)

Note: Most analyses were conducted using SHRIMP U–Pb methods. Samples from Annesley et al. (1992a) were dated using ID–TIMS U–Pb. Ages from metasedimentary rocks are from detrital zircon crystals. Modified from Yeo and Delaney (2007)

Table 0.5: Compiled geochronological data for Archean basement rocks from the eastern Hearne Craton. After cited sources.

Lithology	Age (Ma)	Unit	Reference
Granite	2494 ± 38	Johnson River inlier	Ray and Wanless (1980)
Granite	2574 ± 3	Johnson River inlier	Hamilton and Delaney (2000)
Granodiorite	2566 ± 6	Duddridge Lake inlier	Hamilton and Delaney (2000)
Granite–syenogranite	$2574 \pm 8/7$	Anderson Lake inlier	Hamilton and Delaney (2000)
Biotite granite	2587 ± 3	Linn Island inlier	Rayner et al. (2005)
Granite	2593 ± 13	Fraser Lakes inlier	Hamilton and Delaney (2000)
Granite	2600 ± 18 2652 ± 20	Zimmer Lake inlier	Krogh and Clark (1987)
Tonalitic gneiss	$2733\ ^{+9}_{-8}$	Karpinka Lake gneiss	Annesley et al. (1992a)

Note. Ages reported are from U–Pb zircon thermal ionization mass spectrometry (TIMS) analyses. Modified from Yeo and Delaney (2007)

References

Annesley, I. R., and C. Madore, 1997, U–Pb geochronology of peraluminous pegmatites from the Wollaston Lake area, northern Saskatchewan: Abstracts Volume, Geological Association of Canada – Mineralogical Association of Canada Annual Meeting, Geological Association of Canada, A49.

Annesley, I. R., C. Madore, Y. D. Chen, and T. E. Krogh, 1995, U–pb geochronological studies on the gabbros from the sandy islands gabbro complex, wollaston domain, northern saskatchewan: Abstracts Volume, Geological Association of Canada – Mineralogical Association of Canada Annual Meeting, Geological Association of Canada, A43.

Annesley, I. R., C. Madore, S. L. Kamo, and T. E. Krogh, 1999a, U–Pb zircon and monazite ages from the sub–Athabasca basement of the P–Patch uranium deposit, Wollaston Domain, Saskatchewan: Abstracts Volume, Geological Association of Canada – Mineralogical Association of Canada Annual Meeting, Geological Association of Canada, GS2–GS4.

Annesley, I. R., C. Madore, and T. E. Krogh, 1992a, U–Pb geochronology of mylonitic gneiss and foliated granite from the boundary zone of the Wollaston and Peter Lake domains, Saskatchewan: Abstracts Volume, Geological Association of Canada – Mineralogical Association of Canada Annual Meeting, Geological Association of Canada, A36.

Annesley, I. R., C. Madore, and T. E. Krogh, 1992b, U-Pb zircon, titanite, and monazite ages from the Wollaston Domain: A summary, *in* Summary of Investigations 1992: Saskatchewan Geological Survey, volume **Misc. Rep. 92-4** *of* Saskatchewan Geological Survey, Saskatchewan Energy and Mines, 61–64.

Annesley, I. R., C. Madore, and T. E. Krogh, 1993, U–Pb zircon, titanite, and monazite geochronology from the Wollaston–Mudjatik Domain boundary, Karpinka Lake area, northern Saskatchewan: Abstracts Volume, Geological Association of Canada – Mineralogical Association of Canada Annual Meeting, Geological Association of Canada, A38.

Annesley, I. R., C. Madore, T. E. Krogh, and K. K. Kwok, 1998, New U–Pb zircon and monazite dates from the sub–Athabasca basement, wollaston domain, hearne province, saskatchewan: Abstracts Volume, Geological Association of Canada – Mineralogical Association of Canada Annual Meeting, Geological Association of Canada, A50.

Annesley, I. R., C. Madore, T. E. Krogh, Y. Y. Kwok, and S. L. Kamo, 1999b, New U–Pb zircon and monazite geochronological results for Archean and Paleoproterozoic basement to the southeastern part of the Athabasca Basin, Saskatchewan, *in* Summary of Investigations 1999: Saskatchewan Energy and Mines, Saskatchewan Energy and Mines, Miscellaneous Report 99-4.2, 90–99.

Annesley, I. R., C. Madore, A. J. McCready, S. L. Kamo, and T. Bonli, 2007, U–Pb ages of zircon, monazite, and zircon tips in Hudsonian granites at the McArthur River uranium deposit: A record of U mineralizing fluids: Proceedings of the Ninth Biennial SGA Meeting, Society for Geology Applied to Mineral Deposits, 1125–1128.

Annesley, I. R., C. Madore, R. Shi, and T. E. Krogh, 1996, U–pb geochronology and ther-

motectonic history of the wollaston domain in the wollaston lake area, hearne province, saskatchewan: Abstracts Volume, Geological Association of Canada – Mineralogical Association of Canada Annual Meeting, Geological Association of Canada, A46.

Annesley, I. R., C. Madore, R. Shi, and T. E. Krogh, 1997, U–Pb geochronology of thermotectonic events in the Wollaston Lake area, Wollaston Domain: A summary of 1994–96 results, *in* Summary of Investigations 1997: Saskatchewan Energy and Mines, Saskatchewan Energy and Mines, Miscellaneous Report 97-4, 162–173.

Ansdell, K. M., L. M. Heaman, N. Machado, R. A. Stern, D. Corrigan, P. Bickford, I. R. Annesley, C. O. Böhm, H. V. Zwanzig, A. H. Bailes, R. Syme, T. Corkery, K. E. Ashton, R. O. Maxeiner, G. M. Yeo, and G. D. Delaney, 2005, Correlation Chart of the evolution of the Trans-Hudson Orogen ManitobaSaskatchewan segment: Canadian Journal of Earth Sciences, **42**, 761; doi: 10.1139/e05-004.

Hamilton, M. A., and G. Delaney, 2000, New u-pb geochronological constraints on the age of basement and cover in the eastern wollaston domain, saskatchewan, and evolution of the SE hearne province: Presented at the GeoCanada 2000: The Millennium Geoscience Summit; Joint Meeting of the Canadian Geophysical Union, Canadian Society of Exploration Geophysicists, Canadian Society of Petroleum Geologists, Canadian Well Logging Society, Geological Association of Canada, and the Mineralogical Association of Canada.

Harper, C. T., N. Rayner, and C. Card, 2006, Preliminary U-Pb Ages for Archean Basement and Proterozoic Intrusion from the Northern Wollaston Lake Area, Saskatchewan.

Krogh, T., and L. A. Clark, 1987, Zircon dating of sub-Athabasca granitoid rocks, Saskatchewan: Abstract Volume, Geological Association of Canada–Mineralogical Association of Canada, Annual Meeting, 64.

Madore, C., I. R. Annesley, K. K. Kwok, and T. E. Krogh, 1999, Petrography, geochemistry, and age of granitic pegmatites from the close lake and epp lake areas, mudjatik domain, saskatchewan: Abstracts Volume, Geological Association of Canada – Mineralogical Asso-

ciation of Canada Annual Meeting, Geological Association of Canada, GS8–GS9.

McFarlane, C. R. M., and M. McKeough, 2013, Petrogenesis of the Kulyk Lake monazite-apatite-Fe(Ti)-oxide occurrence revealed using in-situ LA-(MC)-ICP-MS trace element mapping, U-Pb dating, and Sm-Nd isotope systematics on monazite: American Mineralogist, **98**, 1644–1659; doi: 10.2138/am.2013.4368.

McKechnie, C. L., I. R. Annesley, and K. M. Ansdell, 2012, Radioactive abyssal granitic pegmatites and leucogranites in the Wollaston Domain, northern Saskatchewan, Canada: Mineral compositions and conditions of emplacement in the Fraser Lakes area: The Canadian Mineralogist, **50**, 1637–1667; doi: 10.3749/canmin.50.6.1637.

Mercadier, J., I. R. Annesley, C. L. McKechnie, T. S. Bogdan, and S. Creighton, 2013, Magmatic and Metamorphic Uraninite Mineralization in the Western Margin of the Trans-Hudson Orogen (Saskatchewan, Canada): A Uranium Source for Unconformity-Related Uranium Deposits?: Economic Geology, **108**, 1037–1065; doi: 10.2113/econgeo.108.5.1037.

Orrell, S., M. Bickford, and J. Lewry, 1999, Crustal evolution and age of thermotectonic reworking in the western hinterland of the Trans-Hudson Orogen, northern Saskatchewan: Precambrian Research, **95**, 187–223; doi: 10.1016/S0301-9268(98)00117-X.

Parslow, G. R., F. Bandstaetter, G. Kurat, and D. J. Thomas, 1985, Chemical ages and mobility of U and th in anatectites of the cree lake zone, saskatchewan: The Canadian Mineralogist, **23**, 543–551.

Ray, G. E., and R. K. Wanless, 1980, The age and geological history of the Wollaston, Peter Lake, and Rottenstone domains in northern Saskatchewan: Canadian Journal of Earth Sciences, **17**, 333–347; doi: 10.1139/e80-033.

Rayner, N. M., R. A. Stern, and M. E. Bickford, 2005, Tectonic implications of new SHRIMP and TIMS UPb geochronology of rocks from the Sask Craton, Peter Lake Domain, and Hearne margin, Trans-Hudson Orogen, Saskatchewan: Canadian Journal of Earth Sciences, **42**, 635–657; doi: 10.1139/e04-045.

Tran, H. T., 2001, Tectonic evolution of the Paleoproterozoic Wollaston group in the Cree Lake Zone, Northern Saskatchewan, Canada: PhD thesis.

Williams-Jones, A. E., and M. J. Sawiuk, 1985, The Karpinka Lake uranium prospect, Saskatchewan; a possible metamorphosed middle Precambrian sandstone-type uranium deposit: Economic Geology, **80**, 1927–1941; doi: 10.2113/gsecongeo.80.7.1927.

Yeo, G. M., and G. Delaney, 2007, The Wollaston Supergroup, stratigraphy and metallogeny of a Paleoproterozoic Wilson cycle in the Trans-Hudson Orogen, Saskatchewan: Technical Report 588.