Supplementary Information for

Calibrating the co-evolution of Ediacaran life and environment

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Supplementary Information Text

Geological Setting: Oman

The Ediacaran Nafun Group of Oman is exposed in outcrop in the southern Huqf Desert and northern Oman Mountains (Al Hajar Mountains) and is extensively penetrated by drillcore in the South Oman Salt Basin and Huqf-Haushi High areas (Fig. S1). In the subsurface and Huqf Desert, the Nafun Group is exceptionally well-preserved and has not undergone significant metamorphism or burial. The sedimentology, stratigraphy, and geochemistry of the Nafun Group has been extensively studied (1-23), in part motivated by the presence of hydrocarbon resources and in part because its exceptional preservation offers the opportunity to study proxy records that have been obscured or obliterated in many other Ediacaran successions. Proxy records examined in Oman have included carbonate clumped isotopes (15), biomarkers (5-7, 12) and carbonate-associated sulphate (10, 11).

The Nafun Group overlies the Abu Mahara Group, which contains diamictites correlated with Cryogenian glaciations, and the Nafun Group's basal Hadash Formation (Fm) is correlated with the post-Marinoan cap carbonate globally. The Nafun Group is a mixed siliciclastic-carbonate deposit with two major cycles of siliciclastic-to-carbonate deposition. The lower cycle is represented by the Masirah Bay and Khufai formations, and the upper cycle by the Shuram and Buah formations. Both cycles are characterized by lithofacies assemblages consistent with a shallowing upwards pattern (15).

The Masirah Bay overlies the Hadash Fm, the Cryogenian Ghadir Manquil Fm, or the Halfayn volcanic suite depending on the location. The Masirah Bay Fm is dominantly siliciclastic, with shales, siltstones, and sandstones, though in it contains interbedded shales and dolomites near its top (16). Its upper contact with the Khufai Fm is transitional, from thinly bedded shales and dolomites into continuous carbonate (21). The Khufai Fm contains both limestones and dolomites and was deposited in a ramp setting (11, 21). Fetid carbonates are common, as are grainstones and silicification. The onset of the Shuram CIE is captured in the uppermost Khufai Fm, and its contact with the Shuram Fm in the Huqf Desert is marked by a laterally continuous oolite on which cauliform stromatolites nucleated (2; Table S1). The transition to the Shuram Fm is also marked by a sharp shift to silicilastic siltstone with occasional interbedded limestones, which increase in abundance moving upsection (2, 9, 21). Shuram Fm limestones often contain ooids and edgewise conglomerates and siltstones in the Huqf Desert typically contain hummocky and swaley cross stratification (9, 21). Full recovery to positive $\delta^{13}C$ values occurs in the overlying, carbonate-dominated Buah Fm (2, 3, 19, 21, 23; Fig. S2; Table S1). In deep-water sections, a thick silicilyte (rock containing >90% cryptocrystalline silica) occurs in the upper Buah Fm. An unconformity between the Buah Fm and the overlying carbonates and evaporites of the Ara Group is often seen in the subsurface, while in the Oman Mountains, the Buah is overlain by the volcaniclastics of the Fara Fm (16).

Radioisotopic constraints on the Nafun Group are limited to minimum depositional ages derived from detrital zircons (17). Extensive dating of volcaniclastic and ash units in the overlying Ara Group from the Oman Mountains and South Oman Salt Basin have yielded latest Ediacaran ages (17). Fossils of Ediacaran biota are not known from any Nafun Group stratigraphy, but Cloudina and Namacalathus are reported in Ara Group drillcore (20).

Two drillcores, drilled by Petroleum Development Oman in the last decade, sample the deepest water environments of the South Oman Salt Basin (Fig. S1). We refer to them as Well L and Well M. Carbon isotope data, sedimentology, and gamma ray data guide the correlation of these cores both to other subsurface wells and to outcrop in the Huqf Desert and Oman Mountains. Correlation of Wells L and M to Thamoud-6, a well that has been previously described is shown in Figs. S1, S2), with stratigraphic location of Re-Os samples sampled for this study. Organic-rich shale intervals were targeted for Re-Os geochronology. Sample suites comprise up to 9 subsamples taken within intervals up to 1.4 meters in total thickness.

Geological Setting: NW Canada

In the Wernecke and Ogilvie Mountains of Yukon, Canada, Neoproterozoic rocks of the Windermere Supergroup (ca. 780-540 Ma) consist of a ca. 6 km thick mixed carbonate-siliciclastic succession deposited along the northwestern margin of Laurentia (24-26). Ediacaran strata of the Wernecke Mountains comprise the recently formalized Rackla Group (27), which is composed of the Sheepbed, Nadaleen, Gametrail, Blueflower, Algae, and Risky formations (24, 25, 27-30; Fig. S3). The ca. 632 Ma Sheepbed Formation locally overlies glaciogenic diamictite (Rapitan Group) and cap carbonate (Ravensthroat Formation) of the Cryogenian Marinoan glaciation (27, 28, 31-34). These strata are overlain by mixed siliciclastic and carbonate strata of the Nadaleen Formation, which locally contains the Ediacaran macrofossil Aspidella and are characterized by highly enriched $\delta^{13}C_{carb}$ values up to +9‰ (ref. 27). The overlying Gametrail

Formation contains highly depleted $\delta^{13}C_{carb}$ values down to -13‰ that have been correlated globally with the Shuram CIE (27, 28; Table S1); this unit records an abrupt return to positive $\delta^{13}C_{carb}$ values near the top of the formation and its contact with the overlying Blueflower Formation (Fig. 1; Extended Data Fig. 3). The Gametrail Formation is overlain by mixed siliciclastic and carbonate strata of the fossiliferous Blueflower, Algae, and Risky formations, the latter of which lies at or just below the Ediacaran-Cambrian boundary (25, 29, 35-37).

Ediacaran–Cambrian strata of the Ogilvie Mountains comprise a series of informal map units labeled PH3, PH4, and PH5 (28, 38-41; Fig. S3). Units PH3 and PH4 were previously correlated with the informal "upper group" (28), but recent formalization of the Rackla Group suggests these units instead belong within this newer lithostratigraphic unit (27). Unit PH3 consists predominantly of black shale and mudstone that directly overlies an unnamed Cryogenian glacial deposit and cap carbonate pair belonging to the ca. 635 Ma Marinoan glaciation (28, 39). This is succeeded by unit PH4, which is composed primarily of hummocky cross-stratified dolostone, silty dolostone, and rare dolorudstone with interbedded black shale and concretionary limestone near its top. These strata record highly depleted $\delta^{13}C_{carb}$ values down to -9‰, which have previously been correlated with the Shuram CIE (27; Table S1). The concretionary limestone unit at the top of unit PH4 has been loosely correlated with the Blueflower Formation and records a return to enriched $\delta^{13}C_{carb}$ values (Fig. S3). Locally, units PH3 and PH4 are truncated by an angular unconformity beneath unit PH5, which is composed of siltstone and sandstone that contain diagnostic early-middle Cambrian trace fossils including Skolithos, Cruziana, and Rusophycus (38).

Re-Os geochronology

All radioisotopic analyses were performed at the Yale University Metal Geochemistry and Geochronology Center. Weathered surfaces were removed with a diamond-encrusted rock saw and samples were then hand-polished using a diamond-encrusted polishing pad to remove cutting marks and eliminate any potential for contamination from the saw blade. The samples were dried overnight at ~40 °C and then crushed to a fine (~30 µm) powder in a SPEX 8500 Shatterbox using a zirconium ceramic grinding container and puck in order to homogenize any Re and Os heterogeneity present in the samples (42). The Re and Os isotopic abundances and compositions were determined following methodologies previously described (43, 44).

Between 0.15 and 1 g of sample was digested and equilibrated in 8 ml of $Cr^{VI}O_3$-H_2SO_4 together with a mixed tracer (spike) solution of ^{190}Os and ^{185}Re in carius tubes at 220 °C for 48 hours. Rhenium and Os were isolated and purified using solvent extraction (NaOH, $(CH_3)_2CO$, and $CHCl_3$), micro-distillation and anion column chromatography methods, as outlined previously (45, 46). The $Cr^{VI}O_3$-H_2SO_4 digestion method was employed as it has been shown to preferentially liberate hydrogenous Re and Os yielding more accurate and precise age determinations (47, 48). Total procedural blanks during this study were 88.0 ± 2.1 pg and 0.18 ± 0.07 pg for Re and Os respectively, with an average $^{187}Os/^{188}Os$ value of 0.25 ± 0.05 (1σ, n = 4). The major source (>90%) of Re blank is from the $Cr^{VI}O_3$-H_2SO_4 solution.

Isotopic measurements were performed using a ThermoFisher TRITON PLUS thermal ionization mass spectrometer in negative mode at the Yale University via static Faraday collection for Re and ion-counting using a secondary electron multiplier in peak-hopping mode for Os (49, 50). The Os samples were loaded onto 99.995% Pt wire (H-Cross, NJ) in 9 N HBr and covered with a saturated solution of $Ba(OH)_2$ in 0.1 N NaOH as activator and analyzed as oxides of Os. Interference of $^{187}ReO_3$ on $^{187}OsO_3$ was corrected by the measured intensity of $^{185}ReO_3$. Mass fractionation was corrected with $^{192}Os/^{188}Os$ = 3.0826, using the exponential fractional law. Measurement quality was monitored by repeated measurement of the DROsS standard solution, which yielded $^{187}Os/^{188}Os$ values of 0.16091 ± 0.00015 (n=51) over the course of the measurement campaign, in good agreement with values obtained by other laboratories (51, 52). The Yale University Re standard solution (measured on faraday cups during analytical sessions) yields an average $^{185}Re/^{187}Re$ value of 0.59783 ± 0.0006; 1σ, n = 17), which is indistinguishable, within uncertainty previously published values (53). The measured difference in $^{185}Re/^{187}Re$ values for the Re solution and the accepted $^{185}Re/^{187}Re$ value of 0.59738; previously published values (53) are used to correct the Re sample data for instrument mass fractionation and blank and spike contributions.

Uncertainties for $^{187}Re/^{188}Os$ and $^{187}Os/^{188}Os$ are determined by error propagation of uncertainties in Re and Os mass spectrometry measurements, blank abundances and isotopic compositions, spike calibrations, and reproducibility of standard Re and Os isotopic values. The Re-Os isotopic data, 2σ calculated uncertainties for $^{187}Re/^{188}Os$ and $^{187}Os/^{188}Os$, and the associated error correlation function (rho) are regressed to yield a Re-Os date using Isoplot V. 4.15 with the λ ^{187}Re constant of $1.666 \times 10^{-11} a^{-1}$ (54-56). Elemental concentrations and isotopic compositions for the Re-Os geochronology samples are listed in Table S2. All samples display enrichments above average crustal values with Re abundances ranging from 0.64 to 245.1 ng/g and Os abundances from 56 to 4703 pg/g.

Carbon and Oxygen Isotope Geochemistry

Carbonate rock samples from northwestern Canada were analyzed at both Dartmouth College and the Yale Analytical and Stable Isotope Center. 0.1-0.5 kg samples of limestone and dolostone were collected approximately every m throughout detailed measured stratigraphic sections and targeted to avoid obvious fracturing or veining. The samples were then slabbed perpendicular to bedding using a lapidary saw and ~ 5-10 mg of powder was drilled from individual laminations using a drill press with a dental carbide drill bit. Carbonate powders analyzed at Dartmouth College (JB1704, J1711, JB1707, T1701, J1713, JB1801) were reacted with phosphoric acid (H_3PO_4) at 70°C on a Gasbench II preparation device attached to a ThermoFinnigan DeltaPlus XL continuous flow isotope ratio mass spectrometer. $\delta^{13}C_{carb}$ and $\delta^{18}O_{carb}$ were measured simultaneously and isotopic data are reported in standard delta notation as the per mil difference from VPDB (Vienna Pee Dee Belemnite). Precision and accuracy were monitored by running a total of 12 standards for every 76 samples using 11:3 sample/standard bracketing. The standard set includes two external standards (NBS-18 and Elemental Microanalysis (EM) Carrara Marble), as well as an internal marble standard. Samples are measured relative to an internal CO_2 gas standard and then converted to the VPDB scale using the known composition of NBS-18 ($\delta^{13}C$ = -5.01; $\delta^{18}O$ = -23.20) and the EM-Carrara Marble ($\delta^{13}C_{carb}$ = 2.10; $\delta^{18}O_{carb}$ = -2.01). Measured precision was 0.1-0.15‰ (1σ) for $\delta^{13}C_{carb}$ and 0.15-0.2‰ (1σ) for $\delta^{18}O_{carb}$. Samples run at the Yale Analytical and Stable Isotopic Center (J1719) followed an identical procedure using a KIEL carbonate preparation device connected to a ThermoFinnigan MAT 253. The standard set includes the MERC ($\delta^{13}C$ = -48.96; $\delta^{18}O$ = -16.48), PX ($\delta^{13}C_{carb}$ = 2.25; $\delta^{18}O_{carb}$ = -1.79), and YM ($\delta^{13}C_{carb}$ = -1.59; $\delta^{18}O_{carb}$ = -6.03) standards which were calibrated against the NIBS 19, NBS 18, and LSVEC international standards on the VPDB scale. Internal precision was reported as 0.1-0.15‰ (1σ) for $\delta^{13}C_{carb}$ and 0.1-0.15 ‰ (1σ) for $\delta^{18}O_{carb}$.

Fig. S1: Geological map of Oman, modified after published work (15, 16). Approximate locations of Wells L and M shown. Stratigraphic and chemostratigraphic overview of Wells L and M, with sampled horizons indicated.

Fig. S2: Lithostratigraphic and chemostratigraphic data for well Thamoud-6 with stratigraphic positions of samples from Well L and Well M shown. Formation boundaries follow Petroleum Development Oman's 2019 revision of stratigraphy. Recovery from the Shuram Excursion occurs within the Buah Fm.

Fig. S3: Geological map and detailed measured sections from Ediacaran strata in the Ogilvie and Wernecke Mountains, Yukon, Canada. The inset map shows the location of the measured sections in the main figure where NWT–Northwest Territories. Measured sections display main lithofacies and carbon isotope chemostratigraphy of the Rackla Group modified following published work (27, 28). The starred locations display the stratigraphic position of the sampled horizons.

Table S1: $\delta^{13}C_{carb}$ isotope data were compiled from the literature from globally distributed successions (57-61). Published geochronological constraints and $\delta^{13}C_{carb}$ chemostratigraphy were used to develop an age model.

Table S2: Rhenium and Os elemental abundance and isotopic composition data for isochron regressions. Uncertainties are given as 2σ for $^{187}Re/^{188}Os$ and $^{187}Os/^{188}Os$ and ^{192}Os. The uncertainty includes the 2σ uncertainty for mass spectrometer analysis plus uncertainties for Os blank abundance and isotopic composition. (a) Rho is the associated error correlation (55). (b) Os_i = initial $^{187}Os/^{188}Os$ isotope ratio calculated at 578, 567, 575, 562 and 574 Ma.

Table S3: In addition to ages from this work, some ages used for the construction of Figure 3 are from previously published work (17, 31, 62-66). Ages published before 2012 are as recalculated (67); ages are color-coded to their region of origin. All uncertainties include relevant decay constant uncertainties. The * indicates U-Pb zircon chemical abrasion isotope dilution thermal ionization mass spectrometry (CA-ID-TIMS) age; †indicates U-Pb zircon Sensitive High-

Resolution Ion Microprobe (SHRIMP) age; ‡indicates Re-Os organic-rich rock age. Ages from this study are bolded.

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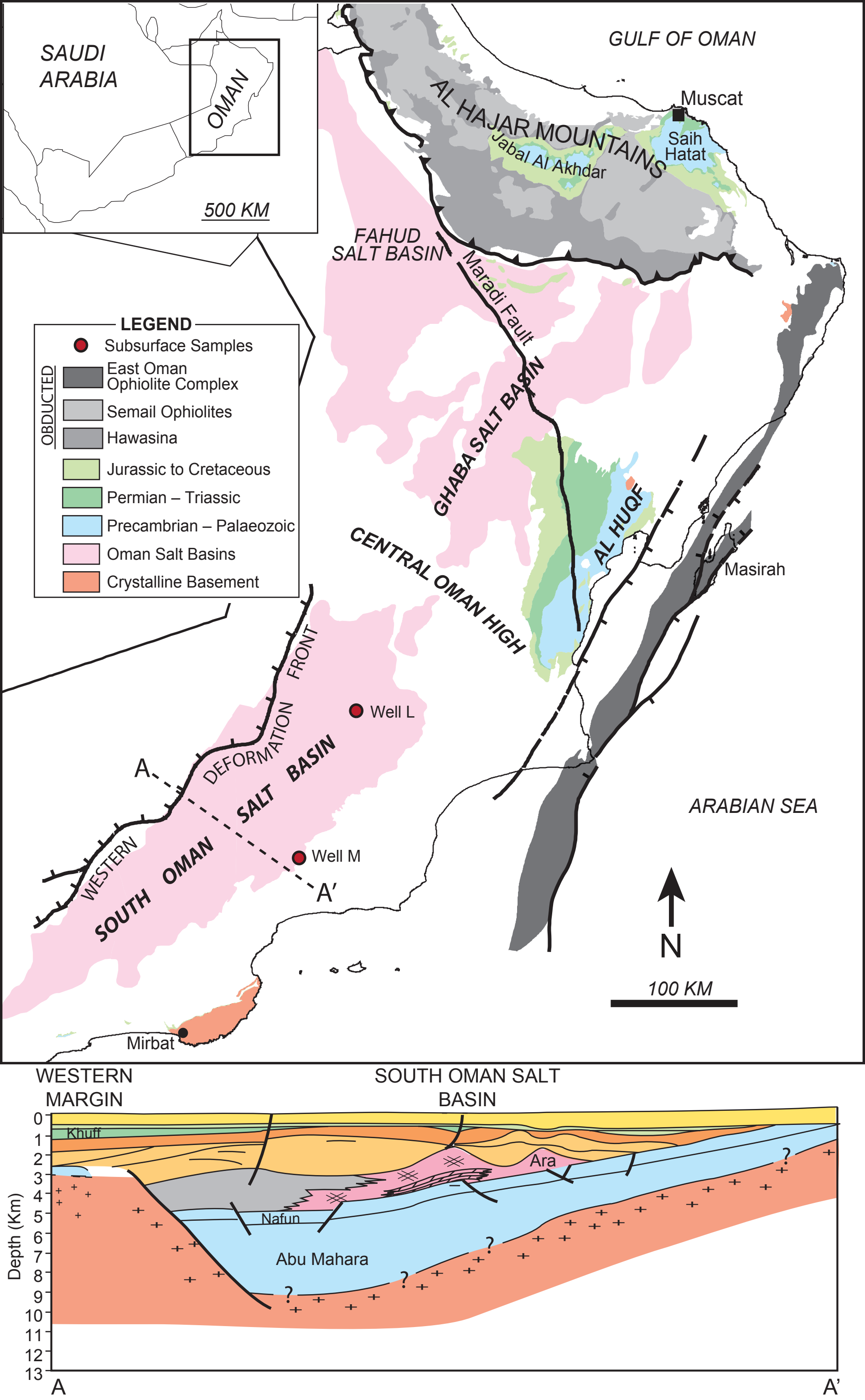
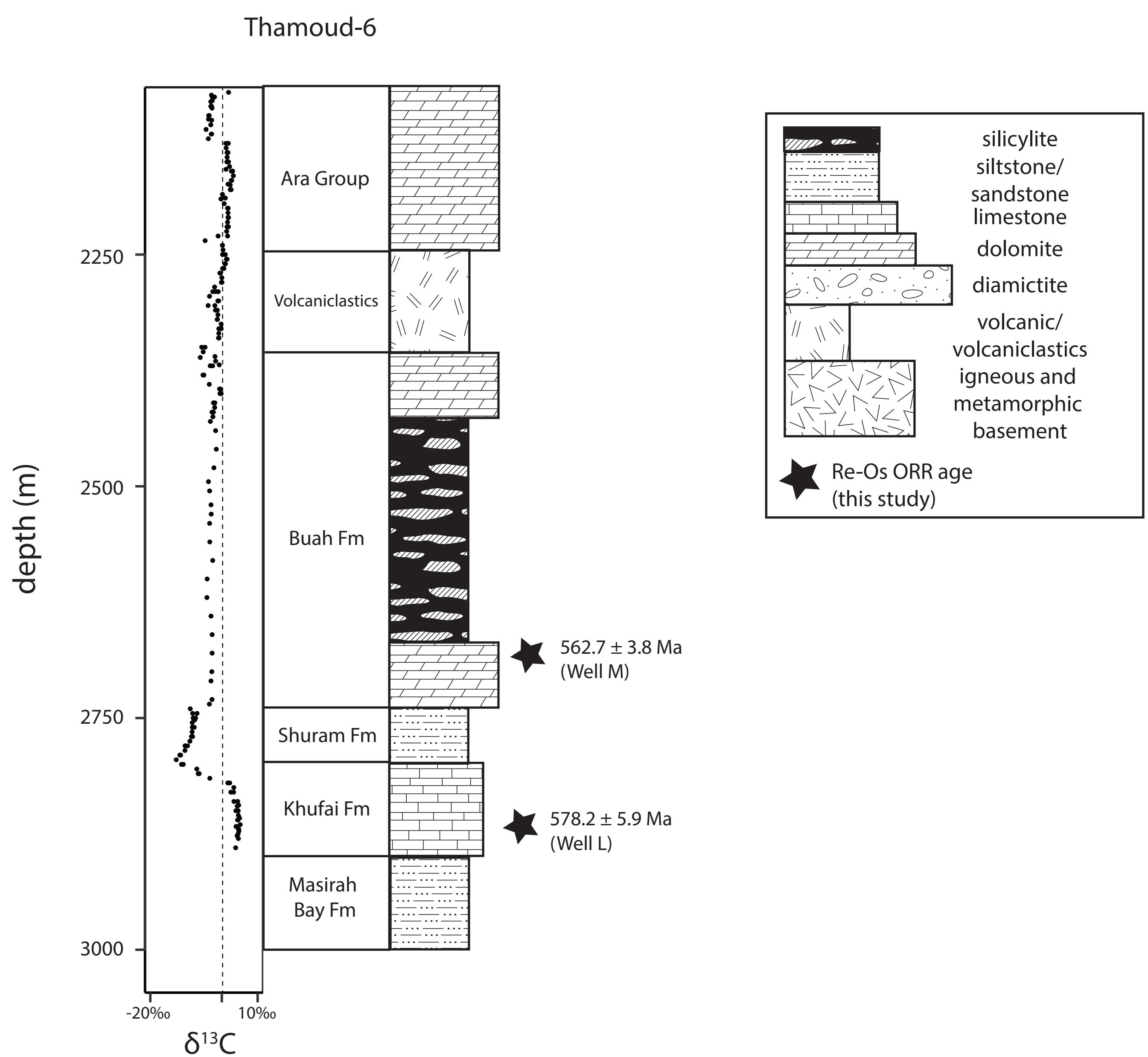
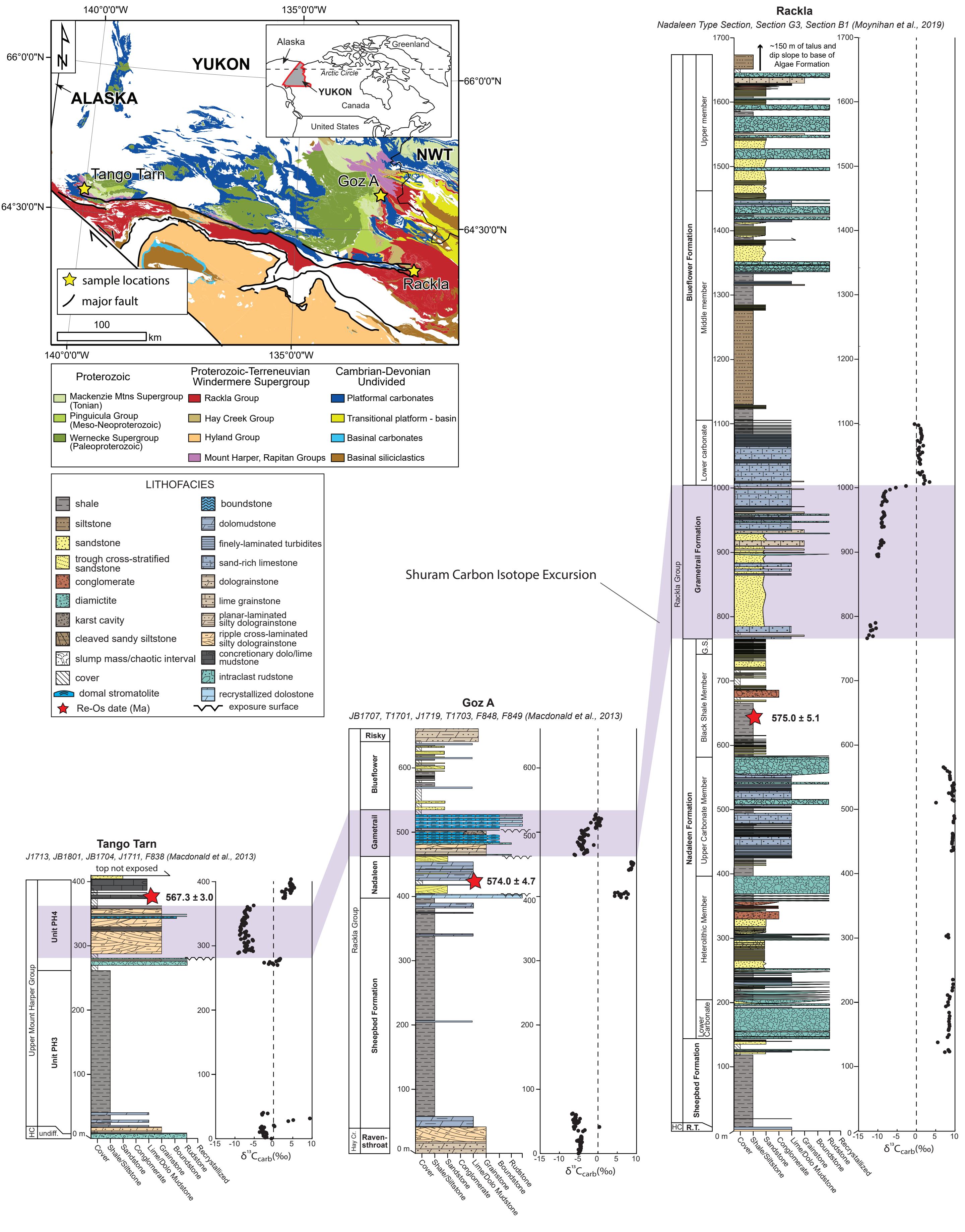


SAUDI ARABIA
OMAN
500 KM
GULF OF OMAN
Muscat
AL HAJAR MOUNTAINS
Jabal Al Akhdar
Saih Hatat
FAHUD SALT BASIN
Maradi Fault
GHABA SALT BASIN
AL HUQF
CENTRAL OMAN HIGH
Masirah
ARABIAN SEA
WESTERN DEFORMATION FRONT
SOUTH OMAN SALT BASIN
Well L
Well M
A
A′
N
100 KM
Mirbat
LEGEND
Subsurface Samples
OBDUCTED
East Oman Ophiolite Complex
Semail Ophiolites
Hawasina
Jurassic to Cretaceous
Permian – Triassic
Precambrian – Palaeozoic
Oman Salt Basins
Crystalline Basement
WESTERN MARGIN
SOUTH OMAN SALT BASIN
Khuff
Ara
Nafun
Abu Mahara
Depth (Km)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
A
A′


Thamoud-6
depth (m)
2250
2500
2750
3000
-20‰
10‰
δ13C
Ara Group
Volcaniclastics
Buah Fm
Shuram Fm
Khufai Fm
Masirah Bay Fm
562.7 ± 3.8 Ma (Well M)
578.2 ± 5.9 Ma (Well L)
silicylite
siltstone/ sandstone
limestone
dolomite
diamictite
volcanic/ volcaniclastics
igneous and metamorphic basement
Re-Os ORR age (this study)



YUKON
ALASKA
NWT
Tango Tarn
Goz A
Rackla
sample locations
major fault
Proterozoic
Mackenzie Mtns Supergroup (Tonian)
Pinguicula Group (Meso-Neoproterozoic)
Wernecke Supergroup (Paleoproterozoic)
Proterozoic-Terreneuvian Windermere Supergroup
Rackla Group
Hay Creek Group
Hyland Group
Mount Harper, Rapitan Groups
Cambrian-Devonian Undivided
Platformal carbonates
Transitional platform - basin
Basinal carbonates
Basinal siliciclastics
LITHOFACIES
Shuram Carbon Isotope Excursion
Rackla
Nadaleen Type Section, Section G3, Section B1 (Moynihan et al., 2019)
~150 m of talus and dip slope to base of Algae Formation
575.0 ± 5.1
Goz A
JB1707, T1701, J1719, T1703, F848, F849 (Macdonald et al., 2013)
574.0 ± 4.7
Tango Tarn
J1713, JB1801, JB1704, J1711, F838 (Macdonald et al., 2013)
top not exposed
567.3 ± 3.0

Table S1 Carbon Isotope Data

*Ages in bold are tied directly to an age constraint or other assumption as detailed In the Note. Ages not in bold are interpolated between them.

Region	Location	Stratigraphic Height (Outcrop) (m)	Depth (Drillcore) (m)	$\delta^{13}C_{carb}$ (‰)	Source	Unit	Age*	Note
Oman	Thamoud-6 core	n/a	2074.00	2.23	Petroleum Development Oman	Ara Group	537.73	
Oman	Thamoud-6 core	n/a	2075.00	1.88	Petroleum Development Oman	Ara Group	537.79	
Oman	Thamoud-6 core	n/a	2078.00	-2.9	Petroleum Development Oman	Ara Group	537.97	
Oman	Thamoud-6 core	n/a	2080.00	-2.69	Petroleum Development Oman	Ara Group	538.08	
Oman	Thamoud-6 core	n/a	2080.00	-2.06	Petroleum Development Oman	Ara Group	538.08	
Oman	Thamoud-6 core	n/a	2084.00	-2.68	Petroleum Development Oman	Ara Group	538.32	
Oman	Thamoud-6 core	n/a	2085.00	-3.08	Petroleum Development Oman	Ara Group	538.38	
Oman	Thamoud-6 core	n/a	2090.00	-3.07	Petroleum Development Oman	Ara Group	538.67	
Oman	Thamoud-6 core	n/a	2090.00	-2.89	Petroleum Development Oman	Ara Group	538.67	
Oman	Thamoud-6 core	n/a	2092.00	-2.75	Petroleum Development Oman	Ara Group	538.78	
Oman	Thamoud-6 core	n/a	2100.00	-3.67	Petroleum Development Oman	Ara Group	539.25	
Oman	Thamoud-6 core	n/a	2100.00	-3.53	Petroleum Development Oman	Ara Group	539.25	
Oman	Thamoud-6 core	n/a	2104.00	-3.73	Petroleum Development Oman	Ara Group	539.48	
Oman	Thamoud-6 core	n/a	2105.00	-2.85	Petroleum Development Oman	Ara Group	539.54	
Oman	Thamoud-6 core	n/a	2110.00	-3.11	Petroleum Development Oman	Ara Group	539.83	
Oman	Thamoud-6 core	n/a	2110.00	-3.09	Petroleum Development Oman	Ara Group	539.83	
Oman	Thamoud-6 core	n/a	2115.00	-4.41	Petroleum Development Oman	Ara Group	540.13	
Oman	Thamoud-6 core	n/a	2120.00	-2.86	Petroleum Development Oman	Ara Group	540.42	
Oman	Thamoud-6 core	n/a	2120.00	-2.95	Petroleum Development Oman	Ara Group	540.42	
Oman	Thamoud-6 core	n/a	2125.00	-3.78	Petroleum Development Oman	Ara Group	540.71	
Oman	Thamoud-6 core	n/a	2130.00	1.8	Petroleum Development Oman	Ara Group	541.00	
Oman	Thamoud-6 core	n/a	2130.00	1.13	Petroleum Development Oman	Ara Group	**541.00**	ID-TIMS U-Pb age on ash layer within A4C unit of Ara Group, sample BB-5, from Oman. Bowring et al. 2007. As recalculated in GTS 2012.
Oman	Thamoud-6 core	n/a	2135.00	1.21	Petroleum Development Oman	Ara Group	541.29	
Oman	Thamoud-6 core	n/a	2140.00	1.45	Petroleum Development Oman	Ara Group	541.58	
Oman	Thamoud-6 core	n/a	2140.00	1.73	Petroleum Development Oman	Ara Group	541.58	
Oman	Thamoud-6 core	n/a	2145.00	1.47	Petroleum Development Oman	Ara Group	541.88	
Oman	Thamoud-6 core	n/a	2150.00	1.42	Petroleum Development Oman	Ara Group	542.17	
Oman	Thamoud-6 core	n/a	2150.00	1.87	Petroleum Development Oman	Ara Group	542.17	
Oman	Thamoud-6 core	n/a	2155.00	2.15	Petroleum Development Oman	Ara Group	542.46	
Oman	Thamoud-6 core	n/a	2158.00	1.16	Petroleum Development Oman	Ara Group	542.63	
Oman	Thamoud-6 core	n/a	2160.00	3.02	Petroleum Development Oman	Ara Group	542.75	
Oman	Thamoud-6 core	n/a	2160.00	2.66	Petroleum Development Oman	Ara Group	542.75	
Oman	Thamoud-6 core	n/a	2165.00	3.22	Petroleum Development Oman	Ara Group	543.04	
Oman	Thamoud-6 core	n/a	2170.00	2.65	Petroleum Development Oman	Ara Group	543.33	
Oman	Thamoud-6 core	n/a	2170.00	2.75	Petroleum Development Oman	Ara Group	543.33	
Oman	Thamoud-6 core	n/a	2174.00	1.73	Petroleum Development Oman	Ara Group	543.57	
Oman	Thamoud-6 core	n/a	2175.00	2.35	Petroleum Development Oman	Ara Group	543.63	
Oman	Thamoud-6 core	n/a	2180.00	2.35	Petroleum Development Oman	Ara Group	543.92	
Oman	Thamoud-6 core	n/a	2180.00	2.6	Petroleum Development Oman	Ara Group	543.92	
Oman	Thamoud-6 core	n/a	2185.00	0.17	Petroleum Development Oman	Ara Group	544.21	
Oman	Thamoud-6 core	n/a	2189.00	0.98	Petroleum Development Oman	Ara Group	544.44	
Oman	Thamoud-6 core	n/a	2190.00	-0.24	Petroleum Development Oman	Ara Group	544.50	
Oman	Thamoud-6 core	n/a	2190.00	-0.21	Petroleum Development Oman	Ara Group	544.50	
Oman	Thamoud-6 core	n/a	2195.00	0.66	Petroleum Development Oman	Ara Group	544.79	
Oman	Thamoud-6 core	n/a	2200.00	1.77	Petroleum Development Oman	Ara Group	545.08	
Oman	Thamoud-6 core	n/a	2200.00	1.59	Petroleum Development Oman	Ara Group	545.08	
Oman	Thamoud-6 core	n/a	2205.00	1.73	Petroleum Development Oman	Ara Group	545.37	
Oman	Thamoud-6 core	n/a	2210.00	1.87	Petroleum Development Oman	Ara Group	545.67	
Oman	Thamoud-6 core	n/a	2210.00	1.71	Petroleum Development Oman	Ara Group	545.67	
Oman	Thamoud-6 core	n/a	2215.00	1.6	Petroleum Development Oman	Ara Group	545.96	
Oman	Thamoud-6 core	n/a	2220.00	1.46	Petroleum Development Oman	Ara Group	546.25	
Oman	Thamoud-6 core	n/a	2220.00	1.84	Petroleum Development Oman	Ara Group	546.25	
Oman	Thamoud-6 core	n/a	2225.00	1.36	Petroleum Development Oman	Ara Group	546.54	
Oman	Thamoud-6 core	n/a	2230.00	-1.04	Petroleum Development Oman	Ara Group	546.83	
Oman	Thamoud-6 core	n/a	2230.00	1.61	Petroleum Development Oman	Ara Group	546.83	
Oman	Thamoud-6 core	n/a	2235.00	-4.67	Petroleum Development Oman	Ara Group	547.12	
Oman	Thamoud-6 core	n/a	2240.00	0.17	Petroleum Development Oman	Ara Group	547.42	
Oman	Thamoud-6 core	n/a	2240.00	0.17	Petroleum Development Oman	Ara Group	547.42	
Oman	Thamoud-6 core	n/a	2245.00	0.34	Petroleum Development Oman	Ara Group	547.71	
Oman	Thamoud-6 core	n/a	2250.00	0.96	Petroleum Development Oman	Ara Group	548.00	
Oman	Thamoud-6 core	n/a	2250.00	0.19	Petroleum Development Oman	Ara Group	**548**	Estimated age of Buah-Ara unconformity, after Bowring et al. 2007.
Oman	Thamoud-6 core	n/a	2255.00	1.47	Petroleum Development Oman	Volcaniclastics	548.14	
Oman	Thamoud-6 core	n/a	2255.00	1.27	Petroleum Development Oman	Volcaniclastics	548.14	
Oman	Thamoud-6 core	n/a	2260.00	0.98	Petroleum Development Oman	Volcaniclastics	548.28	
Oman	Thamoud-6 core	n/a	2260.00	0.87	Petroleum Development Oman	Volcaniclastics	548.28	
Oman	Thamoud-6 core	n/a	2260.00	1.01	Petroleum Development Oman	Volcaniclastics	548.28	
Oman	Thamoud-6 core	n/a	2265.00	0.23	Petroleum Development Oman	Volcaniclastics	548.42	
Oman	Thamoud-6 core	n/a	2265.00	0.59	Petroleum Development Oman	Volcaniclastics	548.42	
Oman	Thamoud-6 core	n/a	2270.00	-0.54	Petroleum Development Oman	Volcaniclastics	548.56	
Oman	Thamoud-6 core	n/a	2270.00	-0.39	Petroleum Development Oman	Volcaniclastics	548.56	
Oman	Thamoud-6 core	n/a	2275.00	0	Petroleum Development Oman	Volcaniclastics	548.70	
Oman	Thamoud-6 core	n/a	2280.00	-0.13	Petroleum Development Oman	Volcaniclastics	548.84	
Oman	Thamoud-6 core	n/a	2280.00	0.03	Petroleum Development Oman	Volcaniclastics	548.84	
Oman	Thamoud-6 core	n/a	2285.00	-2.02	Petroleum Development Oman	Volcaniclastics	548.98	
Oman	Thamoud-6 core	n/a	2290.00	-1.69	Petroleum Development Oman	Volcaniclastics	549.12	
Oman	Thamoud-6 core	n/a	2290.00	-2.54	Petroleum Development Oman	Volcaniclastics	549.12	
Oman	Thamoud-6 core	n/a	2290.00	-1.01	Petroleum Development Oman	Volcaniclastics	549.12	
Oman	Thamoud-6 core	n/a	2295.00	-3.44	Petroleum Development Oman	Volcaniclastics	549.26	
Oman	Thamoud-6 core	n/a	2300.00	-1.11	Petroleum Development Oman	Volcaniclastics	549.40	
Oman	Thamoud-6 core	n/a	2300.00	-0.89	Petroleum Development Oman	Volcaniclastics	549.40	
Oman	Thamoud-6 core	n/a	2305.00	-1.95	Petroleum Development Oman	Volcaniclastics	549.55	
Oman	Thamoud-6 core	n/a	2305.00	-3.83	Petroleum Development Oman	Volcaniclastics	549.55	
Oman	Thamoud-6 core	n/a	2310.00	-1.77	Petroleum Development Oman	Volcaniclastics	549.69	
Oman	Thamoud-6 core	n/a	2310.00	-1.27	Petroleum Development Oman	Volcaniclastics	549.69	
Oman	Thamoud-6 core	n/a	2315.00	-1.09	Petroleum Development Oman	Volcaniclastics	549.83	
Oman	Thamoud-6 core	n/a	2320.00	-1.23	Petroleum Development Oman	Volcaniclastics	549.97	
Oman	Thamoud-6 core	n/a	2320.00	-1.3	Petroleum Development Oman	Volcaniclastics	549.97	
Oman	Thamoud-6 core	n/a	2325.00	-0.19	Petroleum Development Oman	Volcaniclastics	550.11	
Oman	Thamoud-6 core	n/a	2330.00	-0.19	Petroleum Development Oman	Volcaniclastics	550.25	
Oman	Thamoud-6 core	n/a	2330.00	-0.84	Petroleum Development Oman	Volcaniclastics	550.25	
Oman	Thamoud-6 core	n/a	2335.00	-0.85	Petroleum Development Oman	Volcaniclastics	550.39	
Oman	Thamoud-6 core	n/a	2340.00	-0.78	Petroleum Development Oman	Volcaniclastics	550.53	
Oman	Thamoud-6 core	n/a	2340.00	-0.92	Petroleum Development Oman	Volcaniclastics	550.53	
Oman	Thamoud-6 core	n/a	2350.00	-5.61	Petroleum Development Oman	Volcaniclastics	550.81	
Oman	Thamoud-6 core	n/a	2350.00	-4.69	Petroleum Development Oman	Volcaniclastics	550.81	
Oman	Thamoud-6 core	n/a	2355.00	-5.21	Petroleum Development Oman	Volcaniclastics	550.95	
Oman	Thamoud-6 core	n/a	2360.00	-1.92	Petroleum Development Oman	Buah Fm	**551.09**	ID-TIMS U-Pb date on ash layer in Doushantuo Fm, China. Condon et al. 2005. Associated with δ13C values ~0 permil, above Shuram Excursion; sequence boundary between age and excursion in Doushantuo stratigraphy. Correlated on the basis of chemostratigraphy. As recalculated in GTS 2012.
Oman	Thamoud-6 core	n/a	2361.00	-6.03	Petroleum Development Oman	Buah Fm	551.42	
Oman	Thamoud-6 core	n/a	2365.00	-1.73	Petroleum Development Oman	Buah Fm	552.75	
Oman	Thamoud-6 core	n/a	2369.00	-0.73	Petroleum Development Oman	Buah Fm	554.08	
Oman	Thamoud-6 core	n/a	2370.00	-3.25	Petroleum Development Oman	Buah Fm	554.41	
Oman	Thamoud-6 core	n/a	2370.00	-2.57	Petroleum Development Oman	Buah Fm	554.41	
Oman	Thamoud-6 core	n/a	2380.00	-5.27	Petroleum Development Oman	Buah Fm	557.72	
Oman	Thamoud-6 core	n/a	2380.00	-5.02	Petroleum Development Oman	Buah Fm	557.72	
Oman	Thamoud-6 core	n/a	2390.00	-3.51	Petroleum Development Oman	Buah Fm	561.04	
Oman	Thamoud-6 core	n/a	2395.00	-0.47	Petroleum Development Oman	Buah Fm	**562.7**	Well M sample, middle Buah Fm, Oman, this study. Sample Overlies Shuram excursion; associated with positive δ13C values.
Oman	Thamoud-6 core	n/a	2395.00	-0.64	Petroleum Development Oman	Buah Fm	562.70	
Oman	Thamoud-6 core	n/a	2400.00	-0.19	Petroleum Development Oman	Buah Fm	562.78	
Oman	Thamoud-6 core	n/a	2400.00	-0.52	Petroleum Development Oman	Buah Fm	562.78	
Oman	Thamoud-6 core	n/a	2410.00	-1.96	Petroleum Development Oman	Buah Fm	562.93	
Oman	Thamoud-6 core	n/a	2410.00	-2.33	Petroleum Development Oman	Buah Fm	562.93	
Oman	Thamoud-6 core	n/a	2415.00	-2	Petroleum Development Oman	Buah Fm	563.00	
Oman	Thamoud-6 core	n/a	2420.00	-2.74	Petroleum Development Oman	Buah Fm	563.08	
Oman	Thamoud-6 core	n/a	2420.00	-2.37	Petroleum Development Oman	Buah Fm	563.08	
Oman	Thamoud-6 core	n/a	2425.00	-2.49	Petroleum Development Oman	Buah Fm	563.15	
Oman	Thamoud-6 core	n/a	2430.00	-3.2	Petroleum Development Oman	Buah Fm	563.23	
Oman	Thamoud-6 core	n/a	2440.00	-1.74	Petroleum Development Oman	Buah Fm	563.38	
Oman	Thamoud-6 core	n/a	2460.00	-1.55	Petroleum Development Oman	Buah Fm	563.68	
Oman	Thamoud-6 core	n/a	2480.00	-2.22	Petroleum Development Oman	Buah Fm	563.98	
Oman	Thamoud-6 core	n/a	2495.00	-3.73	Petroleum Development Oman	Buah Fm	564.21	
Oman	Thamoud-6 core	n/a	2505.00	-3.42	Petroleum Development Oman	Buah Fm	564.36	
Oman	Thamoud-6 core	n/a	2520.00	-3.03	Petroleum Development Oman	Buah Fm	564.59	
Oman	Thamoud-6 core	n/a	2530.00	-2.97	Petroleum Development Oman	Buah Fm	564.74	
Oman	Thamoud-6 core	n/a	2540.00	-3.42	Petroleum Development Oman	Buah Fm	564.89	
Oman	Thamoud-6 core	n/a	2560.00	-3.37	Petroleum Development Oman	Buah Fm	565.19	
Oman	Thamoud-6 core	n/a	2580.00	-2.55	Petroleum Development Oman	Buah Fm	565.49	
Oman	Thamoud-6 core	n/a	2600.00	-4.11	Petroleum Development Oman	Buah Fm	565.79	
Oman	Thamoud-6 core	n/a	2620.00	-4.17	Petroleum Development Oman	Buah Fm	566.09	
Oman	Thamoud-6 core	n/a	2640.00	-3.03	Petroleum Development Oman	Buah Fm	566.40	
Oman	Thamoud-6 core	n/a	2660.00	-2.71	Petroleum Development Oman	Buah Fm	566.70	
Oman	Thamoud-6 core	n/a	2680.00	-2.71	Petroleum Development Oman	Buah Fm	567.00	
Oman	Thamoud-6 core	n/a	2700.00	-2.8	Petroleum Development Oman	Buah Fm	**567.3**	Sample A1707, Blueflower Fm, NW Canada, this study. Lies 16 m above the contact with the underlying Gametrail Fm. Coal Creek location; lies in +2 permille plateau above a carbonate gap. Correlated to Oman on the basis of chemostratigraphy.
Oman	Thamoud-6 core	n/a	2710.00	-3.03	Petroleum Development Oman	Buah Fm	567.86	
Oman	Thamoud-6 core	n/a	2730.00	-2.74	Petroleum Development Oman	Buah Fm	568.98	
Oman	Thamoud-6 core	n/a	2735	-3.48	Petroleum Development Oman	Buah Fm	569.25	
Oman	Thamoud-6 core	n/a	2740	-8.83	Petroleum Development Oman	Buah Fm	569.53	
Oman	Thamoud-6 core	n/a	2745	-6.94	Petroleum Development Oman	Shuram Fm	569.81	
Oman	Thamoud-6 core	n/a	2745	-8.16	Petroleum Development Oman	Shuram Fm	569.81	
Oman	Thamoud-6 core	n/a	2750	-7.34	Petroleum Development Oman	Shuram Fm	570.09	
Oman	Thamoud-6 core	n/a	2750	-8.02	Petroleum Development Oman	Shuram Fm	570.09	
Oman	Thamoud-6 core	n/a	2752	-7.58	Petroleum Development Oman	Shuram Fm	570.20	
Oman	Thamoud-6 core	n/a	2755	-8.28	Petroleum Development Oman	Shuram Fm	570.37	
Oman	Thamoud-6 core	n/a	2760	-7.72	Petroleum Development Oman	Shuram Fm	570.65	
Oman	Thamoud-6 core	n/a	2760	-8.27	Petroleum Development Oman	Shuram Fm	570.65	
Oman	Thamoud-6 core	n/a	2765	-8.31	Petroleum Development Oman	Shuram Fm	570.93	
Oman	Thamoud-6 core	n/a	2770	-8.18	Petroleum Development Oman	Shuram Fm	571.21	
Oman	Thamoud-6 core	n/a	2770	-8.49	Petroleum Development Oman	Shuram Fm	571.21	
Oman	Thamoud-6 core	n/a	2775	-8.92	Petroleum Development Oman	Shuram Fm	571.49	
Oman	Thamoud-6 core	n/a	2780	-9.6	Petroleum Development Oman	Shuram Fm	571.77	
Oman	Thamoud-6 core	n/a	2780	-10.28	Petroleum Development Oman	Shuram Fm	571.77	
Oman	Thamoud-6 core	n/a	2785	-10.31	Petroleum Development Oman	Shuram Fm	572.05	
Oman	Thamoud-6 core	n/a	2790	-11.53	Petroleum Development Oman	Shuram Fm	572.33	
Oman	Thamoud-6 core	n/a	2790	-11.75	Petroleum Development Oman	Shuram Fm	572.33	
Oman	Thamoud-6 core	n/a	2795	-12.75	Petroleum Development Oman	Shuram Fm	572.60	
Oman	Thamoud-6 core	n/a	2800	-10.78	Petroleum Development Oman	Khufai Fm	572.88	
Oman	Thamoud-6 core	n/a	2800	-11.28	Petroleum Development Oman	Khufai Fm	572.88	
Oman	Thamoud-6 core	n/a	2805	-7	Petroleum Development Oman	Khufai Fm	573.16	
Oman	Thamoud-6 core	n/a	2810	-6.61	Petroleum Development Oman	Khufai Fm	573.44	
Oman	Thamoud-6 core	n/a	2810	-6.33	Petroleum Development Oman	Khufai Fm	573.44	

Oman	Thamoud-6 core	n/a	2815	-3.36	Petroleum Development Oman	Khufai Fm	573.72	
Oman	Thamoud-6 core	n/a	2820	1.67	Petroleum Development Oman	Khufai Fm	**574**	Sample J1719, Nadaleen Fm, NW Canada. Underlies Shuram excursion. Occurs within a plateau δ13C values of +8 permille about 30 meters below contact with the Gametrail. Correlated to Oman on the basis of chemostratigraphy.
Oman	Thamoud-6 core	n/a	2820	2.2	Petroleum Development Oman	Khufai Fm	574.00	
Oman	Thamoud-6 core	n/a	2825	3.35	Petroleum Development Oman	Khufai Fm	574.26	
Oman	Thamoud-6 core	n/a	2830	2.52	Petroleum Development Oman	Khufai Fm	574.53	
Oman	Thamoud-6 core	n/a	2830	3.29	Petroleum Development Oman	Khufai Fm	574.53	
Oman	Thamoud-6 core	n/a	2840	3.39	Petroleum Development Oman	Khufai Fm	575.05	
Oman	Thamoud-6 core	n/a	2840	4.42	Petroleum Development Oman	Khufai Fm	575.05	
Oman	Thamoud-6 core	n/a	2844	4.7	Petroleum Development Oman	Khufai Fm	575.26	
Oman	Thamoud-6 core	n/a	2845	4.3	Petroleum Development Oman	Khufai Fm	575.31	
Oman	Thamoud-6 core	n/a	2850	3.93	Petroleum Development Oman	Khufai Fm	575.58	
Oman	Thamoud-6 core	n/a	2850	4.57	Petroleum Development Oman	Khufai Fm	575.58	
Oman	Thamoud-6 core	n/a	2855	4.62	Petroleum Development Oman	Khufai Fm	575.84	
Oman	Thamoud-6 core	n/a	2858	4.96	Petroleum Development Oman	Khufai Fm	576.00	
Oman	Thamoud-6 core	n/a	2860	4.4	Petroleum Development Oman	Khufai Fm	576.10	
Oman	Thamoud-6 core	n/a	2860	4.5	Petroleum Development Oman	Khufai Fm	576.10	
Oman	Thamoud-6 core	n/a	2865	5.13	Petroleum Development Oman	Khufai Fm	576.36	
Oman	Thamoud-6 core	n/a	2867	3.98	Petroleum Development Oman	Khufai Fm	576.47	
Oman	Thamoud-6 core	n/a	2870	4.68	Petroleum Development Oman	Khufai Fm	576.63	
Oman	Thamoud-6 core	n/a	2870	4.72	Petroleum Development Oman	Khufai Fm	576.63	
Oman	Thamoud-6 core	n/a	2872	4.76	Petroleum Development Oman	Khufai Fm	576.73	
Oman	Thamoud-6 core	n/a	2875	4.54	Petroleum Development Oman	Khufai Fm	576.89	
Oman	Thamoud-6 core	n/a	2877	4.27	Petroleum Development Oman	Khufai Fm	576.99	
Oman	Thamoud-6 core	n/a	2880	4.61	Petroleum Development Oman	Khufai Fm	577.15	
Oman	Thamoud-6 core	n/a	2890	3.86	Petroleum Development Oman	Khufai Fm	577.68	
Oman	Thamoud-6 core	n/a	2900		Petroleum Development Oman	basal Khufai Fm	**578.2**	Well L sample, basal Khufai Fm, Oman. This study. Underlies Shuram excursion.
Northwest Canada	Redstone section	0.0	n/a	-1.9	James et al. 2001	Ravensthroat Fm	**635.3**	ID-TIMS U-Pb date on ash layer in Doushantuo Fm, China. Condon et al. 2005. Correlated to the Northwest Canada cap carbonate. As recalculated in GTS 2012.
Northwest Canada	Redstone section	0.0	n/a	-0.7	James et al. 2001	Ravensthroat Fm	635.3	
Northwest Canada	Redstone section	0.1	n/a	-1.7	James et al. 2001	Ravensthroat Fm	635.3	
Northwest Canada	Redstone section	0.2	n/a	-1.9	James et al. 2001	Ravensthroat Fm	635.3	
Northwest Canada	Redstone section	0.5	n/a	-2.3	James et al. 2001	Ravensthroat Fm	635.3	
Northwest Canada	Redstone section	0.7	n/a	-2.0	James et al. 2001	Ravensthroat Fm	635.3	
Northwest Canada	Redstone section	1.0	n/a	-2.6	James et al. 2001	Ravensthroat Fm	635.3	
Northwest Canada	Redstone section	1.5	n/a	-3.0	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	2.0	n/a	-2.7	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	2.0	n/a	-2.6	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	2.2	n/a	-2.7	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	2.3	n/a	-2.7	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	2.4	n/a	-2.6	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	2.5	n/a	-2.8	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	3.0	n/a	-2.9	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	3.0	n/a	-2.5	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	3.5	n/a	-3.1	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	3.8	n/a	-2.6	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	4.0	n/a	-2.8	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	4.5	n/a	-2.9	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	5.0	n/a	-2.9	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	5.5	n/a	-2.7	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	5.8	n/a	-2.7	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	6.5	n/a	-2.5	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	6.8	n/a	-2.7	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	7.8	n/a	-2.8	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	8.8	n/a	-2.8	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	9.8	n/a	-2.8	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	11.0	n/a	-2.9	James et al. 2001	Ravensthroat Fm	635.2	
Northwest Canada	Redstone section	12.0	n/a	-3.1	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	13.0	n/a	-3.0	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	13.8	n/a	-3.2	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	14.0	n/a	-3.2	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	14.7	n/a	-3.2	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	14.7	n/a	-2.6	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	15.8	n/a	-2.8	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	16.0	n/a	-3.6	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	16.0	n/a	-1.4	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	17.0	n/a	-3.5	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	17.0	n/a	-4.6	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	17.0	n/a	-4.4	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	17.0	n/a	-4.5	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	17.7	n/a	-3.5	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	18.0	n/a	-3.7	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	18.0	n/a	-3.9	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	18.8	n/a	-5.5	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	19.2	n/a	-4.1	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	19.2	n/a	-5.5	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	20.0	n/a	-5.2	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	21.0	n/a	-5.2	James et al. 2001	Ravensthroat Fm	635.1	
Northwest Canada	Redstone section	22.0	n/a	-5.4	James et al. 2001	Ravensthroat Fm	635.0	
Northwest Canada	Redstone section	22.7	n/a	-4.1	James et al. 2001	Ravensthroat Fm	635.0	
Northwest Canada	Redstone section	23.0	n/a	-5.1	James et al. 2001	Ravensthroat Fm	635.0	
Northwest Canada	Redstone section	23.8	n/a	-4.9	James et al. 2001	Ravensthroat Fm	635.0	
Northwest Canada	Redstone section	24.0	n/a	-5.4	James et al. 2001	Ravensthroat Fm	635.0	
Northwest Canada	Redstone section	24.8	n/a	-4.6	James et al. 2001	Ravensthroat Fm	635.0	
Northwest Canada	Redstone section	26.7	n/a	-3.6	James et al. 2001	Ravensthroat Fm	**635.0**	Estimated end of cap carbonate deposition.
Northwest Canada	Nadaleen Type Section	121.50	n/a	7.31	Moynihan et al. 2019	Nadaleen Fm	**595.0**	Estimated start of Nadaleen Fm deposition on the basis of chemostratigraphic correlation.
Northwest Canada	Nadaleen Type Section	122.40	n/a	8.51	Moynihan et al. 2019	Nadaleen Fm	595.0	
Northwest Canada	Nadaleen Type Section	123.00	n/a	8.39	Moynihan et al. 2019	Nadaleen Fm	594.9	
Northwest Canada	Nadaleen Type Section	125.00	n/a	8.2	Moynihan et al. 2019	Nadaleen Fm	594.8	
Northwest Canada	Nadaleen Type Section	136.80	n/a	5.48	Moynihan et al. 2019	Nadaleen Fm	594.2	
Northwest Canada	Nadaleen Type Section	144.80	n/a	8	Moynihan et al. 2019	Nadaleen Fm	593.8	
Northwest Canada	Nadaleen Type Section	148.50	n/a	8.36	Moynihan et al. 2019	Nadaleen Fm	593.6	
Northwest Canada	Nadaleen Type Section	155.80	n/a	8.27	Moynihan et al. 2019	Nadaleen Fm	593.3	
Northwest Canada	Nadaleen Type Section	158.00	n/a	8.37	Moynihan et al. 2019	Nadaleen Fm	593.2	
Northwest Canada	Nadaleen Type Section	162.00	n/a	8.53	Moynihan et al. 2019	Nadaleen Fm	593.0	
Northwest Canada	Nadaleen Type Section	165.10	n/a	8.48	Moynihan et al. 2019	Nadaleen Fm	592.8	
Northwest Canada	Nadaleen Type Section	169.40	n/a	8.36	Moynihan et al. 2019	Nadaleen Fm	592.6	
Northwest Canada	Nadaleen Type Section	173.60	n/a	8.44	Moynihan et al. 2019	Nadaleen Fm	592.4	
Northwest Canada	Nadaleen Type Section	177.80	n/a	8.55	Moynihan et al. 2019	Nadaleen Fm	592.2	
Northwest Canada	Nadaleen Type Section	183.20	n/a	8.41	Moynihan et al. 2019	Nadaleen Fm	591.9	
Northwest Canada	Nadaleen Type Section	192.80	n/a	7.57	Moynihan et al. 2019	Nadaleen Fm	591.4	
Northwest Canada	Nadaleen Type Section	195.20	n/a	8.17	Moynihan et al. 2019	Nadaleen Fm	591.3	
Northwest Canada	Nadaleen Type Section	199.60	n/a	8.13	Moynihan et al. 2019	Nadaleen Fm	591.1	
Northwest Canada	Nadaleen Type Section	204.70	n/a	8.48	Moynihan et al. 2019	Nadaleen Fm	590.8	
Northwest Canada	Nadaleen Type Section	207.90	n/a	8.6	Moynihan et al. 2019	Nadaleen Fm	590.6	
Northwest Canada	Nadaleen Type Section	210.50	n/a	8.03	Moynihan et al. 2019	Nadaleen Fm	590.5	
Northwest Canada	Nadaleen Type Section	217.50	n/a	9.21	Moynihan et al. 2019	Nadaleen Fm	590.1	
Northwest Canada	Nadaleen Type Section	222.10	n/a	9.33	Moynihan et al. 2019	Nadaleen Fm	589.9	
Northwest Canada	Nadaleen Type Section	227.50	n/a	9.45	Moynihan et al. 2019	Nadaleen Fm	589.6	
Northwest Canada	Nadaleen Type Section	234.60	n/a	9.37	Moynihan et al. 2019	Nadaleen Fm	589.3	
Northwest Canada	Nadaleen Type Section	300.20	n/a	8.26	Moynihan et al. 2019	Nadaleen Fm	586.0	
Northwest Canada	Nadaleen Type Section	302.50	n/a	7.69	Moynihan et al. 2019	Nadaleen Fm	585.8	
Northwest Canada	Nadaleen Type Section	304.60	n/a	8.17	Moynihan et al. 2019	Nadaleen Fm	585.7	
Northwest Canada	Nadaleen Type Section	435.50	n/a	9.03	Moynihan et al. 2019	Nadaleen Fm	579.1	
Northwest Canada	Nadaleen Type Section	436.50	n/a	9.43	Moynihan et al. 2019	Nadaleen Fm	579.1	
Northwest Canada	Nadaleen Type Section	438.10	n/a	9.58	Moynihan et al. 2019	Nadaleen Fm	579.0	
Northwest Canada	Nadaleen Type Section	441.10	n/a	9.46	Moynihan et al. 2019	Nadaleen Fm	578.8	
Northwest Canada	Nadaleen Type Section	446.60	n/a	9.16	Moynihan et al. 2019	Nadaleen Fm	578.6	
Northwest Canada	Nadaleen Type Section	449.20	n/a	9.18	Moynihan et al. 2019	Nadaleen Fm	578.4	
Northwest Canada	Nadaleen Type Section	451.60	n/a	9.29	Moynihan et al. 2019	Nadaleen Fm	578.3	
Northwest Canada	Nadaleen Type Section	454.80	n/a	9.31	Moynihan et al. 2019	Nadaleen Fm	578.2	
Northwest Canada	Nadaleen Type Section	457.10	n/a	9.33	Moynihan et al. 2019	Nadaleen Fm	578.0	
Northwest Canada	Nadaleen Type Section	460.00	n/a	9.38	Moynihan et al. 2019	Nadaleen Fm	577.9	
Northwest Canada	Nadaleen Type Section	462.40	n/a	9.3	Moynihan et al. 2019	Nadaleen Fm	577.8	
Northwest Canada	Nadaleen Type Section	477.80	n/a	10.89	Moynihan et al. 2019	Nadaleen Fm	577.0	
Northwest Canada	Nadaleen Type Section	479.70	n/a	9.53	Moynihan et al. 2019	Nadaleen Fm	576.9	
Northwest Canada	Nadaleen Type Section	481.70	n/a	9.54	Moynihan et al. 2019	Nadaleen Fm	576.8	
Northwest Canada	Nadaleen Type Section	484.20	n/a	10.03	Moynihan et al. 2019	Nadaleen Fm	576.7	
Northwest Canada	Nadaleen Type Section	486.10	n/a	9.82	Moynihan et al. 2019	Nadaleen Fm	576.6	
Northwest Canada	Nadaleen Type Section	488.80	n/a	10.38	Moynihan et al. 2019	Nadaleen Fm	576.4	
Northwest Canada	Nadaleen Type Section	489.80	n/a	9.7	Moynihan et al. 2019	Nadaleen Fm	576.4	
Northwest Canada	Nadaleen Type Section	491.30	n/a	10.04	Moynihan et al. 2019	Nadaleen Fm	576.3	
Northwest Canada	Nadaleen Type Section	493.20	n/a	10.56	Moynihan et al. 2019	Nadaleen Fm	576.2	
Northwest Canada	Nadaleen Type Section	495.20	n/a	11.4	Moynihan et al. 2019	Nadaleen Fm	576.1	
Northwest Canada	Nadaleen Type Section	496.30	n/a	10.86	Moynihan et al. 2019	Nadaleen Fm	576.1	
Northwest Canada	Nadaleen Type Section	499.20	n/a	11.26	Moynihan et al. 2019	Nadaleen Fm	575.9	
Northwest Canada	Nadaleen Type Section	504.70	n/a	10.69	Moynihan et al. 2019	Nadaleen Fm	575.6	
Northwest Canada	Nadaleen Type Section	508.80	n/a	11.38	Moynihan et al. 2019	Nadaleen Fm	575.4	
Northwest Canada	Nadaleen Type Section	510.60	n/a	5.04	Moynihan et al. 2019	Nadaleen Fm	575.3	
Northwest Canada	Nadaleen Type Section	513.50	n/a	9.69	Moynihan et al. 2019	Nadaleen Fm	575.2	
Northwest Canada	Nadaleen Type Section	515.20	n/a	9.26	Moynihan et al. 2019	Nadaleen Fm	575.1	
Northwest Canada	Nadaleen Type Section	521.10	n/a	9.38	Moynihan et al. 2019	Nadaleen Fm	574.8	
Northwest Canada	Nadaleen Type Section	523.40	n/a	9.11	Moynihan et al. 2019	Nadaleen Fm	574.7	
Northwest Canada	Nadaleen Type Section	525.50	n/a	8.33	Moynihan et al. 2019	Nadaleen Fm	574.6	
Northwest Canada	Nadaleen Type Section	527.50	n/a	9.22	Moynihan et al. 2019	Nadaleen Fm	574.5	
Northwest Canada	Nadaleen Type Section	529.50	n/a	9.73	Moynihan et al. 2019	Nadaleen Fm	574.4	
Northwest Canada	Nadaleen Type Section	531.70	n/a	9.41	Moynihan et al. 2019	Nadaleen Fm	574.3	
Northwest Canada	Nadaleen Type Section	533.50	n/a	9.39	Moynihan et al. 2019	Nadaleen Fm	574.2	
Northwest Canada	Nadaleen Type Section	536.90	n/a	9.2	Moynihan et al. 2019	Nadaleen Fm	**574.0**	Sample J1719, Nadaleen Fm, NW Canada, this study. Underlies Shuram excursion. Occurs within a plateau of positive δ13C values about 30 meters below contact with the Gametrail.
Northwest Canada	Nadaleen Type Section	539.00	n/a	9.69	Moynihan et al. 2019	Nadaleen Fm	573.9	
Northwest Canada	Nadaleen Type Section	541.00	n/a	9.61	Moynihan et al. 2019	Nadaleen Fm	573.9	
Northwest Canada	Nadaleen Type Section	544.00	n/a	10.4	Moynihan et al. 2019	Nadaleen Fm	573.8	
Northwest Canada	Nadaleen Type Section	547.00	n/a	8.69	Moynihan et al. 2019	Nadaleen Fm	573.7	
Northwest Canada	Nadaleen Type Section	549.50	n/a	8.64	Moynihan et al. 2019	Nadaleen Fm	573.6	
Northwest Canada	Nadaleen Type Section	552.70	n/a	8.59	Moynihan et al. 2019	Nadaleen Fm	573.5	
Northwest Canada	Nadaleen Type Section	558.00	n/a	8.55	Moynihan et al. 2019	Nadaleen Fm	573.4	
Northwest Canada	Nadaleen Type Section	560.00	n/a	7.97	Moynihan et al. 2019	Nadaleen Fm	573.3	
Northwest Canada	Nadaleen Type Section	564.00	n/a	7.36	Moynihan et al. 2019	Nadaleen Fm	573.2	
Northwest Canada	Nadaleen Type Section	566.00	n/a	6.96	Moynihan et al. 2019	Nadaleen Fm	573.1	
Northwest Canada	Gametrail G3 Section	0.60	n/a	-12.67	Moynihan et al. 2019	Gametrail Fm	573.1	
Northwest Canada	Gametrail G3 Section	3.10	n/a	-11.19	Moynihan et al. 2019	Gametrail Fm	573.1	
Northwest Canada	Gametrail G3 Section	4.40	n/a	-12.19	Moynihan et al. 2019	Gametrail Fm	573.0	
Northwest Canada	Gametrail G3 Section	9.70	n/a	-11.76	Moynihan et al. 2019	Gametrail Fm	572.9	
Northwest Canada	Gametrail G3 Section	10.70	n/a	-11.26	Moynihan et al. 2019	Gametrail Fm	572.8	
Northwest Canada	Gametrail G3 Section	12.60	n/a	-10.38	Moynihan et al. 2019	Gametrail Fm	572.8	
Northwest Canada	Gametrail G3 Section	14.90	n/a	-11.79	Moynihan et al. 2019	Gametrail Fm	572.7	
Northwest Canada	Gametrail G3 Section	16.40	n/a	-11.87	Moynihan et al. 2019	Gametrail Fm	572.7	
Northwest Canada	Gametrail G3 Section	19.00	n/a	-10.52	Moynihan et al. 2019	Gametrail Fm	572.6	
Northwest Canada	Gametrail G3 Section	98.70	n/a	-9.79	Moynihan et al. 2019	Gametrail Fm	570.3	
Northwest Canada	Gametrail G3 Section	99.20	n/a	-10.03	Moynihan et al. 2019	Gametrail Fm	570.2	
Northwest Canada	Gametrail G3 Section	100.70	n/a	-10.14	Moynihan et al. 2019	Gametrail Fm	570.2	

Northwest Canada	Gametrail G3 Section	101.30	n/a	-9.79	Moynihan et al. 2019	Gametrail Fm	570.2	
Northwest Canada	Gametrail G3 Section	108.90	n/a	-9.6	Moynihan et al. 2019	Gametrail Fm	570.0	
Northwest Canada	Gametrail G3 Section	112.10	n/a	-9.02	Moynihan et al. 2019	Gametrail Fm	569.9	
Northwest Canada	Gametrail G3 Section	113.10	n/a	-9.25	Moynihan et al. 2019	Gametrail Fm	569.8	
Northwest Canada	Gametrail G3 Section	114.20	n/a	-9.12	Moynihan et al. 2019	Gametrail Fm	569.8	
Northwest Canada	Gametrail G3 Section	115.30	n/a	-8.43	Moynihan et al. 2019	Gametrail Fm	569.8	
Northwest Canada	Gametrail G3 Section	117.00	n/a	-9.17	Moynihan et al. 2019	Gametrail Fm	569.7	
Northwest Canada	Gametrail G3 Section	118.20	n/a	-8.92	Moynihan et al. 2019	Gametrail Fm	569.7	
Northwest Canada	Gametrail G3 Section	133.90	n/a	-8.87	Moynihan et al. 2019	Gametrail Fm	569.2	
Northwest Canada	Gametrail G3 Section	134.30	n/a	-8.36	Moynihan et al. 2019	Gametrail Fm	569.2	
Northwest Canada	Gametrail G3 Section	137.80	n/a	-8.9	Moynihan et al. 2019	Gametrail Fm	569.1	
Northwest Canada	Gametrail G3 Section	138.60	n/a	-9	Moynihan et al. 2019	Gametrail Fm	569.1	
Northwest Canada	Gametrail G3 Section	139.70	n/a	-8.85	Moynihan et al. 2019	Gametrail Fm	569.1	
Northwest Canada	Gametrail G3 Section	143.90	n/a	-8.97	Moynihan et al. 2019	Gametrail Fm	568.9	
Northwest Canada	Gametrail G3 Section	144.80	n/a	-8.81	Moynihan et al. 2019	Gametrail Fm	568.9	
Northwest Canada	Gametrail G3 Section	146.70	n/a	-8.4	Moynihan et al. 2019	Gametrail Fm	568.9	
Northwest Canada	Gametrail G3 Section	147.80	n/a	-8.17	Moynihan et al. 2019	Gametrail Fm	568.8	
Northwest Canada	Gametrail G3 Section	149.00	n/a	-8.25	Moynihan et al. 2019	Gametrail Fm	568.8	
Northwest Canada	Gametrail G3 Section	150.90	n/a	-8.35	Moynihan et al. 2019	Gametrail Fm	568.7	
Northwest Canada	Gametrail G3 Section	151.80	n/a	-8.53	Moynihan et al. 2019	Gametrail Fm	568.7	
Northwest Canada	Gametrail G3 Section	160.20	n/a	-8.96	Moynihan et al. 2019	Gametrail Fm	568.5	
Northwest Canada	Gametrail G3 Section	163.80	n/a	-8.69	Moynihan et al. 2019	Gametrail Fm	568.4	
Northwest Canada	Gametrail G3 Section	164.70	n/a	-7.62	Moynihan et al. 2019	Gametrail Fm	568.3	
Northwest Canada	Gametrail G3 Section	165.60	n/a	-8.16	Moynihan et al. 2019	Gametrail Fm	568.3	
Northwest Canada	Gametrail G3 Section	166.80	n/a	-8.04	Moynihan et al. 2019	Gametrail Fm	568.3	
Northwest Canada	Gametrail G3 Section	169.90	n/a	-8.32	Moynihan et al. 2019	Gametrail Fm	568.2	
Northwest Canada	Gametrail G3 Section	170.20	n/a	-8.59	Moynihan et al. 2019	Gametrail Fm	568.2	
Northwest Canada	Gametrail G3 Section	172.30	n/a	-8.41	Moynihan et al. 2019	Gametrail Fm	568.1	
Northwest Canada	Gametrail G3 Section	174.40	n/a	-8.28	Moynihan et al. 2019	Gametrail Fm	568.1	
Northwest Canada	Gametrail G3 Section	176.50	n/a	-7.91	Moynihan et al. 2019	Gametrail Fm	568.0	
Northwest Canada	Gametrail G3 Section	178.70	n/a	-6.79	Moynihan et al. 2019	Gametrail Fm	567.9	
Northwest Canada	Gametrail G3 Section	181.00	n/a	-5.29	Moynihan et al. 2019	Gametrail Fm	567.9	
Northwest Canada	Gametrail G3 Section	183.00	n/a	-2.67	Moynihan et al. 2019	Gametrail Fm	567.8	
Northwest Canada	Blueflower G3 Section	185.70	n/a	1.94	Moynihan et al. 2019	Blueflower Fm	567.7	
Northwest Canada	Blueflower G3 Section	187.80	n/a	3.4	Moynihan et al. 2019	Blueflower Fm	567.7	
Northwest Canada	Blueflower G3 Section	189.70	n/a	2.25	Moynihan et al. 2019	Blueflower Fm	567.6	
Northwest Canada	Blueflower G3 Section	193.00	n/a	1.98	Moynihan et al. 2019	Blueflower Fm	567.5	
Northwest Canada	Blueflower G3 Section	195.10	n/a	1.94	Moynihan et al. 2019	Blueflower Fm	567.4	
Northwest Canada	Blueflower G3 Section	196.80	n/a	1.01	Moynihan et al. 2019	Blueflower Fm	567.4	
Northwest Canada	Blueflower G3 Section	198.90	n/a	0.6	Moynihan et al. 2019	Blueflower Fm	567.3	
Northwest Canada	Blueflower G3 Section	200.10	n/a	1.52	Moynihan et al. 2019	Blueflower Fm	**567.3**	Sample A1707, Blueflower Fm, NW Canad, this study. Lies 16 m above the contact with the underlying Gametrail Fm. Coal Creek location; lies in +2 permille plateau above a carbonate gap.
Northwest Canada	Blueflower G3 Section	209.40	n/a	1.01	Moynihan et al. 2019	Blueflower Fm	566.1	
Northwest Canada	Blueflower G3 Section	211.60	n/a	0.78	Moynihan et al. 2019	Blueflower Fm	565.8	
Northwest Canada	Blueflower G3 Section	214.50	n/a	1.01	Moynihan et al. 2019	Blueflower Fm	565.5	
Northwest Canada	Blueflower G3 Section	216.50	n/a	0.67	Moynihan et al. 2019	Blueflower Fm	565.2	
Northwest Canada	Blueflower G3 Section	219.20	n/a	0.45	Moynihan et al. 2019	Blueflower Fm	564.9	
Northwest Canada	Blueflower G3 Section	221.10	n/a	0.95	Moynihan et al. 2019	Blueflower Fm	564.6	
Northwest Canada	Blueflower G3 Section	223.30	n/a	1.56	Moynihan et al. 2019	Blueflower Fm	564.3	
Northwest Canada	Blueflower G3 Section	225.40	n/a	0.66	Moynihan et al. 2019	Blueflower Fm	564.1	
Northwest Canada	Blueflower G3 Section	227.20	n/a	0.37	Moynihan et al. 2019	Blueflower Fm	563.8	
Northwest Canada	Blueflower G3 Section	229.30	n/a	0.78	Moynihan et al. 2019	Blueflower Fm	563.6	
Northwest Canada	Blueflower G3 Section	231.40	n/a	1.78	Moynihan et al. 2019	Blueflower Fm	563.3	
Northwest Canada	Blueflower G3 Section	235.40	n/a	0.97	Moynihan et al. 2019	Blueflower Fm	562.8	
Northwest Canada	Blueflower G3 Section	237.30	n/a	0.32	Moynihan et al. 2019	Blueflower Fm	562.5	
Northwest Canada	Blueflower G3 Section	239.30	n/a	1.29	Moynihan et al. 2019	Blueflower Fm	562.3	
Northwest Canada	Blueflower G3 Section	241.30	n/a	1.39	Moynihan et al. 2019	Blueflower Fm	562.0	
Northwest Canada	Blueflower G3 Section	243.10	n/a	1.46	Moynihan et al. 2019	Blueflower Fm	561.8	
Northwest Canada	Blueflower G3 Section	245.50	n/a	1.25	Moynihan et al. 2019	Blueflower Fm	561.5	
Northwest Canada	Blueflower G3 Section	247.40	n/a	1.16	Moynihan et al. 2019	Blueflower Fm	561.3	
Northwest Canada	Blueflower G3 Section	249.70	n/a	1.19	Moynihan et al. 2019	Blueflower Fm	561.0	
Northwest Canada	Blueflower G3 Section	251.80	n/a	1.07	Moynihan et al. 2019	Blueflower Fm	560.7	
Northwest Canada	Blueflower G3 Section	255.80	n/a	0.56	Moynihan et al. 2019	Blueflower Fm	560.2	
Northwest Canada	Blueflower G3 Section	257.20	n/a	-0.47	Moynihan et al. 2019	Blueflower Fm	**560.0**	Estimated end of Blueflower Fm deposition on the basis of chemostratigraphy.
Northwest Canada	Algae/Risky A2 Section	1.10	n/a	3.3	Moynihan et al. 2019	Algae/Risky Fm	**550.0**	Estimated start of Algae/Risky Fm deposition on the basis of chemostratigraphy.
Northwest Canada	Algae/Risky A2 Section	1.40	n/a	3.48	Moynihan et al. 2019	Algae/Risky Fm	550.0	
Northwest Canada	Algae/Risky A2 Section	3.30	n/a	3.16	Moynihan et al. 2019	Algae/Risky Fm	549.9	
Northwest Canada	Algae/Risky A2 Section	4.20	n/a	2.87	Moynihan et al. 2019	Algae/Risky Fm	549.8	
Northwest Canada	Algae/Risky A2 Section	5.00	n/a	3.43	Moynihan et al. 2019	Algae/Risky Fm	549.8	
Northwest Canada	Algae/Risky A2 Section	6.70	n/a	3.19	Moynihan et al. 2019	Algae/Risky Fm	549.7	
Northwest Canada	Algae/Risky A2 Section	7.10	n/a	2.9	Moynihan et al. 2019	Algae/Risky Fm	549.7	
Northwest Canada	Algae/Risky A2 Section	8.80	n/a	2.99	Moynihan et al. 2019	Algae/Risky Fm	549.6	
Northwest Canada	Algae/Risky A2 Section	9.90	n/a	3.2	Moynihan et al. 2019	Algae/Risky Fm	549.5	
Northwest Canada	Algae/Risky A2 Section	11.00	n/a	2.87	Moynihan et al. 2019	Algae/Risky Fm	549.4	
Northwest Canada	Algae/Risky A2 Section	12.90	n/a	3.16	Moynihan et al. 2019	Algae/Risky Fm	549.3	
Northwest Canada	Algae/Risky A2 Section	15.10	n/a	3.08	Moynihan et al. 2019	Algae/Risky Fm	549.2	
Northwest Canada	Algae/Risky A2 Section	16.00	n/a	2.81	Moynihan et al. 2019	Algae/Risky Fm	549.2	
Northwest Canada	Algae/Risky A2 Section	18.20	n/a	2.78	Moynihan et al. 2019	Algae/Risky Fm	549.0	
Northwest Canada	Algae/Risky A2 Section	20.80	n/a	2.54	Moynihan et al. 2019	Algae/Risky Fm	548.9	
Northwest Canada	Algae/Risky A2 Section	22.80	n/a	2.28	Moynihan et al. 2019	Algae/Risky Fm	548.8	
Northwest Canada	Algae/Risky A2 Section	26.30	n/a	1.61	Moynihan et al. 2019	Algae/Risky Fm	548.6	
Northwest Canada	Algae/Risky A2 Section	29.40	n/a	0.13	Moynihan et al. 2019	Algae/Risky Fm	548.4	
Northwest Canada	Algae/Risky A2 Section	37.50	n/a	2.34	Moynihan et al. 2019	Algae/Risky Fm	547.9	
Northwest Canada	Algae/Risky A2 Section	39.50	n/a	2.33	Moynihan et al. 2019	Algae/Risky Fm	547.8	
Northwest Canada	Algae/Risky A2 Section	41.70	n/a	2.5	Moynihan et al. 2019	Algae/Risky Fm	547.7	
Northwest Canada	Algae/Risky A2 Section	43.30	n/a	2.3	Moynihan et al. 2019	Algae/Risky Fm	547.6	
Northwest Canada	Algae/Risky A2 Section	44.60	n/a	2.68	Moynihan et al. 2019	Algae/Risky Fm	547.5	
Northwest Canada	Algae/Risky A2 Section	47.70	n/a	2.2	Moynihan et al. 2019	Algae/Risky Fm	547.3	
Northwest Canada	Algae/Risky A2 Section	48.90	n/a	2.07	Moynihan et al. 2019	Algae/Risky Fm	547.3	
Northwest Canada	Algae/Risky A2 Section	49.80	n/a	2.16	Moynihan et al. 2019	Algae/Risky Fm	547.2	
Northwest Canada	Algae/Risky A2 Section	52.30	n/a	1.62	Moynihan et al. 2019	Algae/Risky Fm	547.1	
Northwest Canada	Algae/Risky A2 Section	53.40	n/a	1.42	Moynihan et al. 2019	Algae/Risky Fm	547.0	
Northwest Canada	Algae/Risky A2 Section	54.30	n/a	2.07	Moynihan et al. 2019	Algae/Risky Fm	547.0	
Northwest Canada	Algae/Risky A2 Section	56.10	n/a	1.31	Moynihan et al. 2019	Algae/Risky Fm	546.9	
Northwest Canada	Algae/Risky A2 Section	57.30	n/a	2.31	Moynihan et al. 2019	Algae/Risky Fm	546.8	
Northwest Canada	Algae/Risky A2 Section	59.40	n/a	2.56	Moynihan et al. 2019	Algae/Risky Fm	546.7	
Northwest Canada	Algae/Risky A2 Section	61.80	n/a	4.09	Moynihan et al. 2019	Algae/Risky Fm	546.5	
Northwest Canada	Algae/Risky A2 Section	63.60	n/a	4.38	Moynihan et al. 2019	Algae/Risky Fm	546.4	
Northwest Canada	Algae/Risky A2 Section	64.60	n/a	5.36	Moynihan et al. 2019	Algae/Risky Fm	546.4	
Northwest Canada	Algae/Risky A2 Section	66.80	n/a	5.86	Moynihan et al. 2019	Algae/Risky Fm	546.3	
Northwest Canada	Algae/Risky A2 Section	68.90	n/a	5.29	Moynihan et al. 2019	Algae/Risky Fm	546.1	
Northwest Canada	Algae/Risky A2 Section	69.70	n/a	5.73	Moynihan et al. 2019	Algae/Risky Fm	546.1	
Northwest Canada	Algae/Risky A2 Section	71.00	n/a	5.48	Moynihan et al. 2019	Algae/Risky Fm	546.0	
Northwest Canada	Algae/Risky A2 Section	71.70	n/a	4.81	Moynihan et al. 2019	Algae/Risky Fm	546.0	
Northwest Canada	Algae/Risky A2 Section	73.20	n/a	5.12	Moynihan et al. 2019	Algae/Risky Fm	545.9	
Northwest Canada	Algae/Risky A2 Section	74.50	n/a	4.88	Moynihan et al. 2019	Algae/Risky Fm	545.8	
Northwest Canada	Algae/Risky A2 Section	76.30	n/a	3.85	Moynihan et al. 2019	Algae/Risky Fm	545.7	
Northwest Canada	Algae/Risky A2 Section	77.50	n/a	3.99	Moynihan et al. 2019	Algae/Risky Fm	545.7	
Northwest Canada	Algae/Risky A2 Section	78.70	n/a	3.98	Moynihan et al. 2019	Algae/Risky Fm	545.6	
Northwest Canada	Algae/Risky A2 Section	79.90	n/a	3.8	Moynihan et al. 2019	Algae/Risky Fm	545.5	
Northwest Canada	Algae/Risky A2 Section	91.20	n/a	3.55	Moynihan et al. 2019	Algae/Risky Fm	544.9	
Northwest Canada	Algae/Risky A2 Section	92.10	n/a	3.82	Moynihan et al. 2019	Algae/Risky Fm	544.8	
Northwest Canada	Algae/Risky A2 Section	93.40	n/a	3.64	Moynihan et al. 2019	Algae/Risky Fm	544.8	
Northwest Canada	Algae/Risky A2 Section	94.70	n/a	4.3	Moynihan et al. 2019	Algae/Risky Fm	544.7	
Northwest Canada	Algae/Risky A2 Section	95.70	n/a	3.97	Moynihan et al. 2019	Algae/Risky Fm	544.6	
Northwest Canada	Algae/Risky A2 Section	97.50	n/a	4.57	Moynihan et al. 2019	Algae/Risky Fm	544.5	
Northwest Canada	Algae/Risky A2 Section	98.30	n/a	4.51	Moynihan et al. 2019	Algae/Risky Fm	544.5	
Northwest Canada	Algae/Risky A2 Section	99.70	n/a	3.71	Moynihan et al. 2019	Algae/Risky Fm	544.4	
Northwest Canada	Algae/Risky A2 Section	103.40	n/a	2.47	Moynihan et al. 2019	Algae/Risky Fm	544.2	
Northwest Canada	Algae/Risky A2 Section	104.30	n/a	1.88	Moynihan et al. 2019	Algae/Risky Fm	544.1	
Northwest Canada	Algae/Risky A2 Section	105.40	n/a	1.64	Moynihan et al. 2019	Algae/Risky Fm	544.1	
Northwest Canada	Algae/Risky A2 Section	108.20	n/a	1.94	Moynihan et al. 2019	Algae/Risky Fm	543.9	
Northwest Canada	Algae/Risky A2 Section	110.10	n/a	2.15	Moynihan et al. 2019	Algae/Risky Fm	543.8	
Northwest Canada	Algae/Risky A2 Section	110.80	n/a	1.81	Moynihan et al. 2019	Algae/Risky Fm	543.8	
Northwest Canada	Algae/Risky A2 Section	112.10	n/a	2.05	Moynihan et al. 2019	Algae/Risky Fm	543.7	
Northwest Canada	Algae/Risky A2 Section	113.00	n/a	2.25	Moynihan et al. 2019	Algae/Risky Fm	543.6	
Northwest Canada	Algae/Risky A2 Section	115.80	n/a	2.34	Moynihan et al. 2019	Algae/Risky Fm	543.5	
Northwest Canada	Algae/Risky A2 Section	116.80	n/a	3.19	Moynihan et al. 2019	Algae/Risky Fm	543.4	
Northwest Canada	Algae/Risky A2 Section	118.10	n/a	2.31	Moynihan et al. 2019	Algae/Risky Fm	543.3	
Northwest Canada	Algae/Risky A2 Section	120.20	n/a	2.62	Moynihan et al. 2019	Algae/Risky Fm	543.2	
Northwest Canada	Algae/Risky A2 Section	122.20	n/a	2.13	Moynihan et al. 2019	Algae/Risky Fm	543.1	
Northwest Canada	Algae/Risky A2 Section	123.10	n/a	1.26	Moynihan et al. 2019	Algae/Risky Fm	543.1	
Northwest Canada	Algae/Risky A2 Section	125.80	n/a	0.62	Moynihan et al. 2019	Algae/Risky Fm	542.9	
Northwest Canada	Algae/Risky A2 Section	128.70	n/a	2.09	Moynihan et al. 2019	Algae/Risky Fm	542.7	
Northwest Canada	Algae/Risky A2 Section	129.60	n/a	2.05	Moynihan et al. 2019	Algae/Risky Fm	542.7	
Northwest Canada	Algae/Risky A2 Section	131.10	n/a	2.16	Moynihan et al. 2019	Algae/Risky Fm	542.6	
Northwest Canada	Algae/Risky A2 Section	132.70	n/a	1.69	Moynihan et al. 2019	Algae/Risky Fm	542.5	
Northwest Canada	Algae/Risky A2 Section	133.90	n/a	1.91	Moynihan et al. 2019	Algae/Risky Fm	542.4	
Northwest Canada	Algae/Risky A2 Section	137.00	n/a	1.9	Moynihan et al. 2019	Algae/Risky Fm	542.3	
Northwest Canada	Algae/Risky A2 Section	139.20	n/a	1.87	Moynihan et al. 2019	Algae/Risky Fm	542.1	
Northwest Canada	Algae/Risky A2 Section	140.30	n/a	1.66	Moynihan et al. 2019	Algae/Risky Fm	542.1	
Northwest Canada	Algae/Risky A2 Section	143.40	n/a	2.13	Moynihan et al. 2019	Algae/Risky Fm	541.9	
Northwest Canada	Algae/Risky A2 Section	147.00	n/a	2.15	Moynihan et al. 2019	Algae/Risky Fm	541.7	
Northwest Canada	Algae/Risky A2 Section	148.10	n/a	2.13	Moynihan et al. 2019	Algae/Risky Fm	541.6	
Northwest Canada	Algae/Risky A2 Section	150.30	n/a	2.01	Moynihan et al. 2019	Algae/Risky Fm	541.5	
Northwest Canada	Algae/Risky A2 Section	152.40	n/a	2.23	Moynihan et al. 2019	Algae/Risky Fm	541.4	
Northwest Canada	Algae/Risky A2 Section	154.60	n/a	2.02	Moynihan et al. 2019	Algae/Risky Fm	541.3	
Northwest Canada	Algae/Risky A2 Section	156.60	n/a	2.47	Moynihan et al. 2019	Algae/Risky Fm	541.2	
Northwest Canada	Algae/Risky A2 Section	159.70	n/a	2.48	Moynihan et al. 2019	Algae/Risky Fm	541.0	
Northwest Canada	Algae/Risky A2 Section	161.80	n/a	2.17	Moynihan et al. 2019	Algae/Risky Fm	540.9	
Northwest Canada	Algae/Risky A2 Section	163.90	n/a	2.43	Moynihan et al. 2019	Algae/Risky Fm	540.7	
Northwest Canada	Algae/Risky A2 Section	166.10	n/a	2.11	Moynihan et al. 2019	Algae/Risky Fm	540.6	
Northwest Canada	Algae/Risky A2 Section	169.20	n/a	1.11	Moynihan et al. 2019	Algae/Risky Fm	540.4	
Northwest Canada	Algae/Risky A2 Section	170.20	n/a	1.98	Moynihan et al. 2019	Algae/Risky Fm	540.4	
Northwest Canada	Algae/Risky A2 Section	173.00	n/a	1.73	Moynihan et al. 2019	Algae/Risky Fm	540.2	
Northwest Canada	Algae/Risky A2 Section	175.60	n/a	2.1	Moynihan et al. 2019	Algae/Risky Fm	540.1	
Northwest Canada	Algae/Risky A2 Section	177.00	n/a	1.4	Moynihan et al. 2019	Algae/Risky Fm	540.0	
Northwest Canada	Algae/Risky A2 Section	179.30	n/a	1.83	Moynihan et al. 2019	Algae/Risky Fm	539.9	
Northwest Canada	Algae/Risky A2 Section	182.10	n/a	1.66	Moynihan et al. 2019	Algae/Risky Fm	539.7	
Northwest Canada	Algae/Risky A2 Section	183.40	n/a	1.51	Moynihan et al. 2019	Algae/Risky Fm	539.6	
Northwest Canada	Algae/Risky A2 Section	184.20	n/a	1.27	Moynihan et al. 2019	Algae/Risky Fm	539.6	
Northwest Canada	Algae/Risky A2 Section	186.20	n/a	1.27	Moynihan et al. 2019	Algae/Risky Fm	539.5	
Northwest Canada	Algae/Risky A2 Section	187.00	n/a	0.89	Moynihan et al. 2019	Algae/Risky Fm	539.4	
Northwest Canada	Algae/Risky A2 Section	187.40	n/a	1.21	Moynihan et al. 2019	Algae/Risky Fm	539.4	
Northwest Canada	Algae/Risky A2 Section	188.90	n/a	0.97	Moynihan et al. 2019	Algae/Risky Fm	539.3	
Northwest Canada	Algae/Risky A2 Section	189.10	n/a	1.35	Moynihan et al. 2019	Algae/Risky Fm	539.3	
Northwest Canada	Algae/Risky A2 Section	189.90	n/a	0.83	Moynihan et al. 2019	Algae/Risky Fm	539.3	
Northwest Canada	Algae/Risky A2 Section	190.80	n/a	0.15	Moynihan et al. 2019	Algae/Risky Fm	539.2	
Northwest Canada	Algae/Risky A2 Section	195.20	n/a	0.04	Moynihan et al. 2019	Algae/Risky Fm	539.0	
Northwest Canada	Algae/Risky A2 Section	196.30	n/a	0.05	Moynihan et al. 2019	Algae/Risky Fm	538.9	
Northwest Canada	Algae/Risky A2 Section	197.70	n/a	-0.26	Moynihan et al. 2019	Algae/Risky Fm	538.8	
Northwest Canada	Algae/Risky A2 Section	199.80	n/a	0.08	Moynihan et al. 2019	Algae/Risky Fm	**538.7**	Precambrian-Cambrian boundary. Age after Linnemann et al. 2018, a combined paleontological study + ID-TIMS U-Pb ash dates on Swartpunt section, Namibia, suggest moving the Precambrian-Cambrian boundary younger, between 538.8 and 538.6 Ma.

China	Drill core	n/a	35.6	1.87	Tahata et al. 2013	Dengying Fm	**547.29**	Tied to age model below built from Jiang et al. 2007 data for boundary of Shibantan and Hamajin members.
China	Drill core	n/a	36.08	-0.32	Tahata et al. 2013	Dengying Fm	547.38	
China	Drill core	n/a	41.06	1.15	Tahata et al. 2013	Dengying Fm	548.33	
China	Drill core	n/a	41.15	1.7	Tahata et al. 2013	Dengying Fm	548.35	
China	Drill core	n/a	41.2	1.5	Tahata et al. 2013	Dengying Fm	548.36	
China	Drill core	n/a	41.21	2.87	Tahata et al. 2013	Dengying Fm	548.36	
China	Drill core	n/a	41.25	1.77	Tahata et al. 2013	Dengying Fm	548.37	
China	Drill core	n/a	41.28	2.53	Tahata et al. 2013	Dengying Fm	548.37	
China	Drill core	n/a	44.67	1.66	Tahata et al. 2013	Dengying Fm	549.02	
China	Drill core	n/a	46.05	2.82	Tahata et al. 2013	Dengying Fm	549.28	
China	Drill core	n/a	49.61	1.83	Tahata et al. 2013	Dengying Fm	549.96	
China	Drill core	n/a	50.6	1.21	Tahata et al. 2013	Dengying Fm	550.15	
China	Drill core	n/a	52.61	1.64	Tahata et al. 2013	Dengying Fm	550.53	
China	Drill core	n/a	52.92	1.4	Tahata et al. 2013	Dengying Fm	550.59	
China	Drill core	n/a	53	0.74	Tahata et al. 2013	Dengying Fm	550.60	
China	Drill core	n/a	54.6	-0.34	Tahata et al. 2013	Dengying Fm	550.91	
China	Drill core	n/a	54.76	-1.05	Tahata et al. 2013	Dengying Fm	550.94	
China	Drill core	n/a	55.34	-0.84	Tahata et al. 2013	Dengying Fm	551.05	
China	Drill core	n/a	55.47	-0.66	Tahata et al. 2013	Dengying Fm	551.07	
China	Drill core	n/a	55.56	-3.05	Tahata et al. 2013	Doushantuo Fm (Member IV)	**551.09**	ID-TIMS U-Pb date on ash layer in Doushantuo Fm, China. Associated with δ13C values ~0 permil, above Shuram Excursion; sequence boundary between age and excursion in stratigraphy. Condon et al. 2005. As recalculated in GTS 2012.
China	Drill core	n/a	58.59	-5.05	Tahata et al. 2013	Doushantuo Fm (Member IV)	560.27	
China	Drill core	n/a	60.91	-4.38	Tahata et al. 2013	Doushantuo Fm (Member IV)	**567.3**	Sample A1707, Blueflower Fm, NW Canada. Lies 16 m above the contact with the underlying Gametrail Fm. Coal Creek location; lies in +2 permille plateau above a carbonate gap. Correlated to China on the basis of chemostratigraphy (return to less negative δ13C values) and existing age contraints.
China	Drill core	n/a	62.4	-7.27	Tahata et al. 2013	Doushantuo Fm (Member III)	567.53	
China	Drill core	n/a	62.48	-3.89	Tahata et al. 2013	Doushantuo Fm (Member III)	567.54	
China	Drill core	n/a	64.11	-7.81	Tahata et al. 2013	Doushantuo Fm (Member III)	567.79	
China	Drill core	n/a	68.54	-7.68	Tahata et al. 2013	Doushantuo Fm (Member III)	568.47	
China	Drill core	n/a	72.2	-6.43	Tahata et al. 2013	Doushantuo Fm (Member III)	569.03	
China	Drill core	n/a	72.39	-7.87	Tahata et al. 2013	Doushantuo Fm (Member III)	569.06	
China	Drill core	n/a	73.87	-7.93	Tahata et al. 2013	Doushantuo Fm (Member III)	569.29	
China	Drill core	n/a	73.95	-6.66	Tahata et al. 2013	Doushantuo Fm (Member III)	569.30	
China	Drill core	n/a	75.4	-8.17	Tahata et al. 2013	Doushantuo Fm (Member III)	569.52	
China	Drill core	n/a	75.86	-6.82	Tahata et al. 2013	Doushantuo Fm (Member III)	569.59	
China	Drill core	n/a	75.9	-8.19	Tahata et al. 2013	Doushantuo Fm (Member III)	569.60	
China	Drill core	n/a	78.22	-7.57	Tahata et al. 2013	Doushantuo Fm (Member III)	569.95	
China	Drill core	n/a	80.92	-8.11	Tahata et al. 2013	Doushantuo Fm (Member III)	570.37	
China	Drill core	n/a	81.07	-6.96	Tahata et al. 2013	Doushantuo Fm (Member III)	570.39	
China	Drill core	n/a	84.17	-7.99	Tahata et al. 2013	Doushantuo Fm (Member III)	570.86	
China	Drill core	n/a	87.23	-8.07	Tahata et al. 2013	Doushantuo Fm (Member III)	571.33	
China	Drill core	n/a	87.38	-8.04	Tahata et al. 2013	Doushantuo Fm (Member III)	571.36	
China	Drill core	n/a	89.35	-8.9	Tahata et al. 2013	Doushantuo Fm (Member III)	571.66	
China	Drill core	n/a	89.97	-8.71	Tahata et al. 2013	Doushantuo Fm (Member III)	571.75	
China	Drill core	n/a	91.1	-8.99	Tahata et al. 2013	Doushantuo Fm (Member III)	571.93	
China	Drill core	n/a	92.4	-8.82	Tahata et al. 2013	Doushantuo Fm (Member III)	572.13	
China	Drill core	n/a	92.53	-9.12	Tahata et al. 2013	Doushantuo Fm (Member III)	572.15	
China	Drill core	n/a	93.65	-8.94	Tahata et al. 2013	Doushantuo Fm (Member III)	572.32	
China	Drill core	n/a	94.81	-9	Tahata et al. 2013	Doushantuo Fm (Member III)	572.50	
China	Drill core	n/a	95.95	-8.48	Tahata et al. 2013	Doushantuo Fm (Member III)	572.67	
China	Drill core	n/a	96.44	-7.78	Tahata et al. 2013	Doushantuo Fm (Member III)	572.74	
China	Drill core	n/a	97.19	-8.38	Tahata et al. 2013	Doushantuo Fm (Member III)	572.86	
China	Drill core	n/a	97.33	-8.39	Tahata et al. 2013	Doushantuo Fm (Member III)	572.88	
China	Drill core	n/a	97.47	-8.17	Tahata et al. 2013	Doushantuo Fm (Member III)	572.90	
China	Drill core	n/a	97.79	-7.76	Tahata et al. 2013	Doushantuo Fm (Member III)	572.95	
China	Drill core	n/a	97.94	-8.11	Tahata et al. 2013	Doushantuo Fm (Member III)	572.97	
China	Drill core	n/a	98.19	-7.99	Tahata et al. 2013	Doushantuo Fm (Member III)	573.01	
China	Drill core	n/a	98.48	-8.3	Tahata et al. 2013	Doushantuo Fm (Member III)	573.06	
China	Drill core	n/a	98.65	-8.56	Tahata et al. 2013	Doushantuo Fm (Member III)	573.08	
China	Drill core	n/a	98.67	-8.67	Tahata et al. 2013	Doushantuo Fm (Member III)	573.09	
China	Drill core	n/a	99	-8.14	Tahata et al. 2013	Doushantuo Fm (Member III)	573.14	
China	Drill core	n/a	99.26	-7.73	Tahata et al. 2013	Doushantuo Fm (Member III)	573.18	
China	Drill core	n/a	99.55	-7.56	Tahata et al. 2013	Doushantuo Fm (Member III)	573.22	
China	Drill core	n/a	99.72	-7.37	Tahata et al. 2013	Doushantuo Fm (Member III)	573.25	
China	Drill core	n/a	99.85	-7.21	Tahata et al. 2013	Doushantuo Fm (Member III)	573.27	
China	Drill core	n/a	100.05	-7.15	Tahata et al. 2013	Doushantuo Fm (Member III)	573.30	
China	Drill core	n/a	100.13	-6.78	Tahata et al. 2013	Doushantuo Fm (Member III)	573.31	
China	Drill core	n/a	100.27	-6.75	Tahata et al. 2013	Doushantuo Fm (Member III)	573.33	
China	Drill core	n/a	100.43	-6.65	Tahata et al. 2013	Doushantuo Fm (Member III)	573.36	
China	Drill core	n/a	100.52	-6.48	Tahata et al. 2013	Doushantuo Fm (Member III)	573.37	
China	Drill core	n/a	100.65	-6.3	Tahata et al. 2013	Doushantuo Fm (Member III)	573.39	
China	Drill core	n/a	100.8	-7.32	Tahata et al. 2013	Doushantuo Fm (Member III)	573.41	
China	Drill core	n/a	100.99	-7.28	Tahata et al. 2013	Doushantuo Fm (Member III)	573.44	
China	Drill core	n/a	101.13	-6.58	Tahata et al. 2013	Doushantuo Fm (Member III)	573.46	
China	Drill core	n/a	101.38	-5.97	Tahata et al. 2013	Doushantuo Fm (Member III)	573.50	
China	Drill core	n/a	101.5	-5.7	Tahata et al. 2013	Doushantuo Fm (Member III)	573.52	
China	Drill core	n/a	101.67	-5.95	Tahata et al. 2013	Doushantuo Fm (Member III)	573.55	
China	Drill core	n/a	101.89	-5.52	Tahata et al. 2013	Doushantuo Fm (Member III)	573.58	
China	Drill core	n/a	102.01	-5.25	Tahata et al. 2013	Doushantuo Fm (Member III)	573.60	
China	Drill core	n/a	102.09	-4.99	Tahata et al. 2013	Doushantuo Fm (Member III)	573.61	
China	Drill core	n/a	102.17	-4.89	Tahata et al. 2013	Doushantuo Fm (Member III)	573.62	
China	Drill core	n/a	102.32	-4.37	Tahata et al. 2013	Doushantuo Fm (Member III)	573.65	
China	Drill core	n/a	102.54	-4.1	Tahata et al. 2013	Doushantuo Fm (Member III)	573.68	
China	Drill core	n/a	104.06	-0.31	Tahata et al. 2013	Doushantuo Fm (Member III)	573.91	
China	Drill core	n/a	104.63	-0.27	Tahata et al. 2013	Doushantuo Fm (Member III)	**574**	Sample J1719, Nadaleen Fm, NW Canada, this study. Underlies Shuram excursion. Correlated to China on the basis of chemostratigraphy.
China	Drill core	n/a	105.91	0.65	Tahata et al. 2013	Doushantuo Fm (Member III)	574.95	
China	Drill core	n/a	107.4	0.93	Tahata et al. 2013	Doushantuo Fm (Member III)	576.07	
China	Drill core	n/a	108.12	0.95	Tahata et al. 2013	Doushantuo Fm (Member III)	576.60	
China	Drill core	n/a	109.54	2.31	Tahata et al. 2013	Doushantuo Fm (Member III)	577.66	
China	Drill core	n/a	109.67	3.14	Tahata et al. 2013	Doushantuo Fm (Member III)	577.76	
China	Drill core	n/a	109.97	3.05	Tahata et al. 2013	Doushantuo Fm (Member III)	577.98	
China	Drill core	n/a	111.54	4.34	Tahata et al. 2013	Doushantuo Fm (Member III)	579.15	
China	Drill core	n/a	111.83	4.09	Tahata et al. 2013	Doushantuo Fm (Member III)	579.37	
China	Drill core	n/a	112.53	4.47	Tahata et al. 2013	Doushantuo Fm (Member III)	579.89	
China	Drill core	n/a	112.56	4.39	Tahata et al. 2013	Doushantuo Fm (Member III)	579.91	
China	Drill core	n/a	112.76	4.38	Tahata et al. 2013	Doushantuo Fm (Member III)	580.06	
China	Drill core	n/a	112.9	4.42	Tahata et al. 2013	Doushantuo Fm (Member III)	580.17	
China	Drill core	n/a	113.57	4.83	Tahata et al. 2013	Doushantuo Fm (Member III)	580.67	
China	Drill core	n/a	114	4.62	Tahata et al. 2013	Doushantuo Fm (Member III)	580.99	
China	Drill core	n/a	114.18	4.42	Tahata et al. 2013	Doushantuo Fm (Member III)	581.12	
China	Drill core	n/a	114.49	4.84	Tahata et al. 2013	Doushantuo Fm (Member III)	581.35	
China	Drill core	n/a	114.58	4.11	Tahata et al. 2013	Doushantuo Fm (Member III)	581.42	
China	Drill core	n/a	114.81	4.83	Tahata et al. 2013	Doushantuo Fm (Member III)	581.59	
China	Drill core	n/a	114.97	4.76	Tahata et al. 2013	Doushantuo Fm (Member III)	581.71	
China	Drill core	n/a	115.11	4.54	Tahata et al. 2013	Doushantuo Fm (Member III)	581.82	
China	Drill core	n/a	115.22	4.92	Tahata et al. 2013	Doushantuo Fm (Member III)	581.90	
China	Drill core	n/a	115.39	4.96	Tahata et al. 2013	Doushantuo Fm (Member III)	582.03	
China	Drill core	n/a	115.58	4.4	Tahata et al. 2013	Doushantuo Fm (Member III)	582.17	
China	Drill core	n/a	115.63	4.73	Tahata et al. 2013	Doushantuo Fm (Member III)	582.20	
China	Drill core	n/a	115.84	4.34	Tahata et al. 2013	Doushantuo Fm (Member III)	582.36	
China	Drill core	n/a	116.21	4.58	Tahata et al. 2013	Doushantuo Fm (Member III)	582.64	
China	Drill core	n/a	116.43	4.4	Tahata et al. 2013	Doushantuo Fm (Member III)	582.80	
China	Drill core	n/a	116.62	4.31	Tahata et al. 2013	Doushantuo Fm (Member III)	582.94	
China	Drill core	n/a	116.76	4.15	Tahata et al. 2013	Doushantuo Fm (Member III)	583.05	
China	Drill core	n/a	116.87	4.27	Tahata et al. 2013	Doushantuo Fm (Member III)	583.13	
China	Drill core	n/a	117.02	5.45	Tahata et al. 2013	Doushantuo Fm (Member III)	583.24	
China	Drill core	n/a	117.21	5.15	Tahata et al. 2013	Doushantuo Fm (Member III)	583.38	
China	Drill core	n/a	117.34	5.45	Tahata et al. 2013	Doushantuo Fm (Member III)	583.48	
China	Drill core	n/a	117.93	4.88	Tahata et al. 2013	Doushantuo Fm (Member III)	583.92	
China	Drill core	n/a	118.03	5.11	Tahata et al. 2013	Doushantuo Fm (Member III)	583.99	
China	Drill core	n/a	118.24	5.12	Tahata et al. 2013	Doushantuo Fm (Member III)	584.15	
China	Drill core	n/a	118.4	5.24	Tahata et al. 2013	Doushantuo Fm (Member III)	584.27	
China	Drill core	n/a	118.54	5.05	Tahata et al. 2013	Doushantuo Fm (Member III)	584.37	
China	Drill core	n/a	118.66	4.98	Tahata et al. 2013	Doushantuo Fm (Member III)	584.46	
China	Drill core	n/a	118.84	4.89	Tahata et al. 2013	Doushantuo Fm (Member III)	584.60	
China	Drill core	n/a	119.08	5.21	Tahata et al. 2013	Doushantuo Fm (Member III)	584.78	
China	Drill core	n/a	119.49	5.22	Tahata et al. 2013	Doushantuo Fm (Member III)	585.08	
China	Drill core	n/a	119.63	5.08	Tahata et al. 2013	Doushantuo Fm (Member III)	585.19	
China	Drill core	n/a	119.75	4.95	Tahata et al. 2013	Doushantuo Fm (Member III)	585.28	
China	Drill core	n/a	119.99	5.01	Tahata et al. 2013	Doushantuo Fm (Member III)	585.46	
China	Drill core	n/a	120.17	4.72	Tahata et al. 2013	Doushantuo Fm (Member III)	585.59	
China	Drill core	n/a	120.42	4.81	Tahata et al. 2013	Doushantuo Fm (Member III)	585.78	
China	Drill core	n/a	120.57	4.61	Tahata et al. 2013	Doushantuo Fm (Member III)	585.89	
China	Drill core	n/a	120.76	4.93	Tahata et al. 2013	Doushantuo Fm (Member III)	586.03	
China	Drill core	n/a	121.81	4.87	Tahata et al. 2013	Doushantuo Fm (Member III)	586.81	
China	Drill core	n/a	122.28	4.52	Tahata et al. 2013	Doushantuo Fm (Member III)	587.16	
China	Drill core	n/a	123.1	3.49	Tahata et al. 2013	Doushantuo Fm (Member III)	587.78	
China	Drill core	n/a	123.29	4.28	Tahata et al. 2013	Doushantuo Fm (Member III)	587.92	
China	Drill core	n/a	123.45	4.29	Tahata et al. 2013	Doushantuo Fm (Member III)	588.04	
China	Drill core	n/a	123.64	4.21	Tahata et al. 2013	Doushantuo Fm (Member III)	588.18	
China	Drill core	n/a	123.97	4.11	Tahata et al. 2013	Doushantuo Fm (Member III)	588.42	
China	Drill core	n/a	124.09	4.23	Tahata et al. 2013	Doushantuo Fm (Member III)	588.51	
China	Drill core	n/a	124.22	4.16	Tahata et al. 2013	Doushantuo Fm (Member III)	588.61	
China	Drill core	n/a	124.37	4.42	Tahata et al. 2013	Doushantuo Fm (Member III)	588.72	
China	Drill core	n/a	124.47	4.52	Tahata et al. 2013	Doushantuo Fm (Member III)	588.80	
China	Drill core	n/a	125.03	4.89	Tahata et al. 2013	Doushantuo Fm (Member III)	589.22	
China	Drill core	n/a	125.22	4.33	Tahata et al. 2013	Doushantuo Fm (Member III)	589.36	
China	Drill core	n/a	125.3	4.3	Tahata et al. 2013	Doushantuo Fm (Member III)	589.42	
China	Drill core	n/a	125.45	4.71	Tahata et al. 2013	Doushantuo Fm (Member III)	589.53	
China	Drill core	n/a	125.6	3.99	Tahata et al. 2013	Doushantuo Fm (Member III)	589.64	
China	Drill core	n/a	125.78	4.48	Tahata et al. 2013	Doushantuo Fm (Member III)	589.77	
China	Drill core	n/a	126.7	5.55	Tahata et al. 2013	Doushantuo Fm (Member III)	590.46	
China	Drill core	n/a	126.87	5.5	Tahata et al. 2013	Doushantuo Fm (Member III)	590.59	
China	Drill core	n/a	127.03	5.48	Tahata et al. 2013	Doushantuo Fm (Member III)	590.71	
China	Drill core	n/a	127.15	5.62	Tahata et al. 2013	Doushantuo Fm (Member III)	590.80	
China	Drill core	n/a	127.29	5.82	Tahata et al. 2013	Doushantuo Fm (Member III)	590.90	
China	Drill core	n/a	127.33	5.75	Tahata et al. 2013	Doushantuo Fm (Member III)	590.93	
China	Drill core	n/a	127.49	5.8	Tahata et al. 2013	Doushantuo Fm (Member III)	591.05	
China	Drill core	n/a	127.65	5.78	Tahata et al. 2013	Doushantuo Fm (Member III)	591.17	
China	Drill core	n/a	127.76	5.83	Tahata et al. 2013	Doushantuo Fm (Member III)	591.25	
China	Drill core	n/a	128.63	5.03	Tahata et al. 2013	Doushantuo Fm (Member III)	591.90	
China	Drill core	n/a	128.88	5.22	Tahata et al. 2013	Doushantuo Fm (Member III)	592.09	
China	Drill core	n/a	130.26	4.65	Tahata et al. 2013	Doushantuo Fm (Member III)	593.12	
China	Drill core	n/a	131.4	3.93	Tahata et al. 2013	Doushantuo Fm (Member III)	593.97	
China	Drill core	n/a	131.66	3.86	Tahata et al. 2013	Doushantuo Fm (Member III)	594.16	
China	Drill core	n/a	131.82	3.6	Tahata et al. 2013	Doushantuo Fm (Member III)	594.28	
China	Drill core	n/a	131.98	3.75	Tahata et al. 2013	Doushantuo Fm (Member III)	594.40	
China	Drill core	n/a	132.16	3.6	Tahata et al. 2013	Doushantuo Fm (Member III)	594.53	
China	Drill core	n/a	132.75	3.11	Tahata et al. 2013	Doushantuo Fm (Member III)	594.97	
China	Drill core	n/a	132.88	3.44	Tahata et al. 2013	Doushantuo Fm (Member III)	595.07	

China	Drill core	n/a	133.12	2.61	Tahata et al. 2013	Doushantuo Fm (Member III)	595.25	
China	Drill core	n/a	133.14	2.55	Tahata et al. 2013	Doushantuo Fm (Member III)	595.26	
China	Drill core	n/a	133.35	2.85	Tahata et al. 2013	Doushantuo Fm (Member III)	595.42	
China	Drill core	n/a	134.76	-1.32	Tahata et al. 2013	Doushantuo Fm (Member III)	596.47	
China	Drill core	n/a	134.97	-0.84	Tahata et al. 2013	Doushantuo Fm (Member III)	596.63	
China	Drill core	n/a	135.25	-1.22	Tahata et al. 2013	Doushantuo Fm (Member III)	596.84	
China	Drill core	n/a	135.52	-1.02	Tahata et al. 2013	Doushantuo Fm (Member III)	597.04	
China	Drill core	n/a	135.65	-1.03	Tahata et al. 2013	Doushantuo Fm (Member III)	597.14	
China	Drill core	n/a	135.9	0.06	Tahata et al. 2013	Doushantuo Fm (Member III)	597.32	
China	Drill core	n/a	138.19	-3.92	Tahata et al. 2013	Doushantuo Fm (Member III)	599.03	
China	Drill core	n/a	139.26	-5.13	Tahata et al. 2013	Doushantuo Fm (Member III)	599.83	
China	Drill core	n/a	140.31	-0.81	Tahata et al. 2013	Doushantuo Fm (Member III)	600.61	
China	Drill core	n/a	140.38	-0.46	Tahata et al. 2013	Doushantuo Fm (Member III)	600.66	
China	Drill core	n/a	140.46	-2	Tahata et al. 2013	Doushantuo Fm (Member III)	600.72	
China	Drill core	n/a	140.54	-2.51	Tahata et al. 2013	Doushantuo Fm (Member III)	600.78	
China	Drill core	n/a	140.91	-2.24	Tahata et al. 2013	Doushantuo Fm (Member III)	601.06	
China	Drill core	n/a	141.13	-1.19	Tahata et al. 2013	Doushantuo Fm (Member III)	601.22	
China	Drill core	n/a	141.26	-0.89	Tahata et al. 2013	Doushantuo Fm (Member III)	601.32	
China	Drill core	n/a	141.45	-1.35	Tahata et al. 2013	Doushantuo Fm (Member III)	601.46	
China	Drill core	n/a	141.68	-4.22	Tahata et al. 2013	Doushantuo Fm (Member III)	601.63	
China	Drill core	n/a	141.81	-4.12	Tahata et al. 2013	Doushantuo Fm (Member III)	601.73	
China	Drill core	n/a	141.92	-1.78	Tahata et al. 2013	Doushantuo Fm (Member III)	601.81	
China	Drill core	n/a	142.05	-1.37	Tahata et al. 2013	Doushantuo Fm (Member III)	601.91	
China	Drill core	n/a	142.31	-0.54	Tahata et al. 2013	Doushantuo Fm (Member III)	602.10	
China	Drill core	n/a	142.46	-1.62	Tahata et al. 2013	Doushantuo Fm (Member III)	602.22	
China	Drill core	n/a	142.52	-2.74	Tahata et al. 2013	Doushantuo Fm (Member III)	602.26	
China	Drill core	n/a	142.69	-2.77	Tahata et al. 2013	Doushantuo Fm (Member III)	602.39	
China	Drill core	n/a	143.33	-1.96	Tahata et al. 2013	Doushantuo Fm (Member III)	602.86	
China	Drill core	n/a	144.41	-2.36	Tahata et al. 2013	Doushantuo Fm (Member III)	603.67	
China	Drill core	n/a	145.29	-1.72	Tahata et al. 2013	Doushantuo Fm (Member III)	604.33	
China	Drill core	n/a	145.72	-0.67	Tahata et al. 2013	Doushantuo Fm (Member III)	604.65	
China	Drill core	n/a	146.04	-3.17	Tahata et al. 2013	Doushantuo Fm (Member III)	604.89	
China	Drill core	n/a	146.84	-4.19	Tahata et al. 2013	Doushantuo Fm (Member III)	605.48	
China	Drill core	n/a	147.11	-3.9	Tahata et al. 2013	Doushantuo Fm (Member III)	605.68	
China	Drill core	n/a	147.96	-2.39	Tahata et al. 2013	Doushantuo Fm (Member III)	606.32	
China	Drill core	n/a	148.05	-2.47	Tahata et al. 2013	Doushantuo Fm (Member III)	606.38	
China	Drill core	n/a	148.42	-3.17	Tahata et al. 2013	Doushantuo Fm (Member III)	606.66	
China	Drill core	n/a	148.64	-3.44	Tahata et al. 2013	Doushantuo Fm (Member III)	606.82	
China	Drill core	n/a	148.72	-3.4	Tahata et al. 2013	Doushantuo Fm (Member III)	606.88	
China	Drill core	n/a	149.75	-2.75	Tahata et al. 2013	Doushantuo Fm (Member III)	607.65	
China	Drill core	n/a	149.9	-2.41	Tahata et al. 2013	Doushantuo Fm (Member III)	607.76	
China	Drill core	n/a	150.34	-4.33	Tahata et al. 2013	Doushantuo Fm (Member III)	608.09	
China	Drill core	n/a	150.52	-3.61	Tahata et al. 2013	Doushantuo Fm (Member III)	608.23	
China	Drill core	n/a	150.77	-3.24	Tahata et al. 2013	Doushantuo Fm (Member III)	608.41	
China	Drill core	n/a	150.96	-3.6	Tahata et al. 2013	Doushantuo Fm (Member III)	608.56	
China	Drill core	n/a	151.12	-3.31	Tahata et al. 2013	Doushantuo Fm (Member III)	608.67	
China	Drill core	n/a	151.3	-3.49	Tahata et al. 2013	Doushantuo Fm (Member III)	608.81	
China	Drill core	n/a	151.76	-2.84	Tahata et al. 2013	Doushantuo Fm (Member III)	609.15	
China	Drill core	n/a	151.98	-3.57	Tahata et al. 2013	Doushantuo Fm (Member III)	609.32	
China	Drill core	n/a	152.13	-3.62	Tahata et al. 2013	Doushantuo Fm (Member III)	609.43	
China	Drill core	n/a	152.37	-3.93	Tahata et al. 2013	Doushantuo Fm (Member III)	609.61	
							614.00	Ash at the top of Doushantuo member II dated by SHRIMP on zircon by Liu et al. 2009. As recalculated in GTS 2012.
China	Drill core	n/a	158.26	1.3	Tahata et al. 2013	Doushantuo Fm (Member II)		
China	Drill core	n/a	158.42	0.72	Tahata et al. 2013	Doushantuo Fm (Member II)	614.03	
China	Drill core	n/a	159.08	1.75	Tahata et al. 2013	Doushantuo Fm (Member II)	614.13	
China	Drill core	n/a	161.3	2.24	Tahata et al. 2013	Doushantuo Fm (Member II)	614.48	
China	Drill core	n/a	161.77	1.3	Tahata et al. 2013	Doushantuo Fm (Member II)	614.55	
China	Drill core	n/a	163.59	4.09	Tahata et al. 2013	Doushantuo Fm (Member II)	614.84	
China	Drill core	n/a	165.54	3.77	Tahata et al. 2013	Doushantuo Fm (Member II)	615.14	
China	Drill core	n/a	165.76	4.68	Tahata et al. 2013	Doushantuo Fm (Member II)	615.18	
China	Drill core	n/a	169.12	5.09	Tahata et al. 2013	Doushantuo Fm (Member II)	615.70	
China	Drill core	n/a	169.25	4.98	Tahata et al. 2013	Doushantuo Fm (Member II)	615.72	
China	Drill core	n/a	169.47	5.18	Tahata et al. 2013	Doushantuo Fm (Member II)	615.76	
China	Drill core	n/a	174.08	5.15	Tahata et al. 2013	Doushantuo Fm (Member II)	616.48	
China	Drill core	n/a	174.84	5.86	Tahata et al. 2013	Doushantuo Fm (Member II)	616.60	
China	Drill core	n/a	175.06	6.05	Tahata et al. 2013	Doushantuo Fm (Member II)	616.64	
China	Drill core	n/a	175.3	5.91	Tahata et al. 2013	Doushantuo Fm (Member II)	616.67	
China	Drill core	n/a	175.68	6.04	Tahata et al. 2013	Doushantuo Fm (Member II)	616.73	
China	Drill core	n/a	176.43	6.09	Tahata et al. 2013	Doushantuo Fm (Member II)	616.85	
China	Drill core	n/a	176.54	6.1	Tahata et al. 2013	Doushantuo Fm (Member II)	616.87	
China	Drill core	n/a	180.54	5.51	Tahata et al. 2013	Doushantuo Fm (Member II)	617.50	
China	Drill core	n/a	180.69	5.61	Tahata et al. 2013	Doushantuo Fm (Member II)	617.52	
China	Drill core	n/a	180.81	5.52	Tahata et al. 2013	Doushantuo Fm (Member II)	617.54	
China	Drill core	n/a	184.36	2.83	Tahata et al. 2013	Doushantuo Fm (Member II)	618.10	
China	Drill core	n/a	186.14	4.3	Tahata et al. 2013	Doushantuo Fm (Member II)	618.37	
China	Drill core	n/a	186.56	3.93	Tahata et al. 2013	Doushantuo Fm (Member II)	618.44	
China	Drill core	n/a	189.39	3.85	Tahata et al. 2013	Doushantuo Fm (Member II)	618.88	
China	Drill core	n/a	191.38	4.62	Tahata et al. 2013	Doushantuo Fm (Member II)	619.20	
China	Drill core	n/a	191.61	4.52	Tahata et al. 2013	Doushantuo Fm (Member II)	619.23	
China	Drill core	n/a	191.72	4.38	Tahata et al. 2013	Doushantuo Fm (Member II)	619.25	
China	Drill core	n/a	194.28	3.74	Tahata et al. 2013	Doushantuo Fm (Member II)	619.65	
China	Drill core	n/a	196.37	2.58	Tahata et al. 2013	Doushantuo Fm (Member II)	619.98	
China	Drill core	n/a	201.82	3.29	Tahata et al. 2013	Doushantuo Fm (Member II)	620.84	
China	Drill core	n/a	201.94	3.32	Tahata et al. 2013	Doushantuo Fm (Member II)	620.85	
China	Drill core	n/a	205.2	4.74	Tahata et al. 2013	Doushantuo Fm (Member II)	621.37	
China	Drill core	n/a	208.25	4.86	Tahata et al. 2013	Doushantuo Fm (Member II)	621.84	
China	Drill core	n/a	208.39	4.52	Tahata et al. 2013	Doushantuo Fm (Member II)	621.87	
China	Drill core	n/a	209.05	4.54	Tahata et al. 2013	Doushantuo Fm (Member II)	621.97	
China	Drill core	n/a	209.27	4.44	Tahata et al. 2013	Doushantuo Fm (Member II)	622.00	
China	Drill core	n/a	211.95	5.83	Tahata et al. 2013	Doushantuo Fm (Member II)	622.42	
China	Drill core	n/a	212.03	5.29	Tahata et al. 2013	Doushantuo Fm (Member II)	622.44	
China	Drill core	n/a	214.43	5.1	Tahata et al. 2013	Doushantuo Fm (Member II)	622.81	
China	Drill core	n/a	215.28	5.29	Tahata et al. 2013	Doushantuo Fm (Member II)	622.95	
China	Drill core	n/a	215.39	5.28	Tahata et al. 2013	Doushantuo Fm (Member II)	622.96	
China	Drill core	n/a	215.6	5.12	Tahata et al. 2013	Doushantuo Fm (Member II)	623.00	
China	Drill core	n/a	218.51	4.07	Tahata et al. 2013	Doushantuo Fm (Member II)	623.45	
China	Drill core	n/a	218.63	3.63	Tahata et al. 2013	Doushantuo Fm (Member II)	623.47	
China	Drill core	n/a	219.71	3.19	Tahata et al. 2013	Doushantuo Fm (Member II)	623.64	
China	Drill core	n/a	219.81	3.07	Tahata et al. 2013	Doushantuo Fm (Member II)	623.66	
China	Drill core	n/a	219.93	3.11	Tahata et al. 2013	Doushantuo Fm (Member II)	623.68	
China	Drill core	n/a	221.13	4.81	Tahata et al. 2013	Doushantuo Fm (Member II)	623.87	
China	Drill core	n/a	221.39	5.06	Tahata et al. 2013	Doushantuo Fm (Member II)	623.91	
China	Drill core	n/a	222.24	4.71	Tahata et al. 2013	Doushantuo Fm (Member II)	624.04	
China	Drill core	n/a	223.82	2.46	Tahata et al. 2013	Doushantuo Fm (Member II)	624.29	
China	Drill core	n/a	223.97	3.1	Tahata et al. 2013	Doushantuo Fm (Member II)	624.31	
China	Drill core	n/a	225.16	2.91	Tahata et al. 2013	Doushantuo Fm (Member II)	624.50	
China	Drill core	n/a	225.57	0.86	Tahata et al. 2013	Doushantuo Fm (Member II)	624.56	
China	Drill core	n/a	225.76	0.92	Tahata et al. 2013	Doushantuo Fm (Member II)	624.59	
China	Drill core	n/a	225.93	-0.93	Tahata et al. 2013	Doushantuo Fm (Member II)	624.62	
China	Drill core	n/a	226.65	-3.63	Tahata et al. 2013	Doushantuo Fm (Member II)	624.73	
China	Drill core	n/a	228.14	2.46	Tahata et al. 2013	Doushantuo Fm (Member II)	624.97	
China	Drill core	n/a	229.68	3.31	Tahata et al. 2013	Doushantuo Fm (Member II)	625.21	
China	Drill core	n/a	230.16	3.96	Tahata et al. 2013	Doushantuo Fm (Member II)	625.28	
China	Drill core	n/a	230.25	4.1	Tahata et al. 2013	Doushantuo Fm (Member II)	625.30	
China	Drill core	n/a	230.5	4.97	Tahata et al. 2013	Doushantuo Fm (Member II)	625.34	
China	Drill core	n/a	234.44	2.9	Tahata et al. 2013	Doushantuo Fm (Member II)	625.95	
China	Drill core	n/a	237.2	4.47	Tahata et al. 2013	Doushantuo Fm (Member II)	626.39	
China	Drill core	n/a	237.32	4.43	Tahata et al. 2013	Doushantuo Fm (Member II)	626.41	
China	Drill core	n/a	240.87	4.59	Tahata et al. 2013	Doushantuo Fm (Member II)	626.96	
China	Drill core	n/a	240.97	4.65	Tahata et al. 2013	Doushantuo Fm (Member II)	626.98	
China	Drill core	n/a	245.99	5.87	Tahata et al. 2013	Doushantuo Fm (Member II)	627.77	
China	Drill core	n/a	246.19	5.63	Tahata et al. 2013	Doushantuo Fm (Member II)	627.80	
China	Drill core	n/a	246.3	5.48	Tahata et al. 2013	Doushantuo Fm (Member II)	627.81	
China	Drill core	n/a	246.4	6.3	Tahata et al. 2013	Doushantuo Fm (Member II)	627.83	
China	Drill core	n/a	248.25	5.33	Tahata et al. 2013	Doushantuo Fm (Member II)	628.12	
China	Drill core	n/a	248.35	5.56	Tahata et al. 2013	Doushantuo Fm (Member II)	628.14	
China	Drill core	n/a	250.6	5.99	Tahata et al. 2013	Doushantuo Fm (Member II)	628.49	
China	Drill core	n/a	250.82	6.11	Tahata et al. 2013	Doushantuo Fm (Member II)	628.52	
China	Drill core	n/a	254.77	5.96	Tahata et al. 2013	Doushantuo Fm (Member II)	629.14	
China	Drill core	n/a	255.08	5.48	Tahata et al. 2013	Doushantuo Fm (Member II)	629.19	
China	Drill core	n/a	255.24	5.12	Tahata et al. 2013	Doushantuo Fm (Member II)	629.22	
China	Drill core	n/a	256.67	5.42	Tahata et al. 2013	Doushantuo Fm (Member II)	629.44	
China	Drill core	n/a	259.99	5.8	Tahata et al. 2013	Doushantuo Fm (Member II)	629.96	
China	Drill core	n/a	260.07	5.44	Tahata et al. 2013	Doushantuo Fm (Member II)	629.98	
China	Drill core	n/a	262.47	1.83	Tahata et al. 2013	Doushantuo Fm (Member II)	630.35	
China	Drill core	n/a	262.71	2.05	Tahata et al. 2013	Doushantuo Fm (Member II)	630.39	
China	Drill core	n/a	262.88	5.07	Tahata et al. 2013	Doushantuo Fm (Member II)	630.42	
China	Drill core	n/a	264.13	0.28	Tahata et al. 2013	Doushantuo Fm (Member II)	630.61	
China	Drill core	n/a	267.06	0.47	Tahata et al. 2013	Doushantuo Fm (Member II)	631.07	
China	Drill core	n/a	267.08	0.36	Tahata et al. 2013	Doushantuo Fm (Member II)	631.08	
China	Drill core	n/a	267.39	1	Tahata et al. 2013	Doushantuo Fm (Member II)	631.12	
China	Drill core	n/a	267.44	1.19	Tahata et al. 2013	Doushantuo Fm (Member II)	631.13	
China	Drill core	n/a	267.56	1.39	Tahata et al. 2013	Doushantuo Fm (Member II)	631.15	
China	Drill core	n/a	267.58	1.45	Tahata et al. 2013	Doushantuo Fm (Member II)	631.15	
China	Drill core	n/a	267.7	3.67	Tahata et al. 2013	Doushantuo Fm (Member II)	631.17	
China	Drill core	n/a	268.72	-2.62	Tahata et al. 2013	Doushantuo Fm (Member II)	631.33	
China	Drill core	n/a	269.41	3.69	Tahata et al. 2013	Doushantuo Fm (Member II)	631.44	
China	Drill core	n/a	269.57	-0.99	Tahata et al. 2013	Doushantuo Fm (Member II)	631.47	
China	Drill core	n/a	269.67	-0.51	Tahata et al. 2013	Doushantuo Fm (Member II)	631.48	
China	Drill core	n/a	269.96	-0.98	Tahata et al. 2013	Doushantuo Fm (Member II)	631.53	
China	Drill core	n/a	270.11	-1.47	Tahata et al. 2013	Doushantuo Fm (Member II)	631.55	
China	Drill core	n/a	270.16	-2.34	Tahata et al. 2013	Doushantuo Fm (Member II)	631.56	
China	Drill core	n/a	270.34	-3.98	Tahata et al. 2013	Doushantuo Fm (Member II)	631.59	
China	Drill core	n/a	272.23	-4.48	Tahata et al. 2013	Doushantuo Fm (Member II)	631.88	
China	Drill core	n/a	273.54	-1.33	Tahata et al. 2013	Doushantuo Fm (Member II)	632.09	
China	Drill core	n/a	275.86	-2.53	Tahata et al. 2013	Doushantuo Fm (Member II)	632.45	
China	Drill core	n/a	276.03	3.34	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	632.48	
China	Drill core	n/a	276.73	3.03	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	632.81	
China	Drill core	n/a	277.12	3.95	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	633.00	
China	Drill core	n/a	277.25	3.41	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	633.06	
China	Drill core	n/a	277.4	2.55	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	633.13	
China	Drill core	n/a	277.5	3.94	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	633.18	
China	Drill core	n/a	277.83	0.8	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	633.34	
China	Drill core	n/a	277.97	2.35	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	633.40	
China	Drill core	n/a	278.06	-0.78	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	633.45	
China	Drill core	n/a	278.23	-1.3	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	633.53	
China	Drill core	n/a	278.91	-9.57	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	633.85	
China	Drill core	n/a	279	-5.56	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	633.89	
China	Drill core	n/a	279.28	-3.5	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.03	
China	Drill core	n/a	279.5	-3.21	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.13	
China	Drill core	n/a	279.6	-2.82	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.18	
China	Drill core	n/a	279.65	-1.88	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.20	
China	Drill core	n/a	279.74	-3.71	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.25	
China	Drill core	n/a	279.81	-3.04	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.28	
China	Drill core	n/a	279.89	-3.03	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.32	
China	Drill core	n/a	280	-2.54	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.37	
China	Drill core	n/a	280.07	-2.56	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.40	
China	Drill core	n/a	280.15	-2.14	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.44	
China	Drill core	n/a	280.19	-1.32	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.46	
China	Drill core	n/a	280.29	-2.46	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.51	
China	Drill core	n/a	280.36	-2.57	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.54	
China	Drill core	n/a	280.36	-2.9	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.54	

China	Drill core	n/a		280.42	-2.48	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.57	
China	Drill core	n/a		280.48	-2.92	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.60	
China	Drill core	n/a		280.52	-2.3	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.62	
China	Drill core	n/a		280.57	-2.58	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.64	
China	Drill core	n/a		280.66	-2.26	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.68	
China	Drill core	n/a		280.69	-1.55	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	634.70	
China	Drill core	n/a		281.74	-2.96	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	635.20	
China	Drill core	n/a		281.87	-3.5	Tahata et al. 2013	Doushantuo Fm (Member I, cap carbonate)	**635.26**	ID-TIMS U-Pb date on ash layer in Doushantuo Fm, China. ~10 meters above Nantuo diamictite (Marinoan glacial). Condon et al. 2005. As recalculated in GTS 2012.
China	Jinunongwan		155.50	n/a	-5.02	Jiang et al. 2007	Doushantuo (Member IV)	**551.09**	Condon et al. 2005 U-Pb TIMS zircon age; identified at this layer by Jiang et al., 2007.
China	Jinunongwan		156.00	n/a	-1.8	Jiang et al. 2007	Doushantuo (Member IV)	551.06	
China	Jinunongwan		156.20	n/a	-1.75	Jiang et al. 2007	Dengying Fm	551.05	
China	Jinunongwan		156.40	n/a	-1.23	Jiang et al. 2007	Dengying Fm	551.03	
China	Jinunongwan		159.00	n/a	0.92	Jiang et al. 2007	Dengying Fm	550.88	
China	Jinunongwan		163.00	n/a	1.7	Jiang et al. 2007	Dengying Fm	550.63	
China	Jinunongwan		166.00	n/a	5.86	Jiang et al. 2007	Dengying Fm	550.45	
China	Jinunongwan		170.00	n/a	5.86	Jiang et al. 2007	Dengying Fm	550.20	
China	Jinunongwan		172.00	n/a	6.65	Jiang et al. 2007	Dengying Fm	550.08	
China	Jinunongwan		176.00	n/a	4.8	Jiang et al. 2007	Dengying Fm	549.83	
China	Jinunongwan		179.00	n/a	4.36	Jiang et al. 2007	Dengying Fm	549.65	
China	Jinunongwan		182.00	n/a	4.02	Jiang et al. 2007	Dengying Fm	549.47	
China	Jinunongwan		185.00	n/a	3.79	Jiang et al. 2007	Dengying Fm	549.28	
China	Jinunongwan		189.00	n/a	4.12	Jiang et al. 2007	Dengying Fm	549.04	
China	Jinunongwan		192.00	n/a	4.01	Jiang et al. 2007	Dengying Fm	548.85	
China	Jinunongwan		195.00	n/a	3.38	Jiang et al. 2007	Dengying Fm	548.67	
China	Jinunongwan		199.00	n/a	4.17	Jiang et al. 2007	Dengying Fm	548.42	
China	Jinunongwan		203.00	n/a	4.3	Jiang et al. 2007	Dengying Fm	548.18	
China	Jinunongwan		205.00	n/a	4.11	Jiang et al. 2007	Dengying Fm	548.06	
China	Jinunongwan		208.00	n/a	3.69	Jiang et al. 2007	Dengying Fm	547.87	
China	Jinunongwan		211.00	n/a	3.15	Jiang et al. 2007	Dengying Fm	547.69	
China	Jinunongwan		215.00	n/a	2.7	Jiang et al. 2007	Dengying Fm	547.44	
China	Shipai section		217.00	n/a	3.95	Jiang et al. 2007	Dengying Fm	**547.32**	
China	Shipai section		218.60	n/a	1.617	Jiang et al. 2007	Dengying Fm	547.29	
China	Shipai section		229.80	n/a	2.632	Jiang et al. 2007	Dengying Fm	547.10	
China	Shipai section		241.10	n/a	2.299	Jiang et al. 2007	Dengying Fm	546.90	
China	Shipai section		253.80	n/a	0.879	Jiang et al. 2007	Dengying Fm	546.67	
China	Shipai section		265.20	n/a	1.622	Jiang et al. 2007	Dengying Fm	546.47	
China	Shipai section		281.20	n/a	2.668	Jiang et al. 2007	Dengying Fm	546.19	
China	Shipai section		281.30	n/a	2.784	Jiang et al. 2007	Dengying Fm	546.19	
China	Shipai section		288.40	n/a	2.007	Jiang et al. 2007	Dengying Fm	546.07	
China	Shipai section		307.90	n/a	1.649	Jiang et al. 2007	Dengying Fm	545.72	
China	Shipai section		331.20	n/a	1.329	Jiang et al. 2007	Dengying Fm	545.31	
China	Shipai section		338.10	n/a	3.326	Jiang et al. 2007	Dengying Fm	545.19	
China	Shipai section		345.00	n/a	4.118	Jiang et al. 2007	Dengying Fm	545.07	
China	Shipai section		350.80	n/a	5.258	Jiang et al. 2007	Dengying Fm	544.97	
China	Shipai section		356.20	n/a	3.244	Jiang et al. 2007	Dengying Fm	544.88	
China	Shipai section		362.90	n/a	4.201	Jiang et al. 2007	Dengying Fm	544.76	
China	Shipai section		367.30	n/a	3.386	Jiang et al. 2007	Dengying Fm	544.68	
China	Shipai section		372.90	n/a	4.016	Jiang et al. 2007	Dengying Fm	544.58	
China	Shipai section		378.20	n/a	3.279	Jiang et al. 2007	Dengying Fm	544.49	
China	Shipai section		383.80	n/a	3.184	Jiang et al. 2007	Dengying Fm	544.39	
China	Shipai section		390.80	n/a	3.117	Jiang et al. 2007	Dengying Fm	544.27	
China	Shipai section		398.10	n/a	3.036	Jiang et al. 2007	Dengying Fm	544.14	
China	Shipai section		403.00	n/a	3.017	Jiang et al. 2007	Dengying Fm	544.05	
China	Shipai section		408.20	n/a	3.313	Jiang et al. 2007	Dengying Fm	543.96	
China	Shipai section		414.20	n/a	2.025	Jiang et al. 2007	Dengying Fm	543.86	
China	Shipai section		419.90	n/a	4.76	Jiang et al. 2007	Dengying Fm	543.76	
China	Shipai section		429.40	n/a	3.07	Jiang et al. 2007	Dengying Fm	543.59	
China	Shipai section		436.80	n/a	3.013	Jiang et al. 2007	Dengying Fm	543.46	
China	Shipai section		447.50	n/a	3.493	Jiang et al. 2007	Dengying Fm	543.27	
China	Shipai section		456.70	n/a	2.42	Jiang et al. 2007	Dengying Fm	543.11	
China	Shipai section		464.00	n/a	1.621	Jiang et al. 2007	Dengying Fm	542.98	
China	Shipai section		470.00	n/a	2.08	Jiang et al. 2007	Dengying Fm	542.88	
China	Shipai section		476.00	n/a	1.413	Jiang et al. 2007	Dengying Fm	542.77	
China	Shipai section		482.20	n/a	2.896	Jiang et al. 2007	Dengying Fm	542.66	
China	Shipai section		490.00	n/a	3.135	Jiang et al. 2007	Dengying Fm	542.53	
China	Shipai section		497.60	n/a	2.994	Jiang et al. 2007	Dengying Fm	542.39	
China	Shipai section		506.50	n/a	2.472	Jiang et al. 2007	Dengying Fm	542.24	
China	Shipai section		515.60	n/a	2.063	Jiang et al. 2007	Dengying Fm	542.08	
China	Shipai section		531.50	n/a	2.262	Jiang et al. 2007	Dengying Fm	541.80	
China	Shipai section		545.20	n/a	2.733	Jiang et al. 2007	Dengying Fm	541.56	
China	Shipai section		551.90	n/a	2.764	Jiang et al. 2007	Dengying Fm	541.44	
China	Shipai section		558.20	n/a	1.552	Jiang et al. 2007	Dengying Fm	541.33	
China	Shipai section		565.20	n/a	2.961	Jiang et al. 2007	Dengying Fm	541.21	
China	Shipai section		572.20	n/a	2.528	Jiang et al. 2007	Dengying Fm	541.08	
China	Shipai section		578.10	n/a	2.52	Jiang et al. 2007	Dengying Fm	540.98	
China	Shipai section		584.30	n/a	1.85	Jiang et al. 2007	Dengying Fm	540.87	
China	Shipai section		590.00	n/a	2.84	Jiang et al. 2007	Dengying Fm	540.77	
China	Shipai section		594.00	n/a	3.113	Jiang et al. 2007	Dengying Fm	540.70	
China	Shipai section		598.80	n/a	2.965	Jiang et al. 2007	Dengying Fm	540.62	
China	Shipai section		603.80	n/a	2.791	Jiang et al. 2007	Dengying Fm	540.53	
China	Shipai section		607.20	n/a	2.687	Jiang et al. 2007	Dengying Fm	540.47	
China	Shipai section		612.30	n/a	2.586	Jiang et al. 2007	Dengying Fm	540.38	
China	Shipai section		621.80	n/a	3.033	Jiang et al. 2007	Dengying Fm	540.21	
China	Shipai section		643.50	n/a	2.541	Jiang et al. 2007	Dengying Fm	539.83	
China	Shipai section		652.00	n/a	3.033	Jiang et al. 2007	Dengying Fm	539.68	
China	Shipai section		661.00	n/a	2.873	Jiang et al. 2007	Dengying Fm	539.52	
China	Shipai section		670.00	n/a	3.179	Jiang et al. 2007	Dengying Fm	539.37	
China	Shipai section		678.00	n/a	2.472	Jiang et al. 2007	Dengying Fm	539.23	
China	Shipai section		686.00	n/a	0.09	Jiang et al. 2007	Dengying Fm	539.08	
China	Shipai section		694.20	n/a	-0.144	Jiang et al. 2007	Dengying Fm	538.94	
China	Shipai section		707.90	n/a	-0.576	Jiang et al. 2007	Dengying Fm	**538.7**	Precambrian-Cambrian boundary. Age after Linnemann et al. 2018, a combined paleontological study + ID-TIMS U-Pb ash dates on Swartpunt section, Namibia, suggest moving the Precambrian-Cambrian boundary younger, between 538.8 and 538.6 Ma.
Brazil	Laginha Mine western base		0.00	n/a		Boggiani et al. 2010	Tamengo Fm	**555.18**	Tuff dated by TIMS, upper Bocaina Fm, Parry et al. 2017. Minimum depositional age for Tamengo Fm. Ocurrs below a small negative excursion.
Brazil	Laginha Mine western base		0.70	n/a	-3.64	Boggiani et al. 2010	Tamengo Fm	554.99	
Brazil	Laginha Mine western base		2.10	n/a	-3.23	Boggiani et al. 2010	Tamengo Fm	554.57	
Brazil	Laginha Mine western		3.20	n/a	-0.11	Boggiani et al. 2010	Tamengo Fm	554.28	
Brazil	Laginha Mine western base		4.80	n/a	-0.71	Boggiani et al. 2010	Tamengo Fm	553.82	
Brazil	Laginha Mine western base		7.00	n/a	-0.56	Boggiani et al. 2010	Tamengo Fm	553.18	
Brazil	Laginha Mine western		8.30	n/a	-0.43	Boggiani et al. 2010	Tamengo Fm	552.82	
Brazil	Laginha Mine western base		8.90	n/a	-1.12	Boggiani et al. 2010	Tamengo Fm	552.66	
Brazil	Laginha Mine western base		11.00	n/a	-0.31	Boggiani et al. 2010	Tamengo Fm	552.05	
Brazil	Laginha Mine western base		12.40	n/a	-0.29	Boggiani et al. 2010	Tamengo Fm	551.66	
Brazil	Laginha Mine western base		14.40	n/a	-0.4	Boggiani et al. 2010	Tamengo Fm	551.07	
Brazil	Laginha Mine western base		15.50	n/a	-1.38	Boggiani et al. 2010	Tamengo Fm	550.76	
Brazil	Laginha Mine western base		17.30	n/a	-0.95	Boggiani et al. 2010	Tamengo Fm	550.26	
Brazil	Laginha Mine western base		19.20	n/a	-1.46	Boggiani et al. 2010	Tamengo Fm	549.71	
Brazil	Laginha Mine western		20.00	n/a	-3.32	Boggiani et al. 2010	Tamengo Fm	549.48	
Brazil	Laginha Mine western base		20.40	n/a	-1.13	Boggiani et al. 2010	Tamengo Fm	549.37	
Brazil	Laginha Mine western base		22.00	n/a	-1.07	Boggiani et al. 2010	Tamengo Fm	548.91	
Brazil	Laginha Mine western		22.60	n/a	0.27	Boggiani et al. 2010	Tamengo Fm	548.76	
Brazil	Laginha Mine western base		23.30	n/a	-1.1	Boggiani et al. 2010	Tamengo Fm	548.56	
Brazil	Laginha Mine western		23.60	n/a	0.42	Boggiani et al. 2010	Tamengo Fm	548.46	
Brazil	Laginha Mine western base		24.60	n/a	-1.28	Boggiani et al. 2010	Tamengo Fm	548.17	
Brazil	Laginha Mine western base		25.60	n/a	-1.34	Boggiani et al. 2010	Tamengo Fm	547.88	
Brazil	Laginha Mine western base		27.20	n/a	-1.35	Boggiani et al. 2010	Tamengo Fm	547.45	
Brazil	Laginha Mine western		27.30	n/a	4.59	Boggiani et al. 2010	Tamengo Fm	547.42	
Brazil	Laginha Mine western base		28.50	n/a	-1.51	Boggiani et al. 2010	Tamengo Fm	547.08	
Brazil	Laginha Mine western base		30.20	n/a	-1.89	Boggiani et al. 2010	Tamengo Fm	546.57	
Brazil	Laginha Mine western base		31.50	n/a	-1.1	Boggiani et al. 2010	Tamengo Fm	546.23	
Brazil	Laginha Mine western		32.00	n/a	1.3	Boggiani et al. 2010	Tamengo Fm	546.08	
Brazil	Laginha Mine western base		33.00	n/a	-0.36	Boggiani et al. 2010	Tamengo Fm	545.79	
Brazil	Laginha Mine western base		36.20	n/a	0.45	Boggiani et al. 2010	Tamengo Fm	544.88	
Brazil	Laginha Mine western base		37.00	n/a	0.13	Boggiani et al. 2010	Tamengo Fm	544.64	
Brazil	Laginha Mine western base		38.30	n/a	0.97	Boggiani et al. 2010	Tamengo Fm	544.29	
Brazil	Laginha Mine western base		39.40	n/a	-0.56	Boggiani et al. 2010	Tamengo Fm	543.98	
Brazil	Laginha Mine western base		40.40	n/a	0.34	Boggiani et al. 2010	Tamengo Fm	543.68	
Brazil	Laginha Mine western base		42.60	n/a	0.56	Boggiani et al. 2010	Tamengo Fm	543.07	
Brazil	Laginha Mine western base		44.00	n/a	0.54	Boggiani et al. 2010	Tamengo Fm	542.65	
Brazil	Laginha Mine western		45.00	n/a	1.87	Boggiani et al. 2010	Tamengo Fm	**542.37**	Tuff dated by TIMS, Tamengo Fm (upper). Occurs within +2 δ13C permille plateau. Parry et al. 2017.
Brazil	Laginha Mine western base		45.40	n/a	3.18	Boggiani et al. 2010	Tamengo Fm	542.36	
Brazil	Laginha Mine western		50.40	n/a	2.6	Boggiani et al. 2010	Tamengo Fm	542.25	
Brazil	Laginha Mine western		52.80	n/a	3.15	Boggiani et al. 2010	Tamengo Fm	542.20	
Brazil	Laginha Mine western		57.20	n/a	3.11	Boggiani et al. 2010	Tamengo Fm	542.10	
Brazil	Laginha Mine western		59.70	n/a	1.39	Boggiani et al. 2010	Tamengo Fm	542.04	
Brazil	Laginha Mine western		68.40	n/a	2.75	Boggiani et al. 2010	Tamengo Fm	**541.85**	Tuff dated by TIMS, basal Guicaras Fm, Parry et al. 2017.
Namibia	Southern sub-basin		0.00	n/a		Saylor et al. 1998, digitized from figure 2D	Kaines Member	**550**	Estimated onset of deposition of Kaines Member in Witputs subbasin, Namibia. Estimate made on the basis of chemostratigraphic correlation of units upsection.
Namibia	Southern sub-basin		55.00	n/a	-1.4	Saylor et al. 1998, digitized from figure 2D	Kaines Member	549.43	
Namibia	Southern sub-basin		57.00	n/a	-3.6	Saylor et al. 1998, digitized from figure 2D	Kaines Member	549.40	
Namibia	Southern sub-basin		68.00	n/a	-3.6	Saylor et al. 1998, digitized from figure 2D	Mara Member	549.29	
Namibia	Southern sub-basin		68.00	n/a	-2.1	Saylor et al. 1998, digitized from figure 2D	Mara Member	549.29	
Namibia	Southern sub-basin		77.00	n/a	-2.7	Saylor et al. 1998, digitized from figure 2D	Mara Member	549.20	
Namibia	Southern sub-basin		92.00	n/a	-2.7	Saylor et al. 1998, digitized from figure 2D	Mara Member	549.03	
Namibia	Southern sub-basin		98.00	n/a	-1.6	Saylor et al. 1998, digitized from figure 2D	Mara Member	548.97	
Namibia	Southern sub-basin		133.00	n/a	-3.7	Saylor et al. 1998, digitized from figure 2D	Kliphoek Member	548.60	
Namibia	Southern sub-basin		162.00	n/a	2.4	Saylor et al. 1998, digitized from figure 2D	Mooifontein Member	548.30	
Namibia	Southern sub-basin		164.00	n/a	-0.3	Saylor et al. 1998, digitized from figure 2D	Mooifontein Member	548.28	
Namibia	Southern sub-basin		171.00	n/a	0.3	Saylor et al. 1998, digitized from figure 2D	Mooifontein Member	548.21	
Namibia	Southern sub-basin		171.00	n/a	0.6	Saylor et al. 1998, digitized from figure 2D	Mooifontein Member	548.21	
Namibia	Southern sub-basin		173.00	n/a	1.8	Saylor et al. 1998, digitized from figure 2D	Mooifontein Member	548.18	
Namibia	Southern sub-basin		173.00	n/a	2.7	Saylor et al. 1998, digitized from figure 2D	Mooifontein Member	548.18	
Namibia	Southern sub-basin		188.00	n/a	2.2	Saylor et al. 1998, digitized from figure 2D	Mooifontein Member	548.02	
Namibia	Southern sub-basin		425.00	n/a	1.5	Saylor et al. 1998, digitized from figure 2D	Nasep Member	545.54	
Namibia	Southern sub-basin		440.00	n/a	2.1	Saylor et al. 1998, digitized from figure 2D	Nasep Member	545.38	
Namibia	Southern sub-basin		573.00	n/a	2	Saylor et al. 1998, digitized from figure 2D	Huns Member	543.98	
Namibia	Southern sub-basin		602.00	n/a	1.4	Saylor et al. 1998, digitized from figure 2D	Huns Member	543.68	
Namibia	Southern sub-basin		635.00	n/a	2.2	Saylor et al. 1998, digitized from figure 2D	Huns Member	543.34	
Namibia	Southern sub-basin		670.00	n/a	2.3	Saylor et al. 1998, digitized from figure 2D	Huns Member	542.97	
Namibia	Southern sub-basin		705.00	n/a	1.9	Saylor et al. 1998, digitized from figure 2D	Huns Member	542.60	
Namibia	Southern sub-basin		746.00	n/a	2.3	Saylor et al. 1998, digitized from figure 2D	Huns Member	542.16	
Namibia	Southern sub-basin		783.00	n/a	1.8	Saylor et al. 1998, digitized from figure 2D	Huns Member	541.77	
Namibia	Southern sub-basin		838.00	n/a	2.1	Saylor et al. 1998, digitized from figure 2D	Huns Member	541.20	
Namibia	Southern sub-basin		943.00	n/a	1.8	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	**540.095**	Spitskop member ash, southern subbasin, within +2 δ13C permille plateau. Linnemann et al. 2018

Namibia	Southern sub-basin	958.00	n/a	1.8	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	540.04	
Namibia	Southern sub-basin	972.00	n/a	2.5	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	540.00	
Namibia	Southern sub-basin	989.00	n/a	2.1	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.94	
Namibia	Southern sub-basin	1009.00	n/a	2.1	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.88	
Namibia	Southern sub-basin	1022.00	n/a	1.8	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.84	
Namibia	Southern sub-basin	1033.00	n/a	1.8	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.80	
Namibia	Southern sub-basin	1055.00	n/a	1.5	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.73	
Namibia	Southern sub-basin	1063.00	n/a	2.1	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.70	
Namibia	Southern sub-basin	1077.00	n/a	1.1	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.66	
Namibia	Southern sub-basin	1088.00	n/a	1.5	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.62	
Namibia	Southern sub-basin	1114.00	n/a	1.8	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.54	
Namibia	Southern sub-basin	1186.00	n/a	1	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.30	
Namibia	Southern sub-basin	1197.00	n/a	2	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.27	
Namibia	Southern sub-basin	1204.00	n/a	1.6	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.24	
Namibia	Southern sub-basin	1276.00	n/a	1.2	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	539.01	
Namibia	Southern sub-basin	1282.00	n/a	-1	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.99	
Namibia	Southern sub-basin	1289.00	n/a	1	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.97	
Namibia	Southern sub-basin	1293.00	n/a	1.6	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.95	
Namibia	Southern sub-basin	1304.00	n/a	1	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.92	
Namibia	Southern sub-basin	1317.00	n/a	1.4	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.87	
Namibia	Southern sub-basin	1324.00	n/a	0.9	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.85	
Namibia	Southern sub-basin	1346.00	n/a	0.9	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.78	
Namibia	Southern sub-basin	1352.00	n/a	1.6	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.76	
Namibia	Southern sub-basin	1376.00	n/a	0	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.68	
Namibia	Southern sub-basin	1376.00	n/a	1.2	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.68	
Namibia	Southern sub-basin	1385.00	n/a	0.7	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.65	
Namibia	Southern sub-basin	1396.00	n/a	1.9	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.62	
Namibia	Southern sub-basin	1398.00	n/a	0.7	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.61	
Namibia	Southern sub-basin	1407.00	n/a	1.2	Saylor et al. 1998, digitized from figure 2D	Spitzkopf Member	538.58	
Namibia			n/a			Nomtsas Fm	**538.58**	Nomstas Fm ash, Namibia. Southern subbasin, +2 δ13C permille plateau. Dated by U-Pb TIMS on zircon by Linnemann et al. 2018

Table S2: Re and Os elemental abundance and isotopic composition data for isochron regressions

Sample	Isochron	Re (ng/g)	±	Os (pg/g)	±	^{192}Os (pg/g)	±	^{187}Re/^{188}Os	±	^{187}Os/^{188}Os	±	rho[a]	Osi[b]
30	Well L	41.345	0.118	909.1	9.3	239.8	1.8	342.9918	2.7299	4.4592	0.0570	0.543	1.140
31		159.444	0.393	3084.5	18.9	769.6	2.6	412.1811	1.7281	5.1469	0.0247	0.572	1.159
32		192.669	0.473	3625.8	22.5	896.0	3.1	427.7917	1.8078	5.2690	0.0258	0.573	1.130
28		163.530	0.400	2805.6	18.0	659.1	2.3	493.6122	2.0855	5.9341	0.0290	0.576	1.158
34		288.910	0.706	4805.7	31.8	1109.4	3.9	518.0780	2.2189	6.1712	0.0315	0.567	1.158
27		70.994	0.175	1128.5	7.6	253.7	0.9	556.7242	2.4284	6.5406	0.0333	0.584	1.163
29		260.549	0.636	3823.0	25.4	815.4	2.8	635.7007	2.6535	7.3007	0.0350	0.575	1.150
26		210.434	0.516	2880.3	20.6	583.7	2.1	717.1764	3.1518	8.0781	0.0424	0.579	1.139
A	A1707	1.397	0.005	160.7	0.8	59.2	0.3	46.9540	0.3075	1.0532	0.0080	0.590	0.608
B	64° 43' 10.0704" -140°	3.883	0.012	79.8	0.5	22.0	0.1	351.4028	1.9460	3.9508	0.0246	0.599	0.616
C	2' 30.0834"	4.976	0.017	61.5	0.5	12.3	0.1	802.7904	5.4531	8.2357	0.0618	0.676	0.616
D		2.311	0.008	43.6	0.3	11.6	0.1	397.2155	2.9232	4.3846	0.0372	0.654	0.615
E		0.821	0.005	205.1	0.8	77.7	0.3	21.0201	0.1603	0.8132	0.0050	0.404	0.614
1	J1443	0.643	0.003	85.6	0.3	31.8	0.1	40.2820	0.2510	0.9895	0.0057	0.477	0.602
2	64° 5' 36.999" -132°	7.487	0.019	348.3	1.3	117.7	1.2	126.4998	1.3294	1.8232	0.0187	0.967	0.608
3	13' 53.0004"	1.154	0.004	82.4	0.5	29.3	0.2	78.3031	0.5221	1.3591	0.0122	0.554	0.607
4		0.790	0.003	56.3	0.3	20.0	0.1	78.5263	0.4857	1.3630	0.0087	0.544	0.609
5		9.441	0.023	387.9	2.0	128.7	0.5	145.9664	0.6835	2.0024	0.0117	0.581	0.600
3	Well M	86.7780	0.2128	3150.7	15.6	1014.9	3.6	170.1028	0.7336	2.2867	0.0116	0.576	0.687
4		41.7632	0.1039	1378.0	6.9	435.6	1.5	190.7463	0.8186	2.4739	0.0123	0.575	0.680
5		243.8726	0.5974	4703.2	27.9	1254.8	4.4	386.6377	1.6394	4.3239	0.0213	0.574	0.687
6		25.6715	0.0637	781.9	4.3	242.3	0.9	210.7425	0.9610	2.6731	0.0147	0.584	0.691
7		133.9473	0.3272	2250.8	14.0	560.5	2.0	475.4030	2.0213	5.1705	0.0255	0.578	0.698
8		166.7851	0.4081	3403.1	20.0	931.4	3.3	356.2314	1.5233	4.0248	0.0202	0.572	0.674
1	J1719	0.738	0.002	50.6	0.3	17.9	0.1	81.8245	0.5768	1.3908	0.0095	0.684	0.605
2	64°50'47.8026" -	1.104	0.004	61.4	0.3	21.3	0.1	103.2652	0.6476	1.5954	0.0116	0.622	0.603
3	133°0'43.5564"	0.761	0.003	45.0	0.2	15.7	0.1	96.3474	0.7473	1.5345	0.0116	0.653	0.609
4		0.821	0.008	79.3	0.4	28.9	0.1	56.5053	0.8440	1.1432	0.0081	0.559	0.600
5		0.996	0.004	69.7	0.4	24.8	0.1	80.0356	0.5449	1.3700	0.0098	0.553	0.601
6		3.547	0.013	131.7	0.8	42.9	0.2	164.6136	1.0067	2.1850	0.0152	0.576	0.603
7		0.890	0.005	57.7	0.3	20.3	0.1	87.0138	0.9443	1.4346	0.0098	0.762	0.599
8		13.769	0.050	312.1	2.0	89.0	0.4	307.6607	1.7531	3.5544	0.0222	0.548	0.598

Uncertainties are given as 2σ for ^{187}Re/^{188}Os and ^{187}Os/^{188}Os and ^{192}Os.

The uncertainty includes the 2 SE uncertainty for mass spectrometer analysis plus uncertainties for Os blank abundance and isotopic composition.

[a] Rho is the associated error correlation (Ludwig, 1980).

[b] Os_i = initial ^{187}Os/^{188}Os isotope ratio calculated at 578, 567, 575, 562 and 574 Ma.

Table S3: Geochronological data for Figure 3

Sample	Locality	Lithostratigraphy	Age (Ma)	± 2s analytical	± 2s total	Age Type	Radiometric age details	Reference
17SWART7 ash 6 volcanic ash bed	Swartkloofberg section, Witputs Subbasin, Nama Basin, southern Namibia	Nomtsas Fm, Nama Group	538.58	± 0.19	± 0.63	$^{206}Pb/^{238}U$	Three of nine concordant single grain zircon analyses (excluding six older grains) combined to produce a weighted mean $^{206}Pb/^{238}U$ age, utilizing CA-TIMS and the EARTHTIME 535 spike.	Linneman et al., 2019
BB5 volcanic ash bed	Oman (3045m depth, Birba-5 well)	Ara Group, 1m above base of A4 carbonate unit	541.00	± 0.29	± 0.63	$^{206}Pb/^{238}U$	Eight concordant single zircon grain analyses combined to produce a weighted mean $^{206}Pb/^{238}U$age, utilizing CA-TIMS and the EARTHTIME 535 spike.	Bowring et al., 2007
sample 1.04 volcanic ash bed	Corcal, Corumbá - State of Mato Grosso do Sul, Brazil	top of Tamengo Formation, Corumba Group, southern Paraguay Belt	541.85	± 0.77	± 0.97	$^{206}Pb/^{238}U$	Five of eleven concordant single zircon grain analyses (excluding six older grains) combined to produce a weighted mean 206Pb/238U age, utilizing CA-TIMS and the EARTHTIME 535 spike.	Parry et al., 2017
sample 1.08 volcanic ash bed	Corcal, Corumbá - State of Mato Grosso do Sul, Brazil	top of Tamengo Formation, Corumba Group, southern Paraguay Belt	542.37	± 0.32	± 0.68	$^{206}Pb/^{238}U$	Four of eight concordant single zircon grain analyses (excluding 1 older and 3 younger grains) combined to produce a weighted mean 206Pb/238U age, utilizing CA-TIMS and the EARTHTIME 535 spike.	Parry et al., 2017
JIN04-2 volcanic ash bed	Jijiawan (Jiuqunao) section, 17 km west of Maoping in Yangtze Gorges area, western Hubei Province, South China	top of Miaohe member black shale, uppermost Doushantuo Fm	551.09	± 0.84	± 1.02	$^{206}Pb/^{238}U$	Sample JIN04-02 yields two concordant (of ten total) single zircon grain analyses with a weighted mean 206Pb/238U age of 551.09 ± 1.02 Ma. A corroborating weighted mean 207Pb/206Pb age of 548.09 ± 2.61 Ma is obtained from all ten zircons (recalculated using the U decay constant ratio of Mattinson, 2010).	Condon et al., 2005
Porto Morrinhos tuff	Porto Morrinhos - State of Mato Grosso do Sul, Brazil	Bocaina Formation, Corumba Group, southern Paraguay Belt	555.18	± 0.34	± 0.70	$^{206}Pb/^{238}U$	Eight concordant single zircon grain analyses combined to produce a weighted mean 206Pb/238U age, utilizing CA-TIMS and the EARTHTIME 535 spike.	Parry et al., 2017
volcanic ash bed, sample NoP-0.9	North Point, St. Mary's Bay, Avalon Peninsula, Newfoundland	post-glacial strata; basal Drook Formation, 0.9 m above the Gaskiers Formation; Conception Group	579.88	± 0.52	± 0.81	$^{206}Pb/^{238}U$	Five single zircon grains combined to produce a weighted mean 206Pb/238U age, utilizing CA-TIMS and the EARTHTIME 535 spike.	Pu et al., 2016
7527 volcanic ash bed	Wangjiagou section in the Zhangcunping area, Yichang, Hubei Province, South China	between beds 3 and 4, below erosional unconformity in middle Doushantuo Fm	614.00	± 9.00	± 9.00	$^{206}Pb/^{238}U$	SHRIMP II ion probe analyses of 18 zircon grains yield a weighted mean 206Pb/238 age of 614.0 ± 9.0 Ma, (95% conf. int. including geologic scatter and an assumed 1% error in the TEMORA standardization).	Liu et al., 2009
SpB	Mackenzie Mountains, NW Canada	Sheepbed Formation, 0.9m above contact with Hayhook Limestone Formation	632.30	± 3.4	± 5.9	^{187}Re-^{187}Os	Re-Os isochron age from organic-rich carbonaceous mudstones. Regressed using Isoplot V4.15 and includes the uncertainty in the 187Re decay constant from the Smoliar et al. (1996) paper	Rooney et al., 2015
YG04-2 volcanic ash bed	Jijiawan (Jiuqunao) section, 17 km west of Maoping in Yangtze Gorges area, western Hubei Province, South China	9.5m above base of Doushantuo Fm, 5m above top of Lower Dolomite Member (Nantuo Cap Carbonate)	632.48	± 0.84	± 1.02	$^{206}Pb/^{238}U$	Three concordant (of nine total) single zircon grain analyses have a weighted mean 206Pb/238U age of 632.48 ± 1.02 Ma. A corroborating weighted mean 207Pb/206Pb age of 629.97 ± 2.83 Ma is obtained from all nine zircons (recalculated using the U decay constant ratio of Mattinson, 2010).	Condon et al., 2005
YG04-15 volcanic ash bed	Wuhe-Gaojiaxi section, south of Sandouping in Yangtze Gorges area, western Hubei Province, South China	2.3m above base of Doushantuo Fm, within the Lower Dolomite Member (cap carbonate)	635.26	± 0.84	± 1.07	$^{206}Pb/^{238}U$	Three concordant (of 18 total) single zircon grain analyses have a weighted mean 206Pb/238U age of 635.26 ± 1.07 Ma. A corroborating weighted mean 207Pb/206Pb age of 632.85 ± 2.82 Ma is obtained from 11 zircons (recalculated using the U decay constant ratio of Mattinson, 2010).	Condon et al., 2005