**Supplementary Table 2** Tephra depth, thickness, bulk grain size, stratification, main characteristics, and modelled tephra age, from all composite tephra records analysed in this study.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Comp. tephra-nba | Comp. short. depth (cm)b | Thick-ness (cm)c | Bulk grain sized | Stratifi-catione | Main tephra characteristicf | Tm-group and gl chemistryg | Modeled tephra age (cal yr BP)h |
| Lake Richmond |  |  |  |  |  |  |  |
| Ri-1 | 28.5 | cryp | fa |  |  |  | 424±11 |
| Ri-2 | 36 | 0.5 | fa |  | gr ash, bleached upper contact | 11/12 | 517±10 |
| Ri-3 | 38 | cryp | fa |  |  |  | 539±10 |
| Ri-4 | 42 | 0.1 | fa |  |  | 12 | 581±12 |
| Ri-5 | 51 | 0.05 | fa |  |  |  | 680±23 |
| Ri-6 | 61 | 0.5 | fa |  | gr ash | 12 | 794±32 |
| Ri-7 | 113.5 | 0.05 | fa |  |  |  | 1534±47 |
| Ri-8 | 118 | 0.1 | fa |  |  |  | 1602±47 |
| Ri-9 | 126 | 0.1 | fa |  |  |  | 1730±43 |
| Ri-10 | 127 | 0.5 | ca |  | lithic rich | 6, TD | 1739±43 |
| Ri-11 | 129 | 0.1 | fa |  |  |  | 1771±41 |
| Ri-12 | 129.5 | 0.1 | fa |  |  |  | 1778±41 |
| Ri-13 | 130 | 0.1 | fa |  |  |  | 1785±41 |
| Ri-14 | 134 | 0.1 | fa |  |  |  | 1853±38 |
| Ri-15 | 135 | 0.1 | fa |  |  |  | 1870±37 |
| Ri-16 | 136 | 0.1 | fa |  |  |  | 1886±37 |
| Ri-17 | 139 | 0.1 | fa |  |  |  | 1938±35 |
| Ri-18 | 141.5 | 0.1 | fa |  |  |  | 1983±35 |
| Ri-19 | 142.5 | 0.1 | fa |  |  |  | 1999±35 |
| Ri-20 | 150 | 1 | ca | ig | gr ves pumice, sp lithics, bl frag | 12, TD | 2122±37 |
| Ri-21 | 152 | cryp | fa |  |  |  | 2161±38 |
| Ri-22 | 155 | 0.5 | ca-fl |  |  | 12, TD | 2209±39 |
| Ri-23 | 156.5 | 0.5 | fa |  | gr ash | 12 | 2228±40 |
| Ri-24 | 158.5 | 0.5 | ma |  | bl ash | 11, TA | 2258±41 |
| Ri-25 | 164 | 0.5 | ca |  |  | 11 | 2355±42 |
| Ri-26 | 167 | 2.5 | ca | ig-ng | br-bl micves py pumice, lithic poor | 11, TA | 2365±42 |
| Ri-27 | 171 | cryp | fa |  |  | 11 | 2445±41 |
| Ri-28 | 171.5 | 0.5 | ca |  | bl micves pumice |  | 2445±41 |
| Ri-29 | 173 | 0.05 | fa |  |  | 11 | 2476±41 |
| Ri-30 | 176 | 2 | ca |  | dgr-bl micves pumice, red scoria | 11, bA-bTA-TA | 2497±40 |
| Ri-31 | 181 | 0.05 | fa |  |  |  | 2604±39 |
| Ri-32 | 183.5 | cryp | fa |  |  |  | 2659±39 |
| Ri-33 | 200 | 0.05 | fa |  |  |  | 2960±52 |
| Ri-34 | 209.5 | 1 | fa |  | gr ash, bleached upper contact | 10, R | 3201±61 |
| Ri-35 | 220 | cryp | fa |  |  |  | 3398±52 |
| Ri-36 | 220.5 | 0.1 | fa |  |  |  | 3405±51 |
| Ri-37 | 221.5 | 0.1 | fa |  |  |  | 3422±50 |
| Ri-38 | 222.5 | 0.1 | fa |  |  |  | 3438±49 |
| Ri-39 | 225 | 0.1 | fa |  |  |  | 3483±46 |
| Ri-40 | 227.5 | 1 | fl-ml | m | wh f-ves pumice, lithic rich | 10, R | 3510±45 |
| Ri-41 | 228.5 | 0.3 | fa |  |  |  | 3523±44 |
| Ri-42 | 229.5 | 0.1 | fa |  |  |  | 3539±44 |
| Ri-43 | 243 | 0.05 | fa |  |  |  | 3770±45 |
| Ri-44 | 243.5 | 0.05 | fa |  |  |  | 3778±45 |
| Ri-45 | 245.5 | cryp | fa |  |  |  | 3810±46 |
| Ri-46 | 248 | 0.05 | fa |  |  |  | 3848±46 |
| Ri-47 | 259 | 8 | ca-fl | ig-ng | pgr ves pumice, banded, lithic rich  | 10, R | 3893±46 |
| Ri-48 | 259.5 | 0.03 | fa |  |  |  | 3900±46 |
| Ri-49 | 273 | cryp | fa |  |  |  | 4070±37 |
| Stent | 287 | 1.5 | fa |  | pwh ash | R | 4279±47 |
| Ri-50 | 294 | 0.3 | fa |  |  | 8 | 4315±50 |
| Ri-51 | 302.5 | 8 | ma-ca | m, ws | crys rich pgr pumiceous ash | 9, TD | 4328±51 |
| Ri-52 | 304.5 | cryp | fa |  |  |  | 4371±53 |
| Ri-53 | 307 | cryp | fa |  |  |  | 4424±56 |
| Ri-54 | 309.5 | cryp | fa |  |  |  | 4476±57 |
| Ri-55 | 313.5 | 1 | fa |  |  |  | 4538±57 |
| Ri-56 | 323 | 0.1 | fa |  |  |  | 4732±52 |
| Ri-57 | 324.5 | 0.3 | fa |  |  |  | 4757±51 |
| Ri-58 | 329.5 | 3 | ma | m, ws | crys rich pgr pumiceous ash | 8, TD | 4801±49 |
| Ri-59 | 332.5 | 0.1 | fa-ma |  |  |  | 4866±46 |
| Ri-60 | 337.5 | 4.5 | ml | m | pgr ves pumice, banded, lithic poor | 8, TD | 4878±46 |
| Ri-61 | 338.5 | 0.1 | fa |  |  |  | 4899±45 |
| Ri-62 | 339.5 | cryp | fa |  |  |  | 4921±44 |
| Ri-63 | 344.5 | 0.05 | fa |  |  |  | 5049±42 |
| Ri-64 | 345 | 0.1 | fa |  |  |  | 5060±42 |
| Ri-65 | 349 | 1 | fa |  | gr ash, dispersed on top | tm spread | 5145±42 |
| Ri-66 | 353.5 | 0.05 | fa-ma |  |  |  | 5285±43 |
| Ri-67 | 357.5 | 0.1 | fa |  |  |  | 5423±46 |
| Ri-68 | 358.5 | 0.1 | fa |  |  |  | 5457±47 |
| Ri-69 | 359.5 | cryp | fa |  |  |  | 5494±48 |
| Ri-70 | 369.5 | 9 | ml | m | pgr ves pumice, banded, lithic poor | 9, TD-R | 5534±48 |
| Ri-71 | 370.5 | 0.1 | fa |  |  |  | 5568±47 |
| Ri-72 | 371.5 | 0.1 | fa |  |  |  | 5601±48 |
| Ri-73 | 372.5 | cryp | fa |  |  |  | 5641±48 |
| Ri-74 | 373.5 | 0.5 | fa-ma | ig | gr ash | 8 | 5662±48 |
| Ri-75 | 375 | 0.1 | fa |  |  |  | 5723±47 |
| Ri-76 | 378.5 | 0.05 | fa |  |  |  | 5894±45 |
| Ri-77 | 380 | 0.05 | fa |  |  |  | 5974±45 |
| Ri-78 | 387 | 0.3 | fa |  |  |  | 6350±50 |
| Ri-79 | 389 | 0.1 | fa |  |  |  | 6457±54 |
| Ri-80 | 392 | 0.3 | fa | ls |  |  | 6605±60 |
| Ri-81 | 393.5 | 0.3 | fa | ls |  |  | 6668±62 |
| Ri-82 | 394.5 | 0.3 | fa | ls |  |  | 6704±64 |
| Ri-83 | 398.5 | 0.3 | fa | ls |  |  | 6879±69 |
| Ri-84 | 402.5 | 2 | ma-ca | ng | gr ves pumice, lithic rich | 3, TD | 6960±70 |
| Ri-85 | 403.5 | 0.3 | fa | ls |  |  | 6986±70 |
| Ri-86 | 413 | 0.1 | fa | ls |  |  | 7277±64 |
| Ri-87 | 416 | 0.1 | fa | ls |  |  | 7354±61 |
| Ri-88 | 424.5 | 1 | ml | ls | gr ves pumice, lithic rich | 3 | 7535±53 |
| Ri-89 | 426 | 0.5 | fa | ls |  |  | 7558±52 |
| Ri-90 | 438.5 | 0.5 | fa | ls |  |  | 7813±39 |
| Ri-91 | 441 | 0.5 | fa | ls |  |  | 7856±37 |
| Ri-92 | 450 | 0.1 | fa | ls |  |  | 8054±32 |
| Ri-93 | 451 | 0.1 | fa | ls |  |  | 8075±32 |
| Ri-94 | 454.5 | 0.1 | fa |  |  |  | 8160±31 |
| Ri-95 | 464 | 1 | ca | m, ws | crys rich pgr pumiceous ash | 8, TD | 8401±33 |
| Ri-96 | 464.5 | 0.1 | fa-ma |  |  |  | 8414±33 |
| Ri-97 | 472 | 0.05 | fa |  |  |  | 8669±34 |
| Ri-98 | 477.5 | 0.5 | fa |  |  |  | 8857±34 |
| Ri-99 | 503 | 1 | ca |  | gr-pgr ves-micves pumice, crys rich | 2 | 9947±33 |
| Ri-100 | 504.5 | 0.1 | fa |  |  |  | 10,017±33 |
| Ri-101 | 505.5 | 0.1 | fa |  |  |  | 10,062±34 |
| Ri-102 | 506.5 | 0.1 | fa |  |  |  | 10,107±35 |
| Ri-103 | 507 | 0.1 | fa |  |  |  | 10,127±35 |
| Ri-104 | 508 | 0.1 | fa |  |  |  | 10,173±36 |
| Ri-105 | 509.5 | 0.5 | ca |  | pgr ves pumice, crys & lithic rich | 2 | 10,224±36 |
| Ri-106 | 511 | 0.3 | ca |  | lithic rich |  | 10,285±38 |
| Ri-107 | 512.5 | 0.5 | ca |  |  |  | 10,337±39 |
| Ri-108 | 513.5 | 0.5 | fa |  |  |  | 10,362±39 |
| Ri-109 | 516 | 1 | ca | m, ws | gr ves pumice, crys rich | 2, TD | 10,440±41 |
| Ri-110 | 518 | 0.5 | ca |  |  |  | 10,519±43 |
| Ri-111 | 518.5 | 0.05 | ca |  |  |  | 10,543±43 |
| Ri-112 | 520 | 0.5 | fa |  |  |  | 10,595±44 |
| Ri-113 | 521.5 | 1.5 | ml |  | pgr c-ves pumice, crys rich | 5 | 10,595±44 |
| Ri-114 | 525.5 | 3 | ml |  |  |  | 10,660±46 |
| Ri-115 | 529.5 | 3 | ml |  | pgr c-ves pumice, crys rich |  | 10,741±45 |
| Ri-116 | 530.5 | 0.5 | fa-ca |  |  |  | 10,782±45 |
| Ri-117 | 538 | 5.5 | ca-ml |  | pgr-gr c-ves pumice, crys&lithic rich | 4 | 10,955±43 |
| Ri-118 | 539.5 | 1 | ca |  | pgr-gr c-ves pumice, lithic poor | 7 | 11,000±44 |
| Ri-119 | 542.5 | 1 | fa |  |  |  | 11,182±40 |
| Ri-120 | 544.5 | 0.1 | fa |  |  |  | 11,359±36 |
| Ri-121 | 556 | 4 | ca |  | pgr ves pumice, crys rich | 2, TD | 12,042±24 |
| Ri-122 | 559.5 | 0.5 | ca |  |  |  | 12,283±21 |
| Ri-123 | 567.5 | 1 | fa-ca | m | dgr ash, bl frag | 2, TD | 12,696±18 |
| Ri-124 | 574.5 | 0.05 | fa |  |  |  | 12,944±24 |
| Ri-125 | 584.5 | 4 | ca |  | pgr-wh ves pumice |  | 13,146±37 |
| Ri-126 | 588.5 | 3 | ca |  | pgr-wh ves pumice |  | 13,178±40 |
| Ri-127 | 608.5 | 0.05 | fa | m, ws |  |  | 13,766±91 |
| Ri-128 | 641.5 | 1 | ca |  | pgr-gr ves pumice, lithic poor |  | 14,404±161 |
| Ri-129 | 665.5 | 1 | fa-ca |  | br ash |  | 14,588±184 |
| Ri-130 | 726.5 | ? | ml |  | dp in paleosol | 8 | unknown |
| Ri-131 | 727 | 0.1 | fa |  |  |  | unknown |
| Ri-132 | 735 | 8 | ca-ml | ig | pgr ves pumice, sp lithics | 2, R | unknown |
| Tariki Swamp |  |  |  |  |  |  |  |
| T-1 | 24 | 0.5 | fl in fa | dp | wh ves pumice, sp pgr lithics |  | 1736±42 |
| T-2 | 33 | 1 | ca |  | pgr ves pumice, sp lithics, bl frag | 12, TD | 1830±37 |
| T-3 | 34.5 | 0.5 | ca |  | gr lithics, bl frag, pumice poor | 12 | 1841±36 |
| T-4 | 51.5 | 7.5 | ca-fl | ig-ng | pgr-gr micves pumice, red scoria | 11, bTA-TA | 1952±31 |
| T-5 | 56.5 | 1 | ca-fl |  | pgr ves pumice, sp lithics, bl frag | 12 | 2005±29 |
| T-6 | 61 | 1 | ca | dpb, st | wh ves pumice, sp pgr lithics | 12 | 2052±28 |
| T-7 | 68 | 2 | fl in ca | dp | pgr lithics | 12 | 2118±28 |
| T-8 | 74 | 2 | ca | m | pgr ves pumice, sp lithics | 12, TD | 2170±29 |
| T-9 | 82 | 2 | ca | ig | br-bl micves py pumice, lithic poor | 11, TA | 2247±32 |
| T-10 | 97 | 6.5 | ca | ig | br-gr-bl micves py pumice | 11, TA | 2353±38 |
| T-11 | 115 | 2 | ma | dp | bl ash | 11 | 2536±48 |
| T-12 | 192.5 | 0.3 | fa |  |  |  | 3056±39 |
| T-13 | 219 | 1 | fl in fa | rew | lithics, wh pumice poor |  | 3181±34 |
| T-14 | 247.5 | 1 | ml | rew | wh f-ves pumice, lithic rich | 10, R | 3433±41 |
| T-15 | 268 | ? | ca-fl | dp/rew | pgr ves pumice, lithic poor, dp peat | 10, R | 3935±41 |
| T-16 | 298 | ? | ca-ml | dp/rew | pgr ves pumice, lithic poor, dp paleosol | 9, TD | 5271±51 |
| T-17 | 315 | ? | ca-cl | dp/rew | pgr ves pumice, lithic rich, dp paleosol | 9, TD | 6083±65 |
| T-18 | 392 | ? | ca | dp/rew | lithic & crys rich, dp peat | 2 | 10,522±194 |
| T-19 | 436 | 5 | ma | dp/rew | pgr ves pumice, lithic poor, dp peat | 2 | 11,862±100 |
| T-20 | 452 | 0.5 | fa |  |  | 2 | 12,022±100 |
| T-21 | 464 | 7 | ca |  | pgr-gr ves pumice, lithic rich, bl frag | 2, TD | 12,076±115 |
| T-22 | 468 | 0.5 | fa | m |  | 2 | 12,121±128 |
| T-23 | 479 | 10 | ca-fl | mg | pgr-dgr ves pumice, banded, bl frag | 1/2, TA-TD | 12,135±132 |
| T-24 | 487 | 4 | ml | dpb, st | dgr ves pumice, sp lithics | 1, TD spread | 12,198±150 |
| T-25 | 494 | 2.5 | ma | dpb, st | crys rich ash | 1 | 12,281±166 |
| T-26 | 498 | 1 | ca | dpb, st | lithic rich, dgr ves pumice poor | 2, TD | 12,343±176 |
| T-27 | 510 | 1 | ml | m | wh-pgr ves-micves pumice, lithic rich | 3, TD-R | 12,481±190 |
| T-28 | 512 | 1 | ml | m | wh-pgr ves-micves pumice, lithic rich | 3, TD-R | 12,506±191 |
| T-29 | 519 | 0.5 | fa |  | pgr pumiceous ash | 3 | 12,679±199 |
| T-30 | 550.5 | 0.3 | fa |  |  | 2 | 13,704±171 |
| T-31 | 575.5 | cryp | fa |  |  |  | 14,508±110 |
| T-32 | 582.5 | cryp | fa | dp |  |  | 14,725±115 |
| T-33 | 588 | cryp | fa | dp |  |  | 14,887±119 |
| T-34 | 596.5 | cryp | fa | dp |  |  | 15,119±124 |
| T-35 | 603.5 | 0.5 | fa |  |  | 1 | 15,281±127 |
| T-36 | 606 | 0.1 | fa |  |  | 1 | 15,336±127 |
| T-37 | 608.5 | 0.5 | fa |  |  | 1 | 15,381±128 |
| T-38 | 611 | 1 | ca |  | br-dgr scoriaceous py pumice | 1, TA | 15,414±128 |
| T-39 | 615 | 1 | fa |  |  | 1 | 15,476±127 |
| T-40 | 617.5 | 0.3 | fa |  |  | 1 | 15,519±127 |
| T-41 | 621.5 | 3 | fa |  |  | 1 | 15,538±126 |
| T-42 | 626.5 | 4 | fa |  |  | 1 | 15,556±126 |
| T-43 | 629.5 | 0.5 | fa |  |  | 1 | 15,600±125 |
| T-44 | 631.5 | 0.5 | ma |  | pbr-br ves pumice, lithic rich | 1 | 15,626±124 |
| T-45 | 634.5 | 2 | ca | ng | lithic rich, br ves pumice poor | 1, TA-TD | 15,642±123 |
| T-46 | 637.5 | cryp | fa |  |  | 1 | 15,689±120 |
| T-47 | 648 | 0.3 | ma |  |  | 1 | 15,843±112 |
| T-48 | 652.5 | 0.1 | fa |  |  | 1 | 15,907±109 |
| T-49 | 654 | 0.3 | fa |  |  |  | 15,925±108 |
| T-50 | 656 | 1 | fa |  |  | 1 | 15,939±107 |
| T-51 | 658.5 | 1 | ca |  | br scoriaceous pumice, bl frag | 1, TA | 15,960±106 |
| T-52 | 659.5 | 0.5 | ma |  | bl crys rich ash | 1 | 15,968±106 |
| T-53 | 676.5 | 1 | ma-ca |  | br scoriaceous pumice, bl frag | 1 | 16,185±98 |
| T-54 | 703 | 1 | ca |  |  | 1, TA | 16,493±102 |
| T-55 | 749 | 1 | ma-ca |  | dgr-br ves pumice, bl frag | 1 | 16,800±99 |
| T-56 | 754.5 | 2 | ca-fl |  | pbr-br ves pumice, lithic rich | 1 | 16,863±102 |
| T-57 | 759 | 1.5 | fa-ca |  | dbr scoriaceous pumice, ion-stained | 1 | 16,890±104 |
| T-58 | 772 | 3 | ca |  | lithic & crys rich | 1 | 16,976±111 |
| T-59 | 777 | 2 | ca |  | lithic & crys rich | 1, TA-TD | 17,027±116 |
| T-60 | 783.5 | 0.5 | fa |  |  | 1, TA-TD | 17,119±110 |
| T-61 | 797.5 | 0.5 | ma |  | br scoriaceous pumice | 1 | 17,180±96 |
| T-62 | 806.5 | 0.5 | fa |  |  | 1 | 17,218±89 |
| T-63 | 814.5 | 1.5 | ca |  | br-dbr scoriaceous pumice, bl frag | 1 | 17,244±85 |
| T-64 | 870.5 | 4 | ca-ml | m | bl-dbr scoriaceous pumice, banded | 1, TD | 17,397±96 |
| Ngaere Swamp |  |  |  |  |  |  |  |
| N-1 | 8 | 0.5 | ca |  |  |  | 1847±111 |
| N-2 | 15 | 1 | ma | ws | wh-pgr ves pumice | 12 | 1953±108 |
| N-3 | 23.5 | 0.5 | ca |  | wh ves pumice, bl frag |  | 2094±103 |
| N-4 | 30 | 0.5 | ca |  |  |  | 2201±100 |
| N-5 | 40 | 1 | ca |  |  |  | 2360±95 |
| N-6 | 54 | 8 | ca | ig | pgr-gr micves pumice, red scoria | 11, bA-bTA-TA | 2448±92 |
| N-7 | 69 | 3 | ca-fl | ig | pgr-gr-bl micves py pumice, lithic rich | 11 | 2603±83 |
| N-8 | 113 | 2.5 | ca-ml |  | wh f-ves pumice, lithic rich | 10, R | 3216±67 |
| N-9 | 127 | 5 | ca-ml |  | wh f-ves pumice, lithic poor | 10, R | 3365±65 |
| N-10 | 157 | cryp | fa | dp |  |  | 4204±56 |
| N-11 | 173 | cryp | ca | dp |  |  | 4680±55 |
| N-12 | 177 | cryp | ma | dp |  |  | 4792±55 |
| N-13 | 182 | 0.5 | fa |  | pgr-gr lithics |  | 4927±54 |
| N-14 | 199 | 1 | ca |  |  |  | 5383±51 |
| N-15 | 204 | cryp | ca | dp |  |  | 5492±49 |
| N-16 | 207 | cryp | ca | dp |  |  | 5548±48 |
| N-17 | 228 | cryp | ca | dp |  |  | 6107±45 |
| N-18 | 271 | 4 | ma | ws |  |  | 6844±55 |
| N-19 | 282.5 | 10 | ca-fl | mg, sb | pgr ves pumice, lithic rich | 9, TD-R | 6862±53 |
| N-20 | 307.5 | 1 | ca |  |  |  | 7049±34 |
| N-21 | 321.5 | 2.5 | ml | m | pgr ves pumice, lithic rich | 3, TD | 7124±38 |
| N-22 | 327 | 2 | ca-ml | m | pgr ves pumice, lithic rich | 8, TD | 7151±40 |
| N-23 | 335 | 2.5 | ca | sb-t, ws | pgr-gr ves-micves pumice, lithic rich | 3, TD-R spread | 7200±45 |
| N-24 | 341 | 3.5 | ca | dpb, st | pgr-gr ves-micves pumice, lithic rich | 3 | 7226±47 |
| N-25 | 347 | 1 | ml | dp | pgr ves pumice | TD-R spread | 7285±49 |
| N-26 | 352 | 2 | ca-ml | m |  | 8, TD-R spread | 7326±49 |
| N-27 | 400 | 3 | ca-fl | m | pgr-dgr lithics, banded, pumice poor |  | 8090±46 |
| N-28 | 417 | 0.5 | ca |  |  |  | 8336±46 |
| N-29 | 428 | 1.5 | ca-fl |  | gr-dgr lithics |  | 8479±43 |
| N-30 | 430 | 1 | ml |  | pgr ves pumice | TD-R spread | 8494±43 |
| N-31 | 449.5 | cryp | fa |  |  |  | 8781±37 |
| N-32 | 503 | 4 | ca | ng, sb-t | pgr ves pumice with micves core | tm spread, TD | 9519±36 |
| N-33 | 514 | 0.5 | ca in fa |  |  | 2 | 9677±35 |
| N-34 | 523 | 1 | ca | dp |  |  | 9796±34 |
| N-35 | 532 | 1 | ca |  |  | 2 | 9914±35 |
| N-36 | 542 | 4 | ca | ig, sb | pgr ves pumice, crys rich | 2 | 10,003±37 |
| N-37 | 548 | 3 | ca | ig |  | 2 | 10,048±38 |
| N-38 | 555 | 2 | ca |  |  | 2 | 10,124±41 |
| N-39 | 559 | 3 | ma | dp |  | 2 | 10,139±42 |
| N-40 | 562 | 0.5 | ma |  |  | 2 | 10,177±44 |
| N-41 | 564 | 0.5 | fa |  |  |  | 10,200±45 |
| N-42 | 566 | 2 | ca-ml |  | gr c-ves pumice, crys rich, lithic poor | 4 | 10,200±45 |
| N-43 | 574 | 1.5 | ma-ca |  |  |  | 10,301±50 |
| N-44 | 586 | 1.5 | ca |  | pgr-gr ves pumice, crys rich, bl frag | 2 | 10,471±56 |
| N-45 | 594 | 1.5 | ca |  | wh ves pumice | 5, TD | 10,580±59 |
| N-46 | 597.5 | 1.5 | ca |  | crys rich, wh pumice poor | 5 | 10,614±59 |
| N-47 | 611 | 1 | ca |  | pgr c-ves pumice, crys rich | 4 | 10,838±60 |
| N-48 | 614 | 1.5 | ma-ca |  | pgr c-ves pumice, crys rich | 4 | 10,866±60 |
| N-49 | 618.5 | 2 | ca | ng | pgr c-ves pumice, crys rich | 4 | 10,912±60 |
| N-50 | 622 | 3 | ca |  | pgr c-ves pumice, crys rich | 4, TD | 10,922±60 |
| N-51 | 623 | 0.5 | ca |  |  | 4 | 10,931±60 |
| N-52 | 634 | 4 | ca-ml | m | wh ves pumice, lithic poor | 7 | 11,065±63 |
| N-53 | 636 | 1 | ma-ca |  | wh ves pumice | 7 | 11,084±64 |
| N-54 | 642 | 4 | ma | dpb, st | wh ves pumice | 7, TD | 11,123±65 |
| N-55 | 683 | 0.5 | ca |  |  | 5 | 11,958±119 |
| N-56 | 684 | 0.5 | ca |  |  | 5 | 11,969±119 |
| N-57 | 699.5 | 3 | ca | ig, sb-t | gr ves pumice, crys rich (augite) | 2, TD | 12,238±114 |
| N-58 | 712.5 | 7 | ca-ml | ig-ng | dgr-gr ves pumice, banded, bl frag | 1, TA-TD | 12,370±104 |
| N-59 | 715 | 2 | ca | dp | dgr-gr ves pumice, lithic rich, bl frag | 1 | 12,382±102 |
| N-60 | 721 | 1.5 | ca |  | dgr-gr ves pumice, lithic rich, bl frag | 1, TA-TD | 12,486±90 |
| N-61 | 724 | 2 | ma-ca |  | dgr-gr ves pumice, lithic rich, bl frag | 1 | 12,509±87 |
| N-62 | 733 | 3 | ma-ca |  | gr ves pumice, lithic poor, crys rich | 1, TD | 12,653±69 |
| N-63 | 736 | 1 | fa |  | lithic rich, pumice poor | 1 | 12,701±65 |
| N-64 | 741 | 1 | ca-ml | m | pgr c-ves pumice, crys rich | 2 | 12,799±60 |
| N-65 | 749 | 2.5 | ca-fl | m | pgr-gr ves pumice, lithic poor | 2, TD | 12,934±69 |
| N-66 | 754 | 2 | ca-fl |  | pgr-gr ves-micves pumice, lithic rich |  | 13,005±77 |
| N-67 | 768 | cryp | ca |  | pgr ves pumice | 3, TD | 13,266±114 |
| N-68 | 776 | 1 | ma |  | crys rich pgr pumiceous ash | 3, TD | 13,400±136 |
| Eltham Swamp |  |  |  |  |  |  |  |
| E-1 | 47.5 | 4 | ma | ws | wh-pgr ves pumice | 2, TD | 1532±76 |
| E-2 | 58 | 0.5 | ma-ca |  | wh ves pumice, lithic rich, bl frag |  | 1829±64 |
| E-3 | 68 | 2 | ma-ca |  |  | 12 | 2066±54 |
| E-4 | 70.5 | 1 | ma-ca |  |  | 12, TD | 2110±53 |
| E-5 | 81 | 7 | ca | ig | pgr-gr micves pumice, red scoria | 11, bTA-TA | 2214±49 |
| E-6 | 97.5 | 7 | ca | ig | gr-br-bl micves py pumice, lithic poor | 11, TA | 2501±39 |
| E-7 | 117 | 1.5 | ma-ca |  | pgr-gr micves pumice, red&bl scoria | 11, bTA-TA | 3042±33 |
| E-8 | 140 | 3.5 | ca-fl |  | wh f-ves pumice, lithic rich | 10, R | 3593±43 |
| E-9 | 149 | 1 | fl | dp |  |  | 4120±35 |
| E-10 | 154 | 1.5 | ca |  | pgr ves pumice | 8 | 4354±34 |
| E-11 | 176 | 2 | fl | dp |  |  | 5567±42 |
| E-12 | 191 | 2 | ma | ws |  |  | 6202±45 |
| E-13 | 200 | 5 | ca-ml | mg | pgr ves pumice, sp lithics | R | 6366±44 |
| E-14 | 217 | 4 | ca-fl | dp |  |  | 6721±40 |
| E-15 | 230 | 6 | ma-ca | sb, dpt | pgr-gr ves-micves pumice, lithic rich | 3, TD | 6936±39 |
| E-16 | 234 | 1 | ca |  | lithic rich, pumice poor |  | 7022±40 |
| E-17 | 237 | 0.5 | ma |  | crys rich ash |  | 7091±41 |
| E-18 | 265 | 0.5 | fa-ma | dp |  |  | 7788±66 |
| E-19 | 302 | 1 | fa |  |  | 3, TD | 8244±71 |
| E-20 | 344 | 2 | ca |  | pgr ves pumice, crys & lithic rich | 2, TD | 9617±52 |
| E-21 | 369 | 4.5 | ca-fl |  | pgr c-ves pumice, crys rich, lithic poor | 2 | 10,022±39 |
| E-22 | 390 | 3 | ma-ca |  | pgr c-ves pumice, crys rich (augite) | 2, TD | 10,307±38 |
| E-23 | 393 | 1 | ma-ml |  | lithic rich, pgr pumice poor | 2/4 | 10,337±38 |
| E-24 | 398 | 2 | fa-ma |  |  | 2 | 10,383±40 |
| E-25 | 420 | 8 | ca-fl | sb, dpt | pgr-gr ves pumice, crys rich, bl frag | 2, TD | 10,612±45 |
| E-26 | 424 | 2 | ma-ca |  |  | 4 | 10,647±46 |
| E-27 | 428 | 1 | fl-ml |  | reworked E-28? |  | 10,701±46 |
| E-28 | 433.5 | 3 | ca-ml | m | pgr c-ves pumice, crys rich | 7, TD | 10,746±46 |
| E-29 | 436 | 1 | fa |  |  |  | 10,772±47 |
| E-30 | 438 | 1 | fa |  |  |  | 10,790±47 |
| E-31 | 493 | 3 | fa |  |  |  | 11,748±103 |
| E-32 | 525 | 6 | ca-ml | m | lithic rich, dgr pumice poor, bl frag | 1, TD | 12,230±119 |
| E-33 | 529 | 2 | ca-fl |  | gr-dgr ves pumice, lithic rich, bl frag | 1 | 12,358±113 |
| E-34 | 533 | 3 | ma-ca |  | gr-dgr ves pumice, lithic rich, bl frag | 1, TD | 12,377±112 |
| E-35 | 539.5 | 1 | fa | dp |  |  | 12,478±104 |
| E-36 | 561 | 4 | ma | dp | pgr-gr ves pumice, crys rich | 2, TD | 12,800±70 |
| E-37 | 571 | 0.5 | fa | dp |  |  | 12,977±55 |
| E-38 | 581 | 0.5 | ca |  | wh-pgr ves pumice | 3, TD | 13,159±48 |
| E-39 | 582.5 | 0.5 | ma |  |  |  | 13,178±48 |
| E-40 | 593.5 | 1 | fa-ma | dp |  | 3 | 13,375±50 |
| E-41 | 597.5 | 3.5 | ma-ca | sb, dpt | pgr ves pumice, crys rich | 3, TD | 13,385±50 |
| E-42 | 806.5 | 5 | ma |  | crys rich pgr pumiceous ash | 1, TD | 23,472±141 |
| E-43 | 811 | 1 | ca |  |  |  | 23,700±142 |
| E-44 | 817 | cryp | ca |  |  |  | 24,071±143 |
| E-45 | 819 | 0.1 | ca |  |  |  | 24,171±143 |
| E-46 | 820 | 0.1 | ma |  |  | 2 | 24,211±143 |
| E-47 | 830 | 0.3 | ma |  |  | 1 | 24,729±141 |
| E-48 | 833.5 | 0.1 | fa |  |  | 1 | 24,890±139 |
| E-49 | 842.5 | 2.5 | ma | sb-t, m | crys rich pgr pumiceous ash | 1, TA-TD | 25,144±135 |
| E-50 | 846 | 0.1 | fa |  |  |  | 25,271±132 |
| Kawakawa | 854 | 3 | fa |  | pyell ash | R | 25,447±125 |
| E-51 | 856 | 1 | fa |  | bl lithic rich ash | 1 | 25,475±124 |
| E-52 | 860 | 2.5 | ma | sb-t, m | gr-dgr ves pumice, lithic rich, red frag | 1, TA-TD | 25,517±122 |
| E-53 | 866 | 0.1 | fa-ma |  | bl lithic rich ash |  | 25,670±114 |
| E-54 | 868 | 1.5 | ca |  | gr-dgr ves pumice, lithic rich, red frag | 1 | 25,682±114 |
| E-55 | 869 | cryp | fa |  |  |  | 25,706±112 |
| E-56 | 884 | 2 | fa-ma | ig | dgr lithic rich ash | 1, TA-TD | 25,991±99 |
| E-57 | 888.5 | 1 | fa |  | bl ash |  | 26,059±96 |
| E-58 | 897 | cryp | fa |  |  | 1 | 26,212±91 |
| E-59 | 899 | cryp | fa-ma | dp |  |  | 26,246±90 |
| E-60 | 905 | cryp | ma |  |  |  | 26,344±88 |
| E-61 | 919.5 | 2 | fa |  | bl ash |  | 26,537±89 |
| E-62 | 923 | cryp | ma-ca |  | gr-br c-vesicular pumice, lithic poor |  | 26,589±90 |
| E-63 | 924 | 0.1 | ca |  | gr-br c-vesicular pumice, lithic poor |  | 26,603±90 |
| E-64 | 935 | 6 | ca-fl | ig | iron-stained ves pumice, sp lithics | 1, TD | 26,679±92 |
| E-65 | 941 | 1.5 | ca |  | iron-stained (strongly altered) |  | 26,748±94 |
| E-66 | 974 | 0.1 | ma |  | gr pumiceous ash |  | 27,352±111 |
| E-67 | 980.5 | 0.5 | ca-fl | sb-t, m | gr-dgr ves pumice, lithic rich | 1 | 27,495±114 |
| E-68 | 982.5 | 2 | ma | sb-t, ws | gr pumiceous ash | 1, TA-TD | 27,495±114 |
| E-69 | 996 | 0.5 | fa |  | iron-stained ash | 1 | 27,855±115 |
| E-70 | 1000 | 0.5 | fa-ma |  | iron-stained ash with gr pumice frag |  | 27,964±114 |
| E-71 | 1011 | 2 | ma-ca | sb-t, m | gr pumiceous ash | 6, TA-TD | 28,262±118 |
| Okaia | 1027 | 3 | fa-ml |  | yell pumiceous ash | R | 28,735±143 |
| E-72 | 1032 | 2 | ca-ml | m | iron-stained c-ves pumice |  | 28,850±153 |
| E-73 | 1043 | 2 | ca-ml | m | iron-stained c-ves pumice, lithic rich |  | 29,205±191 |
| E-74 | 1054 | 3 | ca-ml | m | dgr-gr ves pumice, banded, lithic poor | 1 | 29,531±231 |
| E-75 | 1062.5 | 7 | ca-fl | m | pgr-gr ves pumice, banded, lithic poor | 2, TD | 29,593±240 |
| E-76 | 1064 | 1 | ma-ca |  | crys rich pgr pumiceous ash | 2 | 29,614±242 |
| E-77 | 1068 | 3 | ma | ws | crys rich wh pumiceous ash | 8 | 29,655±248 |
| E-78 | 1073 | 2 | ma |  | crys rich wh pumiceous ash | 8 | 29,780±265 |
| E-79 | 1083.5 | 8.5 | ca-fl | mg | pgr-gr ves pumice, lithic poor | 8, TD-R | 29,855±274 |
| E-80 | 1089 | 5 | ca-fl |  | iron-stained ves pumice, lithic rich |  | 29,872±276 |

*Note: Gray-highlighted rows represent the most prominent tephra layers within each composite core. The Taupo volcano-derived tephra layers (i.e., Stent, Kawakawa, Okaia) are marked in red.*

*\*The age of the Stent Tephra (4279±47 cal yr BP) is a mean age calculated from all three Lake Richmond cores (Fig. 2).*

*a Tephra numbers are based on each composite record (refer to Fig. 3-6).*

*b Depth is given as composite shortened depth (refer to text)*

*c Abbr. as followed: cryp=crypto (tephra is not visible by naked eye, only identified in radiographic images), ?=unknown thickness, since tephra occurs dispersed in soil*

*d Abbr. as followed: fa=fine ash (63-250µm), ma=medium ash (250-500µm), ca=coarse ash (500µm-2mm), fl=fine lapilli (2-4mm), ml=medium lapilli (4-16mm), cl=coarse lapilli (16-64mm)*

*e Abbr. as followed: ng=normal graded, ig=inverse graded, mg=multiple graded, m=massive, ws=well sorted, ls=lensing, dp=dispersed, s=sharp, b=bottom, t=top, (i.e., sb-t=sharp bottom and top)*

*f Abbr. as followed: gr=gray, wh=white, bl=black, br=brown, yell=yellow, p=pale, d=dark (i.e., dgr=dark gray), ves=vesicular, micves=microvesicular, f-ves=finely vesicular, c-ves= coarsely vesicular, sp=similar portion, dp=dispersed, rew=reworked, crys=crystal, py=porphyritic*

*g Titanomagnetite groups and glass shard chemistry (refer to Fig. 7, 8)*

*h Calibrated ages based on model shown in Fig. 2*