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Volume 1 of 2

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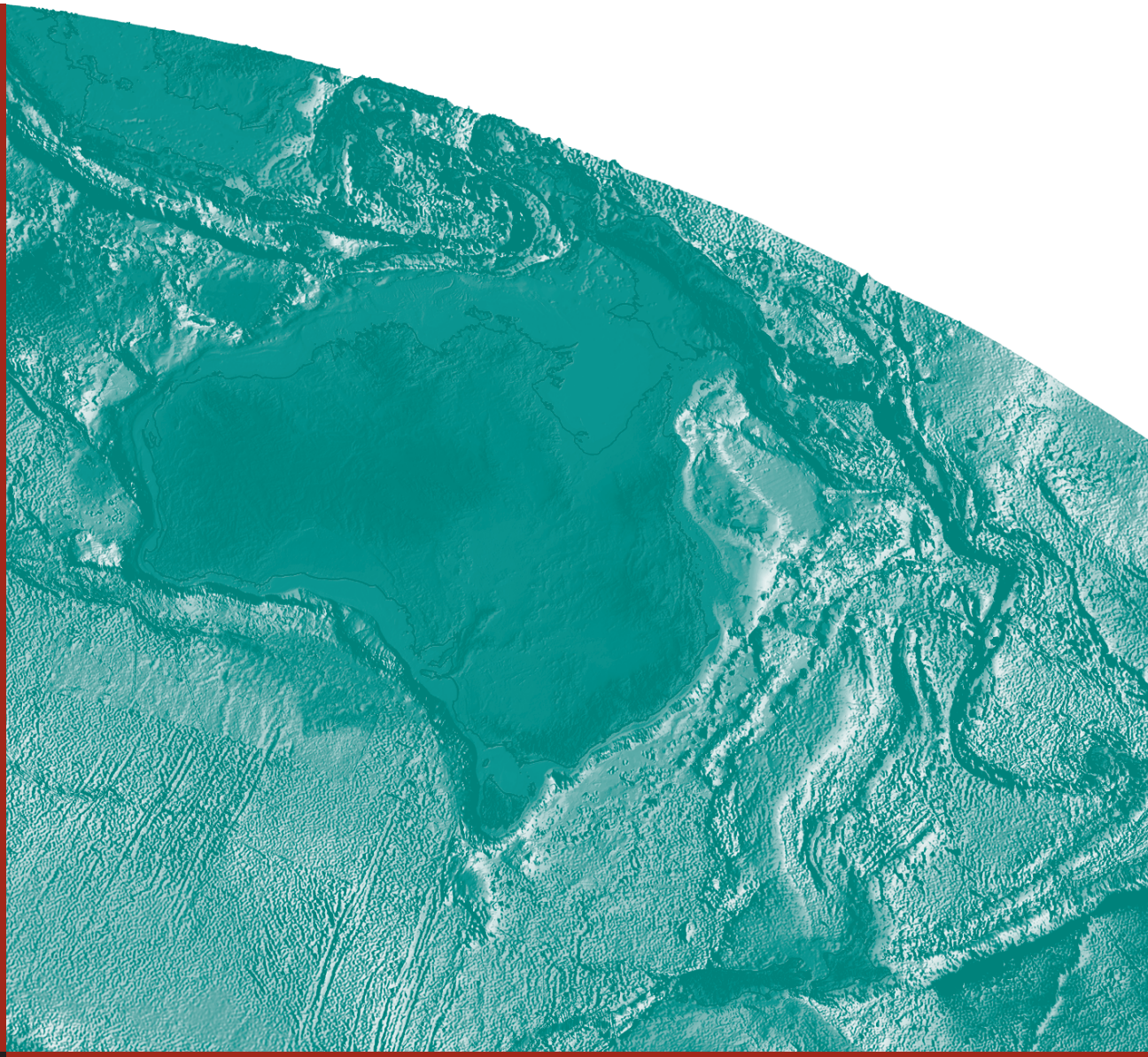

National Geochemical Survey of Australia: The Geochemical Atlas of Australia

Volume 1 of 2

GEOSCIENCE AUSTRALIA
RECORD 2011/20

by

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Executive Summary

From 2007 to 2009, the National Geochemical Survey of Australia (NGSA) project collected sediment samples from 1315 sites located in 1186 catchments (~10 % of which were sampled in duplicate) from across Australia. The total area covered by the survey is 6.174 million km^2, or ~81% of Australia. The resulting average sampling density is 1 site per ~5200 km^2.

Catchment outlet sediments, in most cases similar to overbank sediments, were chosen as the sampling medium, with a near-surface sample (Top Outlet Sediment, TOS, from 0-10 cm below the surface) and a bottom sample (Bottom Outlet Sediment, BOS, between on average 60-80 cm below the surface) being collected. The sample sites were selected to be near outlets or spill points of large catchments, so that overbank sediments there could reasonably be assumed to represent well-mixed, fine-grained composite samples of all major rock and soil types present in the catchment.

A number of parameters were recorded in the field, including GPS coordinates, and dry and moist Munsell® colour and field pH of the soil. The sampling sites were described and photographed, with all field data captured digitally for easy subsequent upload into databases. In the laboratory, the samples were air-dried, homogenised and split into an archive sample for future investigations and an analytical sample for immediate analysis. The latter was further split into a bulk subsample, a dry sieved <2 mm grain size fraction subsample and a dry sieved <75 µm grain size fraction subsample. The bulk subsample was analysed for electrical conductivity of 1:5 (soil:water) slurries (EC1:5), pH of 1:5 (soil:water) slurries (pH1:5) and grain size analysis using a laser particle size analyser.

During 2009 to 2010, the coarse (<2 mm) and fine (<75 µm) fractions were analysed using a variety of analytical methods to determine (1) Total element content, (2) Aqua Regia soluble element content, and (3) Mobile Metal Ion (MMI™) element content (only done on the TOS coarse subsamples). Thus, with two depths sampled, two grain size fractions separated, and three analytical methods applied, up to nine element determinations were obtained per sampling site. This data is collated in spreadsheets and graphically represented as a series of maps; the latter available in this report and both available digitally from the project website (www.ga.gov.au/ngsa).

The present report is a compilation of 529 geochemical maps that result from the National Geochemical Survey of Australia. These constitute the first continental-scale series of geochemical maps based on internally consistent, state-of-the-art data pertaining to the same sampling medium collected, prepared and analysed in a uniform and well documented manner and over a short time period (four years). Interpretations of the data and maps will be published separately.

The geochemical maps can be used for better understanding the accumulation, mobility and significance of chemical elements in the near-surface environment of Australia. It is expected that they will provide a new, additional pre-competitive dataset for the energy and mineral resource exploration industry, which should help prioritise areas for further exploration investment and thus reduce risk. Further, it is also likely that some of the geochemical maps will find use in other disciplines related to natural resource management and environmental monitoring.

List of Abbreviations Used

AMU	Atomic Mass Unit
BOS	Bottom Outlet Sediment (60-80 cm depth, on average)
EC	Electrical Conductivity (in µS/cm)
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
IQR	Inter-Quartile Range
ISE	Ion Specific Electrode
LLD	Lower Limit of Detection
LOI_C	Loss on Ignition (Calculated from XRF data)
LPSA	Laser Particle Size Analyser
MMI™	Mobile Metal Ion™
NGSA	National Geochemical Survey of Australia
PGEs	Platinum Group Elements
TOS	Top Outlet Sediment (0-10 cm depth)
ULD	Upper Limit of Detection
XRF	X-Ray Fluorescence

Introduction

A 5-year Onshore Energy Security Program (OESP) was announced in 2006 to enable Geoscience Australia to deliver high quality pre-competitive geoscience information relating to onshore energy prospectivity (Johnson, 2006). The National Geochemical Survey of Australia (NGSA), which is part of this programme (Baldwin, 2007), collected transported regolith (sediment) samples from across the Australian continent and determined their inorganic chemical composition. The NGSA provides the only nation-wide, internally consistent geochemical dataset with state-of-the-art detection limits. It aimed to:

- Help calibrate and ground-truth the airborne radiometrics coverage of Australia (including addressing mother-daughter disequilibrium in the uranium-decay chain);
- Fill gaps in the existing airborne radiometric and geochemical coverages of Australia with quality data;
- Permit multi-element characterisation and ranking of radiometric anomalies (e.g., differentiation of uranium signatures from 'hot' granites, black shales or palaeochannels); and
- Provide fundamental data to enable first-order characterisation of geothermal hot-spots.

As such, the NGSA project (http://www.ga.gov.au/energy/projects/national-geochemical-survey.html) supports and adds value to a number of other OESP projects, particularly the Australia-Wide Airborne Geophysical Survey project (http://www.ga.gov.au/energy/projects/awags.html; Minty *et al*., 2009a) and the Geothermal Energy project (http://www.ga.gov.au/energy/projects/geothermal-energy.html). Additionally, the NGSA results will have wider applications in mineral exploration for other commodities and natural resource management.

At its completion in June 2011, the NGSA delivered:

- A geochemical dataset that is national in scope, internally consistent and acquired through the application of state-of-the-art methods and instrumentation;
- A web-delivered geochemical atlas of Australia for some 68 elements showing for the first time what the concentrations of these elements are in surface materials and how they vary spatially; and
- Reports and papers documenting the project in detail and drawing implications on energy resource prospectivity and other applications.

Samples were collected from 1186 catchments (or 1315 sites, including duplicates), which together cover over 6.174 million km^2 or ~81% of Australia at the average sample density of 1 site per 5200 km^2 (statistics based on equal area projection). Approximately 200 catchments in South Australia and Western Australia could not be sampled during this project due to access limitations. Collaboration with State and Northern Territory geoscience agencies was critical for the completion of the project, particularly regarding the sampling phase.

Sampling procedures were reported in Lech *et al.* (2007) and field data was compiled in Cooper *et al*. (2010). Sample preparation protocols were documented in Caritat *et al*. (2009) and sample analysis methods were detailed in Caritat *et al*. (2010). A data quality assessment is presented in Caritat & Cooper (2011). In the present report, which should be used in the context of the above mentioned reports, we present 529 maps illustrating the geographical distribution of the concentration of chemical elements and properties as acquired by the NGSA project.

Background to the Project

The NGSA project aimed to provide pre-competitive data and knowledge to support exploration for energy resources in Australia. In particular, it improved existing knowledge of the concentrations and distributions of energy-related elements such as uranium (U) and thorium (Th) at the national scale.

The project was underpinned by a series of pilot geochemical surveys carried out in the previous four years by Geoscience Australia and the Cooperative Research Centre for Landscape Environments and Mineral Exploration (CRC LEME) to test robust and cost-effective protocols for sample collection, preparation and analysis. Examples of these are the Riverina (Caritat *et al.*, 2005; Caritat *et al.*, 2007), the Gawler (Caritat *et al.*, 2008a) and the Thomson (Caritat & Lech, 2007; Lech and Caritat, 2007) pilot geochemical surveys. Selected results from these pilot projects were summarised in Caritat *et al.* (2008b).

The current national project, briefly described below, was conducted in collaboration with all the State and the Northern Territory geoscience agencies.

RATIONALE

The national geochemical survey was initiated because of the absence of a complete geochemical coverage for Australia and because such a data layer is an important complement to national-scale geological and geophysical datasets (Caritat *et al.*, 2008c).

The distribution of geochemical data available at the commencement of the survey through the national repository (OZCHEM database) is shown in Figure 1. The map shows that there are vast areas of the country (>60 %) that lack any geochemical information. Where geochemical data are available in the public domain, they may often not be internally comparable as a result of:

- Inconsistent sampling material (e.g., rocks of various types and/or degree of alteration, mineralisation or weathering);
- Inconsistent sample preparation methods (e.g., total analyses *versus* partial digests with weak acids);
- Differences in instrumentation used and between laboratories, leading to variable lower limits of detection between datasets (e.g., older *versus* state-of-the-art instruments);
- Lack of metadata on data quality (e.g., instrument calibration, bias, precision, sample type description, replicates, etc.); and
- Variable suite of elements analysed (e.g., sometimes a very limited suite such as gold (Au) only or Au + copper (Cu)).

Although a significantly improved nation-wide, levelled coverage of airborne gamma-ray spectrometric (radiometric) data (Minty *et al*., 2009a,b) became available (Figure 2) during the course of the NGSA project, field calibration of radiogenic elements potassium (K), uranium (U) or thorium (Th) is perhaps not as systematic as is desirable and the question of disequilibrium in the radiogenic decay chain is poorly constrained as a result. It is hoped the NGSA data, in combination with the new radiometric coverage, will yield insights into this problem.

Some regional geochemical surveys have been carried out in parts of Australia (e.g. Morris *et al.,* 1998; Cornelius *et al.*, 2008; the pilot geochemical surveys mentioned above), but no national coverage exists. The modern concept of regional geochemical surveys was first developed in the 1960s, and it has since proven to be a reliable tool for mineral exploration at various scales (Garrett *et al.*, 2008; Smith & Reimann, 2008).

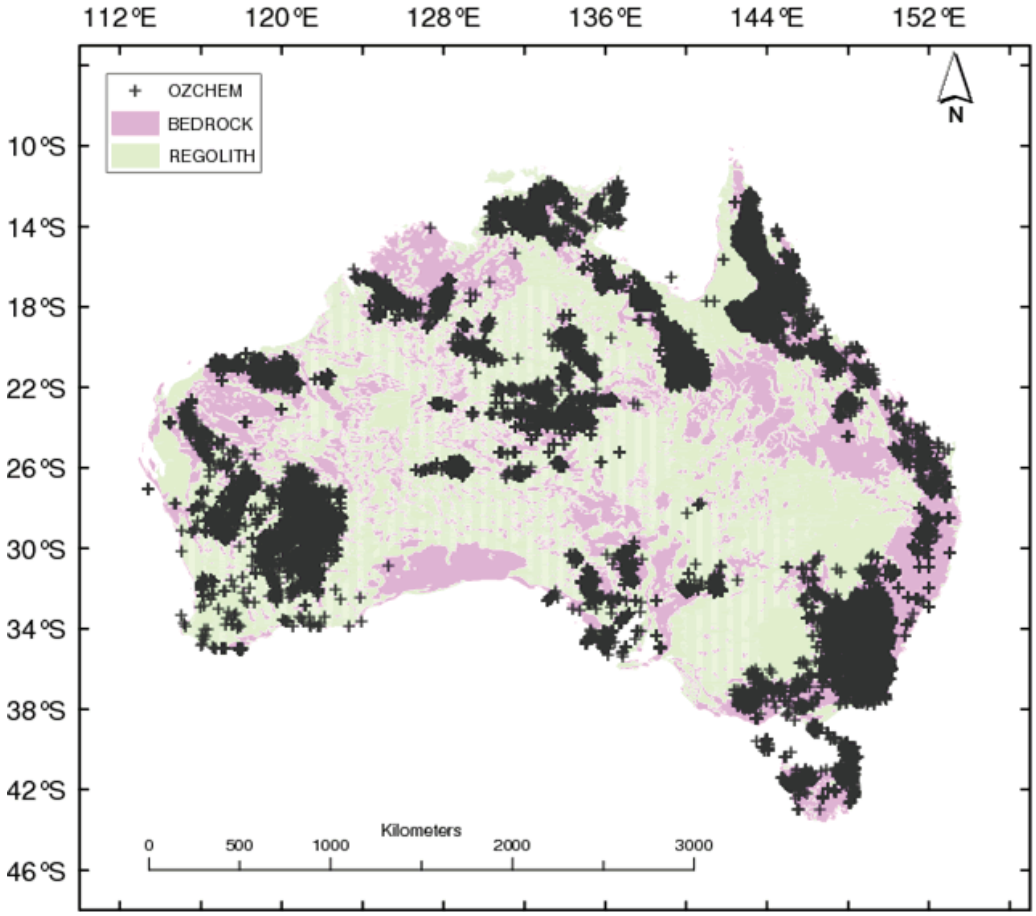

Figure 1. Distribution of whole rock geochemical data in Australia (plus signs) extracted from the OZCHEM national database as at June 2006, overlain on bedrock and regolith coverage.

OBJECTIVES

The objectives of the NGSA project were to:

- Collect transported regolith samples at the outlet of large catchments covering >90 % of Australia using an ultra low sampling density approach;
- Prepare and analyse the samples to extract the maximum amount of geochemical information (60+ elements/parameters) using internally consistent, state-of-the-art techniques;
- Populate the national geochemical database with the resulting new data; and
- Compile an atlas of geochemical maps (this document) for use by the mineral exploration industry to identify areas of interest in terms of energy-related resources and other mineral commodities, which can then be the focus of targeted exploration efforts.

STRATEGY

The sampling method was adapted to Australian landscape and climate conditions (e.g., importance of aeolian landforms in some areas, climate ranging from tropical to arid). It was fine-tuned and field-tested during the Riverina, Gawler and Thomson pilot projects (e.g., see Caritat *et al.*, 2008b). The cost of a national survey was minimised by applying an ultra low sampling density approach (generally accepted to mean between 1 site/1000 km^2 and 1 site/10,000 km^2).

The strategy adopted for the national geochemical survey is briefly described below.

Figure 2. Ternary image (K-red, eU-blue, eTh-green) of Australia derived from the new levelled National Radioelement Database (Minty et al., 2009b)

Sampling medium

Catchment outlet sediments (similar to floodplain sediments in most cases) were sampled at two depths (0-10 cm below the surface as well as at a depth of between ~60 and 80 cm on average). The term 'catchment outlet sediment' is deliberately chosen because it is more general than 'floodplain sediment' to allow for those cases where aeolian influence is important in the regolith formation process.

Sampling sites

Initially 1385 catchments covering 91% (or about 7 million km^2) of Australia across all States and Territories were targeted for sampling (Figure 3). Five catchments were assigned a second sampling site (i.e., target site) due to their size and topography so in total, it was expected that 1529 samples (1390 catchments + 10 % of which are sampled in duplicate) would be collected. Most catchments were sampled near their outlet, while those exhibiting internal or poorly defined drainage were sampled at, or as close as possible to, their lowest point. Lech *et al.* (2007) give details of the method for determining sampling sites. Catchments smaller than 1000 km^2 (mostly coastal) and small islands were not included in the survey. The resulting distribution of catchment outlet sites targeted for sampling is shown in Figure 4 and translates to an average sampling density of around 1 site/5500 km^2.

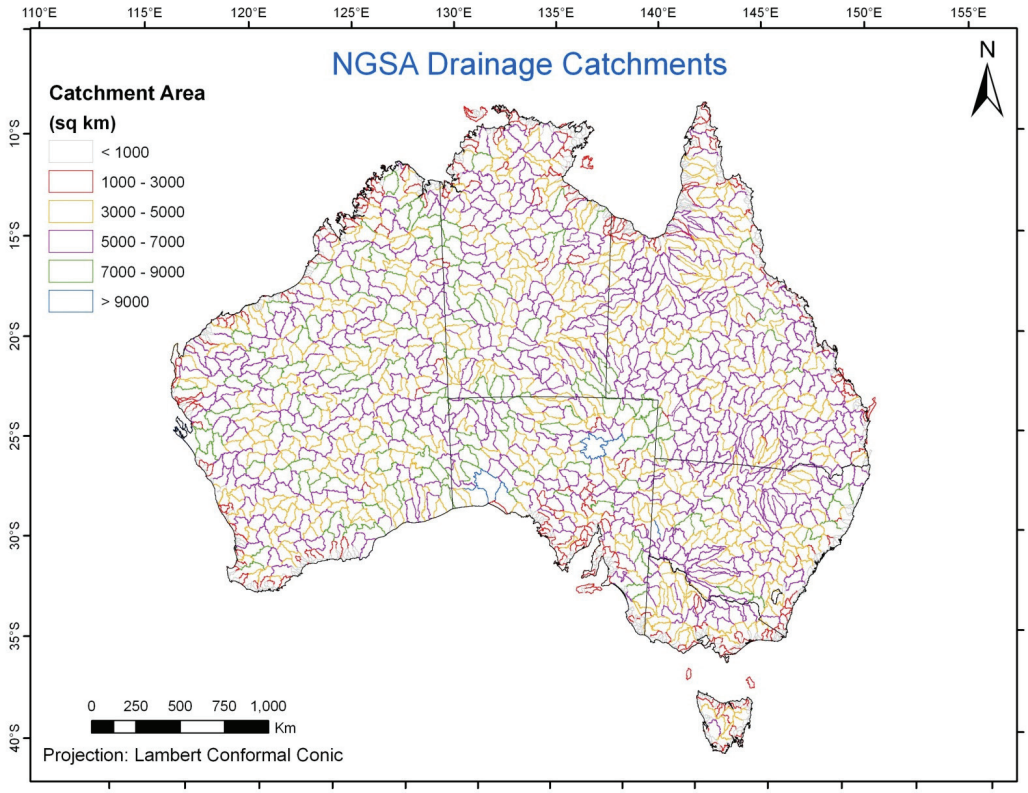

Figure 3. Distribution of catchments for the National Geochemical Survey of Australia.

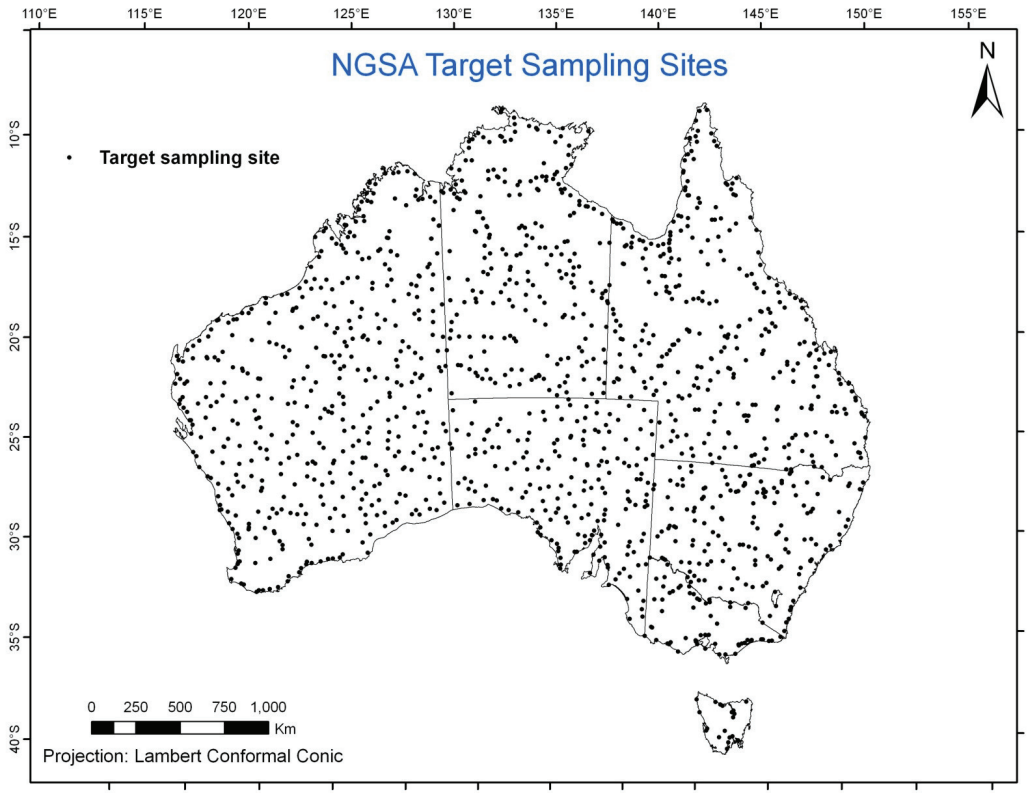

Figure 4. Distribution of initial target sampling sites for the National Geochemical Survey of Australia.

Sample collection

A detailed Field Manual was compiled (Lech *et al.*, 2007) and all sampling equipment and consumables were centrally purchased. Despite best efforts to access all target sites, only 1186 catchments could be sampled before the deadline for field work was reached. Of these 1186 catchments, 123 were sampled in duplicate (on average ~200 m away from the original site) for quality control purposes, and six of the largest catchments were sampled at two widely separated locations (on average 69 km apart), yielding a total of 1315 sampled sites (Figure 5). At each site, a Top Outlet Sediment (TOS) sample was collected from 0-10 cm (below the root zone, if applicable), and a Bottom Outlet Sediment (BOS) sample was collected from a depth of (on average) between 60 and 80 cm. To reduce natural soil heterogeneity, every sample collected was a composite either from a shallow soil pit (TOS) or from at least three auger holes or, rarely, a pit (BOS) at a given site (see Lech *et al.*, 2007, for more information). An average of 9 kg of sediment was collected per sample.

Sample collection was carried out by the State and Northern Territory geoscience agencies following a hands-on, in-field training period with the Geoscience Australia NGSA team. At each locality a detailed site description, field pH, and dry (if possible) and moist Munsell® soil colours were recorded and several digital photographs were taken (Cooper *et al.*, 2010). All information was recorded digitally to facilitate subsequent uploading into databases.

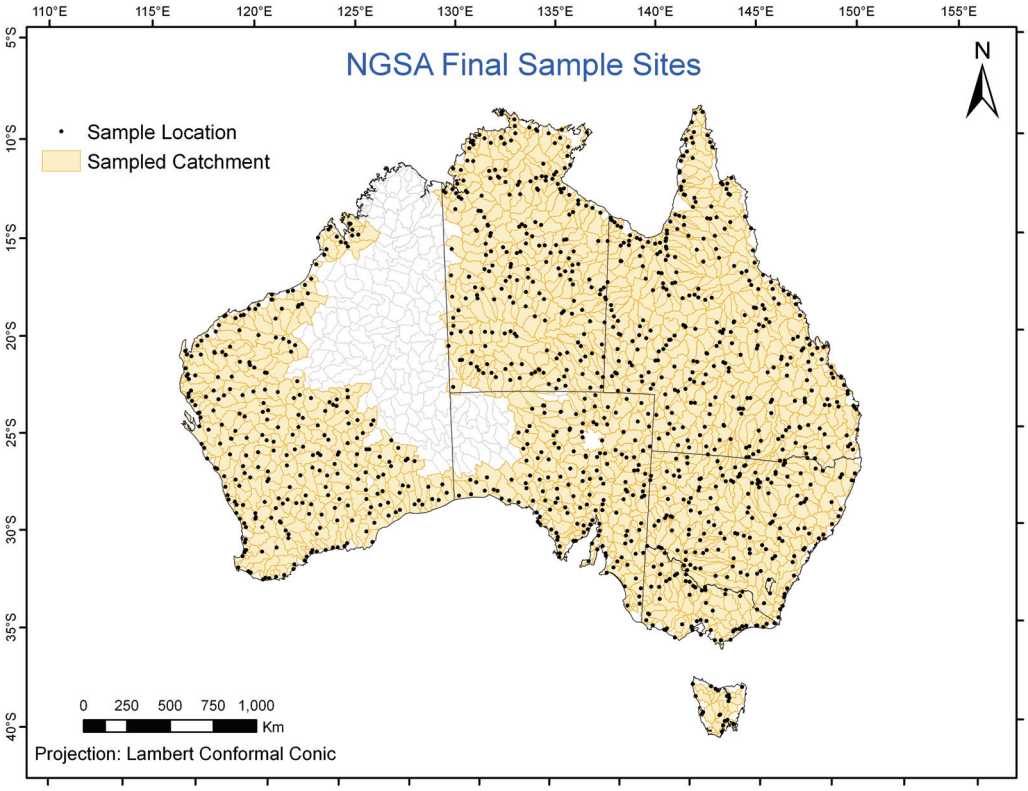

Figure 5. Final distribution of catchments sampled for the National Geochemical Survey of Australia (1186 catchments, or 86 %, completed).

Sample preparation

All samples were sent to Geoscience Australia for processing, where they were air-dried and homogenised. A bulk split (~50 %) of each sample was archived for future investigations. The remainder was riffle split and dry sieved to <2 mm and <75 µm fractions. The <2 mm fraction was mechanically ground for some analyses, while the finer fraction was not. The sample preparation protocols were discussed in detail in the NGSA Sample Preparation Manual (Caritat *et al.*, 2009).

Sample analysis

The analysis philosophy from the outset was to apply a multi-element approach on two grain-size fractions prepared by at least two digestion methods, in order to maximise the amount of geochemical information extracted from the samples. Sample analysis was carried out for 68 elements (Total element content) using X-ray fluorescence (XRF) and (reaction cell) inductively coupled plasma-mass spectrometry (ICP-MS) at Geoscience Australia. The ICP-MS analyses were carried out on a total digest (HF + HNO_3) of fragments of the XRF beads (Pyke, 2000). Additional parameters recorded at Geoscience Australia were pH 1:5 (soil:water), electrical conductivity (EC) 1:5 (soil:water), and laser particle size analysis (LPSA). Analyses for selected elements not available at Geoscience Australia (e.g., Au, fluorine (F), selenium (Se), and platinum group elements (PGEs)) were undertaken externally. Additional digests/analyses (e.g., after Aqua Regia digestion, ligand-based extractions, near visible-infrared spectroscopy) were also carried out externally. The Mobile Metal Ion analysis (MMI™) was made possible through collaboration with SGS Minerals Services. Details of the sample analysis protocols are discussed in the NGSA Analytical Methods Manual (Caritat *et al*., 2010).

Quality assessment/quality control

Sample numbers were randomised to minimise regional bias, help separate false from true anomalies and obtain meaningful estimates of the variance of duplicates. Field duplicates, analytical duplicates, internal standards and certified reference materials were introduced at regular intervals in the analytical streams. Care was also taken throughout the project to minimise contamination, cross-contamination and mislabelling risks. Details are discussed in the NGSA Data Quality Assessment report (Caritat & Cooper, 2011).

Data analysis

National-scale geochemical maps were produced and released as a Geochemical Atlas (this report) and a web-based map collection. Reports providing preliminary interpretations and including graphical and statistical analysis will be prepared separately and released via Geoscience Australia's website.

Timeline

Following planning in the first half of 2007, fieldwork, including initial training, began in mid-2007 and concluded in late 2009. Figure 5 shows the final distribution of catchments actually sampled for NGSA at the end of fieldwork (December 2009). Sample preparation started in early 2008 and concluded in December 2009. Sample analysis started late 2008 and finished in late 2010. Data analysis and reporting took place in 2010 and early 2011. The project concluded in late June 2011, with a dataset and product release at the Association of Mining and Exploration Companies (AMEC) convention in Perth, 28-30 June 2011.

The Geochemical Atlas of Australia

In the following pages, a series of 529 geochemical maps are presented. The maps are grouped here by analytical method, with the Total content maps shown first, followed by Aqua Regia digestion, then Mobile Metal Ion (MMI™) maps. For enhanced flexibility, the digital Geochemical Atlas on the NGSA webpage (www.ga.gov.au/ngsa) allows the user to search maps in this order or, alternatively, to look at and download all maps pertaining to any given element/parameter.

In creating the geochemical maps for the atlas, the following procedures were followed:

1. For catchments sampled in duplicate for the purposes of quality control (N = 123), only one set of data was retained. The arbitrary decision was taken to keep the sample with the lowest sample identification number of the pair and set aside the one with the higher number;
2. Any data that was returned as below the lower limit of detection (<LLD) was replaced by half the lower limit of detection (<LLD = ½ LLD);
3. Similarly, any data that was returned as above the upper limit of detection (>ULD) was replaced by twice the upper limit of detection (>ULD = 2 ULD) (only Al, Sr and W concentrations after Aqua Regia digestion are affected by >ULD issues);
4. Map symbology was based on exploratory data analysis principles (Tukey, 1977). The data for each element was sorted in order of increasing value and isometric log ratio-transformed (e.g., see Filzmoser *et al*., 2009). The isometric log ratio (ilr) transformation yields a correct representation of compositional data in Euclidean space where standard statistical methods can be applied (Filzmoser *et al*., 2009). Minimum (0th percentile), First Quartile (25th percentile), Median (second quartile or 50th percentile), Third Quartile (75th percentile) and Maximum (100th percentile) values were determined by identifying the appropriate rank in the sorted data. A small circle symbol (○) is assigned for data between the Minimum and the First Quartile, a small dot (.) for data between the First Quartile and the Median, a larger dot (•) for data between the Median and the Third Quartile, and a plus sign (+) for data between the Third Quartile and the Maximum.
5. For identifying the existence of outliers, Lower and Upper Fences were calculated on the ilr-transformed data as follows:
    a. Lower Fence = 25th percentile – (1.5 x IQR), and
    b. Upper Fence = 75th percentile + (1.5 x IQR),

    where IQR is the Inter-Quartile Range (75th percentile - 25th percentile). Where the Lower Fence is smaller than the Minimum or the Upper Fence greater than the Maximum, no lower or upper outliers exist. *If*, however, values in the dataset exist between the Minimum and the Lower Fence they are assigned a large circle symbol (○). Similarly, *if* values in the dataset exist between the Upper Fence and the Maximum they are assigned a large solid square symbol (■). Thus, the latter two symbols are not present in all maps, as the existence of lower and/or upper outliers depends on the structure (i.e., size of IQR relative to range, skewness) of the dataset at hand.

Table 1 presents a summary of the chemical elements reported in this Atlas, together with basic chemical and geochemical information, including crustal abundances mostly from Rudnick & Gao (2003). For further information on element abundances in terrestrial media and environmental mobility, see Reimann & Caritat (1998). The first column in Table 1 is coloured according to element categories as per the key below the table. In the other coloured columns, the colour indicates low (~0-33rd percentile), medium (~34-66th percentile) and high (~67-100th percentile) values as per keys at the foot of columns.

Table 1. List of chemical elements analysed for in the NGSA project with selected properties (data from Wieser (2007), except crustal abundances, which are from Rudnick & Gao (2003), except for Te, which they did not report and which is taken here from Taylor & McLennan (1985)).

Symbol	Name	Atomic # Z	Atomic Mass (AMU)	Density (g/cm3)	Valence	Melting Point (K)	Boiling Point (K)	Electro-Negativity	Crustal Abundance (mg/kg)
Ag	silver	47	107.8682(2)	10.501	+1, (+2), (+3)	1234.15	2435	1.93	0.053
Al	aluminium	13	26.9815386(8)	2.698	3	933.4	2792	1.61	81512
As	arsenic	33	74.9216(2)	5.776	-3, (+2), +3, +5	1090.157	887	2.18	4.8
Au	gold	79	196.966569(4)	19.282	+1, (+2), +3	1337.73	3129	2.54	0.0015
B	boron	5	10.811(7)	2.34	-3, +3	2573.15	4200	2.04	17
Ba	barium	56	137.327(7)	3.594	2	1002.15	2170	0.89	624
Be	beryllium	4	9.012182(3)	1.85	2	1560.15	2742	1.57	2.1
Bi	bismuth	83	208.98040(1)	9.807	(-3), (+2), +3, (+4), (+5)	544.67	1837	2.02	0.16
Ca	calcium	20	40.078(4)	1.54	2	1112.15	1757	1.00	25658
Cd	cadmium	48	112.411(8)	8.69	(+1), +2	594.33	1040	1.69	0.09
Ce	cerium	58	140.116(1)	6.77	+3, +4	1071.15	3716	1.12	63
Cl	chlorine	17	35.453(2)	0.003214	-1, +1, (+2), +3, (+4), +5, +7	172.31	239.11	3.16	370
Co	cobalt	27	58.933195(5)	8.86	+2, +3, (+4)	1768.15	3200	1.88	17.3
Cr	chromium	24	51.9961(6)	7.15	+2, +3, +6	2130.15	2944	1.66	92
Cs	caesium	55	132.9054519(2)	1.873	1	301.7	944	0.79	4.9
Cu	copper	29	63.546(3)	8.96	+1, +2, (+3)	1357.75	2835	1.90	28
Dy	dysprosium	66	162.500(1)	8.55	3	1680.15	2840	1.22	3.9
Er	erbium	68	167.259(3)	9.066	3	1795.15	3503	1.24	2.3
Eu	europium	63	151.964(1)	5.243	(+2), +3	1095.15	1802	1.20	1
F	fluorine	9	18.9984032(5)	0.001696	-1, (+1)	53.63	85.03	3.98	557

Symbol	Name	Atomic # Z	Atomic Mass (AMU)	Density (g/cm3)	Valence	Melting Point (K)	Boiling Point (K)	Electro-Negativity	Crustal Abundance (mg/kg)
Fe	iron	26	55.845(2)	7.874	+2, +3, (+4), (+6)	1808.15	3134	1.83	39176
Ga	gallium	31	69.723(1)	5.907	(+2). +3	302.91	2477	1.81	17.5
Gd	gadolinium	64	157.25(3)	7.895	3	1585.15	3546	1.20	4
Ge	germanium	32	72.64(1)	5.323	-4, +2, +4	1211.45	3106	2.01	1.4
Hf	hafnium	72	178.49(2)	13.31	4	2500.15	4876	1.30	5.3
Hg	mercury	80	200.59(2)	13.5336	+1, +2	234.43	630	2.00	0.05
Ho	holmium	67	164.93032(2)	8.795	3	1743.15	2993	1.23	0.83
In	indium	49	114.818(3)	7.31	(+1), (+2), +3	429.91	2345	1.78	0.056
K	potassium	19	39.0983(1)	0.862	1	336.5	1032	0.82	23.243
La	lanthanum	57	138.90547(7)	6.145	3	1193.15	3737	1.10	31
Li	lithium	3	6.941(2)	0.534	1	453.85	1615	0.98	20
Lu	lutetium	71	174.9668(1)	9.84	3	1936.15	3675	1.27	0.31
Mg	magnesium	12	24.3050(6)	1.738	2	923.15	1363	1.31	14954
Mn	manganese	25	54.938045(5)	7.44	+2, (+3), +4, (+6), +7	1519.15	2334	1.55	775
Mo	molybdenum	42	95.96(2)	10.22	(+2), +3, (+4), (+5), +6	2890.15	4912	2.16	1.1
Na	sodium	11	22.98976928(2)	0.971	1	371.15	1156	0.93	24260
Nb	niobium	41	92.90638(2)	8.57	(+2), +3, (+4), +5	2741.15	5017	1.60	12
Nd	neodymium	60	144.242(3)	7.007	+3, +4	1289.15	3347	1.14	27
Ni	nickel	28	58.6934(4)	8.912	(+1), +2, (+3), (+4)	1726.15	3186	1.91	47
P	phosphorus	15	30.973762(2)	1.82	-3, +1, +3, +5	317.25	553	2.19	655
Pb	lead	82	207.2(1)	11.342	+2, +4	600.75	2022	2.33	17
Pd	palladium	46	106.42(1)	12.02	+2, +4, (+6)	1825.15	3236	2.20	0.00052

Symbol	Name	Atomic # Z	Atomic Mass (AMU)	Density (g/cm3)	Valence	Melting Point (K)	Boiling Point (K)	Electro-Negativity	Crustal Abundance (mg/kg)
Pr	praseodymium	59	140.90765(2)	6.773	3	1204.15	3793	1.13	7.1
Pt	platinum	78	195.084(9)	21.46	(+1), +2, (+3), +4, +6	2045.15	4098	2.28	0.0005
Rb	rubidium	37	85.4678(3)	1.532	1	312.79	961	0.82	84
Re	rhenium	75	186.207(1)	21.02	(-1), (+1), +2, (+3), +4, (+5), +6, +7	3453.15	5869	1.90	0.000198
S	sulfur	16	32.065(5)	2.067	-2, +2, +4, +6	388.51	717.8	2.58	621
Sb	antimony	51	121.760(1)	6.685	-3, +3, (+4), +5	904.05	1860	2.05	0.4
Sc	scandium	21	44.955912(6)	2.989	3	1812.15	3109	1.36	14
Se	selenium	34	78.96(3)	4.809	-2, (+2), +4, +6	494.15	958	2.55	0.09
Si	silicon	14	28.0855(3)	2.3296	-4, (+2), +4	1683.15	3538	1.90	311382
Sm	samarium	62	150.36(2)	7.52	(+2), +3	1345.15	2067	1.17	4.7
Sn	tin	50	118.710(7)	7.287	+2, +4	505.21	2875	1.96	2.1
Sr	strontium	38	87.62(1)	2.64	2	1042.15	1655	0.95	320
Ta	tantalum	73	180.94788(2)	16.654	(+3), (+4), +5	3269.15	5731	1.50	0.9
Tb	terbium	65	158.92535(2)	8.229	+3, +4	1630.15	3503	1.20	0.7
Te	tellurium	52	127.60(3)	6.232	-2, (+2), +4, +6	722.8	1261	2.10	0.005^
Th	thorium	90	232.03806(2)	11.72	4	2028.15	5061	1.30	10.5
Ti	titanium	22	47.867(1)	4.54	+2, +3, +4	1933.15	3560	1.54	3836
Tl	thallium	81	204.3833(2)	11.85	+1, (+2), +3	577.15	1746	1.62	0.9
Tm	thulium	69	168.93421(2)	9.321	(+2), +3	1818.15	2223	1.25	0.3
U	uranium	92	238.02891(3)	18.95	(+2), +3, +4, (+5), +6	1405.15	4404	1.38	2.7

Symbol	Name	Atomic # Z	Atomic Mass (AMU)	Density (g/cm3)	Valence	Melting Point (K)	Boiling Point (K)	Electro-Negativity	Crustal Abundance (mg/kg)
V	vanadium	23	50.9415(1)	6.11	+2, +3, +4, +5	2175.15	3680	1.63	97
W	tungsten	74	183.84(1)	19.25	(+2), (+3), (+4), (+5), +6	3680.15	5828	2.36	1.9
Y	yttrium	39	88.90585(2)	4.469	3	1799.15	3609	1.22	21
Yb	ytterbium	70	173.054(5)	6.965	(+2), +3	1097.15	1469	1.10	2
Zn	zinc	30	65.38(2)	7.134	2	692.88	1180	1.65	67
Zr	zirconium	40	91.224(2)	6.506	(+2), (+3), +4	2125.15	4682	1.33	193

^: From Taylor & McLennan (1985)

=<65	=<5.3	=<930	=<1850	=<1.3	=<2
=<140	=<8.5	=<1681	=<3200	=<1.9	=<25
>140	>8.5	>1681	>3200	>1.9	>25

Element categories:

Metals						Metalloids	Nonmetals			Unknown chemical properties
Alkali metals	Alkaline earth metals	Inner transition metals		Transition metals	Post-transition metals		Other nonmetals	Halogens	Noble gases	
		Lanthanides	Actinides							

TOTAL CONTENT MAPS

Table 2. List of maps showing the concentrations and distributions of elements as determined after Total digestion/analysis.

Element	Depth	Fraction	Preparation	Analysis
Ag	TOS	<2 mm	Total	ICP-MS
Al	TOS	<2 mm	Total	XRF
As	TOS	<2 mm	Total	ICP-MS
Au	TOS	<2 mm	Fire Assay	ICP-MS
Ba	TOS	<2 mm	Total	ICP-MS
Be	TOS	<2 mm	Total	ICP-MS
Bi	TOS	<2 mm	Total	ICP-MS
Ca	TOS	<2 mm	Total	XRF
Cd	TOS	<2 mm	Total	ICP-MS
Ce	TOS	<2 mm	Total	ICP-MS
Cl	TOS	<2 mm	Total	XRF
Co	TOS	<2 mm	Total	ICP-MS
Cr	TOS	<2 mm	Total	ICP-MS
Cs	TOS	<2 mm	Total	ICP-MS
Cu	TOS	<2 mm	Total	ICP-MS
Dy	TOS	<2 mm	Total	ICP-MS
Er	TOS	<2 mm	Total	ICP-MS
Eu	TOS	<2 mm	Total	ICP-MS
F	TOS	<2 mm	Alkaline Fusion	ISE
Fe (Total)	TOS	<2 mm	Total	XRF
Ga	TOS	<2 mm	Total	ICP-MS
Gd	TOS	<2 mm	Total	ICP-MS
Ge	TOS	<2 mm	Total	ICP-MS
Hf	TOS	<2 mm	Total	ICP-MS
Ho	TOS	<2 mm	Total	ICP-MS
K	TOS	<2 mm	Total	XRF
La	TOS	<2 mm	Total	ICP-MS
LOI_C	TOS	<2 mm	Total	Calculated
Lu	TOS	<2 mm	Total	ICP-MS
Mg	TOS	<2 mm	Total	XRF
Mn	TOS	<2 mm	Total	XRF
Mo	TOS	<2 mm	Total	ICP-MS
Na	TOS	<2 mm	Total	XRF
Nb	TOS	<2 mm	Total	ICP-MS
Nd	TOS	<2 mm	Total	ICP-MS
Ni	TOS	<2 mm	Total	ICP-MS
P	TOS	<2 mm	Total	XRF
Pb	TOS	<2 mm	Total	ICP-MS
Pd	TOS	<2 mm	Fire Assay	ICP-MS
Pr	TOS	<2 mm	Total	ICP-MS
Pt	TOS	<2 mm	Fire Assay	ICP-MS
Rb	TOS	<2 mm	Total	ICP-MS
S	TOS	<2 mm	Total	XRF
Sb	TOS	<2 mm	Total	ICP-MS
Sc	TOS	<2 mm	Total	ICP-MS
Si	TOS	<2 mm	Total	XRF

Element	Depth	Fraction	Preparation	Analysis
Sm	TOS	<2 mm	Total	ICP-MS
Sn	TOS	<2 mm	Total	ICP-MS
Sr	TOS	<2 mm	Total	ICP-MS
Ta	TOS	<2 mm	Total	ICP-MS
Tb	TOS	<2 mm	Total	ICP-MS
Th	TOS	<2 mm	Total	ICP-MS
Ti	TOS	<2 mm	Total	XRF
U	TOS	<2 mm	Total	ICP-MS
V	TOS	<2 mm	Total	ICP-MS
W	TOS	<2 mm	Total	ICP-MS
Y	TOS	<2 mm	Total	ICP-MS
Yb	TOS	<2 mm	Total	ICP-MS
Zn	TOS	<2 mm	Total	ICP-MS
Zr	TOS	<2 mm	Total	ICP-MS
Ag	TOS	<75 um	Total	ICP-MS
Al	TOS	<75 um	Total	XRF
As	TOS	<75 um	Total	ICP-MS
Au	TOS	<75 um	Fire Assay	ICP-MS
Ba	TOS	<75 um	Total	ICP-MS
Be	TOS	<75 um	Total	ICP-MS
Bi	TOS	<75 um	Total	ICP-MS
Ca	TOS	<75 um	Total	XRF
Cd	TOS	<75 um	Total	ICP-MS
Ce	TOS	<75 um	Total	ICP-MS
Cl	TOS	<75 um	Total	XRF
Co	TOS	<75 um	Total	ICP-MS
Cr	TOS	<75 um	Total	ICP-MS
Cs	TOS	<75 um	Total	ICP-MS
Cu	TOS	<75 um	Total	ICP-MS
Dy	TOS	<75 um	Total	ICP-MS
Er	TOS	<75 um	Total	ICP-MS
Eu	TOS	<75 um	Total	ICP-MS
F	TOS	<75 um	Alkaline Fusion	ISE
Fe (Total)	TOS	<75 um	Total	XRF
Ga	TOS	<75 um	Total	ICP-MS
Gd	TOS	<75 um	Total	ICP-MS
Ge	TOS	<75 um	Total	ICP-MS
Hf	TOS	<75 um	Total	ICP-MS
Ho	TOS	<75 um	Total	ICP-MS
K	TOS	<75 um	Total	XRF
La	TOS	<75 um	Total	ICP-MS
LOI_C	TOS	<75 um	Total	Calculated
Lu	TOS	<75 um	Total	ICP-MS
Mg	TOS	<75 um	Total	XRF
Mn	TOS	<75 um	Total	XRF
Mo	TOS	<75 um	Total	ICP-MS
Na	TOS	<75 um	Total	XRF
Nb	TOS	<75 um	Total	ICP-MS
Nd	TOS	<75 um	Total	ICP-MS
Ni	TOS	<75 um	Total	ICP-MS

Element	Depth	Fraction	Preparation	Analysis
P	TOS	<75 um	Total	XRF
Pb	TOS	<75 um	Total	ICP-MS
Pd	TOS	<75 um	Fire Assay	ICP-MS
Pr	TOS	<75 um	Total	ICP-MS
Pt	TOS	<75 um	Fire Assay	ICP-MS
Rb	TOS	<75 um	Total	ICP-MS
S	TOS	<75 um	Total	XRF
Sb	TOS	<75 um	Total	ICP-MS
Sc	TOS	<75 um	Total	ICP-MS
Si	TOS	<75 um	Total	XRF
Sm	TOS	<75 um	Total	ICP-MS
Sn	TOS	<75 um	Total	ICP-MS
Sr	TOS	<75 um	Total	ICP-MS
Ta	TOS	<75 um	Total	ICP-MS
Tb	TOS	<75 um	Total	ICP-MS
Th	TOS	<75 um	Total	ICP-MS
Ti	TOS	<75 um	Total	XRF
U	TOS	<75 um	Total	ICP-MS
V	TOS	<75 um	Total	ICP-MS
W	TOS	<75 um	Total	ICP-MS
Y	TOS	<75 um	Total	ICP-MS
Yb	TOS	<75 um	Total	ICP-MS
Zn	TOS	<75 um	Total	ICP-MS
Zr	TOS	<75 um	Total	ICP-MS
Ag	BOS	<2 mm	Total	ICP-MS
Al	BOS	<2 mm	Total	XRF
As	BOS	<2 mm	Total	ICP-MS
Au	BOS	<2 mm	Fire Assay	ICP-MS
Ba	BOS	<2 mm	Total	ICP-MS
Be	BOS	<2 mm	Total	ICP-MS
Bi	BOS	<2 mm	Total	ICP-MS
Ca	BOS	<2 mm	Total	XRF
Cd	BOS	<2 mm	Total	ICP-MS
Ce	BOS	<2 mm	Total	ICP-MS
Cl	BOS	<2 mm	Total	XRF
Co	BOS	<2 mm	Total	ICP-MS
Cr	BOS	<2 mm	Total	ICP-MS
Cs	BOS	<2 mm	Total	ICP-MS
Cu	BOS	<2 mm	Total	ICP-MS
Dy	BOS	<2 mm	Total	ICP-MS
Er	BOS	<2 mm	Total	ICP-MS
Eu	BOS	<2 mm	Total	ICP-MS
F	BOS	<2 mm	Alkaline Fusion	ISE
Fe (Total)	BOS	<2 mm	Total	XRF
Ga	BOS	<2 mm	Total	ICP-MS
Gd	BOS	<2 mm	Total	ICP-MS
Ge	BOS	<2 mm	Total	ICP-MS
Hf	BOS	<2 mm	Total	ICP-MS
Ho	BOS	<2 mm	Total	ICP-MS
K	BOS	<2 mm	Total	XRF

Element	Depth	Fraction	Preparation	Analysis
La	BOS	<2 mm	Total	ICP-MS
LOI_C	BOS	<2 mm	Total	Calculated
Lu	BOS	<2 mm	Total	ICP-MS
Mg	BOS	<2 mm	Total	XRF
Mn	BOS	<2 mm	Total	XRF
Mo	BOS	<2 mm	Total	ICP-MS
Na	BOS	<2 mm	Total	XRF
Nb	BOS	<2 mm	Total	ICP-MS
Nd	BOS	<2 mm	Total	ICP-MS
Ni	BOS	<2 mm	Total	ICP-MS
P	BOS	<2 mm	Total	XRF
Pb	BOS	<2 mm	Total	ICP-MS
Pd	BOS	<2 mm	Fire Assay	ICP-MS
Pr	BOS	<2 mm	Total	ICP-MS
Pt	BOS	<2 mm	Fire Assay	ICP-MS
Rb	BOS	<2 mm	Total	ICP-MS
S	BOS	<2 mm	Total	XRF
Sb	BOS	<2 mm	Total	ICP-MS
Sc	BOS	<2 mm	Total	ICP-MS
Si	BOS	<2 mm	Total	XRF
Sm	BOS	<2 mm	Total	ICP-MS
Sn	BOS	<2 mm	Total	ICP-MS
Sr	BOS	<2 mm	Total	ICP-MS
Ta	BOS	<2 mm	Total	ICP-MS
Tb	BOS	<2 mm	Total	ICP-MS
Th	BOS	<2 mm	Total	ICP-MS
Ti	BOS	<2 mm	Total	XRF
U	BOS	<2 mm	Total	ICP-MS
V	BOS	<2 mm	Total	ICP-MS
W	BOS	<2 mm	Total	ICP-MS
Y	BOS	<2 mm	Total	ICP-MS
Yb	BOS	<2 mm	Total	ICP-MS
Zn	BOS	<2 mm	Total	ICP-MS
Zr	BOS	<2 mm	Total	ICP-MS
Ag	BOS	<75 um	Total	ICP-MS
Al	BOS	<75 um	Total	XRF
As	BOS	<75 um	Total	ICP-MS
Au	BOS	<75 um	Fire Assay	ICP-MS
Ba	BOS	<75 um	Total	ICP-MS
Be	BOS	<75 um	Total	ICP-MS
Bi	BOS	<75 um	Total	ICP-MS
Ca	BOS	<75 um	Total	XRF
Cd	BOS	<75 um	Total	ICP-MS
Ce	BOS	<75 um	Total	ICP-MS
Cl	BOS	<75 um	Total	XRF
Co	BOS	<75 um	Total	ICP-MS
Cr	BOS	<75 um	Total	ICP-MS
Cs	BOS	<75 um	Total	ICP-MS
Cu	BOS	<75 um	Total	ICP-MS
Dy	BOS	<75 um	Total	ICP-MS

Element	Depth	Fraction	Preparation	Analysis
Er	BOS	<75 um	Total	ICP-MS
Eu	BOS	<75 um	Total	ICP-MS
F	BOS	<75 um	Alkaline Fusion	ISE
Fe (Total)	BOS	<75 um	Total	XRF
Ga	BOS	<75 um	Total	ICP-MS
Gd	BOS	<75 um	Total	ICP-MS
Ge	BOS	<75 um	Total	ICP-MS
Hf	BOS	<75 um	Total	ICP-MS
Ho	BOS	<75 um	Total	ICP-MS
K	BOS	<75 um	Total	XRF
La	BOS	<75 um	Total	ICP-MS
LOI_C	BOS	<75 um	Total	Calculated
Lu	BOS	<75 um	Total	ICP-MS
Mg	BOS	<75 um	Total	XRF
Mn	BOS	<75 um	Total	XRF
Mo	BOS	<75 um	Total	ICP-MS
Na	BOS	<75 um	Total	XRF
Nb	BOS	<75 um	Total	ICP-MS
Nd	BOS	<75 um	Total	ICP-MS
Ni	BOS	<75 um	Total	ICP-MS
P	BOS	<75 um	Total	XRF
Pb	BOS	<75 um	Total	ICP-MS
Pd	BOS	<75 um	Fire Assay	ICP-MS
Pr	BOS	<75 um	Total	ICP-MS
Pt	BOS	<75 um	Fire Assay	ICP-MS
Rb	BOS	<75 um	Total	ICP-MS
S	BOS	<75 um	Total	XRF
Sb	BOS	<75 um	Total	ICP-MS
Sc	BOS	<75 um	Total	ICP-MS
Si	BOS	<75 um	Total	XRF
Sm	BOS	<75 um	Total	ICP-MS
Sn	BOS	<75 um	Total	ICP-MS
Sr	BOS	<75 um	Total	ICP-MS
Ta	BOS	<75 um	Total	ICP-MS
Tb	BOS	<75 um	Total	ICP-MS
Th	BOS	<75 um	Total	ICP-MS
Ti	BOS	<75 um	Total	XRF
U	BOS	<75 um	Total	ICP-MS
V	BOS	<75 um	Total	ICP-MS
W	BOS	<75 um	Total	ICP-MS
Y	BOS	<75 um	Total	ICP-MS
Yb	BOS	<75 um	Total	ICP-MS
Zn	BOS	<75 um	Total	ICP-MS
Zr	BOS	<75 um	Total	ICP-MS

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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ag

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *0.84 mg/kg*

Upper Fence: *Less than 0.03 mg/kg*

75%: *N/A**

Median: *N/A**

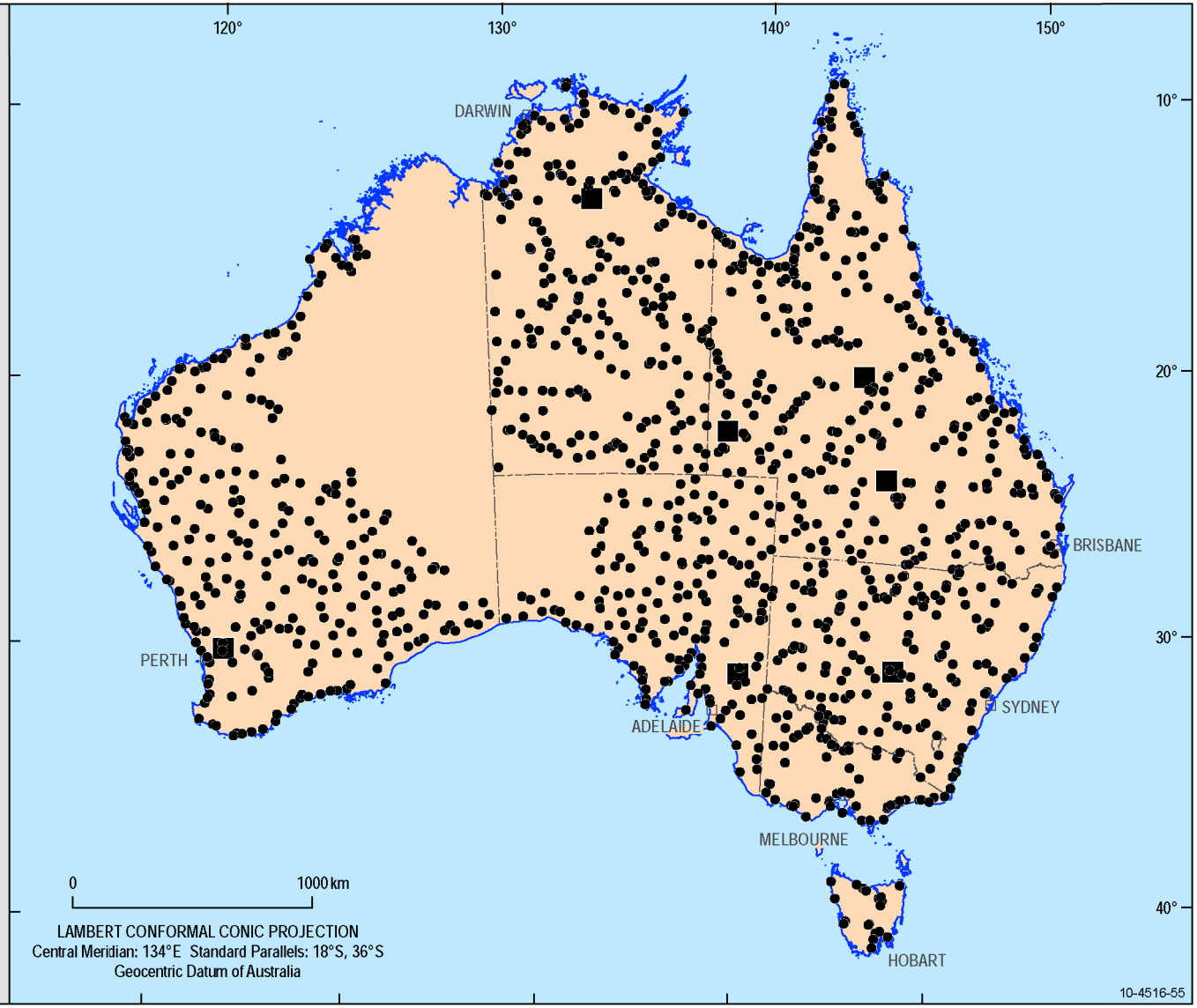
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Al

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 26 mg/kg
N: 1190

Maximum: *148336 mg/kg*

Upper Fence: *N/A**

75%: *58800 mg/kg*

Median: *42831 mg/kg*

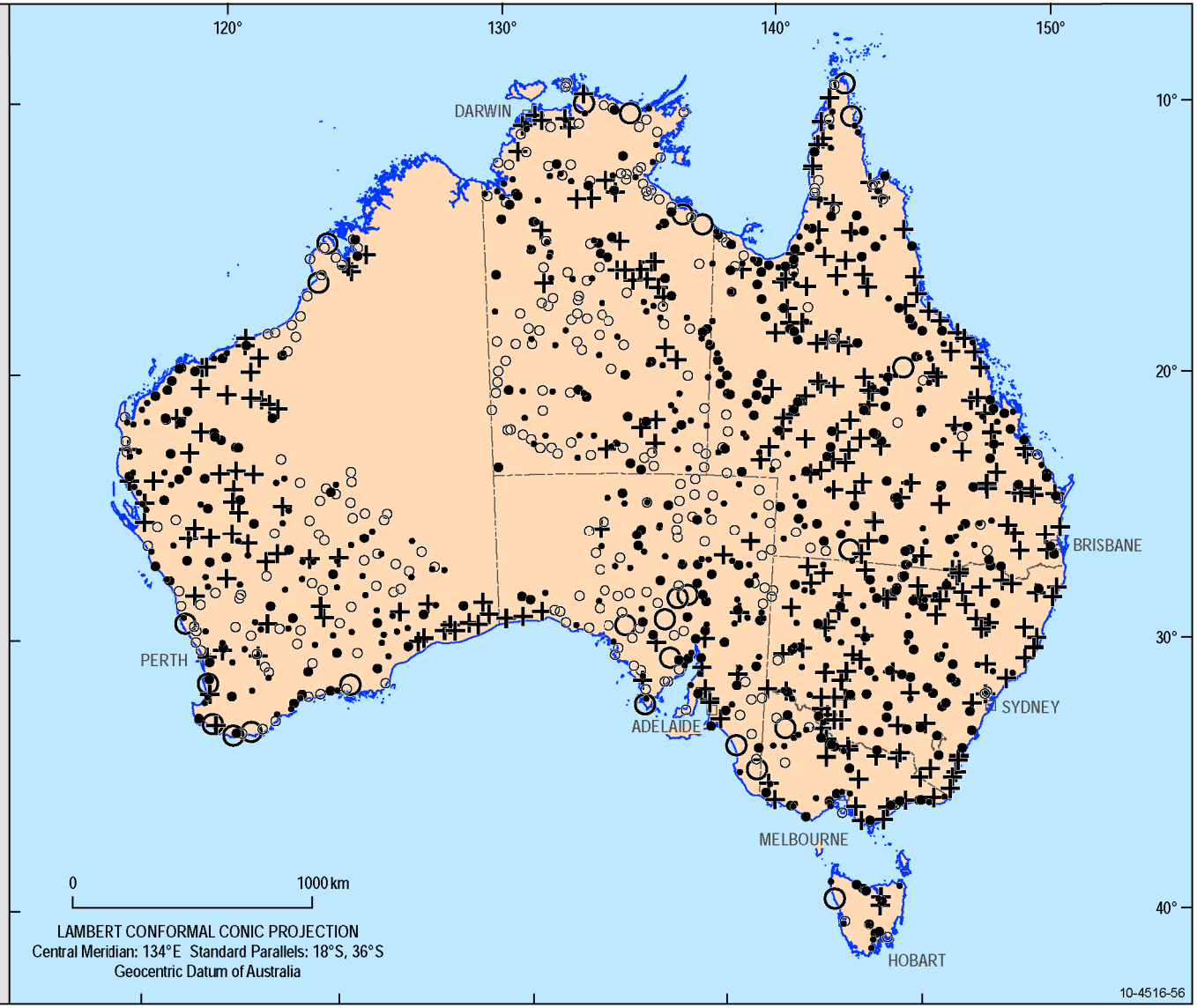
25%: *24215 mg/kg*

Lower Fence: *6174 mg/kg*

Minimum: *879 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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As

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.4 mg/kg
N: 1190

Maximum: *112.7 mg/kg*

Upper Fence: *19.8 mg/kg*

75%: *4.7 mg/kg*

Median: *3.1 mg/kg*

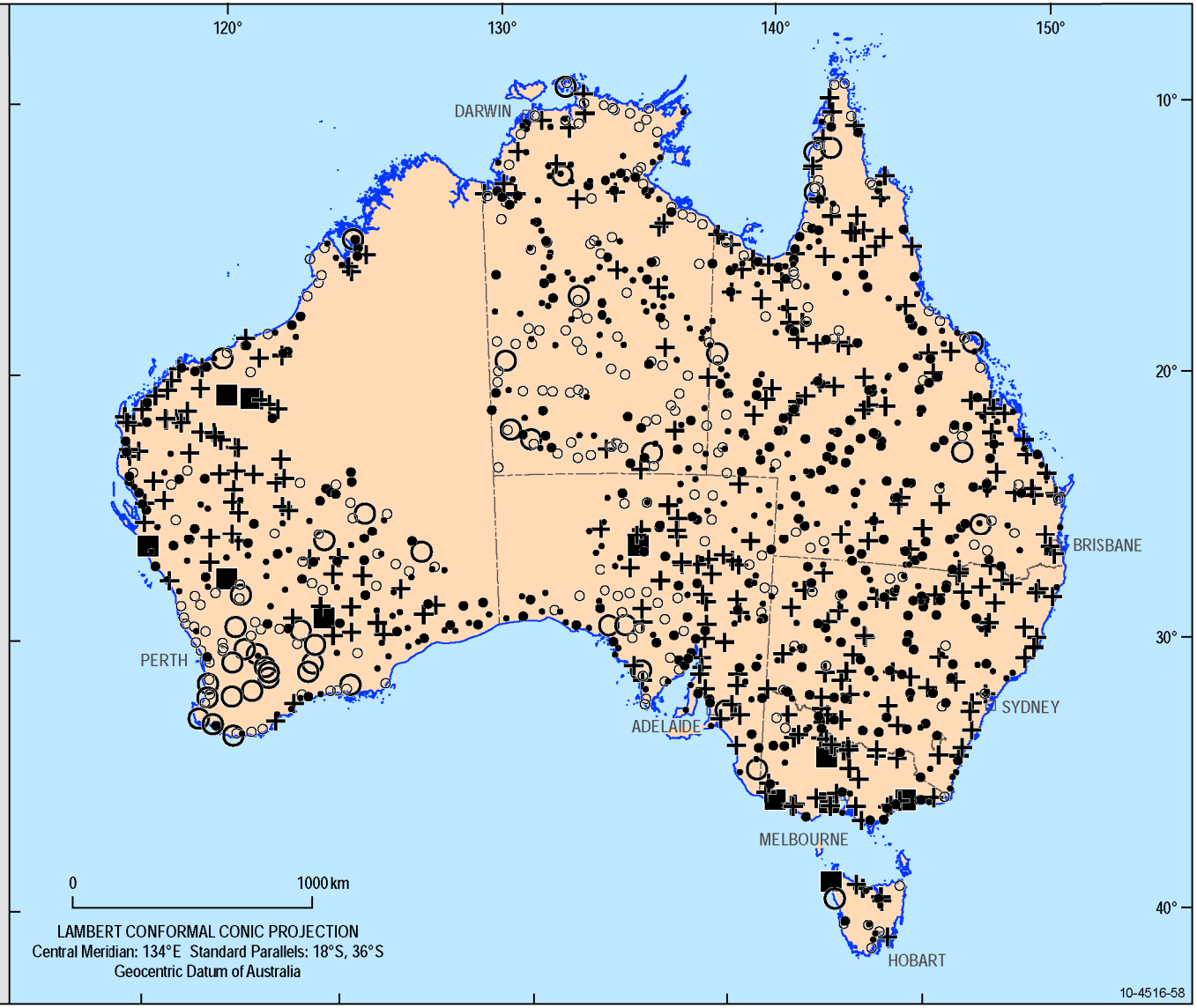
25%: *1.8 mg/kg*

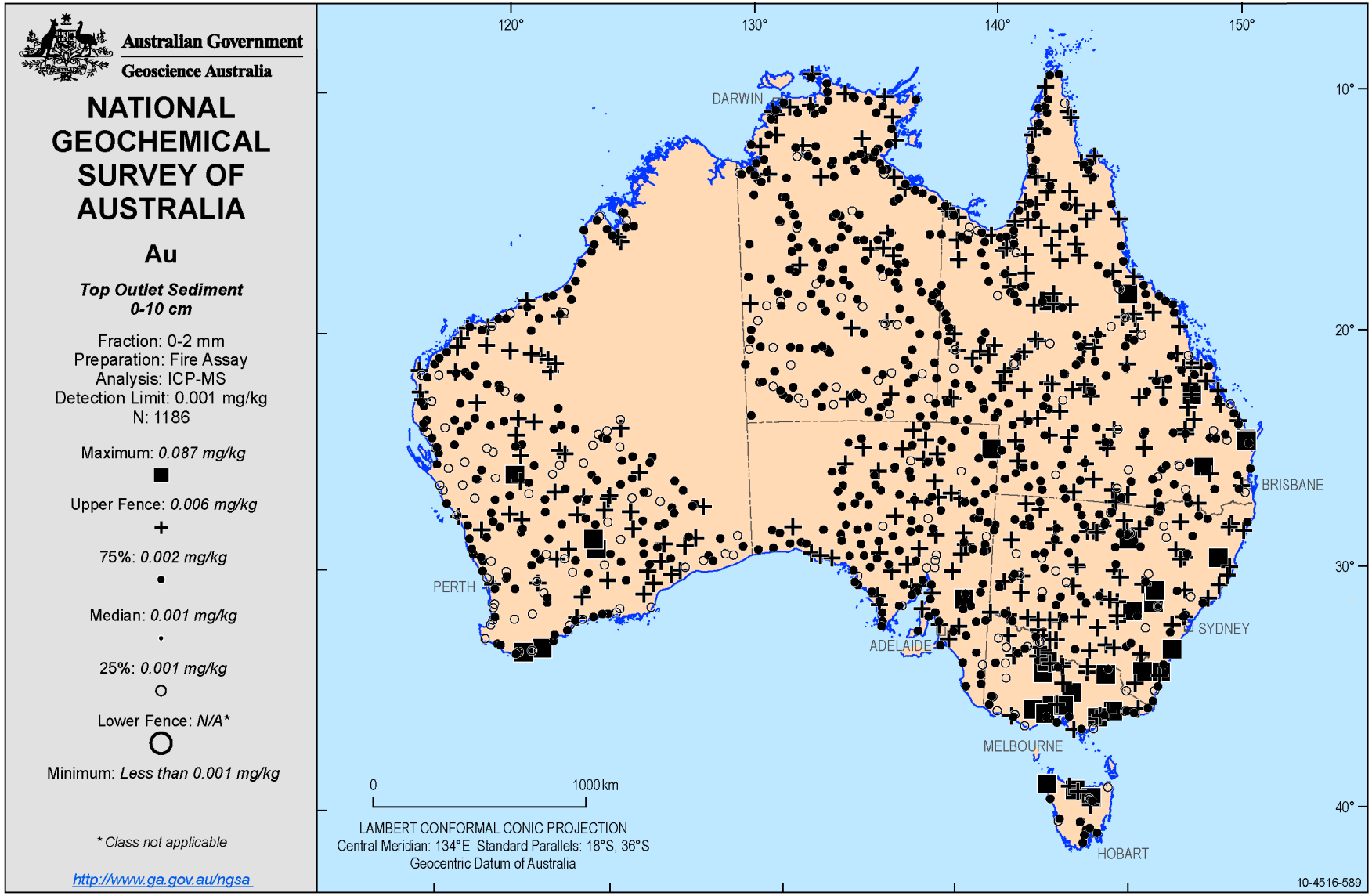
Lower Fence: *0.4 mg/kg*

Minimum: *Less than 0.4 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa

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Au
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.001 mg/kg
N: 1186
Maximum: 0.087 mg/kg
Upper Fence: 0.006 mg/kg
75%: 0.002 mg/kg
Median: 0.001 mg/kg
25%: 0.001 mg/kg
Lower Fence: N/A*
Minimum: Less than 0.001 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-589

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Ba

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1190

Maximum: *2576.5 mg/kg*

Upper Fence: *1240.2 mg/kg*

75%: *415.3 mg/kg*

Median: *315.5 mg/kg*

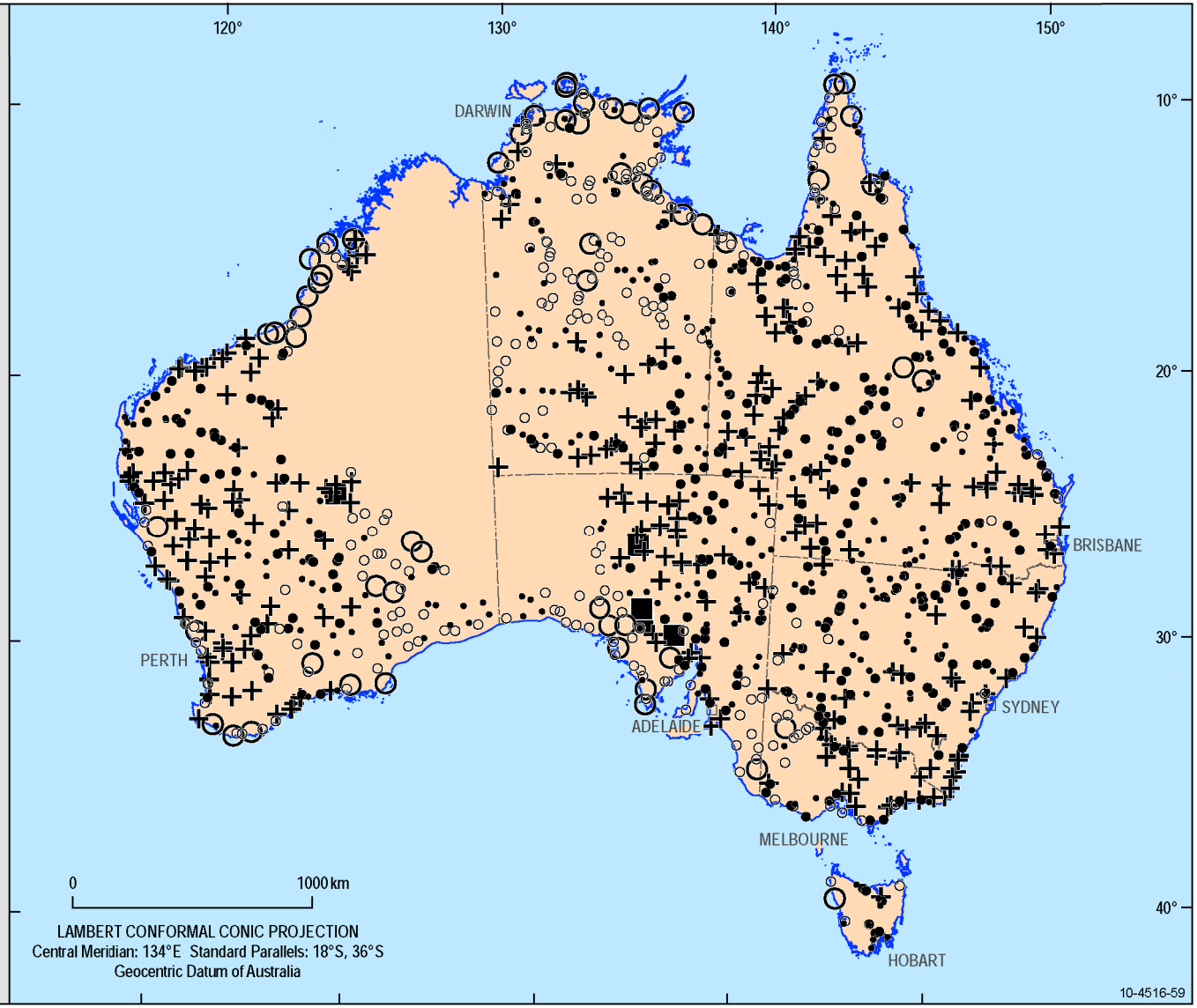
25%: *200.2 mg/kg*

Lower Fence: *67 mg/kg*

Minimum: *3.6 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Be

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 1.1 mg/kg
N: 1190

Maximum: *18.1 mg/kg*

Upper Fence: *10.7 mg/kg*

75%: *1.8 mg/kg*

Median: *1.2 mg/kg*

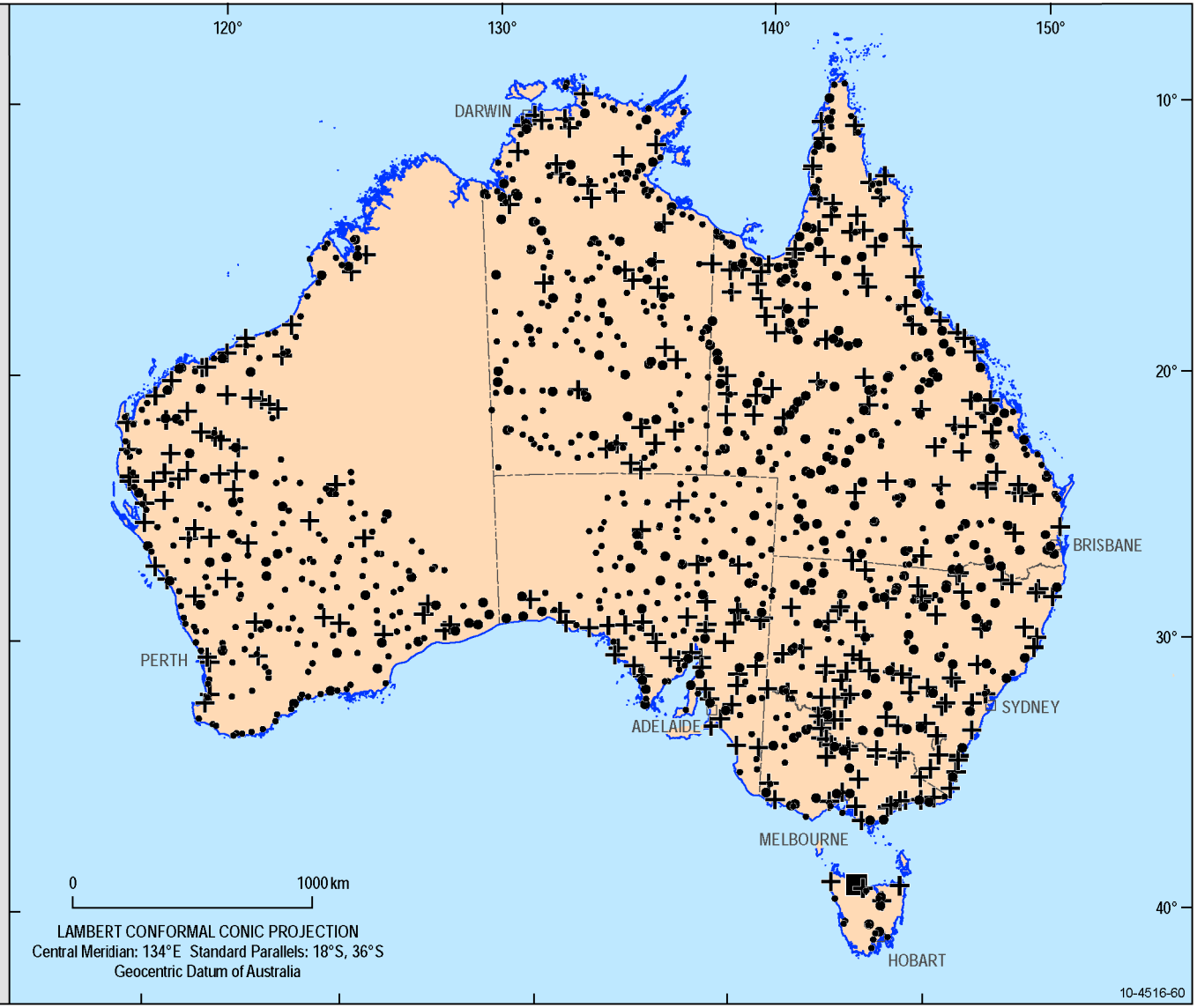
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 1.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Bi

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *31.9 mg/kg*

Upper Fence: *1.14 mg/kg*

75%: *0.28 mg/kg*

Median: *0.18 mg/kg*

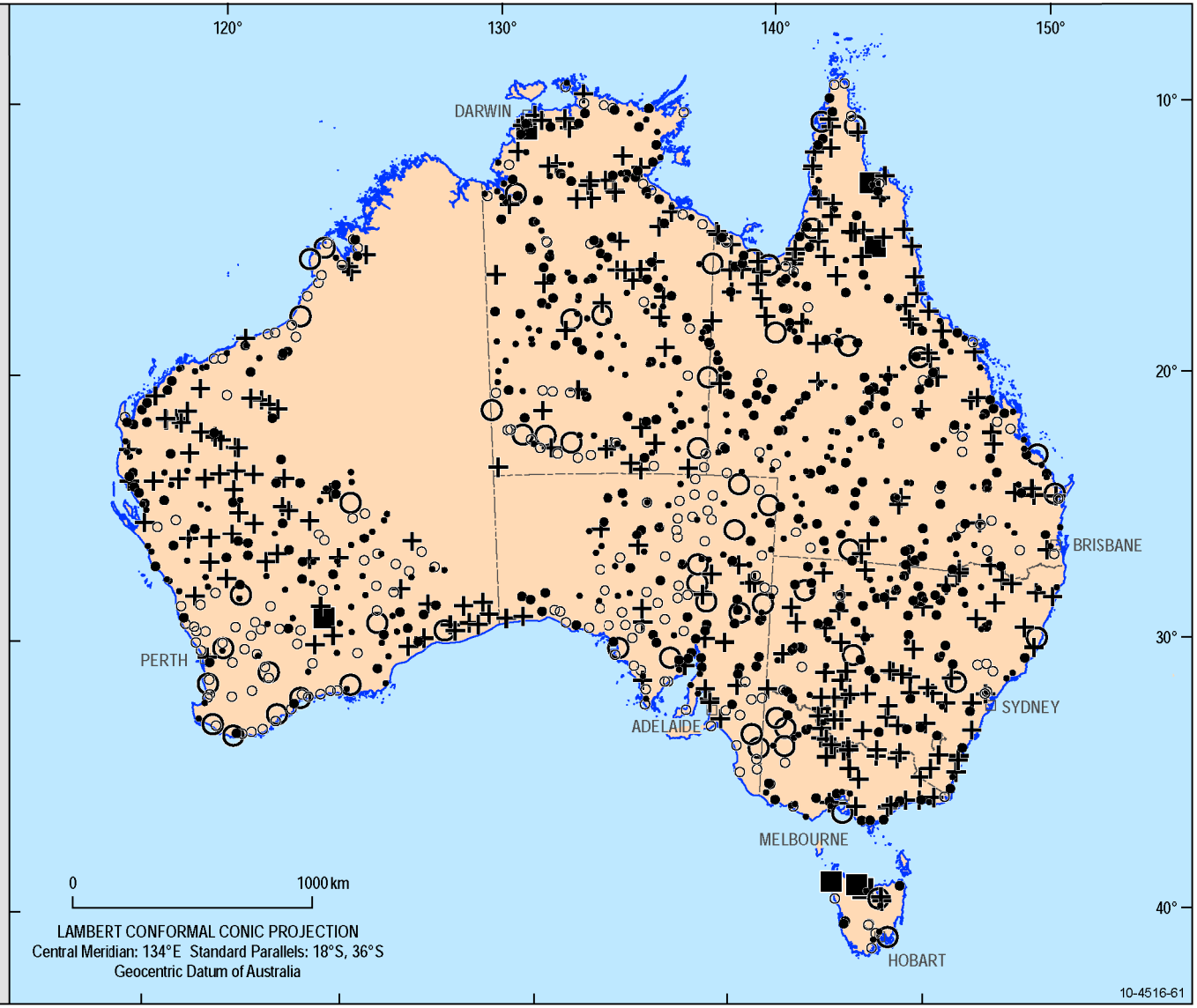
25%: *0.11 mg/kg*

Lower Fence: *0.03 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Ca

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 14 mg/kg
N: 1190

Maximum: *365619 mg/kg*

Upper Fence: *64775 mg/kg*

75%: *6568 mg/kg*

Median: *3252 mg/kg*

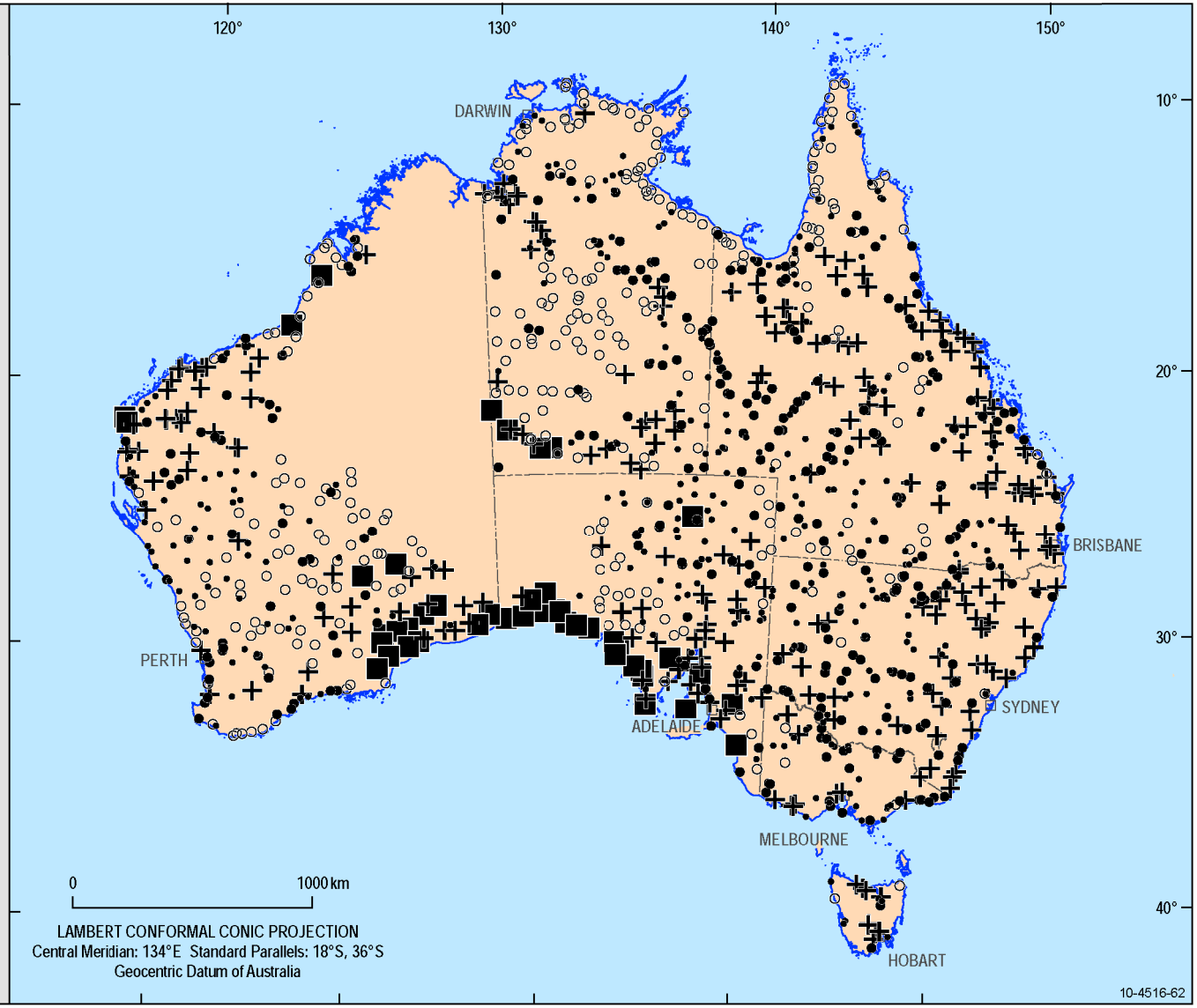
25%: *1379 mg/kg*

Lower Fence: *N/A**

Minimum: *229 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cd

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *4 mg/kg*

Upper Fence: *0.4 mg/kg*

75%: *0.1 mg/kg*

Median: *N/A**

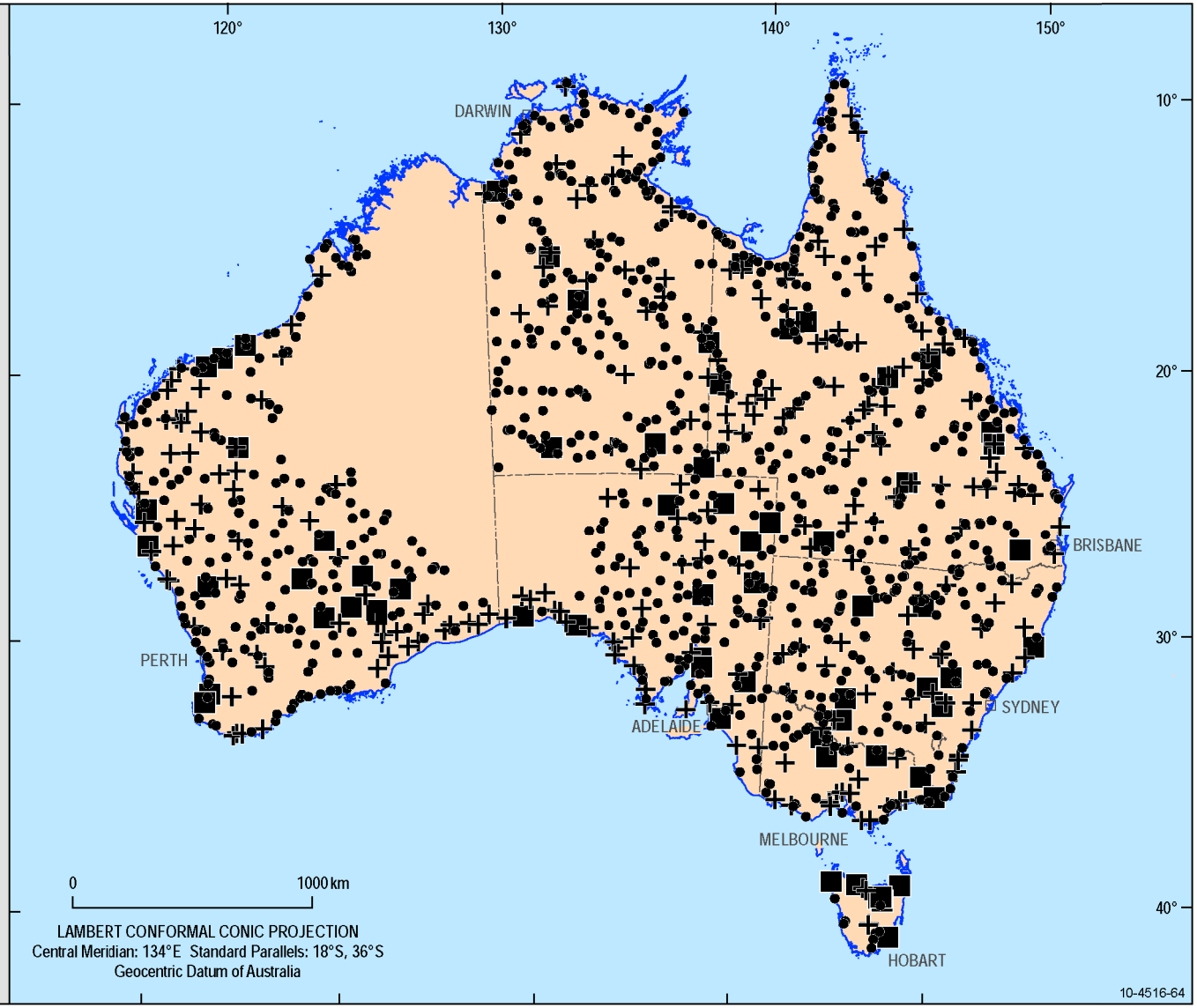
25%: *N/A**

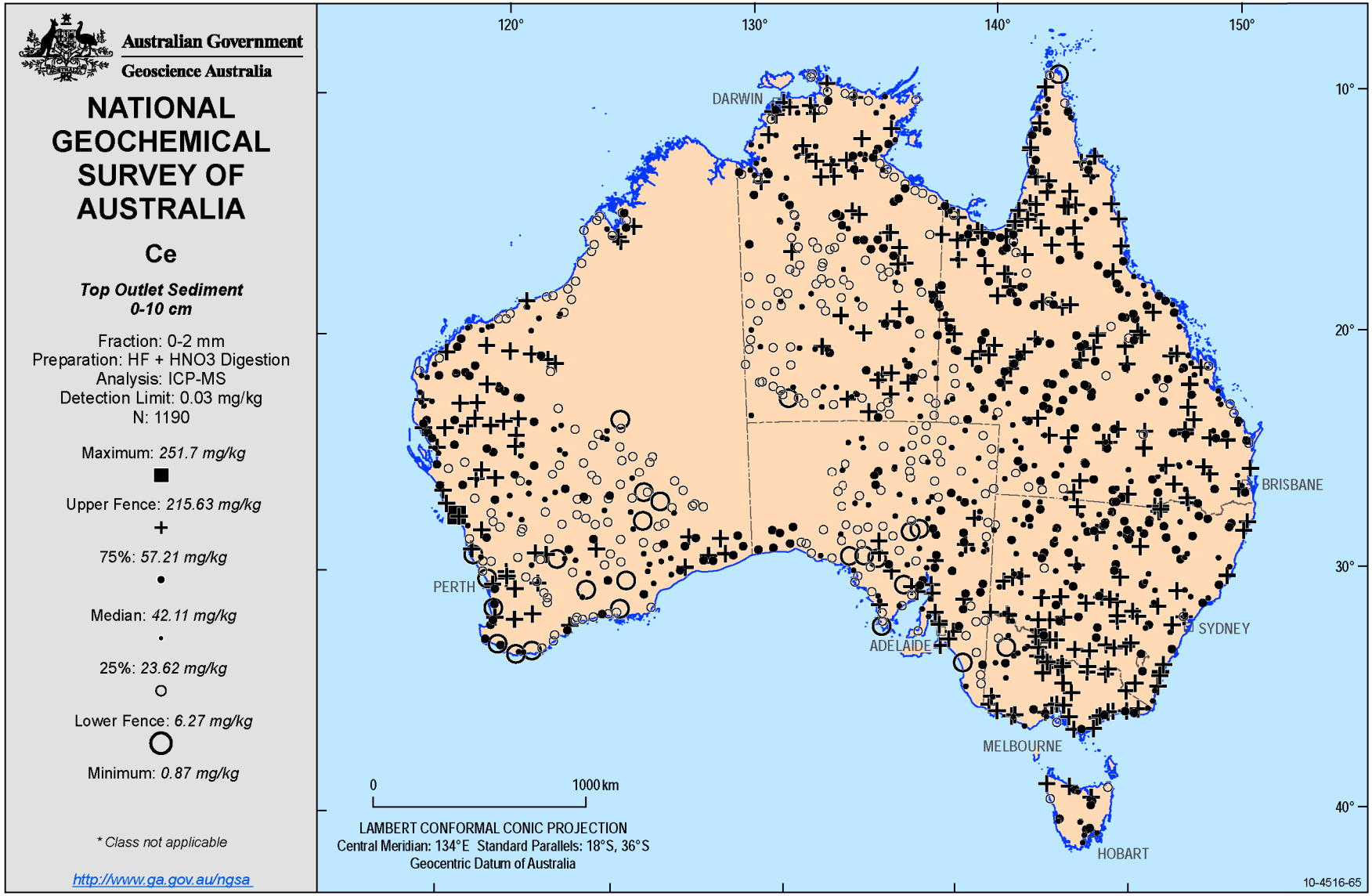
Lower Fence: *N/A**

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Ce
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190
Maximum: 251.7 mg/kg
Upper Fence: 215.63 mg/kg
75%: 57.21 mg/kg
Median: 42.11 mg/kg
25%: 23.62 mg/kg
Lower Fence: 6.27 mg/kg
Minimum: 0.87 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-65

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cl

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 10 mg/kg
N: 1190

Maximum: *53239 mg/kg*

Upper Fence: *347 mg/kg*

75%: *92 mg/kg*

Median: *53 mg/kg*

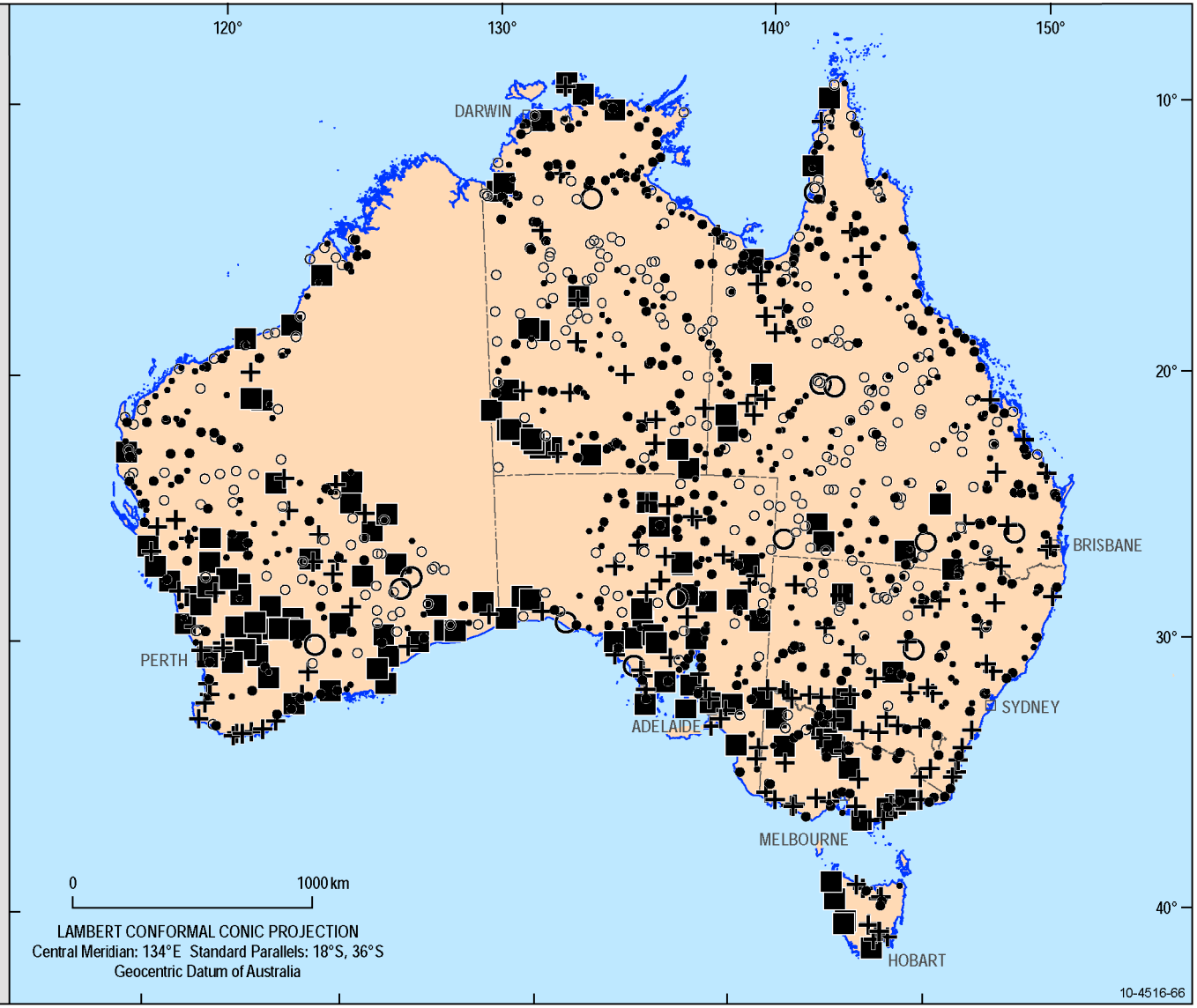
25%: *38 mg/kg*

Lower Fence: *10 mg/kg*

Minimum: *Less than 10 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Co

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *74.7 mg/kg*

Upper Fence: *N/A**

75%: *13.4 mg/kg*

Median: *8.3 mg/kg*

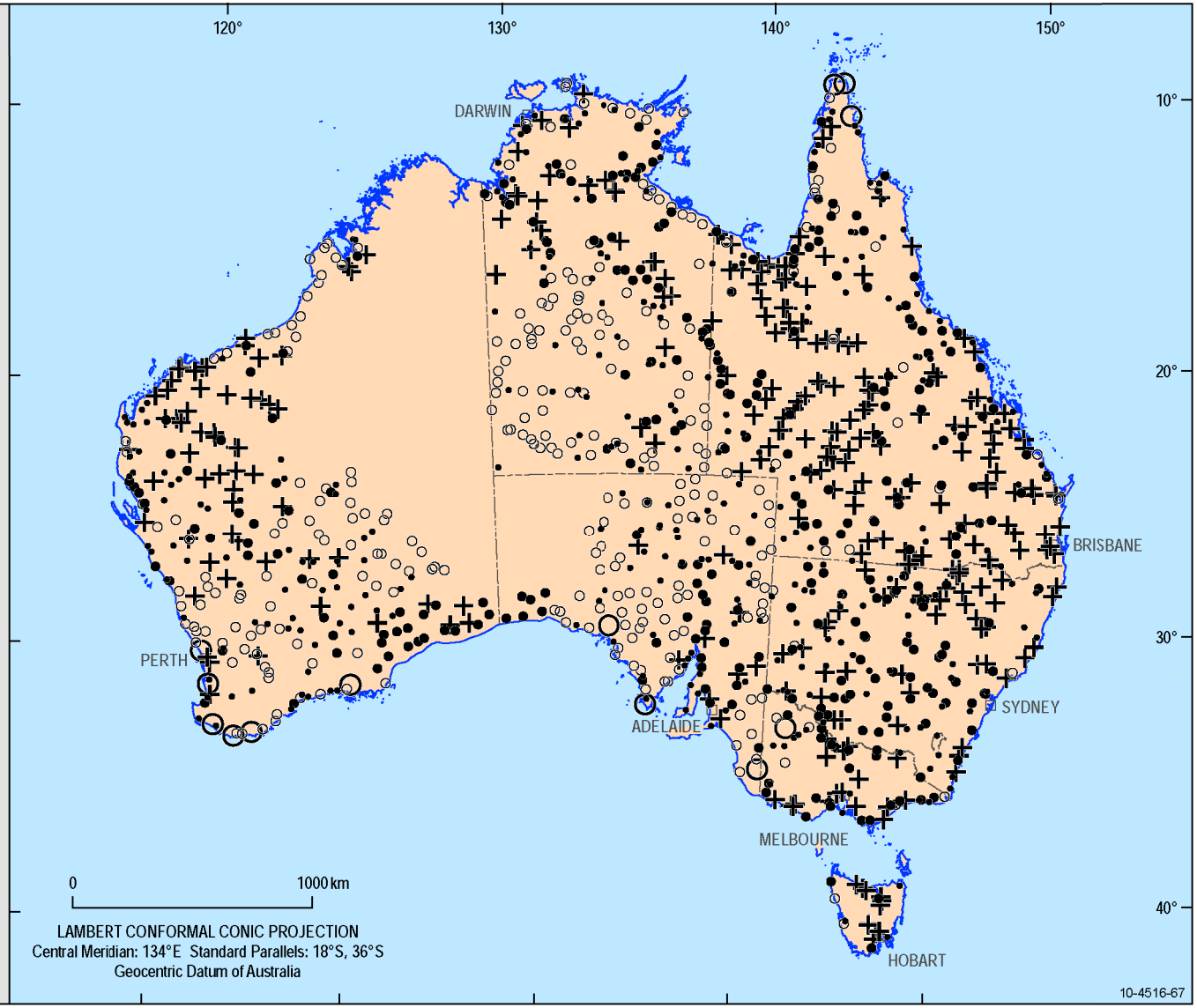
25%: *3.5 mg/kg*

Lower Fence: *0.5 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cr

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1190

Maximum: *2039 mg/kg*

Upper Fence: *195.7 mg/kg*

75%: *65.9 mg/kg*

Median: *47.9 mg/kg*

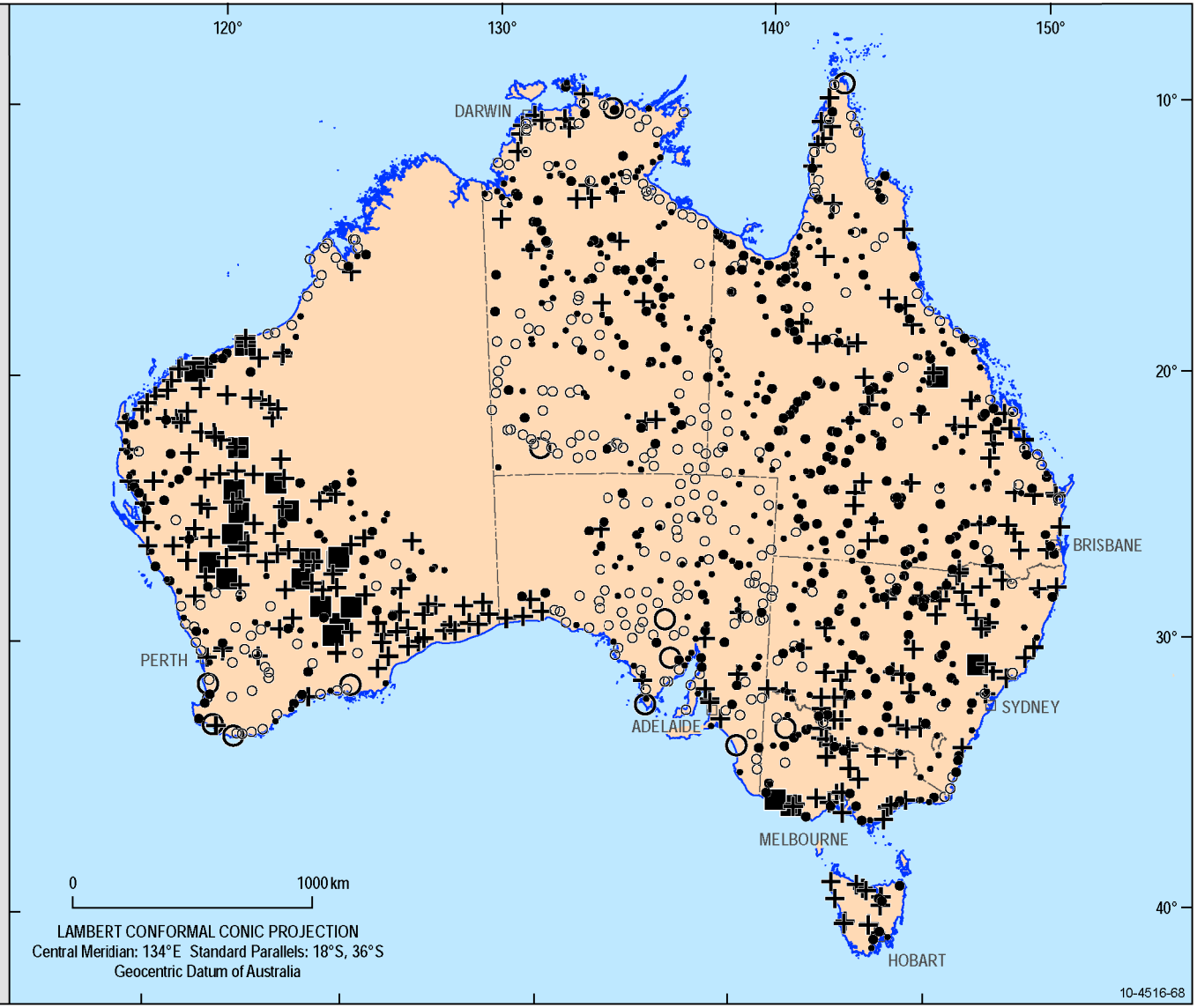
25%: *31.9 mg/kg*

Lower Fence: *10.7 mg/kg*

Minimum: *4.8 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cs

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *13.4 mg/kg*

Upper Fence: *N/A**

75%: *3.6 mg/kg*

Median: *2.3 mg/kg*

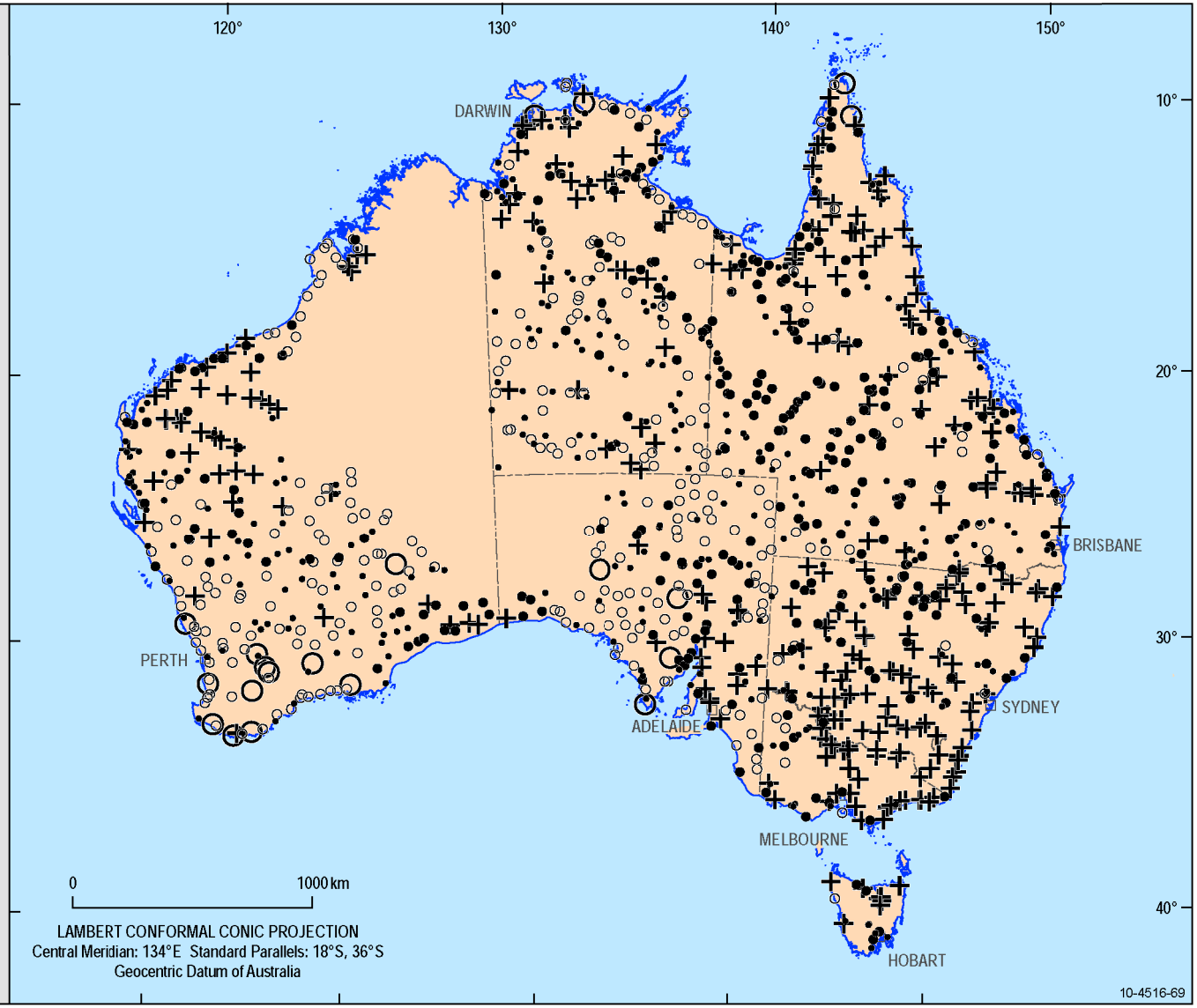
25%: *1.2 mg/kg*

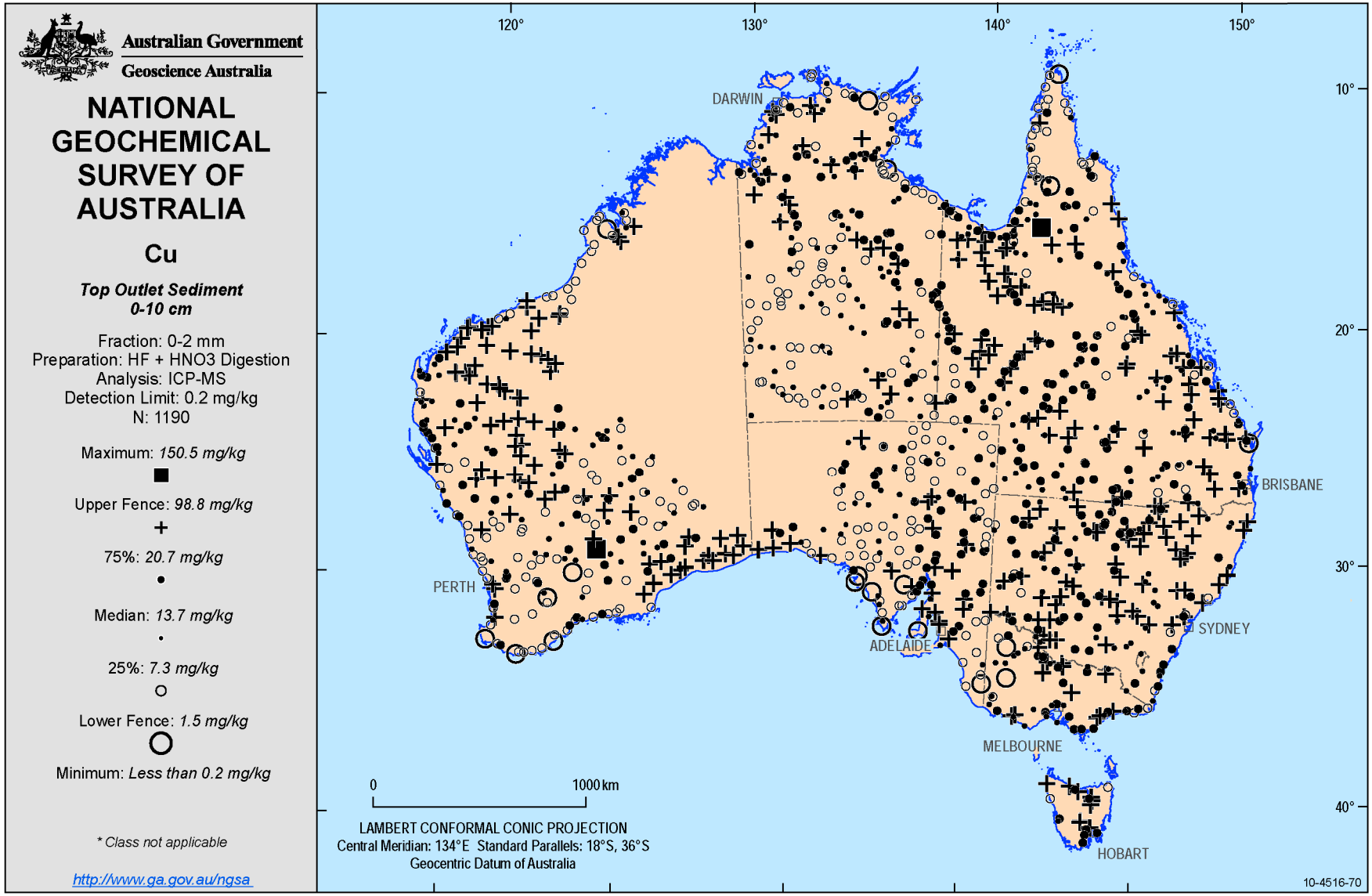
Lower Fence: *0.2 mg/kg*

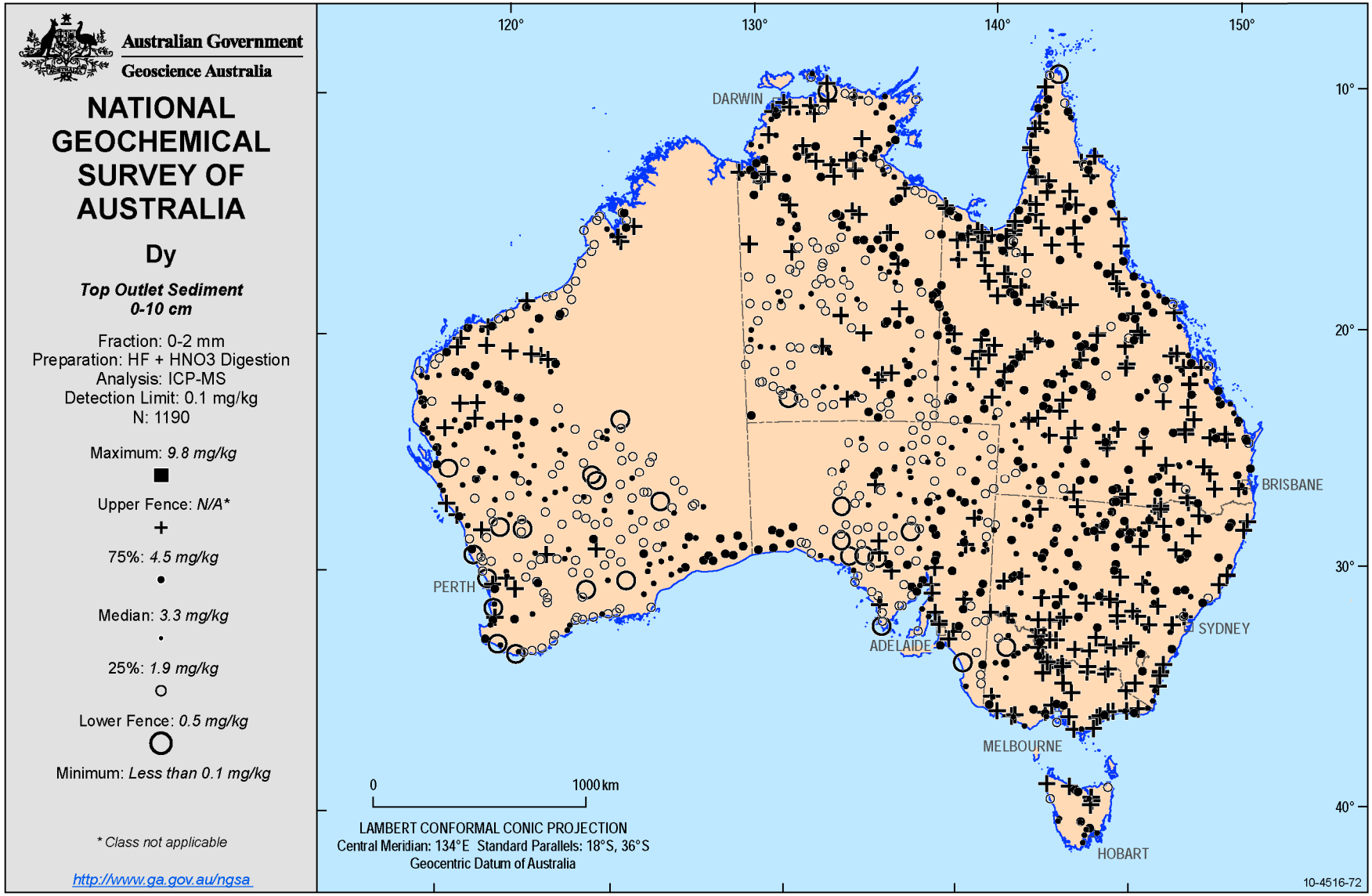
Minimum: *Less than 0.1 mg/kg*

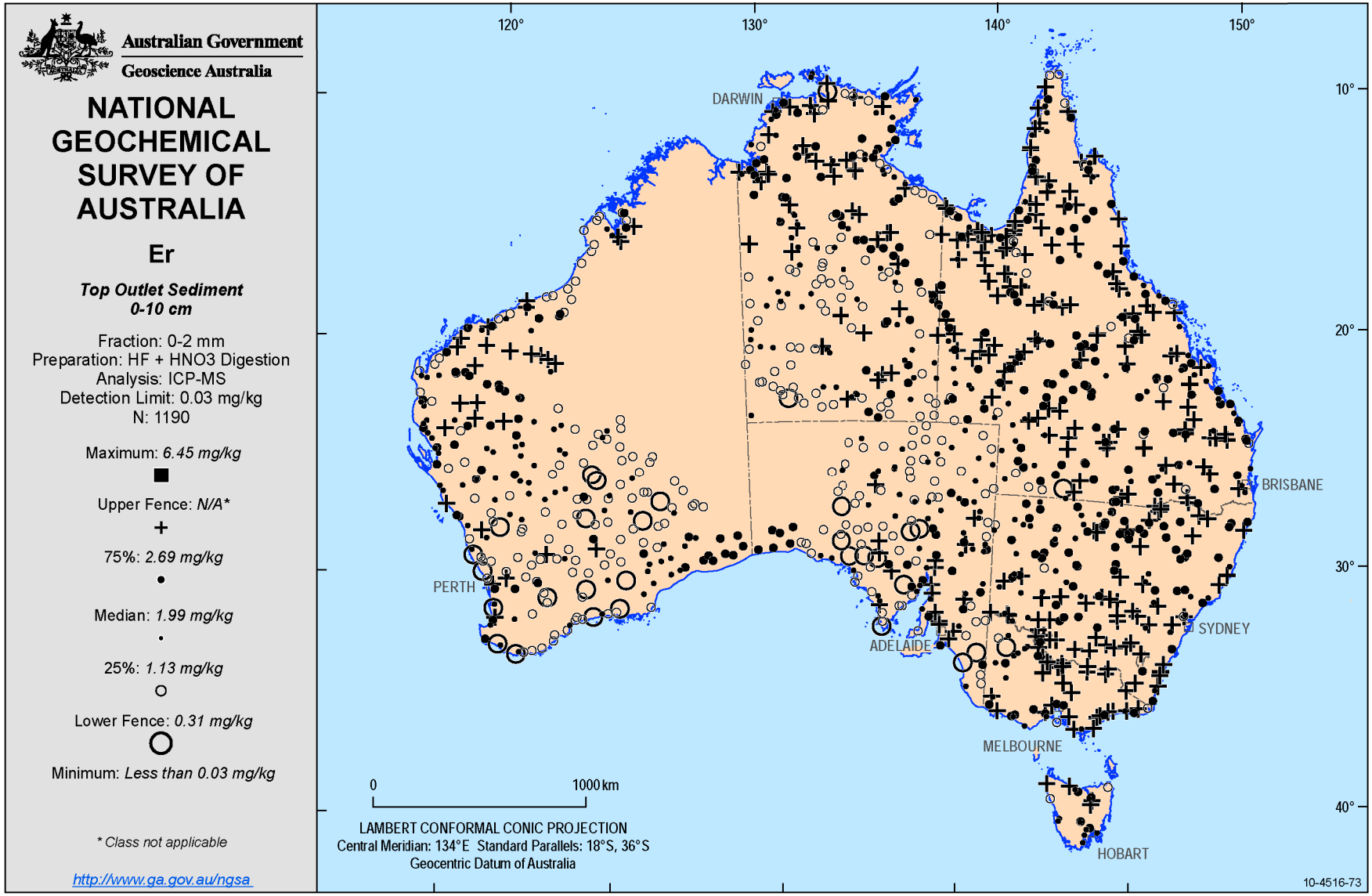
** Class not applicable*

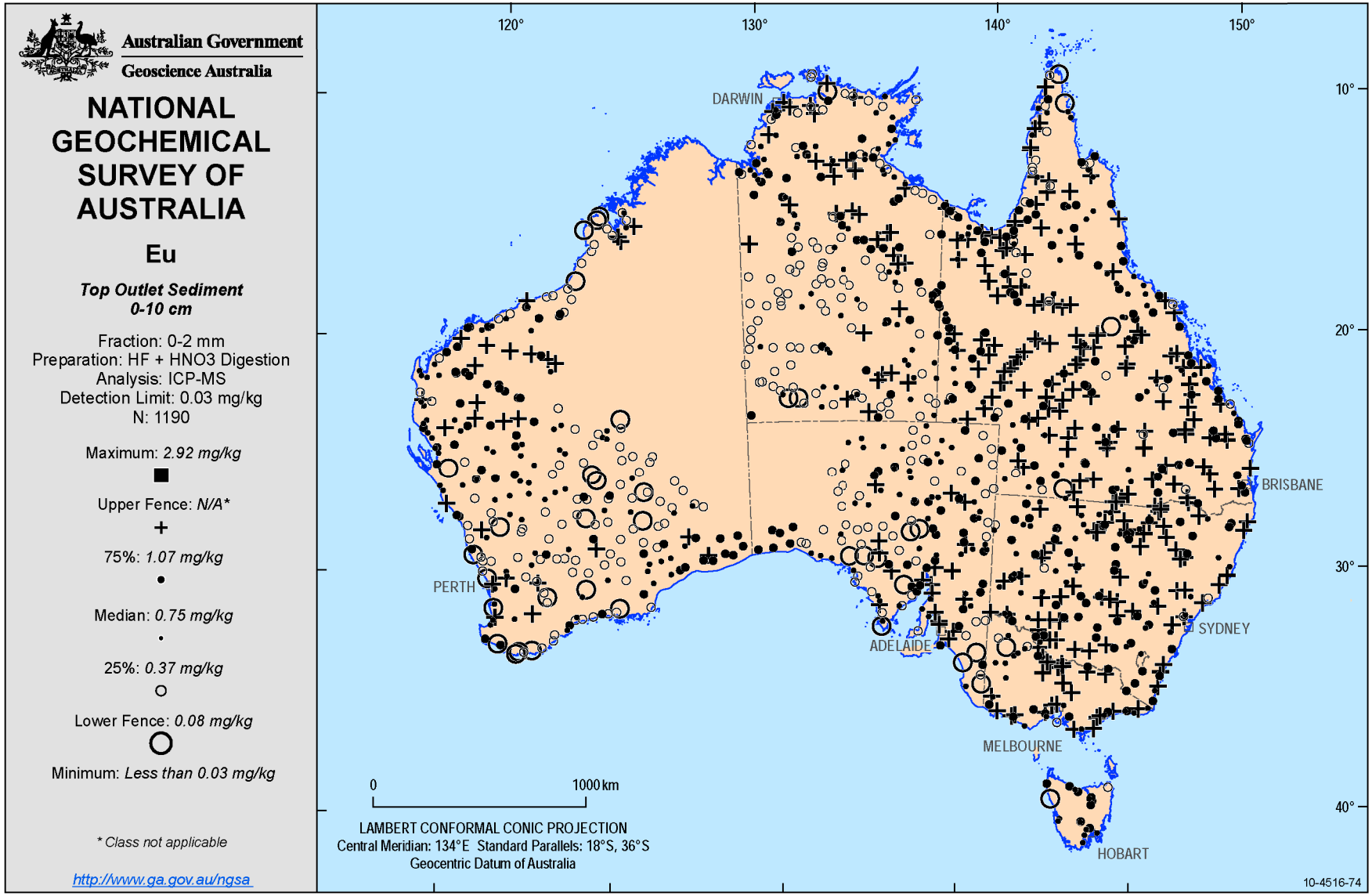
http://www.ga.gov.au/ngsa

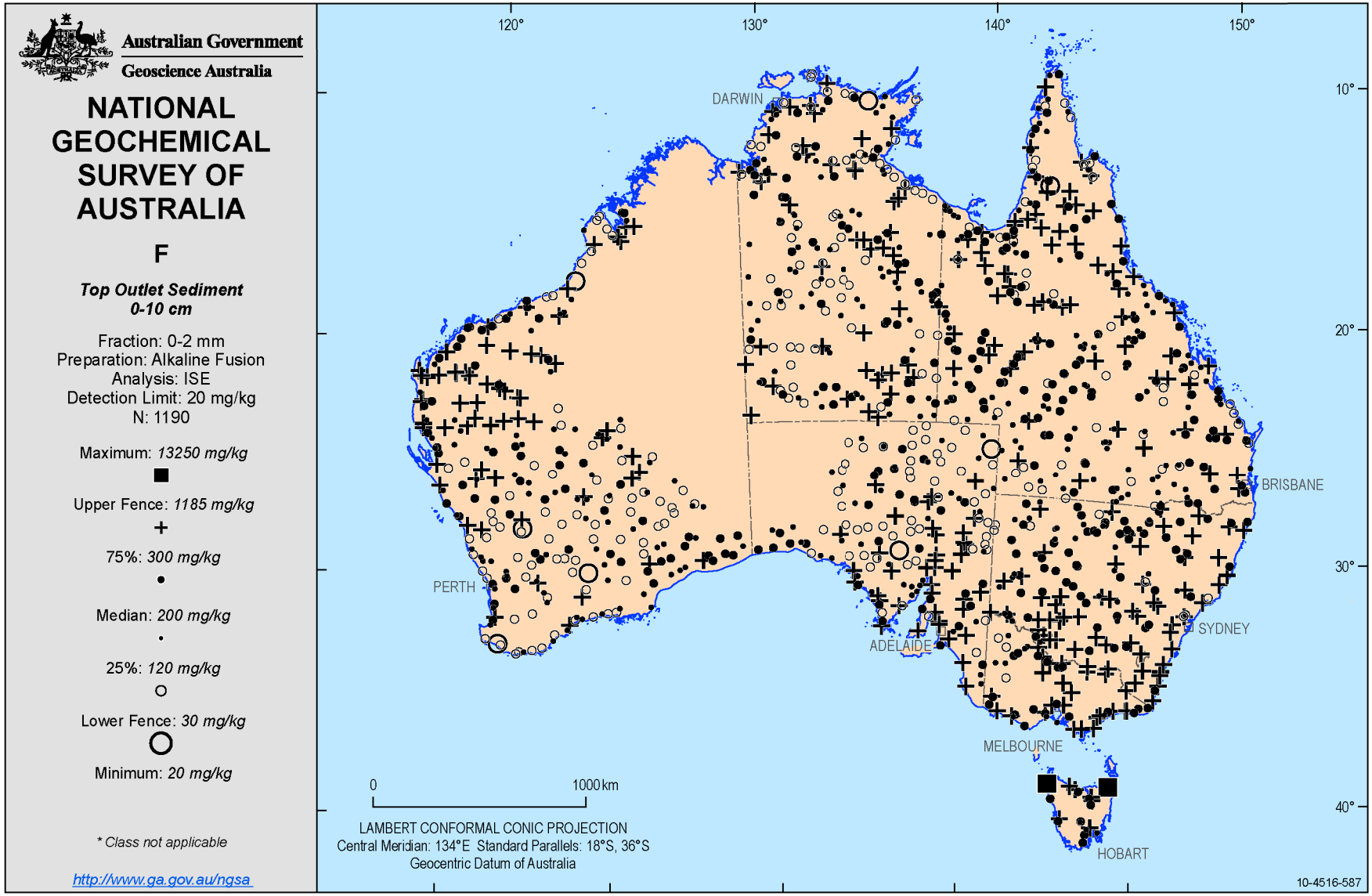



Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Cu
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190
Maximum: 150.5 mg/kg
Upper Fence: 98.8 mg/kg
75%: 20.7 mg/kg
Median: 13.7 mg/kg
25%: 7.3 mg/kg
Lower Fence: 1.5 mg/kg
Minimum: Less than 0.2 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
MELBOURNE
HOBART
SYDNEY
BRISBANE
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-70


Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Dy
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190
Maximum: 9.8 mg/kg
Upper Fence: N/A*
75%: 4.5 mg/kg
Median: 3.3 mg/kg
25%: 1.9 mg/kg
Lower Fence: 0.5 mg/kg
Minimum: Less than 0.1 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-72


Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Er
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190
Maximum: 6.45 mg/kg
Upper Fence: N/A*
75%: 2.69 mg/kg
Median: 1.99 mg/kg
25%: 1.13 mg/kg
Lower Fence: 0.31 mg/kg
Minimum: Less than 0.03 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
MELBOURNE
SYDNEY
BRISBANE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-73


Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Eu
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190
Maximum: 2.92 mg/kg
Upper Fence: N/A*
75%: 1.07 mg/kg
Median: 0.75 mg/kg
25%: 0.37 mg/kg
Lower Fence: 0.08 mg/kg
Minimum: Less than 0.03 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
MELBOURNE
SYDNEY
BRISBANE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-74


Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
F
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: Alkaline Fusion
Analysis: ISE
Detection Limit: 20 mg/kg
N: 1190
Maximum: 13250 mg/kg
Upper Fence: 1185 mg/kg
75%: 300 mg/kg
Median: 200 mg/kg
25%: 120 mg/kg
Lower Fence: 30 mg/kg
Minimum: 20 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
MELBOURNE
SYDNEY
BRISBANE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-587

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Fe (Total)

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 35 mg/kg
N: 1190

Maximum: *229088 mg/kg*

Upper Fence: *103536 mg/kg*

75%: *32151 mg/kg*

Median: *22556 mg/kg*

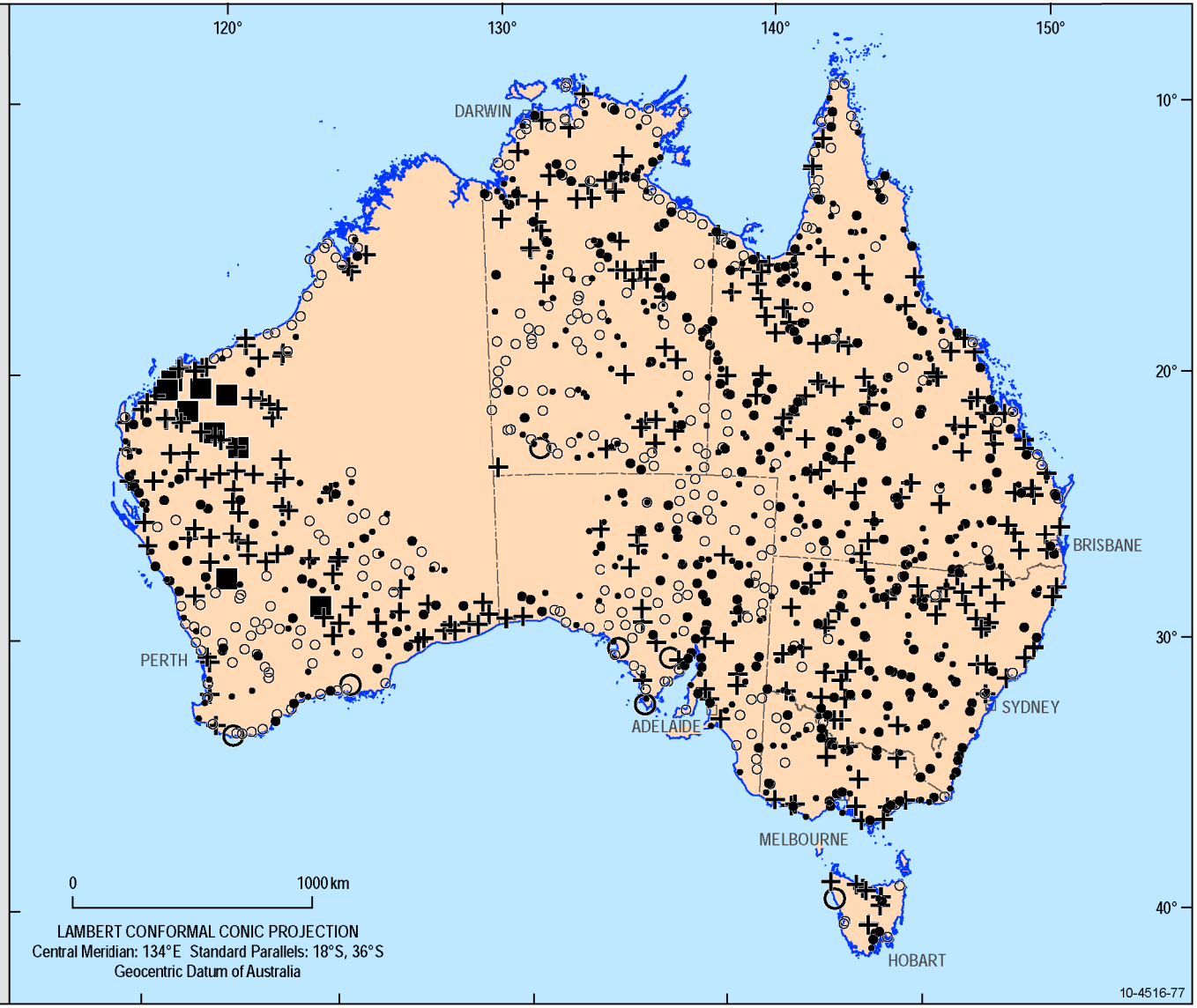
25%: *14268 mg/kg*

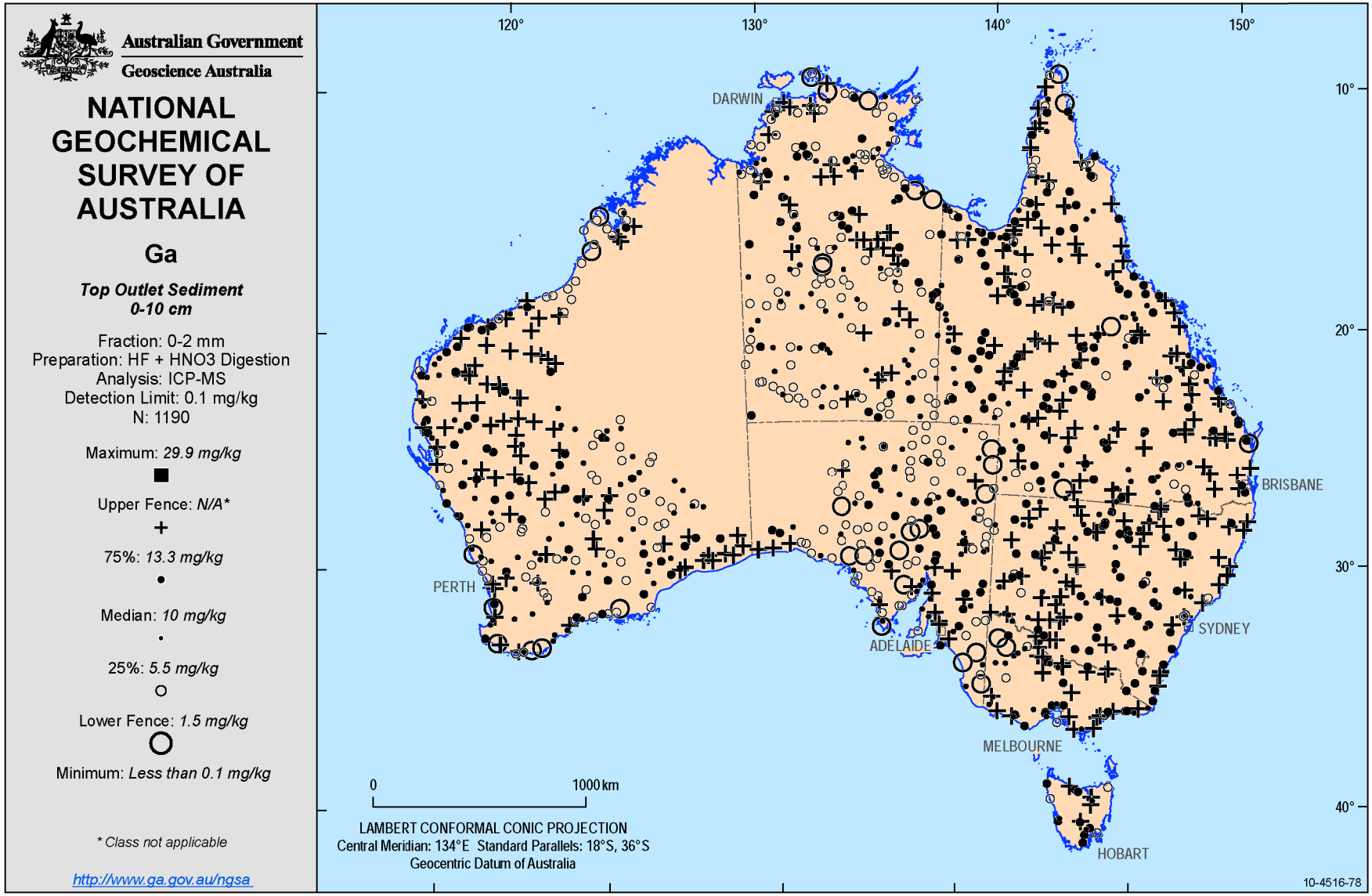
Lower Fence: *4146 mg/kg*

Minimum: *678 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Ga
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190
Maximum: 29.9 mg/kg
Upper Fence: N/A*
75%: 13.3 mg/kg
Median: 10 mg/kg
25%: 5.5 mg/kg
Lower Fence: 1.5 mg/kg
Minimum: Less than 0.1 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-78

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Gd

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *11.34 mg/kg*

Upper Fence: *N/A**

75%: *4.67 mg/kg*

Median: *3.39 mg/kg*

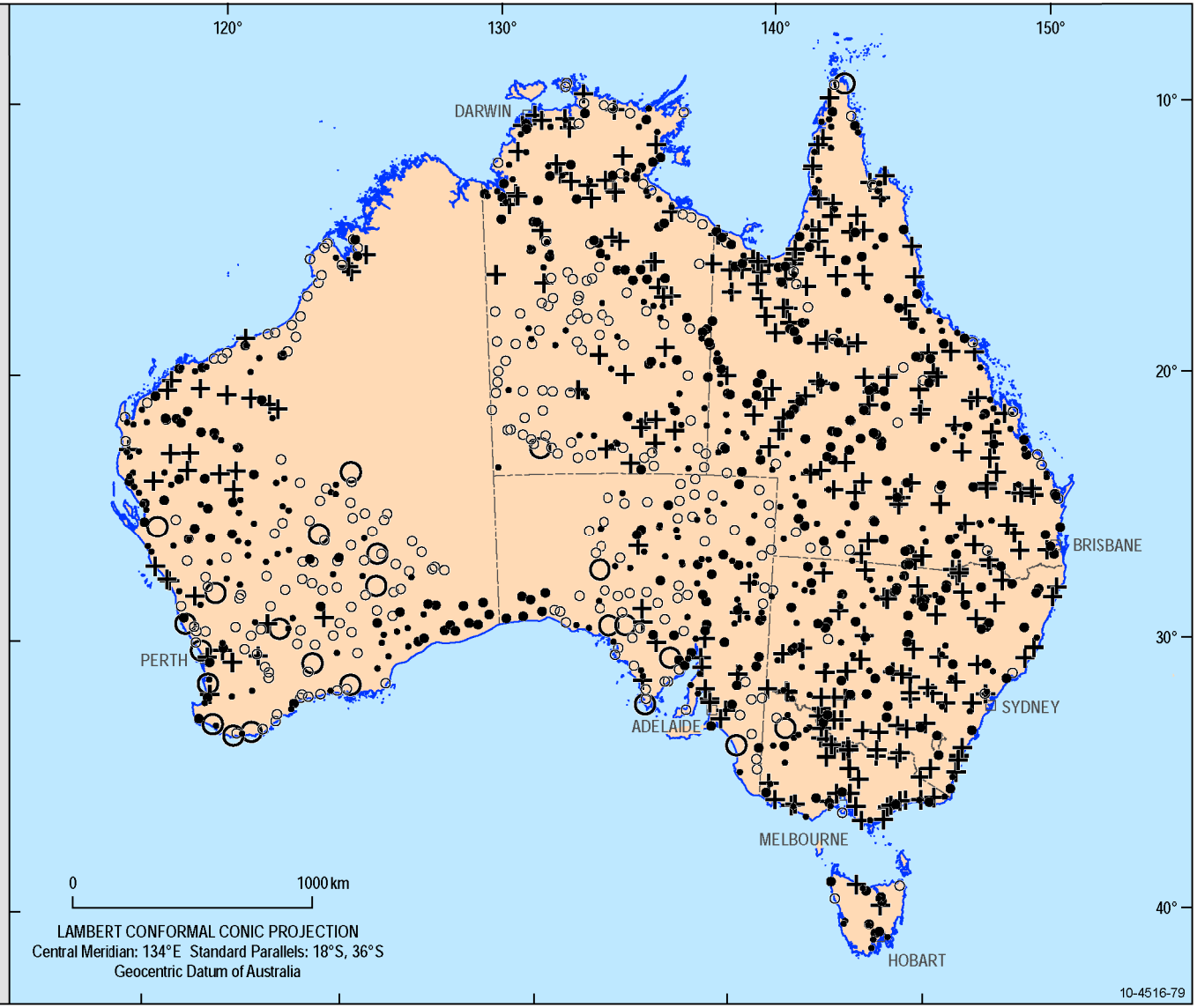
25%: *1.79 mg/kg*

Lower Fence: *0.42 mg/kg*

Minimum: *0.07 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ge

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *1.91 mg/kg*

Upper Fence: *1.1 mg/kg*

75%: *0.6 mg/kg*

Median: *0.5 mg/kg*

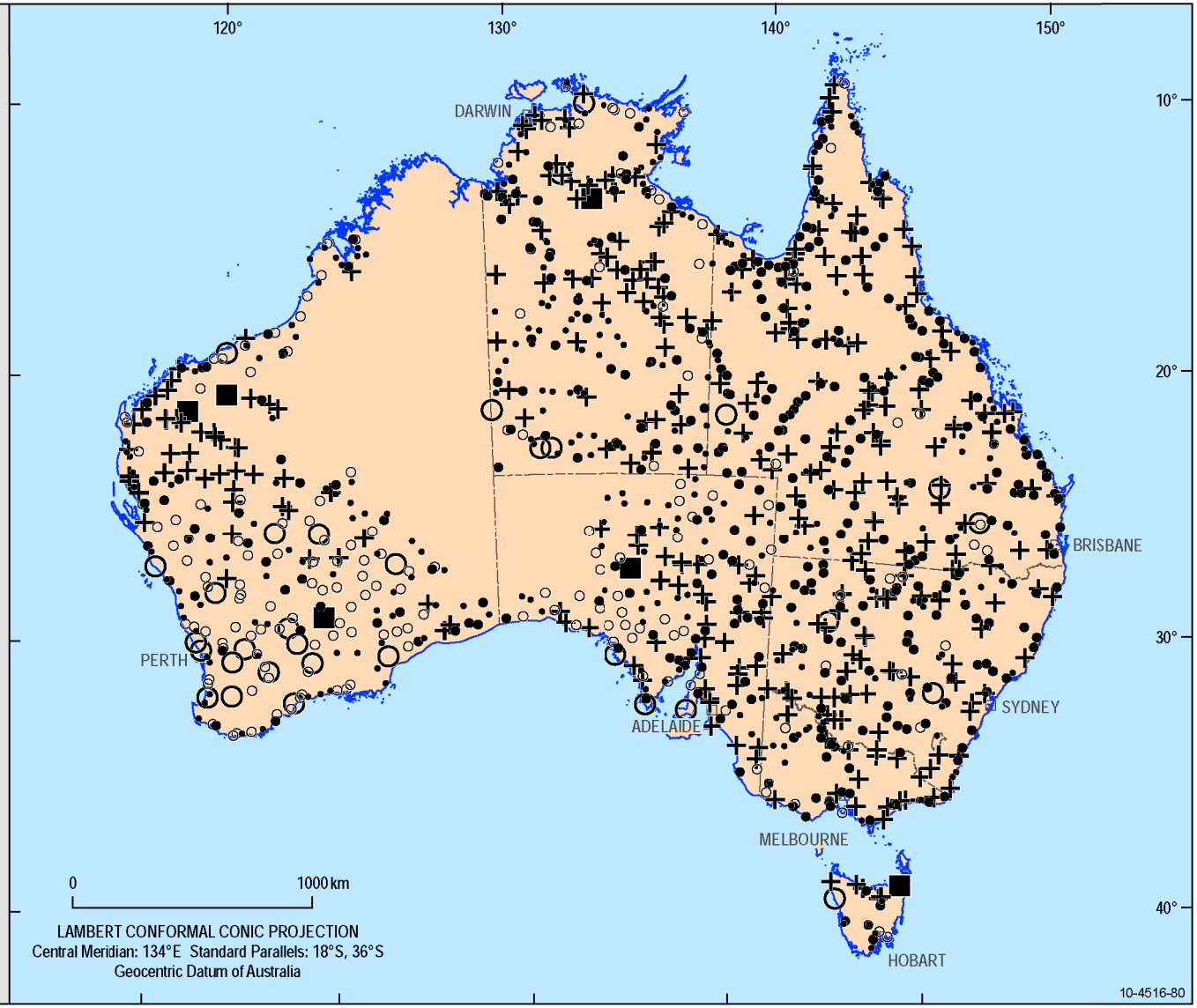
25%: *0.4 mg/kg*

Lower Fence: *0.22 mg/kg*

Minimum: *Less than 0.04 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Hf

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *46.6 mg/kg*

Upper Fence: *24.38 mg/kg*

75%: *10 mg/kg*

Median: *7.78 mg/kg*

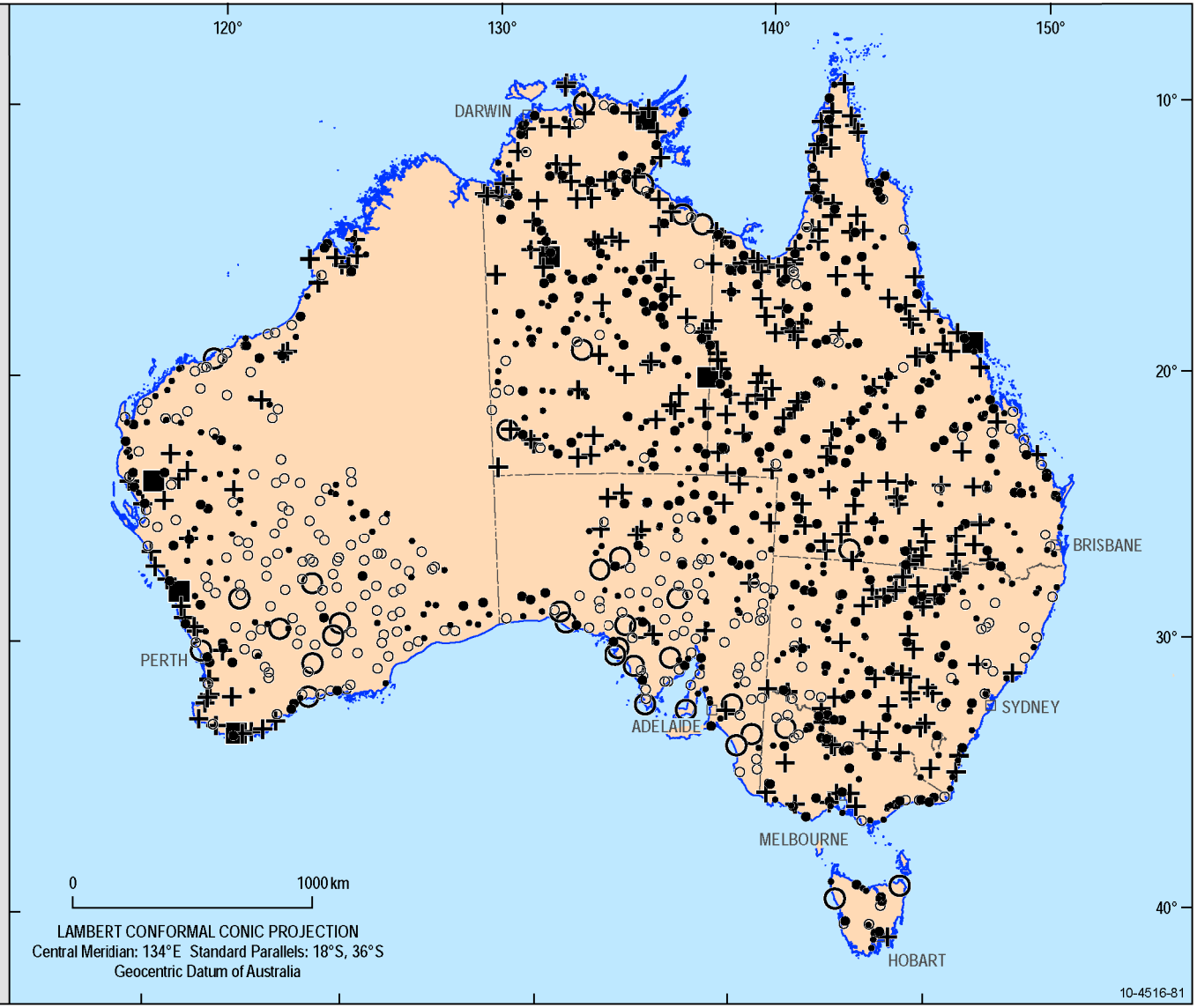
25%: *5.52 mg/kg*

Lower Fence: *2.26 mg/kg*

Minimum: *0.05 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ho

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *2.18 mg/kg*

Upper Fence: *N/A**

75%: *0.92 mg/kg*

Median: *0.66 mg/kg*

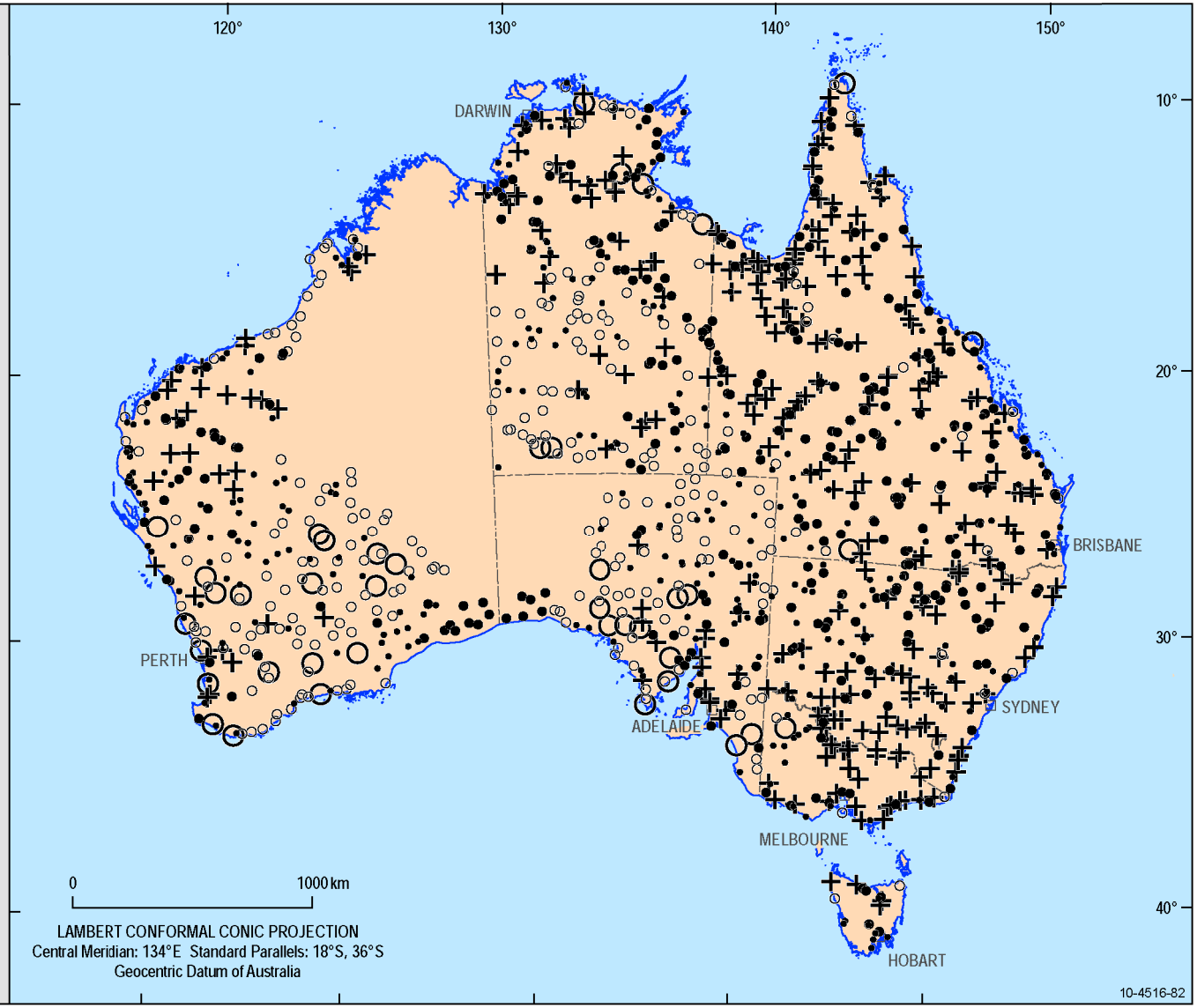
25%: *0.36 mg/kg*

Lower Fence: *0.09 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

K

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 42 mg/kg
N: 1190

Maximum: *36499 mg/kg*

Upper Fence: *N/A**

75%: *14701 mg/kg*

Median: *9895 mg/kg*

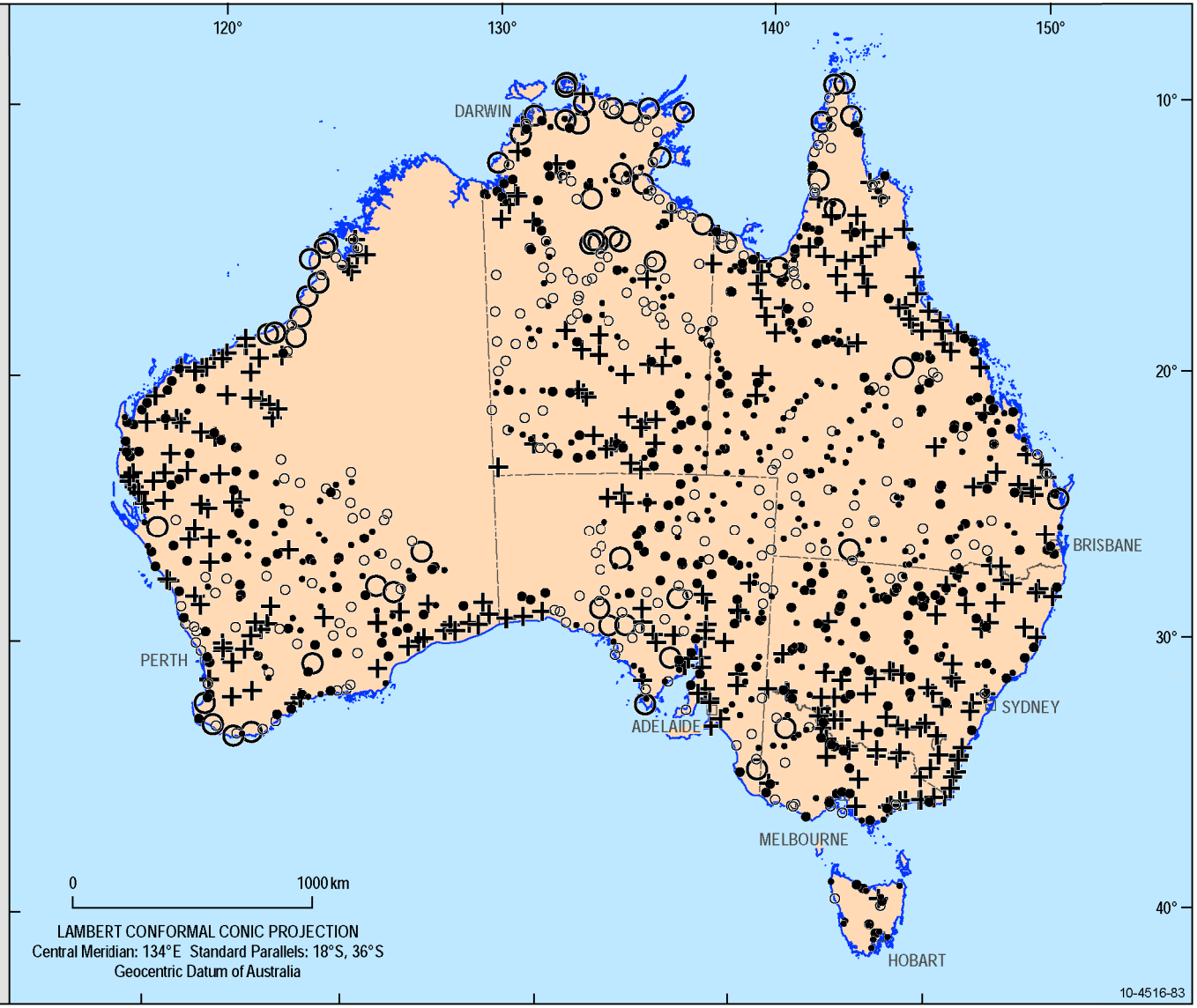
25%: *5504 mg/kg*

Lower Fence: *1249 mg/kg*

Minimum: *Less than 42 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

La

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *122.7 mg/kg*

Upper Fence: *100.6 mg/kg*

75%: *28.2 mg/kg*

Median: *20.9 mg/kg*

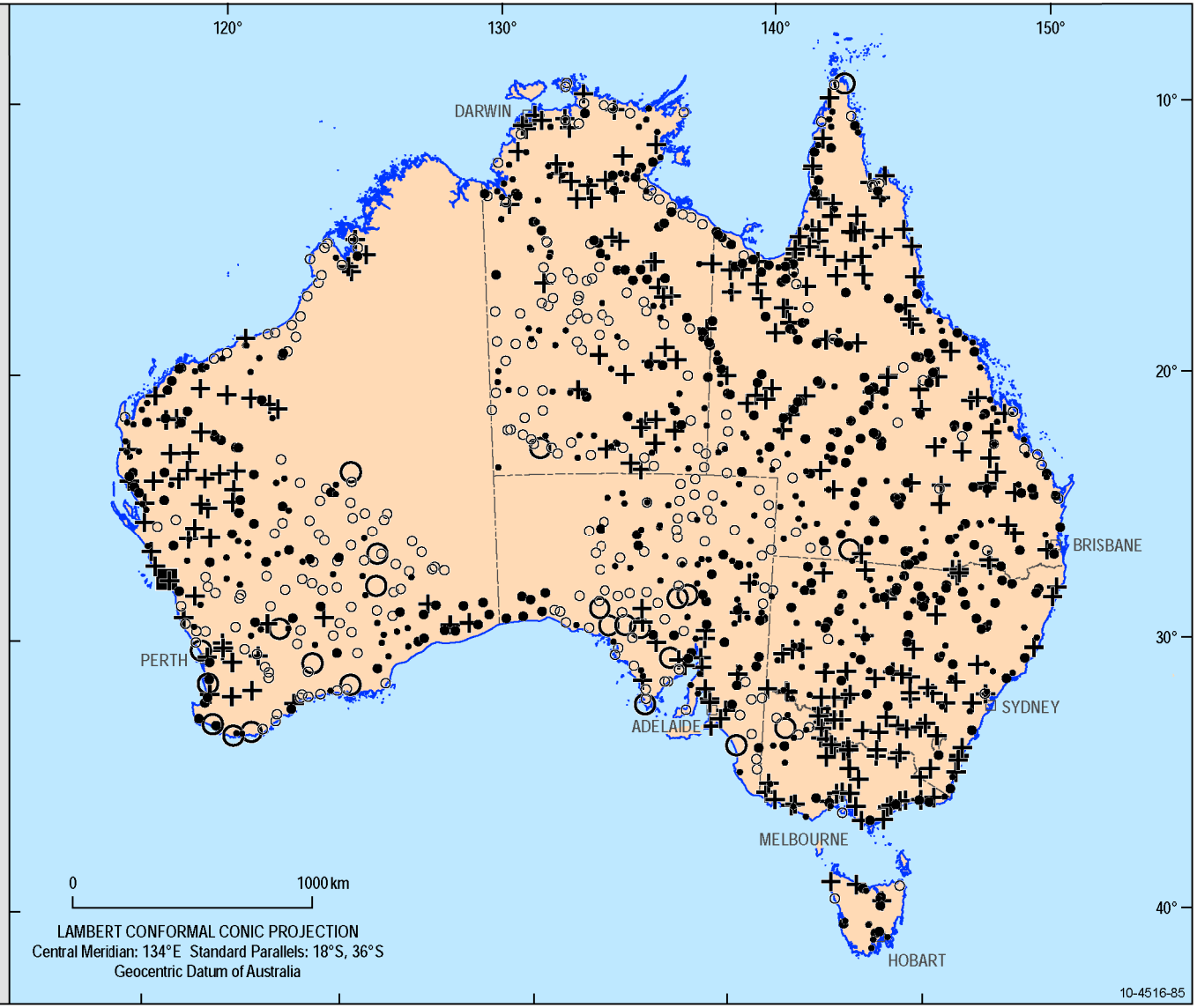
25%: *12.1 mg/kg*

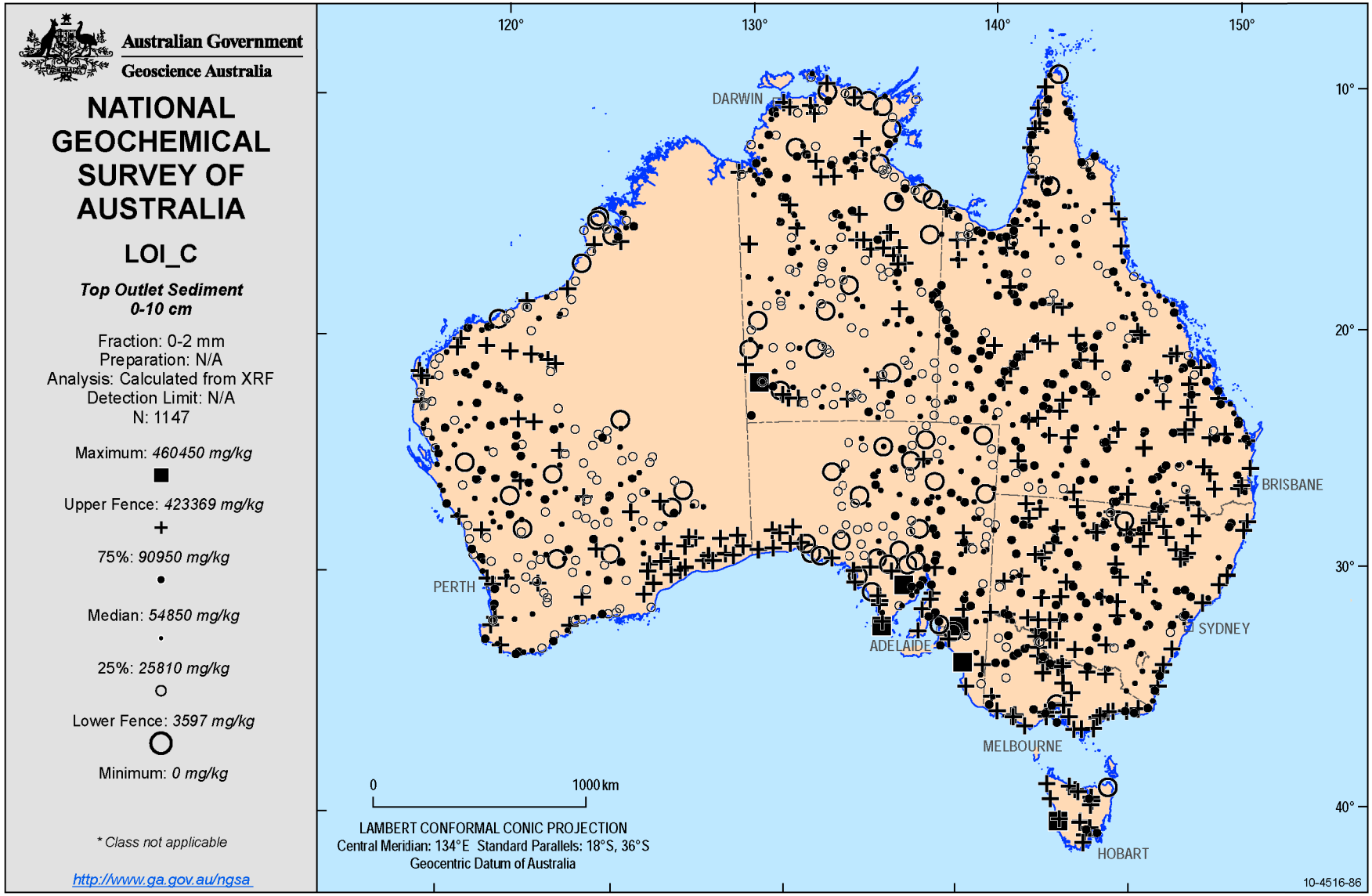
Lower Fence: *3.4 mg/kg*

Minimum: *0.4 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
LOI_C
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: N/A
Analysis: Calculated from XRF
Detection Limit: N/A
N: 1147
Maximum: 460450 mg/kg
Upper Fence: 423369 mg/kg
75%: 90950 mg/kg
Median: 54850 mg/kg
25%: 25810 mg/kg
Lower Fence: 3597 mg/kg
Minimum: 0 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
MELBOURNE
HOBART
SYDNEY
BRISBANE
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-86

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Lu

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *1.07 mg/kg*

Upper Fence: *N/A**

75%: *0.39 mg/kg*

Median: *0.29 mg/kg*

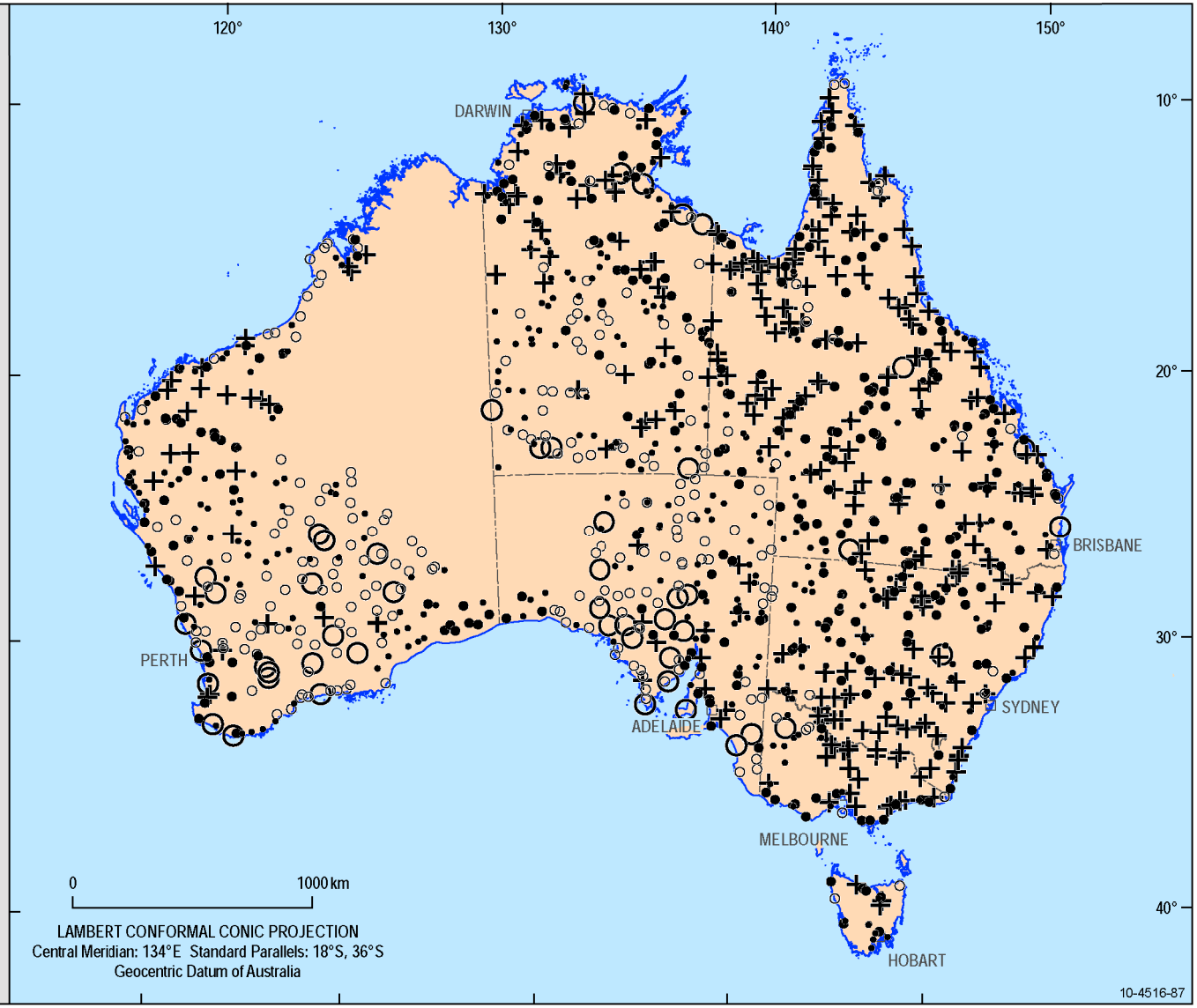
25%: *0.15 mg/kg*

Lower Fence: *0.04 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mg

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 60 mg/kg
N: 1190

Maximum: *54053 mg/kg*

Upper Fence: *N/A**

75%: *5445 mg/kg*

Median: *2991 mg/kg*

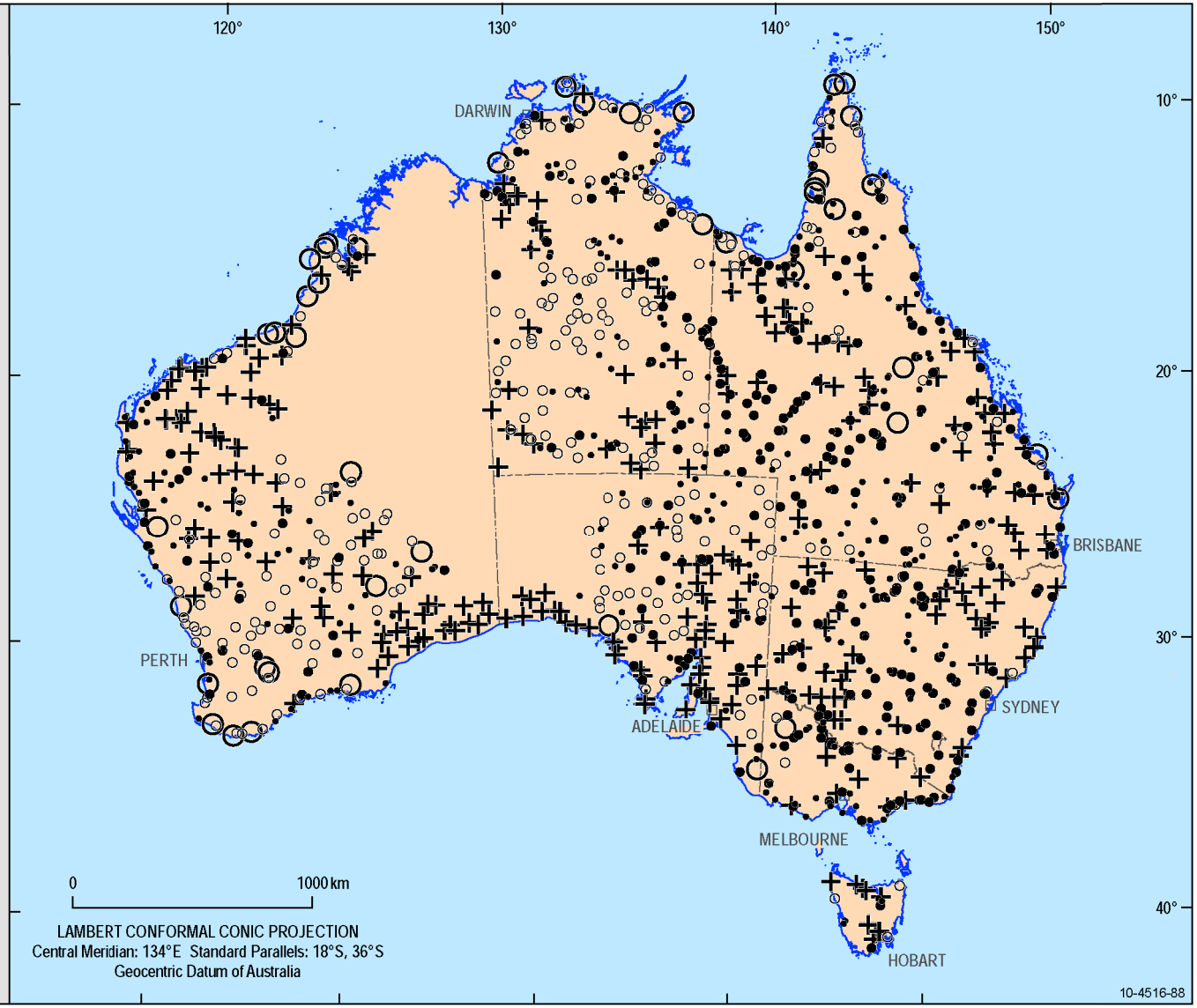
25%: *1037 mg/kg*

Lower Fence: *86 mg/kg*

Minimum: *Less than 60 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mn

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 39 mg/kg
N: 1190

Maximum: *5096 mg/kg*

Upper Fence: *4984 mg/kg*

75%: *565 mg/kg*

Median: *333 mg/kg*

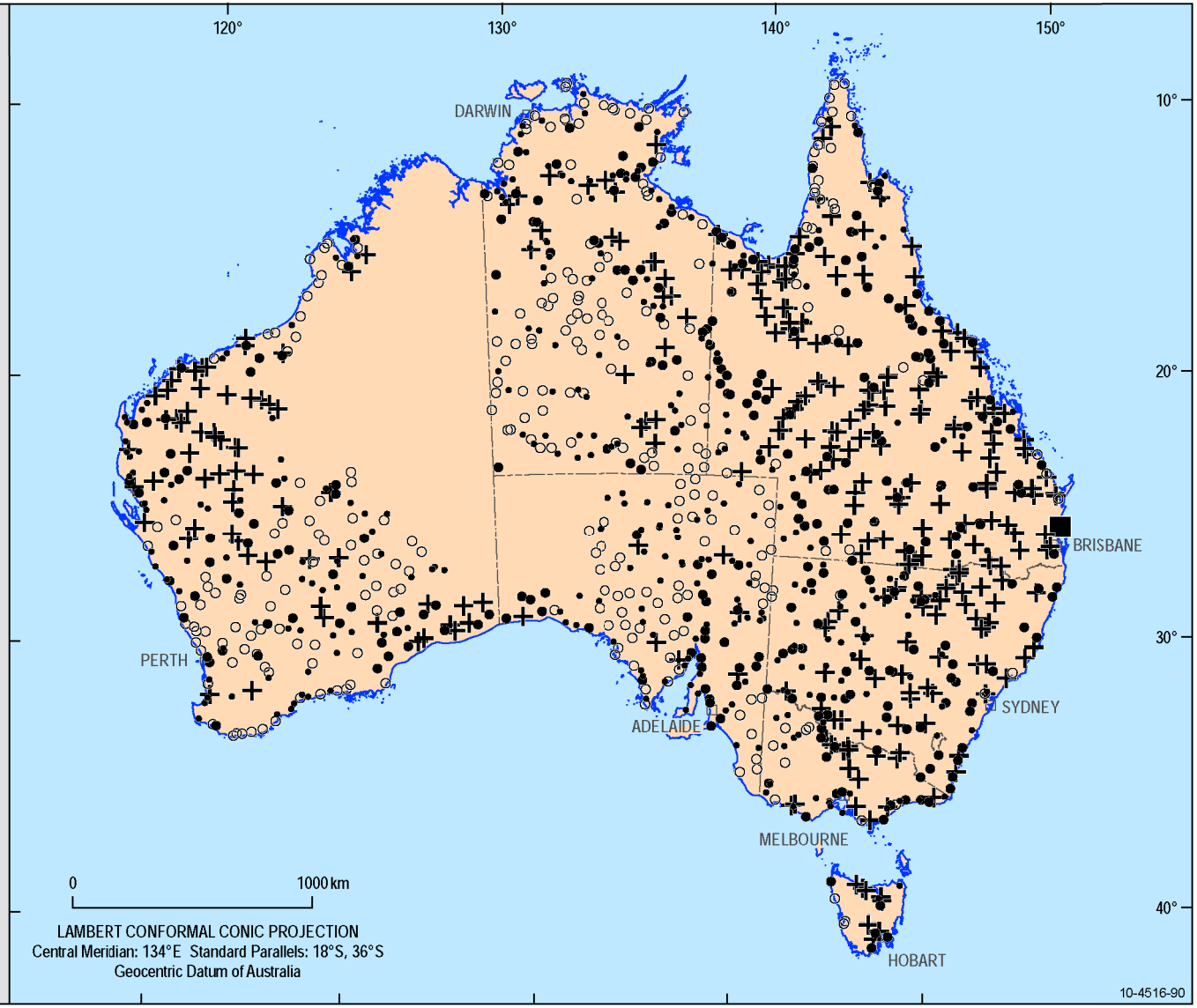
25%: *132 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 39 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mo

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.3 mg/kg
N: 1190

Maximum: *18.7 mg/kg*

Upper Fence: *3.5 mg/kg*

75%: *0.8 mg/kg*

Median: *0.5 mg/kg*

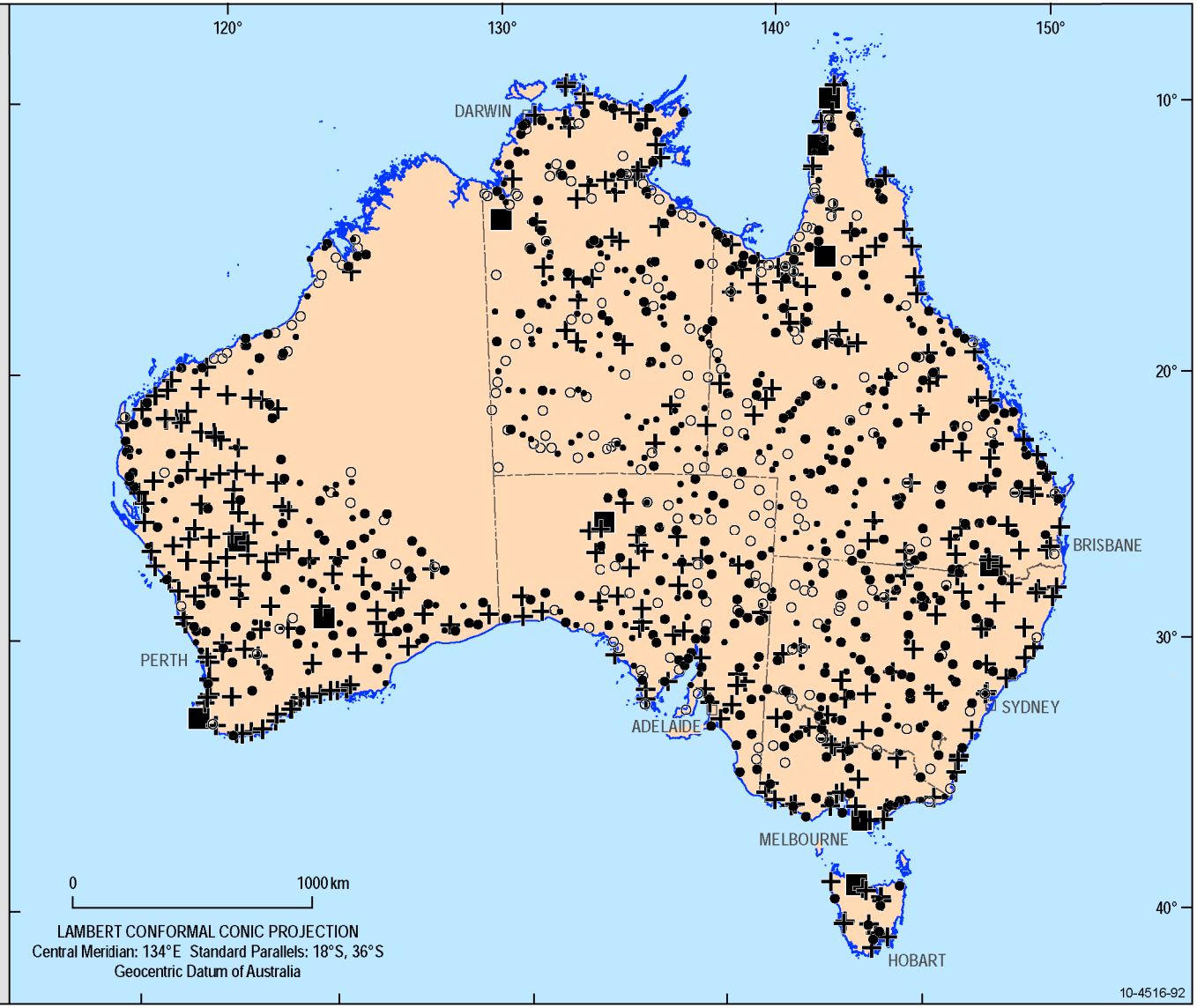
25%: *0.3 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 0.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Na

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 74 mg/kg
N: 1190

Maximum: *42941 mg/kg*

Upper Fence: *N/A**

75%: *5134 mg/kg*

Median: *2255 mg/kg*

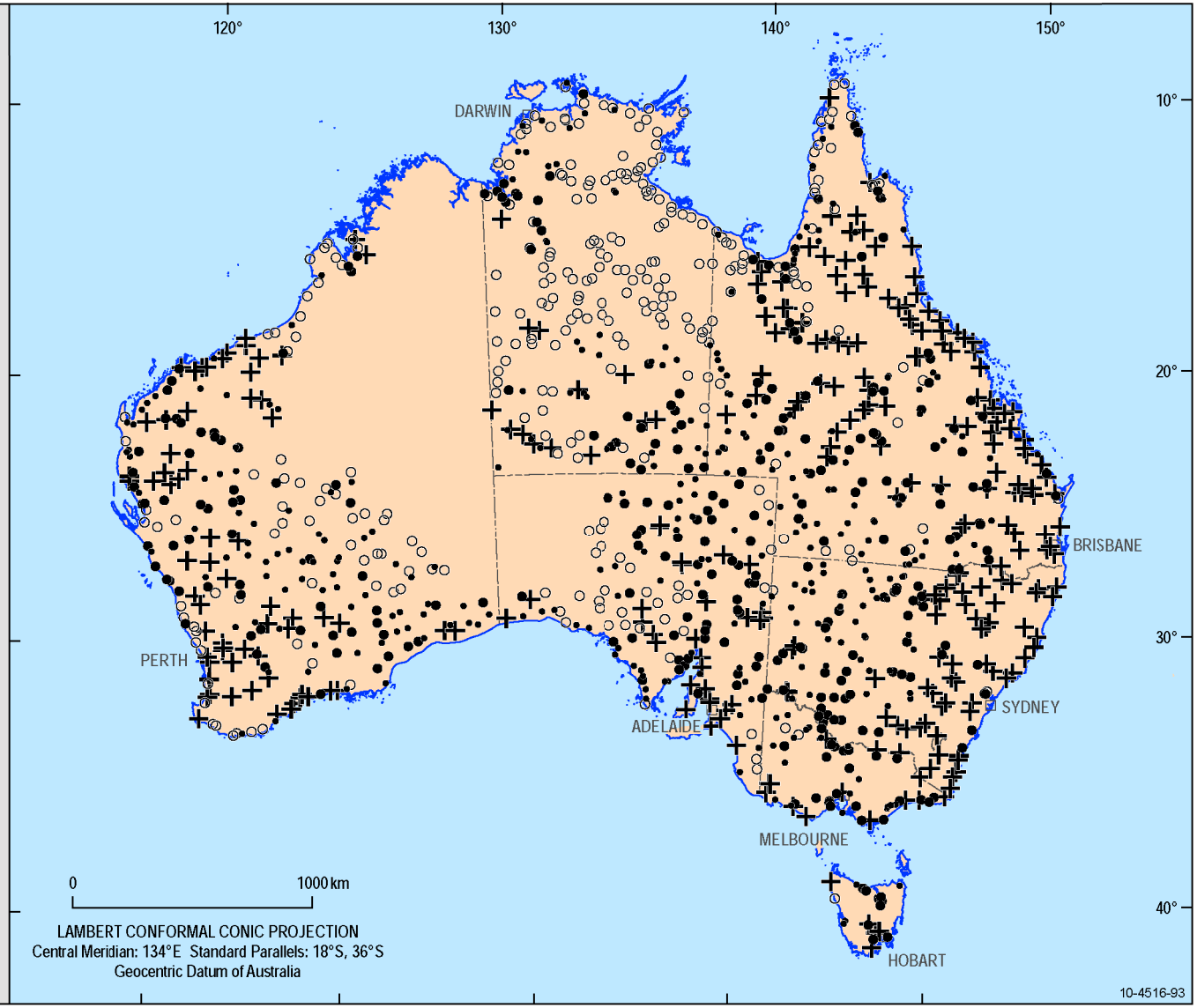
25%: *831 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 74 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Nb

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *64.2 mg/kg*

Upper Fence: *37 mg/kg*

75%: *11.4 mg/kg*

Median: *8.5 mg/kg*

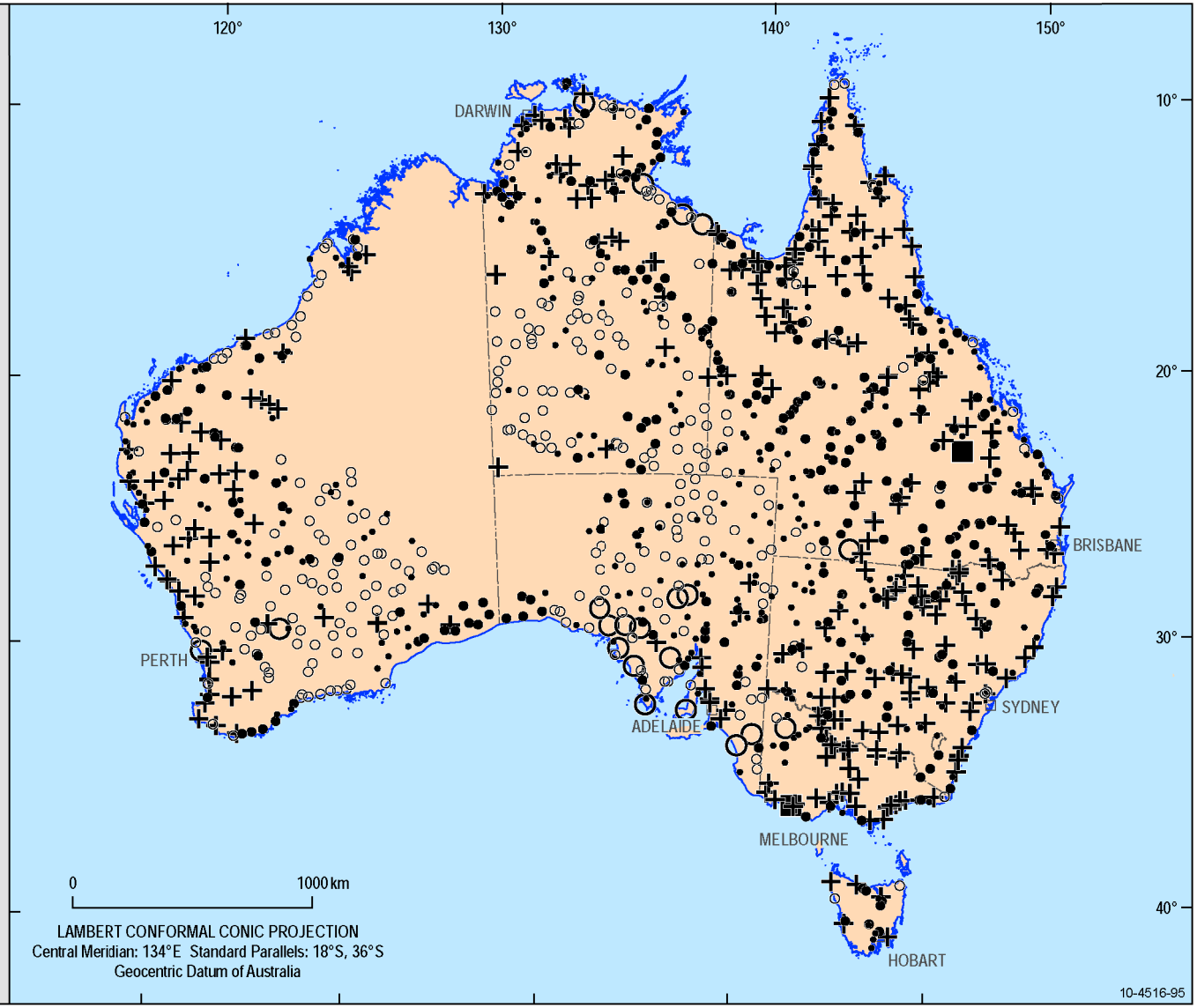
25%: *5.2 mg/kg*

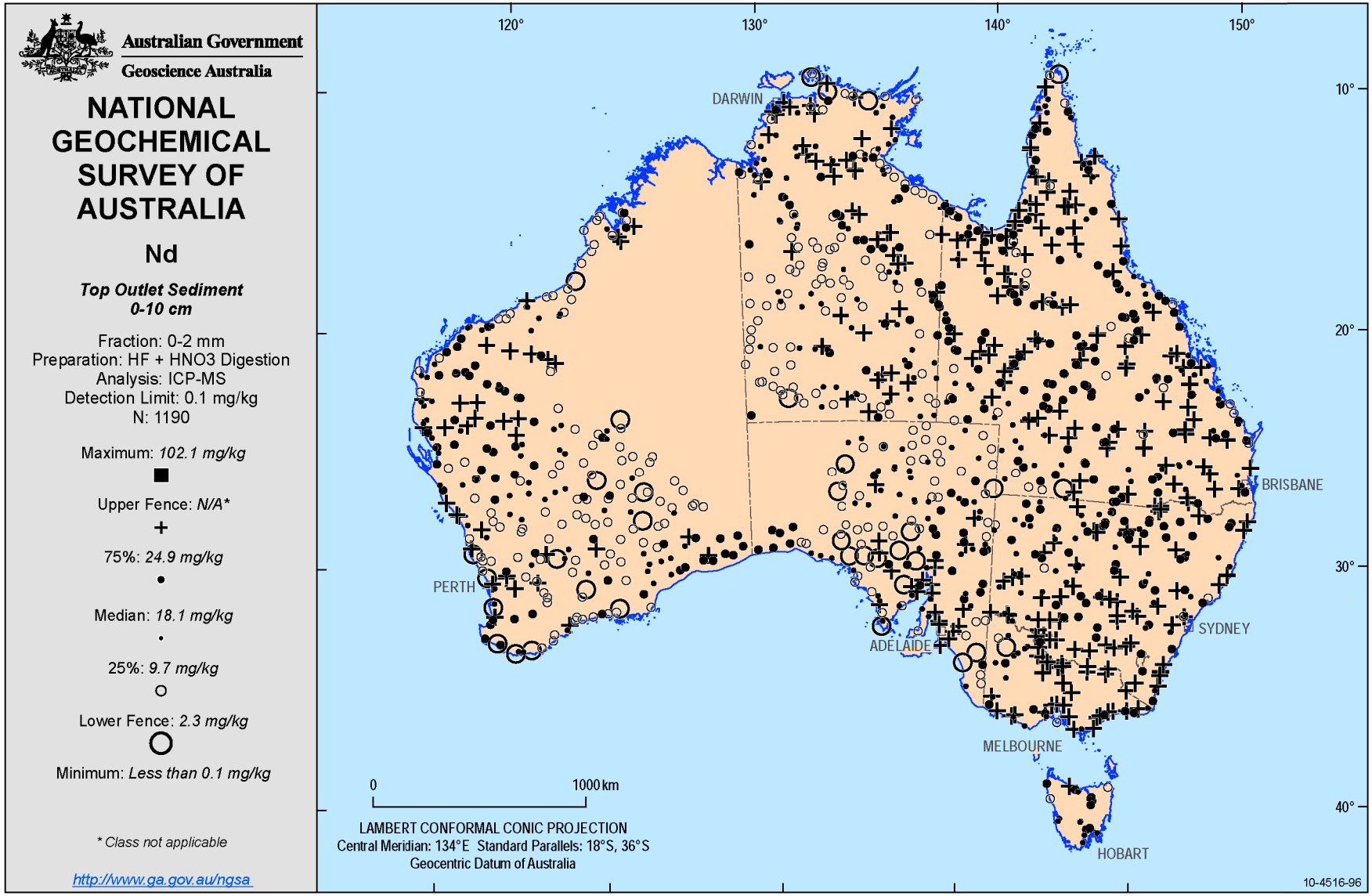
Lower Fence: *1.6 mg/kg*

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Nd
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190
Maximum: 102.1 mg/kg
Upper Fence: N/A*
75%: 24.9 mg/kg
Median: 18.1 mg/kg
25%: 9.7 mg/kg
Lower Fence: 2.3 mg/kg
Minimum: Less than 0.1 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-96

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ni

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1190

Maximum: *227 mg/kg*

Upper Fence: *80.2 mg/kg*

75%: *22.3 mg/kg*

Median: *15.3 mg/kg*

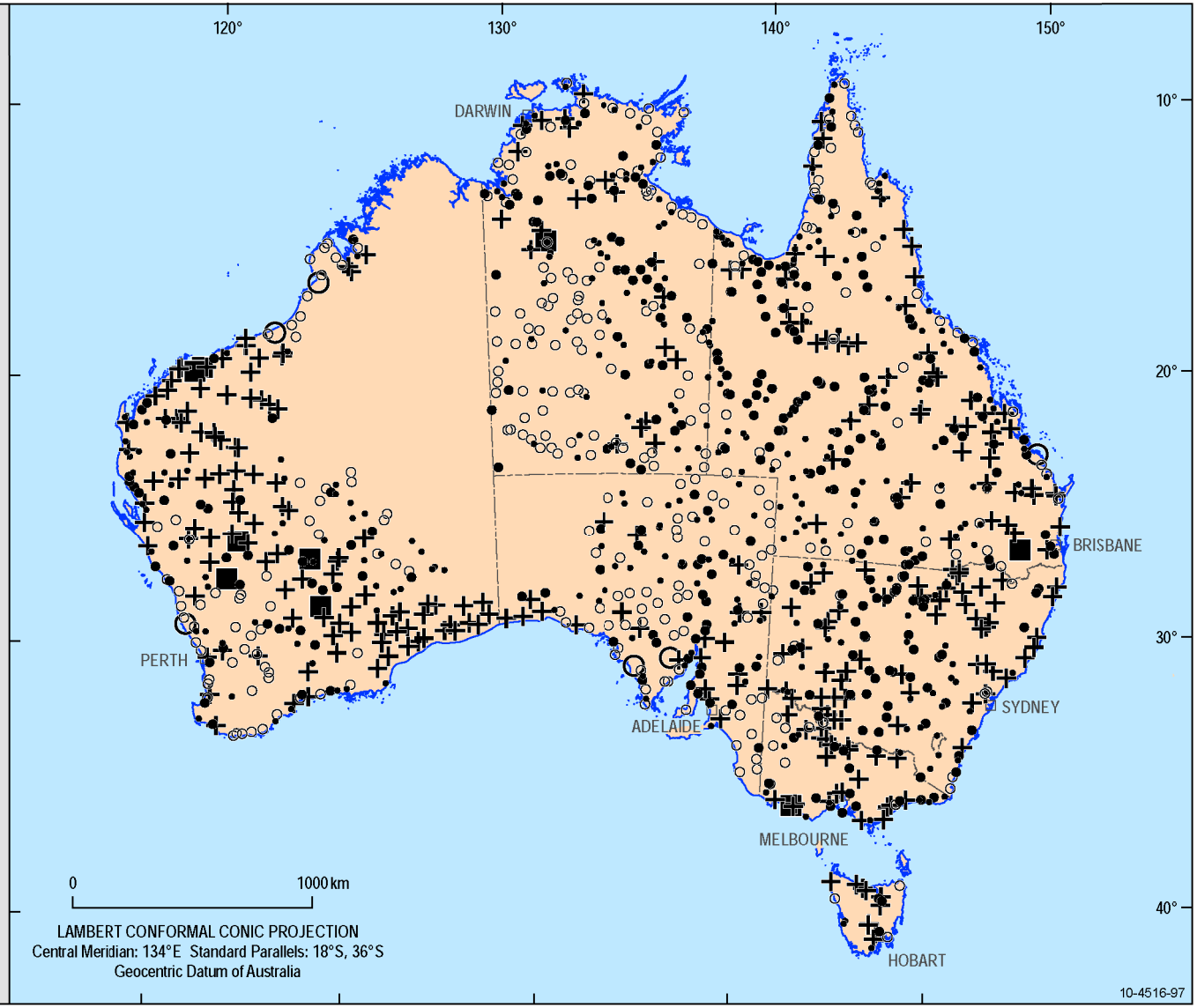
25%: *9.5 mg/kg*

Lower Fence: *2.6 mg/kg*

Minimum: *Less than 0.5 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

P

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 22 mg/kg
N: 1190

Maximum: *2444 mg/kg*

Upper Fence: *1665 mg/kg*

75%: *410 mg/kg*

Median: *266 mg/kg*

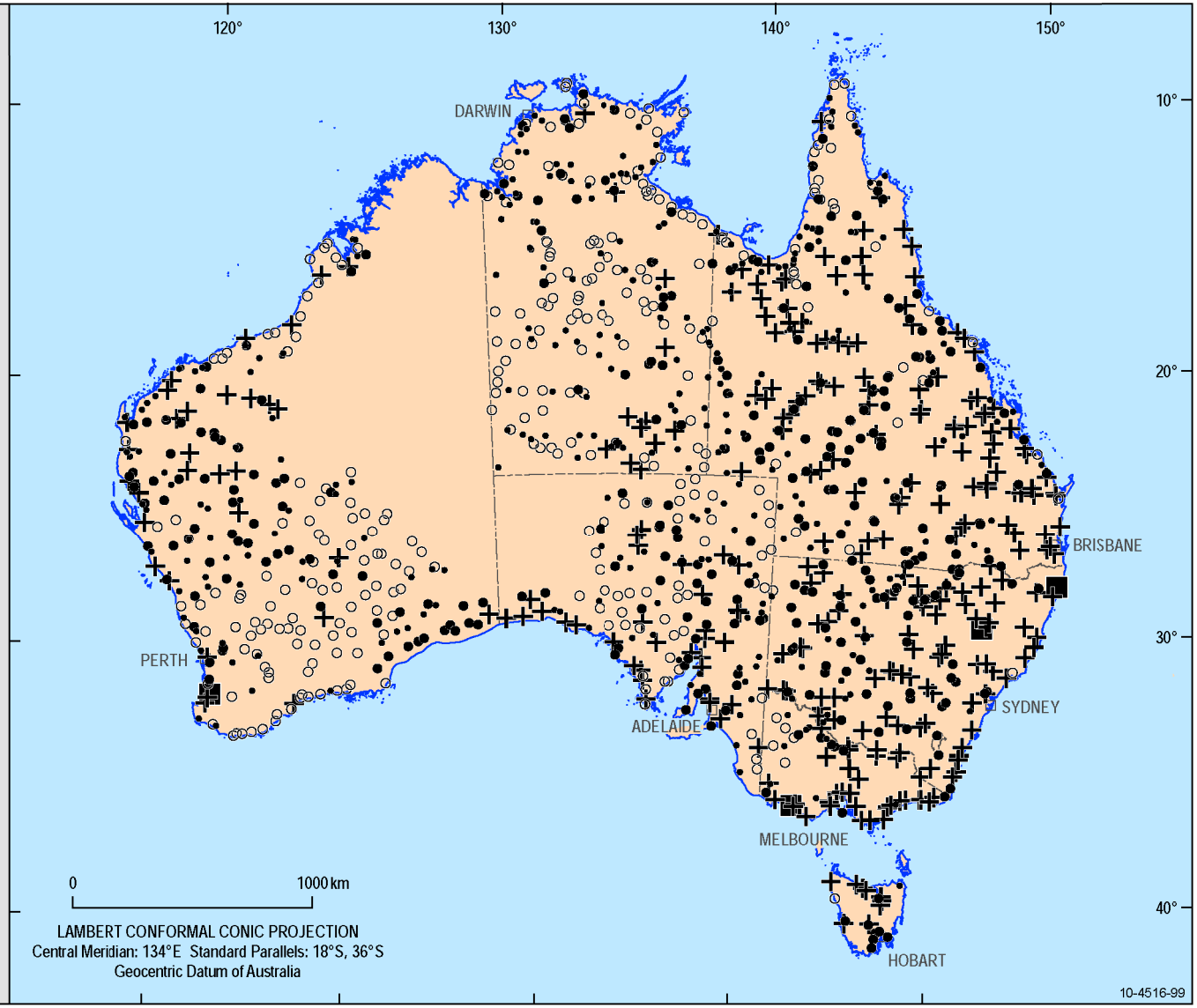
25%: *161 mg/kg*

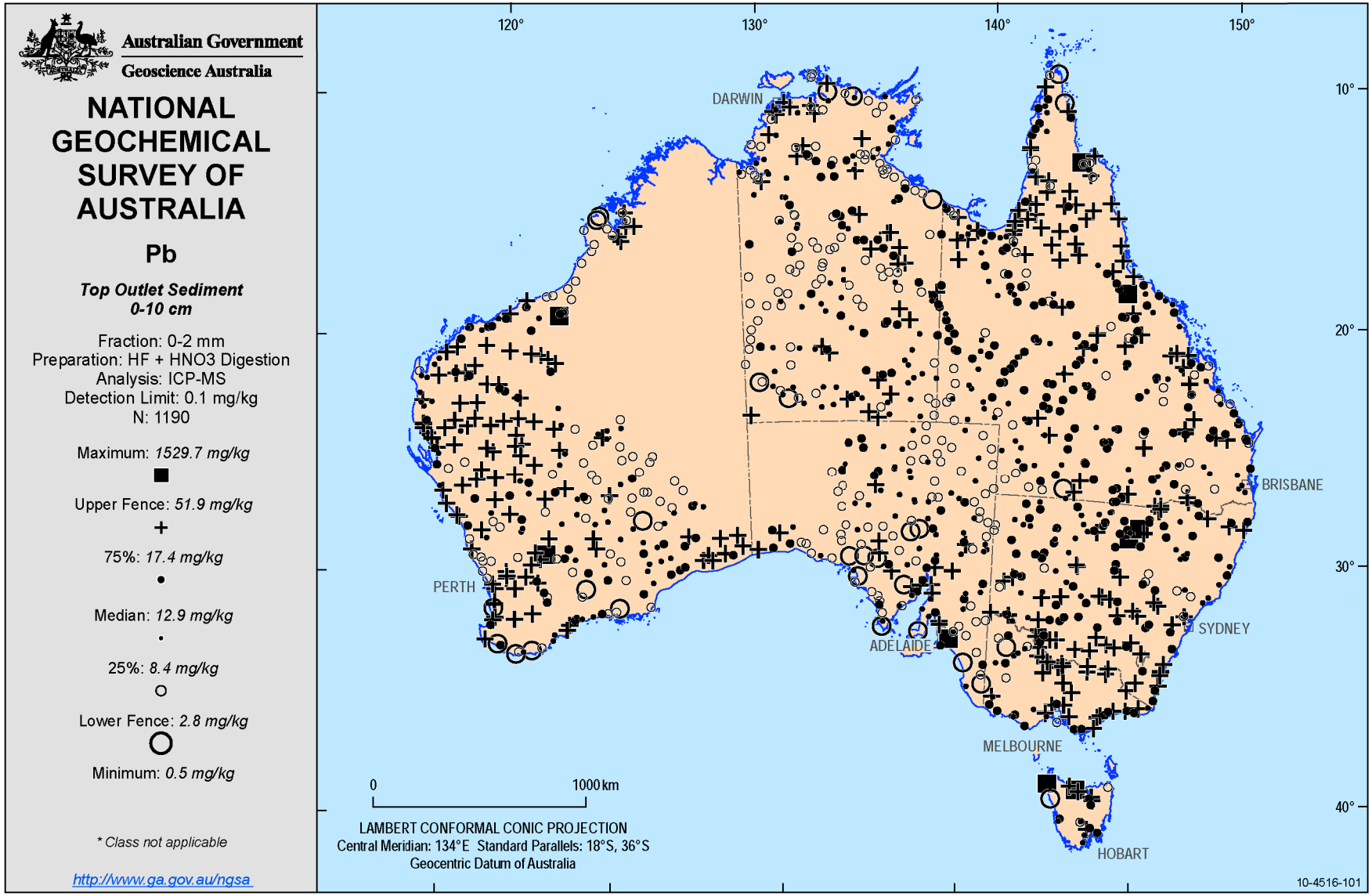
Lower Fence: *N/A**

Minimum: *52 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Pb
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190
Maximum: 1529.7 mg/kg
Upper Fence: 51.9 mg/kg
75%: 17.4 mg/kg
Median: 12.9 mg/kg
25%: 8.4 mg/kg
Lower Fence: 2.8 mg/kg
Minimum: 0.5 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
MELBOURNE
SYDNEY
BRISBANE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-101

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pd

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.001 mg/kg
N: 1186

Maximum: *0.013 mg/kg*

Upper Fence: *0.003 mg/kg*

75%: *0.001 mg/kg*

Median: *N/A**

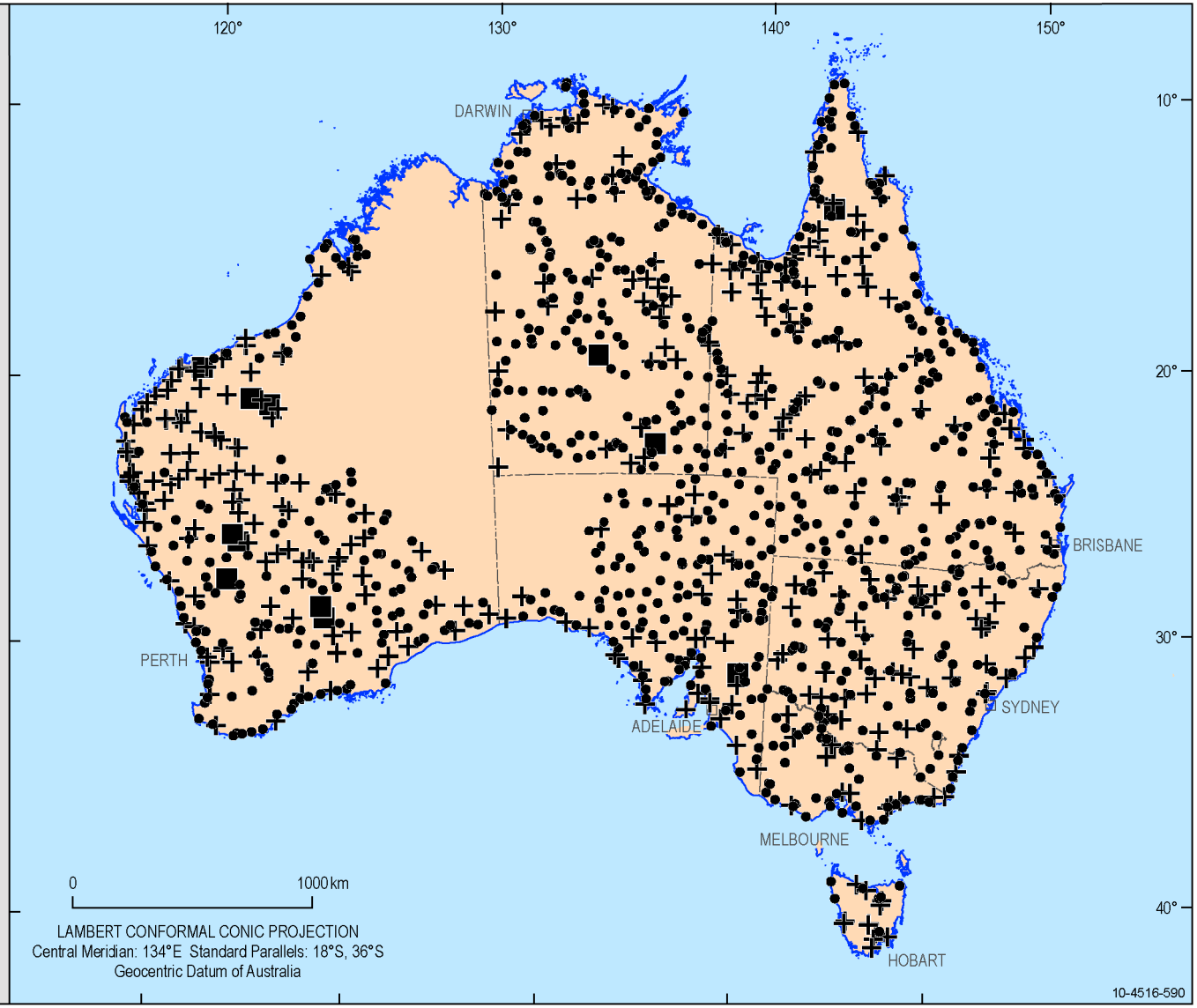
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.001 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pr

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *27.98 mg/kg*

Upper Fence: *24.01 mg/kg*

75%: *6.37 mg/kg*

Median: *4.71 mg/kg*

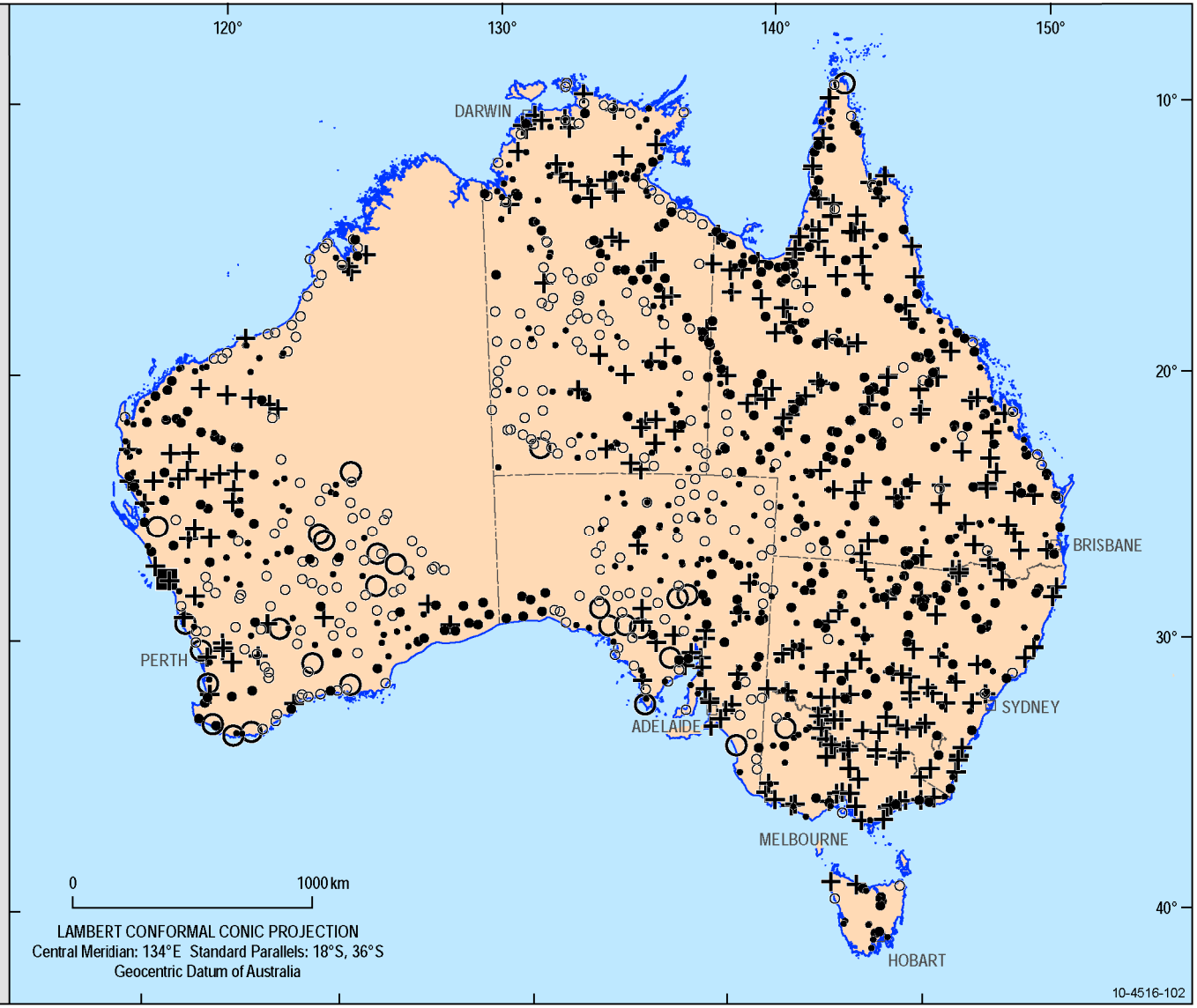
25%: *2.63 mg/kg*

Lower Fence: *0.7 mg/kg*

Minimum: *0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pt

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.0005 mg/kg
N: 1186

Maximum: *0.0075 mg/kg*

Upper Fence: *0.0014 mg/kg*

75%: *0.0005 mg/kg*

Median: *N/A**

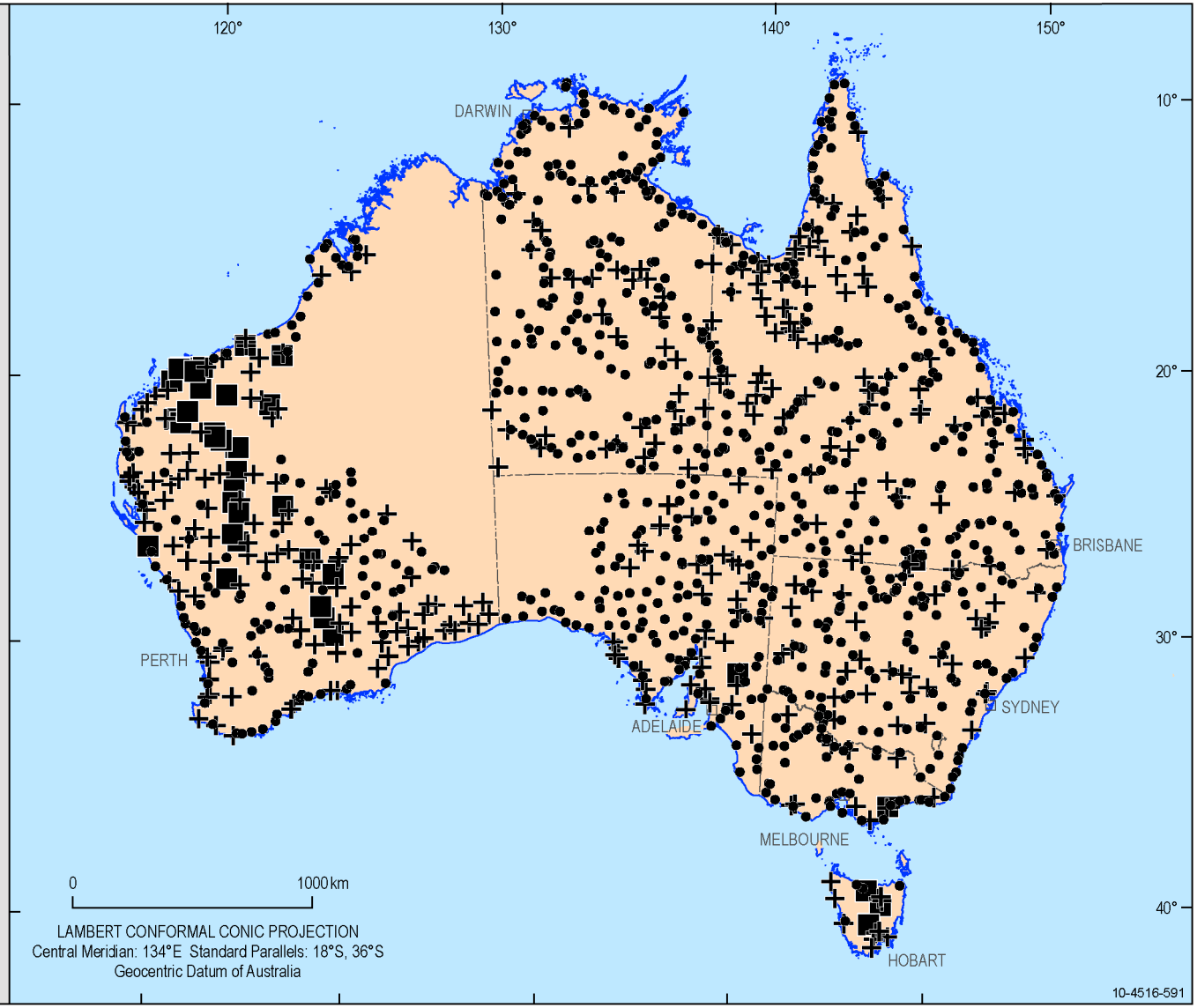
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.0005 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Rb

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *269.4 mg/kg*

Upper Fence: *N/A**

75%: *77.7 mg/kg*

Median: *51.3 mg/kg*

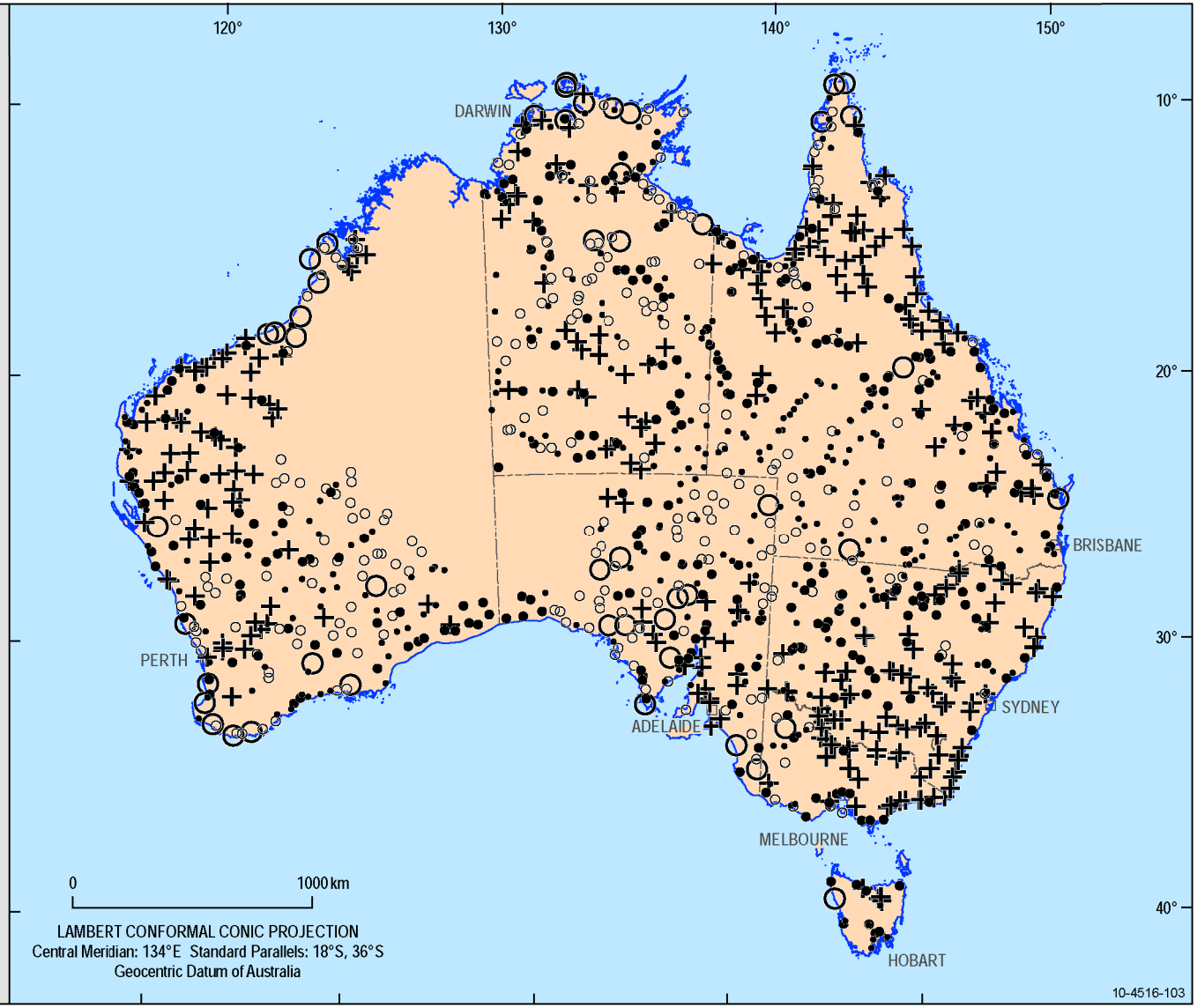
25%: *30.3 mg/kg*

Lower Fence: *7.4 mg/kg*

Minimum: *Less than 0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

S

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 10 mg/kg
N: 1190

Maximum: *151475 mg/kg*

Upper Fence: *1291 mg/kg*

75%: *263 mg/kg*

Median: *150 mg/kg*

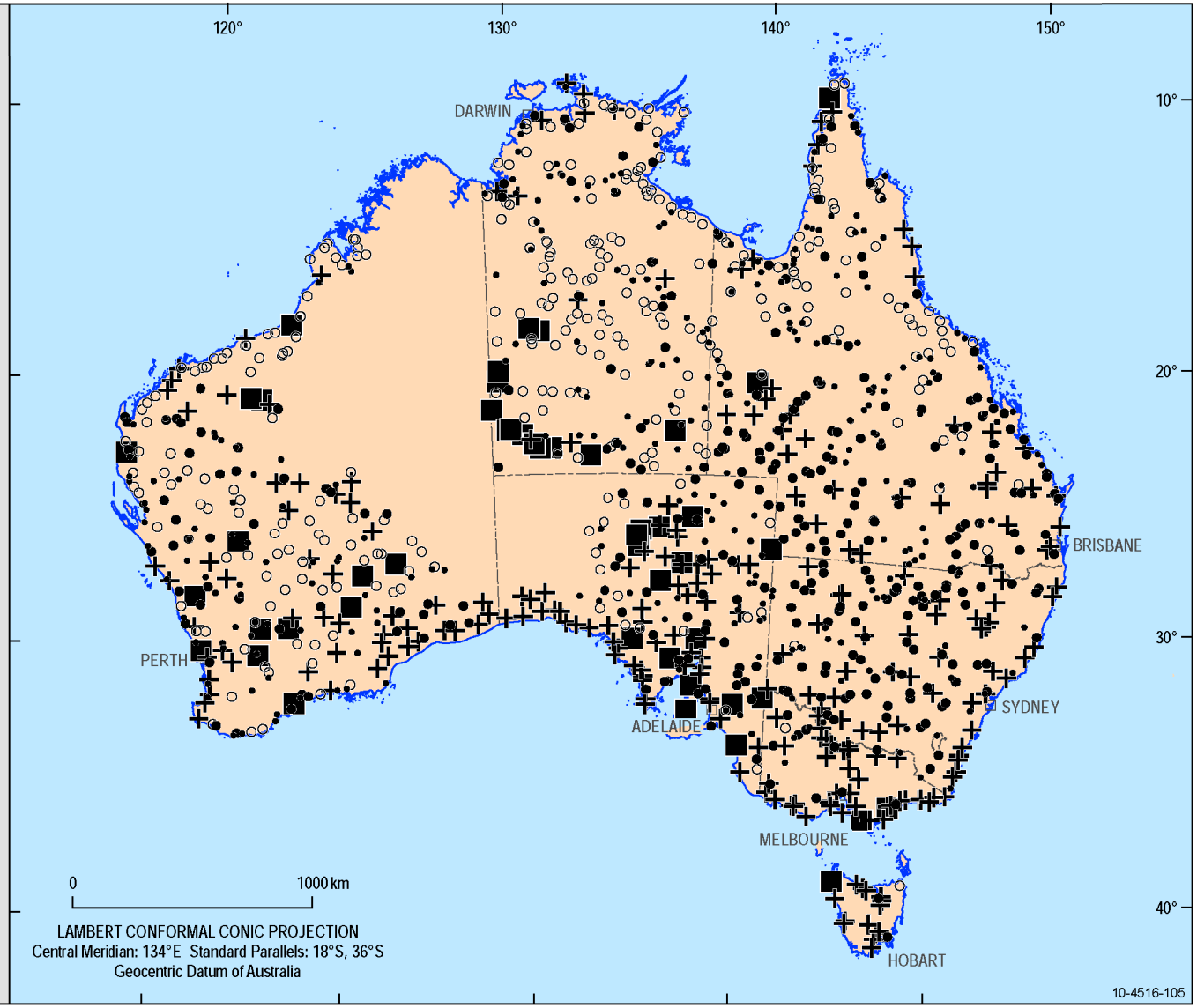
25%: *91 mg/kg*

Lower Fence: *N/A**

Minimum: *19 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sb

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.4 mg/kg
N: 1190

Maximum: *14.5 mg/kg*

Upper Fence: *8.6 mg/kg*

75%: *0.9 mg/kg*

Median: *N/A**

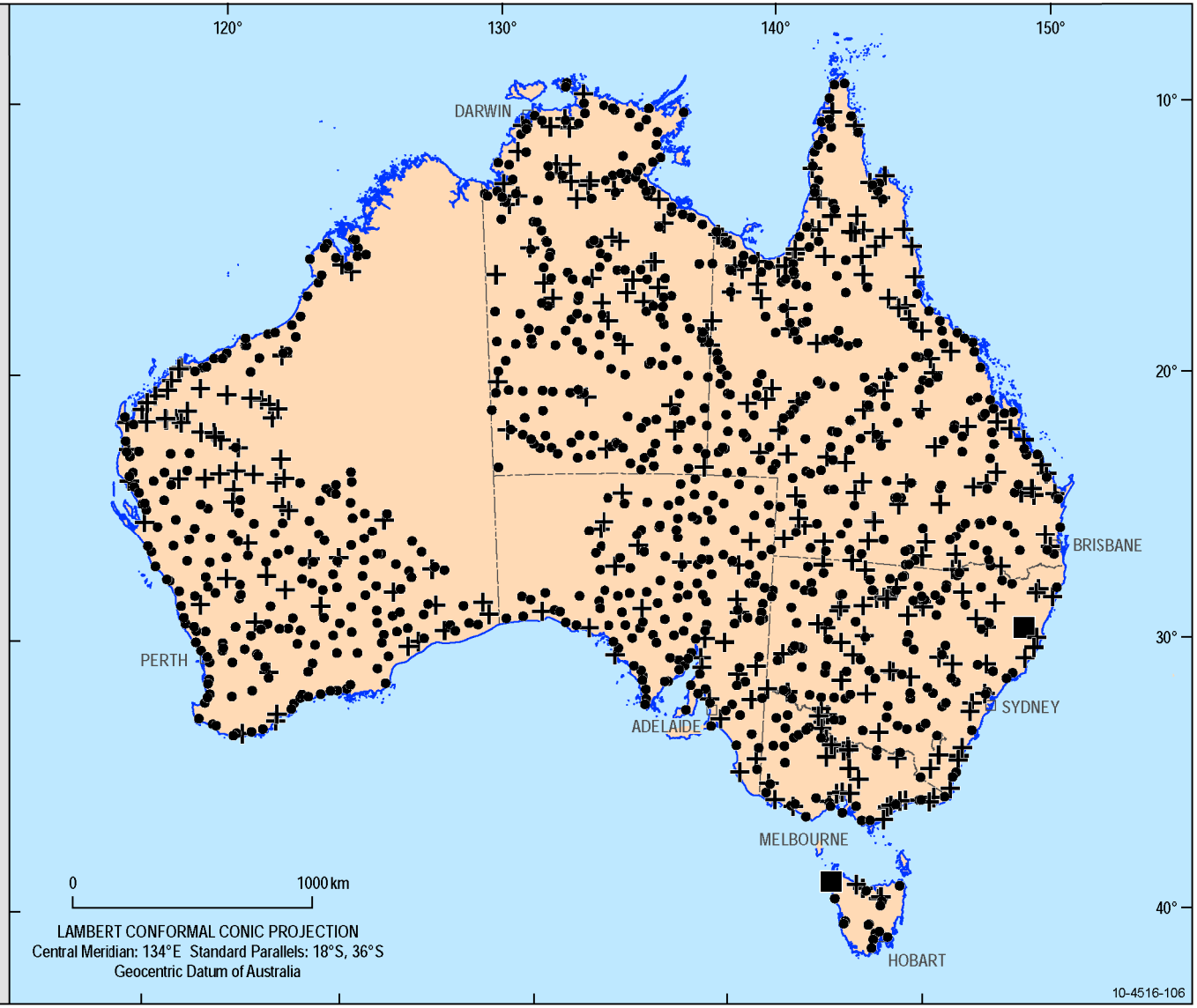
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.4 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sc

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.3 mg/kg
N: 1190

Maximum: *30.6 mg/kg*

Upper Fence: *N/A**

75%: *10.6 mg/kg*

Median: *7.6 mg/kg*

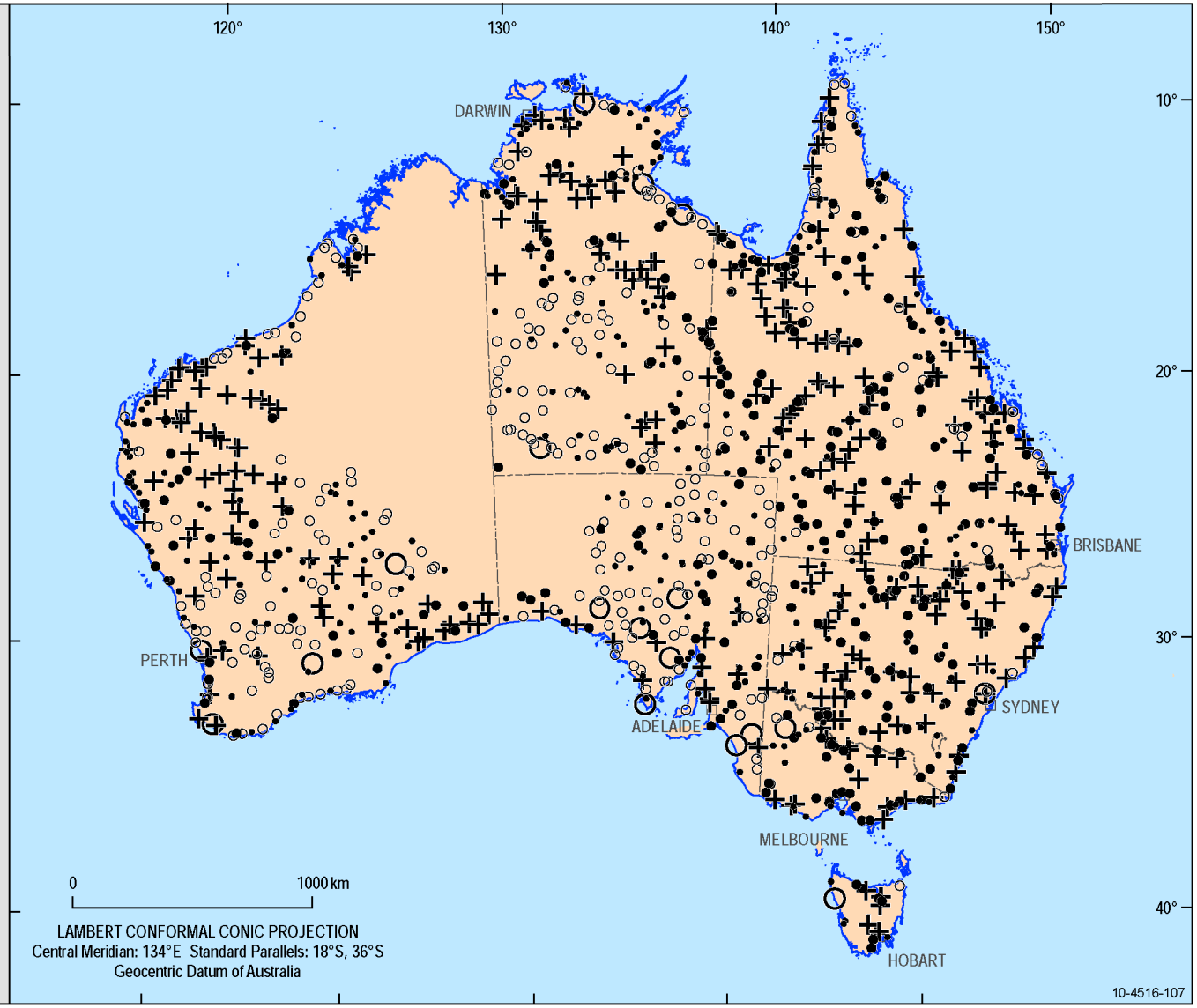
25%: *4.4 mg/kg*

Lower Fence: *1.2 mg/kg*

Minimum: *Less than 0.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Si

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 47 mg/kg
N: 1190

Maximum: *462661 mg/kg*

Upper Fence: *N/A**

75%: *408858 mg/kg*

Median: *362399 mg/kg*

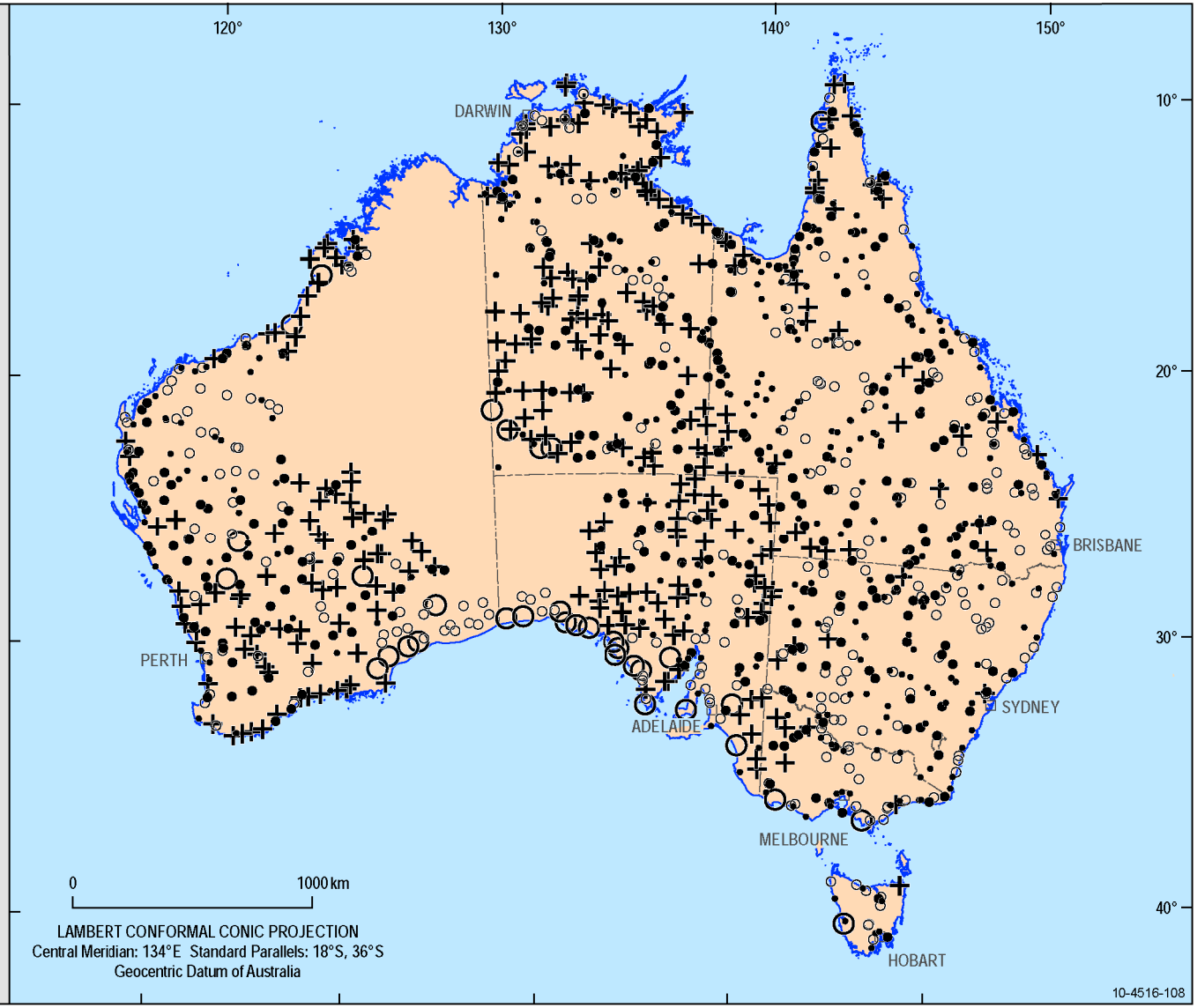
25%: *323352 mg/kg*

Lower Fence: *215347 mg/kg*

Minimum: *3506 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sm

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *19.56 mg/kg*

Upper Fence: *N/A**

75%: *5.3 mg/kg*

Median: *3.75 mg/kg*

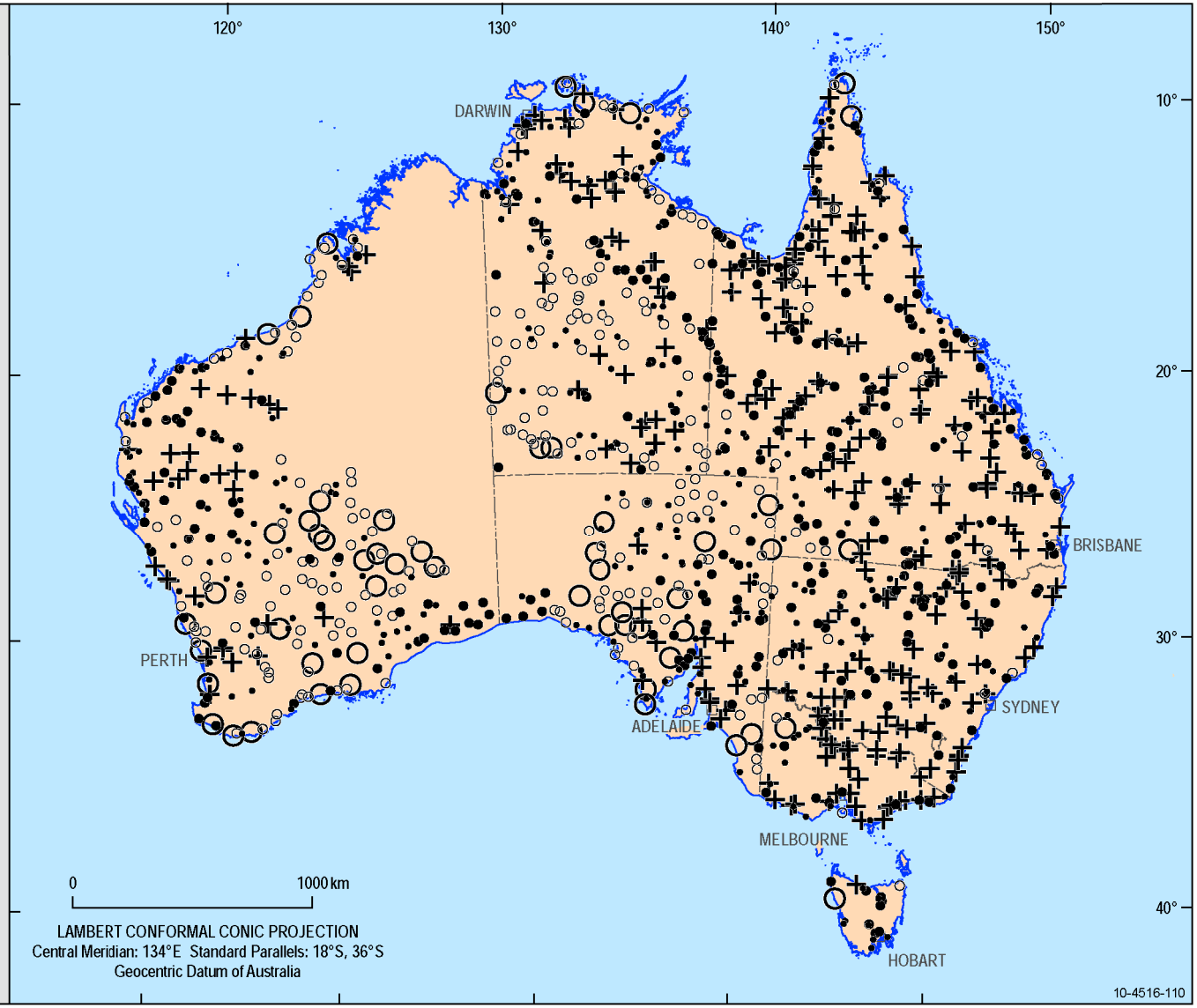
25%: *1.9 mg/kg*

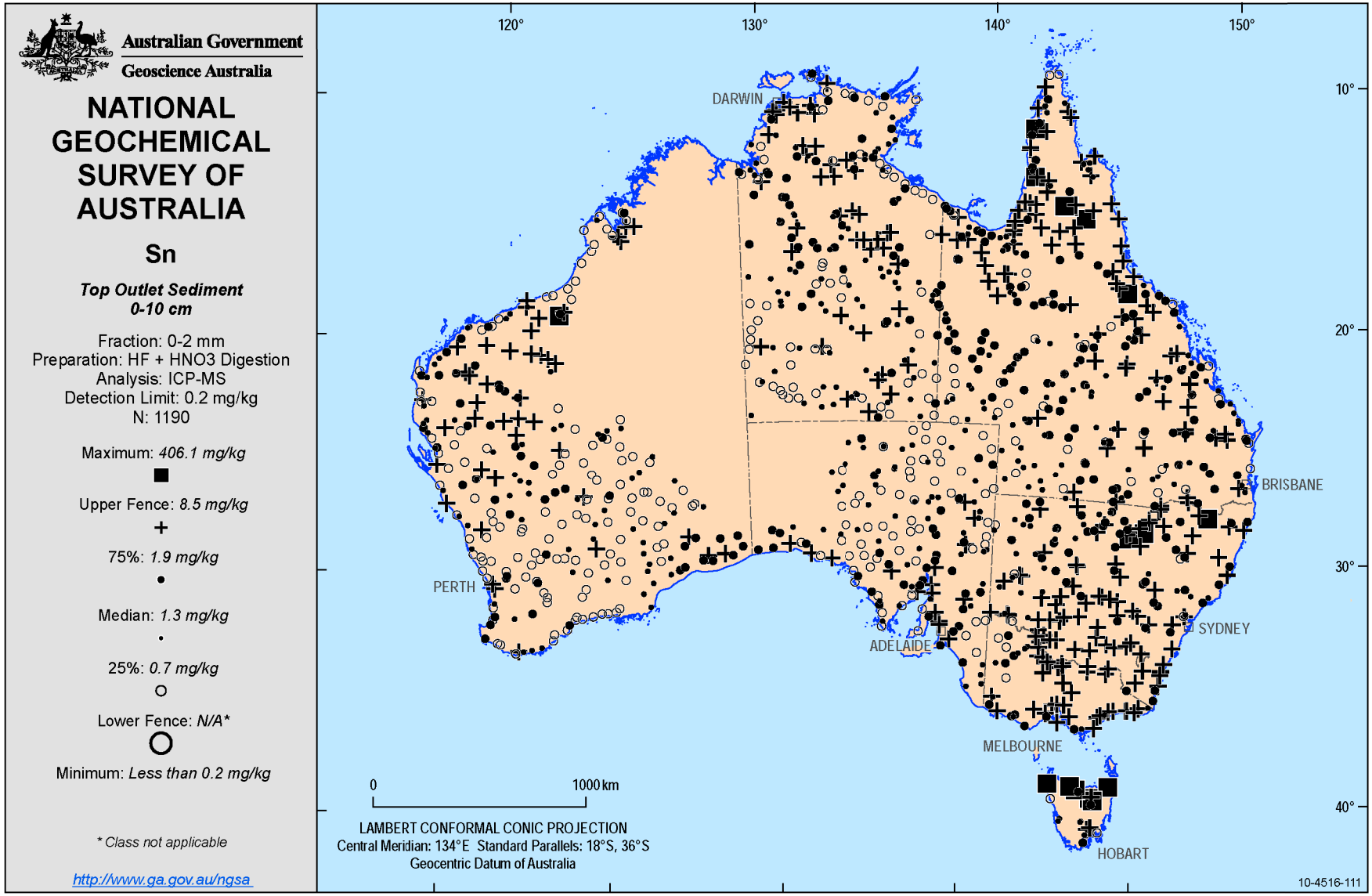
Lower Fence: *0.41 mg/kg*

Minimum: *Less than 0.04 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Sn
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190
Maximum: 406.1 mg/kg
Upper Fence: 8.5 mg/kg
75%: 1.9 mg/kg
Median: 1.3 mg/kg
25%: 0.7 mg/kg
Lower Fence: N/A*
Minimum: Less than 0.2 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
MELBOURNE
SYDNEY
BRISBANE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-111

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sr

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *6458.6 mg/kg*

Upper Fence: *576.2 mg/kg*

75%: *114 mg/kg*

Median: *68.5 mg/kg*

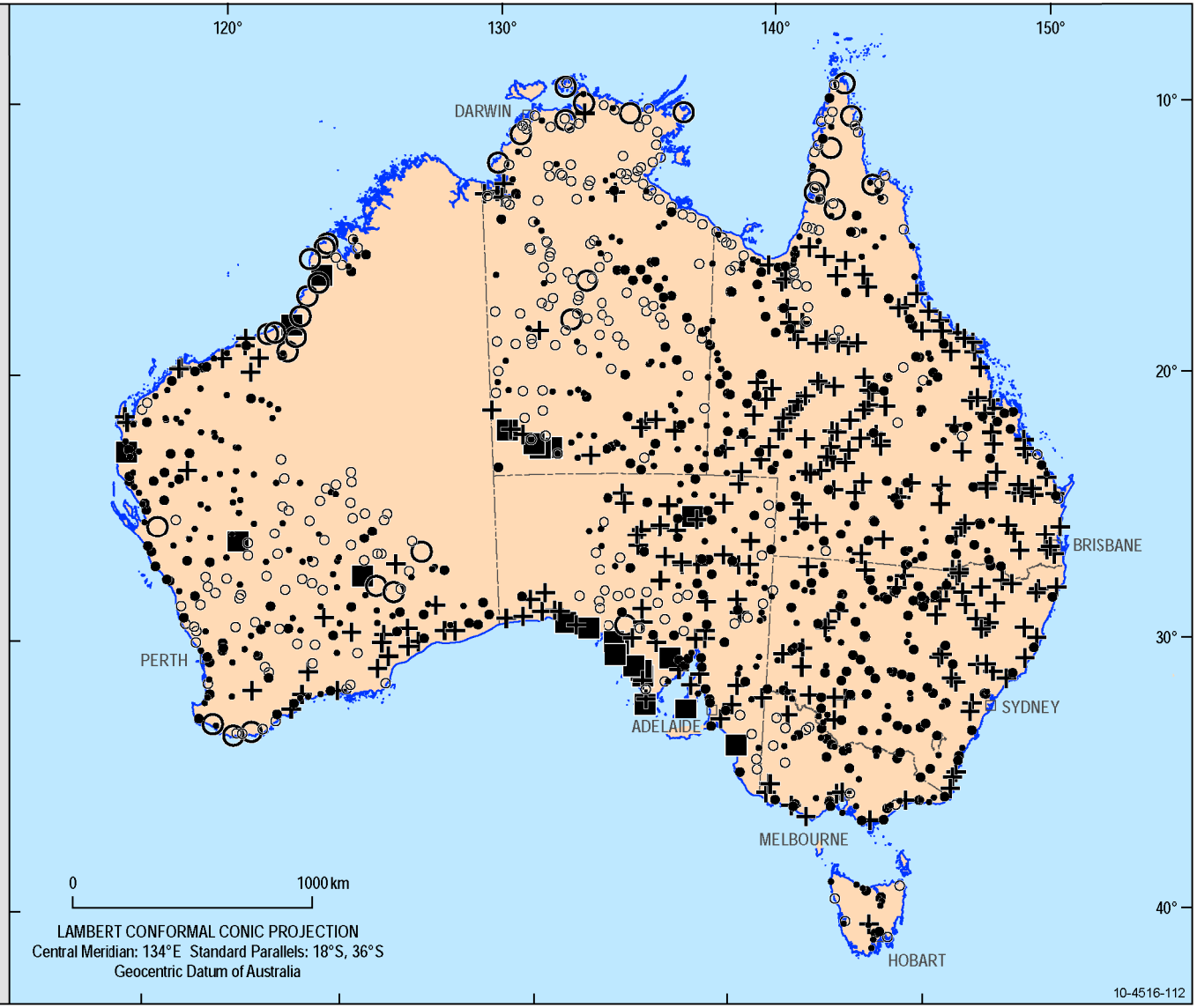
25%: *38.7 mg/kg*

Lower Fence: *7.7 mg/kg*

Minimum: *1.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ta

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *3.4 mg/kg*

Upper Fence: *N/A**

75%: *0.95 mg/kg*

Median: *0.67 mg/kg*

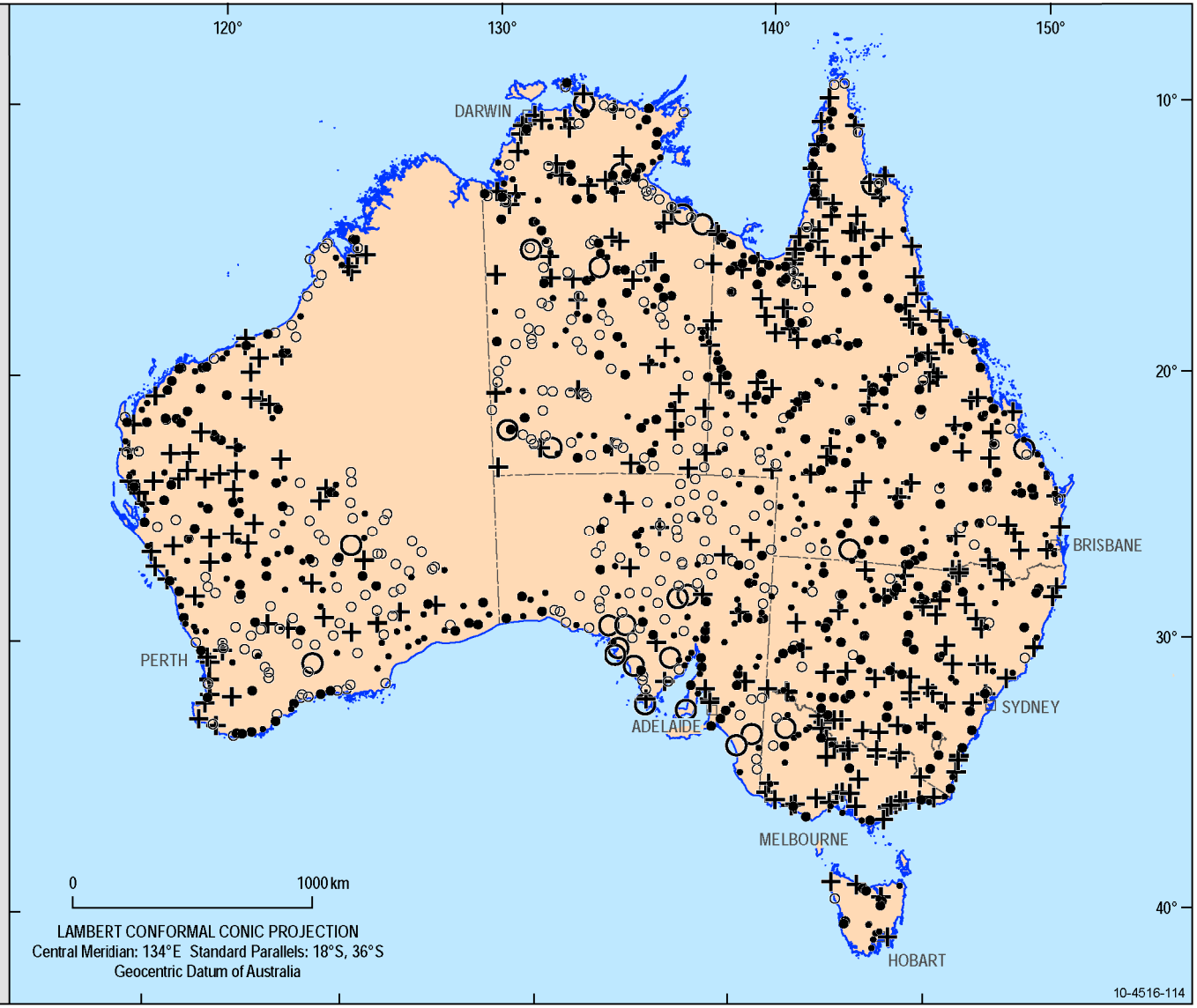
25%: *0.4 mg/kg*

Lower Fence: *0.11 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Tb

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *1.78 mg/kg*

Upper Fence: *N/A**

75%: *0.79 mg/kg*

Median: *0.55 mg/kg*

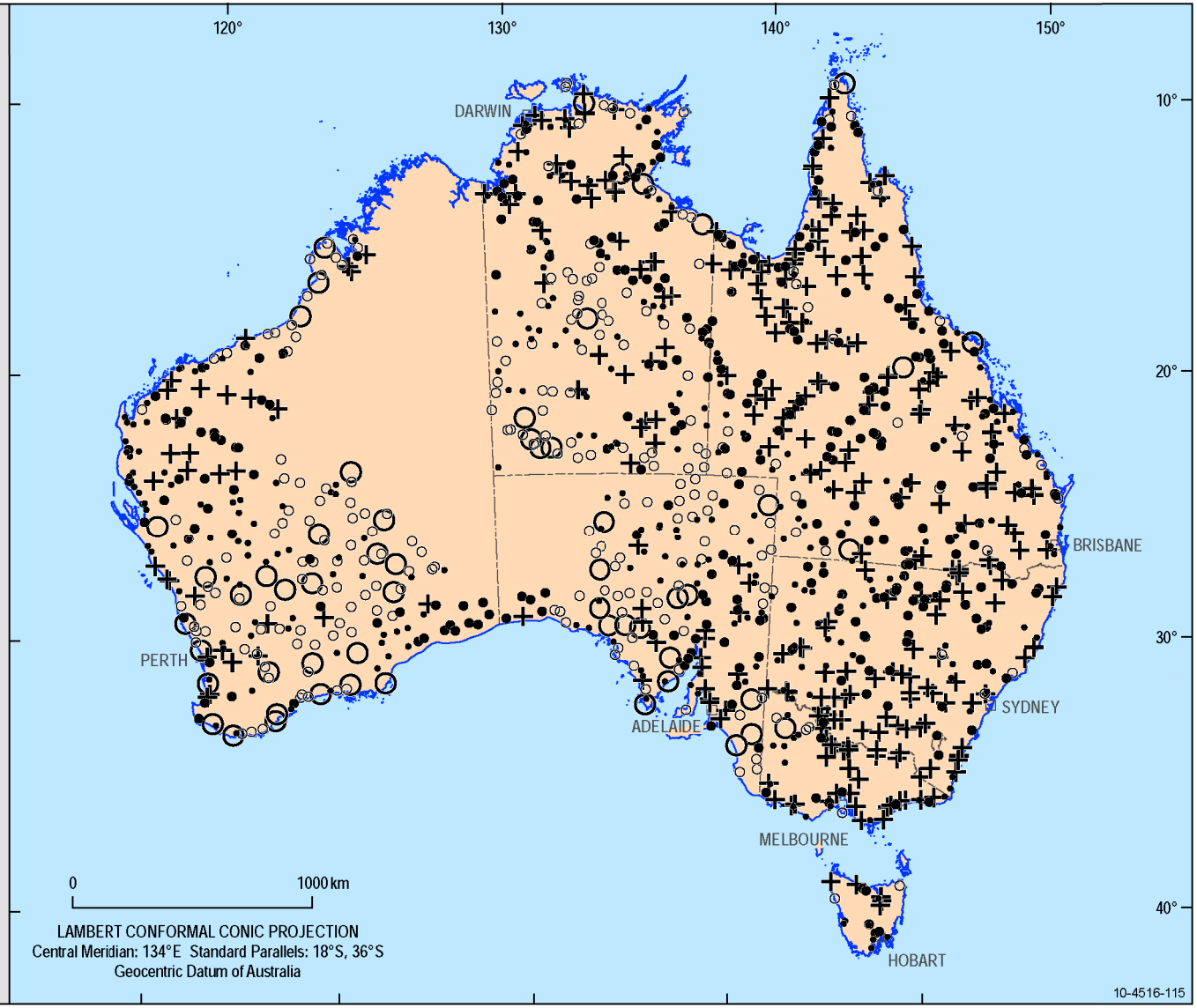
25%: *0.28 mg/kg*

Lower Fence: *0.06 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Th

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *84.19 mg/kg*

Upper Fence: *32.96 mg/kg*

75%: *11.22 mg/kg*

Median: *7.89 mg/kg*

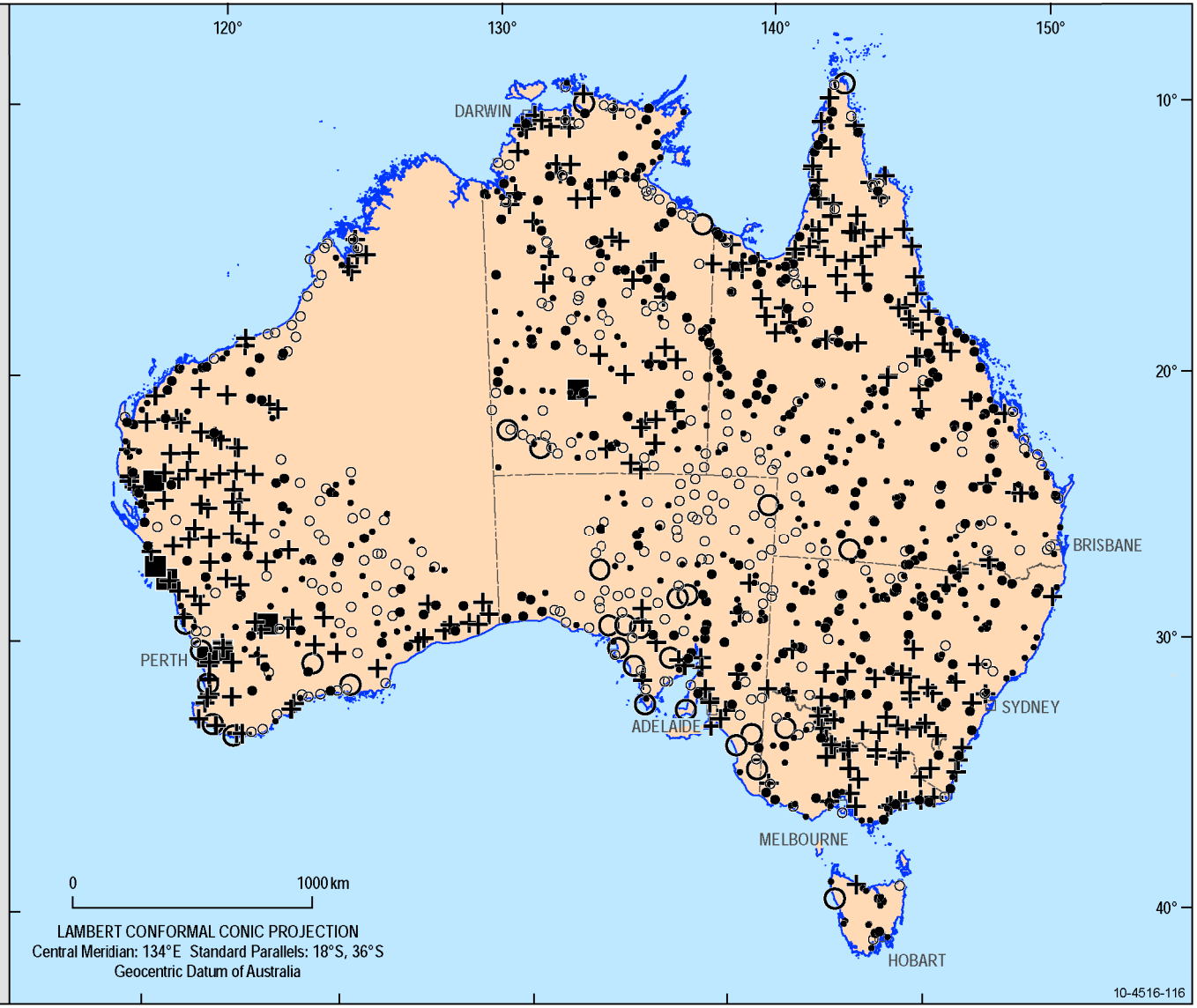
25%: *5.47 mg/kg*

Lower Fence: *1.86 mg/kg*

Minimum: *0.18 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ti

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 30 mg/kg
N: 1190

Maximum: *30690 mg/kg*

Upper Fence: *17121 mg/kg*

75%: *4782 mg/kg*

Median: *3500 mg/kg*

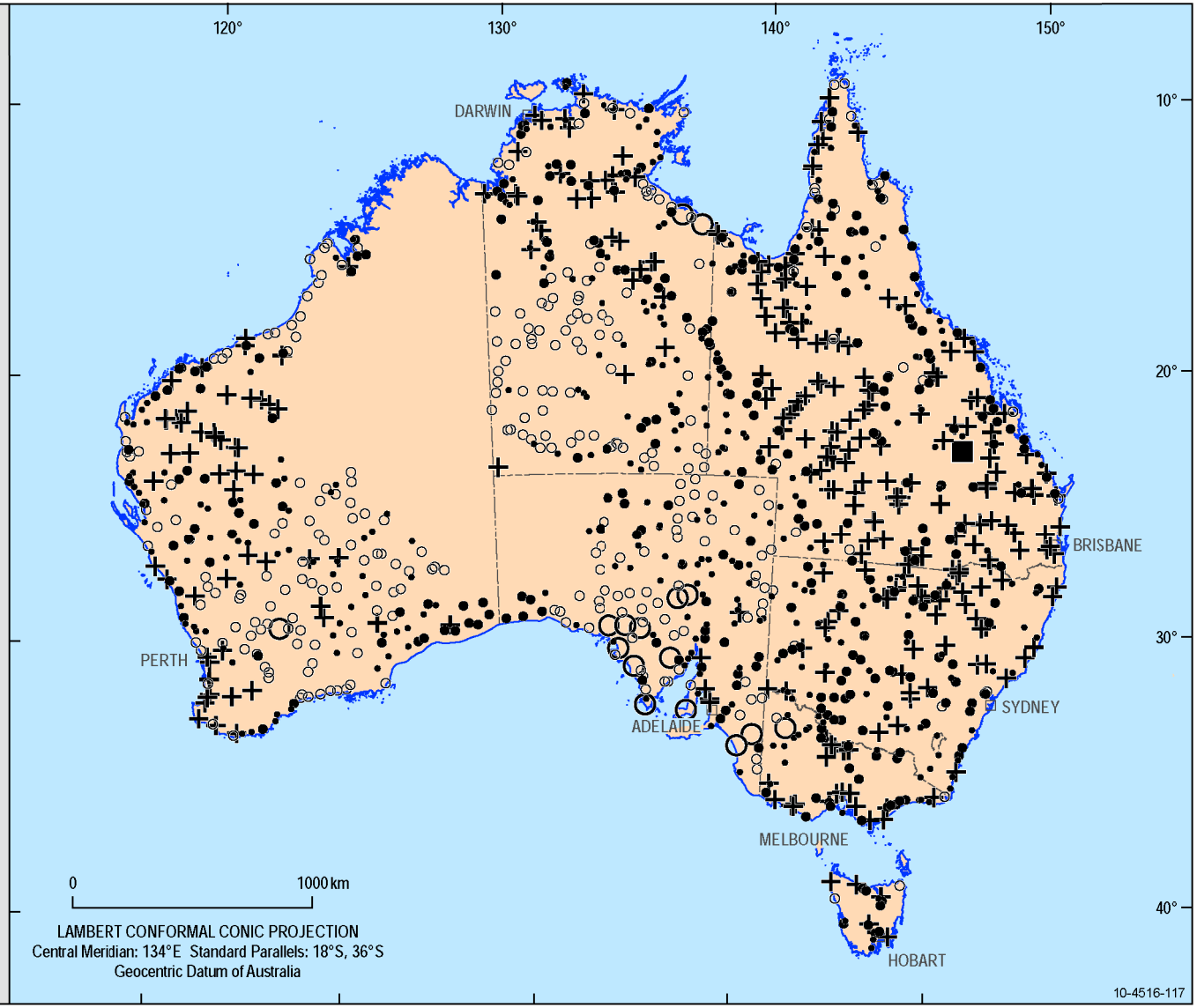
25%: *2032 mg/kg*

Lower Fence: *561 mg/kg*

Minimum: *108 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

U

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *37.43 mg/kg*

Upper Fence: *8.09 mg/kg*

75%: *2.51 mg/kg*

Median: *1.75 mg/kg*

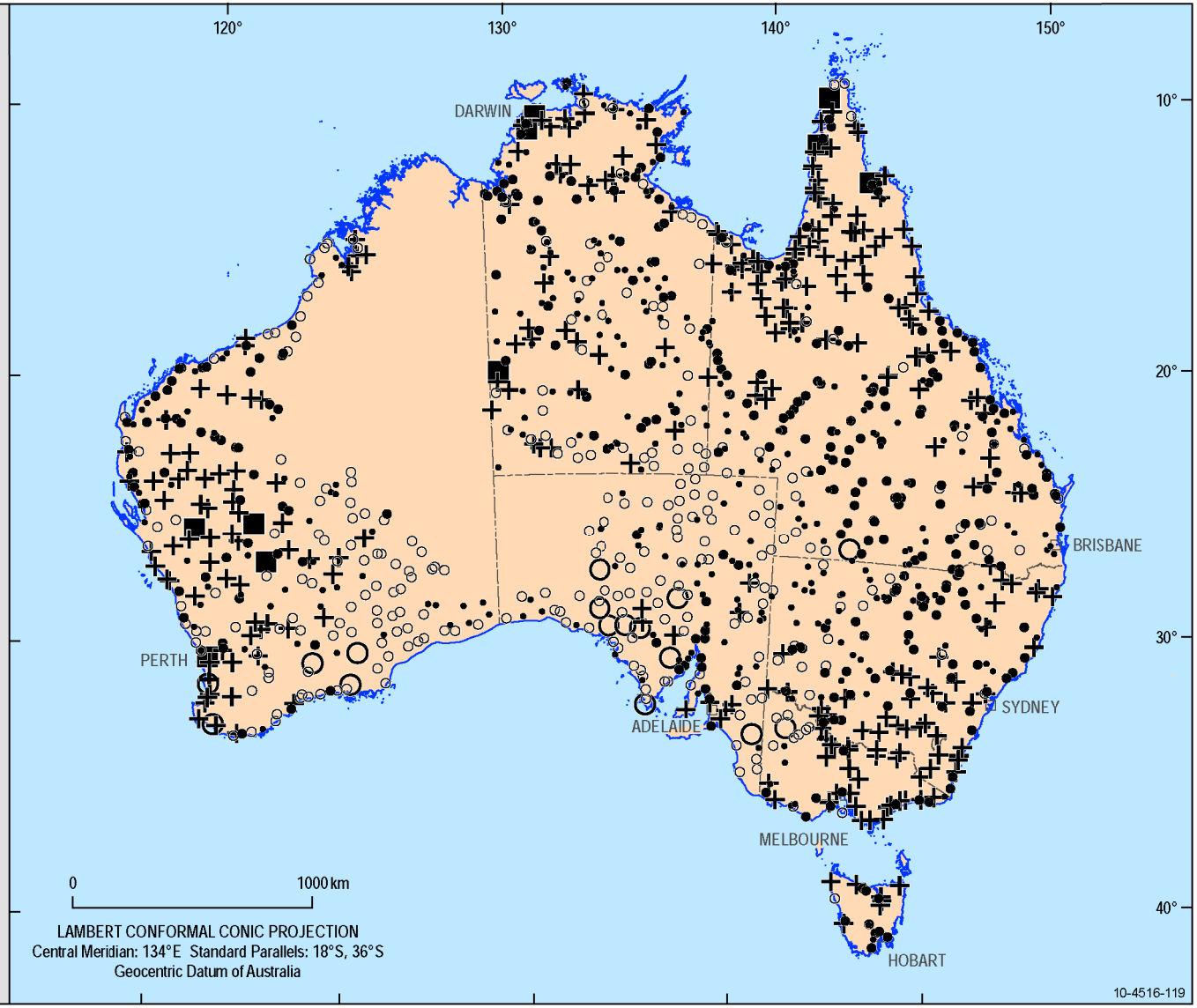
25%: *1.15 mg/kg*

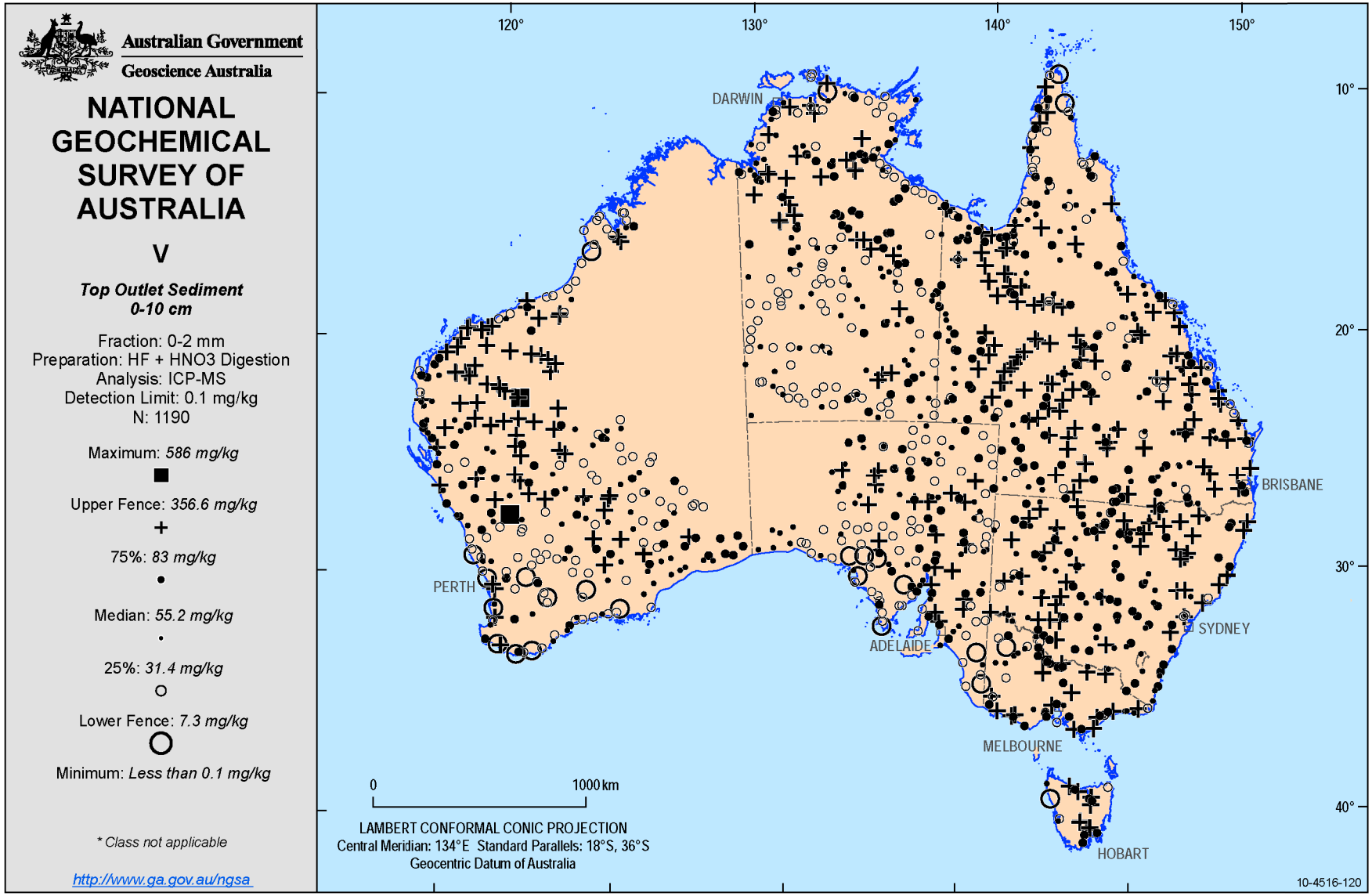
Lower Fence: *0.36 mg/kg*

Minimum: *0.12 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
V
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190
Maximum: 586 mg/kg
Upper Fence: 356.6 mg/kg
75%: 83 mg/kg
Median: 55.2 mg/kg
25%: 31.4 mg/kg
Lower Fence: 7.3 mg/kg
Minimum: Less than 0.1 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-120

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

W

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *327 mg/kg*

Upper Fence: *5.9 mg/kg*

75%: *1.5 mg/kg*

Median: *1 mg/kg*

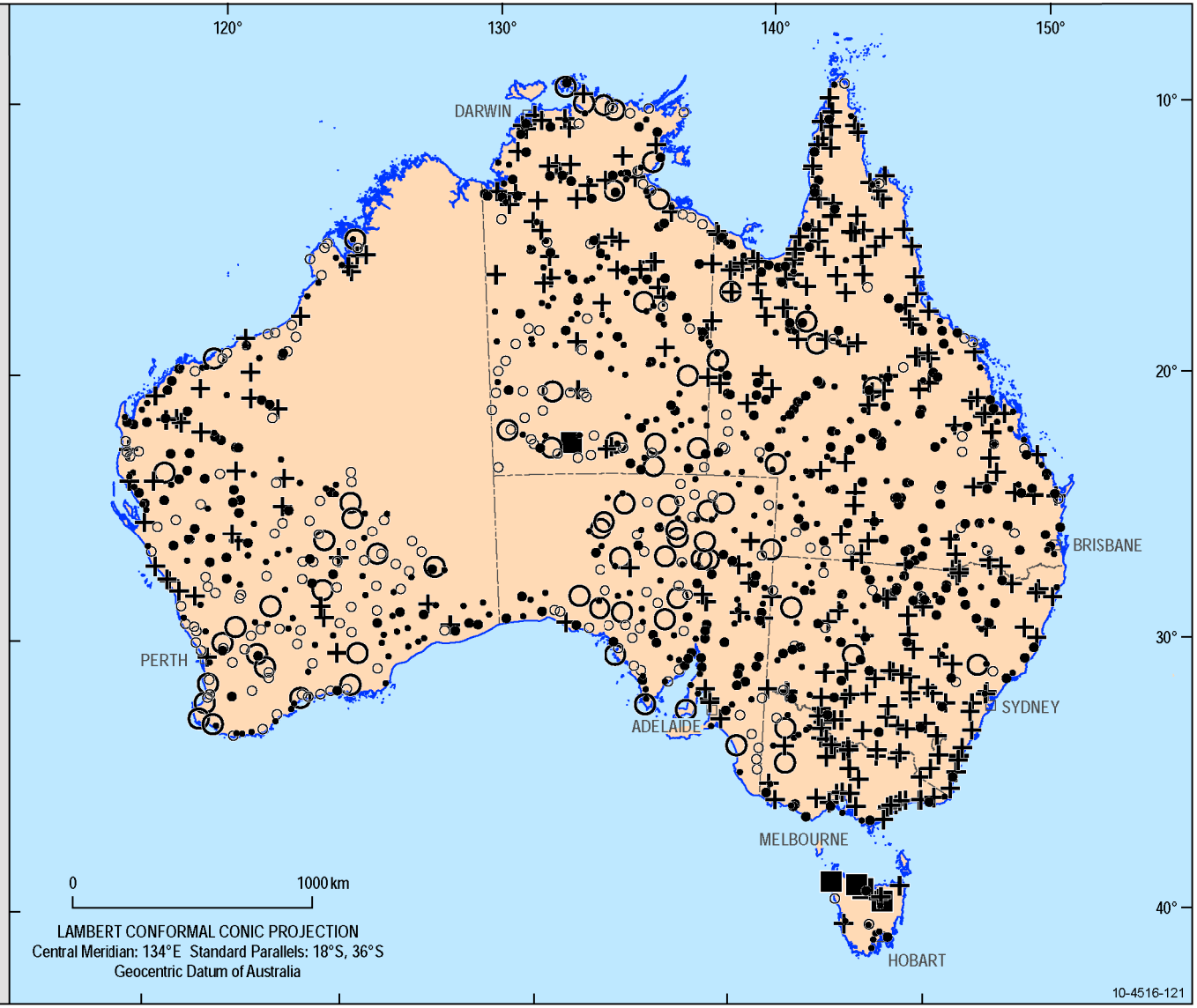
25%: *0.6 mg/kg*

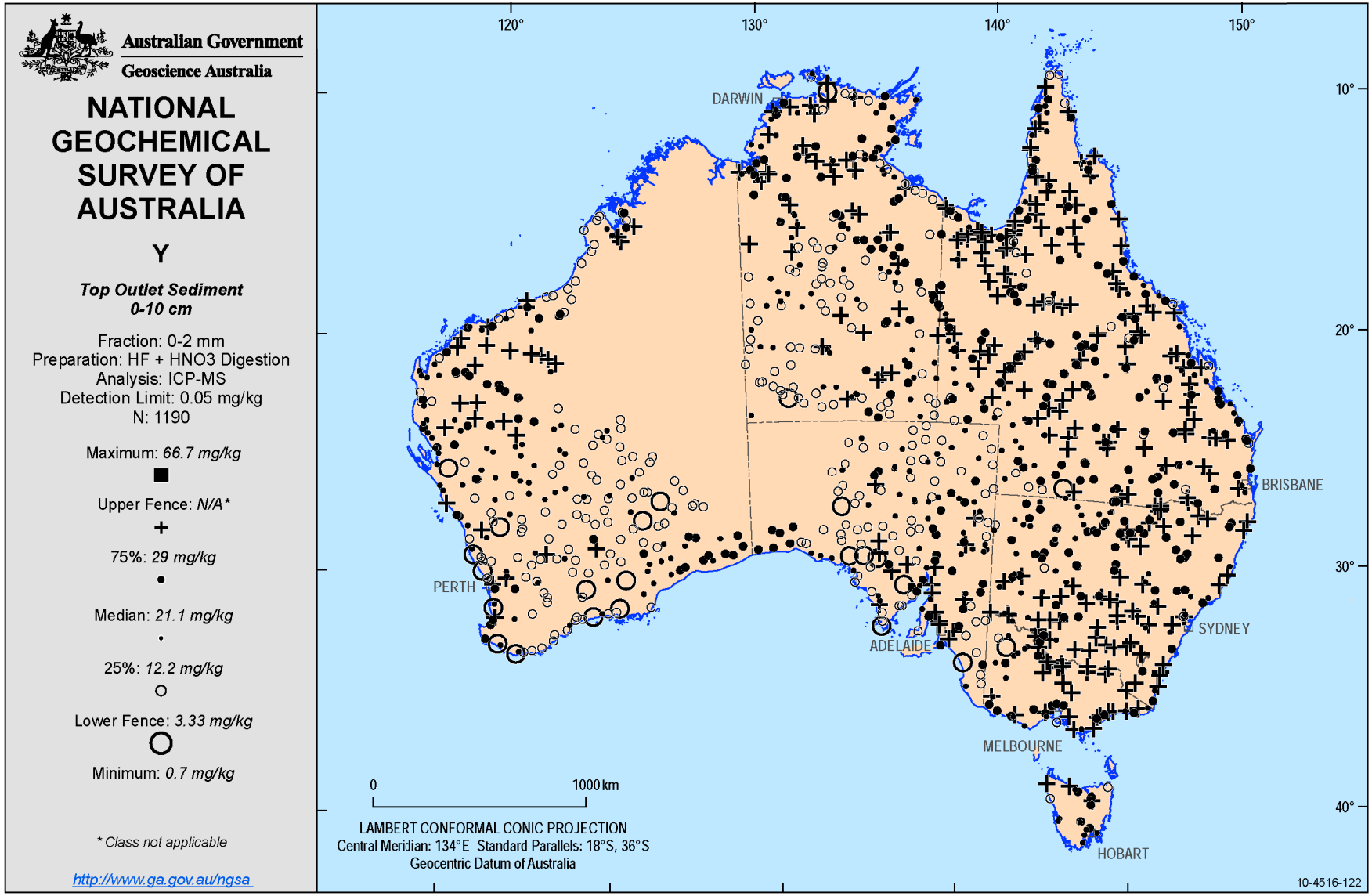
Lower Fence: *0.2 mg/kg*

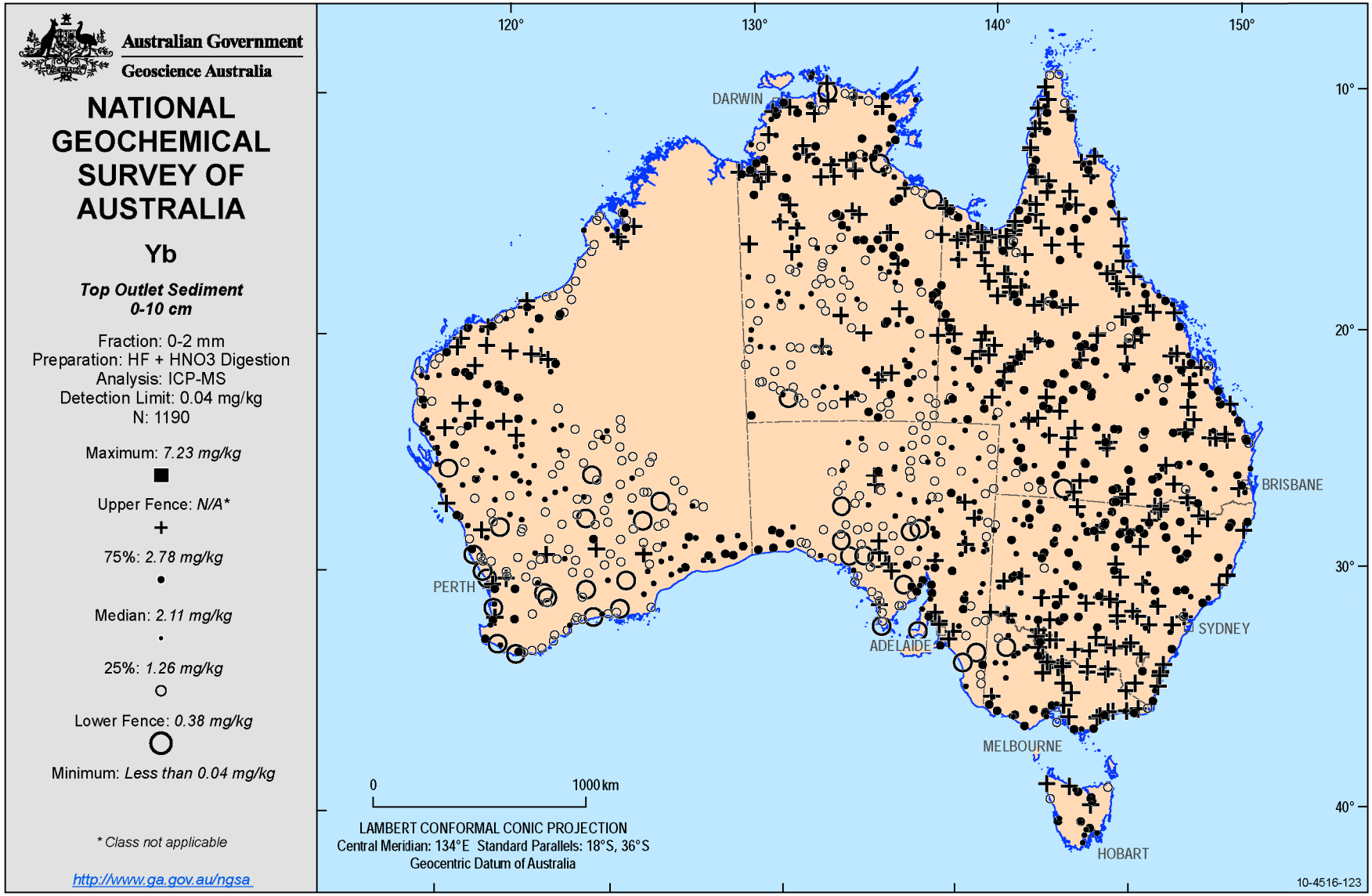
Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Y
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.05 mg/kg
N: 1190
Maximum: 66.7 mg/kg
Upper Fence: N/A*
75%: 29 mg/kg
Median: 21.1 mg/kg
25%: 12.2 mg/kg
Lower Fence: 3.33 mg/kg
Minimum: 0.7 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-122


Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Yb
Top Outlet Sediment
0-10 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190
Maximum: 7.23 mg/kg
Upper Fence: N/A*
75%: 2.78 mg/kg
Median: 2.11 mg/kg
25%: 1.26 mg/kg
Lower Fence: 0.38 mg/kg
Minimum: Less than 0.04 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-123

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Zn

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.9 mg/kg
N: 1190

Maximum: *210 mg/kg*

Upper Fence: *N/A**

75%: *52.4 mg/kg*

Median: *31.4 mg/kg*

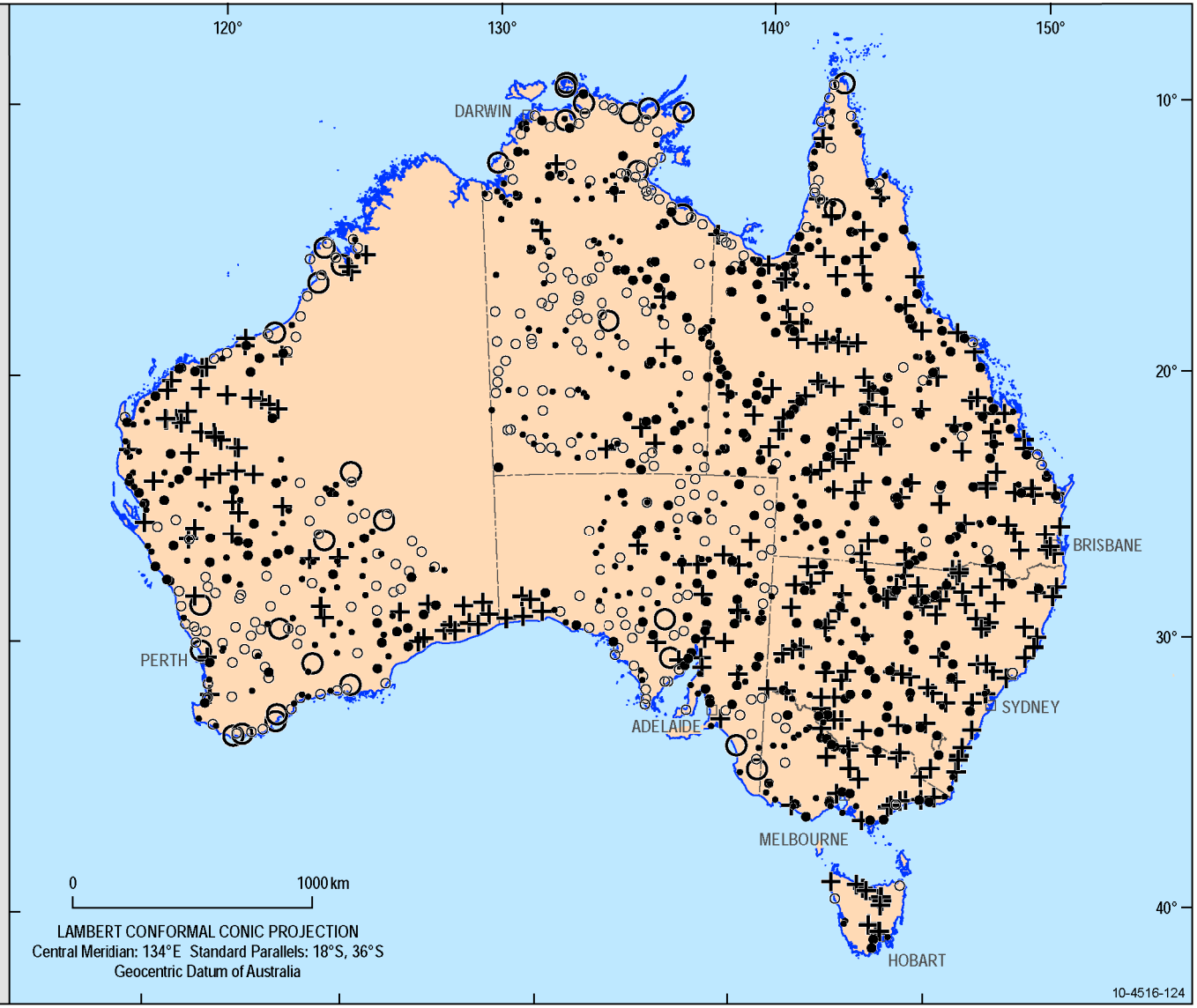
25%: *13.4 mg/kg*

Lower Fence: *1.7 mg/kg*

Minimum: *Less than 0.9 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Zr

Top Outlet Sediment
0-10 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *1777.9 mg/kg*

Upper Fence: *978.2 mg/kg*

75%: *393.4 mg/kg*

Median: *304.4 mg/kg*

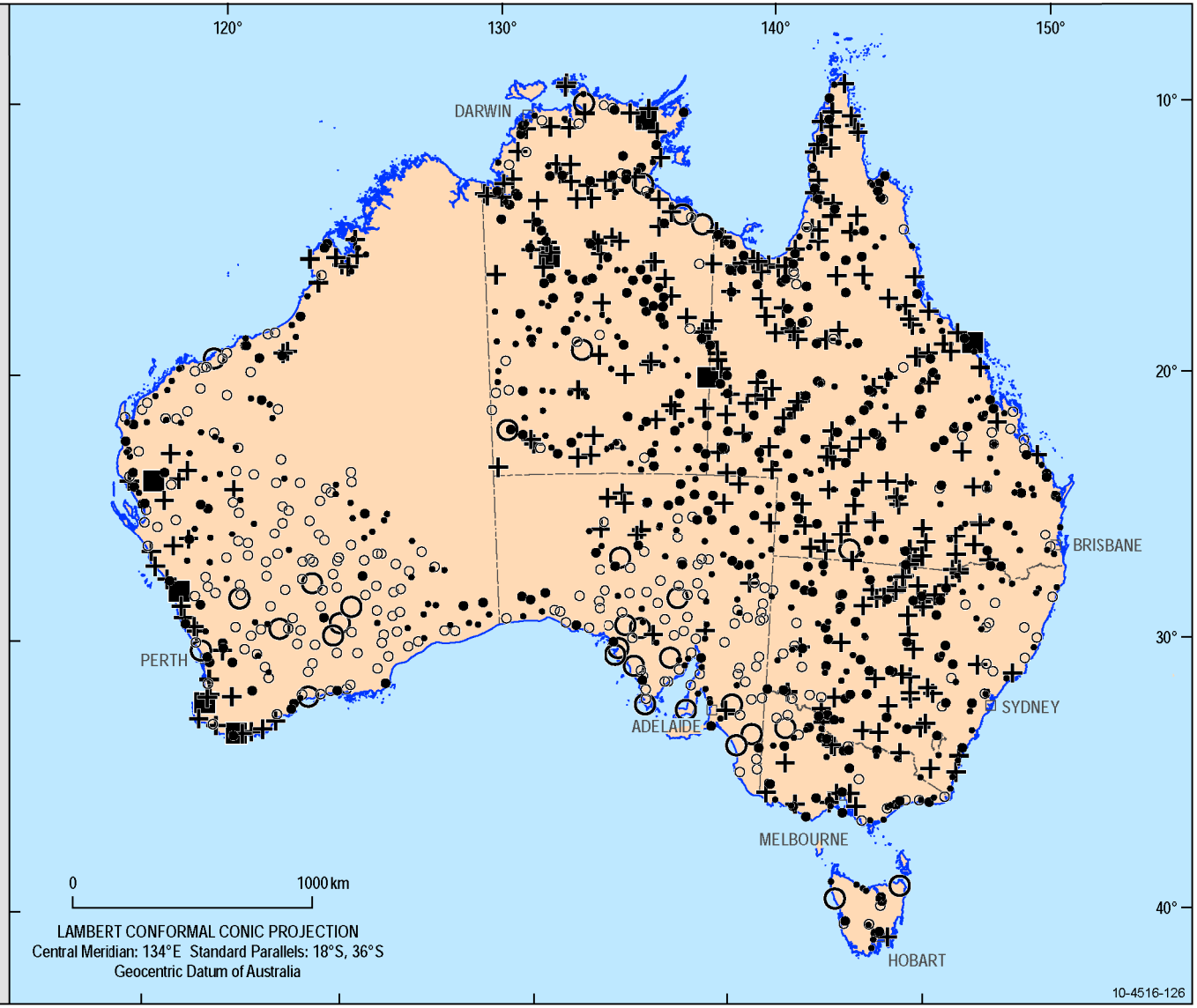
25%: *214.3 mg/kg*

Lower Fence: *86.1 mg/kg*

Minimum: *4.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ag

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1187

Maximum: *1.95 mg/kg*

Upper Fence: *Less than 0.03 mg/kg*

75%: *N/A**

Median: *N/A**

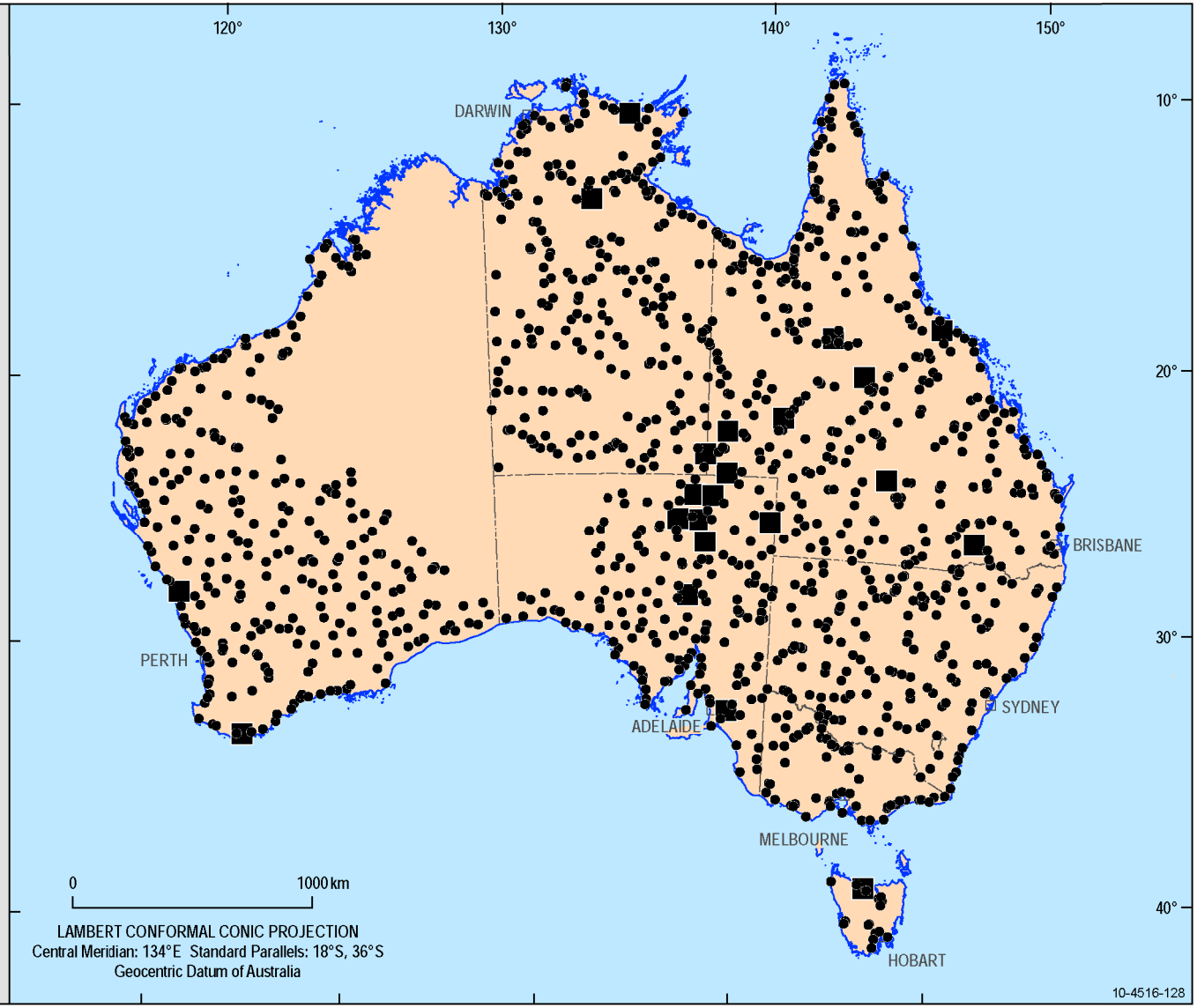
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Al

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 26 mg/kg
N: 1187

Maximum: *137581 mg/kg*

Upper Fence: *125977 mg/kg*

75%: *70291 mg/kg*

Median: *58308 mg/kg*

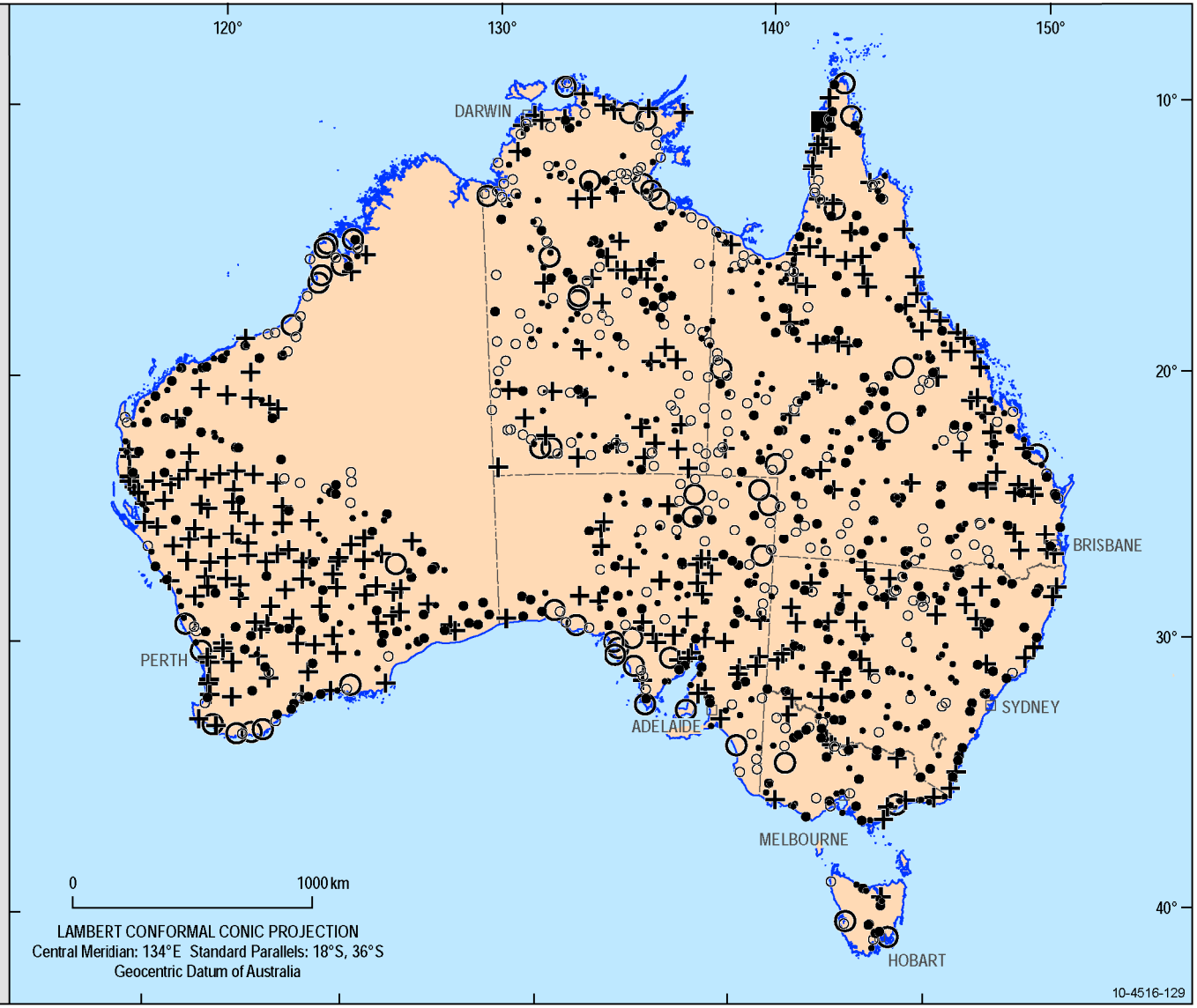
25%: *46870 mg/kg*

Lower Fence: *25146 mg/kg*

Minimum: *1085 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

As

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.4 mg/kg
N: 1187

Maximum: *80.3 mg/kg*

Upper Fence: *18.3 mg/kg*

75%: *5.8 mg/kg*

Median: *4.1 mg/kg*

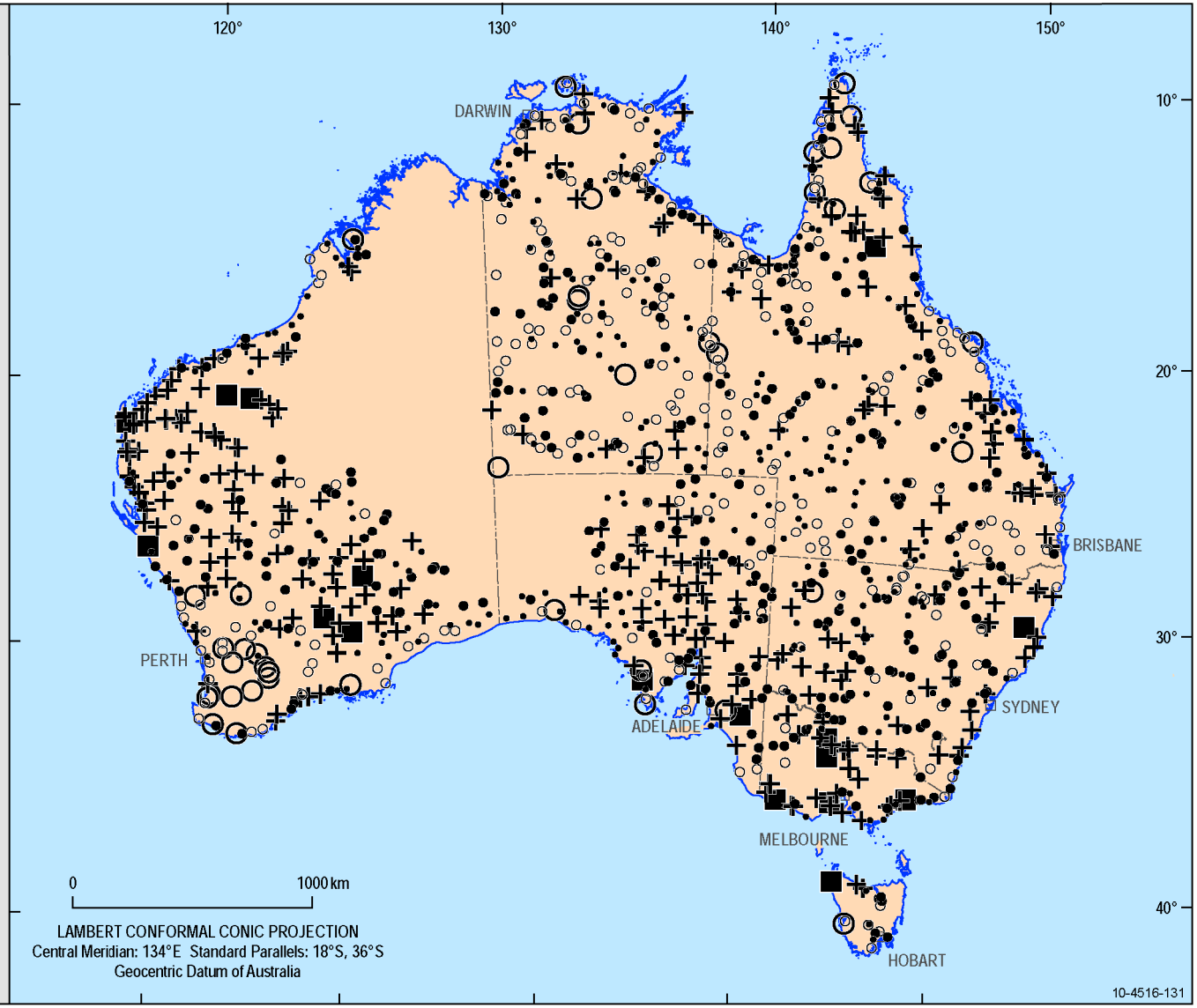
25%: *2.7 mg/kg*

Lower Fence: *0.9 mg/kg*

Minimum: *Less than 0.4 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Au

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.001 mg/kg
N: 1137

Maximum: *0.175 mg/kg*

Upper Fence: *0.006 mg/kg*

75%: *0.002 mg/kg*

Median: *0.002 mg/kg*

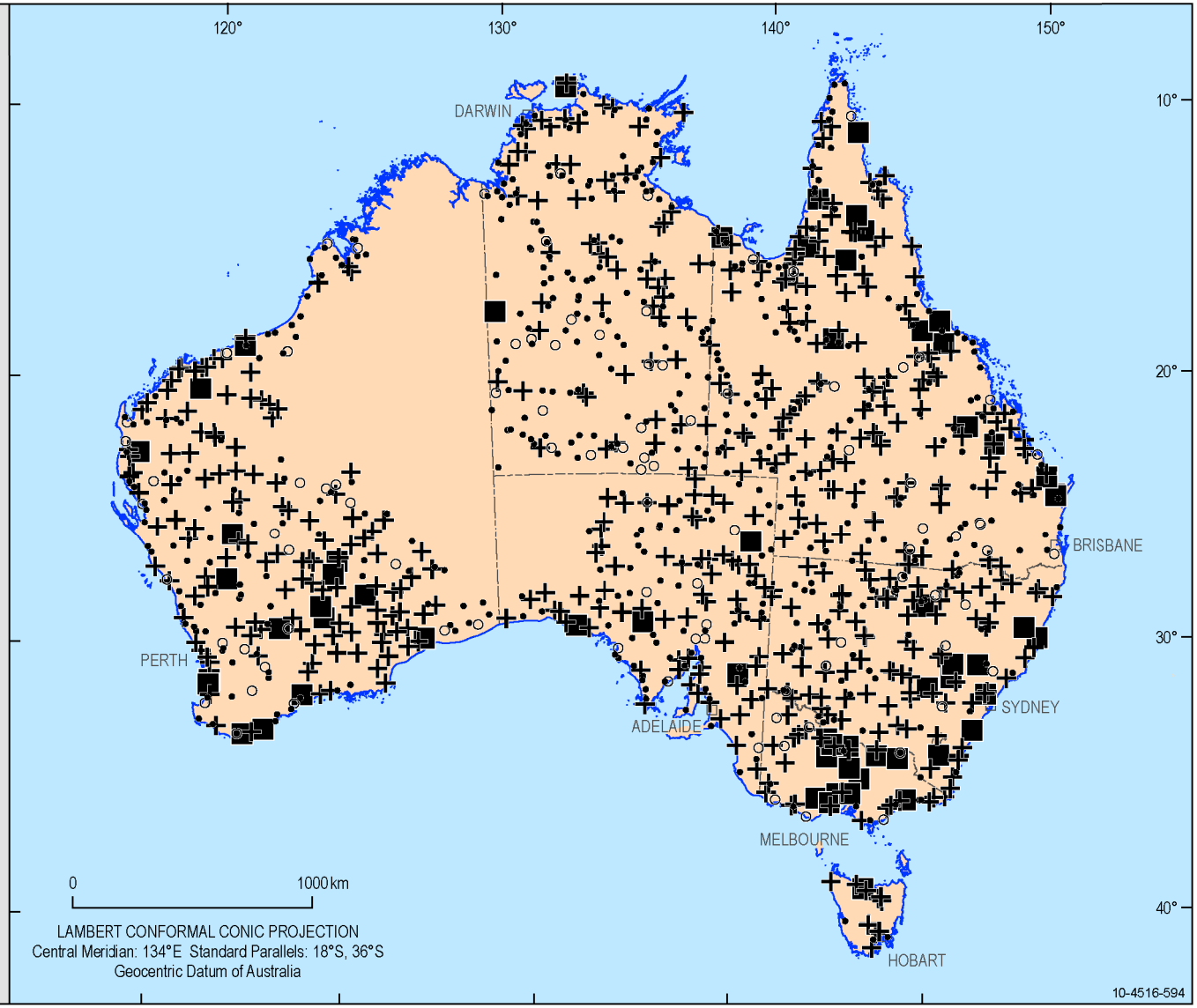
25%: *0.001 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 0.001 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ba

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1187

Maximum: *983 mg/kg*

Upper Fence: *892.7 mg/kg*

75%: *430.2 mg/kg*

Median: *345.1 mg/kg*

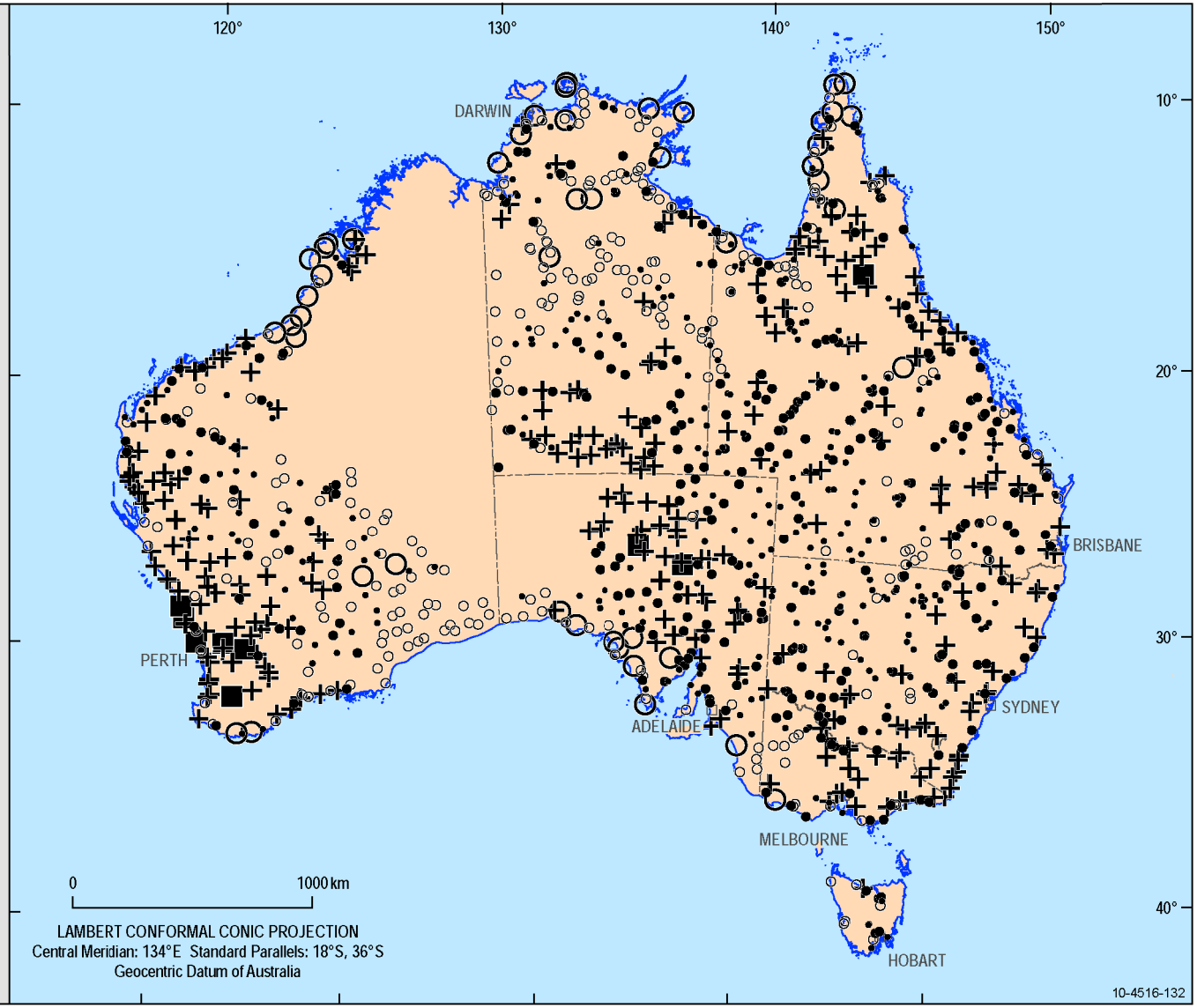
25%: *264.4 mg/kg*

Lower Fence: *127.4 mg/kg*

Minimum: *12.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Be

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 1.1 mg/kg
N: 1187

Maximum: *26.2 mg/kg*

Upper Fence: *5.5 mg/kg*

75%: *2.2 mg/kg*

Median: *1.6 mg/kg*

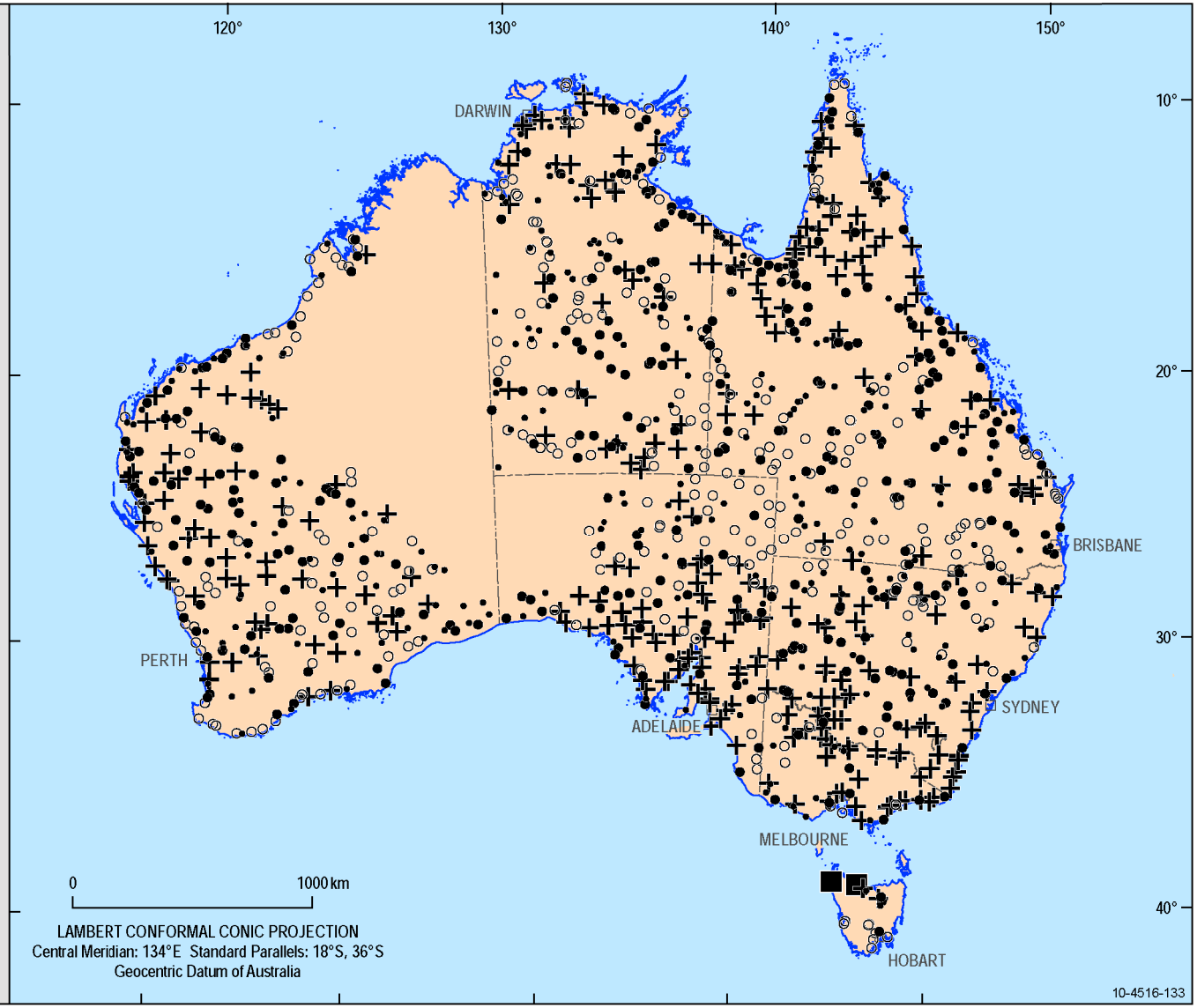
25%: *1.2 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 1.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Bi

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1187

Maximum: *44.77 mg/kg*

Upper Fence: *1.01 mg/kg*

75%: *0.37 mg/kg*

Median: *0.28 mg/kg*

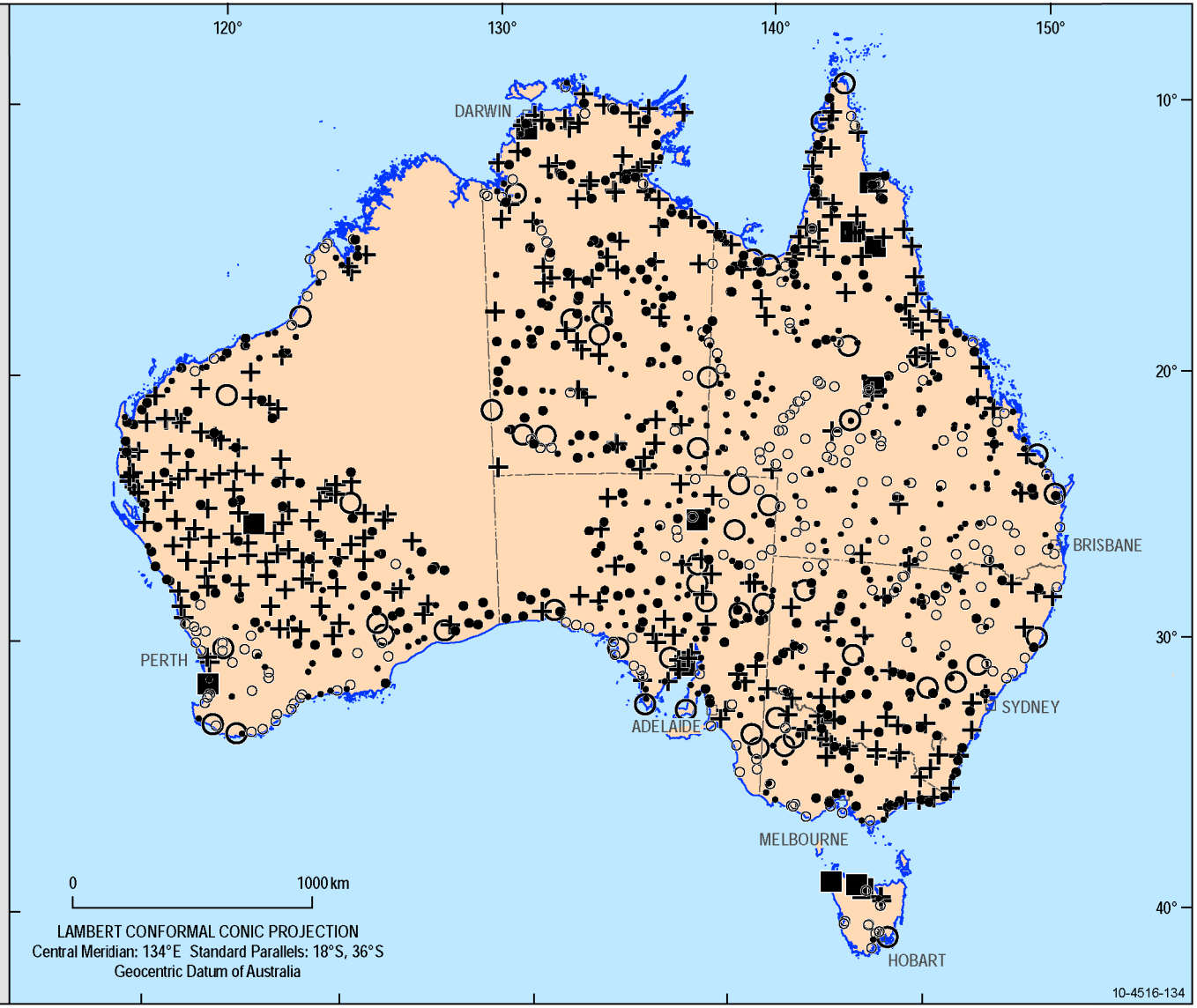
25%: *0.19 mg/kg*

Lower Fence: *0.07 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ca

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 14 mg/kg
N: 1187

Maximum: *346830 mg/kg*

Upper Fence: *48913 mg/kg*

75%: *8283 mg/kg*

Median: *4388 mg/kg*

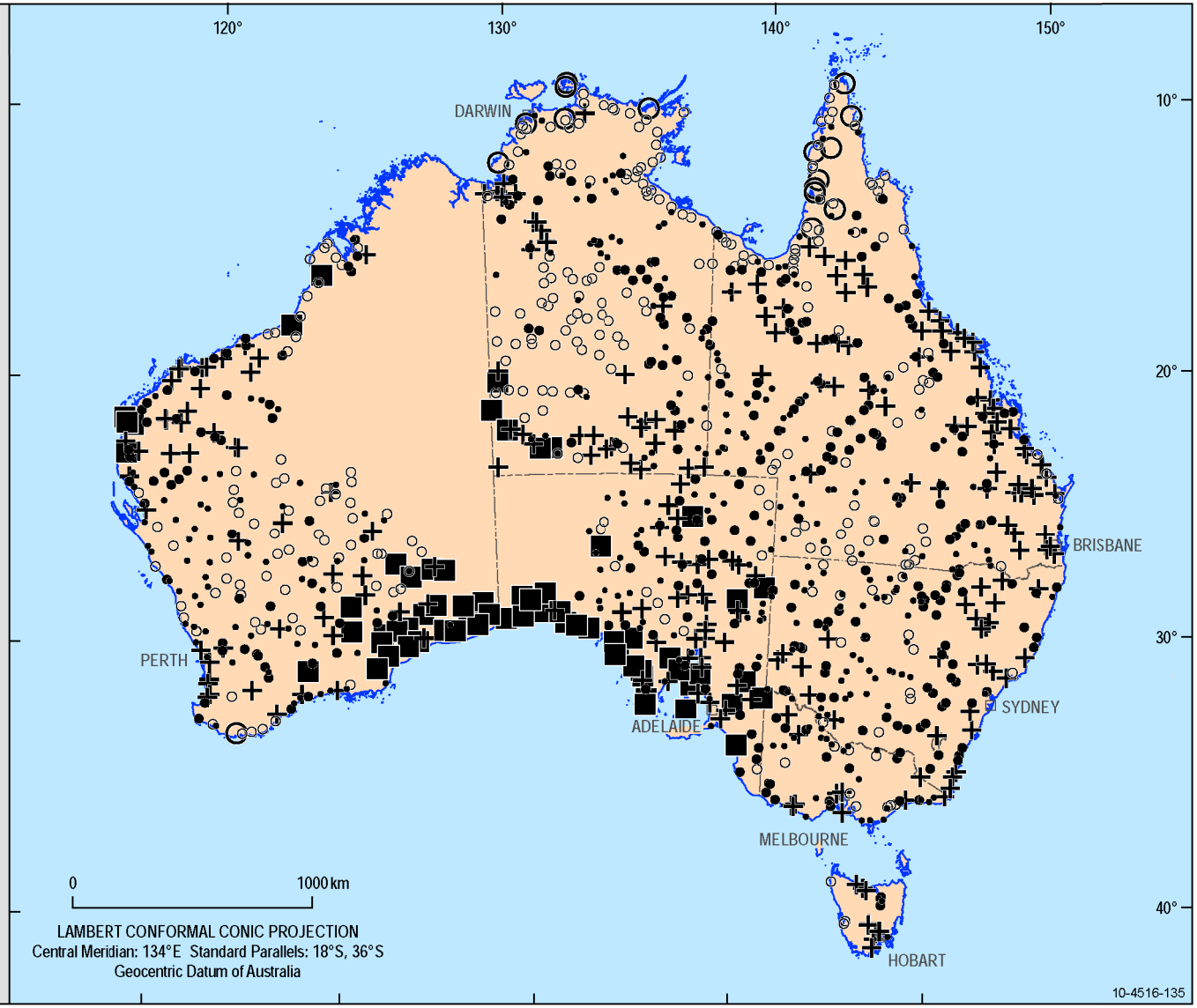
25%: *2480 mg/kg*

Lower Fence: *404 mg/kg*

Minimum: *250 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cd

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1187

Maximum: *4.5 mg/kg*

Upper Fence: *1.6 mg/kg*

75%: *0.2 mg/kg*

Median: *0.1 mg/kg*

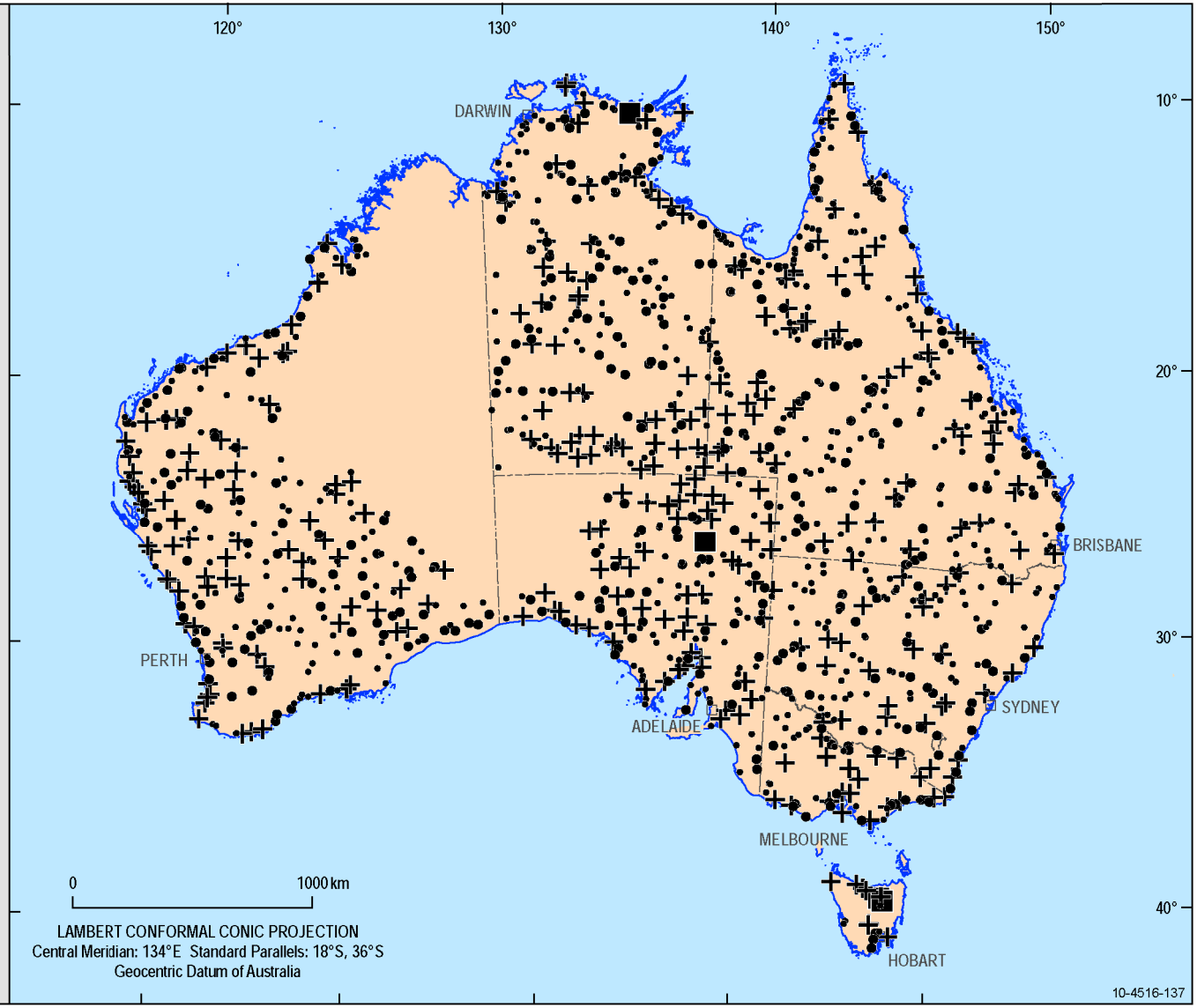
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ce

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1187

Maximum: *2680.16 mg/kg*

Upper Fence: *179.4 mg/kg*

75%: *84.11 mg/kg*

Median: *63.6 mg/kg*

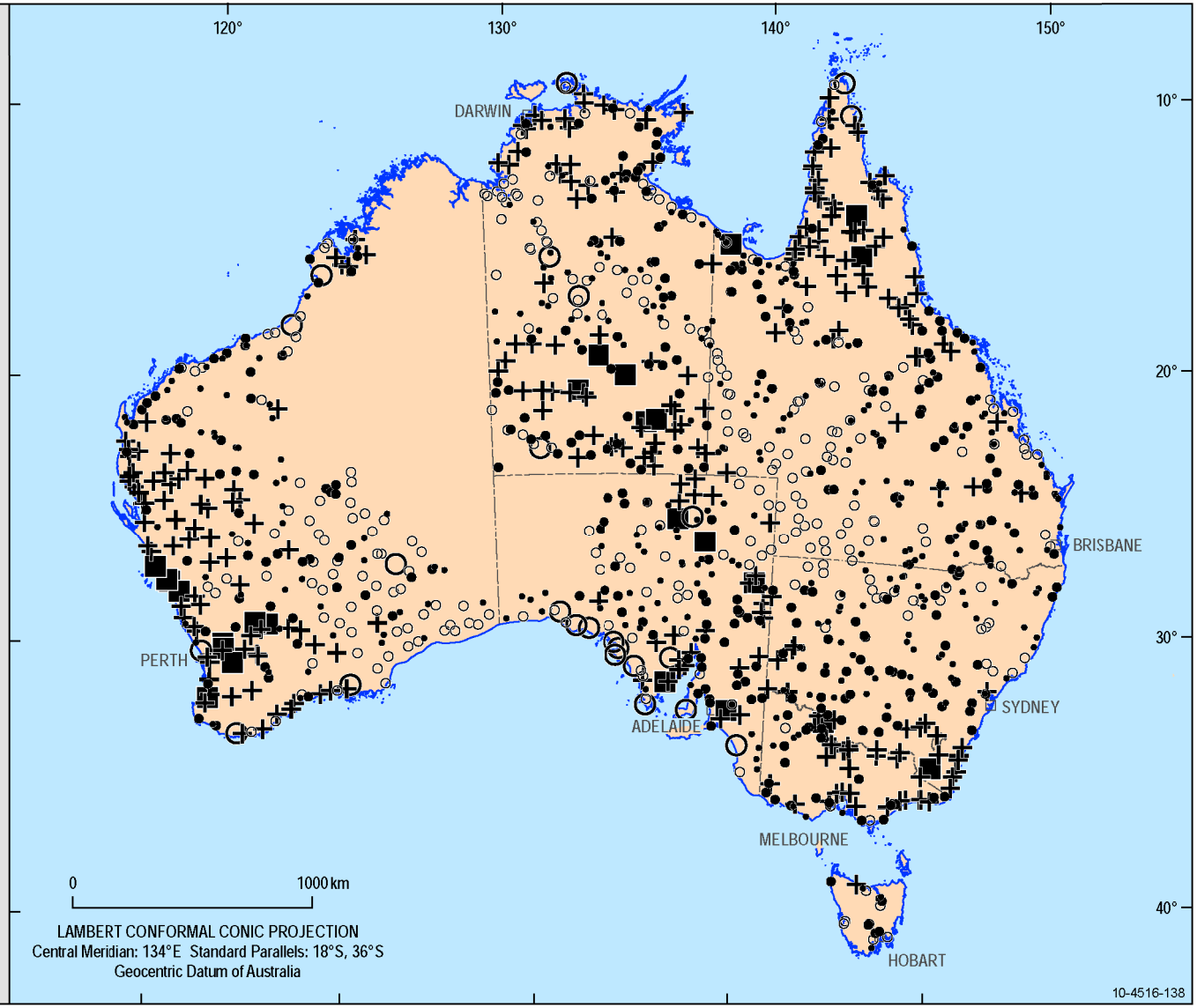
25%: *50.76 mg/kg*

Lower Fence: *23.8 mg/kg*

Minimum: *1.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cl

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 10 mg/kg
N: 1186

Maximum: *38350 mg/kg*

Upper Fence: *595 mg/kg*

75%: *116 mg/kg*

Median: *62 mg/kg*

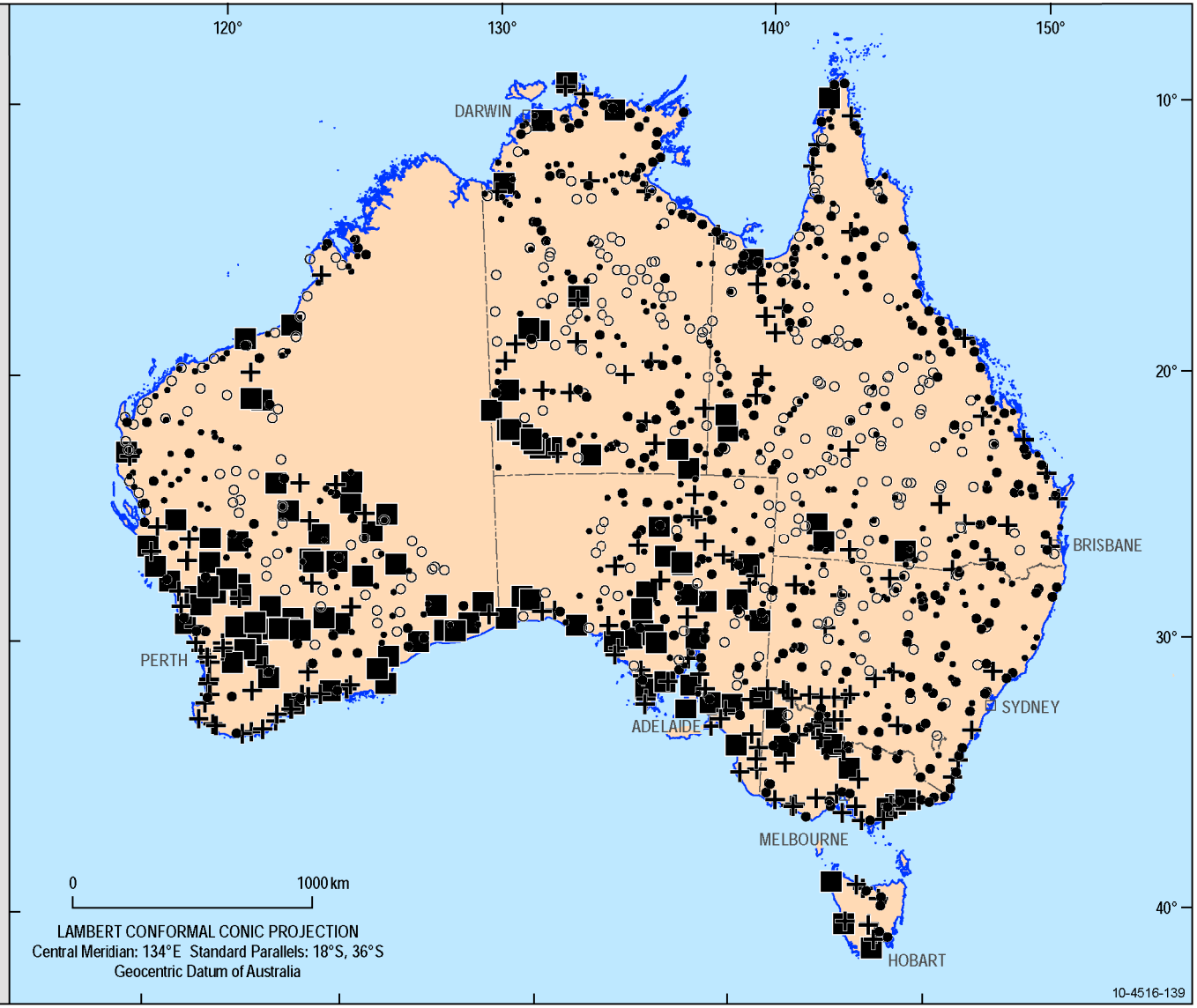
25%: *39 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 10 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Co

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1187

Maximum: *71.9 mg/kg*

Upper Fence: *41.8 mg/kg*

75%: *15.5 mg/kg*

Median: *11.3 mg/kg*

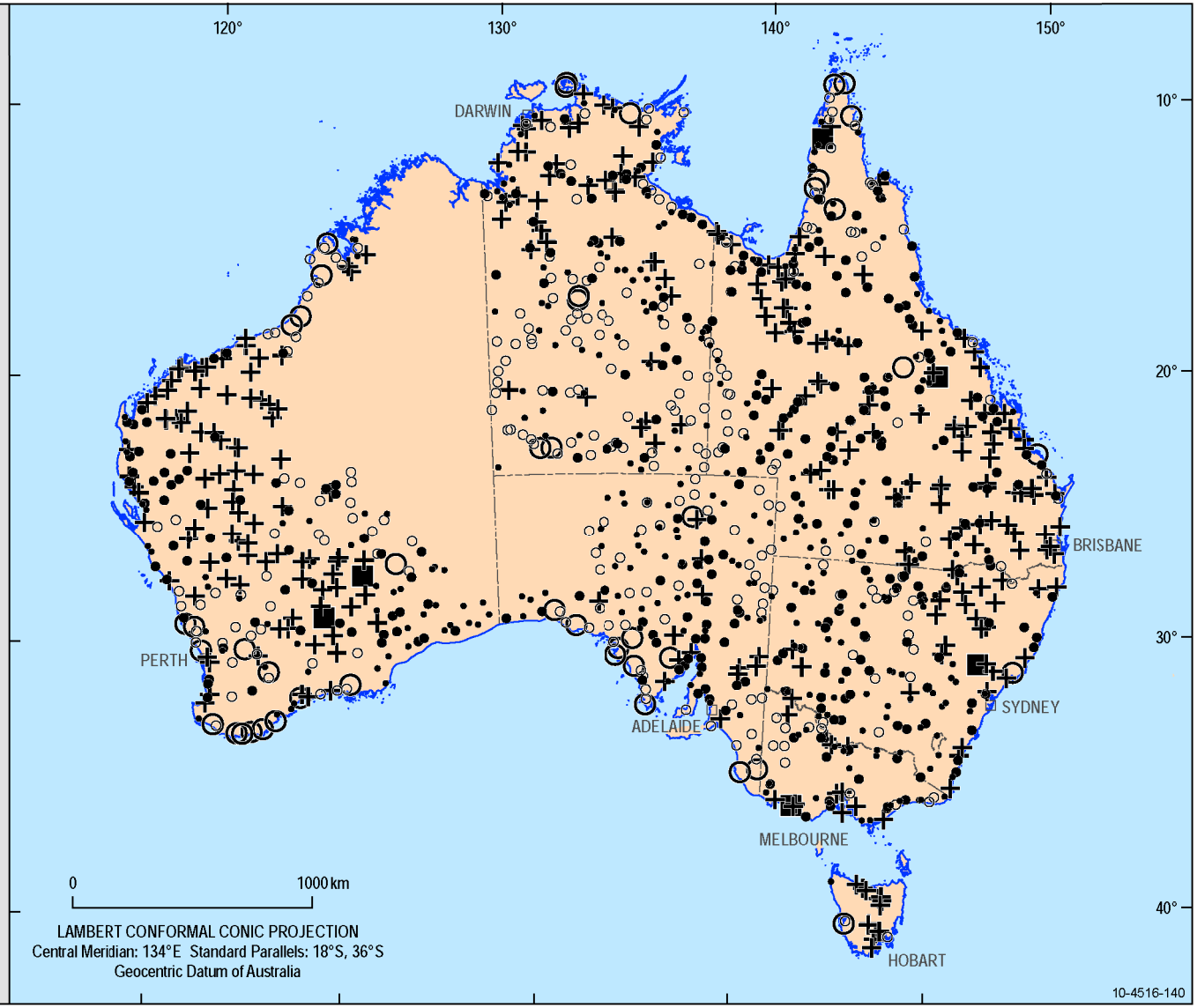
25%: *8 mg/kg*

Lower Fence: *3 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cr

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1187

Maximum: *1496.6 mg/kg*

Upper Fence: *206.5 mg/kg*

75%: *90.7 mg/kg*

Median: *65.9 mg/kg*

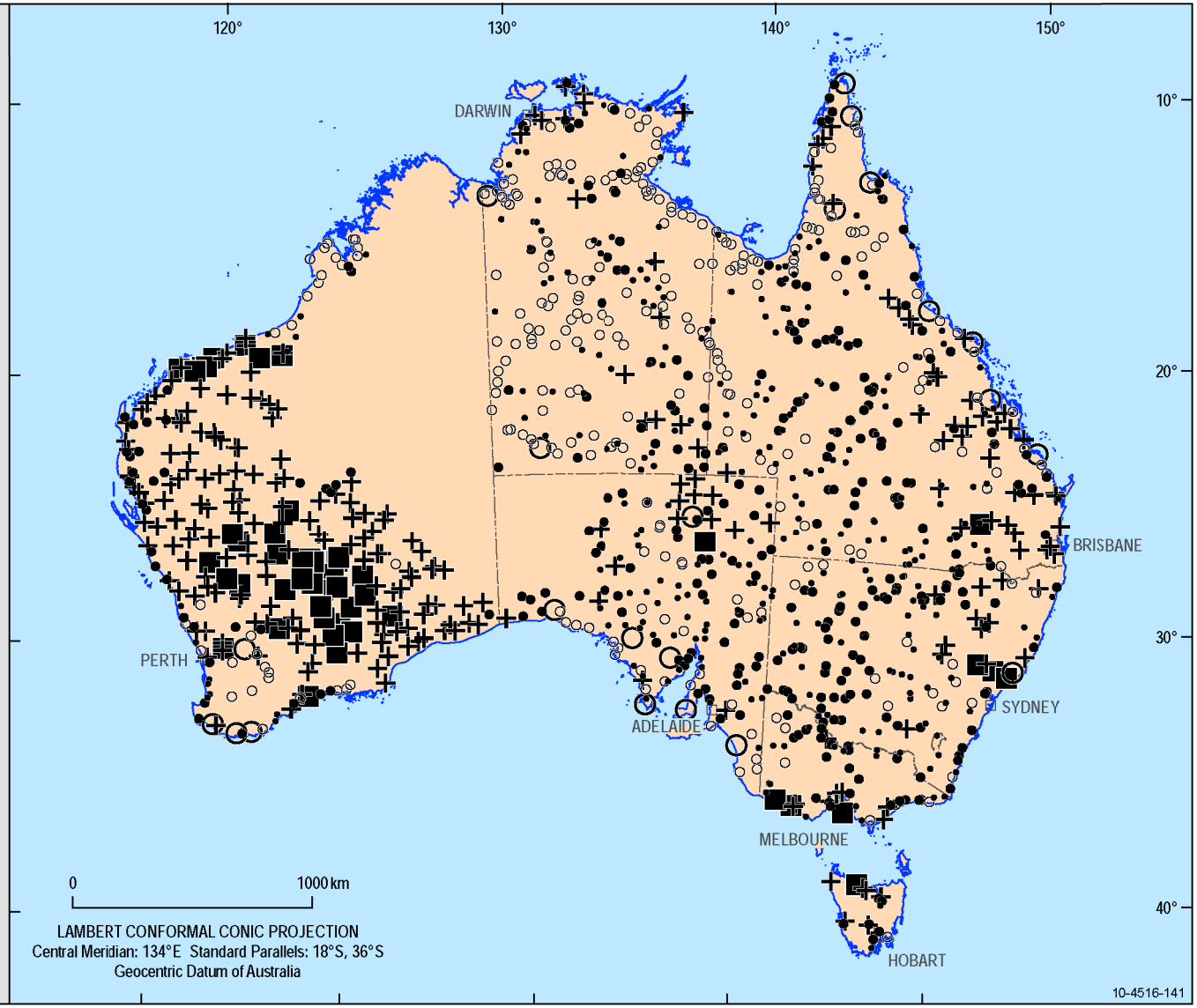
25%: *52.4 mg/kg*

Lower Fence: *23 mg/kg*

Minimum: *4.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cs

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1187

Maximum: *13.6 mg/kg*

Upper Fence: *12.4 mg/kg*

75%: *4.6 mg/kg*

Median: *3.3 mg/kg*

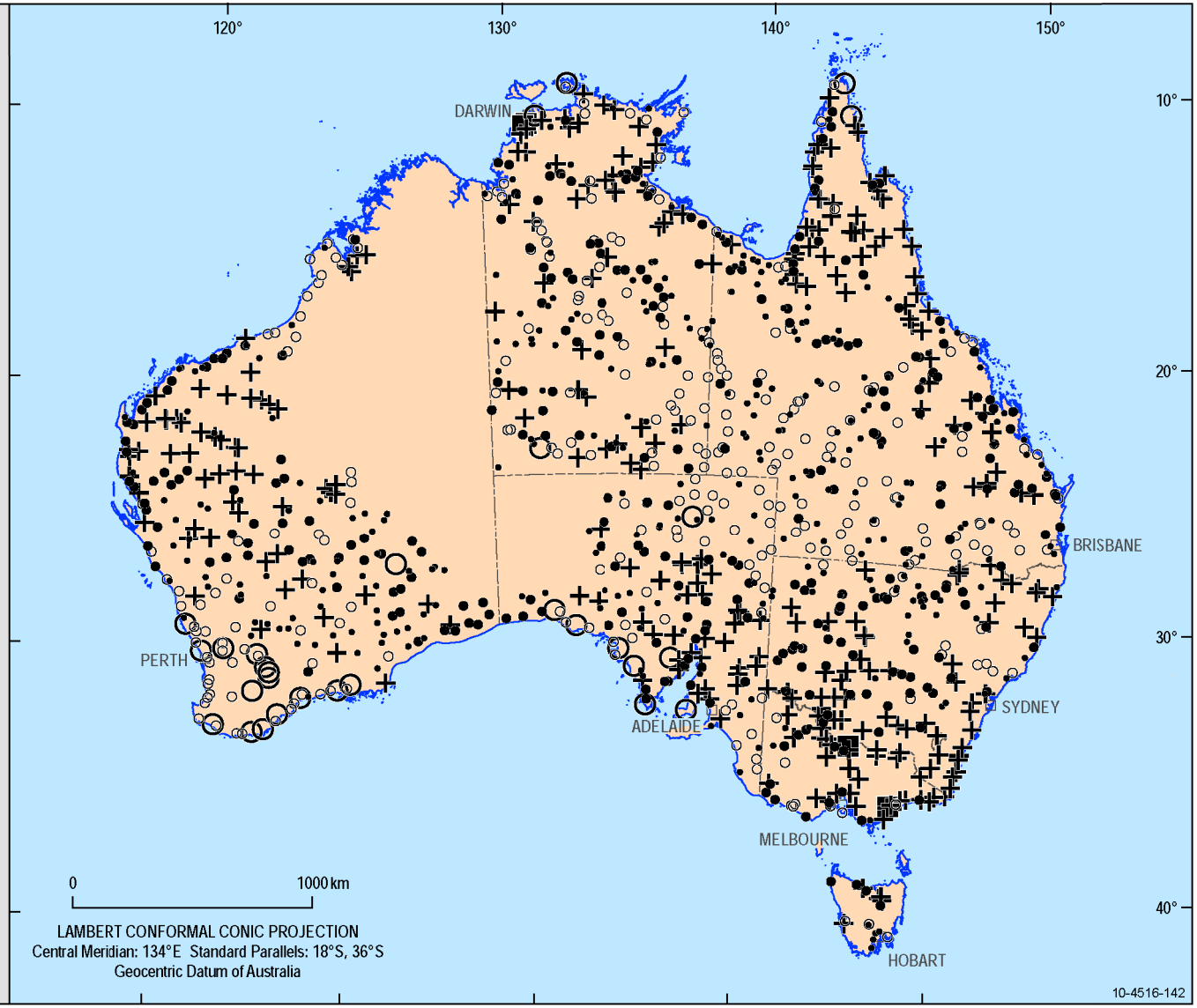
25%: *2.3 mg/kg*

Lower Fence: *0.9 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cu

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1187

Maximum: *159.4 mg/kg*

Upper Fence: *70 mg/kg*

75%: *26.3 mg/kg*

Median: *19.3 mg/kg*

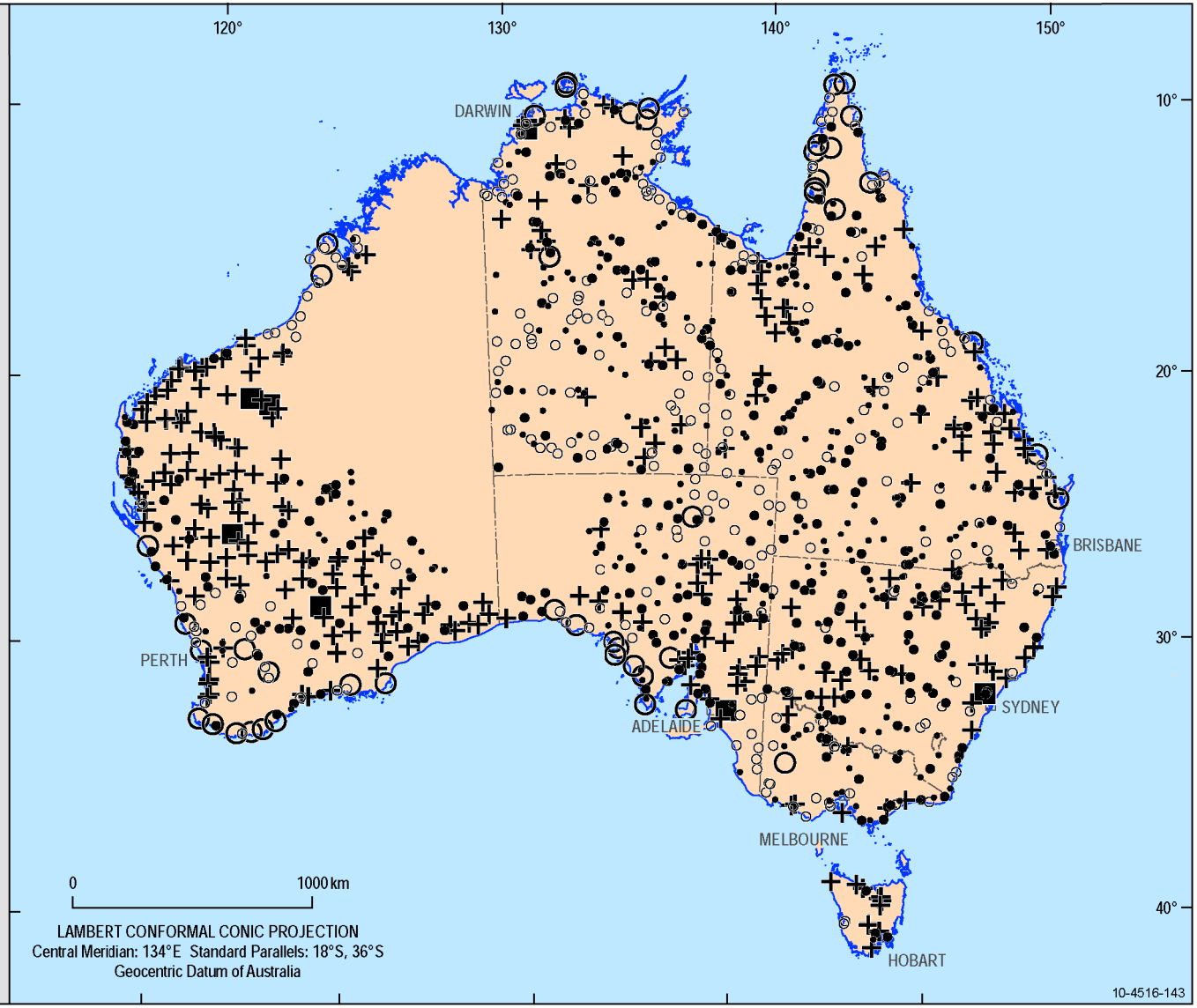
25%: *13.7 mg/kg*

Lower Fence: *5.2 mg/kg*

Minimum: *Less than 0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Dy

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1187

Maximum: *100.9 mg/kg*

Upper Fence: *11 mg/kg*

75%: *6.4 mg/kg*

Median: *5.3 mg/kg*

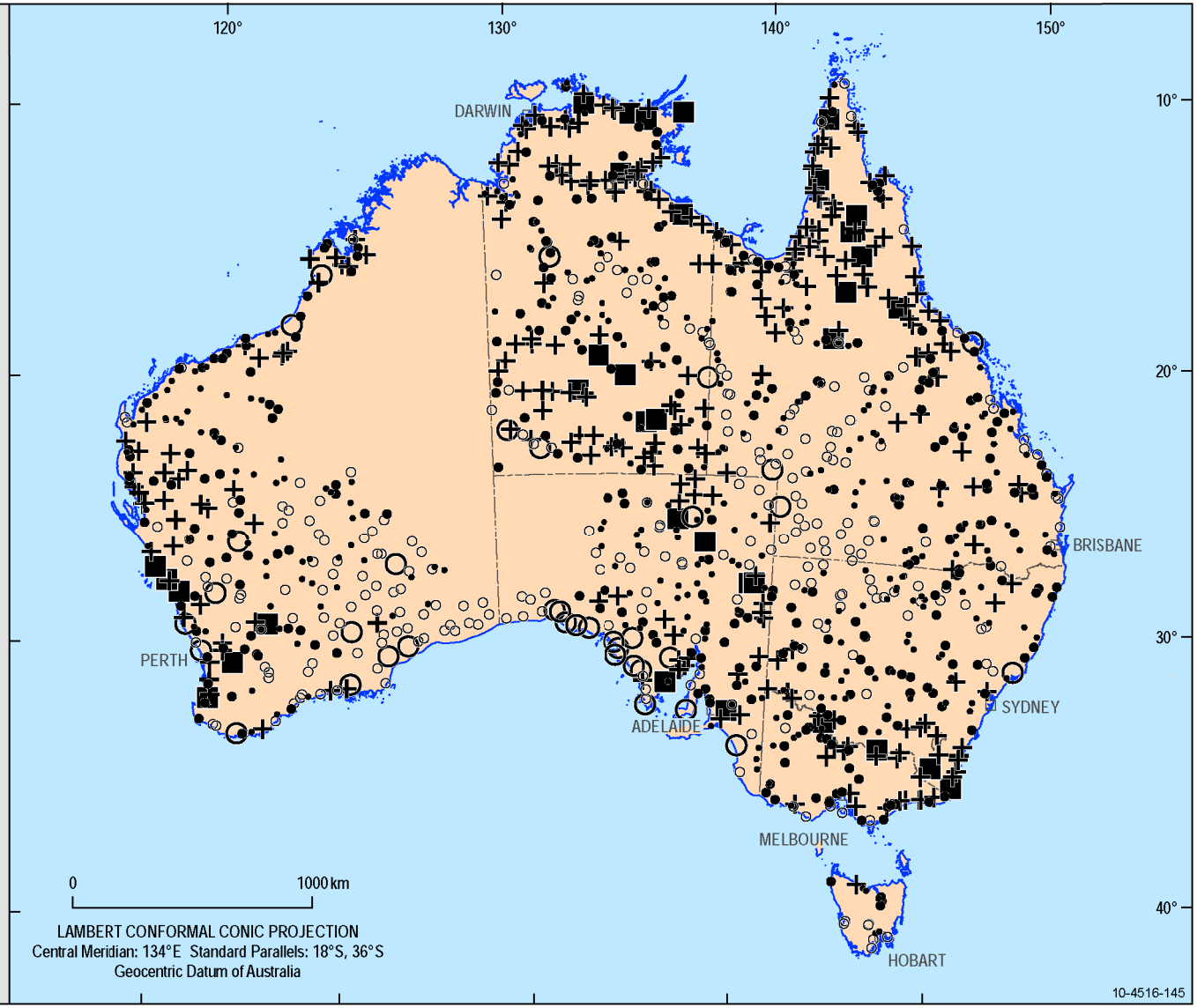
25%: *4.5 mg/kg*

Lower Fence: *2.6 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Er

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1187

Maximum: *49.65 mg/kg*

Upper Fence: *6.89 mg/kg*

75%: *4.06 mg/kg*

Median: *3.35 mg/kg*

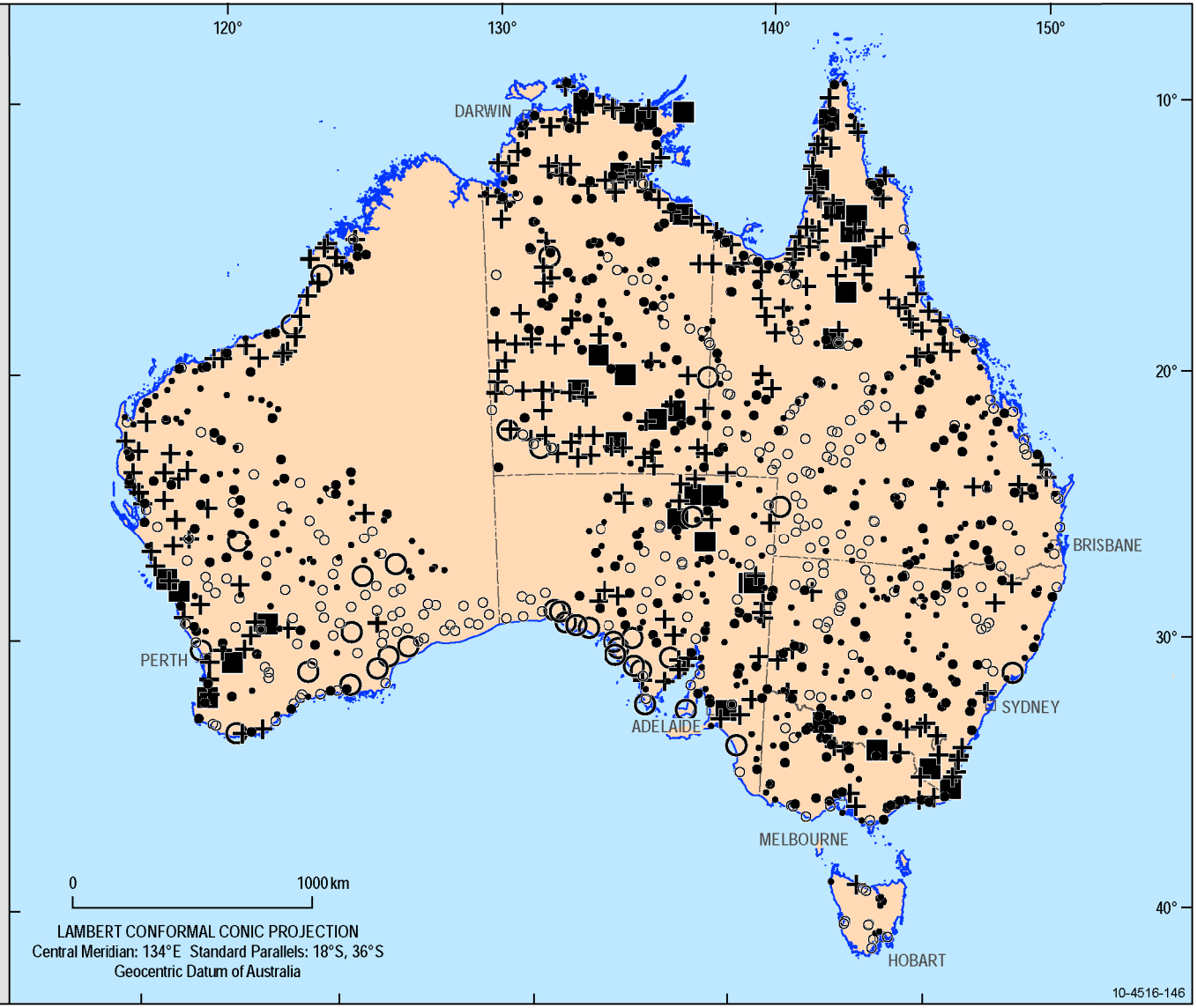
25%: *2.85 mg/kg*

Lower Fence: *1.68 mg/kg*

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Eu

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1187

Maximum: *29.29 mg/kg*

Upper Fence: *2.41 mg/kg*

75%: *1.36 mg/kg*

Median: *1.14 mg/kg*

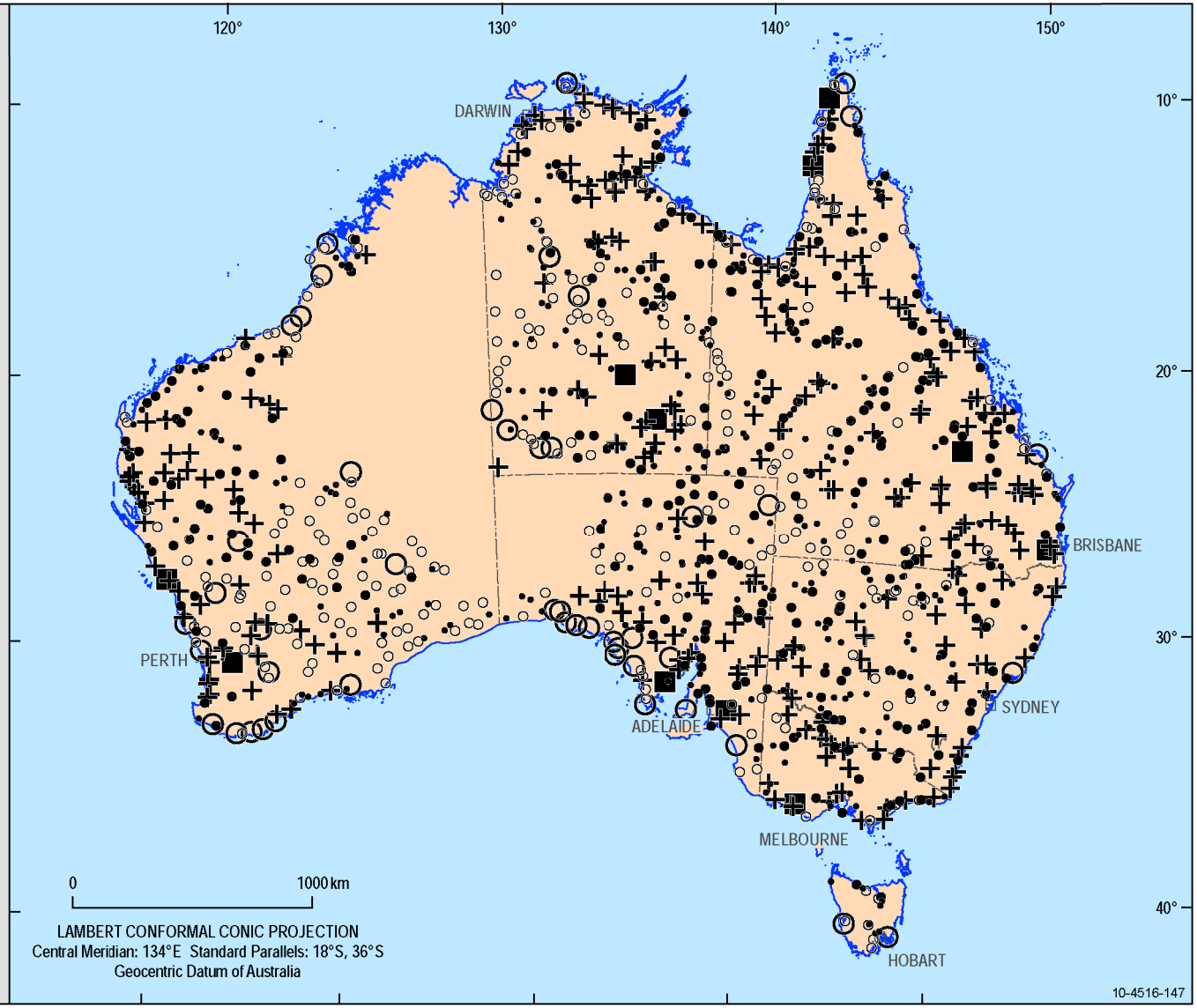
25%: *0.93 mg/kg*

Lower Fence: *0.52 mg/kg*

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

F

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Alkaline Fusion
Analysis: ISE
Detection Limit: 20 mg/kg
N: 1191

Maximum: *3200 mg/kg*

Upper Fence: *882 mg/kg*

75%: *340 mg/kg*

Median: *240 mg/kg*

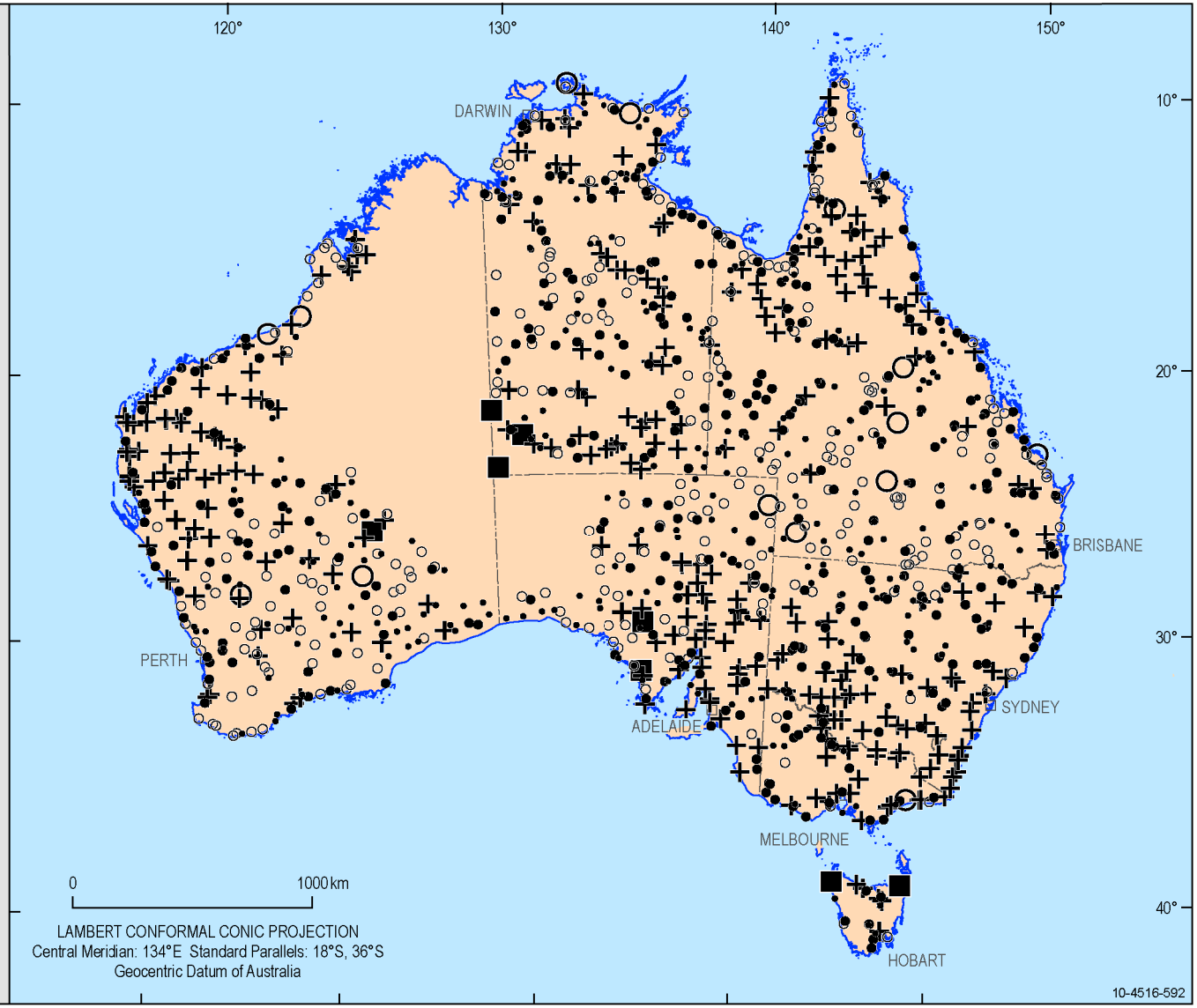
25%: *180 mg/kg*

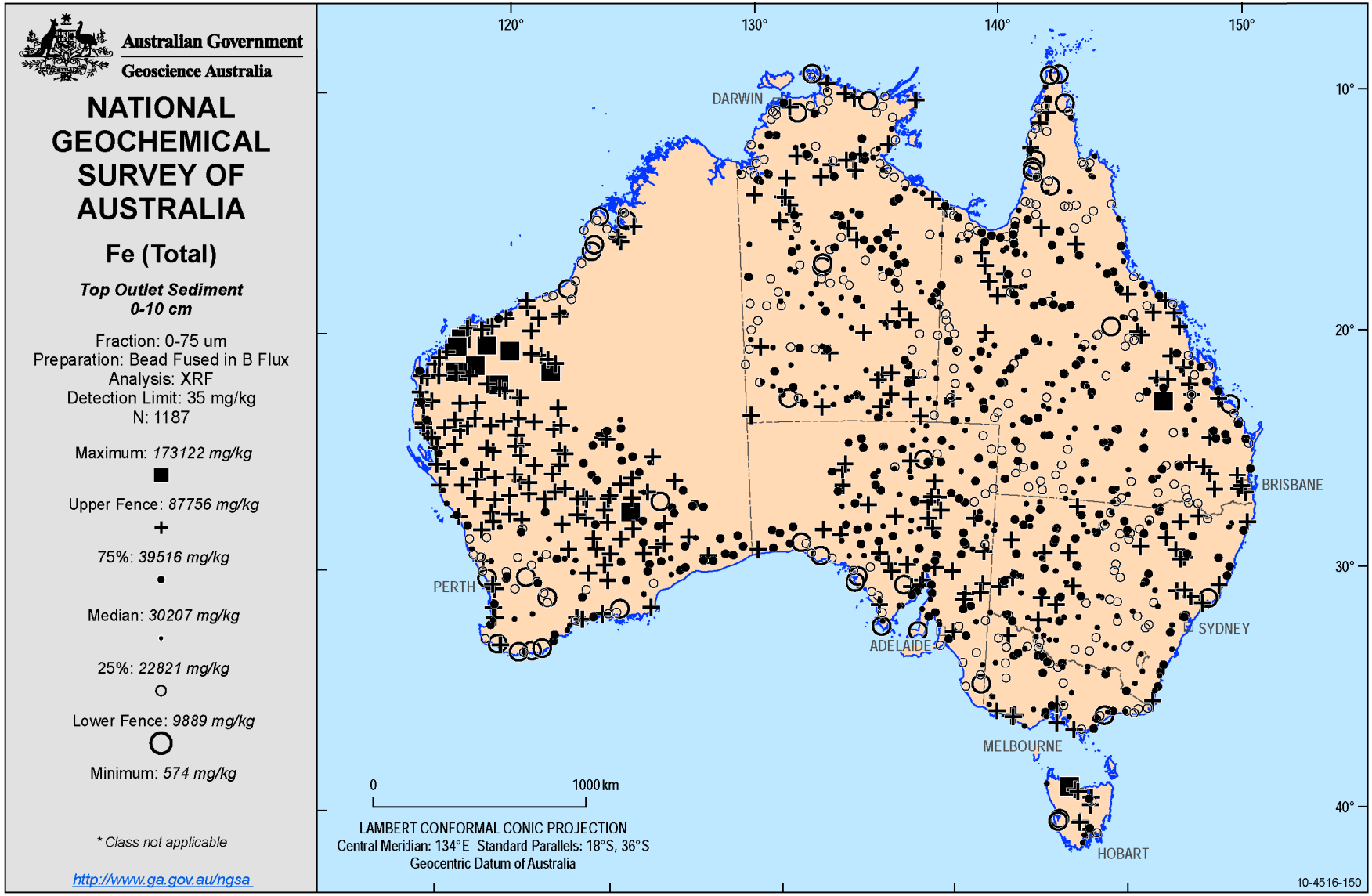
Lower Fence: *69 mg/kg*

Minimum: *40 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Fe (Total)
Top Outlet Sediment
0-10 cm
Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 35 mg/kg
N: 1187
Maximum: 173122 mg/kg
Upper Fence: 87756 mg/kg
75%: 39516 mg/kg
Median: 30207 mg/kg
25%: 22821 mg/kg
Lower Fence: 9889 mg/kg
Minimum: 574 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-150

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ga

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1187

Maximum: *29.2 mg/kg*

Upper Fence: *N/A**

75%: *16.2 mg/kg*

Median: *13.3 mg/kg*

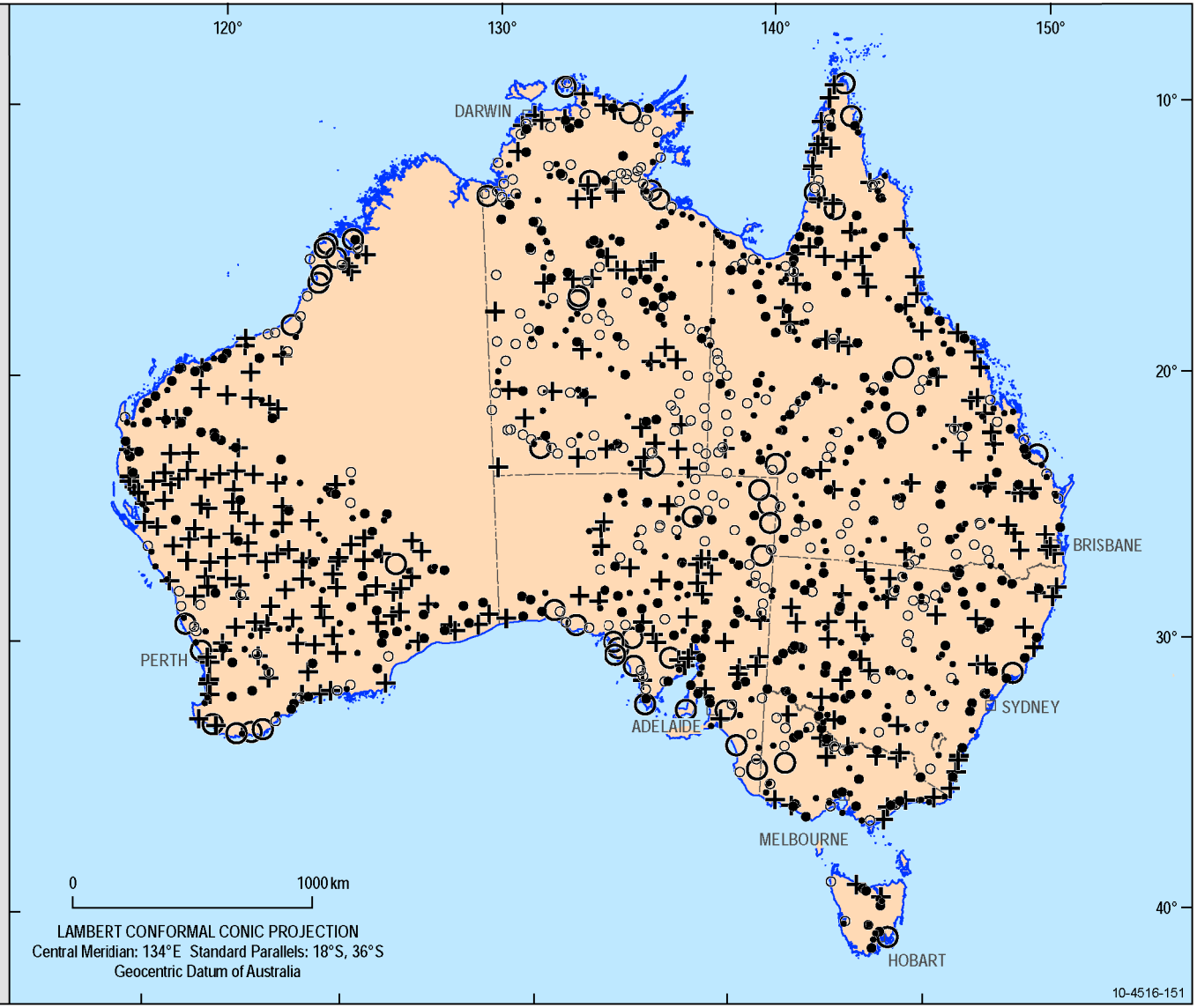
25%: *10.2 mg/kg*

Lower Fence: *5.1 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Gd

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1187

Maximum: *135.89 mg/kg*

Upper Fence: *11.9 mg/kg*

75%: *6.56 mg/kg*

Median: *5.37 mg/kg*

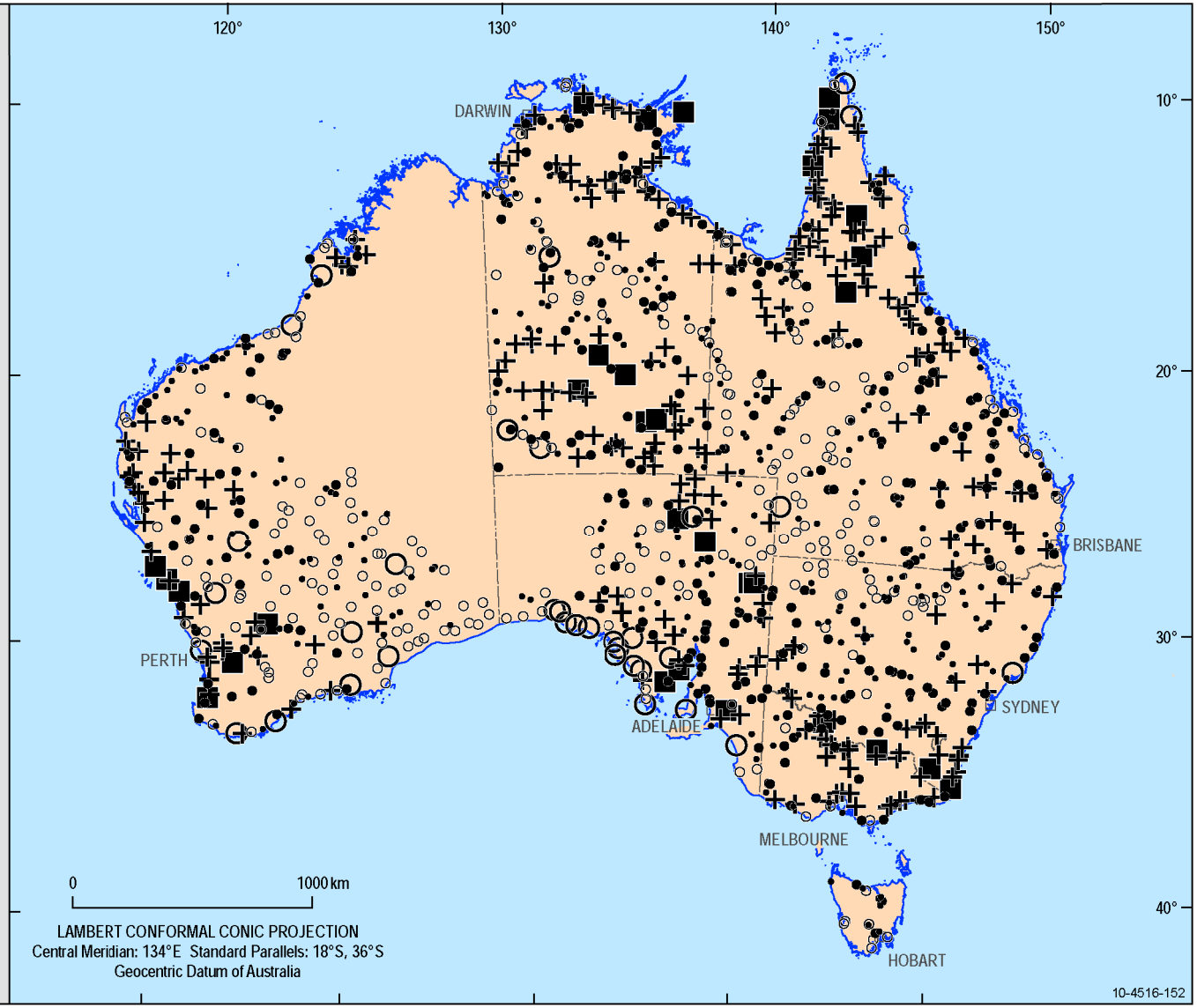
25%: *4.41 mg/kg*

Lower Fence: *2.43 mg/kg*

Minimum: *0.07 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ge

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1187

Maximum: *2.2 mg/kg*

Upper Fence: *0.96 mg/kg*

75%: *0.65 mg/kg*

Median: *0.57 mg/kg*

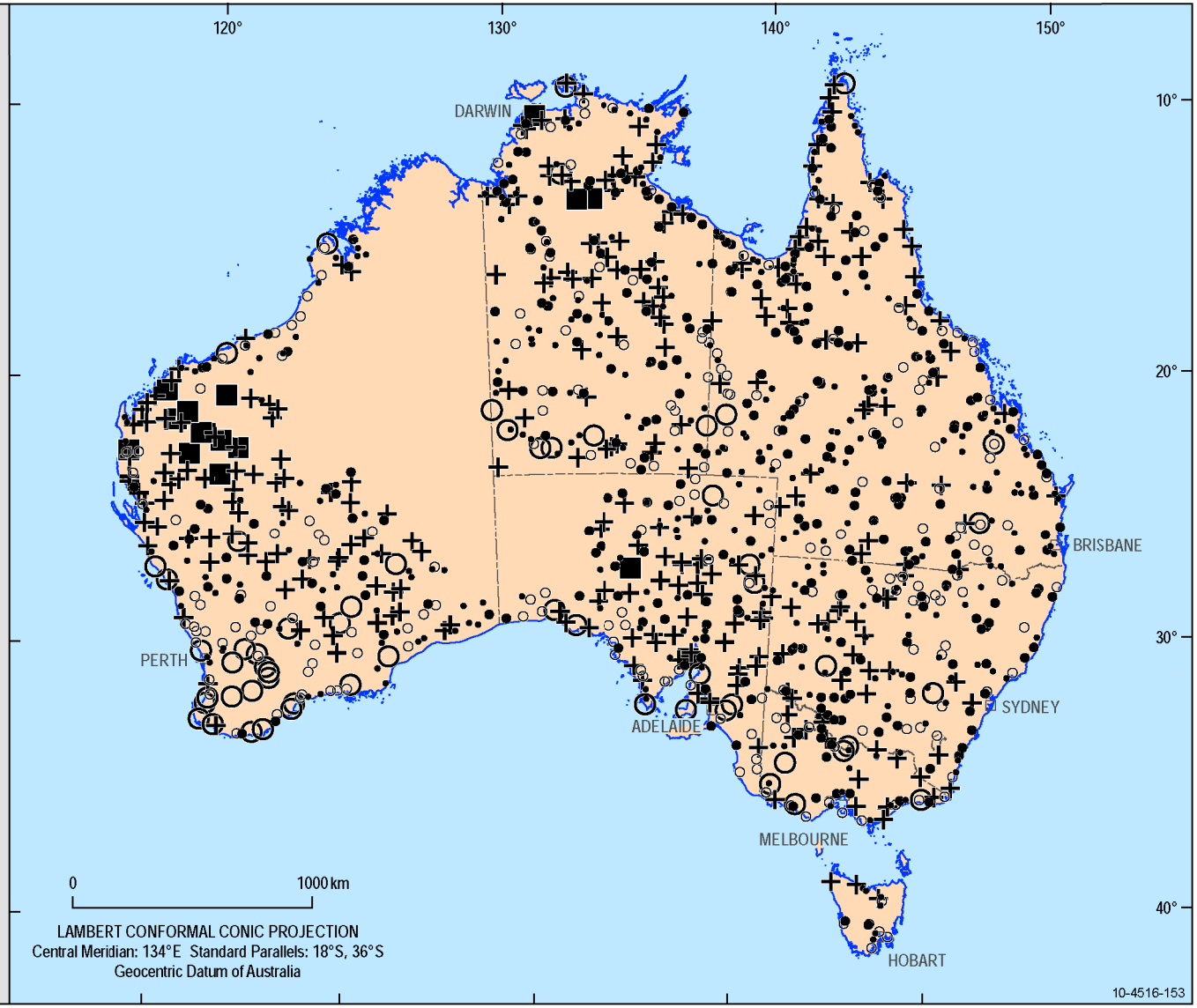
25%: *0.5 mg/kg*

Lower Fence: *0.34 mg/kg*

Minimum: *Less than 0.04 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Hf

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1187

Maximum: *433.47 mg/kg*

Upper Fence: *102.84 mg/kg*

75%: *27.94 mg/kg*

Median: *17.89 mg/kg*

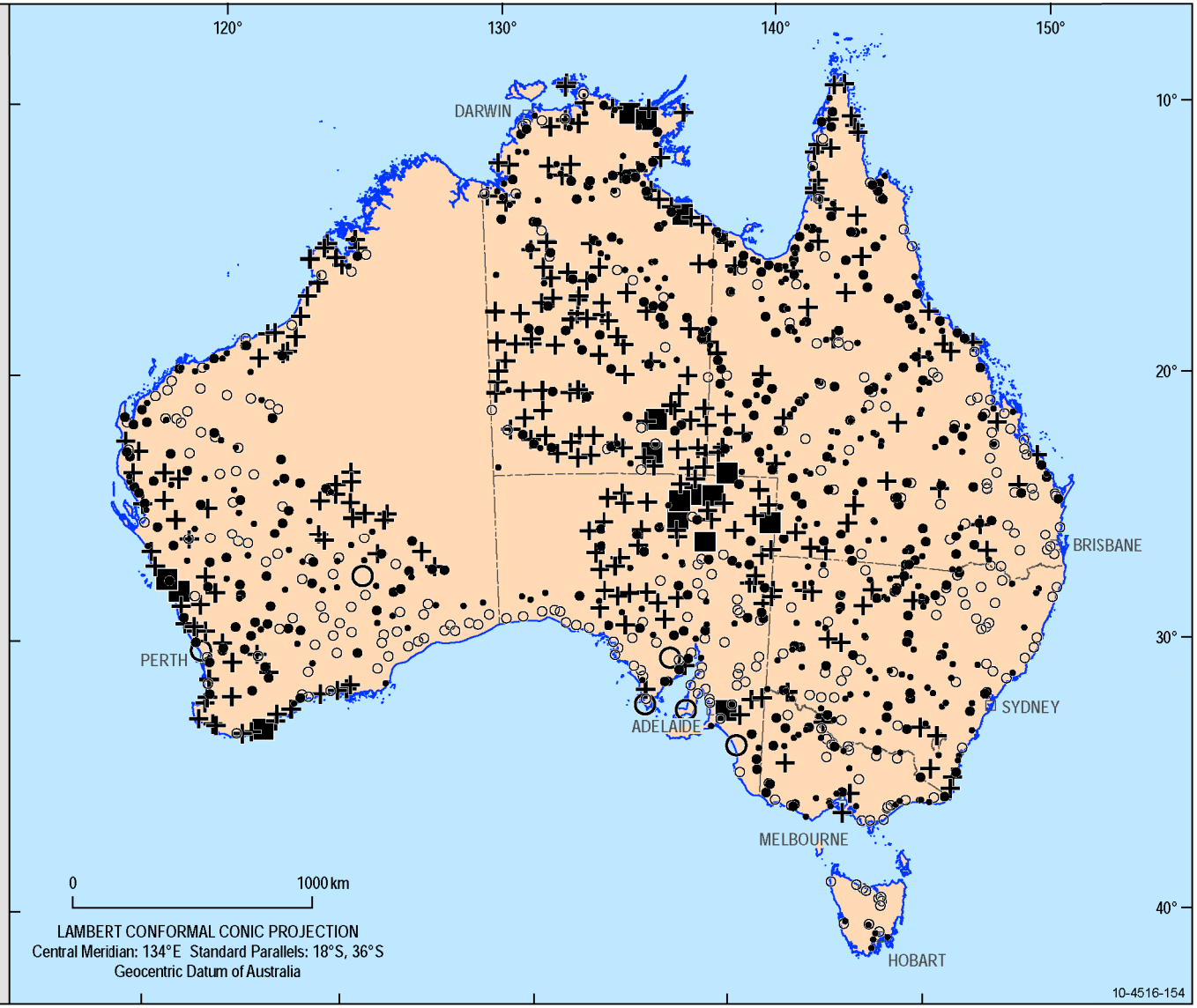
25%: *11.72 mg/kg*

Lower Fence: *3.18 mg/kg*

Minimum: *0.06 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ho

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1187

Maximum: *18.83 mg/kg*

Upper Fence: *2.37 mg/kg*

75%: *1.36 mg/kg*

Median: *1.12 mg/kg*

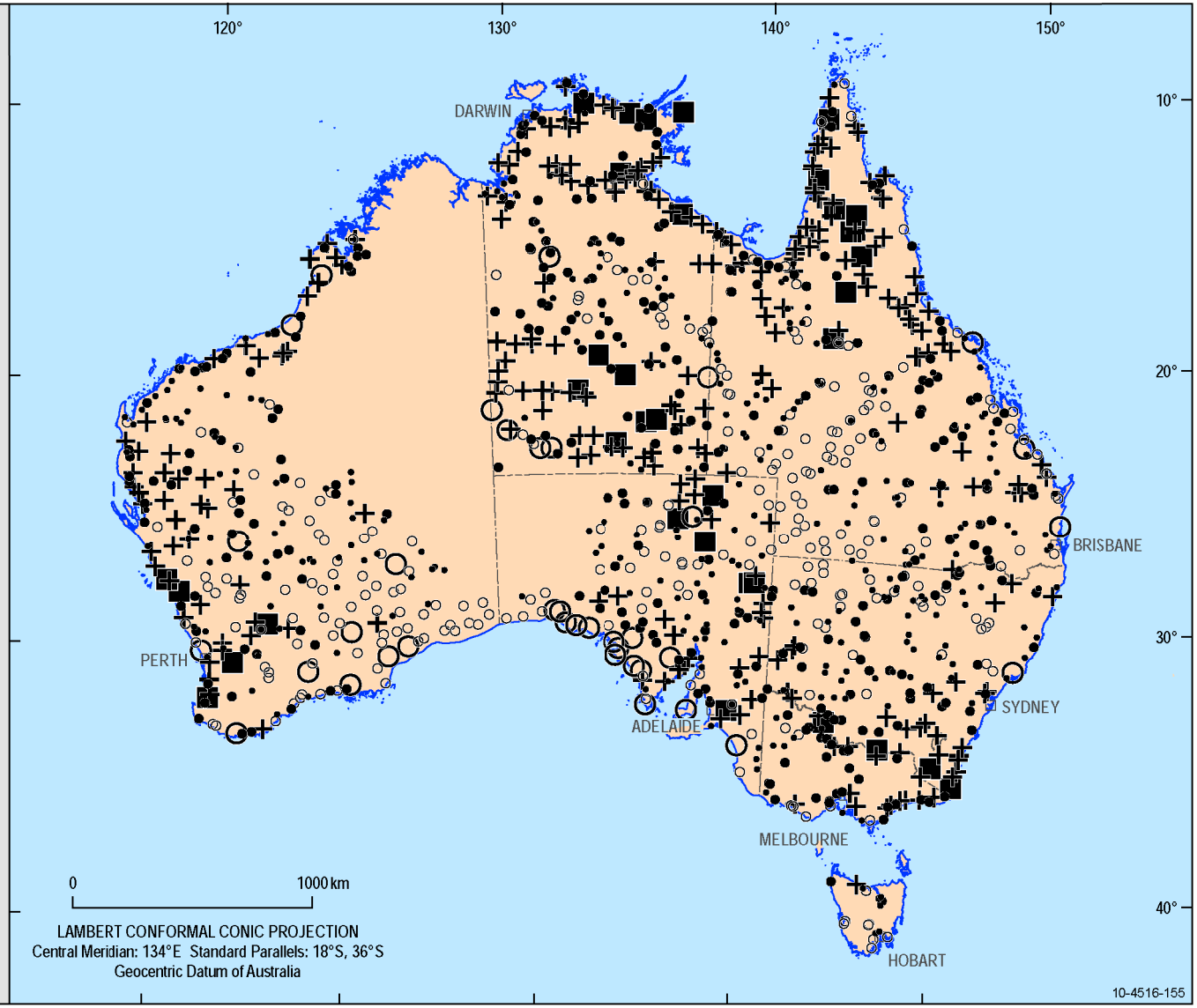
25%: *0.94 mg/kg*

Lower Fence: *0.54 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

K

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 42 mg/kg
N: 1187

Maximum: *41621 mg/kg*

Upper Fence: *39905 mg/kg*

75%: *16511 mg/kg*

Median: *13124 mg/kg*

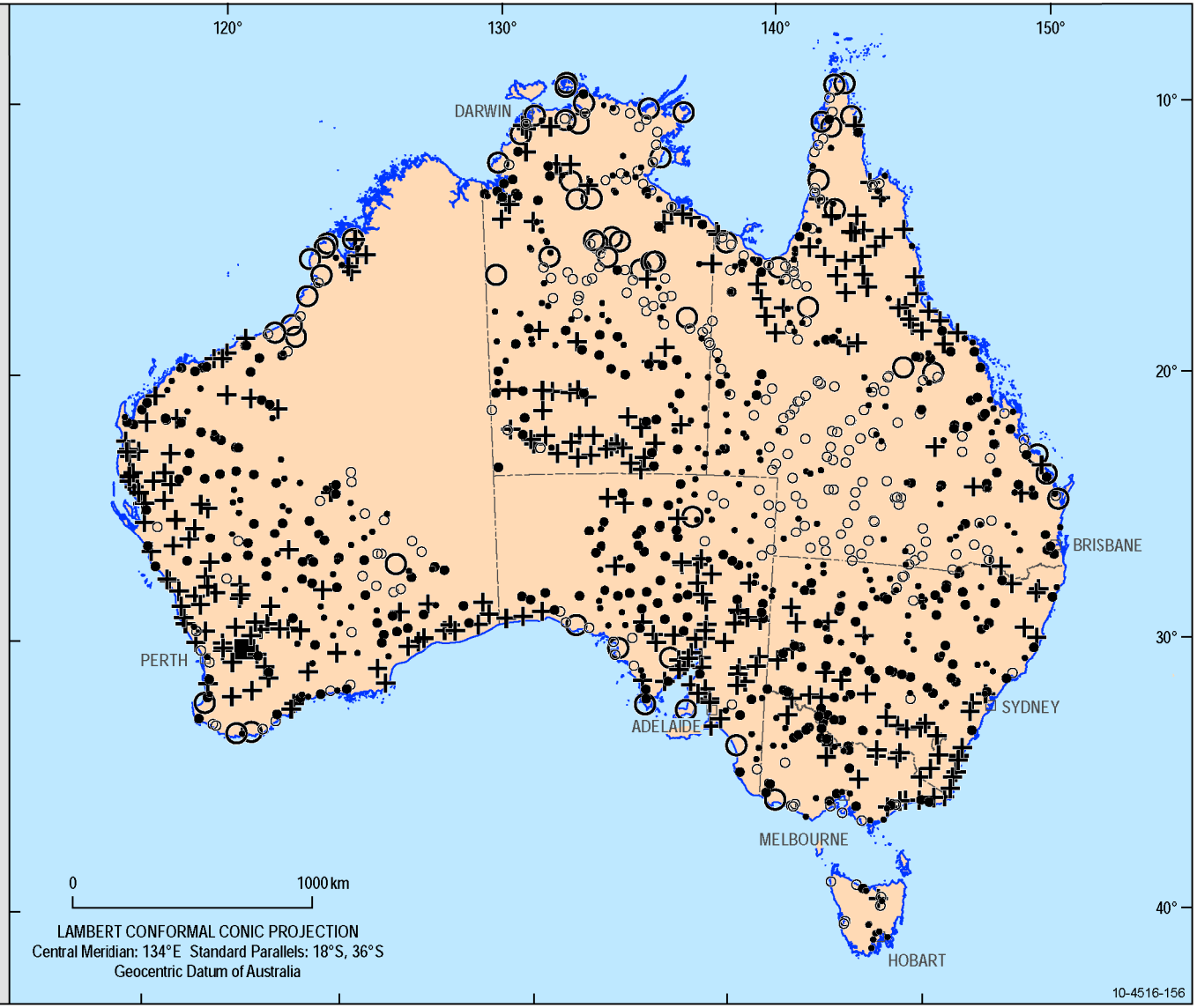
25%: *9090 mg/kg*

Lower Fence: *3692 mg/kg*

Minimum: *58 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

La

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1187

Maximum: *1462.1 mg/kg*

Upper Fence: *88.1 mg/kg*

75%: *41.8 mg/kg*

Median: *31.9 mg/kg*

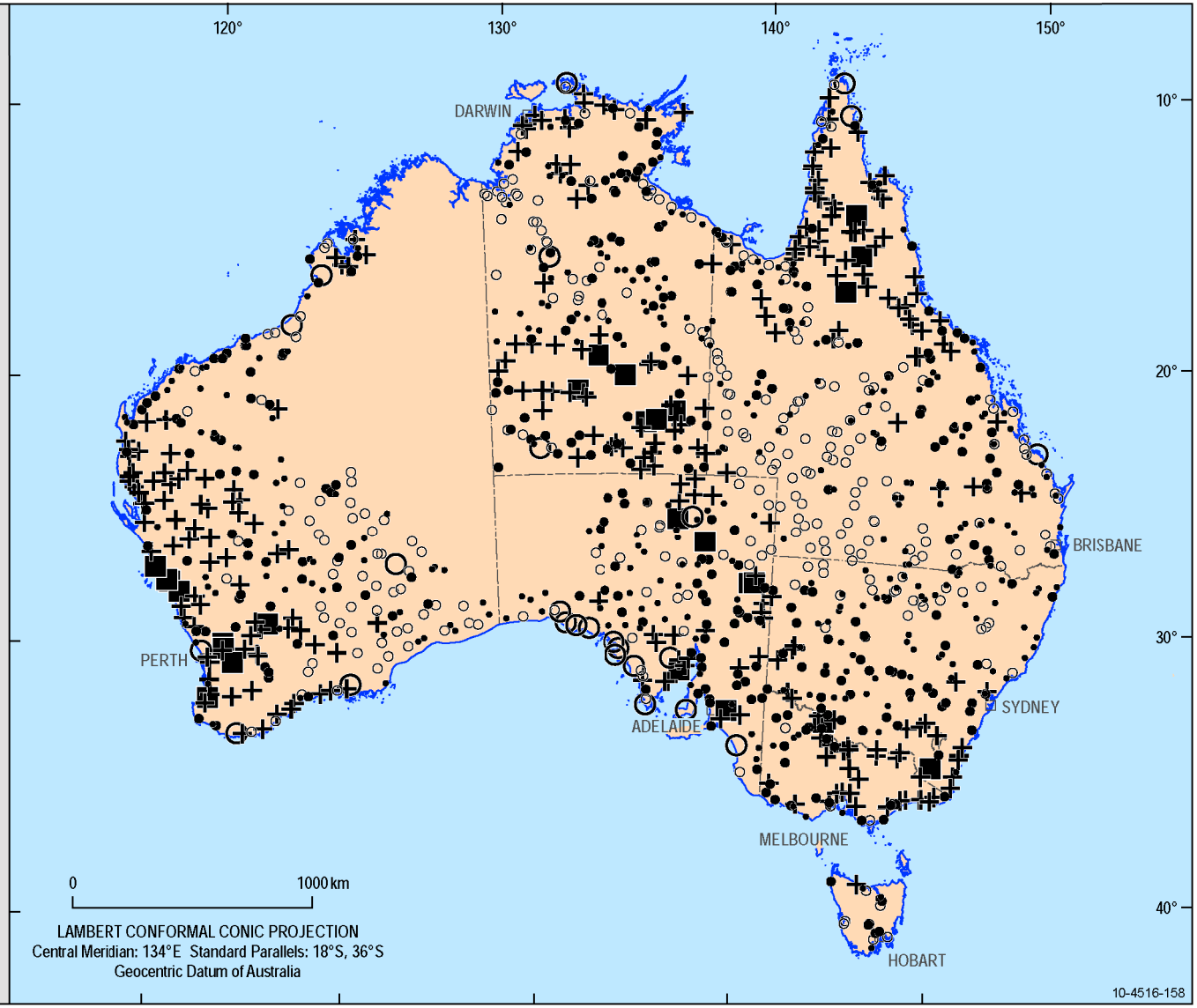
25%: *25.5 mg/kg*

Lower Fence: *12.1 mg/kg*

Minimum: *0.5 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

LOI_C

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: N/A
Analysis: Calculated from XRF
Detection Limit: N/A
N: 1170

Maximum: *530810 mg/kg*

Upper Fence: *292894 mg/kg*

75%: *117350 mg/kg*

Median: *85850 mg/kg*

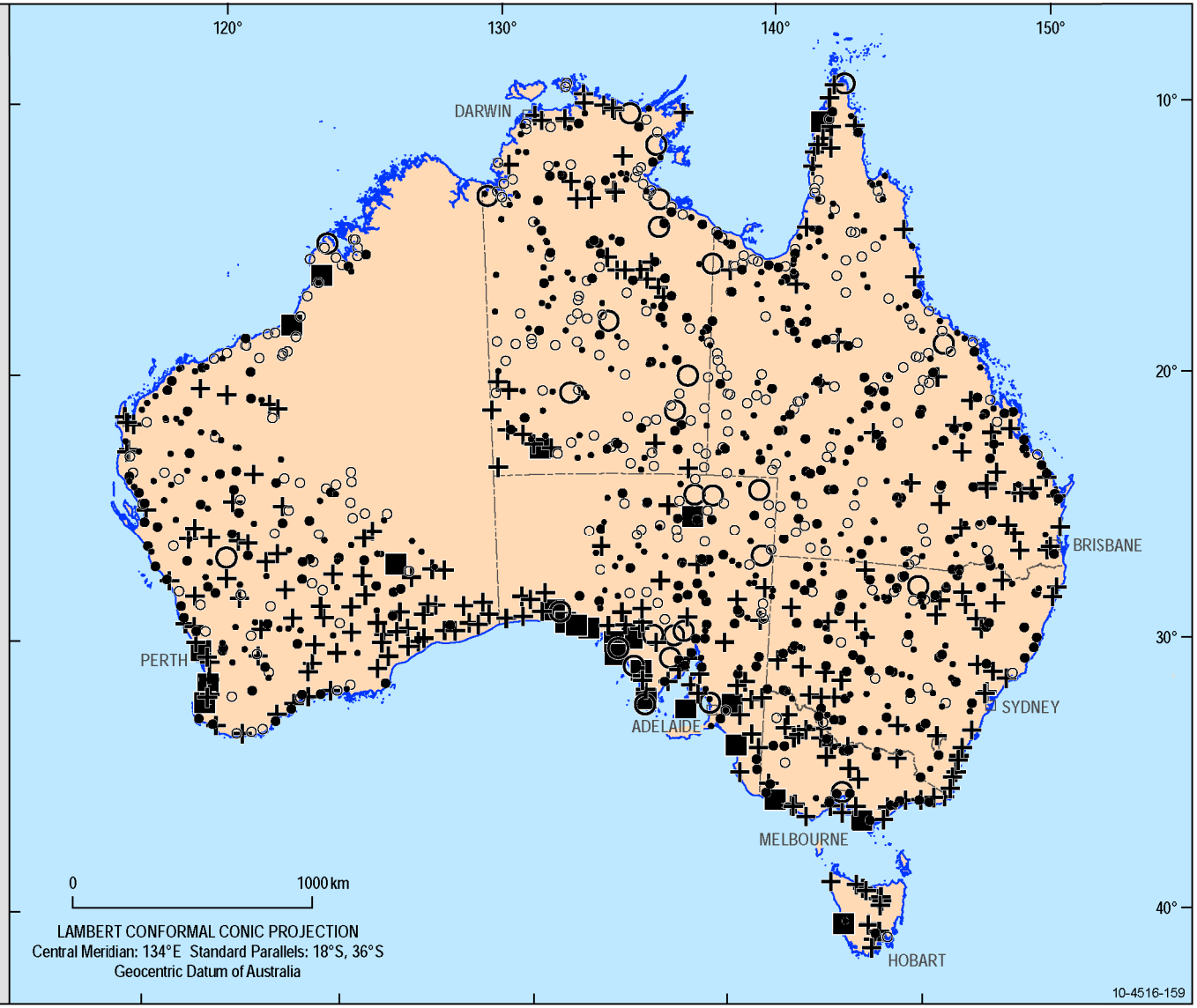
25%: *58670 mg/kg*

Lower Fence: *19613 mg/kg*

Minimum: *0 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Lu

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1187

Maximum: *7.73 mg/kg*

Upper Fence: *1.35 mg/kg*

75%: *0.68 mg/kg*

Median: *0.54 mg/kg*

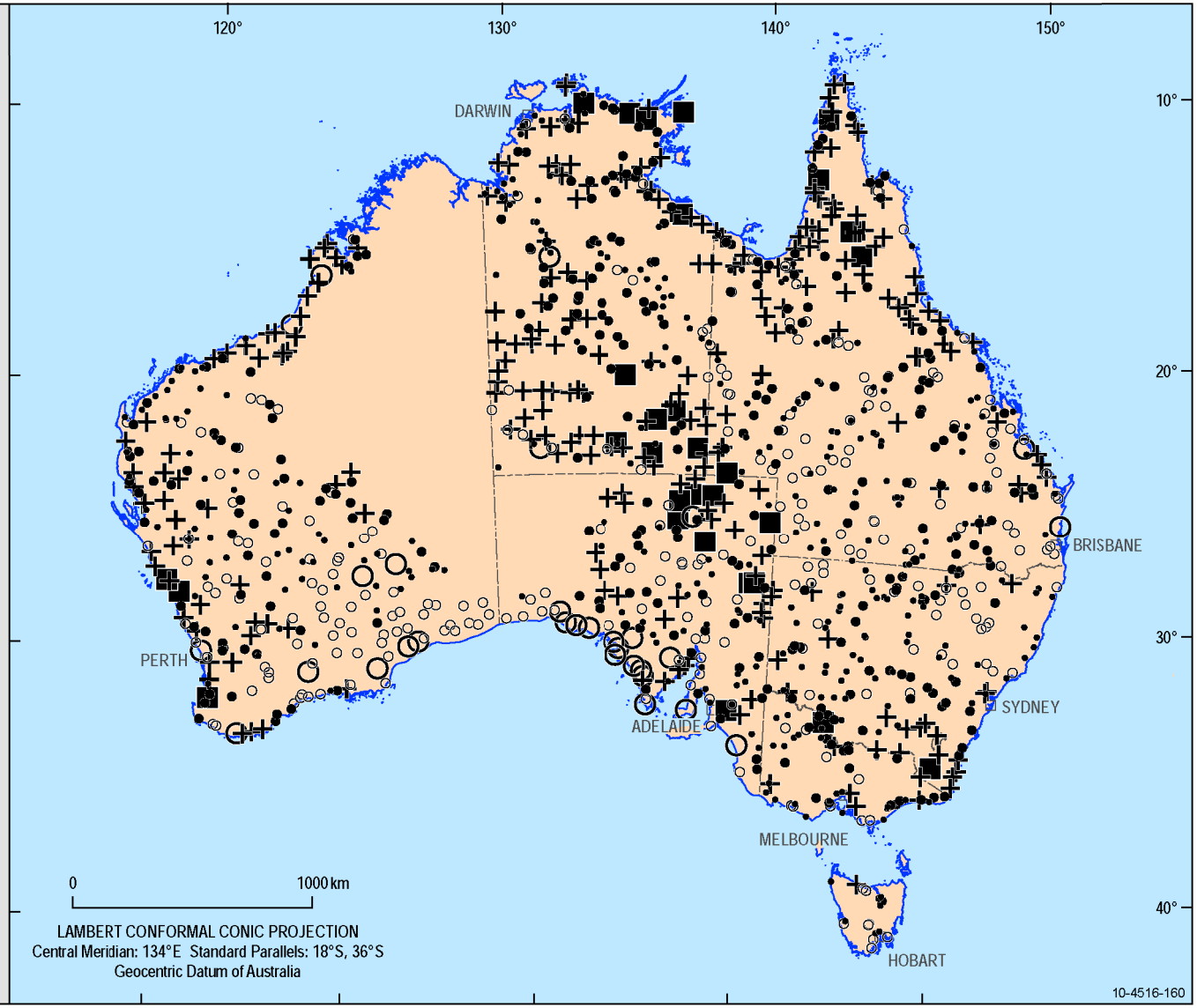
25%: *0.43 mg/kg*

Lower Fence: *0.22 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mg

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 60 mg/kg
N: 1187

Maximum: *74344 mg/kg*

Upper Fence: *31044 mg/kg*

75%: *6922 mg/kg*

Median: *4191 mg/kg*

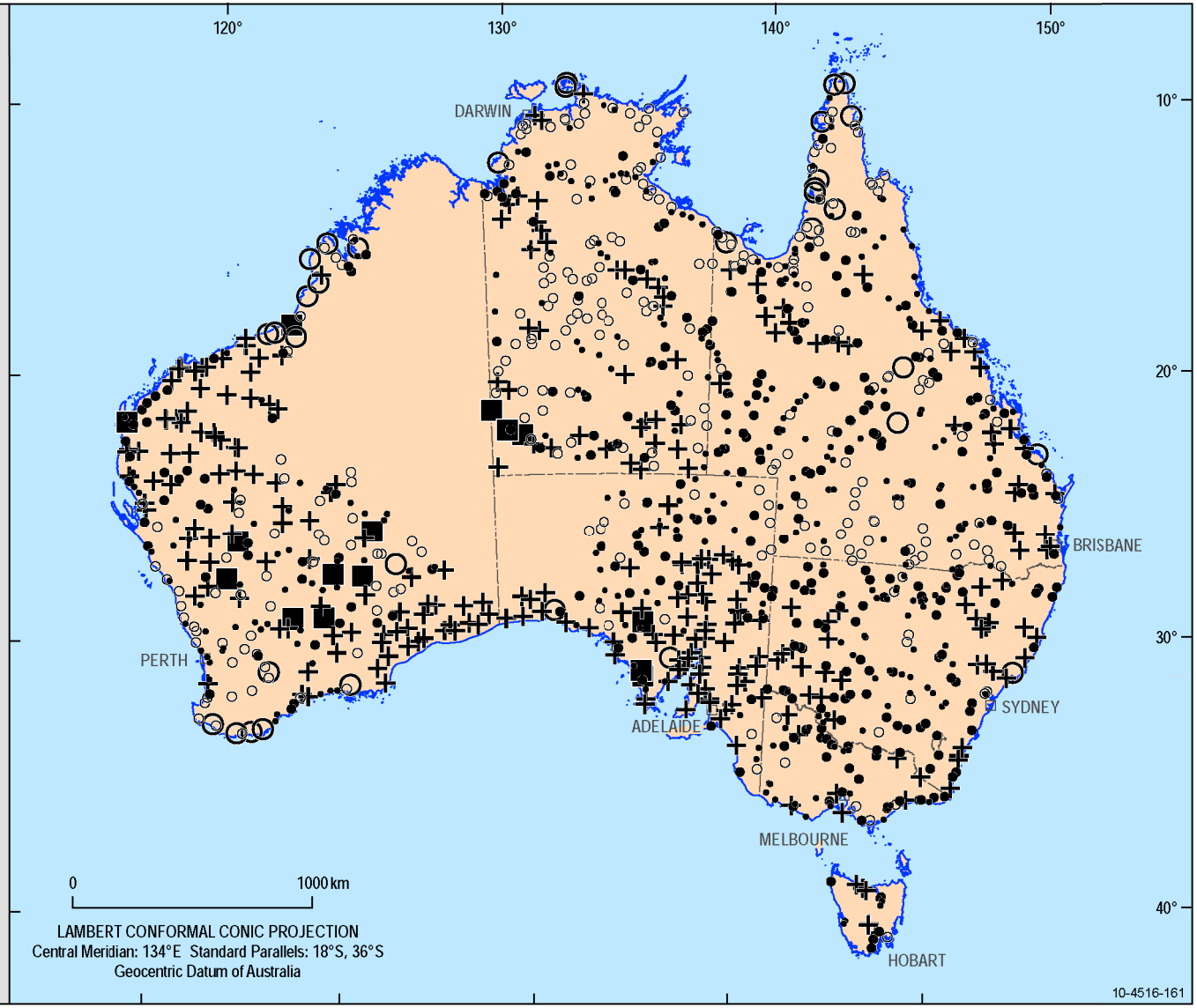
25%: *2515 mg/kg*

Lower Fence: *548 mg/kg*

Minimum: *Less than 60 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mn

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 39 mg/kg
N: 1187

Maximum: *2595 mg/kg*

Upper Fence: *2223 mg/kg*

75%: *682 mg/kg*

Median: *465 mg/kg*

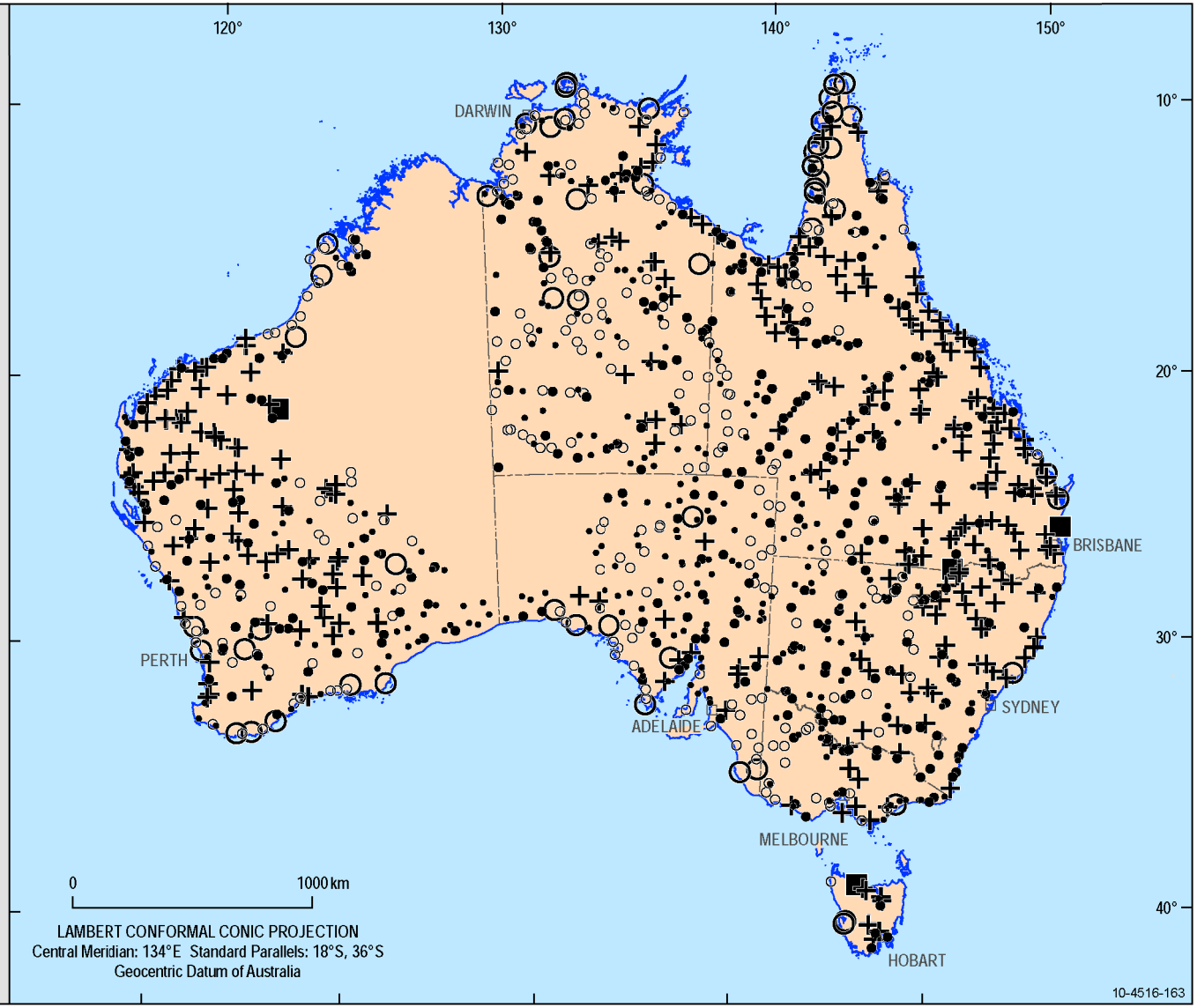
25%: *310 mg/kg*

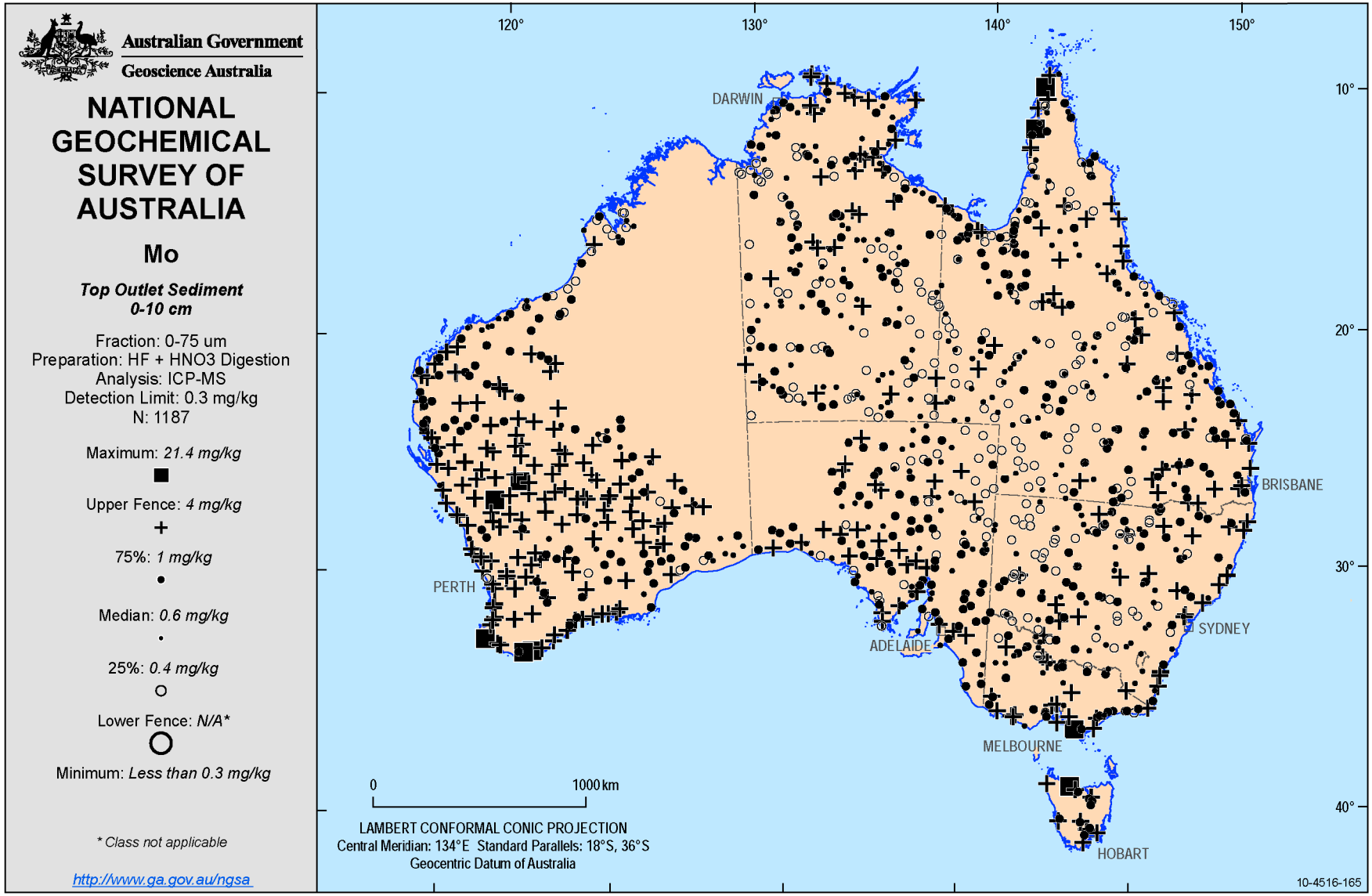
Lower Fence: *95 mg/kg*

Minimum: *Less than 39 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Mo
Top Outlet Sediment
0-10 cm
Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.3 mg/kg
N: 1187
Maximum: 21.4 mg/kg
Upper Fence: 4 mg/kg
75%: 1 mg/kg
Median: 0.6 mg/kg
25%: 0.4 mg/kg
Lower Fence: N/A*
Minimum: Less than 0.3 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
MELBOURNE
SYDNEY
BRISBANE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-165

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Na

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 74 mg/kg
N: 1187

Maximum: *32629 mg/kg*

Upper Fence: *N/A**

75%: *6054 mg/kg*

Median: *3405 mg/kg*

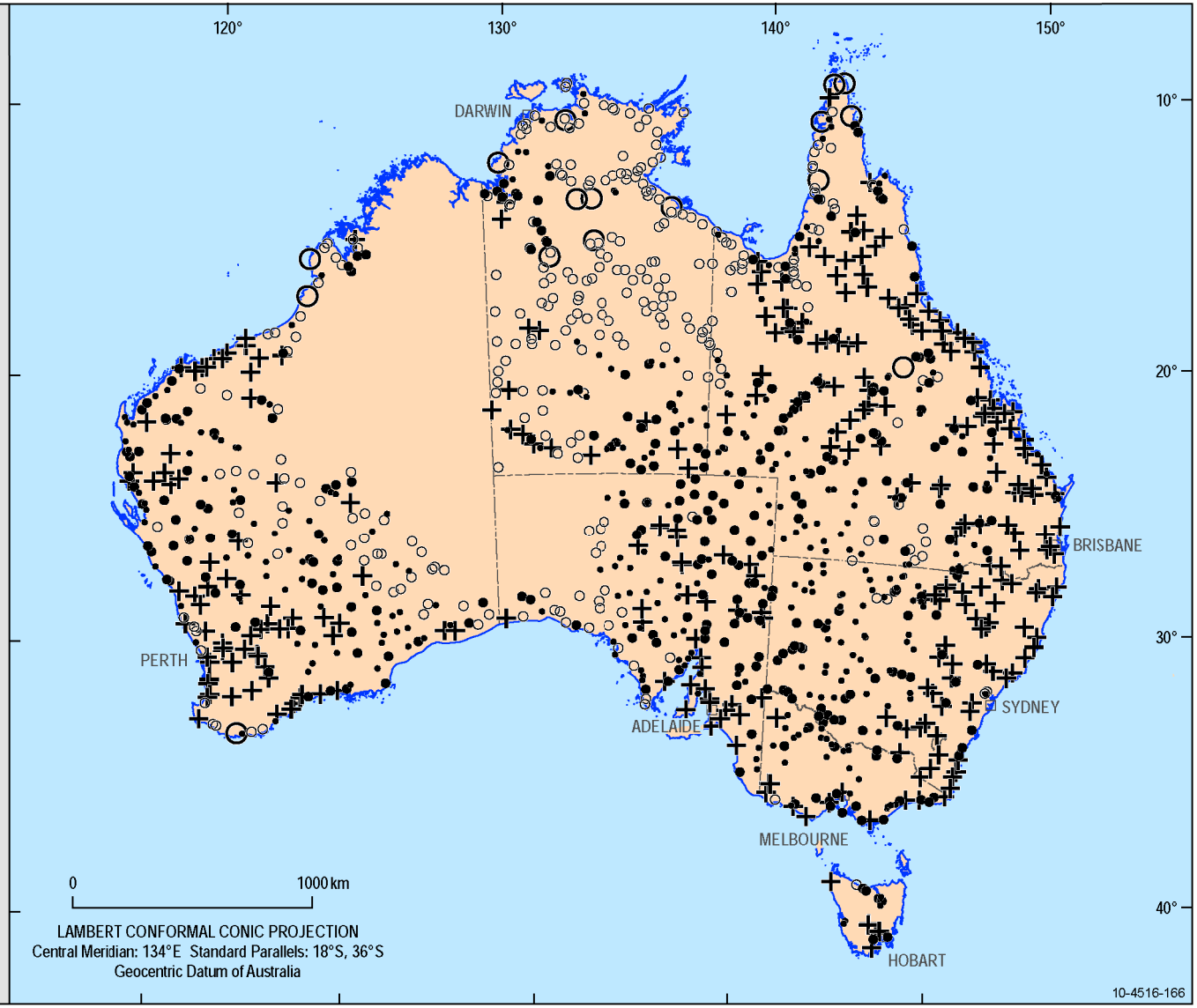
25%: *1543 mg/kg*

Lower Fence: *197 mg/kg*

Minimum: *Less than 74 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Nb

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1187

Maximum: *110.4 mg/kg*

Upper Fence: *31.21 mg/kg*

75%: *17.5 mg/kg*

Median: *14.2 mg/kg*

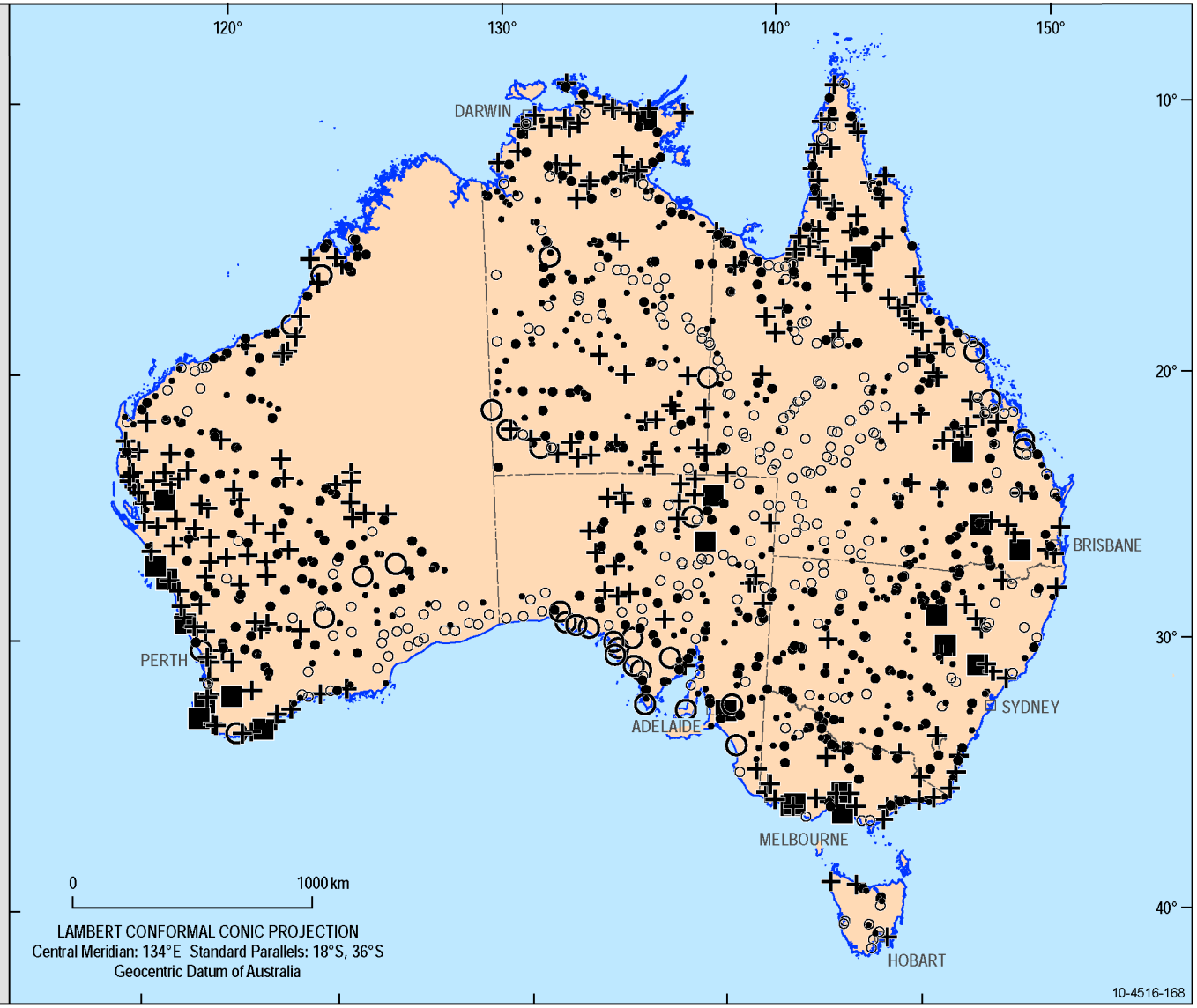
25%: *11.9 mg/kg*

Lower Fence: *6.67 mg/kg*

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Nd

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1187

Maximum: *1109.7 mg/kg*

Upper Fence: *69.8 mg/kg*

75%: *35.5 mg/kg*

Median: *28.1 mg/kg*

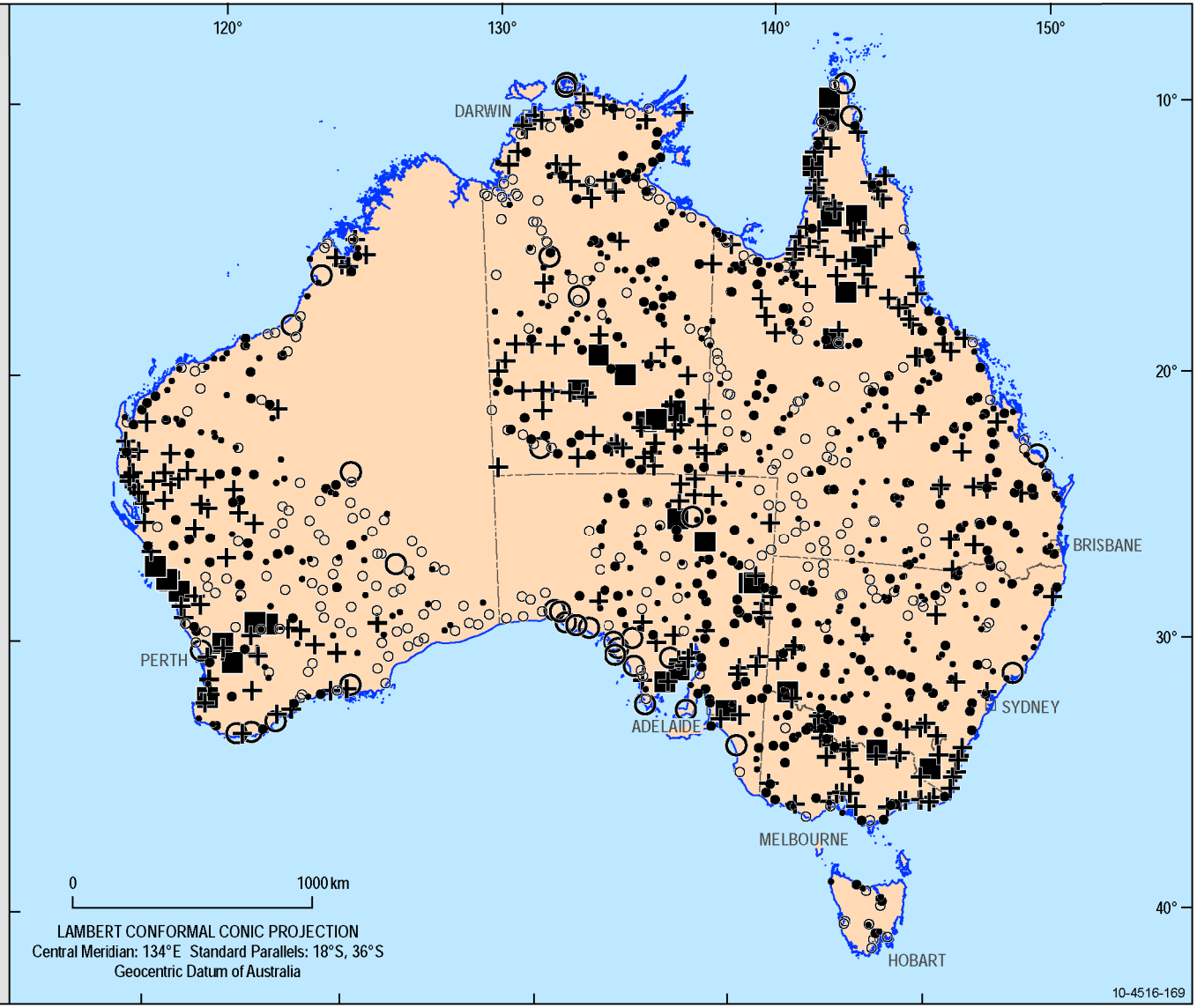
25%: *22.6 mg/kg*

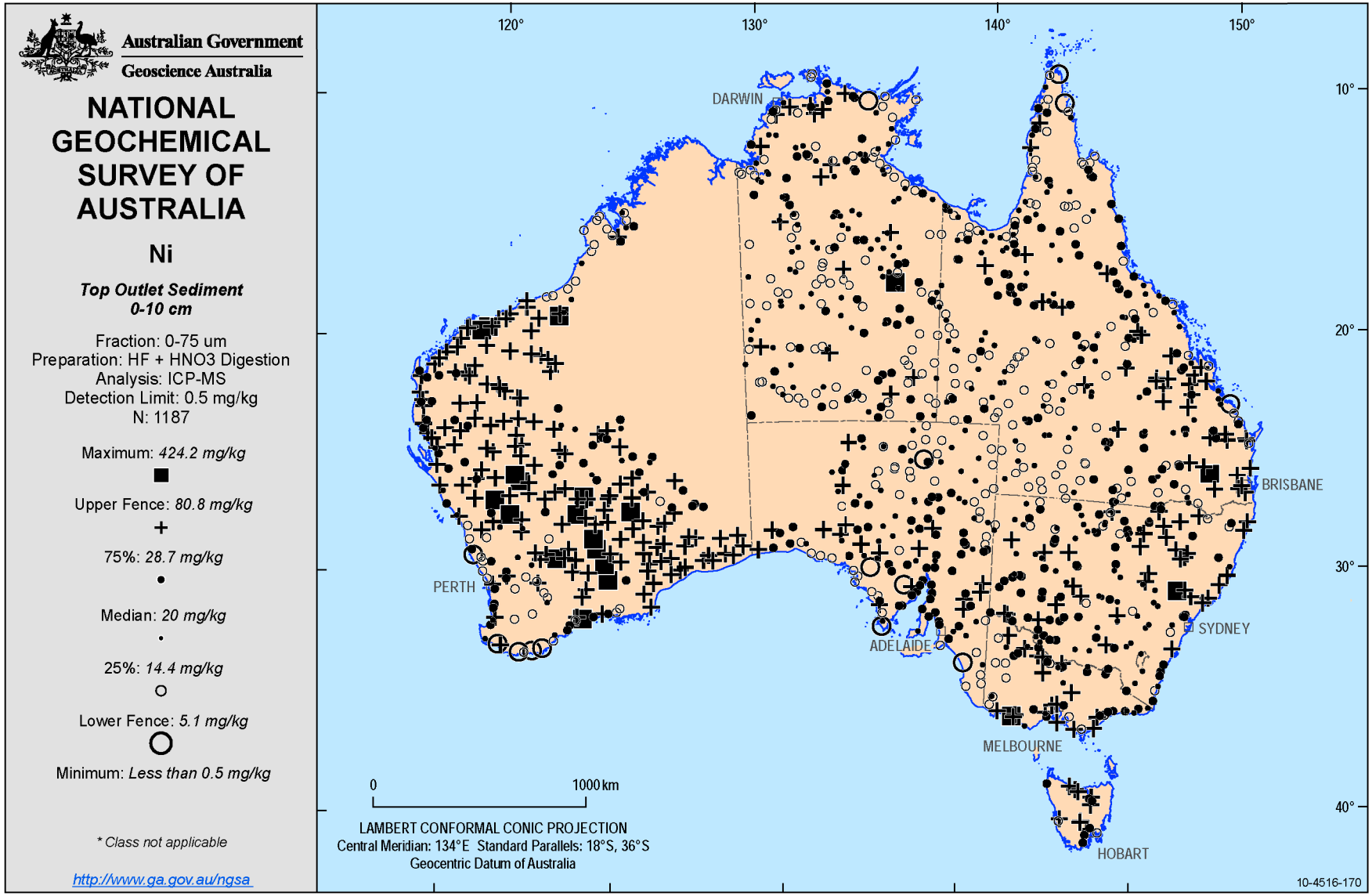
Lower Fence: *11.5 mg/kg*

Minimum: *1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Ni
Top Outlet Sediment
0-10 cm
Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1187
Maximum: 424.2 mg/kg
Upper Fence: 80.8 mg/kg
75%: 28.7 mg/kg
Median: 20 mg/kg
25%: 14.4 mg/kg
Lower Fence: 5.1 mg/kg
Minimum: Less than 0.5 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-170

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

P

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 22 mg/kg
N: 1187

Maximum: *2579 mg/kg*

Upper Fence: *1345 mg/kg*

75%: *519 mg/kg*

Median: *380 mg/kg*

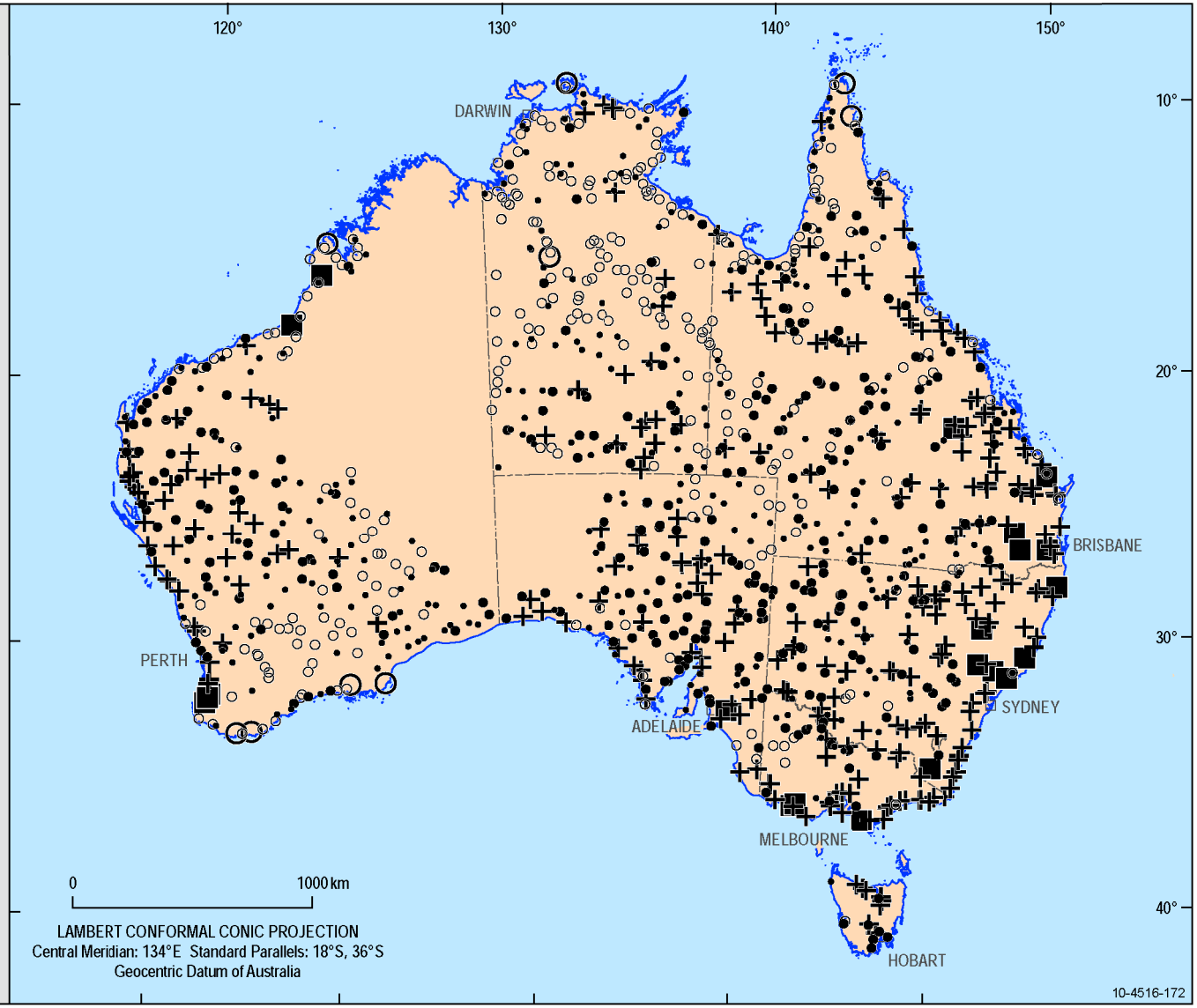
25%: *275 mg/kg*

Lower Fence: *106 mg/kg*

Minimum: *57 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pb

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1187

Maximum: *1443.9 mg/kg*

Upper Fence: *41.8 mg/kg*

75%: *21.2 mg/kg*

Median: *17 mg/kg*

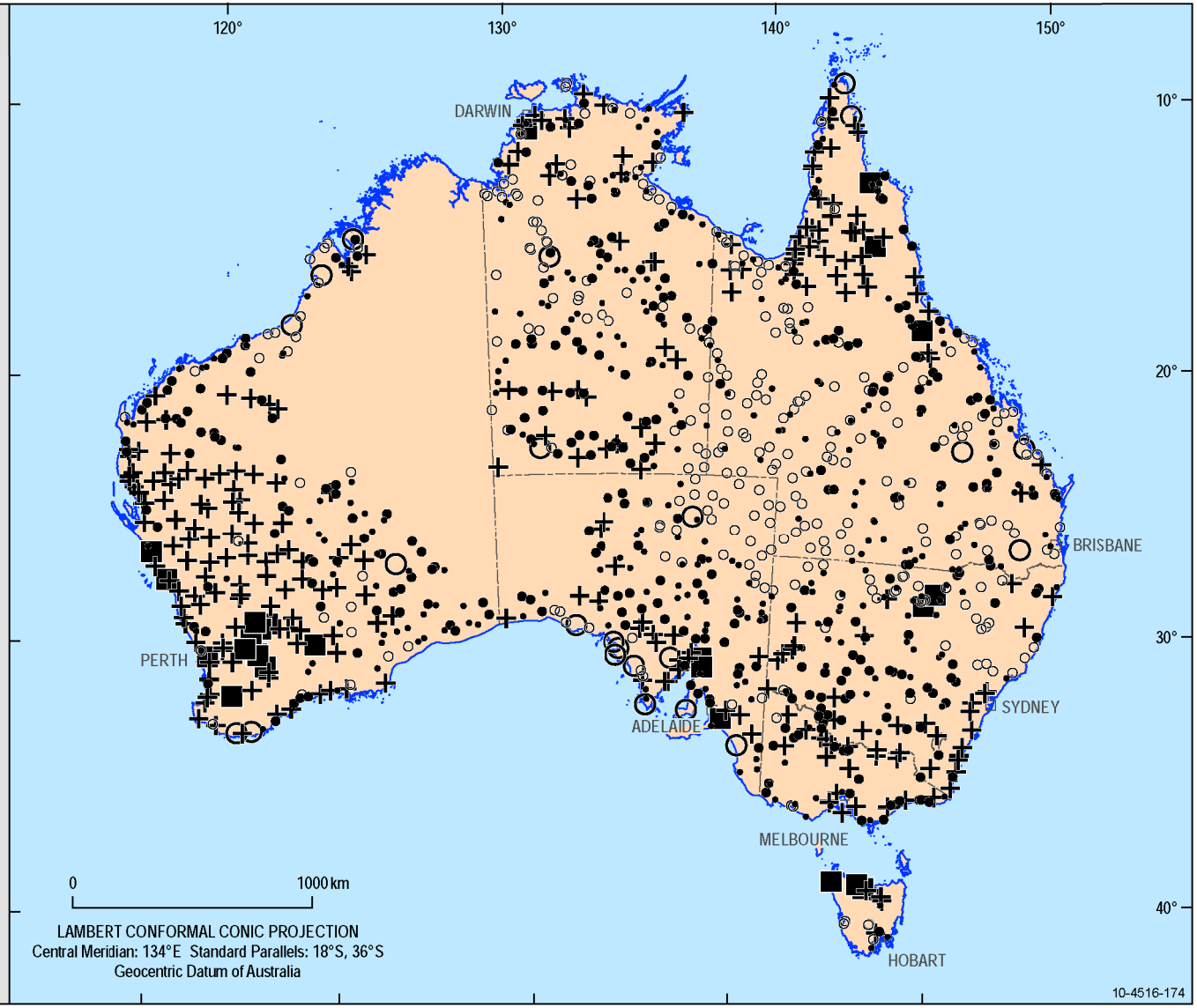
25%: *13.4 mg/kg*

Lower Fence: *6.8 mg/kg*

Minimum: *0.7 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pd

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.001 mg/kg
N: 1137

Maximum: *0.018 mg/kg*

Upper Fence: *0.003 mg/kg*

75%: *0.001 mg/kg*

Median: *0.001 mg/kg*

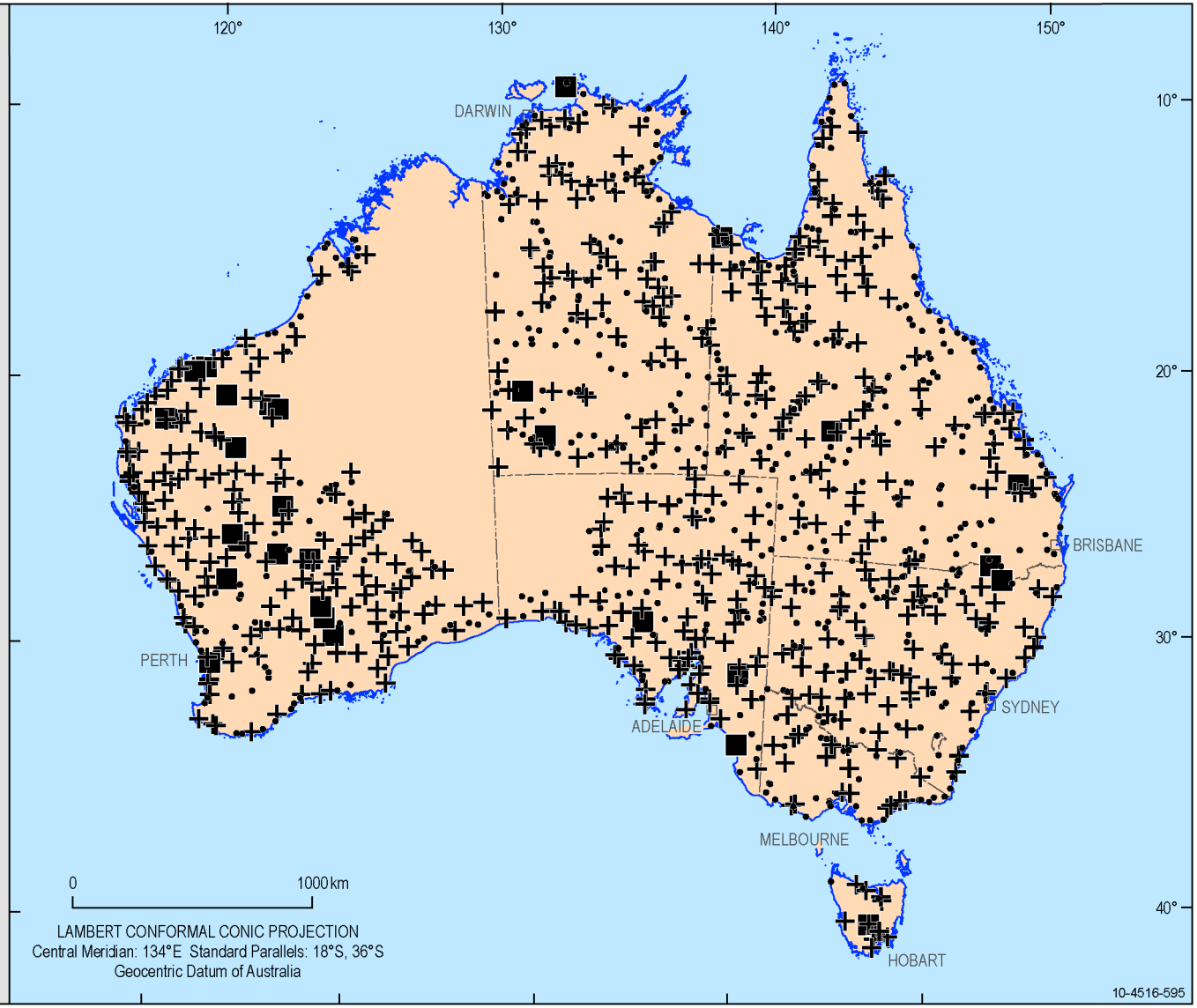
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.001 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pr

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1187

Maximum: *302.2 mg/kg*

Upper Fence: *18.68 mg/kg*

75%: *9.28 mg/kg*

Median: *7.27 mg/kg*

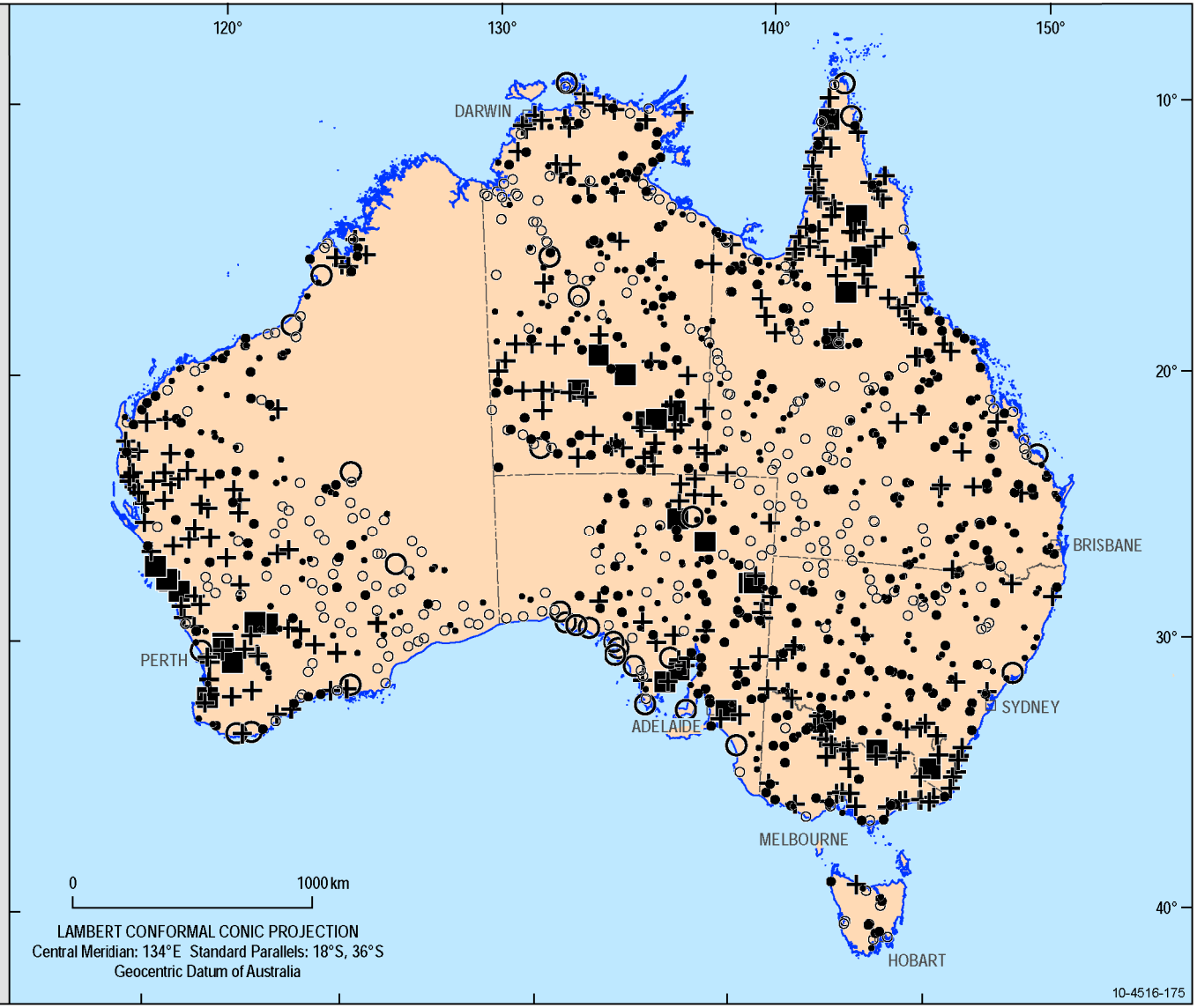
25%: *5.82 mg/kg*

Lower Fence: *2.89 mg/kg*

Minimum: *0.11 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pt

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.0005 mg/kg
N: 1137

Maximum: *0.0076 mg/kg*

Upper Fence: *0.0033 mg/kg*

75%: *0.0007 mg/kg*

Median: *0.0005 mg/kg*

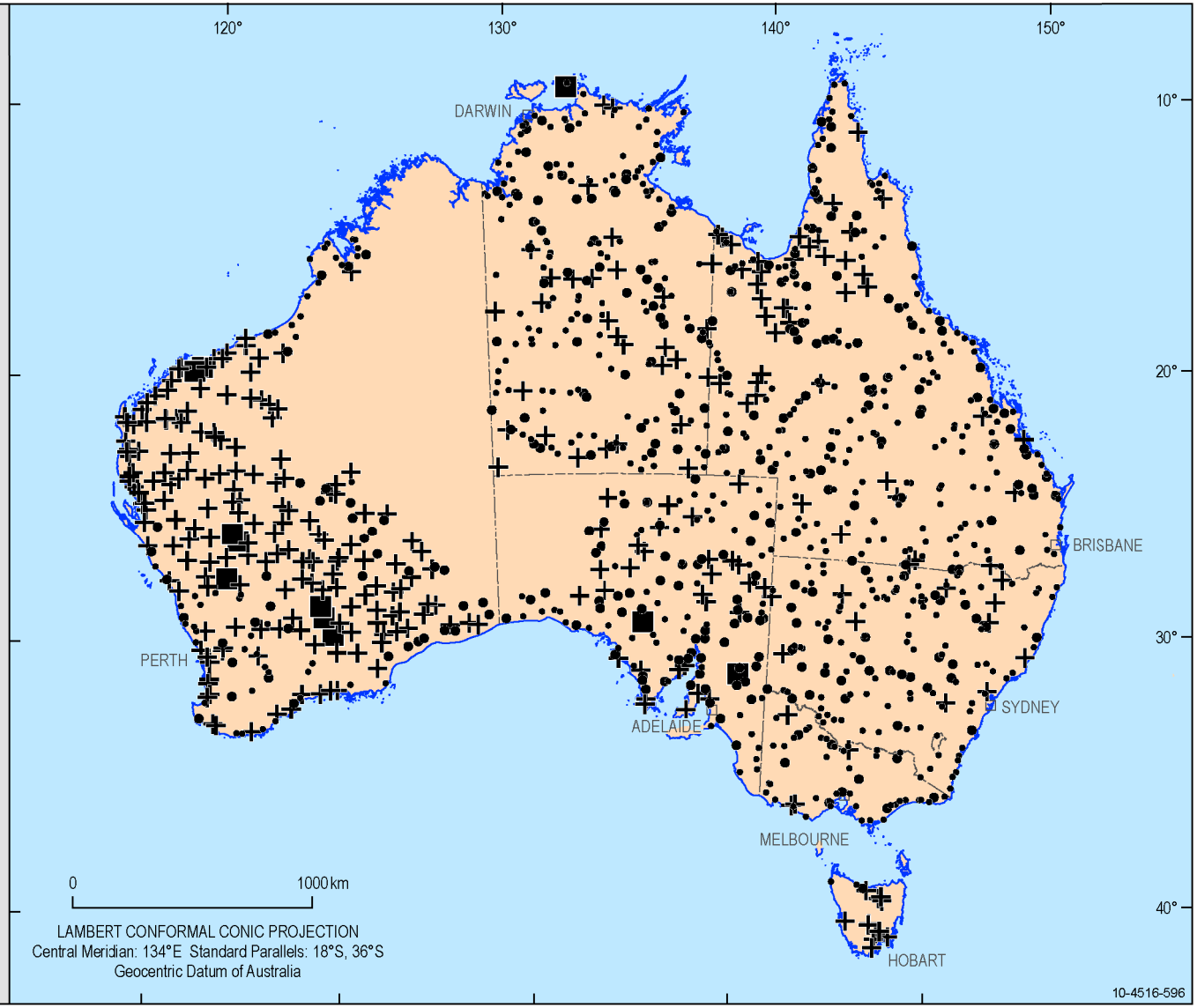
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.0005 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Rb

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1187

Maximum: *267.1 mg/kg*

Upper Fence: *240 mg/kg*

75%: *93.3 mg/kg*

Median: *69.4 mg/kg*

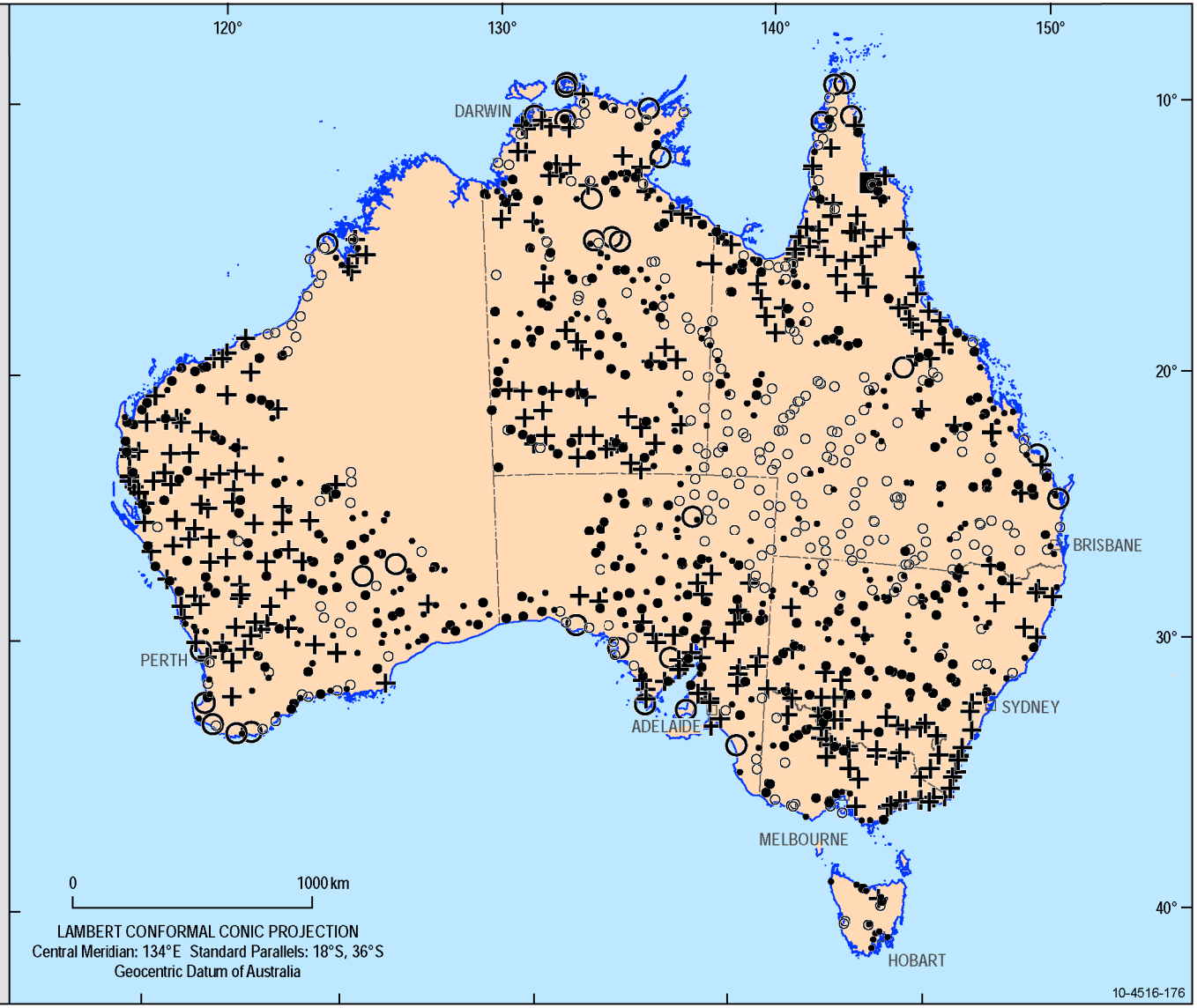
25%: *49.7 mg/kg*

Lower Fence: *19.3 mg/kg*

Minimum: *Less than 0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

S

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 10 mg/kg
N: 1186

Maximum: *140452 mg/kg*

Upper Fence: *1798 mg/kg*

75%: *365 mg/kg*

Median: *199 mg/kg*

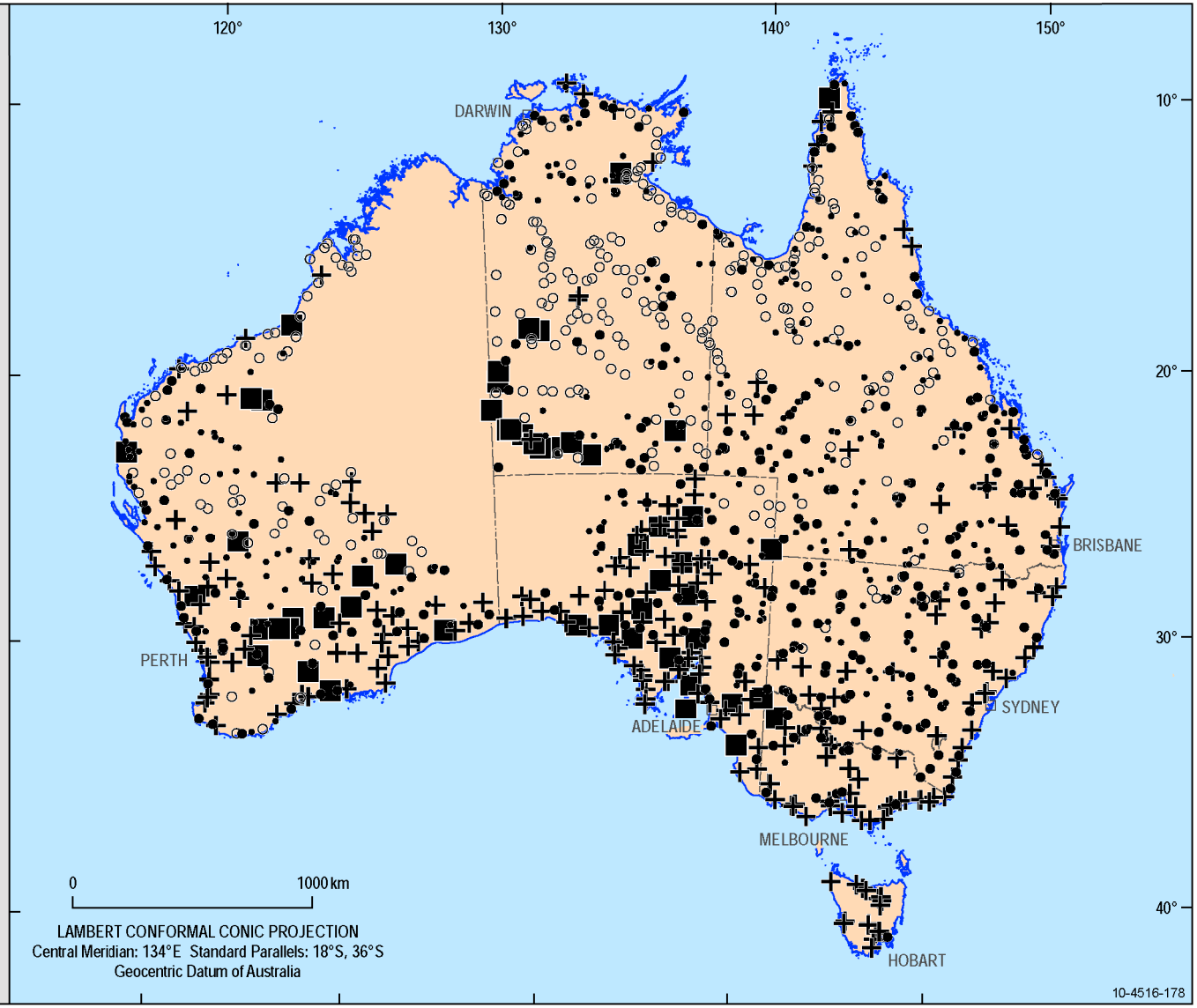
25%: *126 mg/kg*

Lower Fence: *N/A**

Minimum: *40 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sb

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.4 mg/kg
N: 1187

Maximum: *28.9 mg/kg*

Upper Fence: *11.2 mg/kg*

75%: *1 mg/kg*

Median: *N/A**

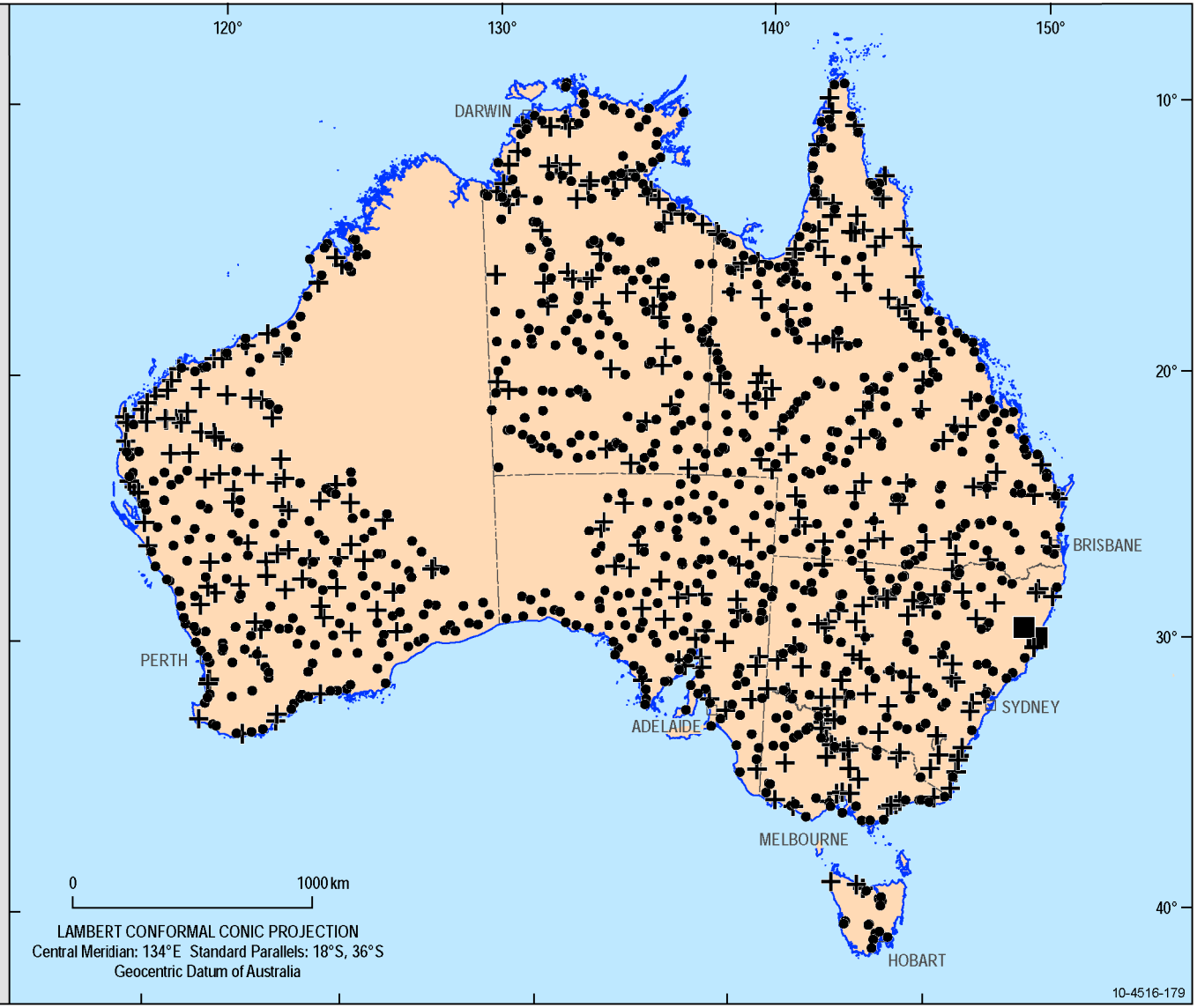
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.4 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sc

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.3 mg/kg
N: 1187

Maximum: *94.6 mg/kg*

Upper Fence: *25.1 mg/kg*

75%: *14.8 mg/kg*

Median: *12.5 mg/kg*

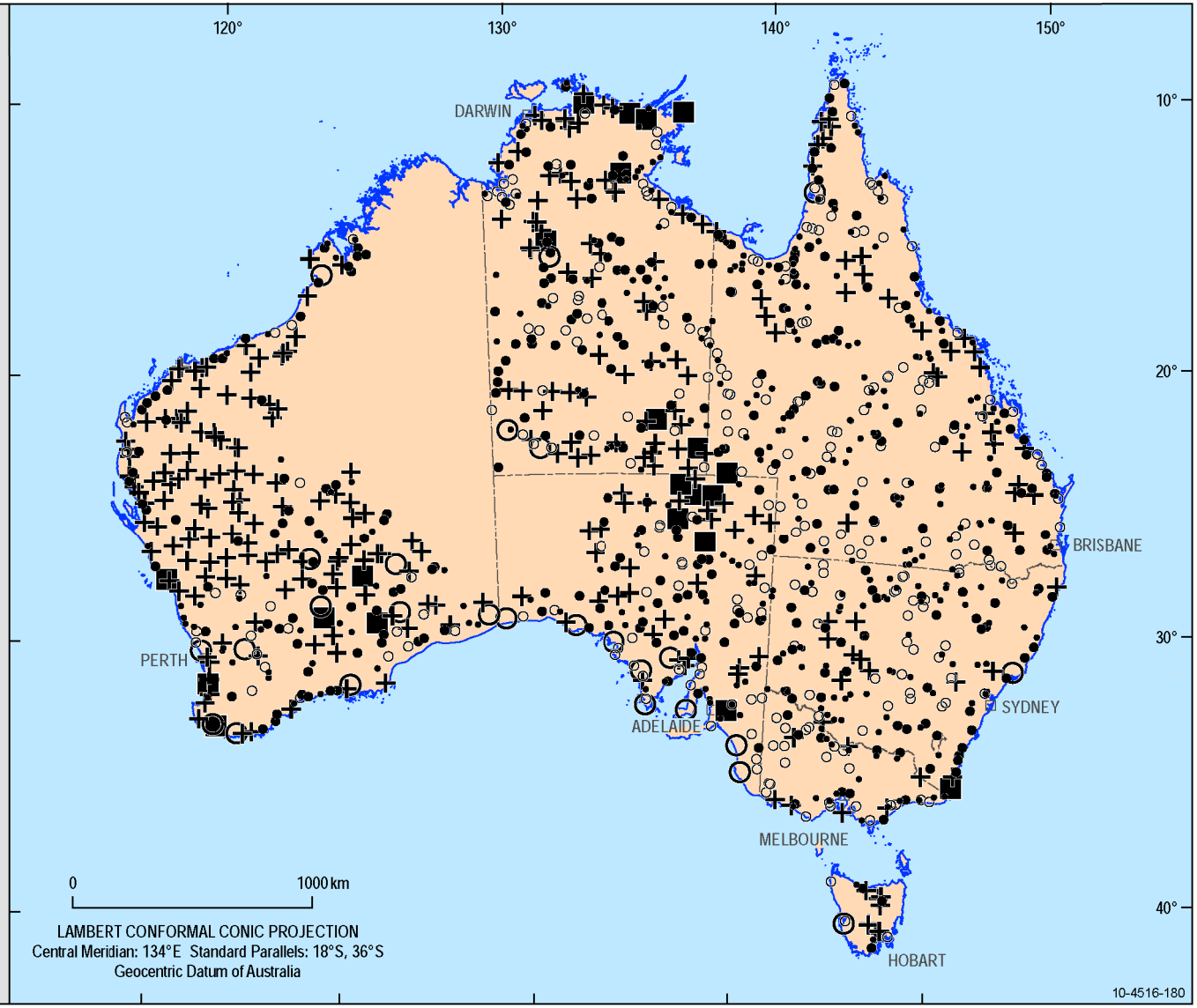
25%: *10.4 mg/kg*

Lower Fence: *6.1 mg/kg*

Minimum: *Less than 0.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Si

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 47 mg/kg
N: 1187

Maximum: *453556 mg/kg*

Upper Fence: *N/A**

75%: *353990 mg/kg*

Median: *324876 mg/kg*

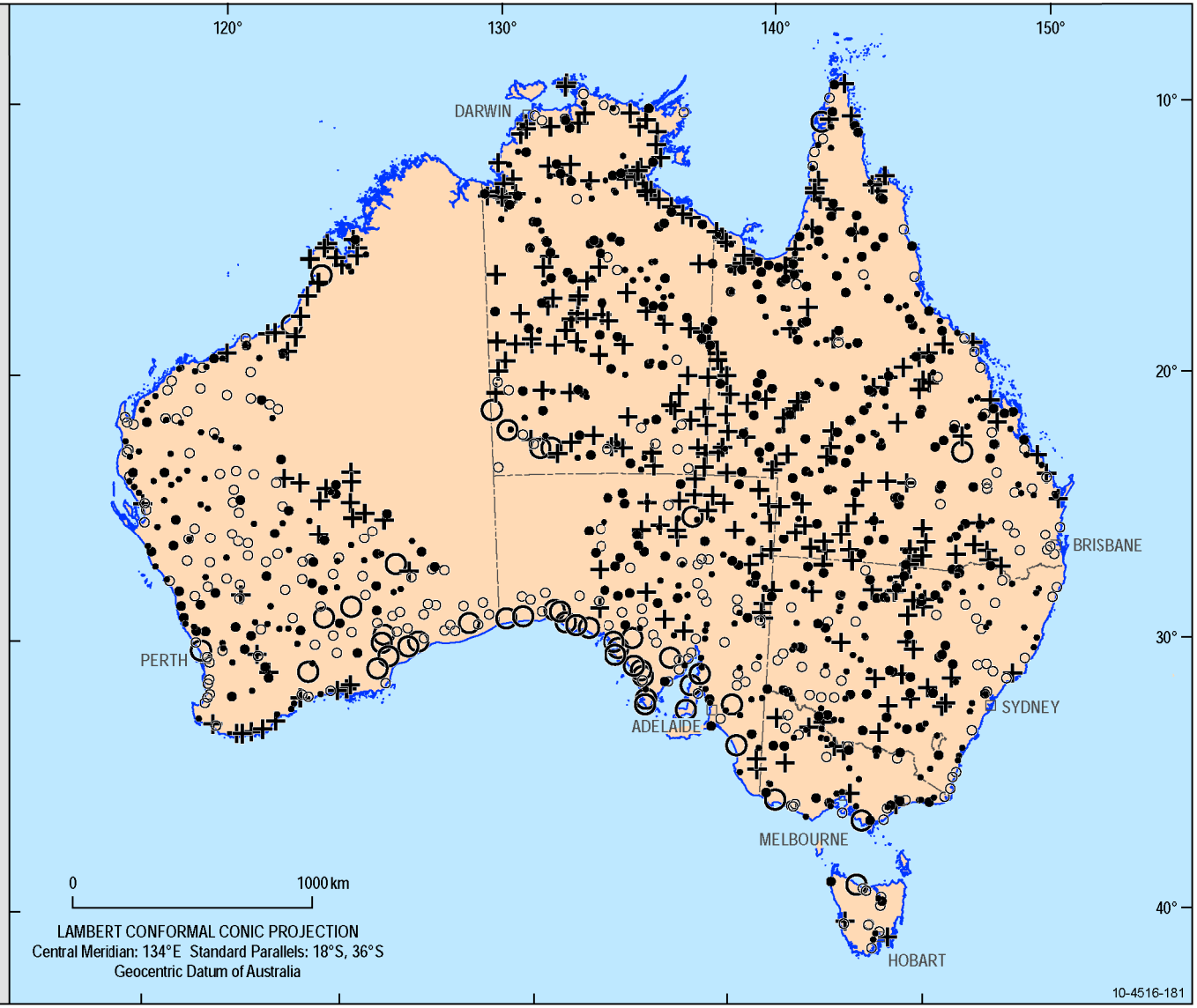
25%: *289349 mg/kg*

Lower Fence: *206845 mg/kg*

Minimum: *4552 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sm

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1187

Maximum: *205.93 mg/kg*

Upper Fence: *14.79 mg/kg*

75%: *7.59 mg/kg*

Median: *6.09 mg/kg*

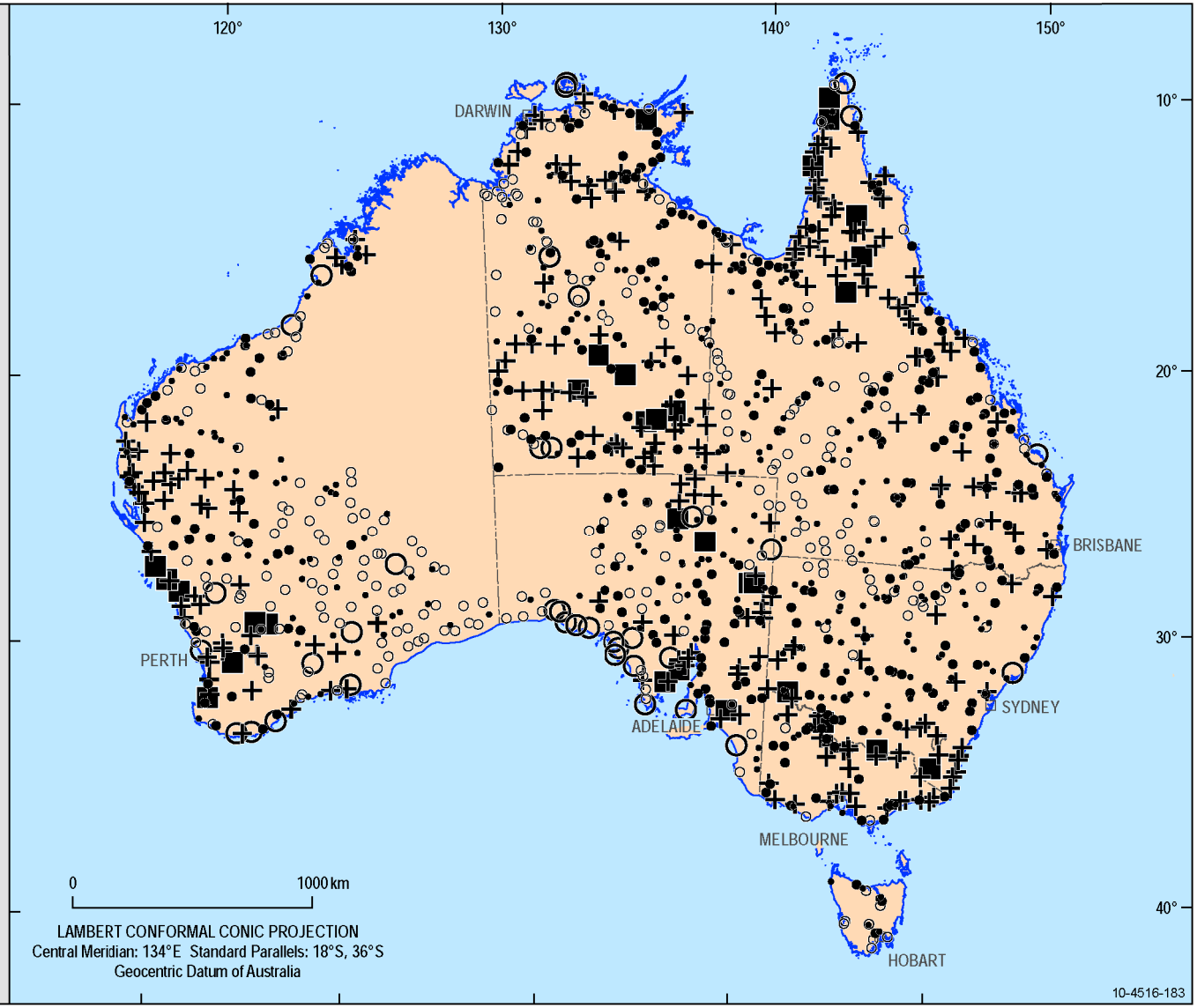
25%: *4.86 mg/kg*

Lower Fence: *2.49 mg/kg*

Minimum: *Less than 0.04 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sn

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1187

Maximum: *532.5 mg/kg*

Upper Fence: *5.4 mg/kg*

75%: *2.6 mg/kg*

Median: *2 mg/kg*

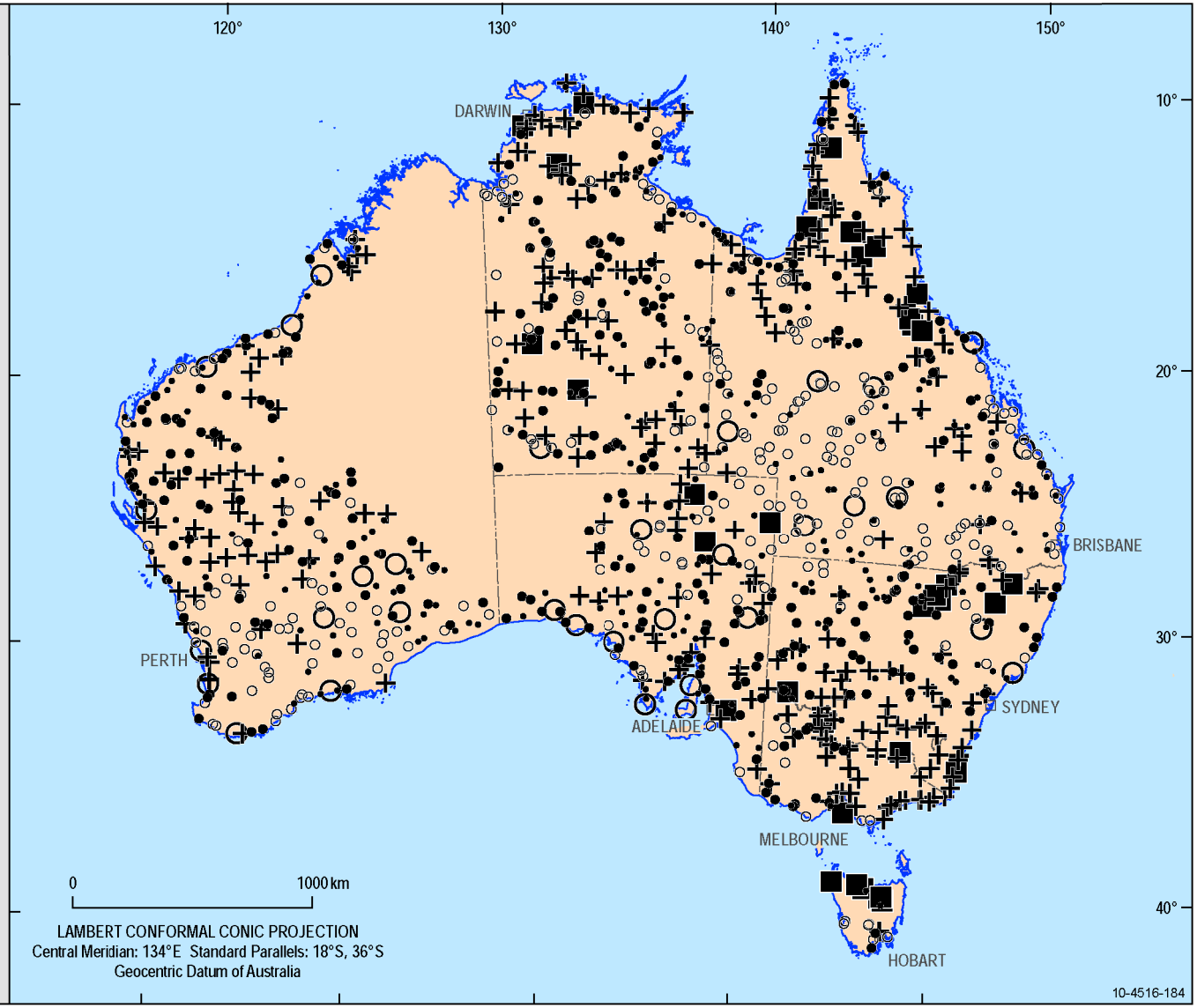
25%: *1.6 mg/kg*

Lower Fence: *0.8 mg/kg*

Minimum: *Less than 0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sr

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1187

Maximum: *15840 mg/kg*

Upper Fence: *501 mg/kg*

75%: *140.8 mg/kg*

Median: *91.4 mg/kg*

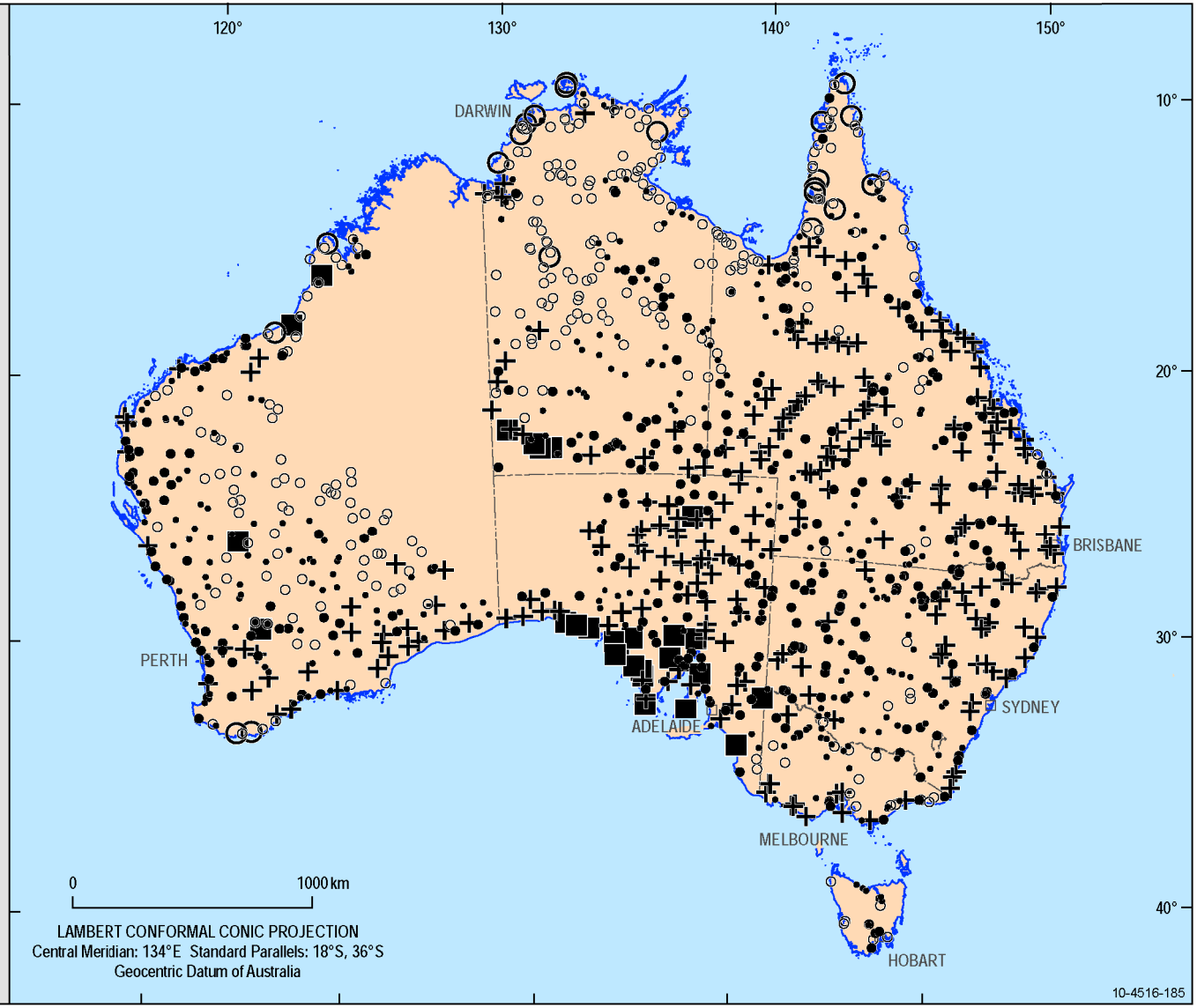
25%: *60.4 mg/kg*

Lower Fence: *17 mg/kg*

Minimum: *2.5 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ta

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1187

Maximum: *9.36 mg/kg*

Upper Fence: *3.39 mg/kg*

75%: *1.51 mg/kg*

Median: *1.15 mg/kg*

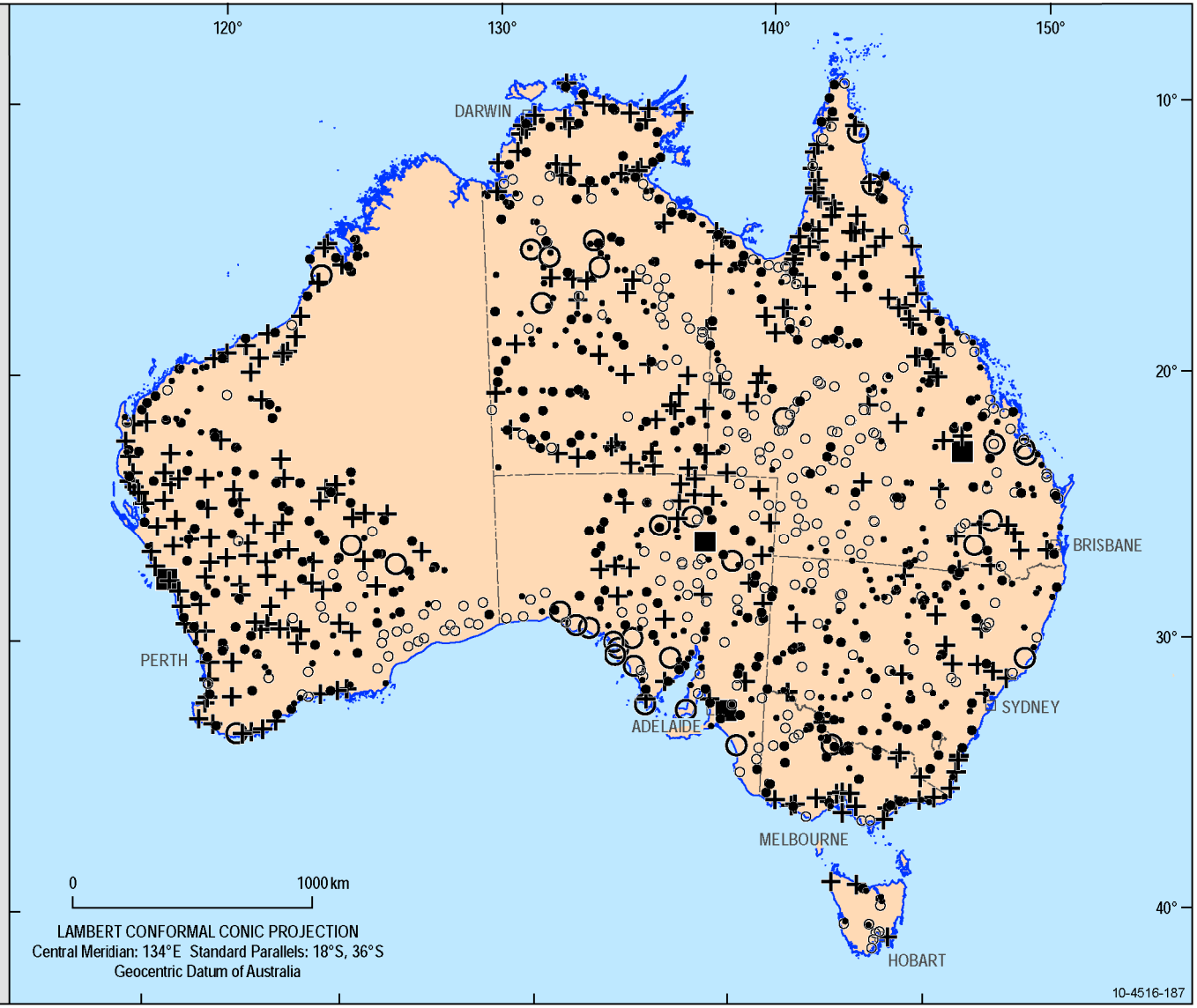
25%: *0.88 mg/kg*

Lower Fence: *0.39 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Tb

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1187

Maximum: *21.01 mg/kg*

Upper Fence: *2.05 mg/kg*

75%: *1.13 mg/kg*

Median: *0.94 mg/kg*

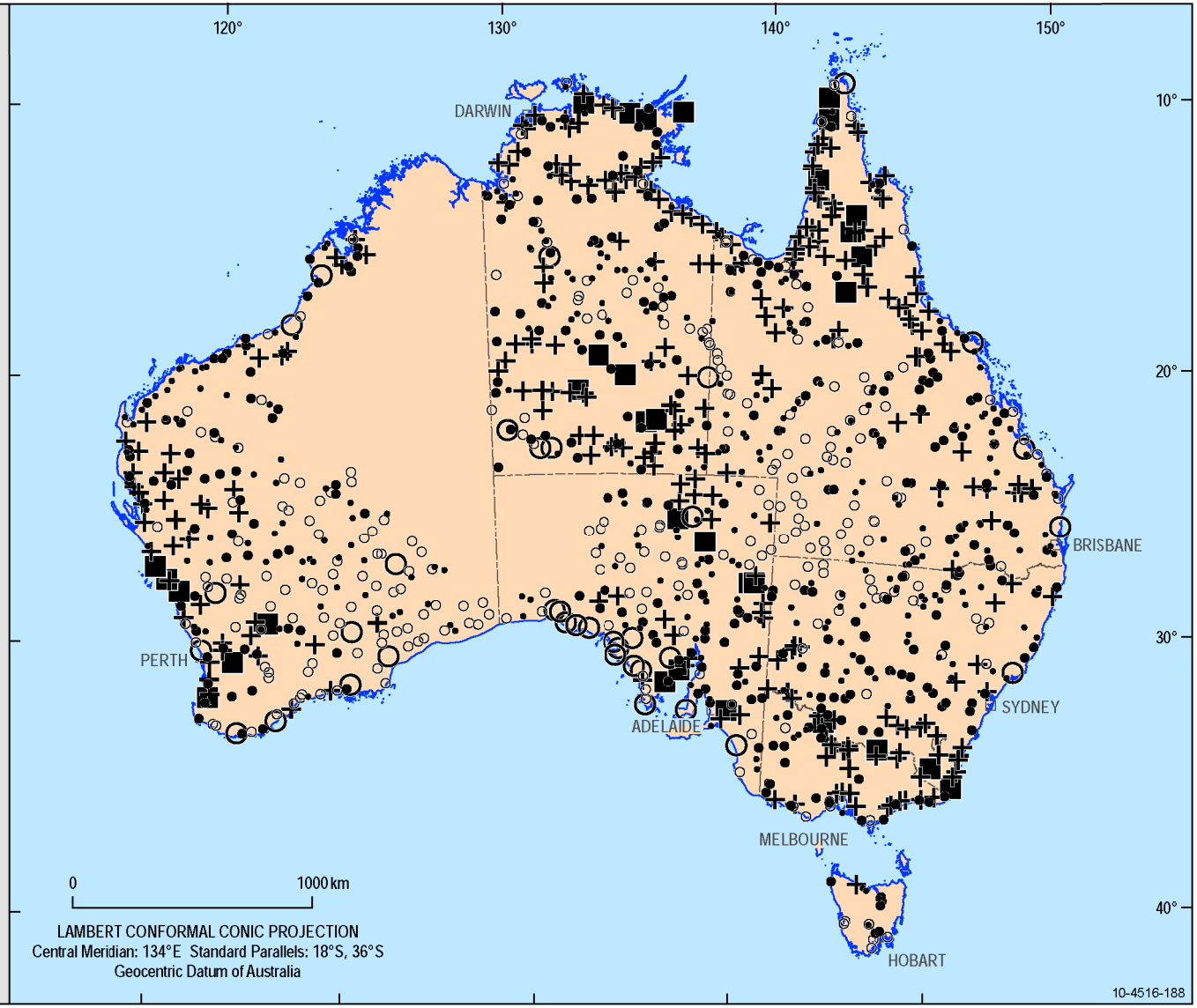
25%: *0.76 mg/kg*

Lower Fence: *0.42 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Th

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1187

Maximum: *462.83 mg/kg*

Upper Fence: *50.43 mg/kg*

75%: *19.33 mg/kg*

Median: *13.56 mg/kg*

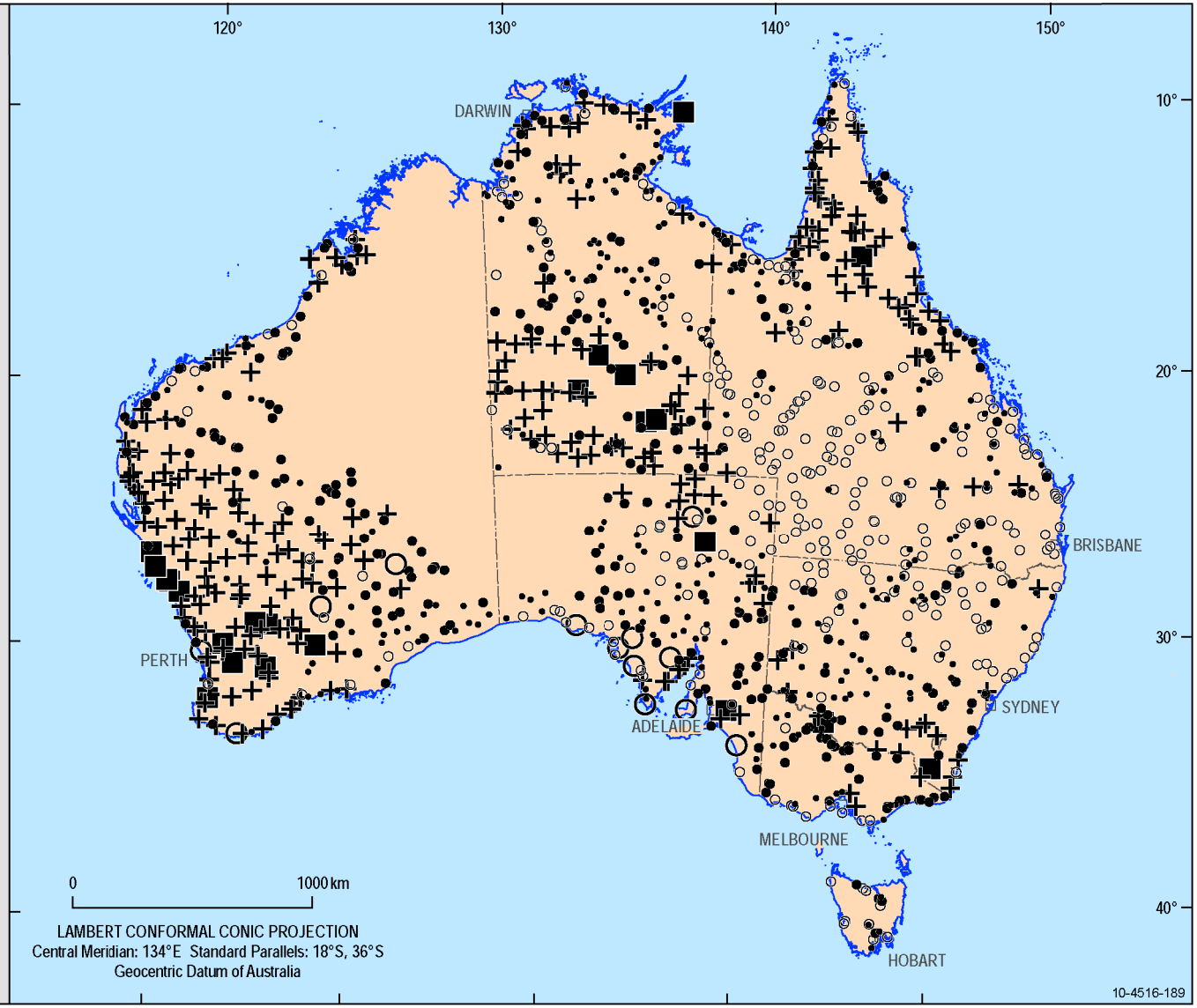
25%: *10.2 mg/kg*

Lower Fence: *3.91 mg/kg*

Minimum: *0.21 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ti

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 30 mg/kg
N: 1187

Maximum: *42406 mg/kg*

Upper Fence: *10769 mg/kg*

75%: *6670 mg/kg*

Median: *5651 mg/kg*

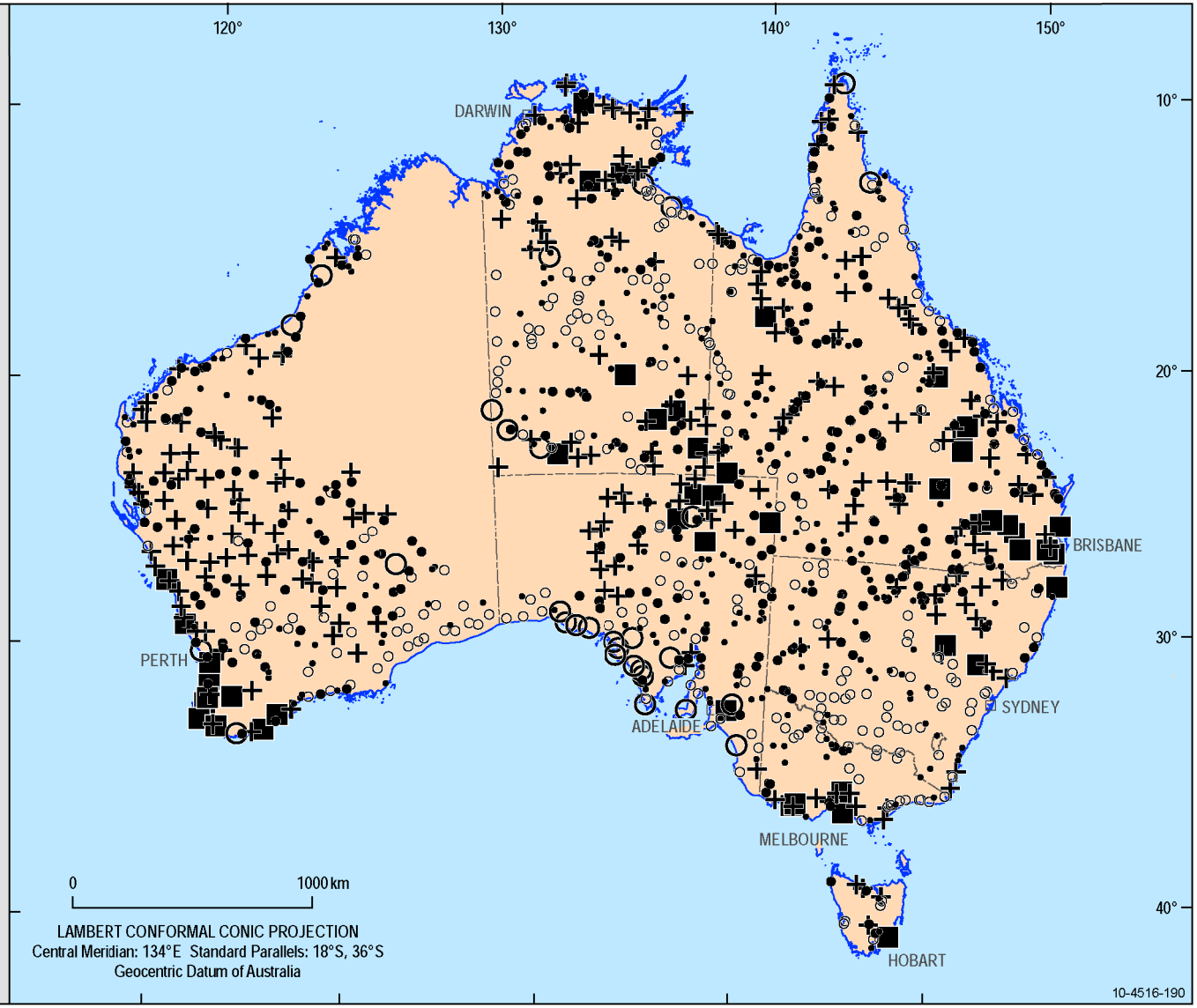
25%: *4842 mg/kg*

Lower Fence: *2992 mg/kg*

Minimum: *108 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

U

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1187

Maximum: *79.34 mg/kg*

Upper Fence: *13.11 mg/kg*

75%: *4.71 mg/kg*

Median: *3.15 mg/kg*

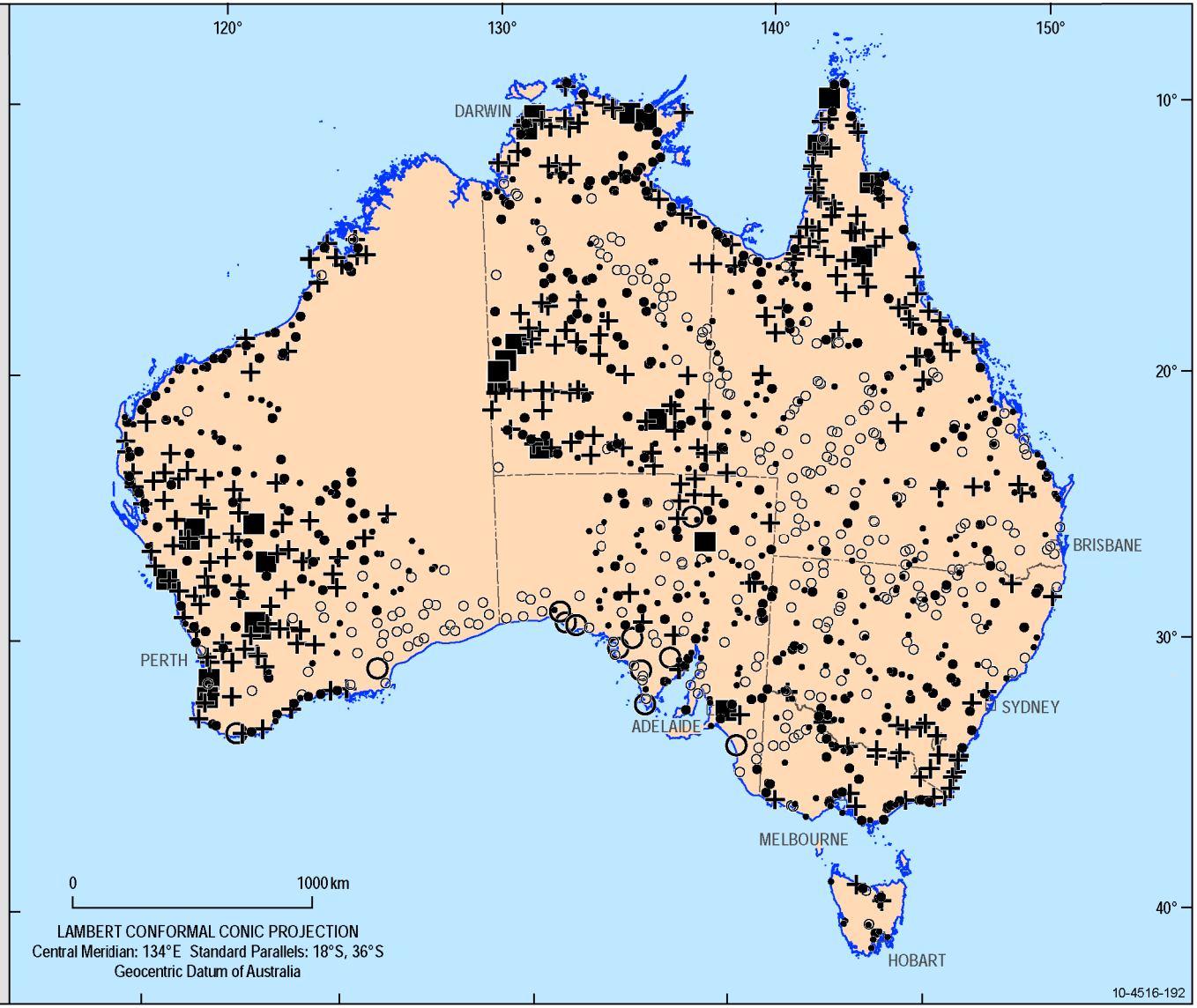
25%: *2.38 mg/kg*

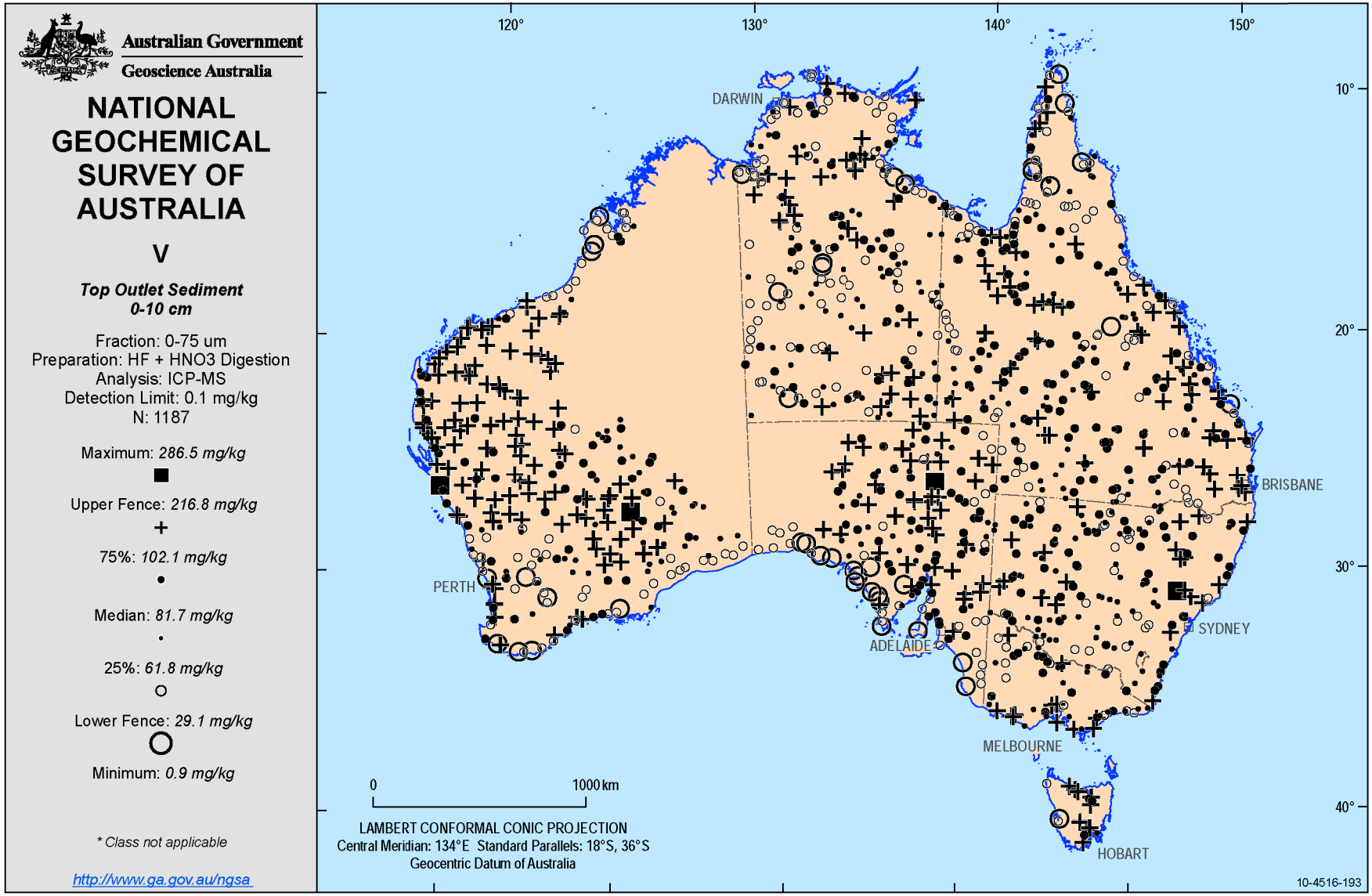
Lower Fence: *0.85 mg/kg*

Minimum: *0.18 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
V
Top Outlet Sediment
0-10 cm
Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1187
Maximum: 286.5 mg/kg
Upper Fence: 216.8 mg/kg
75%: 102.1 mg/kg
Median: 81.7 mg/kg
25%: 61.8 mg/kg
Lower Fence: 29.1 mg/kg
Minimum: 0.9 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-193

Australian Government
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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

W

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1187

Maximum: *643.3 mg/kg*

Upper Fence: *4.3 mg/kg*

75%: *2.1 mg/kg*

Median: *1.6 mg/kg*

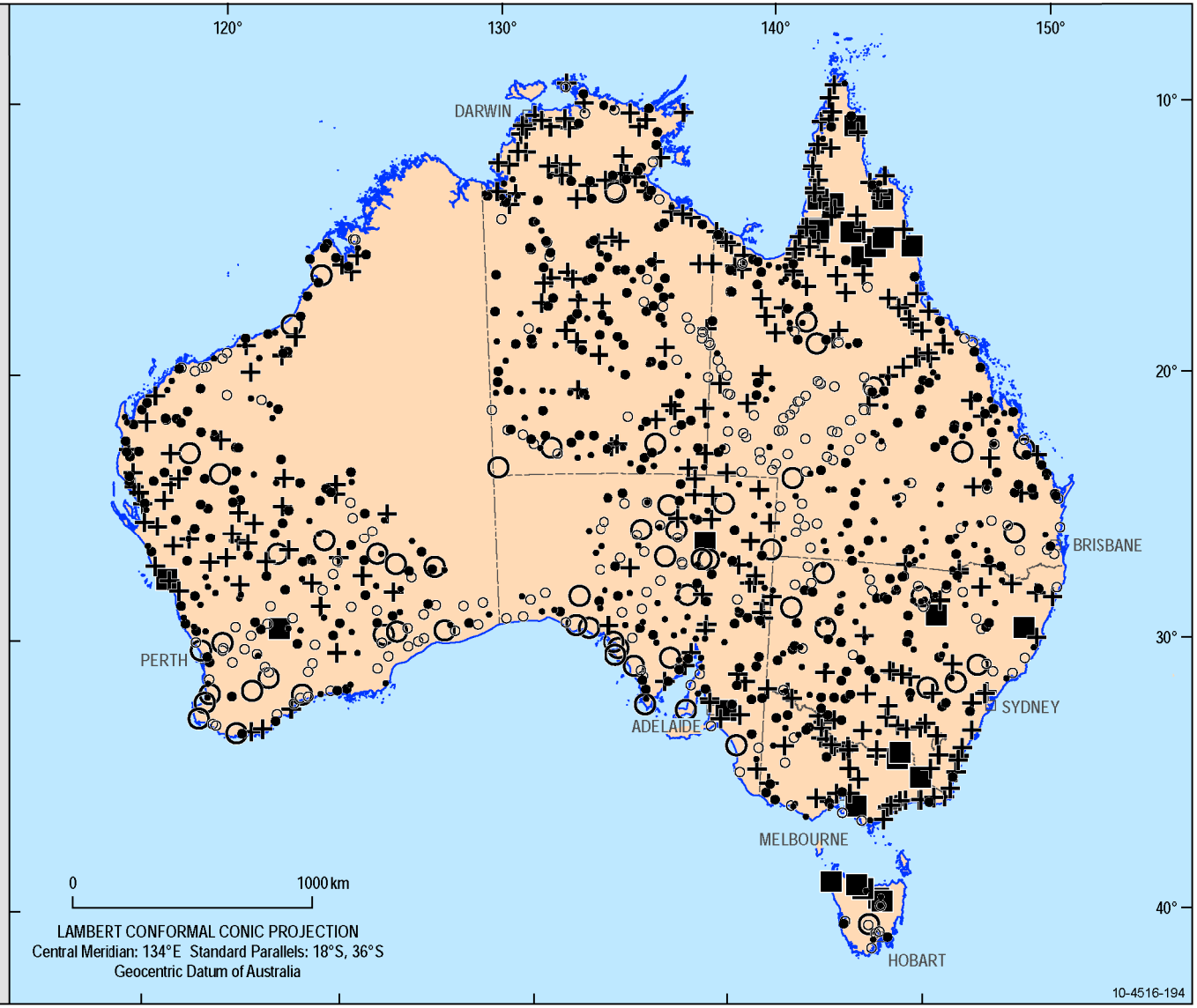
25%: *1.3 mg/kg*

Lower Fence: *0.6 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Y

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.05 mg/kg
N: 1187

Maximum: *583.5 mg/kg*

Upper Fence: *74.79 mg/kg*

75%: *42.8 mg/kg*

Median: *35.4 mg/kg*

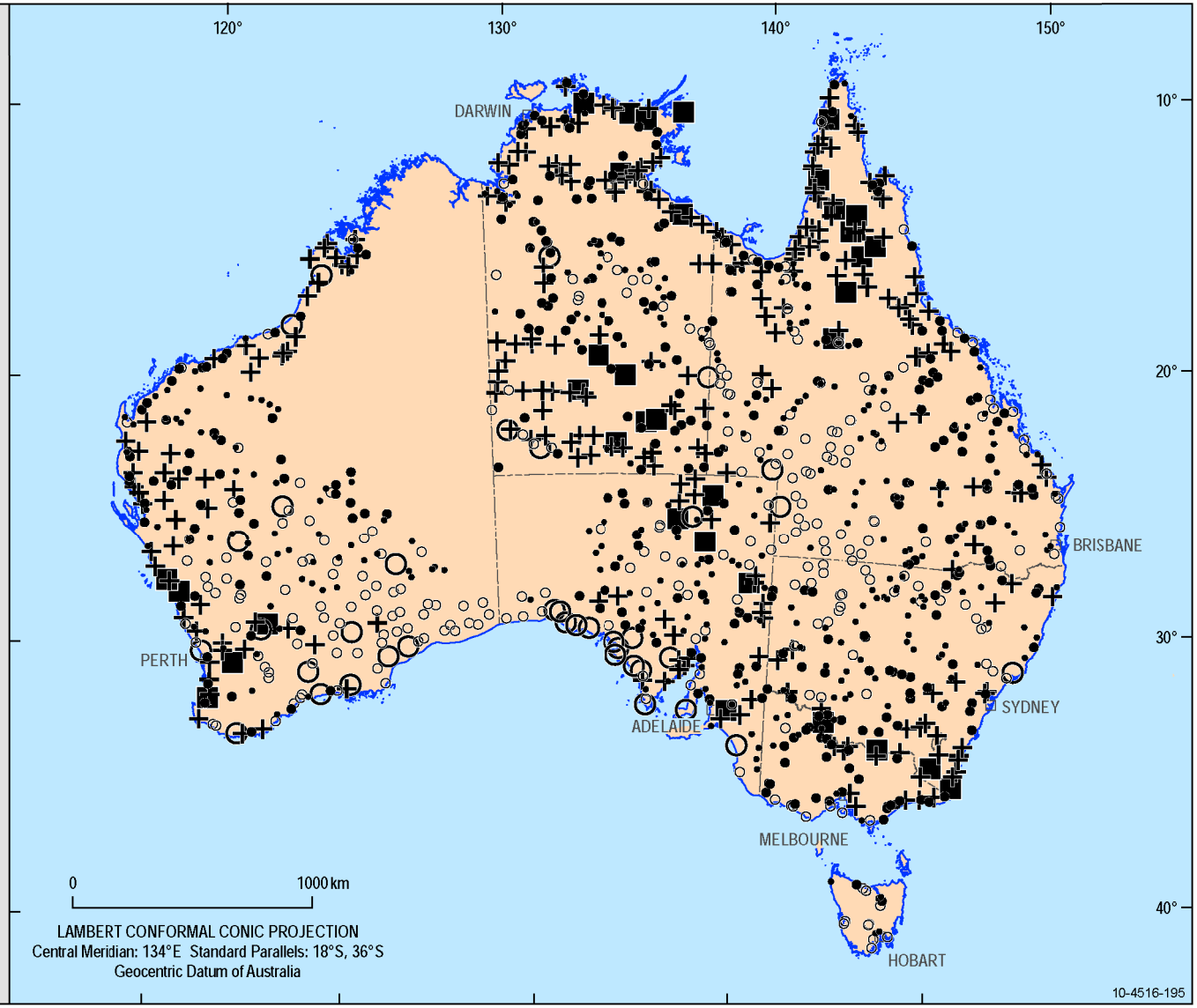
25%: *29.5 mg/kg*

Lower Fence: *16.88 mg/kg*

Minimum: *0.7 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Yb

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1187

Maximum: *50.69 mg/kg*

Upper Fence: *8.17 mg/kg*

75%: *4.55 mg/kg*

Median: *3.7 mg/kg*

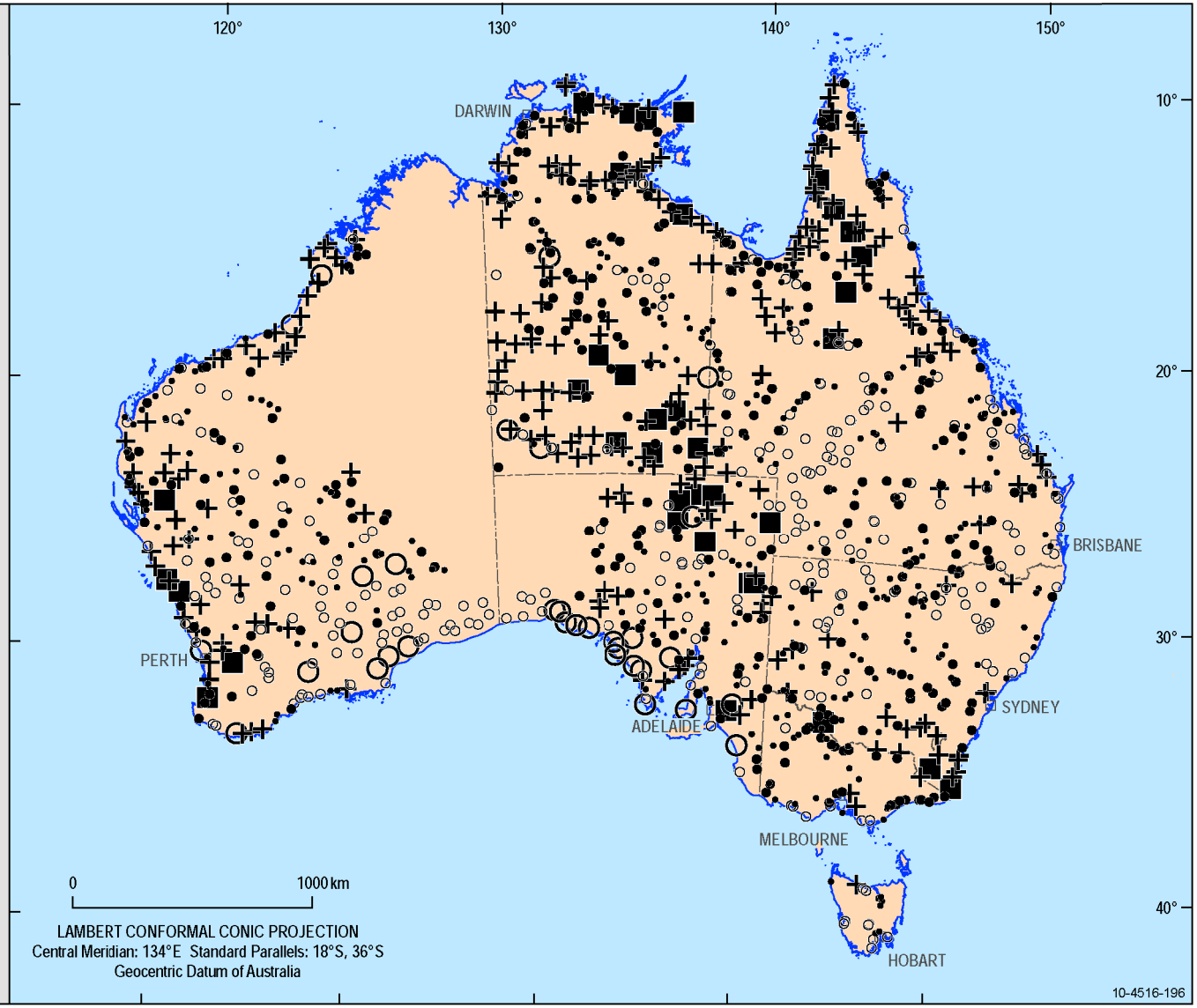
25%: *3.08 mg/kg*

Lower Fence: *1.72 mg/kg*

Minimum: *0.04 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Zn

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.9 mg/kg
N: 1187

Maximum: *289 mg/kg*

Upper Fence: *206.2 mg/kg*

75%: *67.3 mg/kg*

Median: *49.2 mg/kg*

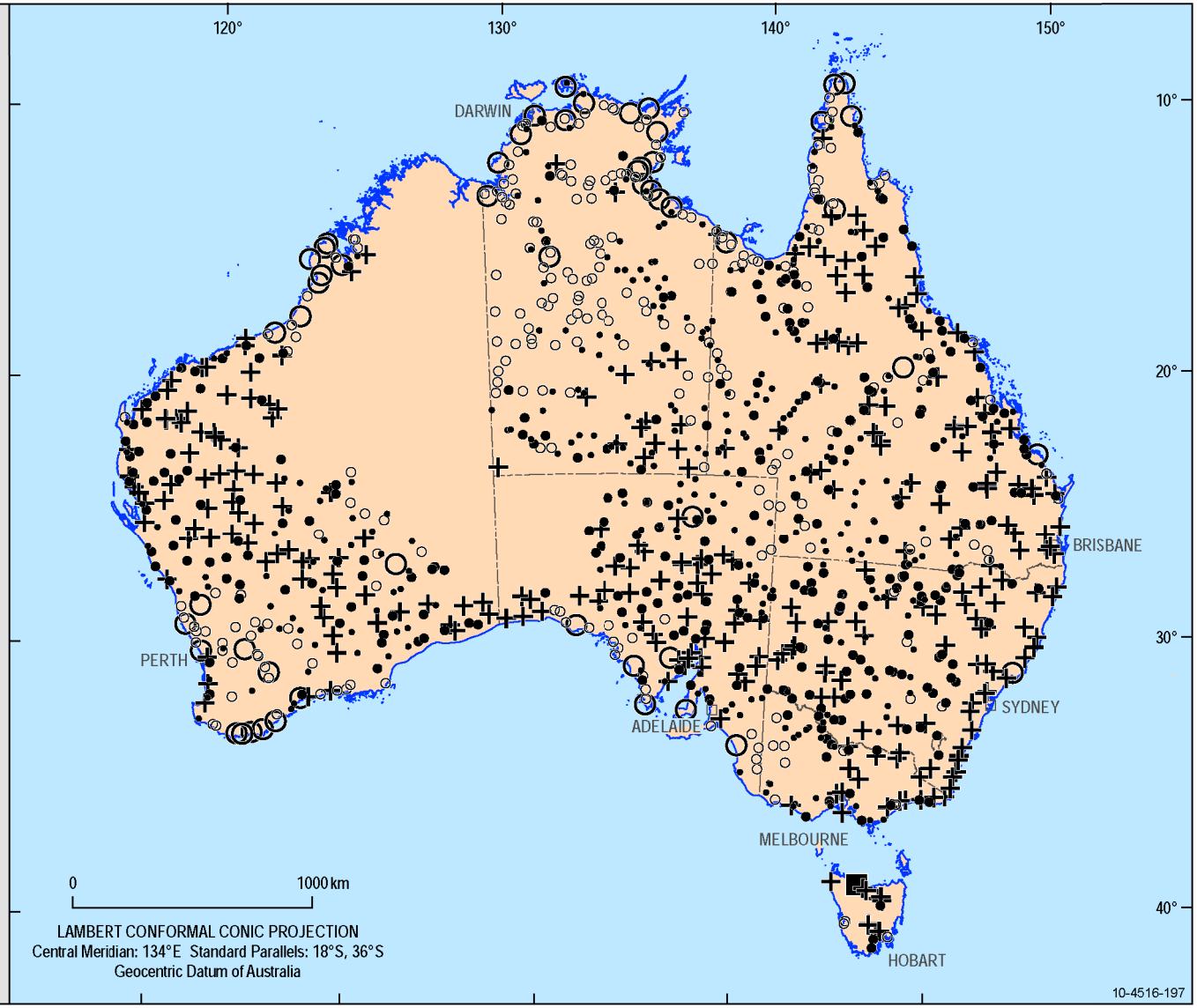
25%: *31.9 mg/kg*

Lower Fence: *10.4 mg/kg*

Minimum: *Less than 0.9 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Zr

Top Outlet Sediment
0-10 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1187

Maximum: *17288 mg/kg*

Upper Fence: *4236.6 mg/kg*

75%: *1115.5 mg/kg*

Median: *710.4 mg/kg*

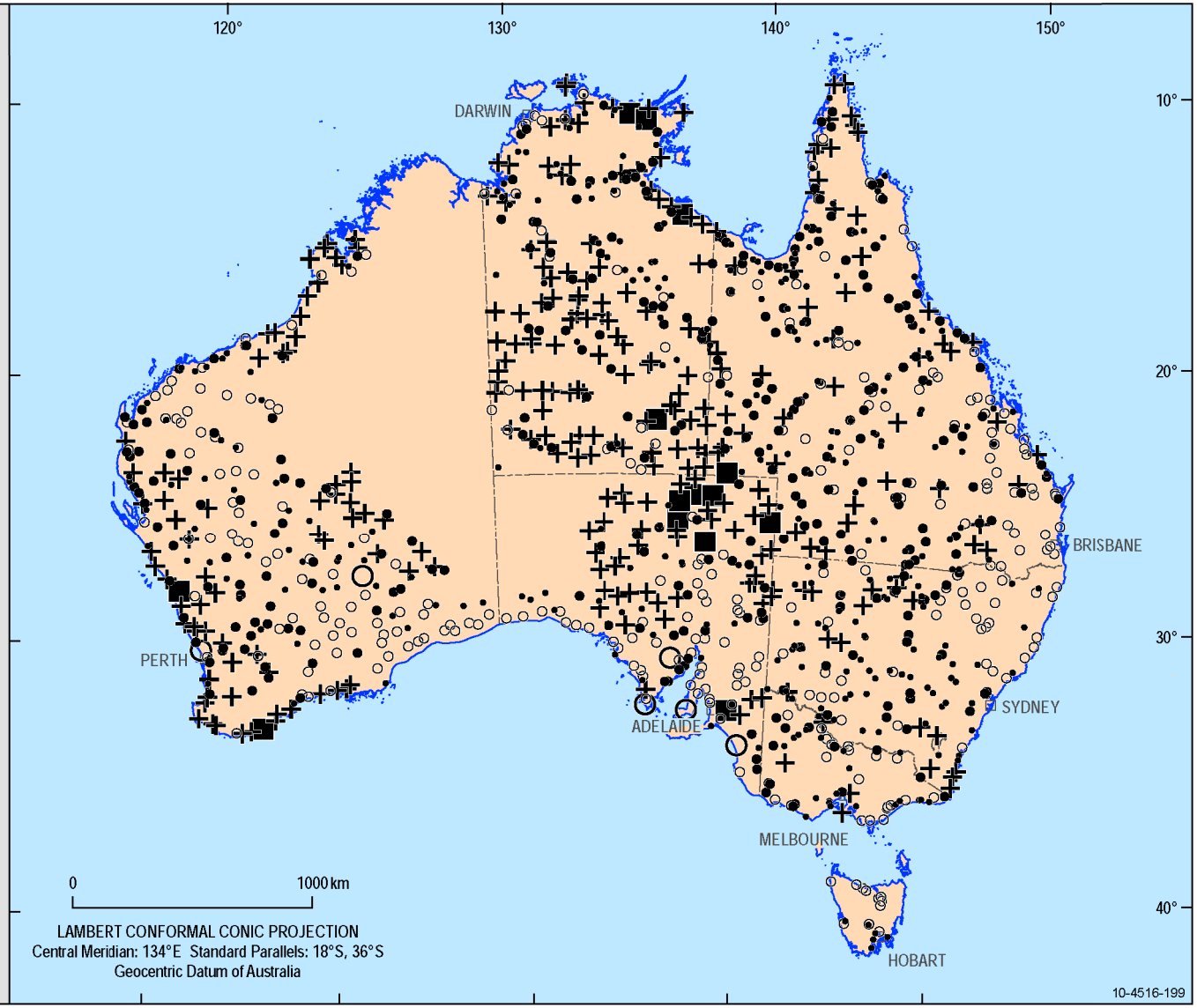
25%: *457.6 mg/kg*

Lower Fence: *120.2 mg/kg*

Minimum: *4.5 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ag

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *0.71 mg/kg*

Upper Fence: *Less than 0.03 mg/kg*

75%: *N/A**

Median: *N/A**

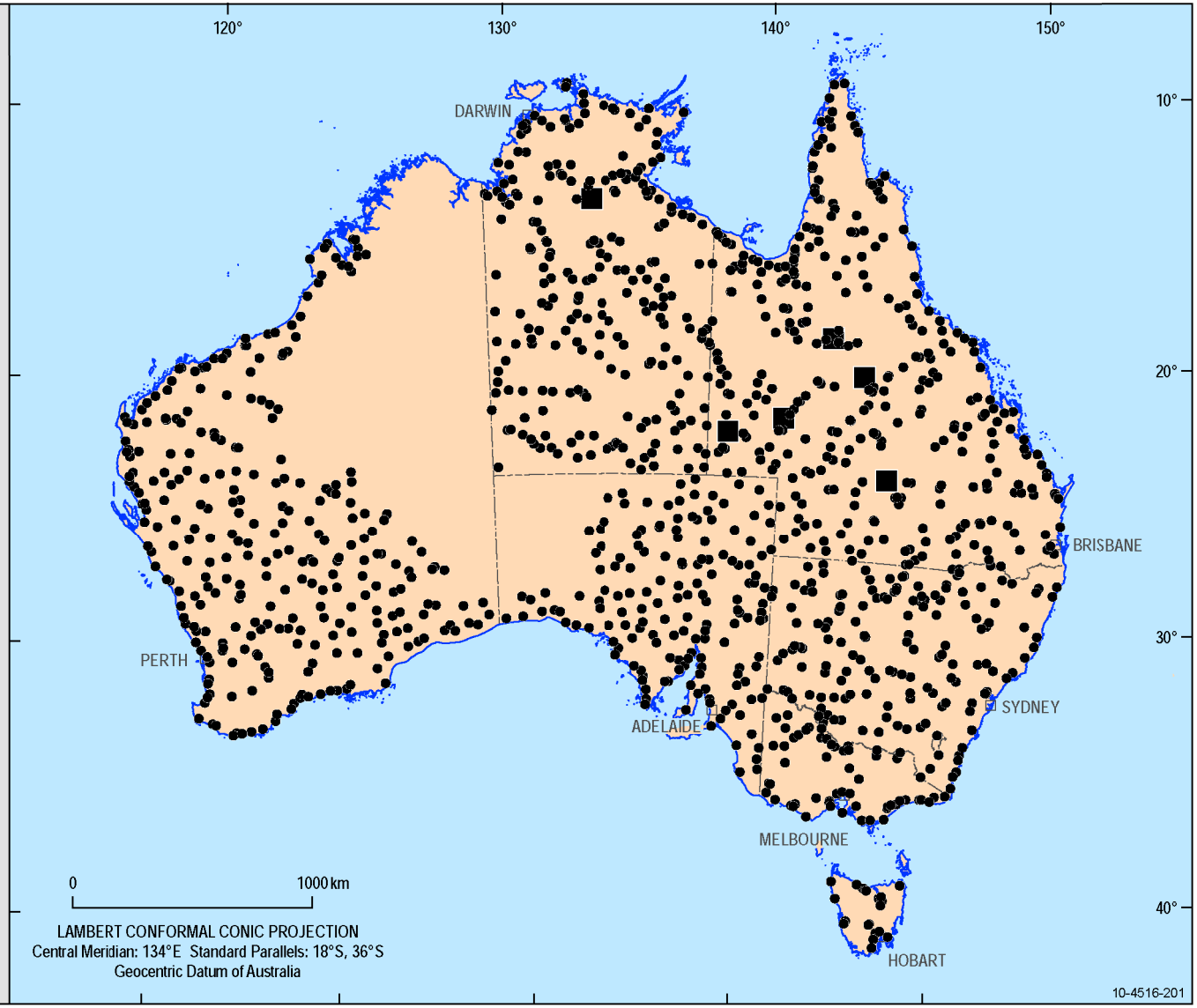
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Al

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 26 mg/kg
N: 1190

Maximum: *194624 mg/kg*

Upper Fence: *161487 mg/kg*

75%: *61118 mg/kg*

Median: *46954 mg/kg*

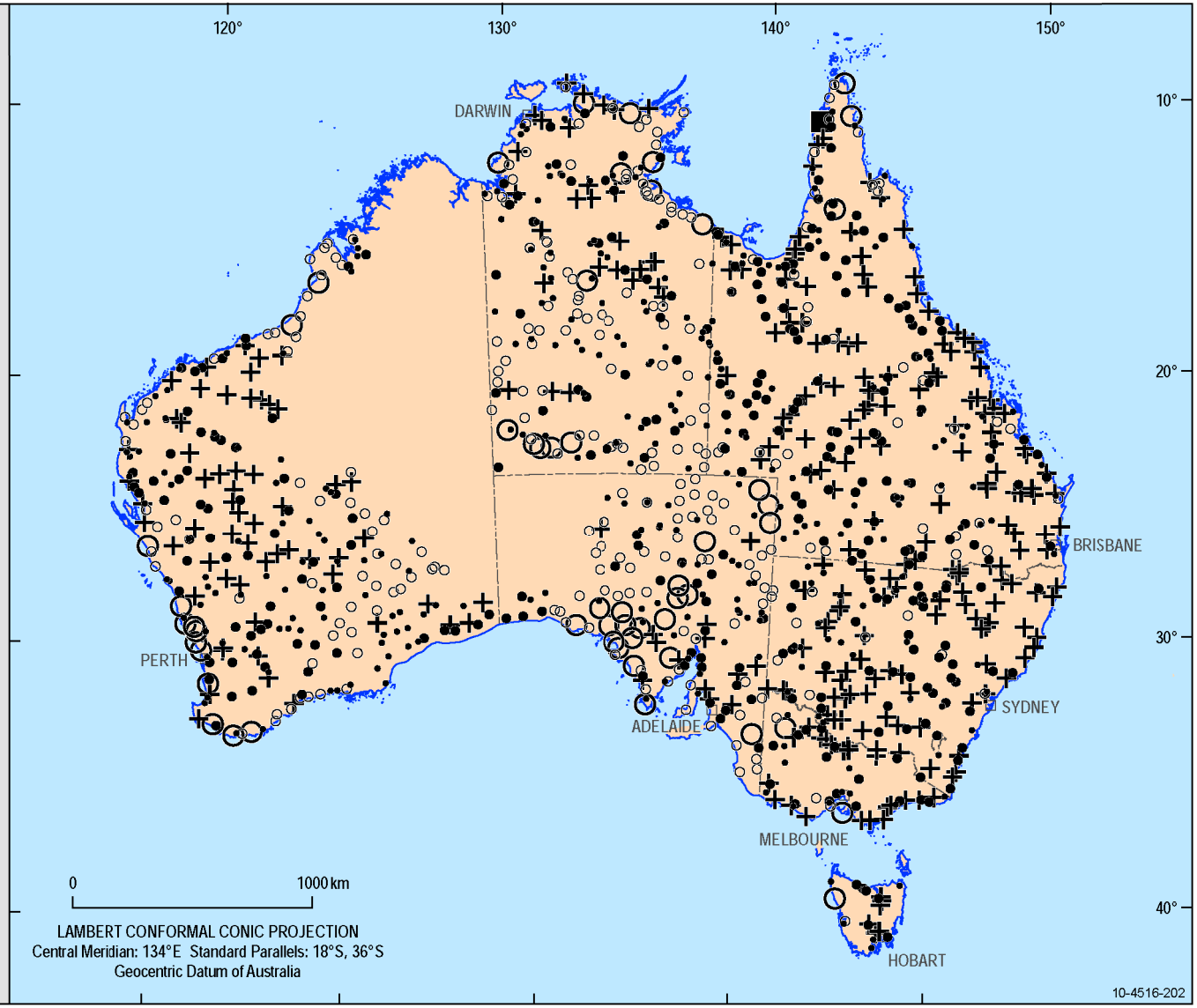
25%: *30620 mg/kg*

Lower Fence: *10564 mg/kg*

Minimum: *778 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

As

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.4 mg/kg
N: 1190

Maximum: *62.2 mg/kg*

Upper Fence: *21.2 mg/kg*

75%: *5.3 mg/kg*

Median: *3.6 mg/kg*

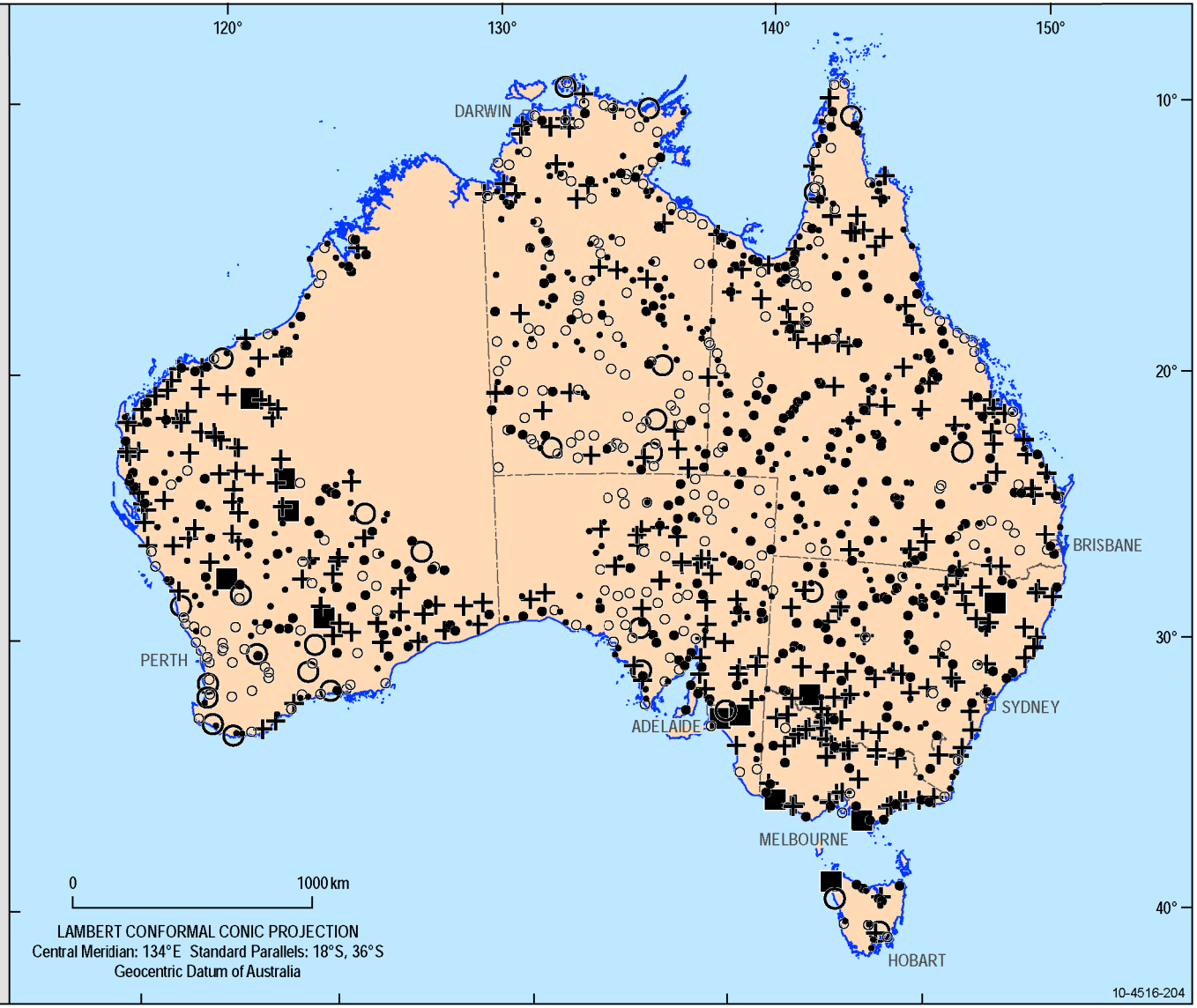
25%: *2.1 mg/kg*

Lower Fence: *0.5 mg/kg*

Minimum: *Less than 0.4 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Au

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.001 mg/kg
N: 1189

Maximum: *0.109 mg/kg*

Upper Fence: *0.006 mg/kg*

75%: *0.002 mg/kg*

Median: *0.001 mg/kg*

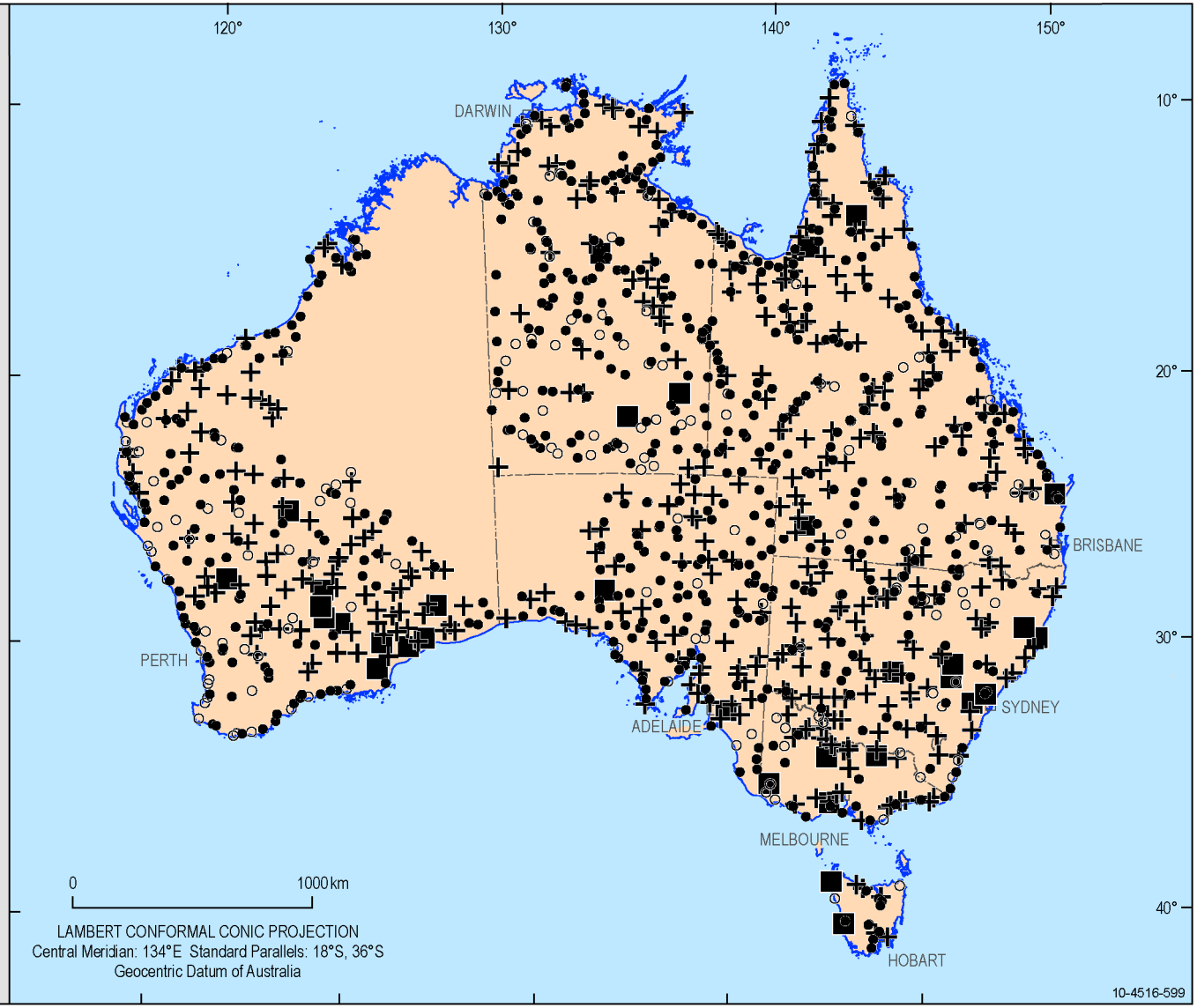
25%: *0.001 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 0.001 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ba

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1190

Maximum: *2373.5 mg/kg*

Upper Fence: *1312.1 mg/kg*

75%: *424.4 mg/kg*

Median: *326.3 mg/kg*

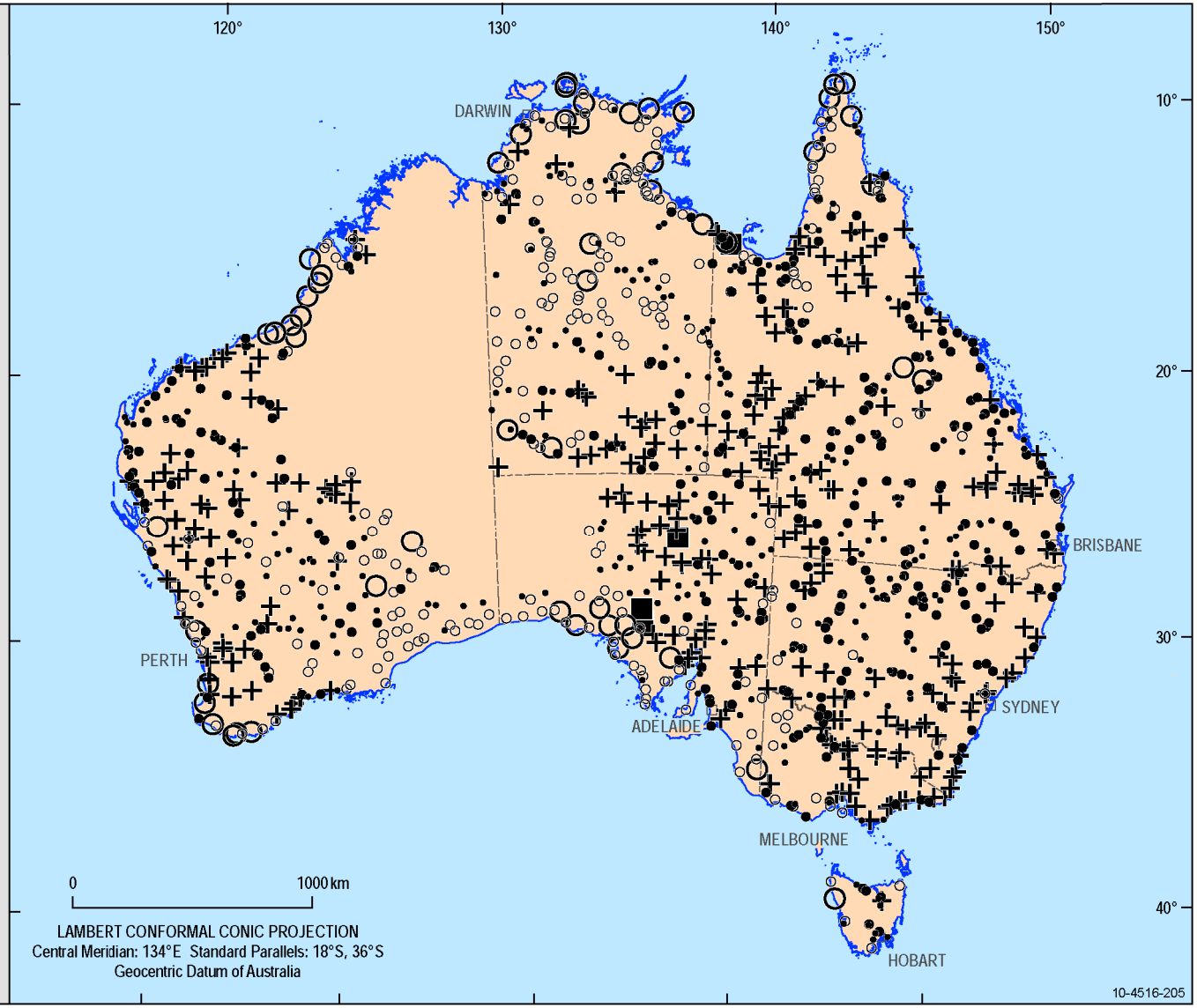
25%: *199.9 mg/kg*

Lower Fence: *64.6 mg/kg*

Minimum: *5.6 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Be

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 1.1 mg/kg
N: 1190

Maximum: *7.5 mg/kg*

Upper Fence: *N/A**

75%: *1.9 mg/kg*

Median: *1.3 mg/kg*

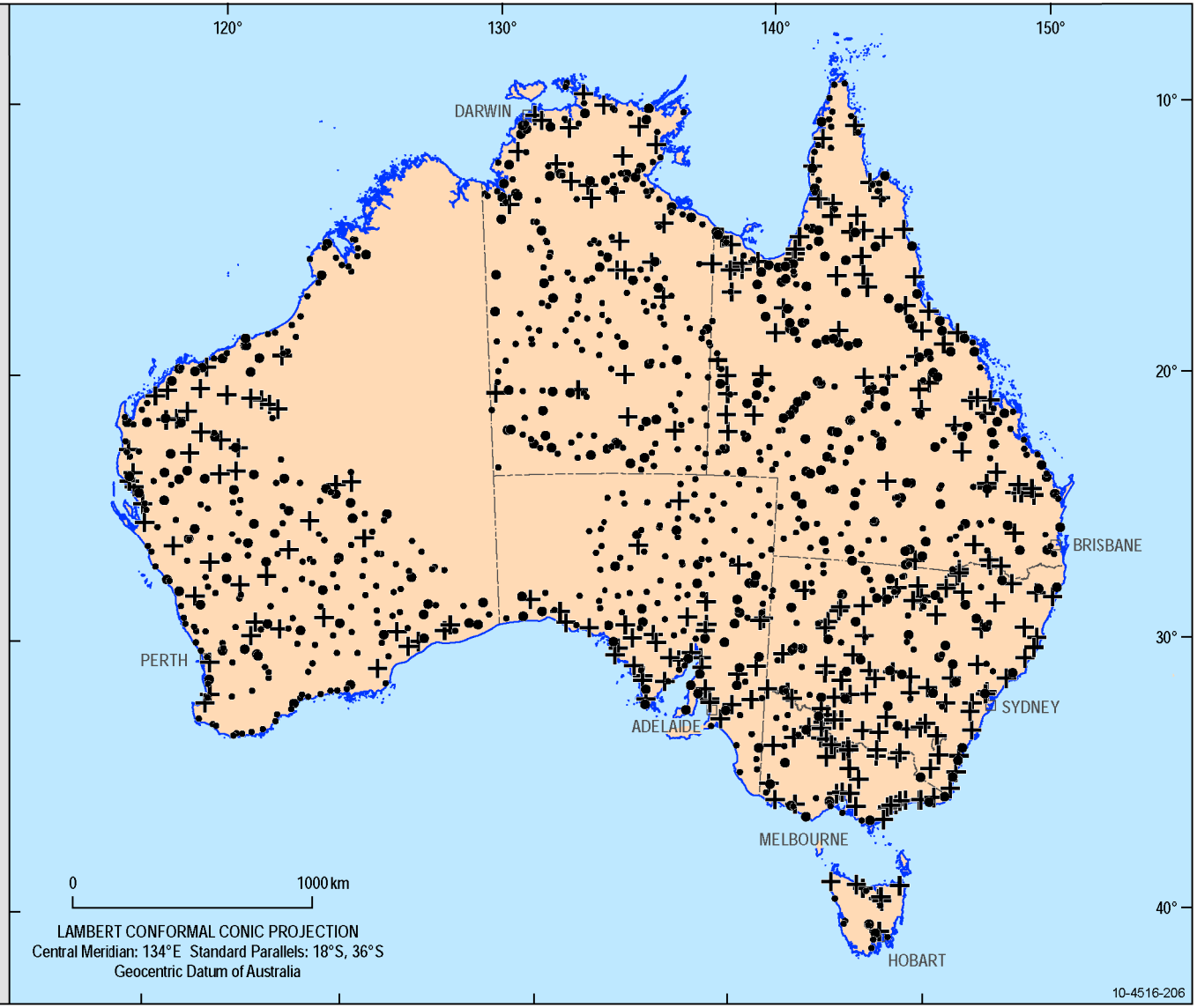
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 1.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Bi

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *7.9 mg/kg*

Upper Fence: *1 mg/kg*

75%: *0.28 mg/kg*

Median: *0.19 mg/kg*

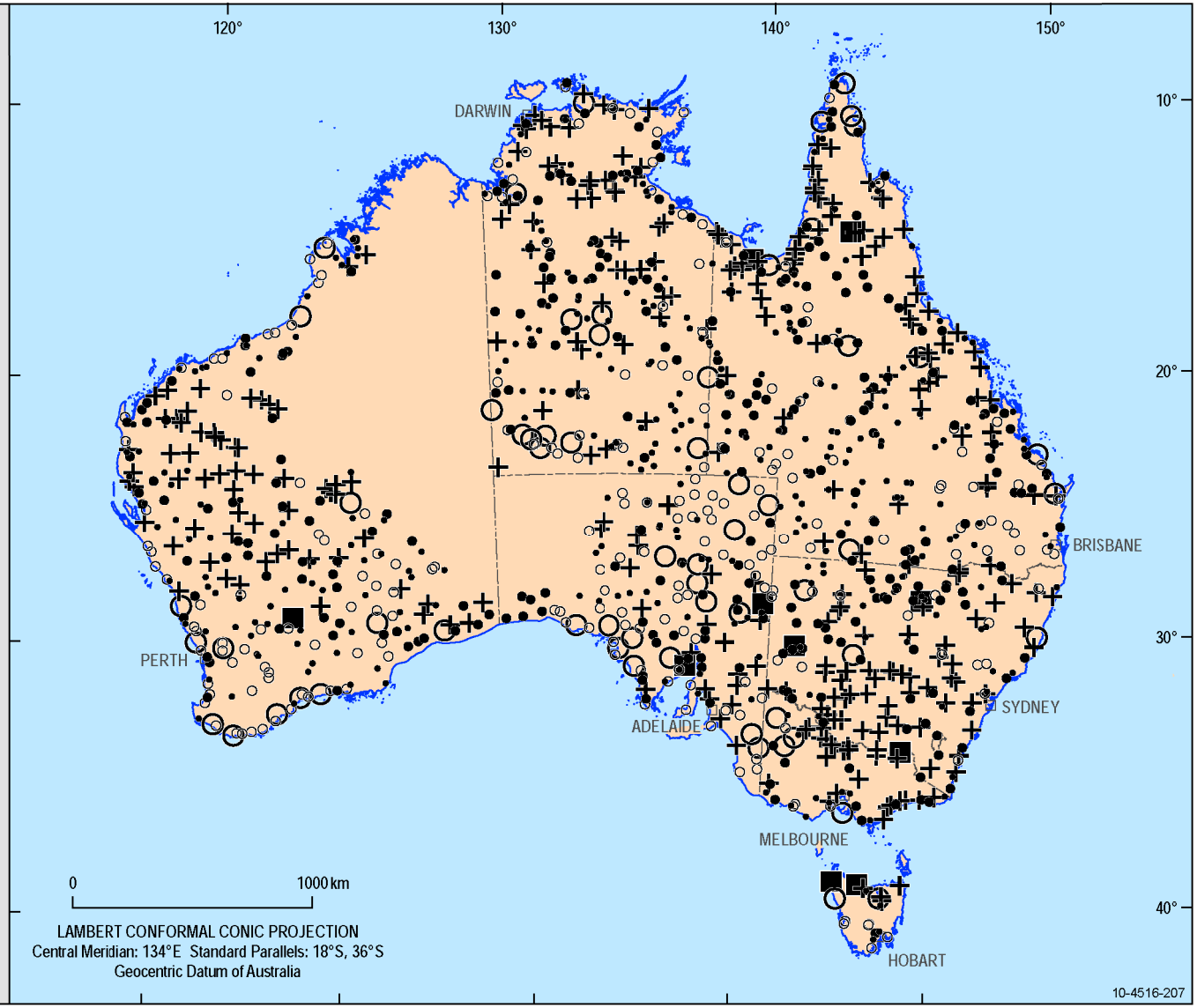
25%: *0.12 mg/kg*

Lower Fence: *0.03 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ca

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 14 mg/kg
N: 1190

Maximum: *360102 mg/kg*

Upper Fence: *114448 mg/kg*

75%: *9148 mg/kg*

Median: *4074 mg/kg*

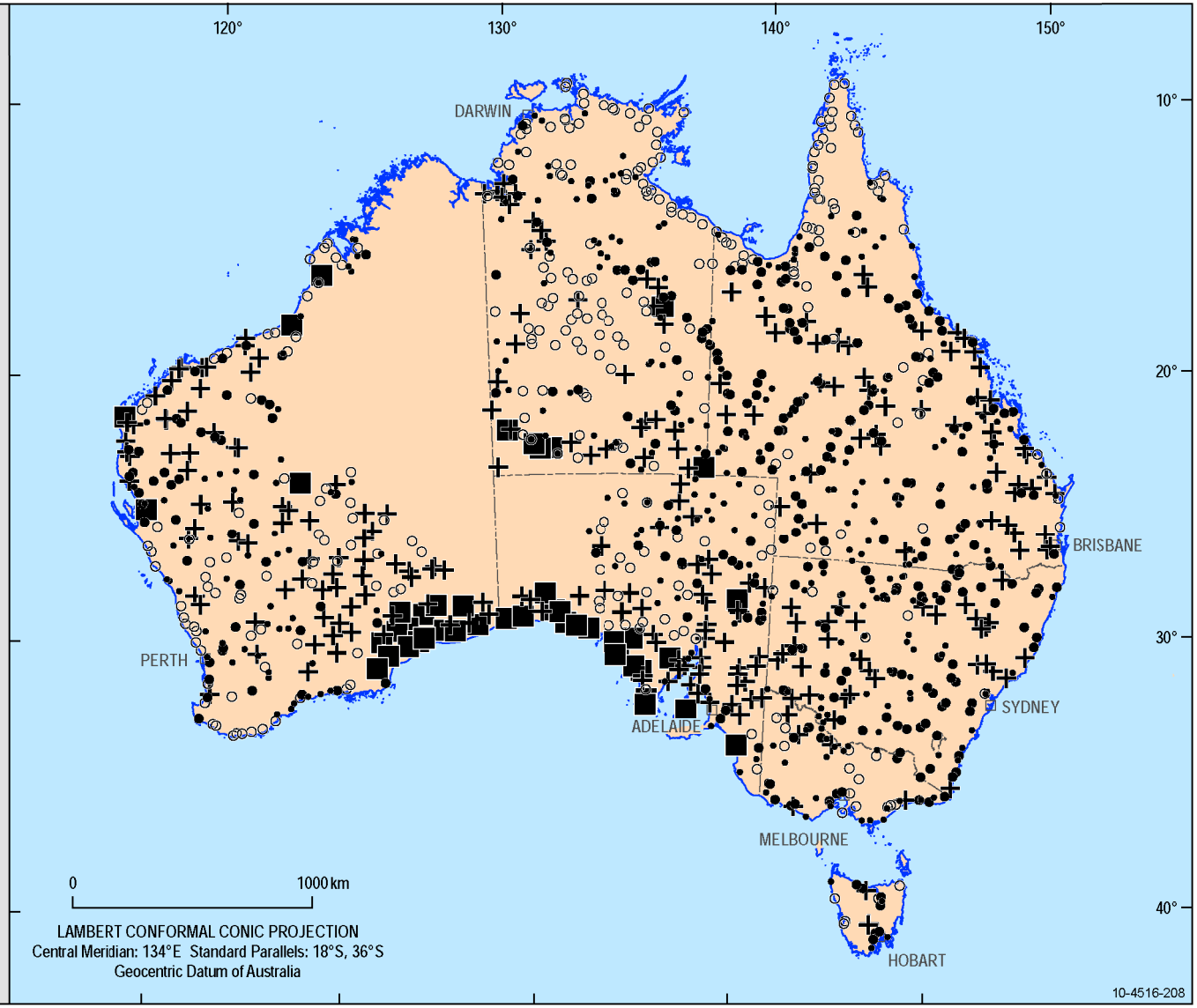
25%: *1587 mg/kg*

Lower Fence: *N/A**

Minimum: *214 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cd

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *1.2 mg/kg*

Upper Fence: *0.3 mg/kg*

75%: *0.1 mg/kg*

Median: *N/A**

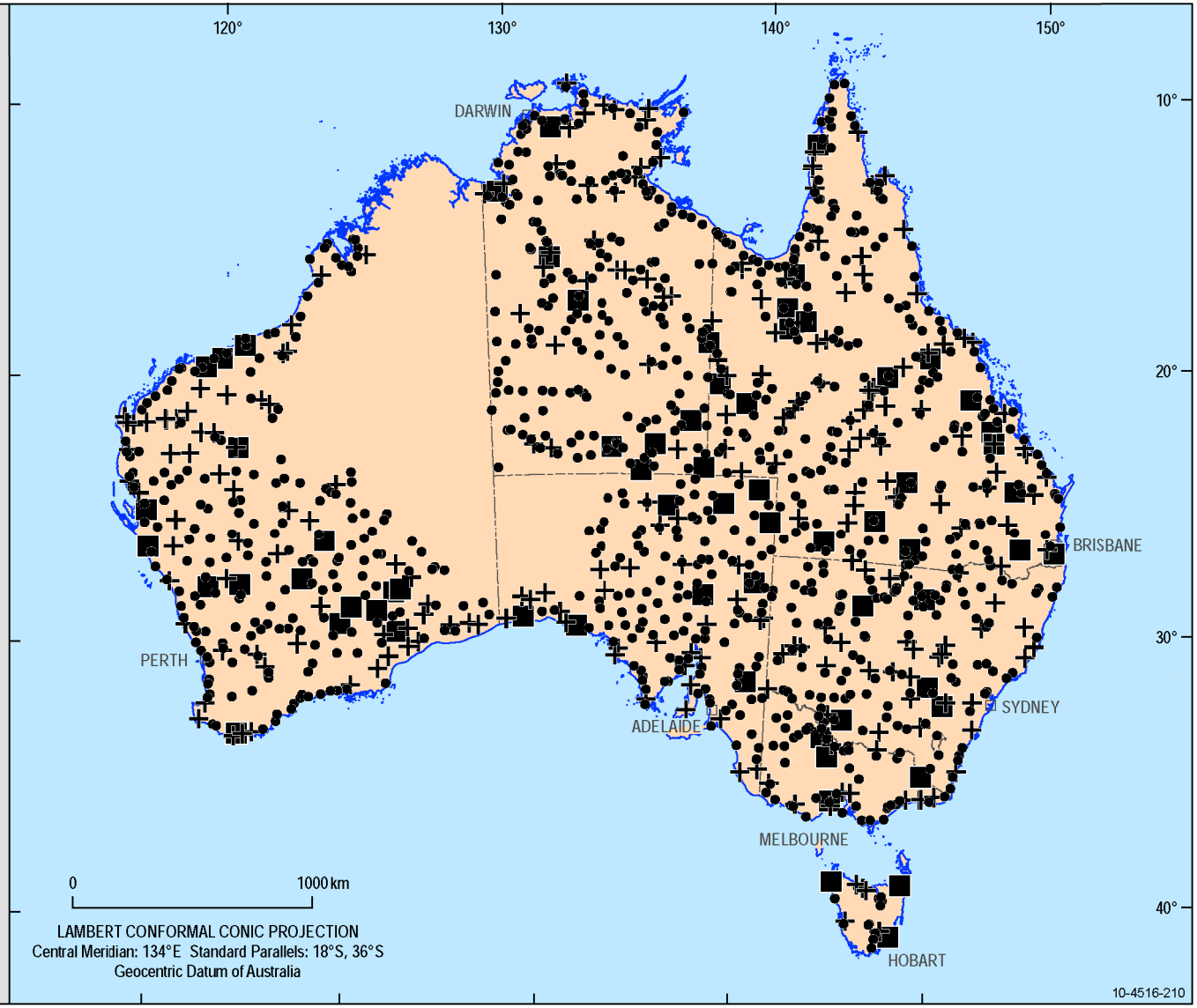
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ce

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *179.2 mg/kg*

Upper Fence: *N/A**

75%: *57.52 mg/kg*

Median: *41.9 mg/kg*

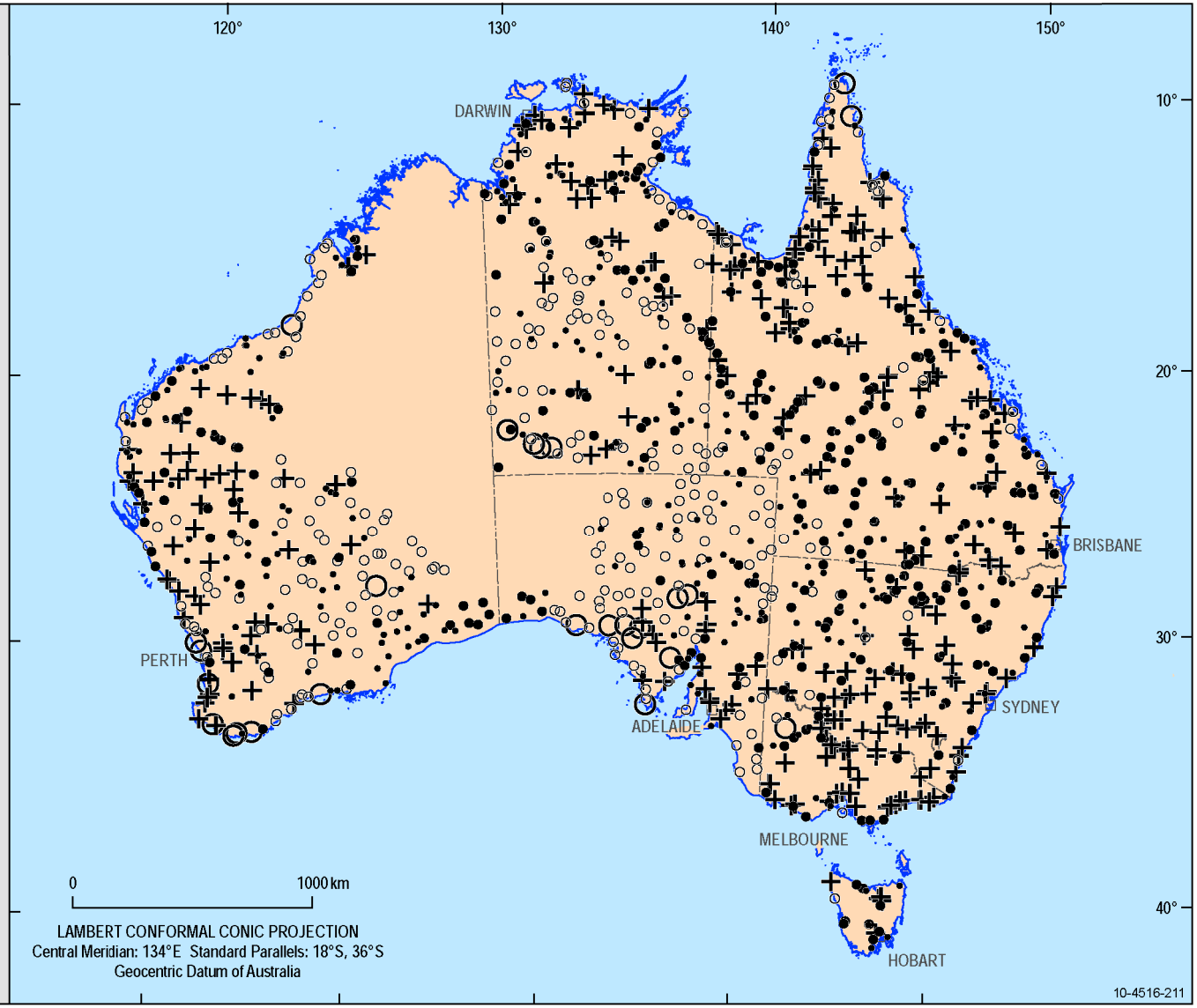
25%: *24.62 mg/kg*

Lower Fence: *6.89 mg/kg*

Minimum: *1.47 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cl

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 10 mg/kg
N: 1190

Maximum: *32613 mg/kg*

Upper Fence: *28581 mg/kg*

75%: *577 mg/kg*

Median: *75 mg/kg*

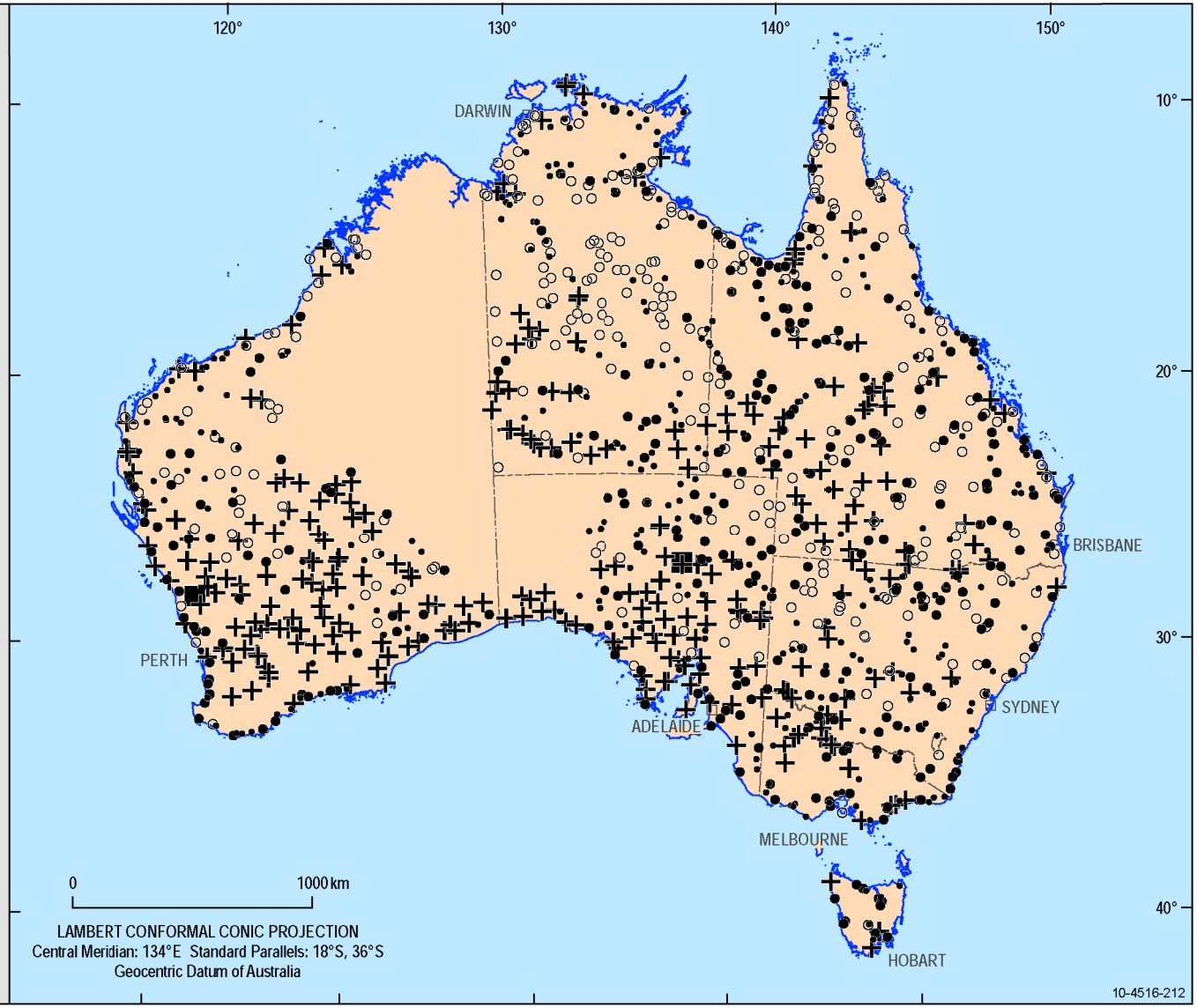
25%: *42 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 10 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Co

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *74.5 mg/kg*

Upper Fence: *N/A**

75%: *13.6 mg/kg*

Median: *8.5 mg/kg*

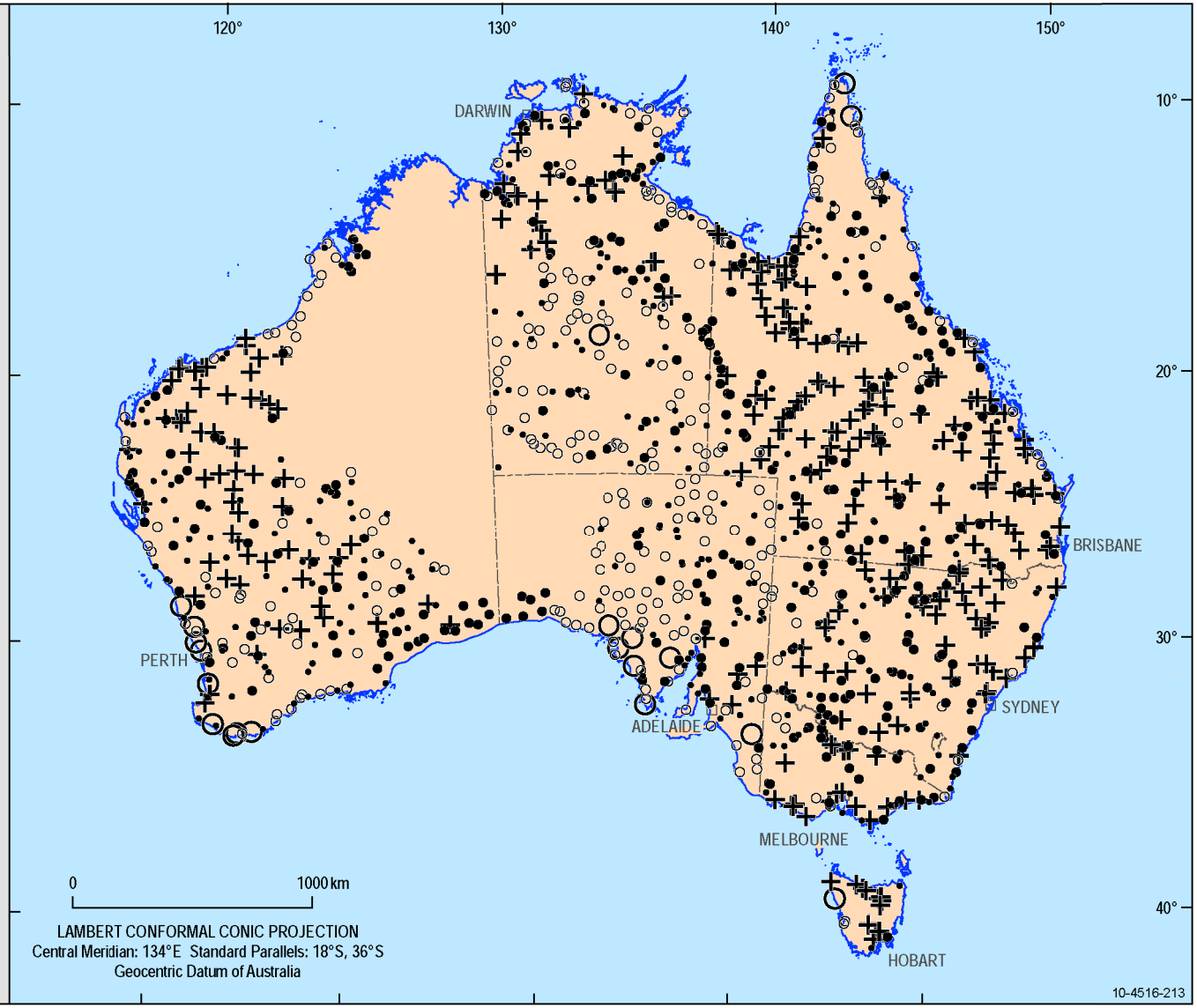
25%: *4.3 mg/kg*

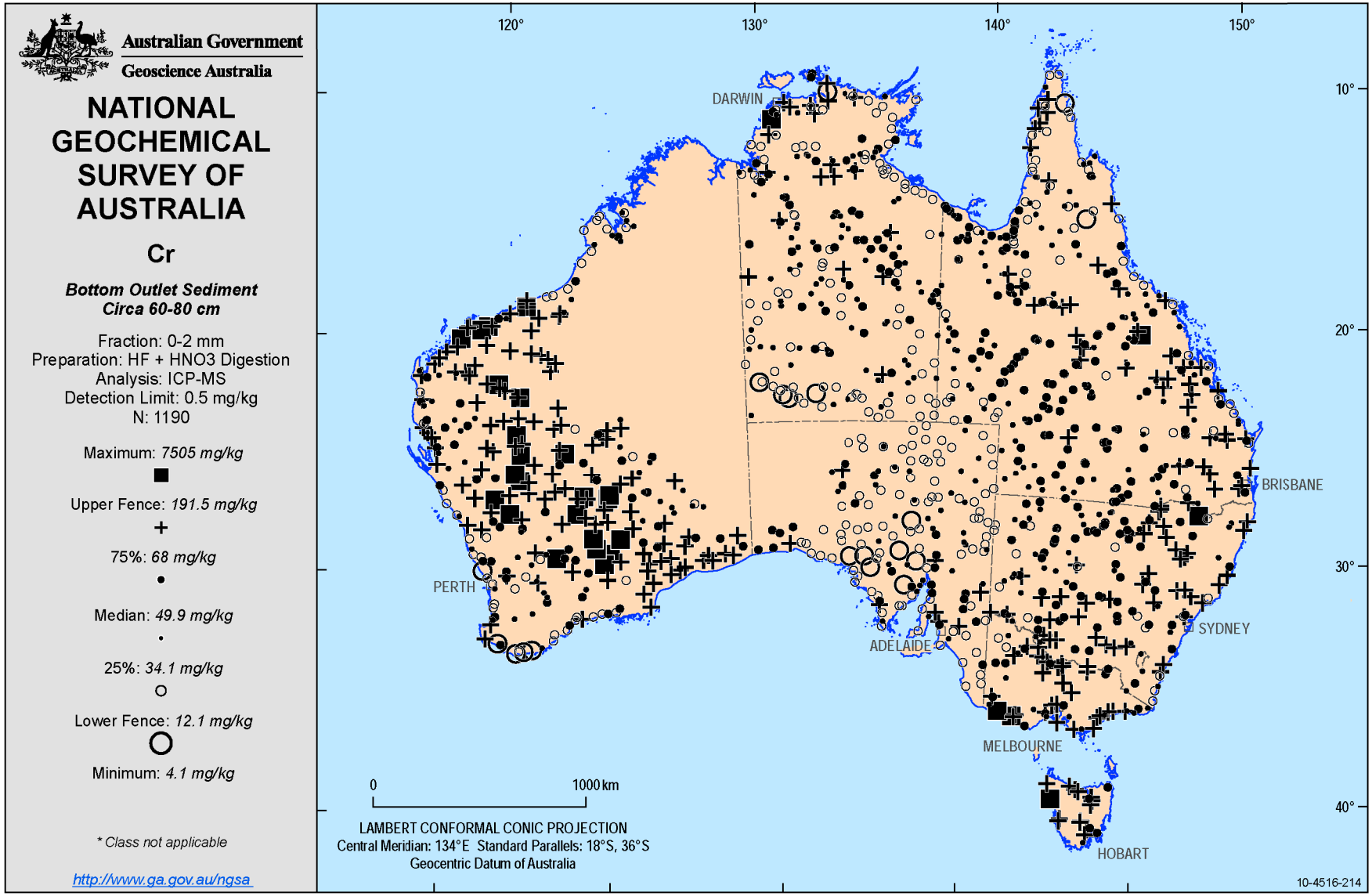
Lower Fence: *0.8 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Cr
Bottom Outlet Sediment
Circa 60-80 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1190
Maximum: 7505 mg/kg
Upper Fence: 191.5 mg/kg
75%: 68 mg/kg
Median: 49.9 mg/kg
25%: 34.1 mg/kg
Lower Fence: 12.1 mg/kg
Minimum: 4.1 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-214

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cs

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *22.7 mg/kg*

Upper Fence: *15.3 mg/kg*

75%: *3.8 mg/kg*

Median: *2.5 mg/kg*

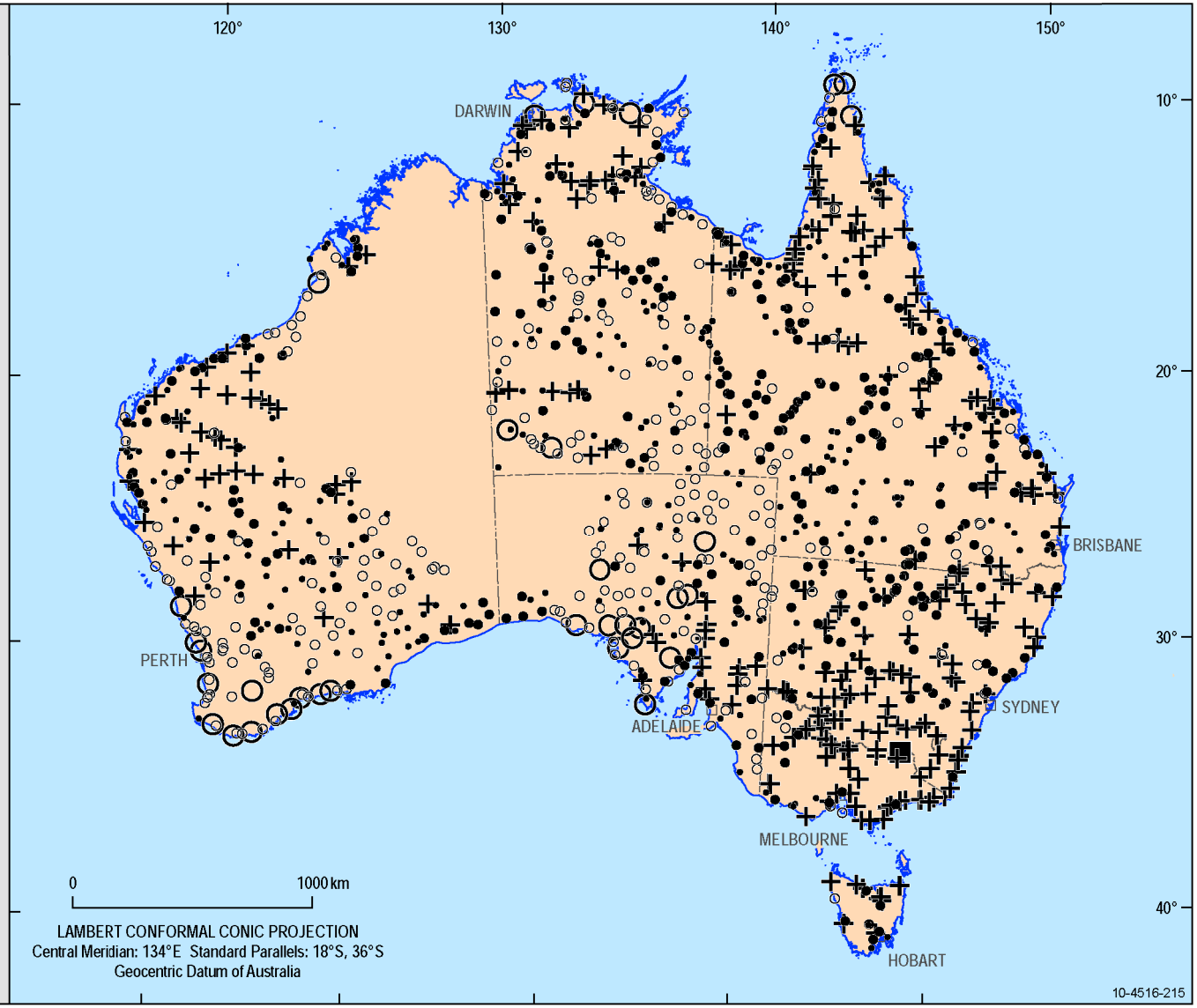
25%: *1.5 mg/kg*

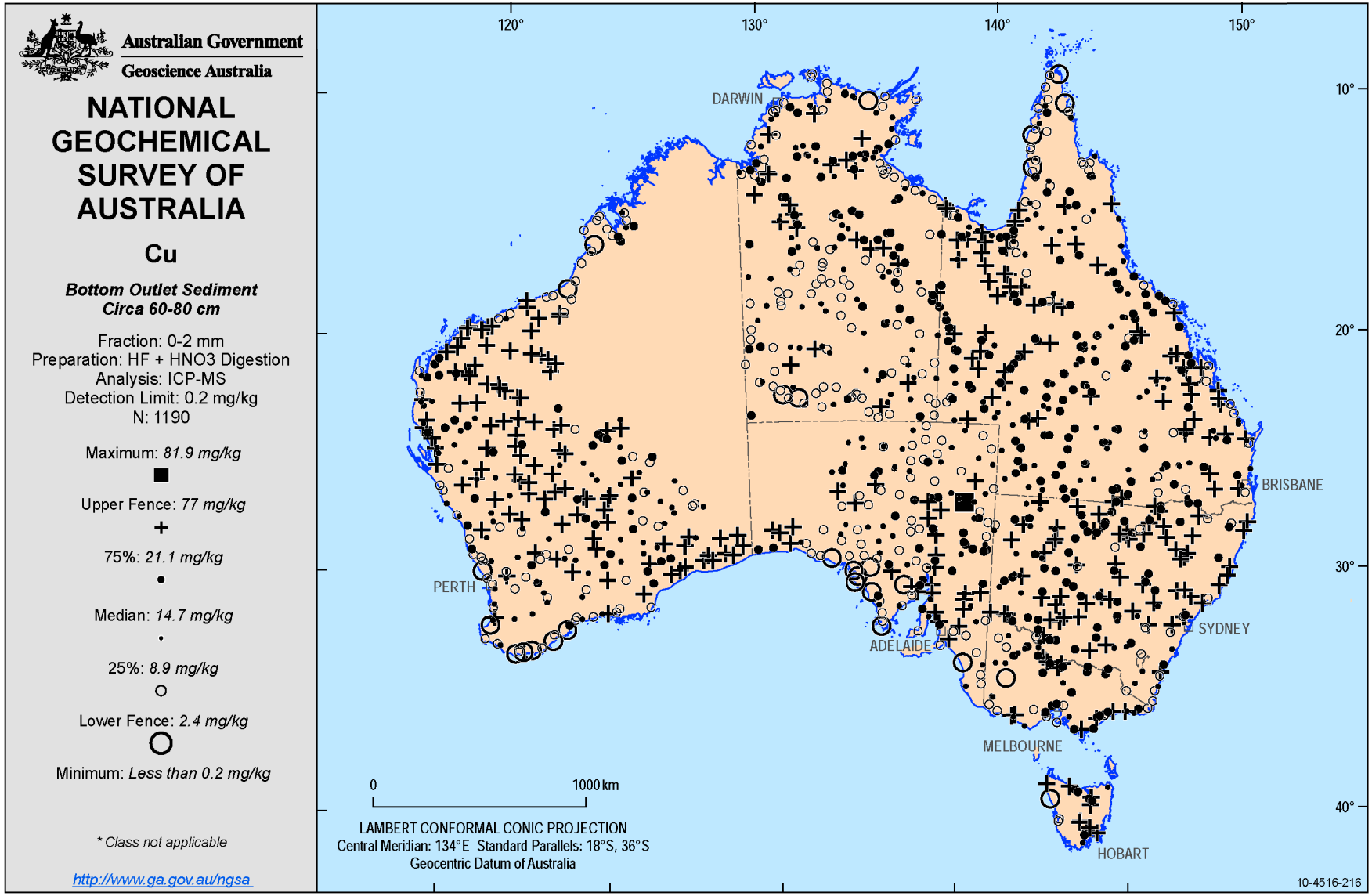
Lower Fence: *0.4 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Cu
Bottom Outlet Sediment
Circa 60-80 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190
Maximum: 81.9 mg/kg
Upper Fence: 77 mg/kg
75%: 21.1 mg/kg
Median: 14.7 mg/kg
25%: 8.9 mg/kg
Lower Fence: 2.4 mg/kg
Minimum: Less than 0.2 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-216

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Dy

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *9.8 mg/kg*

Upper Fence: *N/A**

75%: *4.4 mg/kg*

Median: *3.3 mg/kg*

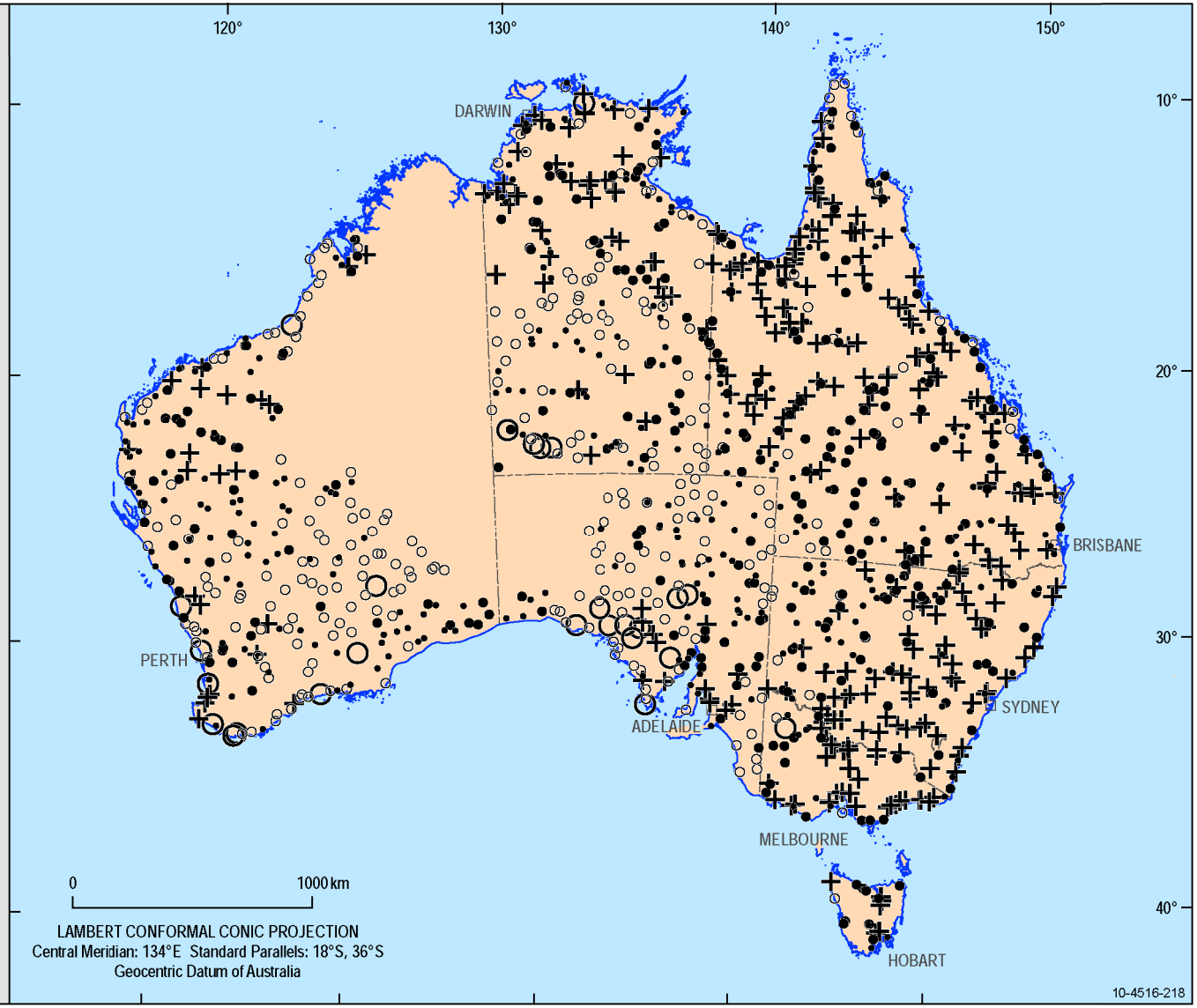
25%: *1.9 mg/kg*

Lower Fence: *0.6 mg/kg*

Minimum: *0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Er

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *5.87 mg/kg*

Upper Fence: *N/A**

75%: *2.64 mg/kg*

Median: *1.97 mg/kg*

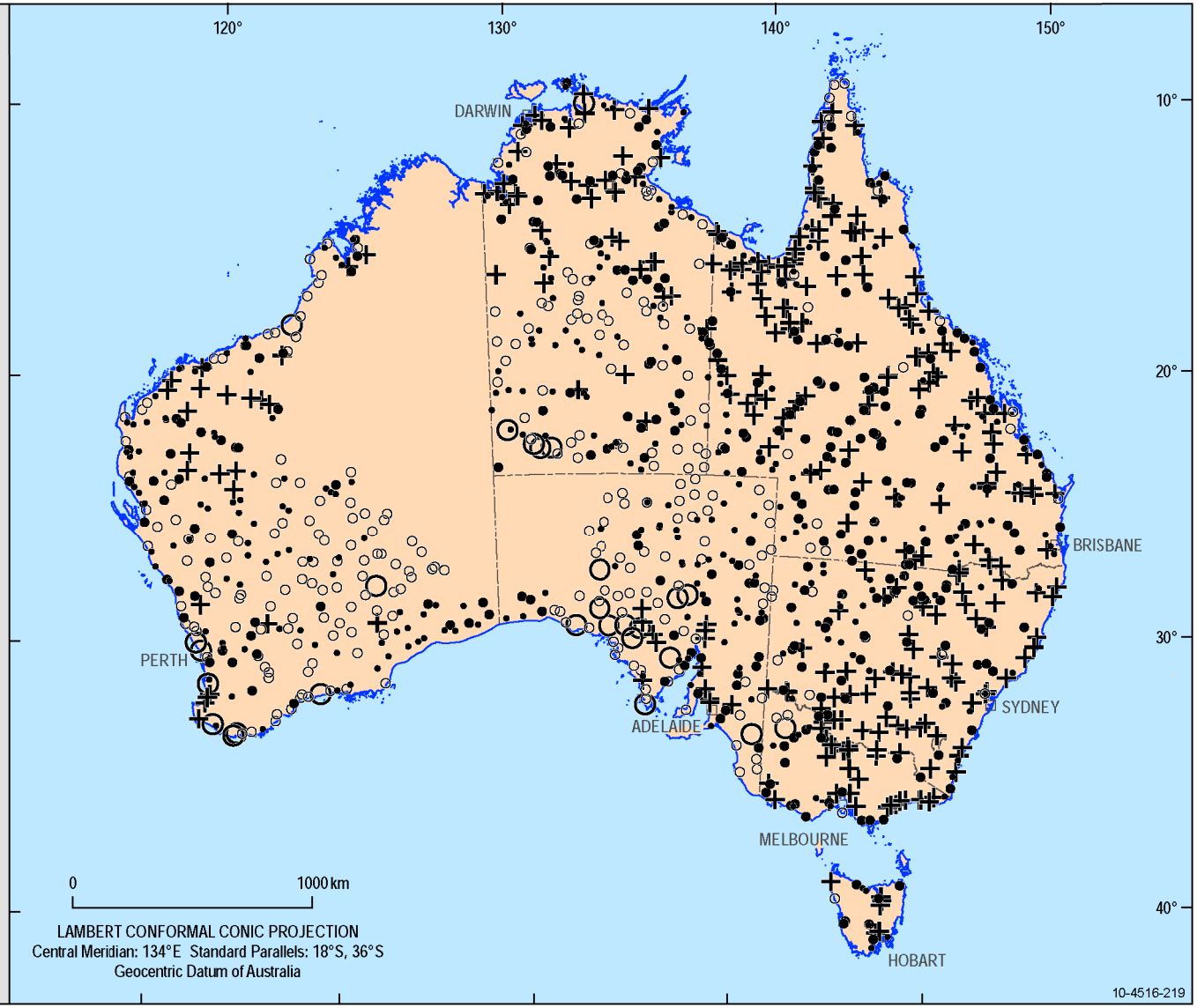
25%: *1.14 mg/kg*

Lower Fence: *0.33 mg/kg*

Minimum: *0.06 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Eu

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *3.17 mg/kg*

Upper Fence: *N/A**

75%: *1.07 mg/kg*

Median: *0.75 mg/kg*

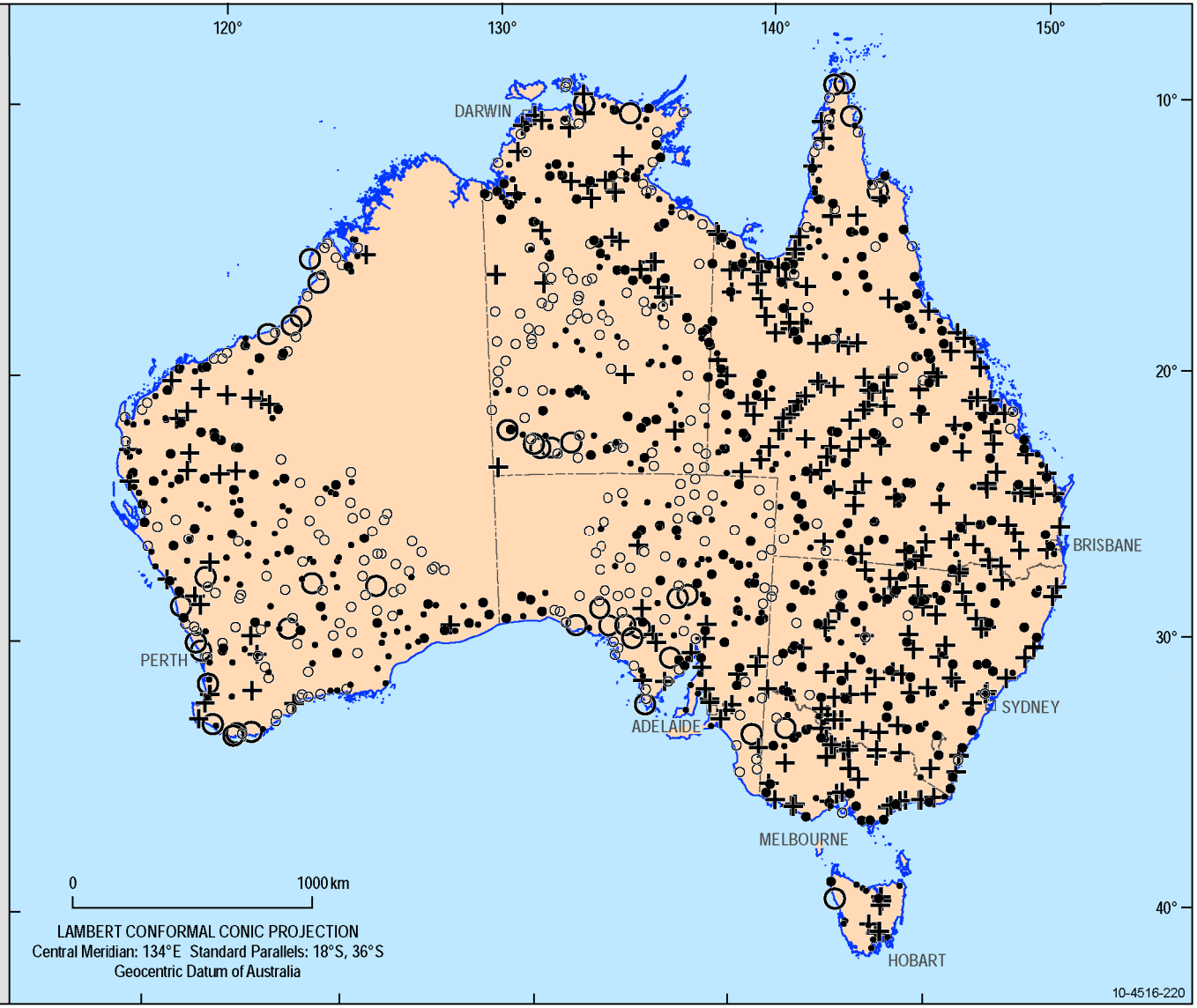
25%: *0.41 mg/kg*

Lower Fence: *0.09 mg/kg*

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

F

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Alkaline Fusion
Analysis: ISE
Detection Limit: 20 mg/kg
N: 1188

Maximum: *3360 mg/kg*

Upper Fence: *1105 mg/kg*

75%: *320 mg/kg*

Median: *220 mg/kg*

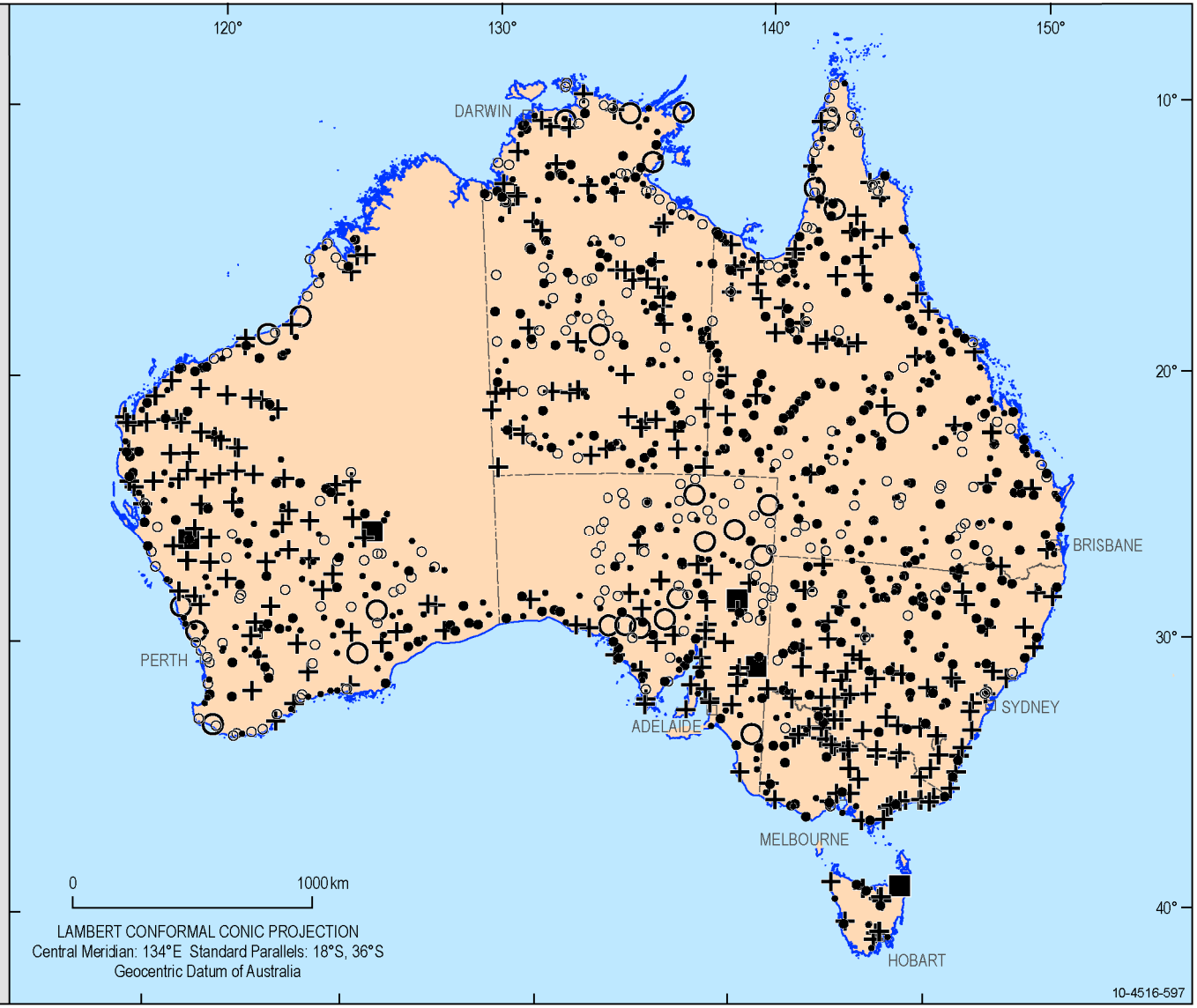
25%: *140 mg/kg*

Lower Fence: *41 mg/kg*

Minimum: *Less than 20 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Fe (Total)

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 35 mg/kg
N: 1190

Maximum: *228571 mg/kg*

Upper Fence: *95197 mg/kg*

75%: *32795 mg/kg*

Median: *24024 mg/kg*

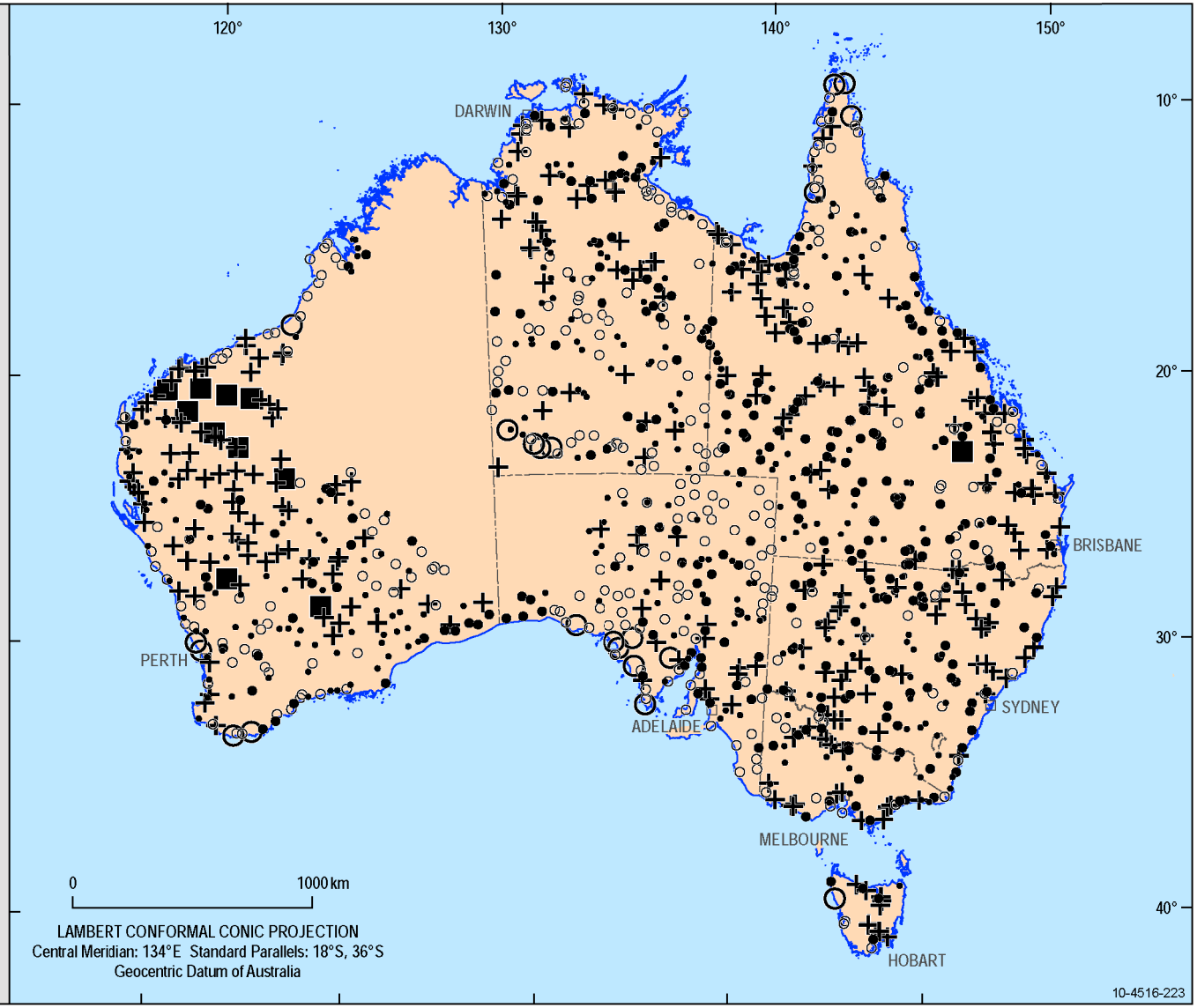
25%: *15688 mg/kg*

Lower Fence: *5110 mg/kg*

Minimum: *567 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ga

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *42.8 mg/kg*

Upper Fence: *42.1 mg/kg*

75%: *14.1 mg/kg*

Median: *10.6 mg/kg*

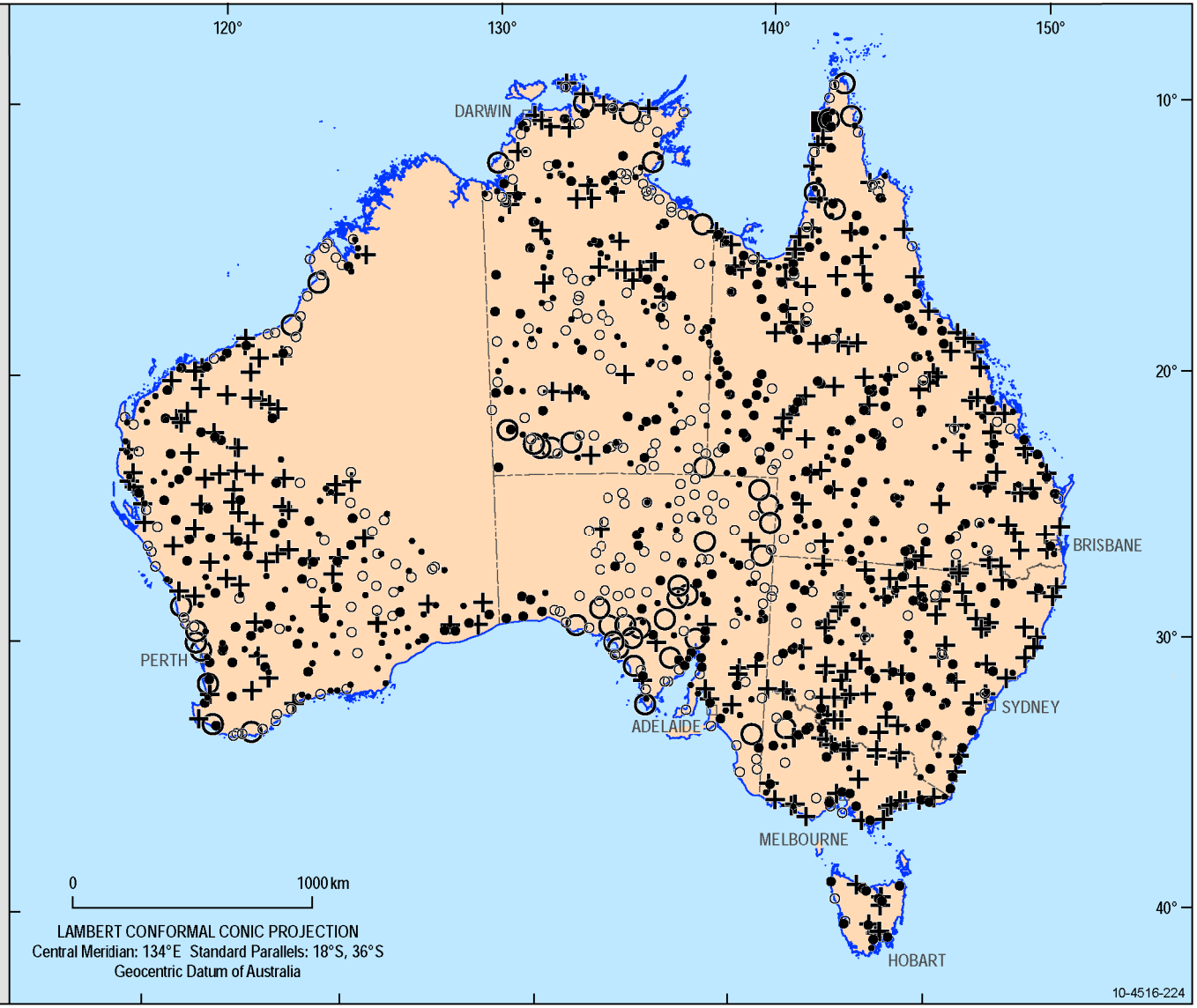
25%: *6.8 mg/kg*

Lower Fence: *2.3 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Gd

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *11.29 mg/kg*

Upper Fence: *N/A**

75%: *4.7 mg/kg*

Median: *3.38 mg/kg*

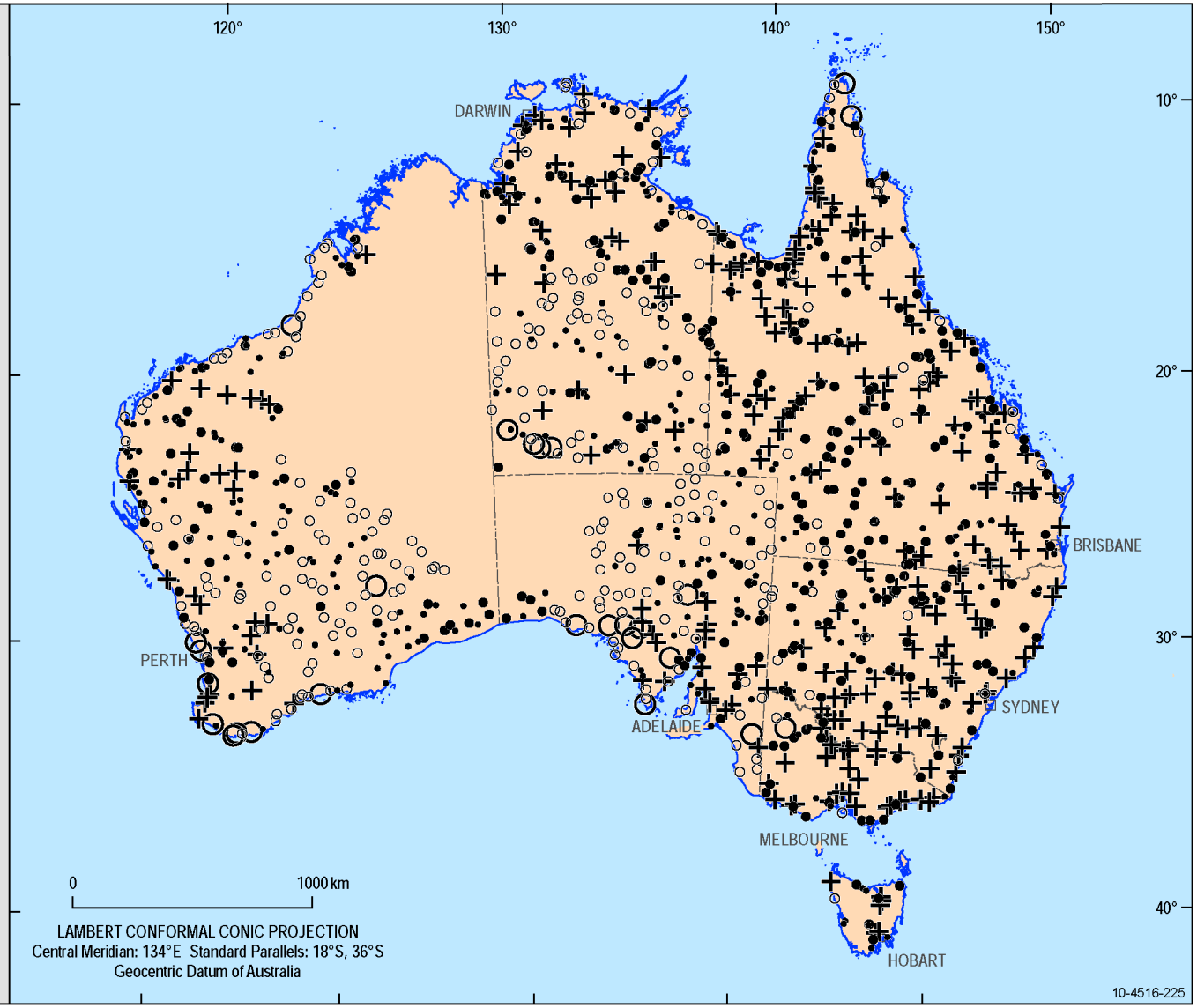
25%: *1.88 mg/kg*

Lower Fence: *0.48 mg/kg*

Minimum: *0.13 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ge

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *1.6 mg/kg*

Upper Fence: *1.1 mg/kg*

75%: *0.6 mg/kg*

Median: *0.5 mg/kg*

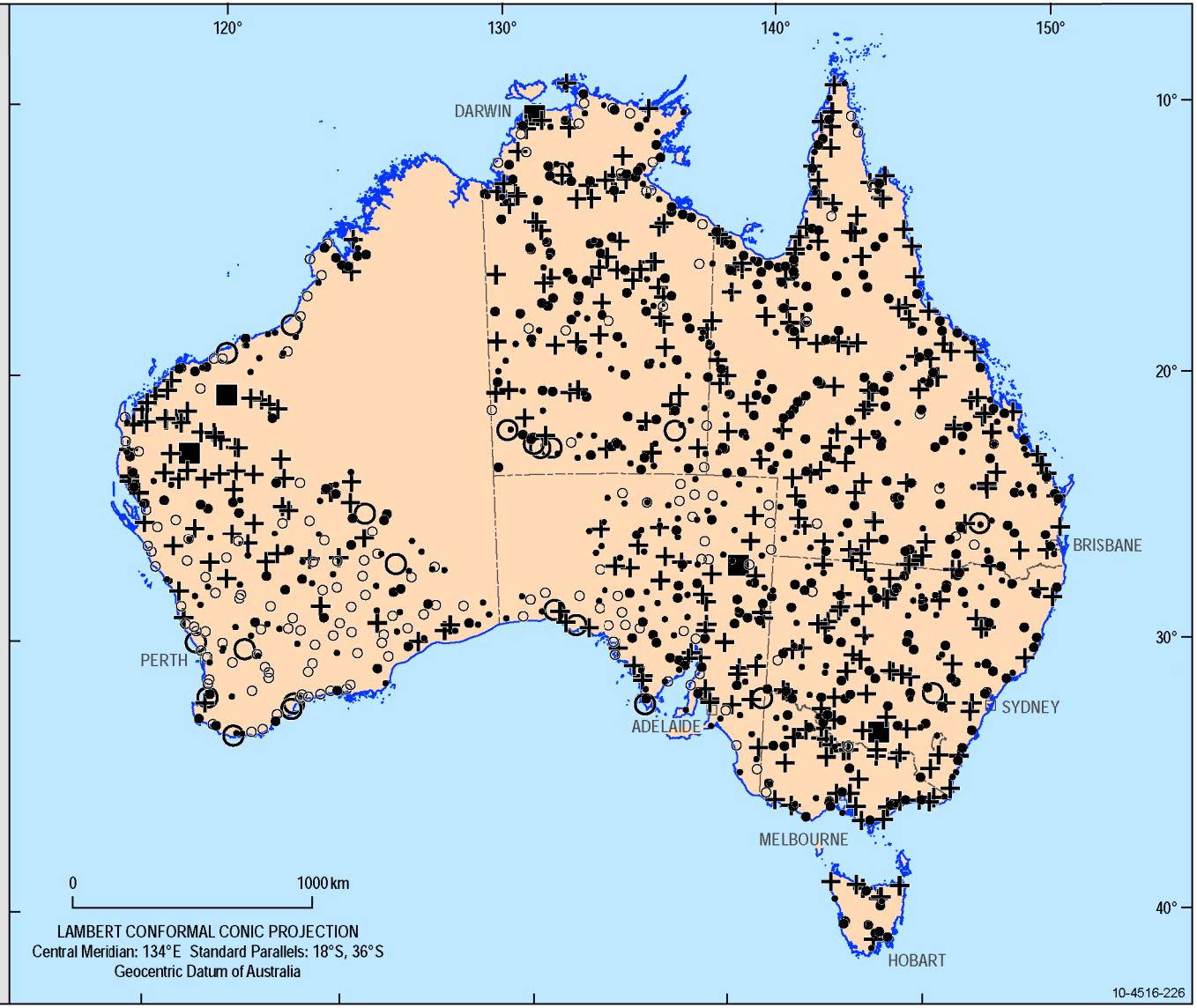
25%: *0.4 mg/kg*

Lower Fence: *0.22 mg/kg*

Minimum: *Less than 0.04 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Hf

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *46.73 mg/kg*

Upper Fence: *23.32 mg/kg*

75%: *9.5 mg/kg*

Median: *7.33 mg/kg*

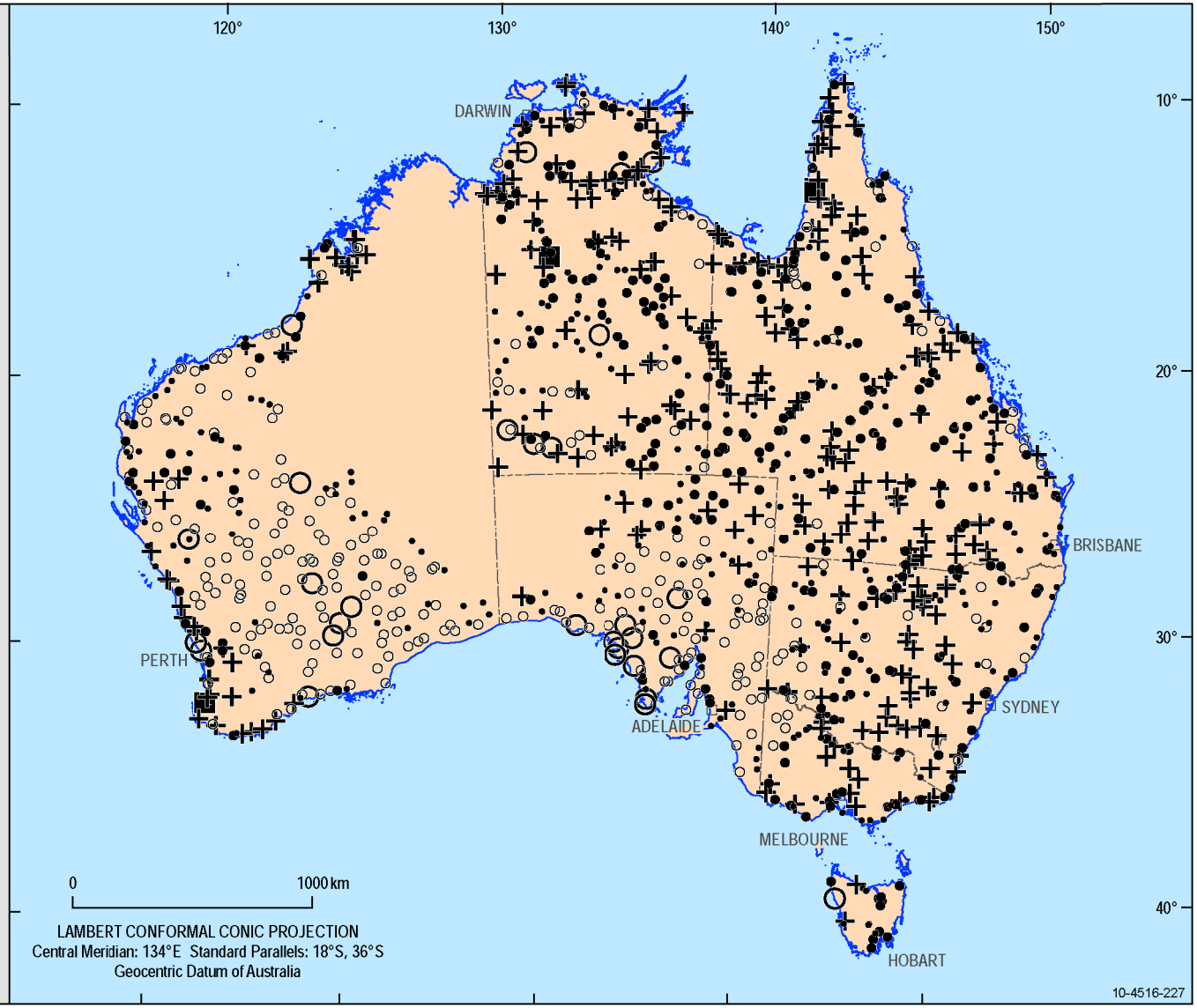
25%: *5.22 mg/kg*

Lower Fence: *2.13 mg/kg*

Minimum: *0.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ho

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *2.03 mg/kg*

Upper Fence: *N/A**

75%: *0.9 mg/kg*

Median: *0.66 mg/kg*

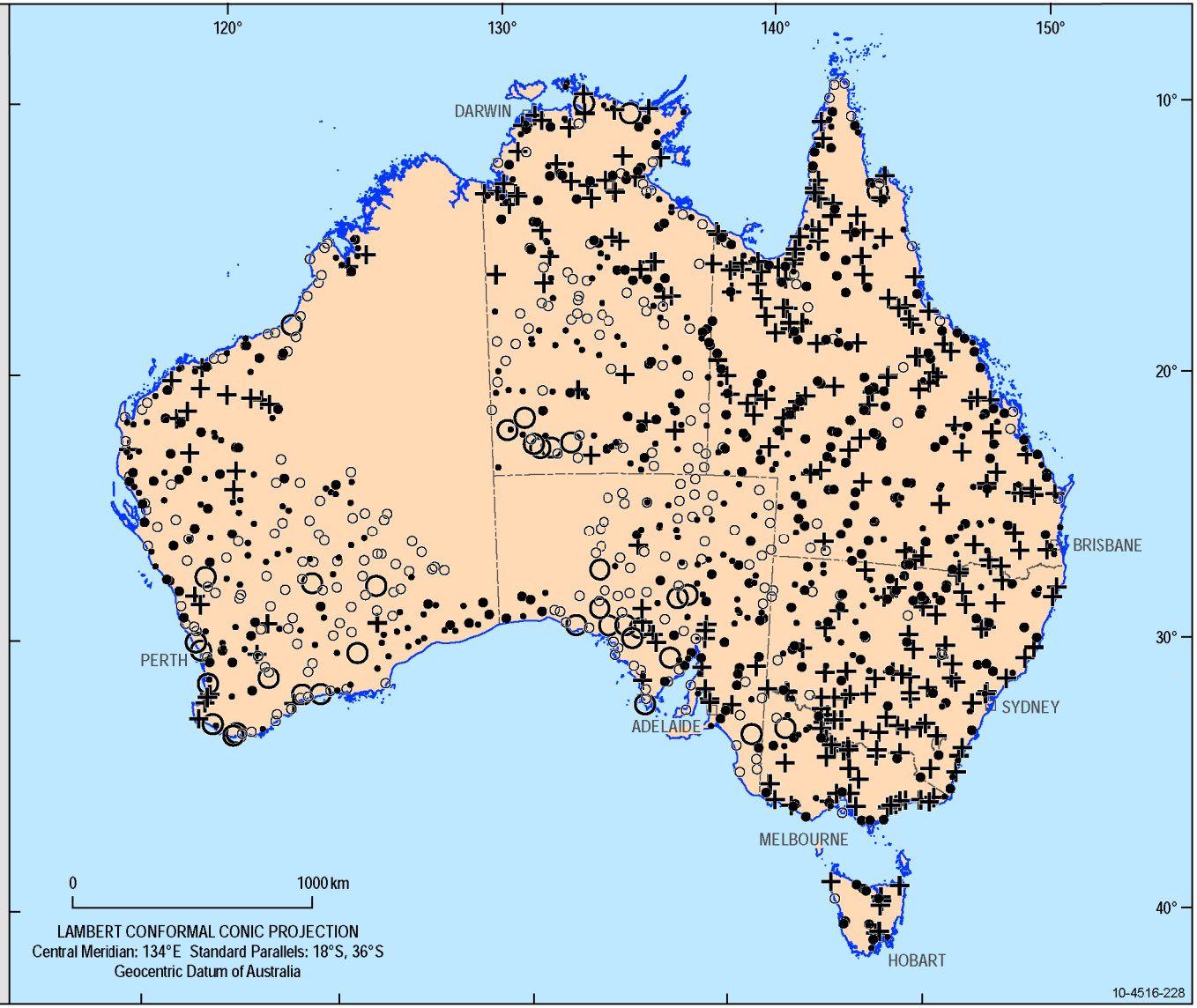
25%: *0.37 mg/kg*

Lower Fence: *0.1 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

K

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 42 mg/kg
N: 1190

Maximum: *34341 mg/kg*

Upper Fence: *N/A**

75%: *14411 mg/kg*

Median: *10053 mg/kg*

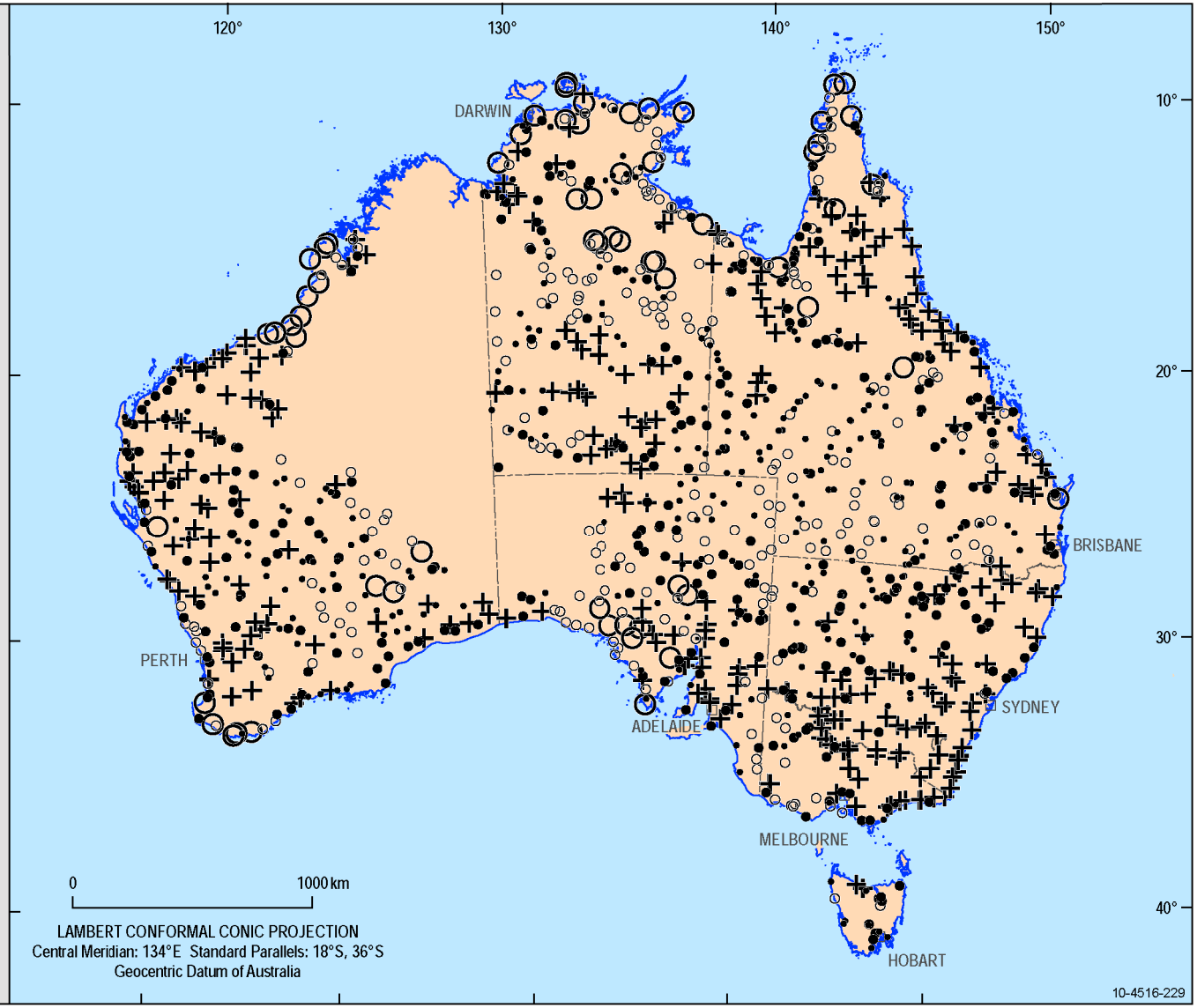
25%: *5670 mg/kg*

Lower Fence: *1387 mg/kg*

Minimum: *Less than 42 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

La

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *88.5 mg/kg*

Upper Fence: *N/A**

75%: *28.6 mg/kg*

Median: *21.1 mg/kg*

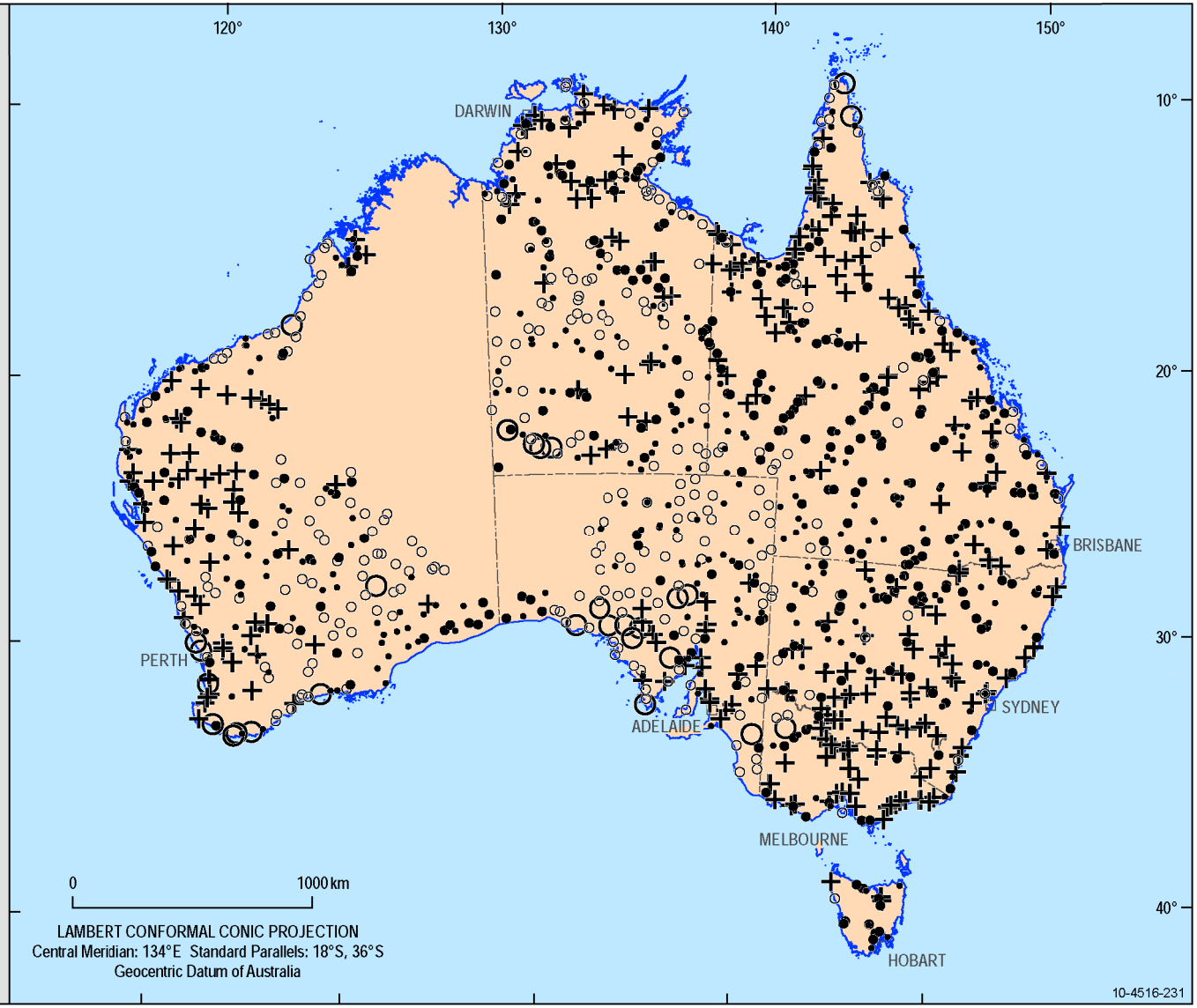
25%: *12.8 mg/kg*

Lower Fence: *3.9 mg/kg*

Minimum: *0.7 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

LOI_C

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: N/A
Analysis: Calculated from XRF
Detection Limit: N/A
N: 1151

Maximum: *485150 mg/kg*

Upper Fence: *351535 mg/kg*

75%: *86350 mg/kg*

Median: *52810 mg/kg*

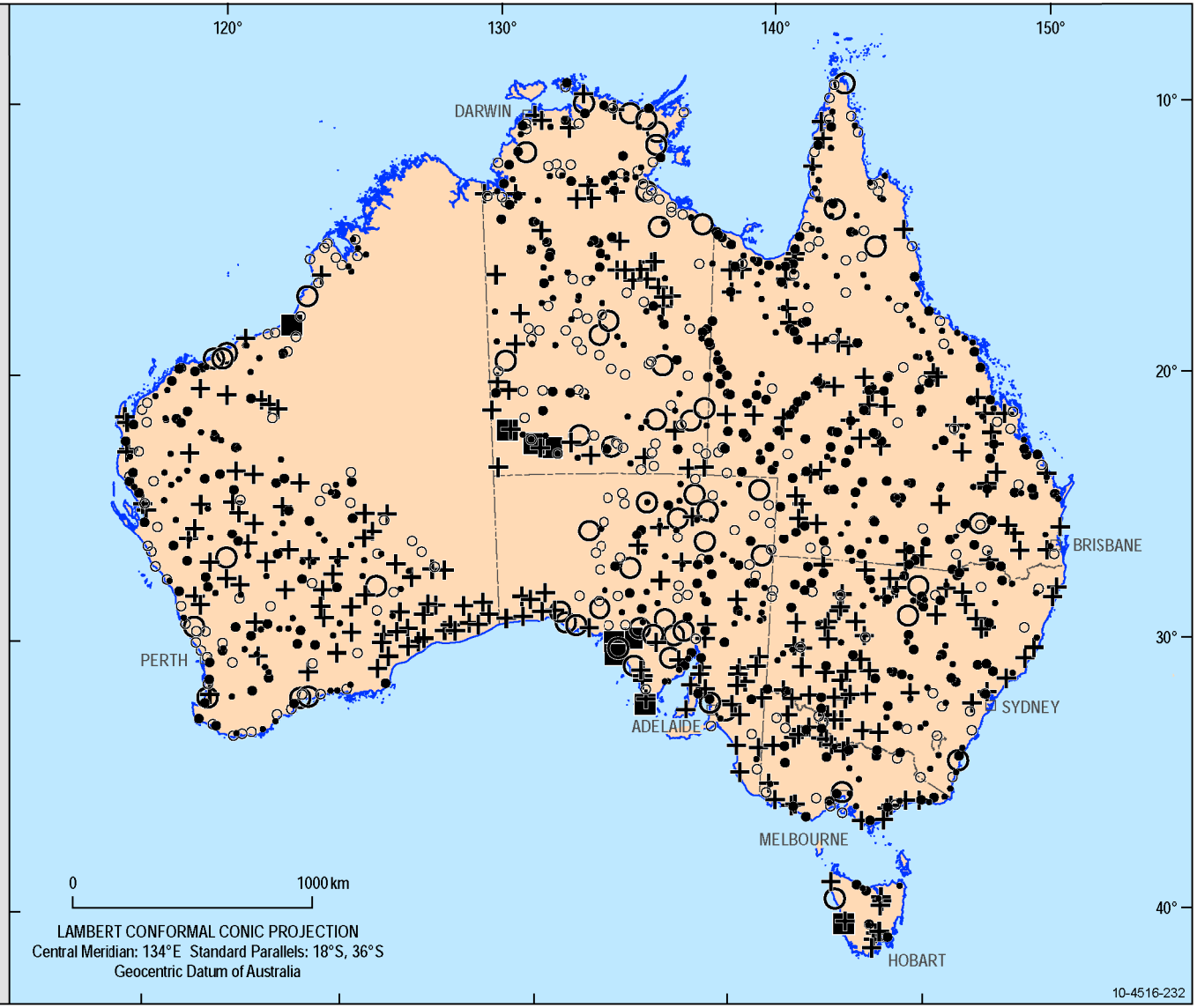
25%: *28650 mg/kg*

Lower Fence: *5116 mg/kg*

Minimum: *0 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Lu

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *0.97 mg/kg*

Upper Fence: *N/A**

75%: *0.38 mg/kg*

Median: *0.28 mg/kg*

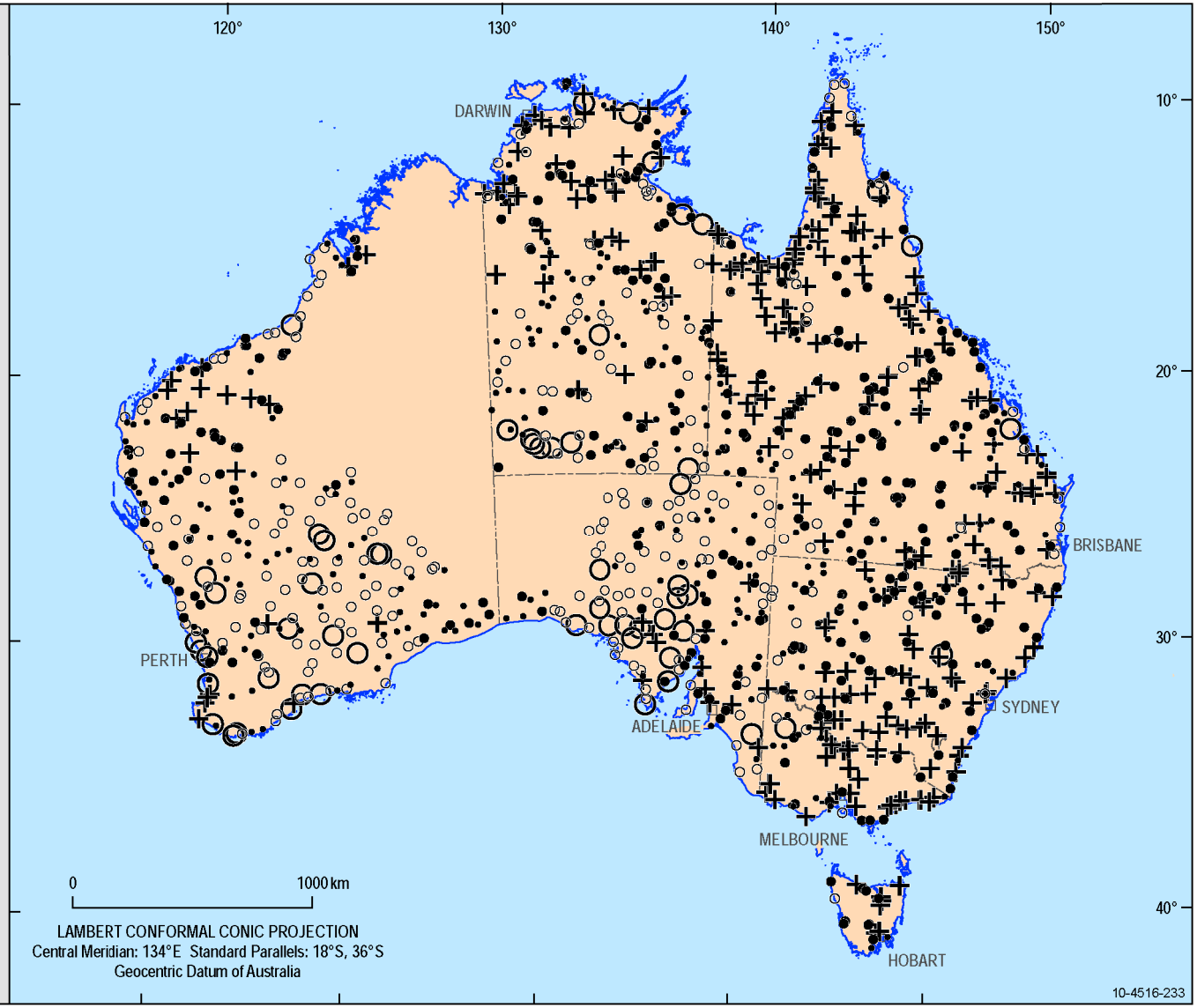
25%: *0.16 mg/kg*

Lower Fence: *0.04 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mg

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 60 mg/kg
N: 1190

Maximum: *74609 mg/kg*

Upper Fence: *50990 mg/kg*

75%: *6440 mg/kg*

Median: *3672 mg/kg*

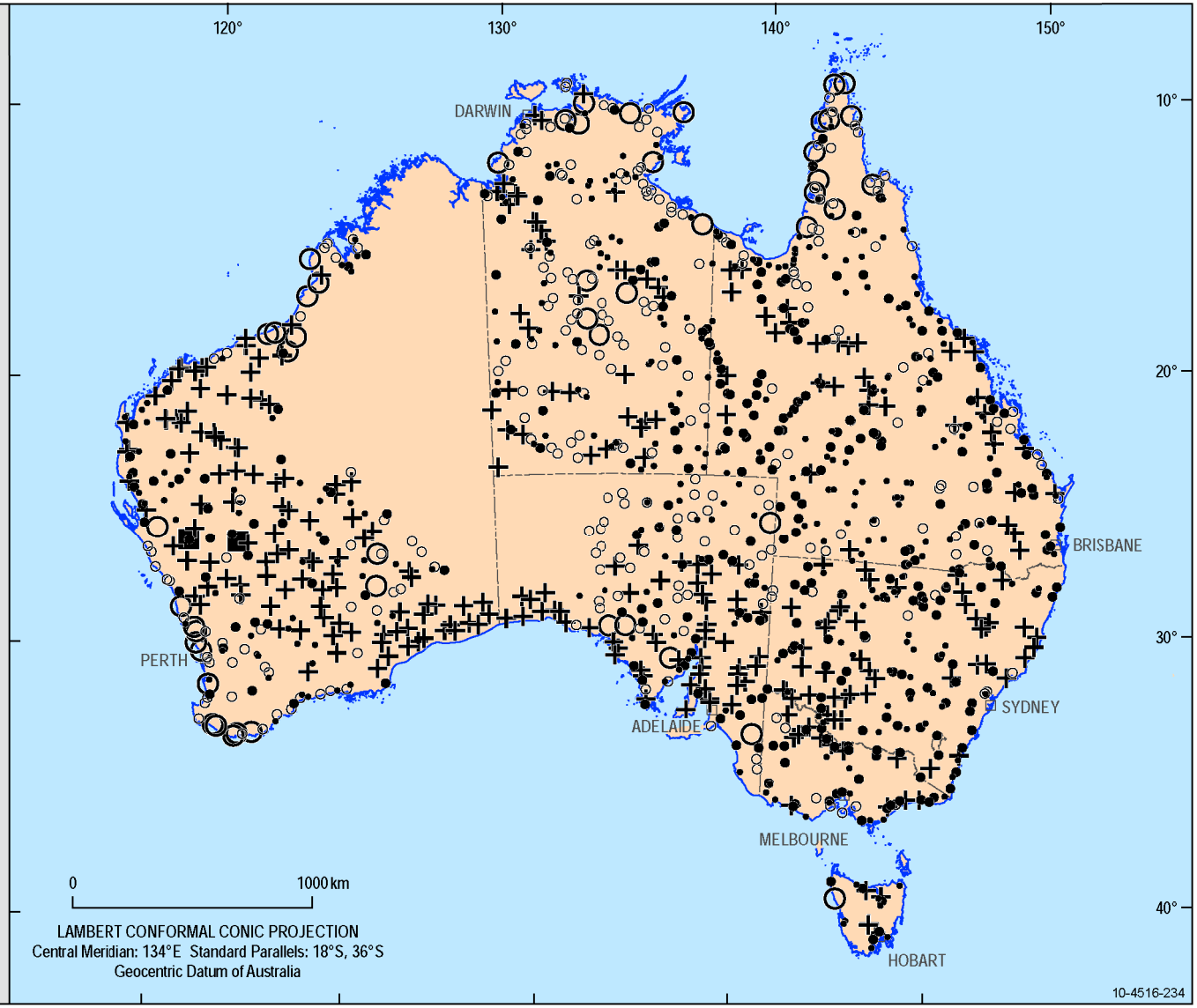
25%: *1580 mg/kg*

Lower Fence: *191 mg/kg*

Minimum: *Less than 60 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mn

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 39 mg/kg
N: 1190

Maximum: *3423 mg/kg*

Upper Fence: *N/A**

75%: *519 mg/kg*

Median: *294 mg/kg*

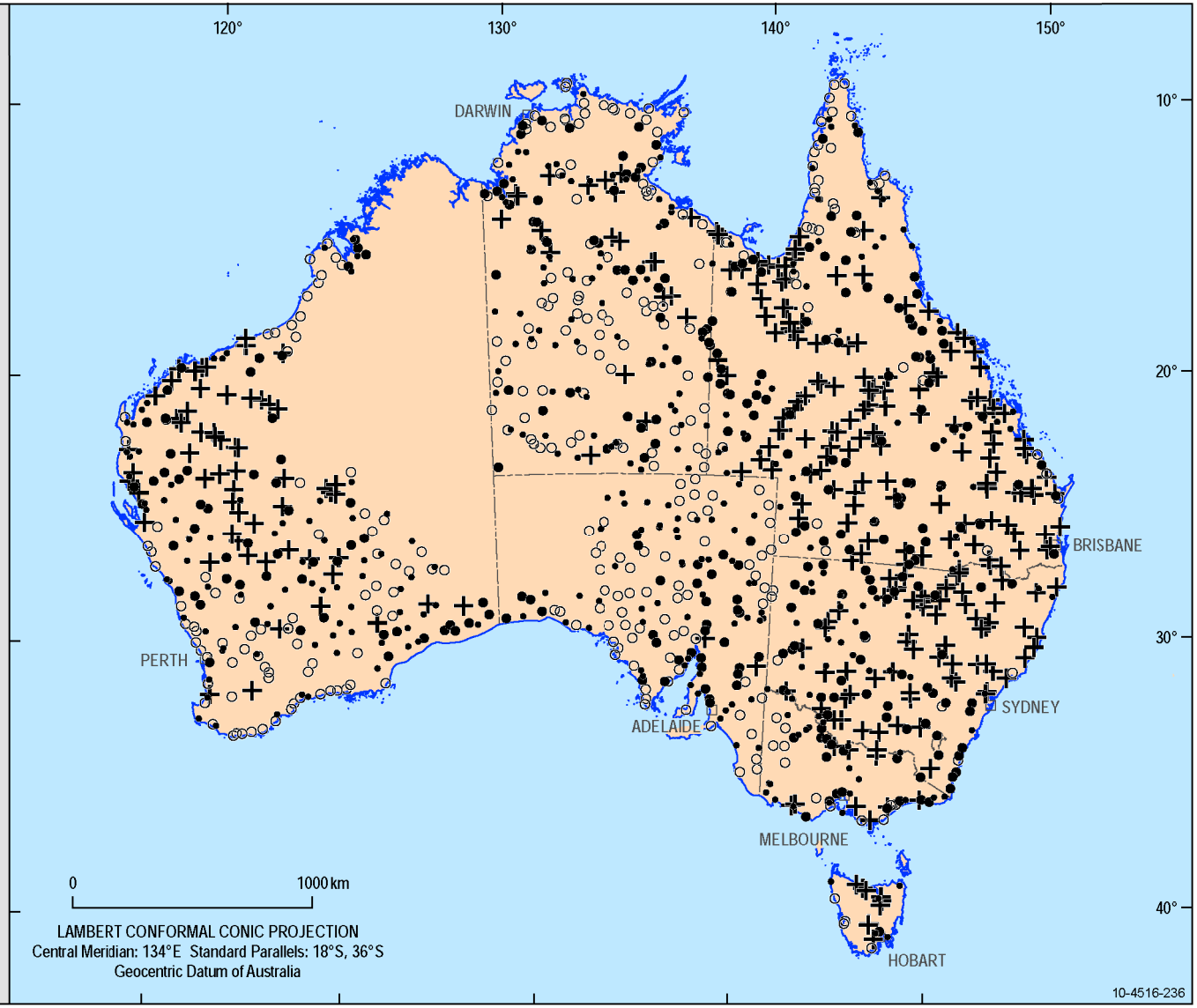
25%: *124 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 39 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mo

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.3 mg/kg
N: 1190

Maximum: *26.9 mg/kg*

Upper Fence: *3 mg/kg*

75%: *0.9 mg/kg*

Median: *0.6 mg/kg*

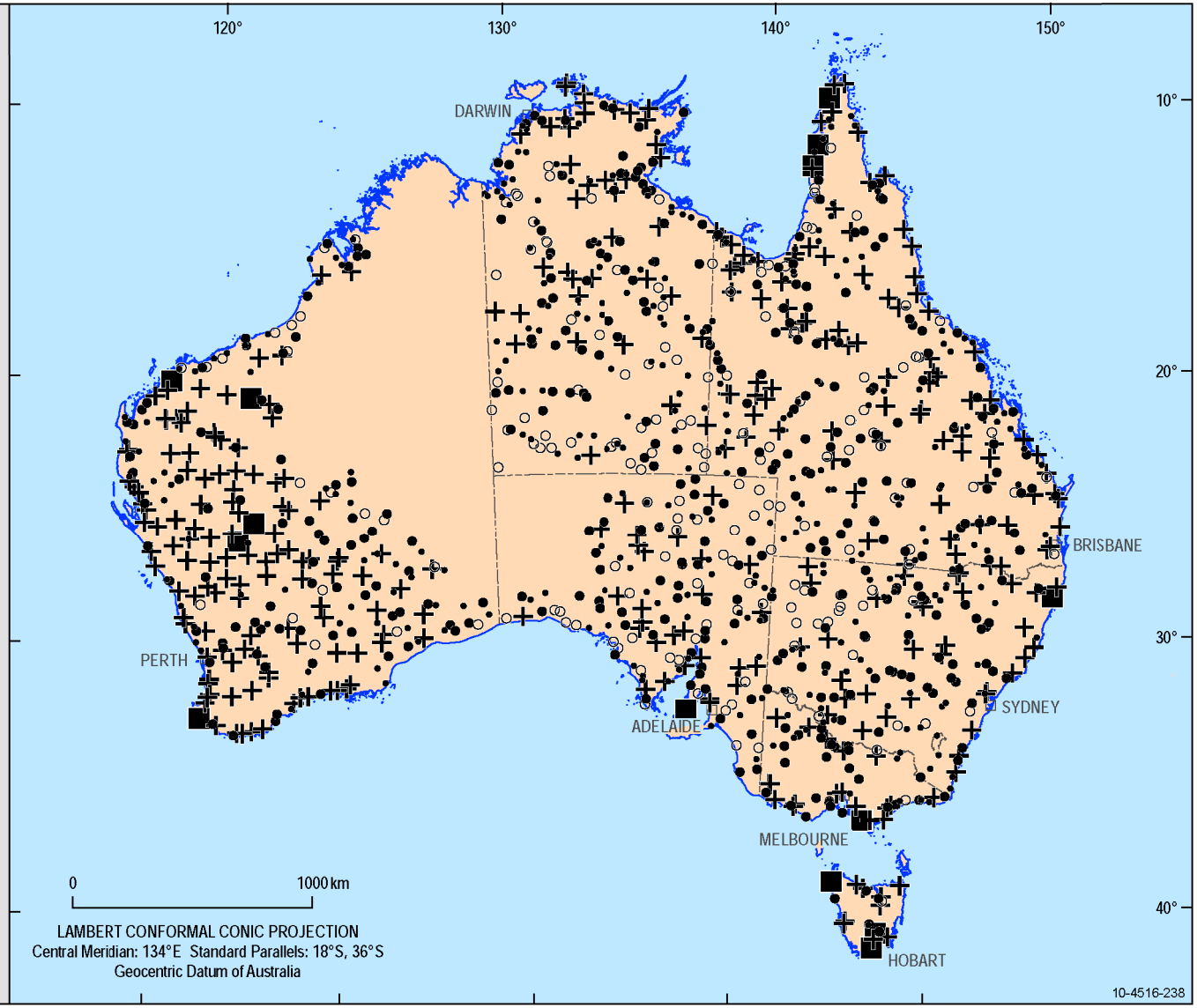
25%: *0.4 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 0.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Na

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 74 mg/kg
N: 1190

Maximum: *28200 mg/kg*

Upper Fence: *N/A**

75%: *5861 mg/kg*

Median: *3027 mg/kg*

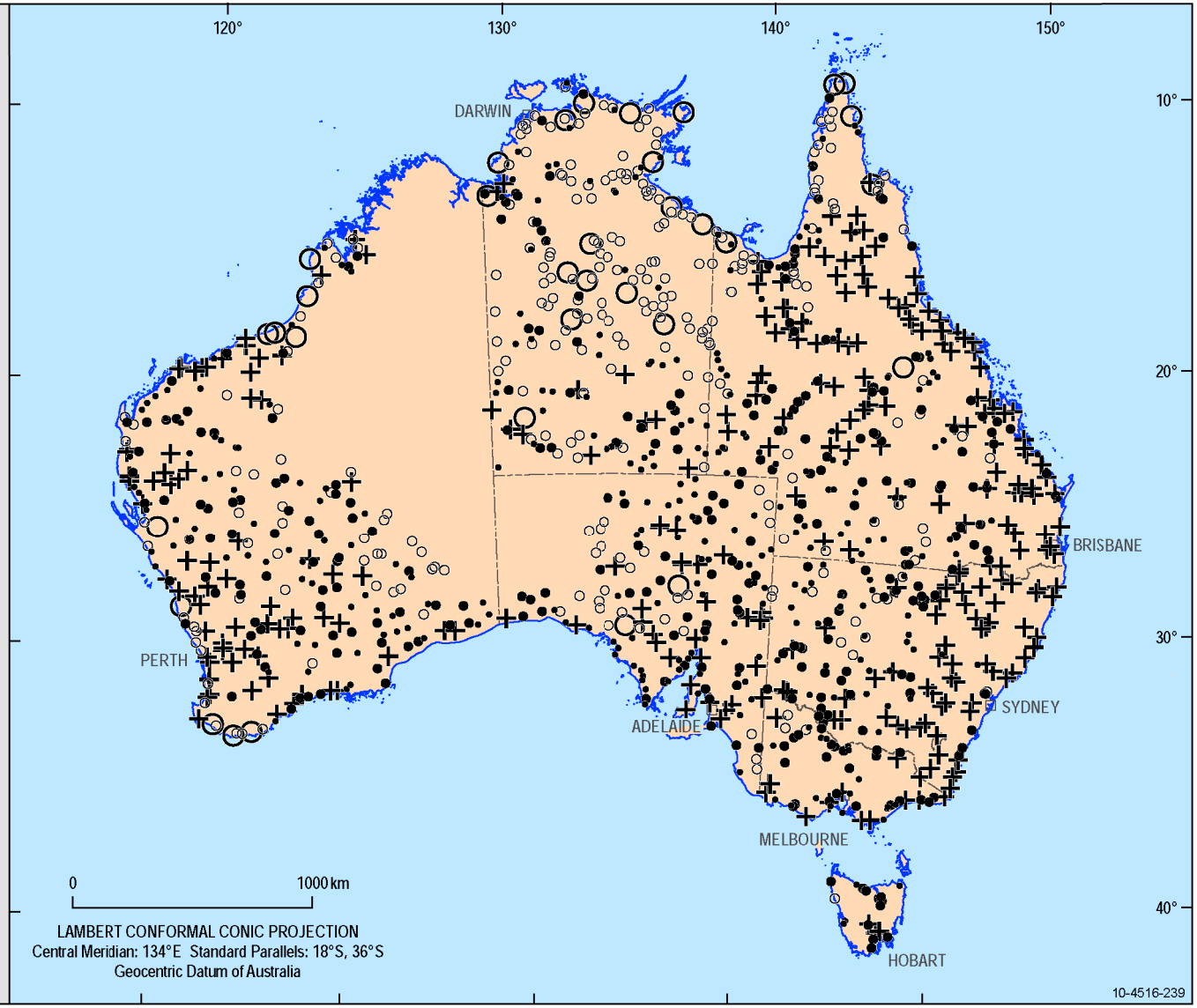
25%: *1187 mg/kg*

Lower Fence: *108 mg/kg*

Minimum: *Less than 74 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Nb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *62.2 mg/kg*

Upper Fence: *36.2 mg/kg*

75%: *11.3 mg/kg*

Median: *8 mg/kg*

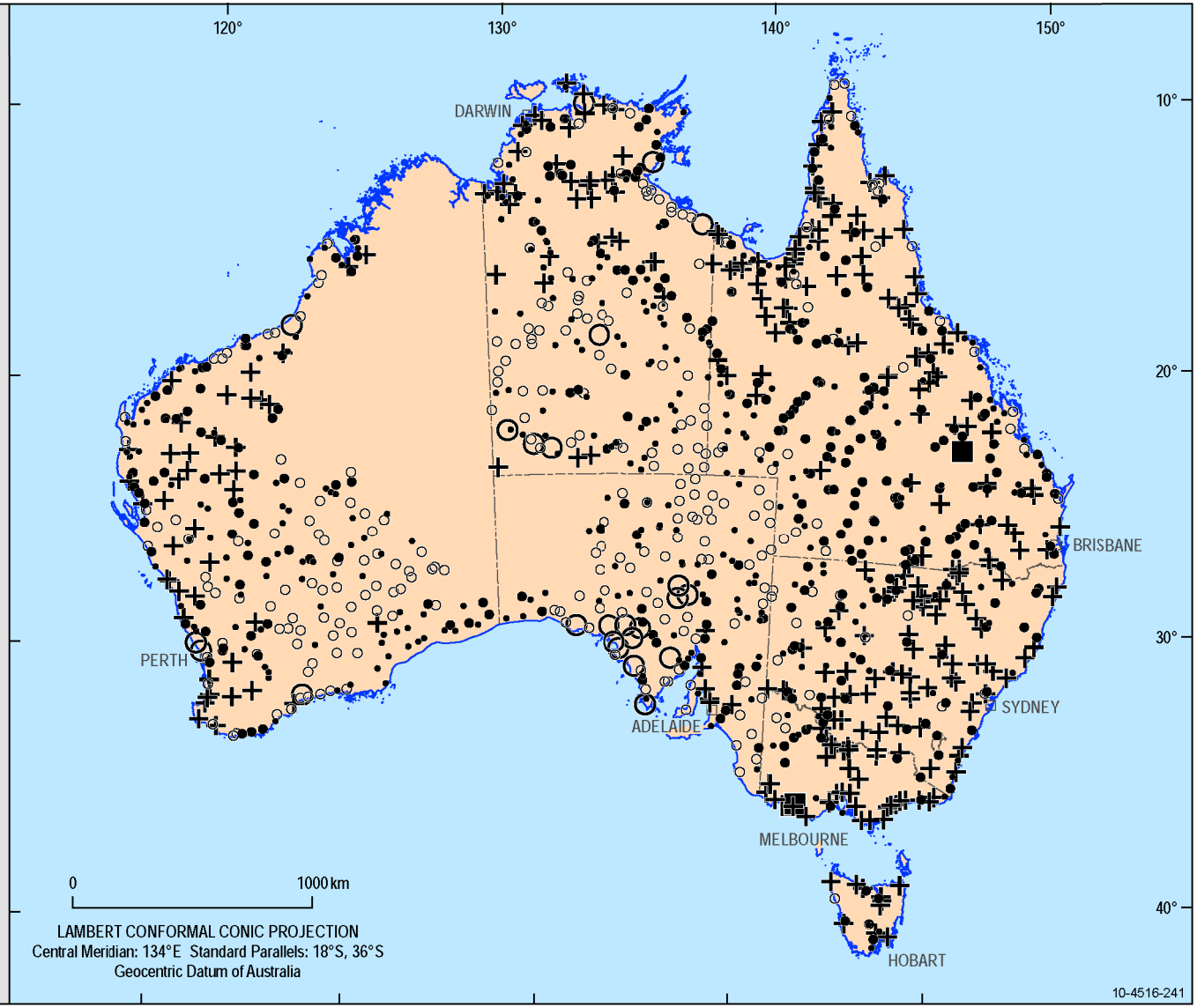
25%: *5.2 mg/kg*

Lower Fence: *1.62 mg/kg*

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Nd

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *73.3 mg/kg*

Upper Fence: *N/A**

75%: *25.1 mg/kg*

Median: *18.3 mg/kg*

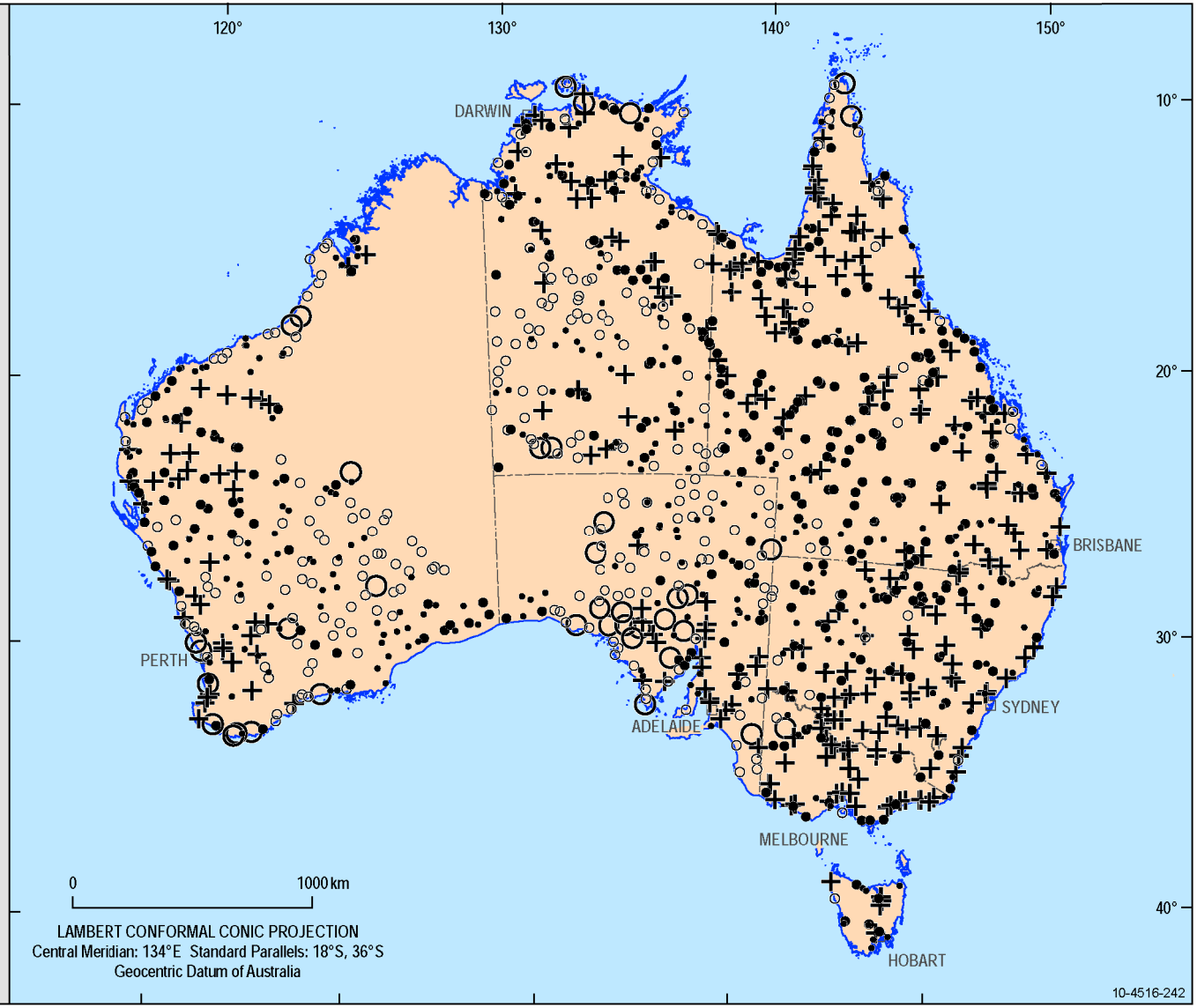
25%: *10.4 mg/kg*

Lower Fence: *2.8 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ni

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1190

Maximum: *604.7 mg/kg*

Upper Fence: *73.5 mg/kg*

75%: *23.9 mg/kg*

Median: *17 mg/kg*

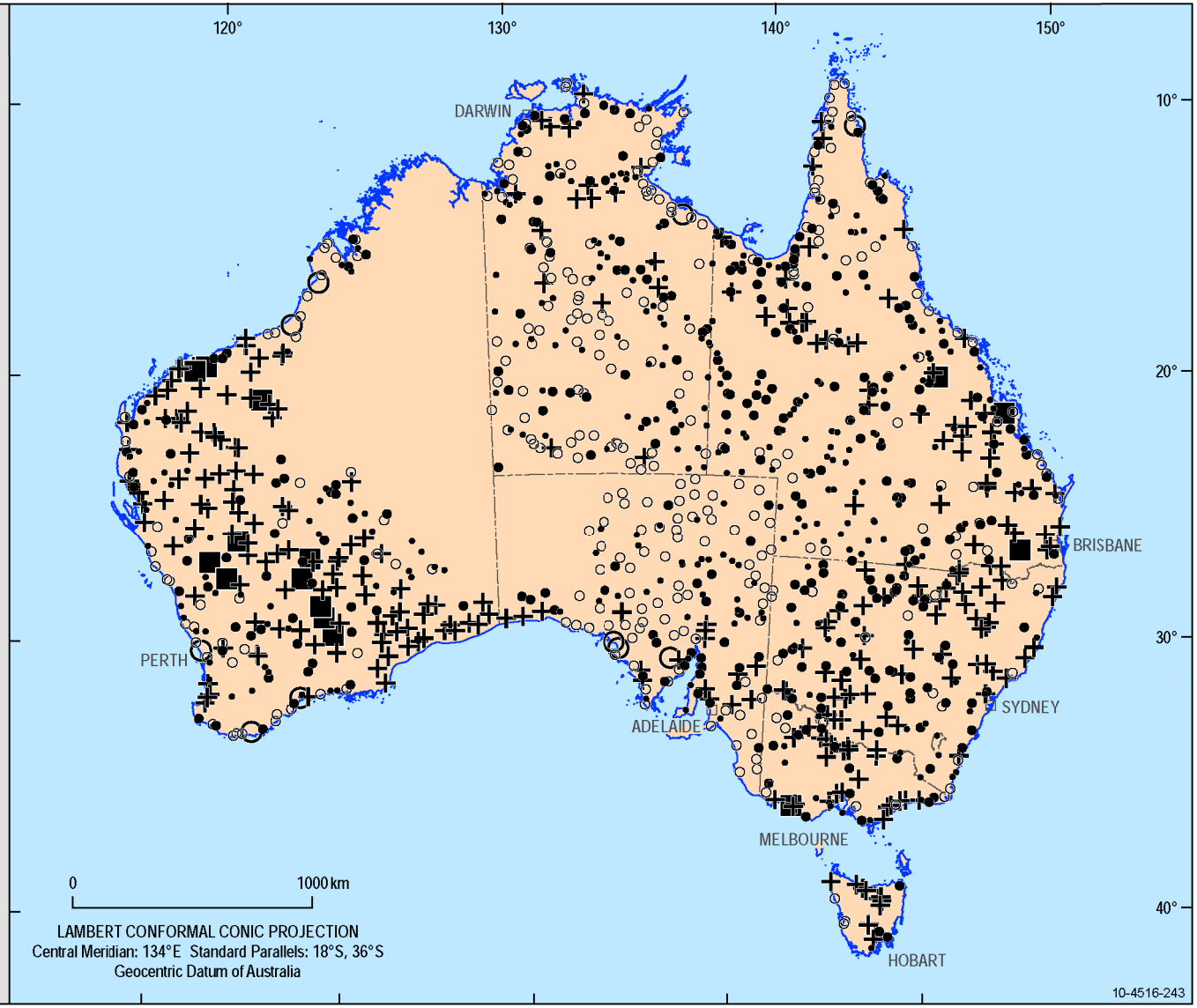
25%: *11.3 mg/kg*

Lower Fence: *3.7 mg/kg*

Minimum: *Less than 0.5 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

P

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 22 mg/kg
N: 1190

Maximum: *1859 mg/kg*

Upper Fence: *1131 mg/kg*

75%: *323 mg/kg*

Median: *209 mg/kg*

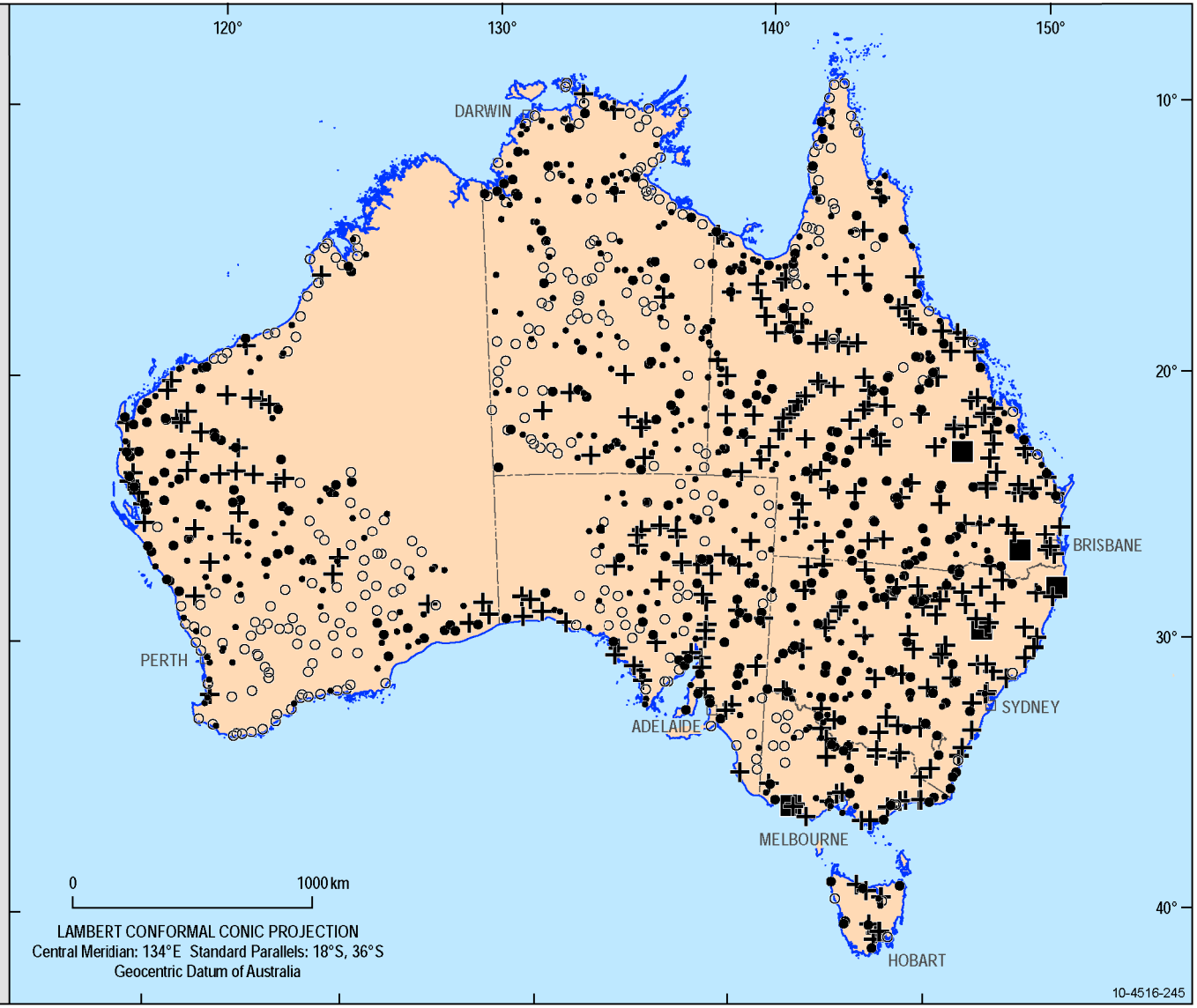
25%: *140 mg/kg*

Lower Fence: *N/A**

Minimum: *48 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *153.2 mg/kg*

Upper Fence: *44.2 mg/kg*

75%: *16.9 mg/kg*

Median: *13.1 mg/kg*

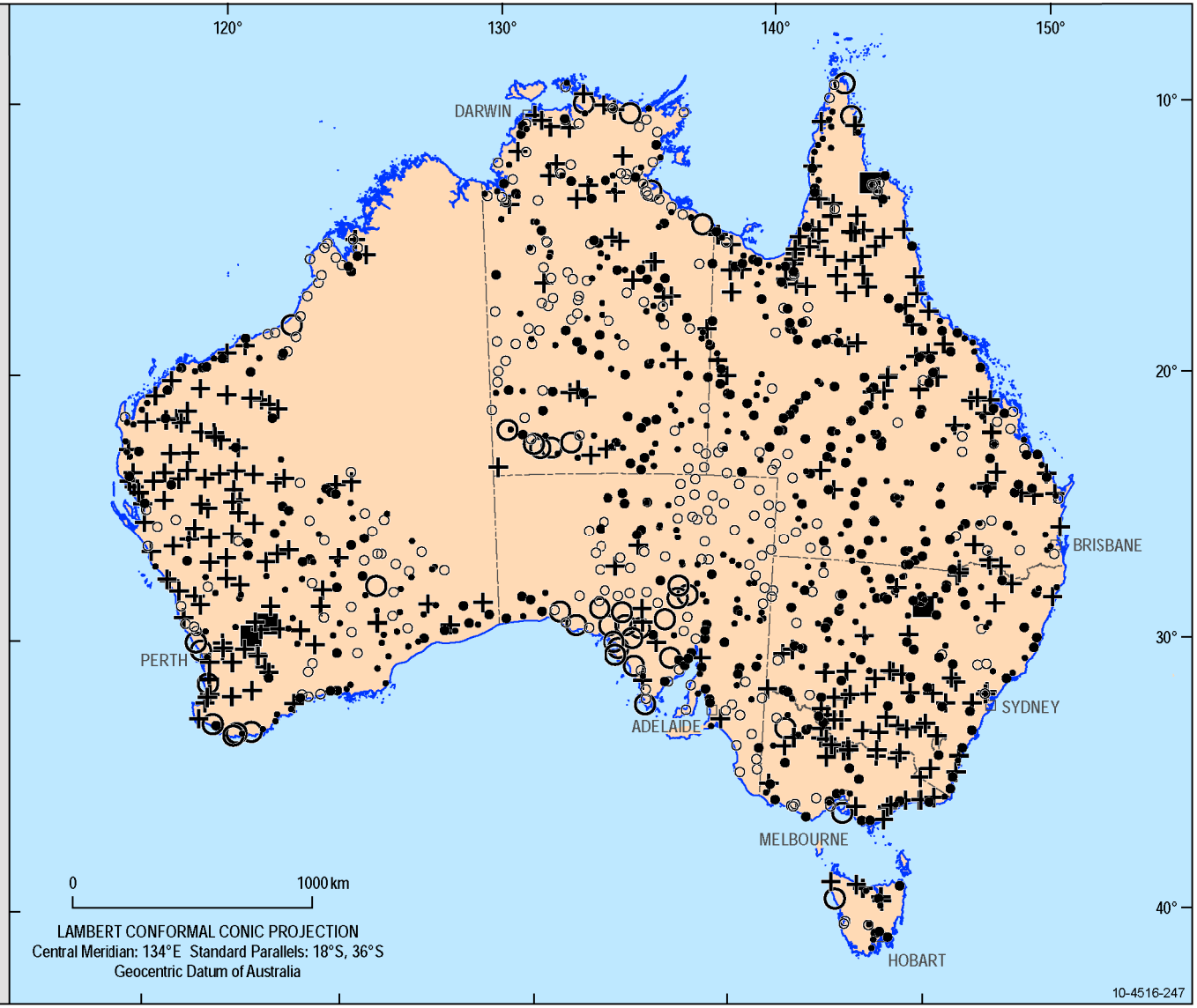
25%: *8.9 mg/kg*

Lower Fence: *3.4 mg/kg*

Minimum: *0.5 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pd

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.001 mg/kg
N: 1189

Maximum: *0.015 mg/kg*

Upper Fence: *0.003 mg/kg*

75%: *0.001 mg/kg*

Median: *N/A**

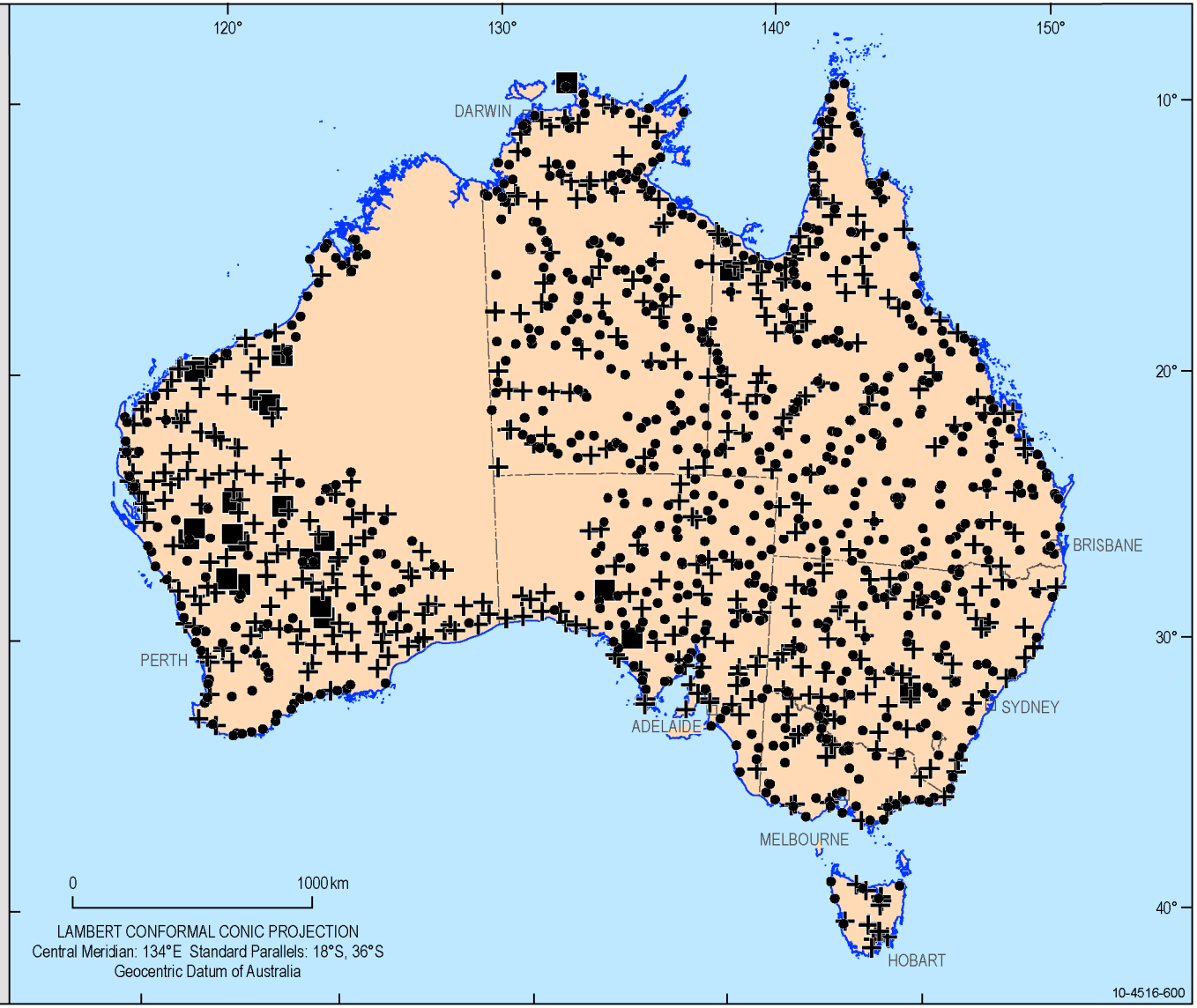
25%: *N/A**

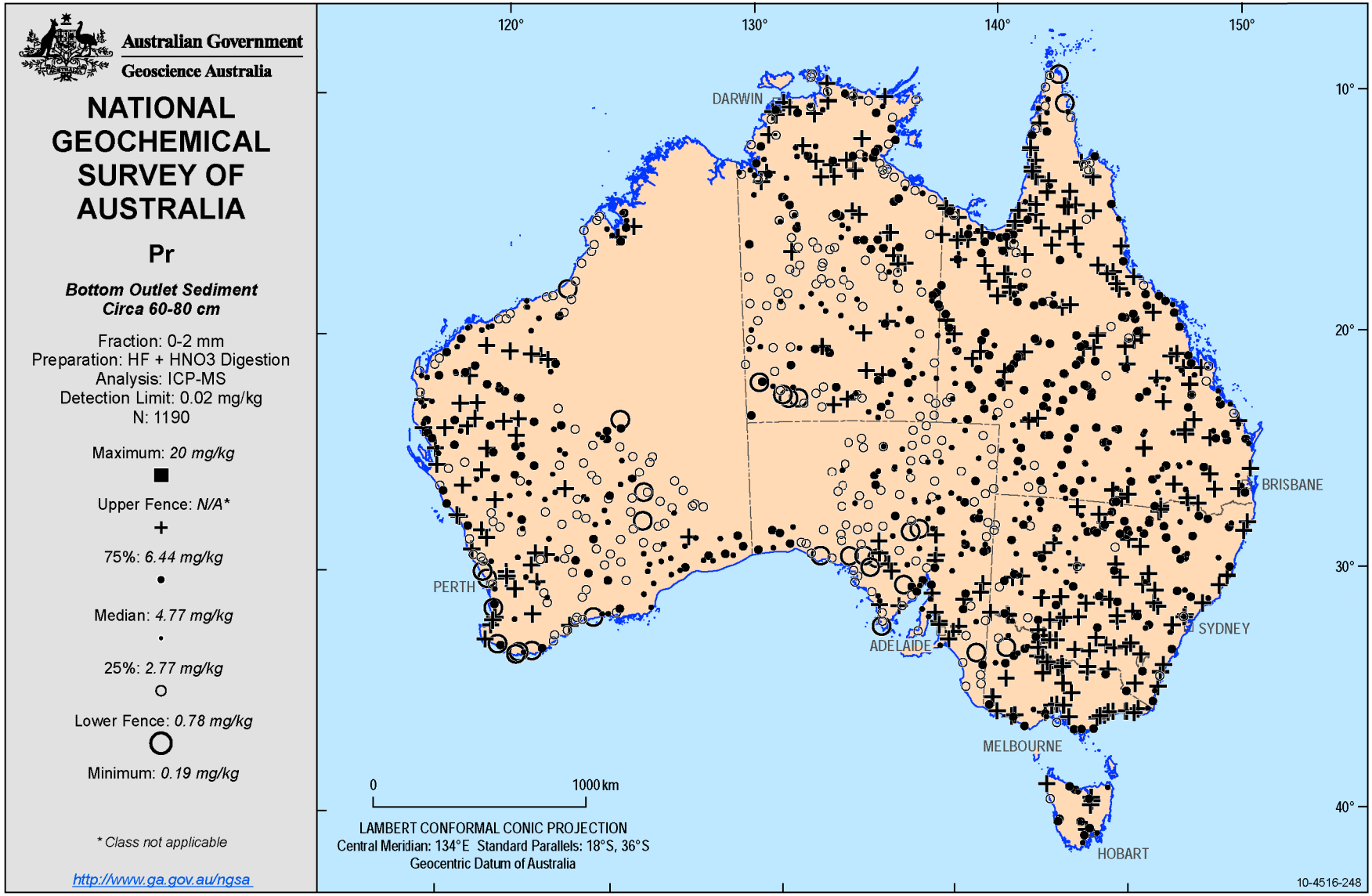
Lower Fence: *N/A**

Minimum: *Less than 0.001 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Pr
Bottom Outlet Sediment
Circa 60-80 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190
Maximum: 20 mg/kg
Upper Fence: N/A*
75%: 6.44 mg/kg
Median: 4.77 mg/kg
25%: 2.77 mg/kg
Lower Fence: 0.78 mg/kg
Minimum: 0.19 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
MELBOURNE
SYDNEY
BRISBANE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-248

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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pt

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.0005 mg/kg
N: 1189

Maximum: *0.012 mg/kg*

Upper Fence: *0.0022 mg/kg*

75%: *0.0006 mg/kg*

Median: *N/A**

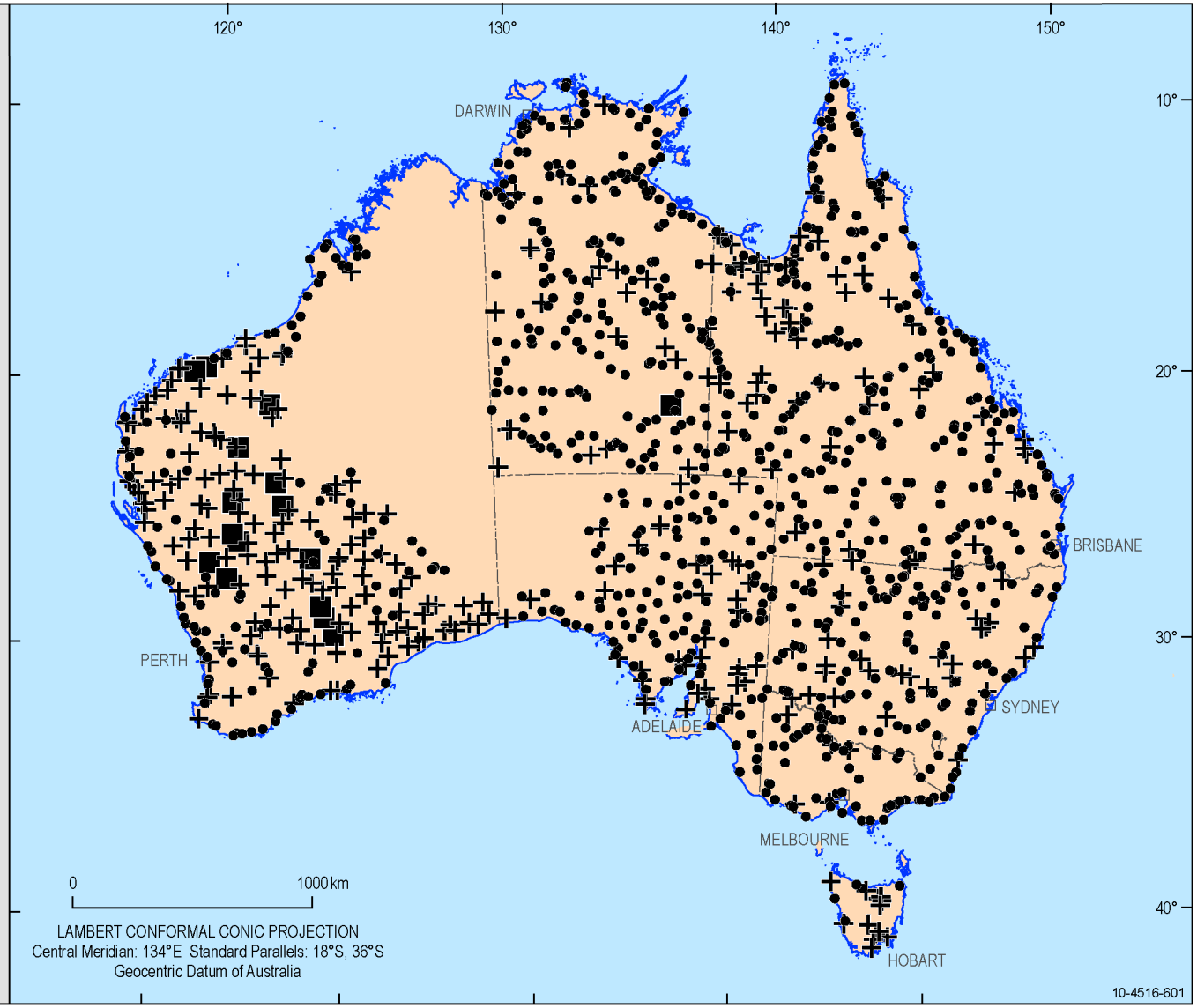
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.0005 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Rb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *249.2 mg/kg*

Upper Fence: *N/A**

75%: *80.9 mg/kg*

Median: *52.5 mg/kg*

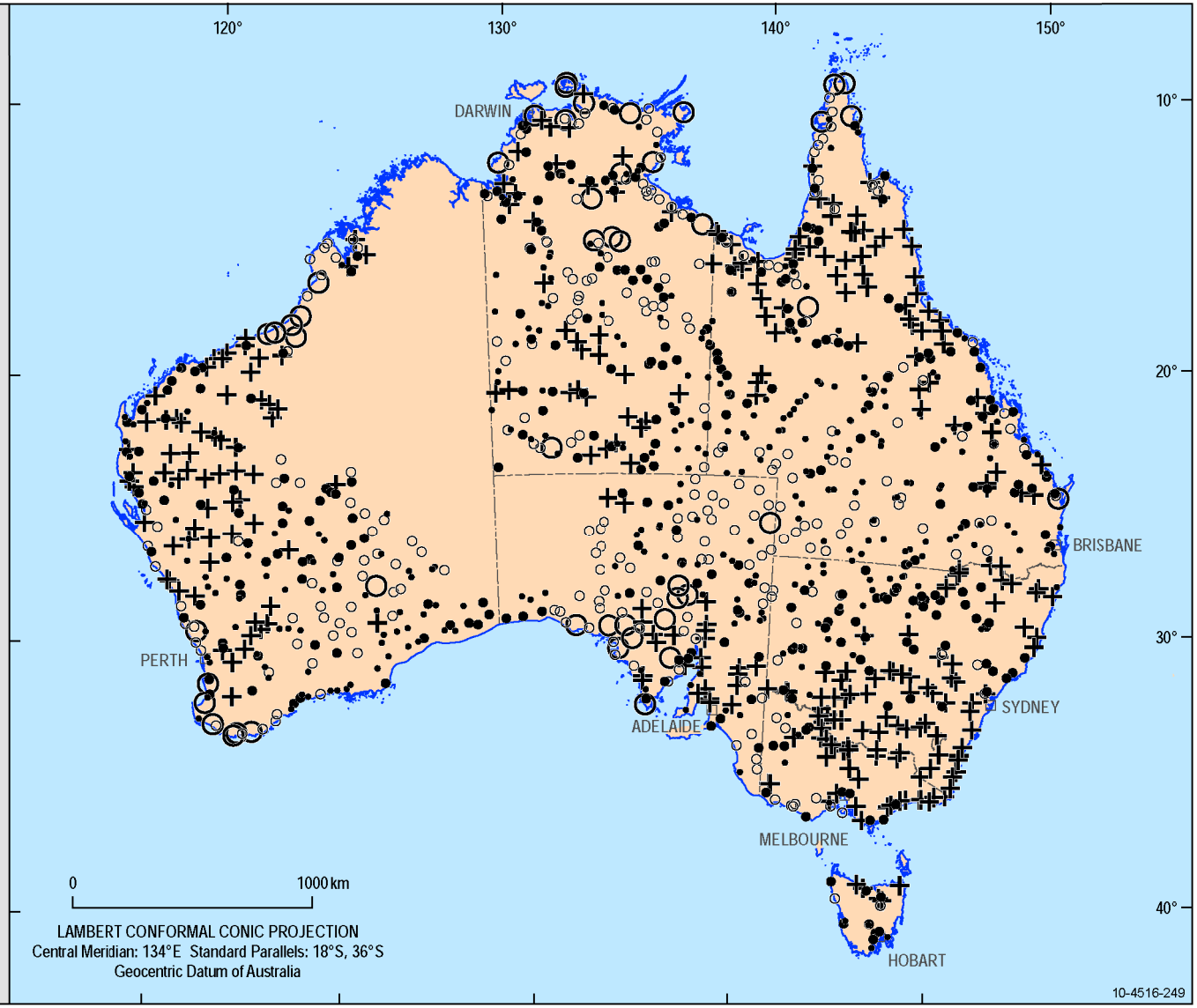
25%: *33.1 mg/kg*

Lower Fence: *8.7 mg/kg*

Minimum: *Less than 0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

S

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 10 mg/kg
N: 1190

Maximum: *129638 mg/kg*

Upper Fence: *2113 mg/kg*

75%: *283 mg/kg*

Median: *134 mg/kg*

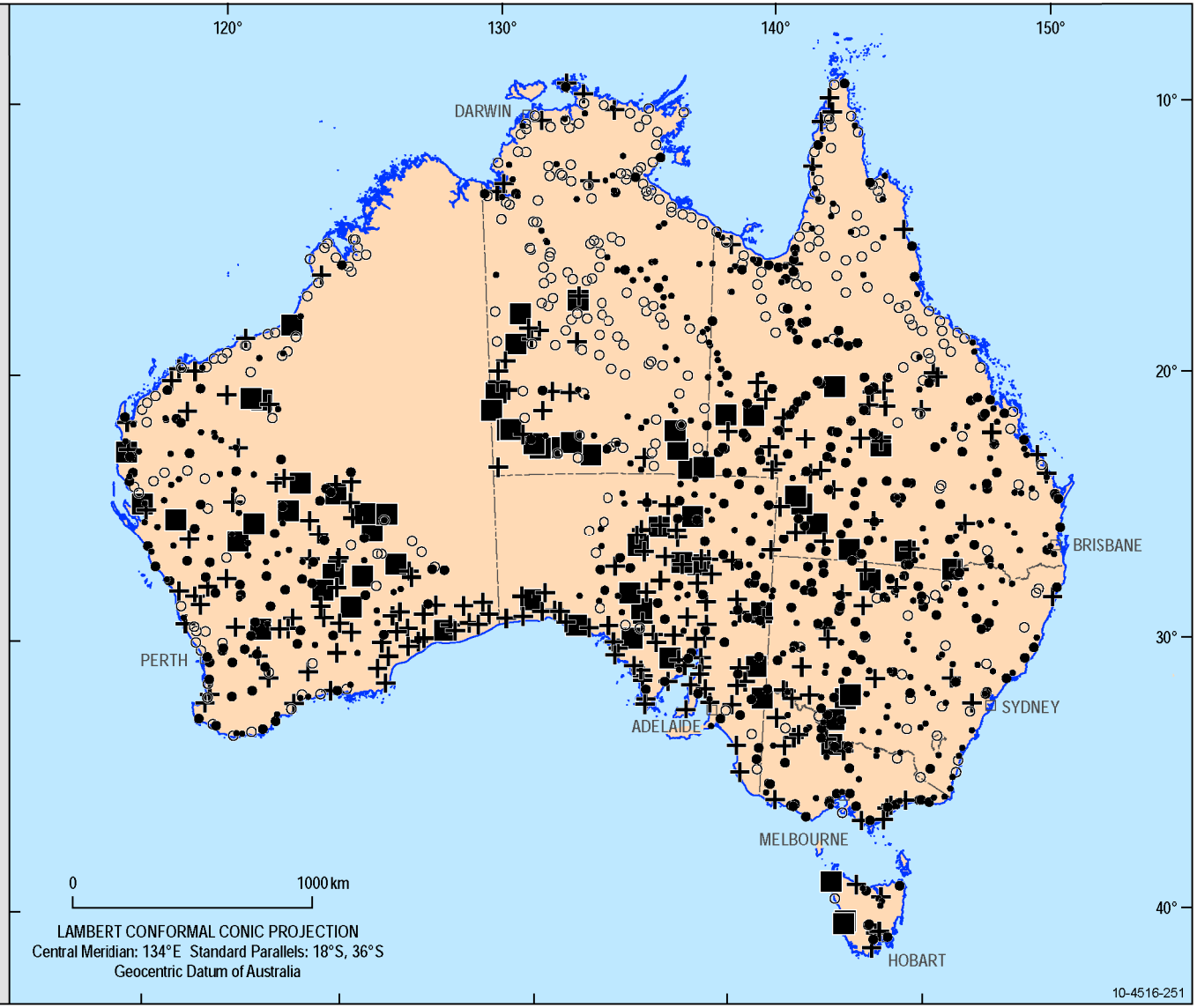
25%: *74 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 10 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.4 mg/kg
N: 1190

Maximum: *21.4 mg/kg*

Upper Fence: *8.6 mg/kg*

75%: *0.9 mg/kg*

Median: *N/A**

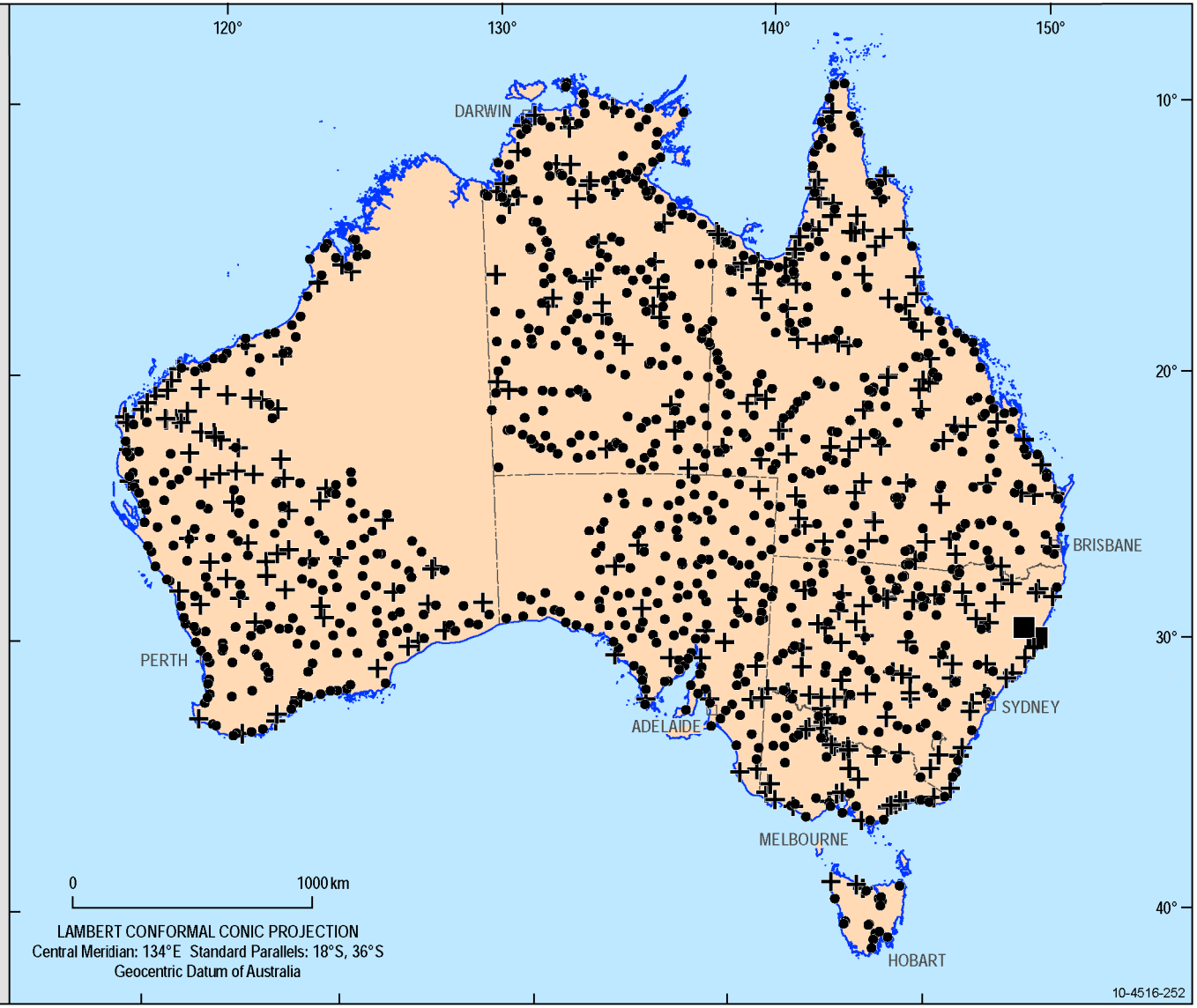
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.4 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sc

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.3 mg/kg
N: 1190

Maximum: *33.6 mg/kg*

Upper Fence: *33.5 mg/kg*

75%: *10.7 mg/kg*

Median: *7.9 mg/kg*

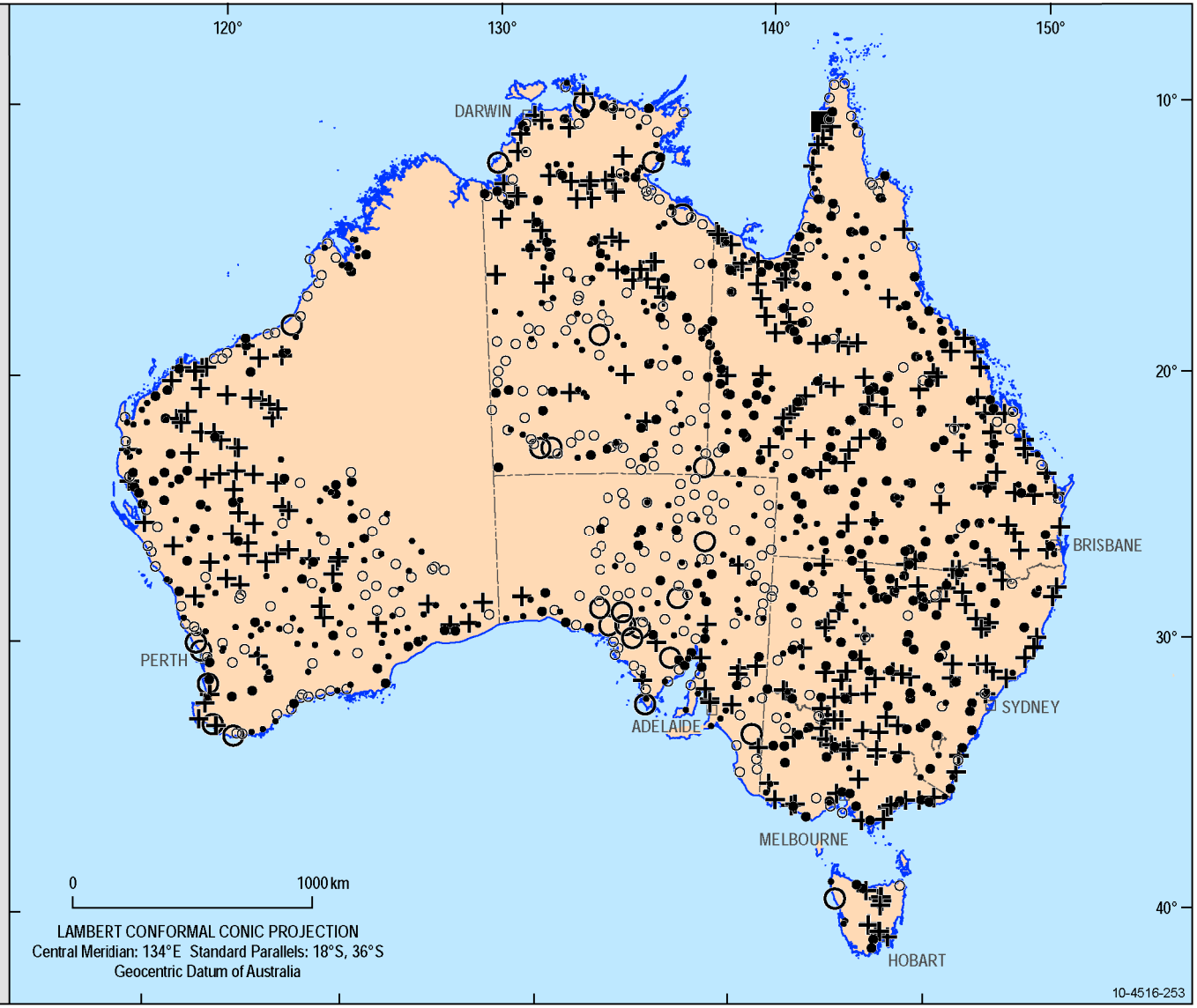
25%: *5 mg/kg*

Lower Fence: *1.6 mg/kg*

Minimum: *Less than 0.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Si

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 47 mg/kg
N: 1190

Maximum: *461413 mg/kg*

Upper Fence: *N/A**

75%: 394308 mg/kg

Median: *357626 mg/kg*

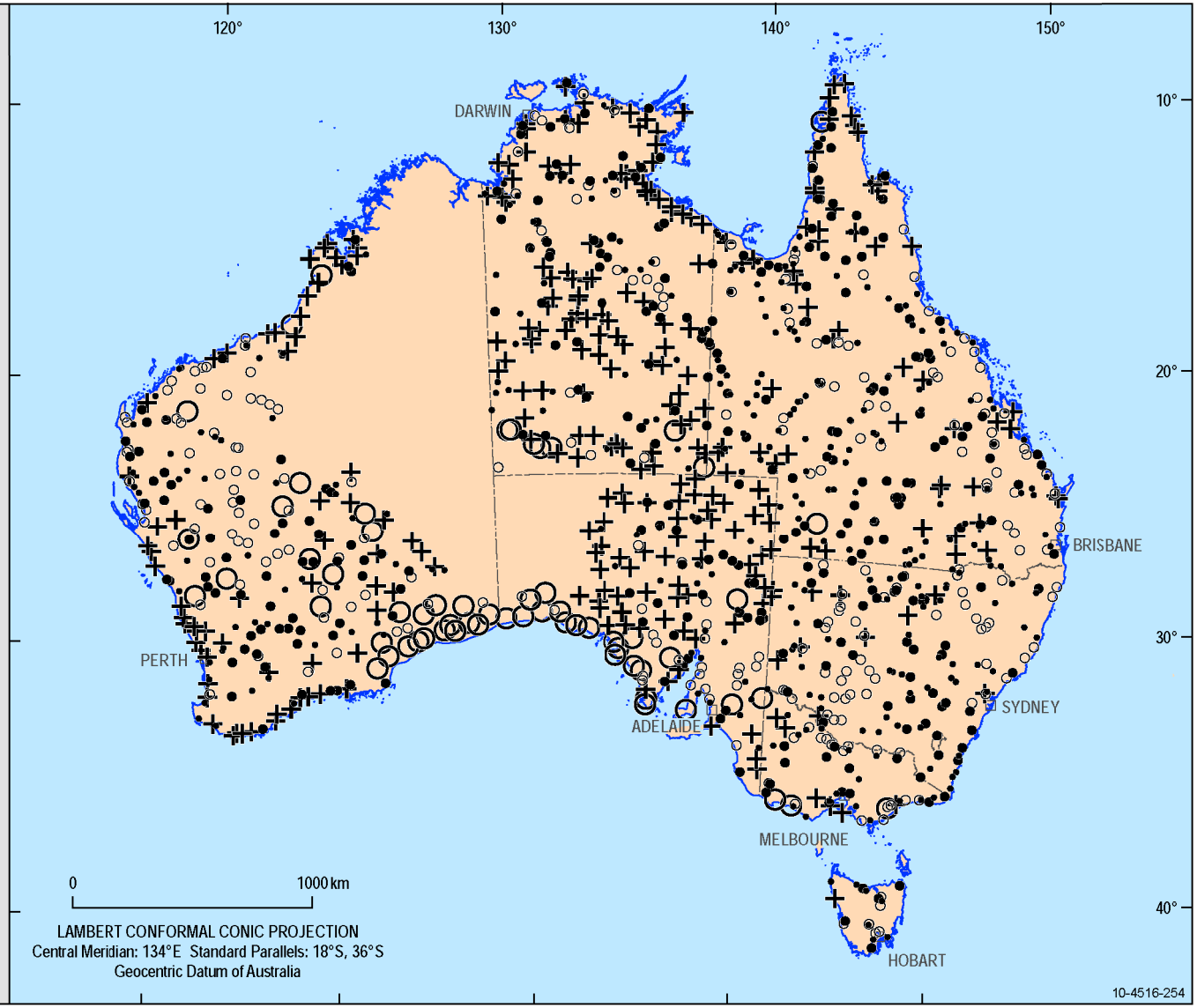
25%: 321716 mg/kg

Lower Fence: *227781 mg/kg*

Minimum: *8296 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sm

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *13.93 mg/kg*

Upper Fence: *N/A**

75%: *5.38 mg/kg*

Median: *3.84 mg/kg*

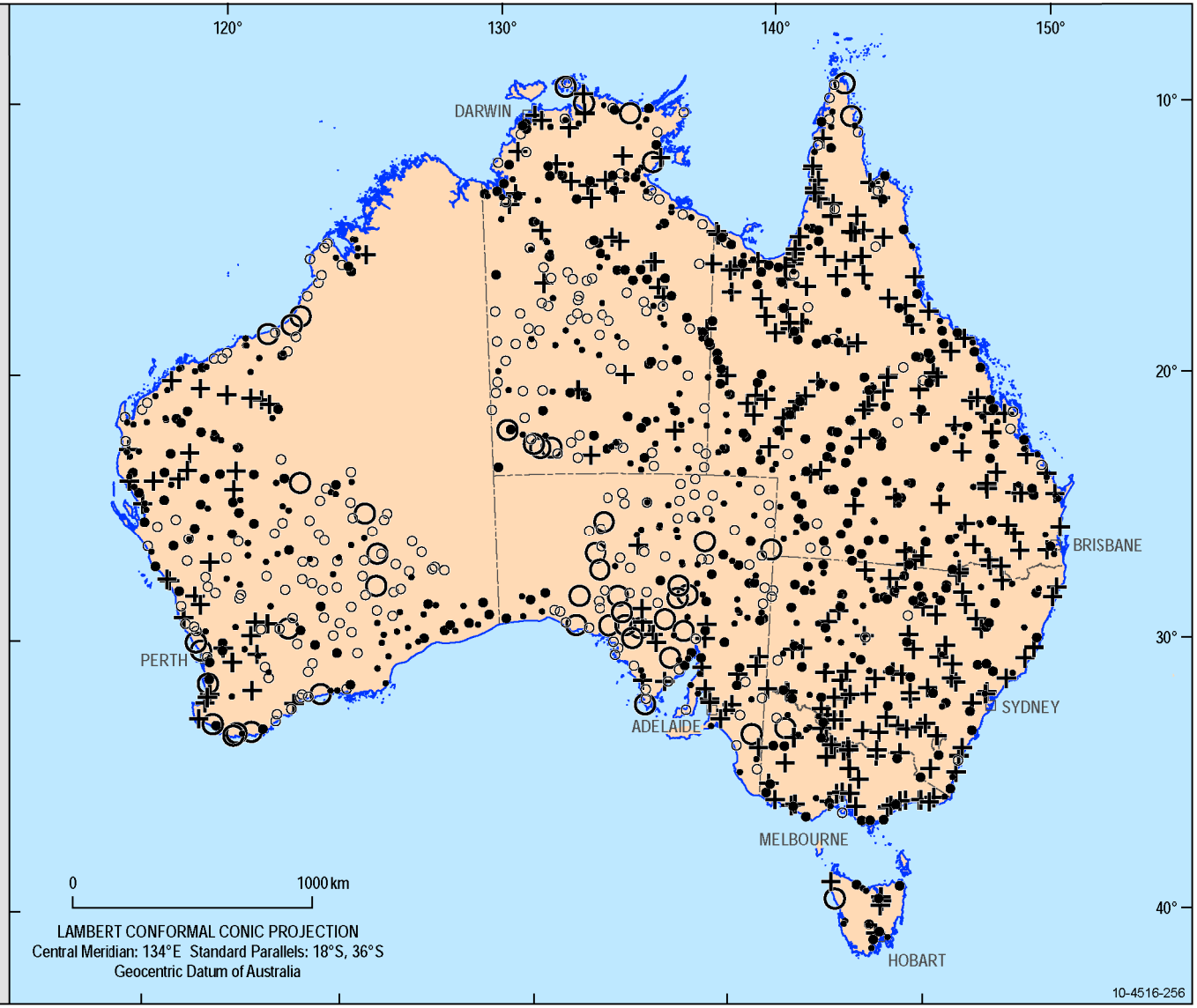
25%: *2.09 mg/kg*

Lower Fence: *0.5 mg/kg*

Minimum: *Less than 0.04 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sn

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *85 mg/kg*

Upper Fence: *5.8 mg/kg*

75%: *1.9 mg/kg*

Median: *1.3 mg/kg*

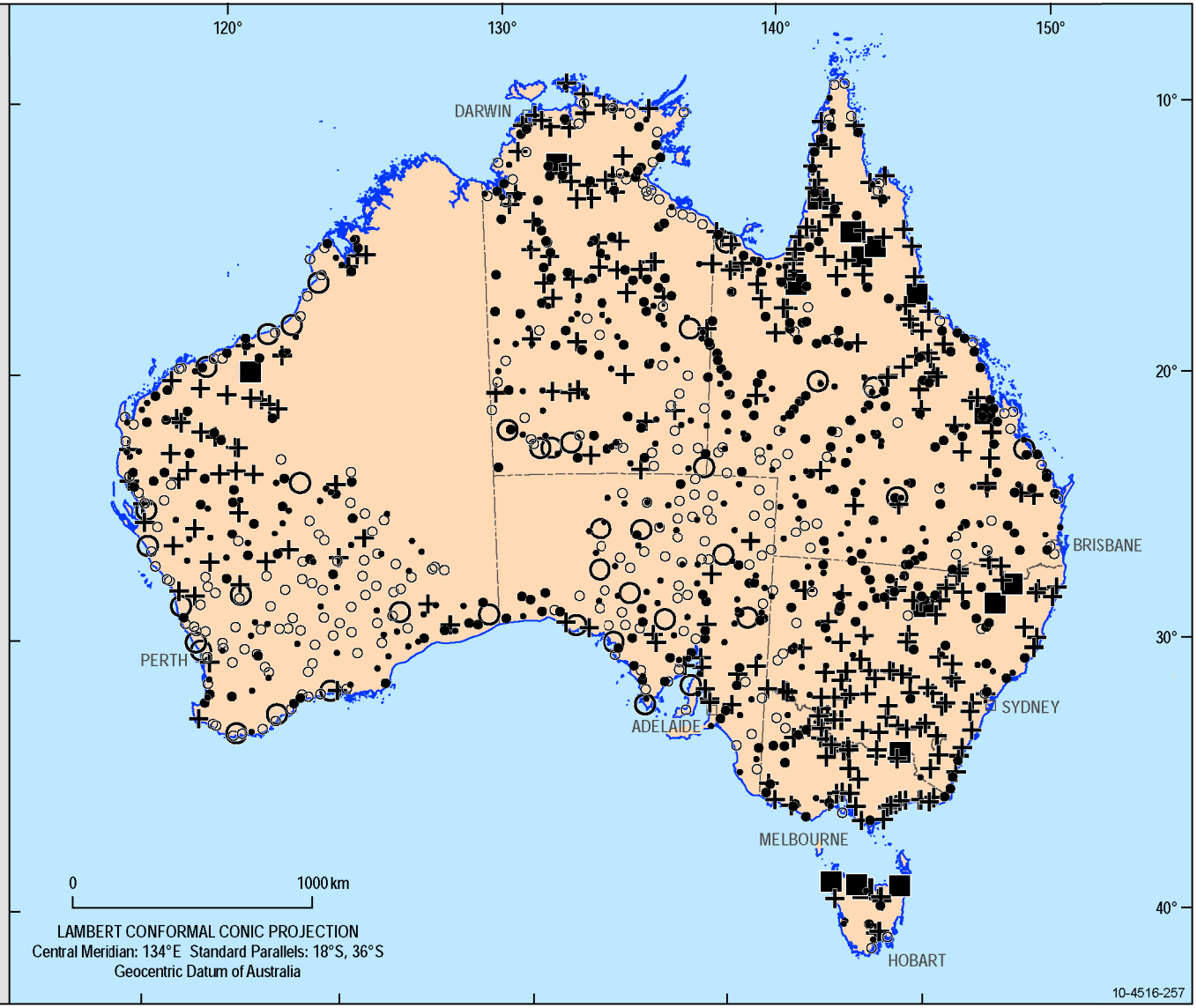
25%: *0.9 mg/kg*

Lower Fence: *0.3 mg/kg*

Minimum: *Less than 0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sr

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *5443.9 mg/kg*

Upper Fence: *750.2 mg/kg*

75%: *134.4 mg/kg*

Median: *76.2 mg/kg*

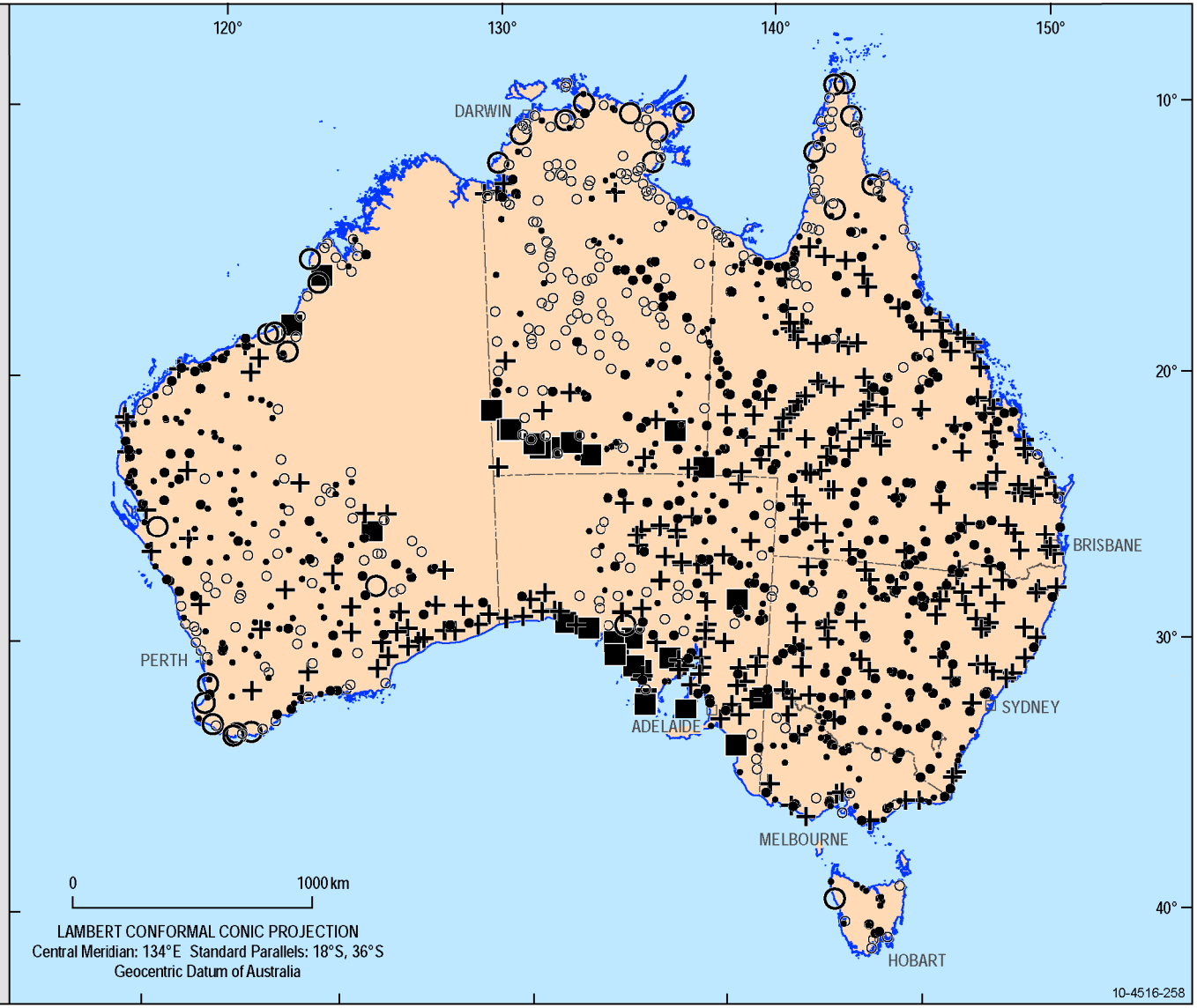
25%: *42.7 mg/kg*

Lower Fence: *7.6 mg/kg*

Minimum: *Less than 0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ta

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *3.42 mg/kg*

Upper Fence: *N/A**

75%: *0.95 mg/kg*

Median: *0.64 mg/kg*

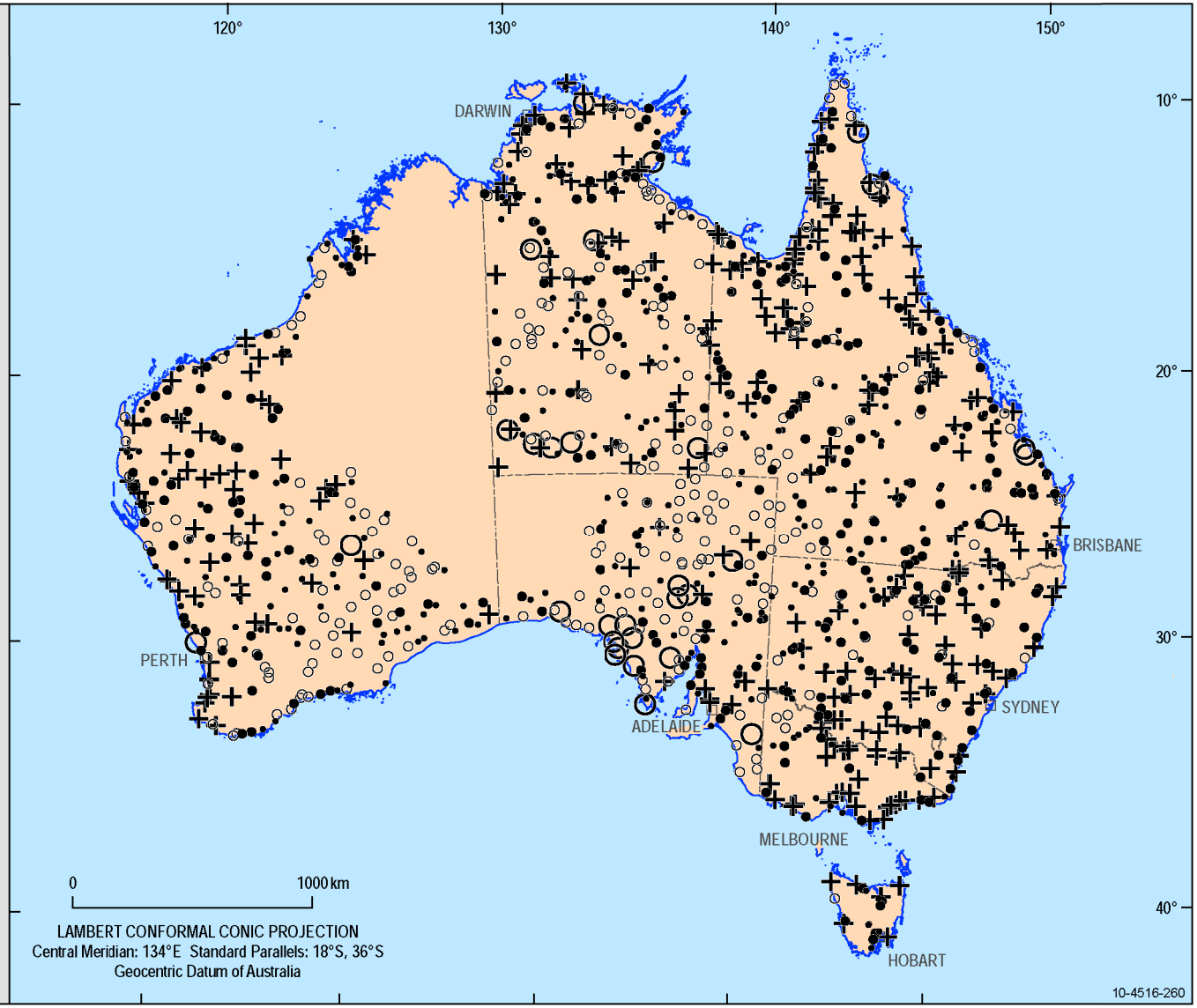
25%: *0.4 mg/kg*

Lower Fence: *0.11 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Tb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *2.11 mg/kg*

Upper Fence: *N/A**

75%: *0.77 mg/kg*

Median: *0.56 mg/kg*

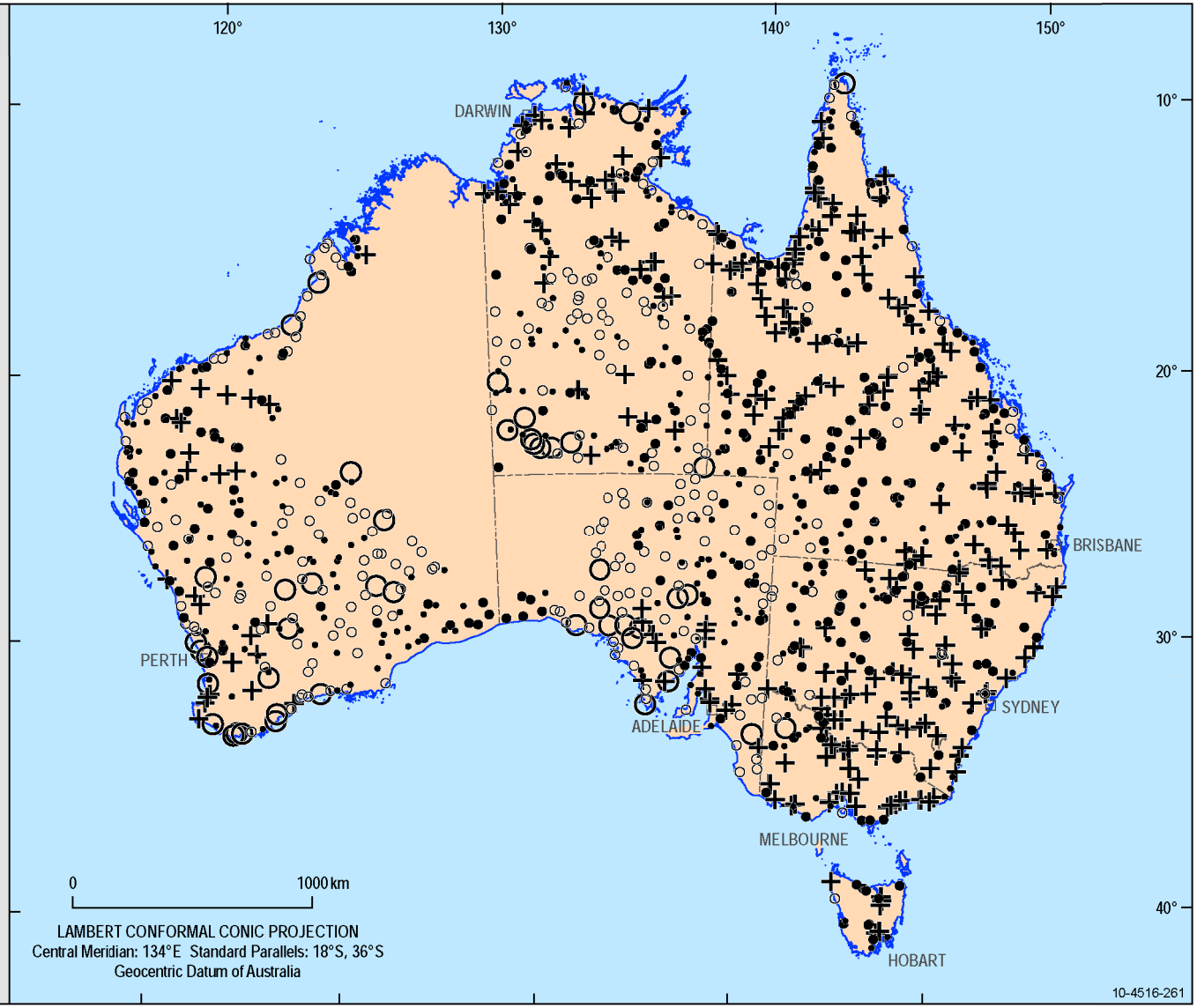
25%: *0.29 mg/kg*

Lower Fence: *0.07 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Th

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *59.05 mg/kg*

Upper Fence: *32.67 mg/kg*

75%: *11.52 mg/kg*

Median: *8.09 mg/kg*

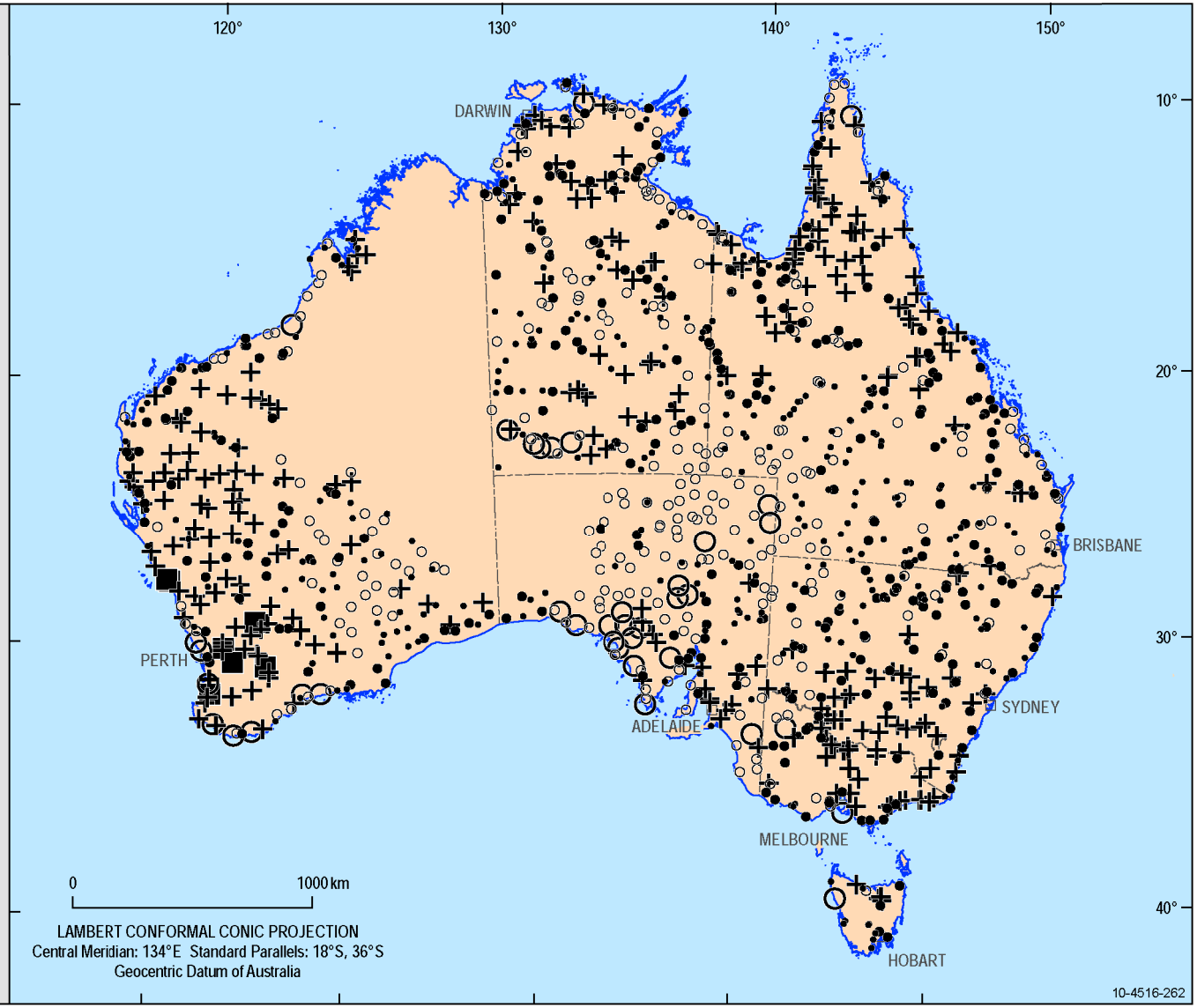
25%: *5.75 mg/kg*

Lower Fence: *2.03 mg/kg*

Minimum: *0.13 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ti

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 30 mg/kg
N: 1190

Maximum: *30175 mg/kg*

Upper Fence: *15556 mg/kg*

75%: *4705 mg/kg*

Median: *3410 mg/kg*

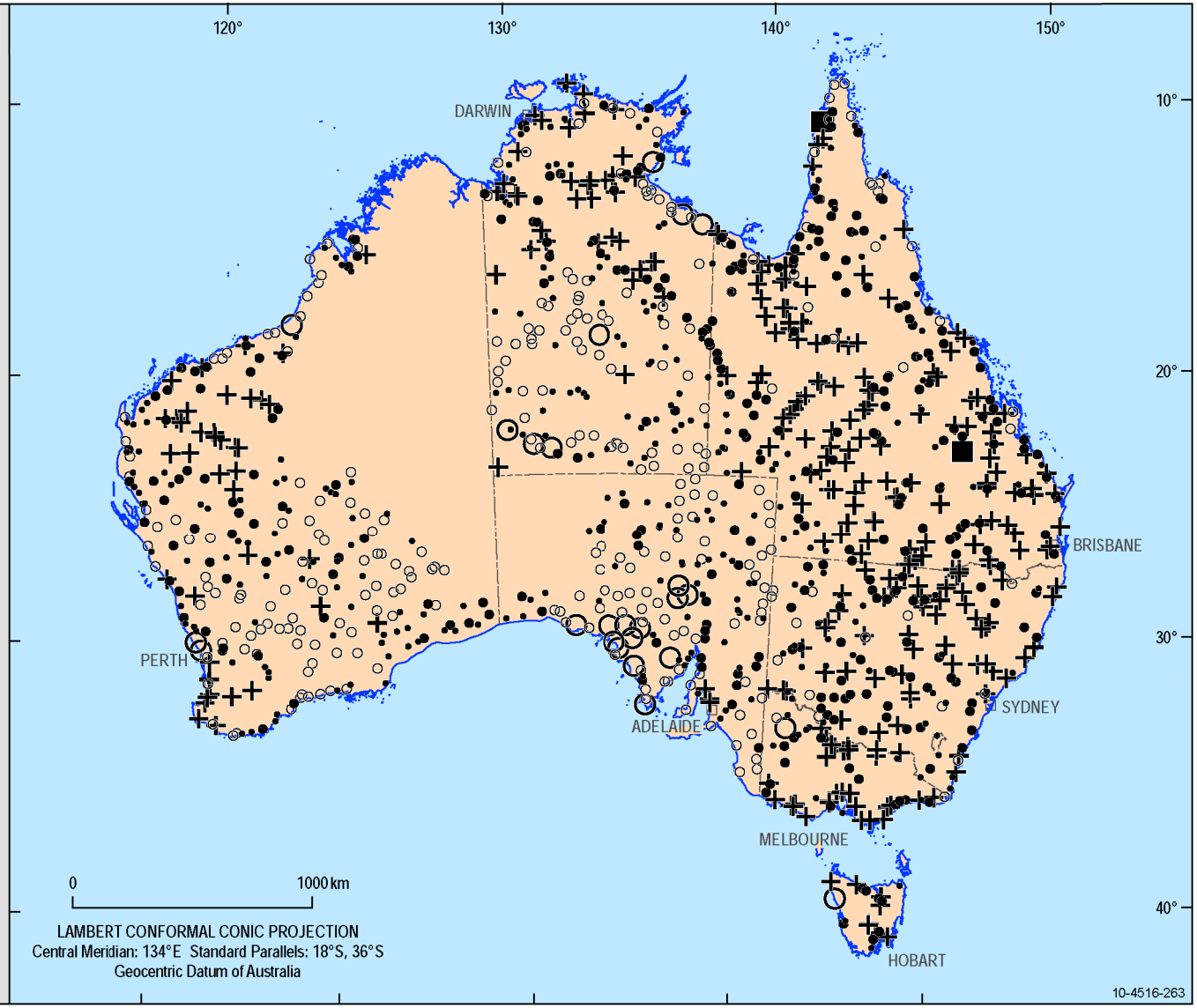
25%: *2110 mg/kg*

Lower Fence: *632 mg/kg*

Minimum: *90 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

U

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *18.61 mg/kg*

Upper Fence: *7.84 mg/kg*

75%: *2.58 mg/kg*

Median: *1.83 mg/kg*

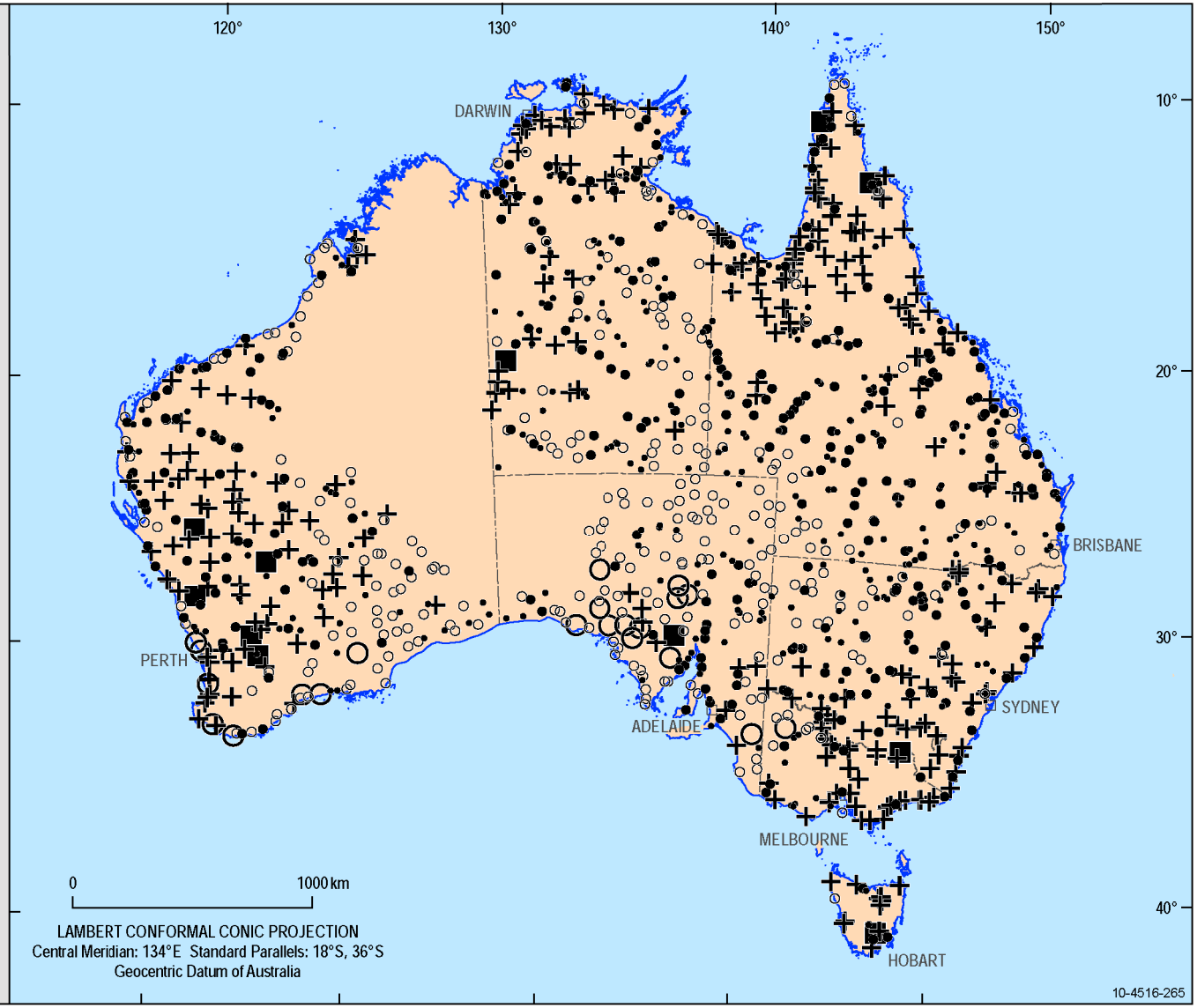
25%: *1.23 mg/kg*

Lower Fence: *0.4 mg/kg*

Minimum: *0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

V

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *528.7 mg/kg*

Upper Fence: *320.5 mg/kg*

75%: *87.9 mg/kg*

Median: *61.5 mg/kg*

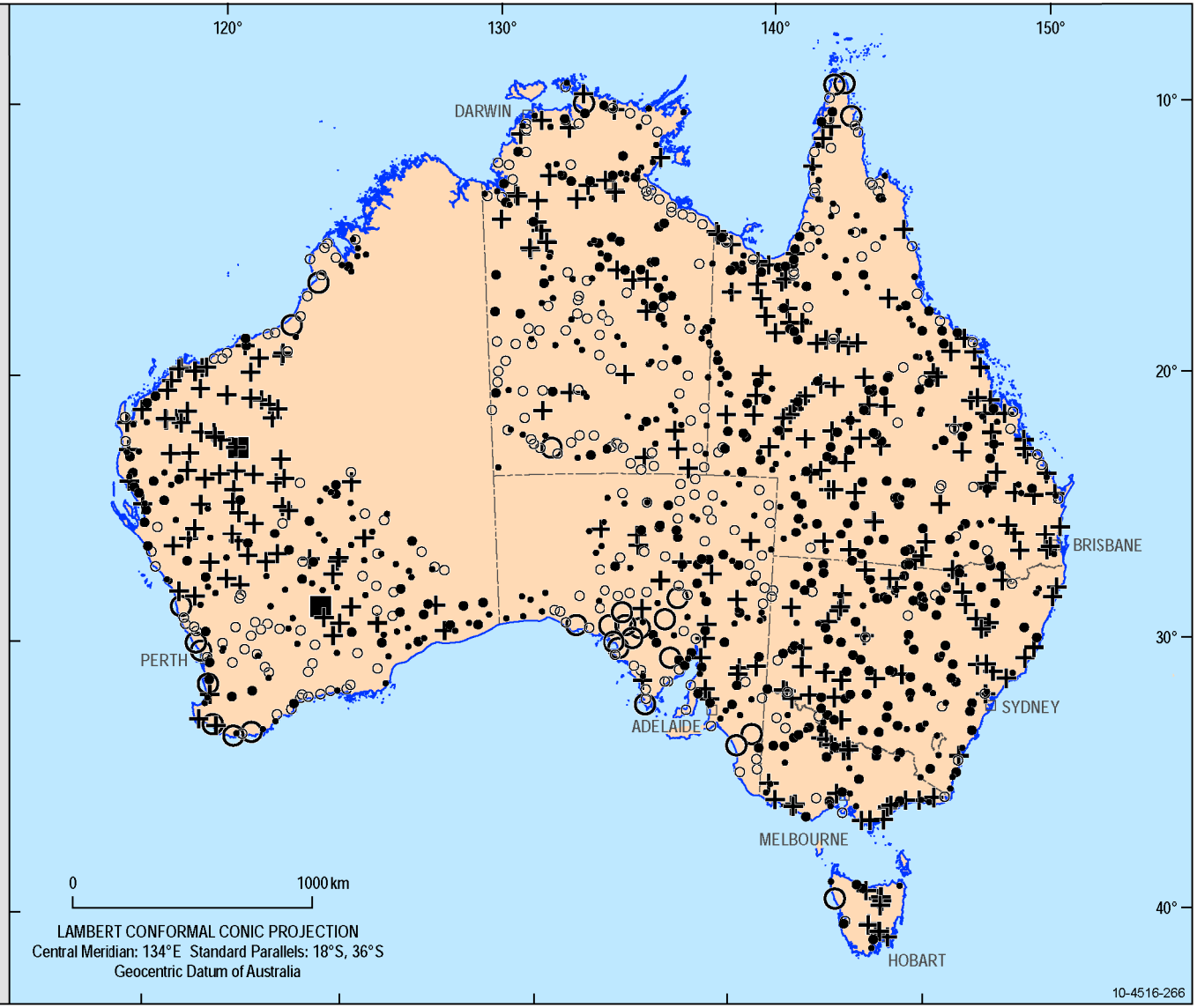
25%: *37.1 mg/kg*

Lower Fence: *10.2 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

W

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *33.7 mg/kg*

Upper Fence: *5.9 mg/kg*

75%: *1.5 mg/kg*

Median: *1 mg/kg*

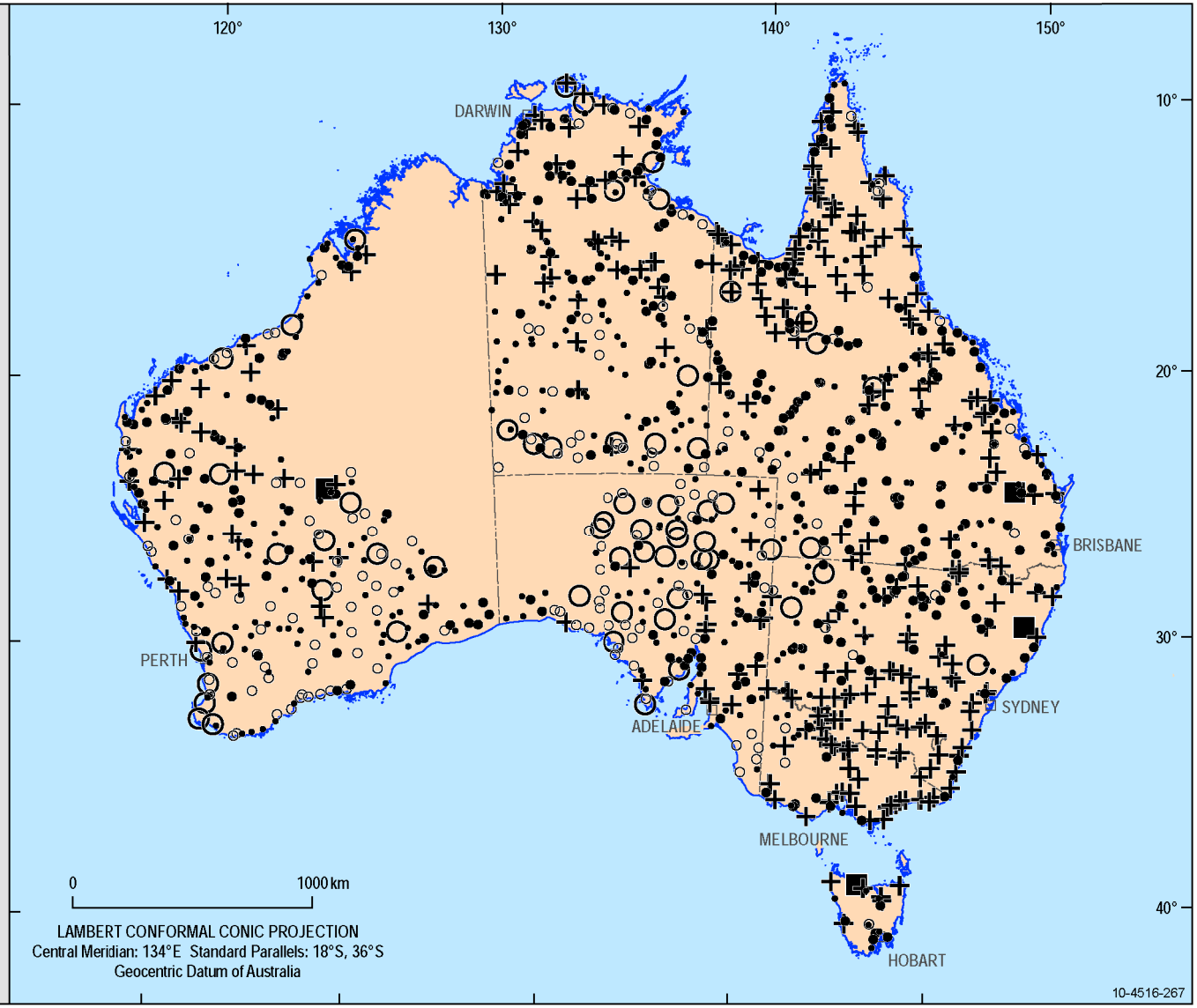
25%: *0.6 mg/kg*

Lower Fence: *0.2 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Y

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.05 mg/kg
N: 1190

Maximum: *64.9 mg/kg*

Upper Fence: *N/A**

75%: *28.4 mg/kg*

Median: *20.8 mg/kg*

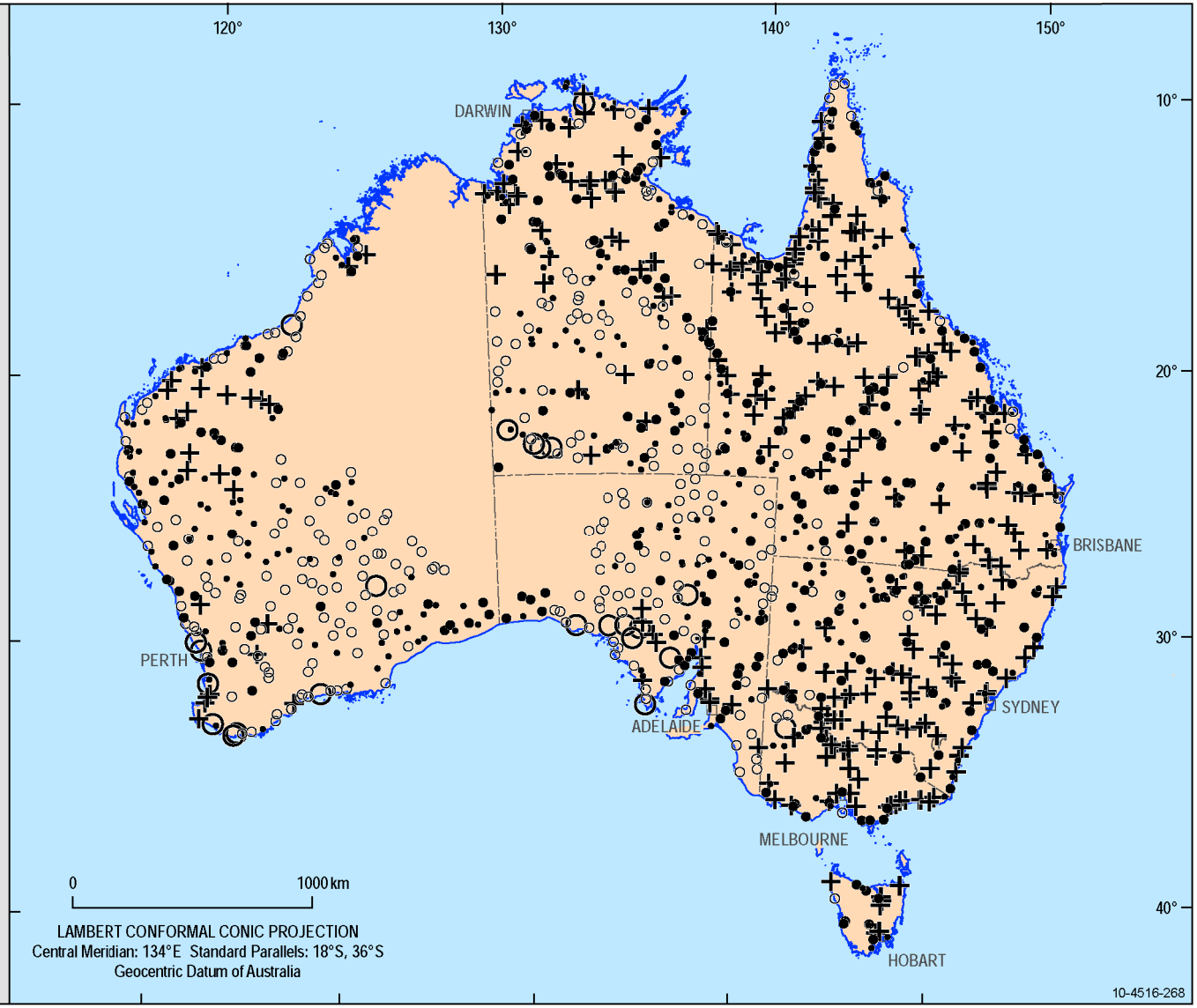
25%: *12.4 mg/kg*

Lower Fence: *3.58 mg/kg*

Minimum: *1.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Yb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *6.42 mg/kg*

Upper Fence: *N/A**

75%: *2.75 mg/kg*

Median: *2.07 mg/kg*

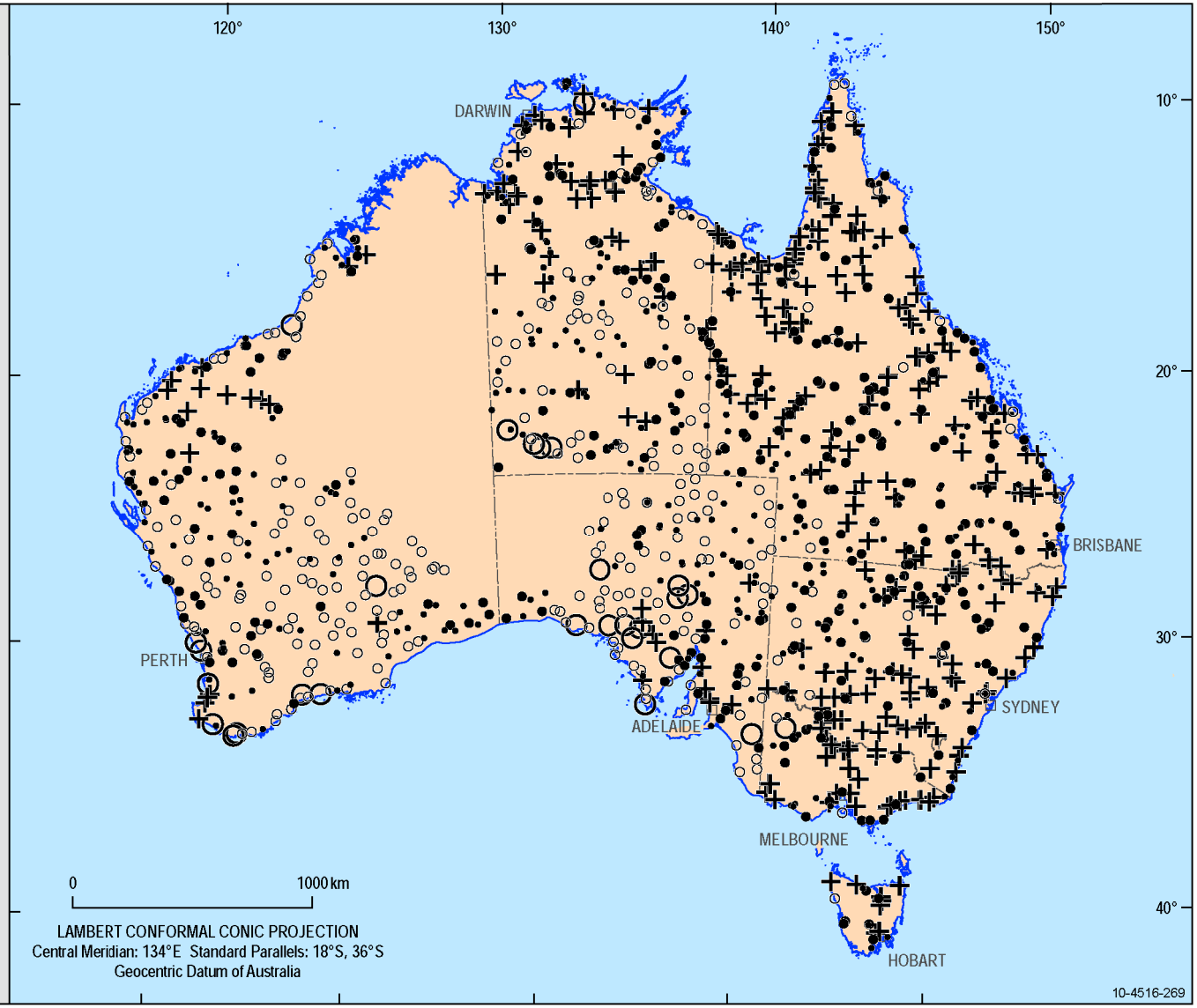
25%: *1.26 mg/kg*

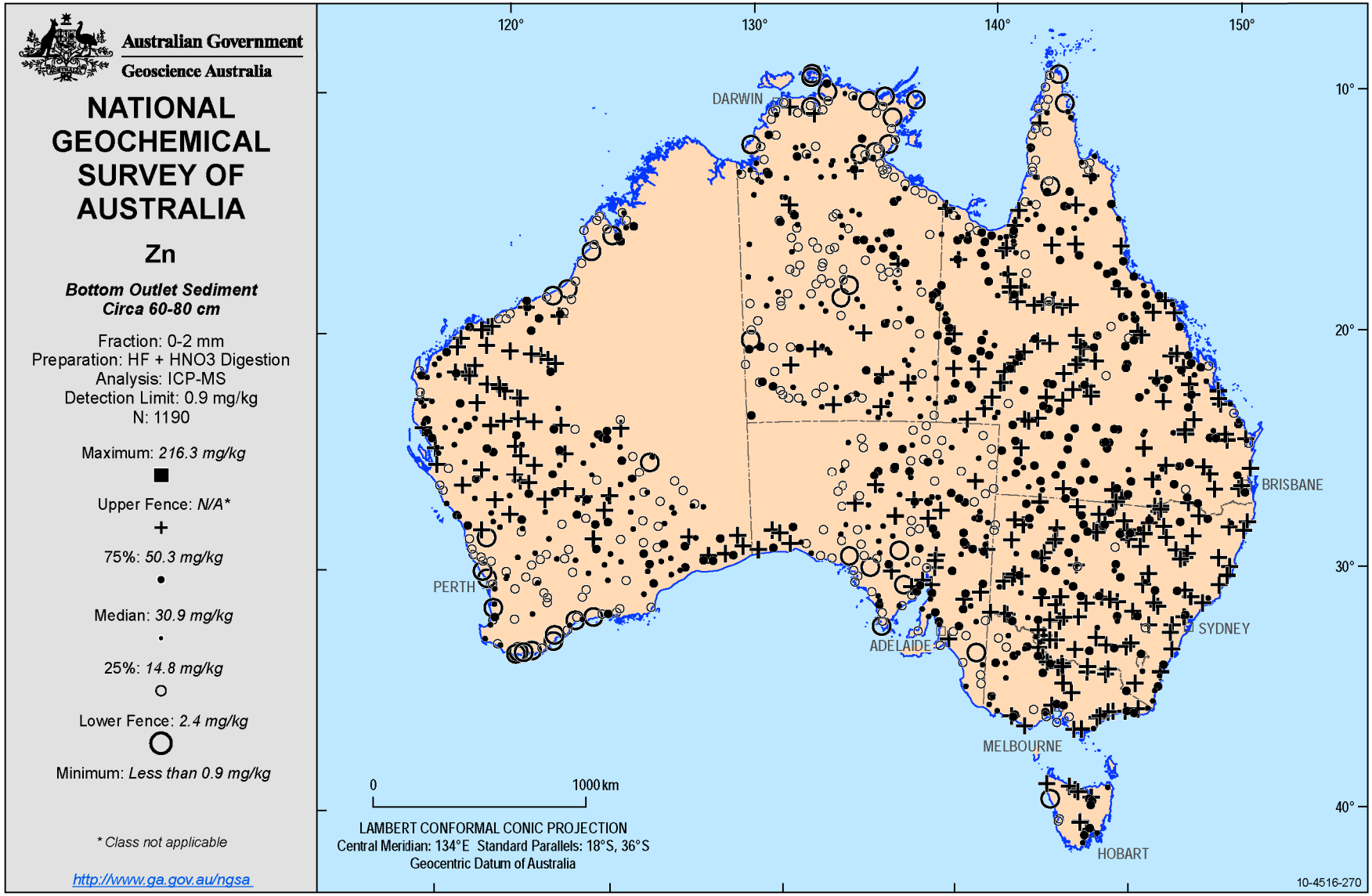
Lower Fence: *0.39 mg/kg*

Minimum: *0.05 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Zn
Bottom Outlet Sediment
Circa 60-80 cm
Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.9 mg/kg
N: 1190
Maximum: 216.3 mg/kg
Upper Fence: N/A*
75%: 50.3 mg/kg
Median: 30.9 mg/kg
25%: 14.8 mg/kg
Lower Fence: 2.4 mg/kg
Minimum: Less than 0.9 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-270

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Zr

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-2 mm
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *1889 mg/kg*

Upper Fence: *947.5 mg/kg*

75%: *372.2 mg/kg*

Median: *283.2 mg/kg*

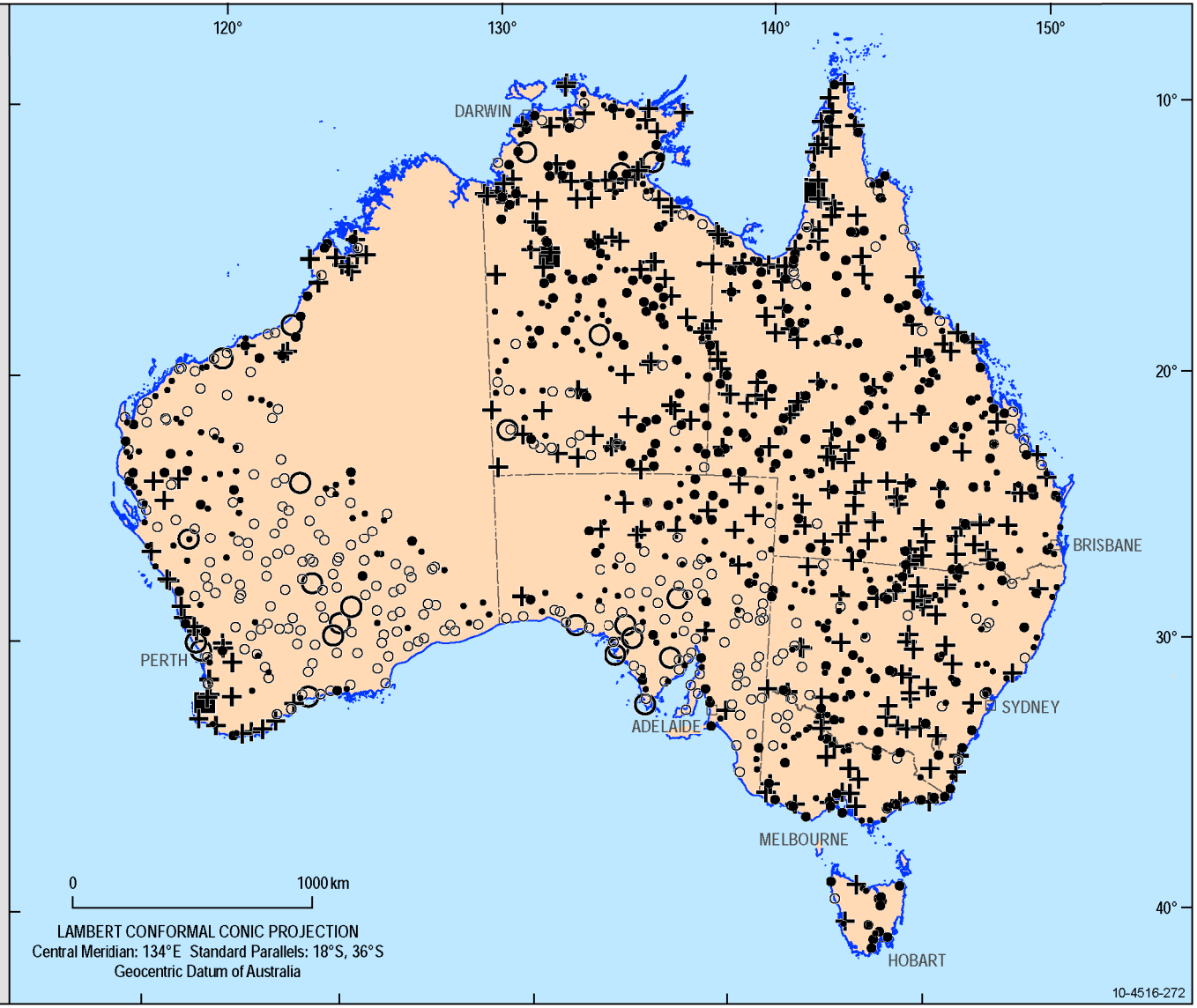
25%: *199.6 mg/kg*

Lower Fence: *78.4 mg/kg*

Minimum: *19.7 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ag

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *11.88 mg/kg*

Upper Fence: *Less than 0.03 mg/kg*

75%: *N/A**

Median: *N/A**

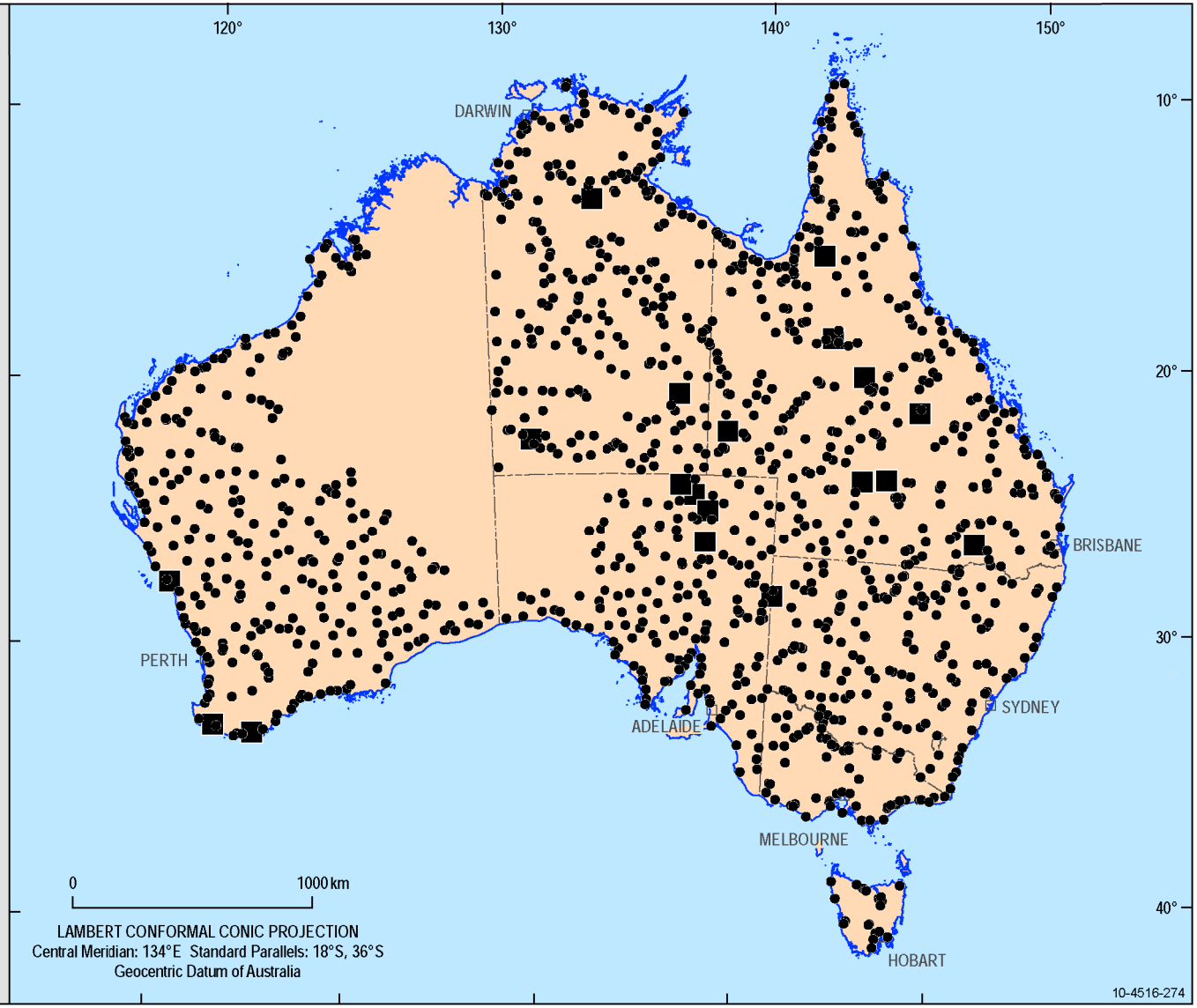
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Al

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 26 mg/kg
N: 1190

Maximum: *188214 mg/kg*

Upper Fence: *141471 mg/kg*

75%: *78040 mg/kg*

Median: *64860 mg/kg*

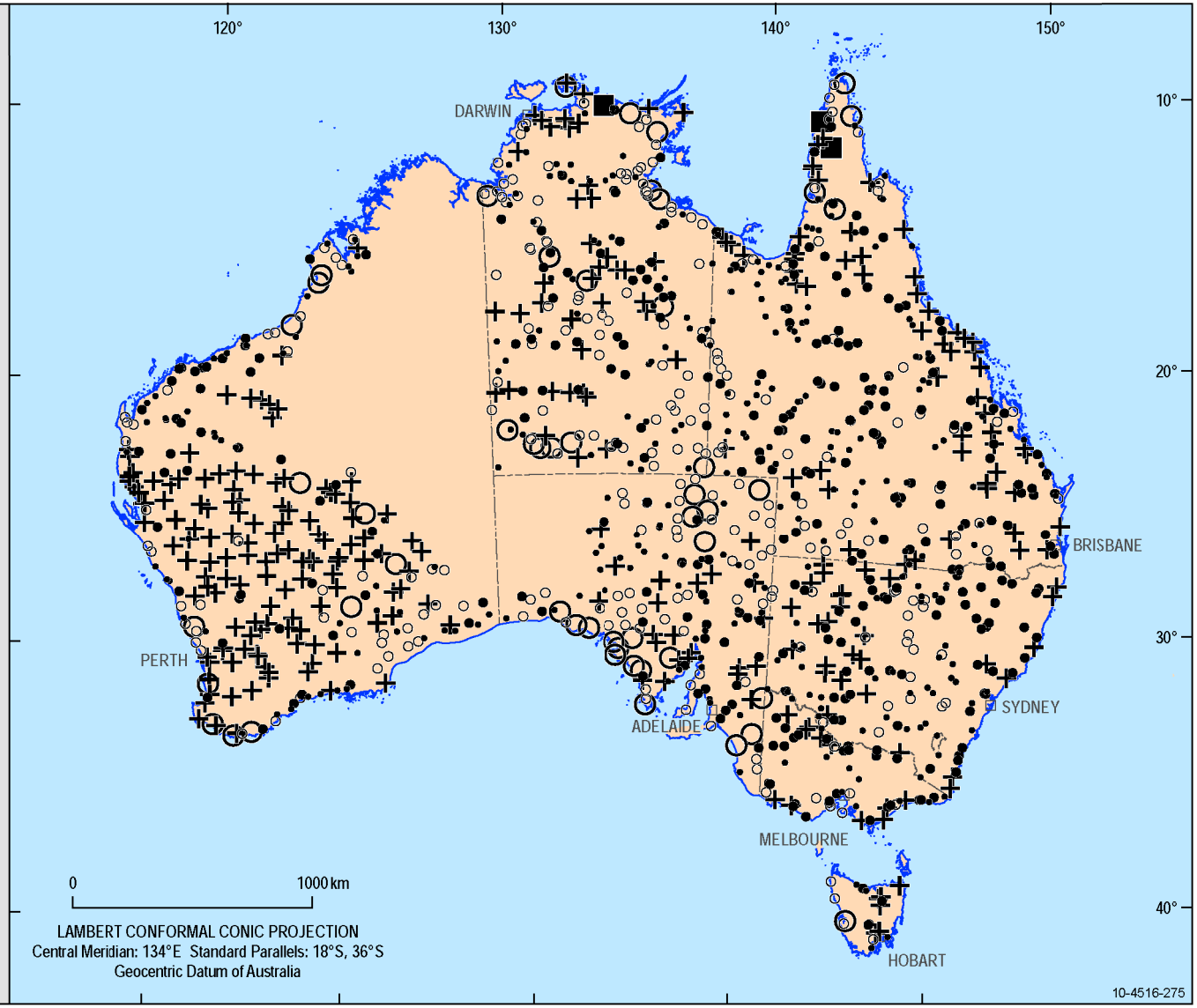
25%: *51496 mg/kg*

Lower Fence: *27132 mg/kg*

Minimum: *725 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

As

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.4 mg/kg
N: 1190

Maximum: *112.6 mg/kg*

Upper Fence: *21.8 mg/kg*

75%: *6.9 mg/kg*

Median: *4.9 mg/kg*

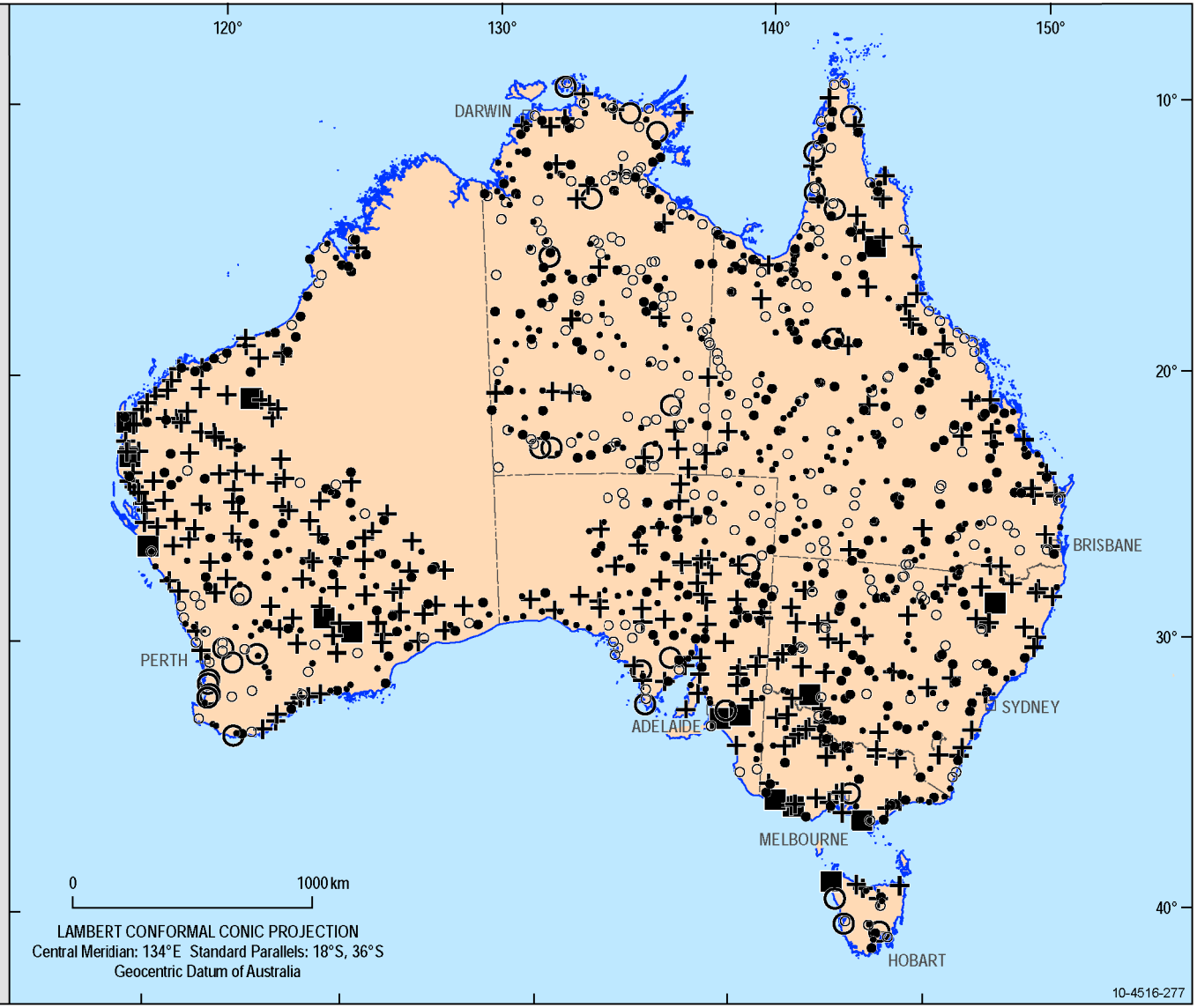
25%: *3.2 mg/kg*

Lower Fence: *1 mg/kg*

Minimum: *Less than 0.4 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Au

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.001 mg/kg
N: 1124

Maximum: *0.116 mg/kg*

Upper Fence: *0.016 mg/kg*

75%: *0.003 mg/kg*

Median: *0.002 mg/kg*

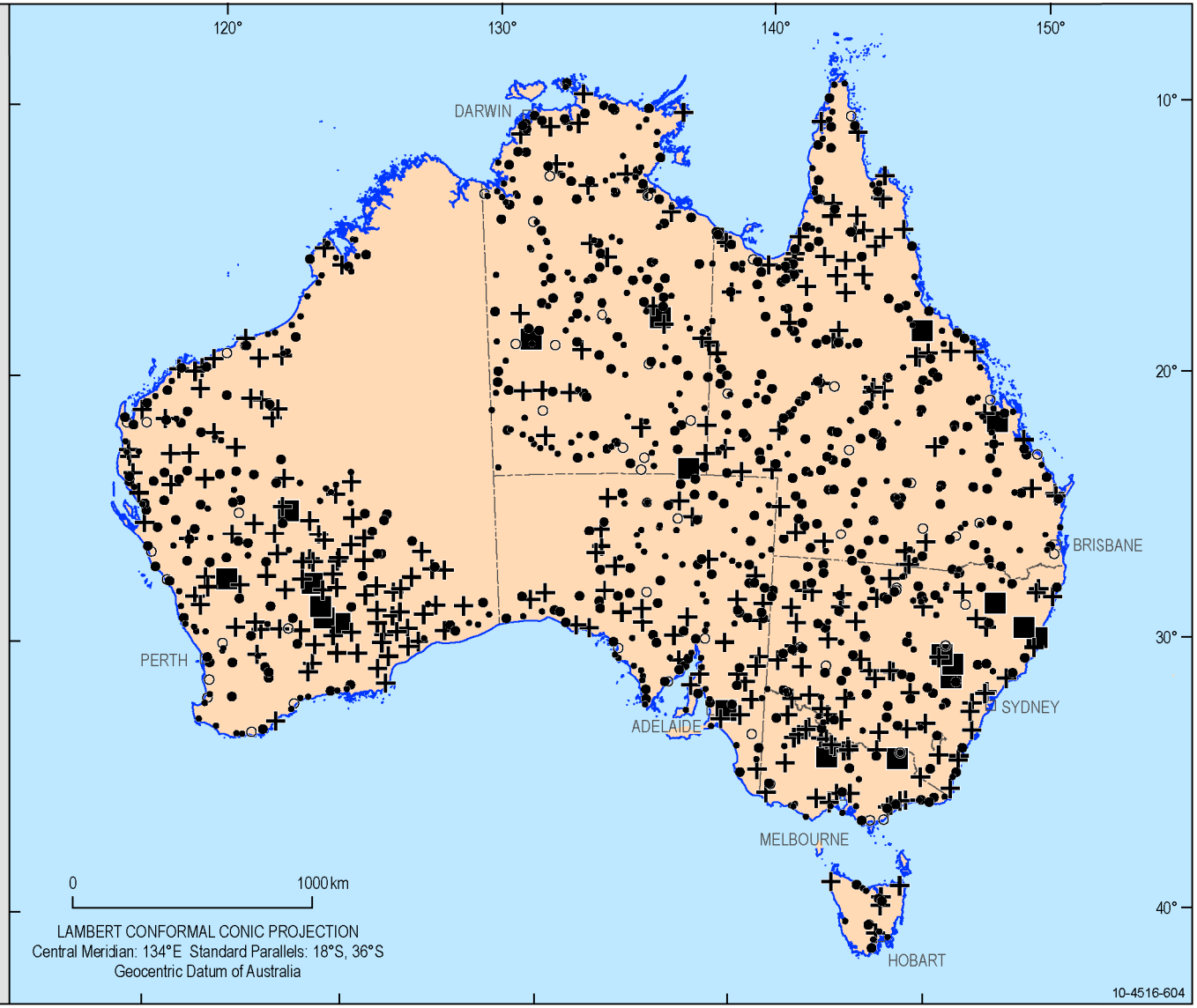
25%: *0.001 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 0.001 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ba

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1190

Maximum: *3403.1 mg/kg*

Upper Fence: *1025.3 mg/kg*

75%: *461.2 mg/kg*

Median: *366.6 mg/kg*

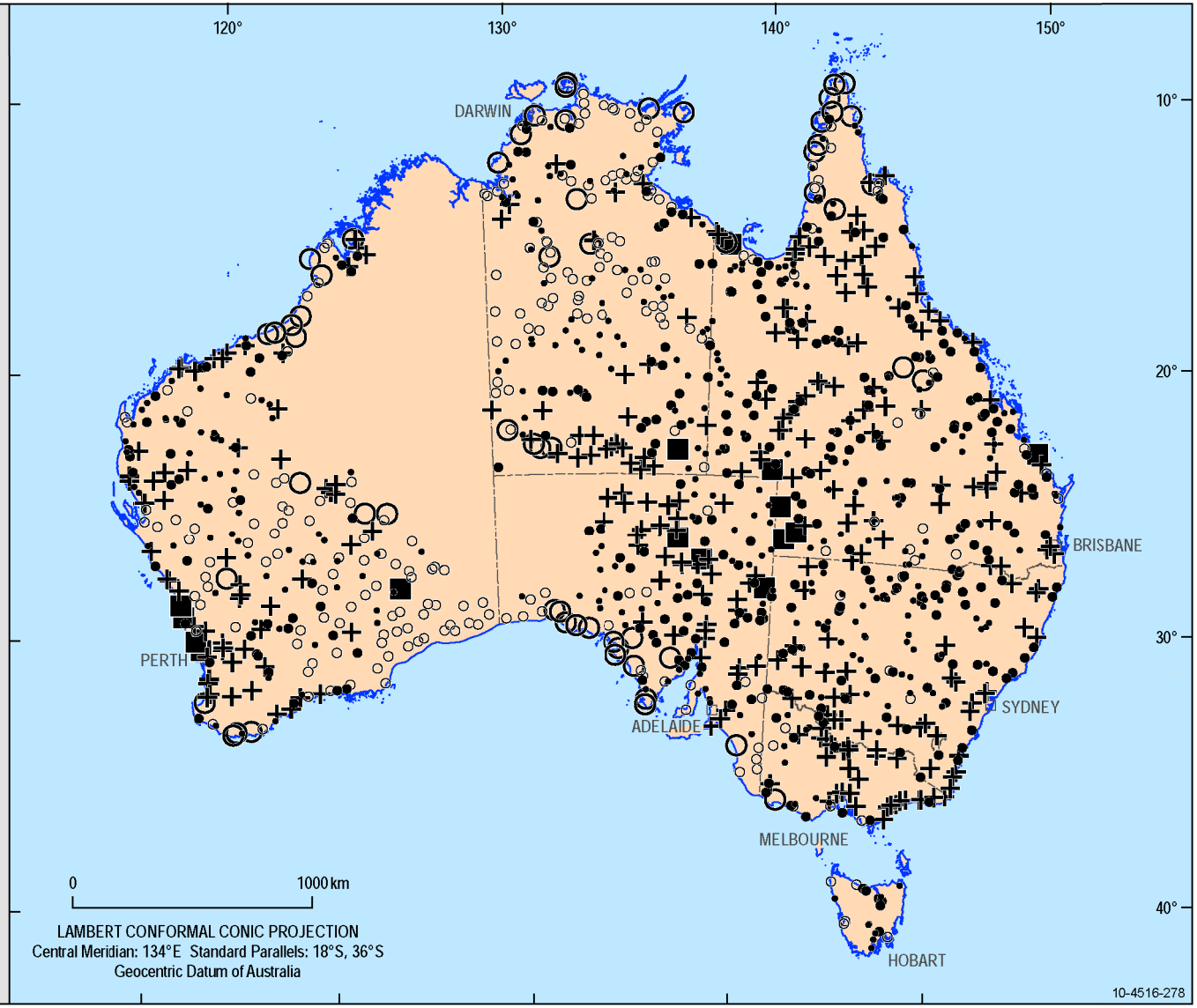
25%: *270.7 mg/kg*

Lower Fence: *121.7 mg/kg*

Minimum: *5.6 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Be

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 1.1 mg/kg
N: 1190

Maximum: *11.1 mg/kg*

Upper Fence: *5.4 mg/kg*

75%: *2.3 mg/kg*

Median: *1.8 mg/kg*

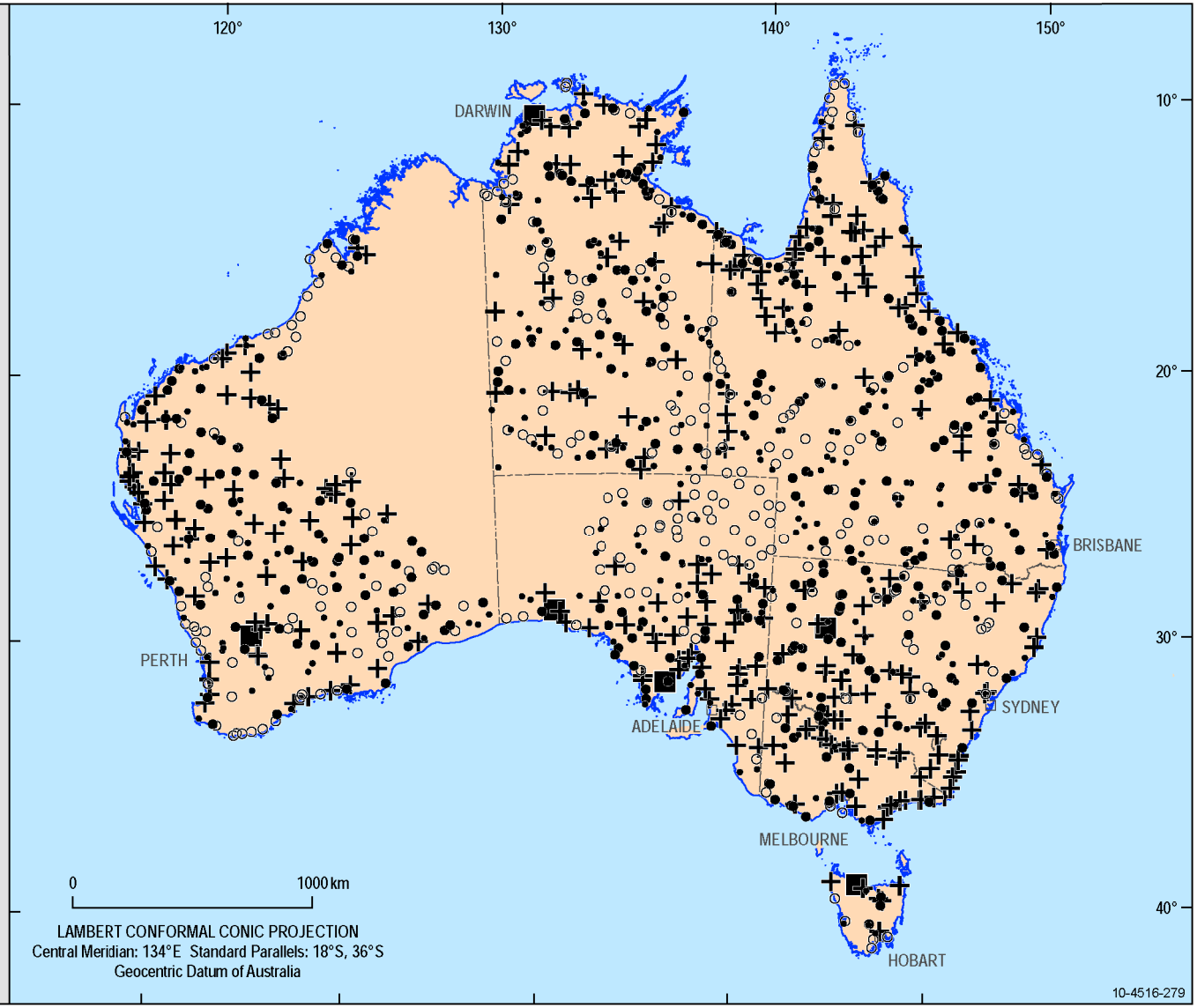
25%: *1.3 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 1.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Bi

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *9.65 mg/kg*

Upper Fence: *1 mg/kg*

75%: *0.38 mg/kg*

Median: *0.28 mg/kg*

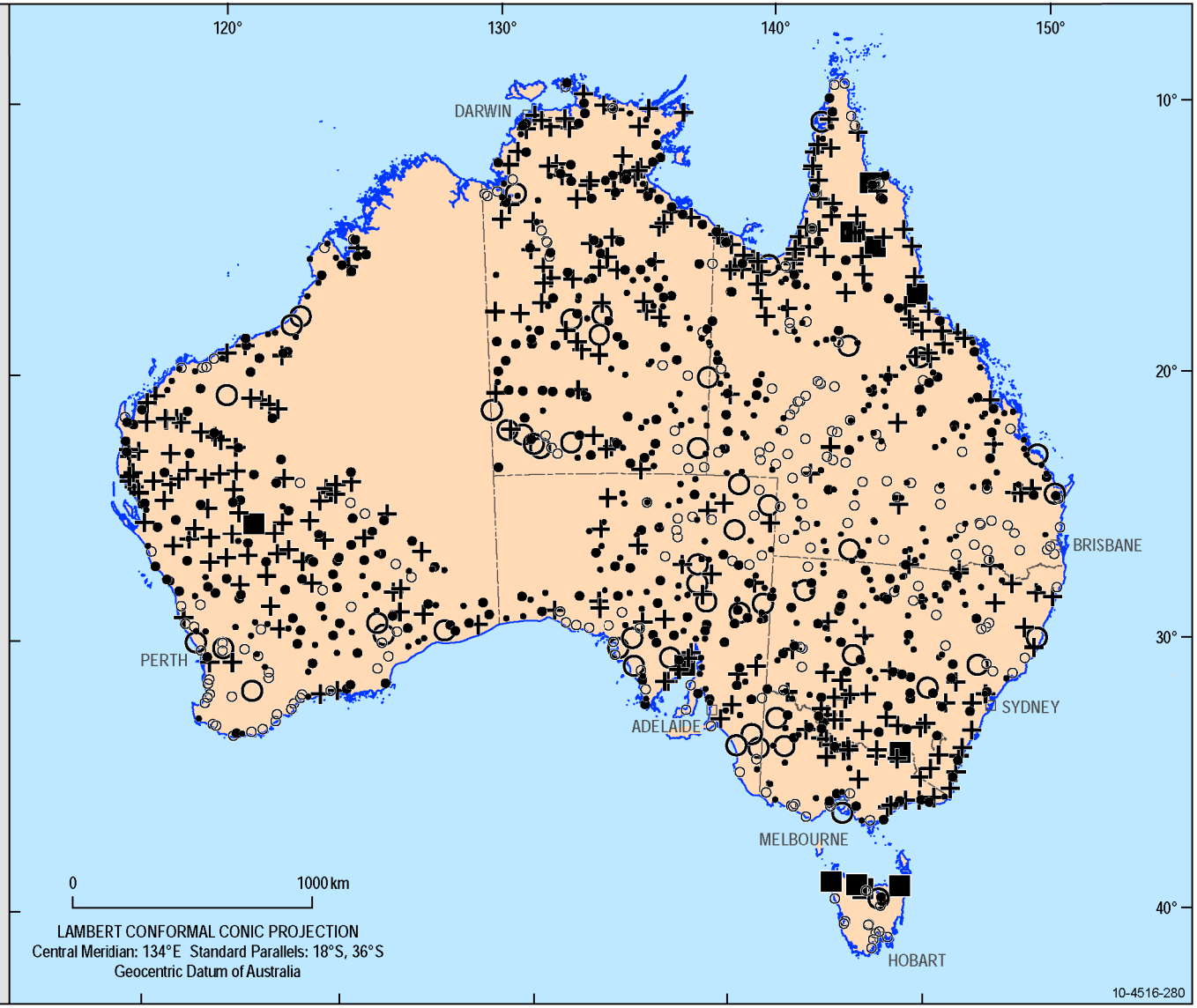
25%: *0.2 mg/kg*

Lower Fence: *0.08 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ca

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 14 mg/kg
N: 1190

Maximum: *340283 mg/kg*

Upper Fence: *104574 mg/kg*

75%: *11907 mg/kg*

Median: *5503 mg/kg*

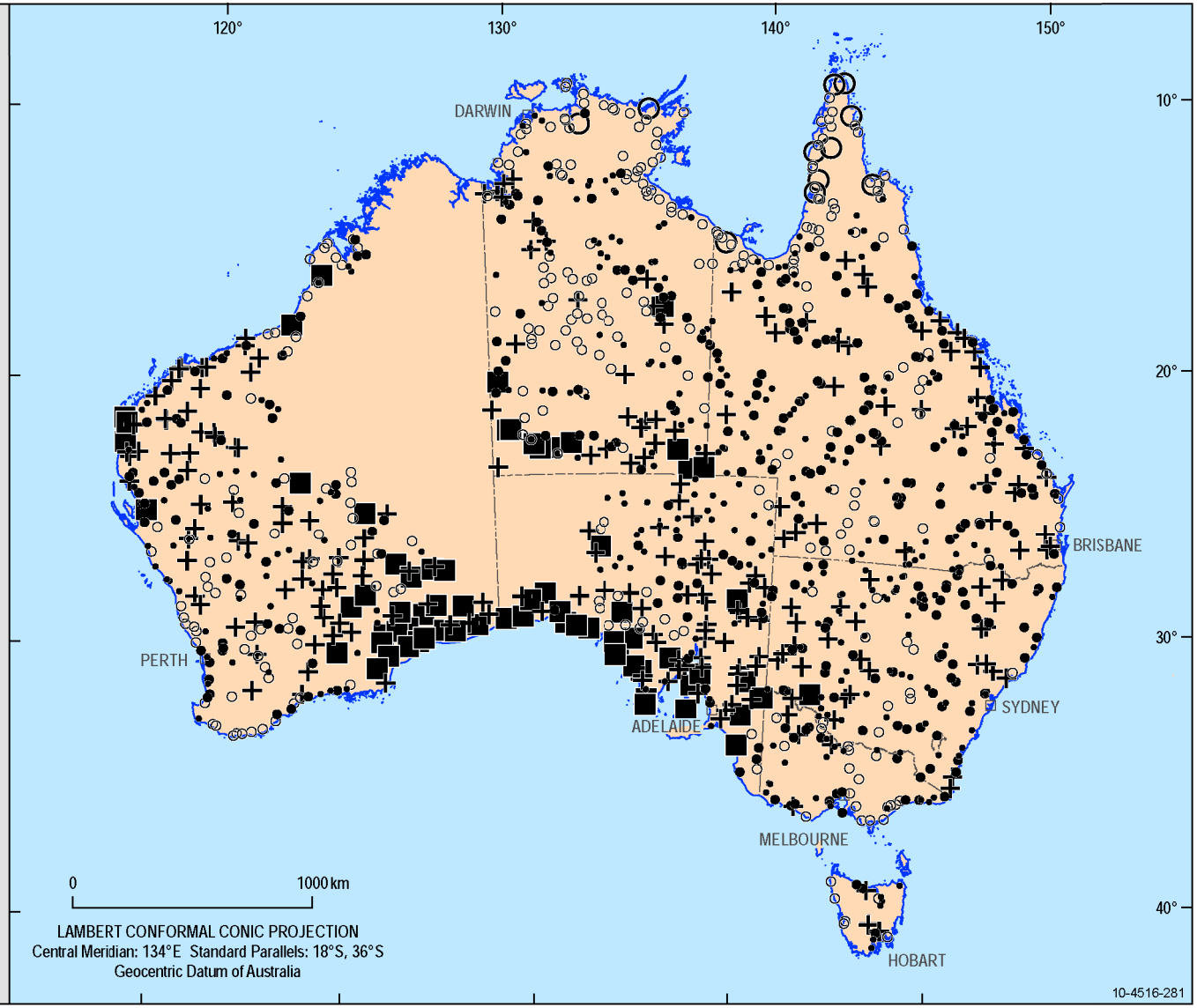
25%: *2644 mg/kg*

Lower Fence: *273 mg/kg*

Minimum: *243 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cd

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *7.4 mg/kg*

Upper Fence: *1.2 mg/kg*

75%: *0.2 mg/kg*

Median: *0.1 mg/kg*

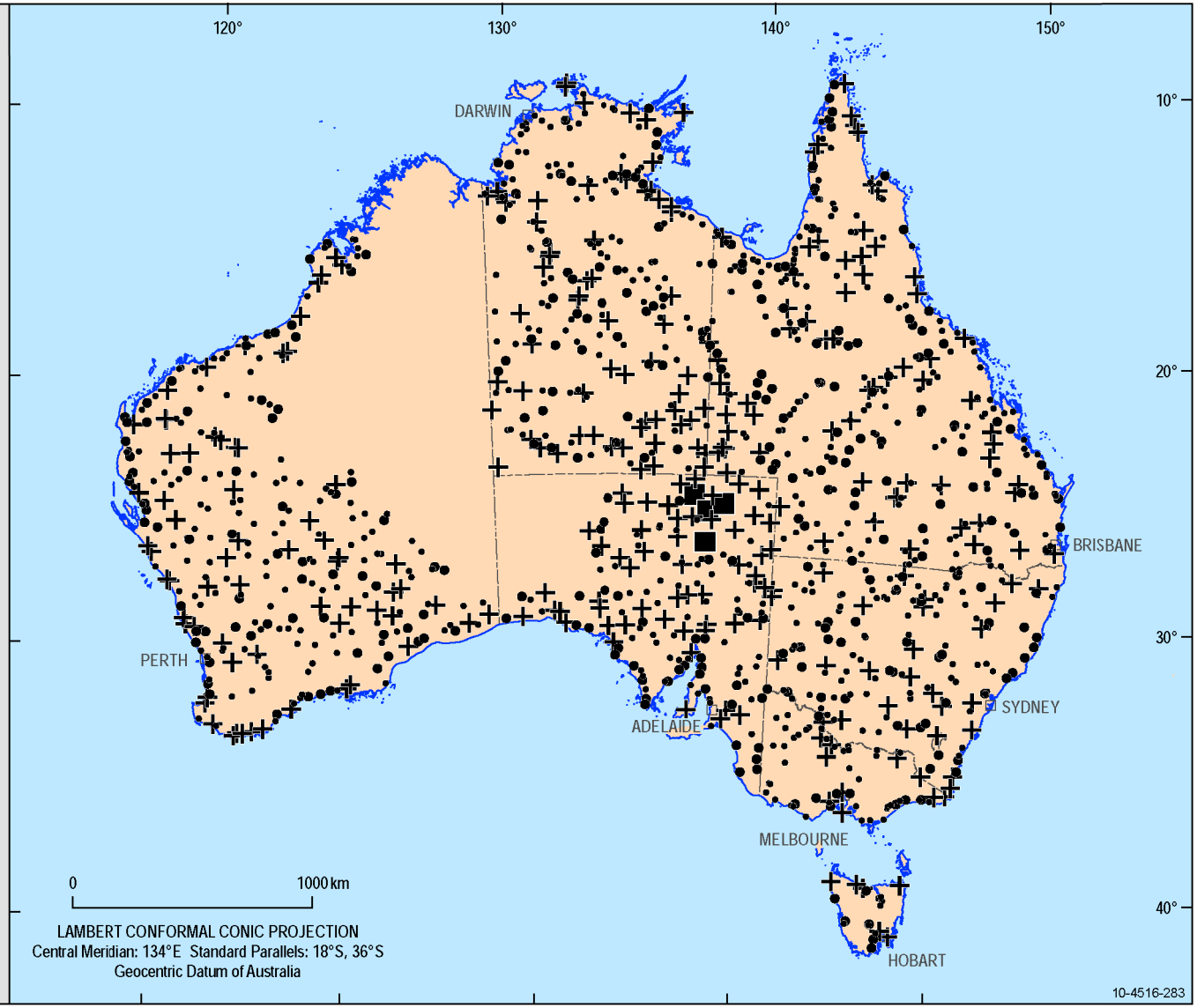
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ce

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *1401 mg/kg*

Upper Fence: *179.24 mg/kg*

75%: *85.7 mg/kg*

Median: *65.74 mg/kg*

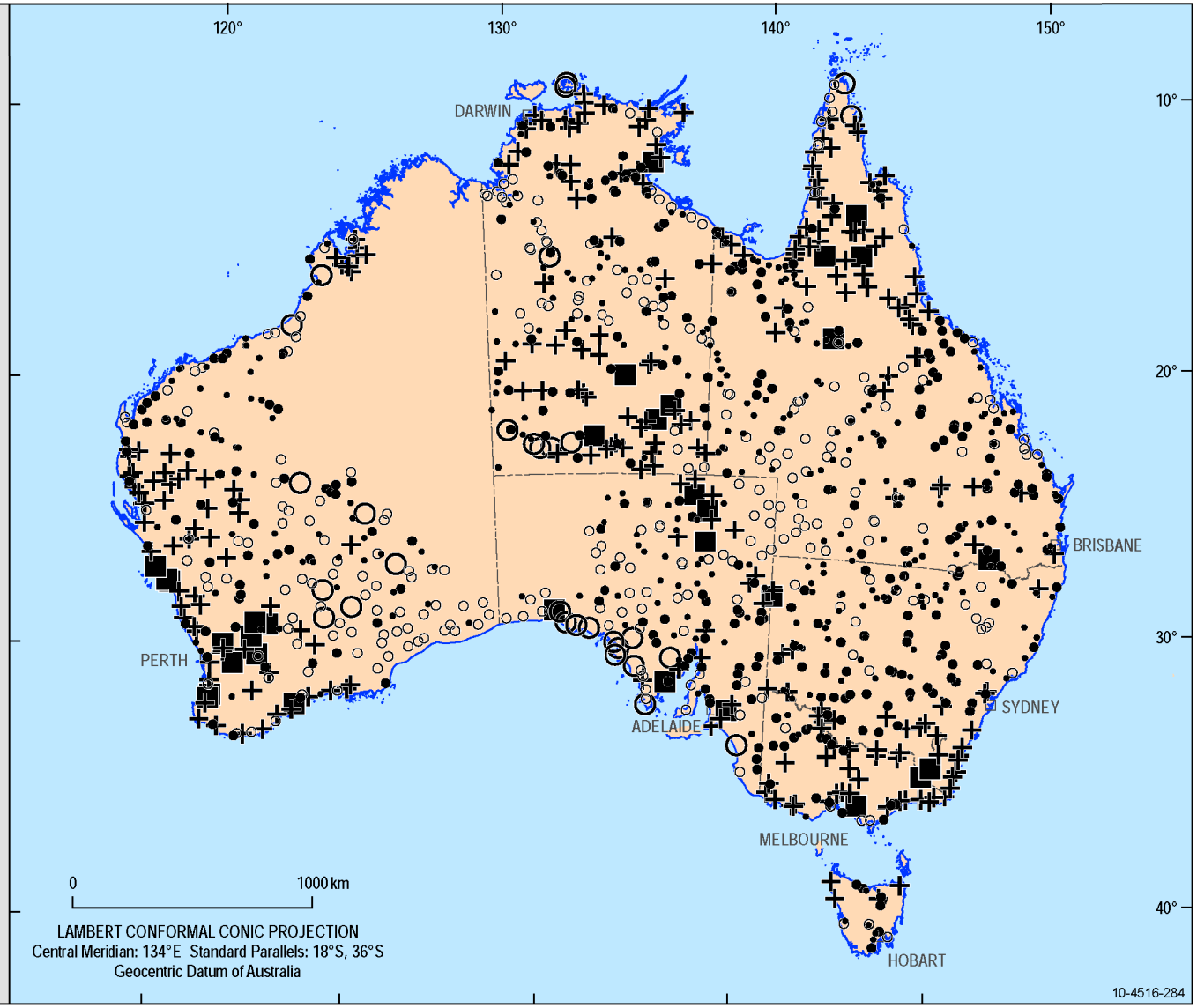
25%: *52.4 mg/kg*

Lower Fence: *25.05 mg/kg*

Minimum: *1.24 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cl

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 10 mg/kg
N: 1189

Maximum: *46680 mg/kg*

Upper Fence: *N/A**

75%: *801 mg/kg*

Median: *94 mg/kg*

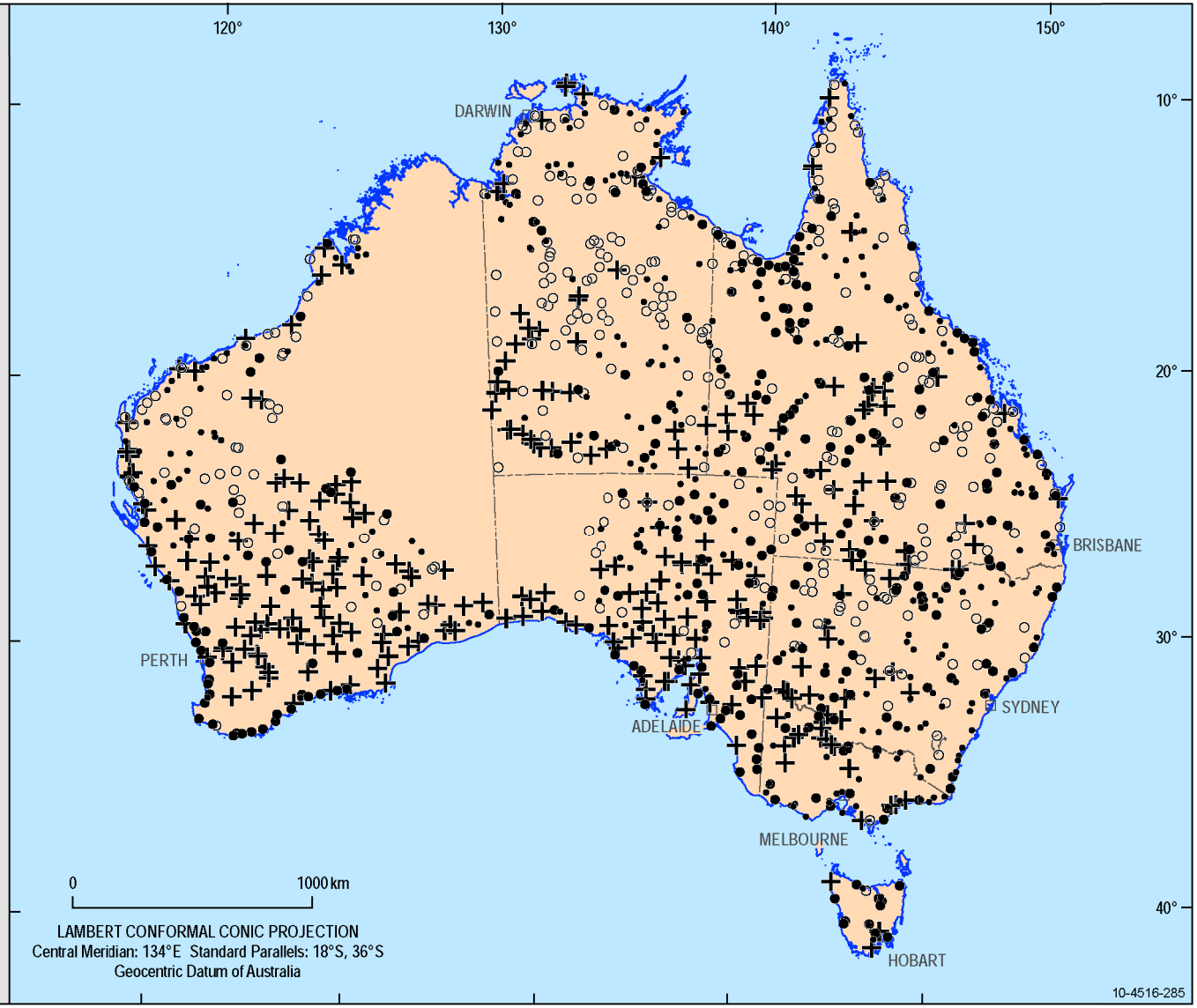
25%: *45 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 10 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Co

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *83.5 mg/kg*

Upper Fence: *48.1 mg/kg*

75%: *17.6 mg/kg*

Median: *12.7 mg/kg*

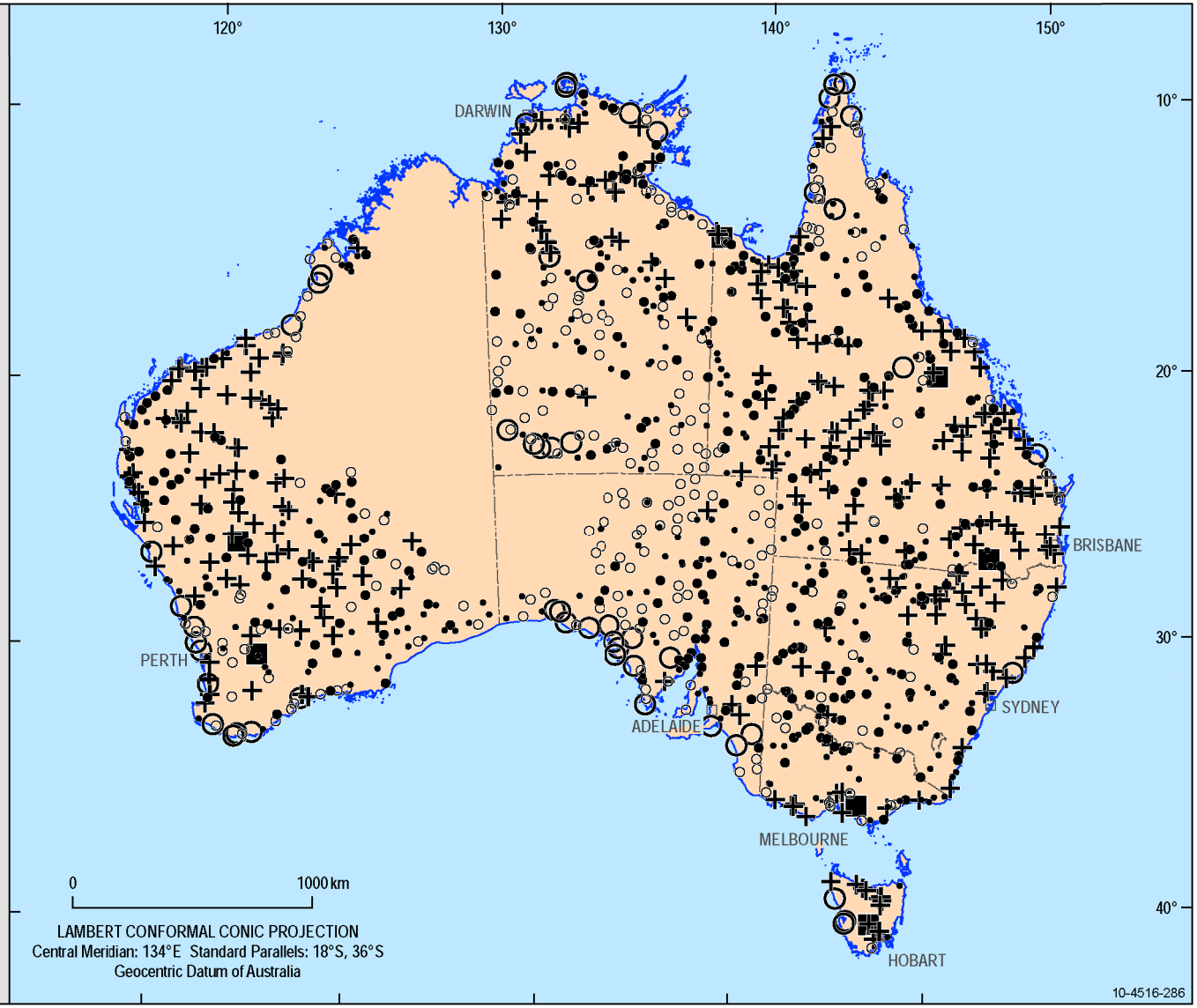
25%: *9 mg/kg*

Lower Fence: *3.3 mg/kg*

Minimum: *0.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cr

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1190

Maximum: *7824 mg/kg*

Upper Fence: *200.7 mg/kg*

75%: *94.4 mg/kg*

Median: *69.4 mg/kg*

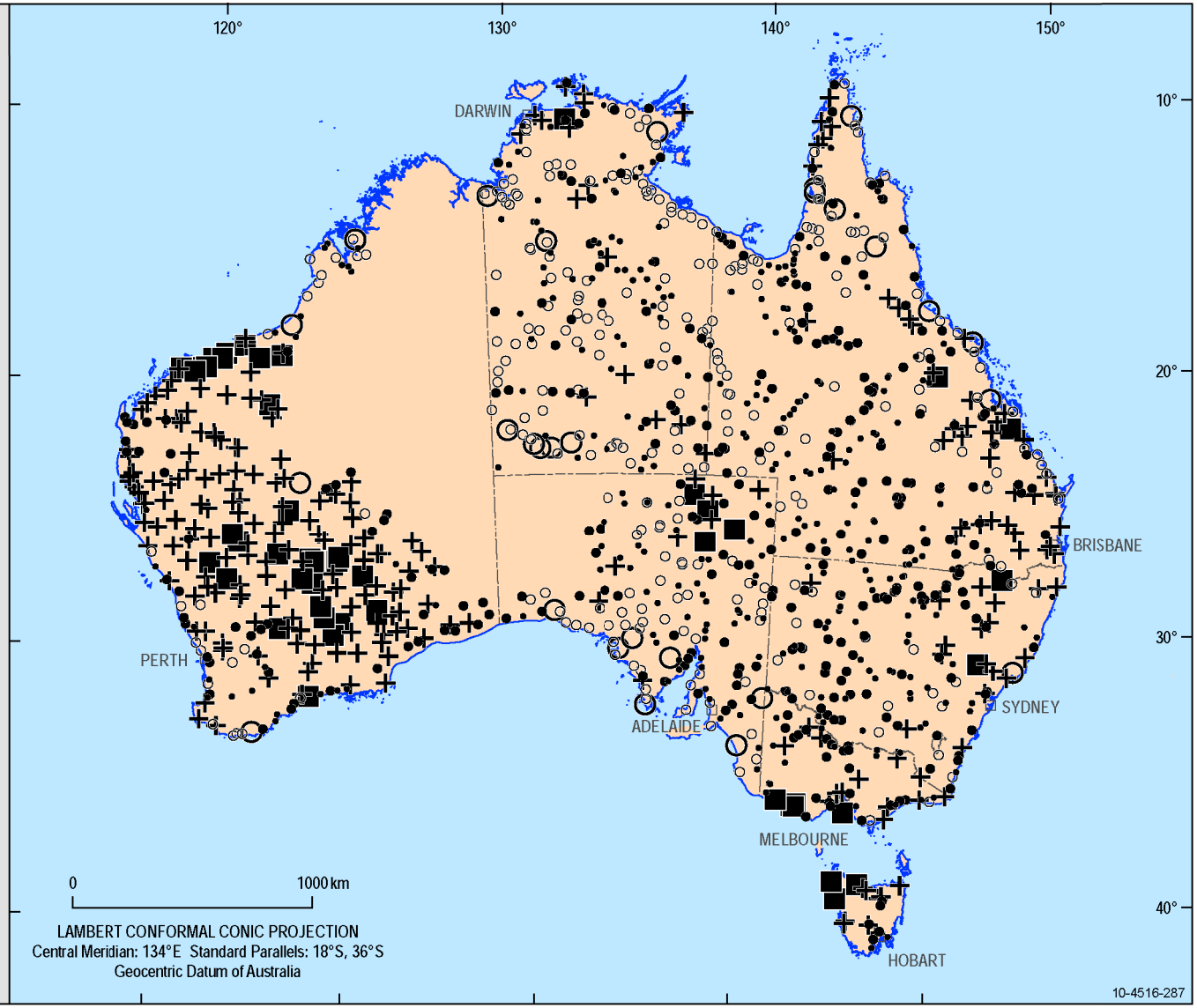
25%: *57.1 mg/kg*

Lower Fence: *26.9 mg/kg*

Minimum: *3.5 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Cs

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *19.7 mg/kg*

Upper Fence: *13.5 mg/kg*

75%: *5.1 mg/kg*

Median: *3.7 mg/kg*

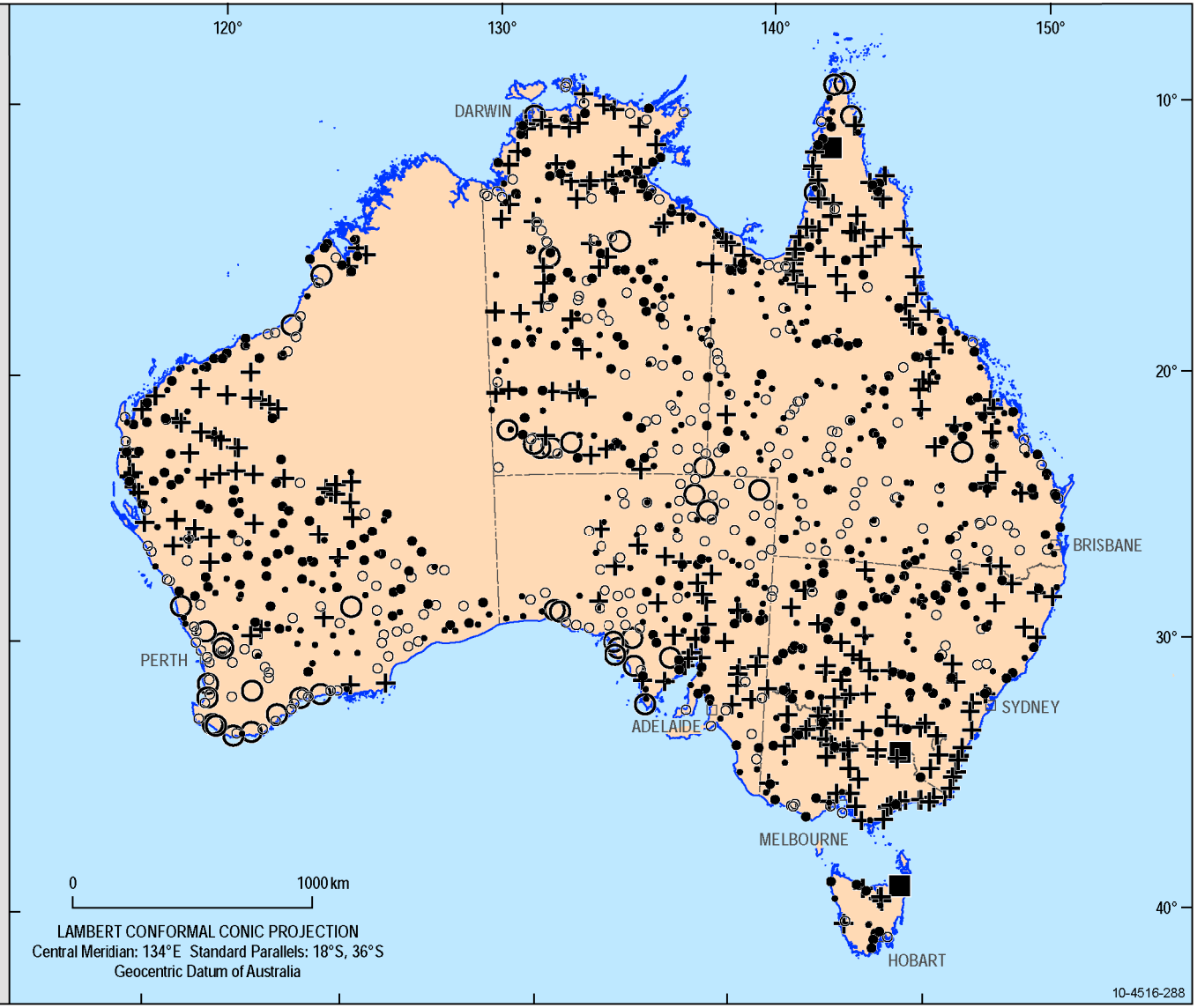
25%: *2.6 mg/kg*

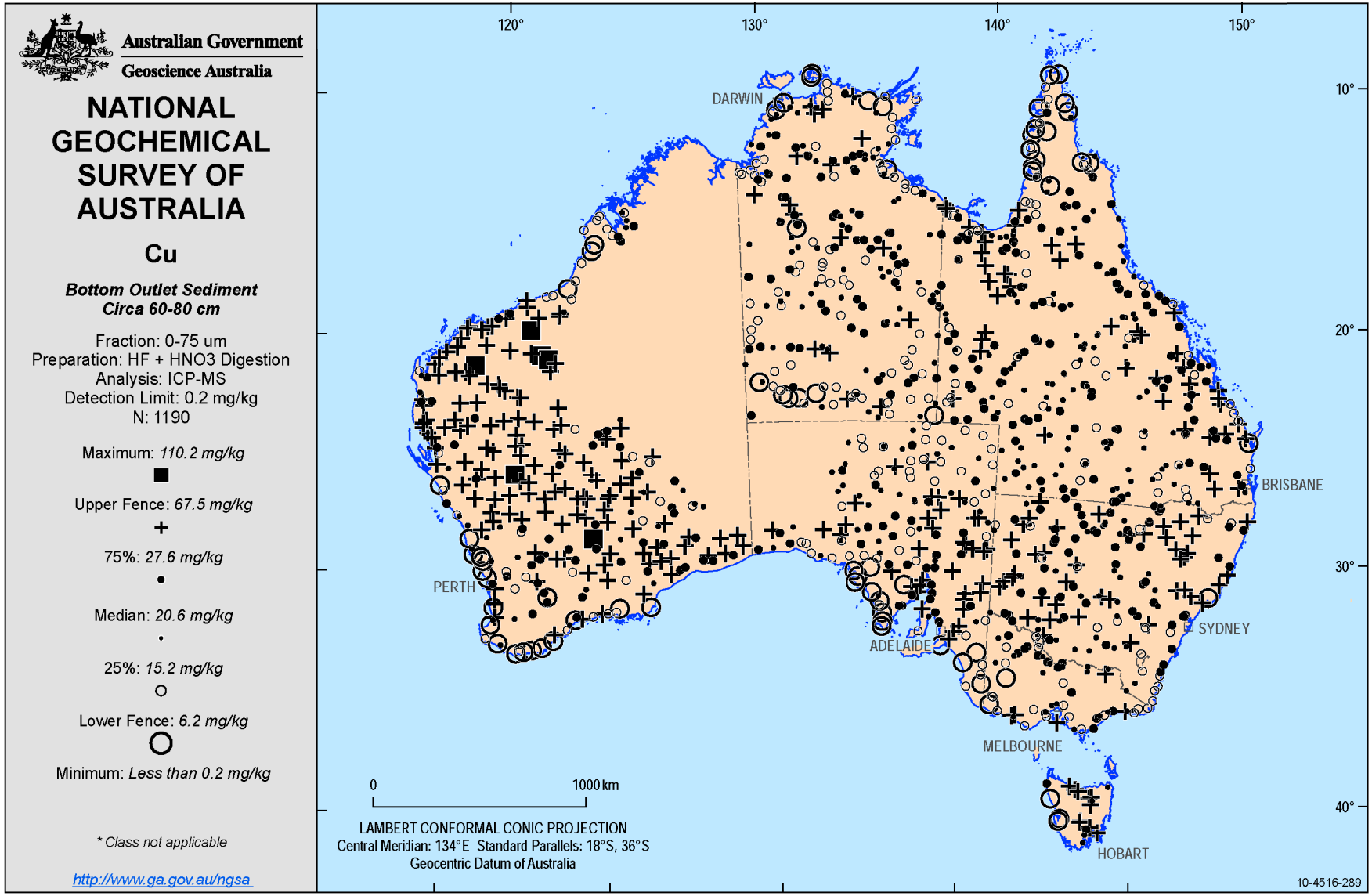
Lower Fence: *1 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Cu
Bottom Outlet Sediment
Circa 60-80 cm
Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190
Maximum: 110.2 mg/kg
Upper Fence: 67.5 mg/kg
75%: 27.6 mg/kg
Median: 20.6 mg/kg
25%: 15.2 mg/kg
Lower Fence: 6.2 mg/kg
Minimum: Less than 0.2 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
MELBOURNE
HOBART
SYDNEY
BRISBANE
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-289

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Dy

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *44.9 mg/kg*

Upper Fence: *11.7 mg/kg*

75%: *6.5 mg/kg*

Median: *5.3 mg/kg*

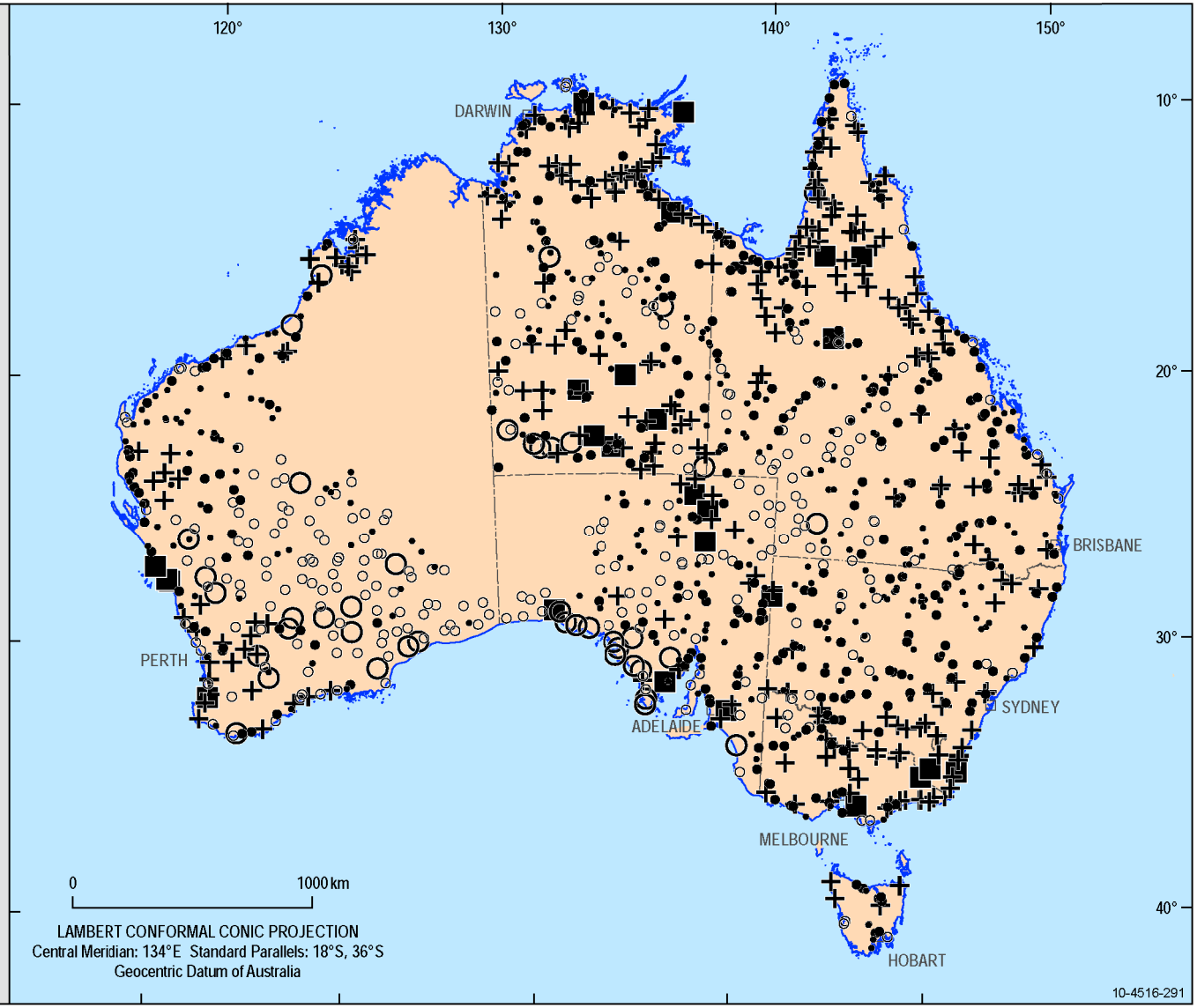
25%: *4.4 mg/kg*

Lower Fence: *2.4 mg/kg*

Minimum: *0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Er

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *35.08 mg/kg*

Upper Fence: *7.34 mg/kg*

75%: *4.09 mg/kg*

Median: *3.27 mg/kg*

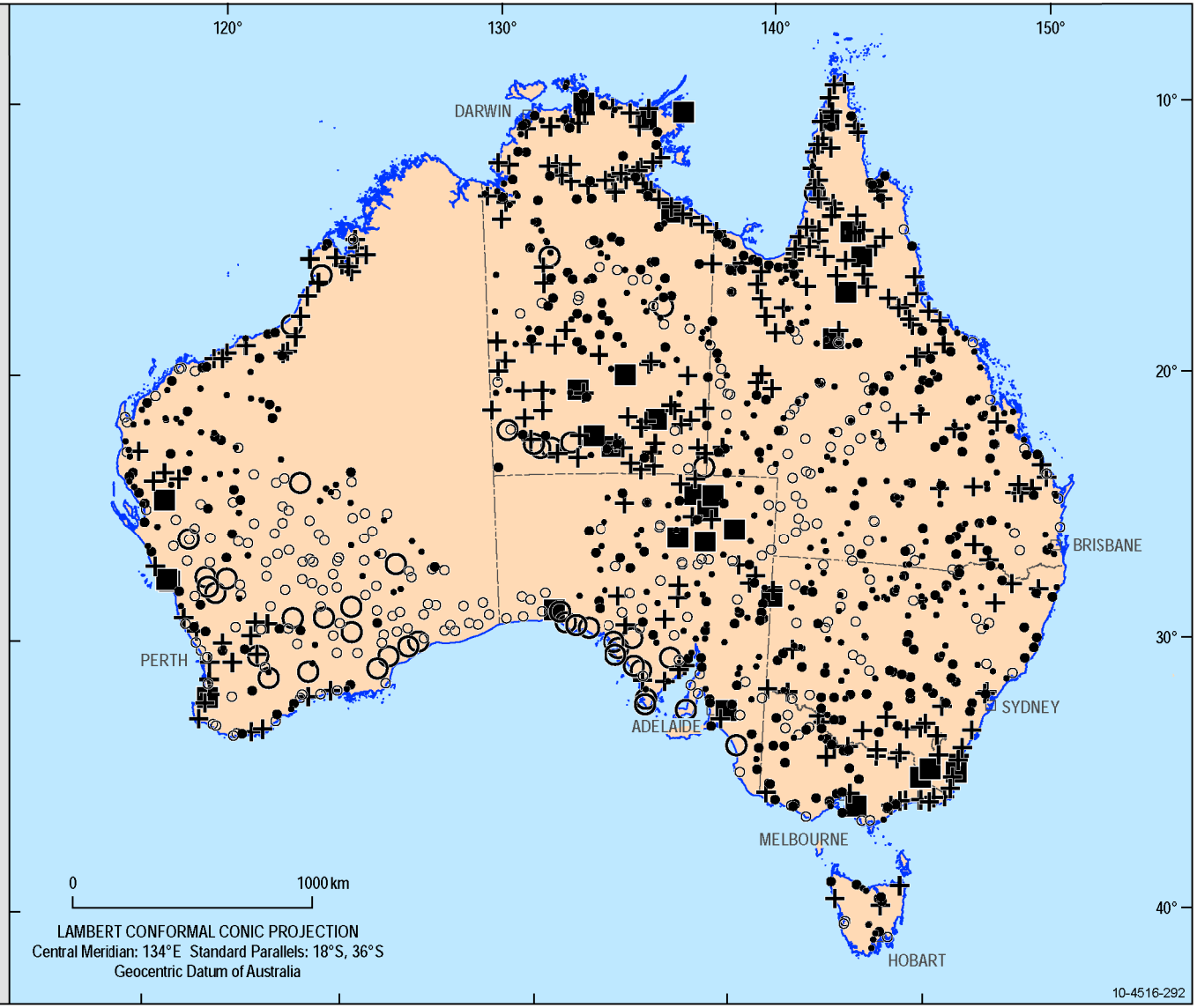
25%: *2.77 mg/kg*

Lower Fence: *1.54 mg/kg*

Minimum: *0.09 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Eu

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *9 mg/kg*

Upper Fence: *2.51 mg/kg*

75%: *1.4 mg/kg*

Median: *1.18 mg/kg*

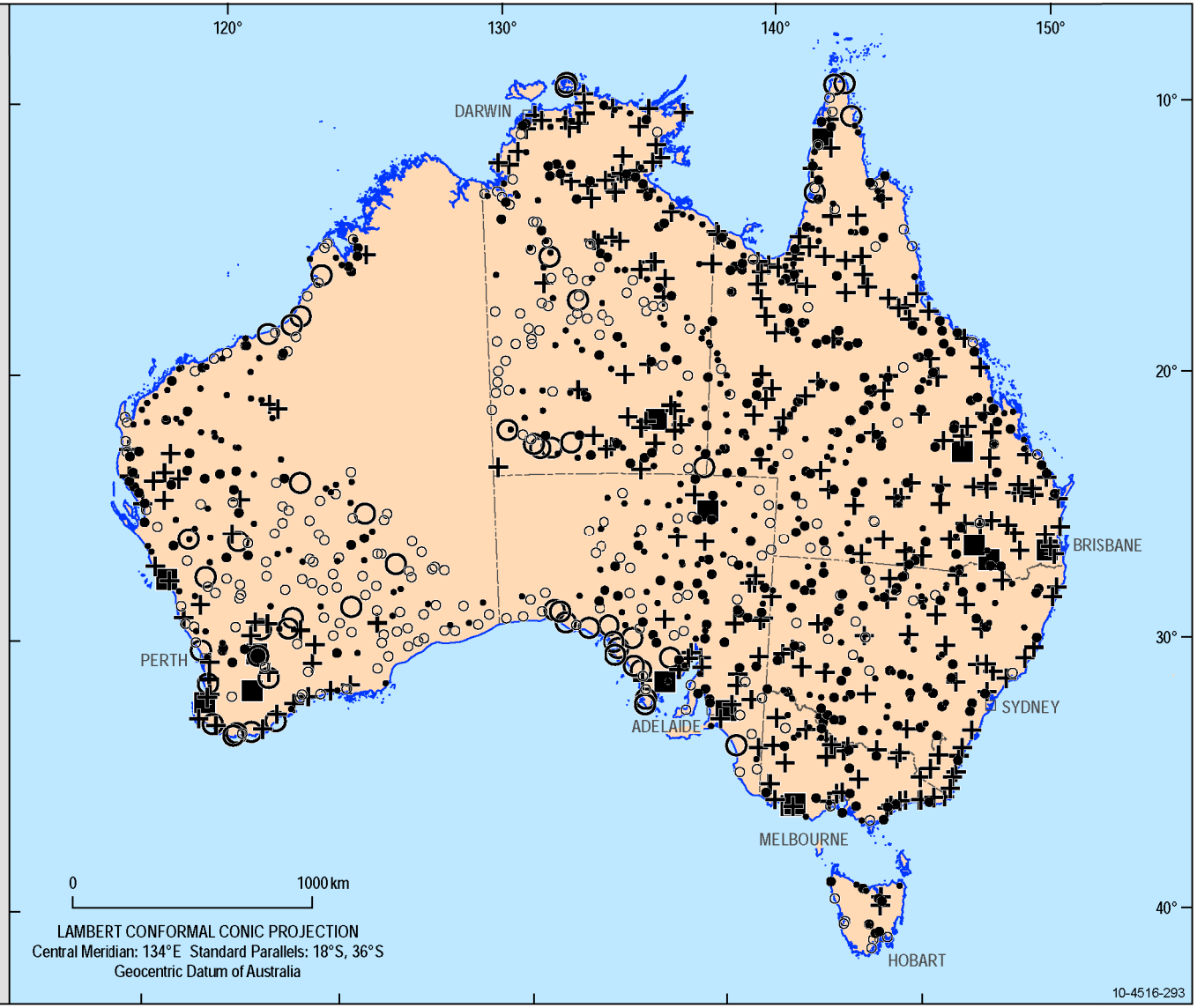
25%: *0.95 mg/kg*

Lower Fence: *0.53 mg/kg*

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

F

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Alkaline Fusion
Analysis: ISE
Detection Limit: 20 mg/kg
N: 1190

Maximum: *2900 mg/kg*

Upper Fence: *1131 mg/kg*

75%: *400 mg/kg*

Median: *280 mg/kg*

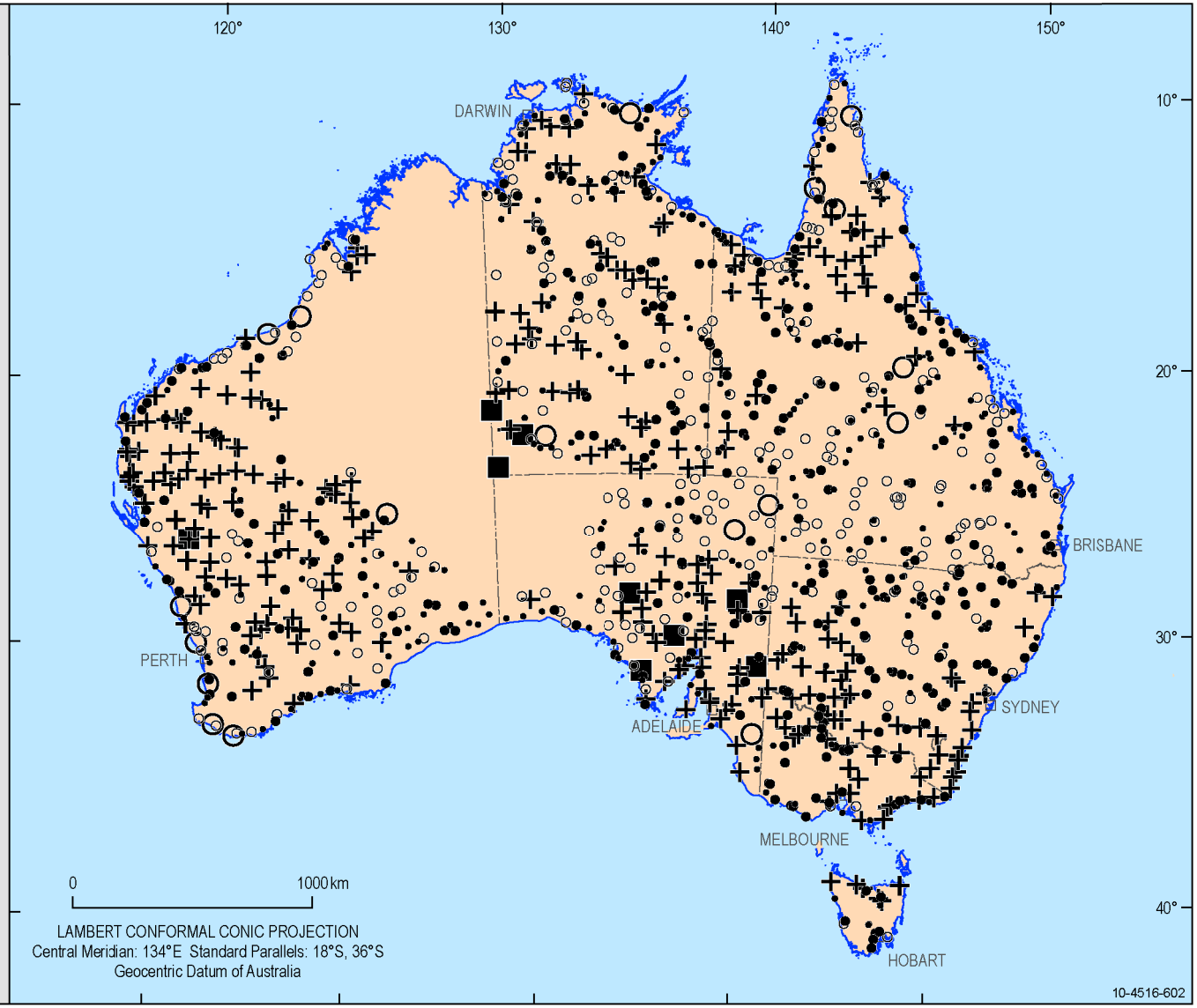
25%: *200 mg/kg*

Lower Fence: *71 mg/kg*

Minimum: *Less than 20 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Fe (Total)

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 35 mg/kg
N: 1190

Maximum: *229319 mg/kg*

Upper Fence: *88938 mg/kg*

75%: *42475 mg/kg*

Median: *33068 mg/kg*

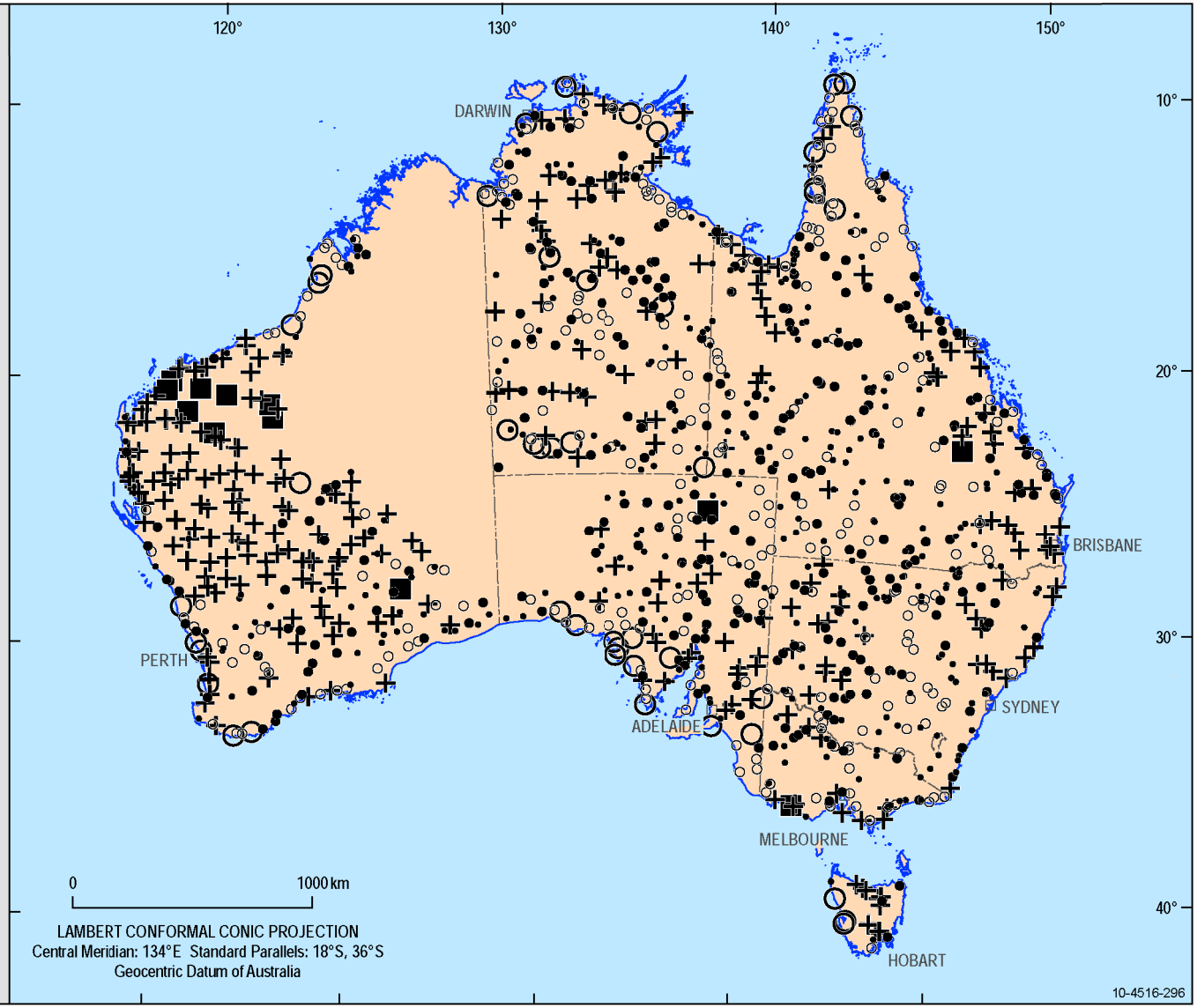
25%: *25549 mg/kg*

Lower Fence: *11774 mg/kg*

Minimum: *336 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ga

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *42.3 mg/kg*

Upper Fence: *37.7 mg/kg*

75%: *18.2 mg/kg*

Median: *14.7 mg/kg*

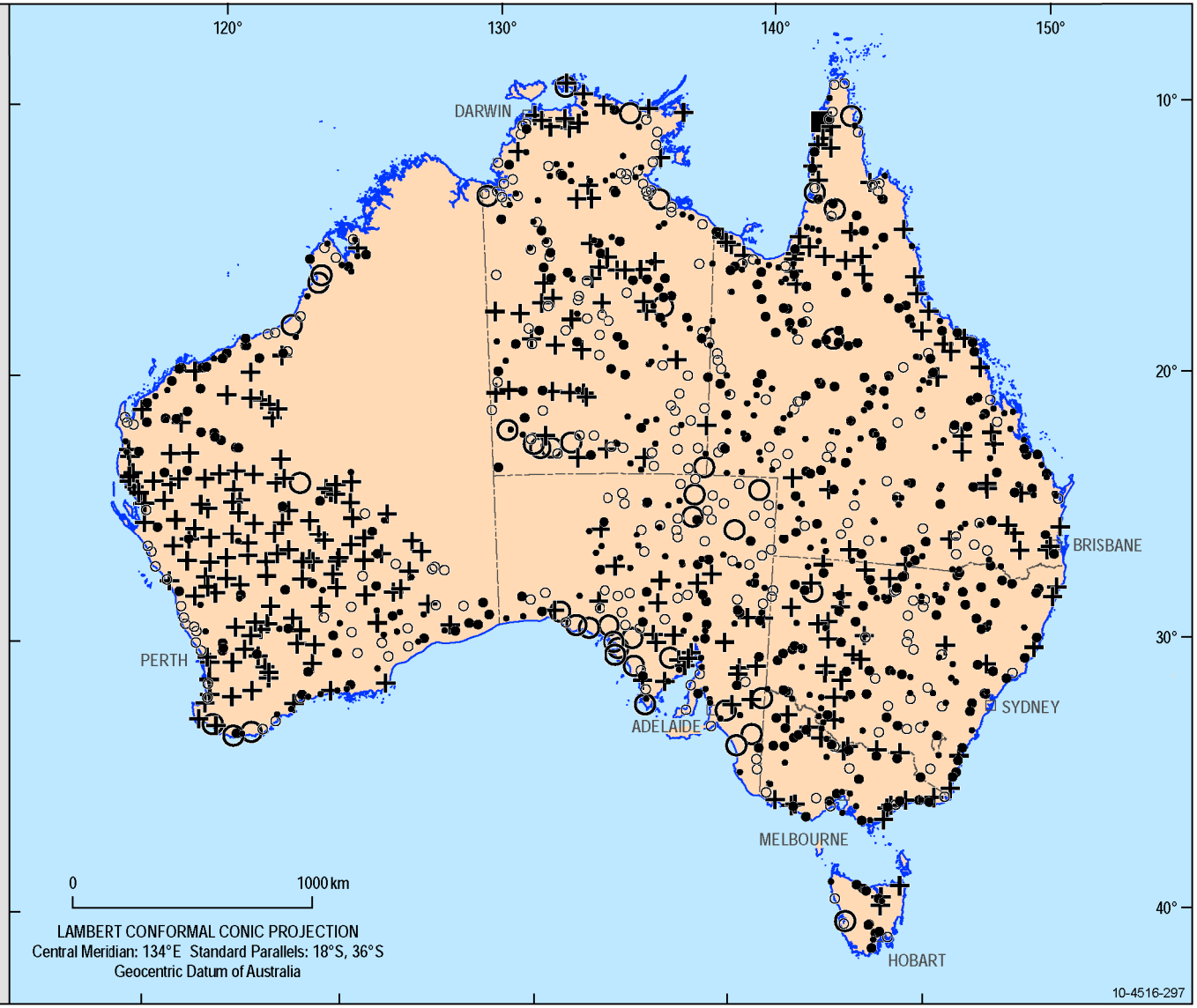
25%: *11.2 mg/kg*

Lower Fence: *5.4 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Gd

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *62.6 mg/kg*

Upper Fence: *12.36 mg/kg*

75%: *6.69 mg/kg*

Median: *5.37 mg/kg*

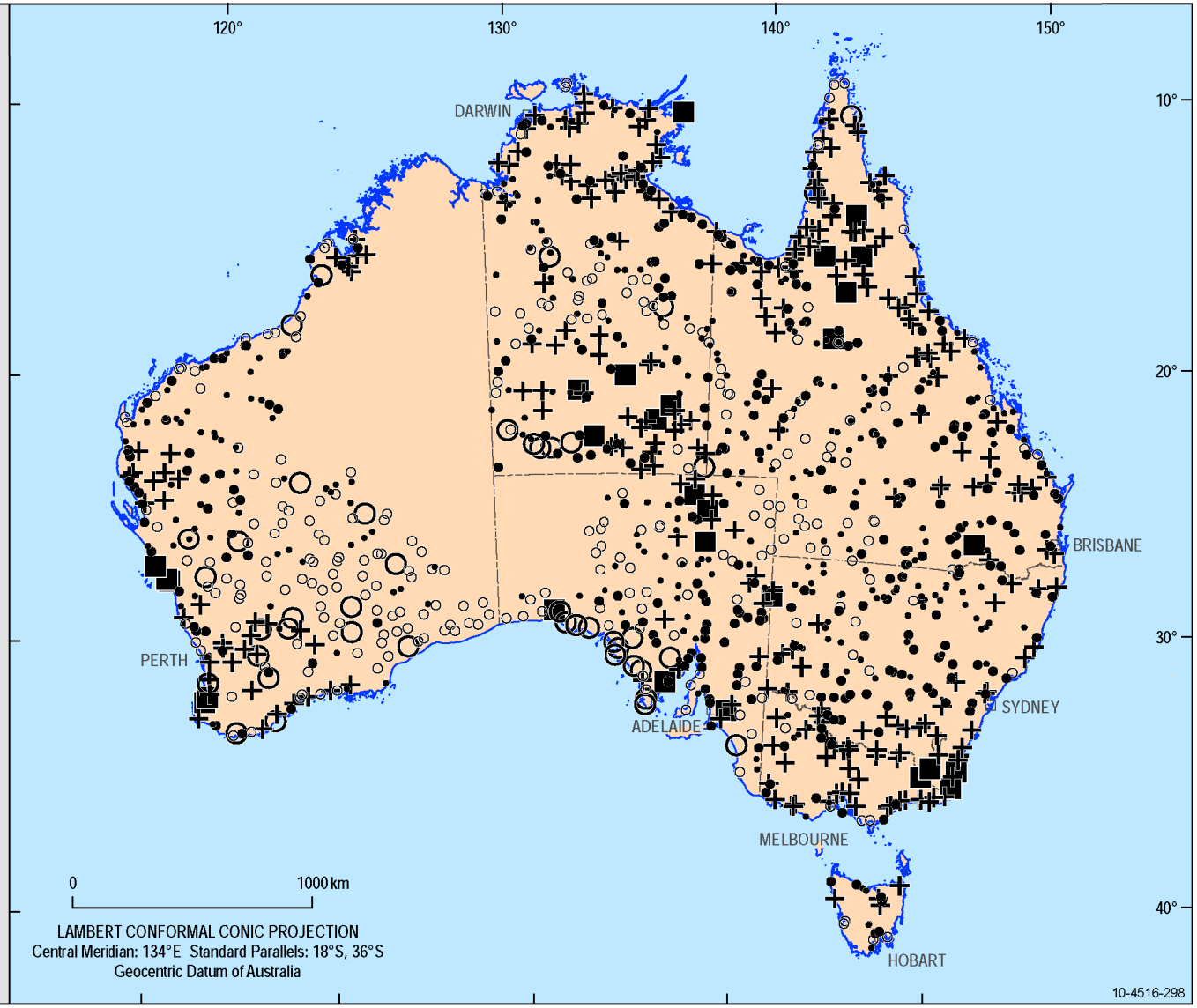
25%: *4.44 mg/kg*

Lower Fence: *2.4 mg/kg*

Minimum: *0.15 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ge

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *1.8 mg/kg*

Upper Fence: *1.16 mg/kg*

75%: *0.7 mg/kg*

Median: *0.6 mg/kg*

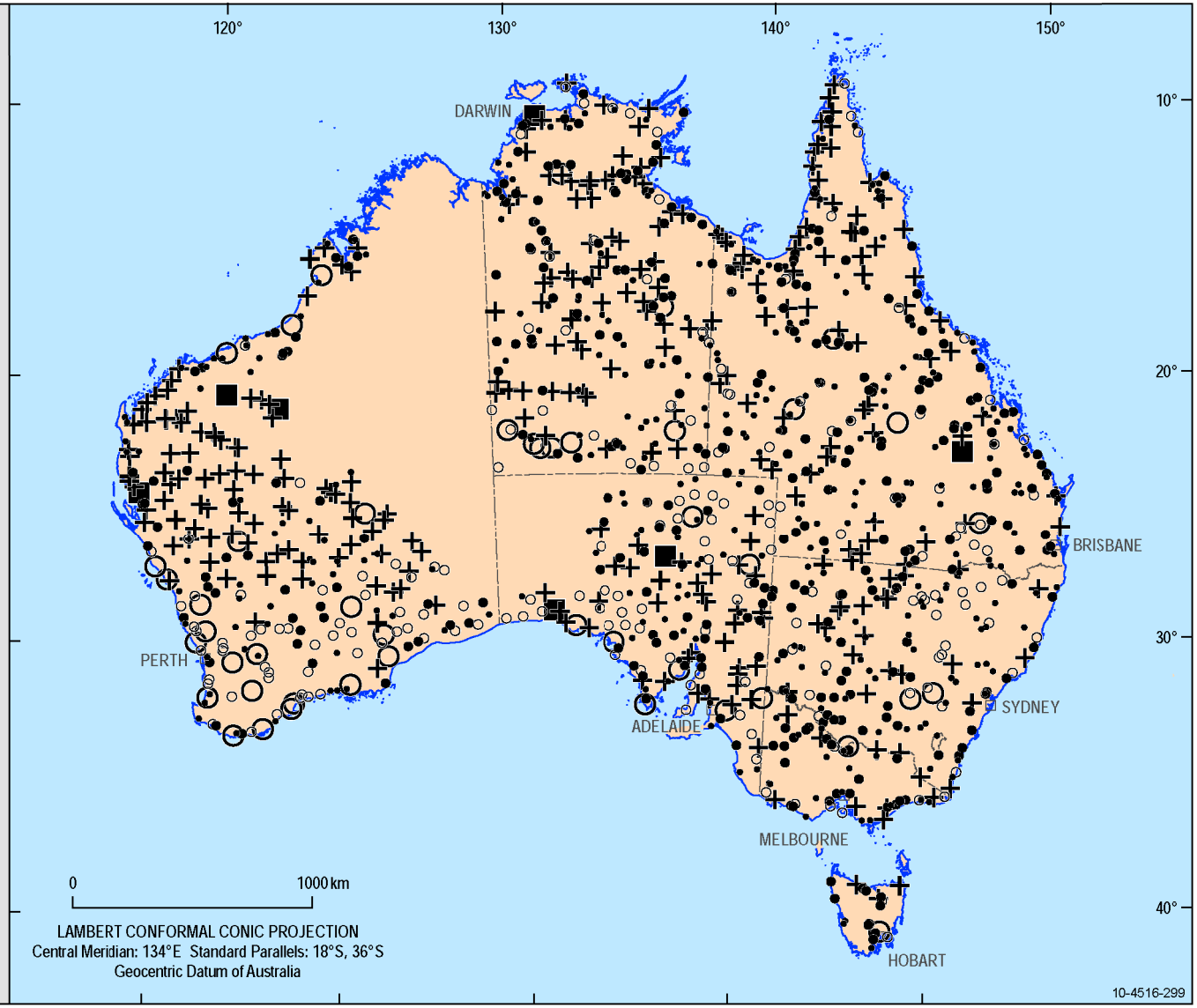
25%: *0.5 mg/kg*

Lower Fence: *0.3 mg/kg*

Minimum: *Less than 0.04 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Hf

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *756.98 mg/kg*

Upper Fence: *89.25 mg/kg*

75%: *24.06 mg/kg*

Median: *15.19 mg/kg*

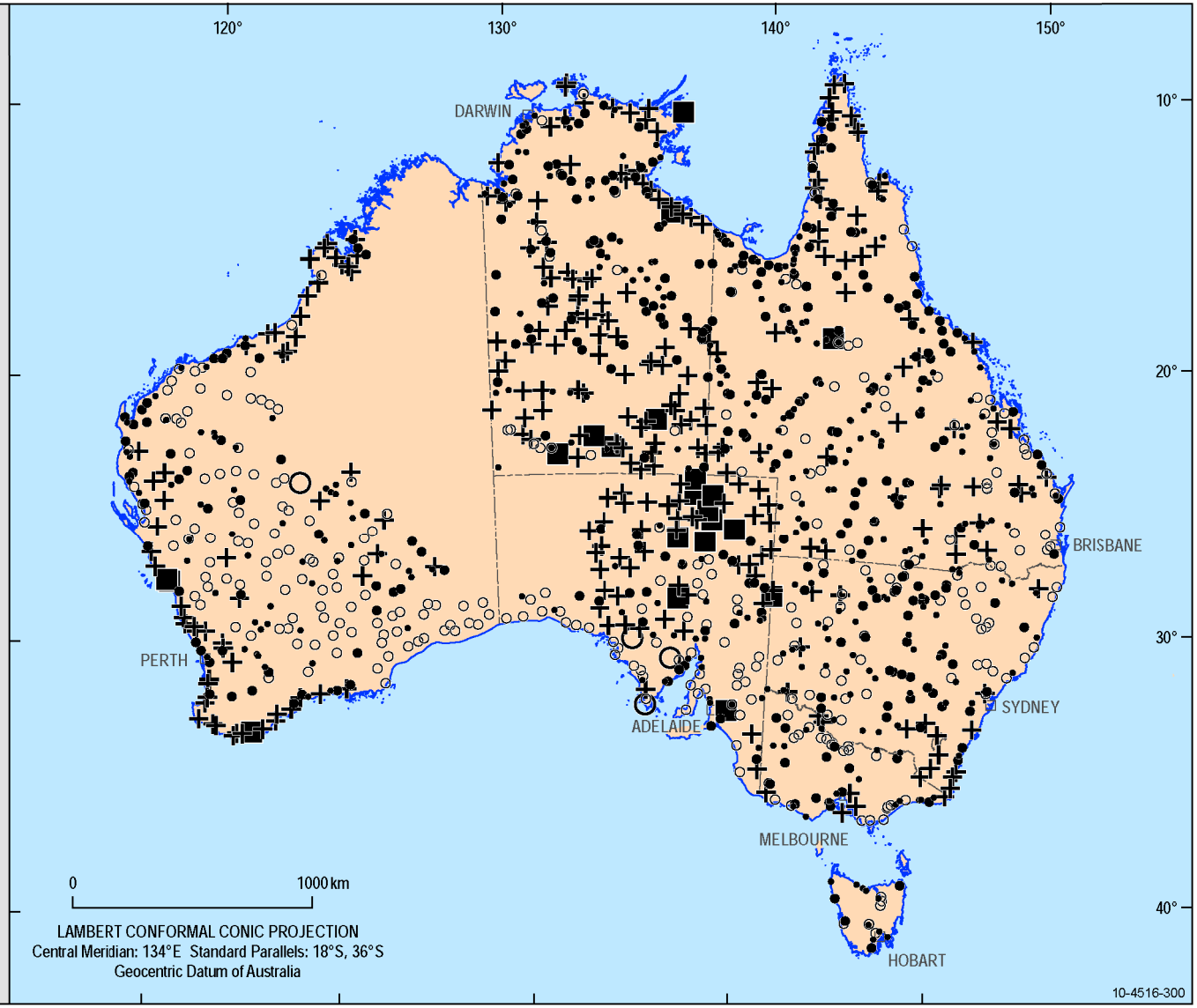
25%: *10.04 mg/kg*

Lower Fence: *2.71 mg/kg*

Minimum: *0.27 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ho

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *10.42 mg/kg*

Upper Fence: *2.45 mg/kg*

75%: *1.37 mg/kg*

Median: *1.1 mg/kg*

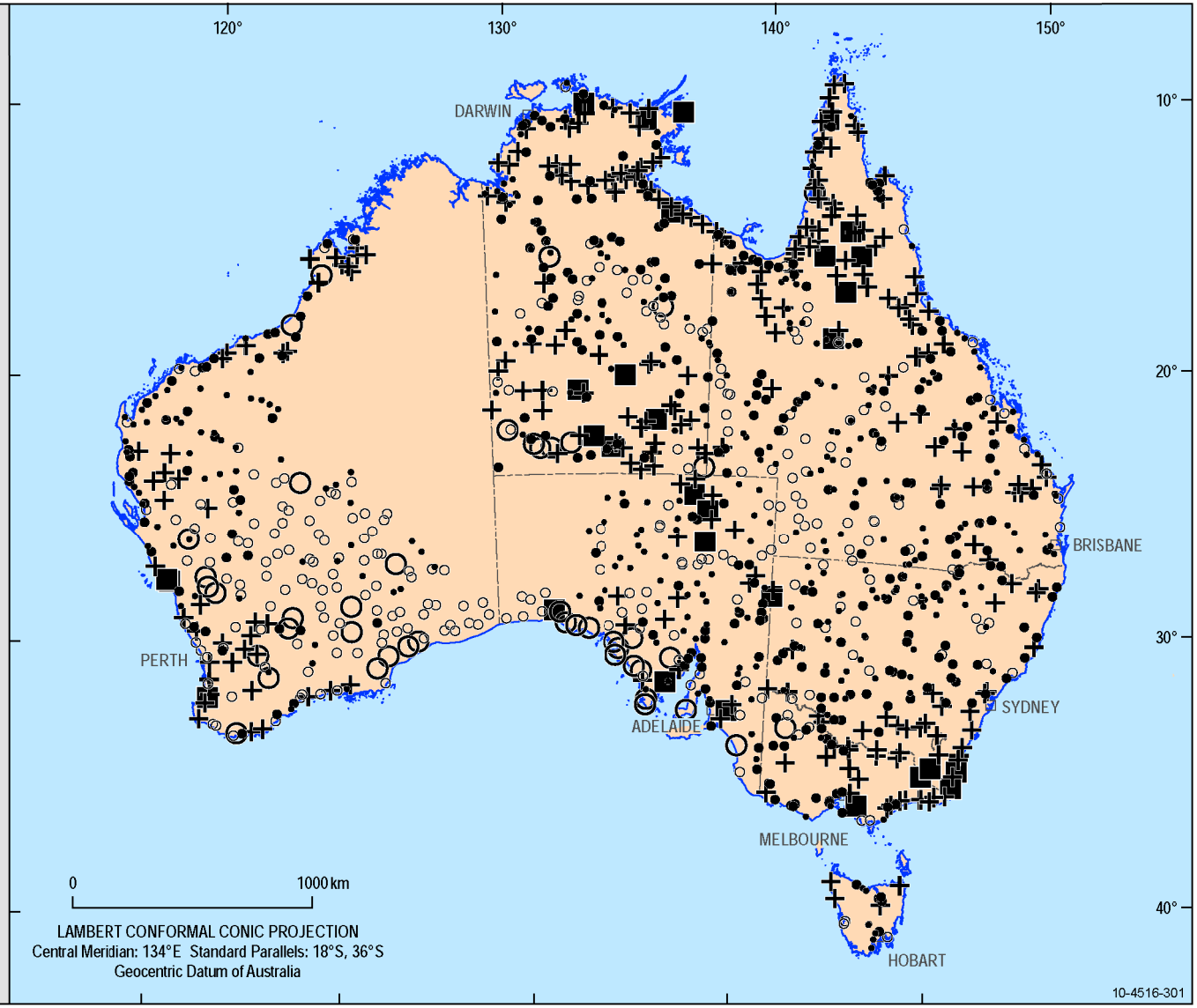
25%: *0.93 mg/kg*

Lower Fence: *0.52 mg/kg*

Minimum: *0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

K

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 42 mg/kg
N: 1190

Maximum: *43912 mg/kg*

Upper Fence: *39521 mg/kg*

75%: *16436 mg/kg*

Median: *13008 mg/kg*

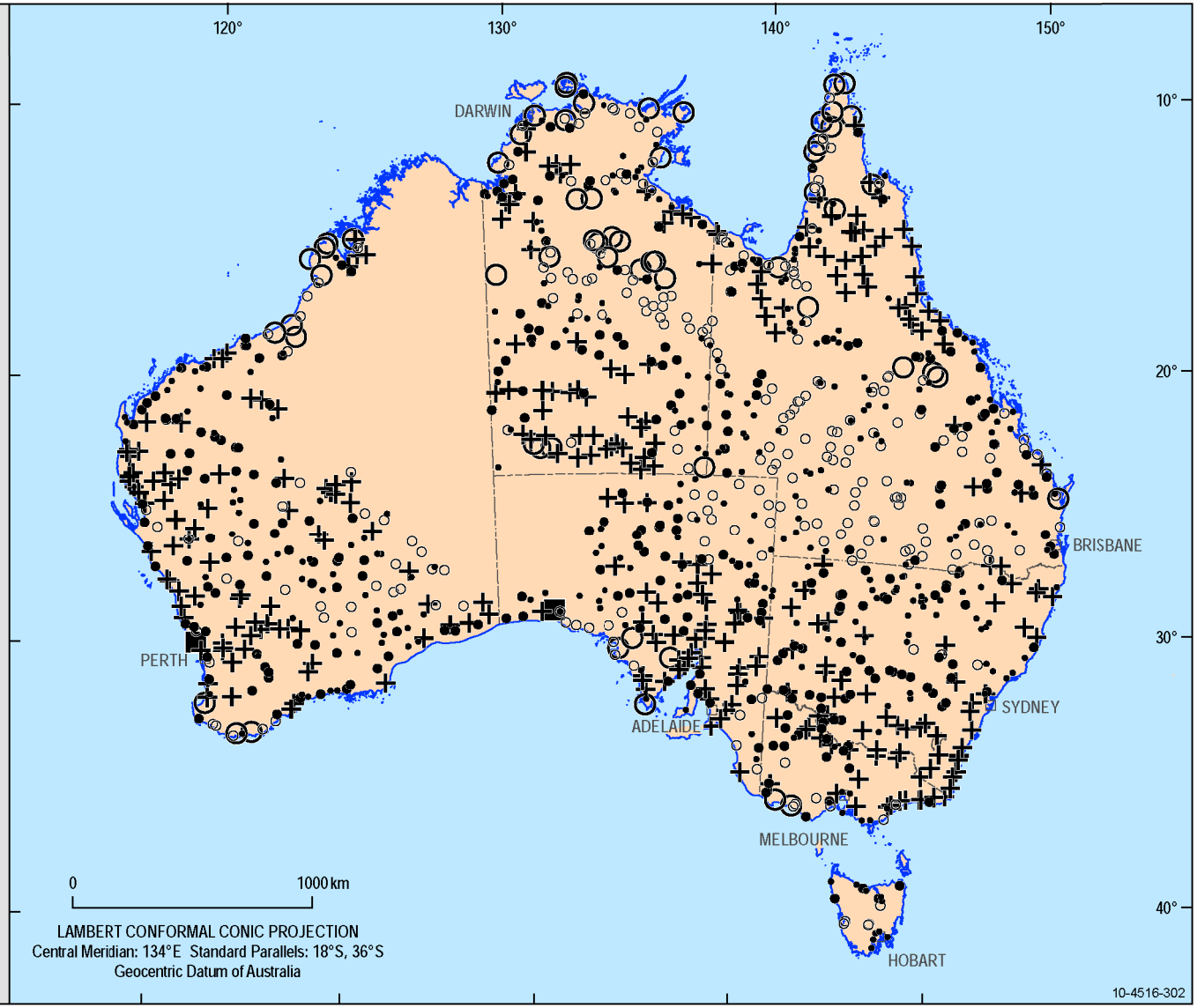
25%: *9081 mg/kg*

Lower Fence: *3708 mg/kg*

Minimum: *100 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

La

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *692.2 mg/kg*

Upper Fence: *92 mg/kg*

75%: *43.1 mg/kg*

Median: *32.5 mg/kg*

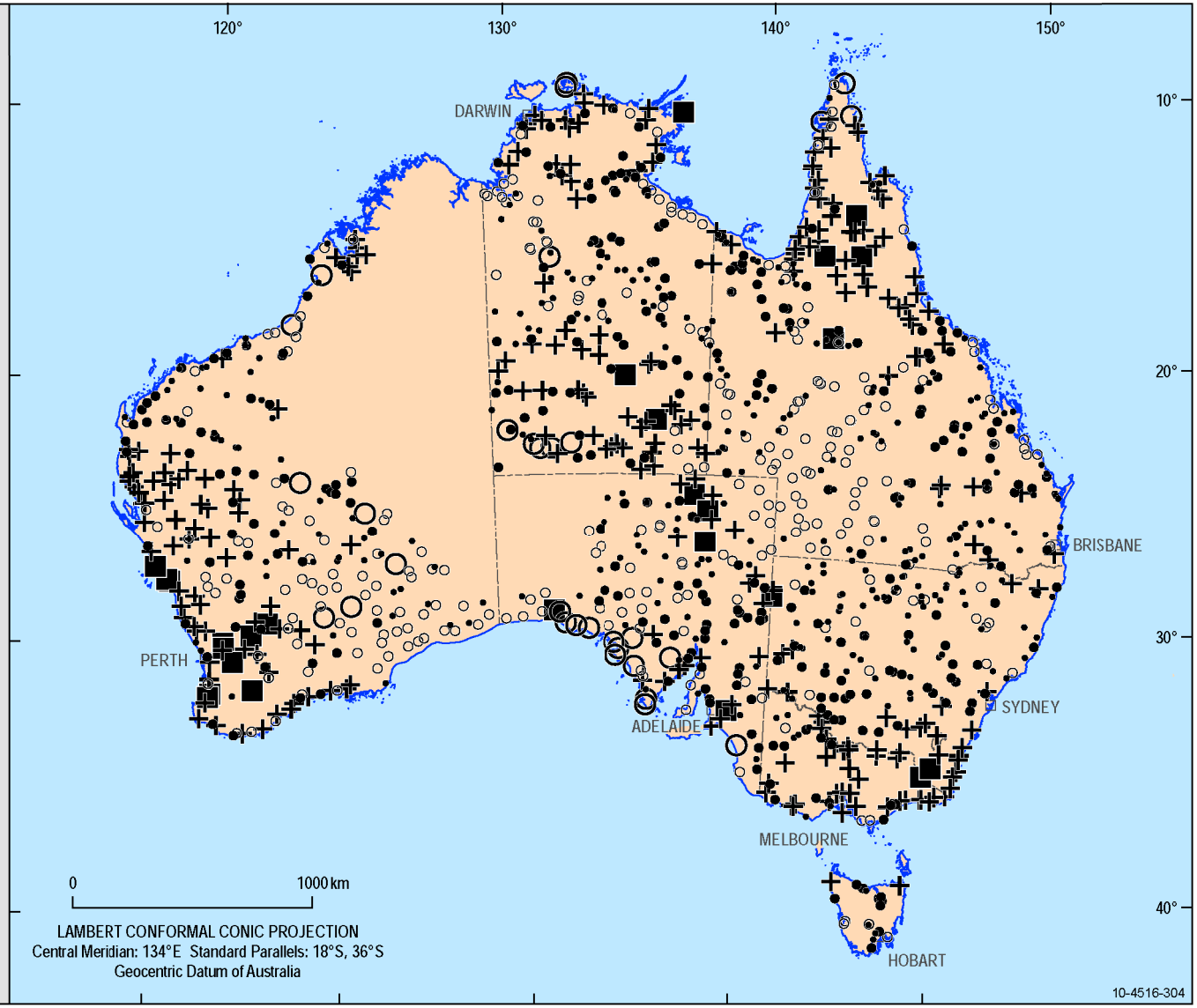
25%: *26 mg/kg*

Lower Fence: *12.2 mg/kg*

Minimum: *0.6 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

LOI_C

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: N/A
Analysis: Calculated from XRF
Detection Limit: N/A
N: 1171

Maximum: *519440 mg/kg*

Upper Fence: *312633 mg/kg*

75%: *123750 mg/kg*

Median: *87750 mg/kg*

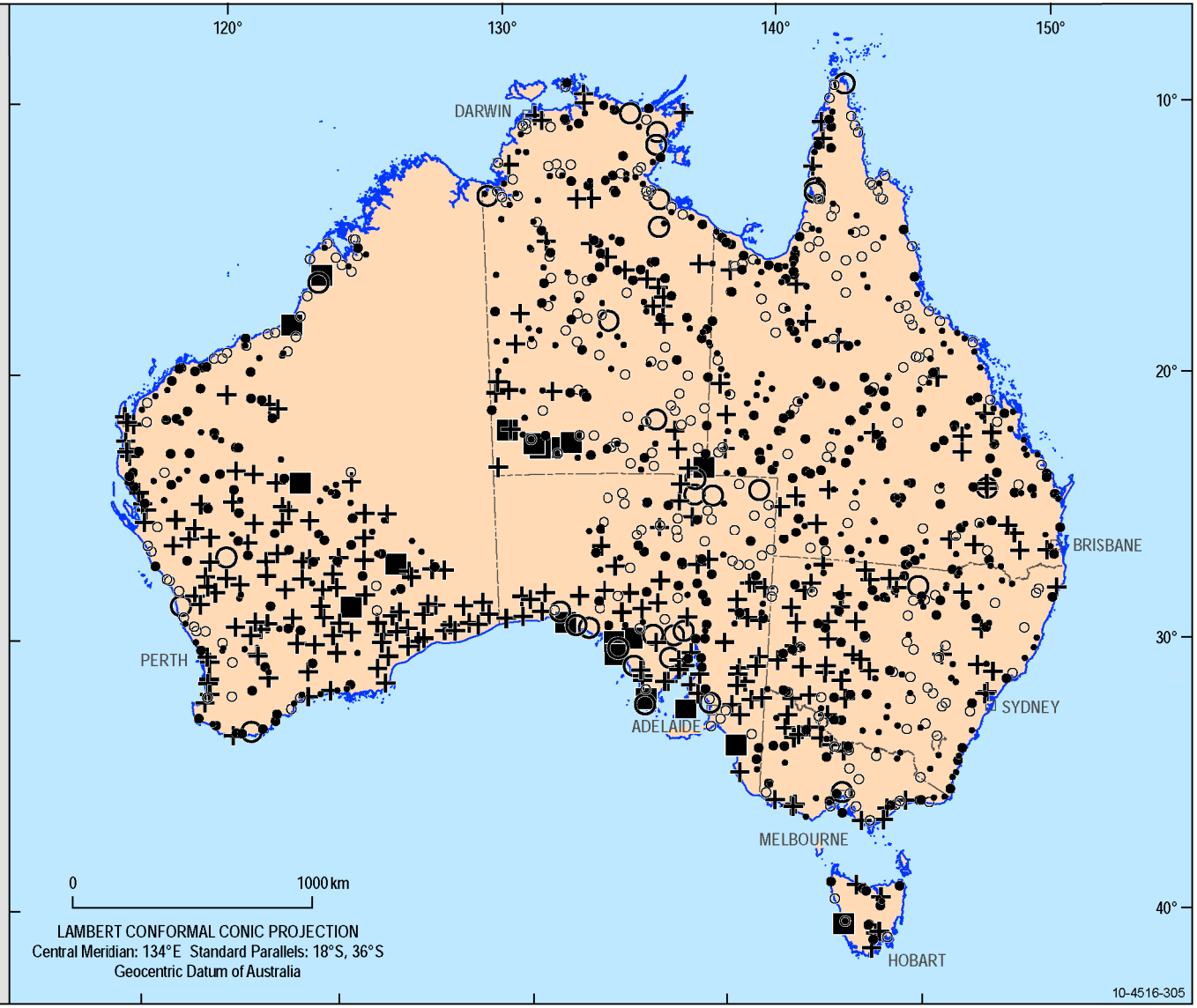
25%: *60820 mg/kg*

Lower Fence: *19712 mg/kg*

Minimum: *0 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Lu

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *8.75 mg/kg*

Upper Fence: *1.35 mg/kg*

75%: *0.66 mg/kg*

Median: *0.51 mg/kg*

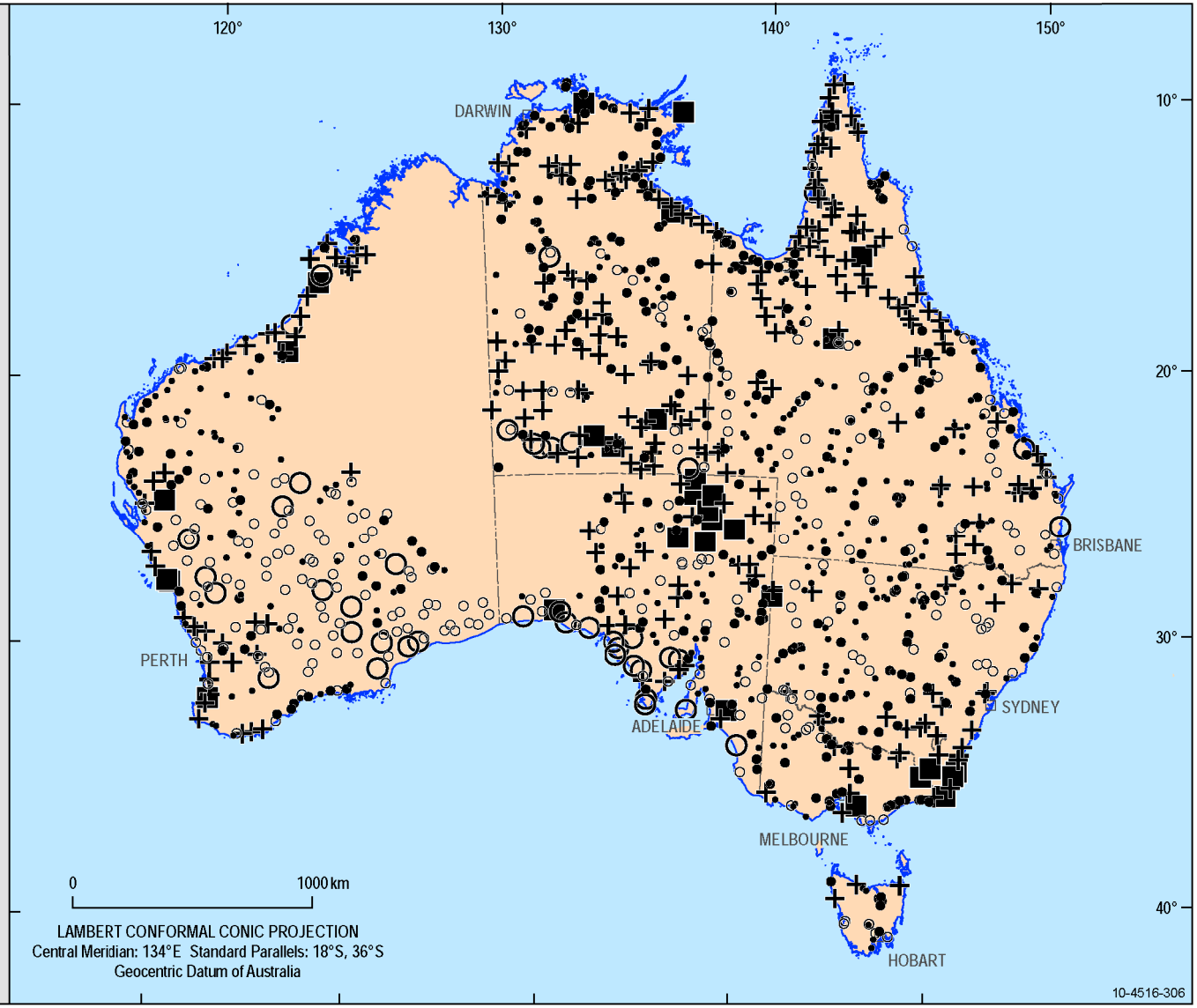
25%: *0.41 mg/kg*

Lower Fence: *0.2 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mg

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 60 mg/kg
N: 1190

Maximum: *88430 mg/kg*

Upper Fence: *42447 mg/kg*

75%: *9003 mg/kg*

Median: *5270 mg/kg*

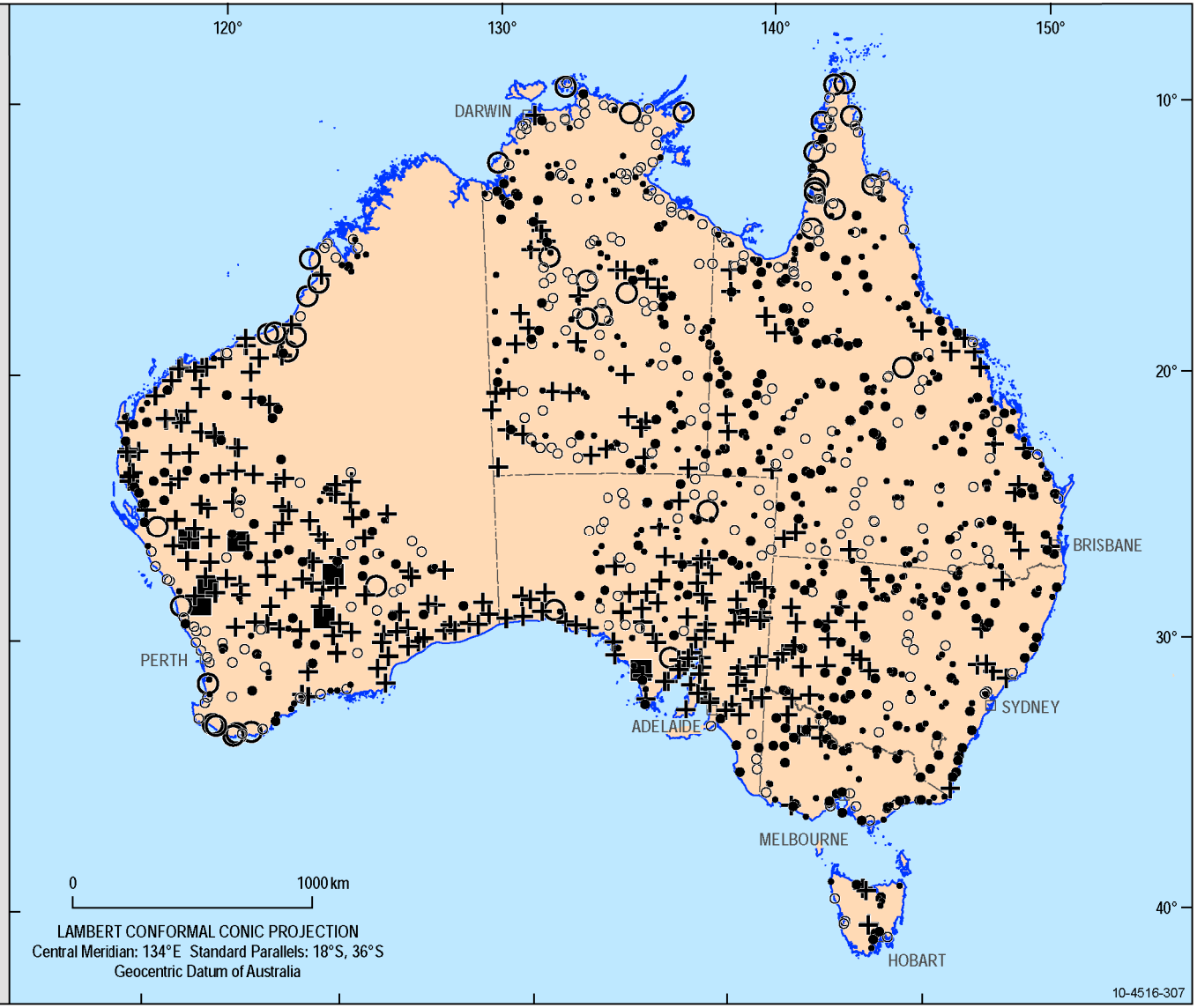
25%: *3148 mg/kg*

Lower Fence: *647 mg/kg*

Minimum: *Less than 60 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mn

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 39 mg/kg
N: 1190

Maximum: *4252 mg/kg*

Upper Fence: *2844 mg/kg*

75%: *682 mg/kg*

Median: *457 mg/kg*

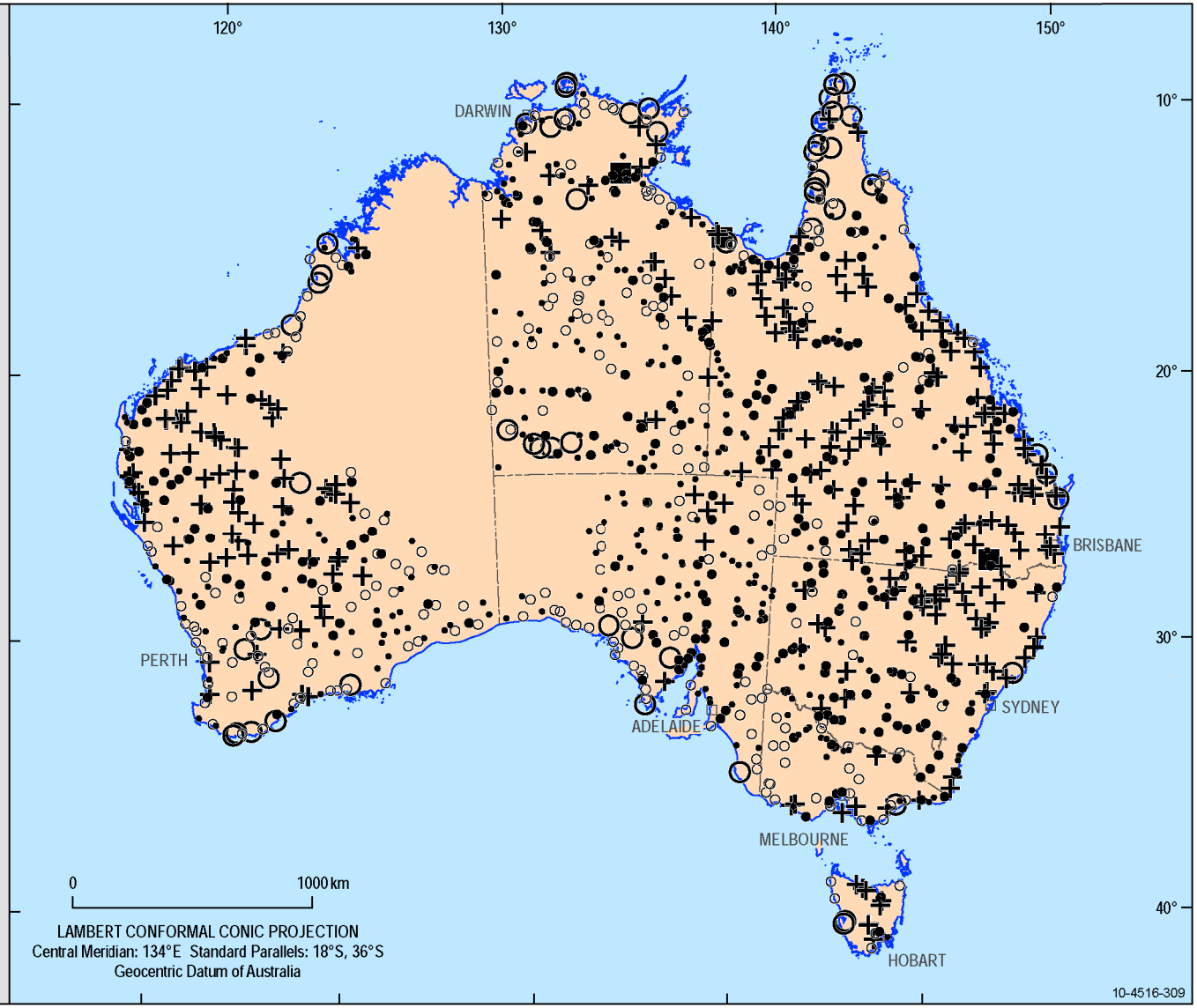
25%: *263 mg/kg*

Lower Fence: *63 mg/kg*

Minimum: *Less than 39 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Mo

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.3 mg/kg
N: 1190

Maximum: *18.5 mg/kg*

Upper Fence: *5.5 mg/kg*

75%: *1.3 mg/kg*

Median: *0.8 mg/kg*

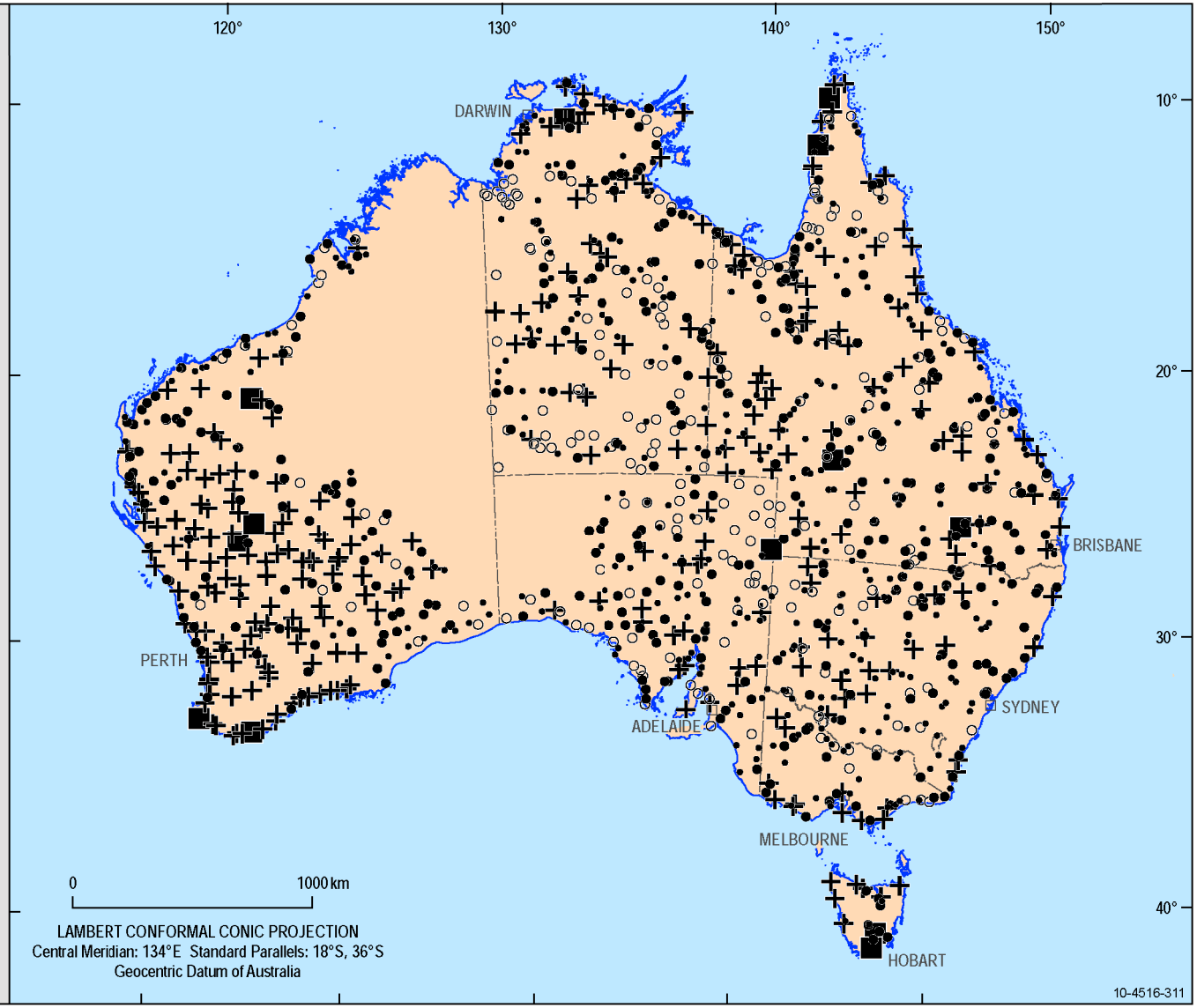
25%: *0.5 mg/kg*

Lower Fence: *N/A**

Minimum: *Less than 0.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Na

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 74 mg/kg
N: 1190

Maximum: *35685 mg/kg*

Upper Fence: *N/A**

75%: *7137 mg/kg*

Median: *4110 mg/kg*

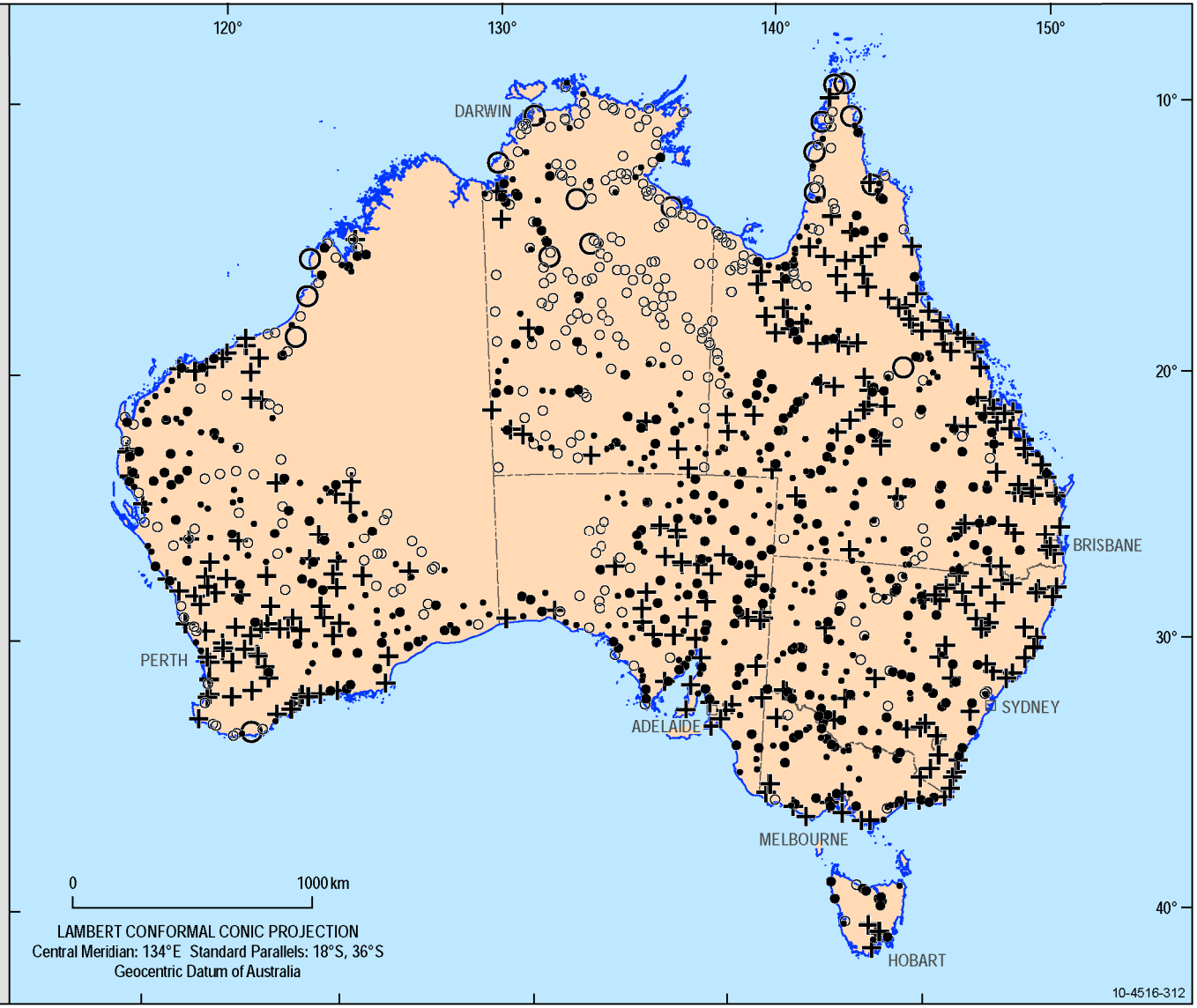
25%: *1922 mg/kg*

Lower Fence: *267 mg/kg*

Minimum: *Less than 74 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Nb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.03 mg/kg
N: 1190

Maximum: *161.3 mg/kg*

Upper Fence: *31.01 mg/kg*

75%: *17.1 mg/kg*

Median: *13.8 mg/kg*

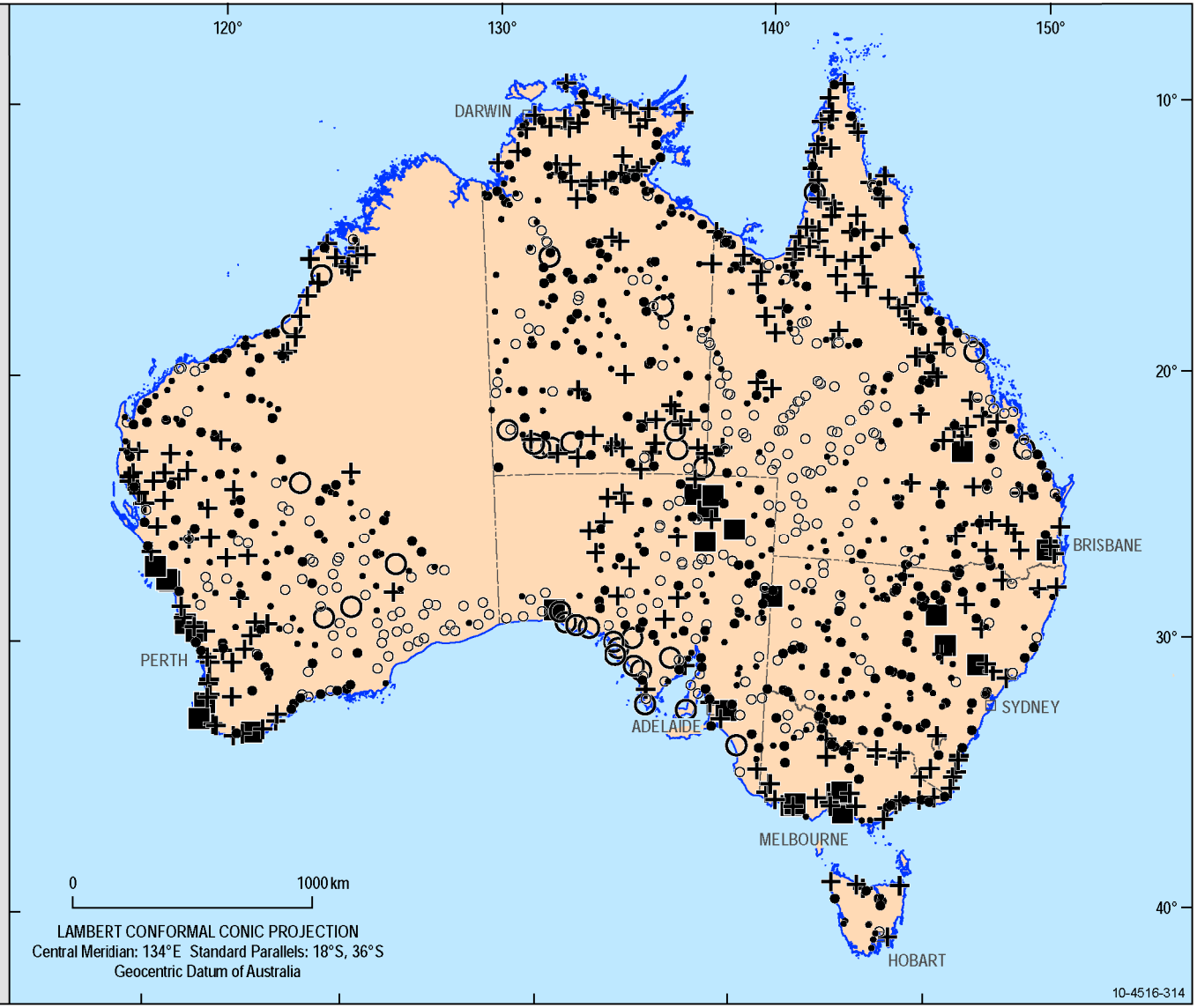
25%: *11.5 mg/kg*

Lower Fence: *6.34 mg/kg*

Minimum: *Less than 0.03 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Nd

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *587.3 mg/kg*

Upper Fence: *74 mg/kg*

75%: *36.5 mg/kg*

Median: *28.6 mg/kg*

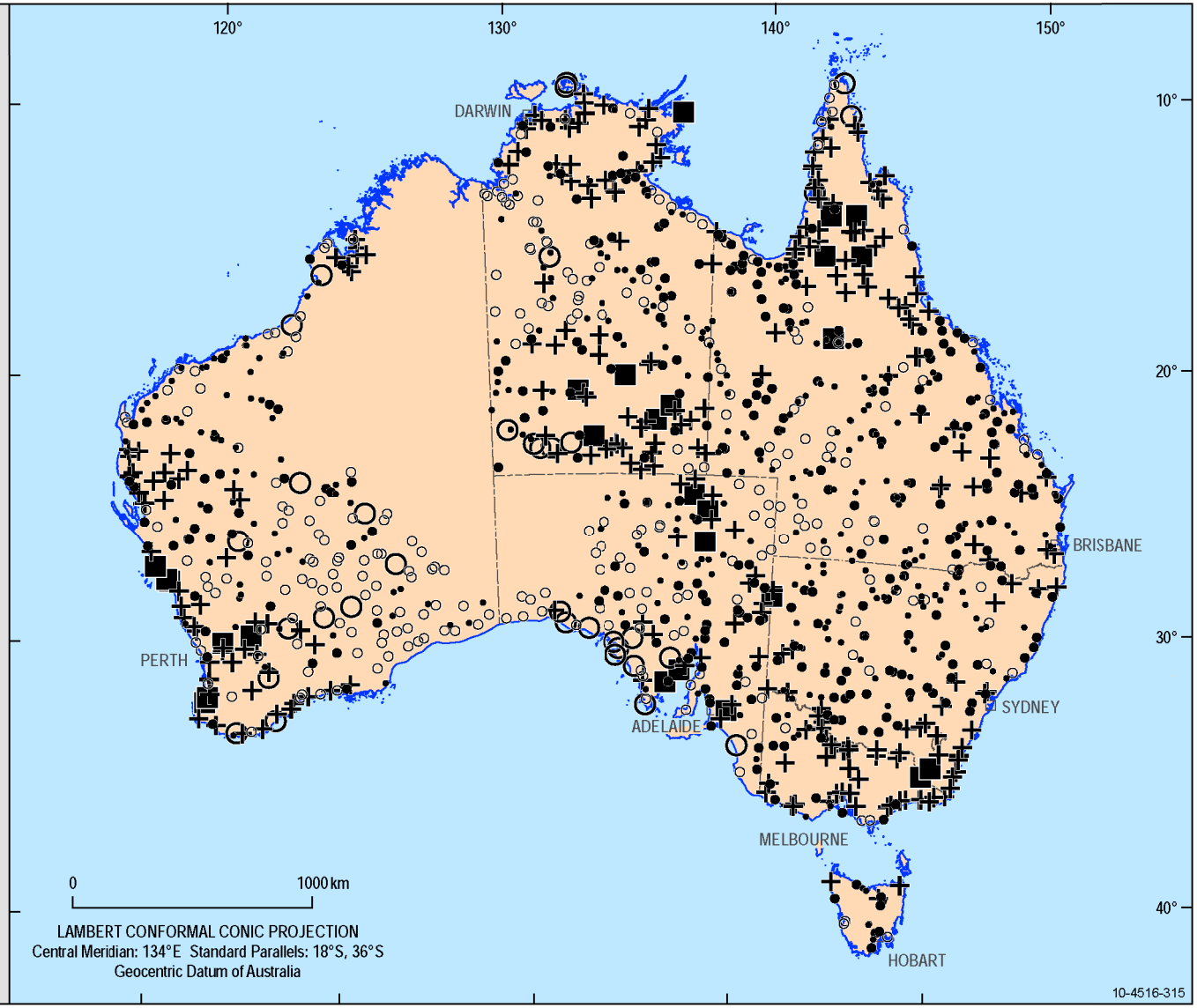
25%: *22.8 mg/kg*

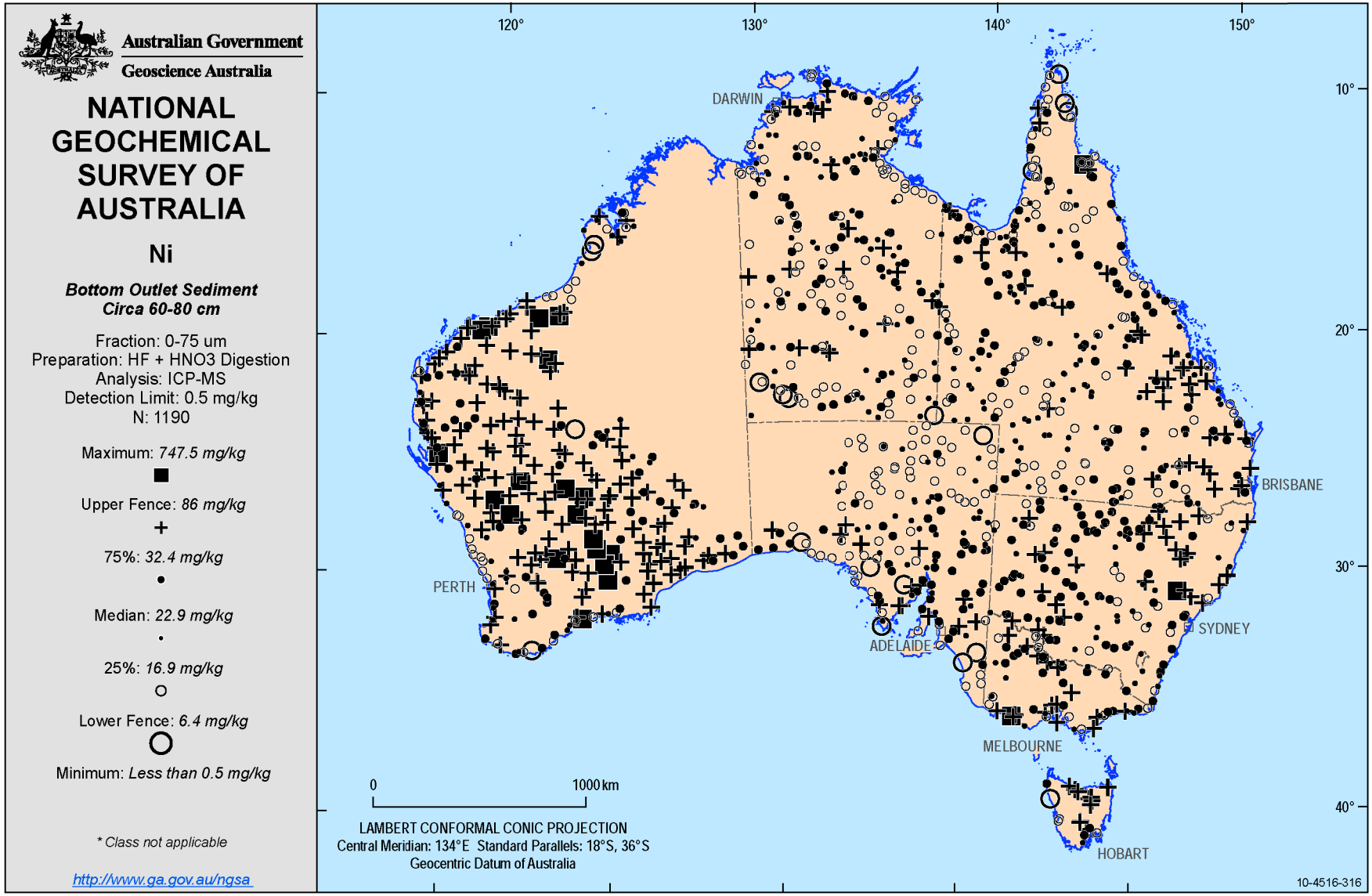
Lower Fence: *11.3 mg/kg*

Minimum: *0.7 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Ni
Bottom Outlet Sediment
Circa 60-80 cm
Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.5 mg/kg
N: 1190
Maximum: 747.5 mg/kg
Upper Fence: 86 mg/kg
75%: 32.4 mg/kg
Median: 22.9 mg/kg
25%: 16.9 mg/kg
Lower Fence: 6.4 mg/kg
Minimum: Less than 0.5 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-316

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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

P

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 22 mg/kg
N: 1190

Maximum: *1772 mg/kg*

Upper Fence: *1143 mg/kg*

75%: *423 mg/kg*

Median: *305 mg/kg*

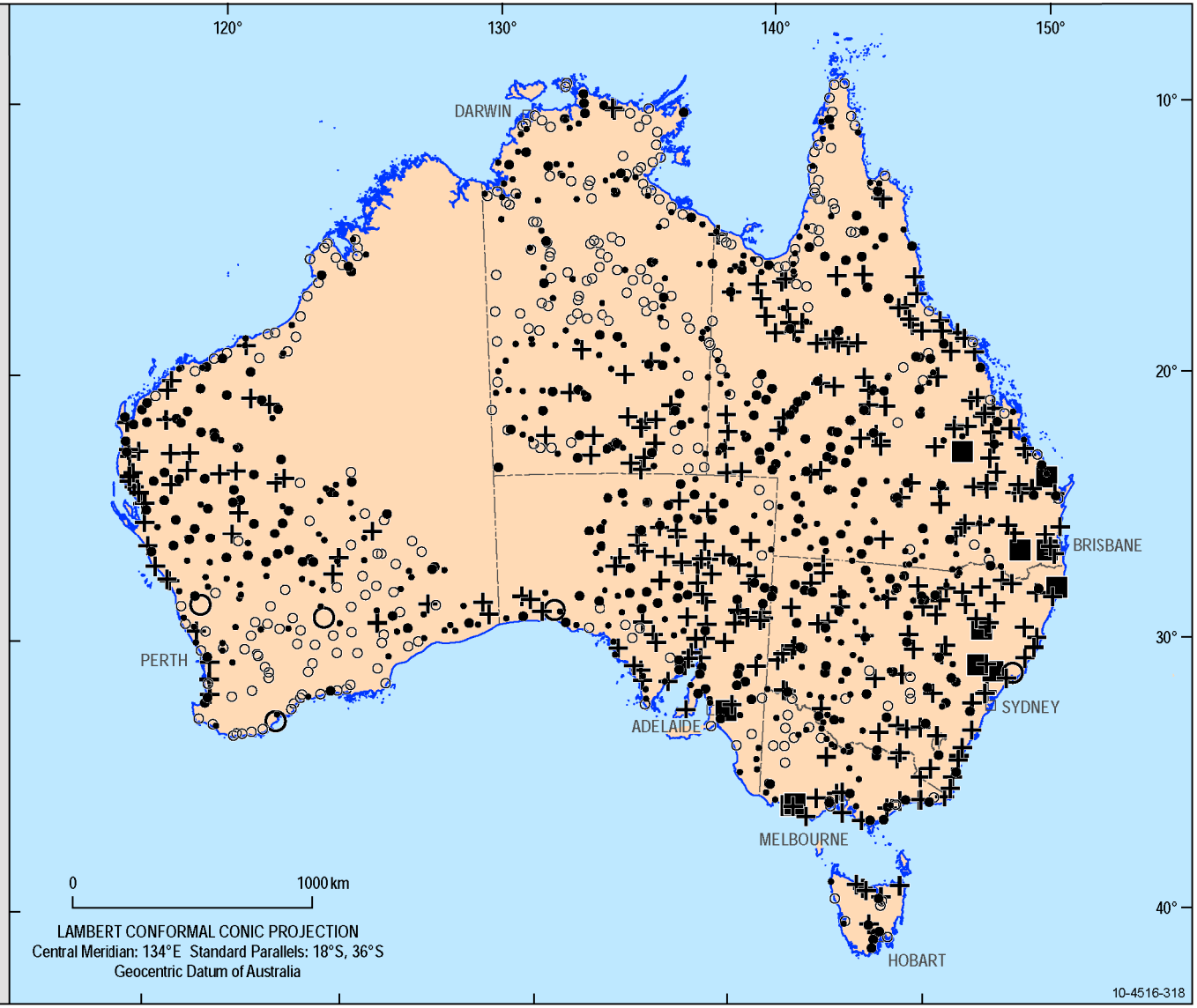
25%: *218 mg/kg*

Lower Fence: *81 mg/kg*

Minimum: *57 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *248.2 mg/kg*

Upper Fence: *40.4 mg/kg*

75%: *21.3 mg/kg*

Median: *17 mg/kg*

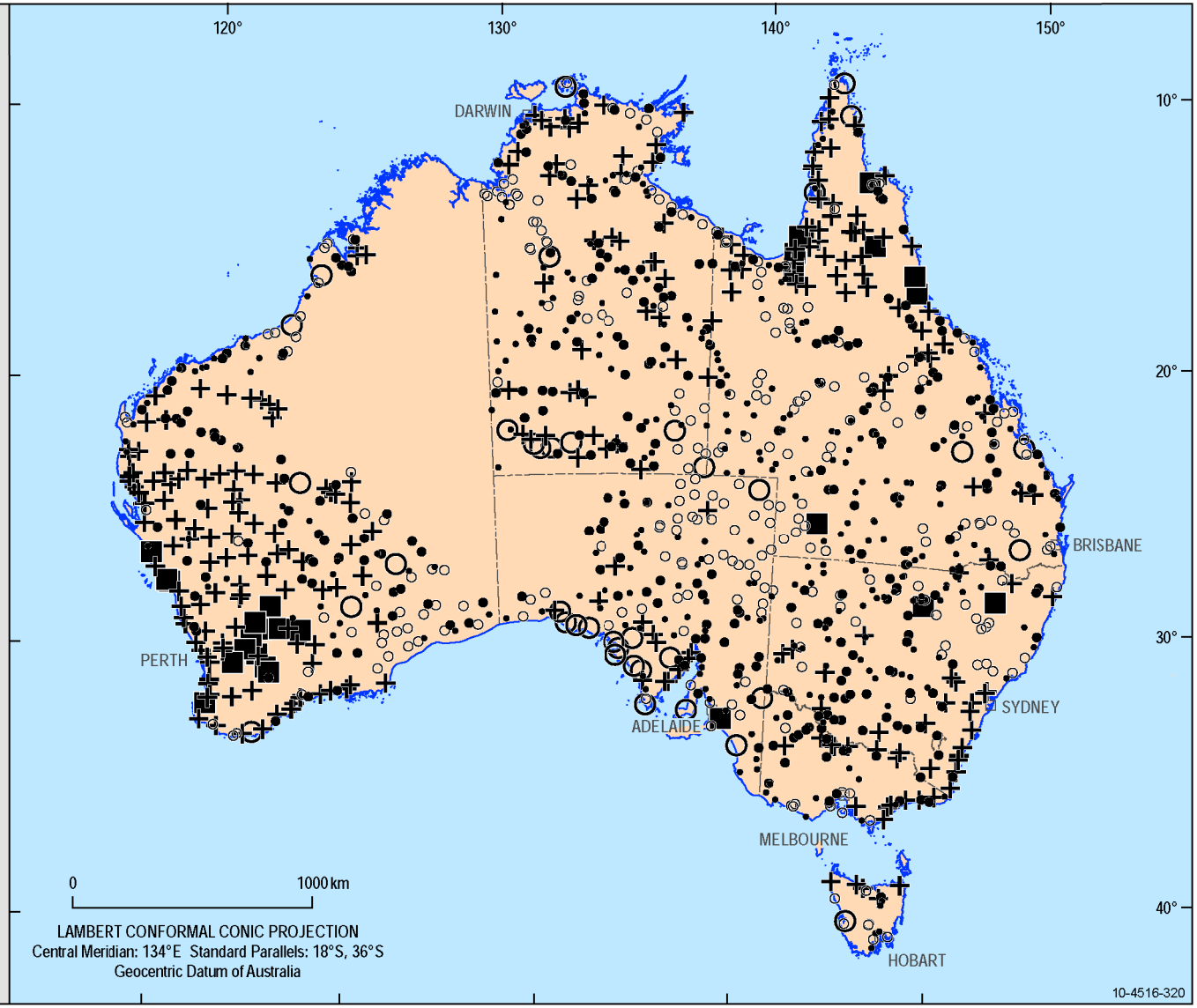
25%: *13.9 mg/kg*

Lower Fence: *7.3 mg/kg*

Minimum: *0.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pd

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.001 mg/kg
N: 1124

Maximum: *0.015 mg/kg*

Upper Fence: *0.003 mg/kg*

75%: *0.001 mg/kg*

Median: *0.001 mg/kg*

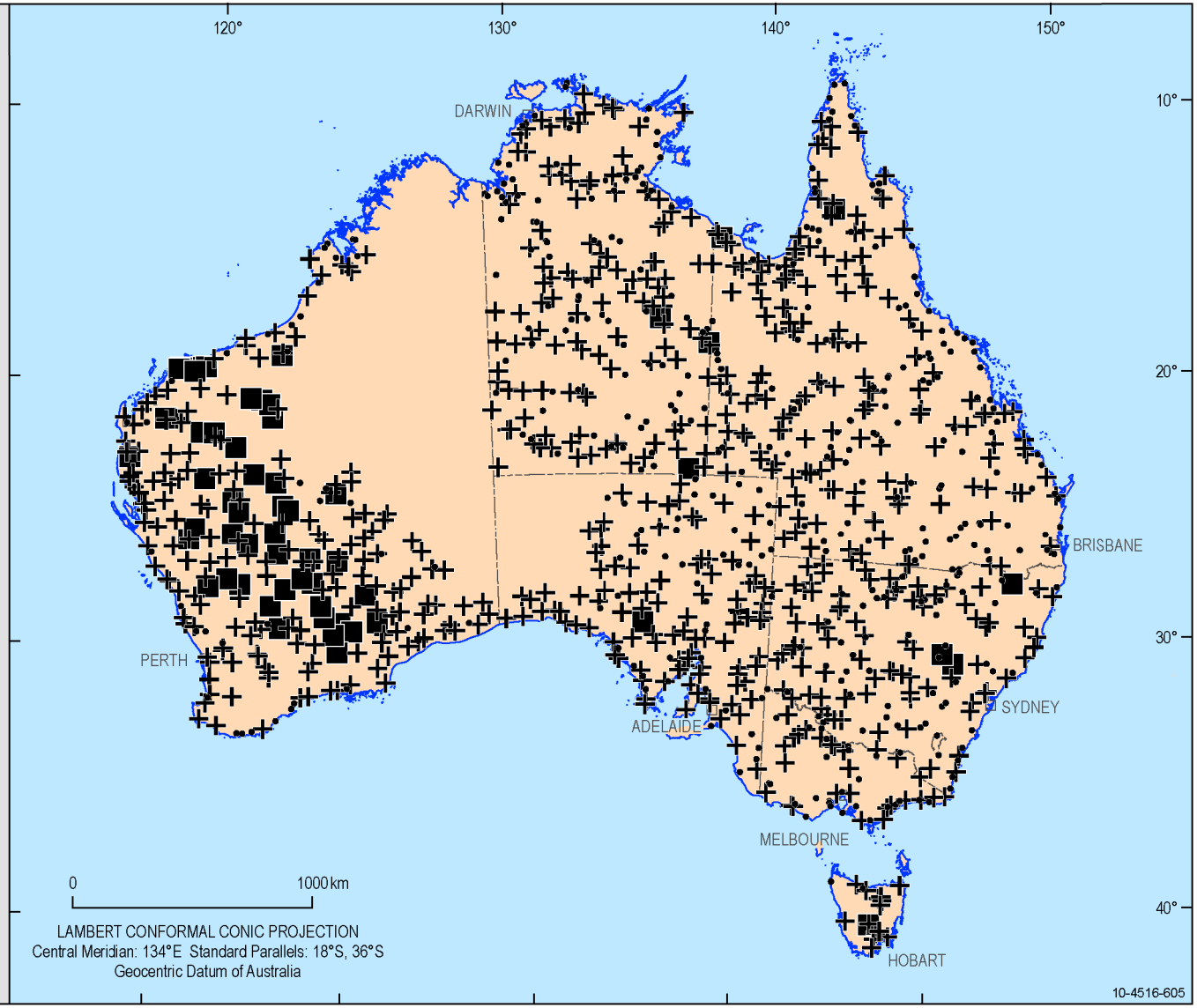
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.001 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pr

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *160.6 mg/kg*

Upper Fence: *19.87 mg/kg*

75%: *9.58 mg/kg*

Median: *7.32 mg/kg*

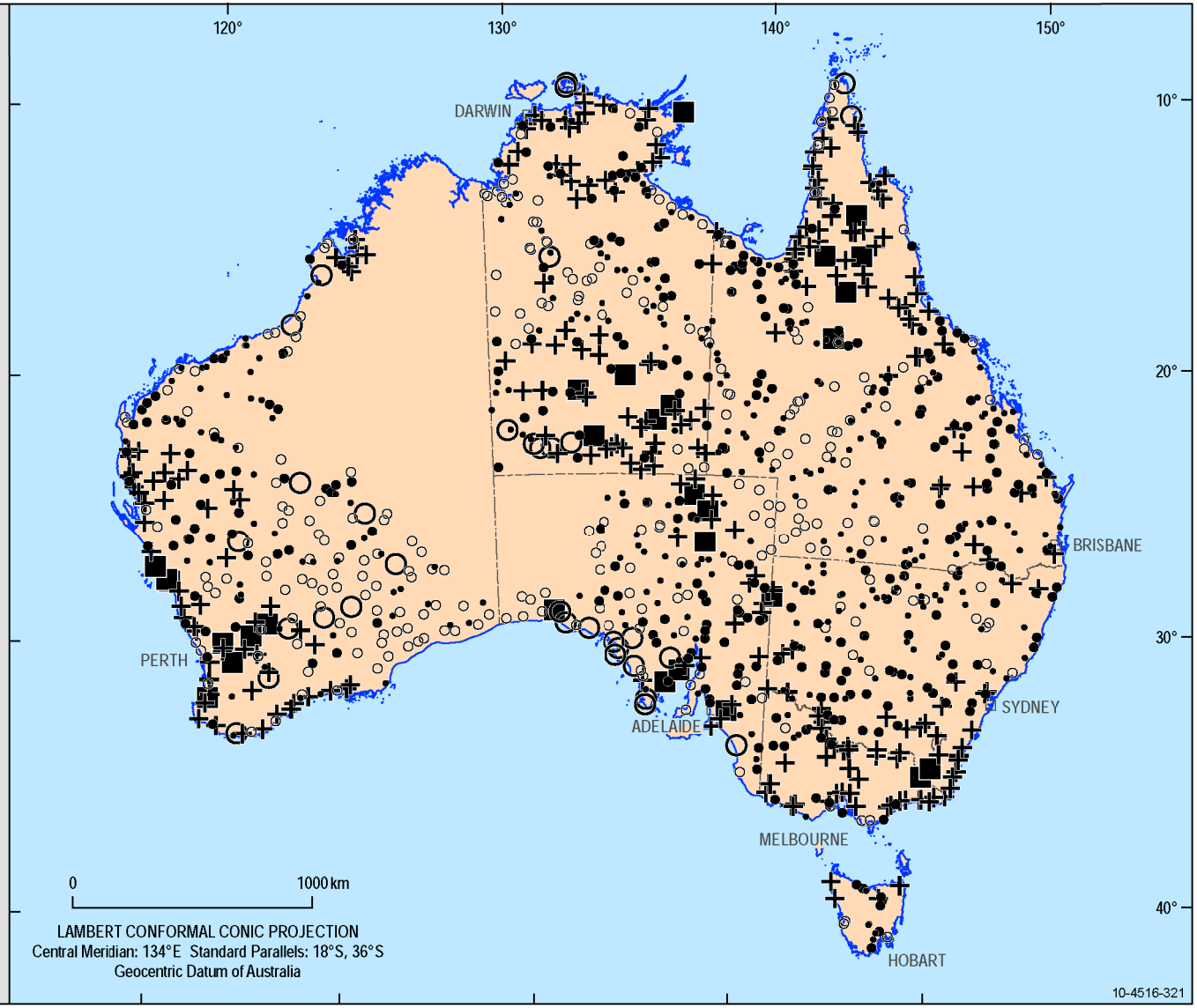
25%: *5.89 mg/kg*

Lower Fence: *2.84 mg/kg*

Minimum: *0.14 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Pt

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Fire Assay
Analysis: ICP-MS
Detection Limit: 0.0005 mg/kg
N: 1124

Maximum: *0.0103 mg/kg*

Upper Fence: *0.0046 mg/kg*

75%: *0.0008 mg/kg*

Median: *0.0005 mg/kg*

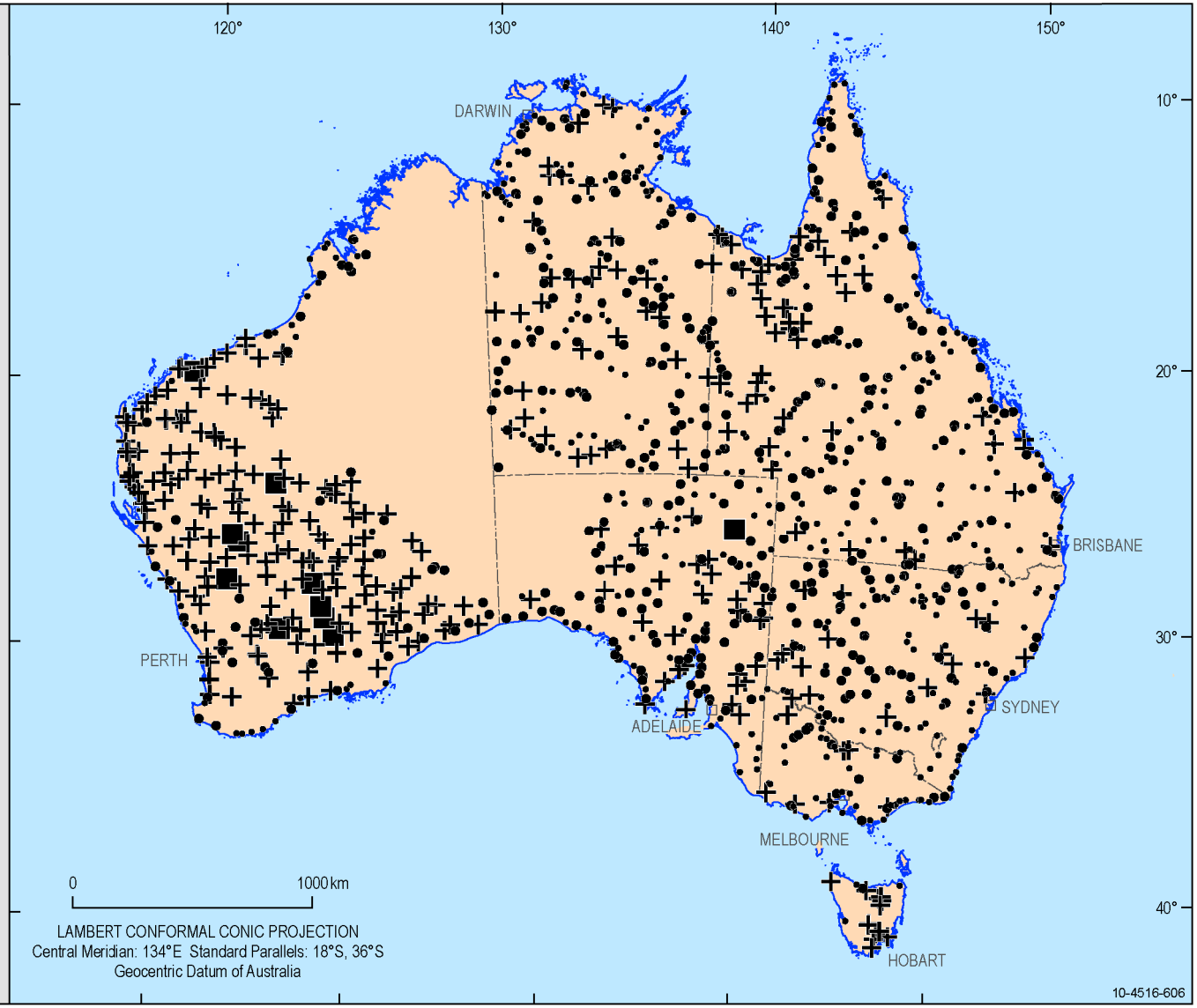
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.0005 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Rb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *299.4 mg/kg*

Upper Fence: *256.4 mg/kg*

75%: *98.1 mg/kg*

Median: *72 mg/kg*

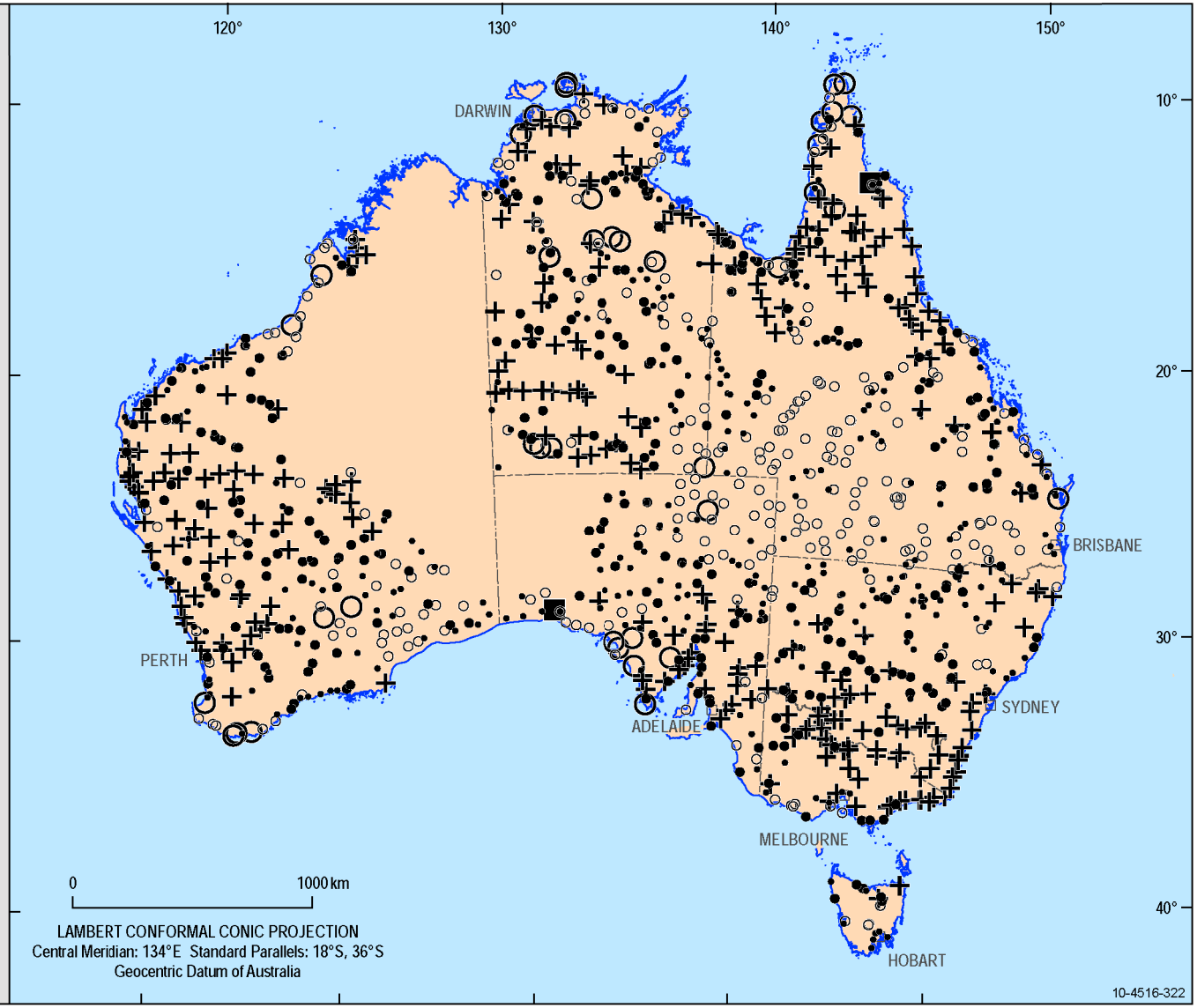
25%: *51.7 mg/kg*

Lower Fence: *19.8 mg/kg*

Minimum: *Less than 0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

S

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 10 mg/kg
N: 1189

Maximum: *141889 mg/kg*

Upper Fence: *3135 mg/kg*

75%: *425 mg/kg*

Median: *185 mg/kg*

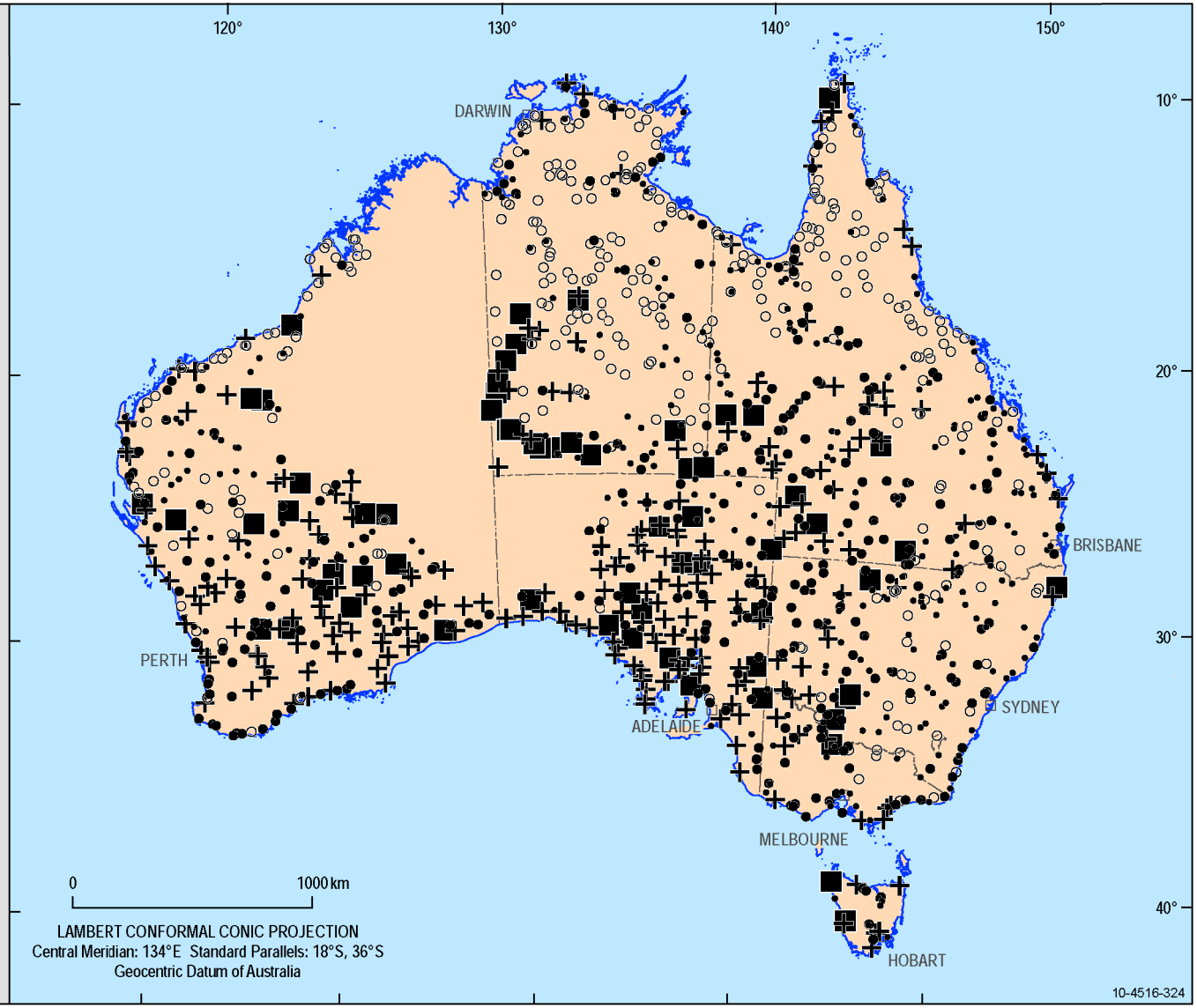
25%: *112 mg/kg*

Lower Fence: *N/A**

Minimum: *27 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.4 mg/kg
N: 1190

Maximum: *27.6 mg/kg*

Upper Fence: *11.2 mg/kg*

75%: *1 mg/kg*

Median: *N/A**

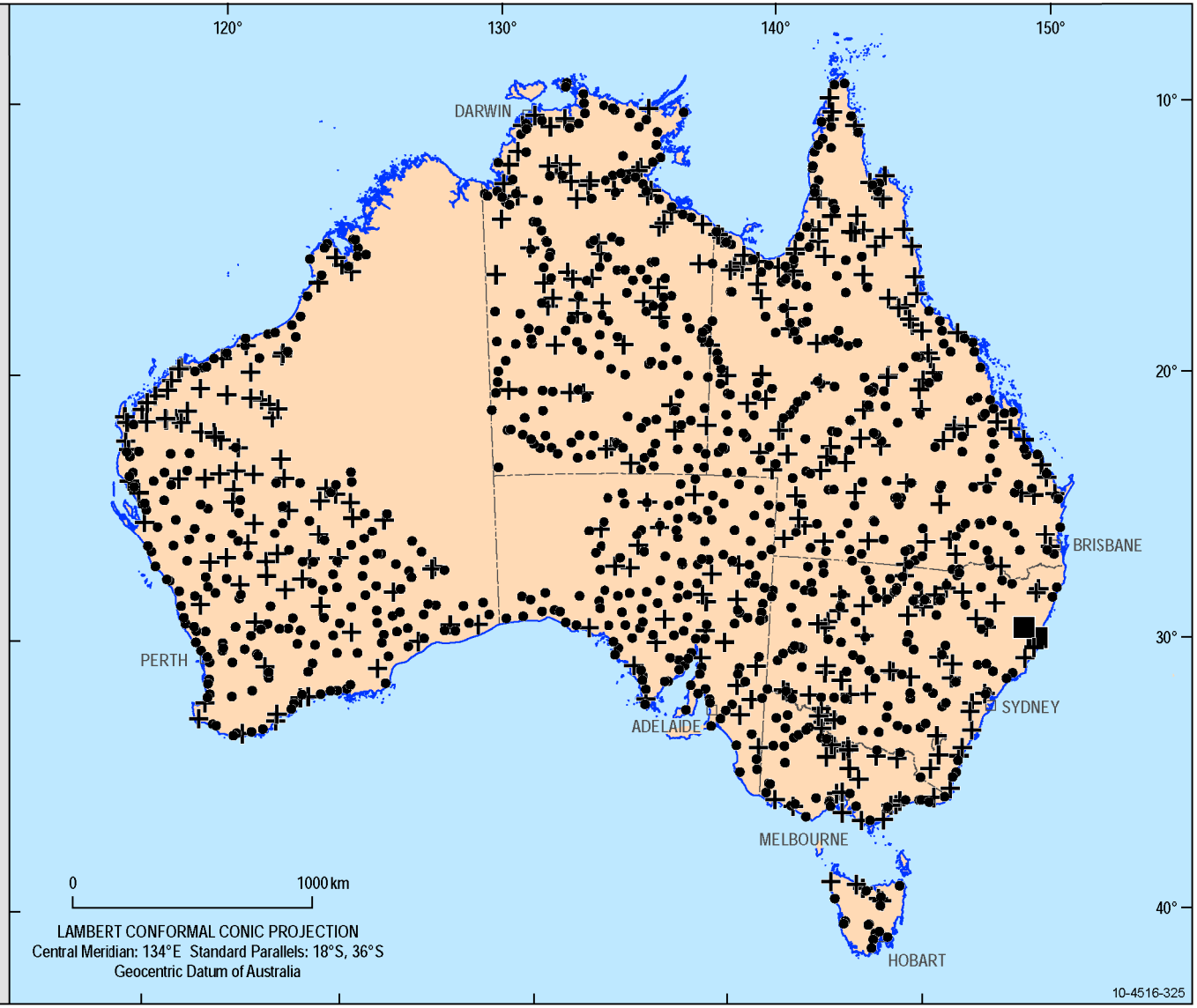
25%: *N/A**

Lower Fence: *N/A**

Minimum: *Less than 0.4 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sc

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.3 mg/kg
N: 1190

Maximum: *180.3 mg/kg*

Upper Fence: *25.1 mg/kg*

75%: *15.3 mg/kg*

Median: *13 mg/kg*

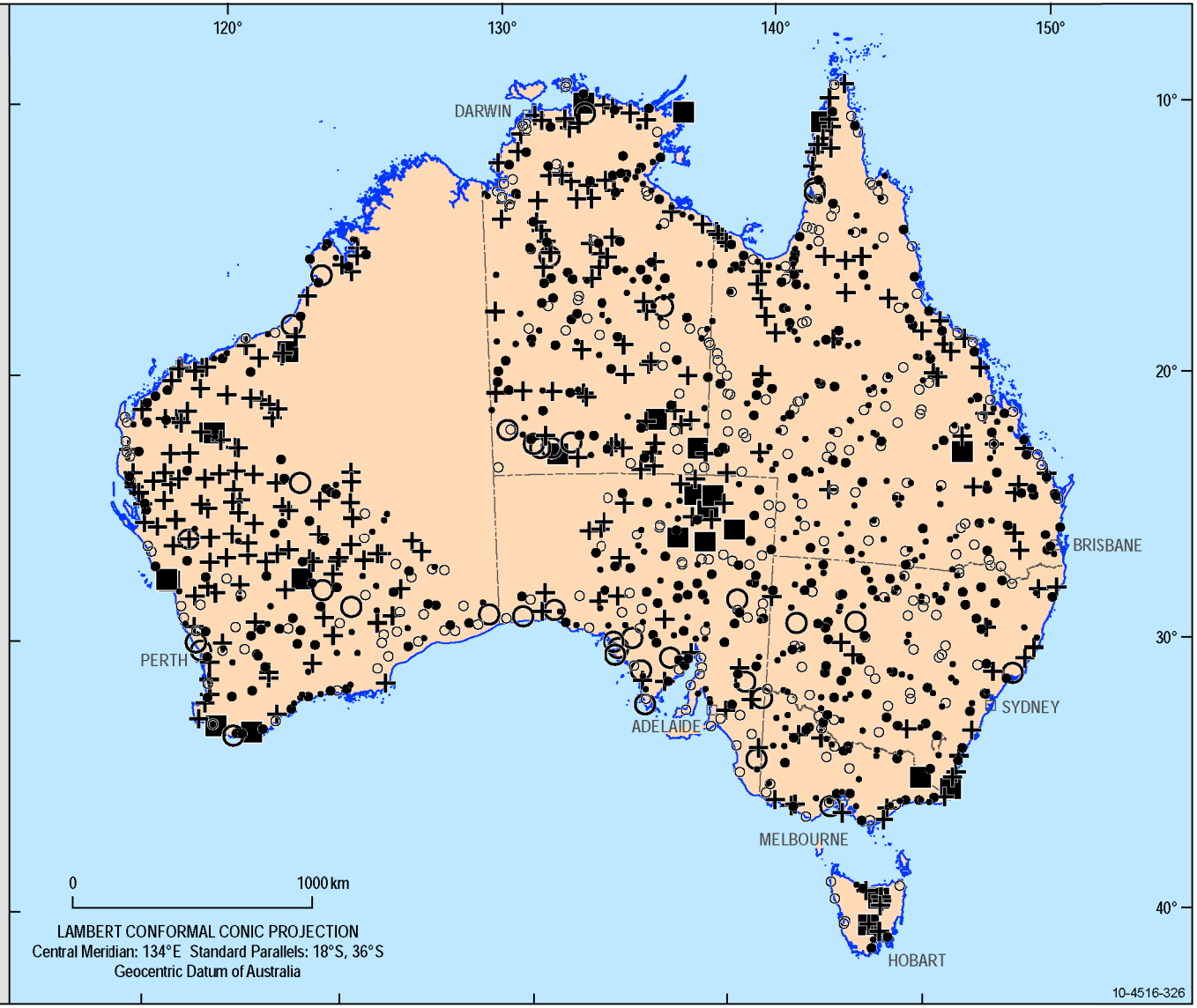
25%: *11 mg/kg*

Lower Fence: *6.7 mg/kg*

Minimum: *Less than 0.3 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Si

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 47 mg/kg
N: 1190

Maximum: *453228 mg/kg*

Upper Fence: *N/A**

75%: *344731 mg/kg*

Median: *312602 mg/kg*

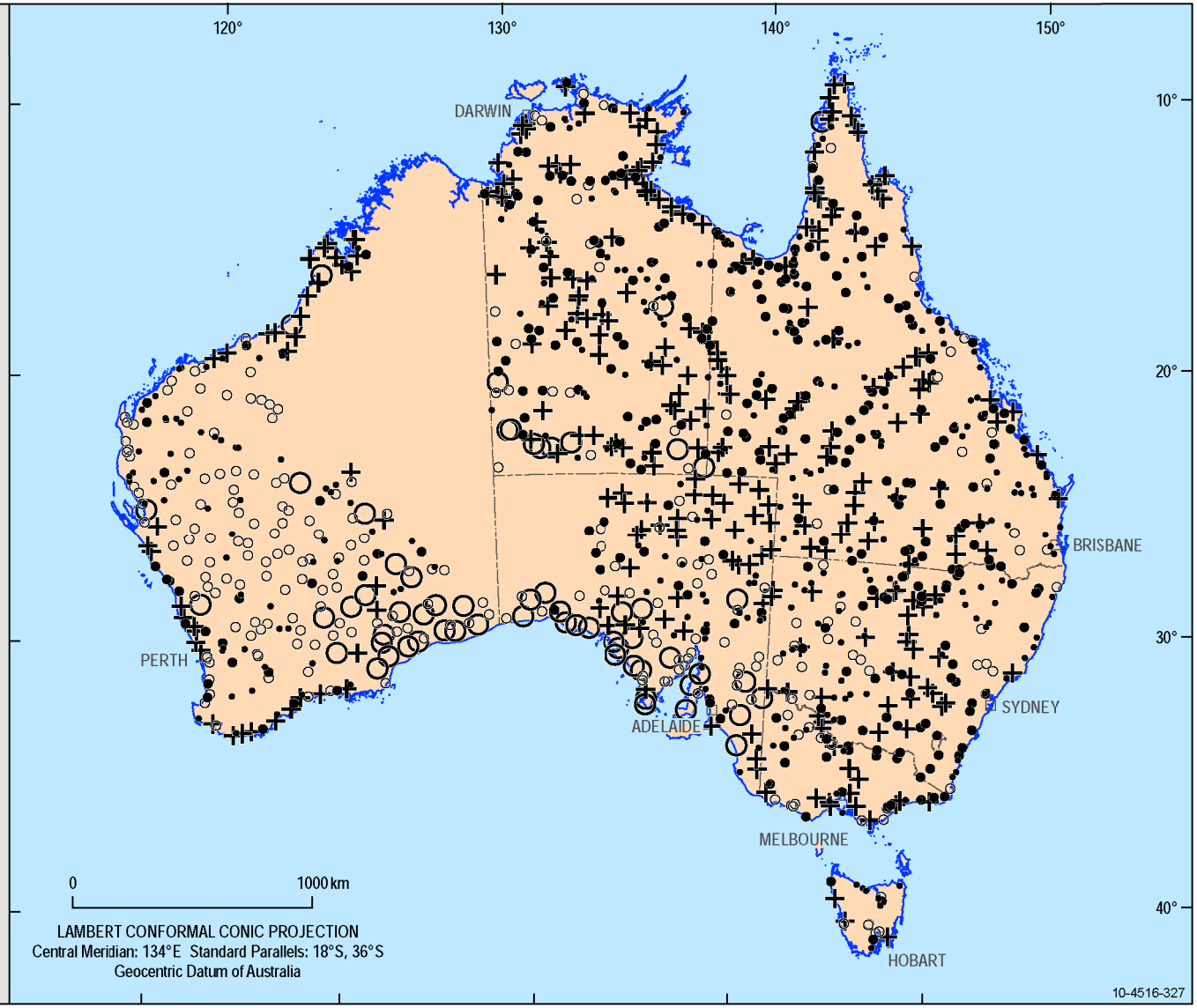
25%: *268255 mg/kg*

Lower Fence: *175764 mg/kg*

Minimum: *6464 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sm

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *112.5 mg/kg*

Upper Fence: *15.31 mg/kg*

75%: *7.74 mg/kg*

Median: *6.15 mg/kg*

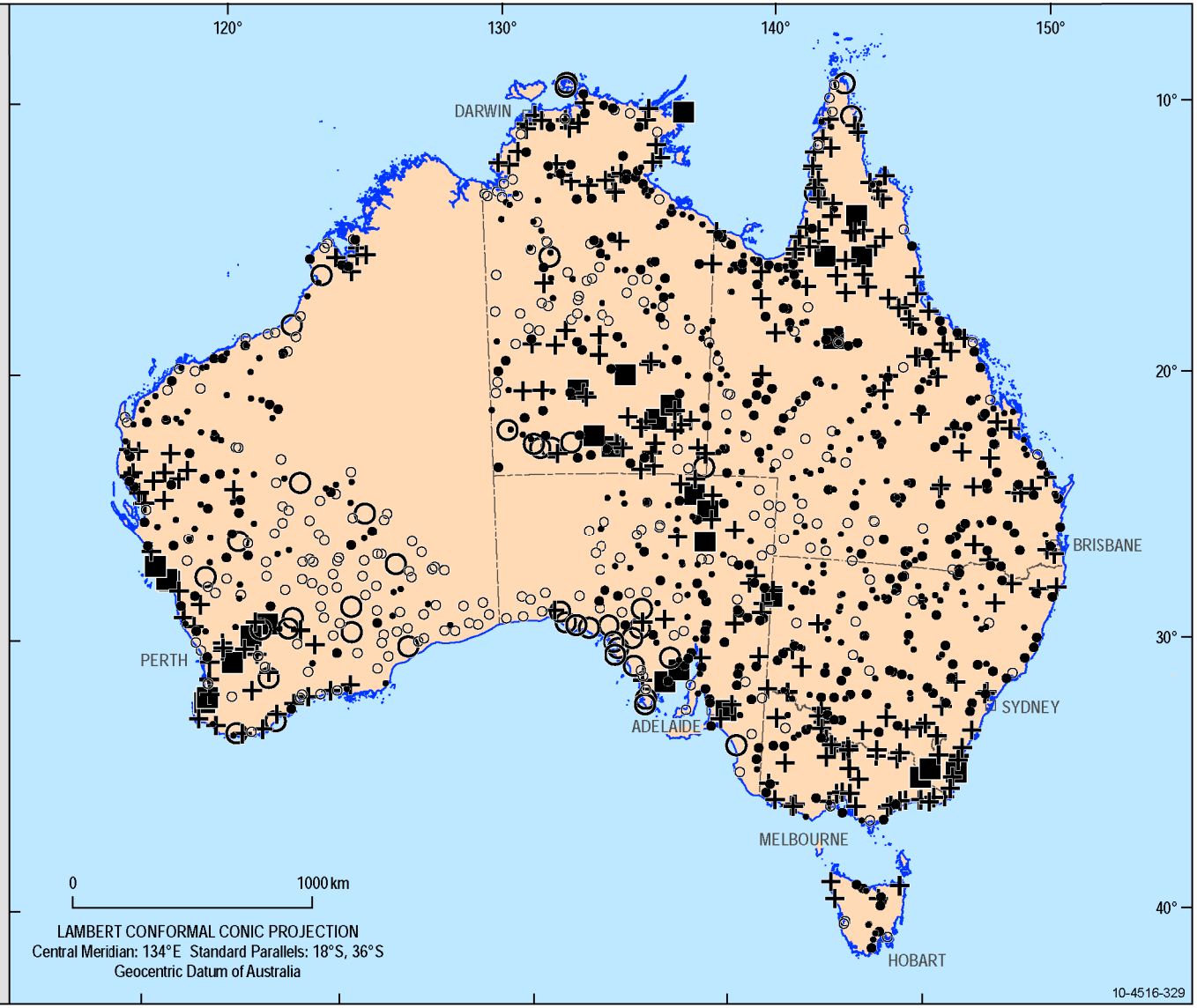
25%: *4.91 mg/kg*

Lower Fence: *2.48 mg/kg*

Minimum: *Less than 0.04 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sn

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *181.1 mg/kg*

Upper Fence: *6.5 mg/kg*

75%: *2.8 mg/kg*

Median: *2.1 mg/kg*

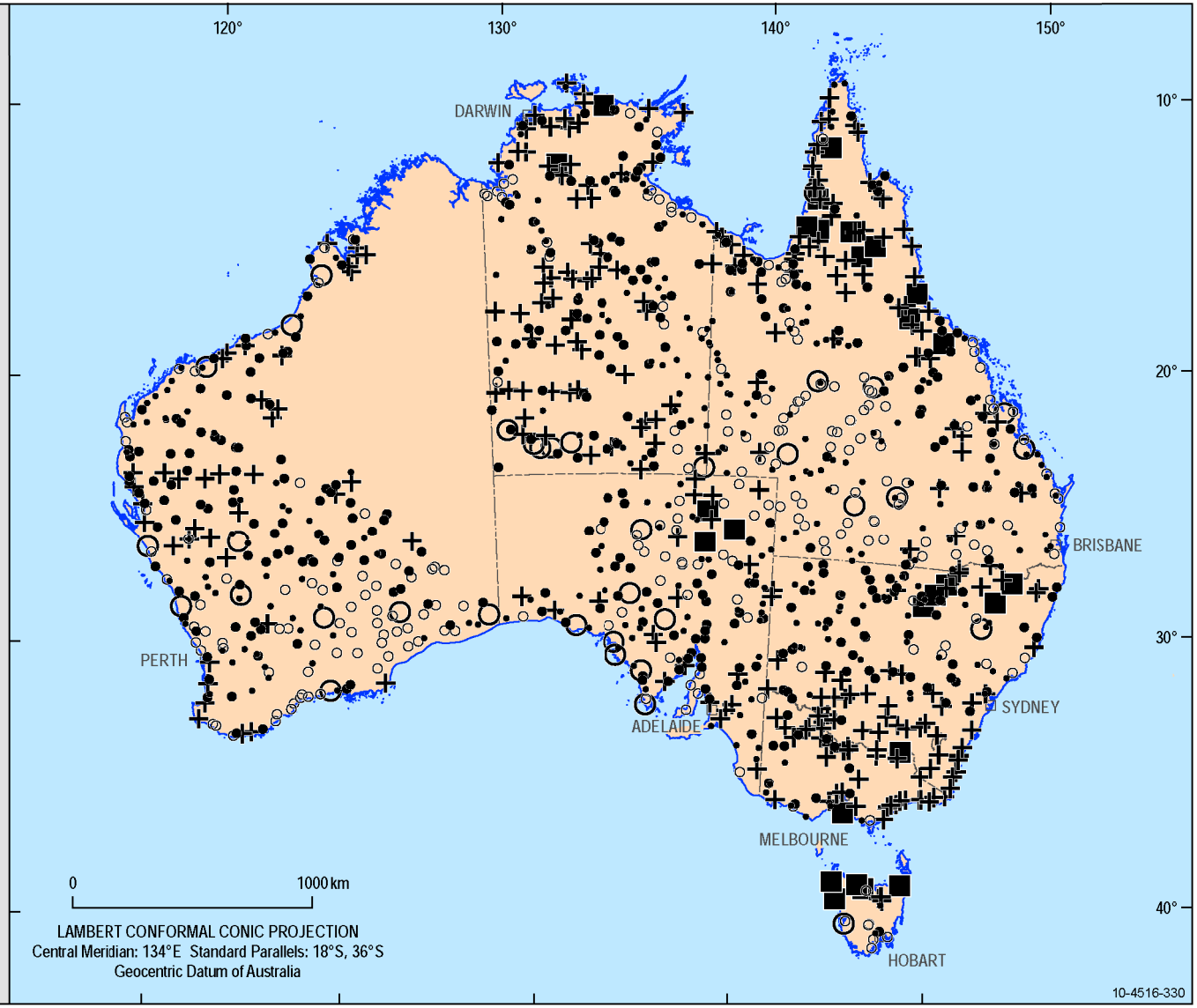
25%: *1.6 mg/kg*

Lower Fence: *0.7 mg/kg*

Minimum: *Less than 0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Sr

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *5803.2 mg/kg*

Upper Fence: *722 mg/kg*

75%: *169.2 mg/kg*

Median: *102.3 mg/kg*

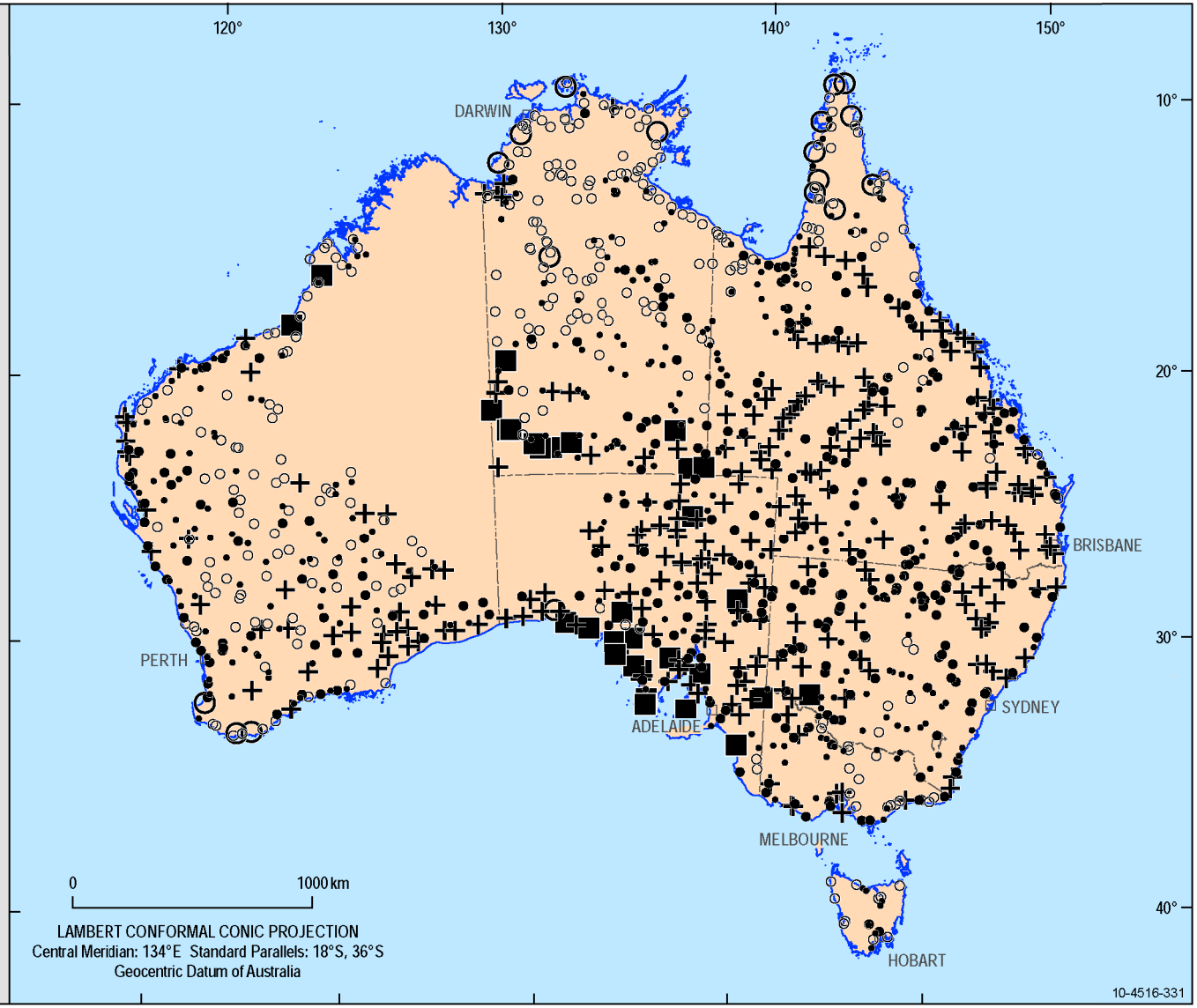
25%: *64.3 mg/kg*

Lower Fence: *15.1 mg/kg*

Minimum: *1.9 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ta

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *11.62 mg/kg*

Upper Fence: *3.23 mg/kg*

75%: *1.45 mg/kg*

Median: *1.1 mg/kg*

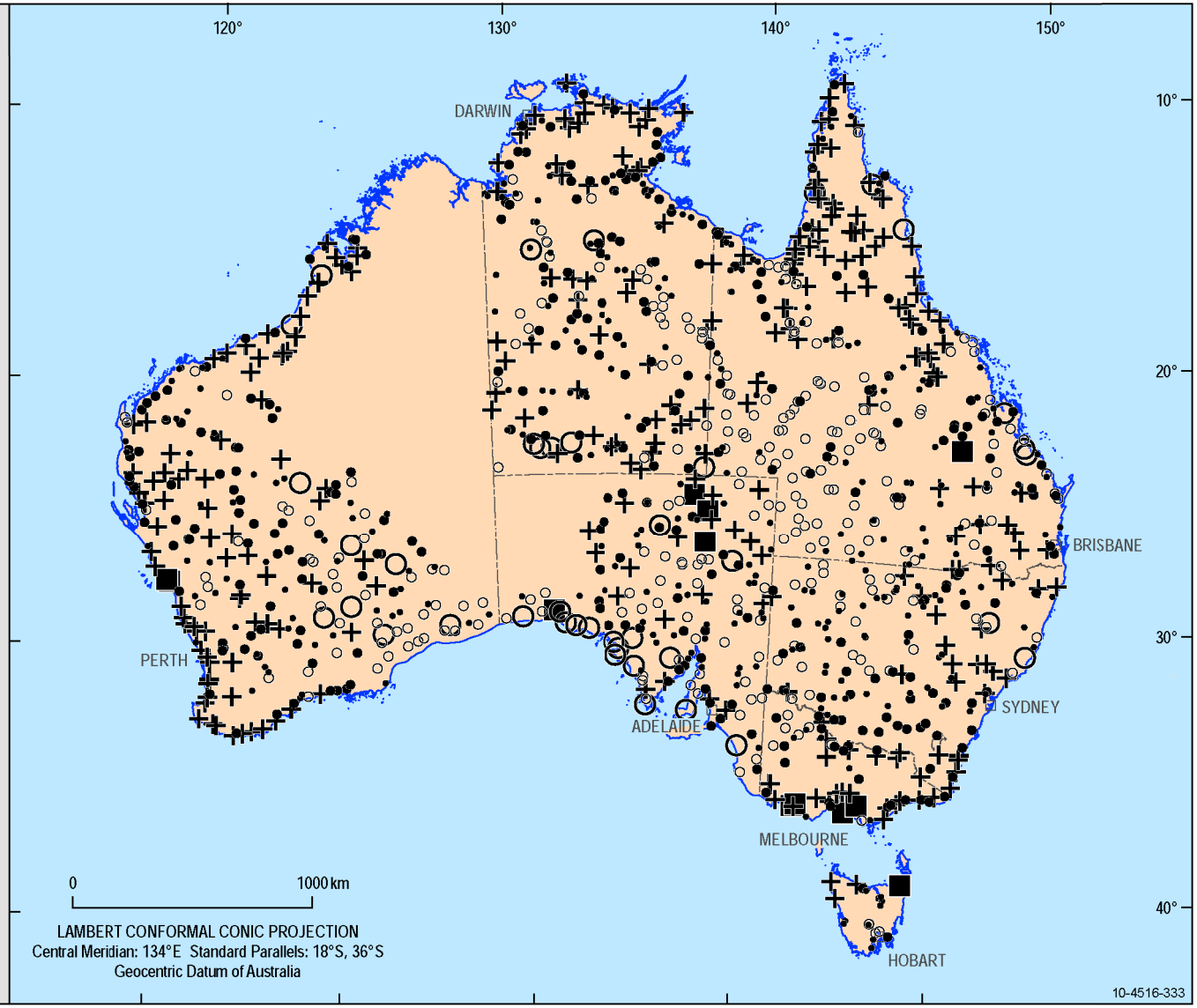
25%: *0.85 mg/kg*

Lower Fence: *0.38 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Tb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *7.81 mg/kg*

Upper Fence: *2.23 mg/kg*

75%: *1.16 mg/kg*

Median: *0.92 mg/kg*

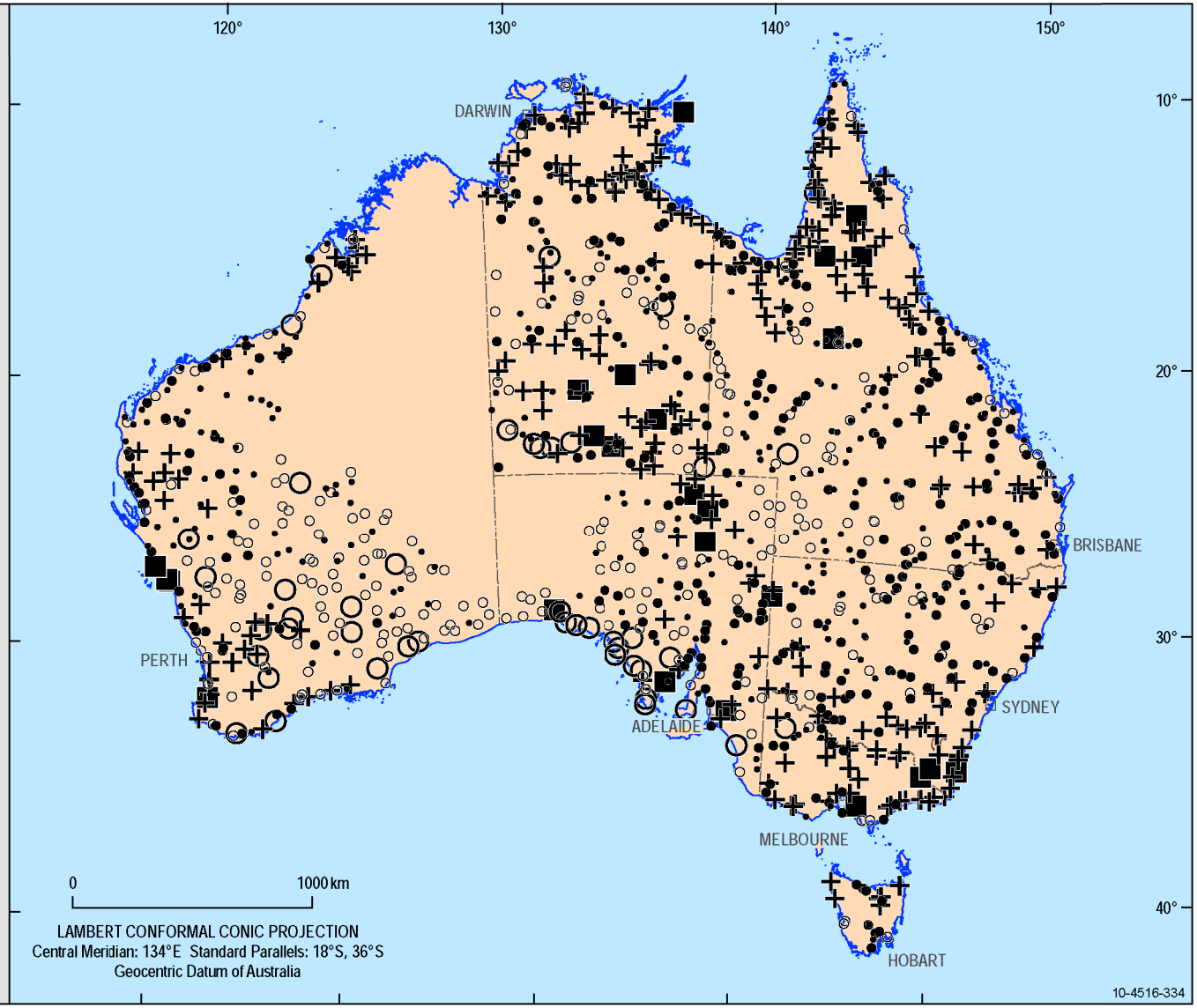
25%: *0.75 mg/kg*

Lower Fence: *0.39 mg/kg*

Minimum: *Less than 0.02 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Th

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *490.2 mg/kg*

Upper Fence: *48.21 mg/kg*

75%: *18.94 mg/kg*

Median: *13.56 mg/kg*

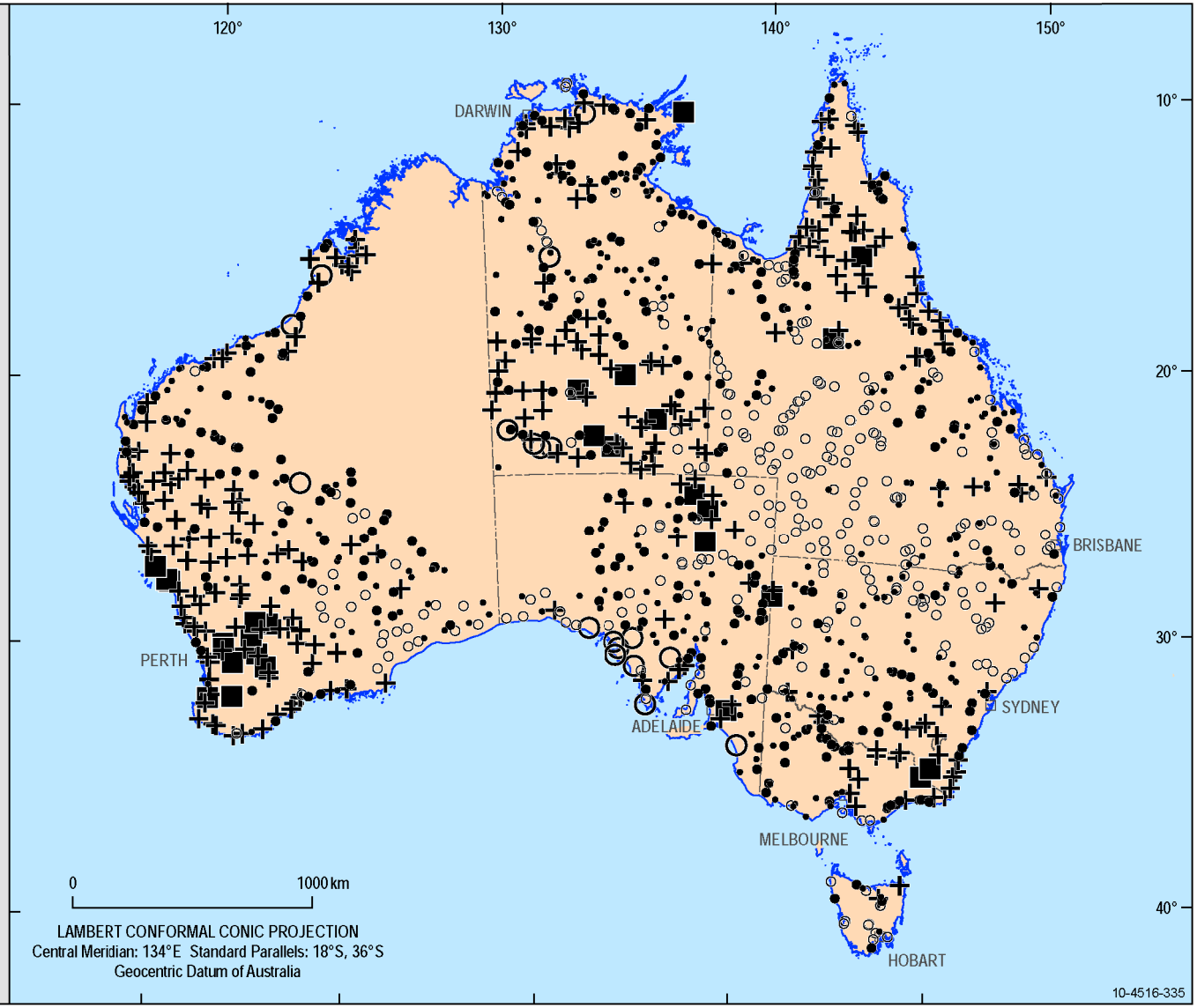
25%: *10.16 mg/kg*

Lower Fence: *3.99 mg/kg*

Minimum: *0.2 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Ti

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: Bead Fused in B Flux
Analysis: XRF
Detection Limit: 30 mg/kg
N: 1190

Maximum: *75458 mg/kg*

Upper Fence: *10249 mg/kg*

75%: *6490 mg/kg*

Median: *5526 mg/kg*

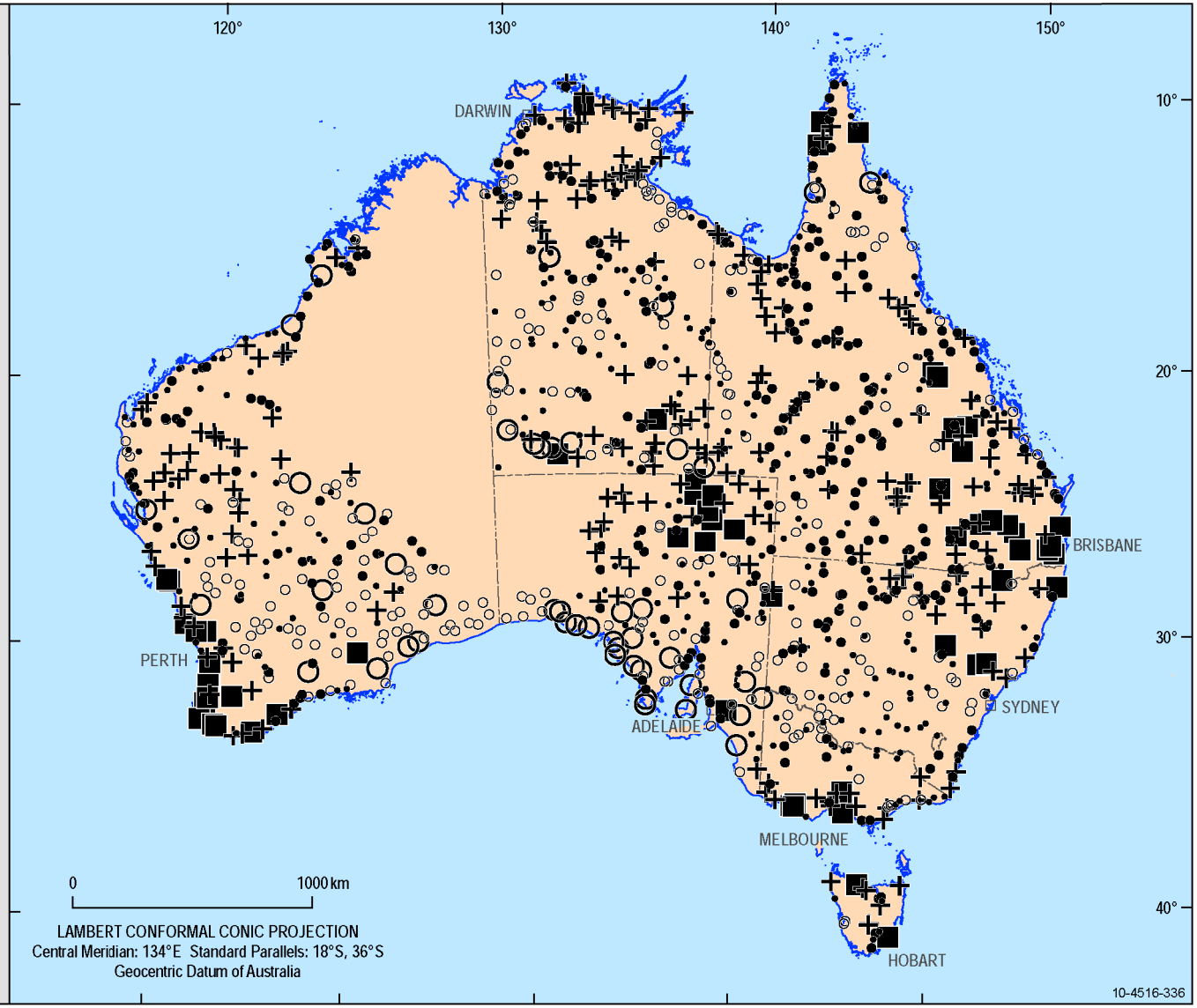
25%: *4782 mg/kg*

Lower Fence: *3022 mg/kg*

Minimum: *78 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

U

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.02 mg/kg
N: 1190

Maximum: *42.28 mg/kg*

Upper Fence: *14.32 mg/kg*

75%: *4.83 mg/kg*

Median: *3.17 mg/kg*

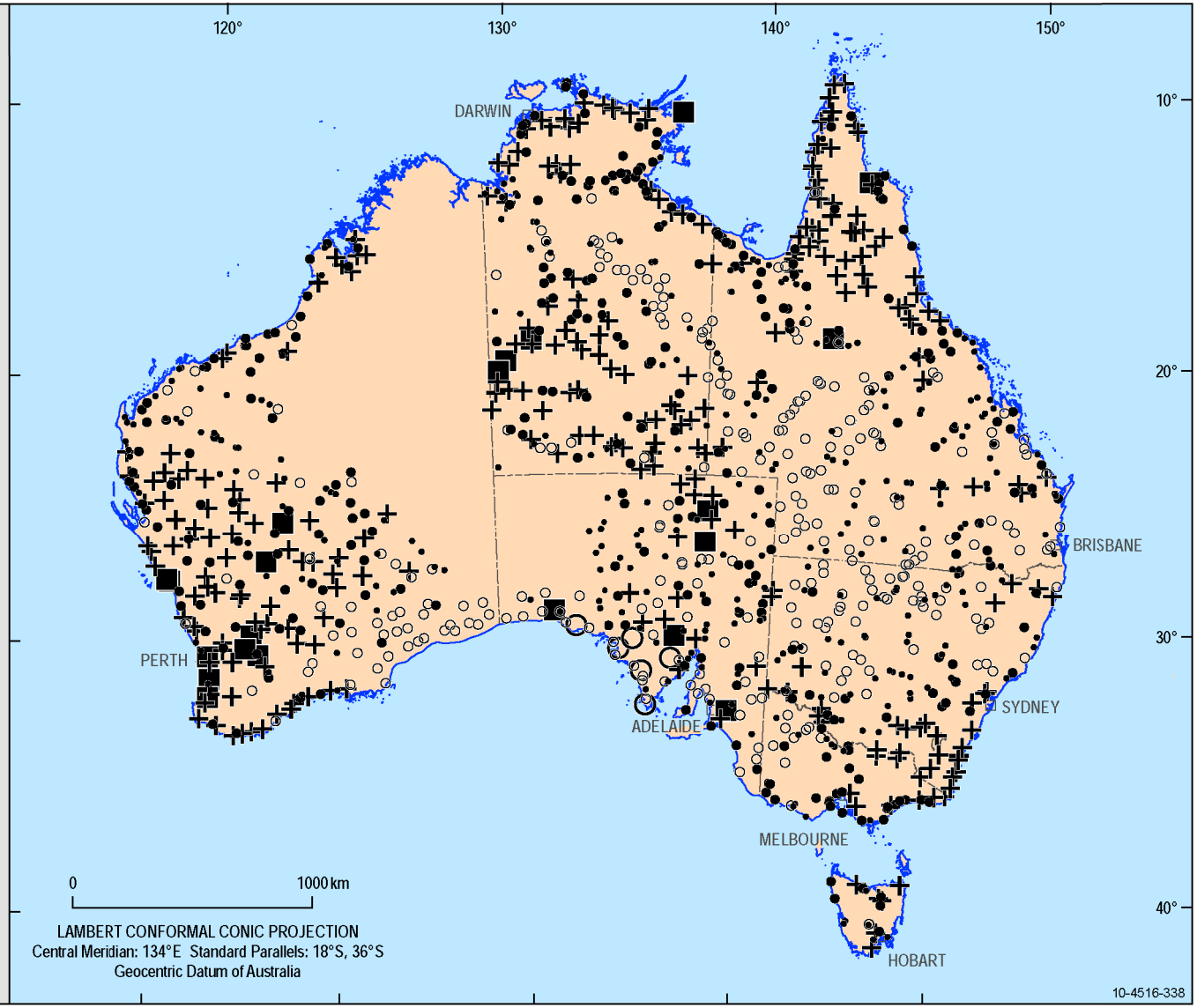
25%: *2.34 mg/kg*

Lower Fence: *0.79 mg/kg*

Minimum: *0.17 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

V

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *510.8 mg/kg*

Upper Fence: *227.7 mg/kg*

75%: *112.4 mg/kg*

Median: *90.8 mg/kg*

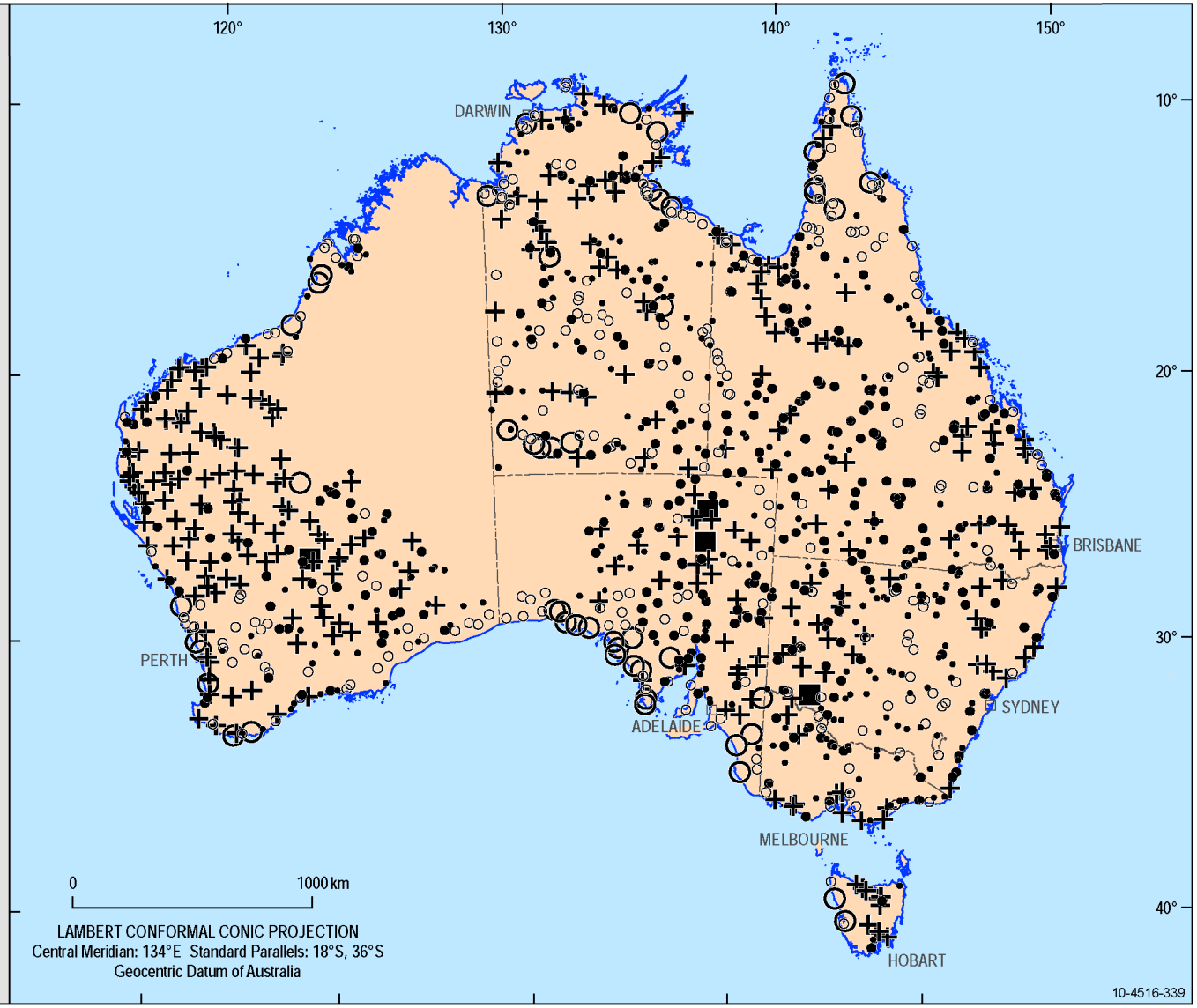
25%: *70.2 mg/kg*

Lower Fence: *34.6 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

W

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.1 mg/kg
N: 1190

Maximum: *103.4 mg/kg*

Upper Fence: *4.8 mg/kg*

75%: *2.2 mg/kg*

Median: *1.7 mg/kg*

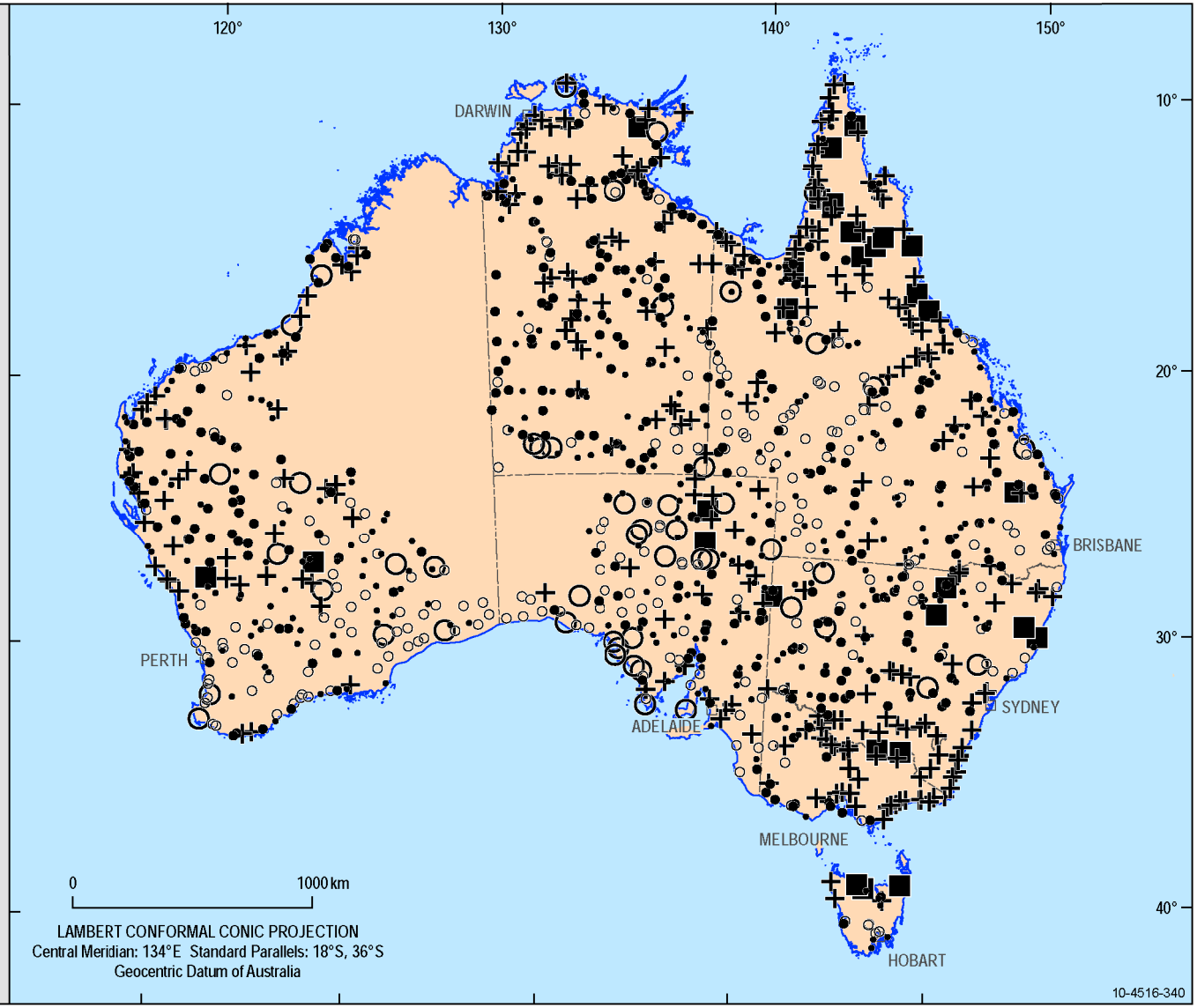
25%: *1.3 mg/kg*

Lower Fence: *0.6 mg/kg*

Minimum: *Less than 0.1 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



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NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Y

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.05 mg/kg
N: 1190

Maximum: *349.4 mg/kg*

Upper Fence: *76.69 mg/kg*

75%: *42.7 mg/kg*

Median: *34.2 mg/kg*

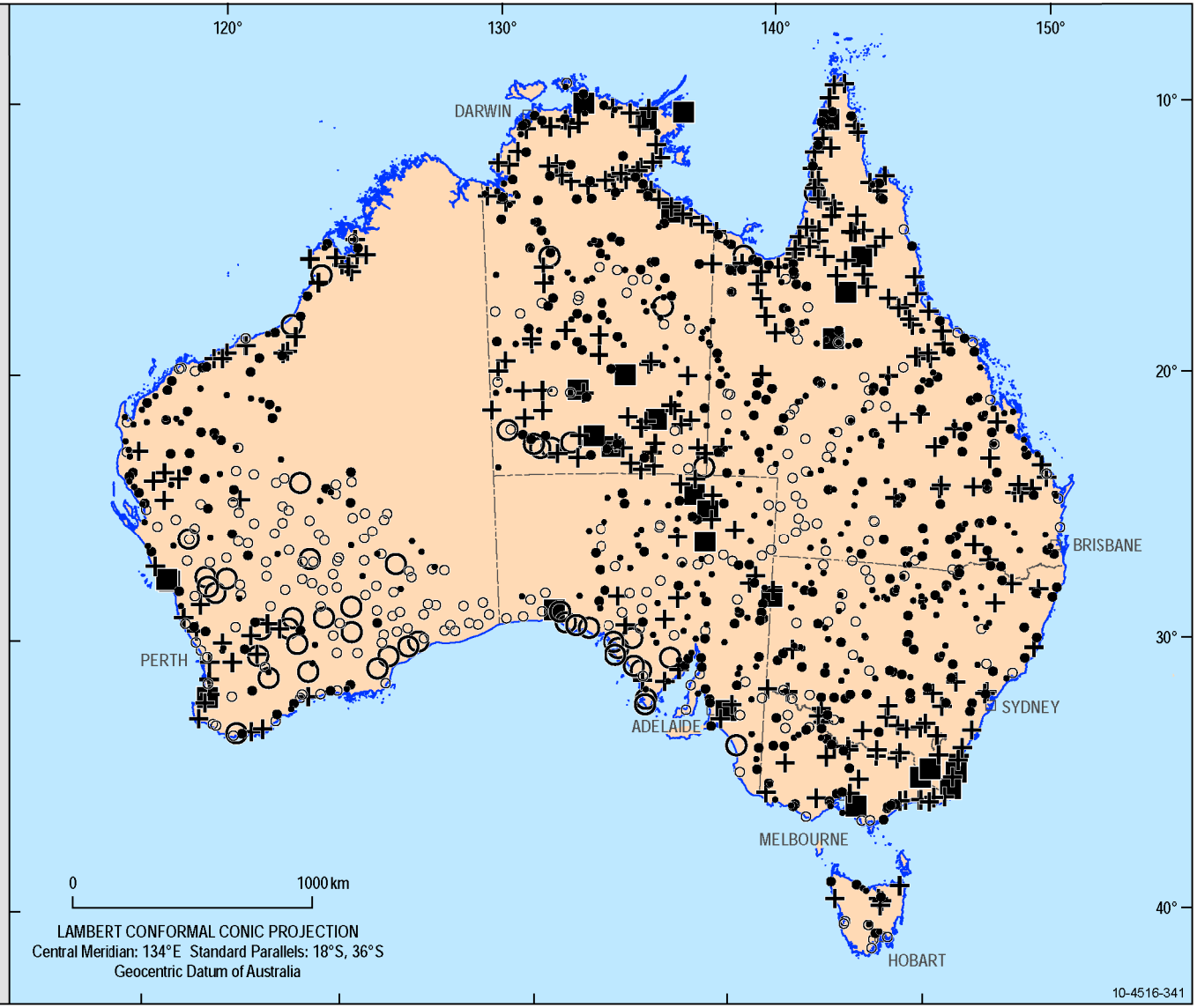
25%: *28.9 mg/kg*

Lower Fence: *16.09 mg/kg*

Minimum: *1.5 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa



Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Yb

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.04 mg/kg
N: 1190

Maximum: *49.33 mg/kg*

Upper Fence: *8.25 mg/kg*

75%: *4.46 mg/kg*

Median: *3.56 mg/kg*

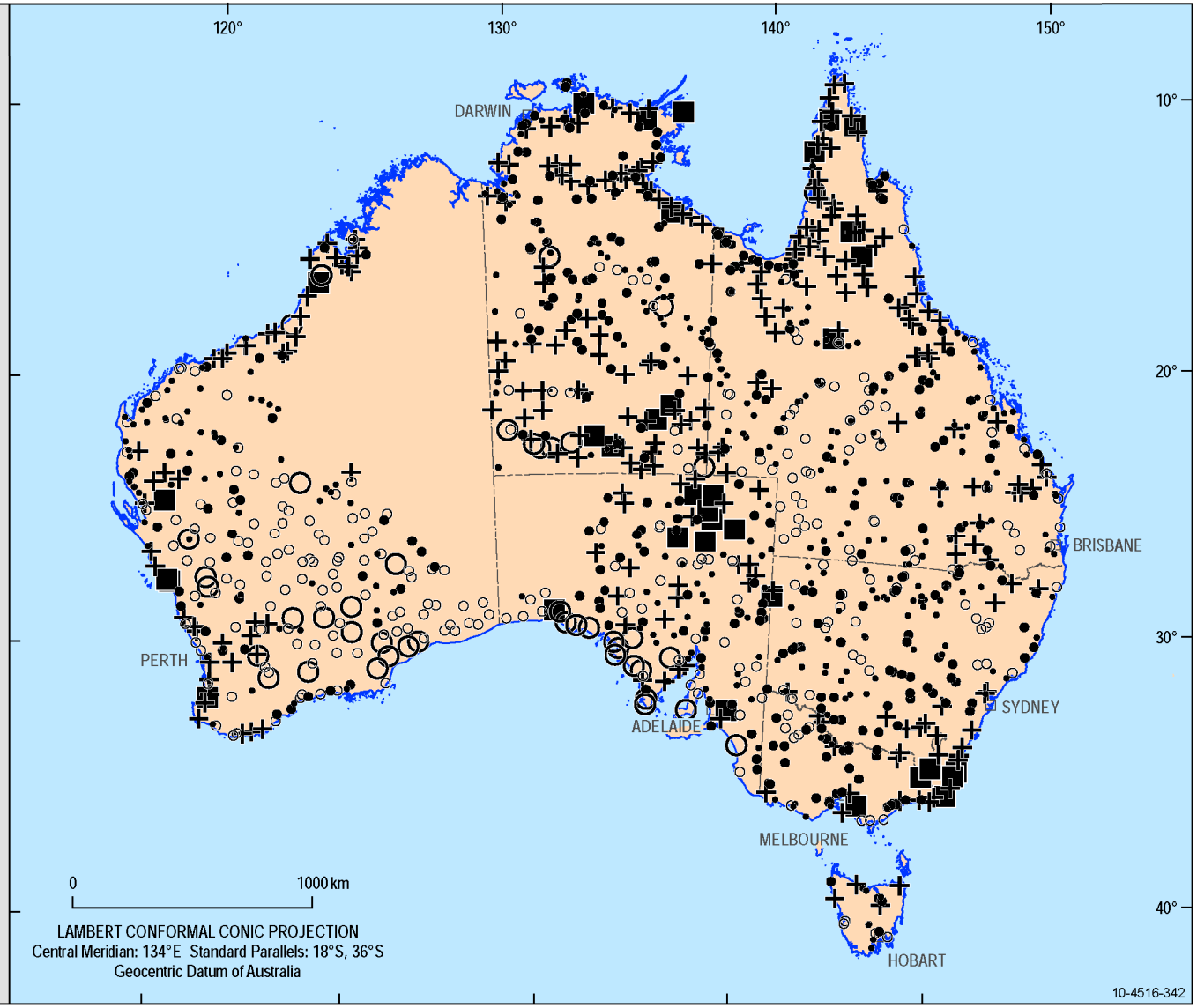
25%: *2.96 mg/kg*

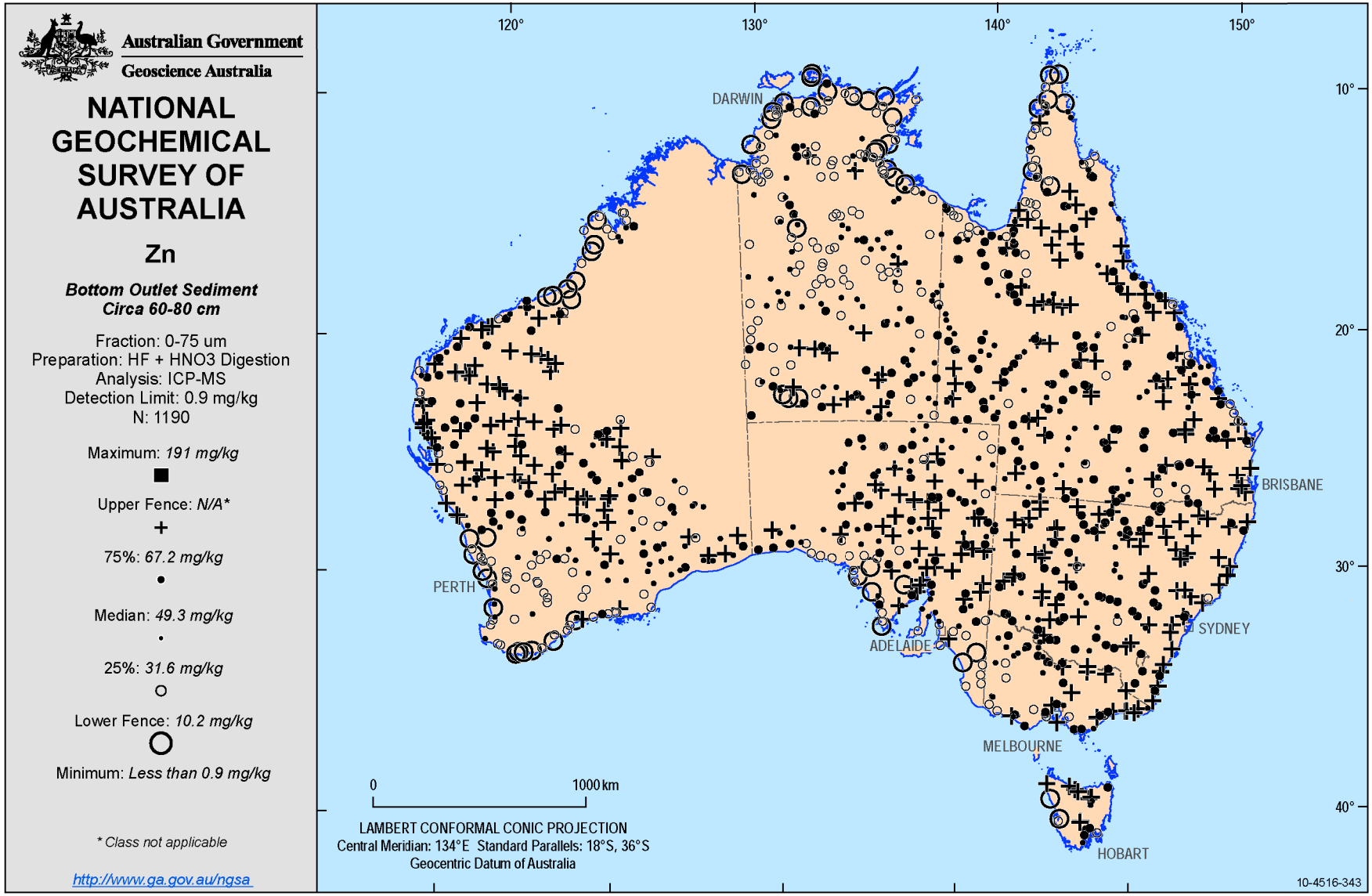
Lower Fence: *1.6 mg/kg*

Minimum: *0.07 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa




Australian Government
Geoscience Australia
NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA
Zn
Bottom Outlet Sediment
Circa 60-80 cm
Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.9 mg/kg
N: 1190
Maximum: 191 mg/kg
Upper Fence: N/A*
75%: 67.2 mg/kg
Median: 49.3 mg/kg
25%: 31.6 mg/kg
Lower Fence: 10.2 mg/kg
Minimum: Less than 0.9 mg/kg
* Class not applicable
http://www.ga.gov.au/ngsa
120°
130°
140°
150°
10°
20°
30°
40°
DARWIN
PERTH
ADELAIDE
BRISBANE
SYDNEY
MELBOURNE
HOBART
0
1000 km
LAMBERT CONFORMAL CONIC PROJECTION
Central Meridian: 134°E Standard Parallels: 18°S, 36°S
Geocentric Datum of Australia
10-4516-343

Australian Government
Geoscience Australia

NATIONAL GEOCHEMICAL SURVEY OF AUSTRALIA

Zr

Bottom Outlet Sediment
Circa 60-80 cm

Fraction: 0-75 um
Preparation: HF + HNO3 Digestion
Analysis: ICP-MS
Detection Limit: 0.2 mg/kg
N: 1190

Maximum: *31517.9 mg/kg*

Upper Fence: *3659.3 mg/kg*

75%: *950.1 mg/kg*

Median: *595.3 mg/kg*

25%: *386.2 mg/kg*

Lower Fence: *100 mg/kg*

Minimum: *17.8 mg/kg*

** Class not applicable*

http://www.ga.gov.au/ngsa