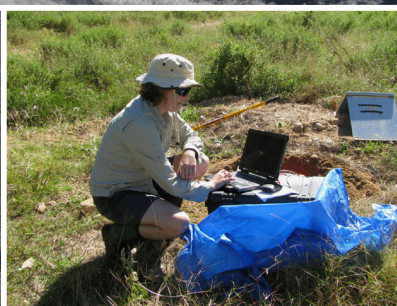
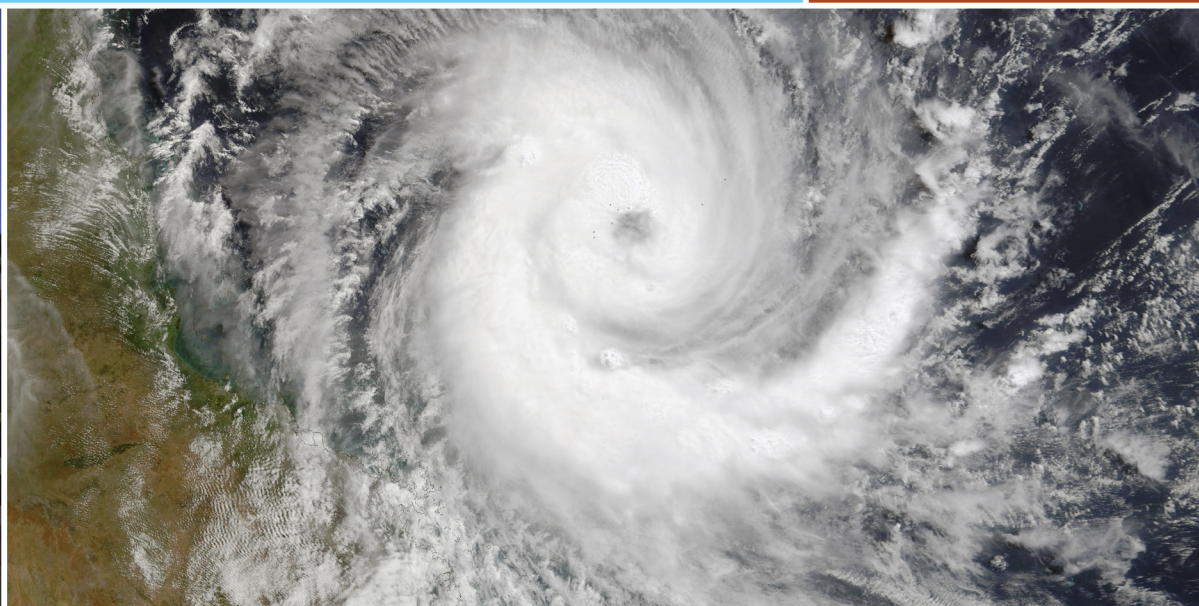




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Results of the National GNSS CORS Campaign, June 2013

G. Hu, J. Dawson

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GEOSCIENCE AUSTRALIA
RECORD 2013/43

G. Hu, J. Dawson



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Name of NATA approved facility

Geoscience Australia – National Geospatial Reference Systems Section
Corner Jerrabomberra Ave and Hindmarsh Drive
Symonston ACT 2609 Australia
Telephone: (02) 6249 9111 Facsimile: (02) 6249 9969
Email: geodesy@ga.gov.au

Client Detail

The following clients submitted data for the June 2013 campaign:

Liam Curran
RPS Australia East Pty Ltd
743 Ann Street, Fortitude Valley, Queensland, Australia, 4006
Telephone: (07) 3606 6078 Facsimile: (07) 3237 8833
Email: liam.curran@rpsgroup.com.au
Date of request: 01 July 2013

Craig Swinbourne
BHP Billiton Mitsubishi Alliance
PMB Peak Downs Mine, Queensland, 4744, Australia
Telephone: (07) 4885 8907 Facsimile: (07) 3229 2575
Email: craig.swinbourne@bmacoal.com
Date of request: 02 July 2013

Aaron Peters
BHP Billiton Mitsubishi Alliance
Blackwater Mine, Private Mail Bag, Blackwater, Queensland, 4717
Telephone: (07) 4980 5900 Facsimile: (07) 4982 5826
Email: Aaron.T.Peters@bmacoal.com
Date of request: 26 July 2013

Darren Burns
Department of Natural Resources and Mines
GPO Box 2454, Brisbane, Queensland 4001 Australia
Telephone: (07) 3896 3349 Facsimile: (07) 3896 3697
Email: darren.burns@dnrm.qld.gov.au
Date of request: 30 July 2013

Volker Janssen
Land and Property Information, NSW Department of Finance and Services, NSW
346 Panorama Avenue, Bathurst NSW 2795
Telephone: (02) 6332 8426 Facsimile: (02) 6332 8479
Email: Volker.Janssen@lpi.nsw.gov.au
Date of request: 09 August 2013

Jason Spall

C.R. Kennedy Survey Solutions

National Tech Support and Training Survey, 80 Kingsford-Smith Drv, Albion, Queensland 4010

Telephone: (07) 3962 6210 Facsimile: (07) 3862 6212

Email: jspall@crkennedy.com.au

Date of request: 21 August 2013

Craig Fleming

Position Partners PTY LTD

7 Transit Drive Campbellfield VIC 3061

Telephone: (03) 9930 7111 Facsimile: (03) 9930 7170

Email: cfleming@positionpartners.com.au

Date of request: 30 August 2013

Nicholas Dando

National Geospatial Reference Systems Section, Geoscience Australia

Symonston ACT 2609 Australia

Telephone: (02) 6249 9552 Facsimile: (02) 6249 9999

Email: Nicholas.Dando@ga.gov.au

Date of request: 04 September 2013

Vince O'Brien

BHP Billiton Mitsubishi Alliance

Saraji Mine, Dysart, Queensland, 4745

Telephone: (07) 4968 9741 Facsimile: (07) 4968 9836

Email: vincent.O'Brien@bhpbilliton.com

Date of request: 04 September 2013

Linda Morgan

Western Australian Land Information Authority

1 Midland Square, Midland, Western Australia 6056

Telephone: (08) 9273 7133 Facsimile: (08) 9273 7657

Email: Linda.Morgan@landgate.wa.gov.au

Date of request: 07 October 2013

Expiry of this Report

5 years after authorisation date.

Abbreviations

AFN	Australian Fiducial Network
ARGN	Australian Regional GNSS Network
CORS	Continuously Operating Reference Station(s)
GDA94	Geocentric Datum Australia 1994
GNSS	Global Navigation Satellite System(s)
GPS	Global Positioning System

GRS80	Geodetic Reference System 1980
IGS	International GNSS Service
ITRF	International Terrestrial Reference Frame
ITRF92	International Terrestrial Reference Frame 1992
ITRF2008	International Terrestrial Reference Frame 2008

Introduction

An Australian-wide certification campaign of positions in accordance with Regulation 13 of the National Measurement Regulations 1999 and the National Measurement Act 1960 has been run from 00:00:00 (UTC time) on Sunday 23 June 2013 to 00:00:00 (UTC time) Sunday 30 June 2013 (GPS week 1746). The primary objective of this campaign was to improve the consistency of legally traceable CORS positions across Australia, and the stated uncertainties on previously certified stations. As of 20 October 2013, ten applications for verification of a reference standard of measurement under Regulation 12 of the National Measurement Regulations 1999 have been received for verification of GDA94 position on their owned or managed station monuments. This report documents the processing and analysis of the national Regulation 13 campaign GPS data for the stations to satisfy the position verification requirements.

Measurand

Station position, at the time of measurement and stated instrumentation, of a GPS monument with respect to the Geocentric Datum of Australia (GDA94) referred to the GRS80 ellipsoid being in the ITRF92 reference frame at the epoch 1994.0.

Measurand Traceability

Measurement traceability was ensured by comparing the computed solution against the recognised value standard for position of the Australian Fiducial Network stations. Additionally, the computed solution was checked against the ITRF based solutions computed by the IGS and the individual global analysis centres of the IGS. The validity and traceability of the entire GPS system was ensured via its link to the global Satellite Laser Ranging (SLR) and Very Long Baseline Interferometry (VLBI) observing networks through the ITRF. The validity and traceability of our internal computation processes were ensured by undertaking standard benchmark analysis prior to this analysis.

Measurand Uncertainty

Position uncertainties were calculated in accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Type A uncertainty sources were evaluated by adopting an *a priori* sigma of **0.001** metre for the precision (1 sigma) of the L1-frequency, one-way, phase observation, at zenith. The corresponding uncertainties of all parameters were determined, by standard error propagation theory, in the least-squares estimation process used in the GPS analysis. Since the formal (internal) precision estimates of GPS solutions are well known to be optimistic, a factor of **10** (i.e. variance scale factor of 100) was subsequently applied to the variance-covariance matrix of the computed GDA94 coordinates.

Type B uncertainty sources, which in practice contribute to position uncertainty, cannot be estimated from the statistical analysis of short-period (i.e. 7-day) observations; these include environmental

effects, such as long-period station loading (deformation) processes. [Table 1](#) shows the major type B uncertainty sources for GPS analysis.

Table 1. Type B uncertainty sources (95% C.L.) for position, determined from GPS, and the total uncertainty, assuming the normal distribution of the uncertainty sources, high degrees of freedom and a coverage factor, k , of 2.

Uncertainty Source	Position Uncertainty Horizontal (mm)	Position Uncertainty Vertical (mm)
Antenna phase centre	3	10
Monument stability	1	1
Other sources including un-modelled crustal loading, satellite orbit variations, atmosphere, tectonics, signal multi-path	6	10

GPS Data

GPS RINEX data was supplied for the campaign week from the above ten clients. [Figure 1](#) shows the locations of the stations. [Tables 2 – 11](#) list the GPS receiver and antenna type at these stations. The AFN/ARGN/IGS network sites used in the GPS data processing are plotted in [Figure 1](#). [Table 12](#) lists the GPS receiver and antenna type used in the GPS data processing for each of the AFN/ARGN/IGS network sites. [Table 13](#) lists the GPS antenna heights to the Antenna Reference Point (ARP) used in the GPS data processing for the AFN/ARGN/IGS stations. The ARP is the reference point as defined by IGS and the RINEX specifications. [Table 14 - 23](#) list the GPS antenna heights to the Antenna Reference Point (ARP) used in the GPS data processing for the campaign stations.

GPS Data Irregularities

Note that the station KARR submitted by CR Kennedy has the same four-char ID as the ARGN site KARR, they are not the same site. There is no solution for the site MIDG submitted by CR Kennedy because of poor quality of data.

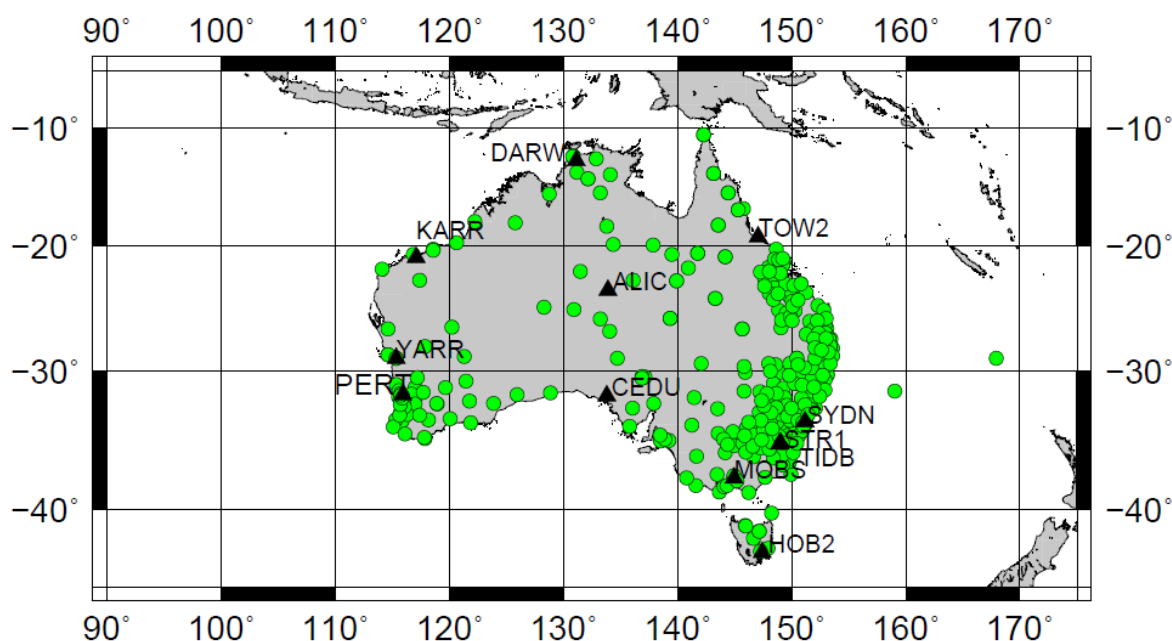


Figure 1: Stations of the campaign week (circles) and AFN/ARGN/IGS (black triangles) stations used in GPS data processing.

Table 2: GPS receiver and antenna types for the station submitted by RPS Australia East Pty Ltd.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
CAVL	TRIMBLE NETR9	4611118879	TRM57971.00 NONE

Table 3: GPS receiver and antenna types for the station submitted by PMB Peak Downs Mine, BHP Billiton Mitsubishi Alliance.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
PDM1	LEICA GRX1200GGPRO	06450065	LEIAX1202GG NONE

Table 4: GPS receiver and antenna types for the stations submitted by Blackwater Mine, BHP Billiton Mitsubishi Alliance.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
BWMA	LEICA GRX1200+GNSS	09341018	LEIAS10 NONE
R10B	LEICA GRX1200GGPRO	09341089	LEIAS10 NONE

Table 5: GPS receiver and antenna types for the stations submitted by Department of Natural Resources and Mines, Queensland.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
BDST	LEICA GRX1200GGPRO	103226	LEIAT504GG NONE
BDVL	TRIMBLE NETR9	5116354145	TRM59800.00 NONE
BEE2	TRIMBLE NETR5	1440932015	TRM57971.00 NONE
BULA	TRIMBLE NETR9	5220354471	TRM59800.00 NONE

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
CBLT	TRIMBLE NETR5	1440947134	TRM57971.00 NONE
CLEV	TRIMBLE NETR5	1440904813	TRM57971.00 NONE
COEN	TRIMBLE NETR9	5116354158	TRM59800.00 NONE
COOL	TRIMBLE NETR9	5209354439	TRM59800.00 NONE
DALB	TRIMBLE NETR5	4822A53935	TRM59800.00 NONE
GATT	TRIMBLE NETR5	30255746	TRM55971.00 NONE
GGTN	TRIMBLE NETR9	5116354139	TRM59800.00 NONE
HNIS	LEICA GRX1200+GNSS	09330024	LEIAR25.R3 LEIT
HUGH	TRIMBLE NETR9	5220354468	TRM59800.00 NONE
IPS2	LEICA GRX1200GGPRO	103242	LEIAT504GG NONE
JLCK	TRIMBLE NETR9	5115354138	TRM59800.00 NONE
KILK	TRIMBLE NETR9	5209354423	TRM59800.00 NONE
LURA	TRIMBLE NETR9	5115354100	TRM59800.00 NONE
MRBA	TRIMBLE NETR9	5115354104	TRM59800.00 NONE
ROBI	LEICA GRX1200GGPRO	200712	LEIAT504GG NONE
RSBY	LEICA GRX1200+GNSS	09310026	LEIAR25.R3 LEIT
STHG	TRIMBLE NETR9	5220354469	TRM59800.00 NONE
TOOG	TRIMBLE NETR5	30473612	TRM55971.00 NONE
TOOW	LEICA GRX1200GGPRO	103231	LEIAT504GG NONE
WARW	LEICA GRX1200GGPRO	200725	LEIAT504GG NONE
WOOL	TRIMBLE NETRS	0220164017	TRM29659.00 NONE

Table 6: GPS receiver and antenna types for the stations submitted by Land and Property Information, NSW.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
ANNA	TRIMBLE NETR9	5109354036	TRM59800.00 SCIS
ARDL	LEICA GRX1200+GNSS	15169075	LEIAR10 NONE
ARMD	LEICA GRX1200+GNSS	09240064	LEIAX1203+GNSS NONE
BALN	LEICA GRX1200GGPRO	07490014	LEIAX1202GG NONE
BATH	TRIMBLE NETR9	5112354079	TRM59800.00 SCIS
BEGA	LEICA GRX1200+GNSS	13110-021	LEIAR10 NONE
BING	TRIMBLE NETR9	5109354040	TRM59800.00 SCIS
BJCT	LEICA GR25	15169089	LEIAR10 NONE
BKNL	TRIMBLE NETR9	5115354136	TRM59800.00 SCIS
BLRN	TRIMBLE NETR9	1441112234	TRM57971.00 NONE
BOMB	TRIMBLE NETR9	0712118519	TRM57971.00 NONE
BRBA	LEICA GRX1200+GNSS	13110-009	LEIAR10 NONE
BRDW	LEICA GRX1200+GNSS	13110-036	LEIAR10 NONE
BURK	LEICA GR25	15169073	LEIAR10 NONE

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
CBAR	TRIMBLE NETR9	5109354030	TRM59800.00 SCIS
CBLE	TRIMBLE NETR9	0712118514	TRM57971.00 NONE
CHIP	LEICA GRX1200GGPRO	CR6200323020	ASH701945E_M SCIS
CKWL	TRIMBLE NETR9	1441112327	TRM57971.00 NONE
CLBI	TRIMBLE NETR9	5000113743	TRM57971.00 NONE
CNBN	TRIMBLE NETR9	5026353820	TRM59800.00 SCIS
CNDO	LEICA GRX1200+GNSS	13110-012	LEIAR10 NONE
COFF	LEICA GRX1200GGPRO	08340033	LEIAX1202GG NONE
COMA	LEICA GRX1200+GNSS	13110-024	LEIAR10 NONE
CRDX	LEICA GRX1200+GNSS	13194-086	LEIAR10 NONE
CSNO	LEICA GRX1200+GNSS	09250174	LEIAX1203+GNSS NONE
CTMD	LEICA GRX1200+GNSS	13194-010	LEIAR10 NONE
CWN2	TRIMBLE NETR5	CR6200323012	ASH701945E_M SCIS
CWRA	LEICA GRX1200+GNSS	13110-028	LEIAR10 NONE
DBBO	TRIMBLE NETR9	5115354140	TRM59800.00 SCIS
DKSN	LEICA GRX1200+GNSS	09120016	LEIAR25 LEIT
DLQN	TRIMBLE NETR9	1441112113	TRM57971.00 NONE
DUNE	LEICA GRX1200+GNSS	13194-012	LEIAR10 NONE
FORB	LEICA GRX1200+GNSS	13110-045	LEIAR10 NONE
FTDN	TRIMBLE NETR9	1441109201	TRM57971.00 NONE
GFEL	TRIMBLE NETR9	1441107128	TRM57971.00 NONE
GFTH	LEICA GRX1200+GNSS	13110-025	LEIAR10 NONE
GFTN	LEICA GRX1200+GNSS	12356-019	LEIAR10 NONE
GILG	TRIMBLE NETR9	0712118768	TRM57971.00 NONE
GLBN	LEICA GRX1200GGPRO	CR6200232023	ASH701945E_M SCIS
GLIN	LEICA GRX1200+GNSS	13110049	LEIAR10 NONE
GONG	TRIMBLE NETR9	5109354035	TRM59800.00 SCIS
GUNN	TRIMBLE NETR9	0712118808	TRM57971.00 NONE
HAY1	LEICA GRX1200+GNSS	13194-016	LEIAR10 NONE
HLBK	TRIMBLE NETR9	0712118140	TRM57971.00 NONE
IHOE	LEICA GRX1200+GNSS	09480019	LEIAR25.R3 LEIT
INVL	TRIMBLE NETR9	5109354041	TRM59800.00 SCIS
JERI	TRIMBLE NETR9	1441109023	TRM57971.00 NONE
LGOW	LEICA GRX1200+GNSS	09250080	LEIAX1203+GNSS NONE
LIRI	LEICA GR25	15039038	LEIAR10 NONE
LKHT	TRIMBLE NETR9	1441112398	TRM57971.00 NONE
MACK	LEICA GRX1200+GNSS	09250086	LEIAX1203+GNSS NONE
MENA	LEICA GRX1200GGPRO	CR6200323021	ASH701945E_M SCIS

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
MGRV	LEICA GRX1200GGPRO	CR6200323001	ASH701945E_M SCIS
MOUL	TRIMBLE NETR9	1441112486	TRM57971.00 NONE
MREE	LEICA GRX1200+GNSS	13110-023	LEIAR10 NONE
MSVL	LEICA GRX1200+GNSS	09250088	LEIAX1203+GNSS NONE
MTHR	TRIMBLE SPS851	30080002	TRM57971.00 NONE
MUDG	LEICA GRX1200+GNSS	09250090	LEIAX1203+GNSS NONE
MWAL	TRIMBLE NETR9	1441112282	TRM57971.00 NONE
NBRI	LEICA GRX1200GGPRO	12356-016	LEIAR10 NONE
NBRK	TRIMBLE NETR9	5112354076	TRM59800.00 SCIS
NDRA	LEICA GRX1200+GNSS	13194-014	LEIAR10 NONE
NEWE	LEICA GRX1200+GNSS	725070	LEIAR25.R4 LEIT
NGAN	LEICA GRX1200+GNSS	09250089	LEIAX1203+GNSS NONE
NOWE	LEICA GRX1200+GNSS	13194-015	LEIAR10 NONE
NSTA	TRIMBLE NETR9	5116354135	TRM59800.00 SCIS
NWCS	TRIMBLE NETR5	CR6200323013	ASH701945E_M SCIS
NWRA	LEICA GRX1200GGPRO	CR6200323011	ASH701945E_M SCIS
OBRN	TRIMBLE NETR9	1441107021	TRM57971.00 NONE
ORNG	LEICA GRX1200+GNSS	09250076	LEIAX1203+GNSS NONE
OVAL	TRIMBLE NETR9	0712118813	TRM57971.00 NONE
PBOT	LEICA GRX1200GGPRO	200930	LEIAT504GG LEIS
PERI	LEICA GRX1200+GNSS	12356-013	LEIAR10 NONE
PMAC	LEICA GRX1200+GNSS	07520004	LEIAX1202GG NONE
PRKS	LEICA GRX1200+GNSS	13194-088	LEIAR10 NONE
PTKL	LEICA GRX1200GGPRO	200537	LEIAT504GG SCIS
PUTY	LEICA GRX1200+GNSS	09250084	LEIAX1203+GNSS NONE
RAND	TRIMBLE NETR9	0712118260	TRM57971.00 NONE
RGLN	TRIMBLE NETR5	30738847	TRM57971.00 NONE
RUUS	TRIMBLE NETR9	5112354075	TRM59800.00 SCIS
RYLS	LEICA GRX1200+GNSS	13110-035	LEIAR10 NONE
SCON	TRIMBLE NETR9	5115354137	TRM59800.00 SCIS
SNGO	LEICA GRX1200+GNSS	09250082	LEIAX1203+GNSS NONE
SPWD	LEICA GRX1200+GNSS	CR6200323024	ASH701945E_M SCIS
TAMW	LEICA GRX1200+GNSS	09250096	LEIAX1203+GNSS NONE
TARE	LEICA GRX1200GGPRO	08340035	LEIAX1202GG NONE
TBOB	LEICA GRX1200GGPRO	200524	LEIAT504GG SCIS
TMBA	TRIMBLE NETR9	5116354154	TRM59800.00 SCIS
TMRA	TRIMBLE NETR9	0712118827	TRM57971.00 NONE
TMUT	TRIMBLE NETR9	1441112528	TRM57971.00 NONE

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
TNTR	LEICA GRX1200+GNSS	13110027	LEIAR10 NONE
TULL	LEICA GR25	15169077	LEIAR10 NONE
TURO	LEICA GRX1200+GNSS	09480009	LEIAR25.R3 LEIT
ULLA	LEICA GRX1200+GNSS	08470020	LEIAX1203+GNSS NONE
UNSW	LEICA GRX1200+GNSS	448	LEIAT504 LEIS
VLWD	TRIMBLE NETR5	CR6200323007	ASH701945E_M SCIS
WAKL	TRIMBLE NETR9	0412118090	TRM57971.00 NONE
WARI	TRIMBLE NETR9	0412118503	TRM57971.00 NONE
WGGA	TRIMBLE NETR5	30765520	TRM57971.00 NONE
WLGT	LEICA GRX1200+GNSS	12356-021	LEIAR10 NONE
WRRN	TRIMBLE NETR9	0712118773	TRM57971.00 NONE
WWLG	LEICA GRX1200GGPRO	200525	LEIAT504GG SCIS
WYNG	LEICA GRX1200GGPRO	08340043	LEIAX1202GG NONE
YARO	LEICA GRX1200+GNSS	09250173	LEIAX1203+GNSS NONE
YASS	TRIMBLE NETR9	1312118069	TRM57971.00 NONE
YMBA	TRIMBLE NETR9	0712118428	TRM57971.00 NONE
YUNG	TRIMBLE NETR9	5106354020	TRM59800.00 SCIS

Table 7: GPS receiver and antenna types for the stations submitted by C.R. Kennedy Survey Solutions.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
ACL2	LEICA GRX1200GGPRO	07160051	LEIAX1202GG NONE
ARCD	LEICA GR10	12261077	LEIAS10 NONE
ARUN	LEICA GRX1200GGPRO	08150070	LEIAX1202GG NONE
BARA	LEICA GR10	12261114	LEIAS10 NONE
BCMT	LEICA GRX1200GGPRO	08150053	LEIAX1202GG NONE
BDMR	LEICA GR10	12261095	LEIAS10 NONE
BDRM	LEICA GRX1200+GNSS	06200165	LEIAX1202GG NONE
BIND	LEICA GR10	12261135	LEIAS10 NONE
BLMT	LEICA GR10	12131113	LEIAS10 NONE
BMDW	LEICA GX1230GG	07150019	LEIAX1202GG NONE
BNBY	LEICA GRX1200+GNSS	12261123	LEIAS10 NONE
BRTN	LEICA GRX1200GGPRO	8240034	LEIAX1202GG NONE
CALN	LEICA GRX1200+GNSS	11301055	LEIAS10 NONE
CANN	LEICA GRX1200GGPRO	08120009	LEIAX1202GG NONE
CANV	LEICA GR10	11501027	LEIAS10 NONE
CAPL	LEICA GR10	12291039	LEIAS10 NONE
CARB	LEICA GRX1200+GNSS	12131123	LEIAS10 NONE
CBTN	LEICA GRX1200+GNSS	11181034	LEIAS10 NONE

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
CCMB	LEICA GRX1200+GNSS	7520021	LEIAX1202GG NONE
CHCC	LEICA GRX1200+GNSS	11331018	LEIAS10 NONE
CORY	LEICA GRX1200+GNSS	11181029	LEIAS10 NONE
CRCW	LEICA GR10	12291046	LEIAS10 NONE
CRKA	LEICA GRX1200GGPRO	09360004	LEIAX1203+GNSS NONE
CRKB	LEICA GRX1200GGPRO	07030026	LEIAX1202GG NONE
CRKM	LEICA GRX1200+GNSS	09380011	LEIAX1203+GNSS NONE
CRKP	LEICA GRX1200+GNSS	11401032	LEIAS10 NONE
CRKS	LEICA GRX1200+GNSS	09410012	LEIAX1203+GNSS NONE
CRL_	LEICA GRX1200GGPRO	08160083	LEIAX1202GG NONE
CRNS	LEICA GRX1200+GNSS	010191058	LEIAS10 NONE
CUDG	LEICA GR10	12291040	LEIAS10 NONE
DIXL	LEICA GR10	12261099	LEIAS10 NONE
DOCK	LEICA GRX1200+GNSS	11331043	LEIAS10 NONE
DUAR	LEICA GR10	12261136	LEIAS10 NONE
DUBO	LEICA GRX1200GGPRO	08470011	LEIAX1202GG NONE
DWSN	LEICA GR10	12261082	LEIAS10 NONE
DYST	LEICA GR10	12261113	LEIAS10 NONE
ENSH	LEICA GRX1200+GNSS	09380073	LEIAX1203+GNSS NONE
EUNG	LEICA GRX1200+GNSS	11081011	LEIAS10 NONE
GLAD	LEICA GRX1200+GNSS	09250131	LEIAX1203+GNSS NONE
GRAS	LEICA GRX1200+GNSS	11071047	LEIAS10 NONE
GSFD	LEICA GRX1200+GNSS	11381093	LEIAS10 NONE
GYM2	LEICA GRX1200GGPRO	08160098	LEIAX1202GG NONE
HBAY	LEICA GX1230GG	06200150	LEIAX1202GG NONE
HBG1	LEICA GRX1200+GNSS	11501026	LEIAS10 NONE
HBG2	LEICA GRX1200+GNSS	11381030	LEIAS10 NONE
HNSB	LEICA GRX1200+GNSS	11181040	LEIAS10 NONE
HOGN	LEICA GRX1200+GNSS	11301060	LEIAS10 NONE
JEEB	LEICA GRX1200+GNSS	09250099	LEIAX1203+GNSS NONE
JOON	LEICA GR10	12661070	LEIAS10 NONE
KARR	LEICA GR10	12261056	LEIAS10 NONE
KING	TRIMBLE NETR5	30607393	TRM55971.00 NONE
KJNG	LEICA GR10	11381032	LEIAS10 NONE
KMRA	LEICA GR10	12291049	LEIAS10 NONE
KOUM	LEICA GRX1200+GNSS	11031067	LEIAS10 NONE
KURR	LEICA GRX1200+GNSS	09380124	LEIAX1203+GNSS NONE
LAUN	LEICA GRX1200+GNSS	9380084	LEIAX1203+GNSS NONE

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
LITH	LEICA GRX1200+GNSS	09390004	LEIAX1203+GNSS NONE
LTSP	LEICA GR10	12261076	LEIAS10 NONE
MCLV	LEICA GRX1200+GNSS	09360005	LEIAX1203+GNSS NONE
MICH	LEICA GRX1200+GNSS	12261094	LEIAS10 NONE
MIDG	LEICA GRX1200+GNSS	11141004	LEIAS10 NONE
MIRA	LEICA GRX1200+GNSS	11081009	LEIAS10 NONE
MISA	LEICA GRX1200GGPRO	08150065	LEIAX1202GG NONE
MNDH	LEICA GR10	12261085	LEIAS10 NONE
MNVA	TRIMBLE NETR5	1440918119	TRM55971.00 NONE
MRYB	LEICA GRX1200+GNSS	09250047	LEIAX1203+GNSS NONE
MTB2	LEICA GRX1200+GNSS	09360006	LEIAX1203+GNSS NONE
MTBL	LEICA GR10	12261084	LEIAS10 NONE
MTGA	LEICA GRX1200+GNSS	09250085	LEIAX1203+GNSS NONE
MUSW	LEICA GRX1200+GNSS	09350036	LEIAX1203+GNSS NONE
NHAV	LEICA GRX1200+GNSS	11331009	LEIAS10 NONE
OLYM	LEICA GX1230GG	06200156	LEIAX1202GG NONE
PAIN	LEICA GRX1200+GNSS	11331019	LEIAS10 NONE
PROS	LEICA GRX1200+GNSS	09391055	LEIAS10 NONE
PTHD	LEICA GRX1200+GNSS	9341086	LEIAS10 NONE
RIDG	LEICA GR10	12261083	LEIAS10 NONE
RLST	LEICA GR10	7030040	LEIAX1203+GNSS NONE
RXBY	LEICA GRX1200+GNSS	10451012	LEIAS10 NONE
SALT	LEICA GRX1200GGPRO	08250003	LEIAX1202GG NONE
SAWG	LEICA GRX1200+GNSS	09390084	LEIAX1203+GNSS NONE
SLAD	LEICA GRX1200+GNSS	11301043	LEIAS10 NONE
TALO	LEICA GR10	12261140	LEIAS10 NONE
TARO	LEICA GR10	11501014	LEIAS10 NONE
TCBY	LEICA GRX1200+GNSS	11181041	LEIAS10 NONE
TERA	LEICA GR10	12291035	LEIAS10 NONE
THEO	LEICA GR10	11471098	LEIAS10 NONE
TNGL	LEICA GR10	11511053	LEIAS10 NONE
TORQ	LEICA GRX1200+GNSS	10461035	LEIAS10 NONE
TRNG	LEICA GRX1200GGPRO	06360003	LEIAX1202GG NONE
TWED	LEICA GRX1200+GNSS	07160038	LEIAX1202GG NONE
WLTN	LEICA GR10	12261111	LEIAS10 NONE
WNDN	LEICA GR10	12261062	LEIAS10 NONE
WWCC	LEICA GX1230GG	07330048	LEIAX1202GG NONE

Table 8: GPS receiver and antenna types for the stations submitted by Position Partners Pty Ltd.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
2FYS	TRIMBLE NETRS	762-10080	TPSCR.G3 TPSH
3CAM	TOPCON NETG3A	403-0291	TPSG3_A1 TPSD
3DAN	TOPCON NETG3A	383-0240	TPSCR.G3 TPSH
7LAU	TOPCON NETG3A	383-2216	TPSCR.G3 TPSH

Table 9: GPS receiver and antenna types for the stations submitted by National Geospatial Reference Systems Section, Geoscience Australia.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
ALBY	LEICA GRX1200GGPRO	200527	LEIAT504GG NONE
ANDA	LEICA GRX1200GGPRO	200531	LEIAT504GG SCIS
ARUB	LEICA GRX1200+GNSS	09500005	LEIAR25.R3 NONE
BALA	LEICA GRX1200+GNSS	09310004	LEIAR25.R3 NONE
BBOO	LEICA GRX1200GGPRO	200547	LEIAT504GG SCIS
BDLE	LEICA GR25	2002048	LEIAT504GG SCIS
BEEC	LEICA GR25	200238	LEIAT504GG NONE
BNDY	TRIMBLE NETR5	CR6200538006	ASH701945E_M NONE
BRO1	LEICA GRX1200+GNSS	0937002	LEIAR25.R3 LEIT
BROC	LEICA GRX1200+GNSS	09330036	LEIAR25.R3 NONE
BUR2	LEICA GRX1200GGPRO	103322	LEIAT504 SCIS
BURA	LEICA GRX1200GGPRO	200552	LEIAT504GG SCIS
COOB	LEICA GRX1200+GNSS	09480010	LEIAR25.R3 LEIT
DARM	LEICA GRX1200PRO	42022	ASH701945C_M NONE
DODA	LEICA GRX1200GGPRO	200536	LEIAT504GG NONE
ESPA	LEICA GRX1200GGPRO	200533	LEIAT504GG SCIS
EXMT	LEICA GRX1200+GNSS	09370012	LEIAR25.R3 LEIT
FLND	TRIMBLE NETR9	5220354464	TRM59800.00 SCIS
FROY	LEICA GRX1200+GNSS	09310030	LEIAR25.R3 LEIT
GABO	LEICA GRX1200GGPRO	200229	LEIAT504GG SCIS
HIL1	LEICA GRX1200PRO	CR5200404028	ASH701945C_M NONE
HYDN	LEICA GRX1200GGPRO	200534	LEIAT504GG SCIS
JAB2	LEICA GRX1200GGPRO	103313	LEIAT504 NONE
JERV	TRIMBLE NETR9	5209354434	TRM59800.00 NONE
KALG	LEICA GRX1200GGPRO	200526	LEIAT504GG SCIS
KAT1	LEICA GRX1200+GNSS	09310015	LEIAR25.R3 LEIT
KAT2	TRIMBLE NETR8	4938353446	TRM59800.00 NONE
KELN	LEICA GRX1200GGPRO	200548	LEIAT504GG SCIS
KUNU	LEICA GRX1200+GNSS	200539	LEIAT504GG SCIS
LAMB	TRIMBLE NETR9	5209354411	TRM59800.00 NONE

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
LARR	LEICA GRX1200GGPRO	200535	LEIAT504GG NONE
LIAW	LEICA GRX1200GGPRO	200538	LEIAT504GG SCIS
LKYA	LEICA GRX1200GGPRO	200541	LEIAT504GG SCIS
LONA	LEICA GRX1200+GNSS	09330034	LEIAR25.R3 LEIT
LORD	LEICA GRX1200GGPRO	200702	LEIAT504GG NONE
MAIN	LEICA GRX1200GGPRO	200540	LEIAT504GG NONE
MEDO	LEICA GRX1200+GNSS	10150007	LEIAR25.R3 LEIT
MNGO	TRIMBLE NETR9	5116354148	TRM59800.00 NONE
MTCV	LEICA GRX1200+GNSS	09370010	LEIAR25.R3 LEIT
MTDN	TRIMBLE NETR9	5209354461	TRM59800.00 SCIS
MTEM	LEICA GRX1200+GNSS	5220354497	TRM59800.00 NONE
MTMA	LEICA GRX1200+GNSS	09440004	LEIAR25.R3 LEIT
NCLF	LEICA GRX1200GGPRO	200542	LEIAT504GG SCIS
NHIL	LEICA GRX1200+GNSS	09330004	LEIAR25.R3 NONE
NORF	LEICA GRX1200GGPRO	200696	LEIAT504GG SCIS
NORS	LEICA GRX1200GGPRO	200546	LEIAT504GG SCIS
PTLD	LEICA GR25	200233	LEIAT504GG SCIS
PTSV	LEICA GRX1200GGPRO	200550	LEIAT504GG SCIS
RAVN	LEICA GRX1200GGPRO	200716	LEIAT504GG SCIS
RHPT	LEICA GRX1200GGPRO	103316	LEIAT504 NONE
RKLD	LEICA GRX1200+GNSS	09310006	LEIAR25.R3 NONE
RNSP	LEICA GRX1200+GNSS	09310019	LEIAR25.R3 NONE
SA45	LEICA GRX1200GGPRO	200551	LEIAT504GG SCIS
SPBY	LEICA GRX1200GGPRO	200549	LEIAT504GG SCIS
STR2	TRIMBLE NETR9	4844A59851	TRM59800.00 NONE
STR3	LEICA GRX1200+GNSS	09330013	LEIAR25.R3 NONE
TID1	TRIMBLE NETR8	205	AOAD/M_T JPLA
TOMP	LEICA GRX1200+GNSS	10120010	LEIAR25.R3 LEIT
UCLA	LEICA GRX1200GGPRO	09370004	LEIAR25.R3 NONE
WAGN	LEICA GRX1200+GNSS	09330050	LEIAR25.R3 LEIT
WARA	LEICA GRX1200GGPRO	200677	LEIAT504GG SCIS
WILU	LEICA GRX1200+GNSS	09330021	LEIAR25.R3 LEIT
WLAL	LEICA GRX1200+GNSS	09310008	LEIAR25.R3 LEIT
WMGA	LEICA GRX1200+GNSS	09500008	LEIAR25.R3 LEIT
YAR2	ASHTech UZ-12	371	AOAD/M_T NONE
YAR3	LEICA GRX1200GGPRO	08360001	LEIAR25 NONE
YEEL	LEICA GRX1200GGPRO	200532	LEIAT504GG SCIS
YELO	LEICA GRX1200GGPRO	200523	LEIAT504GG SCIS

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
YNKI	TRIMBLE NETR9	5116354144	TRM59800.00 NONE
YULA	TRIMBLE NETR9	5220354465	TRM59800.00 NONE

Table 10: GPS receiver and antenna types for the station submitted by Saraji Mine, BHP Billiton Mitsubishi Alliance.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
SRB1	TRIMBLE SPS852	30167877	TRM55971.00 NONE

Table 11: GPS receiver and antenna types for the stations submitted by Western Australian Land Information Authority.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
ABNY	TRIMBLE NETR5	30278501	TRM55971.00 NONE
BALI	TRIMBLE NETR5	30973154	TRM57971.00 NONE
BINN	TRIMBLE NETR5	30318060	TRM55971.00 NONE
BODD	TRIMBLE NETR5	31050746	TRM57971.00 NONE
BUSS	TRIMBLE NETR5	30966303	TRM57971.00 NONE
COLL	TRIMBLE NETR5	30975474	TRM57971.00 NONE
CUND	TRIMBLE NETR5	23534390	TRM55971.00 NONE
DMGB	LEICA GX1230+GNSS	13757	LEIAT502 NONE
DOWE	TRIMBLE NETR9	1441043077	TRM57971.00 NONE
DWEL	TRIMBLE NETR5	30337696	TRM55971.00 NONE
HTDG	TRIMBLE NETR5	30767634	TRM57971.00 NONE
HYDE	TRIMBLE NETR5	1440929055	TRM57971.00 NONE
KDAL	TRIMBLE NETR5	30966384	TRM57971.00 NONE
LANN	TRIMBLE NETR5	1440921040	TRM57971.00 NONE
MDAH	TRIMBLE NETR5	23534323	TRM55971.00 NONE
MIDL	TRIMBLE NETR5	23534341	TRM55971.00 NONE
MURK	TRIMBLE NETR9	1441043075	TRM57971.00 NONE
NYAB	TRIMBLE NETR9	1441009249	TRM57971.00 NONE
PINY	TRIMBLE NETR9	1441040387	TRM57971.00 NONE
QUAN	TRIMBLE NETR5	30377293	TRM55971.00 NONE
ROTT	TRIMBLE NETR5	23534347	TRM55971.00 NONE
STRG	TRIMBLE NETR5	1440921100	TRM57971.00 NONE
TORK	TRIMBLE NETR5	23534334	TRM55971.00 NONE
WHIY	TRIMBLE NETR5	30765368	TRM57971.00 NONE

Table 12: GPS receiver and antenna types for the AFN/ARGN/IGS sites.

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
ALIC	LEICA GRX1200GGPRO	09370001	LEIAR25.R3 NONE

Station	GPS receiver type	GPS antenna serial number	IGS antenna type and dome type
CEDU	TRIMBLE NETR8	194	AOAD/M_T AUST
DARW	GRX1200GGPRO	CR13354	ASH700936D_M NONE
HOB2	LEICA GRX1200GGPRO	203	AOAD/M_T NONE
KARR	TRIMBLE NETR8	4938353444	TRM59800.00 NONE
MOBS	LEICA GRX1200GGPRO	CR20020709	ASH701945C_M NONE
PERT	TRIMBLE NETR9	5220354498	TRM59800.00 NONE
STR1	LEICA GRX1200GGPRO	CR620023911	ASH701945C_M NONE
SYDN	JPS E_GGD	CR519994908	ASH701945C_M NONE
TIDB	ASHTECH UZ-12	205	AOAD/M_T JPLA
TOW2	LEICA GRX1200GGPRO	09310016	LEIAR25.R3 NONE
YARR	LEICA GRX1200PRO	103314	LEIAT504 NONE

Table 13: GPS antenna heights to ARP used in GPS processing for the minimally constrained AFN/ARGN/IGS stations.

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
ALIC	50137M001	0.0015	PERT	50133M001	0.0595
CEDU	50138M001	0.0060	STR1	50119M002	0.0040
DARW	50134M001	0.0025	SYDN	50124M003	0.0300
HOB2	50116M004	0.0000	TIDB	50103M108	0.0614
KARR	50139M001	0.0010	TOW2	50140M001	0.0033
MOBS	50182M001	0.0000	YARR	50107M006	0.0045

Table 14: GPS antenna heights to ARP used in GPS processing for the station submitted by RPS Australia East Pty Ltd.

Station	Domes number	Antenna height to ARP (m)
CAVL	-	0.0001

Table 15: GPS antenna heights to ARP used in GPS processing for the station submitted by PMB Peak Downs Mine, BHP Billiton Mitsubishi Alliance.

Station	Domes number	Antenna height to ARP (m)
PDM1	-	0.0140

Table 16: GPS antenna heights to ARP used in GPS processing for the stations submitted by Blackwater Mine, BHP Billiton Mitsubishi Alliance.

Station	Domes number	Antenna height to ARP (m)
BWMA	-	0.000
R10B	-	0.000

Table 17: GPS antenna heights to ARP used in GPS processing for the stations submitted by Department of Natural Resources and Mines, Queensland.

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
BDST	59981M001	0.0000	IPS2	AUM000007	0.0000
BDVL	59931M001	0.0000	JLCK	59928M001	0.0000
BEE2	59980M001	0.0000	KILK	59918M001	0.0000
BULA	59930M001	0.0000	LURA	59917M001	0.0000
CBLT	59979M001	0.0000	MRBA	59924M001	0.0000
CLEV	59978M001	0.0150	ROBI	59976M001	0.0000
COEN	59921M001	0.0000	RSBY	59953M001	0.0000
COOL	59933M001	0.0010	STHG	59932M001	0.0000
DALB	AUM000095	0.0060	TOOG	-	0.0000
GATT	59977M001	0.0000	TOOW	59982M001	0.0000
GGTN	59920M001	0.0000	WARW	AUM000094	0.0030
HNIS	59959M001	0.0000	WOOL	50143M003	0.0000
HUGH	59929M001	0.0000			

Table 18: GPS antenna heights to ARP used in GPS processing for the stations submitted by Land and Property Information, NSW.

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
ANNA	AUM000265	0.0000	MREE	AUM000185	0.0000
ARDL	AUM000289	0.0000	MSVL	AUM000160	0.0000
ARMD	AUM000143	0.0760	MTHR	AUM000261	0.0000
BALN	AUM000180	0.0000	MUDG	AUM000161	0.0000
BATH	AUM000102	0.0000	MWAL	AUM000253	0.0000
BEGA	AUM000199	0.0000	NBRI	AUM000195	0.0000
BING	59942M001	0.0000	NBRK	59915M001	0.0000
BJCT	AUM000298	0.0000	NDRA	AUM000260	0.0000
BKNL	59951M001	0.0000	NEWE	AUM000268	0.0000
BLRN	AUM000262	0.0000	NGAN	AUM000162	0.0000
BOMB	AUM000284	0.0000	NOWE	AUM000272	0.0000
BRBA	AUM000186	0.0030	NSTA	59934M001	0.0000
BRDW	AUM000200	0.0000	NWCS	AUM000182	0.0000
BURK	AUM000299	0.0000	NWRA	AUM000163	0.0000
CBAR	AUM000294	0.0000	OBRN	AUM000211	0.0000
CBLE	AUM000280	0.0000	ORNG	AUM000164	0.0000
CHIP	AUM000144	0.0000	OVAL	AUM000274	0.0000
CKWL	AUM000213	0.0000	PBOT	AUM000165	0.0000
CLBI	AUM000297	0.0000	PERI	AUM000198	0.0000

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
CNBN	59949M001	0.0000	PMAC	AUM000166	0.0000
CNDO	AUM000145	0.0020	PRKS	AUM000252	0.0000
COFF	AUM000146	0.0000	PTKL	50145M004	0.0000
COMA	AUM000193	0.0000	PUTY	AUM000178	0.0000
CRDX	AUM000197	0.0000	RAND	AUM000288	0.0000
CSNO	AUM000147	0.0000	RGLN	AUM000194	0.0000
CTMD	AUM000277	0.0000	RUUS	AUM000296	0.0000
CWN2	AUM000148	0.0000	RYLS	AUM000290	0.0000
CWRA	AUM000181	0.0000	SCON	AUM000212	0.0000
DBBO	AUM000149	0.0020	SNGO	AUM000168	0.0000
DKSN	AUM000150	0.0000	SPWD	AUM000169	0.0000
DLQN	AUM000216	0.0000	TAMW	AUM000170	0.3000
DUNE	AUM000287	0.0000	TARE	AUM000171	0.0000
FORB	AUM000259	0.0000	TBOB	59963M001	0.0000
FTDN	AUM000263	0.0000	TMBA	AUM000210	0.0000
GFEL	AUM000214	0.0000	TMRA	AUM000282	0.0000
GFTH	AUM000151	0.0000	TMUT	AUM000209	0.0000
GFTN	AUM000152	0.0000	TNTR	AUM000172	0.0000
GILG	AUM000279	0.0000	TULL	AUM000293	0.0000
GLBN	AUM000153	0.0000	TURO	59956M001	0.0000
GLIN	AUM000154	0.0000	ULLA	AUM000173	0.0000
GONG	AUM000155	0.1950	UNSW	50190M001	0.0000
GUNN	AUM000271	0.0000	VLWD	AUM000174	0.0000
HAY1	AUM000267	0.0000	WAKL	AUM000283	0.0000
HLBK	AUM000278	0.0000	WARI	AUM000270	0.0000
IHOE	59962M001	0.0000	WGGA	AUM000176	0.0000
INVL	AUM000269	0.0000	WLGT	AUM000177	0.0000
JERI	AUM000215	0.0000	WRRN	AUM000276	0.0000
LGOW	AUM000156	0.0000	WWLG	59988M001	0.0000
LIRI	AUM000292	0.0000	WYNG	AUM000179	0.0000
LKHT	AUM000256	0.0000	YARO	AUM000196	0.0000
MACK	AUM000157	0.0000	YASS	AUM000275	0.0000
MENA	AUM000158	0.0000	YMBA	AUM000273	0.0000
MGRV	AUM000159	0.0000	YUNG	AUM000258	0.0000
MOUL	AUM000255	0.0000			

Table 19: GPS antenna heights to ARP used in GPS processing for the stations submitted by C.R. Kennedy Survey Solutions.

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
ACL2	-	0.0000	JEEB	-	0.0000
ARCD	-	0.0350	JOON	-	0.0260
ARUN	-	0.0000	KARR	-	0.0050
BARA	-	0.0510	KING	-	0.0030
BCMT	-	0.0000	KJNG	-	0.0000
BDMR	-	0.0350	KMRA	-	0.0350
BDRM	-	0.0000	KOUM	-	0.0000
BIND	-	0.0350	KURR	-	0.0000
BLMT	-	0.0000	LAUN	-	0.0000
BMDW	-	0.0000	LITH	-	0.0000
BNBY	-	0.0000	LTSP	-	0.0350
BRTN	-	0.0000	MCLV	-	0.0000
CALN	-	0.0000	MICH	-	0.0000
CANN	-	0.0000	MIDG	-	0.0000
CANV	-	0.0000	MIRA	-	0.0000
CAPL	-	0.0350	MISA	-	0.0000
CARB	-	0.0000	MNDH	-	0.0000
CBTN	-	0.0000	MNVA	-	0.0000
CCMB	-	0.0000	MRYB	-	0.0000
CHCC	-	0.0000	MTB2	-	0.0000
CORY	-	0.0000	MTBL	-	0.0350
CRCW	-	0.0000	MTGA	-	0.0000
CRKA	-	0.0000	MUSW	-	0.0000
CRKB	-	0.0000	NHAV	-	0.0000
CRKM	-	0.0090	OLYM	-	0.0000
CRKP	-	0.0000	PAIN	-	0.0000
CRKS	-	0.0000	PROS	-	0.0000
CRL_	-	0.0000	PTHD	-	0.0000
CRNS	-	0.0000	RIDG	-	0.0000
CUDG	-	0.0000	RLST	-	0.0000
DIXL	-	0.0350	RXBY	-	0.0000
DOCK	-	0.0000	SALT	-	0.0000
DUAR	-	0.0000	SAWG	-	0.0000
DUBO	-	0.0000	SLAD	-	0.0000
DWSN	-	0.0000	TALO	-	0.0350
DYST	-	0.0350	TARO	-	0.0790

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
ENSH	-	0.0000	TCBY	-	0.0000
EUNG	-	0.0000	TERA	-	0.0350
GLAD	-	0.0000	THEO	-	0.0780
GRAS	-	0.0000	TNGL	-	0.0760
GSFD	-	0.0000	TORQ	-	0.0000
GYM2	-	0.0000	TRNG	-	0.0000
HBAY	-	0.0000	TWED	-	0.0000
HBG1	-	0.0000	WLTN	-	0.0000
HBG2	-	0.0000	WNDN	-	0.0350
HNSB	-	0.0000	WWCC	-	0.0000
HOGN	-	0.0000		-	

Table 20: GPS antenna heights to ARP used in GPS processing for the stations submitted by Position Partners Pty Ltd.

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
2FYS	-	0.0000	3DAN	-	0.0000
3CAM	-	0.0000	7LAU	-	0.0000

Table 21: GPS antenna heights to ARP used in GPS processing for the stations submitted by National Geospatial Reference Systems Section, Geoscience Australia.

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
ALBY	50191M001	0.0000	MAIN	59944M001	0.0000
ANDA	59971M001	0.0000	MEDO	59919M001	0.0000
ARUB	59946M001	0.0000	MNGO	59948M001	0.0000
BALA	59947M001	0.0000	MTCV	59965M001	0.0000
BBOO	59997M001	0.0000	MTDN	59922M001	0.0000
BDLE	50196M001	0.0000	MTEM	59954M001	0.0000
BEEC	59986M001	0.0000	MTMA	59958M001	0.0000
BNDY	50185M001	0.0000	NCLF	59916M001	0.0000
BRO1	50176M003	0.0000	NHIL	59960M001	0.0000
BROC	59955M001	0.0000	NORF	50189M001	0.0000
BUR2	50144M003	0.0005	NORS	50194M001	0.0000
BURA	50193M001	0.0000	PTLD	50158M003	0.0000
COOB	59970M001	0.0000	PTSV	50178M003	0.0019
DARM	50184M001	0.0035	RAVN	59967M001	0.0000
DODA	59985M001	0.0000	RHPT	50187M001	0.0000
ESPA	50177M002	0.0000	RKLD	59941M001	0.0000

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
EXMT	59939M001	0.0000	RNSP	59943M001	0.0000
FLND	59936M001	0.0000	SA45	59987M001	0.0305
FROY	59937M001	0.0000	SPBY	50162M004	0.0005
GABO	59983M001	0.0000	STR2	50119M001	0.0015
HIL1	50141S001	0.0000	STR3	50119M005	0.2687
HYDN	50195M001	0.0000	TID1	50103M108	0.0614
JAB2	50136M002	0.0000	TOMP	59935M001	0.0000
JERV	59923M001	0.0000	UCLA	50153M002	0.0000
KALG	50188M001	0.0000	WAGN	59966M001	0.0040
KAT1	59968M001	0.0000	WARA	50198M001	0.0000
KAT2	59968M002	0.0000	WILU	59964M001	0.0000
KELN	50197M001	0.0000	WLAL	59950M001	0.0000
KUNU	59995M001	0.0000	WMGA	59961M001	0.0000
LAMB	59925M001	0.0000	YAR2	50107M004	0.0814
LARR	59984M001	0.0000	YAR3	50107M008	0.0040
LIAW	50192M001	0.0000	YEEL	59996M001	0.0000
LKYA	59952M001	0.0000	YELO	50199M001	0.0000
LONA	59957M001	0.0000	YNKI	59914M001	0.0000
LORD	59998M001	0.0000	YULA	59926M001	0.0000

Table 22: GPS antenna heights to ARP used in GPS processing for the stations submitted by Saraji Mine, BHP Billiton Mitsubishi Alliance.

Station	Domes number	Antenna height to ARP (m)
SRB1	-	0.0380

Table 23: GPS antenna heights to ARP used in GPS processing for the stations submitted by Western Australian Land Information Authority.

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
ABNY	-	0.0000	KDAL	59989M001	0.0000
BALI	59994M001	0.0000	LANN	-	0.0000
BINN	AUM000091	0.0000	MDAH	AUM000093	0.0000
BODD	-	0.0000	MIDL	59990M001	0.0000
BUSS	59993M001	0.0000	MURK	-	0.0000
COLL	59992M001	0.0000	NYAB	-	0.0000
CUND	59991M001	0.0000	PINY	-	0.0000
DMGB	-	0.0000	QUAN	-	0.0280
DOWE	-	0.0000	ROTT	AUM000088	0.0000
DWEL	AUM000092	0.0000	STRG	AUM000100	0.0000

Station	Domes number	Antenna height to ARP (m)	Station	Domes number	Antenna height to ARP (m)
HTDG	-	0.0000	TORK	AUM000089	0.0000
HYDE	-	0.0000	WHIY	AUM000090	0.0000

Method

Analysis was undertaken following the procedures detailed in Geoscience Australia's GPS Analysis Manual for the Verification of Position Issue 1.15.

In summary, daily solutions of the campaign stations and AFN/ARGN/IGS/other site data were processed using Bernese GPS Processing Software version 5.0. The Bernese GPS Software conforms to the IERS2003 conventions. IGS final GPS satellite ephemerides and earth orientation parameters were used in the computations. The double difference carrier phase observables at 30-second epoch intervals were used for GPS data processing. Other measurement modelling and parameter estimation included:

- Receiver clock corrections.
- Absolute antenna elevation-dependent phase centre variation corrections.
- Solid earth tide displacements.
- Ocean tide loading displacements.
- Elevation cutoff of 10° for all observations.
- QIF integer ambiguity resolution strategy.
- Elevation dependent observation weighting.
- Troposphere zenith delays estimated at 1-hour intervals for all stations.
- Minimum constraint condition for daily network solution in terms of the ITRF2008 using subset of the IGS08 reference stations.

This solution was transformed to GDA94 using the transformation approach detailed in: ITRF to GDA94 coordinate transformation, John Dawson and Alex Woods, *Journal of Applied Geodesy* 4 (2010), no. 4, pp. 189-199, available online at <http://www.reference-global.com/loi/jag>.

Results

Tables 24 - 33 list the Root Mean Square (RMS) of the daily station coordinate values. Table 34 - 43 list the station coordinates resulting from the combination of the daily ITRF solutions and their subsequent transformation to GDA94.

Table 24: Root Mean Square (RMS) of daily station coordinates for the station submitted by RPS Australia East Pty Ltd.

Station	North (mm)	East (mm)	Up (mm)
CAVL	0.7	1.5	3.4

Table 25: Root Mean Square (RMS) of daily station coordinates for the station submitted by PMB Peak Downs Mine, BHP Billiton Mitsubishi Alliance.

Station	North (mm)	East (mm)	Up (mm)
PDM1	1.6	0.8	5.2

Table 26: Root Mean Square (RMS) of daily station coordinates for the station submitted by Blackwater Mine, BHP Billiton Mitsubishi Alliance.

Station	North (mm)	East (mm)	Up (mm)	Station	North (mm)	East (mm)	Up (mm)
BWMA	1.4	0.6	3.5	R10B	1.0	0.4	3.9

Table 27: Root Mean Square (RMS) of daily station coordinates for the stations submitted by Department of Natural Resources and Mines, Queensland.

Station	North (mm)	East (mm)	Up (mm)	Station	North (mm)	East (mm)	Up (mm)
BDST	0.7	1.2	4.9	IPS2	0.9	0.6	2.9
BDVL	0.5	0.7	2.6	JLCK	0.5	0.5	2.5
BEE2	2.2	0.9	4.5	KILK	1.1	1.1	2.1
BULA	0.5	0.4	2.9	LURA	1.0	0.5	3.2
CBLT	0.9	0.7	2.9	MRBA	0.7	0.4	3.3
CLEV	1.2	1.2	5.3	ROBI	1.4	0.9	4.3
COEN	1.0	1.3	5.1	RSBY	0.9	0.9	4.9
COOL	0.6	0.5	1.5	STHG	0.6	0.4	1.9
DALB	1.6	0.8	4.9	TOOG	1.2	0.9	3.0
GATT	1.1	0.7	3.7	TOOW	0.8	0.9	3.8
GGTN	0.7	0.5	2.7	WARW	0.9	2.4	2.7
HNIS	1.4	1.2	4.8	WOOL	0.9	0.7	4.8
HUGH	0.7	0.4	2.2				

Table 28: Root Mean Square (RMS) of daily station coordinates for the stations submitted by Land and Property Information, NSW.

Station	North (mm)	East (mm)	Up (mm)	Station	North (mm)	East (mm)	Up (mm)
ANNA	1.3	1.5	5.6	MREE	0.7	1.1	3.4
ARDL	0.3	0.4	3.6	MSVL	1.2	1.2	2.7
ARMD	1.1	0.9	3.1	MTHR	0.9	0.9	3.7
BALN	1.0	1.1	5.9	MUDG	0.6	1.3	3.5
BATH	0.5	0.5	2.7	MWAL	0.5	0.3	3.4
BEGA	0.8	0.7	5.1	NBRI	1.0	0.6	3.9
BING	0.7	0.7	2.1	NBRK	0.4	0.4	2.3
BJCT	0.6	0.4	3.8	NDRA	0.7	0.5	1.7
BKNL	0.4	0.6	2.5	NEWE	0.9	1.0	4.1
BLRN	0.6	1.0	3.4	NGAN	2.5	0.7	6.3
BOMB	0.9	0.5	3.8	NOWE	0.4	0.7	4.5
BRBA	0.8	0.8	2.2	NSTA	0.8	0.6	3.3
BRDW	0.5	1.0	2.8	NWCS	0.7	0.4	4.9
BURK	0.8	0.5	3.5	NWRA	0.9	0.6	3.5
CBAR	0.4	0.7	1.8	OBRN	0.9	0.6	2.5
CBLE	0.7	0.7	3.0	ORNG	1.1	0.9	5.6
CHIP	0.7	0.7	3.1	OVAL	0.8	0.9	1.8
CKWL	0.4	0.6	2.6	PBOT	0.8	0.6	2.4
CLBI	1.0	0.5	6.9	PERI	1.3	0.9	3.0
CNBN	0.8	0.8	3.5	PMAC	0.6	0.7	5.5
CNDO	0.4	0.4	2.7	PRKS	0.9	0.8	2.8
COFF	0.8	0.5	2.6	PTKL	0.6	0.6	4.0
COMA	0.6	1.0	3.4	PUTY	1.8	1.5	6.2
CRDX	0.5	1.5	4.7	RAND	0.5	0.6	6.0
CSNO	0.8	0.8	6.5	RGLN	0.6	0.7	2.8
CTMD	0.4	0.9	1.4	RUUS	0.6	0.6	2.9
CWN2	0.9	0.6	4.2	RYLS	0.6	0.9	4.6
CWRA	1.2	0.9	5.7	SCON	0.6	1.0	3.9
DBBO	0.5	0.7	3.9	SNGO	1.5	1.7	5.0
DKSN	0.7	0.5	1.7	SPWD	0.9	1.1	5.8
DLQN	0.4	0.5	3.7	TAMW	1.5	1.4	4.0
DUNE	0.8	0.6	3.4	TARE	1.0	1.0	3.3
FORB	0.6	0.6	2.0	TBOB	0.6	0.5	3.2
FTDN	0.8	0.9	3.0	TMBA	0.9	1.4	2.4
GFEL	0.9	0.8	3.6	TMRA	0.7	0.6	2.2
GFTH	1.0	0.6	3.5	TMUT	1.1	0.6	4.1

Station	North (mm)	East (mm)	Up (mm)	Station	North (mm)	East (mm)	Up (mm)
GFTN	0.7	0.6	3.0	TNTR	0.7	1.1	3.4
GILG	0.7	0.7	3.8	TULL	0.4	0.7	2.4
GLBN	0.5	0.6	3.0	TURO	0.5	0.4	1.9
GLIN	0.6	0.7	4.6	ULLA	1.2	2.6	9.5
GONG	0.5	0.6	5.0	UNSW	0.9	0.6	2.9
GUNN	1.0	1.0	3.6	VLWD	0.9	0.5	4.5
HAY1	0.6	0.6	4.0	WAKL	0.8	0.6	3.1
HLBK	0.9	0.5	2.6	WARI	0.6	0.9	4.1
IHOE	0.3	0.4	3.5	WGGA	0.9	0.4	3.2
INVL	0.9	0.8	3.1	WLGT	0.6	0.5	3.7
JERI	0.7	0.5	3.7	WRRN	0.7	0.6	1.5
LGOW	1.8	0.7	5.6	WWLG	0.8	0.2	2.7
LIRI	0.8	0.8	4.0	WYNG	0.7	1.1	4.3
LKHT	0.7	0.6	2.1	YARO	0.9	1.2	2.4
MACK	0.6	1.6	7.3	YASS	0.8	0.3	3.6
MENA	0.6	0.8	5.8	YMBA	1.1	0.8	4.5
MGRV	0.9	0.8	2.7	YUNG	0.7	0.3	3.3
MOUL	0.6	0.6	3.9				

Table 29: Root Mean Square (RMS) of daily station coordinates for the stations submitted by C.R. Kennedy Survey Solutions.

Station	North (mm)	East (mm)	Up (mm)	Station	North (mm)	East (mm)	Up (mm)
ACL2	0.5	0.7	3.0	HOGN	1.5	1.1	4.9
ARCD	1.7	1.2	3.7	JEEB	1.3	1.3	5.2
ARUN	1.8	0.7	6.5	JOON	0.9	1.2	3.4
BARA	1.2	0.8	4.4	KARR	0.8	1.0	2.4
BCMT	1.2	1.0	7.1	KING	0.6	1.1	3.1
BDMR	1.2	1.1	4.4	KJNG	1.8	1.0	6.6
BDRM	1.7	1.2	6.0	KMRA	1.4	1.1	6.2
BIND	0.4	1.5	2.2	KOUM	1.7	0.7	4.9
BLMT	1.2	1.2	2.0	KURR	2.5	2.1	8.7
BMDW	1.1	0.7	3.2	LAUN	1.0	0.6	3.3
BNBY	0.9	1.4	2.1	LITH	1.4	1.2	5.8
BRTN	1.9	0.7	6.0	LTSP	1.9	0.5	8.8
CALN	1.4	0.5	2.3	MCLV	0.8	0.5	4.8
CANN	1.0	0.9	3.8	MICH	1.6	1.3	4.8
CANV	2.0	0.8	5.3	MIRA	1.3	1.1	3.9

Station	North (mm)	East (mm)	Up (mm)	Station	North (mm)	East (mm)	Up (mm)
CAPL	1.1	0.6	2.8	MISA	0.8	0.9	2.1
CARB	1.3	0.5	3.0	MNDH	1.5	1.3	5.1
CBTN	0.6	1.4	6.2	MNVA	1.1	1.9	9.1
CCMB	0.8	1.1	4.4	MRYB	1.6	0.9	4.0
CHCC	1.9	1.2	7.9	MTB2	0.9	0.8	3.3
CORY	1.3	1.0	4.4	MTBL	1.3	0.4	3.2
CRCW	1.0	1.7	4.9	MTGA	1.2	1.5	5.7
CRKA	0.7	0.8	1.6	MUSW	1.2	0.7	3.2
CRKB	1.2	1.0	5.6	NHAV	0.5	0.9	2.2
CRKM	1.7	0.9	4.7	OLYM	0.4	0.5	1.9
CRKP	0.8	1.3	3.1	PAIN	1.6	0.7	4.0
CRKS	1.4	3.0	4.3	PROS	0.7	1.3	3.0
CRL_	1.9	1.1	6.4	PTHD	2.2	1.1	8.2
CRNS	1.2	0.7	4.0	RIDG	1.2	0.9	4.2
CUDG	1.4	0.7	3.4	RLST	1.3	0.4	4.6
DIXL	1.0	0.5	5.0	RXBY	1.0	0.8	2.1
DOCK	1.2	0.4	2.3	SALT	1.7	0.9	3.1
DUAR	1.2	0.5	4.6	SAWG	2.4	0.8	11.2
DUBO	1.1	1.3	7.7	SLAD	1.2	0.7	3.2
DWSN	1.4	0.5	6.0	TALO	1.5	1.0	5.9
DYST	1.6	0.3	3.2	TARO	1.1	1.1	5.6
ENSH	1.2	0.4	3.8	TCBY	2.1	2.1	6.5
EUNG	1.6	0.9	4.5	TERA	1.2	0.7	3.1
GLAD	1.3	1.1	5.6	THEO	1.0	1.6	3.8
GRAS	1.1	0.6	3.5	TNGL	1.2	1.0	5.3
GSFD	1.5	2.1	6.1	TORQ	1.7	0.5	3.7
GYM2	0.5	1.3	3.1	TRNG	1.2	0.8	4.3
HBAY	1.0	1.4	3.1	TWED	0.9	1.4	1.9
HBG1	1.7	2.8	6.3	WLTN	0.9	1.2	1.4
HBG2	1.3	2.8	8.6	WNDN	1.3	1.2	6.3
HNSB	1.9	0.9	2.4	WWCC	0.8	0.6	5.0

Table 30: Root Mean Square (RMS) of daily station coordinates for the stations submitted by Position Partners Pty Ltd.

Station	North (mm)	East (mm)	Up (mm)	Station	North (mm)	East (mm)	Up (mm)
2FYS	0.6	1.2	3.9	3DAN	0.9	0.6	2.9
3CAM	0.9	0.6	2.4	7LAU	0.7	0.7	3.9

Table 31: Root Mean Square (RMS) of daily station coordinates for the stations submitted by National Geospatial Reference Systems Section, Geoscience Australia.

Station	North (mm)	East (mm)	Up (mm)	Station	North (mm)	East (mm)	Up (mm)
ALBY	3.0	2.4	4.1	MEDO	0.7	0.9	4.2
ALIC	0.6	0.5	3.0	MNGO	1.2	0.5	4.3
ANDA	0.3	0.5	4.1	MOBS	0.9	0.5	2.5
ARUB	0.9	0.5	1.8	MTCV	0.5	0.3	3.1
BALA	0.7	0.8	2.5	MTDN	0.7	0.6	3.6
BBOO	0.7	0.7	3.8	MTEM	0.9	0.5	2.2
BDLE	0.7	0.5	2.2	MTMA	0.3	0.1	1.5
BEEC	0.5	0.7	1.4	NCLF	0.9	0.6	3.7
BNDY	1.1	0.5	3.7	NHIL	0.6	0.3	2.4
BRO1	0.9	0.5	3.7	NORF	1.7	1.0	3.5
BROC	0.6	0.4	1.7	NORS	0.5	0.6	2.2
BUR2	0.7	0.6	3.4	PERT	0.7	0.7	4.7
BURA	0.7	0.5	3.3	PTLD	0.7	0.4	4.0
CEDU	0.5	0.8	3.6	PTSV	0.5	0.5	4.5
COOB	0.6	0.6	3.2	RAVN	0.8	1.1	3.0
DARM	0.8	0.6	4.1	RHPT	0.8	0.5	1.6
DARW	1.1	0.6	2.6	RKLD	0.8	0.7	2.0
DODA	0.6	0.8	2.9	RNSP	0.5	0.5	3.0
ESPA	0.7	0.3	3.7	SA45	0.8	0.5	5.1
EXMT	0.9	0.9	2.5	SPBY	0.7	0.7	4.0
FLND	0.7	0.3	2.1	STR1	0.5	0.5	1.6
FROY	0.8	0.7	3.6	STR2	0.8	0.5	1.4
GABO	0.8	0.7	3.7	STR3	0.5	0.5	1.7
HIL1	1.1	1.1	4.6	SYDN	1.0	0.7	3.4
HOB2	0.7	1.0	3.5	TID1	0.7	1.0	2.4
HYDN	0.6	0.5	3.2	TIDB	0.9	0.8	1.7
JAB2	1.0	0.8	3.9	TOMP	1.0	0.3	4.6
JERV	0.6	0.7	2.3	TOW2	0.4	0.5	2.2
KALG	0.5	0.8	2.3	UCLA	0.8	0.9	3.9
KARR	2.0	1.0	2.5	WAGN	0.8	0.9	4.0
KAT1	0.7	0.6	4.1	WARA	0.6	0.5	4.6
KAT2	0.6	0.7	3.7	WILU	0.5	0.6	2.0
KELN	0.7	0.6	2.7	WLAL	1.0	0.8	5.4
KUNU	0.9	0.8	2.4	WMGA	0.6	0.4	2.5
LAMB	0.4	0.6	3.0	YAR2	0.6	1.0	3.7
LARR	0.5	0.4	3.5	YAR3	0.4	0.4	2.1

Station	North (mm)	East (mm)	Up (mm)	Station	North (mm)	East (mm)	Up (mm)
LIAW	1.4	0.7	2.3	YARR	0.3	0.2	2.6
LKYA	0.6	0.6	2.6	YEEL	0.5	0.3	2.2
LONA	0.7	0.7	3.0	YELO	0.4	0.5	2.5
LORD	1.8	2.4	4.8	YNKI	0.8	0.5	4.4
MAIN	0.7	1.1	3.1	YULA	0.5	0.8	5.0

Table 32: Root Mean Square (RMS) of daily station coordinates for the station submitted by Saraji Mine, BHP Billiton Mitsubishi Alliance.

Station	North (mm)	East (mm)	Up (mm)
SRB1	0.6	0.7	2.3

Table 33: Root Mean Square (RMS) of daily station coordinates for the stations submitted by Western Australian Land Information Authority.

Station	North (mm)	East (mm)	Up (mm)	Station	North (mm)	East (mm)	Up (mm)
ABNY	1.6	0.7	5.1	KDAL	1.4	1.2	5.0
BALI	0.9	1.0	3.6	LANN	0.6	0.2	4.7
BINN	1.3	0.9	2.8	MDAH	1.3	1.7	5.7
BODD	1.5	1.0	4.1	MIDL	1.1	1.0	3.0
BUSS	1.0	0.9	3.3	MURK	0.8	0.8	3.1
COLL	0.9	1.9	4.4	NYAB	1.1	1.0	4.1
CUND	0.8	1.2	1.8	PINY	0.8	0.9	2.5
DMGB	4.5	1.2	8.9	QUAN	0.9	1.2	4.5
DOWE	0.5	0.5	1.4	ROTT	2.6	1.2	7.3
DWEL	1.0	1.6	2.7	STRG	0.6	1.4	4.3
HTDG	0.7	0.7	3.8	TORK	1.3	1.5	3.6
HYDE	1.0	0.9	3.8	WHIY	0.9	1.2	2.9

Table 34: Computed Geocentric Datum of Australia (GDA94) geodetic coordinates and their uncertainty for the station submitted by RPS Australia East Pty Ltd. The uncertainties are calculated in accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
CAVL	148	3	4.47441	22	8	53.80434	331.1605
			±0.008			±0.007	±0.019

Table 35: Computed Geocentric Datum of Australia (GDA94) geodetic coordinates and their uncertainty for the station submitted by PMB Peak Downs Mine, BHP Billiton Mitsubishi Alliance. The uncertainties are calculated in

accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
PDM1	148	10	27.52674	22	15	13.05950	320.2465
			±0.007			±0.007	±0.018

Table 36: Computed Geocentric Datum of Australia (GDA94) geodetic coordinates and their uncertainty for the stations submitted by Blackwater Mine, BHP Billiton Mitsubishi Alliance. The uncertainties are calculated in accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
BWMA	148	52	42.89396	23	46	9.22286	289.5868
			±0.007			±0.007	±0.018
R10B	148	49	14.05336	23	35	52.93674	261.9299
			±0.007			±0.007	±0.018

Table 37: Computed Geocentric Datum of Australia (GDA94) geodetic coordinates and their uncertainty for the stations submitted by Department of Natural Resources and Mines, Queensland. The uncertainties are calculated in accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
BDST	152	59	42.27818	27	59	13.56952	101.0957
			±0.007			±0.008	±0.018
BDVL	139	20	52.45815	25	54	1.53286	69.2535
			±0.007			±0.007	±0.018
BEE2	153	12	9.07874	27	43	13.21540	54.8086
			±0.008			±0.008	±0.019
BULA	139	54	11.00047	22	54	48.77562	200.6836
			±0.007			±0.007	±0.018
CBLT	152	57	5.45878	27	5	3.97242	83.9394
			±0.007			±0.008	±0.018
CLEV	153	15	59.52268	27	31	34.17662	67.0056
			±0.007			±0.008	±0.018
COEN	143	10	36.12960	13	57	31.58774	254.8036
			±0.008			±0.008	±0.020
COOL	145	40	49.20249	26	44	31.60503	333.8023
			±0.007			±0.007	±0.017
DALB	151	15	49.65027	27	10	13.97534	394.6846

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Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
			±0.008			±0.008	±0.019
GATT	152	19	51.99962	27	32	38.17784	140.5830
			±0.008			±0.008	±0.018
GGTN	143	32	26.26022	18	18	21.49825	367.2252
			±0.007			±0.008	±0.018
HNIS	142	17	46.34459	10	35	25.36780	87.8323
			±0.007			±0.008	±0.019
HUGH	144	12	16.06842	20	56	50.79625	524.1138
			±0.007			±0.008	±0.019
IPS2	152	45	33.62940	27	36	53.76279	88.6425
			±0.008			±0.008	±0.018
JLCK	141	44	20.36258	20	40	9.41011	169.5250
			±0.007			±0.007	±0.018
KILK	152	15	7.42235	26	5	3.22005	250.9043
			±0.007			±0.007	±0.017
LURA	144	27	25.10260	15	34	39.05660	150.7512
			±0.007			±0.008	±0.018
MRBA	145	19	25.78315	17	1	4.64102	645.5204
			±0.007			±0.007	±0.017
ROBI	153	22	52.50836	28	4	37.08915	65.2921
			±0.007			±0.008	±0.018
RSBY	150	47	24.28230	23	9	39.58844	58.2527
			±0.008			±0.008	±0.020
STHG	143	17	7.01035	24	21	0.92247	195.8079
			±0.007			±0.007	±0.016
TOOG	152	21	59.08272	27	5	0.00691	193.6034
			±0.007			±0.008	±0.018
TOOW	151	55	42.43292	27	32	4.00318	685.7717
			±0.008			±0.008	±0.018
WARW	152	1	49.40184	28	12	48.54182	507.4286
			±0.007			±0.007	±0.018
WOOL	153	2	6.96433	27	29	5.88837	91.0536
			±0.008			±0.008	±0.018

Table 38: Computed Geocentric Datum of Australia (GDA94) geodetic coordinates and their uncertainty for the stations submitted by Land and Property Information, NSW. The uncertainties are calculated in accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
ANNA	152	5	10.77370	32	47	5.28731	41.6966
			±0.008			±0.008	±0.020
ARDL	146	54	12.43554	34	21	3.09323	237.5319
			±0.008			±0.008	±0.019
ARMD	151	39	56.97368	30	30	52.62727	1034.7843
			±0.008			±0.008	±0.019
BALN	153	33	50.71983	28	52	21.62989	44.5350
			±0.008			±0.008	±0.020
BATH	149	34	1.95859	33	25	46.90217	756.6209
			±0.008			±0.008	±0.019
BEGA	149	50	31.21206	36	40	33.30663	52.7123
			±0.008			±0.008	±0.019
BING	151	39	8.37323	32	24	42.41120	486.8683
			±0.008			±0.008	±0.019
BJCT	148	57	51.06077	30	6	5.98048	198.1456
			±0.007			±0.008	±0.017
BKNL	141	28	12.34539	31	59	46.68579	307.5148
			±0.008			±0.008	±0.019
BLRN	143	34	2.66312	34	38	45.11536	77.6241
			±0.008			±0.008	±0.020
BOMB	149	14	13.51680	36	54	43.38425	723.1510
			±0.008			±0.008	±0.020
BRBA	150	36	26.24420	30	22	49.26518	537.2214
			±0.008			±0.008	±0.019
BRDW	149	47	6.64939	35	26	47.38551	679.5570
			±0.008			±0.008	±0.020
BURK	145	56	3.44033	30	5	42.99128	136.4084
			±0.008			±0.008	±0.018
CBAR	145	50	10.14437	31	30	49.18126	260.6348
			±0.008			±0.008	±0.019
CBLE	148	22	41.60972	30	57	12.77009	209.3299
			±0.008			±0.008	±0.019
CHIP	151	12	4.37222	33	53	12.80921	55.9012
			±0.008			±0.008	±0.020

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Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
CKWL	149	28	21.04131	34	27	21.86006	916.1770
			±0.008			±0.008	±0.019
CLBI	148	35	7.80136	29	32	33.22813	179.8644
			±0.008			±0.008	±0.020
CNBN	149	16	10.45059	31	19	59.96386	674.8177
			±0.008			±0.008	±0.019
CNDO	147	9	3.61472	33	5	6.58757	229.7387
			±0.008			±0.008	±0.019
COFF	153	8	17.98122	30	18	0.43829	46.5929
			±0.008			±0.008	±0.019
COMA	149	7	37.99580	36	14	7.35726	823.4612
			±0.008			±0.008	±0.019
CRDX	150	46	3.23112	34	19	29.31445	402.1838
			±0.008			±0.008	±0.020
CSNO	153	2	51.25233	28	51	56.07349	69.0820
			±0.008			±0.008	±0.019
CTMD	148	1	32.32736	34	38	21.49767	356.1929
			±0.008			±0.008	±0.019
CWN2	151	10	17.59692	33	35	37.33386	218.0782
			±0.008			±0.008	±0.020
CWRA	148	42	8.31794	33	49	52.48762	333.3734
			±0.008			±0.008	±0.020
DBBO	148	36	7.64028	32	14	57.75194	297.6600
			±0.008			±0.008	±0.019
DKSN	149	8	8.62187	35	15	2.71111	613.8429
			±0.008			±0.008	±0.019
DLQN	144	57	52.63357	35	31	53.84303	110.0425
			±0.008			±0.008	±0.019
DUNE	149	23	17.42274	32	0	42.71083	412.7569
			±0.008			±0.008	±0.019
FORB	148	0	25.08213	33	23	6.97479	269.7995
			±0.008			±0.008	±0.019
FTDN	151	13	30.88384	33	51	18.23313	27.9279
			±0.008			±0.008	±0.019
GFEL	148	9	38.60640	33	53	34.90199	412.5747
			±0.008			±0.008	±0.019
GFTH	146	2	12.43751	34	17	10.73015	161.6623
			±0.008			±0.008	±0.019

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Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
GFTN	152	55	58.43929	29	41	34.93208	59.1992
			±0.008			±0.008	±0.018
GILG	148	39	44.85857	31	42	39.55949	319.4663
			±0.008			±0.008	±0.019
GLBN	149	43	3.76318	34	45	20.50522	678.7260
			±0.008			±0.008	±0.019
GLIN	151	45	5.98253	29	44	36.80308	1205.6866
			±0.008			±0.008	±0.019
GONG	150	53	55.82782	34	25	38.01219	75.6159
			±0.008			±0.008	±0.019
GUNN	150	15	22.60258	30	58	41.42983	303.8309
			±0.008			±0.008	±0.019
HAY1	144	51	8.82104	34	30	19.95330	107.8181
			±0.008			±0.008	±0.020
HLBK	147	19	2.62937	35	43	27.77881	284.6246
			±0.008			±0.008	±0.019
IHOE	143	29	31.40969	32	51	50.92268	151.0238
			±0.007			±0.008	±0.016
INVL	151	6	51.81551	29	46	35.14380	627.2129
			±0.008			±0.008	±0.020
JERI	145	43	31.67957	35	21	19.18904	129.7161
			±0.008			±0.008	±0.019
LGOW	150	9	35.39253	33	28	51.42941	969.4123
			±0.008			±0.008	±0.019
LIRI	147	58	58.41213	29	25	47.06796	186.0271
			±0.008			±0.008	±0.019
LKHT	146	42	20.93771	35	13	38.15764	169.5221
			±0.008			±0.008	±0.020
MACK	152	55	6.16501	30	42	37.59534	43.4360
			±0.008			±0.008	±0.019
MENA	150	44	37.50900	34	7	33.95992	111.4384
			±0.008			±0.008	±0.021
MGRV	150	49	51.54245	33	37	35.49101	45.2397
			±0.008			±0.008	±0.019
MOUL	144	2	9.68772	35	5	27.78231	84.0504
			±0.008			±0.008	±0.019
MREE	149	49	31.97405	29	27	27.82465	245.9703
			±0.008			±0.008	±0.019

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Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
MSVL	150	22	24.21243	34	33	1.95870	703.1915
			±0.008			±0.008	±0.020
MTHR	151	5	56.78164	32	36	55.58896	96.1321
			±0.008			±0.008	±0.020
MUDG	149	35	4.84577	32	35	24.02344	482.4117
			±0.008			±0.008	±0.020
MWAL	145	59	18.44461	35	59	35.33100	144.2593
			±0.008			±0.008	±0.019
NBRI	149	47	10.87633	30	19	48.47119	253.7299
			±0.008			±0.008	±0.018
NBRK	145	48	50.52518	29	40	37.77703	181.4733
			±0.008			±0.008	±0.019
NDRA	146	32	15.11272	34	45	6.86740	169.1505
			±0.008			±0.008	±0.019
NEWE	151	47	19.47743	32	55	26.31537	30.1798
			±0.008			±0.008	±0.020
NGAN	147	11	40.39978	31	33	50.07345	204.0410
			±0.008			±0.008	±0.019
NOWE	151	42	58.59014	31	30	48.81423	886.7008
			±0.008			±0.008	±0.020
NSTA	150	26	38.76370	29	2	43.99516	458.2989
			±0.008			±0.008	±0.019
NWCS	151	45	54.82063	32	55	46.51105	52.9531
			±0.008			±0.008	±0.020
NWRA	150	36	17.31203	34	52	25.58378	46.5746
			±0.008			±0.008	±0.019
OBRN	149	51	27.37610	33	42	14.23450	1137.4011
			±0.008			±0.008	±0.019
ORNG	149	5	52.87985	33	17	6.72320	906.9414
			±0.008			±0.008	±0.018
OVAL	148	38	45.77720	32	45	13.86716	409.4756
			±0.008			±0.008	±0.019
PBOT	151	12	43.38718	33	58	26.51849	34.5379
			±0.008			±0.008	±0.020
PERI	148	24	35.88117	36	24	40.66109	1753.8096
			±0.008			±0.008	±0.020
PMAC	152	53	51.63168	31	27	42.88792	43.8992
			±0.008			±0.008	±0.020

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
PRKS	148	10	35.26530	33	8	5.05591	367.5505
			±0.008			±0.008	±0.019
PTKL	150	54	49.30152	34	28	31.99637	34.5549
			±0.008			±0.008	±0.019
PUTY	150	39	34.25315	32	57	10.96999	296.4904
			±0.008			±0.008	±0.020
RAND	146	34	42.60973	35	35	37.62696	179.3137
			±0.008			±0.008	±0.019
RGLN	149	39	17.93075	33	24	56.40307	780.9462
			±0.008			±0.008	±0.019
RUUS	141	16	8.29164	34	2	32.99201	39.1390
			±0.008			±0.008	±0.019
RYLS	149	58	36.02164	32	47	32.83404	611.0340
			±0.008			±0.008	±0.019
SCON	150	52	10.70910	32	3	4.89363	247.5848
			±0.008			±0.008	±0.020
SNGO	151	10	32.68926	32	33	29.66461	75.2694
			±0.008			±0.008	±0.020
SPWD	150	33	50.17116	33	41	54.76973	399.5044
			±0.008			±0.008	±0.020
TAMW	150	55	51.28567	31	5	34.29314	439.6462
			±0.008			±0.008	±0.020
TARE	152	27	49.65668	31	54	43.95007	44.8835
			±0.008			±0.008	±0.019
TBOB	142	3	26.70671	29	27	0.60688	191.1505
			±0.008			±0.008	±0.019
TMBA	148	0	41.47934	35	46	39.69380	667.0038
			±0.008			±0.008	±0.020
TMRA	147	32	3.85875	34	26	47.24118	319.5743
			±0.008			±0.008	±0.019
TMUT	148	13	12.63285	35	18	3.93949	306.1132
			±0.008			±0.008	±0.020
TNTR	152	1	11.70394	29	3	17.19619	901.1791
			±0.008			±0.008	±0.020
TULL	147	34	10.92052	32	37	55.97163	271.3865
			±0.008			±0.008	±0.018
TURO	150	7	19.89596	36	2	6.54448	53.3331
			±0.008			±0.008	±0.018

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
ULLA	150	27	55.22171	35	21	43.10391	63.1260
			±0.008			±0.008	±0.021
UNSW	151	13	54.63300	33	55	3.63448	86.9794
			±0.008			±0.008	±0.019
VLWD	150	58	37.79226	33	52	50.30948	42.6771
			±0.008			±0.008	±0.020
WAKL	144	22	51.56391	35	27	19.24644	91.7359
			±0.008			±0.008	±0.018
WARI	150	34	27.12036	29	32	26.11447	372.1093
			±0.008			±0.008	±0.019
WGGA	147	22	9.46446	35	6	25.87662	215.9898
			±0.007			±0.008	±0.017
WLGT	148	7	0.97565	30	1	24.21843	170.3264
			±0.008			±0.008	±0.019
WRRN	147	50	11.18983	31	42	2.93989	229.1351
			±0.008			±0.008	±0.019
WWLG	147	19	18.03028	33	42	12.36732	359.7525
			±0.008			±0.008	±0.018
WYNG	151	25	26.31915	33	16	57.18783	57.9493
			±0.008			±0.008	±0.018
YARO	151	55	19.99605	31	14	10.84111	996.6430
			±0.008			±0.008	±0.019
YASS	148	54	47.68454	34	50	41.68024	522.7266
			±0.008			±0.008	±0.019
YMBA	153	21	28.41352	29	26	50.80004	43.6305
			±0.008			±0.008	±0.019
YUNG	148	16	57.88364	34	18	13.55422	444.9621
			±0.008			±0.008	±0.019

Table 39: Computed Geocentric Datum of Australia (GDA94) geodetic coordinates and their uncertainty for the stations submitted by C.R. Kennedy Survey Solutions. The uncertainties are calculated in accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
ACL2	151	41	58.62005	27	16	13.08162	509.4526
			±0.008			±0.008	±0.020
ARCD	148	51	28.32236	25	16	18.40264	381.1957

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Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
			±0.008			±0.008	±0.020
ARUN	153	22	26.49989	27	56	26.13530	60.6571
			±0.008			±0.008	±0.020
BARA	149	47	44.95257	24	9	32.46967	144.7353
			±0.008			±0.008	±0.020
BCMT	153	11	37.05905	28	7	31.26377	586.7804
			±0.008			±0.008	±0.020
BDMR	149	31	19.21503	25	30	37.69260	295.5943
			±0.008			±0.008	±0.020
BDRM	153	4	9.00864	26	41	4.77841	182.2931
			±0.008			±0.008	±0.020
BIND	149	2	50.90769	26	39	54.36176	366.7524
			±0.008			±0.008	±0.021
BLMT	115	55	31.04907	31	56	49.35724	-15.1601
			±0.008			±0.008	±0.020
BMDW	147	59	17.07577	21	47	50.38073	312.9977
			±0.008			±0.008	±0.020
BNBY	115	38	17.27906	33	19	9.08148	-22.3831
			±0.008			±0.008	±0.021
BRTN	147	14	38.18290	42	44	20.84196	28.1831
			±0.008			±0.008	±0.019
CALN	148	46	35.14110	20	53	54.49549	82.7269
			±0.008			±0.008	±0.020
CANN	140	55	1.84806	21	51	45.53942	301.8179
			±0.008			±0.008	±0.022
CANV	148	40	19.18430	20	17	20.63970	74.3669
			±0.008			±0.008	±0.021
CAPL	148	2	24.02193	23	7	18.49256	315.3126
			±0.008			±0.008	±0.020
CARB	148	14	54.93900	21	59	37.44635	335.8602
			±0.008			±0.008	±0.020
CBTN	150	49	12.50162	34	3	47.86104	101.2933
			±0.008			±0.008	±0.021
CCMB	147	37	21.74641	22	43	35.09935	339.0582
			±0.008			±0.008	±0.020
CHCC	153	7	3.14447	30	17	43.28375	49.9298
			±0.008			±0.008	±0.020
CORY	152	54	39.59460	26	24	58.14967	164.4906

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Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
			±0.008			±0.008	±0.020
CRCW	150	16	28.59999	25	17	29.57730	351.8989
			±0.008			±0.008	±0.020
CRKA	138	35	20.90259	34	56	1.89809	49.2677
			±0.008			±0.008	±0.020
CRKB	153	2	49.72176	27	26	27.81271	56.0416
			±0.008			±0.008	±0.020
CRKM	144	54	24.68318	37	49	30.67280	19.4920
			±0.008			±0.008	±0.019
CRKP	115	50	28.30707	31	56	33.01675	0.9584
			±0.008			±0.008	±0.020
CRKS	151	11	6.07567	33	55	25.29733	43.4138
			±0.008			±0.008	±0.019
CRL_	153	25	17.44646	27	32	15.79359	157.9189
			±0.008			±0.008	±0.020
CRNS	145	45	29.92849	16	56	8.61633	72.0261
			±0.008			±0.008	±0.021
CUDG	147	16	32.91266	22	11	37.74628	298.6960
			±0.008			±0.008	±0.020
DIXL	150	16	15.13514	23	56	37.55407	179.8568
			±0.008			±0.008	±0.020
DOCK	144	56	38.92470	37	48	42.12237	30.9507
			±0.008			±0.008	±0.019
DUAR	149	48	48.44382	23	41	13.78390	125.3019
			±0.008			±0.008	±0.021
DUBO	148	36	10.98803	32	14	48.10770	297.2967
			±0.008			±0.008	±0.019
DWSN	150	1	38.79744	24	33	34.49265	181.0292
			±0.008			±0.008	±0.021
DYST	148	30	0.32734	22	35	54.67271	232.5686
			±0.008			±0.008	±0.020
ENSH	148	31	12.89329	23	28	41.94317	243.6687
			±0.008			±0.008	±0.020
EUNG	148	29	37.95794	21	7	51.74452	741.6323
			±0.008			±0.008	±0.020
GLAD	151	15	15.91660	23	50	28.61213	84.9925
			±0.008			±0.008	±0.020
GRAS	149	18	16.98225	21	21	26.66574	108.8048

Results of the National GNSS CORS Campaign, June 2013

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
			±0.008			±0.008	±0.020
GSFD	151	19	42.89901	33	25	13.68426	44.9386
			±0.008			±0.008	±0.020
GYM2	152	39	36.15960	26	11	18.65461	120.4635
			±0.008			±0.008	±0.020
HBAY	152	49	35.60633	25	16	58.93631	66.8934
			±0.008			±0.008	±0.021
HBG1	150	59	8.05506	34	11	16.51803	258.8722
			±0.008			±0.008	±0.020
HBG2	150	56	21.47877	34	8	25.37856	290.0209
			±0.008			±0.008	±0.020
HNSB	151	5	51.53628	33	42	1.17104	228.2260
			±0.008			±0.008	±0.019
HOGN	148	58	1.95561	21	21	21.69315	322.0699
			±0.008			±0.008	±0.022
JEEB	152	39	29.49822	27	39	4.92931	108.7633
			±0.008			±0.008	±0.020
JOON	115	44	59.73749	31	43	56.72253	25.4939
			±0.008			±0.008	±0.020
KARR	116	50	38.88837	20	44	4.44599	10.2245
			±0.008			±0.008	±0.021
KING	151	50	22.98977	26	32	24.60829	484.8056
			±0.008			±0.008	±0.021
KJNG	150	47	30.17613	33	30	42.86178	102.4456
			±0.008			±0.008	±0.020
KMRA	149	27	54.90116	23	7	19.14545	141.4311
			±0.008			±0.008	±0.020
KOUM	149	14	35.71652	21	36	23.33017	91.3645
			±0.008			±0.008	±0.020
KURR	151	29	28.88560	32	47	56.23691	74.4740
			±0.008			±0.008	±0.022
LAUN	147	8	45.53433	41	26	4.87741	66.5269
			±0.008			±0.008	±0.020
LITH	150	2	28.59833	33	19	29.87180	946.8157
			±0.008			±0.008	±0.019
LTSP	149	0	43.64023	22	17	53.05953	201.1231
			±0.008			±0.008	±0.020
MCLV	138	32	36.14754	35	13	4.88073	66.1421

Results of the National GNSS CORS Campaign, June 2013

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
			±0.008			±0.008	±0.020
MICH	149	8	50.78801	35	43	7.65909	870.9576
			±0.008			±0.008	±0.019
MIRA	148	51	48.17113	21	9	35.63561	112.2989
			±0.008			±0.008	±0.020
MISA	139	29	13.65521	20	44	11.60456	404.4774
			±0.008			±0.008	±0.020
MNDH	115	42	39.72604	32	31	47.09512	-26.8400
			±0.008			±0.008	±0.020
MNVA	148	3	39.85826	23	54	34.41401	323.1541
			±0.010			±0.010	±0.043
MRYB	139	15	42.13056	35	8	58.43896	36.2833
			±0.008			±0.008	±0.020
MTB2	138	51	37.50024	35	3	48.35874	332.3175
			±0.008			±0.008	±0.020
MTBL	147	38	45.86258	23	19	27.42012	328.8110
			±0.008			±0.008	±0.020
MTGA	140	46	51.72386	37	49	59.09893	48.6463
			±0.008			±0.008	±0.019
MUSW	150	56	20.36718	32	15	5.57151	278.1023
			±0.008			±0.008	±0.019
NHAV	138	29	22.18523	34	47	37.78658	11.0257
			±0.008			±0.008	±0.020
OLYM	136	53	26.20686	30	26	21.90245	106.4662
			±0.008			±0.008	±0.020
PAIN	144	4	4.03589	38	26	31.59612	40.0955
			±0.008			±0.008	±0.019
PROS	151	35	47.40510	26	9	27.43574	402.4350
			±0.008			±0.008	±0.020
PTHD	118	36	19.92407	20	24	43.43725	16.3524
			±0.008			±0.008	±0.019
RIDG	150	12	32.75184	23	17	15.57060	127.5686
			±0.008			±0.008	±0.020
RLST	148	23	48.74014	24	24	23.96626	309.1668
			±0.008			±0.008	±0.021
RXBY	136	54	7.48829	30	33	29.19292	115.6643
			±0.008			±0.008	±0.021
SALT	153	34	29.53918	28	16	18.24380	48.9640

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
			±0.008			±0.008	±0.020
SAWG	151	25	47.48069	32	45	31.04612	103.8561
			±0.008			±0.008	±0.020
SLAD	149	13	32.28729	21	4	0.85087	105.8063
			±0.008			±0.008	±0.020
TALO	149	6	47.83138	26	2	26.32660	370.1458
			±0.008			±0.008	±0.021
TARO	149	53	40.23884	25	48	5.01627	275.0222
			±0.008			±0.008	±0.020
TCBY	153	0	12.17343	25	55	7.83000	59.7641
			±0.008			±0.008	±0.021
TERA	148	47	4.12981	23	57	38.29288	329.0337
			±0.008			±0.008	±0.020
THEO	150	4	31.64516	24	56	55.03476	218.5516
			±0.008			±0.008	±0.021
TNGL	150	34	24.69153	24	29	30.31660	247.1266
			±0.008			±0.008	±0.020
TORQ	144	18	35.62299	38	19	19.00628	58.0049
			±0.008			±0.008	±0.019
TRNG	151	53	57.39735	26	47	43.55440	495.2968
			±0.008			±0.008	±0.019
TWED	153	24	0.91164	28	20	56.14439	80.6623
			±0.008			±0.008	±0.020
WLTN	115	52	46.66792	32	2	32.64961	-11.1626
			±0.008			±0.008	±0.020
WNDN	150	1	1.95973	26	7	25.58962	343.6710
			±0.008			±0.008	±0.020
WWCC	147	22	16.33597	35	6	34.67434	207.5326
			±0.008			±0.008	±0.019

Table 40: Computed Geocentric Datum of Australia (GDA94) geodetic coordinates and their uncertainty for the stations submitted by Position Partners Pty Ltd. The uncertainties are calculated in accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
2FYS	149	10	29.05534	35	19	30.33362	603.3351
			±0.007			±0.008	±0.018

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
3CAM	144	58	12.69155	37	39	0.03399	156.5130
			±0.007			±0.008	±0.017
3DAN	145	13	2.47418	38	1	57.82870	24.5556
			±0.007			±0.008	±0.018
7LAU	147	11	3.15270	41	26	45.64903	37.3780
			±0.007			±0.008	±0.018

Table 41: Computed Geocentric Datum of Australia (GDA94) geodetic coordinates and their uncertainty for the stations submitted by National Geospatial Reference Systems Section, Geoscience Australia. The uncertainties are calculated in accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
ALBY	117	48	36.64961	34	57	0.84508	36.7294
			±0.007			±0.007	±0.017
ALIC	133	53	7.84803	23	40	12.44598	603.3548
			±0.007			±0.007	±0.017
ANDA	137	9	36.34836	30	27	11.86849	101.4782
			±0.007			±0.007	±0.018
ARUB	125	55	27.65241	31	48	32.83550	104.2853
			±0.007			±0.007	±0.018
BALA	123	52	4.97182	32	27	38.82245	130.8713
			±0.007			±0.007	±0.017
BBOO	136	3	31.20740	32	48	37.28621	288.7351
			±0.007			±0.007	±0.018
BDLE	147	39	21.68355	37	45	31.01257	126.0429
			±0.008			±0.007	±0.018
BEEC	146	39	27.85395	36	20	47.20960	443.0426
			±0.007			±0.007	±0.017
BNDY	152	19	15.60713	24	54	29.62410	80.1202
			±0.008			±0.008	±0.020
BRO1	122	12	32.69101	18	0	14.33354	42.3448
			±0.007			±0.007	±0.016
BROC	144	12	14.43037	36	1	53.07866	131.5423
			±0.007			±0.007	±0.016
BUR2	145	54	53.45458	41	3	0.26107	3.9024
			±0.007			±0.008	±0.017
BURA	117	10	28.69102	30	31	31.90369	327.9871

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
			±0.007			±0.007	±0.017
CEDU	133	48	35.37567	31	52	0.01671	144.8202
			±0.007			±0.008	±0.019
COOB	134	43	21.25274	29	2	4.99204	230.3935
			±0.007			±0.007	±0.017
DARM	130	53	29.35763	12	25	26.46101	83.1730
			±0.007			±0.007	±0.018
DARW	131	7	57.84792	12	50	37.35867	125.2238
			±0.007			±0.007	±0.018
DODA	131	11	12.56034	13	50	4.50780	90.6358
			±0.007			±0.007	±0.018
ESPA	121	53	39.54897	33	52	27.57626	32.5277
			±0.007			±0.007	±0.018
EXMT	114	6	48.13126	21	57	38.45021	16.5287
			±0.007			±0.007	±0.017
FLND	148	14	29.67729	40	12	51.80933	7.6033
			±0.007			±0.008	±0.017
FROY	125	48	1.60233	18	7	33.47652	156.0151
			±0.007			±0.007	±0.018
GABO	149	54	54.70655	37	34	5.28415	24.0079
			±0.007			±0.007	±0.017
HIL1	115	44	18.87926	31	49	31.90488	-27.1908
			±0.007			±0.007	±0.018
HOB2	147	26	19.43582	42	48	16.98552	41.1322
			±0.007			±0.007	±0.017
HYDN	118	53	30.73635	32	26	57.80223	300.1497
			±0.007			±0.007	±0.017
JAB2	132	53	40.30946	12	39	36.56616	82.6407
			±0.007			±0.007	±0.019
JERV	136	6	2.38638	22	51	37.92638	382.0569
			±0.007			±0.007	±0.017
KALG	121	27	33.30205	30	47	3.83830	338.0964
			±0.007			±0.007	±0.017
KARR	117	5	49.87276	20	58	53.16974	109.2353
			±0.007			±0.007	±0.017
KAT1	132	9	11.76527	14	22	33.63353	184.4104
			±0.007			±0.007	±0.018
KAT2	132	9	9.00218	14	22	30.29311	184.3500

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Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
			±0.007			±0.007	±0.018
KELN	117	42	9.46548	31	37	20.37925	253.1372
			±0.007			±0.007	±0.018
KUNU	128	45	45.42580	15	40	37.09210	92.0033
			±0.007			±0.007	±0.018
LAMB	134	3	46.53892	26	56	19.03785	311.3448
			±0.007			±0.007	±0.018
LARR	133	12	45.90842	15	34	23.39693	229.4491
			±0.007			±0.007	±0.018
LIAW	146	40	23.08315	41	54	8.17811	1054.3449
			±0.007			±0.007	±0.016
LKYA	130	49	29.00221	12	27	19.71276	69.3987
			±0.007			±0.007	±0.018
LONA	121	19	8.58048	28	52	42.38984	354.3158
			±0.007			±0.007	±0.017
LORD	159	3	40.31102	31	31	11.61100	71.5017
			±0.007			±0.007	±0.018
MAIN	134	5	34.33223	14	2	46.35701	162.4689
			±0.008			±0.008	±0.020
MEDO	114	36	34.36182	26	45	26.63317	109.8985
			±0.008			±0.008	±0.019
MNGO	143	39	6.18770	38	46	47.26718	62.6944
			±0.007			±0.008	±0.019
MOBS	144	58	31.20673	37	49	45.89894	40.6757
			±0.007			±0.007	±0.017
MTCV	133	12	24.11502	25	56	44.51358	545.0042
			±0.007			±0.007	±0.016
MTDN	131	29	33.78671	22	7	58.12555	672.6036
			±0.007			±0.007	±0.018
MTEM	143	26	56.04546	37	35	15.46515	518.0803
			±0.007			±0.007	±0.017
MTMA	117	50	35.12086	28	6	55.17055	389.5515
			±0.007			±0.007	±0.016
NCLF	116	7	23.75073	34	42	30.18646	71.2516
			±0.007			±0.007	±0.017
NHIL	141	38	45.61955	36	18	30.34618	139.0333
			±0.007			±0.007	±0.016
NORF	167	56	19.78726	29	2	36.06691	159.1045

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Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
			±0.008			±0.007	±0.019
NORS	121	47	14.04390	32	15	36.10209	461.2646
			±0.007			±0.007	±0.017
PERT	115	53	6.88632	31	48	7.09668	12.7682
			±0.007			±0.007	±0.017
PTLD	141	36	48.48524	38	20	39.85550	0.9605
			±0.007			±0.007	±0.017
PTSV	138	29	8.56195	35	5	40.95686	57.8123
			±0.007			±0.007	±0.018
RAVN	120	4	15.17425	33	35	48.31701	205.8096
			±0.007			±0.007	±0.017
RHPT	145	57	42.61940	41	3	54.48451	25.9555
			±0.007			±0.008	±0.018
RKLD	137	50	5.25732	19	58	3.45646	276.3582
			±0.008			±0.008	±0.020
RNSP	133	48	59.52451	18	23	16.41555	348.5616
			±0.007			±0.007	±0.016
SA45	137	56	3.56716	32	28	13.07681	201.9754
			±0.007			±0.007	±0.017
SPBY	147	55	51.04975	42	32	47.20562	1.1573
			±0.007			±0.008	±0.018
STR1	149	0	36.17982	35	18	55.93953	800.0323
			±0.007			±0.007	±0.017
STR2	149	0	36.54752	35	18	58.19916	802.5802
			±0.007			±0.008	±0.018
STR3	149	0	35.53434	35	18	56.51969	799.0167
			±0.007			±0.007	±0.017
SYDN	151	9	1.35698	33	46	51.18419	85.6857
			±0.007			±0.008	±0.018
TID1	148	58	47.98445	35	23	57.15619	665.4189
			±0.007			±0.007	±0.017
TIDB	148	58	47.98444	35	23	57.15618	665.4200
			±0.007			±0.008	±0.017
TOMP	117	24	1.09575	22	50	47.26822	434.7057
			±0.007			±0.007	±0.017
TOW2	147	3	20.46535	19	16	9.42804	88.2192
			±0.007			±0.007	±0.017
UCLA	128	52	59.32730	31	40	46.54030	68.7443

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
			±0.007			±0.007	±0.018
WAGN	117	24	36.32661	33	19	59.06139	289.0310
			±0.007			±0.007	±0.017
WARA	128	17	46.20597	25	2	13.95629	587.2657
			±0.007			±0.007	±0.018
WILU	120	13	6.10034	26	37	32.47801	491.5164
			±0.007			±0.007	±0.017
WLAL	120	38	36.56685	19	46	43.02109	21.1941
			±0.007			±0.007	±0.016
WMGA	134	21	16.27704	19	56	0.14824	416.4619
			±0.007			±0.007	±0.018
YAR2	115	20	49.10009	29	2	47.61678	241.3711
			±0.007			±0.007	±0.017
YAR3	115	20	49.72804	29	2	47.40382	242.5342
			±0.007			±0.007	±0.016
YARR	115	20	49.08940	29	2	47.74254	241.4315
			±0.007			±0.007	±0.016
YEEL	135	47	3.74897	34	8	38.97288	169.8105
			±0.007			±0.007	±0.017
YELO	119	38	44.85705	31	17	26.52179	347.2349
			±0.007			±0.007	±0.017
YNKI	146	13	5.54333	38	48	44.07050	34.6758
			±0.007			±0.007	±0.017
YULA	130	56	29.63348	25	13	51.82206	512.3395
			±0.008			±0.007	±0.018

Table 42: Computed Geocentric Datum of Australia (GDA94) geodetic coordinates and their uncertainty for the station submitted by Saraji Mine, BHP Billiton Mitsubishi Alliance. The uncertainties are calculated in accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
SRB1	148	16	52.45992	22	25	17.15288	301.7914
			±0.008			±0.008	±0.020

Table 43: Computed Geocentric Datum of Australia (GDA94) geodetic coordinates and their uncertainty for the station submitted by Western Australian Land Information Authority. The uncertainties are calculated in accordance with the principles of the ISO Guide to the Expression of Uncertainty in Measurement (1995), with an interval estimated to have a confidence level of 95% at the time of verification. The combined standard uncertainty was converted to an expanded uncertainty using a coverage factor, k , of 2.

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
ABNY	117	53	11.59826	35	1	37.77401	-12.7758
			±0.008			±0.008	±0.019
BALI	115	50	33.19292	33	46	0.09741	177.4810
			±0.008			±0.008	±0.019
BINN	115	41	51.06124	33	9	11.51285	-23.7166
			±0.008			±0.008	±0.019
BODD	116	26	57.74416	32	57	56.81996	565.6008
			±0.008			±0.008	±0.019
BUSS	115	18	31.75504	33	40	27.71885	-26.2386
			±0.008			±0.008	±0.019
COLL	116	18	1.74095	33	17	23.01302	207.9706
			±0.007			±0.007	±0.018
CUND	117	20	40.19585	31	43	42.72742	282.7114
			±0.008			±0.008	±0.018
DMGB	118	35	12.67482	20	18	43.58411	9.4278
			±0.008			±0.008	±0.019
DOWE	116	58	10.22951	31	16	1.88081	272.0347
			±0.008			±0.008	±0.018
DWEL	116	3	45.13514	32	42	48.81557	233.8879
			±0.007			±0.007	±0.018
HTDG	114	36	38.49775	28	46	22.81254	-14.3993
			±0.008			±0.008	±0.019
HYDE	118	55	15.81700	32	28	39.65301	339.9456
			±0.008			±0.008	±0.018
KDAL	115	5	54.79195	34	9	48.44252	44.3290
			±0.008			±0.008	±0.019
LANN	115	20	47.64442	31	2	47.27038	-9.7708
			±0.008			±0.008	±0.018
MDAH	115	43	45.18922	32	32	7.14203	-18.2121
			±0.008			±0.008	±0.019
MIDL	116	0	19.61783	31	53	11.47334	-6.7581
			±0.008			±0.008	±0.018
MURK	116	40	57.28344	31	44	21.79352	213.2084
			±0.008			±0.008	±0.018

Station	Longitude (DMS east) Uncertainty (m)			Latitude (DMS south) Uncertainty (m)			Ellipsoidal height (m) Uncertainty (m)
NYAB	118	10	29.84141	33	39	56.27001	321.9987
			±0.008			±0.008	±0.018
PINY	116	58	46.77950	32	29	28.37338	347.3601
			±0.008			±0.008	±0.018
QUAN	114	36	49.47580	28	46	12.99127	-13.4479
			±0.008			±0.008	±0.019
ROTT	115	31	44.40538	31	59	40.08256	-13.9446
			±0.008			±0.008	±0.018
STRG	115	49	9.51525	31	51	58.34169	0.0564
			±0.007			±0.007	±0.017
TORK	115	35	3.57383	31	29	44.54346	-11.6917
			±0.008			±0.008	±0.018
WHIY	116	1	41.03494	32	17	51.12815	200.4450
			±0.008			±0.008	±0.019

END OF REPORT