Product data specification

Vicmap™ Position

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Version 1.0 October 2020

Applies to data model 1.0 July 2020

AS/NZS ISO 19131:2008 compliant

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# Document history

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| --- | --- | --- | --- |
| Version | Date | Author | Note |
| 1.0 | October 2020 | J LeLievre  N Tengku  K Halewood | First version |

This document has been formatted and structured in compliance with AS/NZS ISO 19131:2008 Geographic Information – Data product specifications.

# Publication Approval

Before this is approved - compliant metadata must be completed in MetaShare.

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# Overview

## Vicmap™

Vicmap™ is the foundation that underlies most spatial information in Victoria. This portfolio of spatial related authoritative data products, made up from individual datasets, is developed and managed by the Department of Environment, Land, Water & Planning. The information provides the foundation to Victoria’s primary mapping and spatial information systems, and is for building business information and systems.

Vicmap is a registered trademark of the Victorian Government and is synonymous with authoritative statewide mapping since 1975.

The Vicmap portfolio includes:

|  |  |
| --- | --- |
| Vicmap Address  Vicmap Admin  Vicmap Crown Land Tenure  Vicmap Elevation  Vicmap Features of Interest  Vicmap Hydro  Vicmap Imagery | Vicmap Lite  Vicmap Planning  Vicmap Position  Vicmap Property  Vicmap Topographic Mapping  Vicmap Transport  Vicmap Vegetation |

Vicmap data is supported by a collection of Reference Tables, Vicmap Reference Tables. A reference table may list the full name, description and other attributes associated with a feature code or identifier.

Further information can be found at [www.delwp.vic.gov.au/vicmap](http://www.delwp.vic.gov.au/vicmap)

## Data product specification title

Vicmap™ Position

## Responsible party

Department of Environment, Land, Water and Planning

PO Box 500, Melbourne VIC 3001 Australia

[vicmap.info@delwp.vic.gov.au](mailto:vicmap.info@delwp.vic.gov.au)

[gpsnet.support@delwp.vic.gov.au](mailto:gpsnet.support@delwp.vic.gov.au)

## Terms and definitions

For the purpose of this document, the following terms and definitions apply.

|  |  |
| --- | --- |
| **Term** | **Definition** |
| ANZLIC ID | A unique identifier enabling metadata records to be discovered and differentiated within a structured data library. |
| Attribute | A characteristic of a feature that may occur as a type or an instance. |
| Custodian | An organisation responsible for ensuring the accuracy, currency, distribution of their data and the terms and conditions of access and use. |
| Data type | Specification of a value domain with operations allowed on values in this domain  Refer to AS/NZS ISO 19103 |
| Dataset | Identifiable collection of data. Maybe as small as a single feature or feature attribute contained within a larger dataset. A hardcopy map maybe considered a dataset.  Refer to AS/NZS ISO 19115 |
| Datum | A system which allows the location of latitudes and longitudes (and heights) to be identified onto the surface of the Earth. |
| Domain | A well-defined set both necessary and sufficient, as everything that satisfies the definition in the set and everything that does not satisfy the definition is necessarily outside the set.  Refer to ISO/TS 19103 |
| the Department | Meaning the Department of Environment, Land, Water & Planning (DELWP). |
| Entity | A unit of data that can be classified and have stated relationship with other entities. |
| Feature | An abstraction of real-world phenomena. A feature may occur as a type or an instance. Feature type or instance shall be used when only one is meant.  The feature structure of the feature based data model can be summarised as:  feature instance = [spatial object + attribute object] |
| Geodetic framework | A geodetic framework forms the foundation for the creation of spatial data. Consisting of monumented points whose locations have been accurately determined with respect to a mathematical framework, this system permits the spatial referencing of all land data to identifiable positions on the Earth’s surface. A geodetic reference framework provides not only an accurate and efficient means for positioning data, but it also provides a uniform, effective language for interpreting and disseminating land information. (<https://www.nap.edu/read/11803/chapter/4>) |
| GPS time | A time scale maintained by the atomic clocks of satellites and ground control stations of the GPS constellation. It consists of a count of weeks and seconds of the week since 0 hours (midnight) Sunday 6 January 1980. |
| Metadata | Metadata is ‘data about data’ and provides a synopsis about the data lineage, accuracy and details about access permissions.  Refer to ISO 19115 Geographic information ― Metadata |
| Persistent Feature Identifier (PFI) | The unique code provide at creation of the feature which remains until the feature is retired. |
| Product | Dataset or dataset series that conforms to a data product specification. |
| Projection | A system of mathematics and geometry whereby the information on the surface of a sphere (the Earth) is able to be transferred onto a flat piece of paper (a map). |
| Quality | Totality of characteristics of a product that bear on its ability to satisfy stated and implied needs. Refer to:  ISO 19113 Geographic information ― Quality principles  ISO 19114 Geographic information ― Quality evaluation procedures |
| the State | Victoria. |
| Unique Feature identifier (UFI) | Each feature is uniquely identified and renewed with each change. |

## Acronyms

For the purpose of this document, the following acronyms may apply.

|  |  |
| --- | --- |
| **Acronym** | **Definition** |
| AHD | Australian Height Datum |
| DALA | DELWP Data Access License Agreement |
| DELWP | Department of Environment, Land, Water & Planning |
| DSV | Data Share Victoria |
| GDA2020 | Geocentric Datum of Australia 2020 |
| GDA94 | Geocentric Datum of Australia 1994 |
| GLONASS | Globalnaya Navigatsionnaya Sputnikovaya Sistema (Russian GNSS Constellation) |
| GNSS | Global Navigation Satellite Systems |
| GPSnet | Vicmap Position – GPSnet™ |
| LUV | Land Use Victoria |
| NES | Notification for Editing Service |
| SDM | Spatial DataMart *(to be replaced by DataShare Victoria)* |
| SGV | Surveyor-General Victoria |
| SMES | Survey Marks Enquiry Service |
| VGDD | Victorian Government Data Director |
| VLN | Victorian Levelling Network |
| VMPosition | Vicmap Position |

## Informal description of the data product

Vicmap Position includes Victoria's authoritative database of survey marks and a Global Navigation Satellite System (GNSS) correction service for precise positioning.

The products consist of two main arms:

Vicmap Position – Survey Control is the State’s database of permanent and cadastral survey marks, which may also be refered to as survey monuments, survey benchmarks or geodetic marks. They are placed by surveyors to mark key survey points on the Earth's surface and support surveying property boundaries, road building, construction activity, mapping and other geodetic surveys. The Survey Mark Enquiry Service (SMES) publishes this data as the primary means of accessing survey mark information for Victoria. This is sourced from Surveyor-General Victoria (SGV) and product updates are made available weekly through the Vicmap maintenance lifecycle.

Vicmap Position – GPSnet™ is a integrated network of Continually Operating Reference Stations (CORS) that supports precise positioning throughout Victoria. Accurate positioning information is provided in real time or for post-processing. Stakeholders include surveying and mapping, precision agriculture and the construction industry.

# Specification scope

### Level

Dataset & Service

### Extent & coverage

Vicmap Position covers the State of Victoria.

# Data product identification

### Title

Vicmap Position

### Alternative title

VMPosition

GPSnet

Vicmap Position – GPSnet

VICpos

MELBpos

SMES

### Abstract

#### Vicmap Position – Survey Control

A feature-based dataset containing information on survey control mark. Survey control marks are valuable infrastructure that support surveying of property boundaries, development and construction activities, mapping and environmental monitoring. The survey control marks hold accurate coordinate and height information and provide a point of reference for surveying activities.

Key information within the spatial dataset include:

* Nine figure number
* Coordinate and height information
* Mark source and derivation technique
* Uncertainty
* Mark status

The dataset is regularly updated by SGV and registered users through the LASSI-SMES application (<https://maps.land.vic.gov.au/lassi/SmesUI.jsp>).

#### Vicmap Position – GPSnet

Vicmap Position – GSPnet has been developed in cooperation with all levels of government, industry, academic institutions and the community to provide accurate and reliable positioning services across Victoria. Vicmap Position data is available from wireless Internet enabled devices with position correction accuracies achievable to centimetre level (depending on CORS baseline separation,

equipment and techniques used). Vicmap Position support services including a statewide Differential GNSS (DGNSS) networked solution, Networked Real Time Kinematic (NRTK), local Single Base RTK and post processing data accessible via the Internet (http://gnss.vicpos.com.au or www.delwp.vic.gov.au/

gpsnet).

### Topic category

Location

Land Geodesy

# Data content and structure

### Data content

Vicmap Position – Survey Control contains feature-based vector data (points) to represent survey marks. It contains the following datasets:

|  |  |  |  |
| --- | --- | --- | --- |
| **ANZLIC ID** | **Dataset name** | **Description** | **Feature type** |
| ANZVI0803005828 | SMES\_FULL | Point locational survey marks | Point |

Table 1: Datasets that comprise Vicmap Position.

There are four components to Vicmap Position - GPSnet:

|  |  |
| --- | --- |
| **Component** | **Description** |
| Infrastructure | Continuously Operating Reference Station (CORS) network infrastructure using a combination of GNSS satellite constellations, which includes statewide coverage using GPS, GLONASS, QZSS, BeiDou and Galileo. The first GPSnet site was built in 1995 at Ballarat and the Victorian network now contains more than 120CORS. |
| Vicmap Position – NRTK | Network Real Time Kinematic (NRTK) positioning service based on Virtual Reference Station (VRS) technology, where CORS network baselines are  approximately 50–70km, providing a nominal horizontal accuracy of ±2cm. |
| Vicmap Position – Single base RTK | Real Time Kinematic (RTK) positioning providing a nominal horizontal accuracy of ±2cm within 20km of a CORS. |
| Post procressing | Receiver INdependent Exchange Format (RINEX) files from each CORS are available online for the last 24 months, with older data available upon request. Epoch rates available include 1, 2, 5, 10, 15, 20, 30 & 60 seconds. RINEX is the standard data format for raw satellite navigation data. |

### Data models

See Appendix A.

The Vicmap Position product data model is published on the Department’s website [www.delwp.vic.gov.au/vicmap](http://www.delwp.vic.gov.au/vicmap).

### Data dictionary

See Appendix B.

### Data structure

Vector file, with survey mark details attributed to the geodetic framework for the State, represented as points.

# Reference systems

#### Vicmap Position – Survey Control

Vicmap Position is mapped to the Geocentric Datum of Australia 1994 (GDA94), Geocentric Datum of Australia 2020 (GDA2020) and the Australian Height Datum (AHD). Data is held in geographic latitude and longitude coordinates.

#### Vicmap Position – GPSnet

Vicmap Position – GPSnet has been outputting GDA2020 coordinates since 9th February 2019 for all network and single base mount points. All Rinex data from that date onward is stored in GDA2020 and all data prior to this date is stored in GDA94. GPSnet publishes the current coordinates for each Victorian CORS the GPSnet website in both GDA2020 and GDA94 for quick reference.

The temporal reference system for Vicmap is the Gregorian calendar.

# Data quality

## Accuracy

#### Vicmap Position – Survey Control

The primary means to access the accuracy of a survey mark is through the published technique, followed by the horizontal and vertical uncertainty values. Only uncertainties that are derived from the ‘adjusted’ technique are considered reliable as they are derived from the National Geodetic Adjustment (GDA2020) and the Victorian Levelling Network (VLN) adjustment (AHD). Uncertainty is not assigned to marks that do not feature in the nation or state network adjustment datasets.

The following procedures are undertaken as normal update/maintenance routines, to ensure conformity of the data to specification:

* Customised menus for data editing which provide on the fly logical consistency attribute checking as data is edited;
* Automated data QA processes to validate topological integrity, completeness and logical consistency;
* Automated data loading routines, reflecting business rules for data population, to ensure data accuracy;
* Independent review of data upon loading including aspatial attributes, spatial extents and successful data load;
* Validation of accepted types according to approved reference tables;
* Validation of entity PFI/UFI tags for uniqueness.

#### Vicmap Position – GPSnet

Each GPSnet CORS has a Regulation 13 Certificate, which is a legal document certifying the station coordinate and associated uncertainty. These certificates provide stakeholders with an accurate connection to the National Datum –GDA2020.

Within Victoria and extending to 100kms outside of the border GPSnet customers can expect to achieve +/- 2cms horizontal accuracy when using a network corrected mount point.

## Feature and attribute accuracy

Accuracy of the GPSnet CORS coordinates are referenced in the Regulation 13 certificates and are valid for up to 5 years and then renewed. Certification is also renewed in the event of an antenna change or if there is movement outside the tolerance monitored at a site.

## Completeness

#### Vicmap Position – Survey Control

The SMES Database contains all registered survey mark information within Victoria, and Vicmap Position – Survey Control provides a weekly snapshot of the database. Survey marks are regularly added, edited and updated through registered user Submissions. SGV also conducts regular surveys to continuously extend and enhance the SCN (GDA) and VLN (AHD) in order to support surveying activities.

#### Vicmap Position – GPSnet

There are more than 120 CORS located around Victoria with approximately 70km baselines between neighbouring sites. This configuration allows statewide network coverage such that any customer can expect to achieve +/- 2 cms horizontal accuracy anywhere, anytime. RINEX data from each CORS is stored online for up to 24 months and then stored offline beyond that.

# Data capture

#### Vicmap Position – Survey Control

Survey Control is the State’s database of permanent and cadastral survey marks, which may also be refered to as survey monuments, survey benchmarks or geodetic marks. They are placed by surveyors to mark key survey points on the Earth's surface and support surveying property boundaries, road building, construction activity, mapping and other geodetic surveys. The Survey Control dataset contains information submitted by registered users, organisations and authorities.

#### Vicmap Position – GPSnet

Each Vicmap Position – GPSnet CORS is designed to run 24/7/365 with the data from each CORS being sent in real time to two cloud-based data centres. RINEX data from each CORS are stored and made available for post processing subscribers.

# Data maintenance

Vicmap products can change under one of the following three terms:

* *Vicmap maintenance* - The incorporation of new data to an existing dataset via an M1, spatial change requests or scheduled Custodial supply. No changes are made to the data or object model, therefore does not require change management processes. Additions can be seen in the weekly Vicmap update.
* *Vicmap Improvements* – Changing existing data, example the moving of a feature or adding of attributes. Typically carried out as part of a project through the provision of new Custodial data requiring change management.
* *Vicmap upgrades* – Significant changes to a dataset that may see existing data over a large area replaced and/or may require the data model changed. Change management processes are applied.

Approximately 5% of all maintenance advice notices processed are separately audited by DELWP to confirm accuracy, completeness and correctness in the capture process.

# Data product delivery

## Access & licensing

#### Vicmap Position – Survey Control

Vicmap Position – Survey Control is freely available through the Victorian Government Data Directory (VGDD) at [www.data.vic.gov.au](http://www.data.vic.gov.au) under a Creative Commons Attribution 4.0 Australia license.

The Victorian Government Data Directory also provides details such as:

* Timetable for release
* Usage and availability restrictions
* License restrictions and conditions
* Access constraints
* Exclusion of liability
* Supply and media formats
* Projections.

Vicmap is also available through a network of Data Service Providers listed at: [www.delwp.vic.gov.au/vicmapdsp](http://www.delwp.vic.gov.au/vicmapdsp)

Historical versions of Vicmap data is only available under special and exceptional circumstances, such as a legal proceeding, and may incur an administration fee.

#### Vicmap Position – GPSnet

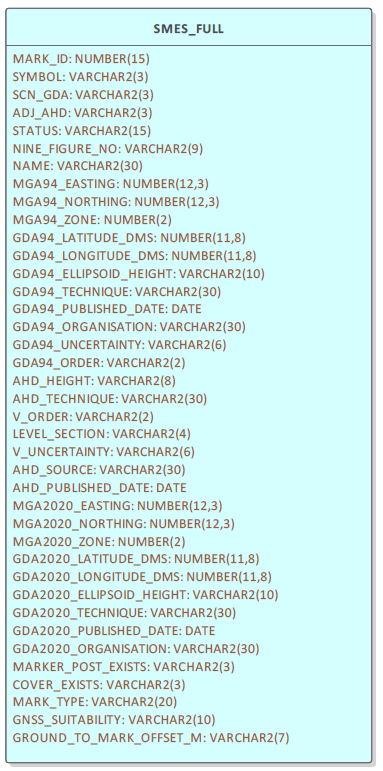
Vicmap Position – GPSnet used to be a subscription based service. Since 1st January 2019 DELWP began transitioning customers who previously subscribed directly to GPSnet GNSS CORS services to an alternative supplier. DELWP no longer accepts new direct to GPSnet subscriptions or registrations.   
  
Instead customers who require access to both real-time or RINEX GNSS Data will need to obtain a new GNSS CORS correction subscription from an alternative supplier listed below.  
  
Geoscience Australia (GA).  
GA provides FREE access to both real-time and RINEX GNSS Data across the entire country  
For archive GNSS RINEX Data please visit https://data.gnss.ga.gov.au/  
For Real-time GNSS Data via the Geoscience Australia Caster please visit https://www.auscors.ga.gov.au/  
  
[AllDayRTK (Topcon)](https://www.alldayrtk.com.au/), [HxGN SmartNetAus (Leica)](http://smartnetaus.com/SpiderWeb/frmIndex.aspx) and [VRSNow (Trimble)](https://vrsnow.com.au/Map/SensorMap.aspx) each operate a commercial network of stations across the country providing subscription based access to both real-time and RINEX GNSS Data.

# Metadata

The metadata, abstract, and preview for the datasets within Vicmap products can be viewed at DataSearch Victoria (DSV) located at [www.delwp.vic.gov.au/datasearch](http://www.delwp.vic.gov.au/datasearch) by searching for the ANZLIC ID.

# Appendix A: Data & object models

Vicmap data models can be located at [www.delwp.vic.gov.au/vicmap](http://www.delwp.vic.gov.au/vicmap).



# Appendix B: Data dictionary

Index to fields (attributes)

| **VMPOSITION Attribute** | **Definition** | **Explanation** | **Field type/size** | **Examples** |
| --- | --- | --- | --- | --- |
| MARK\_ID | Persistent Feature Identifier | Uniquely identifies each address record. Persists through either attribute or spatial representation changes. i.e. Remains for the life of the feature it identifies. | NUMBER(15) | Example mark ID: 30763 |
| SYMBOL | Survey mark symbols | The survey mark symbols displayed on the LASSI-SMES map platform. Survey mark symbols used as a tool to visually classify marks according to its type.  Please email [smes.support@delwp.vic.gov.au](mailto:smes.support@delwp.vic.gov.au) to request for SVG files used within the application. | VARCHAR2(3) | Options include:   * ASCT = SCN (GDA) & Adjusted AHD mark – Blue triangle with bold green circle symbol * ASC = Non-SCN (GDA) & Adjusted AHD mark – Bold green circle symbol * SCT = SCN (GDA) & AHD mark – Blue triangle with green circle symbol * SC = Non-SCN (GDA) & AHD mark – Green circle symbol * SST = SCN (GDA) & Estimated AHD – Blue triangle with pink square symbol * NS = Non-SCN (GDA) & Estimated AHD – Pink square symbol * ST = SCN (GDA) – Blue triangle symbol * SP = PCM – Blue cross symbol * NA = Non-SCN (GDA) – Arrow symbol * D = Defective - Red dot symbol |
| SCN\_GDA | Survey Control Network (GDA) status | Determines whether the survey mark is from the SCN (GDA) adjustment. SCN\_GDA marks with STATUS other than ‘OK’ are treated as Non-SCN. | VARCHAR2(3) | SCN\_GDA options:-   * Y = Yes, survey mark is an SCN (GDA) mark * N = No, survey mark is Non-SCN (GDA) mark |
| ADJ\_AHD | Level-Adjusted AHD status | Determines whether the survey mark is a level-adjusted AHD. Attribute/ field labelled as SCN\_AHD prior to 13/9/2020. | VARCHAR2(3) | SCN\_AHD options:-   * Y = Yes, survey mark is a level-adjusted AHD mark * N = No, survey mark is estimated AHD mark |
| STATUS | Mark status | Provides the current status of the mark. Registered users can submit for an update to the mark status from the Update Existing Mark feature (within the LASSI-SMES application). | VARCHAR2(15) | Options include:   * OK * ABANDONED * DAMAGED * DESTROYED * DISTURBED * NIPPLE DAMAGED * NOT FOUND * NOT USED * PLAQUE MISSING * REMOVED * REPLACED * SUSPECT * UNKNOWN * UNSTABLE |
| NINE\_FIGURE\_NO | Nine Figure Number | The nine-figure number is a mark identifier with parish specified by the first set of four digits, permanent mark number specified in the second set of four digits and mark type specified in the last digit. Each mark has a unique nine-figure number.  List of parish town numbers can be retrieved from the following document: <https://prov.vic.gov.au/sites/default/files/files/ParishTownnumbers.pdf>  Mark type with the value of zero (0) indicates a primary mark, while values 1-9 indicate that it is an eccentric mark with its associated eccentric mark number. One permanent mark number may have multiple eccentric points. | VARCHAR2(9) | Breakdown for an example nine figure number (346300030) are as follows -  Mark name: St. Arnaud PM 3  Parish number: 3463 (St. Arnaud)  Permanent mark number: 0003  Mark type: 0 (Primary mark) |
| NAME | Primary name for survey mark | This field shows the primary name for a survey mark. Majority marks follow the <PARISH NAME> PM <MARK NUMBER> convention.  Older or legacy permanent marks may have a combination of primary and secondary names. A full list of secondary names can be retrieved from individual mark reports in the LASSI-SMES application. Note that not all primary mark names follow the standard SMES permanent mark naming convention. | VARCHAR2(30) | Example name: ST. ARNAUD PM 3 |
| MGA94\_EASTING | Easting coordinates of MGA94 | Survey mark easting coordinate in MGA94 datum. Map projection zone specified in MGA\_ZONE\_94 field. | NUMBER(12,3) | Example value:  701661.657 |
| MGA94\_NORTHING | Northing coordinates of MGA94 | Survey mark northing coordinate in MGA94 datum. Map projection zone specified in MGA\_ZONE\_94 field. | NUMBER(12,3) | Example value:  5945762.944 |
| MGA94\_ZONE | Zone of MGA94 coodinates | MGA projection zone of survey mark coordinates. Zones determined using Regulation 10 of Survey Co-ordination Regulations 2014, which specifies the appropriate MGA zone to be used for cadastral surveys. | NUMBER(2) | Example value:  *54* |
| GDA94\_LATITUDE\_DMS | Latitude of GDA94 in degrees minutes seconds format | Survey mark latitude coordinate in GDA94 datum. Values formatted in degrees, minutes and seconds (DMS) (also known as HP notation). Note these values are not in displayed in decimal degress (DD) format. | NUMBER(11,8) | Example value:  -36.36444339 |
| GDA94\_LONGITUDE\_DMS | Longitude of GDA94 in degrees minutes seconds | Survey mark longitude coordinate in GDA94 datum. Values formatted in degrees, minutes and seconds (DMS) (also known as HP notation). Note these values are not in displayed in decimal degress (DD) format. | NUMBER(11,8) | Example value:  143.1517658 |
| GDA94\_ELLIPSOID\_HEIGHT | Ellipsoidal height of GDA94 in meters | Survey mark ellipsoidal height value in GDA94 datum. Note that ellipsoidal height is different to orthometric height. For orthometric height, please refer to AHD\_HEIGHT field. | VARCHAR2(10) | Example value:  248.308 |
| GDA94\_TECHNIQUE | Technique used to derive GDA94 | Specifies technique used to derive (horizontal) GDA94 coordinates. Technique used provides an estimated accuracy and uncertainty of the coordinate.  Only uncertainties that are derived from the ‘ADJUSTED’ technique are considered reliable as they are derived from the National or Jurisdiction Geodetic Adjustment. | VARCHAR2(30) | Options include:   * ADJUSTED * CADASTRAL * DIGITISED * GPS (DIFFERENTIAL) * GPS (KINEMATICS) * GPS (SINGLE POINT) * INTERSECTION * PLOT * RADIATION * RESECTION * TRANSFORMED * TRAVERSE * TRIANGULATION * UNCHECKED RADIATION * UNKNOWN * Null = No recorded information |
| GDA94\_PUBLISHED\_DATE | Published date for GDA94 coordinate | Published date for GDA94 coordinates following Gregorian Calendar convention. | DATE | Example value: 2019-09-01T00:00:00.000 |
| GDA94\_ORGANISATION | Origin of GDA94 data according to organization. | Specifies the origin of GDA94 data according to organization. | VARCHAR2(30) | Example: SGV = Indicates official coordinates published by SGV |
| GDA94\_UNCERTAINTY | Uncertainty of GDA94 coordinate | Specifies the uncertainty of GDA94 coordinates in metres.  For the purpose of this schema, the uncertainty for GDA2020 coordinates are identical to GDA94. | VARCHAR2(6) | Example value: 0.043 |
| GDA94\_ORDER | Order of GDA94 coordinate | Specifies the order of the GDA94. Refer to GDA\_UNCERTAINTY for a more accurate representation of uncertainty.  For the purpose of this schema, the order for GDA2020 coordinates are identical to GDA94. | VARCHAR2(2) | Options include:   * 0 = <4 ROOT K * 1 = 4 ROOT K * 2 = 8 ROOT K * 3 = 12 ROOT K * 4 = 50 ROOT K * 5 = 100 ROOT K * 99 = >1000 ROOT K * Null = No recorded information |
| AHD\_HEIGHT | AHD height value in metres | Provides orthometric height values (AHD) in metres. | VARCHAR2(8) | Example value:  249.201 |
| AHD\_TECHNIQUE | Technique used to derive AHD | Specifies technique used to orthometric heights (AHD). Technique used influences the accuracy and uncertainty of the height value.  Only uncertainties that are derived from the ‘ADJUSTED’ technique are considered reliable as they are derived from the VLN adjustment. | VARCHAR2(30) | Options include:   * 2ND ORDER * 3RD ORDER * 4TH ORDER * DERIVED FROM AUSGEOID * GPS * SPIRIT LEVELLING * TRIG HEIGHTING * UNKNOWN * VERTICAL ANGLES * ZEROTH ORDER * Null = No recorded information |
| V\_ORDER | Order of AHD value | Specifies the order of the AHD value. Refer to V\_UNCERTAINTY for a more accurate representation of uncertainty. | VARCHAR2(2) | Options include   * 0 = Ellipse 3MM * 1 = Ellipse 7.5mm * 2 = Ellipse 15mm * 3 = Ellipse 30mm * 4 = Ellipse 50mm * 5 = Ellipse 100mm * 99 = Ellipse >1000mm * Null = No recorded information |
| LEVEL\_SECTION | Level section of AHD mark | Specifies the level section of the AHD mark. Level sections are attributed to level booknames used to define the original AHD adjustment. Not all level adjusted marks have an associated level section.  Further information on the determination of AHD is given in Division of National Mapping Technical Report No. 12, The Adjustment of the Australian Levelling Survey, 1970–71 (2nd edition, 1975). | VARCHAR2(4) | Example value:  245 |
| V\_UNCERTAINTY | Vertical/height uncertainty | Specifies the uncertainty of AHD heights in metres. More accurate uncertainties are derived from level adjusted AHD values. | VARCHAR2(6) | Example value:  0.036 |
| AHD\_SOURCE | Source of AHD data | Specifies the source of AHD data according to organization. | VARCHAR2(30) | Example: SGV = Indicates official AHD values sourced from SGV |
| AHD\_PUBLISHED\_DATE | Published date for AHD values | Published date for AHD values following the Gregorian Calendar convention. | DATE | Example value: 2019-09-01T00:00:00.000 |
| MGA2020\_EASTING | Easting coordinates of MGA2020 | Survey mark easting coordinate in MGA2020 datum. Map projection zone specified in MGA\_ZONE\_2020 field. | NUMBER(12,3) | Example value:  701661.657 |
| MGA2020\_NORTHING | Northing coordinates of MGA2020 | Survey mark northing coordinate in MGA2020 datum. Map projection zone specified in MGA\_ZONE\_2020 field. | NUMBER(12,3) | Example value:  5945762.944 |
| MGA2020\_ZONE | Zone of MGA2020 coodinates | MGA projection zone of survey mark coordinates. Zones determined using Regulation 10 of Survey Co-ordination Regulations 2014, which specifies the appropriate MGA zone to be used for cadastral surveys. | NUMBER(2) | Example value:  *54* |
| GDA2020\_LATITUDE\_DMS | Latitude of GDA2020 in degrees minutes seconds format | Survey mark latitude coordinate in GDA2020 datum. Values formatted in degrees, minutes and seconds (DMS) (also known as HP notation). Note these values are not in displayed in decimal degress (DD) format. | NUMBER(11,8) | Example value:  -36.36444339 |
| GDA2020\_LONGITUDE\_DMS | Longitude of GDA2020 in degrees minutes seconds | Survey mark longitude coordinate in GDA2020 datum. Values formatted in degrees, minutes and seconds (DMS) (also known as HP notation). Note these values are not in displayed in decimal degress (DD) format. | NUMBER(11,8) | Example value:  143.1517658 |
| GDA2020\_ELLIPSOID\_HEIGHT | Ellipsoidal height of GDA2020 in meters | Survey mark ellipsoidal height value in GDA2020 datum. Note that ellipsoidal height is different to orthometric height. For orthometric height, please refer to AHD\_HEIGHT field. | VARCHAR2(10) | Example value:  248.308 |
| GDA2020\_TECHNIQUE | Technique used to derive GDA2020 | Specifies technique used to derive (horizontal) GDA2020 coordinates. Technique used influences the accuracy and uncertainty of the coordinate.  Only uncertainties that are derived from the ‘ADJUSTED’ technique are considered reliable as they are derived from the National Geodetic Adjustment. | VARCHAR2(30) | Options include:   * ADJUSTED * CADASTRAL * DIGITISED * GPS (DIFFERENTIAL) * GPS (KINEMATICS) * GPS (SINGLE POINT) * INTERSECTION * PLOT * RADIATION * RESECTION * TRANSFORMED * TRAVERSE * TRIANGULATION * UNCHECKED RADIATION * UNKNOWN * Null = No recorded information |
| GDA2020\_PUBLISHED\_DATE | Published date for GDA2020 coordinate | Published date for GDA2020 coordinates following the Gregorian Calendar convention. | DATE | Example value: 2019-09-01T00:00:00.000 |
| GDA2020\_ORGANISATION | Source organization for GDA2020 data | Specifies the origin of GDA2020 data according to organization. | VARCHAR2(30) | Example: SGV = Indicates official coordinates published by SGV |
| MARKER\_POST\_EXISTS | Indicates whether a marker post exists at the physical mark location | Indicates whether a marker post exists at the physical mark location. Marker posts are used to flag the approximate physical location of a survey mark. Note, not all entries have recorded information. | VARCHAR2(3) | MARKER\_POST\_EXISTS options:-   * Y = Yes, survey mark has a marker post * N = No, survey mark does not have a marker post * Null = No recorded information |
| COVER\_EXISTS | Indicates whether a mark cover exists at the physical mark location | Indicates whether a mark cover exists at the physical mark location. Survey marks with covers are typically placed below ground. Note, not all entries have recorded information. | VARCHAR2(3) | COVER\_EXISTS options:-   * Y = Yes, survey mark has a cover * N = No, survey mark does not have a cover * Null = No recorded information |
| MARK\_TYPE | Description of physical survey mark type | Describes the physical survey mark type. Mark type provides an indication on the physical stability of the mark. | VARCHAR2(20) | Options include:   * cross = cross head nail * deep = deep driven rod * other * pipe * plaque * rivet * star = star picket * Null = no recorded information |
| GNSS\_SUITABILITY | Indicates suitability for GNSS observations | Used to determine whether the physical survey marks are suitable for GNSS observations. ‘Good’ indicates clear skyview while ‘poor’ indicates the the presence of significant obstruction. Field is typically updated by registered user input. | VARCHAR2(10) | Options include:   * good = clear sky view * moderate = partial sky obstruction * poor = significant sky obstruction * Null = no recorded information |

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