# Victoria Flood Database update specification

## 1. Purpose

This document provides detailed specifications for the modification and update of spatial data and associated attributes in the Victorian Flood Database (VFD).

It is expected that Catchment Management Authorities (CMA), Shires and Councils will use this document as a standard when commissioning consultants to prepare data destined to be loaded into VFD master datasets. It is assumed that CMAs will be actively involved in all flood mapping projects in their region, even if they have not directly commissioned the work.

It is recommended that users of this specification familiarise themselves with the 3 appendices to this document prior to commencing any update work:

Appendix 1: Data structure of attribute tables

Appendix 2: Validation and lookup tables

Appendix 3: VFD update protocols

## 2. Flood mapping themes

The VFD was originally established following the Flood Data Transfer Project (FDTP), which was carried out in 1998 - 2000 and involved the systematic collection, collation, analysis and presentation of flood information in GIS and hard copy format. Historic, interpreted and other flood related data for major regional urban and rural floodplains in Victoria, excluding the Melbourne metropolitan area, were captured. Project outputs included GIS layers under several flood related themes in ESRI ArcInfo coverage format. The datasets are being continually modified and updated over time.

The VFD currently comprises the following 26 layers of data:

- Extent_{n}y_ari (x 10 layers) eg. Extent_100y_ari
- Contour_{n}y_ari (x 7 layers) eg. Contour_100y_ari
- Flood_structure
- Floodway
- Flow_direction
- Historic_contour
- Historic_extent
- Historic_height_pt
- Levee
- Levee_spotheight
- Running_distance

## 3. Update protocols

In order to ensure the currency and quality of the VFD datasets, it is critical that established Metadata and data standards are adhered to. This will ensure that all flood related data developed or collected by stakeholders will be in the appropriate format and thus be able to be uploaded into the state-wide master datasets. Key requirements are:

- Adherence to this Specification
- Adherence to VFD Dataset Update Protocols (appended to this document)

- Adherence to the VFD Metadata
- Correct use of established codes, numbering systems and file names
- Supply of clean, Quality Assured data in required GIS data format and precision
- Free of digitisation errors
- Free of attribution errors
- Correct topology and coordinate system

## *4. Storage and Maintenance of the VFD Datasets*

The Floodplain Management Unit of DSE is the Custodian of the VFD. The spatial Data Manager of the VFD is the GIS unit staff at Traralgon. A copy of the VFD is stored in the framework of DSE's Corporate Spatial Data Library. Contact details for relevant contact persons can be provided by Catchment Management Authorities.

## *5. Data structure*

Each spatial layer is made up of a single feature class (ie. points, lines and polygons are separated into individual datasets).

All data supplied to update the VFD datasets must adhere strictly to the data design parameters outlined in the layer's metadata document. Failure to provide data with the appropriate structure will result in the flood data being rejected for inclusion in the VFD.

Metadata, developed to DSE standards, exist for each of the VFD spatial datasets. This provides dataset design details including the specific fields and attribute codes within each layer together with details on associated look-up tables. A set of 14 Metadata documents covering all VFD datasets is available as a series of PDFs on the DSE Water website: www.water.vic.gov.au/environment/floodplains/vfd.

The Metadata includes layer description, purpose, restrictions and details about the attribute table structure. The naming convention used in fields and values as detailed in the Metadata must be used when attributing a feature.

A detailed list of attribute fields is included in Appendix 1.

Note: As changes may be made to the Metadata from time to time, users are encouraged to always obtain an up to date version of the Metadata from the DSE web site before commencing any new work.

## *6. Reliability and Floodway Delineation*

Consultants will find the following two documents of considerable assistance in the determination of what reliability to assign to various linework being captured to the VFD datasets and what should be captured to the FLOODWAY layer.

- "Guidelines for Assessing Reliability", Floodplain Management Unit, DNRE, April 1998
- "Advisory Notes for Delineating Floodways", Floodplain Management Unit, DNRE, July 1998

Both these documents are available from the DSE website, as described above.

## 7. *Supply of VFD data*

Consultants involved in flood mapping need to obtain current data from the VFD data manager for updating. They need to specify which spatial layers will be affected and define a geographical 'box' over the study area by providing the latitude and longitude of the South West and North East corners. This 'clip box' of requested information is the *designated update area*. Provided there are no conflicts with other active update projects, the Data Manager will clip this area from the master dataset and supply it electronically to the requestor.

Updates should be made to this extracted data by the consultants, and then returned to the VFD Data Manager for inclusion in the master dataset.

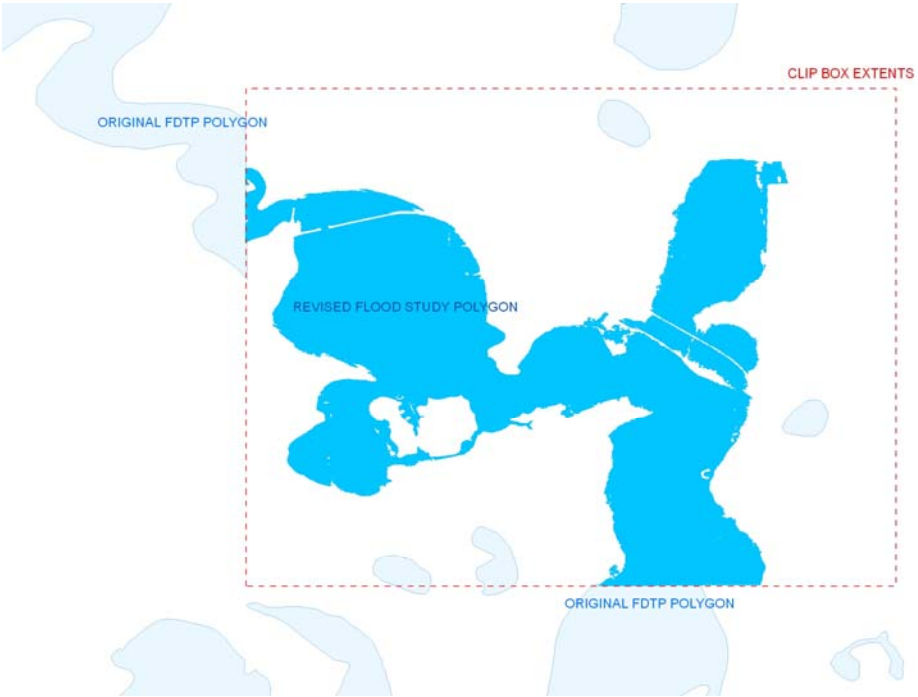
No data will be modified outside the clip box, however it may be as large or small as required to comfortably cover the active flood mapping. It is advisable to request a clip box slightly larger than the defined study area to deal with data compatibility issues, such as edge matching.

## 8. *Updating flood features*

Only change those features/attribute values within the clip box that require modification. Unaffected features within the area that are not edited are returned to the Data Manager exactly as they were provided.

For polygon features, consultants are responsible for edge-matching modified linework with the existing linework. Any required edge matching should be carried out within the confines of the clip box. If this is not possible, then the boundary of the clip box will be used, as shown below. This can be avoided by making the clip box larger than the extent of the affected features at the time when the data is requested. The clip box extents cannot be altered once the clipped VFD data has been provided to consultants.

If new mapping is based on different criteria to older mapping, then edges may never match perfectly unless the entire catchment is re-mapped. The Consultant is requested not to artificially smooth edges to match unless this has been agreed with relevant CMA.



Updates to features will always necessitate changes to the following fields as indicated:

- VERSION — Integer value, 1 to X: This should always be incremented by 1, following changes to attribute values and/or linework. Assign a value of 1 to newly mapped features.
- MODIFIED — This should always be set to the date that the individual feature is modified.

  Format is YYYYMMDD where Y is year, M is month and D is day. The release date of the data may be used. No data value should be older than 20000101 which indicates original FDTP work.

## *9. Return of updated VFD Data – Upload of Clip Box and Edge Matching*

Following integrity checking and verification of data within the clip box (see Section 13) to the satisfaction of the Data Manager, the updates will be progressed to the VFD Master dataset. This will result in the erasure of all existing data within the designated update area in the master datasets and its replacement by the new data.

## *10. Required GIS file format*

GIS data for updating the VFD may be supplied in one of the following formats:

Spatial data:

ESRI ArcView - shapefile
ESRI data interchange file (.e00)
ESRI ArcInfo - coverage
ESRI file geodatabase
DXF (with additional tabular information to support attributes)

Tabular non-spatial data:

INFO table
DBF table
CSV file

## *11. Data Coordinates*

All data is stored centrally as State-wide layers in Geographic (decimal degrees) coordinates based on Geocentric Datum of Australia 1994 (GDA94).

VFD clip box coordinates can be provided to the Data Manager as either

- Map Grid of Australia (MGA) coordinates for zones 54 or 55 in metres
- Latitude and Longitude in decimal degrees (GDA94)

Updated spatial data may also be provided in either of these coordinates, provided they are clearly documented. The best way to do this is to ensure there is a projection file supplied with each dataset

## *12. Detailed feature notes*

Provision has been made in several datasets to assign a note code that links to a look-up table. This is to get around the problem of lengthy text descriptions within the spatial data. In such instances, a 6 digit note code is assigned, then expanded in the look-up table up to a length of 230 characters.

For updates or new mapping where explanatory notes are required, the GIS features should be assigned a new note code starting from 1 and incremented by 1 for consecutive features

requiring a new note. More than one spatial feature can have the same note code, but each different explanatory text string should have a unique number. These numbers need to be added to a new look-up table with relevant expanded details. (See sample notes in appendix 2). The Data Manager will convert these numbers to statewide numbers after the data is returned and append them to the statewide look-up table.

## *13. Quality Assurance*

Primary responsibility of validating VFD amendments and ensuring standards are met rests with the client authority that commissioned the mapping work. Secondary responsibility rests with the relevant CMA.

On completion of any VFD GIS layer or layer update and prior to delivery to the client for validation, it is the responsibility of the Consultant to perform appropriate QA checks on the finished data. This is to include a sign-off and approval process for the completed package of work that explicitly states that the Consultant has conformed to the VFD Metadata and the VFD Dataset Update Specification and has performed appropriate QA checks on the finished data.

The Consultant is also required to provide a summary of dataset changes and/or additions in a form acceptable to the client authority and CMA. The client authority and CMA will already have discussed these requirements with the Data Manager (before commissioning the work). The results of all QA checks and processes are expected to be made available to the CMA and/or Data Manager on request.

Before accepting the Consultant's QA certification, the CMA will validate the data to confirm adherence to Metadata and Update Specification requirements. Validation will include a check of the Consultant's summary of dataset changes and additions.

Provided data is acceptable to the CMA, it should be forwarded to the Data Manager for further integrity checking and verification prior to upload to the VFD Master datasets.

## *14. Useful notes*

### 14.1. Flood Extents

During or after a flood event, the overall extent of flooding should be constructed by aggregating all day/date mapping for the event as captured from successive sources. Alternatively, good coverage of flood photography of an historic flood is an ideal source, if it is available.
These flood events are to be captured as an historic flood extent and be contained in the Historic_Extent_YYYYMMDD layer.

Where there is sufficient evidence to link this to a 1–in-100 year extent, the polygon should also be used to revise in the EXTENT_100Y_ARI layer. All flood extents relating to a particular Average Recurrence Interval (ARI) event (ie. historic events that have been analysed as having a particular ARI, flood study/model results, etc) should be contained in the EXTENT_{n}Y_ARI (where {n} is the ARI of the flood event).

When capturing and delineating flood extents from flood photos the visible edge of water should be captured except where an obvious high water mark (flood level line being debris or water mark) is evident. In such cases this line should be digitised and assigned a reliability depending on the time of the photo and the time of the peak, where known.

Polygons and lines relating to a flood extent should be linked to a gauging station where this can be done in a meaningful way. For example, a flood extent applicable to the Ovens River can be linked to an Ovens River gauging station. However, a flood extent applicable to an

ungauged anabranch of the Ovens River should not be linked to a gauging station unless there is evidence that the behaviour of the anabranch is similar to the main river. In cases where a river has more than one gauging station, Consultants must decide which sections of the floodplain relate to each gauging station. Common sense should prevail.

### 14.2. Flood Heights

Recorded flood levels (ie. historic flood spot heights) should be captured to the HISTORIC_HEIGHT_PT layer while modelled flood levels (ie. flood height contours) should be captured to the CONTOUR_{n}Y_ARI layer, where {n} is the average recurrence interval in years, eg 100. All height data is in metres using the Australian Height Datum (AHD).

### 14.3. Levees

Only structures whose primary purpose is to function as a flood levee are to be included in the LEVEE layer. Other structures that may act in part as a levee (eg. a road embankment) should be stored in the FLOOD_STRUCTURE layer as a point with relevant notes attached.
However, structures (eg. roads) that have been properly and intentionally constructed to act as levees (eg. Kerang, Echuca, etc) should be included in both the LEVEE and FLOOD_STRUCTURE layers.
All height data is in metres using the Australian Height Datum (AHD).

### 14.4. Flood Structures

Only structures with a known link to flooding should be included in the FLOOD_STRUCTURE layer. Examples include bridges which significantly obstruct flows, flood regulators and channel outfalls. However, structures (eg. roads) that have been properly and intentionally constructed to act as levees (eg. Kerang, Echuca, etc) should be in both the LEVEE and FLOOD_STRUCTURE layers.

# Appendix 1: Data structure of attribute tables

1. EXTENT_{n}Y_ARI - polygon attributes table – where {n} is average recurrence interval, eg. 100

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| AREA | DECIMAL | FIT | In square metres. Should be updated by GIS calculation |
| PERIMETER | DECIMAL | FIT | Metres. Should be updated by GIS calculation |
| STATION_ID | INTEGER | 8 | Standard numbering system. Sourced from gauging station managers. Refer to CMAs for relevant numbers. |
| METHOD* | TEXT | 50 | Mapping method used. See validation table for valid descriptors. |
| RELIABILITY* | TEXT | 10 | Reliability of source information. See validation table for valid descriptors. |
| PLAN_NO | TEXT | 10 | Use the original document plan number, if known, when the mapping was from existing maps or plans– otherwise leave blank. |
| SCALE | INTEGER | 8 | Scale of original documents, if information was digitised from maps or aerial imagery. Only use if applicable – otherwise leave blank. |
| SOURCE | TEXT | 30 | Organisation from where the information was sourced. Usually a shire or CMA, not a consultant. |
| REPORT_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded report details are required, otherwise leave blank. Provide expanded notes in a separate table, up to 230 characters of description. Data Manager will reallocate a statewide number. Only one code per report description, however may have many spatial features to one report_ code. Description of flood study report, including name and date of flood study. Company name of consultants is also useful. Leave blank if unknown |
| NOTE_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded notes are required, otherwise leave blank. Provide expanded notes in a separate table, up to 230 characters of description. Data Manager will reallocate a statewide number. Only one code per note description, however may have many spatial features to one note code. |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. |
| VERSION | INTEGER | 3 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |

* Requires use of predefined values – refer to validation table ** requires use of a look-up code – refer to lookup table

2. CONTOUR_{n}Y_ARI - line attributes table – where {n} is average recurrence interval, eg. 100

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| LENGTH | DECIMAL | FIT | Metres. Should be updated by GIS calculation |
| HEIGHT | DECIMAL | FIT | Metres, AHD |
| METHOD* | TEXT | 50 | Mapping method used. See validation table for valid descriptors. |
| RELIABILITY* | TEXT | 10 | Reliability of source information. See lookup table for valid descriptors. |
| PLAN_NO | TEXT | 10 | Use the original document plan number, if known, when the mapping was from existing maps or plans– otherwise leave blank. |
| NOTE_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded notes are required, otherwise leave blank. Provide expanded notes in a separate table, up to 230 characters of description.<br>Data Manager will reallocate a statewide number. Only one code per note description, however may have many spatial features to one note code. |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. Usually the date when updates are completed. |
| VERSION | INTEGER | 3 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |
| TYPE* | TEXT | 15 | Used to determine 'declared' or 'unspecified' height contours. See validation table for valid descriptors. |

* Requires use of predefined values – refer to validation table ** requires use of a look-up code – refer to lookup table

## 3. FLOODWAY – polygon attributes table

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| AREA | DECIMAL | FIT | In square metres. Should be updated by GIS calculation |
| PERIMETER | DECIMAL | FIT | Metres. Should be updated by GIS calculation |
| NAME | TEXT | 50 | Same as planning scheme or declared floodway name, if possible. Otherwise waterway name or blank if unknown |
| FWAY_TYPE* | TEXT | 20 | Type of floodway in terms of planning scheme. See validation table for valid descriptors |
| NOTE_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded notes are required, otherwise leave zero. Provide expanded notes in a separate table (excel,dbase), up to 230 characters of description. Data Manager will reallocate a statewide number. Only one code per note description, however may have many spatial features to one note code. |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. Usually the date when updates are completed. |
| VERSION | INTEGER | 3 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |

* Requires use of predefined values – refer to validation table ** requires use of a look-up code – refer to lookup table

## 4. FLOW_DIRECTION – line attributes table

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| NOTE_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded notes are required, otherwise leave blank. Provide expanded notes in a separate table, up to 230 characters of description. Data Manager will reallocate a statewide number. Only one code per note description, however may have many spatial features to one note code. |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. Usually the date when updates are completed. |
| VERSION | INTEGER | 3 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |

** requires use of a look-up code – refer to lookup table

## 5. HISTORIC_HEIGHT_CONTOUR – line attributes table

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| HEIGHT | DECIMAL | 8 | Metres, AHD |
| DATE | DATE | 8 | Date of flood event - DD/MM/YYYY |
| RELIABILITY* | TEXT | 2 | Reliability of source information. See lookup table for valid descriptors. |
| METHOD* | TEXT | 2 | Mapping method used. See validation table for valid descriptors. |
| PLAN_NO | TEXT | 10 | Use the original document plan number, if known, when the mapping was from existing maps or plans– otherwise leave blank. |
| NOTE_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded notes are required, otherwise leave blank. Provide expanded notes in a separate table, up to 230 characters of description. Data Manager will reallocate a statewide number. Only one code per note description, however may have many spatial features to one note code. |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. Usually the date when updates are completed. |
| VERSION | INTEGER | 2 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |

* Requires use of predefined values – refer to validation table ** requires use of a look-up code – refer to lookup table

## 6. HISTORIC_HEIGHT_POINT – point attributes table

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| HEIGHT | DECIMAL | FIT | Metres, AHD |
| YEAR | INTEGER | 4 | The year of the flood event, eg 2005 |
| MONTH | INTEGER | 2 | The month of the flood event as a number from 1 to 12, if known. Eg 03 for March. Set to 99 if unknown |
| DAY | INTEGER | 2 | The day of the month of the flood event as a number from 1 to 31, if known. Set to 99 if unknown |
| RELIABILITY* | INTEGER | 10 | Reliability of source information. See lookup table for valid descriptors. |
| METHOD* | INTEGER | 50 | Mapping method used. See validation table for valid descriptors. |
| PLAN_NO | TEXT | 10 | Use the original document plan number, if known, when the mapping was from existing maps or plans– otherwise leave blank. |
| NOTE_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded notes are required, otherwise leave blank. Provide expanded notes in a separate table, up to 230 characters of description.<br>Data Manager will reallocate a statewide number. Only one code per note description, however may have many spatial features to one note code. |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. Usually the date when updates are completed. |
| VERSION | INTEGER | 2 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |

* Requires use of predefined values – refer to validation table ** requires use of a look-up code – refer to lookup table

## 7. LEVEE – line attributes table

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| LEVEE_ID | INTEGER | 6 | A unique ID number assigned by Data Manager from 1 to x. This enables linking to spot height data. Leave blank for new data. |
| NAME | TEXT | 50 | The levee or structure name, if known. Can use the name of a road or railway if it is part of infrastructure build-up. Otherwise leave blank |
| OWNER* | TEXT | 30 | Organisation that owns the levee infrastructure. See validation table for valid descriptors |
| SOURCE* | TEXT | 30 | Organisation from where the info was sourced. Usually a shire or Government agency. Not the consultant. |
| RELIABILITY* | TEXT | 10 | Reliability of source information. See lookup table for valid descriptors. |
| PLAN_NO | TEXT | 10 | Use the original document plan number, if known, when the mapping was from existing maps or plans– otherwise leave blank. |
| NOTE_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded notes are required, otherwise leave blank. Provide expanded notes in a separate table, up to 230 characters of description.<br>Data Manager will reallocate a statewide number. Only one code per note description, however may have many spatial features to one note code. |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. Usually the date when updates are completed. |
| VERSION | INTEGER | 2 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |

* Requires use of predefined values – refer to validation table ** requires use of a look-up code – refer to lookup table

## 8. LEVEE_SPOTHEIGHT – point attributes table

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| LEVEE_ID | INTEGER | 6 | A unique ID number assigned by Data Manager from 1 to x. This enables linking to levee line data. Leave blank for new data. |
| HEIGHT | DECIMAL | FIT | Metres, AHD |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. Usually the date when updates are completed. |
| VERSION | INTEGER | 2 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |

## 9. RUNNING_DISTANCE - line attributes table

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| LENGTH | DECIMAL | FIT | Metres. Should be updated by GIS calculation |
| RIVER-ID | INTEGER | 6 | Numeric identifier for watercourses – used to generate measured routes and distances. Do not modify. |
| KILOMETRES | INTEGER | 6 | Created by GIS linear referencing based on VicMap Hydro. Only modify if more detailed information is available. |
| RIVER_NAME | TEXT | 50 | Name of the watercourse, derived from VicMap Hydro Watercourses. Alter only if better information is available. |
| BASIN* | TEXT | 30 | Name of the major river basin, as per defined basin names from CMAs. |
| NOTE_CODE** | INTEGER | 6 | In this layer, all points were allocated the same note code of 52918, referring to how the info was derived. If adding points that were derived by GIS linear referencing methods (measured routes), use 52918. Otherwise allocate a new number. |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. Usually the date when updates are completed. |
| VERSION | INTEGER | 2 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |

* Requires use of predefined values – refer to validation table ** requires use of a look-up code – refer to lookup table

## 10. FLOOD_STRUCTURE - line attributes table

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| LENGTH | DECIMAL | FIT | Metres. Should be updated by GIS calculation |
| NAME | TEXT | 50 | The name of the structure. May be the road or bridge name, if applicable. |
| TYPE* | TEXT | 30 | Flood structure type. See validation table for valid descriptors. |
| NOTE_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded notes are required, otherwise leave blank. Provide expanded notes in a separate table, up to 230 characters of description.<br>Data Manager will reallocate a statewide number. Only one code per note description, however may have many spatial features to one note code |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. Usually the date when updates are completed. |
| VERSION | INTEGER | 2 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |

* Requires use of predefined values – refer to validation table ** requires use of a look-up code – refer to lookup table

11. HISTORIC_EXTENT_{YYYYMMDD} - polygon attributes table - where {YYYYMMDD} is the date that the flood event was mapped at. Eg. 20070621 represents 21 June 2007.

| FIELD NAME | FIELD TYPE | FIELD SIZE LIMIT | COMMENTS |
|---|---|---|---|
| AREA | DECIMAL | FIT | In square metres. Should be updated by GIS calculation |
| PERIMETER | DECIMAL | FIT | Metres. Should be updated by GIS calculation |
| START_DATE | INTEGER | 8 | Start Date of extent mapping - format dd/mm/yyyy: If incomplete or unknown leave blank and include partial details (if any) as a note in flnote.lut |
| START_TIME | INTEGER | 4 | Start Time of extent mapping e.g. 1530 (half past three p.m.)<br>If unknown use 9999 |
| END_DATE | INTEGER | 8 | Finish Date of extent mapping - format dd/mm/yyyy If incomplete or unknown leave blank and include partial details (if any) as a note in flnote.lut |
| END_TIME | INTEGER | 4 | Finish Time of extent mapping e.g. 1530 (half past three p.m.)<br>- If unknown insert a negative number. (-999 preferred) |
| DATE | INTEGER | 8 | Integer version of the start date for data management purposes. Used to merge all events into one history layer. Format yyyymmdd |
| STATION_ID | INTEGER | 8 | Standard numbering system. Sourced from gauging station managers.<br>Refer to CMAs for relevant numbers. |
| METHOD* | TEXT | 50 | Mapping method used. See lookup table for valid descriptors. |
| RELIABILITY* | TEXT | 10 | Reliability of source information. See lookup table for valid descriptors. |
| PLAN_NO | TEXT | 10 | Use the original document plan number, if known, when the mapping was from existing maps or plans– otherwise leave blank. |
| SCALE | INTEGER | 8 | Scale of original documents, if information was digitised from maps or aerial imagery. Only use if applicable – otherwise leave blank. |
| SOURCE* | TEXT | 30 | Organisation from where the info was sourced. Usually a shire or CMA. Not the consultant. |
| REPORT_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded report details are required, otherwise leave blank. Provide expanded notes in a separate table, up to 230 characters of description.<br>Data Manager will reallocate a statewide number. Only one code per report description, however may have many spatial features to one report_ code.<br>Description of flood study report, including name and date of flood study. Company name of consultants is also useful. Leave blank if unknown |
| NOTE_CODE** | INTEGER | 6 | Assign a numeric ID from 1 to x, incremented by 1. Only use if expanded notes are required, otherwise leave blank. Provide expanded notes in a separate table, up to 230 characters of description.<br>Data Manager will reallocate a statewide number. Only one code per note description, however may have many spatial features to one note code. |
| MODIFIED | INTEGER | 8 | Date of revision in format yyyymmdd as an integer. |
| VERSION | INTEGER | 2 | Assign as 1 for newly mapped features, otherwise increment existing number by 1. Leave existing number for any features not updated. |

* Requires use of predefined values – refer to validation table ** requires use of a look-up code – refer to lookup table

# Appendix 2: Validation and lookup tables

This section has tables of valid values or text to be used in the attribute tables for given fields. The table name below is the same as the field's name in the attribute tables.
Tables contain values currently in use as attributes. If further values are required, contact the VFD Data Manager to have more added.

1. METHOD field validation table

| METHOD |
|---|
| Detailed contour and flood info |
| Reasonable contour info and detailed flood info |
| No contour info and detailed flood info |
| Site specific flood map based |
| Flood aerial photography |
| Modelled |
| Detailed contour info and some flood info |
| Reasonable contour info and some flood info |
| No contour info, some flood info & geo maps |
| No contours & some flood info |
| Little info available |
| Not applicable |
| Sourced from planning scheme spatial data |
| Uncorrected GPS (greater than 1 metre error) |
| Corrected GPS survey (less than 1 metre error) |
| Height survey where vertical accuracy is 50 millimetres or less |

2. TYPE field validation table (Floodways)

| TYPE |
|---|
| Rural Floodway |
| Urban Floodway |
| No Floodway |

3. RELIABILITY field validation table

| **RELIABILITY** |
|---|
| High |
| Medium |
| Low |
| Unknown |

4. OWNER field validation table (Levees)

| **OWNER** |
|---|
| Communal / public |
| Private |
| Unknown |

## 5a. NOTE_CODE lookup table – sample entries in master VFD, for indicative purposes.

| NOTE_CODE | NOTE_TYPE* | NOTE |
|---|---|---|
| 52767 | MAPPING METHOD | This data was extracted from Autocad data supplied to SKM by EarthTech as part of the 2006 VFD Infill Project. |
| 52769 | CONDITION | This audit revealed that sections were below 1% level due to erosion effects. Much of levee listed as very poor condition due to poor construction and lack of maintenance. Levee built in 1956. |
| 52779 | NOTE - EXTENT | This Stat1 extent is a result of design works done for the construction of the Mildura Marina Estate by Connell Wagner in 2005. |
| 52781 | INFO SOURCE | This data was provided by Jonathan Bartlett from the NCCMA. It was digitised by Jonathan from hard copy plans attached to the Splitters Creek Flood Study - 2000 - ID&A. |
| 52783 | NOTE - EXTENT | This stat1 extent was supplied by Jonathan Bartlett of the NCCMA with the following detail - Flood event 18-05-2003 - Reports of 30 to 45 mm falling over an hour resulted in flooding of the delineated area. |
| 52785 | NOTE - EXTENT | This Stat1 extent and contours were supplied by Jonathan Bartlett NCCMA - He suggested it was produced by EarthTech for a private developer and should be considered of low reliability. |
| 52786 | INFO SOURCE | This 1998 flood extent is an approximate location only, it was defined using 1998 flood level surveyed by LICS Pty. Ltd. - For more detail see plan number 540216. |

* Requires use of predefined values – refer to validation table 5b below.

## 5b. NOTE_CODE_TYPE validation table – to be used for NOTE_TYPE field in the NOTE_CODE lookup table.

| **NOTE_TYPE** |
|---|
| CONDITION |
| FEATURE TYPE |
| INFO SOURCE |
| MAPPING METHOD |
| NAME SOURCE |
| NOTE – EXTENT |
| NOTE – HEIGHT |
| NOTE - RUNNING DIST |
| OWNERSHIP |
| PLANNING SCHEME |

## 6. BASIN field validation table (Running Distance)

Conforms to designated major river basins spatial layer – Available from CMAs.

| **BASIN** |
|---|
| Avoca River |
| Barwon River |
| Broken River |
| Campaspe River |
| East Gippsland |
| Glenelg River |
| Goulburn River |
| Hopkins River |
| Kiewa River |
| Lake Corangamite |
| Latrobe River |
| Loddon River |
| Mallee |
| Maribynong River |
| Millicent Coast |
| Mitchell River |
| Moorabool River |
| Murray and NSW Tributaries |
| Otway Coast |
| Ovens River |
| Portland Coast |
| Snowy River |
| South Gippsland |
| Tambo River |
| Thomson River |
| Upper Murray River |
| Werribee River |
| Wimmera-Avon Rivers |
| Yarra River |

## 7. SOURCE field validation table

| **SOURCE** |
|---|
| DNRE |
| DSE |
| Melbourne Water |
| Rail Authority |
| Road Authority |
| State Library |
| Gvt Agency |
| Bureau of Meteorology |
| Dept Land & Water Conserv..NSW |
| Goulburn Broken CMA |
| North Central CMA |
| North East CMA |
| East Gippsland CMA |
| West Gippsland CMA |
| Corangamite CMA |
| Glenelg Hopkins CMA |
| Wimmera CMA |
| Mallee CMA |
| Goulburn Murray Water |
| Sunraysia Rural Water Authty |
| Southern Rural Water |
| Wimmera Mallee Water |
| Non Metro Urban Water Authty |
| Municipalities after Apr 1995 |
| Municipalities pre Apr 1995 |
| Consultants |
| Historic Society |
| Newspapers |
| Farmer |
| Unknown |
| Dept Planning and Comm. Dev. |

If source data organisation not listed above, contact Data Manager to have new source organisation created.

## 8. TYPE field validation table (Contour_{n}Y_ARI)

| TYPE |
|---|
| Declared |
| Documented |
| Unspecified |

# Appendix 3: VFD update protocols

The following three protocols have been developed to facilitate a structured and ordered approach to the long term management of the VFD datasets. Specifically, the steps detailed in the protocols are aimed at maintaining the currency of the VFD datasets and assisting maintenance of consistency with corresponding Municipal Planning Schemes.

PROTOCOL 1: for upload of new or corrected data to VFD datasets

To be used for uploading new or corrected data to the VFD generated by

a. a flood (or related) study
b. collection of flood related data
c. identification of errors in the existing VFD datasets

PROTOCOL 2: for Planning Scheme change following VFD dataset update

To be used for updating the relevant Municipal Planning Scheme to be consistent with the VFD.

PROTOCOL 3: for VFD dataset update following change to Planning Scheme

To be used for uploading new or corrected data to the VFD to rectify a mismatch between the relevant Municipal Planning Scheme (and the Planning Scheme data is deemed superior).

# PROTOCOL 1: for upload of new or corrected data to VFD datasets

The Protocol 1 process is initiated by the Requestor. The Requestor is the Authority (Council, Shire or CMA) that has initiated the process to prepare or update data destined to be loaded into VFD master datasets, or the Consultant commissioned by the Authority to undertake the task. If the Requestor is a Consultant, it is assumed that the Authority has contractually required the Consultant to regularly inform them of interactions with the VFD.

1) Requestor identifies layers and areas that will be updated.

2) Requestor advises Data Manager of intent to update nominated layers and areas and expected timing.

3) Requestor submits request to Data Manager for supply of relevant datasets within a specified clip box.

4) Data Manager checks whether there are active clip boxes within or overlapping the requested clip box (i.e. is there another work in progress in the area of interest).

5a) If there are overlaps, Data Manager advises Requestor of delay in access to requested data. Data Manager logs request for data and later advises Requestor when request may proceed.
5b) If there are no overlaps, Data Manager cuts requested data in clip box from Master datasets and supplies to Requester. Data Manager enters data request and supply details to Data Supply Log.

6) Requestor builds or reworks linework, points and attributes in line with VFD Update Specification and Metadata Requirements.

7) Requestor undertakes rigorous quality assurance (QA) on revised and/or new data, linework, points and attributes, including ground truthing spot checks.

8) Requestor signs off QA and supplies data to the relevant CMA, along with report addendums and a summary of dataset changes and additions.

9) Relevant CMA reviews QA certification and validates revised and/or new data, ensuring to:
- undertake ground truthing spot checks;
- review QA log;
- check/verify all note attributes;
- check that IDs and version numbers are valid;
- confirm summary or changes and/or additions;
- check VFD report addendum text.

Data Manager to assist CMA with validation, if requested. (See also Note 1.)

10a) If QA and data are not acceptable, relevant CMA returns information to Requestor, along with report outlining deficiencies and improvements required. Requestor then repeats steps 6 to 8 as required to comply with report from CMA.
10b) If QA and data are acceptable, relevant CMA forwards fully attributable data to Data Manager, along with the summary of dataset changes and additions.

11) Data Manager performs simple verification checks to determine suitability of data for upload.

12a) If data are not acceptable, Data Manager returns data to CMA, along with report outlining deficiencies and improvements required. CMA then returns data and report to Requestor. Process is then repeated from step 6 to improve data quality.
12b) If data are acceptable, Data Manager advises CMA of acceptance. CMA advises Requestor of acceptance.

13) Data Manager completes VFD modifications as required, ensuring that:
- new and/or modified data are uploaded;
- replaced/obsolete datasets are deleted so they cannot be used again;
- dataset changes are summarized and recorded in the VFD Data Modification Log;
- all recognized users are advised of the dataset update;
- the relevant parts of the updated datasets are made available via the DSE website .

14) CMA updates its local Data Modification Log with summary of dataset changes (information received from VFD Data Manager), including/adding references to Planning Scheme amendment numbers, if amendments have been initiated.

15) CMA checks if existing 1% flood and/or floodway extents have been modified or new extents mapped. If so, CMA initiates the process outlined in Protocol 2.

*NOTE 1*
*To increase the likelihood of successful review and validation by CMAs, the following should be taken into account:*
*- CMA personnel with GIS experience should be involved in VFD review and validation tasks;*
*- Additional training of these personnel in VFD review and validation techniques should be provided by Data Manager.*

## PROTOCOL 2: for Planning Scheme change following VFD dataset update

The Protocol 2 process is initiated by the relevant CMA after the Protocol 1 process is completed, because a need to amend flood-related delineations in the Planning Scheme has been identified following a flood or related study and update of the VFD datasets.

1) CMA advises relevant Council/Shire of the need to amend flood-related delineations in the Planning Scheme. CMA provides Council/Shire with linework from VFD as first draft of proposed changes to flood-related delineations.

2) Council/Shire formally initiates the Planning Scheme amendment process. Council/Shire sends VFD linework to Department of Planning & Community Development Information Systems Unit (DPCD ISU), together with request for Planning Scheme amendment mapping.

3) DPCD ISU adjusts Planning Scheme linework to match VFD linework and returns to Council/Shire for sign-off.

4) Council/Shire, together with CMA, identify the need for and agree on any further changes to Planning Scheme and/or VFD linework so that consistency is maintained. This may require step 3 being repeated.

5) Council/Shire manages completion of Planning Scheme amendment process. CMA supports by producing supporting documents for amendments (where appropriate), responding to submissions received by Council/Shire, and participating in Panel Hearing, if one is required.

6a) If, at the end of the Planning Scheme amendment process, the Planning Scheme and VFD datasets are consistent with each other, the update process is completed.
6b) If, at the end of the Planning Scheme amendment process, the Planning Scheme and VFD datasets are not consistent with each other, for the following reasons, the CMA initiates the process outlined in Protocol 3.
- changes to the VFD were agreed during step 4 above;
- changes to the Planning Scheme proposed during the public exhibition process were Ministerially approved and gazetted.

# PROTOCOL 3: for VFD dataset update following change to Planning Scheme

The Protocol 3 process is initiated by the relevant CMA after the Protocol 2 process is completed, because a need to amend flood-related delineations in the VFD has been identified following the completion of a Planning Scheme amendment, to maintain consistency between the two datasets.

1) CMA identifies that flood-related delineations in the Planning Scheme have been changed and gazetted and do not reflect the linework within the corresponding VFD datasets.

2) CMA requests DPCD ISU to provide relevant Planning Scheme linework.

3) Once the linework has been received, CMA, as Requestor, follows the process outlined in Protocol 1 to update VFD datasets.