The Bathurst Showground- Visualisation of a Cadastral Survey

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Abstract

This project involves a cadastral boundary survey of the Bathurst Showground. It includes a historic investigation of the Bathurst Show and the land and tenure which it occupies. It looks at using GIS tools to visualise and manage the job.

The major component of this project is a field survey using traditional traversing techniques as well as Real Time Kinematic (RTK) GPS techniques to locate cadastral and topographical features. The survey consists of redefinition of the perimeter, subdivision of some adjacent parcels and definition of a creek bed. This report describes the methods used in the cadastral survey to produce a plan suitable for lodgement with the Registrar General.

Introduction

Bathurst Showground Survey

The project came about as a request from the showground trust. It involves the collaboration between the trust, local council and Lands office and the Department of Lands. The aim of the job was to amalgamate various parcels of land occupied by the showground that have been irregularly acquired over time. And also to define other interests in land such as drainage easements and flood mitigation works. As part of this it is also desired to fix the current status of title to the land so as to reflect true ownership details. Attempts were made by the council some years ago to rectify the situation but work was never completed. All parties involved are keen to see the problems corrected.

Some significant events of the Bathurst Show

1860- First show held at O'Connell
1863- First show under the name of AH&P held at Alloway Bank
1864- Show held at Raglan
1868- Held at Bathurst Racecourse
1877- Lot 2 Section 150 dedicated to showground trust
1888- Adjoining land occupied on a lease
1890- Some additional land added to lease
1897- Lot 1 Section 150 granted to showground trust
1956- Thompson Street, parts Vale and Bentinck streets closed
1962- Lot 3 Section 150 added to showground trust
1978- Lot 3 Section 150 subdivided by DP257276
1986- Major flooding of the Showground
1996- Lot 1 DP863087 acquired by showground trust as free hold land
1996- Crown land reservation along Macquarie River created
2000-03- Construction of Flood mitigation works

Figure 2 show the various parcels of land occupied by the showground as well as the parcel created for Crown Land Reservation.

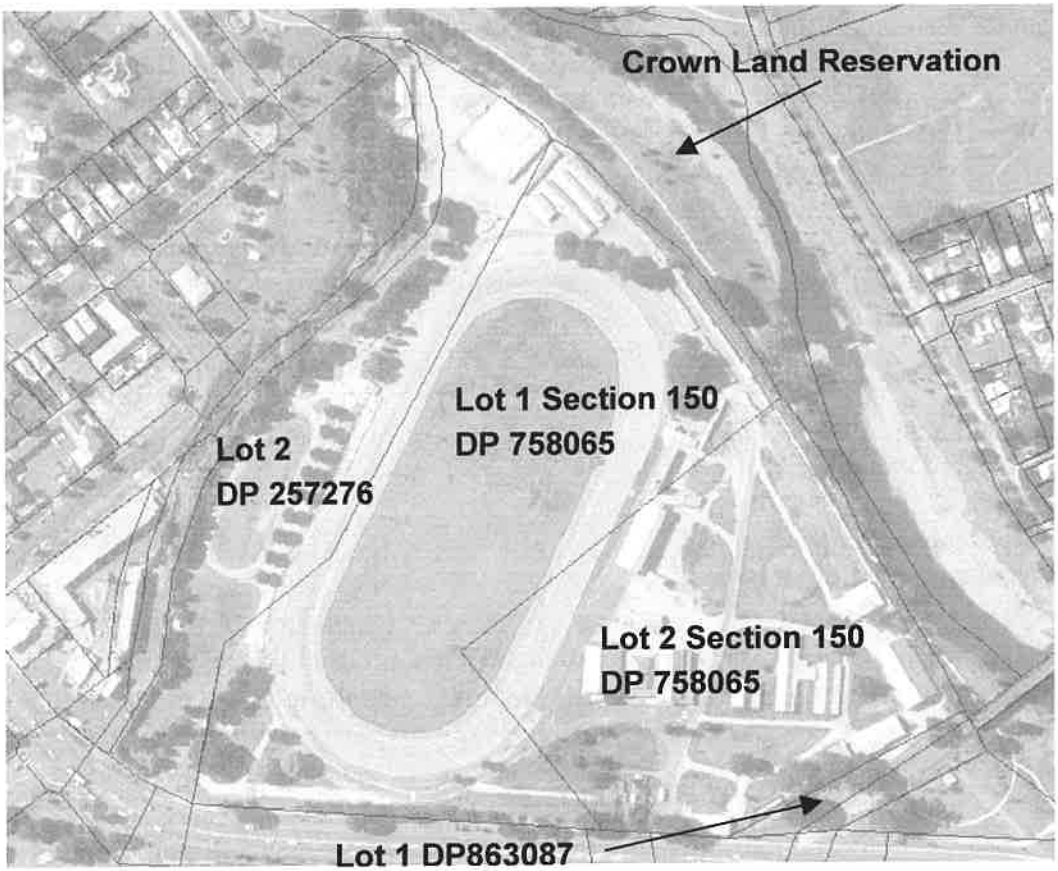

Figure 2 *Various Parcels of land occupied by the Showground*

The first schedule in the certificates of title to the parcels shown in Figure 2 are as follows:

2/150/758065 and **1/150/758065**

- Herbert Cochrane Suttor
- Walter John McPhillamy
- Samuel Williams
- Joseph Benedict Chifley
- Henry Flanagan

As joint tenants

All the above persons are deceased and no longer trustees of the showground trust.

2/257276

COMPUTER FOLIO NOT CREATED

FEE IS CROWN LAND

1/863087

- Bathurst Showground Trust

One of the desired outcomes of the project is that all the land parcels occupied by the Showground be amalgamated and a certificate of title be issued to the Bathurst Showground Trust.

Using GIS to Visualise and Manage Data

Introduction to GIS

Geographic Information Systems (GIS) is a tool that allows the visualisation of various spatial data sets. Georeferenced data is stored in the system and the geographic information attaches a variety of characteristics to geographical locations. Unlike a map, GIS can be used to manipulate and interrogate data to allow the investigation of different aspects. "Compared to maps, GIS has the inherent advantage that data storage and data presentation are separate." (Bernhardsen 1999, p. 4) This separation is what gives GIS its distinct advantage by allowing the stored data to be used to present it in a way that is desired for a particular application. Various users can access the same stored data for many different applications. This capability is possible due to the hardware and software utilised by GIS. As noted by Bernhardsen these hardware and software functions include:

- Acquisition and verification
- Compilation
- Storage
- Updating and changing
- Management and exchange
- Manipulation
- Retrieval and presentation
- Analysis and combination of data

The database stores georeferenced data. The data consists of features which are stored in a geographic location. The features carry information with them. This information can be anything from land type classification to place names and is usually referred to as the attribute of the feature. Features are often represented by objects as either points, lines or polygons. A symbol is usually assigned to a type of feature; for example a main road may be symbolised by a solid line while a dashed line may be used to represent an unformed road.

In order to combine data sets in a way that is meaningful, they must be referenced in a common system. "Georeferencing is defined as positioning objects in either two- or three- dimensional space." (Bernhardsen, 1999, p 100) the easiest way to ensure that data sets can be used together is to make sure they have the same coordinate system. It is possible to assign and change coordinate systems of a particular data set.

GIS is a mixed-data system, meaning that various data types can usually be used. Digital Data can come from a variety of sources. The following are common methods of data collection:

- Digitisation from existing maps
- Scanning existing maps
- Entry of coordinates
- Transfer from existing digital sources

Data collection is often the most time and cost consuming part of GIS. However once the data is acquired and in a suitable format its potential benefits outweigh the cost.

While maps can be used to display data similar to what can be achieved using GIS, there are several advantages to GIS. The following are some examples of the benefits of GIS:

- The space required to store digital data is less than what would be required to store hard copies.
- Various users can access data at the same time for similar or different applications.
- Data can easily be edited and updated
- Allows data to be manipulated to suit the specifics of the job required
- Versatility of GIS tools allowing options such as zooming, turning on/off certain layers when they are not required
- Querying allows the used to define a search to find information
- Hard copies can still be produced if they are required

GIS as used in the Showground Survey

GIS was used in the Showground survey to assist in data management and visualisation. Spatial data could be incorporated with physical features and observed or calculated values. This incorporation allows the information to be easily accessed and interrogated. Understanding the relationship between the data aids in decision making. The visual representation allows for easy communication.

Additionally GIS was used to "sell" the concept to the Showground trust, council and Lands department. The GIS environment allowed features of interest and concern to be identified and communicated. Various options could be tested in order to aim at achieving the best outcome. These options were in areas such as the location of the boundary to be defined and location of the former bed of Queen Charlottes Creek.

Proposals for Location of the Boundary

Before survey work was commenced a number of proposals were made in regards to the location of the boundaries. These proposals were put to the various bodies involved. In most places the survey will redefine the existing external boundary. Consolidating the various parcels will also allow for a single title to be issued to the showground trust. Additionally Bathurst City Council has given permission for the showground to use some additional land adjoining its current allocation. This additional land is located on the western side of Queen Charlottes Creek and is currently Crown land dedicated to the council to be used as parkland. A security fence has been placed along the western edge of the high bank of the former creek bed. The location of the fence as measured using RTK is shown in Figure 3. This fence is to become the new boundary between the showground and the reserve for public recreation giving the showground use of additional land.

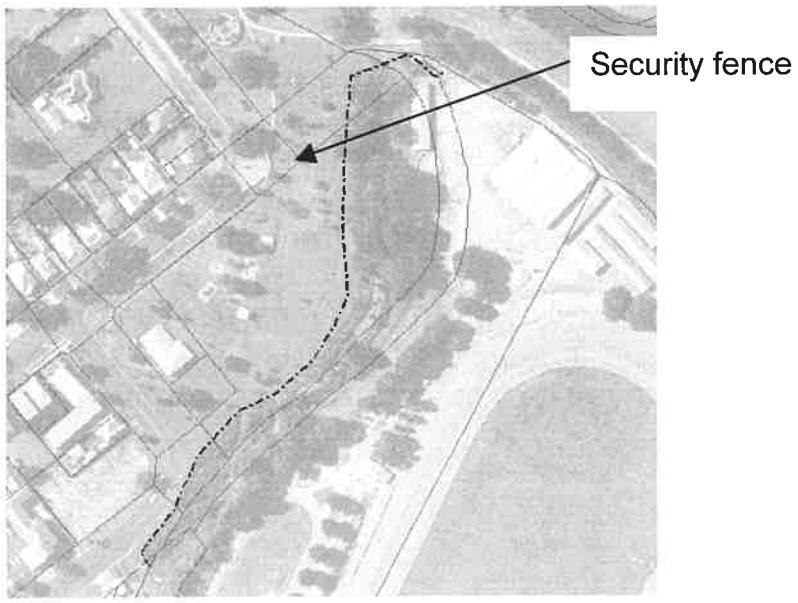

Figure 3 *Location of security fence along the western side of the creek bed*

There were a number of issues which were discussed with the bodies parties involved. The main ones were:

1. The status of the north eastern end of William Street
2. The status of Queen Charlottes Creek
3. Easement for camping adjacent to the river
4. Infrastructure easements (sewage, access, drainage etc)
5. Acquisition of the site of the sewage pump house

North Eastern end of William Street

It can be seen in Figure 4 that the end of William Street, while still open as a road reserve is not a formed road.

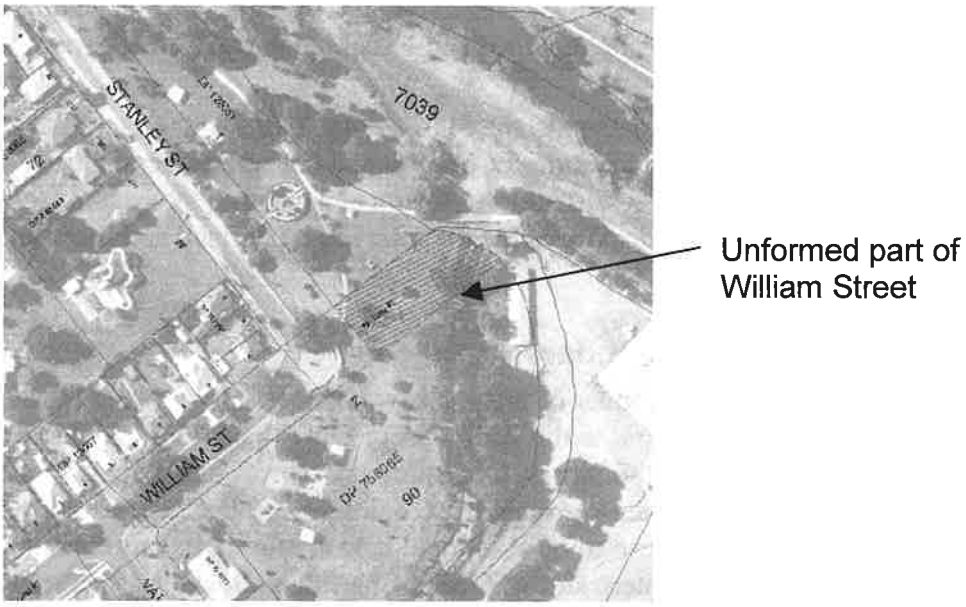

Figure 4 *North eastern end of William Street*

If this section of road were to be closed the section enclosed by the fence could be included in the showground land. The security fence discussed previously protrudes slightly into the road reserve. William Street is council controlled and as such the council would need to be the applicant to the closure. Once closed the land would vest in the Crown. The process for a road closure is costly and timely. Therefore it was decided to leave the road as status-quo. This restricts the dedication for the showground to the south eastern boundary of William Street. It will still leave part of the showground land enclosed by the fence on William Street but the area concerned is only small. If necessary that section of fence could be moved if it were required.

The former bed of Queen Charlottes Creek

Queen Charlottes Creek was once a major drainage feature of the Bathurst region which ran through the showground area. Since the construction of the railway the location of the creek has been altered. Figure 5 shows the current bed of the creek as well as the former bed. The former bed is still a major drainage feature but it has been piped and the majority of the water is carried in the underground pipes.

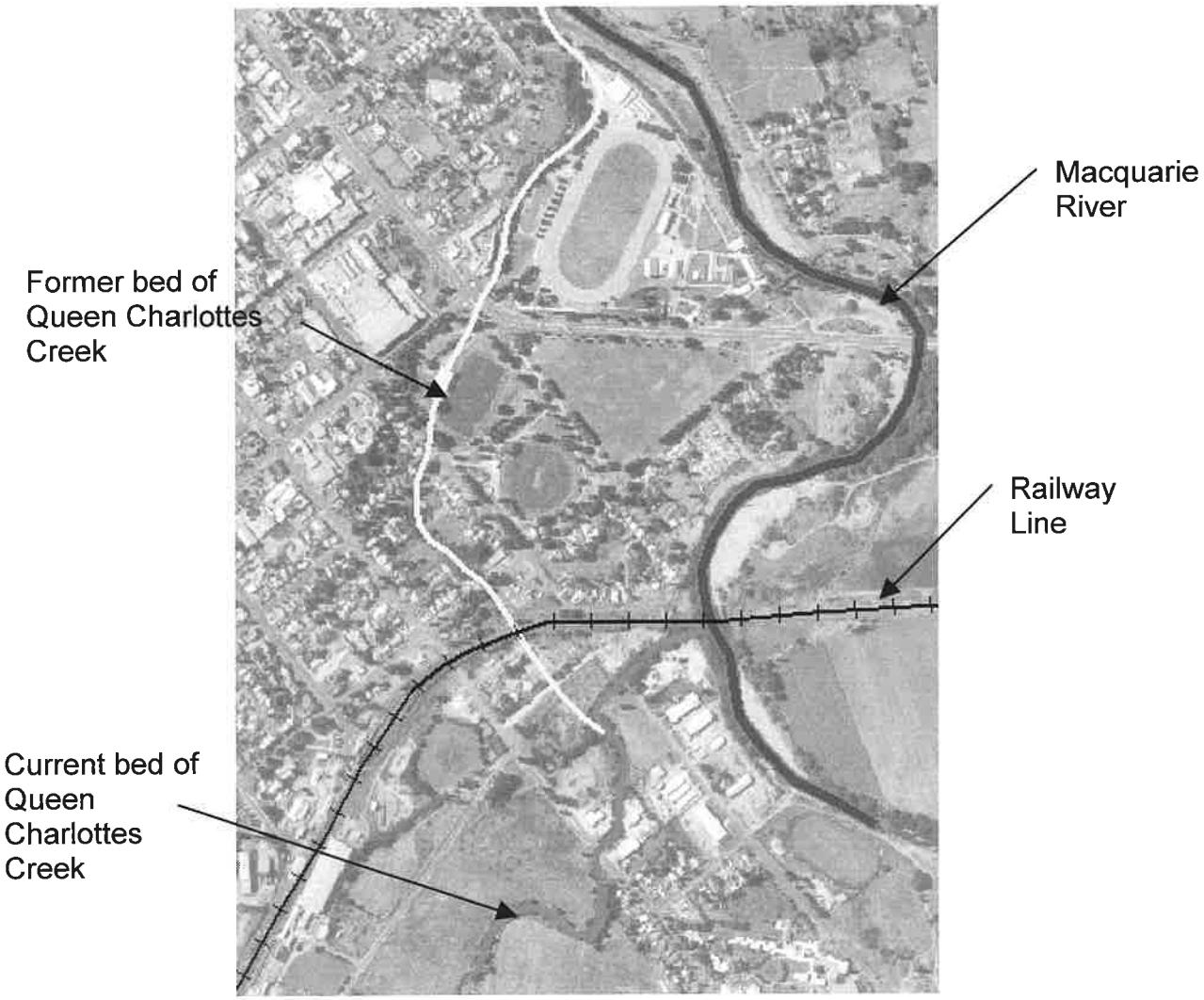

Figure 5 *Queen Charlottes Creek*

The section of the former bed of Queen Charlottes Creek that is in the showground is currently vacant Crown Land. As such it is subject to claim under the Aboriginal Land Rights Act. Section 36 of The Aboriginal Land Rights Act 1983, addresses the issues of Claims to Crown lands. It defines the terms for claimable Crown lands. According to section 36 of the act, Claimable Crown lands are lands which:

b) Are not lawfully used or occupied

c) *Are not needed, or likely to be needed, for an essential public purpose*

The issue was discussed with staff from the Orange Lands office. It was decided that while the land was being occupied by the showground it was not lawful, as it had never been dedicated for its use. Using the land for the showground was also deemed not to be an essential public purpose.

The decision was to survey and define the former creek bed as a separate lot in the survey then Aboriginal titling issues could be addressed separately using the survey plan for description of the creek bed.

Easements

"An easement is a common law right annexed or made appurtenant to land whereby a parcel, called the dominant tenement, has created for its benefit the use for some specific purpose of part or the whole of another parcel in different ownership which part or whole is called the servient tenement." (Hallman 1973, p 63) Easements can be created under section 88B of the Conveyancing Act 1919.

An easement can also be created without a dominant tenement but instead benefiting a prescribed authority such as the Crown or a statutory body. Such easements are called easements in gross.

They can be created under section 88A of the Conveyancing Act 1919. Easements in gross are required for a number of services located in the showground. These include easements for sewage and water.

The easement for camping will benefit the showground land and burden the Crown Land Reservation along the Macquarie River. It is intended to allow the show use of the land for camping and as an overflow carpark during the show period and other times of peak usage.

Establishing the Boundary

Locating Reference Marks

Before the commencement of the survey the location of permanent marks and reference marks was searched. Using the plan information the coordinates of reference marks could be calculated. Using the calculated coordinates RTK GPS methodologies were used to navigate to the location of the mark.

Established permanent marks are permanent marks which accurately known coordinates. By having some established permanent marks in the area it was possible to use these to calculate the coordinates of other marks. A spreadsheet was developed jointly with Keith Haddon of the Cadastral Management Unit to calculate these coordinates. This spreadsheet calculates the scale and rotation of a particular plan given two fixed marks and a traverse from the plan between them.

Defining the former bed of Queen Charlottes Creek

As discussed previously the former bed of Queen Charlottes Creek had to be excluded from the showground land due to Native title issues. This meant that its boundaries would need to be defined. Since the bed of the creek had been piped and to some extent redirected the bed of the creek could not be determined from examining the land. According to Harmer (1967, p9) "where a natural boundary has been destroyed...the usual practice in redefining the creek boundary is to replot the position of the bank from the latest available plan of survey." This practice was employed and the 1956 plan of allotment 3 section 150 of DP 758065 was used for the definition.

Since the plan used did not include offsets to the river from the traverse, distances were scaled off the plan. Figure 6 shows the location of the banks of the creek as determined from various sources.

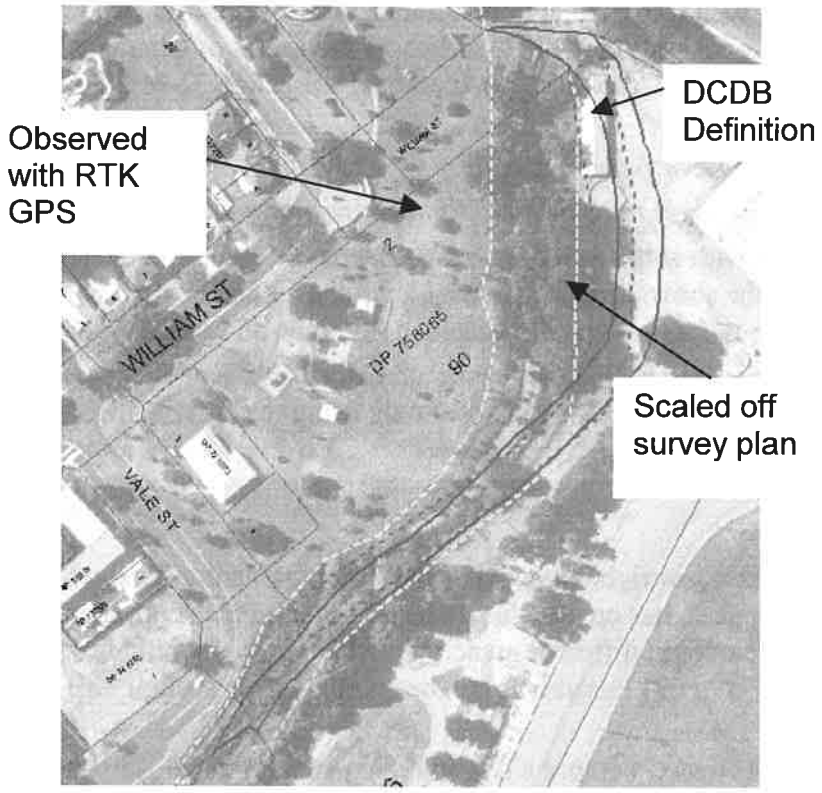

Figure 6 *The Former Bed of Queen Charlottes Creek determined by various means*

Acquisition of the pump site

There is a major pump house located within the showground dedication. Due to the size and importance of the pump house a separate lot was created to exclude it from the showground dedication. This was decided under the instructions of the Orange lands office. Their view was that due to the importance and size of the site the council should do an acquisition of the site under Just Terms.

The Boundary as Placed

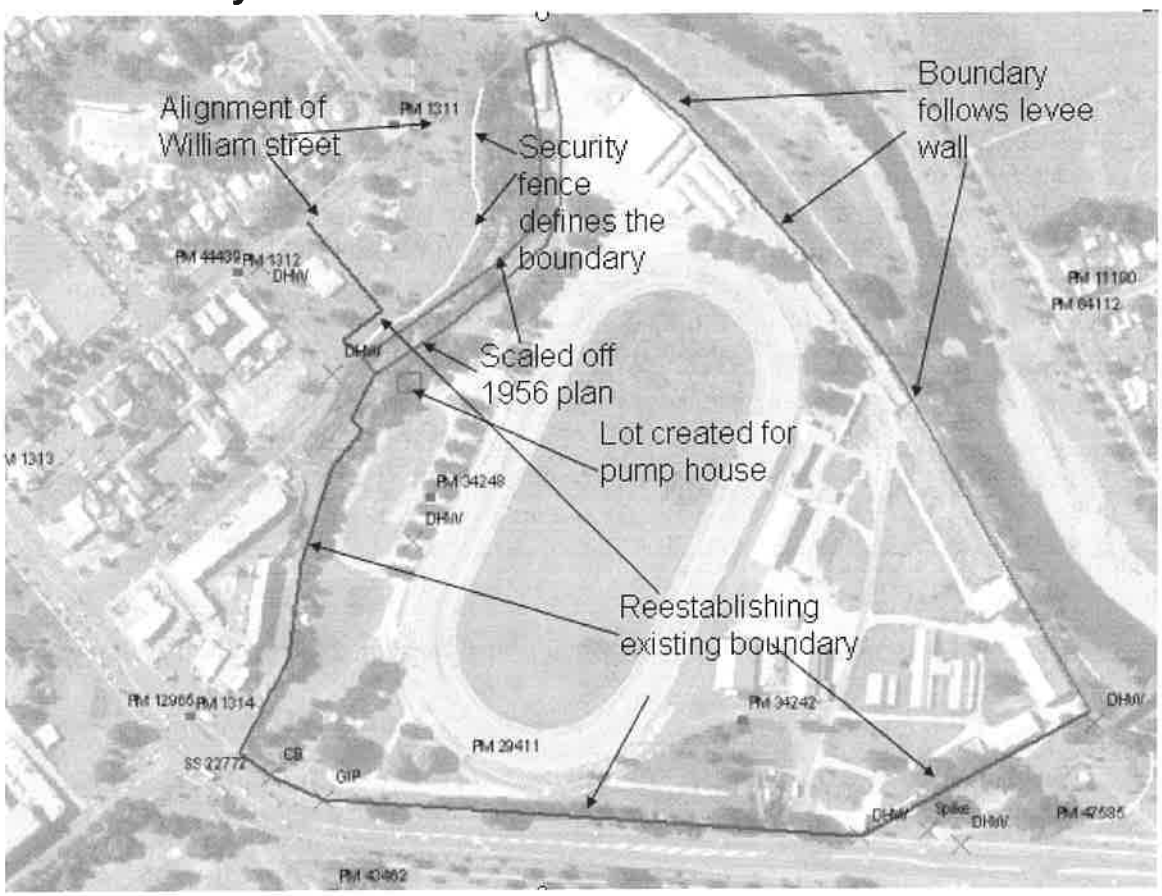

Figure 7 *The Boundary as Established*

Conclusion and Recommendations

Further Requirements

On registration of the plan there are a number of issues which would still need to be pursued. These are:

- Native Title non-claimant application
- Land assessment in accordance with Crown Lands Act 1989
- Compilation plan
- Amend titles

The Native Title non-claimant application would be necessary for the former bed of Queen Charlottes Creek so as to clear it of any further action and allow it to be included as Showground land.

The land assessment, in accordance with part 3 of the Crown Lands Act 1989, will need to be done for the part of lot 2 section 90 (Peace Park) subdivided by the security fence forming the new boundary to change dedication from public recreation to Showground. Assuming successful non-claimant native title application the former creek bed will also need to be dedicated as showground land.

A compilation plan can be done to amalgamate the lot created for the Creek bed. This will allow for one lot containing all the land occupied by the showground. On completion of this process it will also allow for a dedication and title to be issued to Bathurst Showground trust.

Conclusion on the use of GIS in assisting with the survey

As discussed previously Geographic Information Systems (GIS) is a tool that allows the visualisation of various spatial data sets. It was a useful tool in the survey of the Bathurst showground for a number of reasons. Firstly it was useful for planning and decision making. Decision making was aided by the ability to view various layers of information in a single image and analysing the relationship between them. By also being able to move and change information allowed various options to be viewed during the planning stage of the job.

Perhaps the most useful application of the use of GIS in the project was the ease with which information could be communicated. Since the survey involved the collaboration between the showground trust, local council and Lands office and the Department of Lands communicating information was essential so that all parties could understand the issues being discussed.

Bibliography

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