

DCDB Upgrade of the NSW-Queensland Watershed Border: The Tick Protocol

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ABSTRACT

The NSW Digital Cadastral Database (DCDB) is a state-wide integrated database of current land title boundaries used for administrative purposes. State boundary abutments form part of the DCDB. DFSI Spatial Services periodically upgrades sections of the DCDB so a more accurate representation of the State cadastre is available to users. As part of this ongoing process and to maintain consistency across national cadastral databases, a desktop upgrade of the NSW-Queensland watershed border from the Dumaresq River to Bald Rock was undertaken. This paper gives a brief overview of the upgrade process, the difficulties encountered so far, and has a lighter look at some of the history behind the NSW-Queensland watershed border.

KEYWORDS: *DCDB, state cadastre, borders, watershed.*

1 INTRODUCTION

The NSW Digital Cadastral Database (DCDB) is maintained by Spatial Services, a unit of the NSW Department of Finance, Services and Innovation (DFSI). The DCDB is the digital spatial representation of land title ownerships and land administration for New South Wales. In order to provide national coverage for cadastral data for large national and international clients such as Google, Telstra and Australia Post, the NSW dataset is merged with adjoining state jurisdictions (i.e. Queensland, South Australia and Victoria). Each jurisdiction evolved and developed their own cadastre separately and that included the definition of the state border at their margins. When the respective cadastral datasets are merged to form the national dataset, there are small anomalies along the state border. These anomalies are encountered each and every time the datasets are merged. In order to streamline processes for the creation of future national datasets, NSW and Queensland have been upgrading their respective DCDBs so that they bind along a common and agreed state border. This paper gives a brief overview of the upgrade process, the difficulties encountered so far, and has a lighter look at some of the history behind the NSW-Queensland watershed border.

2 BACKGROUND

The NSW-Queensland border was originally described in the letters patent of Queen Victoria dated 6 June 1859 when Queensland was separated from New South Wales in 1865. A part of that description states:

*“...in pursuance of the powers vested in us by the said Bill and Act and of all other powers and authorities in us that behalf vested separated from Our Colony of New South Wales and erected into a separate colony so much of the said Colony of New South Wales as lies northward of a line **commencing** on the sea coast **at Point Danger**, in latitude about twenty-eight degrees eight minutes south and **following the range thence which divides the waters of the Tweed, Richmond and Clarence Rivers** from those of the Logan and Brisbane Rivers, westerly to the dividing range between the waters falling to the east coast and those of the River Murray following the great dividing range southerly to the range dividing the waters of Tenterfield Creek from those of the main head of the Dumaresq River following that range **westerly to the Dumaresq River and following that river** (which is locally known as the Severn) downwards to its confluence with the Macintyre; thence following the Macintyre River which lower down becomes the Barwan [sic] **downwards to the twenty-ninth parallel of south latitude, and following that parallel westerly to the one hundred and forty first meridian of east longitude** which is the easterly boundary of South Australia together with all and every the adjacent islands, their members and appurtenances in the Pacific Ocean: and do by these presents separate from our said Colony of New South Wales **and erect the said Territory so described into a separate Colony to be called the Colony of Queensland.**”*

In order to summarise the above description, the border has three main components:

1. The watershed – from Point Danger near the Gold Coast to the Tenterfield Creek / Dumaresq River confluence.
2. The river (including Dumaresq, Macintyre and Barwon Rivers) – from Tenterfield Creek to Mungindi.
3. The 29th parallel – from Mungindi to Cameron Corner.

The watershed was surveyed by Surveyors Isaiah Rowland (NSW surveyor) and Francis Edward Roberts (QLD surveyor) from 1863-66. Before John Cameron's survey of the 29th parallel in 1879, the 29th parallel was surveyed at the main river crossings only by QLD Surveyor-General A.C. Gregory and NSW District Surveyor W.A.B. Greaves. These plans are recorded in the 'River' series (small number 3039) of Crown Plans as plans 1-6 (Figure 1). The purpose of these surveys was to give the landholders an indication of their leases with respect to the border. The survey of the entire 29th parallel was completed by John Brewer Cameron from 1879-81. Queensland surveyor George Chale Watson was to assist Cameron, but he withdrew from the project after surveying approximately 100 miles from Barrington to Hungerford.

There have been many redeterminations of the border by surveyors since the original surveys. Probably the most significant of these (and definitely the most photographed) would be the construction and placement of the concrete pillar at the original survey mark at Cameron Corner at the 3-way intersection of the borders between New South Wales, Queensland and South Australia by Surveyor David Vincent on 14 May 1969 as recorded on registered Deposited Plan DP767473.

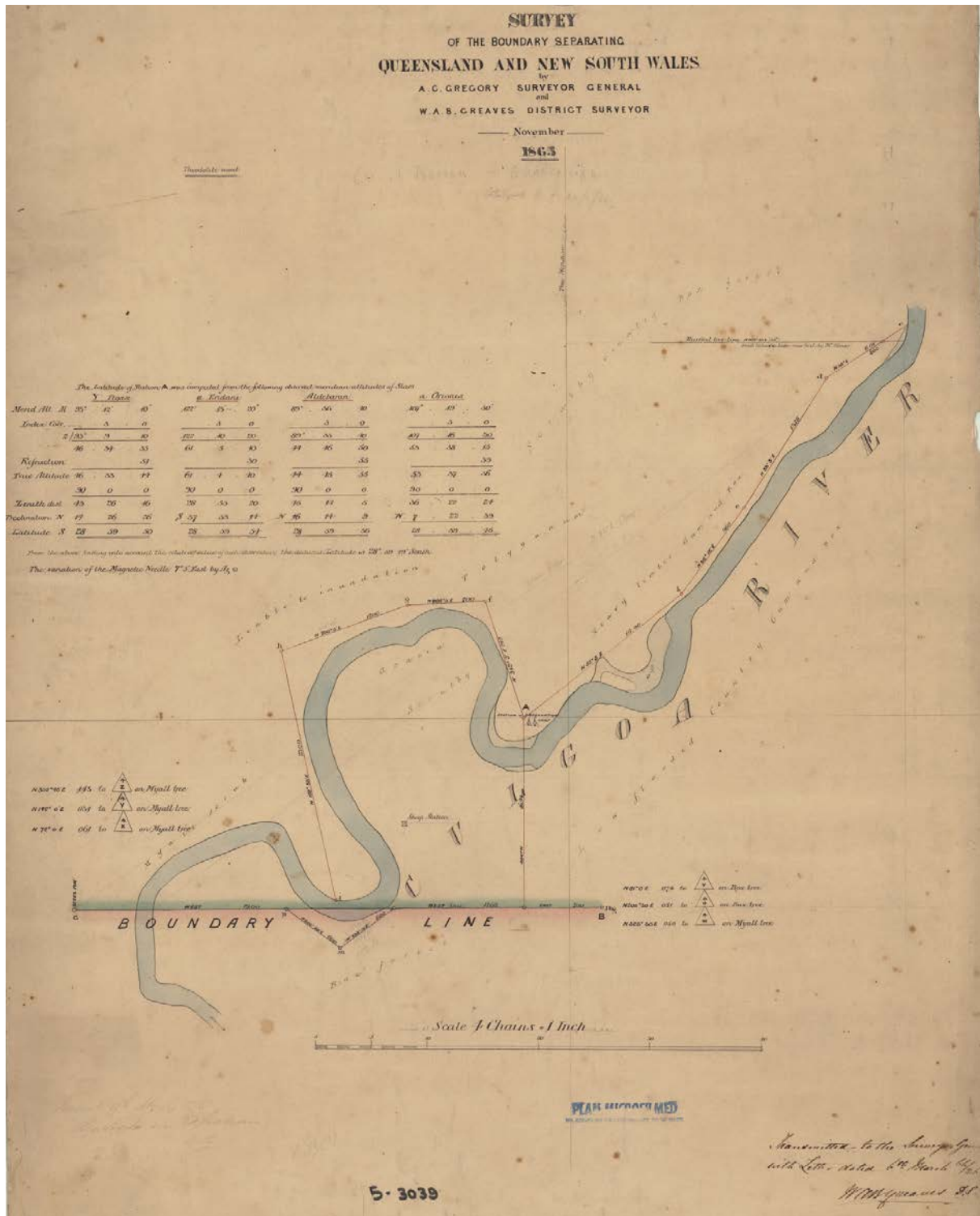


Figure 1: Survey showing the NSW-QLD border crossing the Calgoa River (plan number 5-3039).

John Cameron originally started the survey of the 29th parallel by determining the latitude and longitude of three observatories and comparing that position by using the Sydney observatory as it was linked by telegraph line from Sydney to Greenwich. The telegraph line passed through the small village of Baringun, and the survey could provide a check on distances to the South Australian border. The distance from Baringun to Cameron Corner is 285 miles 24.96 chains (459 km), and from Baringun to the Barwon River 199 miles 40 chains (321 km). John Cameron surveyed the border as a series of 5-mile chords to represent the curved

line on the ground. Every 5th mile is critical in the description of the border as there is a 2' 24.15" angle between each chord. The intervening mile posts and ¼-mile pegs are on a straight line (Figures 2 & 3).

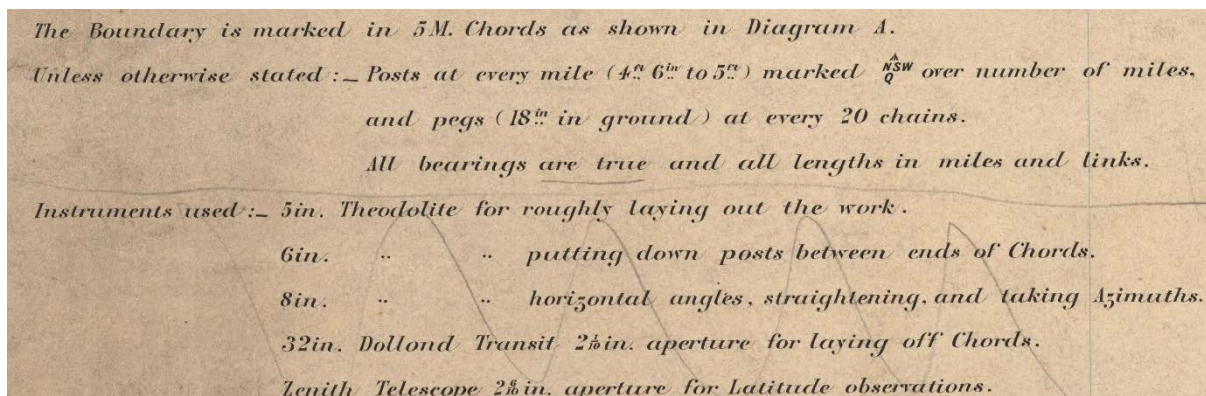


Figure 2: Part of Cameron’s survey, showing explanation of marking and equipment used (plan number 115-3014).

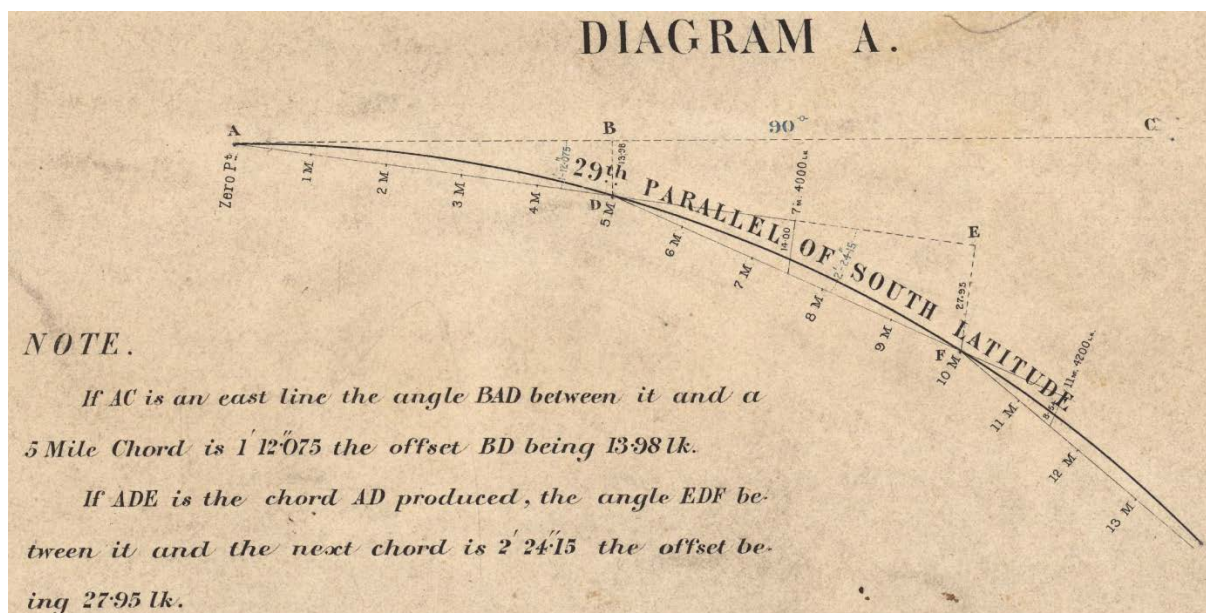


Figure 3: Part of Cameron's survey, showing explanation of marking (plan number 115-3014).

Generally speaking, the border has not been re-surveyed or re-determined since the original surveys. Only occasionally has there been a need to re-determine the border since the 1880s, and as a consequence of the lack of modern surveys, an accurate determination of the border is very difficult.

3 MODERN DETERMINATIONS

3.1 Reconnaissance Surveys

QLD Surveyor R.R. Spurdle undertook a ‘speedo traverse of the NSW-Queensland border’ in August 1969 from Hungerford to Barrington (plan number KU73) (Figure 4). This survey covered 75 miles of the border and found 22 (29%) of the original mile posts. No survey measurements are recorded on the plan.



Figure 4: Part of the speedo traverse by Spurdle (plan number KU73 (Qld)).

QLD Surveyor Bill Kitson drove around the Queensland borders during 1985 (plan numbers KU79 & KU80) (Figure 5) to find and recover as many of the original survey marks (i.e. mile posts) placed by the original surveyors (including John Cameron) on the NSW-QLD border. Only 68 (34%) out of a possible 199 mile posts were found on the eastern section from Barrington to Mungindi. On the western section from Barrington to Cameron Corner, only 33 (11%) out of a possible 282 were found. As the mile posts were found, identified and recovered with witness marks by Kitson, they were later accurately surveyed by Global Navigation Satellite System (GNSS) static survey campaigns to derive accurate Geocentric Datum of Australia 1994 (GDA94) coordinates for each mile post from Cameron Corner to the 'One Ton Post' at Mungindi. The locations of the found mile posts were used to derive a model to predict the location for all intervening mile posts. The distance of one mile was scaled to fit between respective mile posts found.

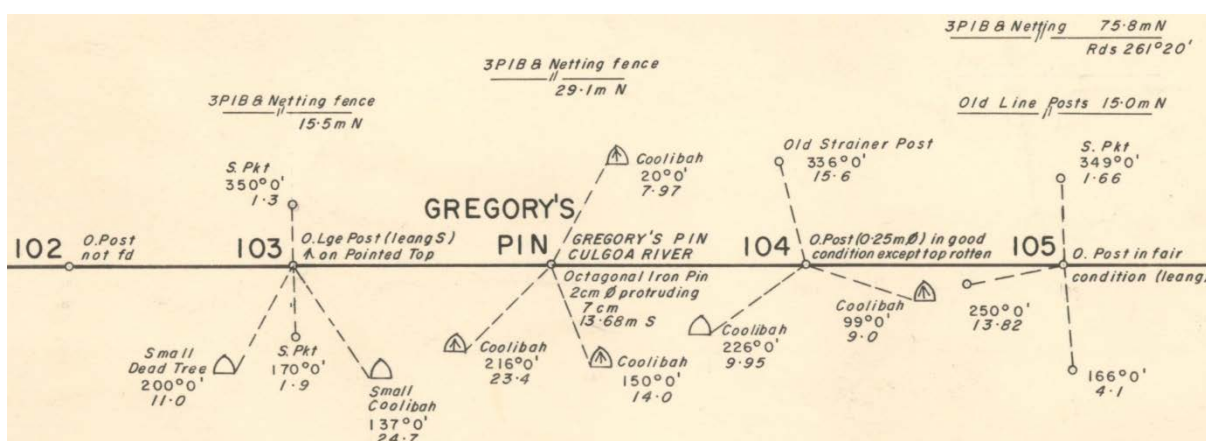


Figure 5: Part of the recovery survey by Kitson (plan numbers KU79 & KU80 (Qld)).

Only 16 (8%) of the mile posts out of a possible 199 mile posts from Barrington to Mungindi were used to compute the model to help find marks on the eastern section. 26 (9%) mile posts out of a possible 282 mile posts were used to compute the model in the western section from Barrington to Cameron Corner.

3.2 Re-Survey: Cameron Corner to Barrington

During 2015, preliminary work was undertaken on the western section from Cameron Corner to Barrington. Permanent survey marks (PMs) were placed at every 5 miles (as that is the point where the border chords form the angle) and extensive searching for each intervening mile post was undertaken using Real-Time Kinematic (RTK) GNSS techniques.

From Cameron Corner to Hungerford (approximately 200 miles), no additional mile posts were found. The section from Hungerford to Barrington has not been re-surveyed at this stage. It is hoped to re-survey this section soon.

As no additional mile posts have been found from Cameron Corner to Hungerford, the best determination of the border will be the predicted model. The model fixes the position of each mile post found and then scales the distances and angles to fit. Generally the distances are not accurate. Sections for the border have scale factors applied as shown in Table 1. As can be seen from the results, there is a large variety of scales that were applied to various segments of the border.

Table 1: Scale comparison from Cameron Corner to Barrington.

From	To	Scale Per Mile (m)
282 W (Cameron Corner)	226 W	+0.64
226 W	210 W	+1.19
210 W	144 W	-0.37
144 W	141 W	+1.59
141 W	125 W	+0.30
125 W	95 W	+0.07
95 W	60 W	+0.18
60 W	10 W	+0.02
10 W	zero	+0.09
Cameron Corner	zero	+0.18 (average)

3.3 Re-Survey: Barrington to Mungindi (Barwon River)

This section has been completely and extensively re-surveyed by surveyors G.R. Stewart (NSW) and R.A. Jenkins (QLD). Four deposited plans have been registered that define the border in 50-mile stages: DP1142937 (zero – 50 mile), DP1142938 (50 – 100 mile), DP1142939 (100 – 150 mile) and DP1142940 (150 – 199 mile). Each sheet of the DPs has 10 miles defined, i.e. two 5-mile segments. In this section, the border is defined by Map Grid of Australia 1994 (MGA94) coordinates for each mile post, and established PMs are located nearby with a distant mark to provide orientation at each mile post. The remains of 71 mile posts (35%) were found and surveyed out of a possible 199 posts. The comparison of each mile interval from Barrington to Mungindi is variable. On average, each mile is 0.63 m short.

3.4 River Section

The New South Wales – Queensland Border Rivers Act 1946 (QLD Legislation, 2002) ratifies certain agreements between the two states, and ‘border rivers’ is defined in the agreement as the median line in question for the respective Dumaresq, Macintyre and Barwon Rivers. The border along the river is a natural-feature boundary and has not been defined by survey. As there is no additional documentation or opinions regarding the description of the border, the common law presumption of *ad medium filum aquae* is to apply to this natural feature as the border. That is, the boundary line between the two states is the middle thread or

line of those rivers as they are presently constituted. The middle thread is the line that divides the bed equally.

The bed is defined in section 172 of the Crown Lands Act 1989 (NSW Legislation, 2016):

“bank” means the limit of the bed of a lake or river.

“bed” means the whole of the soil of a lake or river including that portion:

- (a) which is alternately covered and left bare with an increase or diminution in the supply of water, and*
- (b) which is adequate to contain the lake or river at its average or mean stage without reference to extraordinary freshets in time of flood or to extreme droughts.*

No known modern surveys have determined a recent definition of the NSW-Queensland border along the river section. On the upper reaches of the Dumaresq and Macintyre Rivers there are significant differences or changes from the original cadastral riparian boundaries as defined in the original portion surveys to that of the present river bed.

3.5 Watershed Border

This section presents significant challenges to those seeking to accurately define the NSW-Queensland border. The original survey was undertaken by surveyors Roberts and Rowland in the period from 1862 to 1865. The watershed border has been given special consideration as there is often a road or reservation that separates the adjoining cadastre from the border on both sides. Therefore, in such cases, any subsequent subdivision or development will not form and has not formed a common boundary with the state border. Often the road or reservation is of variable width.

The watershed section is approximately 450 km in length and traverses terrain that has varied land use and varied tenure, is extremely steep and broken, and covered in thick forest. Later on, the area also featured plenty of bush ticks. The challenges that faced the original surveyors Roberts and Rowland would have been significant. The watershed surveys of Roberts and Rowland were essentially two different surveys, which initially diverged significantly as agreement between the two survey parties could not be formed. That divergence continued until near Richmond Gap where, apparently, an accord was reached and the two surveys after Richmond Gap appear to (more or less) coincide. The survey of Roberts is tacitly accepted by both NSW and Queensland governments as the pre-eminent definition of the watershed border.

The document ‘Redefining the Queensland – New South Wales Border: Guidelines for Surveyors’ (DITM & DNRM, 2001) outlines a great deal of detail and procedures of how the surveys were undertaken. The sections near Bald Rock, Wilsons Peak and Mount Lindsay were not surveyed in the original work by Roberts or Rowland.

Not only did the two survey parties of Roberts and Rowland fail initially to form an agreement on the position of the watershed boundary, it would appear from that there was some tension between Rowland and the then NSW Surveyor-General, Walker Rannie Davidson, as indicated by the following correspondence from Davidson to Rowland (Davidson, 1864):

20th June, 1864

Sir,

1. I have to remind you that the long period of 18 months has elapsed since you received my instructions to survey the boundary between Queensland and the Colony of N.S.W. and I am not in the possession of any information as to the progress of the survey, being only reminded that an officer of my Department is so employed thereon by signing large cheques for extra wages and forage allowance, the total expenditure of such service approaching at this moment the sum of nearly £2000.

2. In the absence of monthly Journals, which should have been forwarded with all practicable regularity, I look for a particular account of how your time has been employed since commencing the survey, and which time, however intricate and difficult the country may have been through which it has been carried, has been ample for the accomplishment of a very large amount of work.

3. Indeed, as the distance from Point Danger to where your survey would probably terminate on the Dumaresq River, which cannot, I apprehend, exceed 200 miles, and as the time occupied exceeds 429 working days to be accounted for deducting the period allowed you for leave of absence, I am of the opinion that the survey ought to have been completed, unless very unusual difficulties, of which I am quite uninformed, have arisen. When, however, I consider that a second party, equally strong with your own, has been supplied by Queensland to assist in this work, I am at a loss to understand how it happens that the work has not been completed long before now.

4. It appears to me, may I add, that no excuse can exist for your not having informed me as to your progress, as you assuredly might have availed yourself of the opportunities by which you forward your accounts, to supply me with useful and important information as to your progress in the work which has been entrusted to you. The omission appears to me extremely blameable in an officer so far removed from Head Quarters and entrusted with a work of so much interest.

5. I am compelled to add that in the event of the continued absence of the information which I seek, I shall feel an almost insuperable difficulty in signing further abstracts for pay and allowance.

I have the honour etc.

Sgd. W.R. Davidson

Surveyor-General.

In addition to this candid letter, it would appear that Rowland had later requested payment of a bonus. The reply by Davidson shown below (Davidson, 1865), in addition to his (relatively) brusque assessment of Rowland's request, also shows a fascinating insight into the physical difficulties faced by surveyors of the period:

7th November, 1865

Sir,

In replying to your application of the 2nd instant wherein you seek for the payment of a bonus in consideration of extra services and certain unforeseen expenses incurred on account of the survey of the Northern boundary of the Colony, I have to acquaint you that the grounds on which the bonus in question has been sought are not sufficient to warrant me to make my recommendation in your favour.

The allowances extended to you on account of the expedition were for extra equipment, forage and men's wages and in quoting Mr. Roberts' case as a precedent you have been

unfortunate, as the Surveyor-General of Queensland states that the bonus paid to him was only in fact to cover the cost of equipment but chiefly to compensate for the loss of camp equipment and several horses carried away by floods whilst engaged in a previous survey.

*Sgd. W.R. Davidson
Surveyor-General.*

Surveyor William Drummond surveyed the section not surveyed by Roberts near Bald Rock as described in two Crown Plans being 109-3026 (completed 22 February 1884) (Figure 6) and 118-3026 (completed 23 April 1885). The Crown Plan small number '3026' equates to the 'Mountain Plans' (type of feature survey) series. It is interesting to note that Crown Plans 2414-3010 and 2416-3010 show land that the NSW Department of Agriculture excluded and fenced from the adjoining Queensland Portions (14 January 1957). As there are national parks on both sides of the border in this area, no further surveys have taken place since.

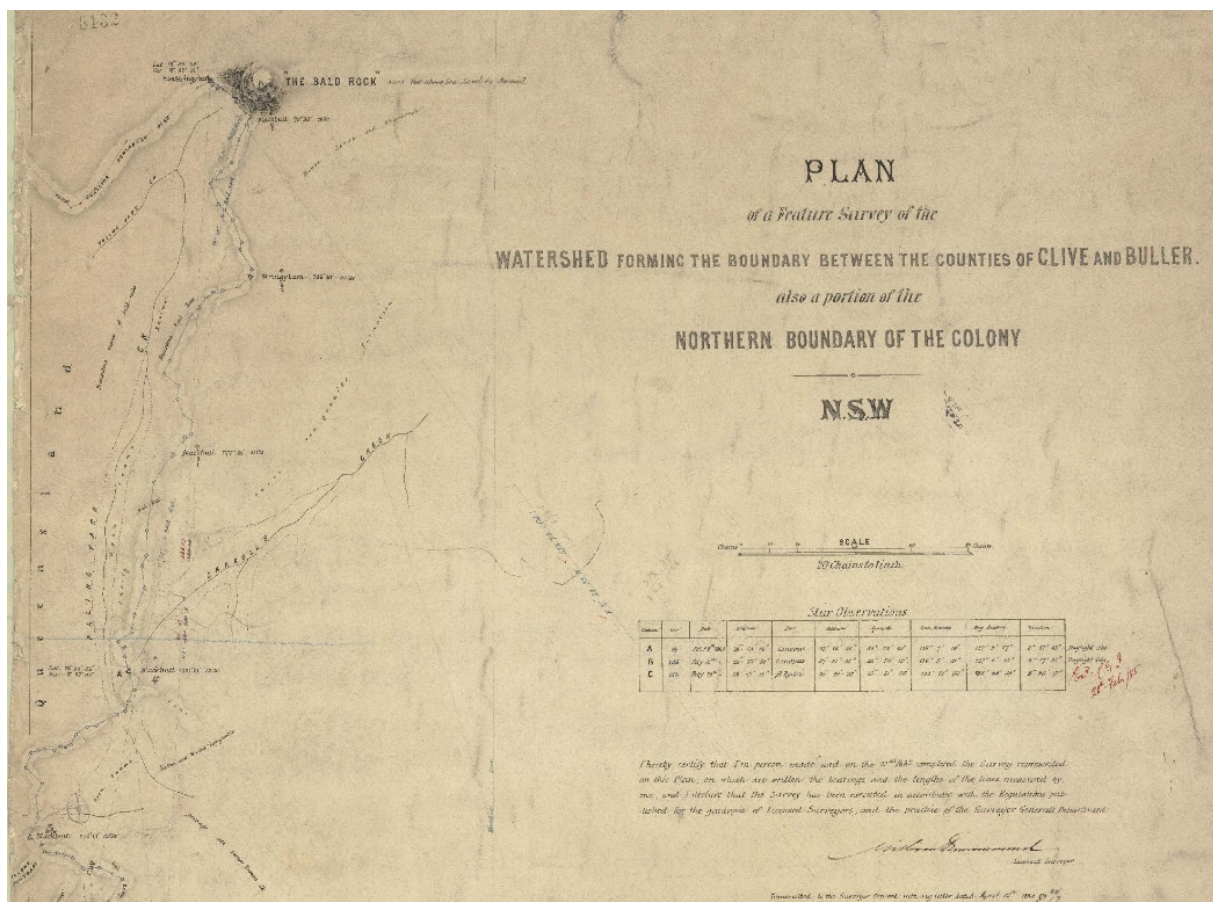


Figure 6: Part of the survey of the watershed by Drummond (Crown Plan 109-3026).

The infestation of ticks was a major issue during the 1930-50s. The NSW Department of Agriculture excluded many areas from adjoining titles in the coastal Queensland area. The Parishes of Tallebudgera and Tenterfield are the few Queensland parishes that alienated land adjacent the NSW-QLD border. Surveyor B.R. Hindmarsh surveyed the watershed and fencing along the border in the area adjoining the Parish of Terranora in 1934 (see Crown Plan 2238-3050, Figure 7), and surveyor Edmund Adrian Du Rieu Hill also surveyed an area adjacent the Parish of Berwick (see Crown Plan 2305-3050, Figure 8).

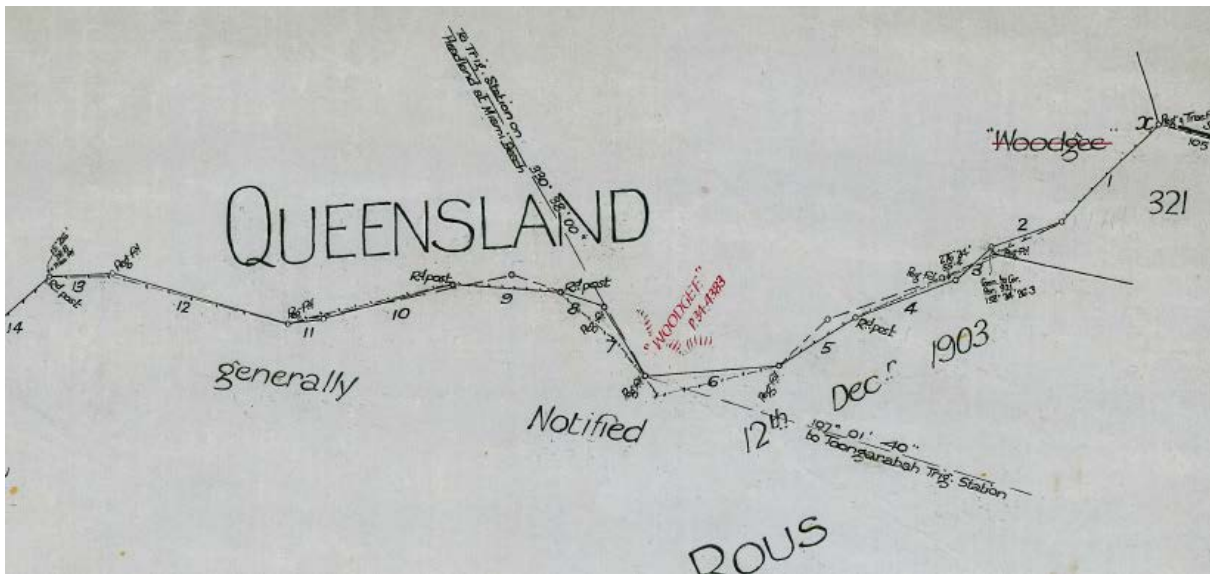


Figure 7: Part of the survey of the watershed of the McPherson Range by Hindmarsh (Crown Plan 2238-3050).

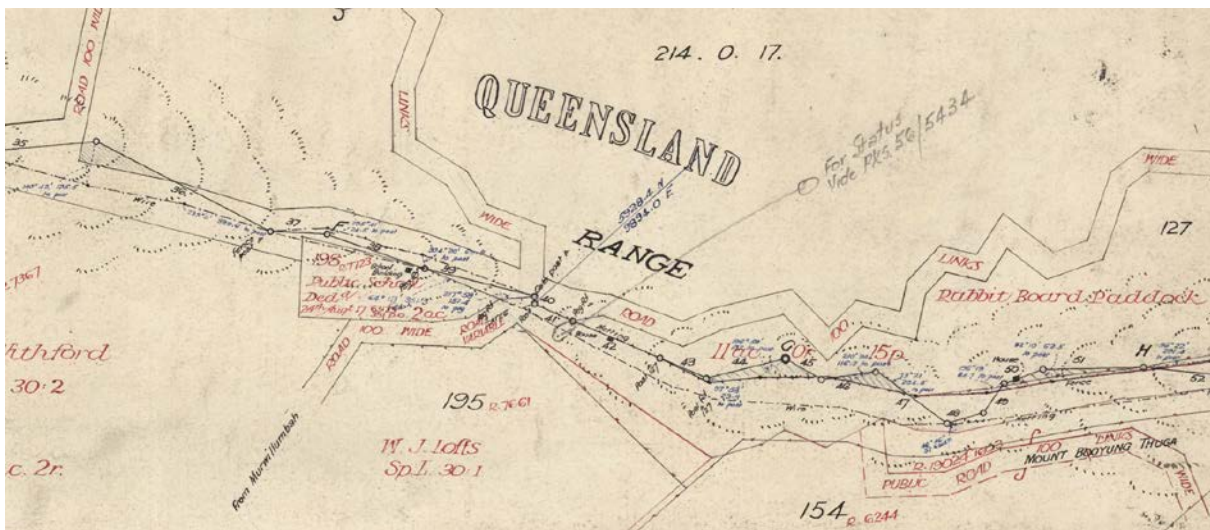


Figure 8: Part of the survey of the watershed of the McPherson Range by Du Rieu Hill (Crown Plan 2305-3050).

These surveys were later followed by land acquisition surveys for the NSW Department of Agriculture by surveyor Stan Hosie (as Hindmarsh was not registered as a surveyor in Queensland) where land was taken from the Queensland titles so that no Queensland title crept over the watershed into the NSW catchments. The theory was that ticks would wash off the cattle in Queensland and roll down the hill into New South Wales. Great attention to detail appears to have been applied to this problem.

Those modern surveys that have been undertaken along the watershed boundary have only redefined small sections relative to the total length of the watershed. The watershed remains largely unsurveyed since its original survey by surveyors Roberts and Rowland.

3.6 DCDB Desktop Upgrade of the Watershed Border

The DCDB desktop upgrade of the watershed border essentially consists of using existing deposited plans with connection to State control survey marks of adequate MGA coordinate accuracy to determine fixed control points on the watershed. The watershed dimensions given

by the existing transcriptions of surveyor Roberts' field books are then swung and proportioned between watershed control points. Unfortunately, Roberts' field books have been lost. Rowland's first field book exists, while his second field book was presumed lost in the Garden Palace fire of 22 September 1882.

The established State control survey network is normally realised within towns and villages or along infrastructure projects and corridors. Very few trigonometrical stations are located along the watershed border, nor are there any established survey marks. In addition, as the area is predominantly covered by state forest, national parks and rural farming, very few subdivisions or surveys have been undertaken since the original land grants along the area of interest. Only in the areas where a survey has been completed that connects from the established network, i.e. since 1990, is it possible to determine a position of the border to any certainty. Therefore, without extensive field work, the entire watershed border feature is very difficult to redefine and locate with any certainty from a DCDB desktop upgrade perspective.

Preliminary work has been undertaken along a 60 km section of the western end of the watershed from the Dumaresq River to Bald Rock (Roberts' watershed corners 1648-1290). There is only one fixed section of watershed control points that provide a reliable definition and position along this section. That section is from an investigation survey (DP1150605) by surveyors David Mallet and Grahame Wallis that redefined Roberts' watershed corners 1595-1608 (Figure 9).

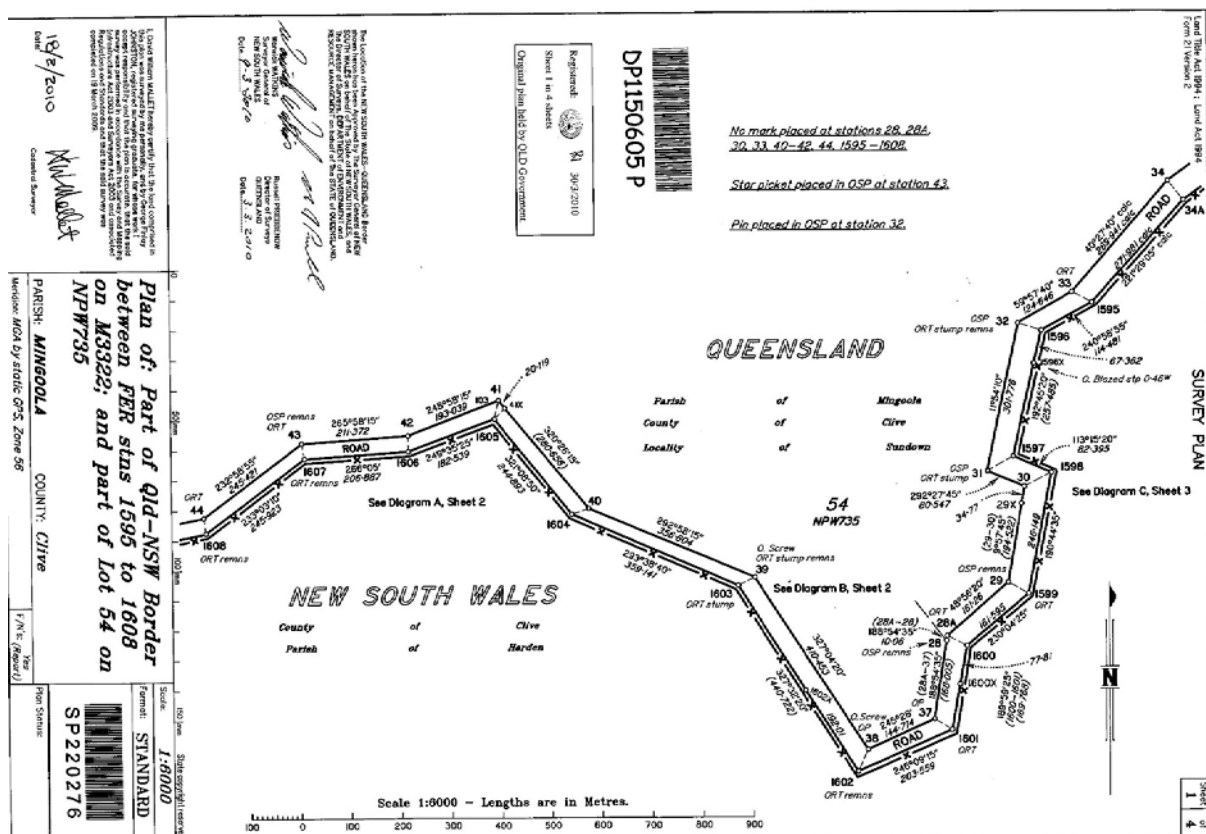


Figure 9: DP1150605 (investigation survey), defining the NSW-QLD border between stations 1595-1608.

Analysis of Table 2 shows the differences in bearings and distances between DP1150605 and surveyor Roberts. It can be seen that the differences are varied and large. The orientation of each line swings approximately $\pm 0.5^\circ$ and the length has a scale as high as 1.029 or 29 m/km.

The swings and scale factors are consistent with those found for Roberts in the DCDB desktop upgrade, as shown in Table 3 for Roberts' watershed corners 1648-1400. The results (or differences) noted in DP1150605 highlight the size and variability (i.e. 4.8 m per 170 m) of the original border surveys. Due to their varied nature without any ground control to provide constraints, it is very difficult to extrapolate any results that could be considered reliable.

Table 2: Comparisons of bearings and distances of the border between DP1150605 and Roberts.

By F.E. Roberts					By DP1150605		Differences		
From Corner	To Corner	Bearing	Distance (links)	Distance (m)	Bearing	Distance (m)	Swing	Δ Dist.	Scale Factor
1594	1595	213°30'	1,340	269.565	221°29'05"	271.981	+7°59'05"	2.42	1.00896
1595	1596	233°00'	564	113.459	240°58'55"	114.481	+7°58'55"	1.02	1.00901
1596	1597	185°00'	1,250	251.460	192°45'20"	257.485	+7°45'20"	6.03	1.02396
1597	1598	105°30'	400	80.467	113°15'20"	82.395	+7°45'20"	1.93	1.02396
1598	1599	183°00'	1,195	240.396	190°44'35"	246.149	+7°44'35"	5.75	1.02393
1599	1600	222°00'	800	160.934	230°04'25"	161.595	+8°04'25"	0.66	1.00411
1600	1601	182°00'	820	164.958	189°59'25"	169.768	+7°59'25"	4.81	1.02916
1601	1602	238°30'	1,000	201.168	246°09'15"	203.559	+7°39'15"	2.39	1.01189
1602	1603	320°00'	2,148	432.109	327°32'20"	440.722	+7°32'20"	8.61	1.01993
1603	1604	286°00'	1,760	354.056	293°38'40"	359.141	+7°38'40"	5.09	1.01436
1604	1605	313°30'	1,200	241.402	321°08'50"	244.893	+7°38'50"	3.49	1.01446
1605	1606	242°00'	900	181.051	249°35'25"	182.539	+7°35'25"	1.49	1.00822
1606	1607	258°30'	1,020	205.191	266°05'00"	206.887	+7°35'00"	1.70	1.00827
1607	1608	225°30'	1,213	244.017	233°03'10"	245.923	+7°33'10"	1.91	1.00781
Range							0°32'05"	7.95	0.0251

Table 3: DCDB desktop upgrade – swings and scale factors between corners 1648 and 1290.

From Corner	To Corner	Original Surveyor	Swing	Scale Factor
1648	1632	F.E. Roberts	+7°42'25"	1.014190
1632	1608	F.E. Roberts	+7°33'31"	1.016018
1608	1595	F.E. Roberts	+7°44'59"	1.014860
1595	1400	F.E. Roberts	+7°46'43"	1.014296
1400	1398	F.E. Roberts	+8°34'37"	1.011650
1398	1390	F.E. Roberts	+8°30'42"	1.010364
1390	1375	F.E. Roberts	+8°39'41"	1.012226
1375	WD7	W. Drummond	+8°36'42"	1.007969
WD7	WD59	W. Drummond	+8°27'05"	1.001115
WD59	WD74	W. Drummond	+8°21'35"	0.995324
WD74	WD81	W. Drummond	+8°20'28"	0.996714
WD81	WD91 (ref tree for cor. 1373)	W. Drummond	+8°20'28"	0.996714
1373	1366	F.E. Roberts	+8°40'04"	1.013134
1366	1290	F.E. Roberts	+8°21'22"	1.014972

The DCDB desktop upgrade either side of Mallet and Wallis' DP1150605 used fixed watershed control points at Roberts' corner 1632, i.e. a permanent survey mark (PM142367) placed by surveyor Les Gardner through the remains of an original border peg to the west of DP1150605, and eastwards at the town of Jennings, i.e. Roberts' corner 1400. In particular, the section from DP1150605 east to Jennings (Roberts' corners 1595-1400) highlights the essential problem of a DCDB desktop upgrade of the watershed as it is a very long section with no intervening fixed control and suspected major errors in the transcription of Roberts'

field notes. Given also the large variance in the measurement comparisons with Roberts' work (see Tables 2 & 3), the proportioning of such a long section of watershed inevitably leads to severe lack of reliability of the results. Reliability of results can only be achieved with extensive field work.

Table 3 refers to the DCDB desktop upgrade and shows the MGA swings and ground distance scale factors for the sections between the corners for which an MGA coordinate fix has been derived. The prefix 'WD' for the station numbers refers to corners surveyed by William Drummond in the hiatus section of the watershed not surveyed by Roberts between Roberts' corners 1374 and 1375.

Table 3 also reveals what appears to be a neat 1° error in the angle 1401-1400-1399. Thorough examination of old Crown Plans in the area confirms this error in Roberts' original work. This is another example of the errors that could be present in any section of the watershed border. Without sufficient density of watershed control points derived directly from original monumentation, such errors will be very difficult to identify, again reducing the reliability of the results.

The investigation of the section near Bald Rock that was re-surveyed by surveyor William Drummond revealed that the starting point used by Drummond is actually the corner denoted as no. 1373 by Roberts in his original survey, not corner no. 1374 as shown on Drummond's plan 109-3026 (Figure 10). This raises the question as to what constitutes the watershed boundary for this section. This question can only be resolved by mutual agreement between the NSW and Queensland governments.

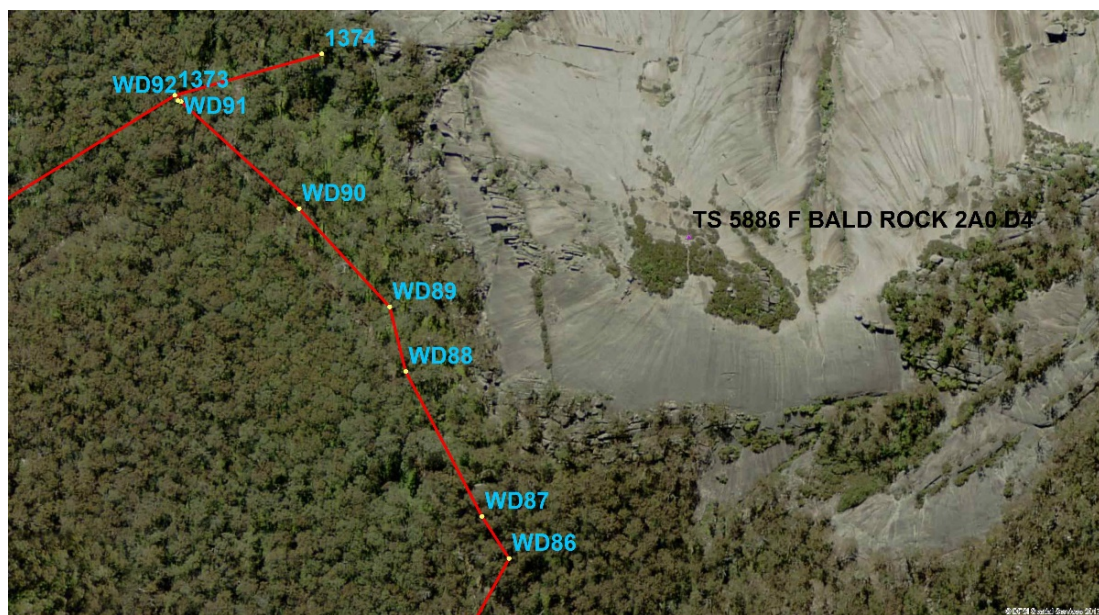


Figure 10: Part of the re-survey of the watershed by Drummond, showing starting point is actually 1373, not 1374. Note that the original border definition has not adopted the true (physical) watershed, as TS5886 is actually located at the top of Bald Rock.

A bare few preliminary GNSS positions on rare original monuments have been available so far to aid in the DCDB upgrade of the NSW-Queensland watershed border. The most notable of these is the substantial rock cairn (Figure 11) found at surveyor Roberts' station no. 1375, being the point of commencement of Roberts' watershed survey after his hiatus west from Bald Rock (the hiatus surveyed by William Drummond).



Figure 11: F.E. Roberts' original rock cairn at station 1375 (photo courtesy Neal Holmes, QLD Department of Natural Resources and Mines).

4 CONCLUDING REMARKS

This paper has outlined a brief history of the NSW-Queensland border with emphasis on the watershed border and has given a summary of the difficulties faced so far as a precursor of the difficulties likely to come in the continued DCDB desktop upgrade of the NSW-Queensland border. Given the paucity of modern border surveys defining the watershed border with reference to original border monumentation and coordinated State control survey marks, any DCDB desktop upgrade of the watershed will not have the rigour associated with a border definition by extensive field work. Such field work would require significant resources. Until a final analysis of all cadastral survey plans has been undertaken in conjunction with extensive field work, a modern and rigorous definition of the NSW-Queensland watershed border cannot be delivered. In the absence of extensive field work, only a line of agreement between the two jurisdictions that equates to a useable description of the watershed border for the purposes of DCDB integrity is possible.

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