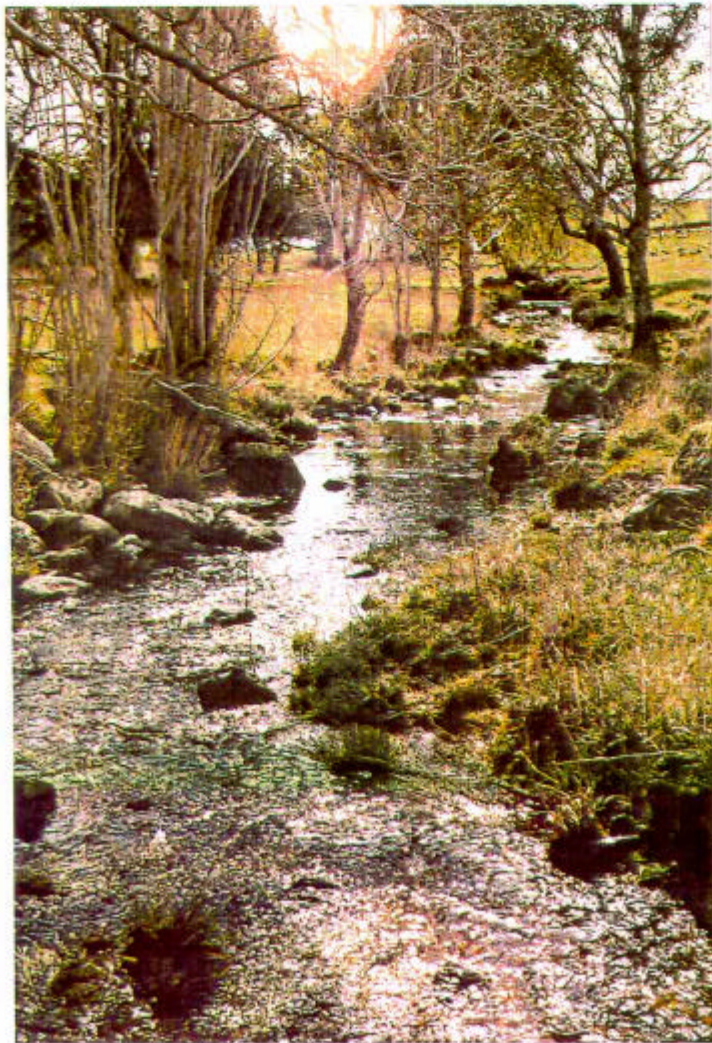


RIVERS AND THEIR IMPACT ON
CADASTRAL BOUNDARIES

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SYNOPSIS

A paper, demonstrating with the examples of case studies, the impact on cadastral boundaries of moving rivers. The paper emphasises the significance and importance of (a) the 1881 Order in Council by which land along some 280 rivers was permanently reserved, (b) the 1905 Water Act which clarified the term "bed and banks", and (c) the 1850 Separation Act which dealt with the Murray River as the State boundary. The role of the Surveyor General as an arbitrator is discussed as is the role of the surveyor as a planner and land manager.

RIVERS AND THEIR IMPACT ON CADASTRAL BOUNDARIES

The complexities and variations of the position of title boundaries abutting or adjacent to water courses are topics that often cause vexation to property owners, surveyors, solicitors and Crown land administrators. A surveyor, grappling with a re-establishment problem on the banks of the Freestone Creek (15 kilometres north west of Stratford) where shortages of 200 metres over entitlement are evident. Or wondering which of the many courses is the main flow of the Murray River through the Barmah Forest, must surely question the sanity or sobriety of the careers adviser of his/her High School who recommended surveying as a suitable and rewarding profession. There are so many variables that effect the problem that as a general rule each and every case must be treated on its own set of circumstances.

Take for example the case where water is released from Eildon Weir into the Goulburn River and the resultant flow causes erosion of the banks far in excess of that caused by the normal flow of the river. Or consider the fact that the very existence of the Eildon Weir has mitigated the flow in times of severe floods over many years. Do such actions balance each other or is the abutting landowner always worse off? Of course at the end of the day, no matter what legal interpretations we may place on the causes and affects, the position of the river as it now flows determines the extent of land available to the Crown for a Reserve or to the abutting owner. No matter how we may like to control the flow of rivers by dams, weirs, channels, or river improvement programs, the enormous power of a swiftly flowing river determines the final outcome of the boundary. It is considered that no man made intervention could have prevented the enormous disturbance and destruction of the banks of the Avon and Mitchell Rivers by the floods of April 1990 or of the Ovens and King Rivers in October 1993.

Land forming the bed and banks of some 280 watercourses in Victoria was set aside for Public Purposes Reserves by an Order in Council dated 23rd May 1881. This Order was made under the provisions of sections 6 and 8 of the 1869 Land Act and it is generally regarded that such an Order did much to enhance, preserve and protect the corridors of Public land along the State's waterways. It is strongly urged that no matter what notation appears on the Parish plan regarding the reservation relating to a particular river, you need also to check the actual reservation details either as detailed in the 1881 Government Gazette or as summarised in the Parish Guide. The details relating to the reservation of so many rivers differ throughout their courses. I quote for example, the Tambo River which has a reserve 20.12 metres wide between its source and tidal water then 30.18 metres wide to Lake King. To the north of Swan Reach, many of the early Crown surveys (made prior to 1881), left a strip of land 150 links (30.18 metres) wide between the river's bank and the allotment boundaries. The Tambo River at this point is non-tidal and therefore there is a 10.06 metres wide strip of unreserved Crown land between the Permanent Reserve and the freehold land. This strip has been utilised in some instances for access.

There is reference in the 1881 gazettal of quite a number of rivers having reservations existing not only on the main stream but also over their tributaries. It should be understood that no reservations exist on tributaries of tributaries. For example the Watts Rivers is a tributary of the Yarra River and is subject to a 20.12 metre wide reservation along each

bank but Chum Creek, Grace Burn and Donnelly Creek, being tributaries of the Watts River are not subject to the 1881 Order in Council.

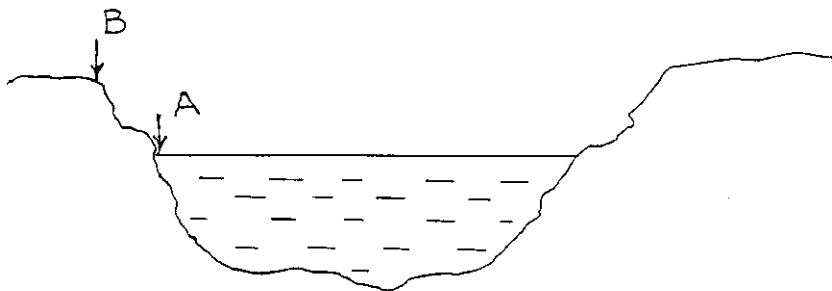
Of course vast tracts of land abutting waterways were alienated prior to 1881. It is opportune to point out that if land on both sides of a river was sold before 1881, then no Permanent Public Purposes Reserve encumbers the bed of the river between the sold parcels. The reason being that up until 1st May 1906 and notwithstanding colourings delineations or measurements shown on the titles of the land abutting the water course, the registered proprietors of the land owned, under Common law, to the centre of the water course. Therefore in 1881, there was no Crown land available to reserve. Section 5 of the Water Act 1905 decreed that if a water course formed the boundary of an allotment then the bed and banks were deemed not to have been alienated. The 1905 Water Act was effective from 1st May 1906. A legal opinion has been obtained that stated that the 1881 Order in Council has no affect on the bed and banks which were deemed to have remained Crown land pursuant to the 1905 Water Act. It was the opinion of the Crown Solicitor that the 1905 legislation did not convey Public Purposes Reserve status to the strip now deemed to be Crown land. Section 5 of the Water Act 1905 is now incorporated into section 385 of the Land Act 1958.

BED AND BANKS

It is important that we agree to a common definition of the term "bank" in our determination of boundaries adjacent to waterways. From 1905 to 1989 the Water Act contained a definition of "bed and bank" which related to that Act. In 1989 the definition was redefined and transferred to the Land Act. This definition reads:-

"Bed and banks ", in relation to a watercourse(a) includes the land over which the water in the watercourse normally flows and the land that is normally covered by water; (b) does not include land abutting on or adjacent to the bed and banks that is from time to time temporarily covered by floodwaters from the watercourse.

It should be made clear that this definition of "bed and banks" only refers to land which is bounded in whole or part by a watercourse and should only be used when defining a boundary pursuant to section 385 of the Land Act 1958. On the sketch hereunder this bank is labelled "A".



There has been much debate as to what part of the bank a surveyor should measure to if, for example, he is endeavouring to re-establish the boundary of the Public Purpose Reserve "20.12 metres from the bank of King Parrot Creek". From a study of many surveys over

many years, it is my belief that the top of the high bank (point labelled "B" on the sketch) was the origin from which reserve boundaries were set out by Crown surveyors in the alienation surveys of the majority of Crown allotments. Unless there is evidence to the contrary, this high bank should be adopted in setting out Crown Reserves. There are however exceptions to this rule. Particular care should be taken in re-establishing boundaries along the Murray River, Goulburn River, Glenelg River,

Godfrey Creek, Bunyip River, Castle Creek, Crawford River, Home Creek, Honeysuckle Creek, Hughes Creek, La Trobe River, Merton Creek, Mitta Mitta River, Seven Creeks, Snowy River, Stokes River and rivers adjacent to the coast where tidal waters affect their flow. Specific water levels, such as summer or winter, are referred to in the reservation of the bed and banks of these rivers.

Because of the many different ways properties abutting or adjacent to rivers have their boundaries defined, I have prepared a series of differing examples so that some re-establishment procedures can be explained.

Case 1, Consider the situation where you have been requested to subdivide Crown allotments 16 and 17, section 1, Parish of Bullarto. These allotments about a 20.12 metre wide reserve along the bank of the Coliban River.

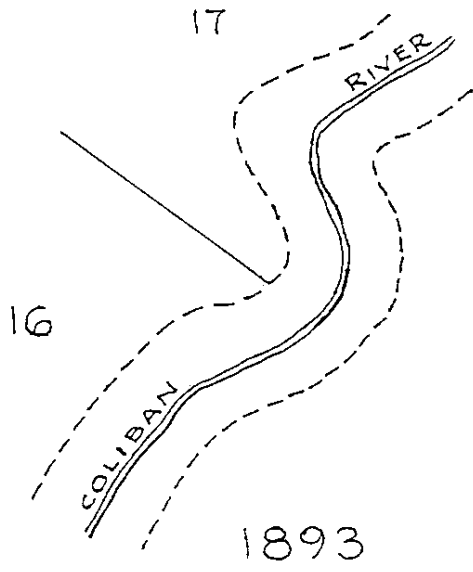
In effecting a re-establishment such as this the following advice is offered:

- (a) re-establish the reserve boundary from the fieldnotes or fieldbook of the original Crown alienation survey
- (b) if the fieldnotes cannot be found, use the plot of the original Crown survey plan
- (c) if fieldnotes and plan cannot be found use the plot shown on the Parish plan. Do not use the plot of the diagram shown on the Crown grant or Certificate of Title.

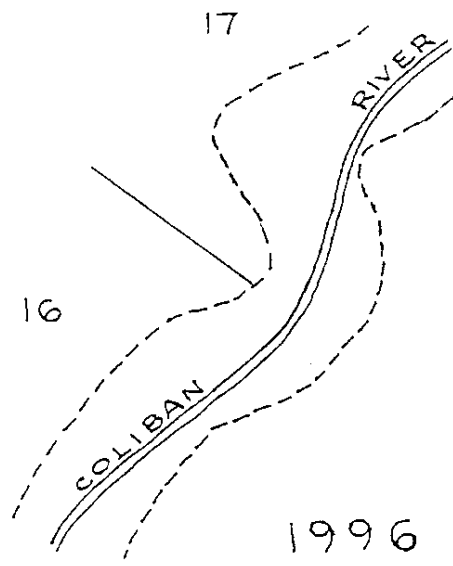
In this particular case, the fieldnotes of the original Crown survey, (fieldnotes 93-4/614) are readily available and the reserve boundary can be re-established.

The position of this boundary does not move with any movement of the river. It stays in the same position as originally surveyed. (fig. 2) The exception to this rule is where the river slowly and imperceptibly moves to such an extent that it crosses the 20.12 metre wide reserve corridor and invades onto the freehold land. The registered proprietor forfeits the new bed of the river which becomes Crown land. (fig. 3) If the river changes course by a sudden or man made influence, and invades onto the freehold land the allotment boundaries remain in their original position. (fig. 4)

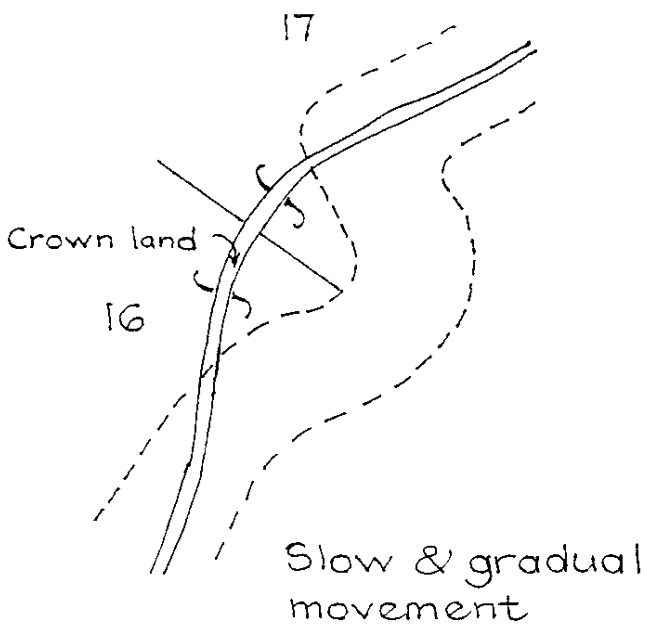
(fig. 1)



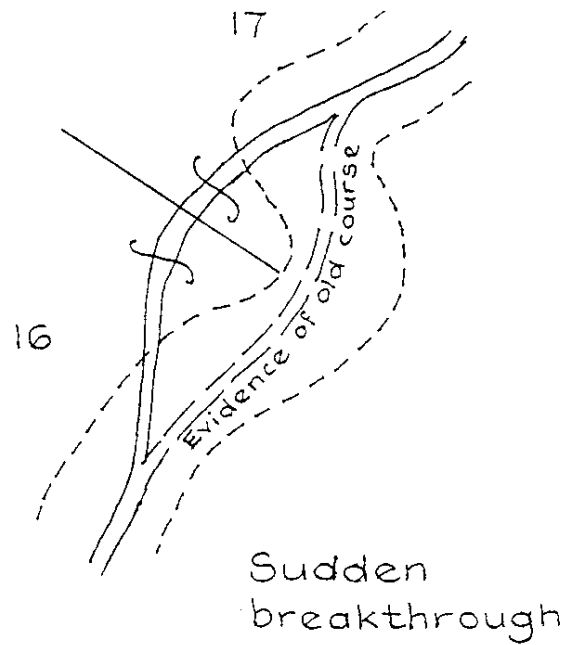
(fig. 2)

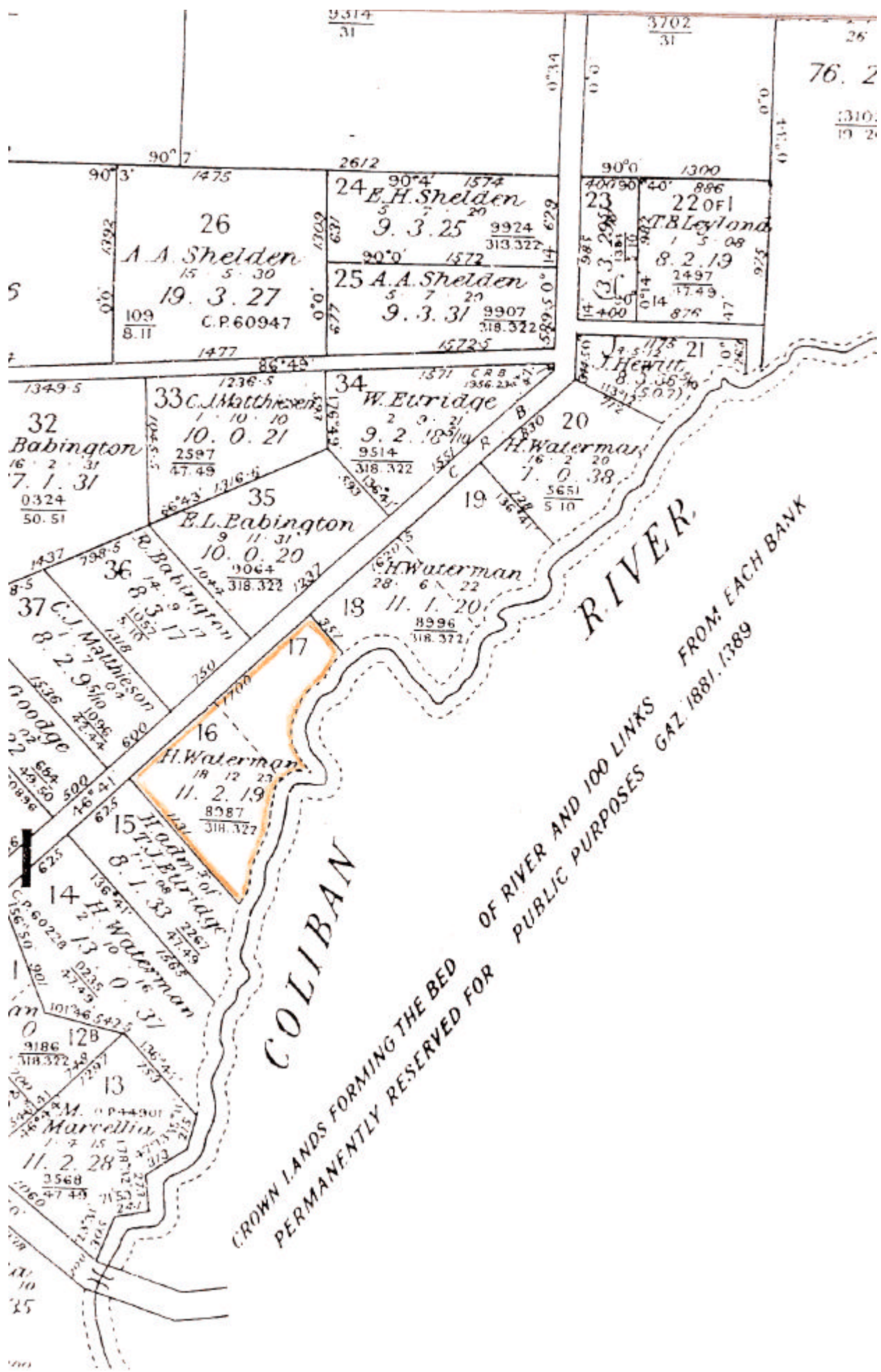


(fig. 3)



(fig. 4)





93-4/614
1893-94/614

Village Settlement Act's
Lyonsville

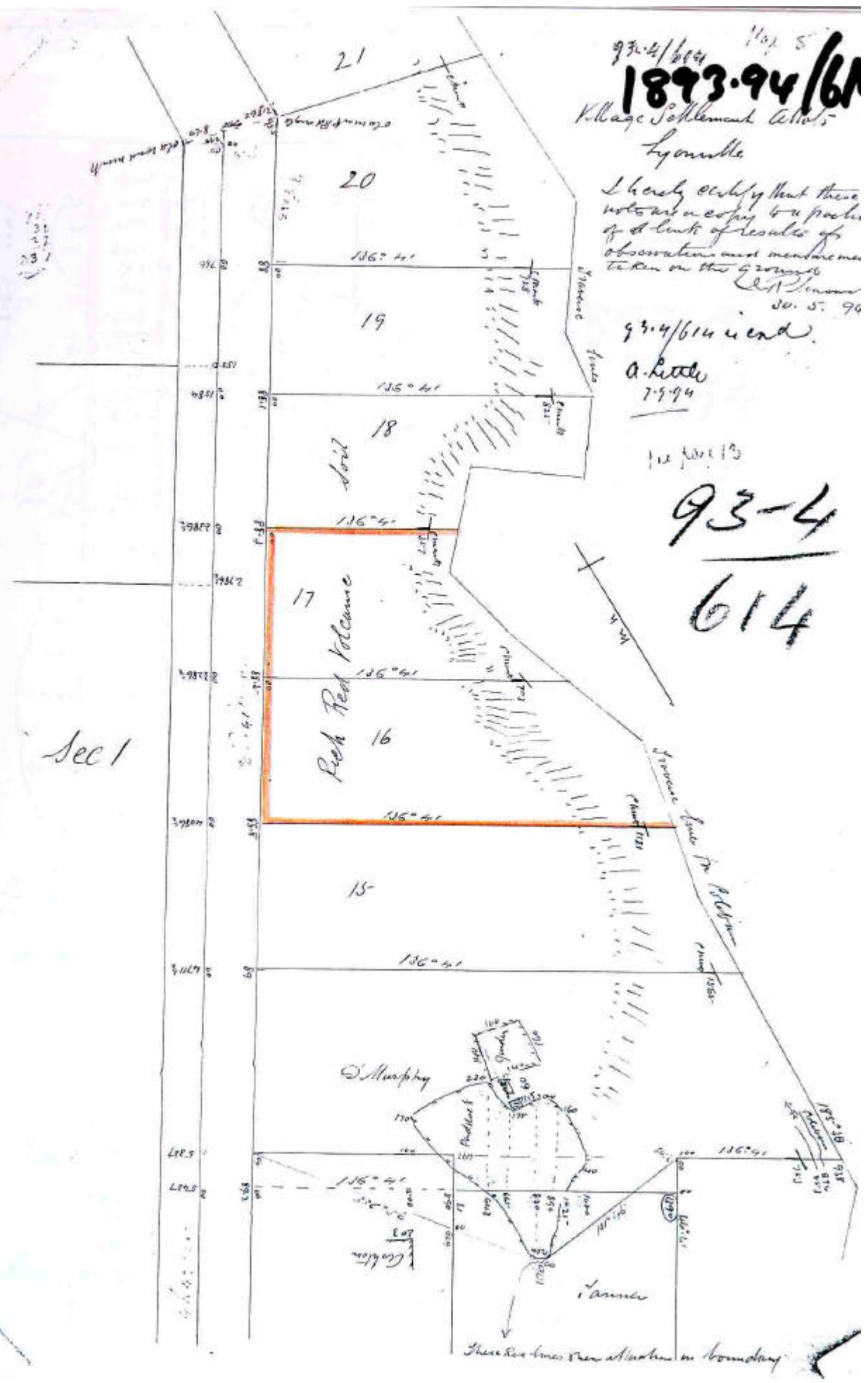
I hereby certify that these
notes are a copy to a pocket
of a book of results of
observations and measurements
taken on the ground
List known
20. 5. 96

93-4/614 i end.

A. Little
7-9-94

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93-4
614



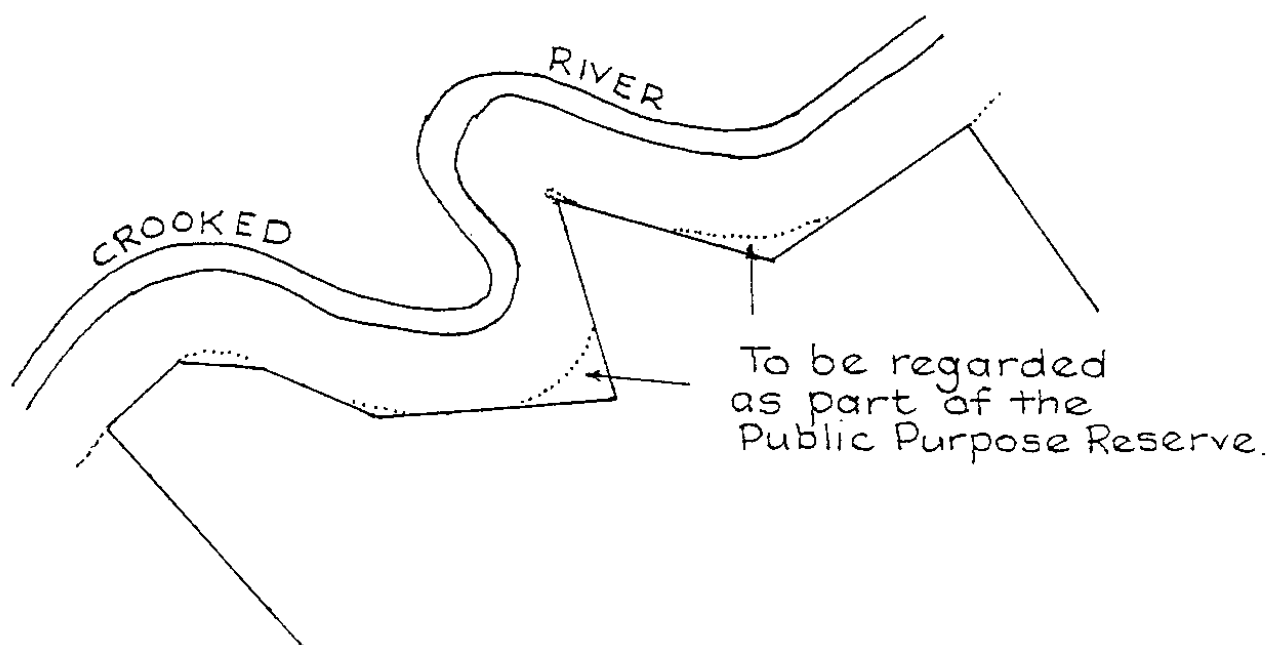
11
36
27
23

Sec 1

These lines were taken on boundary

In the proposed subdivision of allotments 16 and 17, there would be no objection to a series of straight surveyed boundaries, defined by metes and bounds, replacing the irregular undefined river reserve boundary.

It should be noted that a re-established freehold boundary need not necessarily coincide with the Permanent Public Purposes Reserve boundary which was a boundary a nominated distance from the bank of the river's position in 1881. However, for all practical purposes, the boundaries should be considered coincident. An example would be one where the allotment boundary was defined by a series of straight lines the required offset from the water course. Of course the river is not a series of straight lines but a curved and bending course.



Case 2., Crown allotment 3, section 1 SA, Parish of Kororoit, is bounded on its western boundary by the Toolern Creek. The parish plan shows that the bed and 20.12 metres from each bank of the Toolern Creek were permanently reserved for Public Purposes in 1881. The owner of allotment 3 wishes to subdivide his land and because of Council constraints on minimum lot size, the area of the allotment is a critical concern.

The Crown grant was based on OP K74 surveyed in 1856. The surveyor's fieldbooks relating to this survey cannot be found and OP K74 was plotted at a scale of 20 chains to an inch. (1 : 15840)

There is very good agreement between the plot of OP K74 and the plot of the position of the present course of the creek. Obviously the scale of Op K74 makes the plot comparison of minimal value but from a field inspection it is obvious that there has been little or no movement of the creek since alienation. The creek runs in a deep well defined bed some six to eight metres below the flat surrounding plains.

Since allotment 3 was alienated prior to 1881, and as mentioned previously, the grantee and/or his successor in title owned to the centre line of the creek until 1 st May 1906, there is now no reserved land adjacent to allotment 3. The notation "*Crown land forming bed of river and 100 links from each bank permanently reserved for Public Purposes. Gaz.. 1881: 1389*", as shown on the Parish plan is misleading in cases where the abutting land in 1881 was not "the property of the State".

The bank that should now be adopted is one which accords with the definition "*Bed and banks*", in relation to a watercourse (a) includes the land over which the water in the watercourse normally flows and the land that is normally covered by water; (b) does not include land abutting on or adjacent to the bed and banks that is from time to time temporarily covered by floodwaters from the watercourse.

An area comparison indicates an excess of approximately 1700 square metres between the granted area and the current survey. This would be attributable to (a) a general excess of approximately 1 in 3000 in the area, and (b) the probability the original survey adopted the high bank whereas the modern survey adopts a bank which approximated to the waters edge.

This watercourse boundary cannot be replaced by a series of straight surveyed boundaries because this boundary continues to move with any slow and imperceptible movement of the creek. The deletion of the watercourse abuttal would also take away the registered proprietors riparian rights which would include using the creek as access.

Case 3. A prospective purchaser of allotment 4013, Parish of Briagolong, is considering buying the whole Crown allotment. The title shows an area of 53 acres 2 roods 26 perches and is bounded on the west by Freestone Creek. He has engaged you to effect a check survey before he finalises his dealing. The land is being sold for \$4000 per hectare.

Your field measurements from well defined road alignments to the top of the bank of the creek disclose shortages to title dimension in both the northern and southern boundaries of approximately 220 metres and an area shortage of 4.5 hectares.

It is obvious that there have been major movements in the creek's position since the allotment was alienated in 1872. Your concern is to ascertain how these changes occurred. Your research reveals that Freestone Creek originally drained an extensive morass of which Crown allotment 40B now forms part of. The morass was drained and granted up to a creek. Extensive land clearing, having a significant impact on water run-off on land upstream, and devastating fires and floods in the 1890's contributed to a change in the rate of flow of the creek which gouged out and deepened its course and deposited vast silt deposits downstream. These silt deposits in turn caused flooding not only on the Freestone Creek but also on the Avon River. The rabbit plagues early in the century accentuated the instability of the drained land and added to the case in which the now swiftly flowing stream eroded the precarious banks. You also take into consideration that landslips are considered to be the natural and necessary consequence of gradual and imperceptible erosion which have undercut the bank.

The clearing of the land upstream, the rabbit problem and probably the disastrous fires are all factors that have a significant man induced factor in the differing course of the creek. Although the movement adjacent to allotment 40B is over 200 metres and this movement has occurred over 125 years it would be difficult not to attribute the movement to slow and gradual accretion. After weighing up all the evidence, your determination is that the present position of the creek is the title and allotment boundary.

You advise your client of the significant difference between the title's area and the area which is available to him in reality. You also make a mental note to yourself that in the future if asked to undertake reestablishment cases along Freestone Creek or the Avon River you will be "too busy" on other important projects.



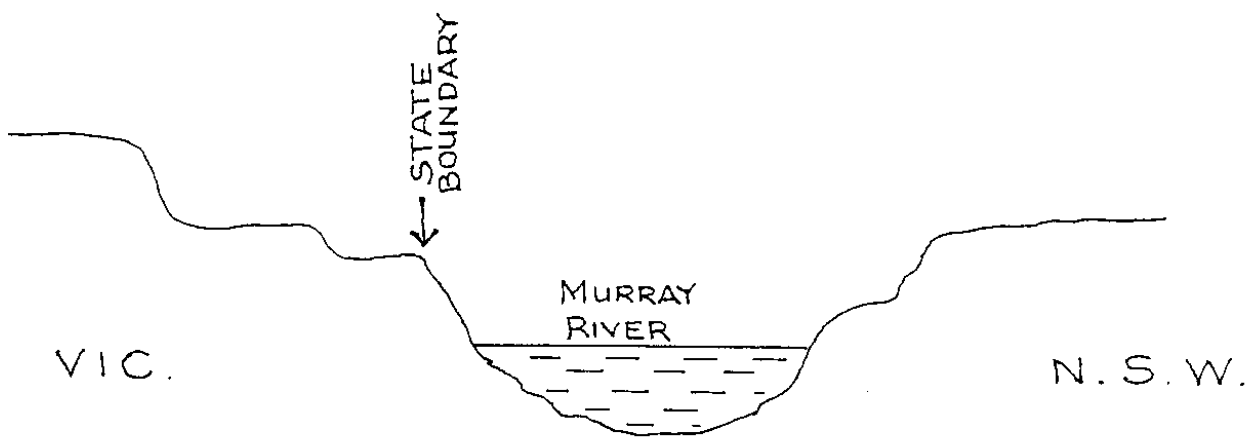
Case 4 The Murray River. It is recommended that before attempting a re-establishment which effects the State border, the 1991 publication "Guidelines for the Determination of the State Border Between New South Wales and Victoria Along the Murray River", be perused. This publication was issued as a joint initiative from the Surveyors General of New South Wales and Victoria.

It is fortunate that from the Murray River's source to the South Australia border there are under twenty properties the titles/deeds of which are bounded by the Murray River. Of these the vast majority are Crown Pre-Emptive Rights. The High Court decision (Ward v The Queen 1980) whereby it was deemed that the border line between the States runs along the top of the southern or left bank of the Murray River and The Separation Act (1850) which decreed that relevant water course which is the State boundary is that channel which in 1850 had the greater flow, are two important factors which now affect the freehold boundary of those allotments which about the river. The top of the bank of the 1850 course is considered to be the freehold boundary with the rule of gradual and imperceptible erosion and accretion applying. This generally would mean that the abutting owner has lost a considerable portion of his paper entitlement. (i. e. the land between the water's edge and the top of the high bank.)

There are of course many other freehold titles where the boundary adjacent to the Murray River was fixed either by metes and bounds or by a line a certain distance from the river and now this boundary has been cut by the left bank of the Murray River by a slow and gradual movement of that watercourse. The land so invaded has not only been lost to the registered proprietor but also to the State of Victoria.

PLAN NUMBER	PARISH/T'SHIP/COUNTY	HISTORICAL MAPS AND PLANS PLAN NAME	SCALE	PAGE 258		DATE SURVEYOR
				CODES		
MURRAY 15	WODONGA	MURRAY DISTRICT. BROKEN CREEK AND OVENS RIVER	126720	B S	BARNETT	
MURRAY 15	YALCA	MURRAY DISTRICT. BROKEN CREEK AND OVENS RIVER	126720	B S	BARNETT	
MURRAY 15	YARRAWONGA	MURRAY DISTRICT. BROKEN CREEK AND OVENS RIVER	126720	B S	BARNETT	
MURRAY 15	YARROWEYAH	MURRAY DISTRICT. BROKEN CREEK AND OVENS RIVER	126720	B S	BARNETT	
MURRAY 15	YIEL IMA	MURRAY DISTRICT. BROKEN CREEK AND OVENS RIVER	126720	B S	BARNETT	
MURRAY 16	COBRAM	MURRAY RIVER FROM YIELMA TO COBRAM	31680	B S		
MURRAY 16	STRATHMERTON	MURRAY RIVER FROM YIELMA TO COBRAM	31680	B S		
MURRAY 16	ULUPNA	MURRAY RIVER FROM YIELMA TO COBRAM	31680	B S		
MURRAY 16	YALCA	MURRAY RIVER FROM YIELMA TO COBRAM	31680	B S		
MURRAY 16	YARROWEYAH	MURRAY RIVER FROM YIELMA TO COBRAM	31680	B S		
MURRAY 16	YIEL IMA	MURRAY RIVER FROM YIELMA TO COBRAM	31680	B S		
MURRAY 17		PLAN MISSING				
MURRAY 17	BARMAH	RIVER MURRAY AND TSHEEA CREEK		B S 1850	BARNELL	
MURRAY 18	MOIRA	RIVER MURRAY AND TSHEEA CREEK		B S 1850	BARNELL	
MURRAY 18	BRIMIN	MURRAY RIVER FROM BRIMIN TO GOORAMADDA	47520	B	BARNELL	
MURRAY 19	CARLYLE	MURRAY RIVER FROM BRIMIN TO GOORAMADDA	47520	B	BARNELL	
MURRAY 19	GOORAMADDA	MURRAY RIVER FROM BRIMIN TO GOORAMADDA	47520	B	BARNELL	
MURRAY 19	NORONG	MURRAY RIVER FROM BRIMIN TO GOORAMADDA	47520	B	BARNELL	
MURRAY 20	BARMAH	MURRAY RIVER AND BROKEN CREEK	31680	B S	BARNELL	
MURRAY 20	BARWO	MURRAY RIVER AND BROKEN CREEK	31680	B S	BARNELL	
MURRAY 20	MOIRA	MURRAY RIVER AND BROKEN CREEK	31680	B S	BARNELL	
MURRAY 20	NARIOKA	MURRAY RIVER AND BROKEN CREEK	31680	B S	BARNELL	
MURRAY 20	PICOLA	MURRAY RIVER AND BROKEN CREEK	31680	B S	BARNELL	
MURRAY 20	WAAIA	MURRAY RIVER AND BROKEN CREEK	31680	B S	BARNELL	
MURRAY 20	YALCA	MURRAY RIVER AND BROKEN CREEK	31680	B S	BARNELL	
MURRAY 21	BOORHAMAN	OVENS AND MURRAY RIVERS	31680	B S	BARNELL	
MURRAY 21	BRIMIN	OVENS AND MURRAY RIVERS	31680	B S	BARNELL	
MURRAY 21	BUNDALONG	OVENS AND MURRAY RIVERS	31680	B S	BARNELL	
MURRAY 21	COBRAM	OVENS AND MURRAY RIVERS	31680	B S	BARNELL	
MURRAY 21	KILLAWARRA	OVENS AND MURRAY RIVERS	31680	B S	BARNELL	
MURRAY 21	PEECHLBA	OVENS AND MURRAY RIVERS	31680	B S	BARNELL	
MURRAY 21	YARROWEYAH	OVENS AND MURRAY RIVERS	31680	B S	BARNELL	
MURRAY 22	CASTLE DONNINGTON	MURRAY RIVER FROM PIANGIL TO SWAN HILL	31680	B S 1851	PRITCHARD	
MURRAY 22	PENTAL ISLAND	MURRAY RIVER FROM PIANGIL TO SWAN HILL	31680	B S 1851	PRITCHARD	
MURRAY 22	PIANGIL	MURRAY RIVER FROM PIANGIL TO SWAN HILL	31680	B S 1851	PRITCHARD	
MURRAY 22	TYNTYNDER	MURRAY RIVER FROM PIANGIL TO SWAN HILL	31680	B S 1851	PRITCHARD	
MURRAY 22	TYNTYNDER NORTH	MURRAY RIVER FROM PIANGIL TO SWAN HILL	31680	B S 1851	PRITCHARD	
MURRAY 22	TYNTYNDER WEST	MURRAY RIVER FROM PIANGIL TO SWAN HILL	31680	B S 1851	PRITCHARD	
MURRAY 23		PLAN MISSING				
MURRAY 24	MULLROO	MURRAY RIVER AND POTTERWALLKAGEE CREEK	31680	B S 1851	PRITCHARD	
MURRAY 24	OLNEY	MURRAY RIVER AND POTTERWALLKAGEE CREEK	31680	B S 1851	PRITCHARD	
MURRAY 24	WALLPOLLA	MURRAY RIVER AND POTTERWALLKAGEE CREEK	31680	B S 1851	PRITCHARD	
MURRAY 24	WARINA	MURRAY RIVER AND POTTERWALLKAGEE CREEK	31680	B S 1851	PRITCHARD	
MURRAY 24	WOOLWOOLA	MURRAY RIVER AND POTTERWALLKAGEE CREEK	31680	B S 1851	PRITCHARD	
MURRAY 25	BURRA	MURRAY RIVER	31680	B S	PRITCHARD	
MURRAY 25	COONIMUR	MURRAY RIVER	31680	B S	PRITCHARD	
MURRAY 25	PIAMBIE	MURRAY RIVER	31680	B S	PRITCHARD	
MURRAY 25	PIANGIL	MURRAY RIVER	31680	B S	PRITCHARD	
MURRAY 26	OLNEY	PORTION OF LINDSAYAND MULLAROO CREEK	31680	B S 1850	PRITCHARD	

A surveyor could, for example, be asked to define the State's border well away from any freehold parcel in a court action which is dependant upon whether an offence took place in Victoria or New South Wales. As with most re-establishment surveys, the collation of existing survey information is a vital prerequisite. From the Historic Collection of early Crown surveys held in the Central Plan Office, the Murray River Survey Series should be examined to find a plan of a survey which was effected nearest to 1850. From this plan you should determine what was the main course of the Murray River and relate this course to your present field investigation. Upon completion of your determination, a copy of your survey should be referred to the Surveyors General of both Victoria and New South Wales for their consideration or comments.



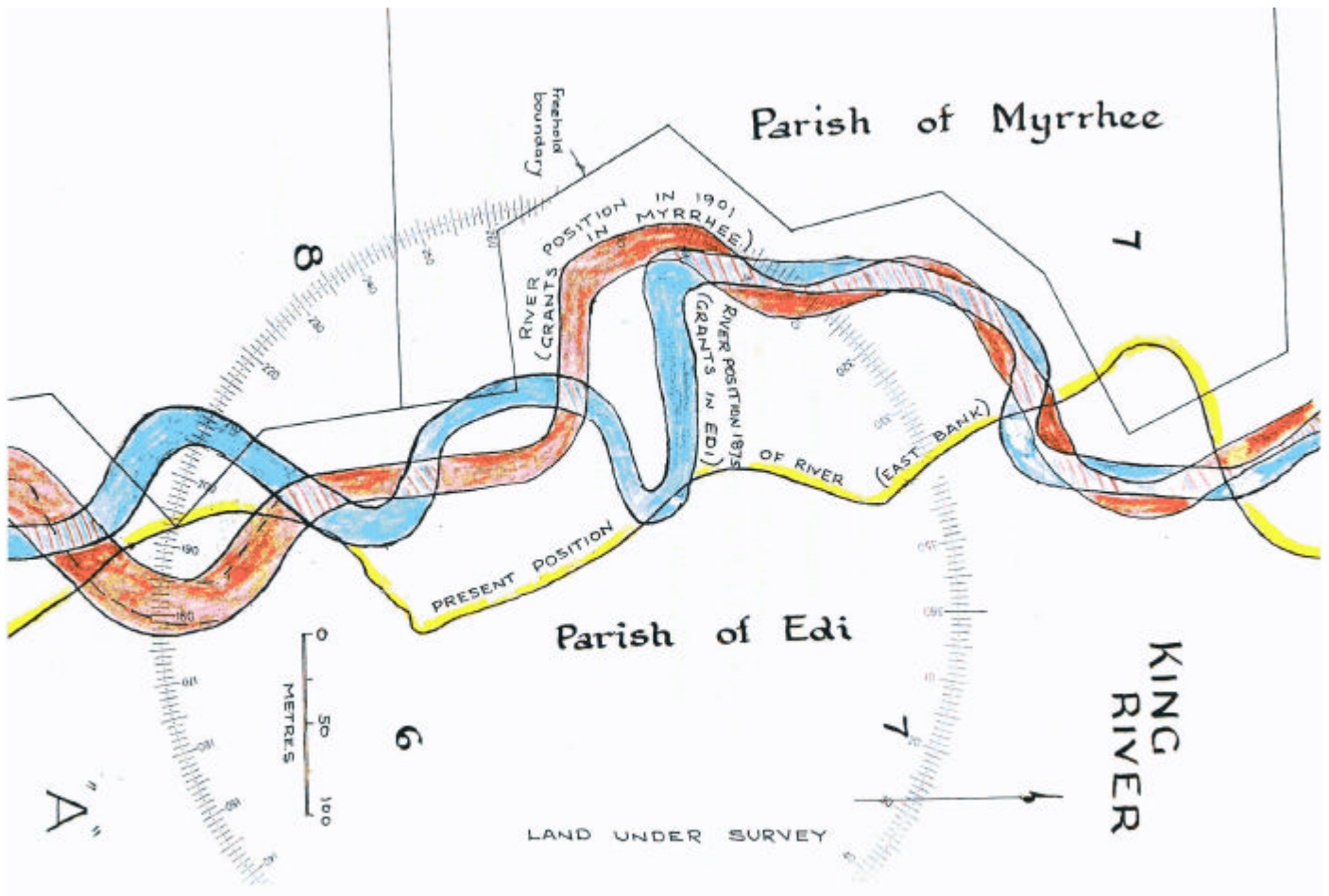
CONCLUSION

It would be hoped that the surveyor would play an important part in future planning, use and management of private land near watercourses. Not only would he interpret and utilise historic information but he should also encourage his client to plan development so that river stability is a major consideration. Eradication of noxious weeds, preservation and replanting of indigenous vegetation, groynes, control of rabbits and removal of obstructions in the stream could be suggested.

No matter what set of rules we may like to formulate in regard to boundary re-establishment along our watercourses, there are exceptions that do not fit in any of the guidelines. In some parts of the State the problems of re-establishment of title boundaries adjacent to rivers are formidable. For example, it has been estimated that thirty percent of the King River between Moyhu and Cheshunt is flowing outside the Reserve corridor. An example of this river movement is shown on the plan marked "A" attached. In this particular case, it was considered that the river had moved by slow and gradual means between 1875 (the blue course) and 1901 (the red course).

Aerial photography was viewed but was of little value. The present course was not accepted as one that was formed by a gradual movement from its last known position but rather one that is a completely new channel. The surveyor was advised to fix the boundary of the land under survey by re-establishing the 1901 position.

The surveyor should use his professional judgement to adopt a practical solution which relates equally to the best interests of both the abutting property owners and the Crown. The role of Surveyor General as an authoritative arbitrator is an important one. Whilst his decision can always be challenged in court the established practice of disputing parties seeking his determination has, over the years, proved to be a one that has been well accepted by most parties and as a result costly litigation has been avoided.



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