

# Riparian Boundary Definition: Legislation vs. Practice

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## ABSTRACT

*Riparian boundary determinations are theoretically governed by common or case law and the legislation which contains the definitions for those boundaries. Surveyors are required to comply with the law or legislation and conduct their survey accordingly. If the surveyor does not comply, then the survey is, theoretically, not accepted by the titling authority. However, do surveyors and the authorities have clarity of vision to know whether or not the legislation has been complied with? Or, as many practitioners across a wide range of disciplines have discovered, is that vision clouded because legislation and theory do not equate to practice but instead are two different things? Is this the case for riparian boundary determinations? Are the theory, legislation and definitions different from the practice, i.e. what surveyors actually define? This paper compares the law combined with the legislation to the practice of surveyors and related practitioners to see if the two are the same or not.*

**KEYWORDS:** *Riparian boundary, definitions, legislation, survey practice.*

## 1 INTRODUCTION

Surveyors have been contemplating the where and how of complying with the definition of riparian boundaries for more than 160 years. Now in 2020, it would be expected that the insight gained over the years would result in clarity of vision over the legislative and legal requirements for the definition of riparian boundaries. One would hope such clarity would provide the surveyor with a bright foresight into future practices. But what would be the case if in hindsight the vision of riparian boundary definition was cloudy, and the practice being conducted was not in accordance with the law or legislation? What then would the future hold? Will the practices of surveyors in defining riparian boundaries continue as is, or not? Will the law or legislation be the same? Will legislation merge with practice or will they remain separate?

It is not easy to split the difference between riparian boundary law and legislation. Often the two coexist and sometimes overlap in duplicate. Common law or law of precedence from court cases is in part the law of the land. So too is legislation the law of the land. To make things easier, law and legislation can and will be interchangeable in this paper, but only as far as ease of dialogue.

Riparian boundaries are split into two main categories, tidal and non-tidal, though it is not always easy to distinguish between the two as some surveyors have experienced. Riparian zones of the sometimes tidal regime often have their category confused. Neither the legislation nor the definitions themselves help if there are any grey areas, and it is left to the surveyor to further ponder the circumstances of what is on the ground, or rather the division between the ground and the riparian entity. One might have simply said the division between

the ground and the water but that too is not always the case. This paper compares the law combined with the legislation to the practice of surveyors and related practitioners to determine if the two are the same or not.

## **2 RIPARIAN BOUNDARY LEGISLATION**

Legislation governing the delineation of riparian boundaries is not spelt out in simple terms. It can be quite convoluted with some things left to interpolation. Practitioners dealing with riparian boundaries are conversant with the theory that the boundary of land fronting tidal water is the mean high water mark (MHWM) and for non-tidal waters the boundary is the bank. Or that is the case for the most part, but it is not necessarily always the case. Some tidal boundaries can be the low water mark and some non-tidal boundaries can be the centreline of the stream.

Today, in 2020, the legislative definition of the MHWM can be found in the Surveying and Spatial Information Regulation 2017, part 1, section 5, definitions (NSW Legislation, 2017). There is no legislation or definition for the low water mark. The legislation does not specifically say that the boundary of tidal waters shall be the mean high water mark. It is left to the law of precedence, common law, that the bed of tidal waters, within limits of the Kingdom, is vested in the Crown and that that boundary is now referred to as the mean high water mark. In some earlier surveys, the boundary of land fronting tidal waters was not always described as the mean high water but simply high water or similar derivatives or sometimes not labelled. The Regulation clarifies the situation in clause 51, stating that in previous survey plans or other description of land, any reference to a boundary abutting or fronting tidal waters or just high water should be read as mean high water mark. The legislation is silent if there is no previous definition. So, if the surveyor is tasked to create a parcel of land fronting tidal water that has never before been delineated or described as fronting tidal water, then it is left to interpolation of the legislation to determine that the boundary should be the mean high water mark.

The Surveying and Spatial Information Regulation 2017 does not specify that the non-tidal boundary of the land should be the bank as in some cases it may not be. The boundary could be the centreline of the stream or even something else. The Regulation in clause 51 does however state that in previous survey plans or other description of land, any reference to a boundary that is the bank of a lake or stream or described as a boundary that abuts a lake or stream is to be taken to be the limit of the bed of the lake or stream. The Regulation does give a definition of the bed in part 2, division 5, boundaries formed by tidal and non-tidal waters and other natural boundaries, section 44, definitions. For a first-time definition of land against a non-tidal stream, the legislation does not specify what or where the boundary is to be located. That is left to the deliberation of the surveyor.

The riparian boundary of non-tidal streams is further complicated by the Crown Lands Act in its varied versions, now the Crown Lands Management Act 2016. The Act in section 13.3 gives a definition of the bank that is then related to the limit of the bed. This is not reproduced in the Surveying and Spatial Information Regulation 2017. The Crown Lands Act however only relates to land alienated, sold, by the Crown. It does not relate to land internally subdivided against non-tidal streams from out of a much larger holding. The non-tidal boundary then could be anything that is intended by the subdivider. A further complication is the reservation of the beds of non-tidal streams from land alienated by the Crown after 11

May 1923 in the eastern and central divisions of NSW or after 31 May 1935 in the western division of NSW.

To add further complexity for non-tidal streams, there is the *ad medium filum aquae* rule emanating from common law. The ownership of the land, despite indicating that the boundary is the bank, could be to the centre thread of the stream, especially if the land was part of a grant or sale from the Crown before the dates of reservation of the beds of stream.

If this is not enough complexity, the riparian boundary could be set at an offset from either the mean high water or the bank, having a reserve or road in between. The position of the land boundary is then dictated by the position of either the mean high water mark or the bank at the time of creation. More often this boundary is termed the landward boundary of either the reserve or road, but overall it is still governed by the definitions of riparian boundaries.

### 3 MEAN HIGH WATER MARK

According to the Surveying and Spatial Information Regulation 2017, “Mean High-Water Mark means the line of mean high tide between the ordinary high-water spring and ordinary high-water neap tides.”

This legislative definition was brought to the surveying industry in 1854 (166 years ago) with the English court case, *Attorney General v. Chambers*. This first definition did not include the reference to ordinary. It was not until 1907 in another court case, *Tracey Elliot v. Morley (Earl)*, where the ordinary part was added (Blume, 1995). Perhaps someone did not like the idea that some tides are higher than others and did not want the mean high water mark being located too far up the shoreline. The then theory did not equate to what was deemed should have been practiced, so changes were sought. It did not do much for the theory and practice merging, but only created further debate and possibly an even wider separation. What the court case did do was limit the ownership of the Crown within tidal waters to the line of mean high water against the foreshore. That may appear to make things simpler, but not in all cases.

If the surveyor is to delineate land against tidal water, then the entity that is to be defined is determined by the wording of the definition. That entity is the line of mean high tide between two other tidal events. If the meaning is taken literally, and there is nothing to suggest otherwise, then that line is a surface of water which is the mean of high tides between the neap and the spring tide events (Figure 1). Surveyors attempt to actually obtain a value of the mean high water surface, but that is only a means to an end as it is not the entity that they are defining on the ground. That entity is the line that the mean high water surface makes against the foreshore (Songberg, 2016).

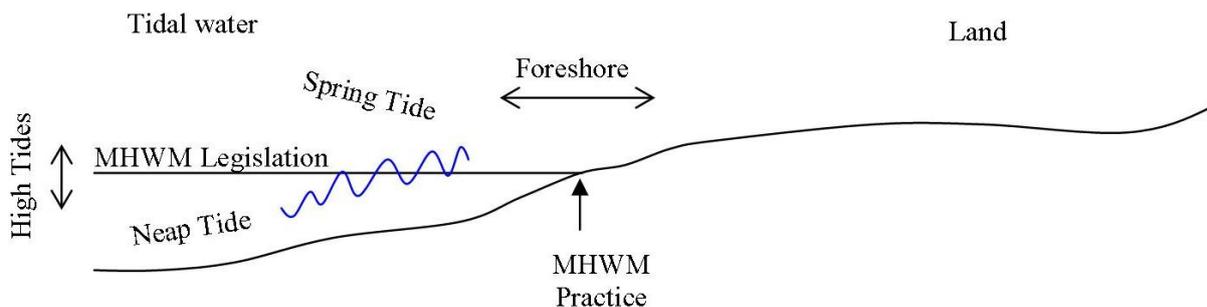


Figure 1: MHWM legislation vs. MHWM practice.

The legislation does not give a definition to the line along the foreshore, but every surveyor knows that that is what is intended so they extrapolate the legislated definition and in practice survey the foreshore line. At the same time, they call the surveyed shoreline the mean high water mark (see Figure 1). Here then is the first point at which the legislation and the practice differ.

### 3.1 Period of Observation

The legislated definition for the MHWM, or really the MHW surface, gives two measures for the time interval of observation, the neap and spring tides. Those events occur around the time of the full and new moons (spring tides) and the 1<sup>st</sup> and 3<sup>rd</sup> quarters of the moon (neap tides). The period between the new or full moons and either quarter is approximately 7 days. The length of time required for observations as required by the legislation is thus 7 days (Songberg, 2015, 2016). The 7-day cycle is reinforced by the explanations of the judges in the *Attorney General v. Chambers* court case: “In our opinion, the average of these median tides in each quarter of a lunar revolution during the year gives the limit” (Blume, 1995). Further strength to the 7-day period comes from the reference “for three days it is exceeded and for three days it is left short and for one day it is reached” (Blume, 1995). Do surveyors use this method of determining a value of mean high water? Such a practice is very unlikely and probably has never been undertaken. Here then is the next variance between legislation and practice.

The legislation governing riparian boundaries does not give direction as to how a surveyor should perform a mean high water mark determination. It is either left to the surveyor to ponder or seek guidance from another source. One source is Surveyor General’s Direction No. 6 (Water as a Boundary). This document does not actually tell the surveyor how to perform a MHWM definition but instead tells the surveyor, rightly or wrongly, what is wanted. For methods to determine a MHWM, the surveyor is referred to part 6 section 22 of the Manual of the New South Wales Integrated Survey Grid (Department of Lands, 1976). So, do these methods coincide with the wording of the legislation?

According to the ISG manual, the time period required for a MHWM observation is 12 months for an accurate result, but it also states that an observation of a full lunation period of 29 days is also acceptable. This then is at odds with the time period ascertained from the legislation. Why the difference? This probably stems from the definition of MHWM used in the manual. The manual’s definition is “the mean of all high tides (including both spring and neap tides) taken over a long period”. This is not the legislation definition. If surveyors follow this definition, then they are not complying with the legislation. This is then another case of legislation and practice not being the same.

Combining 4 sets of legislation observation requirements results in the shorter version of the ISG manual period of observation. Adding more legislation observation periods, the practitioner will arrive at a 12-month period. Doing this thus translates the definition of MHWM from the legislation to the ISG manual. The definitions are not the same and the results will not be the same. The results under the ISG manual definition will not be of greater accuracy as claimed but simply different (Songberg, 2015, 2016).

The ISG manual also specifically includes both the spring and neap tides in the observation. The legislation definition does not. The legislation is worded such that only high tides

between the neap and spring tides should be used. Thus, the neap and spring tides should be excluded (Songberg, 2015). Once again, the legislation is at odds with the practice.

### **3.2 Levelling from a Benchmark**

The ISG manual outlines that the position of MHW can be fixed by levelling from an Australian Height Datum (AHD) benchmark, provided that the tidal gradient is known and that there is a nearby tide gauge related to AHD. At the time of the manual's publication, only a few long-term tide gauges were related to AHD. Today, tidal gradients along the coast and inland along connecting tidal streams have been determined by Manly Hydraulics Laboratory (MHL) through a network of tide gauges. One of their publications is MHL2053 (OEH Tidal Planes Analysis: 1990-2010 Harmonic Analysis (Couriel et al., 2012)). Many surveyors undertaking a MHW definition have referred to this document to obtain the value of MHW, and despite now being 10 years out of date and no longer applicable (Songberg, 2015, 2016), it is still being used. The values for MHW, and other tidal plane entities, are related to the AHD network throughout the country, so it is relatively easy to mark the appropriate AHD level of MHW along the shoreline. This practice usually gives a more consistent, but not necessarily more accurate, value of MHW than values that could be obtained from local short-term observations (Songberg, 2005, 2015, 2016).

Despite the widely accepted use of AHD values of MHW determined by MHL through either the tidal plane analysis or other means, the use thereof does not equate with the legislative requirements for a MHW determination. The values of MHW in the tidal plane analysis have not been determined from the mean of high tides between the neap and spring. Instead, a complex modelling program (Foreman tidal height analysis and prediction) is used (Couriel et al., 2012), which incorporates much more tidal data than just the high tides as required by the legislation. Therefore, technically, legislation and practice are once again two different things.

### **3.3 Range Ratio**

The range ratio method of determining a value for MHW at some point within an estuary is, in simplicity, just a means of transferring the value of MHW from a known point such as a tide gauge to the unknown point. This method does not require any need to know the AHD value of MHW. The method utilises a single day's observation of consecutive high and low tides, comparing them to the tide gauge's recording of the same tides and the relationship of those values to the MHW.

Because the method is just a transfer mechanism, it in itself does not need to satisfy the requirements of the legislation. It is the method by which the reference gauge determines the value of MHW that determines whether or not the MHW definition is compliant with the legislation. If the gauge utilised only the heights of the high tides between the spring and neap tides, then the method would be compliant with the legislation. The value of MHW at the gauge would need to be obtained for the same time period as the survey. If not, then because of the changing values of MHW from one period to the next the value of MHW used would not be compliant for that survey (Songberg, 2015, 2016). Today however, surveyors rely on the values from permanent tide gauges spread throughout the tidal estuaries. The value of MHW determined from those gauges does not comply with the strict wording of the legislation. Thus, seeing that the surveyor only carried out a 1-day observation of a high and low tide and that the tide gauge utilised more than the 7 days observation of high tides, this

method does not agree with the requirements of the legislation. Again, legislation and practice are two different things.

### **3.4 Other Methods**

Where survey sites are a considerable distance from both tide gauges and AHD levelled control marks, surveyors have used other methods to determine the location of the MHW. One method that has been used is to cast an eye over the foreshore and through either experience, or just guesswork, visually determine the MHW. This method may be accurate where the foreshore is very steep, if not near vertical, but it does not comply with the Regulation. Where the foreshore is quite flat, the method may be extremely erroneous. In either case, there has been no observation of the high tides, thus practice and legislation differ, in this case considerably.

Other methods, such as biological assessments, may have also been used, e.g. the top of the oysters surrounding a wharf pile, the limit of the mangrove cobbler pegs or their tops. These or other indicators may provide a natural indication of MHW, but that does not change the fact that it is something different to the requirements of the legislation. If utilised, then legislation and practice again are divergent.

### **3.5 The Sometimes Tidal**

It is the practice in NSW that water is considered tidal along rivers, streams or inlets to the tidal limit. Many of those tidal limits have been recorded rightly or wrongly on parish maps. These notations are not the only record of tidal limits. The Department of Lands (date unknown) compiled tidal limits into a single document (Tidal Limits of Watercourses in New South Wales) from a combination of map and file information. Manly Hydraulics Laboratory also produced their own document, MHL1286 (Survey of Tidal Limits and Mangrove Limits in NSW Estuaries 1996 to 2005).

Some of the tidal limit records were from observations that the estuary was tidal at that time and so surveys were conducted accordingly. However, further observations indicated that the estuary was not always open to the sea and so should have been classed as an Intermittently Closed and Open Lake or Lagoon (ICOLL). Where the surveyor has made the error of judgement conducting a MHW survey, there is the issue of continued validity (Thompson, 2019). Where the next surveyor continues with the MHW presumption, it starts to create a separation between the legislation and practice as the survey should have been conducted as a bank survey.

The tidal limits, assuming that the inlet is not an ICOLL, have been based on observations of the highest tides. In other words, the tidal limit is the furthest reach of the tide along an estuary. The legislative boundary of tidal waters is the MHW. The tidal limit is created by tides higher than the mean high water. The two measures are not the same vertically and consequently will have differing reaches up the estuary (Songberg, 2016). There is part of every estuary that is considered as tidal, but in reality should not be, as all parts of the estuary above the mean high water line, in a cadastral sense, are not tidal. In this instance, the practice definitely does not meet with the legislative requirements for a tidal boundary.

## 4 THE BANK

Another long-term contemplation of surveyors and riparian boundary practitioners is the bank. A definition of the bank first appears in NSW legislation in 1931 with the Crown Lands (Amendment) Act 1931, which amended the Crown Lands Consolidation Act 1913 by adding section 235A. One of the references to the wording given in the Act was from an 1897 English court case *Thames Conservators v. Smeed* 2 G.B. At 123 years, the contemplations of the non-tidal boundary have been going on nearly as long as those for the tidal boundary. Prior to the 1931 amendment, prior contemplations within the Crown Lands acts only mentioned an abuttal as the boundary of land where the land has frontage to a stream, tidal or non-tidal, sea coast or road. The new section made it clear that the boundary along non-tidal streams was to be the bank. And by then, at least for the eastern and central divisions of the State, presumptive middle thread tidal did not apply thanks to reservation 56146. The western division would follow suit four years later.

However, the definition of the bank is not straight forward. The definition also covers both non-tidal streams and lakes. The Crown Lands Management Act 2016 states:

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 drought.

Lake includes a permanent or temporary lagoon or similar collection of water not contained in an artificial work.

River includes any stream of water, whether perennial or intermittent, flowing in a natural channel, and any affluent, confluent, branch or other stream into or from which the river flows.

The Surveying and Spatial Information Regulation 2017 in clause 44 does not entirely duplicate this definition but tries a slightly different wording. It also excludes a definition for the bank.

Bed in relation to a lake or stream, includes any portion of the lake or stream

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

Lake includes a permanent or temporary lagoon or similar collection of water not contained in an artificial work but does not include tidal waters.

Stream includes any non-tidal waters that are not a lake.

Further on in the Regulation, in clause 51 it is stipulated that a reference to the bank in any previous plan is to be taken as a reference to the limit of the bed of the lake or stream. What the intent was for this particular wording is unknown, but what it effectively does is remove the bank as a boundary feature for non-tidal waters. Instead, if the wording is to be taken literally, then the boundary identifier is the limit of the bed.

There is also the nature of the stream that differs between the legislations. In the Crown Lands Act the stream must be natural. That is not the case in the Surveying and Spatial Information Regulation as it includes any non-tidal waters not a lake. Under this wording, a constructed channel would be classed as a stream.

#### 4.1 Surveying the Bank

Because of the differences in the two legislations, if a survey is being conducted on a non-tidal waterway and if the surveyor identifies the boundary feature as the bank, then there will be a disparity with the Surveying and Spatial Information Regulation. However, if the survey is on behalf of the Crown, the surveyor will be required to identify the boundary feature as being the bank. This would make the survey compliant with the Crown Lands Act but not the Surveying and Spatial Information Regulation. So here is the next instance of legislation and practice being different.

When it comes to surveying the bank, things really start to get interesting. Figure 2 shows an image of just one of the varying types of stream banks that will confront a surveyor. Despite any differences in features the ‘how to’ of defining the bank will remain the same. It is the ‘how to’ contemplation that has eluded surveyors over the same time as the bank has been used as a boundary feature of land.



Figure 2: Where along the edge of the river is the bank?

The surveyor’s contemplation of exactly where at the edge of the stream the bank should be located varies with each survey. Figure 2 identifies four differing bank opinions: (A) the edge of the water, (B) somewhere in between the water’s edge and the toe of the high bank, (C) the toe of the high bank, and (D) the top of the high bank. Although all of these choices have been used over time, it is likely that none of these options is correct. All the choices used have been determined by an instantaneous observation. There have been no measurements undertaken for the determination of the height of the mean stage. Essentially, the determinations have been a guess (Songberg, 2002, 2012, 2016).

Position A is the edge of the usual or low-flow channel within the bed, which is not adequate to cater for the average stage or flow. B, a change of vegetation type moving back from the

water, is an entirely unknown quantity. C, be it the back of the shingle bed or the toe of the high bank, if it is a measure of the mean stage, could be the cadastral entity the bank and was often used, but without measurement is just another guess. D has been used from time to time, being the limit of viable agricultural land. It is also the geological bank, but that does not make it the bank for cadastral purposes (Songberg, 2002, 2012). In any of these choices, and most have been used at one time or another, the surveyor is not complying with the requirements of the legislation, so the practice and the legislation do not equate.

In order to undertake a survey of the bank in accordance with the legislation, it would require the surveyor to know the capacity required over the river bed to contain the average or mean stage. That information is not obtainable on any short-term survey. It takes observations of all river stages over decades to determine the quantum required. That is a task not likely to be undertaken by a surveyor. With considerable data analysis, the required information can be ascertained from long-term stream gauges (Songberg, 2002, 2012). Unfortunately, those gauges are few and far between and may not be able to be related up and down a river. Many streams do not have a gauge. Subsequently, it is virtually impossible for a surveyor to comply with the terms of the legislation.

As previously stated, the bank definition only applies to non-tidal boundaries of land alienated from the Crown. It does not apply to riparian boundaries of subdivided land within the bounds of the original Crown delineation. An example of this is land subdivided onto non-tidal streams within the former Port Stephens Estate of the Australian Agricultural Company. In this part of the State, boundary identifiers along streams vary considerably.

#### **4.2 Other Identifiers**

One of the more common non-tidal stream boundary identifiers is the centreline. It is of course related to both banks, and the Surveying and Spatial Information Regulation has this covered. Both banks must be surveyed and shown. However, like the bank survey, unless there is a measure of stream average or mean stage determined, the position subsequently determined for the centreline is a pure guess. It is also likely to be incorrect. As with the bank, there is a non-agreement between practice and legislation.

Another identifier known to exist is the extreme margin of the river. This feature is likely to be synonymous with the top of the high bank and the geological bank. Unlike the cadastral bank, this feature is more easily identified. In Figure 2, the extreme margin would be position D. Although the Crown Lands Acts provide for a definition of the bank, there is nothing saying that the bank must be used. Other features, such as the extreme margin or high bank, show up from time to time. Even though the feature would be acceptable under the Crown Lands Acts, it does not conform to the wording of the Surveying and Spatial Information Regulation 2017. As the land abuts a non-tidal stream, the Regulation at clause 51(d) states that a reference to or description of a boundary that abuts a lake or stream is to be taken as a reference to the limit of the bed. That limit is set at the average or mean stage capacity of the stream, not the extreme capacity. The extreme stage and cadastral bank stage of a stream flow are two distinctly different measures (Songberg, 2002, 2012, 2016). To change the titled boundary from the extreme margin to the cadastral bank would require a purchase of land, all be it within the geological confines of the stream. The wording of the Surveying and Spatial Information Regulation 2017 will not change this. Thus, once again legislation and practice are two different things.

## **5 APPROVAL OF RIPARIAN BOUNDARIES**

Legislation provides surveyors with more than just definitions for riparian boundaries. There is also a series of approvals that need to be complied with before the surveyor's definition can be accepted. These are spelt out in the Surveying and Spatial Information Regulation 2017 from clause 45 on through to 50.

In tidal boundaries, whether it be a first-time determination or a subsequent determination, the surveyor needs to gain approval of the Minister administering the Crown Lands Act, in its varying designations. That is assuming the land below mean high water is Crown land. This may have been the case in early common law, but nowadays it may not be the case. If the land does not belong to the Crown, then approval of the otherwise owner needs to be obtained. Approval, however, cannot be given for an increase in land if the circumstances come under the criteria of section 55N of the Coastal Protection Act. In the coastal zone, if the additional land would cause restriction to public access along the foreshore or the increase is not naturally and indefinitely sustainable, approval cannot be given.

In a non-tidal stream or lake, if the survey contains a first-time determination of the riparian boundary, no approval is required for the determination, but the plan lodging authority will still need to approve the surveyor's work.

In a subsequent determination over a non-tidal boundary, if there is no change from the previous position, then no approval (other than plan examination) is required, but the surveyor must note on the plan that the determination is the same as the previous. If, however, there is a change, the surveyor must lodge a report to the Registrar General setting out why the change should be accepted. In other words, approval must be obtained from the Registrar General to a changed non-tidal riparian boundary.

For the first-time survey of the landward reserve or road boundary, approval from the Minister administering the Crown Lands Act must be obtained. This is irrespective of whether or not the land is tidal, non-tidal, or who the "below water" land belongs to. The reserve or road will fall under the administration of the Crown and approval is required. There is no approval required from the Minister for subsequent determinations. It is a requirement of the surveyor to determine the position of the boundary as it was originally located.

If a surveyor is conducting a survey over Crown Land, generally on behalf of the Crown, in addition to any other approvals, an appropriately delegated Crown Lands officer is also required to sign off on the survey.

Essentially, all riparian boundaries need some form of approval, whether it be from a Parliamentary Minister, land owner, or just the examination requirements of obtaining approval of plan registration. Without that approval, the boundary does not get accepted. The surveyor has no choice but to comply fully with the legislation. Thus, here is where legislation and practice do coincide.

### **5.1 Boundary by Agreement**

Although the surveyor may have obtained approval, or agreement of the various authorities and/or land owner to the position of the riparian boundary and complied with the legislation in doing so, it is another matter when it comes to the determination itself. As has been

discovered, when it comes to surveyors undertaking exactly what the legislated boundary definitions requires, in practice it is another matter. In surveying riparian boundaries legislation and practice do not agree. The boundary surveyed is not that as required by the legislation, but although it may resemble the requirements of the legislation, it is instead something else. As agreement of this boundary line location has been arrived at between the surveyor, authority and/or land owner, the boundary thus becomes a boundary by agreement.

## 6 CONCLUDING REMARKS

It has not been too difficult to show that when it comes to riparian boundary definition, the theory or legislation and practice are two different things. How legislation and practice diverged is unclear. It may have resulted from poor or inadequate legislation. It could also be a result of the legislation being impossible to comply with in a practical sense. It could also be a result of how surveying practices have evolved over time. What may be a practical solution acceptable to the whole industry may not, as we have seen, be the solution required by the legislation. It is, however, quite evident that definitions, legislation and survey practices are not rigorously valid.

What the result does mean is that riparian boundaries by virtue of the evolved non-compliant practices have evolved into boundaries by agreement. The implication of this is that these boundaries have actually moved away from being a strict riparian boundary. The boundary can be located wherever the agreement places it, even though later investigations show that that agreed location has been made in error. If the legislative requirements had been adhered to, the true location would be different (Songberg, 2004, 2007, 2012, 2019). Although the later investigations can show the earlier determination was wrong, the boundary remains, an error in place. This ad-hoc determination of riparians, contrary to what should have been, can result in a divergence of boundaries along the riparian zone, destabilising the cadastre (Songberg, 2019), even to a point where the river disappears from the cadastre and parcels of land from either side overlap (Songberg, 2004).

If this conclusion is examined against all riparian boundaries within the State, then there is a high probability that those boundaries are in effect not true riparian boundaries as none will comply with the legislation. If this were the case, the next outcome would be that the doctrine of accretion and erosion does not apply.

In order to equate legislation and practice so as to get back to riparian boundaries and not boundaries by agreement, do things need to change? The answer to that can only be yes (Songberg, 2016). But what should change? Should it be the legislation, or should it be the survey practice, or should it be both? The answer to that could be quite difficult and revolutionary.

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