



The Boundary Point is published by Four Point Learning as a free monthly e-newsletter, providing case comments of decisions involving some issue or aspect of property title and boundary law of interest to land surveyors and lawyers. The goal is to keep you aware of decisions recently released by the courts in Canada that may impact your work.

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As professional surveyors across Canada, we remain intrigued (if not challenged) by natural boundaries and how our courts consider the evidence of their origin, their behaviour over time, and ultimately, whether the location is defined by a particular feature. This is especially so as a consequence of natural boundaries being the highest category in the hierarchy of evidence. Their status as a legal boundary continues as a paradox to many lay persons when told that a natural boundary can move – but not if the movement is convulsive or, simply not “slow and imperceptible.”

In British Columbia, a decision addressed this very question when a shift in the position of a river from where it was depicted on a plan of survey drawn in 1911, was arguably the result of either a drafting error in 1911, or the result of some cataclysmic change: avulsion. In *Burko v. Martindale*,¹ the competing analysis as to what caused an apparent shift in the position of a watercourse is considered and we obtain the benefit of the court’s evaluation of the evidence and the differing opinions from two land surveyors qualified as experts at the trial.

Avulsion: Challenges in its Detection and Retracement

Key Words: *avulsion, natural boundary, air photos, retracement, expert testimony*

Avulsion is often cited as an exception to the “slow and imperceptible” as giving rise to accretion and erosion. The fact that a sudden – even cataclysmic – change in the position of a natural boundary may occur sounds simple enough to just say. However, its detection at some time in the past, and being to prove that avulsion *did* occur, is an entirely different proposition. It becomes even more problematic when the cataclysmic event cannot be isolated to a single

¹ *Burko v. Martindale*, 2023 BCSC 2 (CanLII), <https://canlii.ca/t/jtpnk>

storm or flood, but is suspected to have occurred *at some single point* over many decades of time.

In the Introduction to *Burko v Martindale*, the court explained:

This case involves a dispute about the location of a property line in the North Okanagan region. The properties in question were separated by Johnson Creek in 1911, and the property line was defined as the centre of Johnson Creek. The dispute turns on a question of fact. Has Johnson Creek moved to the south since 1911? The parties agree that, if Johnson Creek has moved, the movement would be an avulsion, and the property line would have remained where it was.

The question in dispute can be put differently. Where was Johnson Creek in 1911, by comparison to its present location?

Barry Burko and Karen McKibbin own the property that lay to the south of Johnson Creek in 1911 (the “Southern Parcel”). They contend that the creek has not moved, that it is still where it was then. They maintain that two plans prepared in 1911 and filed in the land title office were and are mistaken in their placement of the creek and the property line. The two plans are numbered DD 15293 and DD 24952 (collectively, the “DD Plans”). Mr. Burko and Ms. McKibbin are supported by a licenced land surveyor, Brian Minifie, and other qualified experts.

Cory and Tracey Martindale (the “Martindales”) own the property that lay to the north of Johnson Creek in 1911 (the “Northern Parcel”). They contend that the creek has moved so that their parcel of land now includes land to the south of the creek’s present location. They maintain that the DD Plans were correct in 1911. They are supported by a licenced land surveyor, Brian Sansom, and other qualified experts.²

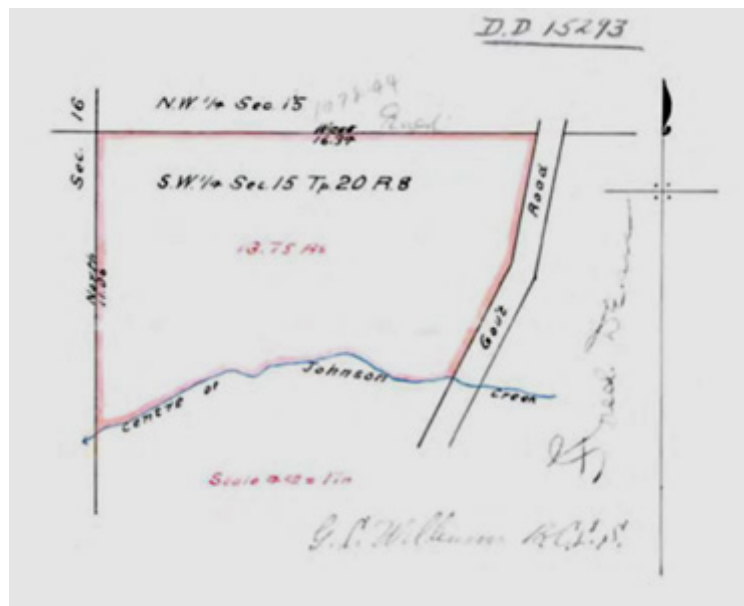


Figure 1: Plan DD 15293 depicts the “Northern Parcel” – owned by the “Martindales”

² *Ibid.*, at paras. 1 to 4



Figure 2: Plan DD 224952 depicts the “Southern Parcel”

The Appendix to the reported decision included a copy of the two “DD Plans” from 1911. Both were signed by G.L. Williams, BCLS. These are reproduced in Figures 1 and 2 for ease of reference.

Readers will be able to make out the line labelled as, “Centre of Johnson Creek” appearing on both of the plans. Both DD plans were registered in the land title office. However, the existence of uncertainty was known at least as early as 2019 when the Deputy Surveyor-General wrote a report which the court referred to:

The professional disagreement between the two surveyors, Mr. Minifie and Mr. Sansom, was addressed by the Deputy Surveyor General, David Swaile, in a report to the Registrar of Land Titles in 2019. Mr. Swaile neatly encapsulates the disagreement and the question I have to decide in the following excerpt from his report:

The westerly portion of the creek is what is uncertain. Mr. Minifie’s assertion is that the creek location today is substantially as it was when the DD plans were prepared, and it is the DD plans that were drafted in error. Mr. Sansom, on the other hand, believes that the DD plans were a fair representation of the creek’s location at the time they were prepared, but that the creek moved – suddenly – at some point afterwards. The difference between the current creek location and the plotted location according to the DD plans (I will occasionally refer to this as the “titled” creek location) appears to range up to approximately 50 metres, with the current location being located further north than the “titled” location.

In the result, Mr. Swaile favours Mr. Minifie’s view that Johnson Creek remains where it was in 1911. The evidentiary status and weight to be given to Mr. Swaile’s report is an issue in this proceeding.³

³ *Ibid.*, at paras. 5 and 6

It might help to depict the position of the creek's location on the ground today, compared to the position of the legal boundary as shown on the parcel map. In Figure 3, the discrepancy between the location of Johnson Creek and the parcel boundary is shown.

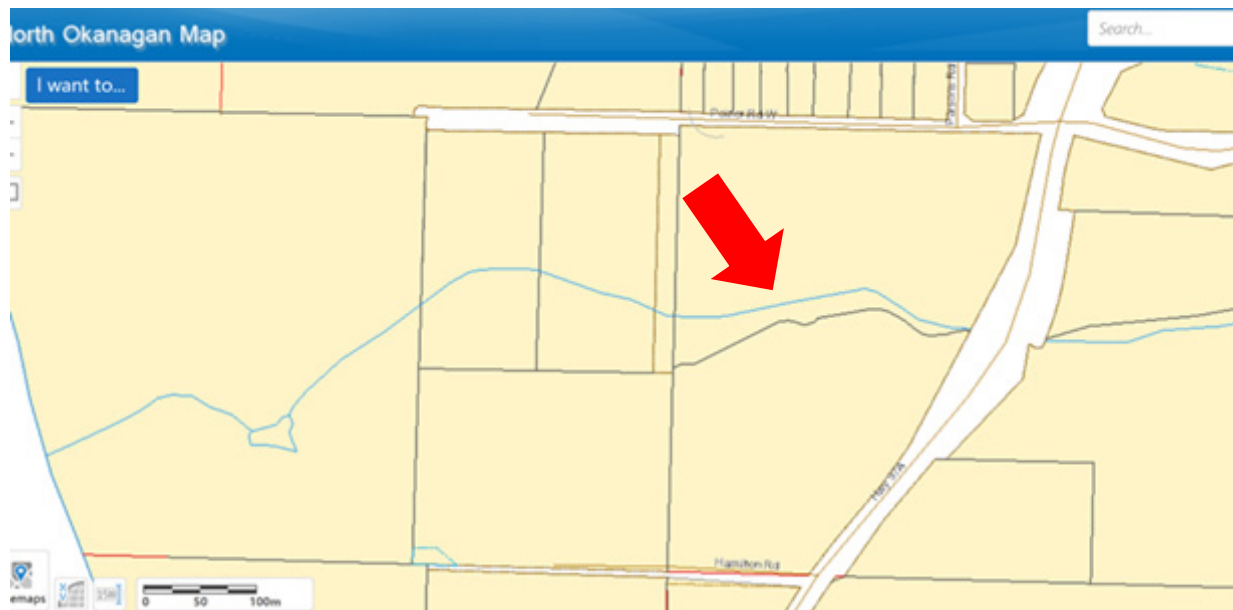


Figure 3: Position of the creek's location today, compared to location of the legal boundary⁴

The court outlined the legal framework and principles that it would use and apply in

In British Columbia, a certificate of title affords to the registered owner of a piece of land conclusive proof of ownership, subject to statutory exceptions; *Land Title Act*, R.S.B.C. 1996, c. 250 [LTA], s. 23(2); *Phillips v. Keefe*, 2012 BCCA 123 at para. 57 [Phillips CA], varying 2010 BCSC 2005 [Phillips SC]. **The documents registered in the land title office describe the property in question, but are not conclusive as to its location on the ground**; *Phillips CA* at paras. 58–63. Location on the ground must be determined by survey evidence and that is the issue in this case.

In determining the location of cadastral boundaries—that is, property boundaries—surveyors refer to a hierarchy of evidence ranging from most to least reliable. This hierarchy is accepted by courts as a precedential ranking of the best evidence with which to locate physically a disputed boundary; *Phillips CA* at para. 66; *Phillips SC* at paras. 66–72. In summary, the hierarchy is as follows:

- i. natural boundaries;
- ii. original monuments;
- iii. fences or indicia of possession that can reasonably be related back to the time of the original survey monuments; and

⁴ City of Vernon, North Okanagan Map, <https://maps.vernon.ca/Html5Viewer/index.html?viewer=NorthOkanaganMap> All rights reserved.

- iv. measurements (as shown on the plan or as stated in the metes and bounds description)

The third order of evidence encompasses a very wide variety of possible indicia of possession including the recollections of knowledgeable residents of long settled possession, with a view to determining “whether a reasonable factual nexus has been established between evidence of possession and the presence of original monuments”; *Phillips SC* at paras. [71–72](#).

The common law’s acceptance of the approach taken by surveyors does not involve a delegation of responsibility from courts to surveyors, but rather the development of common law principles that mirror surveying practice. In *Phillips SC* at para. [67](#), Justice Dickson, as she then was, described the common law principles as grounded in the best evidence rule and policy concerns about the risks of disturbing settled possession based on mathematical measurements. That is why evidence of fencing or long-standing possession relating back to the original boundary tends to trump measurements and calculations based on the description of a property in an ancient deed; *Nicholson v. Halliday* (2005), 74 O.R. (3d) 81 at paras. [33-35](#), [2005 CanLII 259 \(C.A.\)](#). In *Phillips SC*, Dickson J. concluded:

[69] The task of a surveyor is to re-establish original boundaries, taking into account the best available evidence. ***The task is not to define limits as mathematically described in a deed or elsewhere.*** [...]

The respective roles of surveyors and the courts are well summarized by David Lambden and Izaak de Rijcke in *Survey Law in Canada: A Collection of Essays on the Laws Governing the Surveying of Land in Canada* (Carswell, 1989), at p. 120:

§4.40 The locations of boundaries are a matter of fact in the legal sense and the surveying profession acts as the carrier of these facts from the ground to the courts in cases of dispute that are brought to action. In day-to-day operations (as there is actually very little litigation about boundaries), the surveyor creates the record of things on the ground to be thereafter used by people far-distant from the ground location.

§4.41 In one instance, the surveyor is the creator of fresh evidence as in the original surveys of wilderness lands for settlement or in the marking of lots in a new subdivision by a private owner. In another instance, he is the interpreter of old evidence to locate the position of an original boundary, but he is not the authority of final decision; that remains the function of the courts. [emphasis added.]

Where a water course such as Johnson Creek is a natural boundary, the boundary is usually considered as ambulatory. As the edge of the water course or its centre moves according to the natural processes of erosion and accretion, the boundary moves as well. There is an exception to this legal rule if the movement is due to a sudden avulsion rather than gradual erosion or accretion; *Yukon Gold Co. v. Boyle Concessions Ltd.*, 19 D.L.R. 336 at 352, 1914 CarswellYukon 5 (Y.K.T.C.), aff’d 27 D.L.R. 672, 1916 CarswellBC 81 (B.C.C.A.), aff’d 50 D.L.R.

742, [1917 CanLII 702 \(S.C.C.\)](#) [*Boyle Concessions*]; *Clarke v. Canada (Attorney-General)*, [1930] S.C.R. 137, [1929 CanLII 38](#); rev'd 23 Alta. L.R. 233, [1929 CanLII 303 \(C.A.\)](#) [*Clarke*]; *Ontario (Attorney General) v. Shanks*, [1981] O.J. No. 79, 1981 CarswellOnt 1408 (C.A.) [*Shanks*]; *Black v. Norris*, [2012 NBQB 346](#), rev'd on other grounds, [2013 NBCA 62](#). ***An avulsion is rapid and dramatically obvious, and the property line remains where it was.***

As is apparent from the surveyor's hierarchy generally and in particular its third level ("fences or indicia of possession that can reasonably be related back to the time of the original survey monuments"), the hierarchy presupposes a cadastral boundary originally fixed by a natural boundary or original monuments. In a case such as the present, where the boundary in question was fixed by a natural boundary (Johnson Creek), and the issue is whether that natural feature has ceased to serve as a property boundary through an avulsion, a slightly different approach is required, still respecting the underlying principles and policy concerns. The fundamental question is whether Johnson Creek has moved and ***direct evidence of the past and present location of the creek***, including photographs, historic documentation, and the recollections of residents, ***is afforded primacy over historic surveying measurements such as those shown in the DD Plans and found in the original deeds by which the Northern and Southern Parcels were subdivided.***⁵ [emphasis added]

Despite starting this statement of the law with, "*In British Columbia...*" this citation of legal authority from which a statement of the common law is derived includes appellate decisions from Alberta, Ontario and New Brunswick. This is not in error; this statement prevails and is applied in like circumstances in all common law jurisdictions, despite the attraction of mathematics, co-ordinate systems and GIS applications.⁶

The balance of this interesting case is a description of the court's evaluation of evidence that was considered admissible and relevant. As cadastral land surveyors, we will recognize the description of "confirmation bias" as sometimes identified by a court in its review of the expert evidence of the land surveyors. This even truer when provided with an example of confirmation bias by the court in this decision:

⁵*Burko v. Martindale, supra.*, footnote 1, at paras. 19 to 25

⁶ Note that the reference to the title being registered in the *Land Title Act* and the certainty which that brings, has nothing to do with the location on the ground of that parcel or of its boundaries. See: *Phillips v. Keefe*, 2012 BCCA 123 (CanLII), 318 BCAC 184 <https://canlii.ca/t/fql2f>, cited in *Burko v. Martindale*, with support, at paras 63 and 64:

There is no inconsistency, as the defendants suggest, between the statutory provisions of the *Land Title Act*, which govern the indefeasibility of title, and the surveyors' hierarchy of evidence, which is used to locate boundaries on the ground. The *Act* speaks to legal title. The survey evidence speaks to the physical location of what is described in that title.

Section 24 of the *Act* is likewise not inconsistent with the surveyors' hierarchy of evidence, and is of no assistance to the defendants' case. The use of "fences or possession reasonably related to the time of the original survey" for the purposes of locating a boundary is not a resort to adverse possession or the acquisition of a right to land by prescription. It is a category of evidence relied on by surveyors to assist in locating, on the ground, a boundary which cannot be determined by better evidence.

Mr. Sansom and Mr. Minifie testified as expert witnesses. Both are qualified land surveyors subject to a professional obligation of objectivity in the determination of cadastral boundaries. It is obvious that both take that obligation seriously. Both provided comprehensive expert reports and thoughtful, helpful commentary in their oral evidence. Both came to give evidence from the background of a long involvement on opposing sides of this dispute: as already noted, Mr. Minifie was first engaged in 2016, and Mr. Sansom was retained in July 2018. Through their involvement, both have become committed to opposing points of view and, perhaps inevitably, that has made them susceptible to an unconscious confirmation bias, namely, a tendency to examine new evidence for indications that it supports their position, and perhaps to discount or overlook evidence that points in the other direction. I have taken this tendency into account in my assessment of their evidence.

The presence of confirmation bias is illustrated by the fact that Mr. Minifie and Mr. Sansom could walk the same paths along Johnson Creek and the line that Johnson Creek supposedly ran along in 1911 and see different things. Mr. Sansom could see depressions in the ground that “appeared to be the location of an original creek channel” and observe that “the row of stakes marking the 1907 location meander between old trees and intuitively feel like a creek channel did exist through this corridor”. Mr. Minifie could observe that “the Creek is in a well-established channel with no physical signs of having wandered south from this location”.⁷

Further review of the evidence by the court in its reasons include historic survey evidence, aerial photography. These also deserve repeating here. Aerial photography can often serve as valuable evidence in determining shifts in the position of certain features on the ground. The court described this evidence – as well as the qualifications and areas of expertise – of two witnesses called by the opposing sides:

Several aerial photographs are in evidence. The most informative are a photograph taken on July 16, 1928, and one taken in 1969. Both were interpreted by two expert witnesses, Jamie Blackley and Joseph Alcock, who were particularly helpful in matching the photographs to uncontroversial geographical features such as the Shuswap River and Highway 97.

In the 1928 photograph, a line of trees follows the supposed 1911 creek location, and a disturbance in the tree canopy extends westward all the way to the river. A fainter line can be seen fairly close to but not exactly in the present location of the creek on the west side of the properties, but a disturbance in the tree canopy further west is not easily discerned.

The 1969 photograph is different. In it, Johnson Creek is clearly visible close to its present location.

Mr. Blackley is a geospatial analyst with specialist skills in remote sensing of the environment. His expertise involves the interpretation of data such as that provided in a digitized aerial photograph. Mr. Blackley limited his analysis to the 1928 and 1969 photos, to

⁷ *Burko v. Martindale, supra.*, footnote 1, at paras. 69 and 70

which he added publicly available light ranging and detection (“lidar”) data from 2019. He did not attend at the properties to look for physical evidence. He interprets the data as evidencing a northward movement and widening of the western part of Johnson Creek between 1928 and 1969, and further less dramatic movement between 1969 and 2019. He concludes, in measured words, that “there is reasonable evidence in the comparison of historic and current aerial images that the location of Johnson creek has shifted northwards”.

Mr. Alcock is a professional geoscientist with expertise in, among other things, fluvial geomorphology and aerial photograph interpretation. Mr. Alcock provided an opinion to Mr. Martindale in June 2019 in which he relied, for the most part, on his observations on the ground, with some reference to aerial photographs. He then prepared an expert report on June 1, 2022 in which he relied principally on his interpretation of the 1928 and 1969 aerial photographs, and also aerial photographs taken in 1930, 1947, and 1966. He interprets the 1928 and 1930 photographs as showing Johnson Creek in the location shown on the DD Plans, noting that “the creek was wide enough to have separation of the tree canopy along the creek”.

I accept Mr. Blackley’s and Mr. Alcock’s interpretations as confirming my own impression of the 1928 and 1969 photographs. I conclude that these photographs provide persuasive but not necessarily conclusive evidence that Johnson Creek changed its course from that shown in the DD Plans to something close to its present course between 1928 and 1969.⁸

This case is also instructive about the risk in venturing an opinion on incomplete or untested evidence. This was the eventual conclusion reached by the court in evaluating the opinion of Mr. Swaile:

In his report, Mr. Swaile refers to the surveyor’s hierarchy of evidence and reasons as follows:

Johnson Creek would be considered a “natural boundary” – the highest form of evidence. However, the boundary is in dispute because of uncertainty about where the creek has been over the years. If I am to consider that the boundary between the two properties is anywhere other than where the creek exists today, I need to be very comfortable that the evidence fits appropriately into the hierarchy. There were never any original monuments placed along the west boundary to reference the creek, so “original monuments” are of no help. The evidence supporting the “titled” creek location is based primarily on two things: an inexact interpretation of the 1928 photo, and the dimensions shown on old survey records. I have not seen sufficient physical evidence on the ground to support and corroborate these other pieces of evidence.

Thus, based on all of the information I’ve been provided, and based on what I was able to observe in the field, I am of the opinion – on the balance of probabilities – that Johnson Creek has existed in substantially the same location as it exists today

⁸ *Burko v. Martindale, supra.*, footnote 1, at paras. 73 to 78

since at least the time of the DD surveys back in 1911, and that the boundary therefore follows the current location of the creek. [Emphasis added.]

Mr. Swaile’s opinion is only as good as the evidence he had to work with, and his reasoning is incomplete. There is important evidence that was not known to Mr. Swaile, and I do not know what effect it would have had on his opinion. Mr. Swaile had the 1928 aerial photograph, which he viewed as “inexact”. He did not have the benefit of expert assistance in interpreting it. Mr. Swaile had the benefit of a statement setting out some, but not all, of what Mr. Balas had said to Mr. Richardson. He did not address this point in his report. Nor did he address Mr. Powers’ notes on Plan 41352 and, in particular, Mr. Powers’ observation of an original creek channel well to the south of Johnson Creek’s present location.⁹

In the end, the court concluded that the position of Johnson Creek in 1919 was correctly shown on the DD plans. That it moved in position as much as it did at some moment in time between the years 1928 and 1969 to its present position meant that the boundary did not move in a “slow and imperceptible” manner. Instead, it remained fixed in its original position as retraced from the two DD plans.

Editor: Izaak de Rijcke

Cross-references to Principles of Boundary Law in Canada

A discussion of natural boundaries and the consequences of avulsion on the position of the legal boundary on the ground can be found in *Chapter 8: Natural Boundaries*. See especially the discussion in *Confining Accretion and Erosion by Surveyed Lines* at pages 369 to 374, although the subject of avulsion does not appear.



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⁹ *Burko v. Martindale, supra.*, footnote 1, at paras. 92 and 93