



**Forest
Practices
Board**

Road Construction in the Mounce Creek Domestic Watershed

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The Investigation

On October 18, 2009, a resident of Crescent Valley, near Castlegar, complained to the Forest Practices Board that road building by BC Timber Sales (BCTS) had caused Mounce Creek, the stream the complainant draws water from, to become unfit for human consumption.

Background

Mounce Creek is on Mount Sentinel, is the domestic water supply for the complainant's home and a neighbouring residence, and is also the source of water for the complainant's livestock. The intake, or point of diversion (POD)¹, feeds a holding tank which in turn feeds a cistern, from which the two homeowners extract their water.

BCTS plans cutblocks and sells the standing timber to small logging operators on behalf of the Crown. In 2009, BCTS prepared plans to construct roads and to log several cutblocks on Mount Sentinel. No harvesting was proposed in the Mounce Creek watershed, but the main road, MSN Mainline, crosses the Mounce Creek drainage area above the POD. As part of the planning process, BCTS conducted a Terrain Stability and Soil Erosion Assessment, and Drainage Plan (assessment). Field work for the assessment was carried out in December 2008, and April and May 2009, with the final report completed in June 2009.

In February 2009, BCTS reviewed its plans for Mount Sentinel with several local residents, including the complainant's spouse. The residents expressed concern about the risk to water supply and quality. The complainant asserts that at this meeting BCTS told the water users it would take them on a field trip to review the site before road construction commenced. BCTS says it did not make that commitment. Ultimately, BCTS awarded a contract for road construction, and construction of the new road began in September 2009; no pre-construction field trip occurred.

In early October, in accordance with the assessment, BCTS installed sediment traps on Mounce Creek and non-classified drainages (NCD)² that were tributary to Mounce Creek. In mid-October, road construction activities unexpectedly encountered a layer of clay at station 192 near an NCD. Heavy rains and seeping ground water transported the clay, as suspended sediment, along an NCD for approximately 300 metres before entering the Mounce Creek channel, where it flowed to the POD. Here it was diverted to the complainant's water system. The water was then piped further down the mountain where it fed the complainants cistern, from which the complainant drew their water.

Due to the suspended sediment, the complainant experienced several hardships. The cloudy water was deemed unfit for human consumption and could not be used for washing clothes or showering and the complainant's horses were also without water.

¹ The point at which water is diverted from a creek.

² Means a watercourse, including a watercourse obscured by overhanging or bridging vegetation or soil mats, that contains water on a perennial or seasonal basis, is scoured by water or contains observable deposits of mineral alluvium, and that has a continuous channel bed that is less than 100 metres or more in length.



Subsurface flow at station 192.



Suspended clay in standing water at station 192.
Note geotechnical filter fabric.

Discussion

The investigation considered:

1. Did BCTS act reasonably to prevent and subsequently mitigate the impact of siltation of the complainant's water system?
2. Was communication between BCTS and the complainant effective?

Did BCTS make reasonable efforts to prevent and mitigate the impact of siltation of the complainant's water system?

The analyst considered the legal requirements, operational planning and field practices during the construction of the MSN Mainline.

Legal requirements for managing water quality

Section 59 of the *Forest Planning and Practices Regulation (FPPR)* stipulates that an authorized person who carries out a primary forest activity, which includes road construction, must ensure that the activity does not cause material that is harmful to human health to be deposited in, or transported to, water that is diverted for human consumption by a licensed waterworks. "Licensed waterworks" is defined in the FPPR to include a water supply intake or a water storage and delivery infrastructure that is licensed under the *Water Act*. The complainant's POD is licensed under the *Water Act*, therefore BCTS was required to prevent material harmful to human health from being deposited into Mounce Creek.

The siltation was a result of road construction activities and was not a natural occurrence. BCTS agreed that the suspended clay rendered the drinking water unusable without treatment, due to

the increased turbidity.³ However, turbid water in itself does not necessarily mean that the water is harmful to human health; it is the ability of turbid water to harbour microorganisms that is a concern.

Health Canada⁴ recommends that water systems using a surface water source, or a groundwater source under the direct influence of surface water, should filter the source water to reduce turbidity levels to as low a level as possible. The key to ensuring clean, safe and reliable drinking water is to implement multiple barriers⁵ to control microbiological pathogens and contaminants that may enter the water supply system. Although the Health Canada guidelines are targeted towards community watersheds, the concept can be applied to domestic watersheds as well.

A domestic water licence provides the holder of a water licence with rights to divert and use a specified quantity of water from a stream, but does not specify quality of water. Since consumption of untreated surface water poses a health risk, water licensees need to take reasonable measures to ensure that their water system provides safe, clean drinking water in consideration of the risks associated with the source water (i.e., wildlife, microbial activity, industrial activity, etc.). It would be beneficial to water licensees if training and education was made available which included:

- understanding the risks associated with using untreated surface water;
- understanding the legislation related to domestic water licenses; and
- incorporating the guidance provided by Health Canada for reducing turbidity and safeguarding surface drinking water supplies, into their systems.

Operational Planning

There are three documents that provide guidance for planning around streams licensed for human consumption:

1. The FPPR requires that the primary forest activity does not cause material that is harmful to human health to be deposited in, or transported to, water that is diverted for human consumption by a licensed waterworks. How that is achieved is up to the licensee. In this case, BCTS completed a Terrain Stability and Soil Erosion Assessment, and Drainage Plan with field work taking place in 2008 and 2009. The final report was prepared in June 2009 and it addressed terrain stability, soil erosion and sediment delivery risk, as well as recommendations for construction and culvert location and sizing. The road section around station 192 was classified as having a low to moderate likelihood of sediment

³ Turbidity is a measurement of how light scatters when it is aimed at water and it bounces off the suspended particles. It is not a measurement of the particles themselves. In general terms, the cloudier the water, the more the light scatters and the higher the turbidity.

⁴ Guidelines for Canadian Drinking Water Quality: Supporting Documentation – Turbidity <http://www.hc-sc.gc.ca/ewh-sem/sem/pubs/water-eau/turbidity/index-eng.php>

⁵ Guidance for Safe Drinking Water in Canada: From Intake to Tap, <http://www.hc-sc.gc.ca/ewh-sem/sem/pubs/water-eau/guidancetotap-document/index-eng.php>

delivery to the complainant's water source. The clay seam was not visible on the surface and, as a result, was not identified in the field or noted in the report.

2. The Kootenay Boundary Higher Level Plan (KBHLP) specifies that a 30-metre management zone be maintained around streams licensed for human consumption. Other than the road crossing the stream, the requirement for a 30-metre management zone has been met adjacent to Mounce Creek through the establishment of a 3.4 hectare wildlife tree retention area.
3. The forest stewardship plan (FSP) prepared by BCTS stipulates that stream crossings be located more than 100 metres upslope of known and licensed water intakes, unless there is no other practicable option. The MSN Mainline is more than 100 metres upslope of the intake.

At the time of the road construction, BCTS had an environmental management system (EMS), which contained an emergency response plan (ERP). The ERP is used by BCTS provincially and addresses how to respond to spills, fires, erosion events and landslides, but is not specific to dealing with water quality issues associated with licensed waterworks.

Operational Activities

During the course of the investigation, the Board reviewed road construction techniques and the measures taken to maintain water quality before and after the sedimentation occurred. Board staff also visited the site on October 21, 2010 a week after the siltation occurred.

Road construction through the Mounce Creek watershed used a standard, conventional half-bench, side-cast construction method. Culverts were placed in accordance with the drainage plan to maintain natural drainage patterns. An on-site supervisor from the firm that completed the assessment was employed to oversee the road construction.

The assessment contained several recommendations regarding the road section within the Mounce Creek drainage area, including one that required sediment traps (sediment basins with filter fabric) to be installed and maintained (cleaned and repaired as required) for the duration of the road construction, and for a period of one year following completion of construction.



Sediment trap below Mounce Mainline. Note the suspended clay.



Intermittent creek carrying suspended clay. Note the gentle terrain, and how the creek flows above and below ground.

Sediment traps had been installed on the inlet side of the culvert and six sediment traps had also been installed on the NCD that transported the suspended clay. The assessment also stipulated that ditchlines should be armoured if not cut into rock, and that culvert inlets and outlets should be armoured with coarse rock. These recommendations were being completed when the Board conducted the site visit.

On October 14, the complainant notified the BCTS road contractor that sediment was reaching the POD. A review of the sediment traps found that they were ineffective in preventing the suspended clay from being transported to the POD. The contractor immediately stopped road construction.

BCTS conducted an on-site visit the following day. On October 16, BCTS met on-site with a geotechnical engineer to assess the problem and recommend a course of action to deal with the clay seam. On October 17, the road contractor began laying filter fabric overlaid with rock armouring around station 192 in response to the October 16 field trip. Siltation once again occurred because of this activity, so work was halted from October 17 to 23. BCTS took additional steps to deal with the degradation of water quality by bringing in a tanker truck with water, replacing the complainant's hot water tank and installing sediment filters in the water supply system.

Finding

The Board is of the opinion that section 59 of the FPPR likely was not met. The road construction activities did result in sediment entering the complainant's water system, resulting in an increase in turbidity, which may be harmful to human health. Without sampling the water and having baseline water quality data to compare against, it is very difficult to prove that material harmful to human health has been deposited and is the result of forestry activities, or even if the previous water quality had been fit for human consumption.

BCTS was diligent in its planning for road construction and proposed harvesting around Mounce Creek. The assessment done for road construction was thorough and completed by qualified professionals. There is no proposed harvesting in any of the areas draining into Mounce Creek.

BCTS's operational activities followed the recommendations in the assessment, including installation of several sediment traps on each of the NCDs that drain into Mounce Creek, but the sediment traps were ineffective. BCTS had an on-site supervisor coordinating road construction activities, however, it was the complainant who discovered the sedimentation in the water system. The machine operator who caused the damage was preoccupied with road construction activities and the on-site supervisor was away the morning of October 14 when the siltation was discovered.

Once the clay seam was uncovered by the road construction, and the suspended clay introduced into the water system, BCTS took appropriate steps to address the issue. It employed an engineer to review the situation and recommend remedial measures, which were acted upon, and it took additional steps to address the lack of water for domestic use and livestock consumption.

As a result of this situation, BCTS in the Kootenay Business Area recognized the shortcomings of its EMS/ERP, which is very broad in scope and deals more with reactive measures should something go wrong than with preventive measures. BCTS in the Kootenay Business Area has since drafted an ERP specific to watersheds that contain licensed water works. This ERP includes

emergency contact numbers, pre-work requirements (including communication with water users), site review of infrastructure and PODs, best practices for prevention and control of sediment, and a contingency plan in the event the water supply becomes damaged.

Was there effective communication?

The investigation considered two aspects of communication:

1. legal requirements governing communication, and
2. effectiveness of the communication between BCTS and the complainant.

Did BCTS meet the legal requirements for communication?

There are no requirements under the *Forest and Range Practices Act* (FRPA) or associated regulations, for public consultation to occur with licensed water users. FRPA does require that a licensee advertise a forest stewardship plan (FSP) and provide opportunity for public review, including a comment period of 60 days starting from the date of first publication.

However, in this case, BCTS also committed to notifying water licensees of the proposed development through a referral letter. BCTS met its obligations to provide a review and comment period, provided a referral letter on February 9, 2009, and also met with the complainant on February 16, 2009 to review maps and proposed development.

The Board is of the opinion that legal requirements for communication were met.

Was communication effective?

Openness and accountability in forest practices are achieved, in part, through effective public consultation. Public consultation benefits the forest industry by identifying important resources and community values so that forest companies can address them during the planning and implementation of forestry operations.⁶ It is important that any communication strategy be tailored to reflect an individual situation, rather than simply follow a set of standard guidelines. In some instances, this requires communication at all planning levels, from strategic through to operational. In other situations, it requires communication at specific milestones of planning or operations. Each situation varies according to specific concerns and how those concerns are affected by forestry operations. In the Board's view, the effectiveness of BCTS' communication with the water users could have been improved in two ways.

First, BCTS had the professional assessment done in June 2009 and provided it to the complainant on September 22, 2009, after road construction had started. Although this information would not have affected the way the road was constructed and the subsequent water quality issues, it may have helped to establish trust and facilitated communication between BCTS and the water users.

Second, although BCTS made some initial communication efforts, it did not engage the complainant in an ongoing manner. While it is not an expectation that BCTS communicate each

⁶ [Board Bulletin, Volume 3 – Opportunity for Public Consultation under FRPA](#)

and every step of operations, BCTS should have provided an opportunity for the complainant to engage in meaningful dialogue specific to road building and the complainant's water system. For example, the suggested field trip would have allowed the complainant's spouse to fully explain how the water system functions to BCTS and, in turn, would have allowed BCTS to show the complainant what preventive measures it would take to maintain water quality. Ultimately, this type of communication may have resulted in developing a mutually agreed-upon strategy should adverse impacts—such as what occurred—happen.

BCTS has since reviewed its practices and conducted field reviews in cooperation with the remaining water users whose systems may be affected by the road construction on Mount Sentinel. BCTS is being proactive by meeting with other water licensees, assessing intakes and taking time to understand how individual water systems work.

Finding

BCTS met the review and comment provisions specified under FRPA and also met the commitments it made in its FSP. However, communication between BCTS and the complainant could have been more effective.

Conclusions

BCTS likely did not meet the requirements of section 59 of the FPPR (preventing material that is harmful to human health from entering water used for human consumption). However, it would be difficult to prove non-compliance with section 59, since the legislation is very general and there are no criteria that are reasonable, measurable and verifiable.

BCTS complied with the requirements of FRPA, the KBHLP and their FSP with respect to planning and notification. BCTS also completed a detailed assessment to assess risk and to guide road construction activities; however, the clay seam was not evident from the field examination.

Although the complainant's water quality was degraded due to exposure of the clay seam, BCTS took reasonable steps to address the issue and acted promptly in getting qualified professionals on-site to recommend remedial action. BCTS implemented those actions as soon as possible and made a concerted effort to address the complainant's lack of potable water.

The complainant, not BCTS, discovered the siltation problem, which is of concern to the Board. Although BCTS did a good job of planning activities, this situation shows that reality is not always predictable. BCTS has a responsibility to ensure that there is on-site monitoring of their primary forestry activities when they are working around licensed waterworks.

BCTS could have communicated more effectively with the complainant before building the road that negatively affected the complainant's water quality.

When the sedimentation event occurred, the inability of either party to take immediate action due to their unfamiliarity with the system intensified the damage. In order to address the remediation of the damage caused by this, and to prevent this from happening again, it is important for BCTS to establish meaningful communication with water users. For this to occur, all parties must be

willing to work together to establish effective communication, including respecting each other's rights and interests, and developing a mutually agreed-upon strategy to address potential impacts of operational activities on water quality.

As a result of this incident, BCTS in the Kootenay Business Area has a new draft ERP when working in community and domestic consumptive watershed. The amended ERP addresses communication, field practices, and roles and responsibilities of BCTS staff and clients in the case of disruption to water supplies.

Currently the water in the NCD is clear; however, it remains to be seen whether it will carry suspended clay during periods of high flow. BCTS is currently monitoring water quality during spring freshet and high rainfall storm events and should continue to do so until the water quality has stabilized (i.e., doesn't carry suspended clay).



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