Adequacy of Repair and Maintenance of the Elk River Road, Near Elk Lakes Provincial Park

Complaint Investigation 000224

FPB/IRC/35

September 2000

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The Investigation

On January 6, 2000, the Board received a complaint from an Elkford resident about repairs that were made to the Elk River forest service road. The complainant said that the Ministry of Forests failed to repair the road properly after it was partially undermined by the Elk River.

The complainant requested that the steep cut slope[1] on the west side of the road be reduced to prevent erosion and that large rocks be placed along the bank of the Elk River to deflect the current and prevent further erosion.

The Board decided to investigate whether the repairs to the road complied with the requirements of the *Forest Practices Code of British Columbia Act* (the Act).

Background

The Elk River forest service road (the road) extends approximately 70 kilometres north from Elkford to Elk Lakes Provincial Park on the British Columbia/Alberta border. The road was opened in 1932. In 1968, the Ministry of Forests assumed responsibility for the road, which is used extensively by campers, hunters and the forest industry.

In the spring of 1995, a major flood occurred in the Elk Valley. At a point approximately eight kilometres north of Elkford, the Elk River eroded and weakened the bank that supported the road. At that location, the road is approximately 50 metres above the river, and the bank is almost vertical. The erosion continued over the next two years and the road began to fail.

The Ministry of Forests, Cranbrook Forest District (the ministry) became concerned about public safety and decided to relocate the road. The ministry considered relocating the road well away from the problem area, however it estimated that 2.5 kilometres of new road construction, at a cost of $500,000.00, would be required to re-route the road through the steep terrain above the existing road. The ministry also considered relocating the road about 10 metres west of the old location and decided on that option. The ministry applied for and received $70,000.00 in funding from the provincial emergency program. In June 1999, the road was relocated approximately 10 metres farther away from the bank.

The complainant looked at the road in September 1999 and was concerned about the steep cut slope, stability and the possibility of further erosion by the river. He wrote to the district manager with his concerns. The ministry responded one week later stating that the road section was new and was still settling. The ministry promised to monitor the situation and deal with any issues as they arose. The complainant remained concerned about the road and decided to file a complaint with the Board in January 2000. Board staff visited the site in May 2000.

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[1] The *Forest Road Regulation* defines 'cut slope' as the face of an excavated bank required to lower the natural ground line to the desired road profile.

Investigation Findings

Compliance with Forest Practices Code Requirements

a) Armouring the Riverbank

The complainant is concerned that the river will continue to erode and undermine the bank and that, eventually, the remnants of the old road section and possibly the new section will fall down the bank. He suggested that the riverbank be armoured with rocks or other suitable material.

The *Forest Practices Code of British Columbia Act* and Regulations (the Code) does not require the ministry to armour the bank of the river to prevent further erosion. However, the ministry did consider the complainant's suggestion. The ministry's regional geotechnical engineer visited the site on May 24, 2000. He noted that the riverbank comprises steep, partially cemented fluvial[2] deposits topped by a layer of weaker till[3]. Because the bank is made up of these natural sediments and is located on an outside bend of the river, the engineer agreed with the complainant that further natural erosion would likely occur.

However, the engineer considers that stabilisation of the riverbank would be impractical. The bank is almost vertical, so it would be difficult to get equipment down to the base of the bank unless equipment crossed the river from the other side. The ministry feels that, although armouring may be technically feasible, there would be a significant potential for environmental damage if equipment had to work in the river. In addition, armouring the bank would further constrict the river. The Ministry of Environment, Lands and Parks' forest ecosystem specialist stated that it would be a mistake to constrict the river because it could contribute to further undercutting of the bank by the river.

When the complainant visited the site in May 2000, he acknowledged that it would be very difficult to stabilise the bank in the circumstances.

In summary, erosion of the bank by the Elk River is natural and is likely to continue. Armouring the bank with rock is not a requirement of the Code and, in this case, would be impractical.

Finding #1

Natural erosion of the riverbank will likely continue. Armouring the bank is not a Code requirement and would be impractical in the circumstances.

Although the ministry is not required to prevent natural erosion of the riverbank, the Code does require that the government ensure protection of the structural integrity of the road.

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[2] Fluvial means deposited by flowing water.

[3] Glacial till is mixed clay, sand, gravel and boulders deposited by a glacier.

Section 63(6)(b) of the the Act requires that the government maintain forest service roads in accordance with the regulations. Section 18(1) of the *Forest Road Regulation* states, in part, that a person who maintains a road under section 63 of the Act must inspect the road and repair the road to ensure that the structural integrity of the road prism[4] and clearing width[5] are protected, and that the road can be used safely.

The regional geotechnical engineer stated that the relocation of the road has resulted in increased reliability and safety for road users. He considers that the road prism is currently structurally sound. The toe of the new fill slope[6] is at least 6 metres away from the edge of the bank, and the fill slope is stable.

Finding #2

The ministry repaired the road to ensure the structural integrity of the road prism and the safety of users. The ministry complied with section 18(1) of the *Forest Road Regulation*.

Although the road prism is currently stable, the engineer acknowledged that it may not remain stable indefinitely. Continued erosion of the riverbank or a heavy spring melt could adversely affect the stability of the road prism in the future. A regular inspection program will be necessary to identify any safety concerns and indicators of instability so that appropriate action can be taken.

The ministry has inspected the road once each month since April 2000. In addition, the ministry noted that industrial users and the public use the road daily and any problems would likely be noticed and reported by someone immediately.

Finding #3

Frequent ministry inspections, supplemented by a reliance on road users to identify any concerns, are a reasonable approach to identify further erosion of the river bank or road stability concerns.

b) Oversteepened Cut Slope

The complainant is also concerned that the cut slope on the west side of the road is too steep and will erode unless it is reduced.

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[4] Road prism means the area of the ground containing the road surface, cut slope, and fill slope.

[5] Clearing width means the width required to be cleared of standing timber to accommodate road construction maintenance and use.

[6] The *Forest Road Regulation* defines 'fill slope' as the face of an embankment required to raise the desired road profile above the natural ground line.

Section 8(1)(e) of the *Forest Road Regulation* requires, in part, that cut slope angles be designed to remain stable over the life expectancy of the road unless sliding or slumping of soil cannot reasonably be expected to contribute to slope failures.

The cut slope above the road is made up of glacial till and, at approximately 55 degrees, is considered oversteepened. According to the ministry, the natural topography of the site dictated the slope angle, and the steep slope resulted in less material being excavated and hauled away. Additionally, less area was disturbed and exposed to weathering and erosion than if the slope angle had been reduced. Recognising that it was oversteepened, the ministry constructed a 2-metre wide ditch at the base of the cut slope to catch any material that ravelled down the slope. The area was also seeded with grass.

The ministry acknowledges that the ditch below the cut slope will have to be inspected and cleaned out periodically, and the cut slope might have to be re-seeded if the original seed mix does not become established.

The regional geotechnical engineer looked at the cut slope and noted that some sloughing and slumping had occurred over the first winter. The ditch caught most of the material but, during spring runoff, some water flowed down and across the road because the ditch was plugged. Some of this water had eroded the fill slope. Board staff confirmed these observations and noted that sediment from the fill slope was deposited on the old road surface.

The engineer recognised that the cut slope is steep and that continued maintenance of the ditch would be required to ensure the stability of the fill slope. The engineer said that as long as the ditch is maintained regularly, he does not expect that slumping or sliding of soil will contribute to a slope failure.

Finding #4

The regional geotechnical engineer does not expect that slumping or sliding of soil from the oversteepened cut slope will contribute to a slope failure. As a result, the oversteepened cut slope complies with section 8(1)(e) of the *Forest Road Regulation*.

The ministry cleaned out the ditch with a grader on July 6, 2000, and will rely on future inspections to determine the need for further ditch maintenance.

Conclusions

The Ministry of Forests repaired the Elk River forest service road in accordance with Code requirements to ensure that the road was stable and could be used safely by the public and industrial users.

All parties to the complaint agree that the natural processes of the Elk River will likely continue to erode the bank below the road. However, armouring the bank would be impractical and is not a Code requirement. At some time in the future the stability of the road and user safety may be threatened, and a solution will have to be found. In the meantime, regular ministry inspections and maintenance are a reasonable approach to ensure public safety and compliance with Code requirements.

Location of Elk River Road Complaint