

SITE C29: MERIDIAN PIT HAUL ROAD AND EROSION

LEGAL LOCATION: NE 23 and NW 24-53-01-W4 (Gravel Pit)
NE/SE26-53-01-W4 and NW/SW25-53-01-W4 (Erosion)

REFERENCE LOCATION
ALONG HIGHWAY: 0.8 km east of Highway 17 and 2 km south of the North
Saskatchewan River (Gravel Pit), erosion extending to the
river

UTM COORDINATES (NAD 83): N 5,938,746 E 563,935 "Dam"
N5,939,566 E 565,036 End Gabion Chute

AT FILE: H17:08

AT PLAN & PROFILE:

Date of Initial Observation: June 2003

Dates of Previous Inspections: July 9, 2003 (AT)
(Inspected by) July 18, 2003 (KCCL)
May 19, 2004 (KCCL)

Instruments Installed: Inclinometers adjacent to gabion structure

Instruments Operational: Unknown

Reading Dates:
(Read by)

Risk Assessment: PF(9) * CF(2) = **18** (with "dam" removed)

Last Updated by: Klohn Crippen Consultants Ltd. (KCCL)
Date: May 2004

Location

The project site is located about 0.8 km east of Highway 17 and 2 km south of the North Saskatchewan River.

General Description of Site Conditions

To enable gravel to be hauled from the pit with a short haul to Highway 17, an earthfill embankment was constructed across an unnamed creek to the west of the pit. The fill effectively dammed the creek and provided a source of water for the cattle farmer. A nominal 600 mm diameter culvert was provided just below the crest to act as an overflow. No engineering design was performed for the structure.

In 2003, significant rainfall event occurred in the area, with about 150 mm of rain falling in about 4 hours. The result of this was the overtopping and destruction of the haul road “dam” with a significant release of water downstream. The channel downstream of the dam indicated that a significant flow of water was passed down the channel. A high degree of erosion was observed and debris was deposited at a high level above the base of the creek.

About 1000 m downstream of the dam, the natural creek flows into a man-made channel about 10 m wide. It is understood that this channel was constructed as part of the Highway 17 construction and the area between the end of the natural channel and the pump station access road is a fill disposal area. The constructed channel flows into a gabion drop structure before passing under the access road via a 1.8 m diameter culvert and subsequently flowing into the North Saskatchewan River.

At the end of the gabion structure, a plunge pool has formed. The depth of the pool was estimated at about 1.5 m.

The creek terminates in the North Saskatchewan River. A material fan extends about 30 m from the bank into the river.

Geotechnical Conditions

Chronology (Refer to Section G for Further Information)

June 2003

In late June, a significant rainfall event occurred in the area, with about 150 mm of rain falling in about 4 hours. The result of this was the overtopping and destruction of the haul road “dam” with a significant release of water downstream. It is understood that this was not the first time that this structure has failed.

July 2003

On July 18, 2003, a joint site inspection was carried out by representatives of Klohn Crippen and Alberta Transportation. At that time, the earthfill “dam” had been rebuilt and was retaining water upstream. The following recommendations were provided:

- The dam should be removed as soon as possible in such a way that a sudden release of water does not occur. Vehicle traffic should not be permitted to cross the fill.
- If an access road is required for the gravel pit, an engineered fill should be designed and constructed. The fill should be provided with culverts at the base to prevent the retention of water behind the structure. If the cattle farmer requires a source of water, some form of upstream and off-stream development should be considered, such as a dugout
- The downstream channel should be left to re-vegetate naturally.
- Saskatchewan Highways should be contacted regarding the gabion structure. The design and as-built drawings should be obtained. The plunge pool area should be drained and inspected to determine the required remedial work. It is expected that additional gabion baskets will be required to protect the toe area.

Fall 2003

The embankment was removed.

November 2003

Approval from DFO obtained for site remediation.

Reports and Documents

July 21, 2003 (KCCL) Geotechnical Inspection Report

DFO Approval, November 2003

May 2004 Inspection Form