

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 History

Fishing Lake, Saskatchewan is located approximately 24 km north of Foam Lake and 170 km northeast of Regina, Saskatchewan (Figure 1). The lake is in the headwaters of the Whitesand River, which is a tributary to the Assiniboine River. The natural outlet spill for Fishing Lake is at El. 529.74 m above sea level (masl), at which, the majority of cabins are still above the water level. The water level is typically below this natural spill elevation and 90% of the time ranged between an elevation of 527.1 masl and 529.7 masl since 1964, when levels began to be recorded on Fishing Lake (Appendix A) ⁽¹⁾.

A series of water level increases occurred on Fishing Lake beginning in 1995 with a peak level of El. 529.92 masl during 1997 that flooded 149 cabins. While the water levels decreased slightly during the subsequent low runoff years, they remained relatively high and they did not drop below El. 528.5 masl. Project proposals were completed in 1997 for a 7 km ditch to Hazel and Stoney Lakes with control structures and in 2001 for a diversion process to prevent natural flow into Fishing Lake from Hazel Lake, utilizing the Hazel Lake road as a dam. These Project Proposals were completed on behalf of the Fishing Lake Watershed Association; however, they did not proceed due to lack of resources ⁽²⁾.

A number of consecutive high runoff years occurred again resulting in a peak water level on Fishing Lake of approximately El. 530.6 masl during 2007. This was the highest water level on Fishing Lake since the early 1920's, when compared to modeled historical water levels (Appendix A) ⁽¹⁾. This flooding during the 2007 spring runoff affected approximately 300 of the 550 cottages/residences around the lake (Photo 1 and 2; Appendix B). This flooding impacted cabins, several areas of the Fishing Lake Regional Park, the golf course, resort villages and numerous businesses affecting the local economy. The area was declared a disaster by local government emergency orders, which made funds available to assist with responding to the flooding impacts.

It was projected that the lake levels would not lower sufficiently prior to freeze up in the fall of 2007 through natural outflow and evaporation. Therefore, emergency works were proposed to lower the water level to the outlet spill elevation before freeze up and significantly reduce damages. The Saskatchewan Watershed Authority (SWA) developed plans to alleviate the flooding, acting on behalf of the Government of Saskatchewan. Construction of a drainage channel from the outlet of Fishing Lake, to allow water to flow by gravity downstream and thereby lowering the lake level, was initially proposed along with berm construction and construction was prepared to start. Opposition from some local landowners and from the Fishing Lake First Nation stopped the drainage ditch from progressing. Construction of only the earthen berms was subsequently proposed to isolate the flooded structures and allow water to be pumped out of the bermed areas and back into Fishing Lake. These temporary berms were approved on an emergency basis and construction was initiated in early September and completed by early December 2007.

1.1.2 Existing Situation

The overall flood remediation of Fishing Lake through the berm construction has resulted in positive feedback from many local residents upon its completion. The constructed temporary berms are located at Leslie, Knights of Columbus (KC), Murray, Ottman, Pavillion, Kuroki, Saskin and Buckhorn Bay beaches and the Foam Lake Golf and Country Club (Figure 2). The berms were constructed by first end-dumping (Photo 3) fill along the beaches and existing roadways followed by a “clean up” phase consisting of shaping and trimming the berms, applying erosion protection and back filling lots. In total 6,750 m of beach side berms and 6,250 m of back road berms were constructed consisting of approximately 525,000 m³ of excavated dirt and more than 70,000 t of coarse gravel and rocks. Full details of the temporary berm locations and construction are summarized in the Clifton Associates Ltd. Construction Report ⁽³⁾.

Construction of the temporary berms under the emergency nature meant working in a difficult environment due to elevated water levels. As a result of the conditions, not all of the berms are of sufficient height to provide protection to the 1 in 500 year Estimated Peak Water Level (EPWL) at Fishing Lake. The 1:500 year EPWL is estimated based on a the 1:100 year calm water level of 530.9 masl in conjunction with a 1:5 year wind/wave event of 0.7 m resulting in an elevation of 531.6 masl. Additionally, the 6H:1V design slope for the lakeside of the berms was

not achieved in all locations, the top of the temporary berms were generally flat without erosion control measures and wider in places than the 8 m design width (Photo 4), and the overlying rip-rap in places form compound lakeside berm slopes (some portions flatter than and some portion steeper than the 6H:1V design slope). Within the cabin area behind the temporary berms snow melt, precipitation and seepage from the lake is resulting in the accumulation of surface water. To minimize water accumulation and further damage to the cabins, this surface water is regularly pumped into Fishing Lake (Photo 5). Pumping has occurred, beginning in April 2008, at all the beaches where berms were constructed. It is anticipated that pumping will continue to be required during spring melt and following summer rains until the unfilled areas behind the temporary berms are properly finished with drainage provision, as part of the long-term flood protection.

The Department of Fisheries and Oceans Canada (DFO) approval for the temporary berms (RE07-1291-2) expires on October 15, 2009 and it was specified under condition 2.3 that all berms at or below El. 529.57 masl be removed. Approvals from DFO and the Saskatchewan Ministry of Environment (MOE) were received for the emergency berm construction with the understanding that if the berms were to be made permanent, further evaluation and approvals would be required to assess the effects of permanently retaining the berms. In response to these, options for long-term flood protection have been discussed with the Fishing Lake Advisory Committee (FLAC). The local communities have since completed the long-term flood protection plans that include incorporating the existing temporary berms into an overall flood protection system.

1.1.3 Berm Upgrade Proposal

The proposed project is defined as upgrading of the existing emergency flood protection berms to provide an effective and minimal maintenance long-term flood protection at Fishing Lake, Saskatchewan. Upgrading the existing temporary Fishing Lake berms will consist of reshaping and increasing the height so that they meet the design specifications of a lakeside slope of 6H:1V and top of berm El. 531.6 masl to provide permanent protection to the 1:500 year EPWL. The proposed berm upgrade project also includes increased erosion protection on the lakeside slope to ensure protection against wave and ice action and on the top of berm to ensure protection from rain and run-off. Detailed geotechnical investigations will be conducted by others

to assess and analyze the stability and permeability of the existing berms to confirm required reshaping and erosion protection of the existing berms. The addition of new berms or the removal of existing berms is not proposed as part of this project.

1.2 ENVIRONMENTAL ASSESSMENT

The purpose of this environmental assessment (EA) is to ensure that the proposed flood control berm upgrading at Fishing Lake, Saskatchewan is designed, constructed and maintained in an environmentally responsible manner consistent with federal and provincial environmental legislation, policies and guidance. The EA of the proposed project is consistent with the *Canadian Environmental Assessment Act*, Guidelines for the Preparation of a Project Proposal – Saskatchewan Environmental Assessment Review Process and best EA practices.

1.3 REPORT ORGANIZATION

The EA report on the proposed flood control berm upgrading at Fishing Lake, Saskatchewan is organized into ten chapters and an appendix as follows:

1.0 Introduction

Background information on the flooding and emergency flood control is provided. The purpose of the EA is discussed and the organization of the report is described.

2.0 Scope

The scope of the project and the EA for the proposed project are outlined. The scope of the assessment is described in accordance with requirements of the Canadian Environmental Assessment Act, regulations and guidance.

3.0 Project Description

The proposed flood control berm upgrading is described in general and specific terms. Project need, purpose and alternatives, as well as the proposed schedule and funding are discussed. The project is broken down into components and activities for the purpose of the EA.

4.0 Environment Description

The existing environment at Fishing Lake and in the surrounding area is described in general and specific terms. The environment is broken down into biophysical, social and economic components for the purpose of the EA. Valued Ecosystem Components (important, protected or valued components of the environment) or VECs are identified to focus the assessment of environmental effects.

5.0 Public Consultation

Consultations carried out as part of planning for proposed flood control berm upgrading and the EA of the project are reviewed. Comments and concerns expressed by the public and stakeholders are summarized.

6.0 Environmental Effects Analysis

Potential environmental effects of the proposed flood control berm upgrading on biophysical, social and economic conditions are identified and assessed. Mitigation measures are proposed, follow-up needs are identified and significance of residual effect is evaluated. The effects of the environment on the project and cumulative effects are also considered.

7.0 Mitigation Summary

Measures identified by the EA to mitigate potential adverse effects of the proposed project are summarized.

8.0 Follow-up Summary

Follow-up requirements identified by the EA of the proposed project are summarized.

9.0 Conclusions

Conclusions on the significance of residual environmental effects of the proposed flood control berm upgrading are presented. Outstanding issues are identified and courses of action are provided to address them.

10.0 References

Literature consulted as part of the EA as well as contacts with governments, stakeholders and the public are listed. The Appendix contains background information on the proposed project, existing environment, environmental effects and correspondence from public consultation.