

STAFF REPORT

TO: Chair and Members, Engineering Services Committee

FROM: Jeff Cuthbertson, Utilities Asset Manager

REFERENCE: W215-1 and S755-5

DATE: 4 August 2010

SUBJECT: **Reservoir Creek Dam and Reservoir – Progress Report – RESC10-08-10**
Report prepared for meeting of 19 August 2010

1 PURPOSE

The purpose of this report is to inform the Engineering Services Committee of proposed work on the Reservoir Creek Dam and reservoir in Richmond.

2 BACKGROUND

The Reservoir Creek Dam is located on Reservoir Creek to the south of Richmond, accessible from Cropp Place, Marlborough Crescent and Selbourne Avenue (Figure 1).

The Reservoir Creek Dam was constructed in 1889 as a water supply dam for a reticulated firefighting water supply for Richmond.

Over succeeding years the dam was added to with the crest lifted and storage volume increased. The dam was effectively abandoned in the late 1970s when the Richmond well-fields in Lower Queen Street began to supply the town.

A lease on the property on which the dam is located has lapsed and minimal maintenance has been carried out on the dam since it was abandoned.

The existing reservoir, (water which is detained by the dam) is located on Council-owned land being Pt Sec 31 Square 1 (CT 56/229). However, the crest of the dam is situated on private property being Lot 1 DP 6202. An unformed legal road, identified as Sec 5 BLK VII Waimea Survey District (SO 8218) extends through the northern end of the detained water body.

3 DESCRIPTION OF THE DAM

The dam is an earth fill embankment with a “puddle clay” core and was constructed and subsequently extended over a number of successive decades. Over time the spillway and water supply outlets were modified and moved to accommodate increased water supply demand, although records of these changes are poor.

The inlet structure, outlet pipes and spillway on the dam have fallen into a state of disrepair over many decades of service.

Since being abandoned as a water supply reservoir, trees and vegetation have been allowed to grow on the downstream face of the dam. Cattle also graze in the area.

The existing reservoir measures approximately 80m in length and 30m in width at the dam crest. The depth of the reservoir is estimated to be 5.7m below the dam crest and the dam is estimated to hold 6000m³ up to spillway level and approximately 9000m³ to the crest level of the dam.

The existing spillway is located on the left abutment of the dam (facing downstream). This spillway is inadequately sized to accommodate a 100 year-storm, the minimum sized flow considered acceptable for the size and location of this structure.

Reservoir Creek is one of several in the Richmond Hills and collects catchment runoff from an area of 70ha upstream of the dam. The catchment area is approximately 60% forested with a mixture of native and commercial pine trees and 40% bush/grassed areas.

The reservoir does provide a level of stormwater detention which is beneficial as the downstream stormwater network has limited capacity

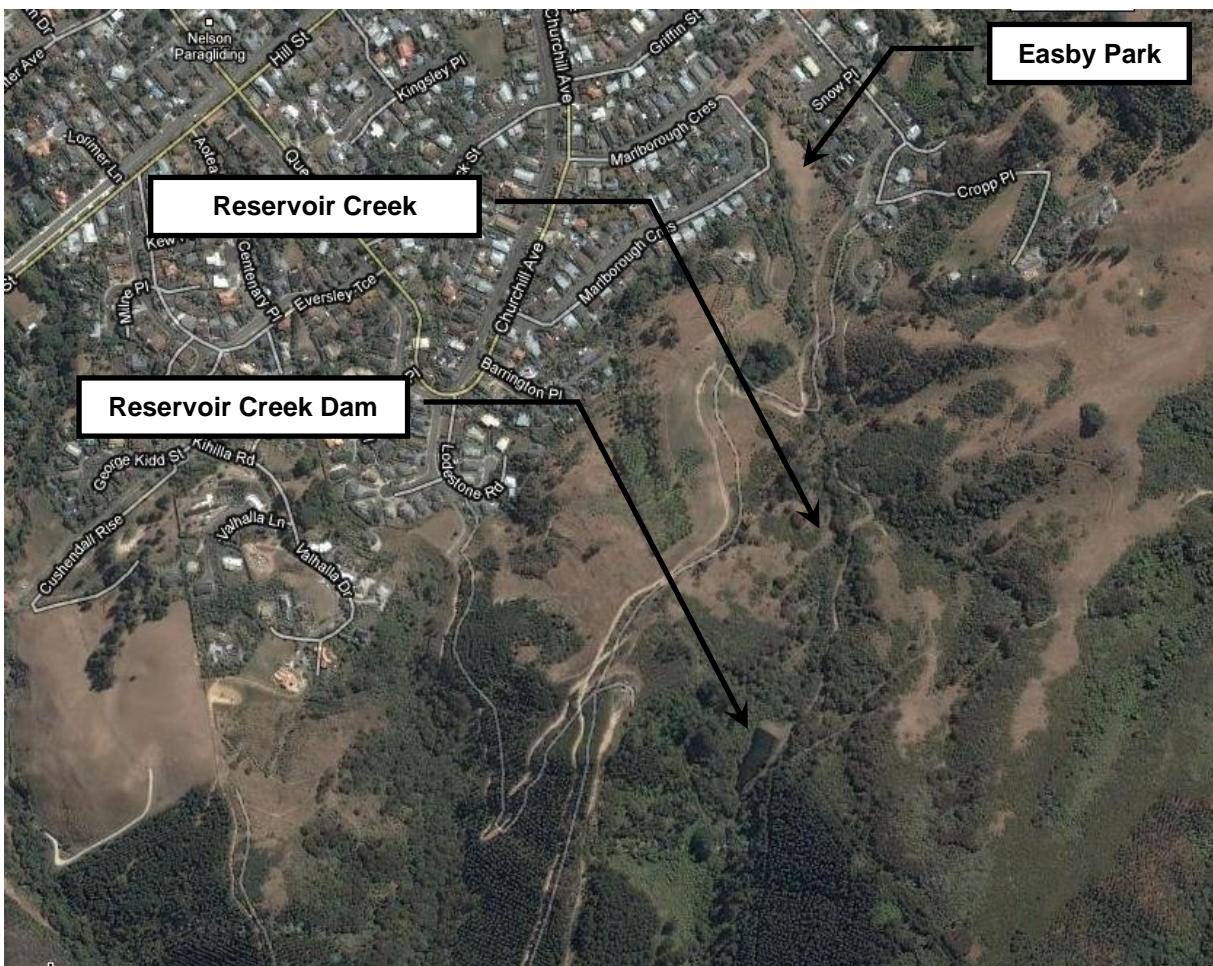


Figure 1 – Reservoir Creek Dam location

4 PREVIOUS STUDIES

While Tasman District Council may not hold strict legal liability for the construction and maintenance of the dam, it is generally accepted that Council has a responsibility to manage the risks associated with a structure that was built and operated by Council's predecessors.

At its meeting of 16 December 2004, the Engineering Services Committee resolved:

THAT the Engineering Services Committee give approval for staff to investigate the demolition of the Reservoir Creek reservoir and budget for that demolition and reinstatement of the site to be included in the 2005/2006 Annual Plan.

Since this time staff have commissioned investigations into the integrity of the dam structure, potential consequences of failure and decommissioning options.

A capital budget for remedial works for the dam and reservoir were subsequently included in the 2009-19 Long Term Council Community Plan.

5 PROPOSED WORKS

A consideration of alternative options for the dam has indicated that the best long-term solution for the dam, reservoir and downstream system is to:

- Create a new spillway in natural ground on the right hand (eastern) side of the dam, at a level lower than the existing spillway.
- Pipe flows from this spillway to Reservoir Creek through a new box culvert and pipe system.
- Create a new low-flow outlet adjacent to the spillway – this outlet will lower normal water levels in the dam and maintain flood storage.
- Decommission and remove the existing spillway and reinstate the dam crest at the existing spillway location.

Alternative options that were considered and discounted included:

- Construction of a new spillway in the location of the existing spillway. This was discounted because of uncertainty around the construction materials of the dam and the geotechnical conditions at the abutment. Current best practice is for dam spillways to be constructed away from the dam structure proper.
- Decommission and fully or partially remove the dam structure. This was discounted because of the potential downstream impact of construction, the likely difficulty of removing water-logged sediment within the reservoir and the loss of any flood storage within the reservoir.

6 EMERGENCY WORKS

On 7 June 2010, a storm event produced a spillway flow over the left bank spillway that caused a minor failure of the integrity of the spillway. This event necessitated emergency repair actions to stabilise the spillway. The result of these actions was the construction of an interim spillway that is expected to remain in place until repairs to the dam are

complete.

Following the emergency works in July staff met with Council's consultant (including a dam specialist) and confirmed the proposed remediation work programme. The detailed design of the work was subsequently finalised.

7 RESOURCE CONSENTS

A resource consent application for the proposed remedial works was submitted in late July and is currently being processed. The consent application also seeks consent for the existing activities of the dam that will continue after the works.

As the Reservoir Creek Dam and associated spillways were constructed in 1889 the dam is classified as an archaeological site under the Historic Places Act 1993. An archaeological authority must be granted by the New Zealand Historic Places Trust (NZHPT) prior to any work on the dam being undertaken. An archaeological assessment has been prepared and has been submitted to the NZHPT.

8 LAND OWNERSHIP

Council staff are currently continuing negotiations for the purchase of the land on which the dam structure is located. Staff are also in discussions on the purchase of additional property alongside the stream between the dam and Easby Park below. Staff hope to resolve these negotiations in the near future.

9 PROGRAMME AND COST

The remedial works are programmed for completion this coming summer. Tenders for work are currently in preparation and are expected to be advertised on 6 September 2010 and the contract awarded by 15 October 2010. The works are expected to take 11 weeks to complete.

The works are expected to cost \$700,000 to complete – including provision for land acquisition, tender documentation, consenting, construction and construction monitoring. The capital works budget for this work is \$733,234.

10 RECOMMENDATION

THAT the Reservoir Creek Dam and Reservoir Progress Report (RESC10-08-10) be received by the Engineering Services Committee.

Jeff Cuthbertson
Utilities Asset Manager