
Project:	██████████ Amp 6 Renovation	
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Subject:	██████████ – additional volume assessment	Rev: C1

Introduction

The existing weir at ██████████ is to be raised by 300mm to increase the storage capacity of the reservoir. An assessment of the storage capacity at the new top water level (TWL) has been carried out by MMB and is detailed in this technical note.

Volume Assessment

Three different sources have been reviewed to determine the existing surface area and storage volume at existing TWL. A summary of the findings is shown in Table 1.

Table 1 - Surface area and reservoir storage volume review

Source	Surface area at TWL (m ²)	Reservoir storage volume at TWL (m ³)	Notes
██████████ S10 Inspection Report August 2011	1,390,000	12,000,000	
██████████ Wave Surcharge June 2012	1,390,000	12,000,000	
██████████ Flood Study and Review of Wave Analysis November 2014	1,320,000	N/A	Study refers to surface area being taken from 2014 topographical survey

The existing surface area will be taken as 1,320,000m² from the most up to date source (the Flood Study from November 2014) which refers to a 2014 topographical survey. The reservoir storage volume was not referenced in the Flood Study, therefore 12,000,000m³ will be used.

Assumptions

The volume assessment is based on the following assumptions:

- The reservoir surface area at existing TWL is 1,320,000m²

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- The reservoir stores 12,000,000m³ at existing TWL
- The slope angle of the reservoir banks is 1:1 (V:H)*

*Sensitivity analysis has been carried out to assess the impact of the bank angle on the increase in storage capacity. Assuming a 1:1 (V:H), the additional storage volume around the perimeter is 207m³ (0.05% of the volume increase) and a 1:2 (V:H) additional storage equates to 414m³ (0.1% of the volume increase). The bank angle therefore has negligible impact on overall storage volume. The island has therefore been ignored for this assessment as change in volume will be negligible.

The results of the volume assessment have been summarised in Table 2.

Table 2 - Surface area and reservoir volume at existing and new TWL

Top Water Level (mAD)	Surface area at TWL (m ²)	Reservoir storage volume at TWL (m ³)
180.57 (existing)	1,320,000	12,000,000
180.87 (new)	1,321,380	12,396,207

Summary

In summary, the increased storage capacity resulting from raising the weir by 300mm is approximately 396,207m³, bringing the total storage capacity up to approximately 12,396,207m³.