

# **Appendix F**

## **Erosion & Sediment Control Plan Stage I (Southern Skies)**

## 1 ESCP-001 - CONSTRUCTION NOTES

### 1.1 McPherson Quarry & Overburden Disposal Area

This Erosion and Sediment Control Plan (ESCP) covers the operation of the current stage of the McPherson Quarry and the overburden disposal area. The overburden will expand over time and the sediment retention pond (SRP 2) has been designed to accommodate the expanding catchment.

Earthwork activities addressed by this ESCP:

- ▶ General earthworks and quarry operations;
- ▶ Overburden disposal; and
- ▶ Installation of clean water control and quarry water management.

Refer to Drawings: ESCP-001-01

### 1.2 Methodology

- ▶ At the approximate locations, as detailed in the attached drawing, the Sediment Retention Ponds (SRPs) will be installed and as-built, followed by the installation of the clean and dirty water diversion bunds (perimeter bunds). See Appendix A for specific SRP and bund details.

#### As-Builts

- ▶ As-built's for all erosion and sediment control devices are to be completed and submitted to Waikato Regional Council immediately upon construction of the particular device.

#### 1.2.1 Sediment Retention Pond 1 (SRP 1)

- ▶ SRP 1 has been sized to accommodate a contributing catchment of 5ha (the recommended upper limit for a SRP in the Waikato Erosion and Sediment Control Guidelines), providing a volume of 1500m<sup>3</sup>.
- ▶ The greater catchment of the quarry is approximately 9ha. Majority of the catchment drains to the quarry floor. Within the quarry floor a perimeter quarry swale drain collects runoff where it is then piped via a 300mm pipe to the current pond and wetland system.
- ▶ To offset the larger catchment discharging to the SRP via the quarry floor a riser and t-bar decant system will be installed on the 300mm diameter pipe inlet to provide extended detention during a rain event. The t-bar decant will be set at the existing quarry swale drain height so that during dry conditions the quarry floor will remain dry. During a rain event the decant would restrict the outflow from the quarry floor to 4.5 litres per second forcing water to impound on the quarry floor.
- ▶ The quarry floor is approximately 0.5ha. The riser will add a height of 300mm and will provide approximately 1500m<sup>3</sup> of additional decanted storage during a rain event. In future, activities may change in the quarry floor. It was discussed that creating a specific pit within the floor off to one side would provide this emergency rain event storage. This would restrict the 'flooding' of the quarry floor to larger rain events.
- ▶ Once SRP 1 has been constructed the outlet from the existing wetland will be redirected to discharge into the forebay of SRP 1. Runoff from the quarry will flow from the quarry pit through the 300mm diameter culvert and continue to discharge to the existing pre-pond before draining to the wetland and finally into SRP 1.
- ▶ *Note:* the existing stormwater wetland may be removed (or reduced in size) in the future. If this occurs the water from the pre-pond will be piped directly to SRP 1.

#### 1.2.2 Sediment Retention Pond 2

- ▶ SRP 2 has been sized for a maximum catchment area of 4ha (including a pond volume of 1200m<sup>3</sup>) to allow for the expansion of the overburden disposal area.
- ▶ As areas of the existing disposal area are completed and shaped, they will be top soiled and grassed. Once the areas have a thick grass take (minimum 80% grass cover) perimeter bunds will be adjusted to direct the clean stabilised areas off site (i.e. will not be directed through the SRP).

### 1.3 Operation and Maintenance

- ▶ The environmental and erosion and sediment control (ESC) measures will be inspected and signed off as soon as they have been completed.
- ▶ All ESC structures will be inspected on a weekly basis and within 24 hours of each rainstorm event that is likely to impair the function of performance of the controls.
- ▶ A record will be maintained of the date and time of inspections undertaken, any maintenance requirements identified and any maintenance undertaken.
- ▶ All ESC measures will be monitored and maintained until the site (or an isolated area) is fully stabilised.

### 1.4 Chemical Treatment

- ▶ Once the SRP's have been constructed and have filled with dirty water, samples will be taken for bench testing to determine the benefits of chemical treatment. The results of the bench testing will be submitted to the Waikato Regional Council.
- ▶ Should the bench testing show benefit from the use of chemical treatment, a Chemical Treatment Management Plan (CTMP) will be prepared and submitted to the Waikato Regional Council.
- ▶ If required, chemical treatment (including dosing, monitoring and maintenance) will be undertaken in accordance the CTMP.
- ▶ Any change to the dose rate or delivery mechanism will be confirmed in writing to the Waikato Regional Council.

## Appendix A – Erosion and Sediment Control Calculations

Table 1: Clean water diversion sizing details.

Clean Water Diversion						
5% AEP (24 hr)	Catchment Area	Peak Flow (m3/s)	Base Width	Slope	Minimum Depth (mm)	Plus minimum 300mm freeboard
121	1ha	0.116	1m	2%	150	450

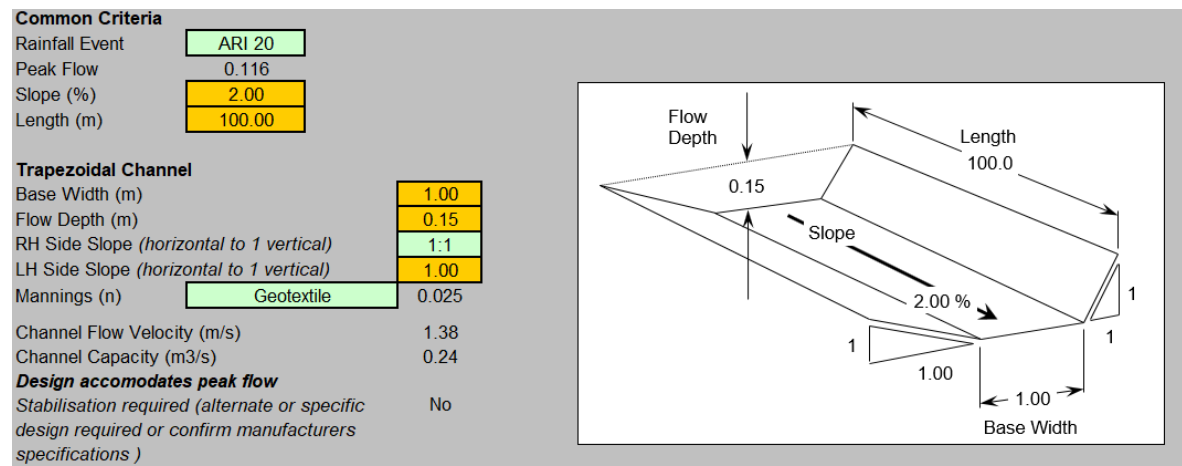


Table 2: Dirty water diversion sizing details.

Dirty Water Diversion						
5% AEP (24 hr)	Catchment Area	Peak Flow (m3/s)	Base Width	Slope	Minimum Depth (mm)	Plus minimum 300mm freeboard
121	4ha	0.566	1m	2%	250	550

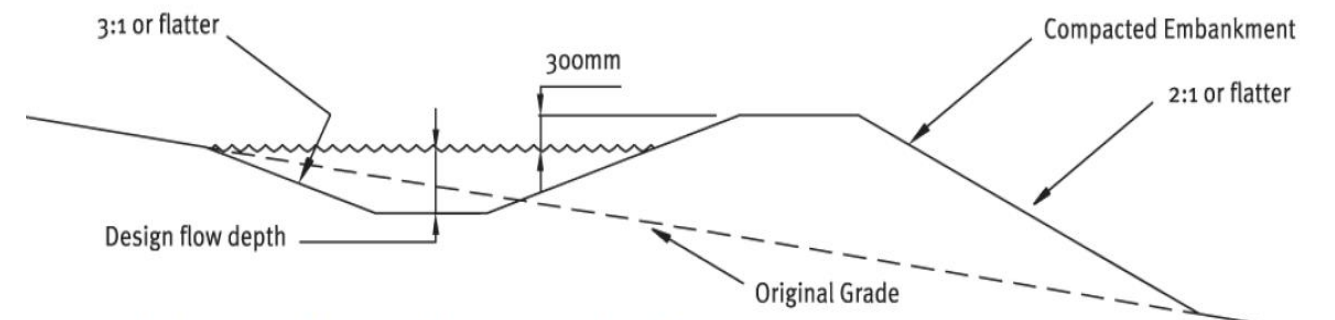
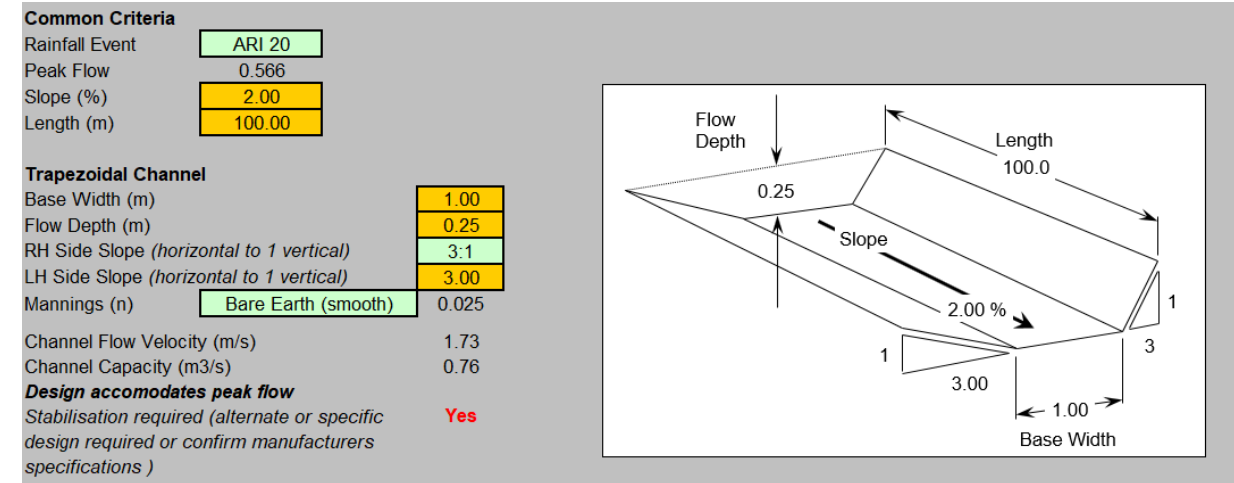


Figure 2: Cross section of a dirty water diversion.

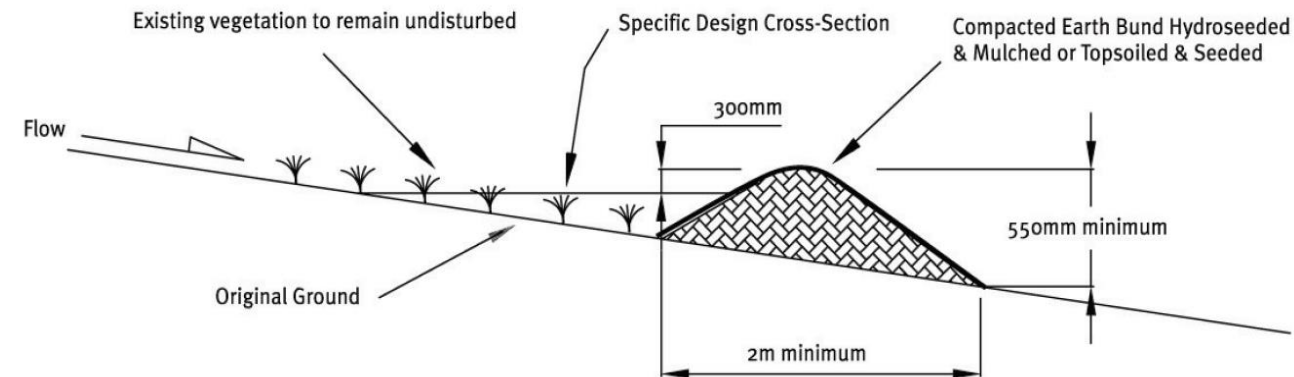


Figure 1: Cross section of clean water diversion bund.

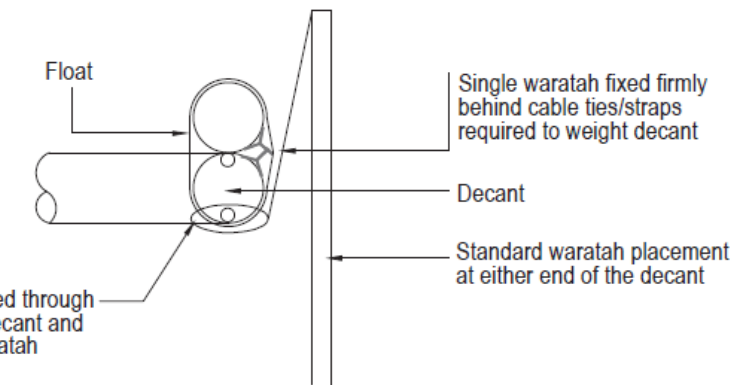
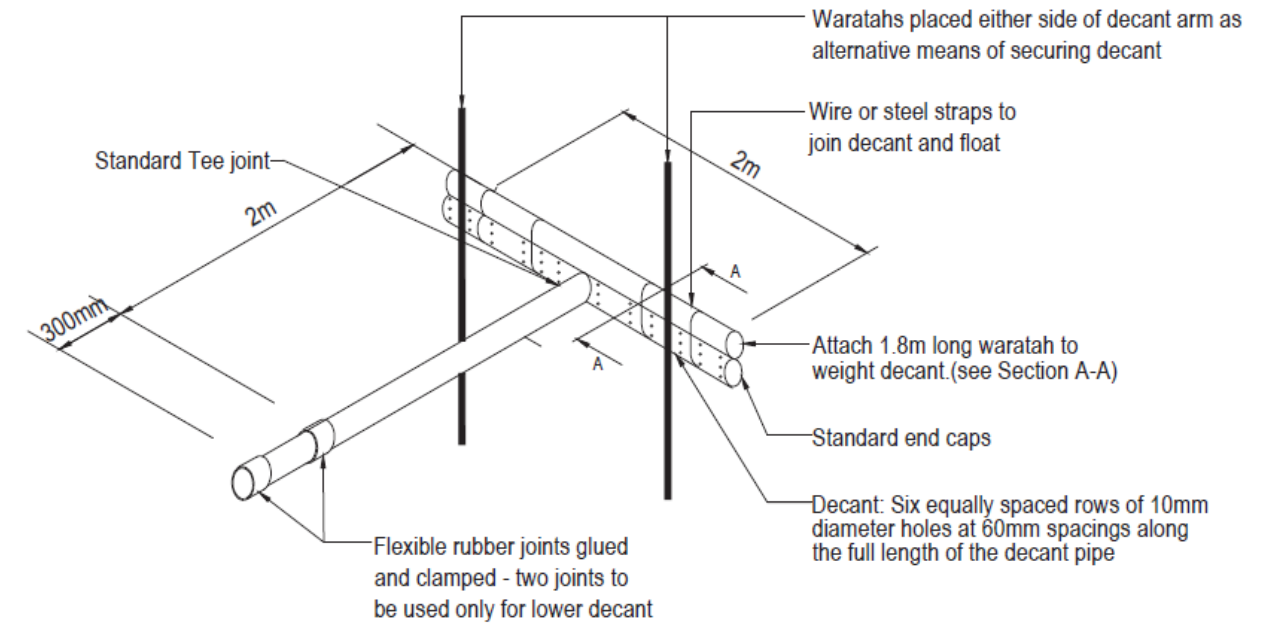
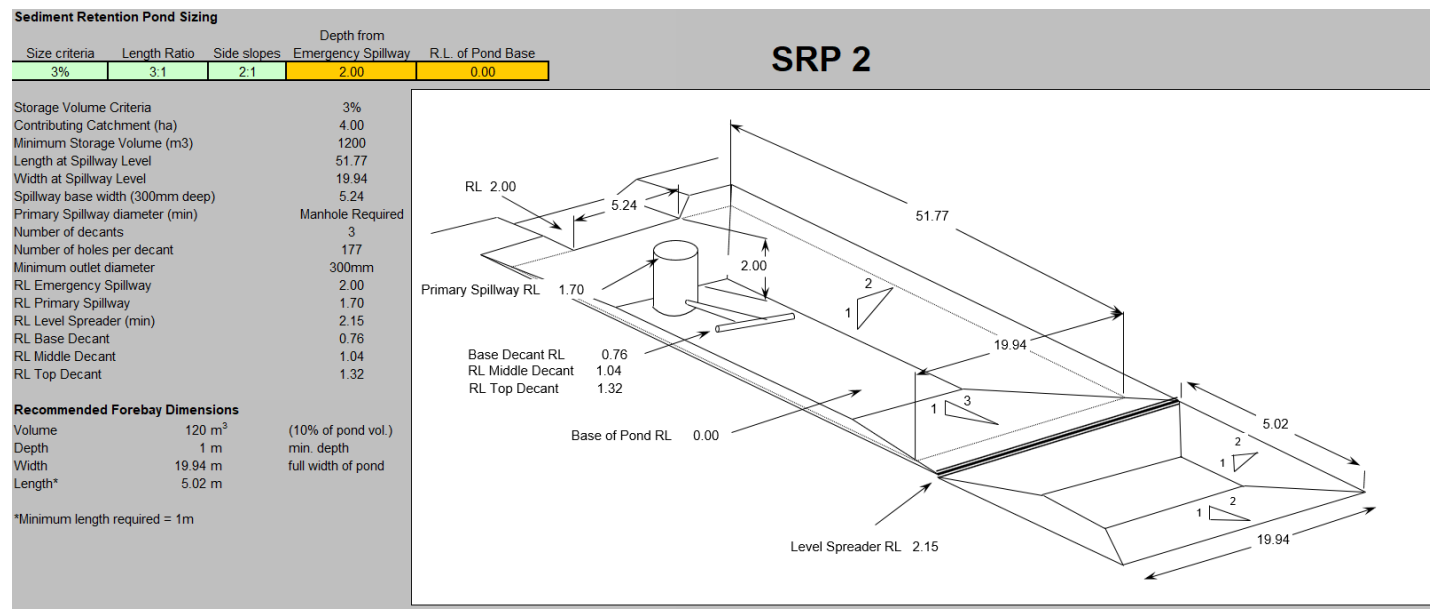
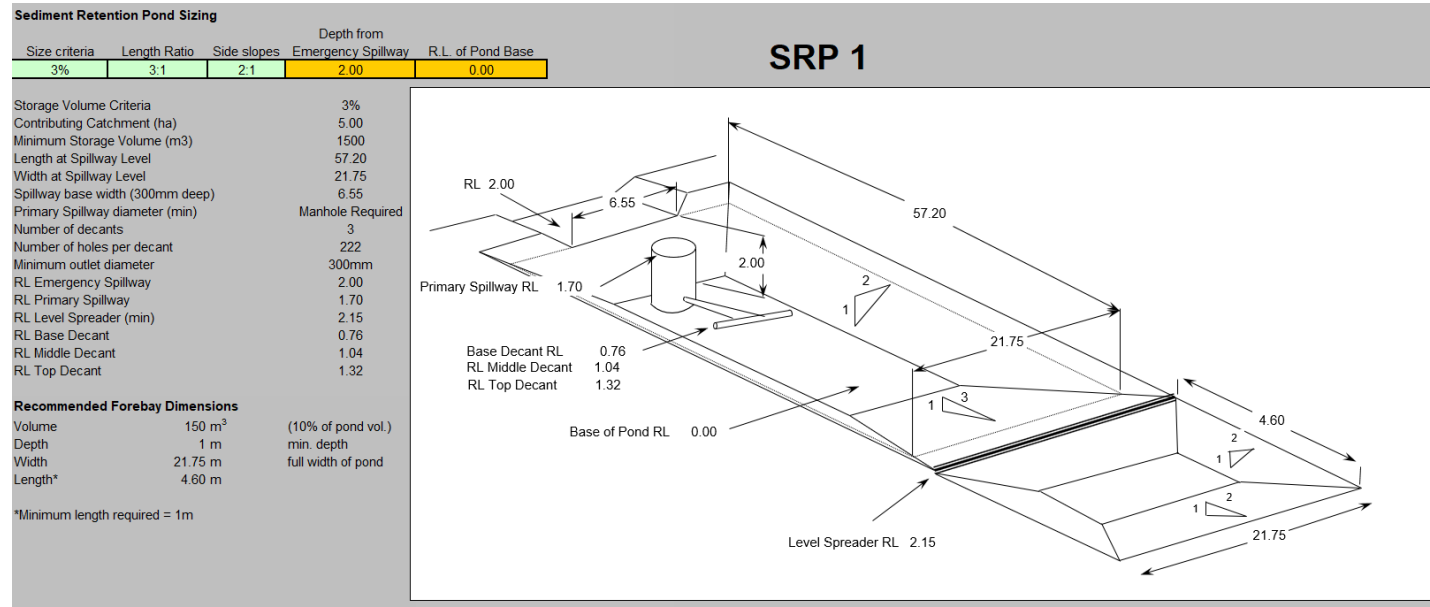


Figure 3: Schematic of a standard t-bar design.



Clean water drain will need to be cut through and along ridge line. Drain will be stabilised with geotextile.

Catchment area approx. 9ha

A riser (minimum height of 300mm) to be attached to the inlet of the quarry floor outflow culvert. A t-bar decant will be installed on the riser at the existing quarry swale drain height to increase runoff detention time within the quarry floor during heavy rainfall events.

Site water will continue to flow from the pit via the existing culvert to the pre-pond. The pre-pond discharges into the wetland. The outlet of the wetland will be redirected to discharge into the forebay of SRP 1.

Site compound. Area stabilised with aggregate.

Note the wetland maybe removed in the future. If this occurs the water from the pre pond will be piped to SRP 1.

**SRP 2**  
Refer to specific SRP 2 (4ha) pond details sheet

**SRP 1**  
Refer to specific SRP 1 (5ha) pond details sheet. Once the SRP has been constructed the wetland outlet will need to be redirected and extended to discharge into the forebay of this SRP.

**KEY**

**Erosion and Sediment Control Plan**

- Clean Water Diversion
- Dirty Water Diversion
- ↔ Culvert
- Sediment Retention Pond (SRP)
- SRP 1 Catchment
- SRP 2 Catchment

**General Erosion & Sediment Control Notes:**

1. All erosion and sediment controls will be installed and maintained in accordance with Waikato Regional Council Technical Report TR2009/02 "Erosion and Sediment Control Guidelines for Soil Disturbing Activities, 2009" (TR2009/02).
2. SRP storage to be 70% live storage, 30% dead storage
3. The volumes of SRP's are to be confirmed following construction.
4. All perimeter bunds to be a minimum height of 0.55m unless specifically specified.
5. All erosion and sediment control measures will be inspected daily.
6. Site monitoring will be undertaken before and immediately after rain as well as during heavy rainfall events.
7. Any required maintenance or improvements to control measures will be undertaken immediately.
8. Sediment retention measures will be cleaned of sediment when 20% full of sediment.
9. All locations of controls are indicative and are to be confirmed on site.



**Project**  
**McPherson Quarry**

**Drawing Title**  
**EROSION AND SEDIMENT CONTROL PLAN**

<b>Sheet No.</b> Sheet 1 of 1	<b>Date</b> 17-04-2019
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<b>Drawing No.</b> ESCP - 001-01	<b>Revision</b> <b>B</b>
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<b>Drawn</b> CS	<b>Approved</b> CS
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