

## Case Study 3: Deans Marsh Stream bank erosion

<b>Landscape zone:</b>	Upper Barwon
<b>Works dates:</b>	30 <sup>th</sup> May – 2 <sup>nd</sup> June 2005
<b>Site inspected by:</b>	Shari Wallis & Greg Bell

<b>Topographic Map:</b>	<ul style="list-style-type: none"> <li>• Map showing catchment area above pipe structural works</li> <li>• Catchment area above pipe works covers approx. 204 ha</li> <li>• Works construction site covers approx. 200 m sq</li> <li>• Pipe structural works on unnamed tributary</li> </ul>
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**Type and extent of threat:** (erosion type, area covered, land holders involved, risk to assets)

- The erosion is occurring at the site of a 20 year old soil conservation structure, put in when erosion began after the Ash Wednesday fires.
- The corrugated iron pipe has corroded in the middle causing water to run out at a point under the track and eroded away the stream bank edge and under the track. This is continuing at a rapid rate, especially after big rainfall events, and is taking back the creek edge and removing trees.
- The pipe has rusted in the middle, while the top half of the pipe under the track is in tact, the lower half, below the erosion, has broken off and fallen down into the erosion below (See before photo 1)

**Site description:** (soils, climate, landscape/topography, catchment area, dominant veg/land use)

- The site is poorly structured, sandy soils which erode easily.
- Although the creek line has a relatively small flow during summer it does flow all year round and has a large catchment area above the works site (approx. 204 ha). Max says that in winter the water requires the whole diameter of the pipe.
- Deans Marsh is a high rainfall area, approx. 900mm and the surrounding catchment is of medium slope
- The land use around the area is grazing land, mainly cattle and sheep, however the catchment above the works site runs though some crown land. The surrounding area is predominantly smaller sized lifestyle farms.

**Severity of threat and impact on assets:** (risk to farm assets, production, vegetation, describe impact)

- The soil conservation pipe structure, where the erosion occurred, leads directly under a farm causeway across a swampy area.
- If the erosion continued the causeway/track would be eroded away and the Smiths would then have limited access (dry weather access only) to one side of their property.
- The erosion is also causing sediment deposition into the tributary, which leads into more main stream river systems.

**Worksplan:**

- The pipe structure needed to be replaced but removing the whole corrugated iron pipe would require digging up the whole causeway. Instead it was decided to feed a new plastic pipe up into the original pipe to reduce the earthworks required.
- This was successful and the join of the old pipe with the new pipe was sealed with meters of concrete (both down and across) to prevent any movement.
- The area under and around the new pipe was filled with heavy black clay brought over from a dam on the farm. This clay was fully compacted before the pipe was layed.
- The Smiths staked in carpet underlay at the end of the pipe where water will trickle out to prevent erosion from occurring while the ground was still bear. Grass seed was going to be spread.

**Comments on completed works:**

- Works were completed on time and only took 3 days.
- Max put in a lot of work with the contractors while laying the pipe
- On completion, the site looked stable and I was happy with the job done.
- Max staked in some carpet underlay at the pipe end to take the water flow while the site stabilised and until vegetation took over.

## Before and after photos:



Original height of pipe before it rusted through and broke off

Erosion was occurring back under the pipe and cutting under the track above. The area under the fallen tree and blackberries was eroded out

### Photo set 1:

Photo 1 on the left shows the site in its original condition before earthworks began. The trees fallen across the erosion site have occurred as a result of the erosion undermining them. This only occurred in the months before our first inspection on 24<sup>th</sup> May 2005.

Photo 2 on the right was taken during works after clay had been imported and compacted. The pipe was then layed level into the existing pipe and joined and stabilised with concrete around the join.



### Photo set 3:

This photo shows the new pipe structure after works were completed and after the landholders had staked the carpet underlay underneath the pipe. Grass was also beginning to cover the area. This photo was taken 2 months after works completion.

**6 month site re-visit:** (comments, photos)

- The site was inspected 2 months after completion and was looking excellent (Photo 3). The carpet underlay was in place and the pipe and earthworks were taking the flow of water well.
- The site was inspected again on 7/12/2005 to take GPS points and the earthworks had failed. The carpet had slipped away, causing water to swirl back under the pipe and erode away the soil under the end of the pipe.
- Spoke to Greg Bell re: the issue, rocks or tires were the suggested solution by Greg. Spoke the landholders and said we will follow up the issue with another visit again in early 2006.
- The grass had grown well on the area above the pipe



Photo 4 and 5:

The above photos show the new erosion occurring around the pipe exit as seen on 7/12/05. While water was flowing out of the pipe there seemed to be a trickle of water coming out from under the pipe which would have caused the erosion around the base of the pipe. The carpet underlay has also been washed away.

This new issue is to be followed up by Shari and Greg in early 2006.

**Site re-visit 7/11/2006**

Returned to site with Greg Bell to see further attempts at stabilisation the Smiths had tried (deep posts with straining wire and tires to hold the bank up). Stan Armstead (contractor) also visited with us. The thought was that water was seeping along the outside of the pipe either from a poor seal at the pipe entrance or because of a natural spring underneath. When diluted paint was added to the pit at the pipe entrance the paint flowed through the pipe, not than along the outside, indicating that it was not a leak around the seal but more likely a spring under the pipe.



Photos 6 and 7: Further attempts at stabilisation of the overhanging pipe which has been undercut by erosion. Photo 7 shows the water leaking along the outside of the pipe causing the erosion around the pipe.