

Farm Environmental Management Plan: Peak Valley Station.

1. Property Description

Peak Valley is a small hard dry Pastoral Lease (Endowment) of 4228.9 hectares at southern end of Falstone Road approximately 30 kilometres from the township of Twizel. Access for the last 10 kilometres is very poor and is essentially heavy vehicle or 4WD only. The trip to Twizel generally takes 50 minutes. The property encompasses the eastern end of the Benmore Range and has over 30 kilometers of lake front.

The property ranges from 370-1822m ASL; rainfall is typically less than 450mm per annum

1. Contour: less than 5% of the property is flat to easy rolling situated largely on the homestead area between Shepherds creek and Coal creek catchment's. The property is dissected by a number of creeks and is of reasonably balanced aspect. The hill country is steep to moderately steep with the western high portion been partially retired from grazing
2. Shelter is generally from contour, native shrub lands and briar.
3. Reversion/Erosion; the higher lands and dryer sunny faces are susceptible to wind and sheet erosion particularly once the vegetative cover becomes depleted. These areas are now hieracium dominant with moderate exposure to increased erosion. There is an element of reversion to tussock and heavy mixed scrub including sweet briar.
4. Naturally free draining
5. Subdivision; 14 hill blocks plus 4 paddocks at the homestead.
6. Access; the run is well tracked with 4WD tracks of which there are approximately 42kms.
7. Soils within the irrigation area are Grampian and Dalgety soils a sandy silt loam of low water holding capacity and can be described as light.

2. Farming System

The irrigation is a renewal from flood to small traveling spray irrigators using gravity flow to irrigate approximately 40 hectares within an irrigable area of 80 hectares being the only flat areas within the 4228 hectares. Minimum flows will be set in the creeks that provide the water; in most years irrigation restrictions will apply to maintain minimum flow levels. The property runs approximately 1600 stock units 70% sheep 30% breeding cows. The property sells all progeny as stores and buys in replacement stock. 10ha of

green feed cops grown annually with minimum tillage, rest of area pasture irrigation and grazed. All supplements generally sheep nuts brought in. The irrigation area has a 550 year history of irrigation through contour and wild flood irrigation.

3. Environmental Context

The surface water catchments for the creeks come from within the property.

3.1 Water Quality Study (WQS) receiving environments and mitigation requirements

Peak valley lies within the Lake Benmore tributaries, which flow into the Lake Benmore surface water catchment. No mitigation for N and P is required and no thresholds from the Water Quality Study for the property are exceeded.

3.2 Local receiving environment

The northern arm of Lake Benmore.

4. Farm Environmental Management Plan development

4.1 Stage 1 – Mandatory good agricultural practices

The OVERSEER nutrient model is applied to the property. Mandatory and good practice will be adopted these include the base assumptions of OVERSEER and therefore help validate the use of the model on the farm. Mandatory good agricultural practices are;

- Fertilisers applied according to code of practice for fertilizer
- Use of fertilizer recommendation system (nutrient budget) and account for all sources of nutrients including applied effluents and soil reservoirs accounted for
- Fertilizer application applied evenly
- Irrigation and effluent applied evenly
- Crop, cultivation, nutrient inputs and yield records kept per farm management unit
- Good design of irrigation systems
- Robust irrigation scheduling
- Supplement and feeding out management
- Winter grazing management

4.2 Stage 2 OVERSEER and meeting WQS mitigation requirements

The Water Quality Study (WQS) set for Peak Valley are largely organic with the existing farm losses as modeled by OVERSEER are within the thresholds. The WQS threshold was **15400kg/N** and **350kg/P**, OVERSEER modeled losses of **9000kg/N** and **230kg/P**

4.3 Stage 3- identification and mitigation of site specific risks,

Specific on farm risks to Peak Valley are

- Runoff from winter-feed crops to creeks or lake
- Laybacks from waterways from fertilizer application
- Fencing off creeks and lake
- Wind erosion
- Supplement management

Run off from winter feed crops can be controlled by there being a buffer of land between crop and waterway the topography of Peak Valley irrigation area assists with this as the areas within 50-100m of the waterways is very rough with large boulders and many willow and matagouri. The creeks are fast flowing with large catchments and the land within the irrigable area falls away from the creeks of more risk would be the lake. However mitigation of runoff to the lake is mitigated by a large buffer zone of 150 meters and more.

Laybacks from waterways from fertilizer application is also achieved by topography and trees and shrub-lands prevent trucks getting near waterways

Fencing off creeks is identified as a risk but in the context of the scale of the property with 35 kilometers of lakefront and 15 kilometers of creeks makes fencing impractical and unnecessary.

Wind erosion with these light soils is of concern. Minimum tillage is practiced through spraying and direct drilling by recognised contractors.

No supplements are made on the property with sheep nuts being brought in for ewe feeding. The N and P content of the brought in supplements has been factored into the OVERSEER model.

5. Farm Environmental Management Plan (FEMP) for Peak Valley Station

FEMP stage 1 are those management tools identified as mandatory good agricultural practices, FEMP stage 2 is for changes required to mitigate and Water Quality Study requirements and FEMP stage 3 are mitigation measures to ameliorate site specific environmental risks.

5.1 Monitoring and Auditing

Soil nutrient testing of the 6 paddocks within the irrigation area will be done I in 3 years with a standard set of soil nutrients, pH, C, N and organic matter being measured.

5.1.1 On-going monitoring

On going monitoring and auditing of the FEMP are as important as the FEMP itself and will be undertaken by the farmer under the direction of best practice and good science.

5.1.2 Auditing

The Auditing process allows the farm operator to illustrate, and other interested parties to have confidence that the management practices and mitigations planned for the farm are being implemented.

An annual audit is proposed and submitted with direction to Ecan by end of July each year.

6. Summary

This FEMP has identified site-specific risks of fertilizer application and irrigation at Peak Valley and mitigation measures for those risks are outlined. Mitigation of N and P losses are not required. The existing irrigation and farming system leaching of N and P is well below the thresholds set by the Water Quality Study for N and P.

The monitoring and auditing of this plan allows monitoring of identified on farm risks on an annual basis and allows for further management should non performance arise.