

Lake Wyangan and Catchment Management Strategy Project

Lake Wyangan and Catchment Management Strategy Project, Water Technology 2016

1. Understand the issue
2. Monitor the conditions
3. Develop a management Strategy

The Issue Blue Green Algae

Increasing frequency and severity since 2011

1. Understand the Issue

3 Main Causes of Blue Green Algae

Nutrient Loading
Nitrogen and Phosphorus

When there is more availability = greater chance of algal bloom

Lake Wyangan sources are inflows via drains and waterways as well as existing loads in the Lake

Residence Time
Circulation time and flushing

Longer turnover time = greater chance of algal bloom

Lake Wyangan is a terminal system (no outlet) with little circulation or flushing

Temperature and Sunlight
Turbidity and mixing regulate these

Clearer water = more light penetration = more aquatic plants

Temperature variance with depth will prevent mixing which causes the release of nutrients from sediment

To prevent algal blooms, the solution must address the causes holistically

2. Water Quality Monitoring and Sediment Sampling

Water Quality Monitoring

Multiple in-lake and in-drain water quality monitoring locations for various health indicators.

Outcome: Sources of nutrients (N&P) are varied depending on land use (farming, horticulture, etc.)

Sediment Sampling

5.5 Tonnes of Phosphorus estimated to be within the existing North Lake sediment

0.5 Tonnes of Phosphorus estimated to be in the North Lake water column

3. Develop Management Strategy

More than
20
options
investigated

A range of options investigated, including...
In lake and catchment options

Each solution must
address the **3** causes of algae...



- | | |
|------------------------|--------------------------------|
| Aeration/oxygenation ✓ | Plant harvesting ✗ |
| Flow manipulations ✓ | Coagulation ✗ |
| Mechanical mixing ✓ | Flocculation ✗ |
| Drawdown ✗ | Nutrient inactivation ✓ |
| Surface skimming ✗ | Substrate capping ✓ |
| Dredging ✗ | Floating artificial wetlands ✗ |
| Ultrasound ✗ | Bio manipulation ✗ |
| Algaecides ✗ | Macrophyte restoration ✓ |
| Barley straw ✗ | Carp removal ✗ |
| | Algae harvesting ✗ |

Sediment + **Circulation** + **Sunlight**



The Strategy prepared
provides a road map to create
a solution for Lake Wyangan,
the catchment and the
community.