High performance, low energy, wastewater management with biodiversity benefits

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The Water and Carbon Group (WCG)

WCG design, implement and manage ecological projects in water and reforestation

High quality water from low cost, low emissions wastewater treatment

Carbon Credits from biodiverse planted forests

WCG major projects

Brisbane 2 Million Trees project	Australia's largest urban biodiverse reforestation project
Stormwater & wastewater treatment	Australia's best performing sewage treatment plants and stormwater treatment utilising new generation constructed wetlands (northern NSW)

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Holistic approach to sewage treatment

Stage 1
Primary/secondary

Stage 2
Secondary

Stage 3
Tertiary

Stage 4
Quaternary

UV / RO

Variable off-take to reuse and discharge

Agricultural irrigation

Environmental reuse

Environmental discharge

Sports fields irrigation

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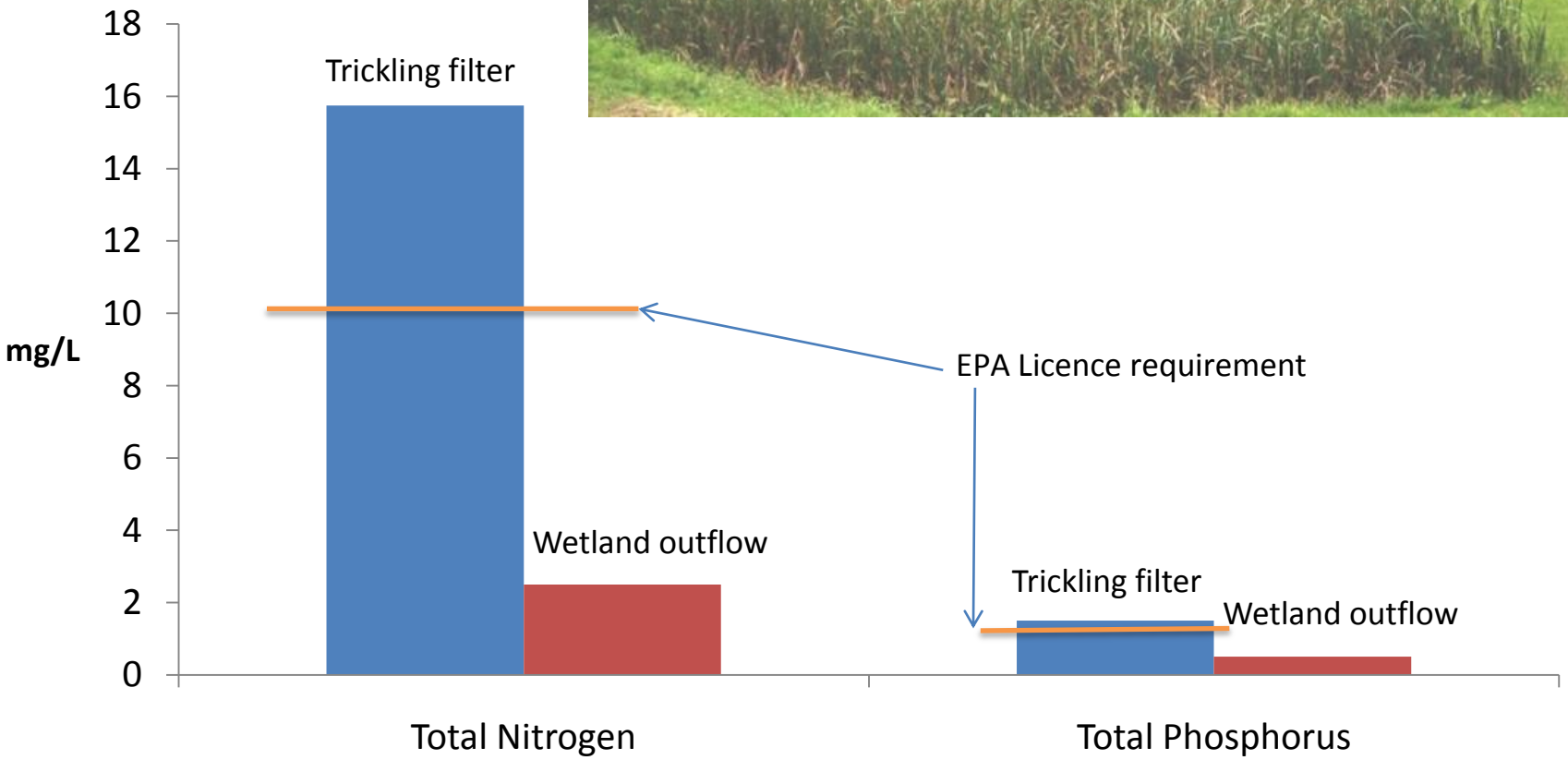
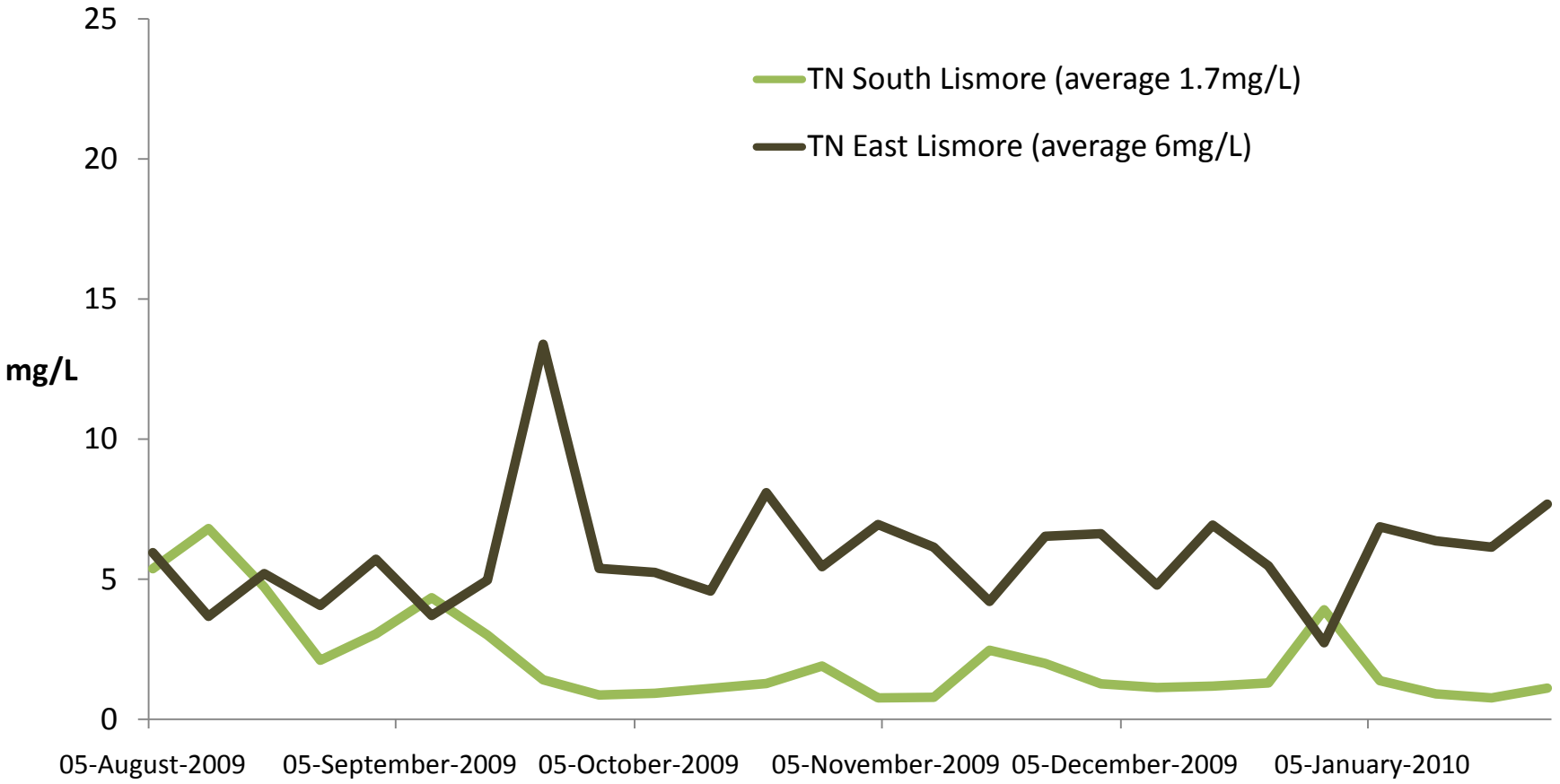
Case study 1: South Lismore STP high performance integrated system



Case study 1: Treatment performance comparison

East Lismore STP (BNR) v South Lismore STP (trickling filter and constructed wetland)



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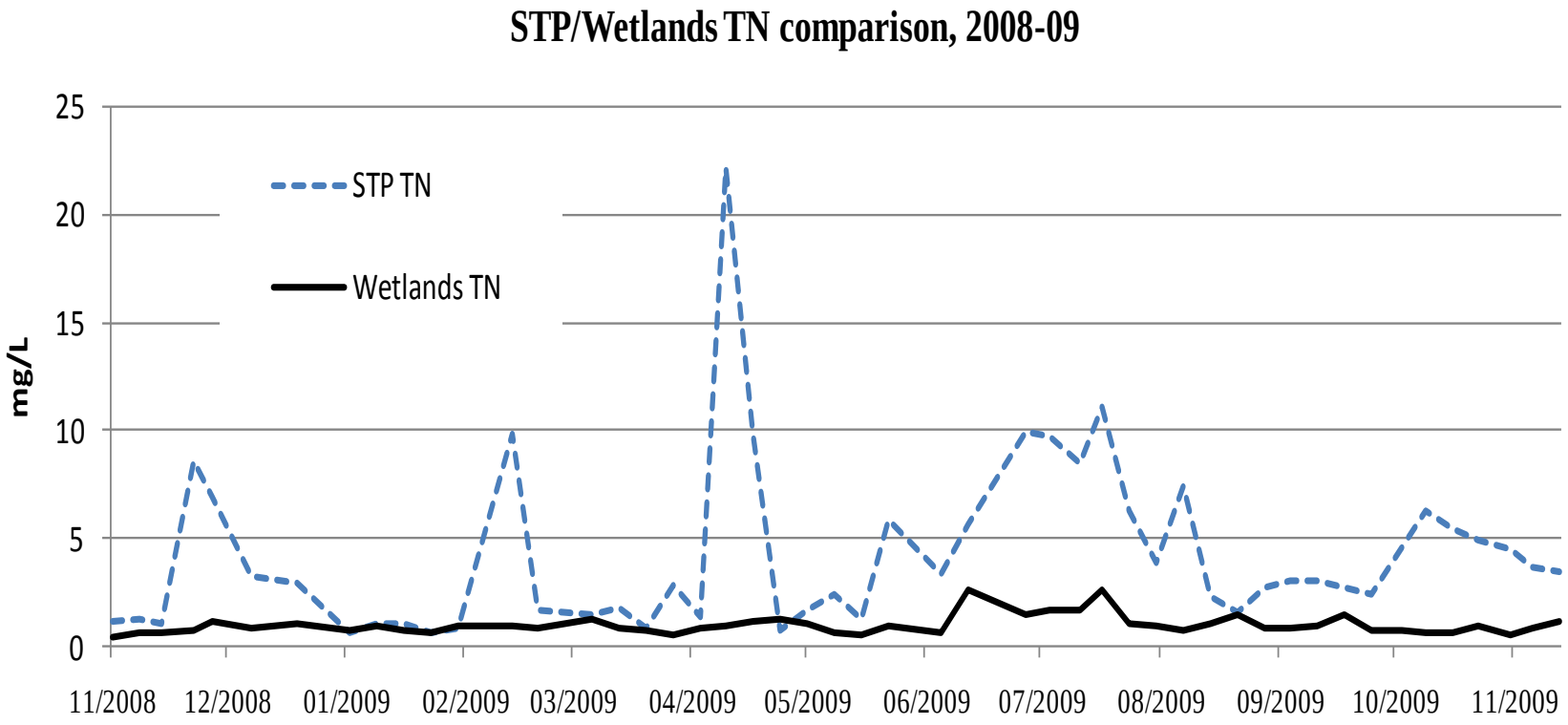
Case study 2: Performance of Byron Bay BNR and wetlands



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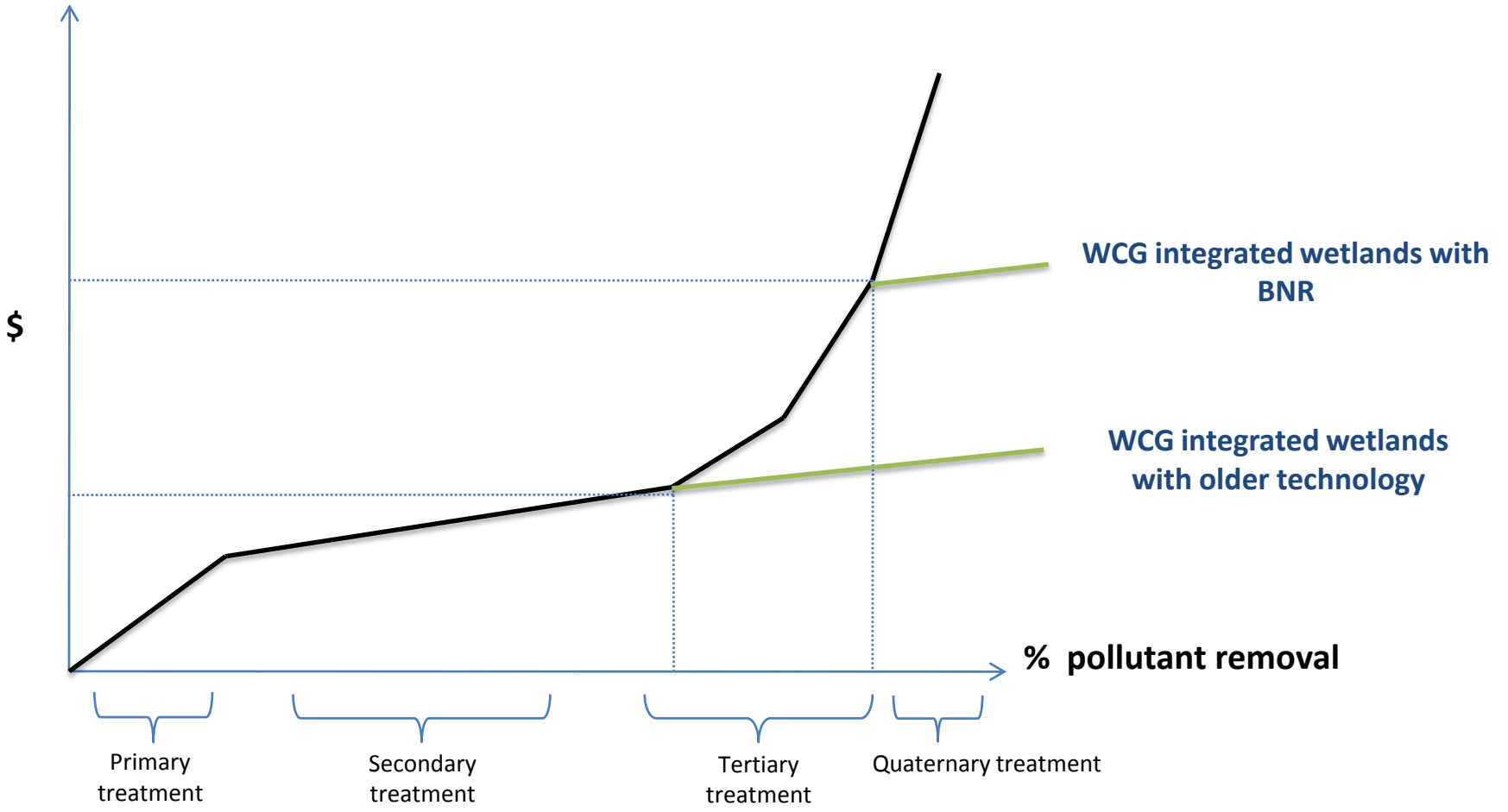
Costs to reach modern treatment performance



Exponential cost increase for improved treatment performance

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Scenario 1: Traditional BNR plant upgrade to meet future growth

Results

- High capital and operational costs
- Accepted technology
- Reasonable performance
- High embedded operational energy requirements
- High GHG emissions
- Poor integration with local ecosystems
- No ecological restoration

Scenario 2: BNR upgrade with wetlands

Results

- Wetland system lowers total cost
- Reduced risk to environment
- Higher treatment performance and benign environmental impact
- Wetland restoration provides additional ecosystem services
- Community engagement

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Scenario 3: Integrate treatment wetlands with existing trickling filters

Results

- Extends life of existing infrastructure
- Lowest capital and operational costs
- Zero additional energy demand
- Resource recovery and reuse
- High treatment performance
- Lower rates for community

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Scenario 4: Integrated wetlands and carbon sink forest

Results

- Carbon sequestration
- Beneficial reuse
- Forest restoration
- Remediation of ASS
- Income from carbon sink forest

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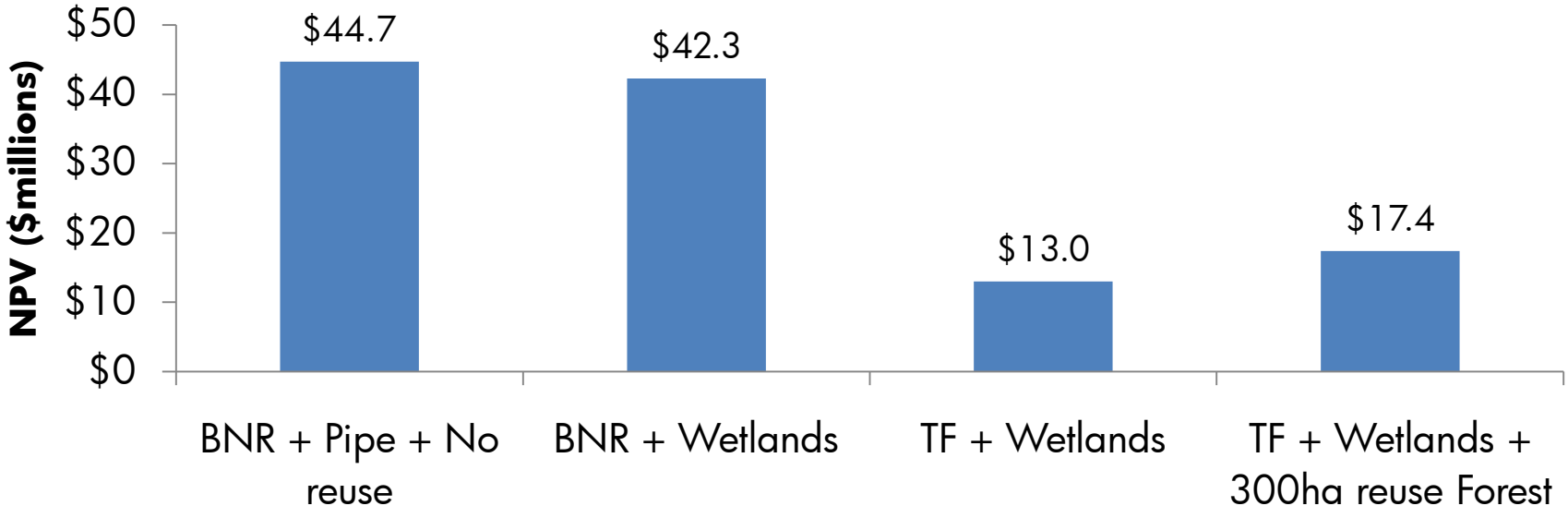
NPV Results – 5ML/day system, 25yrs



TN (mg/L)	~3	0.9	1.7	NA
TP (mg/L)	~1	~0.2	0.8	NA

Assumes carbon offset value of $20/tCO2e

NPV includes operational and capital costs over 25 yrs discounted at 5%

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Summary- benefits of treatment wetlands

- Major reduction in the costs of wastewater treatment
- Enhanced system reliability
- Superior treatment performance
- Enable reuse options or environmentally benign discharge
- Energy savings
- Provides a better opportunity for the wastewater sector to engage with the community

Contact details

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