COMMUNIQUE TWO

Innovative Gully Remediation Project Update May 2018

The Innovative Gully Remediation Project

Greening Australia

Queensland Government

Project Update

A number of important milestones have been completed in the project to date:

- Phase 1 on-ground remediation works were completed in two priority gully areas totalling approximately 1.5ha in the period October to December 2017.
- Wet season water quality and sediment monitoring has been completed with preliminary analyses showing very positive results.
- Planning and design of Phase 2 works have been completed, with works to be commenced in early May 2018. The Phase 2 works will target a further 10.5ha of alluvial gullies on Strathalbyn.
- Greening Australia's Reef Aid™ fundraising program has to date raised $1.5M of co-contribution investment to match the Queensland Government's fundraising commitments for this project.

The completed Phase 1 treatment gully with the control/untreated gully.

The Innovative Gully Remediation Project

The Innovative Gully Remediation Project is a collaborative project supported by the Queensland Government's Reef Innovation Fund and Greening Australia's Reef Aid™ Program.

This project's purpose is to identify more innovative and cost-effective gully remediation techniques applicable to the Great Barrier Reef (GBR) catchments and communicate the outcomes of the trials to ensure broad uptake of best practice gully remediation techniques.

The remediation trials under the project are being conducted in collaboration with the Hughes family on Strathalbyn Station, in the East Burdekin priority sediment reduction catchment.

More information on the Innovative Gully Remediation Project can be found at **www.greeningaustralia.org.au/projects/rebuilding-eroding-land-2/**

Phase 1 Gully Remediation Works Program Complete

The Innovative Gully Remediation Project commenced on-ground works in late October 2017. The initial works involved three stages:

1. Development of an on-site quarry and processing of some 27,000t of quarry materials to use in the remediation works.
2. Earthworks to reshape and regrade approximately 1.2ha of heavily incised alluvial gully, followed by soil amelioration using 18t per hectare of gypsum, construction of a graded rock bed, capping of disturbed soils and batters, mulching using Rhodes grass hay, and seeding (Treatment 1)
3. Construction of a rock chute over a rapidly retreating gully knickpoint and partial diversion of catchment flows from Treatment 1 down through the chute structure (Treatment 5)

SOME GULLY NUMBERS...

The gullies targeted under this project have exported on average 956 tonnes per hectare per year since 1945. That's a staggering 550,000 tonnes of sediment to the river over that period, of which at least 65% is capable of suspension and delivery to the reef lagoon.

1.5ha of gully remediation was undertaken in 2017.

10.5ha of remediation is planned for 2018.

27,000t of quarry materials have been processed on property for gully remediation on this site.

500 large square bales of mulch hay will be used in remediating the first 4 gullies under the program.

110 tonnes of gypsum will be used on the first 4 gullies to stabilise sodic soils.

It is estimated that 300 tonnes of native grass seed will be required for post-remediation revegetation of treated gullies.

Treatment 1 gully remediation

In Treatment 1, regrading the heavily incised gully area to a pre-designed landform was the first task. Care was taken to balance the cut and fill to reduce earthworks costs. Dealing with extensive tunnel erosion was a major challenge on this site.

Capping with a 200mm thick layer of rock and soil from the quarry occurred after gypsum was applied (18t per hectare) and ripped into the prepared surface.

Mulching the batters and all disturbed areas was the second last job on the site. The entire site was re-seeded after rain in March 2018

Remediation works were tricky in the late dry/early wet, but the job was completed on time.

Treatment 5 rock chute and diversion bank

The rock chute at Treatment 5

2017-2018 Water Quality Monitoring

A comprehensive water quality monitoring program has been initiated at the site to gauge the effectiveness of the various treatments applied to gullies on the site. The program is being run primarily by Greening Australia but involves a collaboration between research institutions such as Griffith University, the Queensland Government Department of Environment and Science (DES), and the NESP Tropical Water Quality Hub (3.1.7 program).

A range of sampling equipment installed in the treatment gully completed under Phase 1 of the program.

The water quality monitoring program incorporates a number of technologies for determining change in sediment export from treated gullies compared to untreated gullies. These include automated water quality sampling units triggered by flow, velocity sensors to assist determining discharge, rain gauges, rising stage samplers, water depth sensors, and innovative composite samplers known as PASS samplers (currently being trialled by Griffith University). Vegetation survey, the use of time lapse digital cameras and drone photography, terrestrial laser scanning (DES and Griffith University) and high resolution aerial LiDAR also assist interpreting the results of the remediation trials at the site. A permanent water quality monitoring point will be installed in Bonnie Doon Creek below the various gully remediation trials in July 2018 to help determine the long-term effects of the range of sediment reduction programs being implemented on Strathalbyn.

Preliminary results from the water testing program indicate that sediment concentrations in the treated gully are reduced by greater than 98%. Further, as the suspended sediment in the treated gullies is below 5µm, the quantity of sediment exported by mass is extremely low compared to the control gully. Further analyses of the collected data will be undertaken over the next 2 months and reported in the next project Communique which will focus on the project's monitoring and evaluation program. Stay tuned!

Water quality samples taken from the treated gully (left) and control/ untreated gully (right).

Two of the gullies to be rehabilitated in May 2018 as part of the GA/Qld government gully program at Strathalbyn Station

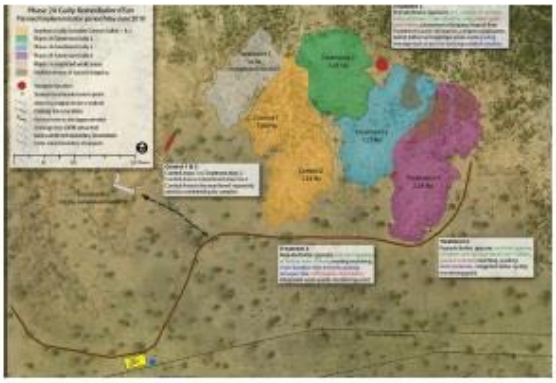
Phase 2 Works to Commence in early May 2018

The Greening Australia team have been on the front foot through the wet season, busily preparing for the 2018 dry season implementation period.

Earthworks designs for the Phase 2 works have been completed and the first tranche of works are contracted to commence in early May. These works will target 5.5ha of direct gully remediation using a variety of treatments including varying batter thicknesses and materials, different ameliorants for soil structure and chemistry improvements, modified forms of within channel check dams and other bed treatments, and different techniques for mulch application and seeding.

The second stage of these works will target a further 5ha of treatments between August and October 2018.

A comprehensive water quality monitoring program focussed on measuring treatment effectiveness in reducing sediment export will be initiated in late November in time for the 2018-2019 wet season. This program will build on the data already collected and also record change against baseline conditions determined in previous monitoring efforts.



Reef Aid Funding Update

The Innovative Gully Remediation Project is jointly funded by Greening Australia and the Queensland Government's Reef Innovation Program administered by the Office of the Great Barrier Reef.

Greening Australia through its Reef Aid campaign has raised over $3.5m from over 530 private supporters to improve water quality on the Great Barrier Reef by restoring eroded gullies and coastal wetlands. Reef Aid supporters include Virgin Australia, Prior Family Foundation, Ian Potter Foundation, Accor Hotels and many more.

More information on Reef Aid can be found at **www.greeningaustralia.org.au/programs/reef-aid/**

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