Battersea Drain

Maintenance strategy review

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1. The Battersea Drain

The Battersea Drain is 40.9km in length, with 17.9km being roadside and 23km being internal i.e.: only accessible through private land.

The extent of the drain is shown in green:

2. The Battersea Drainage scheme

The Battersea Drain is 100% owned by the landowners through which the drain flows. On behalf of the scheme members, GW manage some of the maintenance works within the drain.

The scheme is 100% funded by the landowners, who pay an additional targeted rate into the scheme that is calculated from the benefit derived from the drain.

There are a number of fast-growing invasive weeds, such as water celery, that have established within the drains over the last few years. In the spring these can quite quickly develop into large plants that increase the risk of problems with the drain by:

- Reducing the capacity of the drain
- Slowing the water flow
- Becoming dislodged and blocking downstream culverts

In addition, stock grazing in the watercourse is no longer a permitted activity, so grazing can no longer be used as a vegetation control measure.

There are just over 100 members within the scheme. Data on the SWDC website shows that member financial contributions to the scheme range from 73 cents to $1,791.09. The total annual income for the scheme is $13,238.

Financial contribution range	Number of scheme members
$0-$10	23
$10-$20	17
$20-$50	21
$50-$100	13
$100-$200	15
$200-$500	11
$500-$1000	5
$1000+	1

3. Current Maintenance Strategy

Aspiration of maintenance works managed by GWRC:

- Annual herbicide weed spray
- Drain blockage removal – both during and after rainfall events
- Machine clean every 5/6 years

All other works are the responsibility of the landowner, including:

- Drain condition inspections
- Replacement of culverts/bridges
- Anything which requires consent e.g., enlargement of drain
- Erosion repair
- Repairing/clearing of connecting drains that are not part of the drainage system
- Repair of any damage caused by flooding

4. Herbicide spraying

The herbicide spraying programme is undertaken by external contractors, as GW does not have the resources to deliver the work.

The work programme must be booked in a few months in advance, as the contractor has other work that they undertake. This means that it is not always possible to be flexible around the dates of the spraying, for example if the weed growth starts early, or if the weed spraying is required earlier than originally planned. If the programme gets delayed or disrupted, for example due to poor weather conditions, it can be difficult for the contractor to confirm when they will be able to restart, due to their other commitments.

The Natural Resources Plan states that only agrichemicals approved by the Environment Protection Agency (EPA) can be used over water, as a permitted activity (Clause 5.1.13 [b])

The NIWA report 'Best Management Practice for Aquatic Weed Control'[1] advises that there are two herbicides, diquat (dibromide salt) and endothall (dipotassium salt), registered for use on submerged aquatic plants in New Zealand and that glyphosate (isopropylamine) may be used to control emergent plants around waterways.

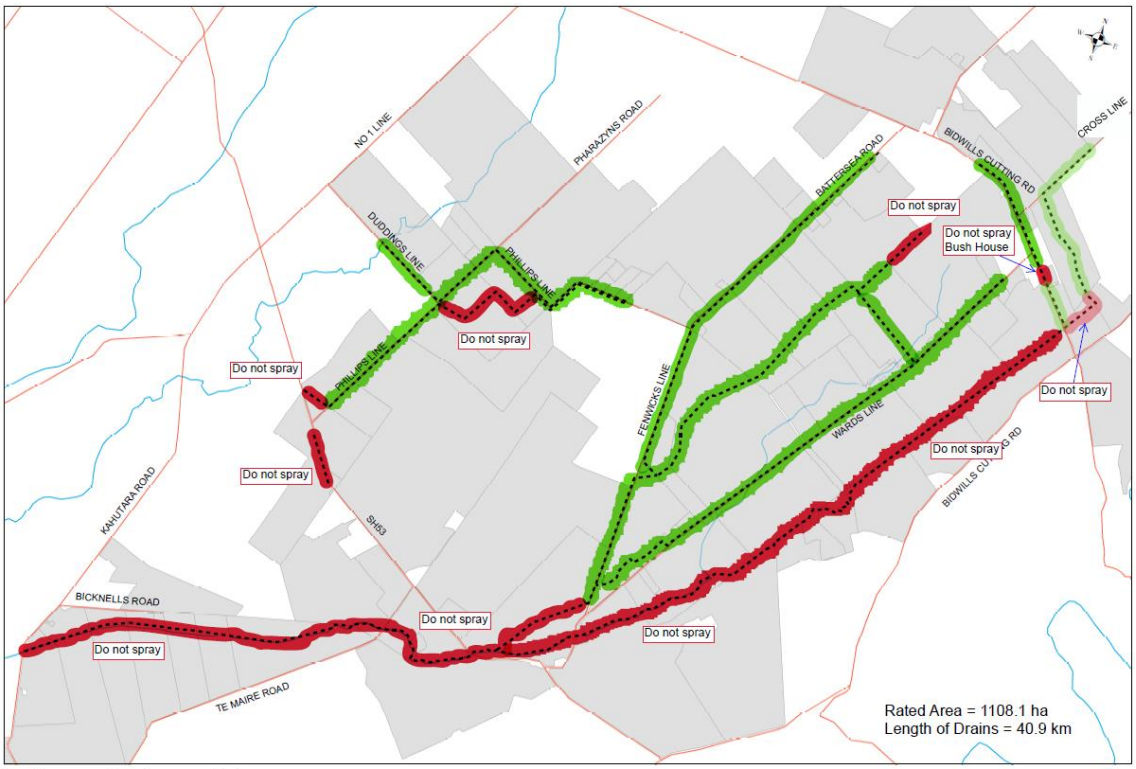
GW use glyphosate to manage the vegetation growth in and around the drains.

Around the world, there are concerns being raised around the use of glyphosate, which the International Agency for Research on Cancer (IARC), concluded is "probably carcinogenic to humans". It is currently banned for use in several countries and its approval is under review within the European Union. The EPA are currently collating information that could be used to assess whether to seek grounds to reassess the use of glyphosate in Aotearoa New Zealand.

If approval of the use of glyphosate for weed control in the drains is removed, then other methods, such as increased mechanical cleaning, would have to be used, which could be significantly more costly.

The 2022/23 spray map is shown below, with the spray areas highlighted in green and the areas not to be sprayed in red.

[1] https://www.envirolink.govt.nz/assets/12-1-Best-Management-Practice-for-Aquatic-Weeds-Framework.pdf



Battersea Drainage Scheme

Whether the drain is sprayed or not is up to each landowner. Some common reasons for not spraying include:

- Landowners grow organically
- Landowners are cropping at the time of spraying
- Landowners would prefer the manage the drain themselves, often with the rest of the drains on their section

Before each spray run GW writes to each scheme member to advise them of the upcoming spraying and whether they want to change the approach being taken on their land.

The spraying programme is heavily dependent on weather conditions, especially forecast rain and wind, and the water level within the drain. As long as part of the vegetation in the base of the drain is exposed above water, then the spraying will be effective. If the vegetation is not exposed, then the spraying will not have an impact. For 2022-23 we arranged for all the spraying across the region to be completed for Christmas and whilst the programme was able to commence in November, due to the weather conditions it was not able to progress very well. With the rain at the start of January, the spraying programme has been delayed further.

5. Cost of works completed FY21-22

Activity	Direct cost	Notes
Blockage clearance after rain	$1,268.75	
Internal machine clean	$405.00	≈200m
Blockage clearance after rain	$1,451.25	
Roadside machine clean	$7,592.26	≈1.3km
Herbicide spray	$10,754.66	≈16.5km roadside ≈6.6km internal
GW staff costs + overheads	$2,239.31	

Total direct cost of the works $23,711.23

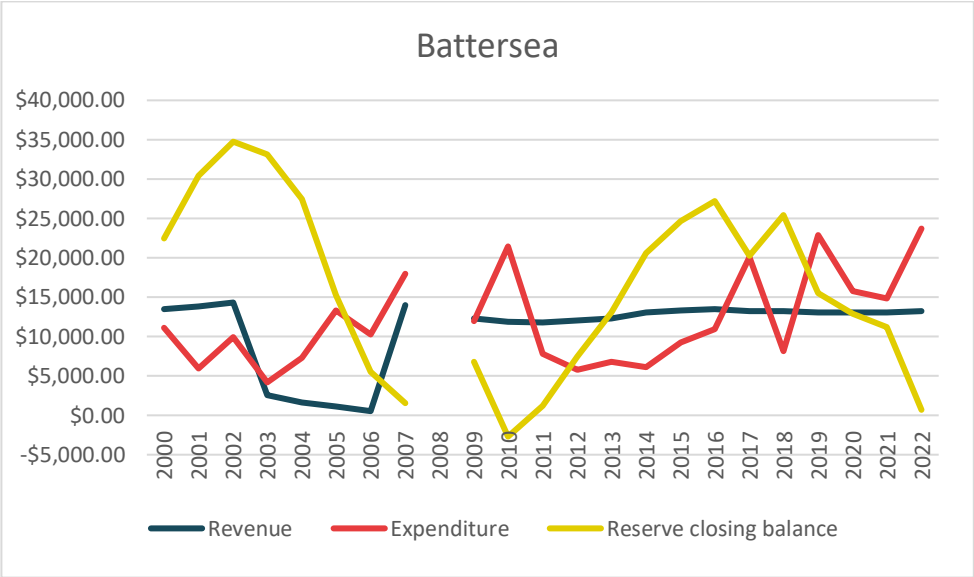
6. Scheme income

The scheme is 100% funded by the scheme members, through a targeted rate payment.

The scheme income in 2021-22 was $13,238, which is less than the expenditure.

The chart below shows the schemes income, expenditure and reserves amounts since 2000.

Over the last 5 years the expenditure has been greater than the income, which is reflected in the reserves being spent.



7. Indicative activity costs

Activity	Rate	Notes
Short notice blockage clearance	$1,200	Include transport, operators, traffic management, minimum call out charge etc and allows up to around 2½ hrs site working time.
Machine clean roadside part of drain	$6,000/km	Includes traffic management and disposal of material.
Machine clean internal part of drain	$3,000/km	Extracted material left alongside drain.
Herbicide spraying	The cost of the herbicide alone in 2021/22 for the Battersea drain was $2,445.66.	
Herbicide spraying roadside part of drain	$300/km	The cost is heavily dependant upon degree of access, number of landowners, amount of traffic management required.
Herbicide spraying internal part of drain	$900/km	

8. Future maintenance strategies

The existing maintenance approach is not sustainable with the current scheme income.

If the maintenance approach is to be sustained then the scheme income, and members targeted rates, would have to triple.

Forecast annual costs:

Annual herbicide spray cost	$11,500
Assume 4 blockages/year to clear	$ 4,800
Machine clean 1/5 of sprayed drain each year (16.6km roadside & 6.7km internal)	$23,940
GW staff costs and overheads	$ 2,300
	$42,540

Current annual income: $13,238

If the future maintenance was to be more intensive, such as additional spraying or machine cleaning or GW undertaking condition inspections, then the income would have to be increased accordingly.

If the future maintenance was to be less intensive, for example if scheme members undertook their own spraying activities and GW managed 5 yearly machine clean and emergency culvert clearance, then the scheme income, and hence member's rates, would not have to increase by as much.

9. Drainage scheme governance

Currently the scheme members have little input into how the GW managed aspects of the drainage scheme are delivered. It is recommended that the scheme members are invited to form a scheme committee, to work with GW to help ensure that the drain is managed in the most effective way for the scheme members. The committee would act as a communications conduit between the scheme members and GW and would agree issues such as:

- Frequency and timing of works
- Whether different parts of the drain need to be managed differently
- The areas to be sprayed and how the areas not sprayed are to be managed
- The responses to events such as heavy rainfall, excess vegetation growth, unseasonal weather
- Whether the extent of the drainage scheme is appropriate or not
- The scheme income requirements and financial planning approach