

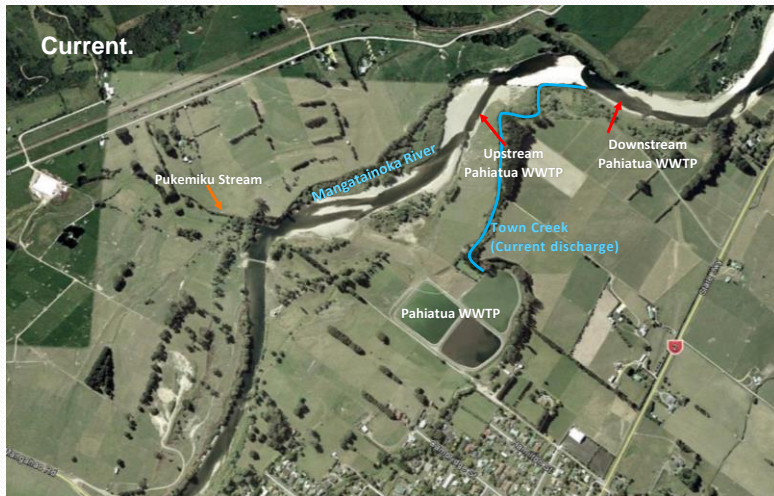
Pahiatua WWTP discharge to the Mangatainoka River

May 2017

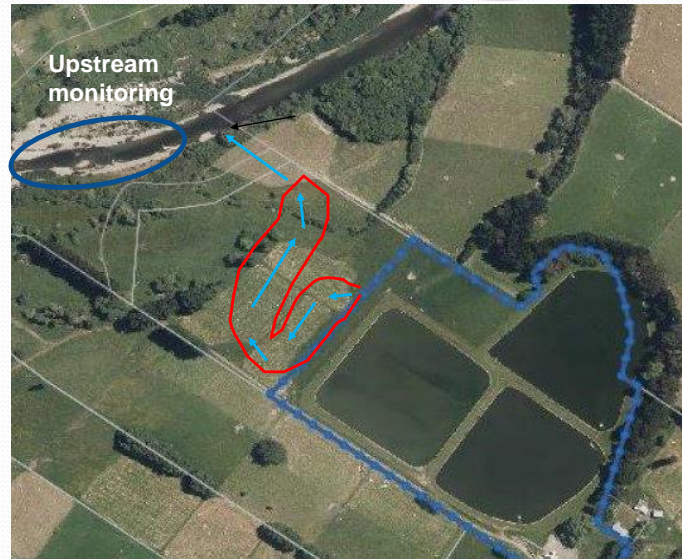
Dr. Olivier Ausseil

Aquanet Consulting Ltd

Pahiatua WWTP – Current discharge Point and Monitoring Sites



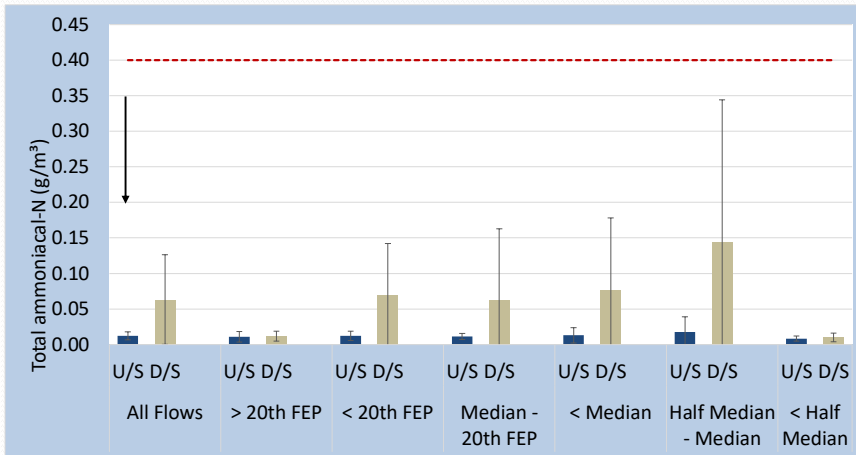
Pahiatua WWTP – Monitoring Sites



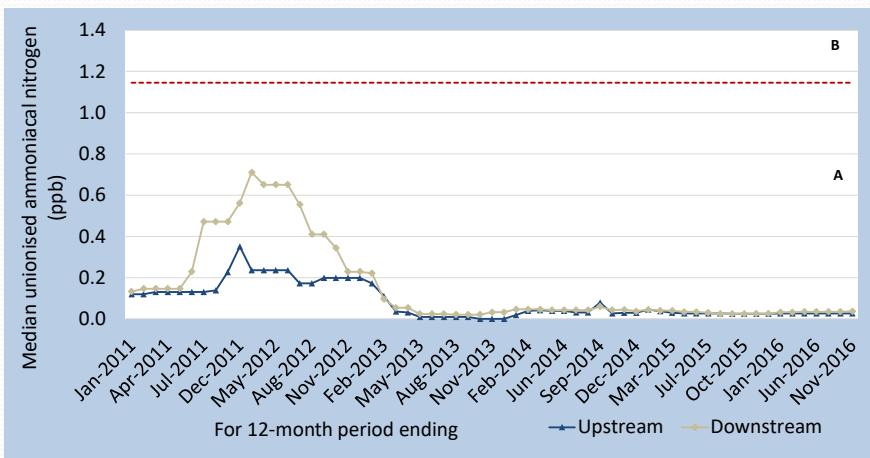
Pahiatua WWTP – Town Creek Data

Date	DRP (mg/l)		SIN (mg/l)		Ammoniacal-N (mg/l)		E. coli (/100mL)	
	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s
18 April 2017	0.035	0.314	1.93	2.31	0.028	0.085	-	-
21 April 2017	0.036	0.297	2.07	2.37	0.030	0.101	480	390
24 April 2017	0.035	0.329	1.98	2.34	0.023	0.144	130	260

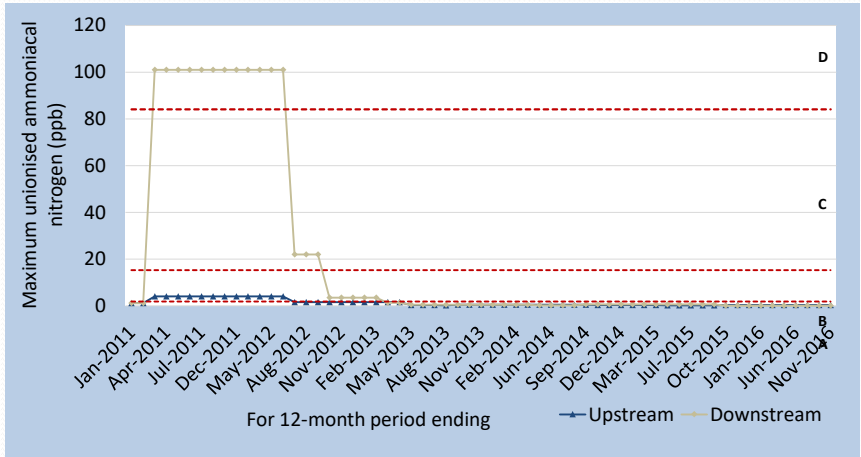
Instream Water Quality – Ammoniacal Nitrogen



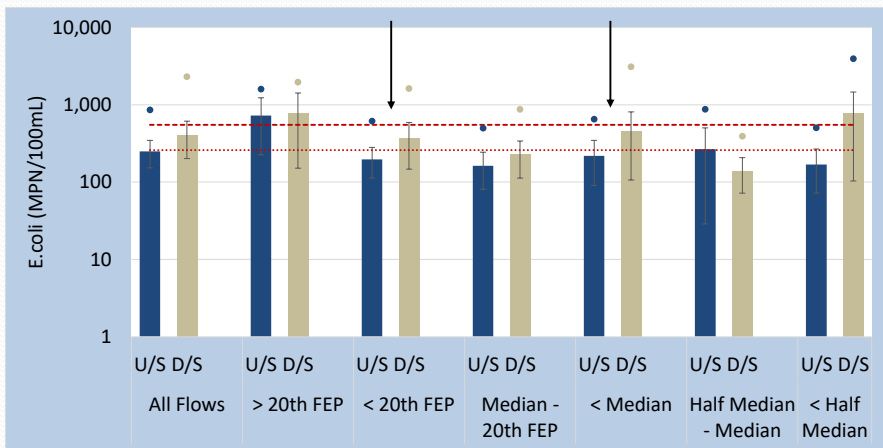
Instream Water Quality – Ammoniacal Nitrogen (NPSFM)



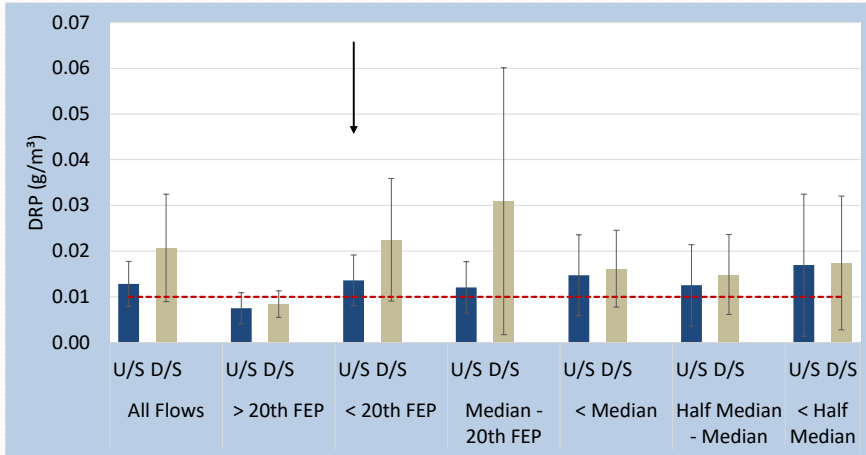
Instream Water Quality – Ammoniacal Nitrogen (NPSFM)



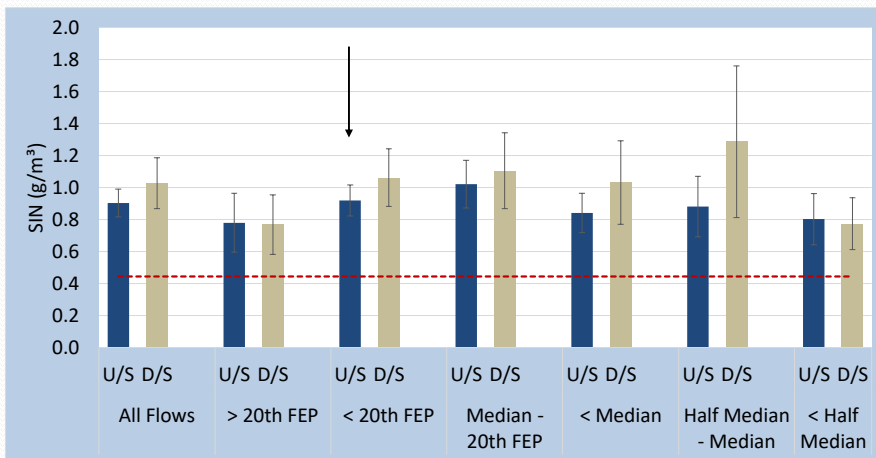
Instream Water Quality – E.coli



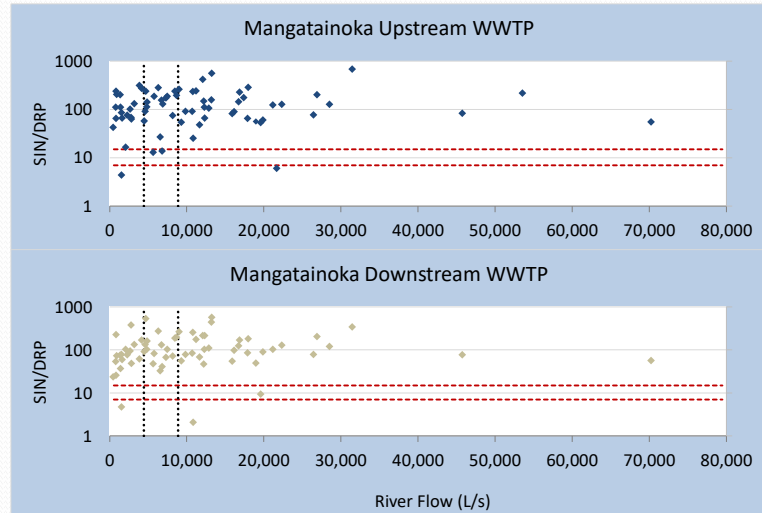
Instream Water Quality – DRP



Instream Water Quality – SIN



Instream Water Quality – SIN:DRP ratios



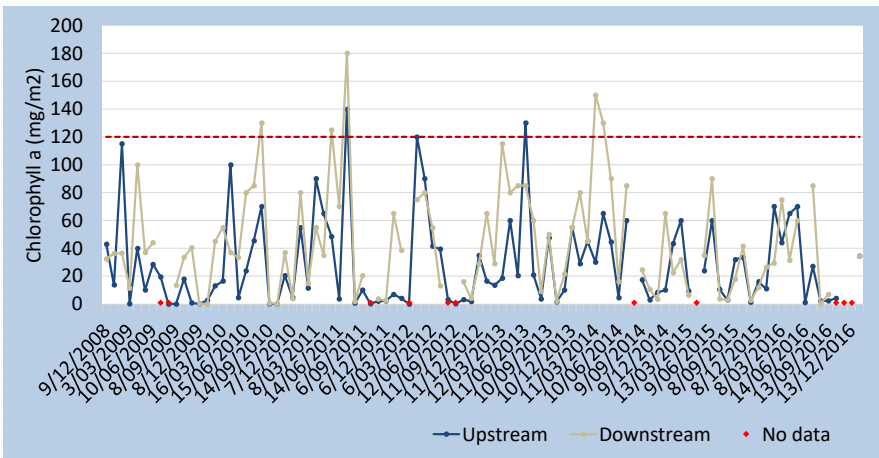
Pahiatua WWTP – Nutrients

Current situation		DRP	SIN
Daily load (kg/day)		1.0	1.9
In river concentration increase (mg/l) (indicative % of One Plan target)	Mean Annual Flow	0.0007 (7%)	0.002 (0.6%)
	Summer low flow (Half median flow)	0.0016 (16%)	0.004 (0.8%)
	Extreme summer low flow (MALF)	0.0044 (44.2%)	0.010 (2.4%)

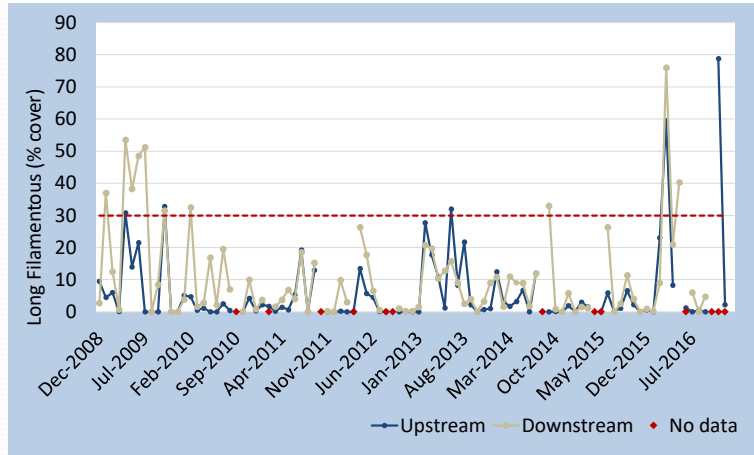
Periphyton



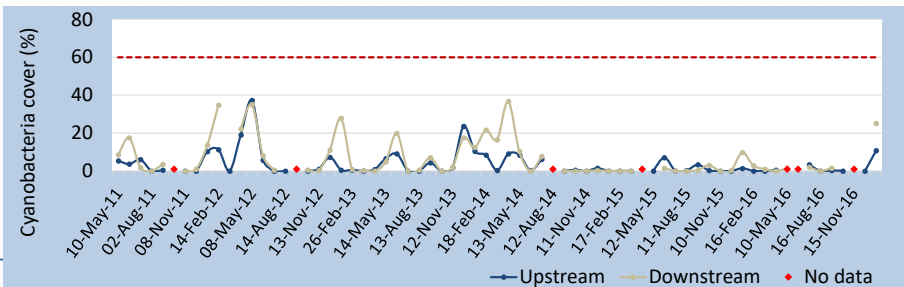
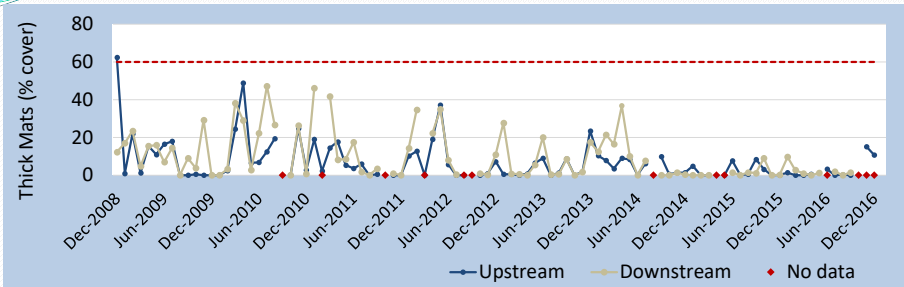
Periphyton – Chlorophyll a



Periphyton – Visual Surveys



Periphyton – Visual Surveys



Macroinvertebrate Communities



Snails



Worms



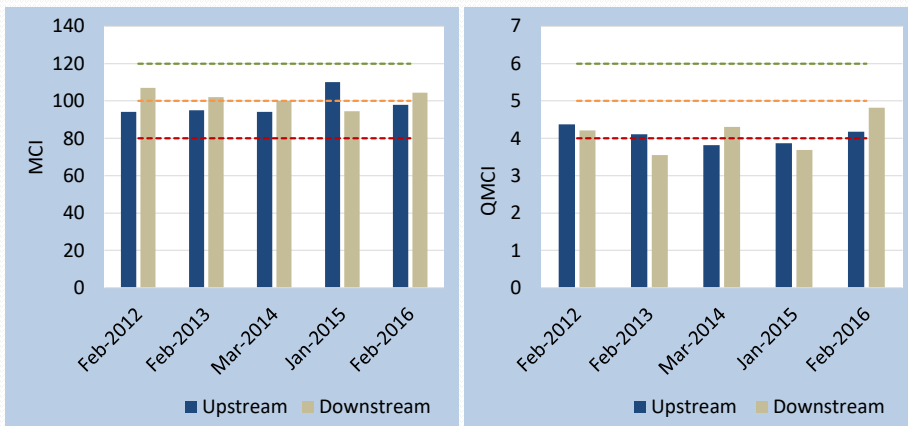
Stoneflies



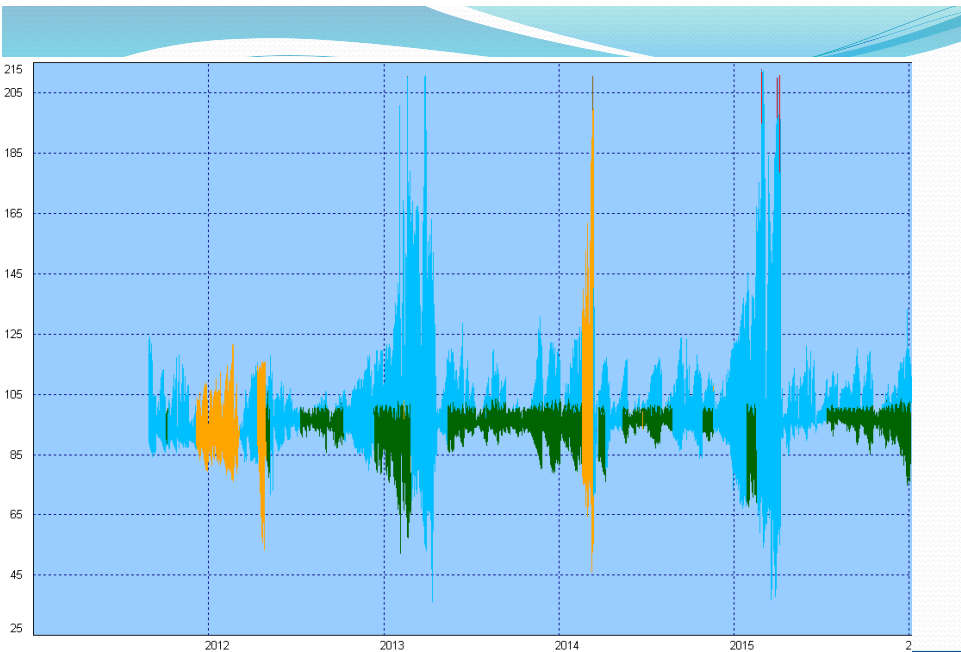
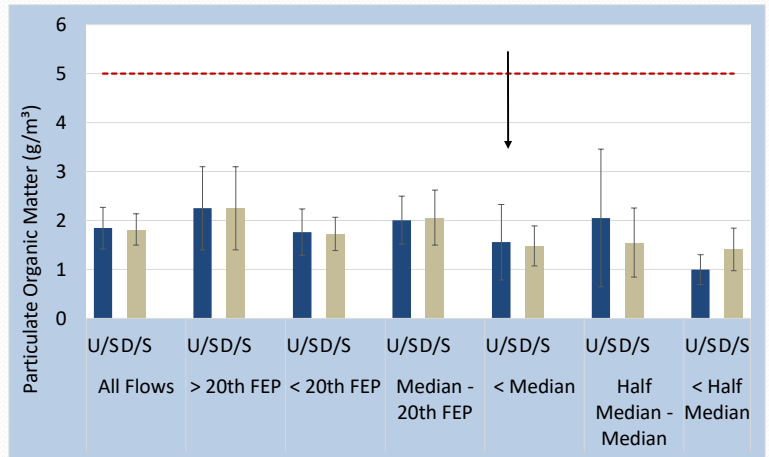
Mayflies



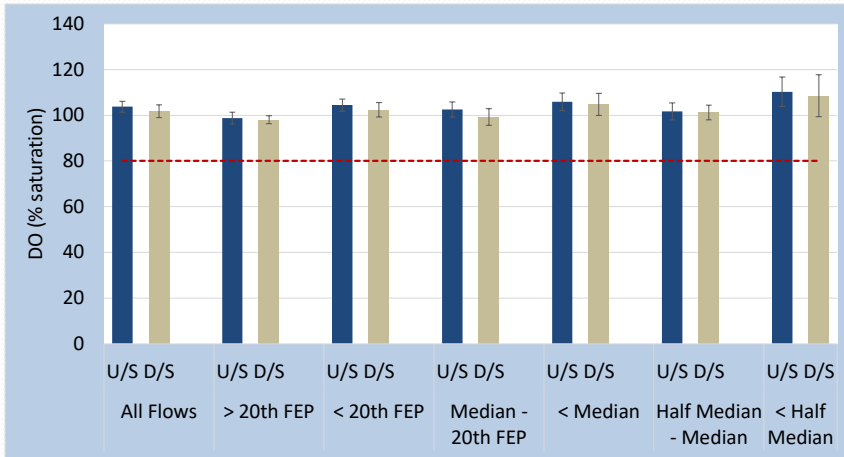
Macroinvertebrate Communities



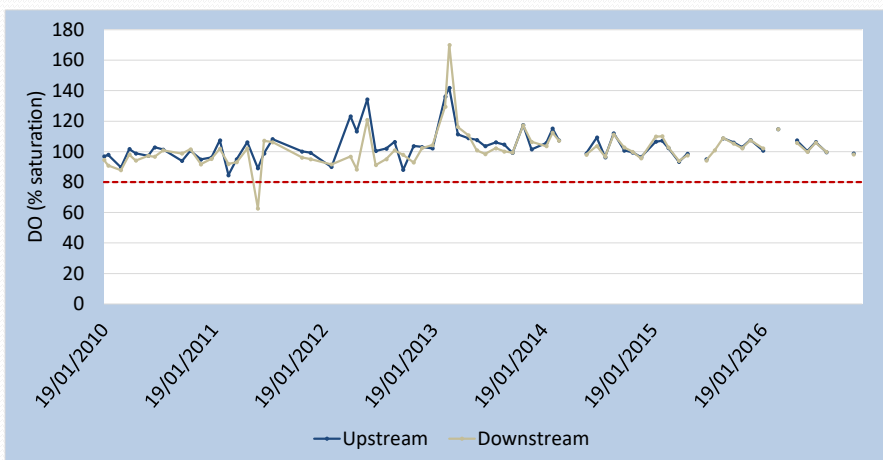
Instream Water Quality – POM



Instream Water Quality – Dissolved Oxygen



Instream Water Quality – Dissolved Oxygen



Instream Water Quality – Dissolved Oxygen

- Background to One Plan target (80% saturation)
- Existence of current issue associated with discharge unknown
- Monitoring options
 - Dawn spot measurements during low flows
 - Continuous DO
- Assessment of data
 - Any difference between upstream and downstream in spot data?
 - If difference, continuous monitoring
 - Any difference
 - If difference, likely significance to aquatic life

Post-upgrade – improvements and effects

Effect/Value	Contamnt	Current effect from the discharge	Post-upgrade effect from the discharge
Contact recreation, Stock water	E.coli	Possible reduction in % time meeting target (Role of discharge unclear)	UV treatment No more than minor
Periphyton (Recreation, trout fishery, life supporting capacity)	DRP	Significant increase in DRP concentration	3 fold reduction
	SIN	Not significant on SIN concentration Unlikely to drive periphyton growth	Similar or reduced
	Periphyton	Mild increase downstream, One Plan target just met/marginally exceeded	Reduced effect associated with DRP reduction
Macroinvertebrates (life-supporting capacity, trout fishery)	Ammonia, POM, DRP/SIN (via periphyton)	Minor, One Plan target always met	Minor, One Plan target always met
DO (life-supporting capacity, trout fishery)	DRP/SIN (via periphyton)	Unknown, but likely to be less than 1.5km upstream	Reduced effect associated with periphyton reduction