

Conclusions Summary for Each Reach

Reach	Estimated observed oPO4 load* (as % of total for whole Ouseburn)	Main conclusions
Reach 1	~11-13%	<p>a) An estimated 11-13% of the P load for the whole Ouseburn enters in Reach 1 so tackling phosphate sources in this reach is important.</p> <p>b) SAGIS suggests agriculture is a significant threat, accounting for ~ 40-50% of the total P load entering this reach. The source of the other 50-60% is unknown. The evidence suggests it is not related to sewage, but an NH4 to P correlation and WQ logger data could point to manures / slurry.</p> <p>c) The following additional sources of P from agriculture were raised as possibilities at the Causes workshop: P bound to washed-off sediment from arable land; manure heaps near watercourses. This suggests that it would be useful to investigate what is known or what can be discovered about the specific sources of agricultural phosphate in this reach.</p> <p>d) No evidence available to the E&M project that transport network and road runoff may be a threat but at the Causes workshop Group 2 flagged these as still potentially important.</p> <p>e) Groups at the Causes workshop scored agriculture & septic tanks as significant threats (score >3). But the evidence suggests that septic tanks are not a significant threat (only 1-5% of the total P load in this reach) although perhaps they could be locally important.</p>
Reach 2	~17-27%	<p>a) An estimated 17-27% of the P load for the whole Ouseburn enters in Reach 2 so tackling phosphate sources in this reach is important.</p> <p>b) SAGIS suggests agriculture is a significant threat, accounting for ~40-50% of the total P load.</p> <p>c) There is evidence that sewage discharges could be part of the problem, in particular: STworkshop, sewage misconnections (or sewer network problems), septic tanks (if most of them are badly maintained) and perhaps storm sewage.</p> <p>d) Some limited evidence that transport network and road runoff may also be a part of the problem and Group 2 think it is important. Westerhope Golf Course also suggested as a possible source of oPO4 by Group 1.</p> <p>e) Groups at the Causes workshop scored agriculture, sewage misconnections & septic tanks as significant threats (score >3).</p>
Reach 3	~2-3%	<p>a) Only 2-3% of the P load for the whole Ouseburn enters in Reach 3 so if the phosphate issues could be addressed upstream, in Reaches 1 and 2, the top three reaches could reach Good status for phosphate.</p> <p>b) Neither agriculture nor sewage are significant threats in this reach but sewage misconnections at Harey Dene and clusters of badly maintained septic tanks could be important issues locally for small streams and ditches.</p> <p>c) No evidence that transport and road runoff is a threat, but Group 2 think it is important.</p> <p>d) Groups at the Causes workshop scored only agriculture as a significant threat (score >3).</p>

Reach 4	~8-16%	<p>a) An estimated 8-16% of the P load for the whole Ouseburn enters in Reach 4 so tackling phosphate inputs in this reach is important.</p> <p>b) Agriculture may be a significant threat, SAGIS suggest it accounts for ~30-80% of the total P load in this reach but the uncertainty is large.</p> <p>c) There is consistent evidence for sewage as a significant threat including: problems with the sewer network (including perhaps a partially blocked sewer), malfunctioning storm overflowworkshop & sewage misconnections.</p> <p>d) Some uncertain evidence that transport and road runoff may be a significant local issue and Group 2 think it is important.</p> <p>e) Groups at the Causes workshop scored sewage misconnections, drainage and a golf course (presumably the City of Newcastle Golf Club, but no other evidence on the golf course available to the E&M project) as significant threats (score >3).</p>
Reach 5	~45-49%	<p>a) An estimated 45-50% of the P load for the whole Ouseburn enters in Reach 5 so tackling phosphate inputs in this reach is a high priority.</p> <p>b) Agriculture may be a minor threat, SAGIS suggests it accounts for ~15-25% of the total P load in this reach but the uncertainty is large.</p> <p>c) NIRS incidents at Salter Lane allotments flagged at Causes workshop. Unknown if this is likely to be significant.</p> <p>d) There is evidence both for sewage (NIRS, polluted outfalls, oPO4 vs TIN ratios) and against sewage (NH4 less then u/s) being a threat in this reach. The positive evidence points towards: inputs from STworkshop, possible malfunctioning storm overflowworkshop & problems with the blocked sewers network and /or sewage misconnections.</p> <p>e) No evidence that transport and road runoff is a threat, but Group 2 think it is important.</p> <p>f) Groups at the Causes workshop scored sewage misconnections (both domestic and sewer network), drainage and the 2 golf courses (although currently there is no evidence available to the E&M project for this) as significant threats (score >3).</p>
Reach 6	~4%	<p>a) An estimated 4% of the P load for the whole Ouseburn enters in Reach 6 so tackling phosphate inputs in this reach is a low priority.</p> <p>b) Consistent evidence that agriculture is not a threat.</p> <p>c) Apart from 2 NIRS incidents in the last 10 years (related to a CSO and a Foul Sewer) there is consistent evidence that sewage inputs are not a threat in this reach.</p> <p>d) No evidence available to the E&M project that transport network and road runoff may be a threat but at the Causes workshop Group 2 flagged these as still potentially important.</p> <p>e) Groups at the Causes workshop scored drainage as significant threats (score >3).</p>

Note (*): the estimated phosphate load is shown as a range based on two estimates. Estimate 1 is the average of WIMS WQ samples collected when flowworkshop were between 50%ile and mean flow conditions (see purple line on the SAGIS load plots). Estimate 2 is the average of WIMS WQ samples collected when flowworkshop were between 50%ile and mean flow conditions (see cyan line on the SAGIS load plots).