



EA Investigation NIRS2071050

SEPA review

DRAFT

The Environment Agency has added the comments in yellow highlight below in response to SEPA's key findings. The Environment Agency's full response to SEPA's report is attached as an appendix at the end of the report.

February 2023

1. Introduction

This document sets out the conclusions of SEPA's review of the Environment Agency's (EA) investigation into a category 1 pollution incident. The incident occurred on 21st June 2022 on the Cunsey Beck, Esthwaite.

The review was undertaken at the request of the EA. The purpose of the review was to provide the EA with an independent assessment of the:

- Investigation process
- Conclusions of the investigation.

2. Key findings of the review

- Based on the evidence in the investigation documentation, SEPA is unable to determine the cause or causes of the pollution incident.
- SEPA cannot rule out that the cause or combination of causes could have been identified, had the investigation obtained further suitable evidence.
- Based on the investigation documentation, the investigation was not carried out in the way SEPA would expect for an incident of this type.
- There appears to have been important omissions and other weaknesses with regards to evidence gathering, including:
 - (i) The absence of documented witness interviews.
 - (ii) No clear, systematic approach to the investigation with regards identifying and eliminating potential sources.
 - (iii) The limited number of sampling locations on the Cunsey Beck, notably upstream of Eel Bridge.
 - (iv) The absence of fish post-mortems and cyanobacteria toxicity analyses.

Section 5 below sets out the detailed findings of the review.

Environment Agency comments on SEPA's key findings

The Environment Agency's investigating officer went to the location of the incident on 21 June 2023. They recorded that there was no discharge occurring from the Near Sawrey Waste Water Treatment Works (WwTW).

Approximately 75m upstream of the WwTW discharge pipe is a road bridge and a further 30m upstream is the outflow from Esthwaite Water into Cunsey Beck. The investigating officer recorded seeing discolouration in the outflow from Esthwaite water, which they attributed to an algal bloom.

Since an impact on Cunsey Beck was recorded upstream of the WwTW, the Environment Agency concentrated on trying to identify a source of the pollution in this location.

As the Environment Agency did not find any obvious source of pollution or polluter, no evidential casefile was produced. This also meant that the Environment Agency did not obtain formal witness statements.

The Environment Agency's full review of SEPA's report is attached as an appendix to the end of this document.

3. Background

Cunsey Beck flows from Esthwaite Water through Out Dubs Tarn to Windermere over approximately 3 km.

A United Utilities, Wastewater Treatment Works (WWTW), Near Sawrey WWTW, is located to the Southeast of Esthwaite Water and discharges into Cunsey Beck approximately 100 m downstream of the outfall from the lake (Map 1).

Map 1: Cunsey Beck showing location of Esthwaite Water (top left), the WWTW & Eel Bridge



The pollution incident caused multiple fish mortalities.

The EA's investigation concluded that:

- An unknown pollutant caused an acute toxic impact over a short space of time in the upper reaches of Cunsey Beck between Esthwaite Water and the United Utilities WWTW outlet.
- There was no evidence linking the pollution event to the WWTW.

4. Review method

SEPA's review was desk-based and considered the following information provided by the EA:

1. Cunsey Beck Review 4
2. Cunsey Beck Fish kill 2022 Ecology Report
3. Near Sawrey EPR Permit
4. Near Sawrey Section 61 Final
5. Near Sawrey Section 61 October 2022
6. Near Sawrey sewer network
7. Near Sawrey WWTW Section 61 notice covering letter Notice 2
8. Near Sawrey WWTW Section 61 notice covering letter
9. Photo-2022-06-22-17-28-05 (10)
10. Photo-2022-06-22-17-28-05 (11)
11. Section 61 notice Near Sawrey WWTW Final
12. Video-2022-06-22-17-28-08

5. Detailed findings of the review

5.1 Initial complaint evidence

The review found that:

- The specific location of pollution that resulted in the initial complaint was not identified in the investigation report documentation.

Recommendation

SEPA recommends that, in an incident of this type:

- Initial complaint evidence should be collected and recorded. Evidence from an initial complaint can be used to help evaluate the severity of the impact and identify its location. This can inform subsequent investigation and enforcement.

5.2 Witness evidence

The review found that the investigation documentation supplied did not contain:

- Any evidence from the initial complaint, such as such as photographs, video footage or a witness statement from the complainant.
- Witness statements from the person providing the photo/video of the 'unidentified' blue tanker.
- Identification of, and witness statements obtained from, the sludge removal tanker drivers operating on that day.
- Witness statements from adjacent landowners/residents.
- Information regarding public, or other, access to parts of the watercourses/lakes from which the pollutant could have originated.
- No EA officer notebook entries were referenced in the investigation documentation.

Recommendations

In a case such as this with a large fish kill, SEPA would expect:

- As many witness statements as possible to be taken.
- Information about public access obtained and used to help identify potential witnesses from whom statements can be sought.
- Third-party photographic evidence to be accompanied by a statement from the photographer. Without such a statement, third-party photographic images are likely to be of limited evidential value. For example, the photographic images of a slurry trailer and a video of the WWTW included in the investigation documentation are not accompanied by a statement from the person(s) providing the images.
- Investigating officer notebook entries to be referenced in the investigation documentation if any investigation conclusions are based on such entries.

5.3 Evidence collection - targeting

The review found that:

- Environmental evidence (sampling and observations) does not appear to have been obtained by the EA investigators from Cunsey Beck and Out Dubs Tarn between the WWTW outfall and Eel Bridge.
- The investigation documentation does not explore whether the small channel draining into the Cunsey Beck to the South of the WWTW could have provided a potential route for pollution to enter Cunsey Beck.

- No comparative environmental data (invertebrates, water quality, etc) appear to have been collected from any unimpacted watercourse in the area.

Recommendations

SEPA recommends that, in an incident of this type involving an unknown pollution source:

- A systematic exercise is undertaken to identify potential sources and locations for investigation.
- Where pollution has been observed (eg as it was at Eel House Bridge – unpleasant odour, discolouration, dead lumbricid worms, etc), samples are collected from locations working upstream to help determine where impacts end. This can enable sources to be ruled out or pinpointed.
- Environmental data from an area outside the zone of potential sources is collected for comparison.

5.4 Fish kill-related evidence

The review found that:

- Details of where dead fish were found were not recorded in the investigation documentation, other than to say none were observed in Esthwaite Water.
- No dead fish were collected for analysis.

Recommendations

SEPA recommends that, in an incident of this type:

- The locations at which dead fish are found are recorded as this may assist in identifying/excluding sources of pollution.
- Dead fish specimens are collected for examination to try to identify the cause of mortality and for potential use as evidence.

5.5 Algae-related evidence

The review found that:

- Algal samples were obtained from immediately downstream of the Lake but do not appear to have been taken from any other locations relevant to the incident.
- Details of the methods used to preserve and store algal samples were not specified in the investigation documentation; and there was no information on algal physical structure (eg formation of resting spores).
- No analysis of cyanobacteria samples for toxicity appears to have been undertaken.

Recommendations

SEPA recommends that, if algal blooms are considered a potential cause of an incident of this type:

- Algal samples are collected from all relevant locations to the incident. In this case, this would include locations along the Cunsey Beck where dead fish were observed and Out Dubs Tarn.
- Toxicity analysis of cyanobacteria samples is undertaken.
- Preservation and storage methods are detailed in investigation documentation to evidence that breakdown is not due to improper preservation.
- Standard units for cell counts (ie cells/ml) are used throughout any documentation.

5.6 Water chemistry-related evidence

The review found that:

- A water quality sample was taken on 21/06/22 from a location between Esthwaite Water and the WWTW outfall and analysed for DO, pH and temperature.
- Two water quality samples were taken from the lower half of Cunsey Beck on 22/06/22 and analysed for BOD and COD but not for DO, pH and temperature.
- No water quality samples appear to have been collected between the WWTW outfall and Eel Bridge.
- No information was provided on the presence or absence of sewage fungus at any sample location.
- The investigation documentation refers to a third-party sample collected from the WWTW outfall but does not include information on whether this sample was witnessed or corroborated.

Recommendations

SEPA recommends that, in an incident of this type:

- Water quality samples are collected from outfall locations, locations upstream of outfall locations and downstream of those locations where the impact of an unauthorised discharge would be expected to be greatest.
- If possible, water quality samples are collected on the same day.
- The same suite of parameters is analysed for each location.
- The presence / absence of sewage fungus is recorded at each sample location.
- Any samples to be used in evidence should be witnessed/corroborated.

5.7 River invertebrate-related evidence

The review found that:

- Standard pollution index metrics did not appear to have been calculated for invertebrate samples.
- Part of the investigation documentation stated that dead (lumbricid) worms were noted at all sites sampled but other parts (the Ecology report) stated that dead worms were only found at the Eel House Bridge sampling location.
- Total numbers of living and dead of different invertebrate taxa do not appear to have been recorded.

Recommendations

SEPA recommends that, in an incident of this type:

- Pollution indices are calculated from invertebrate samples to assist in describing the severity of impact and in tracing potential sources.
- Investigation documentation is reviewed to address any discrepancies in how evidence is presented that could otherwise cause confusion.

5.8 Other visual evidence

The review found that:

- The investigation concluded that an image of the WWTW outfall showed no impact from sewage immediately downstream.

- The image does not provide a wide view of the river adjacent to the outfall.

Recommendation

- SEPA recommends that multiple visual images covering a suitably wide view are captured to assist visual assessments of pollution.

5.9 Conclusions of the investigation

The review found that:

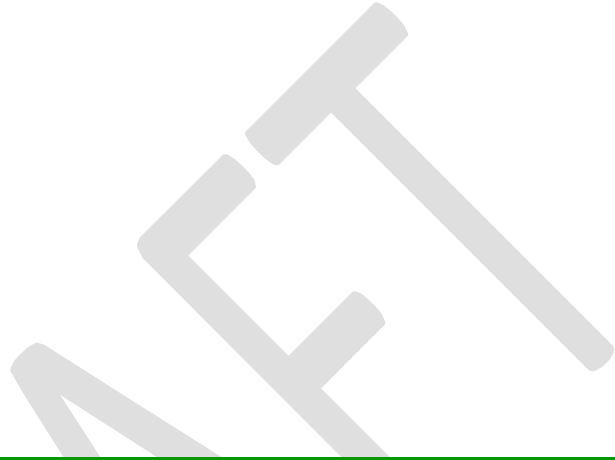
- The investigation concluded that the incident was likely due to an acute toxic event.
- A discharge from the WWTW outfall was ruled out, with the investigation documentation concluding that the source of pollution was upstream of the WWTW outfall.
- There was an algal bloom in Esthwaite Water at the time of the incident, with elevated cell counts of *Aphanizomenon* at its outflow.
- No dead fish or dead invertebrates were documented in the Cunsey Beck upstream of the WWTW outfall.

SEPA assessment

- Based on the evidence in the investigation documentation, SEPA is unable to determine the cause or causes of the pollution incident.
- SEPA cannot rule out that the cause or combination of causes could have been identified, had the investigation obtained further suitable evidence.
- SEPA does not consider there is sufficient evidence in the investigation documentation to conclude that cyanobacteria from the Lake or bloom-related supersaturated dissolved oxygen levels directly resulted in mass fish mortalities. This is because of the absence of evidence of dead, moribund or stressed fish in Esthwaite Water; and because evidence from cyanobacteria toxicity analysis and fish post-mortems was not obtained.
- SEPA does not consider there is sufficient evidence to rule out discharges into the Cunsey Beck, including a discharge from the WWTW, as contributing to the incident. The investigation report found that invertebrates from Eel Bridge, some distance downstream of Esthwaite Water, showed the heaviest impact; and the initial report of pollution referred to discoloured¹ and smelly water.

End of Document

¹ Images in a separate report on the incident prepared by Adler & Allan, which is not part of the investigation documentation, show blue/grey discolouration. This does not indicate cyanobacteria



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Environment Agency Appendix

Water Pollution on Cunsey Beck, Hawkshead 21/06/22**NIRS: 2071050**

I am [REDACTED] for the Environment Agency. I have been asked to lead a review into the SEPA review of the EA's investigation.

Executive Summary

The SEPA report indicated that having reviewed the documents provided, they were unable to determine the cause(s) of the pollution incident. SEPA also reported that they considered a less than thorough investigation had been carried out and that key evidence was either missing or omitted from the investigation documentation which may have indicated, or assisted in identifying, a source. The documentation missing including more water quality samples, fish post-mortems and bacteria toxicology.

From reviewing all aspects of the investigation, I am confident that Environment Agency officers carried out a systematic prioritised investigation in an attempt to identify a source/polluter involved of an acute toxic event. Once no polluter was found the conclusion was that the discolouration, odour and fish and invertebrate mortalities were likely caused by the presence of an algal bloom in Esthwaite Water, a conclusion borne out by satellite imagery, [REDACTED] environmental data and an ecological survey that recorded counts of the blue green algae *Aphanizomenon* well above the public health reporting threshold.

SEPA were not given a full investigation case file to review. Due to there being no obvious source or polluter no evidential casefile was produced. Without a source or polluter, the investigation was truncated and not all evidence collected or produced, or supplied to SEPA for their review.

It is also worth pointing out that there are differences in the legislation that SEPA and the EA work under. It may be that SEPA have looked at the investigation report from a context of Scottish Law whereas the investigating into pollution on Cunsey Beck has been completed in line with our requirements under English Law.

This review attempts to answer the points raised in the SEP report. Where we have no response to points raised, we will take the appropriate action to rectify these shortfalls.

To support the report produced by [REDACTED]:

- All officer statements should be produced,
- The ecological survey be reviewed to ensure EA guidance has been followed
- The fisheries Officer fieldwork be reviewed for locations of observations made
- A map should be produced of the river system an annotated to show locations of observations, samples taken, comments, inspections etc
- The EA Cunsey Beck Investigation Report be amended to include relevant points raised in the SEPA report

EA investigational findings

- The officer who responded on 21st June initially attended the Near Sawrey wastewater treatment works (WwTW) operated by United Utilities, reported seeing an extensive pollution causing poor water quality, extensive discolouration and a noticeable odour, but noted that this extended upstream of the WwTW as well as downstream.
- The officer attended the WwTW first as it had been identified as the source in the first incident report and seemed the most likely source of a pollution event.
- The officer recorded that there was no discharge occurring from the WwTW and that he did not believe that the WwTW was the source. The officer tracked upstream looking for a source with the intention of gathering evidence and stopping the discharge.

- Approximately 75m upstream of the WwTW discharge pipe is a road bridge and a further 30m upstream is the outflow from Esthwaite Water. The attending officer recorded seeing discolouration in the outflow from Esthwaite water, attributed to an algal bloom, but didn't record dead fish beyond one eel caught in a riffle below a collapsed bridge.
- Following further incident reports other Environment Agency officers, including fisheries officers, attended lower reaches of Cunsey Beck on 22nd and 23rd June, finding continuing impacts and a high number of dead fish confirming it as a category 1 incident.
- On 22nd June an officer carried out a systematic investigation into all possible sources and ruling out all other possible sources
- An Ecological survey was carried out confirming that invertebrate colonies were severely impacted along the whole length of Cunsey Beck from the outflow from Esthwaite Water to the discharge to Windermere and that the cause was an acute toxic event. It was suspected that there was 100% mortality of invertebrates and fish on the river. Due to this it was not considered worthwhile deploying mitigating aeration equipment.
- No source was identified by EA officers and as such no casefile was produced. The conclusion was that the invertebrate populations had been severely affected along the whole length of Cunsey Beck and that the cause was an acute toxic event.

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Due to there being no obvious source and high public interest in the Windermere catchment, it was agreed that the findings of the investigation carried out would be reviewed by the Scottish Environment Protection Agency (SEPA).

It is worth noting that SEPA were handed an investigation report and not a full casefile containing all evidence, officer statements, disclosure etc.

SEPA findings and EA response:

1. SEPA recommends that initial complaint evidence should be collected and recorded.
 - a. Initial complaint evidence is collected and recorded on the National Incident Recording System.
 - b. NIRS reports are included in any casefile as schedule 1 unused evidence
2. The supplied documentation did not contain statements, evidence, officer notebook entries etc
 - a. No conclusive evidence was found to a source, or cause of the water quality pollution, as such no casefile recommending sanction or further action, and containing statements, evidence etc was produced
3. There is no sampling from all areas of Cunsey Beck, no consideration of the small channel downstream of the WwTW
 - a. Not all areas of Cunsey Beck are easily accessible for inspection or sampling
 - b. Since an impact was recorded upstream of the WwTW our investigation into the source concentrated there on trying to identify a source
 - c. The small channel was inspected and ruled out of the investigation
4. Locations of the dead fish were not recorded, no dead fish collected for analysis
 - a. Due to the difficulty of access, fisheries officers couldn't inspect all of the river. Officers recorded NGR of where dead fish were first seen (d/s of Out Dubs Tarn) and then reported that dead fish and eels were seen continuously to the bottom of the beck. Officers reported seeing 2 live eels along the whole length, in the fresh water where side streams were merging. This would've have been reported in a witness statement should one have been produced
 - b. Without a polluter it was considered that there was no need for the collection of dead fish for further analysis. It should also be noted that there were Health & Safety concerns over the presence of an unknown substance in the river.
5. Algae samples not taken from further locations along Cunsey Beck, no details on methods of collection or preservation of samples, no toxicity analysis
 - a. Not all areas of Cunsey Beck are easily accessible for inspection or sampling
 - b. Algal samples were collected to show the presence/absence of algae

- c. Comments from the ecological survey officer indicated that approximately 50% of blue green algae is toxic and that
 - d. An ecological report has been produced and would contain detail on the collection and preservation, and would be included as evidence in a full file but the full file was not produced or sent for review by SEPA
6. Water samples were not taken from outfall locations, u/s and d/s utilising the same suite/analysis etc
- a. As no source was found, no evidential (formal) samples of a discharge (including u/s and d/s) were collected.
7. There were inconsistencies in collecting and evidencing the invertebrates samples
- a. Standard metrics were followed in line with EA guidance
 - b. BMWP tolerance measure was used to assess invertebrate mortality, looked at what taxa was absent/present. This is standard approach from which multiple metrics can be calculated.
 - c. The ecology survey looked at the different fauna present and was used as a trail to assist in locating a source – consideration was that it was likely 100% of life within the river had been killed
 - d. An ecological survey was produced and would be evidence with a statement if a file had been produced
8. There were not enough images of the river to provide adequate visual assessment
- a. Further images have been taken, but as a full file has not been completed they were not provided to SEPA as part of the review
9. SEPA Assessments of the EA conclusions
- a. EA concluded that the event was caused by an acute toxic event
Based on the investigation documentation, SEPA is unable to determine the cause(s) of the pollution
 - b. The Near Sawrey WwTW was not the source due to impacts being seen u/s
SEPA cannot rule out that the cause(s) could be identified if further suitable evidence had been gathered
 - c. There was an algal bloom in Esthwaite Water with elevated counts (in excess of reporting limits)
SEPA does not consider that there is sufficient evidence pointing to cyanobacteria or supersaturated DO levels in Esthwaite Water resulted in the fish mortality due to the lack of evidence of algal toxicity or fish post-mortems.
 - d. No dead fish or invertebrates were documented in Cunsey Beck u/s of the WwTW outfall
SEPA does not consider there is sufficient evidence to rule out discharges to Cunsey Beck, including any from the Near Sawrey WwTW as contributing to the incident.
Invertebrates at Eel Bridge showed the heaviest impact.

Conclusions

SEPA have not reviewed a full investigation file but have reviewed a report into the incident and the ecological survey report.

The Environment Agency has been unable to identify a point source and as such a polluter. Without an identified source or polluter no casefile recommending sanction or further action has been produced.

This file would've contained:

- officer and other witness statements,
- rationales for ecological surveys,
- evidence including the results of samples taken from any discharge alongside u/s and d/s samples and potential other samples taken through the catchment to fully indicate an impact, photographs etc and
- some of the dead fish would've collected as evidence.

These are all items that SEPA has said is missing from the report they reviewed.

In order to plug some of those gaps and present more of the evidence gathered by Environment

Agency officers it is recommended that:

- all officers involved in the investigation produce witness statements,
- [REDACTED] reviews the ecological survey,
- [REDACTED] review the fisheries officers fieldwork in order to ascertain if locations of dead fish were logged - completed
- the investigating officer produce a map of the river and annotate it with locations where actions, observations, samples etc have been made or taken
- The EA Cunsey Beck investigation report will be amended to include relevant points addressed by the SEPA report