

Water Contamination Test

19 January 2024

Round Our Way

Horley Sewage Treatment Works, Horley, Surrey, RH6 8FX

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1. Introduction

The following document provides details of a Water Contamination Test carried out by Oakshire Environmental, and includes a description of the site, proposed project, sampling methodology, testing methodology and an evaluation laboratory testing.

1.1 Project Overview

Water contamination testing has been requested by the client, to identify and assess contamination in sampled flood water from the site. Oakshire Environmental will carry out Water Contamination Testing, including delivery and collection of a water test kit, as described below.

1.2 Purpose of Investigation

The objectives of the Water Contamination Testing will be to:

- Identify contamination of sampled water from Bacteria, Detergents and Ammonia.
- Assess the risk to the human health, aquatic life and the quality of receiving waters.

1.3 Scope of Work

- Brief introductory information will be noted to provide context to the report and will include an Introduction, Project Overview, Scope of Work and Limitations.
- In order to identify contamination in sampled water, 1 x sample will be taken from water at the site and analysed for TVC (37°C), E.coli, Total Coliforms, Enterococci, Salmonella, Clostridia, pH, Detergents and Free Ammonia in a UKAS accredited laboratory.
- Results of laboratory testing will be assessed with reference to suitable screening values, including Environment Agency and World Health Organisation (WHO) guidelines, The Water Framework Directive Environmental Quality Standards and Generic Assessment Criteria (GAC), to assess the risk to human health, aquatic life and the quality of receiving waters.
- This information will be used to provide a clear, easy to understand and actionable summary of results, and assess the requirement for further investigations.
- Report will be carried out, by professional Environmental Consultants with BSc (Hons) in Environmental Science or above, in accordance with appropriate technical guidelines, which may include The Water Framework Directive and Oakshire Environmental reporting guidelines.

1.4 Limitations

Quantum Intelligent Trading Ltd is previously and hereafter referred to as “Oakshire Environmental” or “the company”. Oakshire Environmental has exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant when undertaking works of this nature. This report is only valid when used in its entirety and any information or advice contained within the report should not be relied upon until considered in the context of the whole report. Oakshire Environmental disclaims any responsibility to the client, as named on the front of this report (“the client”), and others in respect of any matters outside the scope of this work. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate. This report has been prepared solely for the benefit of the client and any other party using or placing reliance upon any information contained in this report does so at their own risk. Oakshire Environmental accepts no responsibility or liability for the contents of this report being used for any purpose or project for which it was not commissioned. Oakshire Environmental accepts no liability whatsoever for any loss or damage arising from the interpretation or use of this report and in no event shall the company be liable for any punitive, exemplary or other special damages, or for any indirect, incidental or consequential damages, including with respect to the performance or non-performance of any services, whether arising under breach of contract, tort or any other legal theory, and regardless of whether the company has been advised of, knew of, or should have known of the possibility of such damages. Furthermore, Oakshire Environmental does not accept any liability for the consequences of any legislative changes or the release of subsequent guidance documentation and following delivery of the report has no obligation to advise the client or any other party of such changes or their repercussions.

This report excludes consideration of potential hazards arising from any activities at the site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities. Oakshire Environmental does not warrant or guarantee that the site is free of hazardous or potentially hazardous materials or conditions. It should be noted that this report has been produced for environmental purposes only.

Oakshire Environmental cannot be held responsible for incorrect analysis of samples. The information and conclusions provided in this report are limited to, and representative of, the samples taken and cannot be extended to apply to the whole site, in addition, Oakshire Environmental cannot guarantee the accuracy of analysis for samples not taken at the source by the company or those which deviate due to exceedance of holding time or inappropriate sampling practises. The findings and/or recommendations of this report do not take into account any conditions that may be present but have hitherto not been encountered and as such further investigation and/or a reconsideration of the findings of this report should be undertaken if such conditions are subsequently encountered or an alternative development plan or land use is subsequently proposed.

2. Site

The following section describes the site and outlines the details of proposed project.

2.1 Site Description and Location

The site is located on land to the north of Horley Sewage Treatment Works, Horley, Surrey, RH6 8FX.

National Grid Reference: TQ 26983 43779

2.2 Proposed Project

Water contamination testing has been requested by the client, to identify and assess potential bacteria, ammonia and detergent contamination in sampled water from the site, following recent flooding and the potential associated release of sewage.

3. Methodology

3.1 Sampling Methodology

One water sample was taken by the client, on 5th January 2024, and placed into sealed sample containers. Water sample containers used were filled as much as possible, to ensure a suitable sample size was obtained for laboratory analysis.

3.2 Health & Safety

When collecting potentially contaminated water samples it must be assumed that the water is contaminated in order to protect the health of the assessor, Personal Protective Equipment (PPE) was used during the sampling process to mitigate this risk. Sample containers were packed with biodegradable fill for protection and placed in a sealed container for transportation to the laboratory.

3.3 Testing Methodology

UKAS accredited laboratory testing included a suite of microbiological and chemical contaminants, including TVC (37°C), E.coli, Total Coliforms, Enterococci, Salmonella, Clostridia, pH, Ammonia and Detergents.

4. Evaluation of Results

4.1 Screening Values

Results of laboratory testing of water samples were analysed by comparing them to the Bathing Water Standards set out by Environment Agency. These are generally used to assess the quality of water with regards to potential harm to human health and provide a classification from 'Excellent' to 'Poor' based on faecal bacteria concentrations. Results were also compared to World Health Organisation (WHO) Guidelines for drinking-water quality. These guidelines include standards provided by the WHO that are used to manage the risk from hazards that may compromise the safety of drinking water. Screening values take a conservative approach to assessing potential risk and concentrations below these values can be considered to represent 'uncontaminated conditions' which pose a 'LOW' risk.

It is important to note that exceedance of a relevant screening value does not necessarily constitute evidence of either a 'significant possibility of significant harm' or the need for treatment. Rather such exceedance should usually trigger a further detailed quantitative risk assessment, where site-specific parameters are used to derive site-specific assessment criteria. Common sense tells us, and a robust risk evaluation reveals, that a gross exceedance is a good indicator that an unacceptable risk is present.

4.2 Summary of Results

- Clostridia concentration was below the laboratory limit of detection, suggesting this faecal indicator organisms is not present in sampled water
- E.coli and Enterococci concentrations were very high, with the quality of sampled water considered 'Poor', according to Environment Agency bathing water standards
- Salmonella concentration was below the laboratory limit of detection
- Total Coliform concentration was very high
- Aerobic Colony Count (ACC) at 37 degrees concentration was very high, suggesting sampled water contains very high concentrations of bacteria
- Ammonia concentration was very high and significantly exceeded the Long Term Standard for freshwater
- pH was slightly acidic
- Detergent concentration was low

4.3 Conclusions

Based on the results of laboratory testing, sampled water was found to contain very high concentrations of ammonia and bacteria, including faecal indicator organisms, and is considered to present a risk to human health, aquatic life and the quality of receiving waters, in addition, the identified contamination suggests that sampled water has been impacted by sewage.

It should be noted that the potential level of risk posed by a particular source is determined by assessing the potential severity of the impact of the contaminant linkage on a receptor, if it is assumed to be present, and the probability of the contaminant linkage being present.

5. References

Environment Agency *Land contamination: risk management*. [online] Available at: <gov.uk/guidance/land-contamination-how-to-manage-the-risks>.

The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

World Health Organization, 2017. *Guidelines for drinking-water quality: fourth edition incorporating the first addendum*. Geneva. Licence: CC BY-NC-SA 3.0 IGO.

Oakshire Environmental. Available at: <oakshireenvironmental.co.uk>

Sample ID	W01
Sampling Date	05/01/2024
Sampling Time	-

Determinand	Codes	Units	LOD	
Inorganics				
Free ammonia (NH3)	N	mg/l	0.1	6.1
Miscellaneous				
pH	U	pH units	0.1	6.6
Anionic surfactants	N	mg/l	0.2	0.2
Microbiology				
ACC @ 37°C		cfu/100ml	100	280000000
E. coli		cfu/100ml	100	1080000
Total Coliforms		cfu/100ml	100	11000000
Sulphite Reducing Clostridia		cfu/100ml	100	<100
Enterococci		cfu/100ml	100	670000
Salmonella spp.		cfu/100ml	100	<100

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Water					
pH of waters	U		15/01/2024	113	Electromeric
Ammonia in waters	N		15/01/2024	151	Colorimetry
Anionic surfactants	N		15/01/2024	HACH DE-2	Colorimetry

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"
CFU	Colony Forming Units
ACC	Aerobic Colony Count

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage