



Feidhmeannacht na Seirbhíse Sláinte  
Health Service Executive

# Bathing Water Contamination: Public Health Risk Assessment

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*HSE Bathing Water Training Day, March 13<sup>th</sup> 2019*

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# Presentation Overview

- Types of Bathing Water incidents
- Notification and response to BW incident
- In-depth Public health risk assessment (PHRA)
- Harmful Algae Blooms

# Bathing Water Incident

## Potential for an adverse impact on bathing water quality or the health of bathers

- Microbiological exceedances
- Sewage spill
- Proliferation of cyanobacteria
- Poisonous jelly fish
- Oil pollution
- Rodent infestation

# Notification of BW Incident

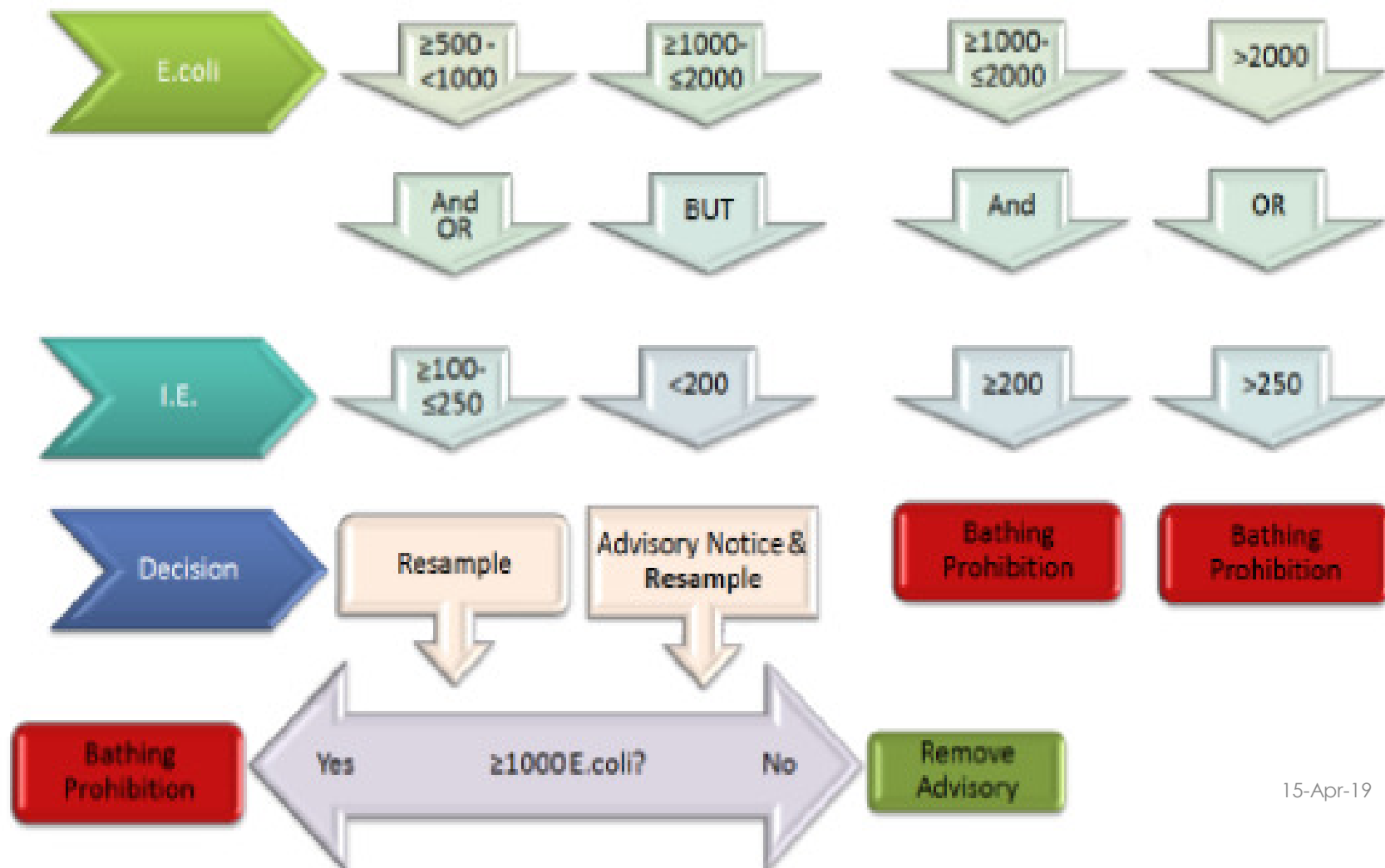
## Consider

- ▶ Is the unsatisfactory water sample result unexpected?
- ▶ Is it likely that the reported contamination incident will adversely affect human health?
- ▶ Is there an on-going risk to human health, e.g. the bathing area is a popular bathing area, or there are planned events?
- ▶ Are there known recent cases of illness linked to this bathing water?

## Table 1: Action levels in response to microbiological sample results

<i>Escherichia coli</i>	Intestinal enterococci	Recommended Action *
> 2,000 E.coli	OR > 250 I.E.	Issue of a Bathing Prohibition Notice (Appendix 8)
≥1,000 - ≤2000 E.coli	AND ≥ 200 I.E.	Issue of a Bathing Prohibition Notice (Appendix 8)
≥1,000 - ≤2000 E.coli	BUT < 200 I.E.	Issue of a Bathing Advisory Notice (Appendix 7) and re-sample immediately
If re-sample is still ≥ 1000 E.coli		Issue of a Bathing Prohibition Notice (Appendix 8)
≥500 - <1,000 E.coli I.E.	AND/OR ≥100 - ≤250 I.E.	Monitor situation and re-sample. Decision based on evidence available/details of pollution event.
Any gross malfunction or leakage of the sewerage system or visual reports of sewage		Issue of a Bathing Prohibition Notice (until the status of the bathing water quality can be verified).
Where any results are close to HSE bacterial action levels (up to 10% below any action level) and/or not typical, a precautionary approach is advised with the issue of an appropriate bathing water notice.		

# Action Levels in response to microbiological sample results



# In-depth Risk Assessment

- Probable source of contamination
- Take into account beach profile
- Previous sample history
- Period of exposure
- Potential population exposed
- Evidence of human illness

Review the Information Checklist in Table A 2.1 in Appendix 2



← Find a Beach

Save to Favourites

# Salthill Beach

View Gallery

Map

Report Issue

## Salthill Beach

Galway



Water Quality  
Excellent

15-Apr-19



## Historical Water Quality



**Excellent**

Galway City Council

Sampled on 10/09/2018

## Historical Results

The water quality of each sample is assessed as either 'Excellent', 'Good', 'Sufficient' or 'Poor'.

Sample Date	E. coli	Intestinal Enterococci	Water Sample Quality Status
10/09/2018	10	3	Excellent
27/08/2018	63	3	Excellent
13/08/2018	10	7	Excellent
30/07/2018	10	2	Excellent

Predictions

Choose a date

## Lifeguard Information

[Click here](#) to view lifeguard information

Download Beach Profile 

# PHRA –continued

## Surveillance

- Recent notifications of possible waterborne origin
- May need to undertake active surveillance

## Control

- Investigate any potential links as per ID Regs 1981
- Ensure any remaining threat to public health is controlled

# Harmful Algae Blooms

- ▶ Algae are natural inhabitants of water
- ▶ *“Harmful algae blooms are excessive accumulations of microscopic photosynthesizing aquatic organisms that produce biotoxins or otherwise adversely affect humans, animals and ecosystems”\**
- ▶ Cyanobacteria or blue-green algae can produce toxins which are harmful to humans and animals—hepatotoxins, neurotoxins and endotoxin

\*Hillborn ED, Roberts VA, Backer L, DeConno E, Egan J, Hyde JB et al. Algal-bloom associated disease outbreaks among users of freshwater lakes, United States, 2009-2010. MMWR 10/1/2014 Vol 63, 1

# PHRA –Possible Harmful Algae Bloom

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## 1. Assessment of water body characteristics and use

- ▶ Type and size of water body
- ▶ Type of water use - Higher risk from immersive/swallowing exposure to lower risk from non-contact uses
- ▶ Reports of human or animal illness, dead fish, etc

## 2. Assessment of nature and intensity of bloom

- ▶ History – occurrence, duration, size
- ▶ Presence and size of bloom, presence of scum on surface or shoreline
- ▶ Location of bloom or scum in relation to human / animal exposure
- ▶ Wind direction – may move scum, bloom

# PHRA –Possible Harmful Algae

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## Bloom

### 3. Cyanobacterial characterisation (species and cell count confirmation)

- Confirmation, speciation
- Count per ml/ micrograms of chlorophyll-a per litre as per Table A2.2

### 4. Comparison of cell count with WHO guidance levels – see Table A2.2

- If there is a concern about exposure risk and no lab results, safest to assume toxicity initially and prohibit water use

**Table A2.2 - WHO Guidelines for safe practice in managing bathing waters which may produce or contain cyanobacterial cells and/or toxins<sup>1</sup>**

<b>Guidance level or situation</b>	<b>How guidance level derived</b>	<b>Health risks</b>	<b>Recommended action</b>
Cyanobacterial scum formation in bathing areas	Inference from oral animal lethal poisonings Actual human illness case histories	Potential for acute poisoning Potential for long-term illness with some cyanobacterial species Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness	Immediate action to prevent contact with scums; possible prohibition of swimming and other water-contact activities Public health follow-up investigation Inform relevant authorities and services
100,000 cells cyanobacteria per ml or 50 µg chlorophyll a per litre with dominance of cyanobacteria	From provisional drinking water guideline for microcystin-LR, and data concerning other cyanotoxins	Potential for long-term illness with some cyanobacterial species Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness	Watch for scums Restrict bathing and further investigate hazard Post on-site risk advisory signs Inform relevant authorities and services
20,000 cells cyanobacteria per ml or 10 µg chlorophyll a per litre with dominance of cyanobacteria	From human bathing epidemiological study	Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness, probably at low frequency	Post on-site risk advisory signs Inform relevant authorities and services

The screenshot shows a web browser window displaying the HSE website. The address bar shows the URL: <https://www.hse.ie/eng/health/hl/water/bathing/bathing%20water.html>. The page header features the HSE logo and the text "Health Service Executive Feidhmeannacht na Seirbhíse Sláinte". A search bar contains the text "How can we help you?". The main navigation menu includes "Health Services", "Health A-Z", "Staff & Careers", and "About Us". The breadcrumb trail reads: Home > Healthy Ireland > Water and Public Health > Bathing Water. The page title is "Bathing Water and Health". A sidebar on the left lists "Water and Public Health" with sub-links for "Bathing Water" and "Drinking Water". The main content area contains the following text: "Ireland - with its long coastline, beautiful beaches, inland waterways and lakes - provides many opportunities for water-based activities. Swimming and other water-based recreation can have important benefits for health and well-being. However, the natural environment can become contaminated, for example by inadequately treated wastewater and agricultural run-off. This can happen especially after heavy rainfall or with flooding. Therefore, some of the places where people swim regularly are selected by the Local Authorities so that they can be carefully monitored to ensure the quality of bathing water is maintained in these popular places. The Local Authorities work with the Environmental Protection Agency in the implementation of the [Bathing Water Quality Regulations, 2008](#). Information on these monitored bathing sites can be found on the [Beaches.ie](#) website. The Health Service Executive assists in the protection of the health of the public in relation to bathing water by advocating a safe environment and by providing a timely response to incidents when they do occur. The HSE Bathing Water Group has developed [Guidance](#) for HSE staff in Departments of Public Health and in the Environmental Health Service to maximise our efficiency and effectiveness towards protecting health. In addition, the Public Health Bathing Water Group publish [Annual Reports on Bathing Water](#)." The Windows taskbar at the bottom shows the time as 11:52 on 11/03/2019.