

## Activated Sludge Foaming Questionnaire

Please fill in the following questionnaire as accurately as possible. The data collected will be form the basis of a model which then will be used as a guide to operators running activated sludge trying to avoid foam production.

### Contact Information

Facility Name:	Contact Name:
Facility Address:	Contact Number:
Email Address:	Facility Type:

### Process Types

Type of activated sludge plant (Indicate appropriate answer with 'X'):

Plug-Flow (Fine bubble diffused aeration):	<input type="checkbox"/>	Completely mixed	<input type="checkbox"/>
Tapered aeration:	<input type="checkbox"/>	Pure oxygen	<input type="checkbox"/>
Step fed aeration:	<input type="checkbox"/>	SBR	<input type="checkbox"/>
Extended aeration (oxidation ditch)	<input type="checkbox"/>		
Extended aeration (other)	<input type="checkbox"/>		

If SBR define duration of each step (in hours)

Fill	<input type="checkbox"/>	React	<input type="checkbox"/>
Settle	<input type="checkbox"/>	Draw	<input type="checkbox"/>

### Plant Design

Number of aeration tanks/basins:	_____	Tank dimensions (m):	Length/diameter	_____	
		(Approximate)	Width	_____	
Total aeration tank capacity (m <sup>3</sup> )	_____		Depth	_____	
Total final settlement tank capacity (m <sup>3</sup> )	_____				
Total population equivalent (PE) treated	_____				
Design dry weather flow (m <sup>3</sup> /d)	_____				
Approximate full flow to treatment (m <sup>3</sup> /d)	_____				
Approximate average return flows to the head of the works			_____ % average flow		
Is your plant designed to		a) nitrify	<input type="checkbox"/>	b) de-nitrify	<input type="checkbox"/>
(Indicate appropriate answer with 'X')					

Types of treated wastewater treated (Indicate appropriate answer with 'X')

Domestic   
 Industrial   
 Municipal

Please state the relative proportions of domestic to industrial influent \_\_\_\_\_

Do you ever receive wastewaters from the following sources  
 (Indicate appropriate answer with 'X')

Agriculture   
 Food processing plants   
 Septic tanks/Cesspools   
 Landfill   
 Sources high in fats and oils  Please describe: \_\_\_\_\_  
 Sources of soaps and surfactants  Please describe: \_\_\_\_\_

How much sludge is hauled off site on a weekly basis? \_\_\_\_\_ m<sup>3</sup>

Please specify if there are anoxic or anaerobic stages, and where they occur  
 (before, after or within the aeration tank)?

anoxic  Location \_\_\_\_\_  
 anaerobic  Location \_\_\_\_\_

### Running Conditions

What is the typical MLSS that the plant is run at? \_\_\_\_\_ mg/l

What is the typical F/M that the plant is run at? \_\_\_\_\_ kgBOD/kgMLSS

What is the typical sludge age that the plant is run at? \_\_\_\_\_ days

Are chemicals dosed for phosphorus removal?  Yes  No

Are anti-foam agents used?  Yes  No



Are chemicals dosed directly into the aeration basin? (Please state what and approximately how much)

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What is the average dissolved oxygen (DO) within the aeration basin? \_\_\_\_\_

Does the level of dissolved oxygen in the basin ever get as low as 1.0 mgO<sub>2</sub>/l?  Yes  No

What time (season) in the year has foaming been experienced? \_\_\_\_\_

What is the average pH of the settled sewage? \_\_\_\_\_

(Please mark appropriate method used with an 'X')

Primary Tank Scum Box	<input type="checkbox"/>
Dissolved air floatation (DAFF)	<input type="checkbox"/>
Other	<input type="checkbox"/>
No removal of FOG	<input type="checkbox"/>

### Activated sludge foaming

Are you currently experiencing foaming issues within your plant?  Yes  No

Where is the foam? a) Final settlement tanks  b) On the aeration basins   
c) Digester foaming

When approximately was the last time you experienced a foaming event? \_\_\_\_\_

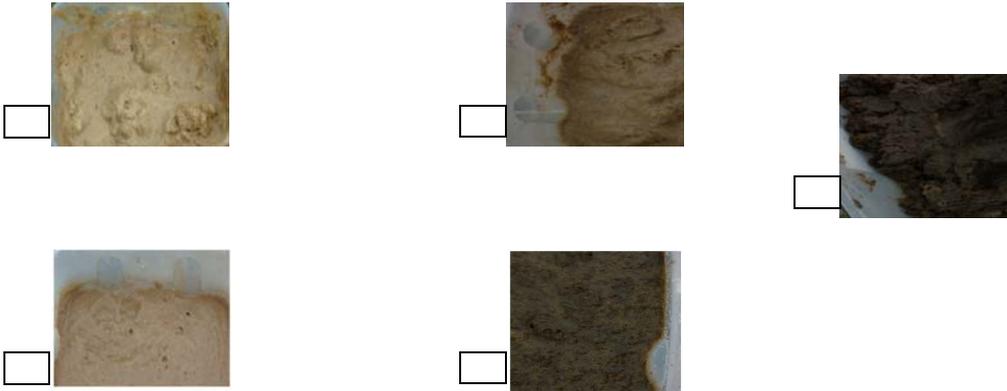
Please state the approximate frequency of foam development on the aeration basin?  
(Indicate appropriate answer with 'X')

Foam occurs at least four times per a year	<input type="checkbox"/>
Foam occurs at least twice a year	<input type="checkbox"/>
Foam occurs only about once a year	<input type="checkbox"/>
Foam normally very rarely occurs	<input type="checkbox"/>

Is the foam overflowing from your aeration basin?  Yes  No

Is the foam distinct 'white' in colour?  Yes  No

If foam is not a distinct white colour then please mark the colour with an 'X' that most closely represents that of your foam?



If none of the pictures correlate well with the colour of your foam then please describe the foam further?

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Please state the level of foam in your activated sludge plant (Indicate appropriate answer with 'X')

10 % (light froth in corners)    
  25% (\*foam in corners meeting at sidewall)    
  50%    
  70% (\*2/3 of plant covered inc patches of foam in middle)    
  100% Total coverage

\* Example in the case of a completely mixed system

What happens when the foam is sprayed with water?

No Dispersal    
  Partial removal (on persistence)    
  Quick dispersion

Visually observe the bubble size within the aeration basin; please can you estimate the average bubble size?

> 5mm    
  2-5mm    
  1-2mm    
  ≤ 1mm

Are there any surface restrictions, regions within your plant where foam have found to become trapped and accumulate? e.g. baffles, pipe work and ducting, scum boards etc (Please specify)

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Has a microscopic evaluation been previously performed on the mixed liquor within your aeration zone?  
If so what were the findings?

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What procedures have you carried out to remove the foam and were they successful (Please specify)?

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### Problems and plant performance

What would be a typical SVI value be recorded from your plant? \_\_\_\_\_ ml/g

Do you ever record values of SVI greater than 120ml/g?  Yes  No

Has there been a recorded or suspect organic shock loading received by the plant in recent times?

Yes  No

Is the plant currently running at design capacity or is it a) overloaded b) under-loaded,  
Mark appropriate box with 'X'. Please elaborate further if possible?

Overloaded  \_\_\_\_\_

Under-loaded  \_\_\_\_\_

Do you ever suffer from any of the following sludge settlement in your final tanks problems:-  
(Indicate appropriate answer with 'X')

Rising sludge (caused by excessive de-nitrification)

Filamentous bulking (noted by slow and poorly settling sludge)

Pin-flocs (small weak flocs on surface of tank leading to turbid effluent)

Do you believe that foam issues within your plant are related to over aeration? For example, is the aerator employed too vigorous or large for the aeration tank?

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Do you ever experience problems with sludge de-waterability?  Yes  No

Do septic conditions occur within your final tanks?  Yes  No

Has there ever been an event whereby the aeration system in your plant has failed? If so, please explain what happened?

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Thank you very much for your time in completing this questionnaire.

Please email or electronic copies to [fryerm@tcd.ie](mailto:fryerm@tcd.ie) or  
Send hard copies to:

Martin Fryer  
Centre for the Environment  
Trinity College  
Dublin 2  
Ireland

If you would like to be kept informed of the progress of the project then please ensure that you provide a contact name and email address at the beginning of the questionnaire.

For further details of project see: <http://www.irelandswater.com/research/foaming.html>

