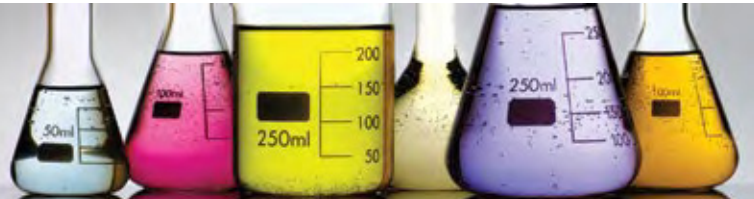




TESTMARK Laboratories Ltd.
Committed to Quality and Service



elements

COMPLIANCE WITH CANADA'S NEWEST WASTEWATER REGULATION *pH STABILIZATION TESTING* – Are You Ready?



in this issue

Consider Your Lab Your Partner!
WHAT WE CAN DO FOR YOU

Compliance with Canada's
Newest Wastewater Regulation
pH Stabilization Testing

- **BACKGROUND**
- **PH STABILIZATION TESTING**
- **WHAT TO EXPECT FROM YOUR LAB**

“... Compliance means meeting the required monitoring, record keeping, and reporting requirements laid out in the Regulation. And unless you've been granted a transitional authorized standard, compliance also means meeting the following national effluent quality standards for deleterious substances...”

[full article inside ►](#)



COMPLIANCE WITH CANADA'S NEWEST WASTEWATER REGULATION **pH STABILIZATION TESTING** — ARE YOU READY?

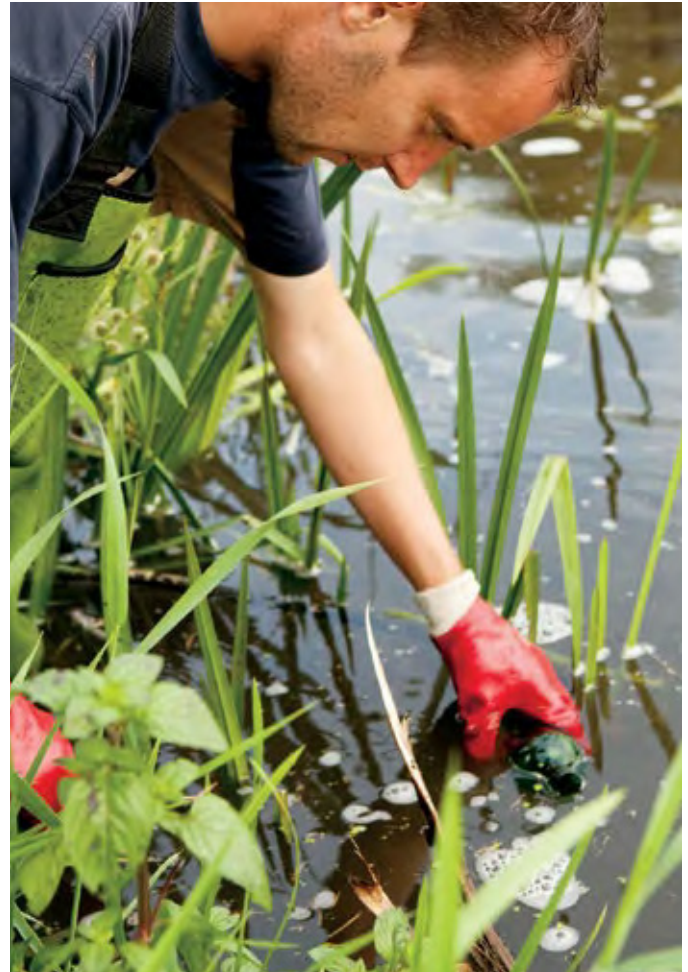
1 BACKGROUND:

If you are operating a wastewater system in Canada (with a few regional exceptions) with a daily effluent volume of 10m³ or more from a final discharge point, and that deposits a deleterious substance to surface water you should already be complying with the Canadian Wastewater Systems Effluent Regulations under Canada's Fisheries Act. Compliance means meeting the required monitoring, record keeping, and reporting requirements laid out in the Regulation. And unless you've been granted a transitional authorized standard, compliance also means meeting the following national effluent quality standards for deleterious substances:

- Average CBOD \leq 25 mg/L
- Average TSS \leq 25 mg/L
- Average total residual chlorine \leq 0.02 mg/L; and
- Maximum concentration of un-ionized ammonia $<$ 1.25 mg/L @ 15°C

Average can refer to a quarterly or monthly average, depending on the annual average daily volume of effluent deposited from the final discharge point of the system.

Toxicity testing is an important part of the required wastewater monitoring. Systems must test effluent for acute lethality to Rainbow Trout with a laboratory that holds accreditation for that test under *ISO 17025*. Rainbow Trout are considered indicator species and are the "canaries in the mine" for the purpose of assessing toxicity of effluent. Testing is either monthly or quarterly, depending on the average daily volume of discharge from the final discharge point, and may be reduced should consecutive results show no toxic response. Similarly, sampling frequency will increase if toxicity is apparent.



2 pH STABILIZATION TESTING:

Should your wastewater system yield a lethal response to either a single-concentration (acute) or a multi-concentration (LC50) toxicity test and it is NOT due to elevated levels of ammonia, you should proceed to test another effluent sample through the pH Stabilization Test. This test controls the pH of a sample throughout the 5 day test and rules out the possibility that pH drift during the initial test was the cause of fish mortality. How does pH drift occur? — During a standard toxicity test, samples are aerated to ensure the fish have adequate oxygen. For some samples, the effect of this aeration can alter the pH of the sample during the test. This



is particularly evident in waste water samples as they often have high biological activity due to their organic nature and therefore higher CO₂ levels. Aeration during the test itself decreases the concentration of CO₂ which in turn raises the pH (as the sample becomes less acidic — recall that CO₂ creates carbonic acid and lowers pH). The pH Stabilization test is intended to rule out the phenomena known as pH drift as the reason for the fish mortality. This test method requires an accredited lab to maintain a constant pH for the duration of the test — keep it at the same level it was when it arrived at the lab and was brought to 15°C.

3 WHAT TO EXPECT FROM YOUR LAB:

Testmark is in the final stages of accreditation for the pH Stabilization Method (EPS1/RM/50) using the approved pH Controller technique. The test can be administered either as a single concentration (acute) toxicity test, or an LC50 toxicity test with multiple dilutions. Your lab report will include initial conditions for the test (with the sample brought to 15°C), including

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Did you know that Testmark, and our sister-lab Accuracy Environmental Laboratories can assist you out of four convenient locations — Sudbury (Garson), Mississauga, Timmins and Kirkland Lake?

SEE WHAT ELSE WE CAN DO FOR YOU:

- Pre-labelled sampling bottles and customized Chains of Custody to save you time
- Functional reports that allow you to compare your results with common Regulation criteria *PLUS* the ability to request customized reports that compare your data to your unique operational limits
- IT solutions that meet your needs — customized XML, CSV or other macro-driven output files that can auto-populate your databases or spreadsheets and avoid manual data entry on your end
- The ability to set standing orders on your samples such as cuing further testing should a sample result exceed your threshold

All this, along with fair prices, customized service and knowledgeable staff. Call us today and see how you can get more from your lab!

What To Expect From Your Lab (continued):

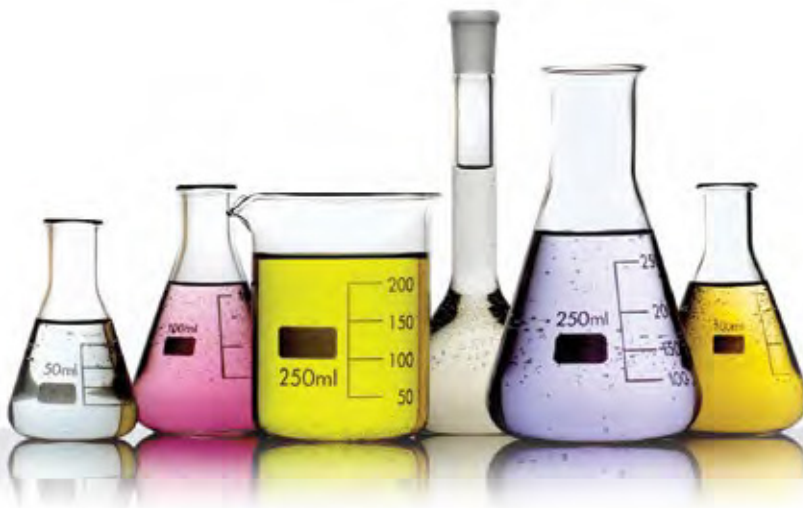
initial pH, total ammonia (measured NH_3 plus calculated NH_4^+), hardness and residual chlorine. Note that residual chlorine is only measured if the fish exhibit stress when introduced to the sample. If the total residual chlorine is greater than 0.1 mg/L the lab will contact you and won't proceed with the test as the chlorine is considered to be the adverse factor and there is no point in continuing with a pH stabilization trial. Your report will also indicate pH results taken at 0 hours, 24 hours, 48 hours, 72 hours and 96 hours, as well as the average pH for the duration of the test.

A favourable result from the lab (from your perspective) would show no toxic response from the pH stabilization toxicity test. This basically confirms that the previous toxicity failure (from your former sample) was likely due to the test itself (i.e. from pH drift due to aeration of the sample). However,

if the pH stabilization test yields a toxicity failure, it suggests that there is something in your effluent besides ammonia that is harmful. It would be prudent to have the lab test the sample further in such cases to try to identify the possible contaminants.

From a quality control perspective, the test is considered invalid if the average pH in the 100% effluent sample is observed to shift more than 0.2 units from the initial pH, if an instantaneous pH reading in the 100% effluent is observed to shift more than 0.3 units from the initial pH, or if over 10% of fish die or exhibit an adverse response in the laboratory control. Specific to the LC50 test, the test is considered null if fish mortality is observed in the diluted effluent but not in the 100% effluent.

Contact us at customer.service@testmark.ca for more information on Testmark's toxicity testing.



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