HydroQual
Laboratories Ltd.

G50-Microtox

#3, 6125 12th Street SE
Calgary, Alberta
Canada T2H 2K1
Tel (403) 253-7121
Fax (403) 252-9363

Client: Syntroleum
Operation: Tulsa
Address: 1350 S. Boulder Ste 1100
City: Tulsa
Province/State: Oklahoma
Country: USA
Postal/ZIP Code: 74119
Tel: 918-592-7900
Contact: Bob Freerks

Client#: 2002117
Sample#: 20011446
Test#: 20022860
Field Ticket: not given
Job Number:

Fax: 918-592-7979

Sample:

Operator:	Unique ID:	Location:	Sample ID:	Sample Type:
Syntroleum	not applicable	not applicable	SLP-15	product

Collected on: na
Received on: na
Collected by: na
Sample Container: 1 x 1L amber glass
Sample pH: 6.5 @ 1000 L/m^3

Sample Description: clear liquid
Sample Odour: chemical
Visible oil: no
Sent for O&G no

Sample Pretreatment

pH Adjustment	Centrifuged (min)	Supernatant	Other pretreatment:
not applicable	20	clear	none

Test Results

Test Description	EC20	EC50	PASS/FAIL
MTX Threshold	0.28% (0.26-0.30)	0.94% (0.89-0.99)	**not applicable**
MTX Confirmation			
@0.85%	41%(22-75)	>91%	**PASS**

Comments: not water soluble - tested water accomodated fraction-nominal values expressed

MTX= Microtox EC50 procedure; MTXC= Microtox after charcoal treatment on clarified sample for 10 minutes; MTX-CC= Microtox with colour correction, performed on clarified supernatant; MTX-XT=Microtox on supernatant from a 1:1 extraction of solid using deionized water for 1 hr; H02/H03:=oil analysis on samples failing MTX, but passing on MTXC. Sublet to WSH Laboratories Ltd.; Pass/Fail = A microtox result which has an EC50 ≥ 75% is a "PASS" according to G50 regulations;

Test Method Reference: Appendix 1: Microtox Bioassay Procedure, Drilling Waste management, Guide G50. 1996. Alberta Energy and Utilities Board, Calgary AB.

Analyzed:	2002/08/15	By:	KC
Faxed:	2002/08/20	By:	ICD
Reported:	2002/08/20	By:	ICD
Phoned:	na	By:	

All criteria have been met for a valid test and the test data and results are verified correct.
(Preliminary reports are not signed; all final reports must be signed)

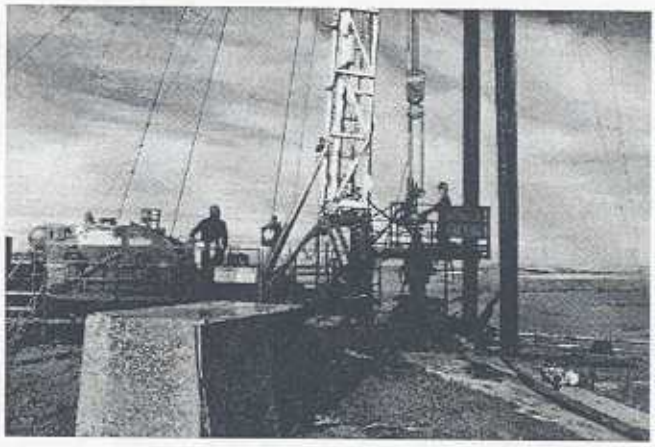
Verified by: Kimberlin Steele

Remediation Support Services

Guide 50 (G50) Drilling Waste Testing

HydroQual tests drilling waste for the oil and gas industry, in adherence with the Guide 50 Drilling Waste Management guidelines.

According to the G50 guidelines, toxicity testing is required for disposals where potentially toxic drilling products have been used to facilitate the drilling process.



HydroQual provides Microtox™ testing of sumps, products and other materials on request. Microtox™ involves exposing luminescent marine bacteria to a sample and measuring light output. Changes in light output indicate if a sample is stressful or toxic.

It is an indicator for assessing potentially harmful effects to vegetation, microbes and other life forms.

Requirements

- A waste sump must pass Microtox™ with an EC50 ≥75%
- If sump wastes are below 75% then they 'fail' and must be treated, retested and pass prior to disposal

Experience and Services

- Experts working with problem sumps and identifying toxic constituents in samples (TIE)
- Product testing (help develop non-toxic drilling formulations)
- Testing in lab or on site
- Available 24 hours/day, 365 days/year
- Rapid turnaround time

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