Core Lab
RESERVOIR OPTIMIZATION

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SAMPLE	Super "C" Concentrate	FILE	52137-2013-2030
PROJECT	H_2S Sequestration Analysis	DATE	17-Oct-13

SCOPE OF WORK

To determine the H_2S sequestration capabilities of Super "C" Concentrate at various concentrations in water.

SAMPLE DESCRIPTION

Sample ID:	Super "C" Concentrate (Clean All)	Date Analyzed:	6-Aug-13
Description:	Fluid, Colloidal Cleaner & Degreaser	Analyst:	RH

RESULTS AND COMMENTS

Phase 1: Testing with a Fixed Super "C" Volume

A glass gas cylinder was filled with 150g of a 20:1[1] dilution of Super "C" Concentrate with tap water. Subsequently the solution was bubbled with 1 mole % H_2S at approximately 5 mL/min (gas inlet). As the gas exited the solution it was captured and analyzed for H_2S by Gas Chromatography (gas outlet). The effects on H_2S concentration after treatment are shown in **Table 1**.

The same experiment was repeated using a 35:1 and 50:1 dilution of Super "C" Concentrate with tap water. These results can be found in **Table 2** and **Table 3**, respectively

Table 1. H_2S concentration after bubbling through a 20:1 mixture of Super "C" Concentrate in water.

Time (min)	H_2S Detected by GC at Gas Outlet (ppm)
0	< 1
60	< 1
120	< 1
240	2.4

[1] For the purposes of this report, any dilutions made refer to Super "C" Concentrate dilutions in tap water. (i.e. A 20:1 dilution refers to 1 part Super "C" Conctentrate and 20 parts tap water.)

Table 2. H_2S concentration after bubbling through a 35:1 mixture of Super "C" Concentrate in water.

Time (min)	H_2S Detected by GC at Gas Outlet (ppm)
0	< 1
60	< 1
120	1.0
240	11

Table 3. H_2S concentration after bubbling through a 50:1 mixture of Super "C" Concentrate in water.

Time (min)	H_2S Detected by GC at Gas Outlet (ppm)
0	< 1
60	< 1
150	2.5
240	8.5

Phase 2: Testing with a Fixed H_2S Volume

A glass gas cylinder was charged with H_2S to yield a 1% H_2S (v/v) atmosphere (i.e. 10 000 ppm). Subsequently, various volumes of 35:1 Super "C" Concentrate diluted in tap water were introduced into the cylinder and the cylinder was shaken vigorously. An aliquot of sample was then removed from the cylinder and analyzed for H_2S by Gas Chromatography. The treatment effects of 35:1 Super "C" Concentrate in tap water on H_2S mass and volume are shown in **Table 4**, and are depicted in **Figure 1**.

Table 4. Results of 35:1 Super "C" Concentrate (in water) treatment on a 1% H_2S (v/v) atmosphere.

Volume of 35:1 Solution Used (mL)	Amount of H_2S *in Cylinder* After Treatment		Amount of H_2S *Removed* After Treatment	
	(mg of H_2S)	(ppm of H_2S)	(mg of H_2S)	(Mass % of H_2S)
0	4.605	10 000	0.000	0.0
1	2.358	5120	2.247	48.8
5	0.231	501	4.374	95.0
10	0.093	201	4.512	98.0

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Figure 1. Overall trends in the 35:1 Super "C" Concentrate (in water) treatment on a 1% H_2S (v/v) atmosphere.