

- **INVESTIGATING FUEL CONTAMINATION AT SOLID ENERGY NORTH CAUSING CONSTANT FUEL FILTER BLOCKING**
- **TEST CHORNCO 2082 DIESEL FUEL TREATMENT AND ITS ABILITY TO DEAL WITH THE CONTAMINATION**

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11 Shoal Bay Road
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FEBRUARY 2003

INTRODUCTION

During tests and trials carried out at Solid Energy North to reduce exhaust gas emissions for underground vehicles it was found that fuel filter blocking presented a serious problem.

The vehicle identified for test had recently been the subject of a Kinetic Flush cleaning the fuel system. Nevertheless the filter and water trap showed signs of contamination with heavy deposits.

As a result samples were taken from the machine in question and from the central bulk storage tank, which were delivered to Oil Inspection Limited in Wellington, New Zealand for independent analysis and testing.

FINDINGS

The results identified:

Fungi Contamination

Storage Tank	-	Slight
Vehicle	-	Heavy

Bacteria Contamination

Storage Tank	-	Heavy
Vehicle	-	Heavy

Yeast Contamination

Storage Tank	-	Slight
Vehicle	-	Slight

TREATMENT PROTOCOL

Chorncoco 2082 Diesel Fuel Condition was added directly to the vehicle fuel tank in accordance with the company's protocol for older vehicles – 1 litre to 640 litres (1:640). This is a multifunctional product which does not include any chemical biocides.

The vehicle was then operational over a period of two weeks before further fuel sampling was carried out and sent to Oil Inspections Limited for analysis.

RESULTS

The test results demonstrated that, following treatment, there was no contamination. The attached reports from Oil Inspections Limited identify the findings, before and after treatment.

CONCLUSIONS

The Chorncoco 2082 Diesel Fuel Treatment quickly cleaned the bacteria from the diesel fuel. Tests show that the main fuel storage tank and the operational vehicles have no sign of bacteria present and the tank continues to be treated with the product.



G. McLean
C Eng., MRAeS, MIMech E.

(Attachments from O.I.L.)

10 August, 2002

Solid Energy North
East Mine Road
Private Bag 502
HUNTLY

Ref Lab No A35226-27

Attention: **Don Woods**

cc George McLean

Dear Mr Woods

Re: DIESEL FUEL EX VEHICLE 4 AND BULK TANK

On 1 August 2002 George McLean delivered two samples of diesel fuel to our laboratory. We were instructed to analyse the samples for contamination that may explain fuel filter plugging problems with Vehicle 4.

The samples are described in Table 1 below.

Table 1
Sample Description

Laboratory ID	Description
A35226	Diesel fuel from the fuel tank of Vehicle 4, Solid Energy North
A35226	Diesel fuel from the bottom of bulk fuel tank

The results of our analyses are presented in Table 2. These results were faxed to George McLean.

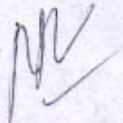
Table 2
Results

Test	Result – A35226	Result - A35227
Appearance	Sediment, water emulsion	Sediment, free water
Density @ 15°C, (g/mL)	0.8348	0.8346
Flash Point, ASTM D92, (°C)	74	75
Microbiology, CFU ¹ /100mL		
Fungi	<1, slight contamination	61, heavy contamination
Bacteria	>100, very heavy contamination	>100, very heavy contamination
Yeast	<1, slight contamination	<1, slight contamination

Based on the results in Table 2 we can make the following observations:

- Both diesel samples are contaminated with a high level of water;
- Both samples were heavily contaminated with microbiological organisms; and
- The fuel represented by these samples is not suitable for use.

Yours sincerely



Vien Vu
Senior Chemist

¹ Colony Forming Units

Checked


6 September 2002

Solid Energy North
Solid Energy New Zealand Ltd
Private Bag 502
HUNTLY

Ref Lab No A35266-9

Attention: **Don Woods**

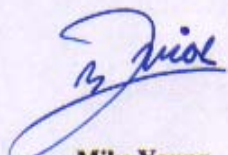
Re: **Diesel samples, order number 23A 27000, Supply Solutions**

Our laboratory received four diesel samples that have been tested for microbiological contamination as requested by George Mclean.

The samples all returned results showing essentially no contamination. The samples descriptions and results are summarised in the table below.

Laboratory ID	Description	Results
A35266	Main Eastmine Diesel Tank	Fungi, Bacteria and Yeast – all very slight
A35267	Elmco NV04 Fuel tank bottom	Fungi, Bacteria and Yeast – all very slight
A35268	Elmco NV04 Fuel filter	Fungi, Bacteria and Yeast – all very slight
A35269	Elmco NV04 ½ level in fuel tank	Fungi, Bacteria and Yeast – all very slight

Yours sincerely


PP **Mike Young**
Fuels Chemist