The DOW CHEMICAL COMPANY

UCARTHERM™ *Heat Transfer Fluids* NORKOOL™

Sample Analysis Report

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Canadian Natural Resources Limited

Sample Number: 2013-130-0084
Report Date: 8/16/2013

Sample Label Description: **Boulder d72g/9308 Unit 2826 K102 main**

		New Data	Acceptable
Appearance:			
Color		green	---
Clarity		clear	clear
Sediment	wt%	<0.01	<0.01
Concentration & Freeze Point:			
Ethylene Glycol	vol% EG	43	30-60
Freeze Point	deg F	-19	---
Freeze Point	deg C	-29	---
Chemical Properties			
Fluid pH		8.0	8-10.5
Reserve Alkalinity	ml of 0.1N HCl	2.7	>8
Corrosion Inhibitors:			
Nitrite	ppm NO2	1064	>600
Phosphate	ppm PO4	2618	>2500
Tolytriazole	ppm C7H7N3	469	>100
Corrosives & Scale Promoters:			
Chloride	ppm Cl	0	<200
Sulfate	ppm SO4	153	<500
Total Hardness	ppm CaCO3	<10	<300
Glycol Degradation & Contaminants:			
Total Degradation Acids	ppm as C2H4O3	1008	<3000
Nitrate	ppm NO3	1149	<500
MBT	ppm MBT	0	<500
Propylene Glycol	vol% PG	0	<1
Diethylene Glycol	vol% DEG	0	<1
Triethylene Glycol	vol% TEG	0	<1

FLUID MAINTENANCE RECOMMENDATIONS:

This fluid is suitable for continued use. Note the following warning(s): Nitrate is most likely from the nitrites breaking down due to the age of the fluid.

This information is not to be taken as a warranty or representation for which we assume legal responsibility nor as permission or recommendation to practice any patented invention without a license. It is offered solely for your consideration, investigation and verification.

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