

## **OIL ANALYSIS REPORT**

Sample Rating Trend

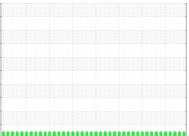
## NORMAL





Fluid

**Diesel Engine** PETRO CANADA DURON SHP 15W40 (40 QTS)



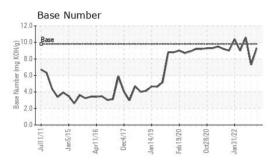


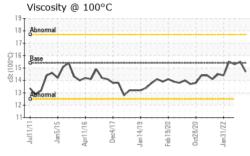
## 

DiAcNOSIS         SAMPLE INFORMATION         method         Unit/Same         Control         Hatory1         Hatory2           Recommendation Recommendation         Sample Nummer         Citer Info         FL061881         FL0008224         S1002223         310020827         S1002223         310020827         S1002223         310020827         S1002223         310020827         S10020827         S10020827         S10020827         S10020827         S10020827         S10020827         S10020223         310020827         S10020827         S10020827 <th></th> <th>,</th> <th></th> <th>il2011 Jan20</th> <th></th> <th>Jan2019 Feb2020 Oct2020</th> <th></th> <th></th>		,		il2011 Jan20		Jan2019 Feb2020 Oct2020		
Resample at the next service interval to monitor.         Name         Client Info         12.829         23.0         10.402.022         31.0         10.222         31.0         10.0	DIAGNOSIS	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
War       All component war rates are normal.       Contamination       Not Changed       Cleant Info       2469       18.46       1178         Contamination       Not Changed       Cleant Info       2469       18.46       1178         The is in indication of any contamination in the il.       Oil Changed       Cleant Info       Not Changed       Changed       Not Rule       Not Rul	Recommendation	Sample Number		Client Info		GFL0061881	GFL0061872	GFL0052242
All component wear rates are normal.       Contamination       Changed       Client Info       Not Changed	Resample at the next service interval to monitor.			Client Info		12 Sep 2023	10 Apr 2023	31 Oct 2022
Contamination There is no indication of any contamination in the ol.         Oil Changed Sample Status         Client Info         Not Changed (NORMAL         Changed NORMAL         Changed NEG         Changed NEG	Wear	Machine Age		Client Info				
Sample Status         NORMAL         NORMAL         NORMAL         NORMAL           There is no indication of any contamination in the ol.         Sample Status         Immthase         current         history1         history1           The Bit no indication of any contamination alkininy remaining in the oil. The condition of any oll is suitable for further service.         NORMAL         NORMAL         NORMAL         NORMAL         NORMAL           VEAR         METALS         method         limit/base         current         history1         history2           Iron         pp         MASTM 05858         >120         29         33         19           Othromium         ppm         ASTM 05858         >20         1         0         <1	All component wear rates are normal.	Ū	hrs				1846	
Oil.       CONTAMINATION       method       immtbase       current       history1       history2         Fuel       WC Method       >3.0       <1.0	Contamination	•		Client Info		•	U	Ū
Fluid Condition         CONTAMINATION         method         instroy         instroy         instroy           The BM result indicates that there is suitable datakinity remaining in the oil. The condition of the oil is suitable for further service.         WC Mehod         >.3.0         <1.0						NORMAL		
The Burle mean indicates that there is suitable atkalinity remaining in the oil. The condition of the oil is suitable for further service.         Fuel         WC Method         S.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0		CONTAMINAT	ION	method	limit/base	current	history1	history2
Bit is suitable for further service.         Glycel         WC Method         Imitbase         current         history1         history2           Iron         ppm         ASTM DS185m         >20         29         33         19           Chromium         ppm         ASTM DS185m         >20         21         0         <1		Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
VEAR METALS         Method         Instroys         Lurrent         Instroys           Iron         ppm         ASTM D588m         >20         29         33         19           Chromium         ppm         ASTM D588m         >20         21         0         -1           Nickel         ppm         ASTM D588m         >20         21         0         0           Silver         ppm         ASTM D588m         >20         11         3         6           Lead         ppm         ASTM D588m         >20         11         3         6           Lead         ppm         ASTM D588m         >0         1         3         6           Lead         ppm         ASTM D588m         >0         1         1         -1           Copper         ppm         ASTM D588m         >0         0         0         0           Cadmium         ppm         ASTM D588m         1         -1         0         0         0           Cadmium         ppm         ASTM D588m         10         0         3         4         8           Barium         ppm         ASTM D588m         10         0         1         1 <td></td> <th>Glycol</th> <td></td> <td>WC Method</td> <td></td> <th>NEG</th> <td>NEG</td> <td>NEG</td>		Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185n         >20         <1         0         <1           Nickel         ppm         ASTM D5185n         >5         0         0         0           Tianium         ppm         ASTM D5185n         >2         1         0         0           Silver         ppm         ASTM D5185n         >20         1         3         6           Lead         ppm         ASTM D5185n         >40         <1	, 0	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D516sn         >5         0         0         0           Titanium         ppm         ASTM D516sn         >2         -1         0         0           Aluminum         ppm         ASTM D516sn         >20         1         3         6           Lead         ppm         ASTM D516sn         >40         -1         0         -1           Copper         ppm         ASTM D516sn         >41         -1         -1         -1           Tin         ppm         ASTM D516sn         >15         -1         -1         -1         -1           Vanadium         ppm         ASTM D516sn         -15         -1         -1         -1         -1           Vanadium         ppm         ASTM D516sn         -1 <t< td=""><td></td><th>Iron</th><td>ppm</td><td>ASTM D5185m</td><td>&gt;120</td><th>29</th><td>33</td><td>19</td></t<>		Iron	ppm	ASTM D5185m	>120	29	33	19
Nickel       ppm       ASTM 05185m       >5       0       0       0         Titanium       ppm       ASTM 05185m       >2.2       0       0.0       .1         Aluminum       ppm       ASTM 05185m       >2.20       0       0.0       .1         Aluminum       ppm       ASTM 05185m       >3.20       1       .3       6         Lead       ppm       ASTM 05185m       >4.0       .1       .0       .1         Copper       ppm       ASTM 05185m       >3.30       -1       .1       .1       .1         Vanadium       ppm       ASTM 05185m       .41       .1       .1       .1       .1         Vanadium       ppm       ASTM 05185m       .15       .1       .1       .1       .1         Vanadium       ppm       ASTM 05185m       0       0       .0       .0       .0         Abdrium       ppm       ASTM 05185m       10.0       .1       .1       .1       .1         Marganeses       ppm       ASTM 05185m       10.0       .1       .1       .1       .1         Marganeses       ppm       ASTM 05185m       10.0       .1       .1       .		Chromium	ppm	ASTM D5185m	>20	<1	0	<1
Tittanium       ppm       ASTM 05185m       >2       <1       0       0         Silver       pm       ASTM 05185m       >2       0       0       <1		Nickel		ASTM D5185m	>5	0	0	0
Atuminum       ppm       ASTM D5185m       >20       1       3       6         Lead       ppm       ASTM D5185m       >40       <1		Titanium		ASTM D5185m	>2	<1	0	0
Lead       ppm       ASTM D5185m       >40       <1		Silver	ppm	ASTM D5185m	>2	0	0	<1
Copper         ppm         ASTM D5165m         >330         <1         <1         <1           Tin         ppm         ASTM D5165m         >15         <1		Aluminum	ppm	ASTM D5185m	>20	1	3	6
Tin       ppm       ASTM D588m       >15       <1		Lead	ppm	ASTM D5185m	>40	<1	0	<1
Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         3         4         8           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Magnessium         ppm         ASTM D5185m         1010         1021         877         784           Calcium         ppm         ASTM D5185m         1010         1022         1073         174           Calcium         ppm         ASTM D5185m         1070         1160         1082         1073           Phosphorus         ppm         ASTM D5185m         1070         1160         1082         1073           Sulfur         ppm         ASTM D5185m         2060         3789         3085         3048           CONTAMINANTS         method         limit/base         current         history1		Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         3         4         8           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         58         56         59           Manganese         ppm         ASTM D5185m         1010         1021         877         784           Calcium         ppm         ASTM D5185m         1070         1160         1082         1073           Phosphorus         ppm         ASTM D5185m         1070         1052         955         931           Zinc         ppm         ASTM D5185m         1270         1296         1178         1119           Sulfur         ppm         ASTM D5185m         2060         3789         3085         3048           CONTAMINANTS         method         imit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         20         1 <td></td> <th>Tin</th> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;15</td> <th>&lt;1</th> <td>&lt;1</td> <td>&lt;1</td>		Tin	ppm	ASTM D5185m	>15	<1	<1	<1
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         3         4         8           Barium         ppm         ASTM D5185m         0         3         4         8           Mainganese         ppm         ASTM D5185m         60         58         56         59           Manganese         ppm         ASTM D5185m         0         <1		Vanadium	ppm	ASTM D5185m		<1	0	0
Boron       ppm       ASTM D5185m       0       3       4       8         Barium       ppm       ASTM D5185m       0       0       0       0         Molybdenum       ppm       ASTM D5185m       60       58       56       59         Manganese       ppm       ASTM D5185m       0       <1       <1       <1         Magnesium       ppm       ASTM D5185m       1010       1021       877       784         Calcium       ppm       ASTM D5185m       1010       1052       955       931         Phosphorus       ppm       ASTM D5185m       1270       1286       1178       1119         Sulfur       ppm       ASTM D5185m       2060       3789       3085       3048         CONTAMINANT       method       imit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >20       1       0       1         Nortassium       ppm       ASTM D5185m       >20       1       0       1         Nortassium       ppm       ASTM D5185m       >20       1       0       1         Nitration       Abs/cm       *ASTM D7624		Cadmium	ppm	ASTM D5185m		0	0	0
Barium       ppm       ASTM D5185m       0       0       0       0         Molybdenum       ppm       ASTM D5185m       60       58       56       59         Manganese       ppm       ASTM D5185m       0       <1       <1       <1         Magnesium       ppm       ASTM D5185m       1010       1021       877       784         Caloium       ppm       ASTM D5185m       1010       1052       955       931         Zine       ppm       ASTM D5185m       1150       1052       955       931         Sulfur       ppm       ASTM D5185m       1270       1296       1178       1119         Sulfur       ppm       ASTM D5185m       2060       3789       3085       3048         CONTAMINANTS       method       imit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       17       14       6         Sodium       ppm       ASTM D5185m       >20       1       0       1         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844		ADDITIVES		method	limit/base	current	history1	history2
Molybdenum       ppm       ASTM D5185m       60       58       56       59         Manganese       ppm       ASTM D5185m       0       <1		Boron	ppm	ASTM D5185m	0	3	4	8
Marganese       ppm       ASTM D5185m       0       <1       <1       <1         Magnesium       ppm       ASTM D5185m       1010       1021       877       784         Calcium       ppm       ASTM D5185m       1070       1160       1082       1073         Phosphorus       ppm       ASTM D5185m       1070       1160       1082       931         Zinc       ppm       ASTM D5185m       1270       1296       1178       1119         Sulfur       ppm       ASTM D5185m       2060       3789       3085       3048         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >20       1       0       1         Sodium       ppm       ASTM D5185m       >20       1       0       1         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       'ASTM D784       >4       1.5       3.7       3.1         Nitration       Abs/(1mm<'ASTM D745		Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium       ppm       ASTM D5185m       1010       1021       877       784         Calcium       ppm       ASTM D5185m       1070       1160       1082       1073         Phosphorus       ppm       ASTM D5185m       1150       1052       955       931         Zinc       ppm       ASTM D5185m       1270       1296       1178       1119         Sulfur       ppm       ASTM D5185m       2060       3789       3085       3048         CONTAMINANTS       method       imit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       17       14       6         Sodium       ppm       ASTM D5185m       >20       1       0       1         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7644       >4       1.5       3.7       3.1         Nitration       Abs/Imm       *ASTM D7624       >20       6.9       12.0       10.0         Sulfation       Abs/Imm       *ASTM D7644       >4       1.5       3.7       3.1         Nitration       Abs/Imm		Molybdenum	ppm	ASTM D5185m	60	58	56	59
Calcium       ppm       ASTM D5185m       1070       1160       1082       1073         Phosphorus       ppm       ASTM D5185m       1150       1052       955       931         Zinc       ppm       ASTM D5185m       1270       1296       1178       1119         Sulfur       ppm       ASTM D5185m       2060       3789       3085       3048         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       17       14       6         Sodium       ppm       ASTM D5185m       >20       1       0       1         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >4       1.5       3.7       3.1         Nitration       Abs/cm       *ASTM D7624       >20       6.9       12.0       10.0         Sulfation       Abs/cm       *ASTM D7624       >30       19.2       25.6       24.4         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       A		Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus       ppm       ASTM D5185m       1150       1052       955       931         Zinc       ppm       ASTM D5185m       1270       1296       1178       1119         Sulfur       ppm       ASTM D5185m       2060       3789       3085       3048         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >25       17       14       6         Sodium       ppm       ASTM D5185m       >25       17       14       6         Sodium       ppm       ASTM D5185m       >20       1       0       1         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >4       1.5       3.7       3.1         Nitration       Abs/cm       *ASTM D7824       >20       6.9       12.0       10.0         Sulfation       Abs/tm       *ASTM D7824       >20       6.9       12.0       10.0         Sulfation       Abs/tm       *ASTM D7824       >20       6.9       12.0       10.0         Sulfation       Abs/tm <td></td> <th>Magnesium</th> <td>ppm</td> <td>ASTM D5185m</td> <td>1010</td> <th>1021</th> <td>877</td> <td>784</td>		Magnesium	ppm	ASTM D5185m	1010	1021	877	784
Zinc         ppm         ASTM D5185m         1270         1296         1178         1119           Sulfur         ppm         ASTM D5185m         2060         3789         3085         3048           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         17         14         6           Sodium         ppm         ASTM D5185m         >25         17         14         6           Sodium         ppm         ASTM D5185m         >25         17         14         6           Sodium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         1.5         3.7         3.1           Nitration         Abs/m         *ASTM D7624         >20         6.9         12.0         10.0           Sulfation         Abs/imm         *ASTM D7415         >30         19.2         25.6         24.4           FLUID DEGRADATION         method         limit/base		Calcium	ppm	ASTM D5185m	1070	1160	1082	1073
SulfurppmASTM D5185m2060378930853048CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>2517146SodiumppmASTM D5185m>20101PotassiumppmASTM D5185m>20101INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%'ASTM D7844>41.53.73.1NitrationAbs/cm'ASTM D7624>206.912.010.0SulfationAbs/1m'ASTM D7415>3019.225.624.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/1m'ASTM D7414>2512.115.215.2		Phosphorus	ppm	ASTM D5185m	1150	1052	955	931
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m<>2517146SodiumppmASTM D5185m5632PotassiumppmASTM D5185m>20101INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>41.53.73.1NitrationAbs/cm*ASTM D7624>206.912.010.0SulfationAbs/1m*ASTM D7415>3019.225.624.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/1m*ASTM D7414>2512.115.215.2			ppm		1270			
Silicon       ppm       ASTM D5185m       >25       17       14       6         Sodium       ppm       ASTM D5185m       >20       6       3       2         Potassium       ppm       ASTM D5185m       >20       1       0       1         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >4       1.5       3.7       3.1         Nitration       Abs/cm       *ASTM D7624       >20       6.9       12.0       10.0         Sulfation       Abs/lmm       *ASTM D7615       >30       19.2       25.6       24.4         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/lmm       *ASTM D7414       >25       12.1       15.2       15.2				ASTM D5185m	2060	3789	3085	3048
SodiumppmASTM D5185m632PotassiumppmASTM D5185m>20101INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>41.53.73.1NitrationAbs/cm*ASTM D7624>206.912.010.0SulfationAbs/.1mm*ASTM D7415>3019.225.624.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2512.115.215.2		CONTAMINAN	ITS	method	limit/base	current	history1	history2
PotassiumppmASTM D5185m>20101INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>41.53.73.1NitrationAbs/cm*ASTM D7624>206.912.010.0SulfationAbs/.1mm*ASTM D7415>3019.225.624.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2512.115.215.2			ppm		>25			
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>41.53.73.1NitrationAbs/cm*ASTM D7624>206.912.010.0SulfationAbs/.1mm*ASTM D7415>3019.225.624.4FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2512.115.215.2								
Soot %         %         *ASTM D7844         >4         1.5         3.7         3.1           Nitration         Abs/cm         *ASTM D7624         >20         6.9         12.0         10.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.2         25.6         24.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.1         15.2         15.2		Potassium	ppm	ASTM D5185m	>20	1	0	1
Nitration         Abs/cm         *ASTM D7624         >20         6.9         12.0         10.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.2         25.6         24.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.1         15.2         15.2		INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.2         25.6         24.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.1         15.2         15.2		Soot %	%	*ASTM D7844	>4		3.7	3.1
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2512.115.215.2		Nitration	Abs/cm	*ASTM D7624	>20	6.9		
Oxidation         Abs/.1mm         *ASTM D7414         >25         12.1         15.2         15.2		Sulfation	Abs/.1mm	*ASTM D7415	>30	19.2	25.6	24.4
		FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         9.3         7.3         10.6								
		Oxidation	Abs/.1mm	*ASTM D7414	>25	12.1	15.2	15.2



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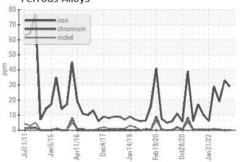


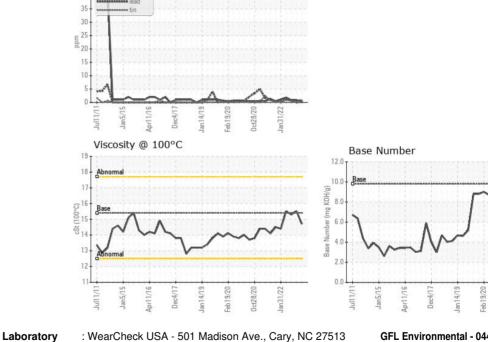
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.7	15.5	15.3
GRAPHS						

Ferrous Alloys

Non-ferrous Metals

45





: 13 Sep 2023

: 15 Sep 2023

GFL Environmental - 044 - Elizabeth City 657 Old US 17 Elizabeth City, NC US 27909 Contact: TOM BAIRD tom.baird@gflenv.com T: (252)562-2645 06:2012) F: (252)264-4411



 Certificate 12367
 Test Package
 : FLEET

 To discuss this sample report, contact Customer Service at 1-800-237-1369.
 \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Received

Diagnosed

Diagnostician : Wes Davis

: GFL0061881

: 05949909

Sample No.

Lab Number

Unique Number : 10645868

Oct28/20

Jan31/22