

## Charlestown

### 612

#### Component Diesel Engine

# PETRO CANADA DURON SHP 10W30 (--- GAL)

## RECOMMENDATION

We advise that you check for the source of the coolant leak. Check for low coolant level. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition.

# WEAR

All component wear rates are normal.

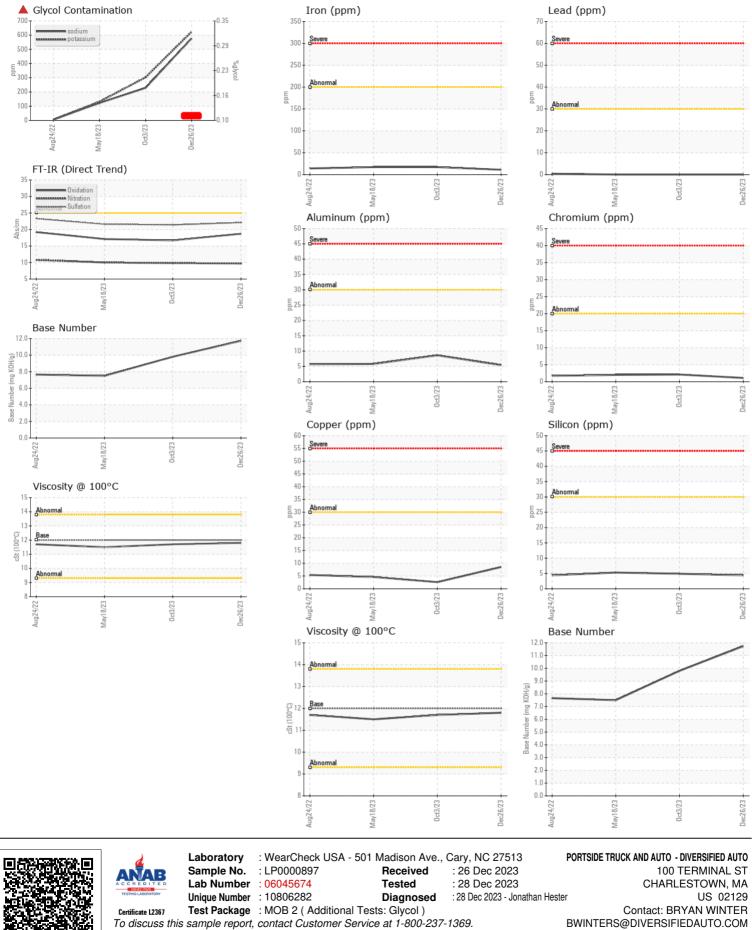
	INATION	

Sodium and/or potassium levels are high. There is a high concentration of glycol present in the oil.

### FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

Sample Number         Client Info         LP0000897         LP000453         LP000           Sample Date         Client Info         26 Dec 2023         03 Oct 2023         18 May           Machine Age         mls         Client Info         0         0         0           Oil Age         mls         Client Info         0         0         0         0           Oil Changed         Client Info         0         0         0         0         0           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Filter Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         -         SEVERE         ABNORMAL         ABNOR           Iron         ppm         ASTM D5185m<>20         11         2         2           Nickel         ppm         ASTM D5185m<>20         1         -1         3         -1           Silver         ppm         ASTM D5185m<>30         6         0         -1         -1           Vanadium         ppm         ASTM D5185m<>30         8         3         5         -1         -1           Vanadium         ppm <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>							
Sample Date         Client Info         26 Dec 2023         03 Oct 2023         18 May           Machine Age         mls         Client Info         0         0         0         0           Oil Chage         mls         Client Info         0         0         0         0         0           Oil Chaged         Client Info         N/A         N/A         N/A         N/A         N/A           Filter Changed         Client Info         N/A         N/A         N/A         N/A         N/A           Sample Status         Client Info         N/A         N/A         N/A         N/A         N/A           Iron         ppm         ASTM D5185m         >20         11         1         7         1           Chromium         ppm         ASTM D5185m         >2         0         <1         <1         1           Silver         ppm         ASTM D5185m         >2         0         0         0         0         0         0         0         0         0         1         0         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <t< th=""><th>Test</th><th>UOM</th><th>Method</th><th>Limit/Abn</th><th>Current</th><th>History1</th><th>History2</th></t<>	Test	UOM	Method	Limit/Abn	Current	History1	History2
Machine Age         mls         Client Info         0         0         0         0           Oil Age         mls         Client Info         0         0         0         0           Filter Age         mls         Client Info         N/A         N/A         N/A         N/A           Filter Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         SEVERE         ABNORMAL         ABNOR         ABNOR           Iron         ppm         ASTM D5185m         >20         1         2         2           Nickel         ppm         ASTM D5185m         >2         0         <1         <1         <1            Silver         ppm         ASTM D5185m         >2         0         0         0         0           Aluminum         ppm         ASTM D5185m         >30         0	Sample Number		Client Info		LP0000897	LP0000453	LP0000481
Oil Age         mls         Client Info         0         0         0         0           Filter Age         mls         Client Info         N/A         N/A         N/A         N/A           Filter Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         SerVER         ABNORMAL         ABNORMAL         ABNORMAL           Iron         ppm         ASTM D5185m         >20         11         2         2           Nickel         ppm         ASTM D5185m         >2         0         <1         <1         <1           Titanium         ppm         ASTM D5185m         >2         <1         3         <1         <1           Silver         ppm         ASTM D5185m         >2         <1         3         <1         <1           Silver         ppm         ASTM D5185m         >30         0         0         0         0           Auminum         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >30         4         5         5           Yellow Metal         scalar         "Visual <t< th=""><th>Sample Date</th><th></th><th>Client Info</th><th></th><th>26 Dec 2023</th><th>03 Oct 2023</th><th>18 May 2023</th></t<>	Sample Date		Client Info		26 Dec 2023	03 Oct 2023	18 May 2023
Filter Age         mis         Client Info         0         0         0         0           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Filter Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         SEVERE         ABNORMAL         ABNOR           Iron         ppm         ASTM D5185m         >200         11         2         2           Nickel         ppm         ASTM D5185m         >2         0         <1         <1           Titanium         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >30         4         5         5           Velow Metal         scalar<*Vi	Machine Age	mls	Client Info		0	0	0
Oil Changed         Client Info         N/A         N/A         N/A         N/A           Filter Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         SEVERE         ABNORMAL         ABNOR           Iron         ppm         ASTM D5185m         >20         11         17         17           Chromium         ppm         ASTM D5185m         >20         1         2         2           Nickel         ppm         ASTM D5185m         >2         0         <1         <1           Titanium         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >30         5         9         6           Lead         ppm         ASTM D5185m         >30         6         <1         <1           Vanadium         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >30         4         5         5           Vanadium         ppm         ASTM D5185m         >20         <623         302         13           Fuel	Oil Age	mls	Client Info		0	0	0
Oil Changed         Client Info         N/A         N/A         N/A         N/A           Filter Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         SEVERE         ABNORMAL         ABNOR           Iron         ppm         ASTM D5185m         >200         11         2         2           Nickel         ppm         ASTM D5185m         >2         0         <1         <1           Titanium         ppm         ASTM D5185m         >2         0         <1         <1           Silver         ppm         ASTM D5185m         >2         0         0         0           Auminum         ppm         ASTM D5185m         >30         5         9         6           Lead         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >30         8         3         5           Vanadium         ppm         ASTM D5185m         >30         4         5         5           Potassium         ppm         ASTM D5185m         >30         4         5         5           Silicon         ppm <th>Filter Age</th> <th>mls</th> <th>Client Info</th> <th></th> <th>0</th> <th>0</th> <th>0</th>	Filter Age	mls	Client Info		0	0	0
Sample Status         SEVERE         ABNORMAL         ABNORMAL         ABNORMAL           Iron         ppm         ASTM D5185m         >200         11         17         17           Chromium         ppm         ASTM D5185m         >20         1         2         2           Nickel         ppm         ASTM D5185m         >2         0         <1         31         <1           Titanium         ppm         ASTM D5185m         >2         0         0         0         0           Aluminum         ppm         ASTM D5185m         >30         5         9         6           Lead         ppm         ASTM D5185m         >30         0         0         0           Vanadium         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >15         0         <1         <1           Vanadium         ppm         ASTM D5185m         >20         A 623         A 302         13           Fuel         WC Method         >3.0         4         5         5           Potassium         ppm         ASTM D5185m         20         A 0.12         NEG <th>-</th> <th></th> <th>Client Info</th> <th></th> <th>N/A</th> <th>N/A</th> <th>N/A</th>	-		Client Info		N/A	N/A	N/A
Iron         ppm         ASTM D5185m         >200         11         17         17           Chromium         ppm         ASTM D5185m         >20         1         2         2           Nickel         ppm         ASTM D5185m         >2         0         <1         <1           Titanium         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >30         5         9         6           Lead         ppm         ASTM D5185m         >30         0         0         0           Copper         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >15         0         <1         0           White Metal         scalar         *Visual         NONE         NONE         NONE         NOCE           Yellow Metal         scalar         *Visual         NONE         NONE         NONE         NORE         NORE           Soto %         %         *ASTM D7844         >3         <	Filter Changed		Client Info		N/A	N/A	N/A
Iron         ppm         ASTM D5185m         >200         11         17         17           Chromium         ppm         ASTM D5185m         >20         1         2         2           Nickel         ppm         ASTM D5185m         >2         0         <1         <1         3         <1           Titanium         ppm         ASTM D5185m         >2         0         0         0         0           Aluminum         ppm         ASTM D5185m         >30         5         9         6           Lead         ppm         ASTM D5185m         >30         0         0         0           Copper         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >15         0         <1         0           White Metal         scalar         *Visual         NONE         NONE         NONE         NORE           Silicon         ppm         ASTM D5185m         >20         623         302         13'           Fuel         WC Method         >3.0	Sample Status				SEVERE	ABNORMAL	ABNORMAL
Chromium         ppm         ASTM D5185m         >20         1         2         2           Nickel         ppm         ASTM D5185m         >2         0         <1         <1         <1           Titanium         ppm         ASTM D5185m         >2         0         0         0         0           Aluminum         ppm         ASTM D5185m         >30         5         9         6           Lead         ppm         ASTM D5185m         >30         0         0         0           Copper         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >30         8         3         5           Vanadium         ppm         ASTM D5185m         >15         0         <1         <1           Vanadium         ppm         ASTM D5185m         >30         4         5         5           Potassium         ppm         ASTM D5185m         >20         4         623         302         13:           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0         <1.0           Water         WC Method         >3.0							
Nickel         ppm         ASTM D5185m         >2         0         <1	Iron	ppm	ASTM D5185m	>200	11	17	17
Titanium         ppm         ASTM D5185m         >2         <1	Chromium	ppm	ASTM D5185m	>20	1	2	2
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >30         5         9         6           Lead         ppm         ASTM D5185m         >30         0         0         0           Copper         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >15         0         <1	Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Aluminum         ppm         ASTM D5185m         >30         5         9         6           Lead         ppm         ASTM D5185m         >30         0         0         0         0           Copper         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >15         0         <1         <1           Vanadium         ppm         ASTM D5185m         >15         0         <1         <1           Vanadium         ppm         ASTM D5185m         >10         <1         0         <10         <1         0           White Metal         scalar         *Visual         NONE         NONE         NONE         NONE         NOE         NOE           Silicon         ppm         ASTM D5185m         >20         ▲ 623         ▲ 302         ▲ 13           Fuel         WC Method         >.20         NEG         NEG         NEG           Glycol         %         *ASTM D7844         >3         0.9         0.5         0.5           Soto %         %         *ASTM D7152         >20         9.7         9.8         10.0      Sulfation         Abs	Titanium	ppm	ASTM D5185m	>2	<1	3	<1
Lead         ppm         ASTM D5185m         >30         0         0         0         0           Copper         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         >15         0         <1         <1           Vanadium         ppm         ASTM D5185m         >10         <1         0           White Metal         scalar         *Visual         NONE         NONE         NONE         NONE         NONE           Yellow Metal         scalar         *Visual         NONE         NONE         NONE         NONE         NONE         NONE           Silicon         ppm         ASTM D5185m         >20         ▲ 623         ▲ 302         ▲ 13           Fuel         WC Method         >3.0         <1.0         <1.0         <1.1         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Soot %         %         *ASTM D7624         >20         9.7         9.8         10.5           Sulfation         Abs/.1mm         *ASTM D7624         >20         9.7         9.8         10.5           San	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >30         8         3         5           Tin         ppm         ASTM D5185m         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1         0           White Metal         scalar         *Visual         NONE         NONE         NONE         NONE           Yellow Metal         scalar         *Visual         NONE         NONE         NONE         NONE         NONE           Silicon         ppm         ASTM D5185m         >20         ▲ 623         ▲ 302         ▲ 137           Fuel         WC Method         >3.0         <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 <td< th=""><th>Aluminum</th><th>ppm</th><th>ASTM D5185m</th><th>&gt;30</th><th>5</th><th>9</th><th>6</th></td<>	Aluminum	ppm	ASTM D5185m	>30	5	9	6
Tin         ppm         ASTM D5185m         >15         0         <1	Lead	ppm	ASTM D5185m	>30	0	0	0
Vanadium         ppm         ASTM D5185m         0         <1	Copper	ppm	ASTM D5185m	>30	8	3	5
White Metal         scalar         *Visual         NONE         NORE         NONE         NORE	Tin	ppm	ASTM D5185m	>15	0	<1	<1
Yellow Metal       scalar       *Visual       NONE       NONE       NONE       NONE       NONE         Silicon       ppm       ASTM D5185m       >30       4       5       5         Potassium       ppm       ASTM D5185m       >20       ▲ 623       ▲ 302       ▲ 133         Fuel       WC Method       >3.0       <1.0       <1.0       <1.0         Water       WC Method       >0.2       NEG       NEG       NEG         Glycol       %       *ASTM D2982       ▲ 0.12       NEG       NEG         Soot %       %       *ASTM D7624       >20       9.7       9.8       10.0         Sulfation       Abs/rm       *ASTM D7624       >20       9.7       9.8       10.0         Sulfation       Abs/rm       *ASTM D7644       >30       22.1       21.4       21.4         Silt       scalar       *Visual       NONE       NONE       NONE       NOR         Debris       scalar       *Visual       NONE       NONE       NONE       NOR         Appearance       scalar       *Visual       NORML       NORML       NORML       NOR         Sodium       ppm       ASTM D5185m	Vanadium	ppm	ASTM D5185m		0	<1	0
Silicon         ppm         ASTM D5185m         >30         4         5         5           Potassium         ppm         ASTM D5185m         >20         ▲ 623         ▲ 302         ▲ 133           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         %         *ASTM D2982         ▲ 0.12         NEG         NEG         NEG           Soot %         %         *ASTM D7844         >3         0.9         0.5         0.55           Nitration         Abs/cm< *ASTM D7624         >20         9.7         9.8         10.0           Sulfation         Abs/cm         *ASTM D7155         >30         22.1         21.4         21.4           Silt         scalar         *Visual         NONE         NONE         NOR         NOR           Debris         scalar         *Visual         NONE         NONE         NOR         NOR           Appearance         scalar         *Visual         NORML         NORML         NORML         NOR           Odor         scalar         *Visual	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Potassium         ppm         ASTM D5185m         >20         ▲ 623         ▲ 302         ▲ 133           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         %         *ASTM D2982         ▲ 0.12         NEG         NEG         NEG           Soot %         %         *ASTM D7844         >3         0.9         0.5         0.5           Nitration         Abs/cm         *ASTM D7624         >20         9.7         9.8         10.0           Sulfation         Abs/.mm         *ASTM D7152         >30         22.1         21.4         21.4           Silt         scalar         *Visual         NONE         NONE         NONE         NOR           Debris         scalar         *Visual         NONE         NONE         NOR         NOR           Appearance         scalar         *Visual         NORML         NORML         NOR         NOR           Goron         ppm         ASTM D5185m         2         1         <1         4           Barium         ppm         ASTM D5	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Potassium         ppm         ASTM D5185m         >20         ▲ 623         ▲ 302         ▲ 133           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         %         *ASTM D2982         ▲ 0.12         NEG         NEG         NEG           Soot %         %         *ASTM D7844         >3         0.9         0.5         0.5           Nitration         Abs/cm         *ASTM D7624         >20         9.7         9.8         10.0           Sulfation         Abs/.tmm         *ASTM D7415         >30         22.1         21.4         21.4           Silt         scalar         *Visual         NONE         NONE         NONE         NOR           Debris         scalar         *Visual         NONE         NONE         NOR         NOR           Appearance         scalar         *Visual         NORML         NORML         NOR         NOR           Godor         scalar         *Visual         NORML         NORML         NOR         NOR           Mored         scalar							
Fuel       WC Method       >3.0       <1.0       <1.0       <1.0       <1.0         Water       WC Method       >0.2       NEG       NEG       NEG       NEG         Glycol       %       *ASTM D2982       ▲ 0.12       NEG       NEG         Soot %       %       *ASTM D7844       >3       0.9       0.5       0.5         Nitration       Abs/cm       *ASTM D7624       >20       9.7       9.8       10.0         Sulfation       Abs/.mm       *ASTM D7415       >30       22.1       21.4       21.4         Silt       scalar       *Visual       NONE       NONE       NONE       NOR         Debris       scalar       *Visual       NONE       NONE       NONE       NOR         Appearance       scalar       *Visual       NORML       NORML       NORML       NOR         Odor       scalar       *Visual       NORML       NORML       NORML       NOR         Sodium       ppm       ASTM D5185m       2       1       <1       4         Barium       ppm       ASTM D5185m       0       0       0       0         Molybdenum       ppm       ASTM D5185m		ppm			-		
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         %         *ASTM D2982         ▲ 0.12         NEG         NEG         NEG           Soot %         %         *ASTM D2982         ▲ 0.12         NEG         NEG           Nitration         Abs/cm         *ASTM D7844         >3         0.9         0.5         0.5           Nitration         Abs/cm         *ASTM D7624         >20         9.7         9.8         10.           Sulfation         Abs/.mm         *ASTM D7415         >30         22.1         21.4         21.           Silt         scalar         *Visual         NONE         NONE         NONE         NOR           Debris         scalar         *Visual         NONE         NONE         NOR         NOR           Appearance         scalar         *Visual         NORML         NORML         NORML         NOR           Odor         scalar         *Visual         NORML         NORML         NOR           Emulsified Water         scalar         *Visual         NORML         NORML         NOR           Sodium         ppm         ASTM D5185m         2         1         <1<		ppm					
Glycol       %       *ASTM D2982       ▲ 0.12       NEG       NEG         Soot %       %       *ASTM D7844       >3       0.9       0.5       0.5         Nitration       Abs/cm       *ASTM D7624       >20       9.7       9.8       10.         Sulfation       Abs/cm       *ASTM D7624       >20       9.7       9.8       10.         Sulfation       Abs/cm       *ASTM D715       >30       22.1       21.4       21.         Silt       scalar       *Visual       NONE       NONE       NONE       NO         Debris       scalar       *Visual       NONE       NONE       NO       NO       NO         Sand/Dirt       scalar       *Visual       NONE       NO       NO       NO       NO       NO         Appearance       scalar       *Visual       NORML       NORML       NORML       NO       NO         Godor       scalar       *Visual       NORML       NORML       NORML       NO       NO         Emulsified Water       scalar       *Visual       >0.2       NEG       NEG       NEG         Sodium       ppm       ASTM D5185m       2       1       <1							<1.0
Soot %         %         *ASTM D7844         >3         0.9         0.5         0.5           Nitration         Abs/cm         *ASTM D7624         >20         9.7         9.8         10.           Sulfation         Abs/.1mm         *ASTM D7624         >20         9.7         9.8         10.           Sulfation         Abs/.1mm         *ASTM D7615         >30         22.1         21.4         21.           Silt         scalar         *Visual         NONE         NONE         NONE         NOR           Debris         scalar         *Visual         NONE         NONE         NONE         NOR           Sand/Dirt         scalar         *Visual         NOR         NOR         NOR         NO           Appearance         scalar         *Visual         NORML         NORML         NOR         NO           Odor         scalar         *Visual         NORML         NORML         NORML         NO           Emulsified Water         scalar         *Visual         >0.2         NEG         NEG         NEG           Sodium         ppm         ASTM D5185m         2         1         <1         4      Barium         ppm         ASTM D51				>0.2	-		NEG
Nitration         Abs/cm         *ASTM D7624         >20         9.7         9.8         10.           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.1         21.4         21.           Silt         scalar         *Visual         NONE         NONE         NONE         NONE         NONE           Debris         scalar         *Visual         NONE         NONE         NONE         NONE         NO           Sand/Dirt         scalar         *Visual         NONE         NONE         NONE         NO           Appearance         scalar         *Visual         NORML         NORML         NORML         NO           Odor         scalar         *Visual         NORML         NORML         NORML         NO           Emulsified Water         scalar         *Visual         >0.2         NEG         NEG         NEG           Sodium         ppm         ASTM D5185m         2         1         <1         4           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         50         101         84         75           Mag	2			-	-		NEG
Sulfation         Abs/.1mm         *ASTM D7415         >30         22.1         21.4         21.4           Silt         scalar         *Visual         NONE         NONE         NONE         NONE         NONE           Debris         scalar         *Visual         NONE         NONE         NONE         NONE         NO           Sand/Dirt         scalar         *Visual         NONE         NONE         NONE         NO           Appearance         scalar         *Visual         NORML         NORML         NORML         NO           Odor         scalar         *Visual         NORML         NORML         NORML         NO           Odor         scalar         *Visual         NORML         NORML         NORML         NO           Emulsified Water         scalar         *Visual         >0.2         NEG         NEG         NEG           Sodium         ppm         ASTM D5185m         2         1         <1         4           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         50         101         84         75							
Siltscalar*VisualNONENONENONENONENONEDebrisscalar*VisualNONENONENONENONENONESand/Dirtscalar*VisualNONENONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLNOROdorscalar*VisualNORMLNORMLNORMLNORMLNOREmulsified Waterscalar*Visual>0.2NEGNEGNEGSodiumppmASTM D5185m21<14BoronppmASTM D5185m0000MolybdenumppmASTM D5185m010184475ManganeseppmASTM D5185m9509111003100CalciumppmASTM D5185m105011371137PhosphorusppmASTM D5185m9959551043100							10.0
Debrisscalar*VisualNONENONENONENONESand/Dirtscalar*VisualNONENONENONENONENOAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLNOOdorscalar*VisualNORMLNORMLNORMLNORMLNORMLNOEmulsified Waterscalar*Visual>0.2NEGNEGNEGSodiumppmASTM D5185m21<14BoronppmASTM D5185m0000MolybdenumppmASTM D5185m01018475ManganeseppmASTM D5185m9509111003100CalciumppmASTM D5185m1050113711371137PhosphorusppmASTM D5185m9959551043105							21.6
Sand/Dirtscalar*VisualNONENONENONENORAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLNOROdorscalar*VisualNORMLNORMLNORMLNORMLNOREmulsified Waterscalar*Visual>0.2NEGNEGNEGSodiumppmASTM D5185m21<14BoronppmASTM D5185m0000MolybdenumppmASTM D5185m5010184475ManganeseppmASTM D5185m9509111003100CalciumppmASTM D5185m10501137113PhosphorusppmASTM D5185m9959551043100				-	-	-	NONE
Appearance         scalar         *Visual         NORML         NOR           Emulsified Water         scalar         *Visual         >0.2         NEG         NEG         NEG         NEG         NEG           Sodium         ppm         ASTM D5185m         2         1         <1         4         4           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         50         101         84         75           Manganese         ppm         ASTM D5185m         0         <11         <1<<<1         <1           Magnesium         ppm         ASTM D5185m         1050         1137         113           Phosphorus         ppm         ASTM D5185m         995					-		NONE
Odor         scalar         *Visual         NORML         NOR         NOR<				-	-		NONE
Emulsified Water         scalar         *Visual         >0.2         NEG         NEG         NEG           Sodium         ppm         ASTM D5185m         ▲ 577         ▲ 228         122           Boron         ppm         ASTM D5185m         2         1         <1         4           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         50         101         84         75           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         950         911         1003         1000           Calcium         ppm         ASTM D5185m         1050         1137         115           Phosphorus         ppm         ASTM D5185m         995         955         1043         105							NORML
Sodium         ppm         ASTM D5185m         ▲         577         ▲ 228         ▲ 122           Boron         ppm         ASTM D5185m         2         1         <1         4           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         50         101         84         75           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         950         911         1003         100           Calcium         ppm         ASTM D5185m         1050         1150         1137         115           Phosphorus         ppm         ASTM D5185m         995         955         1043         100					-		NORML
Boron         ppm         ASTM D5185m         2         1         <1	Emulsified water	scalar	" VISUAI	>0.2	NEG	NEG	NEG
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         50         101         84         75           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         950         911         1003         100           Calcium         ppm         ASTM D5185m         1050         1150         1137         115           Phosphorus         ppm         ASTM D5185m         995         955         1043         100	Sodium	ppm	ASTM D5185m		<b>6</b> 577	<b>A</b> 228	<b>1</b> 22
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         50         101         84         75           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         950         911         1003         100           Calcium         ppm         ASTM D5185m         1050         1150         1137         113           Phosphorus         ppm         ASTM D5185m         995         955         1043         100	Boron		ASTM D5185m	2	1	<1	4
Molybdenum         ppm         ASTM D5185m         50         101         84         75           Manganese         ppm         ASTM D5185m         0         <1	Barium		ASTM D5185m	0	0	0	0
Manganese         ppm         ASTM D5185m         0         <1	Molybdenum		ASTM D5185m	50	101	84	75
Calcium         ppm         ASTM D5185m         1050         1150         1137         115           Phosphorus         ppm         ASTM D5185m         995         955         1043         105	Manganese		ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         995         955         1043         103	Magnesium	ppm	ASTM D5185m	950	911	1003	1001
Phosphorus         ppm         ASTM D5185m         995         955         1043         103	Calcium		ASTM D5185m	1050	1150	1137	1190
	Phosphorus		ASTM D5185m	995	955		1035
ZINC ppm ASIMU5185m 1180 1242 1309 132	Zinc	ppm	ASTM D5185m	1180	1242	1309	1328
	Sulfur		ASTM D5185m	2600	2961	3092	3401
			*ASTM D7414		18.7	16.7	17.1
	Base Number (BN)	mg KOH/g	ASTM D2896				7.5
	Visc @ 100°C		ASTM D445	12.00			11.5



\* - 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)

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