

REC	OMME	ENDA	TION

Resample at the next service interval to monitor.

PROBLEMATIC	C TEST	RESULT	S			
Sample Status				ATTENTION	ATTENTION	ABNORMAL
Visc @ 100°C	cSt	ASTM D445	15.4	<b>11.9</b>	<b>1</b> 2.1	<b>9</b> .9

Customer Id: GFL097 Sample No.: GFL0098797 Lab Number: 06011371 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data: Sean Felton +1 919-379-4092 sfelton@wearcheckusa.com

*To change component or sample information:* Customer Service +1 1-800-237-1369 <u>customerservice@wearcheck.com</u> VISCOSITY

There are no recommended actions for this sample.

### **HISTORICAL DIAGNOSIS**

#### 03 Oct 2023 Diag: Don Baldridge



Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

#### 07 Aug 2023 Diag: Don Baldridge

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.All component wear rates are normal. Fuel content negligible. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.



view report



## **OIL ANALYSIS REPORT**

Sample Rating Trend

VISCOSITY

## Area (**H917017**) Machine Id 413016 ۲

Component **Diesel Engine** Fluid

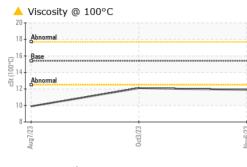
## PETRO CANADA DURON SHP 15W40 (11 GAL)

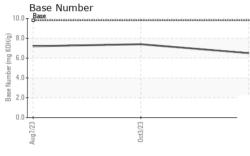
Becommendation ample at the next service interval to monitor, ar component wear rates are normal.     Sample Date     Client Info     GFL0097370 06 0x9 203     GFL007320 07 Aug 222     GFL007320 07 Aug 222       is no indication of any contamination in the is no indication of any contamination in the is no indication of any contamination in the actis that there is subtable alkalinity remaining oil. Contirm oil type.     Not Changed ATTENTION     Not Chang		· ·	,	Auç	<b>2</b> 2023	Oct2023 Nov20	123	
ample at the next service interval to monitor.   Sample Data   Client Info   06 Nov 2023   02 Oct 2023   07 Aug 202     ar component wear rates are normal.   Machina Aga   hrs   Client Info   1179   952   600     traination   Client Info   S75   352   600   0     traination   Client Info   S75   352   600   0     traination   Client Info   S75   352   600   0     oil decadion of any contamination in the   Sample Status   Client Info   S75   352   600   0     total continuition   Client Info   S75   350   Changed   Netsony   1   0   4   0	DIAGNOSIS	SAMPLE INFORM	<b>IATION</b>	method	limit/base	current	history1	history2
max     Machine Age     hrs     Client Info     1179     982     600       component wear rates are normal.     Client Info     575     352     600       trainination     training     Client Info     575     352     600       training     Client Info     Changed     Nat Changed     Ant Changed     Nat Changed       training     Sample Status     Client Info     Changed     Nat Changed     Nat Changed       training     Sample Status     Client Info     Changed     Nat Changed     Nat Changed       training     Sample Status     Client Info     Changed     Nat Changed     Nat Changed       sample Status     Client Info     Client Info     Client Info     Client Info     Client Info     Changed     Nat Change	Recommendation	Sample Number		Client Info		GFL0098797	GFL0073245	GFL007330 <sup>-</sup>
Ownponent wear rates are normal.     Oil Age     Ins     Client Info     575     352     600     Changed       Is no indication of any contamination in the ison of the is	sample at the next service interval to monitor.	Sample Date		Client Info		06 Nov 2023	03 Oct 2023	07 Aug 2023
bomponent wear rates are normal.     Dil Aga     insi     Cilent Info     57     352     000       tamination     reis no indication of any contamination in the     Cilent Info     Changed     ATTENTION     Matchanged       roll obcassify is lower than normal. The BN repution     CONTAMINATION     method     Juit base     current     history     NEG     NEG     NEG       sample Status     with ower than normal. The BN repution     Gilycol     With ower than normal. The BN repution     method     Info (Method)     2.0     NEG     NEG     NEG       oil. Confirm oil type.     WEAR METALS     method     Info (Method)     2.0     1     -1     0.4     2.2       Ition     ppm     ASTI/05188     >2.0     -1     -1     2.2     1     -1     2.2     1     -1     -1     2.2     1     -1     -1     -1     1     -1     2.2     1     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1	ar	Machine Age	hrs	Client Info		1179	952	-
Attaination re is no indication of any contamination in the base base status     Client in o attain and the same status     Client in o attain and the same status     Changed same status     Client in o attain and the same status     Changed same status     Change status     Same status		Oil Age	hrs	Client Info		575	352	600
Sample Status     ATTENTION		-		Client Info		Changed	Not Changd	Changed
Luid Condition     CONTAMINATION     method     limitbase     current     history1     history2       i oli vissositi is lower than normal. The BN result cates that there is suitable alkalinity remaining in oil. Confirm oil type.     WG Method     >3.0     <1.0		-				-	ATTENTION	ABNORMAL
Luid Condition   Oil Viscosity is lower than normal. The BN results that here is suitable alkalinity remaining in oil contirm oil type.   WC Method   >3.0   <1.0				method	limit/base		history1	history2
Water     Witcherhold     Sol.2     NEG     NEG     NEG       aus: bitt hitre is suitable alkalinity remaining in al. Contirm oil type.     Witcherhold     Vitcherhold     Sol.2     NEG     NEG     NEG       Water     Glyod     Witcherhold     Sol.2     NEG     NEG     NEG       Water     Opport     ASTM Officin     Sol.2     NEG     NEG     NEG       Water     Opport     ASTM Officin     Sol.2     Caterret     Netory1     Netory1       Inon     Opport     ASTM Officin     Sol.2     Caterret     Netory1     Netory1       Nickel     Opport     ASTM Officin     Sol.2     Caterret     Aluminum     Pom     ASTM Officin     Sol.2     Caterret     Caterret     Caterret     Caterret     Caterret     Caterret     Caterret     Caterret     Caterret     Netory1	luid Condition							
Gived     WC Method     NEG     NEG     NEG       i.i. Confirm oil ype.     Winder Method     winder Method     winder Method     history1     history1       Iron     ppm     ASTM D6156n     >120     18     12     56       Chromium     ppm     ASTM D6156n     >20     18     12     56       Nickel     ppm     ASTM D6156n     >20     1     <1								
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185n     >20     <1					>0.2			
iron   ppm   ASTM 05185m   >12.0   18   1.2   56     Chromium   ppm   ASTM 05185m   >2.0   <1	on. Comminion type.							
Chromium     ppm     ASTM D5185m     >20     <1     <1     2       Nickel     ppm     ASTM D5185m     >2     <1		WEAR METALS	5					history2
Nickel   ppm   ASTM D5185m   >5   3   2   5     Ttanium   ppm   ASTM D5185m   >2   <1		Iron	ppm				12	
Titanium   ppm   ASTM D5185m   >2   <1   <1   <1     Silver   ppm   ASTM D5185m   >20   5   0   ▲   20     Aluminum   ppm   ASTM D5185m   >40   0   0   ▲   20     Lead   ppm   ASTM D5185m   >40   0   0   0   0     Copper   ppm   ASTM D5185m   >40   0   0   0   0     Copper   ppm   ASTM D5185m   >15   <1			ppm	ASTM D5185m	>20			
Silver   ppm   ASTM D5185m   >2   1   <1		Nickel	ppm	ASTM D5185m	>5	3	2	5
Aluminum   ppm   ASTM D5185m   >20   5   0   ▲ 20     Lead   ppm   ASTM D5185m   >40   0   0   0     Copper   ppm   ASTM D5185m   >330   118   22   113     Tin   ppm   ASTM D5185m   >15   <1		Titanium	ppm	ASTM D5185m	>2	<1	0	<1
Lead   ppm   ASTM D5165m   >>40   0   0     Copper   ppm   ASTM D5165m   >>330   118   22   113     Tin   ppm   ASTM D5165m   >15   <1		Silver	ppm	ASTM D5185m	>2	1	<1	<1
Copper     ppm     ASTM D5185m     >330     118     22     113       Tin     ppm     ASTM D5185m     >15     <1		Aluminum	ppm	ASTM D5185m	>20	5	0	<u> </u>
Tin   ppm   ASTM D5185m   >15   <1   <1   <1   3     Vanadium   ppm   ASTM D5185m   0   0   0   0     Cadmium   ppm   ASTM D5185m   0   0   0   0     ADDITIVES   method   imit/base   current   history1   history2     Boron   ppm   ASTM D5185m   0   13   20   15     Barium   ppm   ASTM D5185m   0   76   81   117     Molybdenum   ppm   ASTM D5185m   0   <1		Lead	ppm	ASTM D5185m	>40	0	0	0
Vanadium     ppm     ASTM D5185m     0     0     0       Cadmium     ppm     ASTM D5185m     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     13     20     157       Barium     ppm     ASTM D5185m     0     13     20     157       Magnesium     ppm     ASTM D5185m     0     1     1     1       Magnesium     ppm     ASTM D5185m     1010     786     794     687       Calcium     ppm     ASTM D5185m     1070     1046     1114     828       Sulfur     ppm     ASTM D5185m     206     2834     3092     2647 <td></td> <td>Copper</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;330</td> <td>118</td> <td>22</td> <td>113</td>		Copper	ppm	ASTM D5185m	>330	118	22	113
Cadimium   ppm   ASTM D5185m   0   0   0     ADDITIVES   method   limit/base   current   history1   history2     Boron   ppm   ASTM D5185m   0   13   20   157     Barium   ppm   ASTM D5185m   0   0   4.1   4.1     Molybdenum   ppm   ASTM D5185m   60   76   81   117     Manganese   ppm   ASTM D5185m   1010   786   794   687     Calcium   ppm   ASTM D5185m   1010   786   794   687     Phosphorus   ppm   ASTM D5185m   1010   786   794   687     Zinc   ppm   ASTM D5185m   1070   1049   1077   1423     Phosphorus   ppm   ASTM D5185m   1070   881   920   680     Zinc   ppm   ASTM D5185m   1010   881   920   2647     CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m <th< td=""><td></td><td>Tin</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;15</td><td>&lt;1</td><td>&lt;1</td><td>3</td></th<>		Tin	ppm	ASTM D5185m	>15	<1	<1	3
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     13     20     157       Barium     ppm     ASTM D5185m     0     0     <1		Vanadium	ppm	ASTM D5185m		0	0	0
Boron   ppm   ASTM D5185m   0   13   20   157     Barium   ppm   ASTM D5185m   0   0   <1		Cadmium	ppm	ASTM D5185m		0	0	0
Barium   ppm   ASTM D5185m   0   0   <1   <1     Molybdenum   ppm   ASTM D5185m   60   76   81   117     Manganese   ppm   ASTM D5185m   0   <1		ADDITIVES		method	limit/base	current	history1	history2
Molybdenum   ppm   ASTM D5185m   6.0   76   8.1   1.17     Manganese   ppm   ASTM D5185m   0   <1		Boron	ppm	ASTM D5185m	0	13	20	157
Marganesse   ppm   ASTM D5185m   0   <1   <1   4     Magnesium   ppm   ASTM D5185m   1010   786   794   687     Calcium   ppm   ASTM D5185m   1070   1049   1077   1423     Phosphorus   ppm   ASTM D5185m   1150   881   920   680     Zinc   ppm   ASTM D5185m   1270   1046   1114   828     Sulfur   ppm   ASTM D5185m   2060   2834   3092   2647     CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >206   2834   3092   2647     Sodium   ppm   ASTM D5185m   2060   2834   3092   2647     Sodium   ppm   ASTM D5185m   >206   1   0   4     Potassium   ppm   ASTM D5185m   >20   15   13   53     INFRA-RED   method   limit/base   current   history1   history2     Soot %   'ASTM D7844<		Barium	ppm	ASTM D5185m	0	0	<1	<1
Manganese   ppm   ASTM D5185m   0   <1   <1   4     Magnesium   ppm   ASTM D5185m   1010   786   794   687     Calcium   ppm   ASTM D5185m   1070   1049   1077   1423     Phosphorus   ppm   ASTM D5185m   1150   881   920   680     Zinc   ppm   ASTM D5185m   1270   1046   1114   828     Sulfur   ppm   ASTM D5185m   2060   2834   3092   2647     CONTAMINANTS   method   imit/base   current   history1   history2     Solicon   ppm   ASTM D5185m   >205   15   19   91     Sodium   ppm   ASTM D5185m   >20   11   0   4     Potassium   ppm   ASTM D5185m   >20   15   13   53     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   'ASTM D7844   >4   0.3   0.2   0.3     Nitration   Abs/cm   'A		Molybdenum	ppm	ASTM D5185m	60	76	81	117
Magnesium   ppm   ASTM D5185m   1010   786   794   687     Calcium   ppm   ASTM D5185m   1070   1049   1077   1423     Phosphorus   ppm   ASTM D5185m   1150   881   920   680   680     Zinc   ppm   ASTM D5185m   1270   1046   1114   828     Sulfur   ppm   ASTM D5185m   2060   2834   3092   2647     CONTAMINANTS   method   limit/base   current   history1   history2     Solicon   ppm   ASTM D5185m   >25   15   19   91     Sodium   ppm   ASTM D5185m   >20   13   53   53     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   *ASTM D7844   >4   0.3   0.2   0.3     Nitration   Abs/m   *ASTM D7842   >20   7.9   6.5   9.9     Sulfation   Abs/im   *ASTM D7415   >30   19.0   17.8   23.4     FLUID DEGRAD				ASTM D5185m	0	<1	<1	4
Calcium   ppm   ASTM D5185m   1070   1049   1077   1423     Phosphorus   ppm   ASTM D5185m   1150   881   920   680     Zinc   ppm   ASTM D5185m   1270   1046   1114   828     Sulfur   ppm   ASTM D5185m   2060   2834   3092   2647     CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >25   15   19   10     Sodium   ppm   ASTM D5185m   >20   13   53     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   *ASTM D7845   >20   15   13   53     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   *ASTM D7844   >4   0.3   0.2   0.3     Nitration   Abs/tmm   *ASTM D7845   >30   19.0   17.8   23.4     FLUID DEGRADATION   method   limit/		Magnesium	ppm			786	794	687
Phosphorus   ppm   ASTM D5185m   1150   881   920   680     Zinc   ppm   ASTM D5185m   1270   1046   1114   828     Sulfur   ppm   ASTM D5185m   2060   2834   3092   2647     CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >25   15   19   91     Sodium   ppm   ASTM D5185m   >25   15   19   91     Sodium   ppm   ASTM D5185m   >20   15   13   53     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   *ASTM D7844   >4   0.3   0.2   0.3     Nitration   Abs/:m   *ASTM D7845   >20   7.9   6.5   9.9     Sulfation   Abs/:m   *ASTM D7845   >30   19.0   17.8   23.4     FLUID DEGRADATION   method   limit/base   current   history1   history2     Oxidation   Abs/:m </td <td></td> <td>-</td> <td></td> <td>ASTM D5185m</td> <td>1070</td> <td>1049</td> <td>1077</td> <td>1423</td>		-		ASTM D5185m	1070	1049	1077	1423
Zinc   ppm   ASTM D5185m   1270   1046   1114   828     Sulfur   ppm   ASTM D5185m   2060   2834   3092   2647     CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >25   15   19   91     Sodium   ppm   ASTM D5185m   >25   15   19   4     Potassium   ppm   ASTM D5185m   >20   15   13   53     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   *ASTM D5185m   >20   15   13   53     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   *ASTM D7624   >20   7.9   6.5   9.9     Sulfation   Abs/:m   *ASTM D7415   >30   19.0   17.8   23.4     FLUID DEGRADATION   method   limit/base   current   history1   history2     Oxidation   Abs/:m <t< td=""><td></td><td>Phosphorus</td><td></td><td></td><td></td><td>881</td><td>920</td><td>680</td></t<>		Phosphorus				881	920	680
SulfurppmASTM D5185m2060283430922647CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25151991SodiumppmASTM D5185m>20104PotassiumppmASTM D5185m>20151353INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.30.20.3NitrationAbs/cm*ASTM D7624>207.96.59.9SulfationAbs/tm*ASTM D7415>3019.017.823.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/tm*ASTM D744>2515.113.522.2					1270	1046	1114	828
SiliconppmASTM D5185m>251519▲ 91SodiumppmASTM D5185mI04PotassiumppmASTM D5185m>20151353INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.30.20.3NitrationAbs/cm*ASTM D7624>207.96.59.9SulfationAbs/lmm*ASTM D7415>3019.017.823.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/lmm*ASTM D7414>2515.113.522.2		Sulfur						2647
SodiumppmASTM D5185m104PotassiumppmASTM D5185m>20151353INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.30.20.3NitrationAbs/cm*ASTM D7624>207.96.59.9SulfationAbs/lmm*ASTM D7415>3019.017.823.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/lmm*ASTM D7414>2515.113.522.2		CONTAMINANT	ſS	method	limit/base	current	history1	history2
PotassiumppmASTM D5185m>20151353INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.30.20.3NitrationAbs/cm*ASTM D7624>207.96.59.9SulfationAbs/.1mm*ASTM D7415>3019.017.823.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2515.113.522.2		Silicon	ppm	ASTM D5185m	>25	15	19	<b>9</b> 1
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.30.20.3NitrationAbs/cm*ASTM D7624>207.96.59.9SulfationAbs/.tmm*ASTM D7415>3019.017.823.4FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/.tmm*ASTM D7414>2515.113.522.2		Sodium	ppm	ASTM D5185m		1	0	4
Soot %   %   *ASTM D7844   >4   0.3   0.2   0.3     Nitration   Abs/cm   *ASTM D7624   >20   7.9   6.5   9.9     Sulfation   Abs/.1mm   *ASTM D7415   >30   19.0   17.8   23.4     FLUID DEGRADATION   method   limit/base   current   history1   history2     Oxidation   Abs/.1mm   *ASTM D7414   >25   15.1   13.5   22.2		Potassium	ppm	ASTM D5185m	>20	15	13	53
Nitration     Abs/cm     *ASTM D7624     >20     7.9     6.5     9.9       Sulfation     Abs/.1mm     *ASTM D7415     >30     19.0     17.8     23.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.1     13.5     22.2		INFRA-RED		method	limit/base	current	history1	history2
Nitration     Abs/cm     *ASTM D7624     >20     7.9     6.5     9.9       Sulfation     Abs/.1mm     *ASTM D7415     >30     19.0     17.8     23.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.1     13.5     22.2		Soot %	%	*ASTM D7844	>4	0.3	0.2	0.3
SulfationAbs/.1mm*ASTM D7415>3019.017.823.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2515.113.522.2		Nitration	Abs/cm				6.5	9.9
Oxidation     Abs/.1mm     *ASTM D7414     >25     15.1     13.5     22.2								
		FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
		Oxidation	Abs/.1mm	*ASTM D7414	>25	15.1	13.5	22.2
						6.5	7.4	7.2



# **OIL ANALYSIS REPORT**

VISUAL





				limit/base	current		
	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
I.	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PROP	ERTIES	method	limit/base	current	history1	history
	Visc @ 100°C	cSt	ASTM D445	15.4	<b>11.9</b>	▲ 12.1	<b>9</b> .9
	GRAPHS						
	Ferrous Alloys						
	iron						
	50 - sessessesses chromium						
	40						
	<u>ة</u> 30						
	20						
		1					
	10 -						
	0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~			
	Aug7/23	0ct3/23		Nov6/23			
	-			2			
	Non-ferrous Meta	ais					
	copper						
				/			
	100 - management lead		/	/			
	100 80		/				
	100 - management lead		/				
	100 80		/				
	100 - tin 80 - tin 40 - tin		/				
	100 80 50 50	$\checkmark$					
	100	23		23			
	100	0cd3/23		Nov6/23			
	Head Head Head Head Head Head Head Head			Nov6/23			
	100				Base Numb	er	
	tin tin tin tin tin tin tin tin				Base Numb	er	
	100 40 40 40 40 40 40 40 40 40 40 40 40 4			10	Base Numb	er	
	Viscosity @ 100°			10	0.0 Base	er	
	100 100 100 100 100 100 100 100			10	0.0 - Base	er	
	Viscosity @ 100°			10	0.0 - Base	er	
	100 minimum lead 100 minimum			ase Mumber (mg KOH(g)	1.0 Base	er	
	100 100 100 100 100 100 100 100			ase Mumber (mg KOH(g)	0.0 - Base 0.0	er	
	100 minimum lead 100 minimum			Base Number (mg KOH(g)	1.0 Base	er er	

method limit/base

history1

current

history2