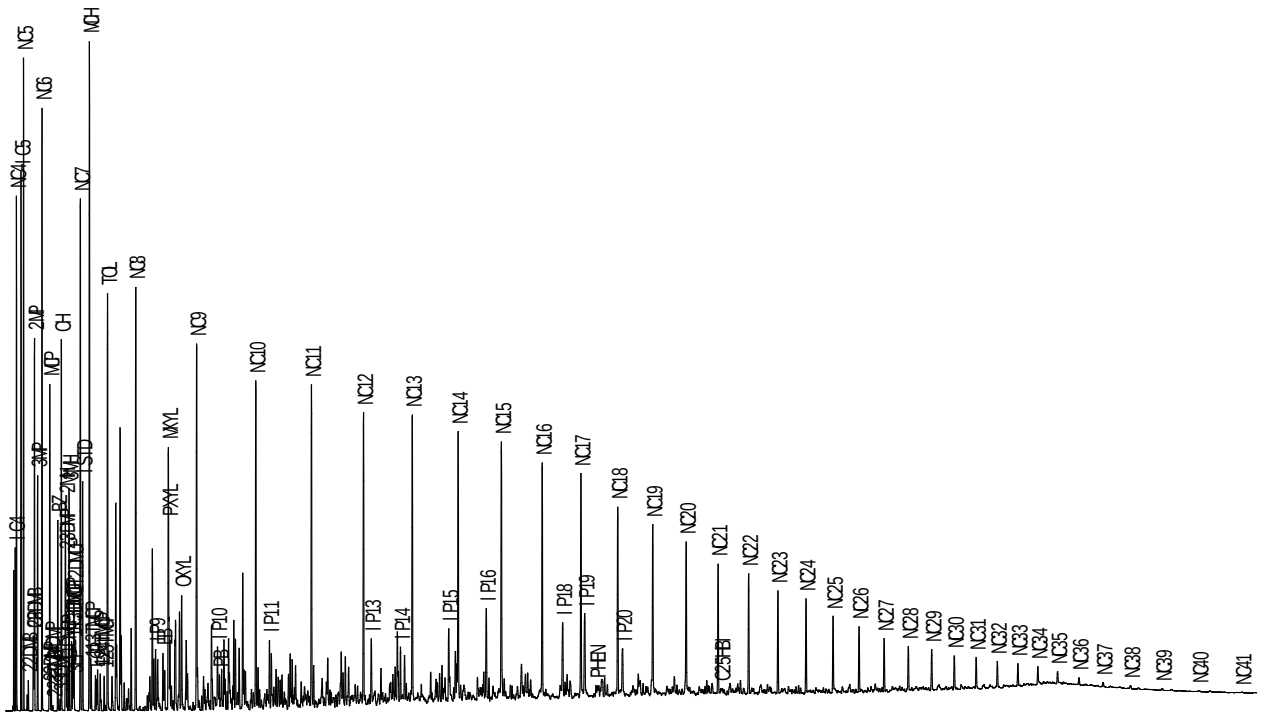
Weatherford LABORATORIES

WHOLE OIL GC

Company:	**Department of Health and Human Service**	**Client ID:**	
Country:		**Project #:**	**BH-65414**
Basin:		**Lab ID:**	**3403042751**
Lease:		**Sample Type:**	**Oil**
Block:		**Sampling Point:**	
Field:		**Formation:**	
Well Name:	**NIOSH Fedan**	**Geologic Age:**	
Latitude:		**Top Depth:**	
Longitude:		**Bottom Depth:**	
Preparation:		**GC Method:**	**G02G**

Whole Oil GC Trace

G5131054.D



WGC parameters	
Pristane/Phytane	1.67
Pristane/*n* C_{17}	0.55
Phytane/*n* C_{18}	0.39
n C_{18}/(nC_{18}+*n* C_{19})	0.52
n C_{17}/(nC_{17}+*n* C_{29})	0.82
CPI Hunt[4]	1.01
Normal Paraffins	29.6
Isoprenoids	4.4
Cycloparaffins	6.4
Branched (iso-) Paraffins	5.4
BTX aromatics	4.4
Resolved unknowns	49.3

Thompson[1]		
A.	BZ/*n* C_6	0.38
B.	TOL/*n* C_7	0.93
C.	(*n* C_6+*n* C_7)/(CH+MCH)	0.92
I.	Isoheptane Value	1.69
F.	*n* C_7/MCH	0.71
U.	CH/MCP	1.24
R.	*n* C_7/2MH	2.59
S.	*n* C_6/22DMB	21.90
H.	Heptane Value	21.86
	MCH/*n* C_7	1.41
	mpXYL/*n* C_8	0.81

Mango[2]	
P_1	19.75
P_2	15.80
P_3	5.75
$5N_1$	5.69
N_2	6.66
$6N_1$	46.36
K_1	1.06
K_2	0.70
$5N_1/6N_1$	0.12
P_3/N_2	0.86
ln(24DMP/23DMP)	-0.58

Halpern[3]	
Tr_1	11.92
Tr_2	12.77
Tr_3	5.29
Tr_4	4.94
Tr_5	10.22
Tr_7	1.62
Tr_8	2.85
C_1	0.12
C_2	0.45
C_3	0.25
C_4	0.08
C_5	0.10

[1]Thompson, K.F.M.,1983.GCA:V.47, p.303. [2]Mango, F.D.,1994.GCA: V.58, p.895. [3]Halpern,H.I.,1995,AAPG Bull.: V.79, p.801. [4]Hunt, 1979

Company:	**Department of Health and Human Services**	**Client ID:**	
Well Name:	**NIOSH Fedan**	**Project #:**	**BH-65414**
Depth:	**-**	**Lab ID:**	**3403042751**
Sampling Point:		**File Name:**	**G5131054.D**

Peak Label	Compound Name	Ret. Time	Area	Height	ppt (Area)	ppt (Hght)
IC4	Iso-alkane C4	3.907	22745	16171	1.48	2.43
NC4	Normal Alkane C4	4.024	72395	51046	4.70	7.68
IC5	Iso-alkane C5	4.459	80606	53871	5.23	8.10
NC5	Normal Alkane C5	4.698	100722	65036	6.54	9.78
22DMB	2,2-Dimethylbutane	5.150	4960	3000	0.32	0.45
CP	Cyclopentane	5.620	12374	7424	0.80	1.12
23DMB	2,3-Dimethylbutane	5.652	11389	6600	0.74	0.99
2MP	2-Methylpentane	5.735	63499	36967	4.12	5.56
3MP	3-Methylpentane	6.033	41786	23350	2.71	3.51
NC6	Normal Alkane C6	6.447	108631	59761	7.05	8.99
22DMP	2,2-Dimethylpentane	7.122	3885	2102	0.25	0.32
MCP	Methylcyclopentane	7.182	64031	32436	4.16	4.88
24DMP	2,4-Dimethylpentane	7.316	8211	4035	0.53	0.61
223TMB	2,2,3-Trimethylbutane	7.473	1247	534	0.08	0.08
BZ	Benzene	7.942	41053	18956	2.66	2.85
33DMP	3,3-Dimethylpentane	8.158	2578	1159	0.17	0.17
CH	Cyclohexane	8.277	79198	36814	5.14	5.54
2MH	2-Methylhexane	8.663	44917	20781	2.92	3.13
23DMP	2,3-Dimethylpentane	8.714	14622	7188	0.95	1.08
11DMCP	1,1-Dimethylcyclopentane	8.803	9099	4025	0.59	0.61
3MH	3-Methylhexane	9.008	48094	22019	3.12	3.31
1C3DMCP	1-cis-3-Dimethylcyclopentane	9.241	15371	6883	1.00	1.04
1T3DMCP	1-trans-3-Dimethylcyclopentane	9.356	14724	6571	0.96	0.99
3EP	3-Ethylpentane	9.419	3290	2211	0.21	0.33
1T2DMCP	1-trans-2-Dimethylcyclopentane	9.472	24904	10874	1.62	1.64
NC7	Normal Alkane C7	10.077	116217	50816	7.54	7.64
ISTD	Internal Standard	10.293	52854	22809	3.43	3.43
MCH	Methylcyclohexane	10.937	164401	66357	10.67	9.98
113TMCP	1,1,3,-Trimethylcyclopentane	11.101	11768	4486	0.76	0.68
ECP	Ethylcyclopentane	11.510	8570	3505	0.56	0.53
124TMCP	1,2,4-Trimethylcyclopentane	11.962	9024	3653	0.59	0.55
123TMCP	1,2,3-Trimethylcyclopentane	12.334	8563	3408	0.56	0.51
TOL	Toluene	12.653	108454	41465	7.04	6.24
NC8	Normal Alkane C8	15.328	122975	41974	7.98	6.31
IP9	Isoprenoid C9	17.203	16786	6062	1.09	0.91
EB	Ethyl-benzene	17.905	16143	5680	1.05	0.85
MXYL	*m*-xylene	18.415	76688	26116	4.98	3.93
PXYL	*p*-xylene	18.473	23372	9272	1.52	1.39
OXYL	*o*-xylene	19.671	37097	11422	2.41	1.72
NC9	Normal Alkane C9	21.091	106624	36416	6.92	5.48
IP10	Isoprenoid C10	23.069	21023	6290	1.36	0.95
PB	Propyl-benzene	23.240	12259	3519	0.80	0.53
NC10	Normal Alkane C10	26.699	100736	32822	6.54	4.94
IP11	Isoprenoid C11	27.992	20735	6898	1.35	1.04
NC11	Normal Alkane C11	31.969	103273	32272	6.70	4.85
NC12	Normal Alkane C12	36.900	95613	29156	6.21	4.38
IP13	Isoprenoid C13	37.634	26296	6650	1.71	1.00
IP14	Isoprenoid C14	40.401	18675	5707	1.21	0.86
NC13	Normal Alkane C13	41.520	96981	28716	6.29	4.32
IP15	Isoprenoid C15	44.969	28151	7363	1.83	1.11
NC14	Normal Alkane C14	45.863	96617	26904	6.27	4.05

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Depth:	**-**	**Lab ID:**	**3403042751**
Sampling Point:		**File Name:**	**G5131054.D**

Peak Label	Compound Name	Ret. Time	Area	Height	ppt (Area)	ppt (Hght)
IP16	Isoprenoid C16	48.527	41297	9216	2.68	1.39
NC15	Normal Alkane C15	49.957	93652	25736	6.08	3.87
NC16	Normal Alkane C16	53.826	86588	23585	5.62	3.55
IP18	Isoprenoid C18	55.763	38310	7608	2.49	1.14
NC17	Normal Alkane C17	57.495	81172	22355	5.27	3.36
IP19	Isoprenoid C19 (Pristane)	57.851	44562	8390	2.89	1.26
PHEN	Phenanthrene	58.926	5834	1192	0.38	0.18
NC18	Normal Alkane C18	60.979	67667	18830	4.39	2.83
IP20	Isoprenoid C20 (Phytane)	61.437	26653	4777	1.73	0.72
NC19	Normal Alkane C19	64.296	62974	17055	4.09	2.57
NC20	Normal Alkane C20	67.462	61352	15268	3.98	2.30
NC21	Normal Alkane C21	70.485	49177	13007	3.19	1.96
C25HBI	Highly Branch Isoprenoid C25	70.742	4044	659	0.26	0.10
NC22	Normal Alkane C22	73.379	44159	12021	2.87	1.81
NC23	Normal Alkane C23	76.153	39613	10327	2.57	1.55
NC24	Normal Alkane C24	78.815	36200	9503	2.35	1.43
NC25	Normal Alkane C25	81.375	30590	7724	1.99	1.16
NC26	Normal Alkane C26	83.838	26431	6582	1.72	0.99
NC27	Normal Alkane C27	86.211	21226	5352	1.38	0.81
NC28	Normal Alkane C28	88.504	18120	4472	1.18	0.67
NC29	Normal Alkane C29	90.717	17481	4113	1.13	0.62
NC30	Normal Alkane C30	92.853	14816	3388	0.96	0.51
NC31	Normal Alkane C31	94.929	13338	3173	0.87	0.48
NC32	Normal Alkane C32	96.934	11230	2641	0.73	0.40
NC33	Normal Alkane C33	98.881	10608	2301	0.69	0.35
NC34	Normal Alkane C34	100.770	8395	1802	0.55	0.27
NC35	Normal Alkane C35	102.641	6587	1219	0.43	0.18
NC36	Normal Alkane C36	104.664	4676	776	0.30	0.12
NC37	Normal Alkane C37	106.958	3422	498	0.22	0.08
NC38	Normal Alkane C38	109.543	2288	329	0.15	0.05
NC39	Normal Alkane C39	112.546	1634	199	0.11	0.03
NC40	Normal Alkane C40	116.033	1530	142	0.10	0.02
NC41	Normal Alkane C41	120.120	1114	97	0.07	0.02

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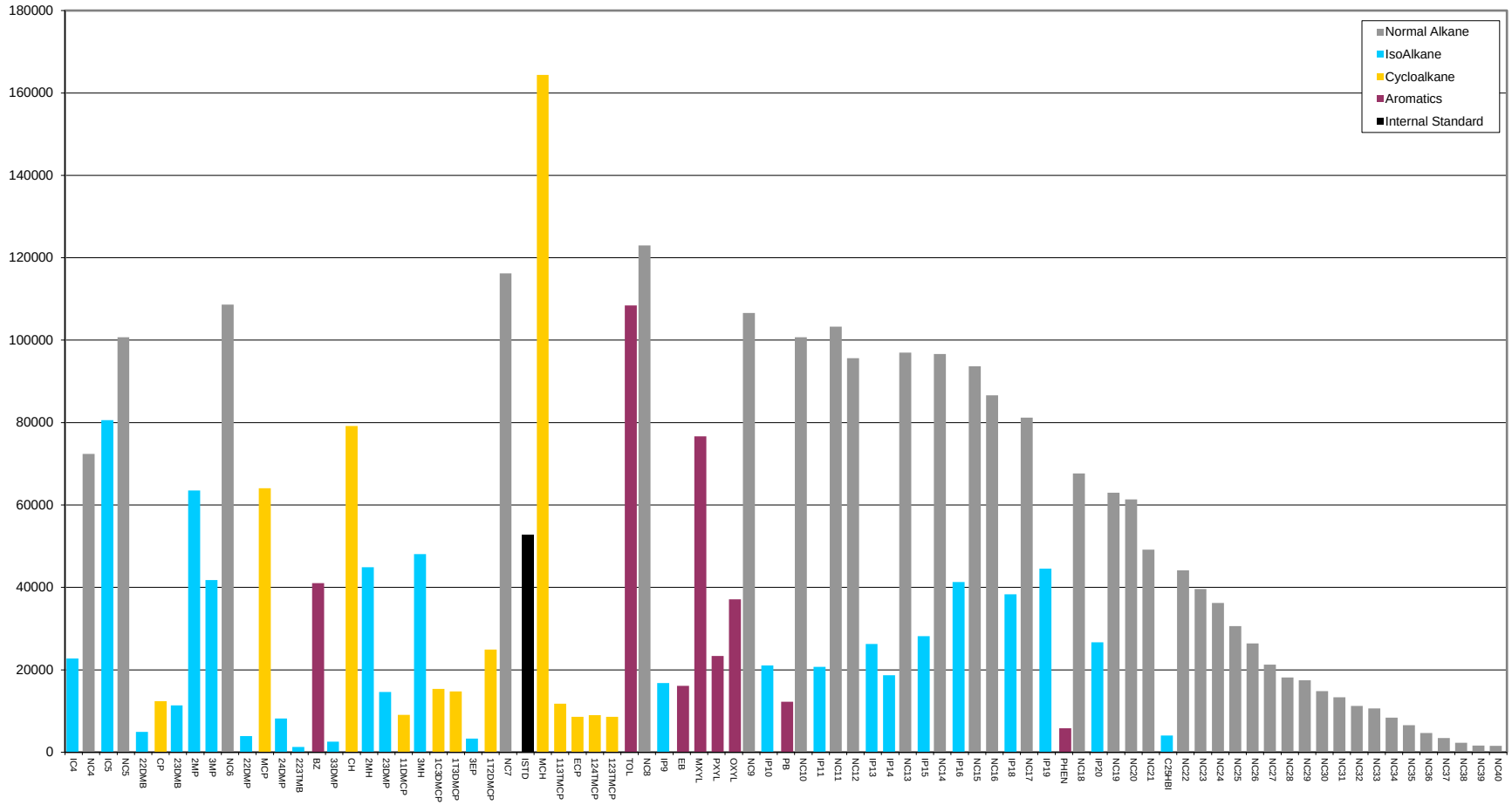
Histogram Based on Area



Geochemical Services Group, 143 Vision Park Blvd., Shenandoah, Texas 77384 • Phone: 281-681-2200 • Fax: 281-681-0326 • Email: geocheminfo@weatherfordlabs.com

Parameter	Formula
WGC Parameters	
Pristane/Phytane	IP19/IP20
Pristane/nC17	IP19/NC17
Phytane/nC18	IP20/NC18
$nC_{18}/(nC_{18}+nC_{19})$	NC18/(NC18+NC19)
$nC_{17}/(nC_{17}+nC_{29})$	NC17/(NC17+NC29)
CPI Hunt[4]	((NC23+NC25+NC27+NC29+NC31)+(NC25+NC27+NC29+NC31+NC33))/(2*(NC24+NC26+NC28+NC30+NC32))
Normal Paraffins	100*(NC4+NC5+NC6+NC7+NC8+NC9+NC10+NC11+NC12+NC13+NC14+NC15+NC16+NC17+NC18+NC19+NC20+NC21+NC22+NC23+NC24+NC25+NC26+NC27+NC28+NC29+NC30+NC31+NC32+NC33+NC34+NC35+NC36+NC37+NC38+NC39+NC40+NC41)/TOTAL_RESOLVED
Isoprenoids	100*(IP9+IP10+IP11+IP13+IP14+IP15+IP16+IP18+IP19+IP20+C25HBI)/TOTAL_RESOLVED
Cycloparaffins	100*(CP+MCP+CH+11DMCP+1T3DMCP+1T2DMCP+MCH+113TMCP+ECP+124TMCP+123TMCP+1C3DMCP+1C2DMCP)/TOTAL_RESOLVED
Branched (iso-) Paraffins	100*(IC4+IC5+22DMB+23DMB+2MP+3MP+22DMP+24DMP+223TMB+33DMP+2MH+23DMP+3MH+3EP)/TOTAL_RESOLVED
BTX aromatics	100*(BZ+TOL+MXYL+PXYL+OXYL)/TOTAL_RESOLVED (*OXYL added 05/21/2007)
Thompson[1]	
BZ/nC6	BZ/NC6
TOL/nC7	TOL/NC7
(nC6+nC7)/(CH+MCH)	(NC6+NC7)/(CH+MCH)
Isoheptane Value	(2MH+3MH)/(1C3DMCP+1T3DMCP+1T2DMCP)
nC7/MCH	NC7/MCH
CH/MCP	CH/MCP
nC7/2MH	NC7/2MH
nC6/22DMB	NC6/22DMB
Heptane Value	100*NC7/(CH+2MH+23DMP+11DMCP+3MH+1C3DMCP+1T3DMCP+1T2DMCP+MCH+NC7)
MCH/nC7	MCH/NC7
mpXYL/nC8	(MXYL+PXYL)/NC8
Mango[2]	
P1	100*NC7/(22DMP+24DMP+223TMB+33DMP+2MH+23DMP+11DMCP+3MH+1C3DMCP+1T3DMCP+3EP+1T2DMCP+NC7+MCH+ECP+TOL)
P2	100*(2MH+3MH)/(22DMP+24DMP+223TMB+33DMP+2MH+23DMP+11DMCP+3MH+1C3DMCP+1T3DMCP+3EP+1T2DMCP+NC7+MCH+ECP+TOL)
P3	100*(3EP+33DMP+23DMP+24DMP+22DMP+223TMB)/(22DMP+24DMP+223TMB+33DMP+2MH+23DMP+11DMCP+3MH+1C3DMCP+1T3DMCP+3EP+1T2DMCP+NC7+MCH+ECP+TOL)
5N1	100*(ECP+1T2DMCP)/(22DMP+24DMP+223TMB+33DMP+2MH+23DMP+11DMCP+3MH+1C3DMCP+1T3DMCP+3EP+1T2DMCP+NC7+MCH+ECP+TOL)
N2	100*(11DMCP+1C3DMCP+1T3DMCP)/(22DMP+24DMP+223TMB+33DMP+2MH+23DMP+11DMCP+3MH+1C3DMCP+1T3DMCP+3EP+1T2DMCP+NC7+MCH+ECP+TOL)
6N1	100*(MCH+TOL)/(22DMP+24DMP+223TMB+33DMP+2MH+23DMP+11DMCP+3MH+1C3DMCP+1T3DMCP+3EP+1T2DMCP+NC7+MCH+ECP+TOL)
K1	(2MH+23DMP)/(3MH+24DMP)
K2	(2MH+3MH)/(2MH+3MH+11DMCP+1C3DMCP+1T3DMCP)
5N1/6N1	(ECP+1T2DMCP)/(MCH+TOL)
P3/N2	(3EP+33DMP+23DMP+24DMP+22DMP+223TMB)/(11DMCP+1C3DMCP+1T3DMCP)
ln(24DMP/23DMP)	ln(24DMP/23DMP)
Halpern[3]	
Tr1	TOL/11DMCP
Tr2	NC7/11DMCP
Tr3	3MH/11DMCP
Tr4	2MH/11DMCP
Tr5	(2MH+3MH)/11DMCP
Tr7	1T3DMCP/11DMCP
Tr8	(2MH+3MH)/(22DMP+23DMP+24DMP+33DMP+3EP)
C1	22DMP/(22DMP+23DMP+24DMP+33DMP+3EP)
C2	23DMP/(22DMP+23DMP+24DMP+33DMP+3EP)
C3	24DMP/(22DMP+23DMP+24DMP+33DMP+3EP)
C4	33DMP/(22DMP+23DMP+24DMP+33DMP+3EP)
C5	3EP/(22DMP+23DMP+24DMP+33DMP+3EP)

1	2	3	4	5	6
INFO	**Name**	**Range Start**	**Range End**	**Add Next sample into next**	**Sample display distance**
PAGE	SUMMARY	A1	BE174	workbook	
PAGE	Histogram	A1	I43	workbook	
FILE				GC_WHOIL_[F]_[S]_[D]-[B]_[P].xls	

7	8	9	10	11
Max samples in one page	**Tick**			