

**Fischer Assay Report on
Cleveland Cliffs Oil Shale Samples
HRI Project 7466**

<u>Hole Number</u>	<u>Sample Type ¹</u>	<u>Beginning Footage</u>	<u>Ending Footage</u>	<u>Oil Yield (GPT)</u>	<u>Oil Specific Gravity</u>	<u>Water Yield (GPT)</u>	<u>Residue Weight (Lb/ton)</u>	<u>Gas+ Loss (Lb/ton)</u>
6-1	RC	0	20	1.1	1.005	4.1	1941	16
6-1	RC	20	40	4.8	1.005	1.8	1930	15
6-1	RC	40	60	7.1	1.005	1.6	1908	19
6-1	RC	60	80	7.2	1.005	1.4	1910	18
6-1	RC	80	100	7.5	1.005	1.6	1906	18
6-1	STD	--	--	22.2	1.005	3.4	1734	51
6-1	RC	100	110	7.8	1.005	1.6	1905	16
6-1	RC	110	120	7.9	1.005	1.4	1901	21
6-1	RC	120	130	5.7	1.005	1.6	1921	18
6-1	RC	130	140	6.9	1.005	1.8	1910	17
6-1	RC	130	140 RE	7.0	1.006	1.1	1910	21
6-1	RC	140	150	8.3	1.005	1.8	1897	18
6-1	RC	150	160	6.7	1.005	2.7	1905	16
6-1	RC	160	170	6.3	1.005	2.3	1911	17
6-1	RC	170	180	8.0	1.005	2.3	1895	19
6-1	RC	180	190	10.4	1.005	2.0	1873	22
6-1	RC	190	200	10.7	1.005	2.3	1870	21
6-1	RC	200	210	10.7	1.005	2.3	1869	22
6-1	RC	210	220	14.1	1.005	3.0	1829	28
6-1	RC	210	220 RE	14.0	1.005	2.9	1829	30
6-1	RC	220	230	11.4	1.005	2.9	1856	24
6-1	RC	230	240	8.0	1.006	2.9	1879	29
6-1	RC	240	250	8.2	1.005	4.3	1869	26
6-1	RC	250	260	10.7	1.005	4.5	1841	31
6-1	RC	260	270	9.8	1.005	4.1	1858	26
6-1	RC	270	280	9.9	1.005	2.9	1866	26
6-1	RC	280	290	9.7	1.005	3.4	1864	26
6-1	RC	290	300	9.7	1.005	2.9	1870	24
6-1	RC	300	310	8.9	1.006	3.2	1868	31

¹ DC - Drill core
RC - Rotary cuttings
STD - Standard (22 gpt)

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<u>Hole Number</u>	<u>Sample Type ¹</u>	<u>Beginning Footage</u>	<u>Ending Footage</u>	<u>Oil Yield (GPT)</u>	<u>Oil Specific Gravity</u>	<u>Water Yield (GPT)</u>	<u>Residue Weight (Lb/ton)</u>	<u>Gas+ Loss (Lb/ton)</u>
6-1	DC	310	310.4	9.8	1.005	2.7	1878	17
6-1	DC	311.3	312	9.5	1.006	1.8	1888	18
6-1	DC	311.3	312 RE	9.0	1.006	1.8	1892	18
6-1	DC	312	313	10.3	1.006	1.1	1886	18
6-1	DC	313	314	11.6	1.005	1.6	1870	19
6-1	DC	314	315	14.0	1.005	1.6	1843	26
6-1	DC	315	316	13.9	1.006	2.0	1838	28
6-1	STD	--	--	22.0	1.006	3.4	1736	51
6-1	DC	316	317	15.9	1.006	2.3	1818	30
6-1	DC	317	318	9.7	1.005	1.8	1883	20
6-1	DC	318	319	6.9	1.005	2.5	1904	17
6-1	DC	319	320.3	6.8	1.006	2.0	1908	18
6-1	DC	320.3	321	8.2	1.005	1.8	1898	18
6-1	DC	321	322	11.0	1.006	1.8	1872	21
6-1	DC	322	323	10.5	1.006	2.3	1873	20
6-1	DC	322	323 RE	10.9	1.005	1.6	1871	24
6-1	DC	323	324	6.0	1.005	2.3	1915	16
6-1	DC	324	325	6.6	1.005	2.7	1903	19
6-1	DC	325	326	7.9	1.005	2.3	1895	19
6-1	STD	--	--	21.9	1.005	3.4	1740	48
6-1	DC	326	327	4.6	1.006	1.6	1929	19
6-1	DC	327	328	8.6	1.005	1.8	1893	20
6-1	DC	328	329	14.6	1.005	2.3	1833	25
6-1	DC	329	330	9.5	1.005	1.8	1882	23
6-1	DC	329	330 RE	9.5	1.005	1.6	1884	23
6-1	DC	330	331	7.7	1.005	1.6	1903	20

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<u>Hole Number</u>	<u>Sample Type ¹</u>	<u>Beginning Footage</u>	<u>Ending Footage</u>	<u>Oil Yield (GPT)</u>	<u>Oil Specific Gravity</u>	<u>Water Yield (GPT)</u>	<u>Residue Weight (Lb/ton)</u>	<u>Gas+ Loss (Lb/ton)</u>
6-1	DC	331	332	9.2	1.005	1.1	1886	28
6-1	DC	332	333	33.5	1.006	2.7	1663	33
6-1	DC	333	334	14.9	1.005	1.8	1831	29
6-1	DC	334	335	10.8	1.005	2.0	1867	26
6-1	DC	335	336	12.0	1.005	2.3	1854	26
6-1	DC	336	337	11.8	1.005	2.7	1853	25
6-1	DC	337	338	13.3	1.006	1.8	1846	28
6-1	DC	338	339	29.7	1.005	2.9	1674	52
6-1	DC	338	339 RE	29.8	1.005	2.9	1676	50
6-1	DC	339	340	13.5	1.005	1.8	1843	29
6-1	DC	340	341	12.8	1.005	2.0	1849	27
6-1	STD	--	--	21.7	1.005	3.4	1742	48
6-1	DC	341	342	32.4	1.005	2.9	1654	50
6-1	DC	342	343	11.9	1.005	1.6	1863	23
6-1	DC	343	344	5.3	1.005	1.8	1922	18
6-1	DC	344	345	4.4	1.005	1.8	1929	19
6-1	DC	344	345 RE	4.3	1.005	1.8	1928	20
6-1	DC	345	346	2.4	1.005	1.6	1951	16
6-1	DC	346	347	4.8	1.006	1.6	1928	19
6-1	DC	347	348	3.7	1.005	1.4	1939	19
6-1	DC	348	349	4.9	1.005	1.8	1928	16
6-1	DC	349	350	3.0	1.005	2.0	1940	18
6-1	DC	350	351	1.8	1.005	2.3	1950	15
6-1	DC	351	352	1.5	1.006	2.0	1959	11
6-1	DC	352	353	2.0	1.005	2.0	1955	11
6-1	DC	353	354	6.0	1.006	2.3	1910	21
6-1	STD	--	--	21.7	1.005	3.2	1745	47
6-1	DC	354	355	15.3	1.005	2.3	1822	31
6-1	DC	355	356	10.9	1.005	2.5	1862	26
6-1	DC	356	357	35.2	1.005	4.5	1611	56
6-1	DC	356	357 RE	36.1	1.005	4.1	1607	57
6-1	DC	357	358	15.7	1.005	2.9	1812	31

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<u>Hole Number</u>	<u>Sample Type ¹</u>	<u>Beginning Footage</u>	<u>Ending Footage</u>	<u>Oil Yield (GPT)</u>	<u>Oil Specific Gravity</u>	<u>Water Yield (GPT)</u>	<u>Residue Weight (Lb/ton)</u>	<u>Gas+ Loss (Lb/ton)</u>
6-1	DC	358	359	12.9	1.005	3.2	1839	26
6-1	Dc	359	360	10.4	1.005	2.3	1870	24
6-1	DC	360	361	11.9	1.005	3.4	1849	22
6-1	DC	361	362	22.2	1.005	3.4	1752	33
6-1	DC	362	363	26.9	1.005	3.4	1703	44
6-1	DC	362	363 RE	27.9	1.005	3.2	1698	41
6-1	DC	363	364	<0.5	1.005	2.3	1770	232
6-1	DC	364	365	27.0	1.005	2.7	1711	40
6-1	DC	365	366	38.8	1.005	2.9	1592	58
6-1	DC	366	367	33.5	1.005	4.1	1639	47
6-1	STD	--	--	21.5	1.005	2.9	1747	48
6-1	DC	367	368	18.3	1.005	2.5	1795	31
6-1	DC	368	369	15.5	1.005	2.9	1818	28
6-1	DC	369	370	9.5	1.005	2.7	1876	22
6-1	DC	369	370 RE	9.5	1.005	2.7	1876	22
6-1	DC	370	371	15.9	1.005	3.2	1812	28
6-1	DC	371	372	15.0	1.005	2.7	1826	26
6-1	DC	372	373	9.7	1.005	1.8	1885	19
6-1	DC	373	374	10.3	1.005	2.3	1873	22
6-1	DC	374	375	10.8	1.005	3.4	1863	19
6-1	DC	375	376	9.1	1.005	1.8	1889	20
6-1	DC	376	377	8.8	1.005	1.6	1898	15
6-1	DC	377	378	12.5	1.005	1.4	1863	20
6-1	DC	378	379	32.4	1.005	3.2	1639	62
6-1	STD	--	--	21.1	1.005	3.4	1747	48
6-1	DC	379	380	28.9	1.005	2.9	1686	47
6-1	DC	380	381	17.0	1.005	2.3	1809	30
6-1	DC	381	382	27.6	1.005	2.3	1712	38
6-1	DC	382	383	38.7	1.005	2.7	1601	52
6-1	DC	383	384	49.6	1.005	3.4	1505	51

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Hole Number	Sample Type(1)	Footage		Oil Yield	Oil Specific	Water Yield	Residue Weight	Gas + Loss
		Begin	End	(gpt)	Gravity	(gpt)	(lb/ton)	(lb/ton)
6-1	DC	384	385	51.1	1.006	3.9	1465	74
6-1	DC	385	386	55.8	1.006	4.6	1402	92
6-1	DC	386	387	68.9	1.006	6.9	1269	96
6-1	DC	387	388	65.3	1.006	5.0	1318	92
STD		27-G		20.9	1.006	3.2	1749	49
6-1	DC	388	389	52.2	1.006	3.7	1453	79
6-1	DC	389	390	37.9	1.006	2.3	1610	53
6-1	DC	390	391	47.1	1.006	3.4	1501	75
6-1	DC	391	392	25.4	1.006	2.3	1726	42
6-1	DC	392	393	17.0	1.006	2.3	1810	28
6-1	DC	393	394	30.1	1.006	2.5	1688	39
6-1	DC	394	395	29.6	1.006	2.8	1682	46
6-1	DC	395	396	19.3	1.006	2.1	1791	30
6-1	DC	396	397	49.3	1.006	3.0	1496	65
6-1	DC	397	398	34.7	1.006	2.5	1637	51
6-1	DC	397	398R	34.2	1.006	2.3	1643	51
6-1	DC	398	399	43.8	1.006	2.3	1550	63
6-1	DC	399	400	13.1	1.006	2.1	1810	63
6-1	DC	400	401	18.1	1.006	1.8	1808	25
6-1	DC	401	402	36.2	1.006	2.5	1622	53
6-1	DC	402	403	15.9	1.006	2.3	1824	24
6-1	DC	403	404	13.3	1.006	2.5	1843	25
6-1	DC	404	405	22.1	1.006	2.7	1755	37
6-1	DC	405	406	46.1	1.006	4.1	1501	77
6-1	DC	406	407	17.3	1.006	2.7	1799	33
6-1	DC	407	408	6.8	1.006	2.3	1905	18
6-1	DC	408	409	10.9	1.006	2.3	1867	22
6-1	DC	409	410	8.8	1.006	1.6	1893	20
STD		27-G		21.1	1.006	3.4	1749	45
6-1	DC	410	411	13.4	1.006	2.8	1836	29
6-1	DC	411	412	28.5	1.006	2.3	1700	41
6-1	DC	412	413	29.8	1.006	2.1	1688	44
6-1	DC	413	414	26.3	1.006	2.3	1728	33

(1) DC- Drill Core
RC - Rotary Cuttings

STD - Standard (22 gpt)
R - Repeat Analysis

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Hole Number	Sample Type(1)	Footage		Oil Yield (gpt)	Oil Specific Gravity	Water Yield (gpt)	Residue Weight (lb/ton)	Gas + Loss (lb/ton)
		Begin	End					
6-1	DC	414	415	19.4	1.006	2.7	1785	29
6-1	DC	415	416	21.9	1.006	3.4	1754	34
6-1	DC	416	417	31.7	1.006	2.7	1661	50
6-1	DC	417	418	18.0	1.006	2.7	1798	28
6-1	DC	418	419	16.5	1.006	3.4	1800	33
6-1	DC	419	420	10.6	1.006	2.3	1869	23
6-1	DC	420	421	9.4	1.006	3.0	1876	21
6-1	DC	421	422	10.4	1.006	2.7	1861	29
6-1	DC	422	423	20.3	1.006	2.8	1768	39
6-1	DC	423	424	11.6	1.006	2.3	1858	26
6-1	DC	424	425	9.6	1.006	2.3	1881	19
6-1	DC	425	426	6.0	1.006	2.3	1913	18
6-1	DC	426	427	4.1	1.006	1.4	1941	13
6-1	DC	427	428	5.3	1.006	1.8	1924	16
6-1	DC	428	429	16.8	1.006	1.8	1816	28
6-1	DC	428	429R	16.9	1.006	1.8	1820	23
6-1	DC	429	430	7.0	1.006	2.1	1906	18
6-1	DC	430	431	6.6	1.006	4.6	1891	17
6-1	DC	431	432	18.6	1.006	2.7	1793	28
6-1	DC	432	433	23.6	1.006	2.1	1741	44
6-1	DC	433	434	7.8	1.006	1.8	1896	23
6-1	DC	434	435	5.6	1.006	1.4	1923	18
6-1	DC	435	436	13.5	1.006	2.5	1838	29
6-1	DC	436	437	38.6	1.006	3.4	1598	50
6-1	DC	437	438	10.8	1.006	2.1	1872	20
6-1	DC	438	439	6.4	1.006	2.7	1907	17
6-1	DC	439	440	2.5	1.006	2.1	1950	13
6-1	DC	440	441	3.8	1.006	2.5	1936	11
STD		27-G		21.5	1.006	3.2	1747	46
6-1	DC	441	442	9.4	1.006	2.5	1882	19
6-1	DC	442	443	17.3	1.006	5.3	1786	25
6-1	DC	443	444	9.9	1.006	8.0	1845	6

(1) DC - Drill Core
RC - Rotary Cuttings

STD - Standard (22 gpt)
R - Repeat Analysis

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Hole Number	Sample Type(1)	Footage		Oil	Oil	Water	Residue	Gas+
		Begin	End	Yield (gpt)	Specific Gravity	Yield (gpt)	Weight (lb/ton)	Loss (lb/ton)
6-1	DC	444	445	12.7	1.006	6.9	1817	19
6-1	DC	445	446	12.6	1.006	3.0	1837	34
6-1	DC	446	447	6.8	1.006	2.3	1907	17
6-1	DC	447	448	4.2	1.006	2.3	1929	17
6-1	DC	448	449	4.4	1.004	2.1	1931	16
6-1	DC	449	450	5.1	1.006	1.8	1926	16
9-1	RC	160	170	4.5	1.006	4.6	1910	14
9-1	RC	170	180	4.6	1.006	4.6	1911	13
9-1	RC	180	190	7.8	1.006	4.6	1877	19
9-1	RC	190	200	11.3	1.006	3.2	1857	22
STD		27-G		21.4	1.006	3.4	1742	49
9-1	RC	200	210	5.5	1.006	1.8	1925	14
9-1	RC	210	220	4.6	1.006	1.8	1934	12
9-1	RC	220	230	6.7	1.006	1.8	1913	16
9-1	RC	230	240	5.2	1.006	1.4	1933	13
9-1	RC	240	250	4.6	1.006	1.4	1939	12
9-1	RC	250	260	3.5	1.006	1.6	1947	10
9-1	RC	260	270	4.8	1.006	1.6	1932	15
9-1	RC	270	280	6.4	1.006	1.4	1919	16
9-1	RC	280	290	7.9	1.006	1.4	1907	16
9-1	RC	290	300	7.3	1.006	1.4	1910	17
9-1	RC	290	300R	7.4	1.006	1.4	1909	18
9-1	RC	300	310	6.7	1.006	1.6	1913	18
9-1	RC	320	330	7.7	1.006	2.3	1897	20
9-1	RC	330	340	6.8	1.008	2.3	1709	216
9-1	RC	380	390	4.1	1.006	1.8	1939	12
9-1	RC	367	377	7.6	1.006	2.5	1897	18
9-1	RC	377	390	7.7	1.006	2.7	1897	16
9-1	RC	390	400	9.3	1.006	2.3	1882	21
9-1	RC	400	410	10.6	1.006	2.3	1871	22
9-1	RC	410	420	9.9	1.006	2.5	1874	22
9-1	RC	420	430	13.5	1.006	2.5	1840	26
STD		27-G		21.4	1.006	3.2	1745	49
(1)	DC- Drill Core					STD - Standard (22 gpt)		
	RC - Rotary Cuttings					RE - Repeat Analysis		