

**Duncan Ranch 11-89-36 #3-4**

**API #05-081-07799**

**Cuttings Analyses**

**December 28, 2016**

Parameter	9/28/16 Results Sample 1	9/28/16 Results Sample 2	9/28/16 Results Sample 3	9/28/16 Results Sample 4	9/28/16 Results Sample 5	9/28/16 Results Sample 6	9/28/16 Results Sample 7	9/28/16 Results Sample 8	9/28/16 Results Sample 9	10/26/16 Results Bkgrd 1	10/26/16 Results Bkgrd 2	10/26/16 Results Bkgrd 3	Table 910-1 Limit
TVH-GRO – C6 to C-10, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	---
TPH-DRO - C10 to C28, mg/Kg	730	610	670	195	400	870	185	194	216	7	U	U	500
Benzene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	0.17
Toluene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	85
Ethylbenzene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	100
Xylenes , mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	175
Acenaphthene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	1,000
Anthracene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	1,000
Benz(a)anthracene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	0.22
Benzo(b)fluoranthene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	0.22
Benzo(k)fluoranthene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	2.2
Benzo(a)pyrene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	0.022
Chrysene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	22
Dibenzo(a,h)anthracene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	0.022
Fluoranthene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	1,000
Fluorene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	1,000
Indeno(1,2,3,c,d)pyrene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	0.22
Naphthalene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	23
Pyrene, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	1,000
Electrical conductivity	19.9	19.0	19.7	20.8	21.9	19.5	19.2	21.9	21.8	0.124	0.0598	0.0575	<4
Sodium Adsorption Ratio	11	11	11	12	12	11	11	15	15	0.17	0.35	0.25	<12
pH	7.4	7.4	7.4	7.5	7.5	7.5	7.5	7.5	7.5	6.0	6.3	6.7	6-9
Arsenic, mg/KG	5.4	5.7	6.2	5.9	6.6	5.8	6.1	6	5.6	3.2	2.8	1.6	0.39
Barium, mg/Kg	9,280	8,660	8,140	8,610	8,660	8,400	8,420	4,910	4,680	270	186	254	15,000
Boron, mg/Kg	U	U	U	U	U	U	U	U	U	2	U	U	2
Cadmium, mg/Kg	U	0.5	0.6	0.6	U	U	0.5	U	U	U	U	U	70
Chromium (III) , mg/Kg	24	25	23	22	25	23	24	36	36	26	30	18	120,000
Chromium (VI) , mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	23
Copper, mg/Kg	26	29	27	27	27	26	27	26	28	12	15	11	3,100
Lead (inorganic) , mg/Kg	12	11	11	11	10	17	11	11	12	8	3	3	400

Mercury, mg/Kg	0.0596	0.0773	0.0647	0.0368	0.0601	0.0655	0.0309	0.0293	0.0304	0.00779	0.0155	0.00937	23
Nickel (soluble salts) , mg/Kg	24.9	24	23.8	29.4	29.8	24.4	28.2	39.3	40.4	32.7	53.4	31.3	1,600
Selenium, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	390
Silver, mg/Kg	U	U	U	U	U	U	U	U	U	U	U	U	390
Zinc, mg/Kg	58	60	66	53	58	57	60	74	69	44	33	26	23,000
Liquid hydrocarbons including condensate and oil	None detected visually	None detected visually	None detected visually	None detected visually	None detected visually	None detected visually	None detected visually	None detected visually	None detected visually	None detected visually	None detected visually	None detected visually	Below detection level

<value>: <value> is above the COGCC Table 910-1 parameter limit

U: less than the Minimum Detection Level, please see analytical results for more detail

---: not analyzed or no value