R. T. HICKS CONSULTANTS, LTD.

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April 24, 2014

HOBBS OCD

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RECEIVED

Mr. Geoffrey Leking
NMOCD District 1
1625 French Drive
Hobbs, New Mexico 88240
VIA EMAIL

RE: Murchison – Mogi 9 State Com 4H, In-place Burial Notice
Unit P, Section 9, T24S, R33E, API #30-025-41071

Dear Mr. Leking:

On behalf of Murchison Oil and Gas, R. T. Hicks Consultants is providing this notice to NMOCD with a copy to the State Land Office (certified, return receipt request) that closure operations at the above- referenced pit will begin on **Tuesday, April 29, 2014**. The closure process should require about two weeks. The "In-place Burial" closure plan for the pit was submitted on August 26, 2013 with the C-144 temporary pit application and NMOCD approved the plan on August 30, 2013. The rig was released on November 15, 2013.

In conformance with the 2013 Pit Rule, five-point (minimum) composite samples that are representative of the solids in the pit were recovered on January 8, 2014 and stabilized with the available mixing soil at a 3:1 ratio. In this first sampling effort we collected numerous samples an effort to gain a better understanding the distribution of hydrocarbon concentrations in the pit solids and of the heterogeneity of the individual samples after mixing with clean fill. Some of the samples were duplicates and the synthetic precipitation leaching procedure (SPLP) was performed on two samples. As shown in the summary table on page 2 of this letter, laboratory analyses of the stabilized cuttings composite demonstrate that the concentrations of the Table II parameters of 19.15.17.13 NMAC met the limits that allow in-place burial of the stabilized cuttings for each constituent except GRO+DRO and TPH in some samples.

We allowed nine weeks for hydrocarbon in the pit to naturally degrade and collected samples again on March 13, 2014. This time we collected composites from the inner horseshoe cell (freshwater) and the outer horseshoe cell (brine and cut brine) and we mixed the inner and outer composites in a ratio consistent with the amount of drilling solids placed in each cell—1 fresh:3brine/cut brine in this case—and the resulting sample was a composite of the pit contents ("Mogi 4 Comp." in the table). We calculated the closure concentrations for GRO/DRO and TPH in two ways using two sample sets. The first calculation used the pit field composite sample (Mogi 4 comp.) and "mixed" it with clean mixing dirt from the site in a 3:1 ratio. The second calculations utilized the separate inner and outer cell samples and "mixed" them mathematically in a 1:3 ratio, consistent with the amount of cuttings in each cell. We then "mixed" these in a 3:1 ratio with the mixing dirt. The resultant calculated concentrations meet Table II limits that allow in-place burial of the stabilized cuttings.

Mogi 9 State Com 4H Sample Name	Sample Type	Sample Date	Chloride *80,000*	Benzene *10*	BTEX *50*	GRO+ DRO *1000*	TPH 418.1 *2500*	GRO+ DRO+ DROext	GRO	DRO	MRO
3:1 Stabilized A-1	stabilized, duplicate	1/8/2014	6100	0.67 0.54	6501.756 0.54	2298 3550	5200 4900	3048 4750	98 150	2200 3400	750 1200
3:1 Stabilized A-2 SPLP	SPLP*	1/8/2014	380	-	-	4.24	1.7	4.24	0.84	3.4	0
3:1 Stabilized A-3	stabilized	1/8/2014	5800	-	-	2787	4700	3787	87	2700	1000
3:1 Stable B1	stabilized, duplicate	1/8/2014	5100	0.55 0.36	0.55 0.36	1186 1300	1600 1900	1186 1300	86 100	1100 1200	0 0
3:1 Stabilized B2 SPLP	SPLP*	1/8/2014	380	-	-	2.18	1.3	2.18	0.38	1.8	0
3:1 Stabilized B3	stabilized	1/8/2014	6700	-	-	1027	1800	1027	57	970	0
Mogi 4 Comp. (inner + outer)	Field 1:3 comp.	3/13/2014	-	-	-	1680	840 550	2200	180	1500	520
Mixing Dirt	composite	1/8/2014	95	-	-	16	0	16	0	16	0
CALCULATED 3 (mixing dirt):1 (inner+outer) stabilized **						*432*	*210* *138*				
Mogi 4 Inner (fresh)	composite	3/13/2014	-	-	-	65	84/23	65	0	65	0
Mogi 4 Outer (brine, cut brine)	composite	3/13/2014	-	-	-	755	620/270	905	25	730	150
Mixing Dirt	composite	1/8/2014	95	-	-	16	0	16	0	16	0
CALCULATED 3 (mixing dirt):1 (inner+outer) stabilized **						*157.625*	*121.5/52*				

*For academic interest only

**[Mixing Dirt x 0.75] + [Pit Composite (1 inner: 3 outer) x 0.25] = 3:1 Stabilized

Note the following relationships of the data in the summary table below:

1. The most soluble constituent, chloride, does not show significant variation between sample results (average = 5925, standard deviation = 576). One can expect this much variation due to the normal heterogeneity of these samples.
2. DRO varies by 65% in the A-1 duplicate sample– two samples from the same 4-oz jar, the same analyst in the lab, the same laboratory protocols
3. DRO varies from sample to sample (average = 1928, standard deviation = 910). The standard deviation is about half the average concentration.
4. DRO for the 4-point composite sample from the inner shoe is 65 mg/kg and for the outer shoe, the composite sample result is 730. The inner shoe represents about 1/3 of the total solids in the pit. With a standard deviation that is about half the average value, one can expect that a sample composed of 1 part inner shoe and 2 parts outer should produce a result of about 563 mg/kg, plus or minus 250 mg/kg. The maximum expected value based upon this simplistic evaluation is 750 mg/kg, well below the 1000 mg/kg limit for closure.
5. In the field, the two inner and outer composite samples are mechanically mixed vigorously to break up any large pieces of sample and to homogenize the solids as much as possible. This sample returns an analytical result of 1680 mg/kg DRO+GRO; about 300% greater than the expected value of 563 mg/kg
6. When 3 parts mixing dirt was added to one part of the composite pit sample [(16 *3)+(1680)/3] the mathematical result is 432, as shown in the table.
7. Remarkably, when 3 parts mixing dirt was mechanically and vigorously mixed with one part of the composite sample in the field, the laboratory result did not make any sense. This is not the first time that field mixing yielded puzzling results (e.g. #5 above).

In trying to make sense of these results, we are speculating that the vigorous mixing in the field changes the nature of the DRO in the sample. Since a trackhoe is used to stabilize the cuttings during closure and it cannot realistically achieve a completely homogeneous mixture, we believe that the most representative sample of the solids scheduled for burial in this pit are the mathematical mixing of

- One part inner shoe composite sample
- Three parts outer shoe solids
- Twelve parts mixing dirt

This example uses a 1:3 inner:outer cell ratio which is utilized in most of the Murchison pits. The pit design and volume of cuttings can change which would then change the inner/outer ratios slightly but the general formula will remain the same in accordance with the Pit Rule requirements—1 part representative pit contents to 3 parts mixing dirt. Given a standard deviation that is about 50% of the average result, we conclude with a high degree of certainty that the GRO+DRO concentration in the buried solids will be 157 mg/kg plus or minus 75 mg/kg.

I will follow up this notice to you with a phone call today as required by the Pit Rule.

Sincerely,

R.T. Hicks Consultants

Kristin Pope

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Copy: Murchison Oil and Gas

Terry Warnell, State Land Office
New Mexico State Land Office
PO Box 1148
Santa Fe, NM 87504-1148
CERTIFIED MAIL – RETURN RECIEPT REQUEST