



September 1, 2011

Alex Fischer, P.G.  
Environmental Supervisor - Western Colorado  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, CO 80203

**RE: Vaquero Energy  
Blue Gravel Pit Closures  
Moffat County, CO**

Dear Mr. Fischer,

The purpose of this letter is to inform you of the progress and direction of the pit closure activities associated with the Vaquero Energy, Inc. (Vaquero) Blue Gravel Pits in Moffat County, Colorado. As directed, Colorado Oil and Gas Conservation Commission (COGCC) Form 27s outlining the closure plan for seventeen pits have been completed and subsequently approved by the COGCC. Kleinfelder and Vaquero Energy identified seven pit locations that represent a cross section of typical site conditions to perform a background sampling program as outlined in the Form 27s. Kleinfelder collected two soil samples at each location; a composite soil screening sample and a background sample at each of the following seven pit locations:

- Blue Gravel 1-26
- Blue Gravel 2-25
- Blue Gravel 7-25
- Blue Gravel 5-24
- Blue Gravel 4-35
- Blue Gravel 1-35
- Blue Gravel 4-36

The composite pit soil samples were submitted to an independent laboratory for analysis of the full COGCC 910 soil list and results were compared to the Table 910-1 standards. In addition, background soil samples were collected outside of the pit areas and analyzed for arsenic to provide representative background concentrations.

The results of the soil samples collected from within the pits indicated concentrations of benzene, total volatile petroleum hydrocarbons (TVPH), total extractable petroleum hydrocarbons (TEPH), arsenic and sodium absorption ratio (SAR) exceeding the Table 910-1 standards. The background concentrations of arsenic in the soil were reported above the arsenic concentrations in all seven pit locations. In all cases, the arsenic concentration in the pit sample was less than the concentration in the background sample. Due to the elevated background



levels, we propose not to include arsenic in the list of constituents of concern during the closure of the 17 pits. The results of the screening soil samples are summarized in the attached Table 1.

Based on the results of the screening samples, Kleinfelder proposes a specific subset of the 910 soil list. Confirmation soil samples, subsequent to excavation of each of the 17 pits, will be analyzed for the following subset of the 910 soil list:

- Benzene,
- TVPH,
- TEPH, and
- SAR

As outlined in the Remediation Workplan section of Form 27, Kleinfelder anticipates impacted soil will be excavated from the pit using a backhoe. Representative soil samples will be collected from the excavated pit to confirm compliance with the above-mentioned subset of constituents and compared to Table 910-1 standards. In lieu of land farming, excavated material from the impacted pits will be disposed off-site at a local landfill (Moffat County Landfill). The Remediation Workplan as outlined in the approved Form 27s will be utilized for backfilling of the pits and the revegetation process.

With State approval, Kleinfelder intends to close Pit 5-35 without any further assessment. The only constituent detected during the screening sampling at Pit 5-35 was arsenic, at a concentration less than the background concentration. Kleinfelder also proposes to identify other pits with similar scenarios to Pit 5-35 (i.e. formation and use) and conduct soil sampling to potentially exclude those pits from further assessment prior to closure.

We also propose to collect background samples to be analyzed for SAR outside of pits similar to Pit 7-25 where SAR was the only constituent to exceed 910-1 Table standards (other than arsenic at background concentrations).

If you or a representative from COGCC would like to witness future activities associated with the closure of the pits, please advise. We will keep you informed of the schedule of activities moving forward. Please provide us with comments or approval of the intended closure plan outlined in the Form 27 and further detailed in this letter. If you have any questions or would like to discuss the closure activities, please contact Derek Bowman at 303-781-8211.

Respectfully submitted,

**KLEINFELDER**

Derek Bowman, CHMM  
Project Manager

Doug Henderer, P.E.  
Client Account Manager

**Vaquero Energy**  
**Blue Gravel Pit Closures**  
**Screening Soil Sample Results**  
**Kleinfelder Project # 120019**

Sample ID	Parameter	Units	COGCC Table 910-1 Standard	BG4-36-072611 4-36 7/26/2011	BG4-35-072611 4-35 7/26/2011	BG5-35-072611 5-35 7/26/2011	BG2-25-072611 2-25 7/26/2011	BG7-25-072611 7-25 7/26/2011	BG1-26-072611 1-26 7/26/2011	BG5-24-072611 5-24 7/26/2011
Pit ID	Method	Parameter	Units	Value	Value	Value	Value	Value	Value	Value
9045D	pH		su	8.4	8.5	7.1	8.7	8.8	8.1	7.9
Calc.	Sodium Adsorption Ratio		<12	19	24	0.5	14	12	19	78
9050AMod	Specific Conductance		umhos/cm	260	930	69	780	700	1200	88
<b>METALS</b>										
7471	Mercury		mg/kg	0.024	0.14	<0.020	<0.020	0.021	0.36	0.027
60108	Arsenic		mg/kg	2.4	3	1.3	2.4	12	2.4	1.4
60108	Arsenic (background levels)		mg/kg	3.3	4	2.6	5.3	21	3.7	2.2
60108	Barium		mg/kg	340	110	56	130	140	170	330
60108	Boron		mg/kg	<10	<10	<10	<10	<10	12	<10
60108	Cadmium		mg/kg	<0.25	0.38	<0.25	0.28	0.55	0.45	0.3
60108	Chromium (III)		mg/kg	11	10	3.9	12	13	17	12
3060A/7196A	Chromium, Hexavalent (VI)		mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
60108	Copper		mg/kg	10	6.6	2.9	10	11	12	12
60108	Lead		mg/kg	19	7.1	4.4	9.4	14	13	11
60108	Nickel		mg/kg	13	3.1	3.1	23	13	13	16
60108	Selenium		mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
60108	Silver		mg/kg	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50
60108	Zinc		mg/kg	66	34	18	47	94	58	59
<b>VOCs</b>										
8021/8015	Benzene		mg/kg	0.21	5.6	<0.0025	<0.025	<0.0025	<0.025	2.8
8021/8015	Toluene		mg/kg	0.25	23	<0.075	<0.25	<0.025	4.4	7.4
8021/8015	Ethylbenzene		mg/kg	0.42	21	<0.0025	0.2	<0.0025	<0.025	11
8021/8015	Total Xylene		mg/kg	1.6	140	<0.0075	4.2	<0.0075	1.6	26
GRO	TVPH (GC/FID) Low Fraction		mg/kg	890	8900	<0.50	3000	<0.50	1500	3800
3546/DHO	TEPH (GC/FID) High Fraction		mg/kg	3900	1700	<4.0	<4.0	<4.0	9.6	3000
<b>SVOCs</b>										
8270C-SIM	Anthracene		mg/kg	<0.12	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.15
8270C-SIM	Acenaphthene		mg/kg	0.12	<0.0060	<0.0060	0.0098	<0.0060	<0.0060	<0.15
8270C-SIM	Benz(a)anthracene		mg/kg	<0.12	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
8270C-SIM	Benzo(b)pyrene		mg/kg	<0.12	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
8270C-SIM	Benzo(k)fluoranthene		mg/kg	<0.12	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
8270C-SIM	Benzo(e)pyrene		mg/kg	<0.12	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
8270C-SIM	Chrysene		mg/kg	<0.12	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
8270C-SIM	Dibenz(a,h)anthracene		mg/kg	<0.12	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
8270C-SIM	Fluoranthene		mg/kg	<0.12	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.15
8270C-SIM	Fluorene		mg/kg	0.33	<0.0060	<0.0060	0.0079	<0.0060	<0.0060	<0.15
8270C-SIM	Indeno(1,2,3-cd)pyrene		mg/kg	<0.12	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
8270C-SIM	Naphthalene		mg/kg	<0.12	0.064	<0.0060	0.24	<0.0060	0.083	1.5
8270C-SIM	Pyrene		mg/kg	<0.12	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.15

**Notes**

**Bold - value exceeds concentrations as listed in COGCC Table 910-1**

Unless otherwise noted, the COGCC Table 910-1 Standard concentrations were taken from CDPHE-HNMWD Table 1 Colorado Soil Evaluation Values (December 2007)

<sup>(1)</sup> US EPA Region 9 April 2009 risk-based soil screening guidance for protection of groundwater resources

<sup>(2)</sup> Concentrations taken from CDPHE-WQCC Regulation 41 - The Basic Standards for Ground Water

\* Value is a sum of total extractable and total volatile petroleum hydrocarbons

## Fischer, Alex

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**From:** Derek Bowman [DBowman@kleinfelder.com]  
**Sent:** Friday, September 02, 2011 11:04 AM  
**To:** Fischer, Alex; 'hgonzalez@VaqueroEnergy.com'  
**Cc:** Doug Henderer  
**Subject:** RE: Vaquero Form 27  
**Attachments:** Vaquero Progress Letter, Pit Closures.pdf

Alex,

Please see the attached letter regarding the soil screening samples and intended plan moving forward for the Blue Gravel Pit closures with Vaquero.

With your approval, we'd like to proceed as written in this letter.

Thank you for your time.

**Derek Bowman, CHMM**  
Project Manager  
Kleinfelder

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**From:** Derek Bowman  
**Sent:** Wednesday, July 27, 2011 4:47 PM  
**To:** Alex.Fischer@state.co.us; hgonzalez@VaqueroEnergy.com  
**Cc:** Doug Henderer  
**Subject:** Re: Vaquero Form 27

Thanks Alex.

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**From:** Fischer, Alex <Alex.Fischer@state.co.us>  
**To:** Hector Gonzalez <hgonzalez@VaqueroEnergy.com>; Derek Bowman  
**Cc:** Doug Henderer  
**Sent:** Wed Jul 27 06:58:57 2011  
**Subject:** RE: Vaquero Form 27

Thanks. I am still in Rifle and will not be back to Moffat Routt Counties until Thurs. Continue with the sampling not need for COGCC to be on site.

Alex Fischer, P.G.

Environmental Supervisor - Western Colorado  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, CO 80203  
(303) 894-2100 ext. 5138  
(303) 894-2109 fax  
[alex.fischer@state.co.us](mailto:alex.fischer@state.co.us)

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**From:** Hector Gonzalez [mailto:hgonzalez@VaqueroEnergy.com]  
**Sent:** Tuesday, July 26, 2011 8:33 AM

**To:** Derek Bowman; Fischer, Alex  
**Cc:** Doug Henderer  
**Subject:** RE: Vaquero Form 27

Derek,

Not sure if this will work for everyone. No need to rush. COGCC might want to be there for the testing. I need to let the lease operator know someone will be on location.

Alex,  
Will this work?

**Hector Gonzalez**  
Production Foreman  
Vaquero Energy  
15545 Hermosa Road  
Bakersfield, CA 93307  
661 363-7240 ext. 206 office  
661 979-3984 cell

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**From:** Derek Bowman [mailto:DBowman@kleinfelder.com]  
**Sent:** Tuesday, July 26, 2011 8:02 AM  
**To:** Fischer, Alex  
**Cc:** Hector Gonzalez; Doug Henderer  
**Subject:** RE: Vaquero Form 27

Alex and Hector,  
We will be collecting the screening samples in the pits starting this afternoon (Tuesday) and finishing up tomorrow morning.

Thanks,

**Derek Bowman, CHMM**  
Project Manager  
Kleinfelder

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**From:** Fischer, Alex [mailto:Alex.Fischer@state.co.us]  
**Sent:** Friday, July 22, 2011 11:08 AM  
**To:** Derek Bowman  
**Cc:** hgonzalez@VaqueroEnergy.com; Doug Henderer  
**Subject:** RE: Vaquero Form 27

No issues with your proposing to collect the screening samples. What date(s) are you going to be out there next week?

Alex Fischer, P.G.  
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[alex.fischer@state.co.us](mailto:alex.fischer@state.co.us)

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**From:** Derek Bowman [mailto:DBowman@kleinfelder.com]  
**Sent:** Friday, July 22, 2011 10:25 AM  
**To:** Fischer, Alex  
**Cc:** Hector Gonzalez (hgonzalez@VaqueroEnergy.com); Doug Henderer  
**Subject:** RE: Vaquero Form 27

Alex,  
The signed Form 27s for the Blue Gravel pits in Moffat County will arrive at your office on Monday. We have identified seven (7) pits that represent the site conditions that we are planning to collect soil samples for screening. With your approval, we'd like to collect these samples next week and get them submitted for the Table 910-1 contaminants. Do you have any problems with us collecting the screening samples next week? Here are the pit locations:

Blue Gravel 1-26  
Blue Gravel 2-25  
Blue Gravel 7-25  
Blue Gravel 5-24  
Blue Gravel 4-35  
Blue Gravel 1-35  
Blue Gravel 4-36

Please advise.

Thanks,

**Derek Bowman, CHMM**  
Project Manager  
Kleinfelder

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**From:** Fischer, Alex [mailto:Alex.Fischer@state.co.us]  
**Sent:** Thursday, July 21, 2011 9:28 AM  
**To:** Derek Bowman  
**Subject:** RE: Vaquero Form 27

Electronic signatures will work.

Alex Fischer, P.G.  
Environmental Supervisor - Western Colorado  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, CO 80203  
(303) 894-2100 ext. 5138  
(303) 894-2109 fax  
[alex.fischer@state.co.us](mailto:alex.fischer@state.co.us)

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**From:** Derek Bowman [mailto:DBowman@kleinfelder.com]  
**Sent:** Thursday, July 21, 2011 8:55 AM  
**To:** Fischer, Alex  
**Subject:** RE: Vaquero Form 27

**Fischer, Alex**

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**To:** Doug Henderer; [hgonzalez@VaqueroEnergy.com](mailto:hgonzalez@VaqueroEnergy.com)  
**Cc:** Brad Baum; Derek Bowman  
**Subject:** RE: Vaquero Form 27

Doug,

I feel that this would be a good practical approach and should be included in the Form 27s.

Thanks  
Alex

Alex Fischer, P.G.  
Environmental Supervisor - Western Colorado  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, CO 80203  
(303) 894-2100 ext. 5138  
(303) 894-2109 fax  
[alex.fischer@state.co.us](mailto:alex.fischer@state.co.us)

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**From:** Doug Henderer [<mailto:dhenderer@kleinfelder.com>]  
**Sent:** Monday, July 11, 2011 5:20 PM  
**To:** Fischer, Alex; [hgonzalez@VaqueroEnergy.com](mailto:hgonzalez@VaqueroEnergy.com)  
**Cc:** Brad Baum; Derek Bowman  
**Subject:** RE: Vaquero Form 27

Alex,

Our thoughts were to screen several pits for the full 910 soil list to identify the constituents of concern. From that we would develop a background sampling program if needed, and identify a subset of constituents (TPH, benzene, etc.) for monitoring the progress of the excavation work. Do you find this approach acceptable? Do you recommend that the full 910 list be analyzed for samples from the pit prior to final closure?

Thank you,

Doug

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**From:** Fischer, Alex [<mailto:Alex.Fischer@state.co.us>]  
**Sent:** Monday, July 11, 2011 2:12 PM  
**To:** Doug Henderer; [hgonzalez@VaqueroEnergy.com](mailto:hgonzalez@VaqueroEnergy.com)  
**Cc:** Brad Baum; Derek Bowman  
**Subject:** RE: Vaquero Form 27

Doug and Hector,

Alex,

Do you need original Form 27s with the signatures, or can I send you the hard copies with scanned signatures?

Thanks,

**Derek Bowman, CHMM**

Project Manager

Kleinfelder

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**From:** Fischer, Alex [mailto:Alex.Fischer@state.co.us]

**Sent:** Tuesday, July 12, 2011 2:47 PM

**To:** Doug Henderer; hgonzalez@VaqueroEnergy.com

**Cc:** Brad Baum; Derek Bowman

**Subject:** RE: Vaquero Form 27

Folks,

Please see attached. The remediation number for this facility is: 5922 Please reference this on subsequent correspondence as it relates to this facility.

Thanks

Alex

Alex Fischer, P.G.

Environmental Supervisor - Western Colorado

Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801

Denver, CO 80203

(303) 894-2100 ext. 5138

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[alex.fischer@state.co.us](mailto:alex.fischer@state.co.us)

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**From:** Doug Henderer [mailto:dhenderer@kleinfelder.com]

**Sent:** Monday, July 11, 2011 5:20 PM

**To:** Fischer, Alex; hgonzalez@VaqueroEnergy.com

**Cc:** Brad Baum; Derek Bowman

**Subject:** RE: Vaquero Form 27

Alex,

Our thoughts were to screen several pits for the full 910 soil list to identify the constituents of concern. From that we would develop a background sampling program if needed, and identify a subset of constituents ( TPH, benzene, etc.) for monitoring the progress of the excavation work. Do you find this approach acceptable? Do you recommend that the full 910 list be analyzed for samples from the pit prior to final closure?

Thank you,

Doug



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**From:** Fischer, Alex [mailto:Alex.Fischer@state.co.us]  
**Sent:** Monday, July 11, 2011 2:12 PM  
**To:** Doug Henderer; hgonzalez@VaqueroEnergy.com  
**Cc:** Brad Baum; Derek Bowman  
**Subject:** RE: Vaquero Form 27

Doug and Hector,

Were you going to collect samples for characterization to determine impact, if any? And are you sampling for the entire 910-1 list?

Please include the API number for the Blue Gravel 1-35).

Thanks  
Alex

Alex Fischer, P.G.  
Environmental Supervisor - Western Colorado  
Colorado Oil and Gas Conservation Commission  
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**From:** Doug Henderer [mailto:dhenderer@kleinfelder.com]  
**Sent:** Thursday, July 07, 2011 11:27 AM  
**To:** Fischer, Alex; Hector Gonzalez (hgonzalez@VaqueroEnergy.com)  
**Cc:** Brad Baum; Derek Bowman  
**Subject:** Vaquero Form 27

Alex,

Thank you again for your time last month to meet with us concerning the closure of the Vaquero Blue Gravel pits. As discussed, attached is the first Form 27 for your review. Upon your approval, we will forward executed forms 27 for the remaining pits.

Concerning the salamanders present at the Blue Gravel 1-35 pit, we do not believe that they are protected. Our research indicates that there are no USFWS listed amphibian T&E species in Moffat County, and no salamanders are listed in the state species of concern or BLM special status species databases. A photograph of a salamander is attached for your reference.

We appreciate your assistance, please let us know if you have any questions or concerns.

Doug

Douglas Henderer, PE

Sr. Principal Professional  
300 E. Mineral Ave, Suite 7  
Littleton, CO 80122  
O| 303.781.8211 x 231  
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F| 303.781.1167



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