R.T. Hicks Consultants, Ltd.

Memo

To: Bob Johnson

From: Randy Hicks

CC: Debbie Baldwin, COGCC, Rudolph Sacks, Esq.

Date: 08/03/2010

Re: Hydrocarbon Recovery Test, Gramps Oil Field

Examination of the attached water level/hydrocarbon thickness table shows that the hydrocarbon thickness in MW-4 may be decreasing over time. In December 1999, the hydrocarbon thickness in this well was only 0.05 feet.

Chemical analyses from MW-4 show benzene ranging from non-detect to 1.4 ug/l (see attached table). In December 1999, we obtained a sample from the bottom of a bailer that exhibited separate phase hydrocarbon (SPH). The Method 8260 analysis detected only:

Naphthalene	35 ug/l
o-Xylene	1.1 ug/l

MW-5 and MW-7 are down gradient from MW-4. MW-7 has not exhibited dissolved phase hydrocarbons in any sampling event. Although MW-5 exhibits a hydrocarbon odor and slight hydrocarbon sheen on the water purged from the well, analyses from MW-5 (1995-1999) did not detect constituents of concern, except a 1996 analysis that showed naphthalene at 0.8 ug/l.

My conversation with Ms. Baldwin, the COGCC regulator who will evaluate our final submission for site closure, asked several questions regarding groundwater that your field visit will attempt to answer. Her questions, and a few of my own questions are addressed below with the proposed response:

Question	Response
What is the nature of the SPH in MW-4 – crude, diesel or a mixture	Obtain a sample of SPH from MW-4. Describe the samples physical characteristics and submit the sample for fuel typing

Will sufficient SPH flow into MW-4 to warrant recovery.	Although 0.05 feet of SPH is essentially unrecoverable with standard techniques, stressing the well by bailing may cause sufficient flow of SPH to warrant an appropriate recovery system. Perform a bailing/recovery test of MW-4 as described in the article Huntley in Ground Water (2000, v. 38, no. 1).
MW-6 has shown as much as 0.1 foot of SPH in the past. In December, we noted that SPH existed in this well. However the water level was below the screen and the SPH was trapped in the bottom cap of the well. What type of SPH is this?	Re-measure the water level, SPH level and total depth of this well. Then, if SPH is present, take a sample of SPH for physical examination and fuel typing.
In December 1999, the new domestic supply well exhibited 1.2 ug/l ethylbenzene, 1.5 ug/l xylene and 1.5 ug/l toluene – all well below drinking water standards.	If the new pump is installed, purge the well (50-100 gallons) and collect a second sample for BTEXN (EPA Method 8260)