



July 26, 2010

Mr. Gary Beers

Colorado Department of Public Health and Environment

Water Quality Control Division

4300 Cherry Creek Drive South

WQCD-P-B2

Denver, Colorado 80246-1530

Subject: Greenback-Produced Water Recovery, LLC
Pending Permit # COG-840002
CGRS Project No. 1-10270-11727aa

Dear Gary:

This letter provides information as required for an amended permit as described in your letter of July 15, 2010, which is attached for reference. Our responses to your information request are addressed by item.

- ♦ *Description of the intermittent discharges as to volume, duration, and timing during a representative year* – Surface discharge would only occur as a waste minimization process should the holding ponds become full. We estimate that 10% of 2500 barrels (bbls) per day influx will be treated. This corresponds to 65,000 bbls per year. At a 45 gpm permeate we would discharge 3.5 days per month.
GB- provide estimate of daily flow (mgd) for the 3-4 days in this discharge period.
- ♦ *Conveyance loss assessment for dry tributary* – The infiltration rate documented for the site was 30 minutes per inch. Water can easily traverse over a ten foot area in the swale bottom. At a 0.0028 feet per minute infiltration rate the resulting volume per 10 square feet would be 0.21 gallons per minute (gpm). This value divided into 45 gpm yields 217 feet of dry tributary to infiltrate all of the discharge. This neglects ponding (which increases infiltration), evaporation and other consumptive losses. The distance to Mamm Creek exceeds 12,000 feet and the possibility of discharge water reaching the creek is extremely unlikely unless excessive precipitation occurs during discharge.
GB- Just confirm that site soil conditions are common to those in swale and include document for referenced site study. Include groundlevel color photograph of downstream swale at proposed discharge point. Also, include

any information on outfall to swale. Will it be fixed structure and will it minimize erosion in immediate area, etc ?

- ♦ *Any management approach to control flow to preclude entrance into Mamm Creek* – During the first discharge the dry drainage will be observed to confirm anticipated infiltration is occurring. Based on the observed water migration subsequent discharges will be modified (duration and volume) as needed to ensure limited migration from the discharge point. GreenBack will limit discharge during precipitation or snow melt events.

GB- More information will be helpful. How much flexibility for timing of discharge is expected ? Since the discharge is not of a continuous or emergency nature, you should have choice to discharge at anytime within a 30-60 day window ?

Are you saying that discharge will be shutdown when flow begins to approach Mamm Creek –i.e, when discharge flow is evident 5,000 ft or “x” ft from the discharge point. We would put this BMP in the permit as clear basis for flow not reaching Mamm Creek.

- **WET (acute) Testing**

As we discussed the very low salt content (i.e., low TDS) of the RO treated water may be the cause of WET test failures and we will need information indicating discharge will pass the WET test, starting with the first day of discharge. There are two ways to supply this information: (1) WET testing to document RO discharge passes test without chemical (salt) amendments, and (2) procedure to add amendments prior to discharge to raise the salt levels for passage of the WET test. You should have some information on what you are going to add to accomplish higher TDS level (i.e., staff at WET testing laboratories should be able to give you suggestions and actually create the mixtures to show resultant salt levels). I assume that you would have a mixing tank setup for amending the RO discharge before release to the swale.

- **RO Discharge Water Quality**

Provide any additional information, including actual data from RO unit operations at other sites or by manufacturer. We will need a clear and full chemical profile of this water. This is critical information.

If you have any questions regarding this letter, please contact me at 970-493-7780.

Sincerely,
CGRS, Inc.,

Joby L. Adams, P.G.