Off Site Sampling & Testing Protocol for Conventional & Unconventional Oil or Gas Drill Cuttings for Placement at Hazleton Creek Properties

Sampling & Chemical Characterization:

Sampling and analysis will be completed for every 1500 tons of material (cuttings) or per well, whichever is more frequent and at least one sample per well. Unconventional (Shale-Formations) gas wells shall be divided into two distinct sections for sampling and analysis. Unconventional (Shale-Formations) vertical drill cuttings are to include material encountered from the surface to the kick-off-point or above the shale formation. Horizontal drill cutting will include material from the kick-off-point or once the vertical drill encounters the shale formation to the end of the horizontal drilling. Separate or discrete samples will be taken to represent Brine, Pyritic, or Petroleum formations encountered within the drilling process. Sampling may take place as the well is drilled or staged.

1. **Sampling Protocol:** The sample protocol described below is for samples that are collected at the well site or stabilization areas intended for acceptance at HCP.

   a. **Sampling during drilling.** Sampling shall represent cutting material after dewatered or stabilization for transportation or handling. All discrete samples are to be taken in 1 liter wide mouth amber bottles filled to within one inch of the top as to leave a headspace for PID screening. The sample bottles are to be stored on ice and shipped directly to the laboratory after sampling with completed Chain of Custody. The following information must accompany the sample:

      1. Drilling Company Name
      2. County
      3. Latitude and Longitude
      4. Type of cuttings (Conventional well, Unconventional (Shale-Formations) Vertical or Horizontal)
      5. Depth of well at time of sampling
      6. Drilling Additives (This may be disclosed prior to sampling)
ii. **Chemical Characterization Composite sample**, representing a maximum of 1500 Tons will be used for chemical characterization analyses except for VOCs, as described below:

1. **Discrete samples** will be obtained to represent every 375 tons of drill cutting material. The expected depth of the well should be divided into four equal sections – a discrete sample shall be obtained from a similar area of each section – preferably the middle of each section. The depth of the well at the time of the sampling must be recorded with the sample. If more than 1500 tons of cuttings will be generated additional discrete samples must be obtained to represent the material.

2. **Composite sample** will be constructed from equal portions of the four discrete samples to represent the drill cutting material for the entire well or well section. If the well has less than 1500 tons of material, four discrete samples representing equal portions of the entire well or one forth the total depth, will still be used to form the representative composite. If cuttings total volume for a well or well section will exceed 1500 tons a second set of discreet samples (4) representing equal portions of the remaining material shall be collected.

iii. **Grab VOC Sample** will be sampled from one of the representative discrete samples which exhibit hydrocarbon odor or highest reading from PID screening, in the head space of sealed amber sample bottle. This sampling will be conducted on receipt at laboratory. If the driller monitors for hydrocarbons and a section of the well indicates potential VOCs the sample should be preserved in the field for VOC analyses.

iv. **Non-typical Discrete Samples** will also be taken to represent any non typical materials encountered during the drilling process. Such non typical cutting materials are the product of Brine, Pyritic, or Petroleum bearing formations for analysis as referenced in the HCP Laboratory Testing Methods and Protocol document.