From: McDaniel, Mark <MMcDaniel@TechLawInc.com>
Sent: Sunday, March 08, 2015 4:02 PM
To: Way, Steven
Cc: Eric.Sandusky@WestonSolutions.com
Subject: Blacktail Creek Composition Analysis
Attachments: DOC305.pdf; SCAN8609_000.pdf

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Steve,

So...I'm sitting at home Saturday night reviewing my busy week in my head - it felt like I had forgotten to do something and then it hit me - I owe you some text. I am so sorry for the delay.

Characterization analysis of samples recovered from the Blacktail Creek spill

Two samples were collected from a suspected spill of produced water at the Blacktail Creek site and submitted for a fingerprinting/characterization analyses at XXX labs in XXX, XX. Chromatograms were produced using GC/MS and GC/PID, and High-Temperature Simulated Distillation (HT SIMDIS) analyses were also performed.

The GC/MS chromatograms reveal a hydrocarbon range of C10-C35) with the bulk of mass in the C10-C35 range; the boiling point distillation (HT SIMDIS) tests hint at smaller amounts of heavy hydrocarbons up to C64 ,giving us a total range of C10-C64. The lighter hydrocarbons found in produced water, such as C2-C10, evaporate quickly on exposure to atmosphere. The hydrocarbon range seen in the samples recovered from the spill (C10-C64) is consistent with unrefined product; refined products have a smaller range, for instance diesel fuel is C12-C20. These sample results, and more specifically this hydrocarbon range (C10-C64), is therefore consistent with what we would expect from hydrocarbons found in produced water (from oil wells) that had been allowed to weather by atmospheric exposure.

Let me know if want anything revised/expanded/added/removed.

-mm