Laboratory Job No: 280-28076-1

CONTRACT LABORATORY DATA-REVIEW WORKSHEET

1.0 GENERAL INFORMATION

Data reviewer: Gary Cottrell Review date: 5/17/12

Office, Project, & Account #: WY, EPA Pavillion Fracking

2.0 DATA DELIVERABLES

Date of Lab analytical report: 5/15/12 Number of copies: bound _____ unbound 1

No. of CD copies of raw-data report: 2 Remarks: _____

Raw-data report reviewed? Yes ✓ No ____ Electronic data files on CD? Yes ✓ No ____

EDD file format: QWDATA ✓ TAL QUA08 ✓ ERPIMS ____ Other ✓

Date rec'd data deliverables: 5/16/12 Date sent deliverables to USGS office 5/17/12

3.0 INVOICE STATUS FOR LOT: OK

4.0 SAMPLE INFORMATION *(Page #'s listed in this worksheet refer to lab analytical report)*

Sample collection date(s): 4/22/12 Sample matrix: Water

No. of sample types in lot: Environmental 2 Trip blank _____ Equip. blank _____

MS/MSD _____ Other: _____

Date samples received at laboratory: 4/24/12

4.1 Were accelerated turn-around times (TATs) requested for analyses? Yes ✓ No ____

If yes, list TAT period and if completed: 2 week, Yes (Note: Hold Placed - PS)

4.2 Were analyses on chain-of-custody (COC) form performed by lab? YES ✓ NO ____

If **no**, list missing or cancelled analyses and reason for non-performance: _____

4.3 Were the samples properly preserved, labeled, no lab log-in problems, and(or) at appropriate temperature (<6 deg. C) upon receipt by the laboratory: Yes ✓ No ____

If **no**, list sample/lab IDs, and associated problems or reference lab report case narrative:

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4.4 Were preparation (extraction) and(or) analysis holding times met? Yes ✓ No ____

If **no**, list analytical methods and sample/lab IDs for samples that exceeded holding-time limits:

4.5 Did surrogate recoveries meet QC acceptance criteria? Yes ✓ No ____ NA ____

If **no**, list methods, surrogates, associated sample/lab IDs, lab report page #s:_____

4.6 Were dilution factors greater than 1 for ***organic*** analyses? Yes ✓ No ____ NA ____

If **yes**, list analytical methods and reason for raised dilution factors: dilution _____

high-analyte levels ✓ matrix interferences ____ other _____

8270C SIM - P20 - MW02 (Preserved) + P22 TEG - P22

NOTE: 1-Methylnaphthalene + 2-Methylnaphthalene - High

Diss Gases - P23 - MW02 (Methane + Ethane High)

4.7 Were dilution factors greater than 1 for **inorganic** analyses? Yes ✓ No ____ NA ____

If **yes**, list analytical methods and reason for raised dilution factors:

high-analyte levels ✓ matrix interferences ____ other _____

TP - X2 - P25

Diss P - X2 - P26

Cl - X20 - P26

4.8 Additional comments about sample analyses: _____

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5.0 QUALITY CONTROL (QC) ANALYSES and RESULTS

5.1 Were any target analytes detected in the **Laboratory Method Blanks**? Yes ✓ No____

If **yes**, list method, analytes, prep batch #, report page #s: TP = 2.33, RL = 5, MDL = 0.42 - P66
Benzyl alcohol = 0.528, RL = 10, MDL = 0.23 - P38
Multiple SVOC (SIM) - All well below the RL = P46
Diss Na = 149, RL = 1000, MDL = 92 - P56
Diss Sb = 0.782, RL = 2, MDL = 0.4; Diss Co = 0.08, RL = 1, MDL = 0.054 - P60
Ammonia = 0.043, RL = 0.1, MDL = 0.022 - P64

5.2 Did lab control samples (LCS/LSCD) meet percent recoveries (%R) criteria? Yes ✓ No___

If **no**, list method, analytes, LCS/LCSD, prep batch #, report page #s:____

5.3 Did the **MS/MSD** results meet %R or RPD acceptance criteria? Yes____ No ✓ NA____

Note: matrix spike and matrix spike duplicate (MS/MSD) data are used to evaluate the effect of sample matrix on the analytical process and should be only used in conjunction with other available lab QC data. In some cases, MS samples not directly associated with this lot may be used by the laboratory.

If **no**, list method, analytes; MS, MSD or RPD; and lab report page #:
Acetone - MEK - Cl Methane - High % Rec - P35; Se Low Rec - P59 + 60
Multiple VOC - % Rec outside Limits - P36 (3 High, 1 Low)
Some Compounds out in the MSD - P37-38; Zn Low Rec - P59
Benzoic acid - 144 % Recovery (Limits 41-120) - P45 (MSD = 112 %)
GRO Spike << Sample Concentration - P49 + MSD % Rec High - RPD Good
↳ Spike = 202; Sample 700 / Diss Se Low MSD Rec - P62
Methane Spike << Sample Conc - P50 - Methane + Ethane % Rec High [MS+MSD]
Ammonia MS+MSD Low % Rec - P64

5.4 Did the **lab-sample duplicate** results meet RPD acceptance criteria? Yes ✓ No___ NA___

If **no**, list method, analytes, prep batch #, report page #s,____

MS+MSD For TP + Diss P had low % Rec - P66

5.5 Additional comments about QC results: Fe spike << Sample Conc - P55 - MS+MSD Rec OK
NOTE: GRO Surrogate - MS+MSD - 0% Rec - P46 [LCS Surrogate OK]
Propane spike << Sample Conc [MS - P51, MSD - P52] - % Rec OK
Propane Spike << Sample Conc [MS+MSD - P52] - % Rec very low
Na Spike << Sample Conc [MS+MSD - P55] - % Rec OK; Same For Diss Na - P57

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6.0 ANALYTICAL METHODS USED in this LABORATORY LOT NUMBER

✓ VOCs by GC/MS--method 8260B/ 524.2 *[water (W) or solids (S) analysis holding-time (HT) of 14 days]*

✓ Gasoline Range Organics (GRO)+BTEX-method 8015B(GRO)/ 8021 *[W and S: analysis HT 14 days]*

✓ Diesel Range Organics-method 8015B-DRO *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

___ Pesticides by GC--method 8081A *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

___ PCBs by GC--method 8082 *[W: prep HT 7 days, S: prep HT14 days analysis HT 40 days]*

___ Pesticides by GC--method 8141A *[W: prep HT 7 days; S: prep HT 14 days analysis HT 40 days]*

___ Herbicides by GC--method 8151A *[W: prep HT 7 days; S: prep HT14 days, analysis HT 40 days]*

✓ SVOCs by GC/MS--method 8270C *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

___ Dioxins and Furans--methods 8280/ 8290/ 1613 *[W and S: prep HT 30 days; analysis HT 45 days]*

✓ PAHs ~~by HPLC method 8310~~ SIM 8270C *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

___ Explosives by HPLC method 8330 or 8321A *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

___ Hexane extractable materials (HEM and SGT-HEM)-method 1664/ 9071B *[W/S: analysis HT 28 days]*

✓ Total organic carbon (TOC) + TIC + DIC or DOC--methods 415.1 or 9060 or 5310B *[W: analysis HT 28 days]*

___ Perchlorate--methods 314.0 or 6850 LC/MS/MS or 6860 IC/MS/MS *[W: analysis HT 28 days]*

✓ Metals by ICP--method 6010B or 200.7 *[W and S: analysis HT 180 days]*

✓ Metals by ICP/MS--method 6020 or 200.8 *[W and S: analysis HT 180 days]*

✓ Mercury by CVAA--method 7470A (W) and 7471A (S) *[W and S: analysis HT 28 days]*

✓ Inorganic anions-method 300/9056 *[W: analysis HT **48 hours**- NO_2, NO_3, ortho-P; HT 28 days--Br,Cl ,F, SO_4]*

✓ Total dissolved solids (TDS)--method 2540C and(or) TSS--method 2540D *[W: analysis HT 7 days]*

___ Alkalinity--method 310.1 (Total, OH, HCO_3, and CO_3) *[W: analysis HT 14 days]*

✓ Nitrogen, ammonia--method 350.1 *[W: analysis HT 28 days]*

___ Nitrogen, TKN--method 351.2 *[W: analysis HT 28 days]*

✓ Nitrogen, nitrate + nitrite--method 353.2 *[W: analysis HT 28 days]* NO_3 or NO_2 only *[HT **48 hours**]*

___ Nitrogen, nitrite--method 353.2 or 354.1 *[W: analysis HT **48 hours**]*

___ Phosphorus-method 365.3 and ortho P by 365.3 *[Phosphorus.: W: analysis HT 28 days, ortho P **48 hours**]*

✓ Phosphorus-method 365.1 and ortho P by 365.1 *[Phosphorus: W: analysis HT 28 days, ortho P **48 hours**]*

___ Cyanide, total, dissolved, or amenable--methods 9012A/ 335.4 *[W and S: analysis HT 14 days]*

___ MBAS surfactants – method 425.1 ***(HT 48 hours)***

___ Moisture content--methods D2216 or 160.3M

___ BOD--method 405.1 *(HT 48 hours)* or COD--method 410.4

___ Turbidity--method 180.1 ***(HT 48 hours)*** ; Hardness 2340B

___ Physical properties: pH--method 4500 H B; specific conductance—method 2510B

✓ Other analyses: Glycols - 8015, Gases - RSK175, MBAS - 425.1