



01/28/14

Technical Report for

Olsson Associates

Johnson 5-05 Produced Water Sample

Accutest Job Number: D54551

Sampling Date: 01/22/14

Report to:

Olsson Associates

shall@oaconsulting.com

ATTN: Stuart Hall

Total number of pages in report: 20



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in black ink, appearing to read 'Scott Heideman'.

Scott Heideman
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO (CO00049), ID, NE (CO00049), ND (R-027), NJ (CO 0007), OK (D9942), UT (NELAP CO00049), TX (T104704511)

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Test results relate only to samples analyzed.

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Sample Summary

Olsson Associates

Job No: D54551

Johnson 5-05 Produced Water Sample

Sample Number	Collected		Matrix Code	Type	Client Sample ID
	Date	Time By			
D54551-1	01/22/14	12:10 KB	01/23/14	AQ Water	JOHNSON 5-05 PW
D54551-1F	01/22/14	12:10 KB	01/23/14	AQ Water	JOHNSON 5-05 PW



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Olsson Associates

Job No D54551

Site: Johnson 5-05 Produced Water Sample

Report Date 1/28/2014 3:43:43 PM

On 01/23/2014, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 1.7 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D54551 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AQ

Batch ID: V6V1299

- All samples were analyzed within the recommended method holding time.
- Sample(s) D54519-10DUP, D54523-6MS were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike (MS) recovery(s) of Ethylbenzene are outside control limits. Outside control limits due to possible matrix interference.
- D54523-6MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D54523-6MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D54519-10DUP: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.

Matrix AQ

Batch ID: V6V1301

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D54549-8MS, D54551-1DUP were used as the QC samples indicated.

Extractables by GCMS By Method SW846 8270C

Matrix AQ

Batch ID: OP9296

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) D54519-12MS, D54519-12MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike (MS) recovery(s) of Benzoic Acid are outside control limits. Outside control limits due to possible matrix interference.
- The matrix spike duplicate (MSD) recovery(s) of Benzoic Acid are outside control limits. Probable cause due to matrix interference.
- Sample(s) D54551-1 have surrogates outside control limits. Outside control limits due to dilution.
- D54551-1: Elevated reporting limits due to sample matrix, dilution required during sample prep. Additional dilution during analysis due to high concentrations of non-target analytes.

Volatiles by GC By Method SW846 8015B

Matrix AQ

Batch ID: GGA1175

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D54495-1MS, D54495-1MSD were used as the QC samples indicated.
- D54551-1: Sample results indicate possible sample nonhomogeneity(multiple phases).

Extractables by GC By Method SW846-8015B

Matrix AQ

Batch ID: OP9285

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) D54519-8MS, D54519-8MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method EPA 200.7

Matrix AQ

Batch ID: MP12194

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D54532-1MS, D54532-1MSD were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Sodium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

Metals By Method EPA 200.8

Matrix AQ

Batch ID: MP12193

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D54560-1MS, D54560-1MSD were used as the QC samples for the metals analysis.
- D54551-1F for Selenium: Elevated detection limit due to dilution required for possible matrix interference.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix AQ

Batch ID: GP11830

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D54525-1MS, D54525-1MSD were used as the QC samples for the Bromide, Chloride, Nitrogen, Nitrate, Nitrogen, Nitrite, Phosphate, Ortho, Sulfate, Bromide analysis.
- D54551-1 for Nitrogen, Nitrate: Elevated detection limit due to matrix interference.
- D54551-1 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.
- D54551-1 for Phosphate, Ortho: Elevated detection limit due to matrix interference.

Wet Chemistry By Method SM 2320B-2011

Matrix AQ

Batch ID: GN23460

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D54556-1DUP, D54556-1MS, D54556-1MSD were used as the QC samples for the Alkalinity, Total as CaCO₃ analysis.

Wet Chemistry By Method SM 2510B-2011

Matrix AQ

Batch ID: GP11844

- Sample(s) D54521-1DUP were used as the QC samples for the Specific Conductivity analysis.

Wet Chemistry By Method SM 2540C-2011

Matrix AQ

Batch ID: GN23457

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D54510-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

Wet Chemistry By Method SM4500HB+-2011/9040C

Matrix AQ

Batch ID: GN23463

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D54551-1 Analysis performed past the required 15 minutes from collection time/holding time.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D54551
 Account: Olsson Associates
 Project: Johnson 5-05 Produced Water Sample
 Collected: 01/22/14

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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D54551-1 JOHNSON 5-05 PW

Benzene	36600	200	50	ug/l	SW846 8260B
Ethylbenzene	25600	400	50	ug/l	SW846 8260B
Toluene	321000	5000	2500	ug/l	SW846 8260B
Xylene (total)	437000	7500	5000	ug/l	SW846 8260B
Dibenzofuran ^a	766 J	3800	380	ug/l	SW846 8270C
Fluorene ^a	2010 J	3800	380	ug/l	SW846 8270C
2-Methylnaphthalene ^a	56800	3800	380	ug/l	SW846 8270C
Naphthalene ^a	18800	3800	380	ug/l	SW846 8270C
Phenanthrene ^a	1730 J	3800	380	ug/l	SW846 8270C
TPH-GRO (C6-C10) ^b	180	40	10	mg/l	SW846 8015B
TPH-DRO (C10-C28)	5810	60	54	mg/l	SW846-8015B
Alkalinity, Total as CaCO3	1080	5.0		mg/l	SM 2320B-2011
Bromide	34.9	1.0		mg/l	EPA 300.0/SW846 9056
Chloride	5730	130		mg/l	EPA 300.0/SW846 9056
Solids, Total Dissolved	10700	10		mg/l	SM 2540C-2011
Specific Conductivity	15500	1.0		umhos/cm	SM 2510B-2011
Sulfate	10.9	10		mg/l	EPA 300.0/SW846 9056
pH ^c	7.57			su	SM4500HB+ -2011/9040C

D54551-1F JOHNSON 5-05 PW

Calcium	195000	400		ug/l	EPA 200.7
Iron	87.0	10		ug/l	EPA 200.7
Magnesium	6760	200		ug/l	EPA 200.7
Manganese	269	5.0		ug/l	EPA 200.7
Potassium	39500	1000		ug/l	EPA 200.7
Sodium	3350000	8000		ug/l	EPA 200.7

- (a) Elevated reporting limits due to sample matrix, dilution required during sample prep. Additional dilution during analysis due to high concentrations of non-target analytes.
- (b) Sample results indicate possible sample nonhomogeneity(multiple phases).
- (c) Analysis performed past the required 15 minutes from collection time/holding time.

Sample Results

Report of Analysis

Report of Analysis

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Client Sample ID:	JOHNSON 5-05 PW	Date Sampled:	01/22/14
Lab Sample ID:	D54551-1	Date Received:	01/23/14
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	Johnson 5-05 Produced Water Sample		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V23139.D	200	01/23/14	BR	n/a	n/a	V6V1299
Run #2	6V23178.D	2500	01/24/14	BR	n/a	n/a	V6V1301

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA HSL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	4000	1400	ug/l	
71-43-2	Benzene	36600	200	50	ug/l	
75-27-4	Bromodichloromethane	ND	400	50	ug/l	
75-25-2	Bromoform	ND	400	86	ug/l	
75-15-0	Carbon disulfide	ND	400	150	ug/l	
56-23-5	Carbon tetrachloride	ND	400	50	ug/l	
108-90-7	Chlorobenzene	ND	400	50	ug/l	
75-00-3	Chloroethane	ND	400	110	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	400	54	ug/l	
67-66-3	Chloroform	ND	400	50	ug/l	
124-48-1	Dibromochloromethane	ND	400	50	ug/l	
95-50-1	o-Dichlorobenzene	ND	400	50	ug/l	
541-73-1	m-Dichlorobenzene	ND	400	50	ug/l	
106-46-7	p-Dichlorobenzene	ND	400	50	ug/l	
75-34-3	1,1-Dichloroethane	ND	400	84	ug/l	
107-06-2	1,2-Dichloroethane	ND	400	60	ug/l	
75-35-4	1,1-Dichloroethylene	ND	400	190	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	200	60	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	400	170	ug/l	
78-87-5	1,2-Dichloropropane	ND	400	68	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	400	50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	400	50	ug/l	
100-41-4	Ethylbenzene	25600	400	50	ug/l	
591-78-6	2-Hexanone	ND	400	150	ug/l	
74-83-9	Methyl bromide	ND	1000	460	ug/l	
74-87-3	Methyl chloride	ND	400	100	ug/l	
75-09-2	Methylene chloride	ND	800	500	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2000	1000	ug/l	
78-93-3	Methyl ethyl ketone	ND	2000	640	ug/l	
100-42-5	Styrene	ND	400	50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	400	50	ug/l	
127-18-4	Tetrachloroethylene	ND	400	56	ug/l	

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	JOHNSON 5-05 PW	Date Sampled:	01/22/14
Lab Sample ID:	D54551-1	Date Received:	01/23/14
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	Johnson 5-05 Produced Water Sample		

VOA HSL List

CAS No.	Compound	Result	RL	MDL	Units	Q
108-88-3	Toluene	321000 ^a	5000	2500	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	400	58	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	400	62	ug/l	
79-01-6	Trichloroethylene	ND	400	50	ug/l	
108-05-4	Vinyl Acetate	ND	2000	520	ug/l	
75-01-4	Vinyl chloride	ND	400	98	ug/l	
1330-20-7	Xylene (total)	437000 ^a	7500	5000	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	86%	94%	62-130%
2037-26-5	Toluene-D8	119%	109%	70-130%
460-00-4	4-Bromofluorobenzene	108%	103%	69-130%

(a) Result is from Run# 2

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Report of Analysis

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Client Sample ID:	JOHNSON 5-05 PW	Date Sampled:	01/22/14
Lab Sample ID:	D54551-1	Date Received:	01/23/14
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8270C SW846 3510C		
Project:	Johnson 5-05 Produced Water Sample		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3G17841.D	10	01/27/14	DC	01/27/14	OP9296	E3G888
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1060 ml	80.0 ml
Run #2		

ABN HSL List

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	7600	7600	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	3800	480	ug/l	
95-57-8	2-Chlorophenol	ND	3800	420	ug/l	
120-83-2	2,4-Dichlorophenol	ND	3800	460	ug/l	
105-67-9	2,4-Dimethylphenol	ND	3800	400	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	3800	380	ug/l	
51-28-5	2,4-Dinitrophenol	ND	3800	3000	ug/l	
95-48-7	2-Methylphenol	ND	3800	380	ug/l	
106-44-5	4-Methylphenol	ND	3800	380	ug/l	
88-75-5	2-Nitrophenol	ND	3800	380	ug/l	
100-02-7	4-Nitrophenol	ND	3800	380	ug/l	
87-86-5	Pentachlorophenol	ND	3800	380	ug/l	
108-95-2	Phenol	ND	3800	380	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	3800	410	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	3800	390	ug/l	
83-32-9	Acenaphthene	ND	3800	390	ug/l	
208-96-8	Acenaphthylene	ND	3800	380	ug/l	
120-12-7	Anthracene	ND	3800	380	ug/l	
56-55-3	Benzo(a)anthracene	ND	3800	380	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	3800	380	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	3800	380	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	3800	380	ug/l	
50-32-8	Benzo(a)pyrene	ND	3800	380	ug/l	
100-51-6	Benzyl Alcohol	ND	3800	490	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	3800	380	ug/l	
85-68-7	Butyl benzyl phthalate	ND	3800	380	ug/l	
106-47-8	4-Chloroaniline	ND	3800	490	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	3800	380	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	3800	380	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	3800	420	ug/l	
91-58-7	2-Chloronaphthalene	ND	3800	380	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	3800	380	ug/l	

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

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E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	JOHNSON 5-05 PW	Date Sampled:	01/22/14
Lab Sample ID:	D54551-1	Date Received:	01/23/14
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8270C SW846 3510C		
Project:	Johnson 5-05 Produced Water Sample		

ABN HSL List

CAS No.	Compound	Result	RL	MDL	Units	Q
218-01-9	Chrysene	ND	3800	380	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	3800	380	ug/l	
132-64-9	Dibenzofuran	766	3800	380	ug/l	J
84-74-2	Di-n-butyl phthalate	ND	3800	520	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	3800	420	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	3800	460	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	3800	450	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	3800	380	ug/l	
84-66-2	Diethyl phthalate	ND	3800	380	ug/l	
131-11-3	Dimethyl phthalate	ND	3800	380	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	3800	380	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	3800	420	ug/l	
117-84-0	Di-n-octyl phthalate	ND	3800	380	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	3800	830	ug/l	
206-44-0	Fluoranthene	ND	3800	380	ug/l	
86-73-7	Fluorene	2010	3800	380	ug/l	J
118-74-1	Hexachlorobenzene	ND	3800	380	ug/l	
87-68-3	Hexachlorobutadiene	ND	3800	380	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	3800	3000	ug/l	
67-72-1	Hexachloroethane	ND	3800	430	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	3800	430	ug/l	
78-59-1	Isophorone	ND	3800	380	ug/l	
91-57-6	2-Methylnaphthalene	56800	3800	380	ug/l	
91-20-3	Naphthalene	18800	3800	380	ug/l	
88-74-4	2-Nitroaniline	ND	3800	440	ug/l	
99-09-2	3-Nitroaniline	ND	3800	700	ug/l	
100-01-6	4-Nitroaniline	ND	3800	390	ug/l	
98-95-3	Nitrobenzene	ND	3800	380	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	3800	380	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	3800	550	ug/l	
85-01-8	Phenanthrene	1730	3800	380	ug/l	J
129-00-0	Pyrene	ND	3800	380	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	3800	380	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	0% ^b		10-130%
4165-62-2	Phenol-d5	0% ^b		10-130%
118-79-6	2,4,6-Tribromophenol	0% ^b		16-130%
4165-60-0	Nitrobenzene-d5	0% ^b		14-130%

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Report of Analysis

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Client Sample ID:	JOHNSON 5-05 PW	Date Sampled:	01/22/14
Lab Sample ID:	D54551-1	Date Received:	01/23/14
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8270C SW846 3510C		
Project:	Johnson 5-05 Produced Water Sample		

ABN HSL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	0% ^b		16-130%
1718-51-0	Terphenyl-d14	123%		10-145%

(a) Elevated reporting limits due to sample matrix, dilution required during sample prep. Additional dilution during analysis due to high concentrations of non-target analytes.

(b) Outside control limits due to dilution.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

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N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	JOHNSON 5-05 PW	Date Sampled:	01/22/14
Lab Sample ID:	D54551-1	Date Received:	01/23/14
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8015B		
Project:	Johnson 5-05 Produced Water Sample		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	GA20861.D	200	01/24/14	EV	n/a	n/a	GGA1175
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	180	40	10	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	92%		60-140%		

(a) Sample results indicate possible sample nonhomogeneity(multiple phases).

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Client Sample ID:	JOHNSON 5-05 PW	Date Sampled:	01/22/14
Lab Sample ID:	D54551-1	Date Received:	01/23/14
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846-8015B SW846 3510C		
Project:	Johnson 5-05 Produced Water Sample		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH017633.D	20	01/27/14	JJ	01/24/14	OP9285	GFH872
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	15.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	5810	60	54	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	97%		10-130%		

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Report of Analysis

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Client Sample ID: JOHNSON 5-05 PW

Lab Sample ID: D54551-1

Matrix: AQ - Water

Date Sampled: 01/22/14

Date Received: 01/23/14

Percent Solids: n/a

Project: Johnson 5-05 Produced Water Sample

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO ₃	1080	5.0	mg/l	1	01/27/14	KB	SM 2320B-2011
Bromide	34.9	1.0	mg/l	20	01/23/14 13:54	SK	EPA 300.0/SW846 9056
Chloride	5730	130	mg/l	250	01/23/14 15:43	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate ^a	< 0.20	0.20	mg/l	20	01/23/14 13:54	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite ^a	< 0.080	0.080	mg/l	20	01/23/14 13:54	SK	EPA 300.0/SW846 9056
Phosphate, Ortho ^a	< 13	13	mg/l	250	01/23/14 15:43	SK	EPA 300.0/SW846 9056
Solids, Total Dissolved	10700	10	mg/l	1	01/27/14	BF	SM 2540C-2011
Specific Conductivity	15500	1.0	umhos/cm	1	01/24/14	KB	SM 2510B-2011
Sulfate	10.9	10	mg/l	20	01/23/14 13:54	SK	EPA 300.0/SW846 9056
pH ^b	7.57		su	1	01/27/14 12:00	KB	SM4500HB+ -2011/9040C

(a) Elevated detection limit due to matrix interference.

(b) Analysis performed past the required 15 minutes from collection time/holding time.

RL = Reporting Limit

Report of Analysis

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Client Sample ID:	JOHNSON 5-05 PW	Date Sampled:	01/22/14
Lab Sample ID:	D54551-1F	Date Received:	01/23/14
Matrix:	AQ - Water	Percent Solids:	n/a
Project:	Johnson 5-05 Produced Water Sample		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 25	25	ug/l	1	01/27/14	01/27/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Calcium	195000	400	ug/l	1	01/27/14	01/27/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Iron	87.0	10	ug/l	1	01/27/14	01/27/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Magnesium	6760	200	ug/l	1	01/27/14	01/27/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Manganese	269	5.0	ug/l	1	01/27/14	01/27/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Potassium	39500	1000	ug/l	1	01/27/14	01/27/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Selenium ^a	< 2.0	2.0	ug/l	5	01/27/14	01/28/14 JB	EPA 200.8 ²	EPA 200.8 ³
Sodium	3350000	8000	ug/l	20	01/27/14	01/28/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴

(1) Instrument QC Batch: MA4406

(2) Instrument QC Batch: MA4408

(3) Prep QC Batch: MP12193

(4) Prep QC Batch: MP12194

(a) Elevated detection limit due to dilution required for possible matrix interference.

RL = Reporting Limit

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Accutest Laboratories Mountain States
4036 Youngfield Street Wheat Ridge, Co. 80033
TEL. 303-425-6021 877-737-4521
FAX 303-425-6021

Client / Reporting Information			Project Information										Requested Analysis (see TEST CODE sheet)										Matrix Codes		
Company Name Olsson Associates			Project Name Johnson S-OS Produced Water Sample																						
Street Address 760 Horizon Drive Suite 102			Street 																						
City State Zip Grand Junction CO 81506			Billing Information (If different from Report to)																						
Project Contact Shant Hall shah@olssona.com			Company Name 																						
E-mail 			Project# 																						
Phone # 970-263-7806			Client PO# 																						
Fax # 			City 																						
Sample(s) Name(s) Kelsie Betz 7/25/14			State 																						
Phone # 			Zip 																						
Project Manager 			Attention: 																						
P.O.# 																									
Accutest Sample #	Field ID / Point of Collection	MECH/DI Vial #	Collection			Matrix	# of bottles	Number of preserved Bottles										Barcodes	LAB USE ONLY						
			Date	Time	Samples by			HCl	NH ₄ OH	HNCO ₃	H ₂ SO ₄	None	D.I. Water	MEDH	ENCORE										
1	Johnson S-OS PW		1/22/14	1210	KB WW	14	2									X	X	X	X	X	X	X			C1
2	Trip Blank				TB	3																			O2TB
Turnaround Time (Business days) <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY			Approved By (Accutest Phil): / Date: _____ _____ _____			<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> Commercial "B" + Narrative <input type="checkbox"/> FULLT1 (Level 3+4)			<input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format <input type="checkbox"/> PDF			Comments / Special Instructions Lab filter Diss Met													
Emergency & Rush T/A data available VIA Loblisk																									
Sample Custody must be documented below each time samples change possession, including courier delivery.																									
Relinquished by: 1 KHB/BJA	Date Time: 1/22/14, 1000	Received By: [Signature]	Relinquished By: 2 [Signature]	Date Time: 12:57	Received By: 2 [Signature] 1-23-14																				
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4																				
Relinquished by:	Date Time:	Received By: 5	Custody Seal # HQ/co	<input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not intact	Preserved where applicable A	On Ice <input type="checkbox"/>	Cooler Temp. 1.7																		

D54551: Chain of Custody

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Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D54551

Client: OLSSON ASSOCIATES

Immediate Client Services Action Required: No

Date / Time Received: 1/23/2014 12:57:00 PM

No. Coolers: 1

Client Service Action Required at Login: No

Project: JOHNSON 5-05 PRODUCED WATER SAMPL

Airbill #'s: hd/co

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

Accutest Laboratories
V:(303) 425-6021

4036 Youngfield Street
F: (303) 425-6854

Wheat Ridge, CO
www.accutest.com