TESTAMERICA LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Range Resources Corporation
DUNN-U2-DAY 14
Project Number: Table 1

Lot #: C9B100119 Date Reported: 4/03/09

Client Sample ID: DUNN-U2-DAY14
Sample #: 001 Date Sampled: 02/10/09 09:00 Date Received: 02/10/09 Matrix: WATER

Reviewed

Reviewed

PARAMETER		RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Trace Inductively Coupled Plasma (ICP) Metals					
Silver		5.5 B	25.0	ug/L	SW846 6010B
Aluminum		ND	1000	ug/L	SW846 6010B
Arsenic		12.6 B	50.0	ug/L	SW846 6010B
Barium		74200	5000	ug/L	SW846 6010B
Beryllium		2.2 B	20.0	ug/L	SW846 6010B
Boron		16200	1000	ug/L	SW846 6010B
Calcium		12500000	125000	ug/L	SW846 6010B
Cadmium		1.4 B	25.0	ug/L	SW846 6010B
Cobalt		ND	250	ug/L	SW846 6010B
Chromium		8.4 B	25.0	ug/L	SW846 6010B
Copper		ND	125	ug/L	SW846 6010B
Iron		54200	500	ug/L	SW846 6010B
Lithium		73700	1250	ug/L	SW846 6010B
Magnesium		1330000	25000	ug/L	SW846 6010B
Manganese		7090	75.0	ug/L	SW846 6010B
Molybdenum		6.8 B	200	ug/L	SW846 6010B
Sodium		32500000	500000	ug/L	SW846 6010B
Nickel		7.0 B	200	ug/L	SW846 6010B
Lead		ND	15.0	ug/L	SW846 6010B
Selenium		ND	25.0	ug/L	SW846 6010B
Strontium		1850000	12500	ug/L	SW846 6010B
Zinc		66.8 B	100	ug/L	SW846 6010B
Silver	Dissolved	ND	25.0	ug/L	SW846 6010B
Aluminum	Dissolved	ND	1000	ug/L	SW846 6010B
Arsenic	Dissolved	10.0 B	50.0	ug/L	SW846 6010B
Barium	Dissolved	58200 E	5000	ug/L	SW846 6010B

(Continued on next page)

TESTAMERICA LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C9B100119

Range Resources Corporation
DUNN-02-DAY 14
Project Number: Table 1

Date Reported: 4/03/09

PARAMETER		RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: DUNN-02-DAY14						
Sample #: 001 Date Sampled: 02/10/09 09:00 Date Received: 02/10/09 Matrix: WATER						
Beryllium	Dissolved	ND	20.0	ug/L	SW846 6010B	
Boron	Dissolved	16100	1000	ug/L	SW846 6010B	
Calcium	Dissolved	12800000 E	125000	ug/L	SW846 6010B	
Cadmium	Dissolved	ND	25.0	ug/L	SW846 6010B	
Cobalt	Dissolved	ND	250	ug/L	SW846 6010B	
Chromium	Dissolved	ND	25.0	ug/L	SW846 6010B	
Copper	Dissolved	ND	125	ug/L	SW846 6010B	
Iron	Dissolved	39800	500	ug/L	SW846 6010B	
Lithium	Dissolved	71400 E	1250	ug/L	SW846 6010B	
Magnesium	Dissolved	1310000	25000	ug/L	SW846 6010B	
Manganese	Dissolved	7000	75.0	ug/L	SW846 6010B	
Molybdenum	Dissolved	10.6 B	200	ug/L	SW846 6010B	
Sodium	Dissolved	31500000	500000	ug/L	SW846 6010B	
Nickel	Dissolved	ND	200	ug/L	SW846 6010B	
Lead	Dissolved	ND	15.0	ug/L	SW846 6010B	
Selenium	Dissolved	ND	25.0	ug/L	SW846 6010B	
Strontium	Dissolved	1990000 E	12500	ug/L	SW846 6010B	
Zinc	Dissolved	62.2 B	100	ug/L	SW846 6010B	
Mercury in Liquid Waste (Manual Cold-Vapor)						Reviewed
Mercury		0.049 B	0.20	ug/L	SW846 7470A	
Mercury	Dissolved	0.028 B	0.20	ug/L	SW846 7470A	

B Estimated result. Result is less than RL.

E Matrix interference.

Reviewed

(Continued on next page)

TESTAMERICA LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Range Resources Corporation
DUNN-02-DAY 14
Project Number: Table 1

Lot #: C9B100119 Date Reported: 4/03/09

Client Sample ID: DUNN-02-DAY14
Sample #: 001 Date Sampled: 02/10/09 09:00 Date Received: 02/10/09 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Inorganic Analysis				Reviewed
Acidity (Titrimetric) 2310B (4a)	106	5.0	mg/L	SM20 2310B (4a)
Alkalinity, Total	53.2	50.0	mg/L	SM18 2320 B
Biochemical Oxygen Demand	149	2.0	mg/L	SM18 5210 B
Chemical Oxygen Demand	4340	500	mg/L	MCAWW 410.4
Specific Conductance	284000	500	umhos/cm	MCAWW 120.1
Hexavalent Chromium	ND G	0.050	mg/L	SW846 7196A
Diss Hexavalent Cr	ND G	0.050	mg/L	SW846 7196A
Dissolved Organic Carbon 5310B	36.9	10.0	mg/L	SM20 5310B

(Continued on next page)

TESTAMERICA LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C9B100119

Range Resources Corporation
DUNN-U2-DAY 14
Project Number: Table 1

Date Reported: 4/03/09

Client Sample ID: DUNN-U2-DAY14
Sample #: 001 Date Sampled: 02/10/09 09:00 Date Received: 02/10/09 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
HARDNESS, TOTAL				
HARDNESS, TOTAL	43500	1250	mg/L	SM20 2340C
				Reviewed
Bromide	849	20.0	mg/L	MCAWW 300.0A
Chloride	78600	1000	mg/L	MCAWW 300.0A
Nitrite as N	77.4	12.5	mg/L	MCAWW 300.0A
Nitrate as N	ND G	1.2	mg/L	MCAWW 300.0A
Sulfate	60.1	25.0	mg/L	MCAWW 300.0A
Nitrogen, Ammonia	107	5.0	mg/L	MCAWW 350.1
Nitrate-Nitrite	0.089 B	0.10	mg/L	MCAWW 353.2
Phenolics	0.015	0.010	mg/L	SW846 9066
pH Aqueous	5.5	0.10	No Units	SW846 9040
Total Dissolved Solids SM 2540 C	112000	50 200	pCi/L mg/L	NONE Rn-222 by LS SM18 2540 C
Total Kjeldahl Nitrogen	112	3.0	mg/L	MCAWW 351.3
Total Suspended Solids SM 2540 D	17.0	4.0	mg/L	SM20 2540D

G Elevated reporting limit. The reporting limit is elevated due to matrix interference.
B Estimated result. Result is less than RL.

TESTAMERICA LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Range Resources Corporation — PAGE 4

Lot #: C9B100119 — DUNN-U2-DAY 14 — Date Reported: 4/03/09

Project Number: Table 1

Client Sample ID: DUNN-U2-DAY14

Sample #: 001 Date Sampled: 02/10/09 09:00 Date Received: 02/10/09 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Benzene	420 ✓	50	ug/L	SW846 8260B
Bromodichloromethane	ND	50	ug/L	SW846 8260B
Bromoform	ND	50	ug/L	SW846 8260B
Bromomethane	ND	50	ug/L	SW846 8260B
Carbon disulfide	ND	50	ug/L	SW846 8260B
Carbon tetrachloride	ND	50	ug/L	SW846 8260B
Chlorobenzene	ND	50	ug/L	SW846 8260B
Chloroethane	ND	50	ug/L	SW846 8260B
Chloroform	ND	50	ug/L	SW846 8260B

(Continued on next page)

TestAmerica Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

SDG Number: C9B100119

Project: Range Resources Corporation
Project Number: C9B100119

Received: 02/11/09
Reported: 02/27/09 14:24

Analytical Report

Analyte	Sample Result	Data Qualifiers	Rpt Limit	MDL	Units	Dilution Factor	Date Analyzed	Analyst	Seq/ Batch	Method
Sample ID: RSB0343-01 (DUNN-U2-DAY 14 - Water)							**Sampled: 02/10/09**			**Recvd: 02/11/09 09:40**
Alcohols by EPA Method 8015 modified										
Non-Halogenated Volatile Organics										
Ethylene Glycol	21.5		10.0	N.A.	mg/L	1.00	02/20/09 14:29	tch	9022002	8015

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

2960 Foster Creighton Road Nashville, TN 37204 * 800-765-0980 * Fax 615-726-3404

Client: TestAmerica Pittsburgh
301 Alpha, RIDC Park
Pittsburgh, PA 15238
Attn: Chris Kovitch

Work Order: NSB0768
Project Name: TA-Pennsylvania Sites
Project Number: 1425392-Range Resources Corporation
Received: 02/11/09 08:00

ANALYTICAL REPORT

Analyte	Result	Flag	Units	MRL	Dilution Factor	Analysis Date/Time	Method	Batch
Sample ID: NSB0768-01 (DUNN-U2-DAY14 - Water) Sampled: 02/10/09 09:00								
General Chemistry Parameters								
MBAS (mol.wt 320)	0.0857		mg/L	0.0500	1	02/11/09 16:05	SM5540 C	9021254

Range Resources Corporation

Client Sample ID: DUNN-U2-DAY14

General Chemistry

Lot-Sample #...: C9B100119-001 Work Order #...: K60MX Matrix.....: WATER

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Oil & Grease (HEM)	30.8	5.0	mg/L	CFR136A 1664A HEM	02/19/09	9050041

Dilution Factor: 1.01 Analysis Time..: 08:30 MS Run #.....:
MDL.....: 0.50

(Continued on next page)

TESTAMERICA LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C9B100119

Range Resources Corporation
DUNN-U2-DAY 14
Project Number: Table 1

Date Reported: 4/03/09

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Client Sample ID: DUNN-U2-DAY14				
Sample #: 001 Date Sampled: 02/10/09 09:00 Date Received: 02/10/09 Matrix: WATER				
Volatile Organics by GC/MS				
Toluene	820	50	ug/L	SW846 8260B

Range Resources Corporation

Client Sample ID: DUNN-U2-DAY14

Radiochemistry

Lab Sample ID: C9B100119-001
Work Order: K60MX
Matrix: WATER

Date Collected: 02/10/09 0900
Date Received: 02/10/09 1045

Parameter	Result	Qual	Total Uncert. (2 sr+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Nits by EPA 901.1 MOD			pCi/L		Batch # 9082473		Yld %
		U	83		140	03/23/09	03/26/09
			86		25	03/23/09	03/26/09
		U	83		140	03/23/09	03/26/09
		U	110		190	03/23/09	03/26/09
			79		42	03/23/09	03/26/09
		U	18	20	32	03/23/09	03/26/09
		U	410		400	03/23/09	03/26/09
		U	120		40	03/23/09	03/26/09
			86		48	03/23/09	03/26/09
		U	180		350	03/23/09	03/26/09
		U	1600		2900	03/23/09	03/26/09
		U	47		80	03/23/09	03/26/09
Radium (226)	634		79		42	03/23/09	03/26/09
Radium 228	435		80		25	03/23/09	03/26/09
Thorium 227	-38	U	83		140	03/23/09	03/26/09
Thorium 234	30	U	290		500	03/23/09	03/26/09
Uranium 235	15	U	82		140	03/23/09	03/26/09
Uranium 238	30	U	290		500	03/23/09	03/26/09

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Yld results are greater than the MDC.

Result is less than the sample detection limit.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

ANALYTICAL REPORT

PROJECT NO. Table 1

Dunn02-Day90

Lot #: C9D290233

Tony Gaudlip

Range Resources Corporation
380 Southpointe Blvd
Suite 300
Canonsburg, PA 15317

TESTAMERICA LABORATORIES, INC.

Christina M. Kovitch
Project Manager

May 28, 2009

NELAC REPORTING:

At the time of analysis the laboratory was in compliance with the current NELAC standards and held accreditation for all analyses performed unless noted by a qualifier. The labs accreditation numbers are listed below. The format and contents of the report meets all applicable NELAC standards except as noted in the narrative and shall not be reproduced except in full, without the written approval of the laboratory. The table below presents a summary of the certifications held by TestAmerica Pittsburgh. Our primary accreditation authority for the Non-potable water and Solid & Hazardous waste programs is Pennsylvania DEP. A more detailed parameter list is available upon request. Please ask your project manager for this information when required.

Certifying State/Program	Certificate #	Program Types	TestAmerica
NFESC	NA	NAVY	X
US Dept of Agriculture	(#P330-07-00101)	Foreign Soil Import Permit	X
Arkansas	(#88-0690)	WW	X
		HW	X
California – NELAC	04224CA	WW	X
		HW	X
Connecticut	(#PH-0688)	WW	X
		HW	X
Florida – NELAC	(#E871008-04)	WW	X
		HW	X
Illinois – NELAC	(#002064)	WW	X
		HW	X
Kansas – NELAC	(#E-10350)	WW	X
		HW	X
Louisiana – NELAC	(#04041)	WW	X
		HW	X
New Hampshire – NELAC	(#203008)	WW	X
		--	--
New Jersey – NELAC	(PA-005)	WW	X
		HW	X
New York – NELAC	(#11182)	WW	X
		HW	X
North Carolina	(#434)	WW	X
		HW	X
Pennsylvania - NELAC	(#02-00416)	WW	X
		HW	X
South Carolina	(#89014002)	WW	X
		HW	X
Utah – NELAC	(STLP)	WW	X
		HW	X
West Virginia	(#142)	WW	X
		HW	X
Wisconsin	998027800	WW	X
		HW	X

The codes utilized for program types are described below:

HW Hazardous Waste certification
WW Non-potable Water and/or Wastewater certification
X Laboratory has some form of certification under the specific program. Many states certify laboratories for specific parameters or tests within a category. The information in the table indicates the lab is certified in a general category of testing. Please contact the laboratory if parameter specific certification information is required.

Updated: 2/5/2009 C:\Documents and Settings\derubeism\My Documents\NELAC NARRATIVE Pittsburgh.doc

C9D290233

TestAmerica Chain of Custody Record

THE LEADER IN ENVIRONMENTAL TESTING

COC ID: KOVITCHC16972-1141-2

TestAmerica, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
Pittsburgh, PA 15238
(412) 963-7058
(412) 963-2468 - fax

Project Information:	Table 1	Quote #: [redacted]	Client: URS Corporation
Date:	4-29-09	Carrier/Waybill #: Range	Foster Plaza 4
Project Manager:	Amanda Baynes		501 Holiday Drive
Phone:	412-849-5403		Suite 300
			Pittsburgh
			PA 15220

SAMPLE ID	DATE/TIME	MATRIX	BOTTLE TYPE		#	PRESERVATIVE	ANALYSIS
DumV2-Day 90	4-29-09 0930	WATER	1LP	Plastic -1 Liter	1	None	WATER, MBAS,Sulfide (TA Nashville)
		WATER	1LP	Plastic -1 Liter	1	None	WATER, TDS, TSS, T-Alk-(Br,Cl,Fl
		WATER	250P	Plastic - 250mL	1	Sulfuric Acid	WATER, TKN, T-Phos N.Canton
		WATER	1LAG	Glass - 1 Liter Amber	2	Hydrochloric Acid	WATER, 1664A HEM, Oil and Grease
		WATER	250P	Plastic - 250mL	1	Nitric Acid	WATER, 2340C, Total Hardness
		WATER	250P	Plastic - 250mL	1	None	WATER, 300.0A, Nitrate ,Nitrite, Sulfate,pH
		WATER	250AP	Plastic - 250mL (8oz) Amber	1	Sodium Hydroxide	WATER, 4500-CN E, Free Cyanide N.Canton
		WATER	1lp	Plastic -1 Liter	1	None	WATER, 5210 B, BOD N.Canton
		WATER	VV	Glass - 40mL Vial	3	None	WATER, 5310B, Dissolved Organic Carbon (Filter at Lab)
		WATER	VV	Glass - 40mL Vial	3	Sulfuric Acid	WATER, 5310B, TOC
		WATER	500P	Plastic - 500mL (16oz)	1	Nitric Acid	WATER, 6010B Diss-Metals (Sp.List) (Filter in Lab)
		WATER	500P	Plastic - 500mL (16oz)	1	Nitric Acid	WATER, 6010B T-Metals (Sp.List)
		WATER	250P	Plastic - 250mL	1	None	WATER, 7196A, Diss Hexavalent Cr (needs filted in lab)
		WATER	250P	Plastic - 250mL	1	None	WATER, 7196A, Total Hexavalent Chromium
		WATER	VV	Glass - 40mL Vial	3	Hydrochloric Acid	WATER, 8015 DAI TA Buffalo

Special Requirements:

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months (A fee may apply if samples are retained longer than 3 months)

Turn Around Time Required: ☐ Normal ☐ Rush ☐ Other _____

QC Level: _____ I _____ II _____ III

Project Specific Requirements (Specify):

Relinquished by:	Date/Time: 4-29-09/1500	Received by:	Date/Time: 4/29/09 1525
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:

Comments:

10

(1 - 206)

Printed On: 4/1/2009 07:17 PM

(NOTE: this ORIGINAL Chain of Custody MUST accompany the samples from collection to receipt at the laboratory)

C9D290233

TestAmerica Chain of Custody Record

THE LEADER IN ENVIRONMENTAL TESTING

COC ID: KOVITCHC16972-1141-2

TestAmerica, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
Pittsburgh, PA 15238
(412) 963-7058
(412) 963-2468 - fax

Project Information:	Table 1	Quote #: [redacted]	Client: URS Corporation
Date:	4-29-07	Carrier/Waybill #: RAN 60	Foster Plaza 4
Project Manager:	Amanda Baynes		501 Holiday Drive
Phone:	412-849-5403		Suite 300
			Pittsburgh
			PA 15220

SAMPLE ID	DATE/TIME	MATRIX	BOTTLE TYPE		#	PRESERVATIVE	ANALYSIS
Dunn Ue Dg 50	429-07/1324	WATER	VV	Glass - 40mL Vial	3	None	WATER, 8015 Glycols TA Buffalo
		WATER	1LAG	Glass - 1 Liter Amber	2	None	WATER, 8081A, Pesticides
		WATER	1LAG	Glass - 1 Liter Amber	2	None	WATER, 8082, PCBs (8082)
		WATER	1LAG	Glass - 1 Liter Amber	2	None	WATER, 8141A, Organophos
		WATER	VV	Glass - 40mL Vial	3	Hydrochloric Acid	WATER, 8260B, VOA (Sp. List)
		WATER	1LAG	Glass - 1 Liter Amber	2	None	WATER, 8270C, BNA Sp. List
		WATER	1GP	Plastic - 1 Gallon	1	Nitric Acid	WATER, 901.1 MOD, Gamma Cs-137 & Hits by
		WATER	250P	Plastic - 250mL	1	Sodium Hydroxide	WATER, 9012A, Total Cyanide
		WATER	250P	Plastic - 250mL	1	Zinc Acetate/NaOH	WATER, 9030B/9034, Total Sulfide
		WATER	4oz	Glass - 4oz (125mL)	2	Sulfuric Acid	WATER, 9066, Phenolics
		WATER	250P	Plastic - 250mL	1	Sulfuric Acid	WATER, Ammonia Nitrogen, Nitrate-Nitrite,COD
		WATER	VVAG	Amber Glass - 40 mL Vial	3	None	WATER, Fatty Acid TA Buffalo
		WATER	1LP	Plastic -1 Liter	1	None	WATER, Osmotic Pressure MJ Raider
		WATER	2oz	Plastic - 2oz	1	None	WATER, Total Coliform Microbac
		WATER	500P	Plastic - 500mL (16oz)	1	None	WATER, TVA TA Watertown

Special Requirements:

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months (A fee may apply if samples are retained longer than 3 months)

Turn Around Time Required: ☐ Normal ☐ Rush ☐ Other _____

QC Level: I ___ II ___ III ___

Project Specific Requirements (Specify):

Relinquished by:	Date/Time: 4/29/07 1325	Received by: Patricia Hanak	Date/Time: 4/29/07 1325
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:

Comments:

11

(1 - 206)

McCracken, Chuck

From: Kenneth Barnhart
Sent: Tuesday, March 16, 2010 1:59 PM
To: Chuck McCracken; Michael Snee; Stephen Helmer
Cc: Jim Colleli; David Lipp
Subject: FW: Warren WWTP Brine

Sorry for the delay in updating everyone in response to these emails. I thought that Chuck was going to take the lead as stated below. I called both of the contacts provided by Donna and obtained the following information.

Andy Blocksom at Patriot who is the receiver as far as transportation is concerned. Before it gets to Patriot the water is usually:

1. Contained in a holding pond at the well head
2. Injected into the well mixed with sand and sometimes a radioactive tracer (such as scandium-46)
3. Water and some trace amounts of sand and possibly tracer are removed from the hole and placed back into the pond or frac tanks for settling
4. Trucks will then be brought in to pull excess water off the tops of the holding ponds and frac tanks as necessary to maintain water inventory
5. That water is then transported by the trucking company directly from the well site to Patriot (the receiver)

Mark Wimsatt at Stallion Oilfield which is the trucking company stated that the water he receives from his customers is offered to him as non-hazardous material. He has some sample analysis from his customers (the generator/shipper) that he will provide me when he gets in from the field today. He transports the non-hazardous water to Patriot where the water is sampled and then accepted or rejected for processing.

With the information that I have been provided so far it does not appear that anyone has compared the radioactive contaminant concentrations present in the water with the requirements listed in the transportation code. Generally this would be accomplished by the generator/shipper.

The radioactive tracers being used could account for the gross beta concentrations that we have seen in a couple of the sample results already provided. Without a full isotopic analysis it would be difficult to determine if that was the case.

Kenneth Barnhart
Bureau of Radiation Protection
Ohio Department of Health

Phone: 614-466-1276
Fax: 614-466-0381
Email: kenneth.barnhart@odh.ohio.gov

From: Chuck McCracken
Sent: Thursday, March 11, 2010 12:33 PM
To: Donna Kniss
Cc: Stephen Helmer; Michael Snee
Subject: Warren WWTP Brine

03.11.2010

Donna:

Someone here will contact Stallion directly.

As far as a site visit - As you should recall, ODH asked that the required analysis be updated to include weekly analysis of the 001 effluent discharge for ALL radiological parameters. ODH would be interested in seeing these weekly effluent results.

Additionally, would you have any objections to one of our staff from our the Akron District office accompanying you to the site?

Please advise.

Thanks,

Charles D. McCracken

Supervisor, Bureau of Radiation Protection
Ohio Department of Health
Ph: 614.466.5136
Fx: 614.466.0381

From: Donna Kniss [mailto:donna.kniss@epa.state.oh.us]
Sent: Thursday, March 11, 2010 10:49 AM
To: Chuck McCracken
Subject: Re: FW: Brine transportation documentation

Chuck:

Sorry about not returning your call; it's been crazy.

Regarding the DOT paperwork:
Andy Blocksom, Patriot, 330-853-9321
Mark Wimsatt, Stallion Oilfield, 330-760-4248

From our January meeting, Stallion is actually transporting the brine from the drill site to the Warren WWTP, or at least coordinates it.

We are planning on visiting Warren next week. Is there anything in particular you want me to ask or look for? I am going to look at the records they have been keeping on what they're getting and how it's going into their WWTP.

Donna

Donna J. Kniss
Ohio Environmental Protection Agency
Division of Surface Water
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087
330-963-1285
fax 330-487-0769

donna.kniss@epa.state.oh.us

>>> Chuck McCracken <Chuck.McCracken@odh.ohio.gov> 3/10/2010 1:49 PM >>>
Donna:

I've been unsuccessful in getting you on the phone, so I'm sending this email.

(1) Sludge sampling for rad constituents should occur at the same locations that are being used for non-rad constituents. My review of the Warren WWTP test study finds that it requires sludge sampling for chlorides, fluorides and metals. Thus, wherever they are sampling sludge for these 3 constituents, they should be sampling for the rad constituents as well. As noted in my 02.25.2010 email message, the Warren WWTP needs to demonstrate compliance with the criteria found in OAC 3701-39-02.1 (B)(1)(c) or OAC 3701-39-02.1 (B)(1)(d) for the sludge to be considered non-licensable by ODH.

(2) If you can give me the contact information for someone knowledgeable of the DOT criteria underwhich the brine is being shipped from PA to Ohio, I will contact them directly.

If you have additional questions, please give me a call.

Thanks,

Charles D. McCracken

Supervisor, Bureau of Radiation Protection
Ohio Department of Health
Ph: 614.466.5136
Fx: 614.466.0381

From: Donna Kniss [mailto:donna.kniss@epa.state.oh.us]
Sent: Tuesday, March 02, 2010 5:07 PM
To: Chuck McCracken
Subject: Re: Brine transportation documentation

Chuck:

We had an internal call this morning, and discussed your additions to the monitoring table. One question was where do you think the sludge sample should be taken. I have attached a flow diagram for the Warren WWTP. Unfortunately, the copier that would send me my PDF promptly did not do color, so my notes aren't in red. I have written "liquid w/solids" at three locations, and "water containing solids" at one location. The solids at the other three locations could be dewatered, and all 4 sites would still have water entrained in the sludge.

Regarding the DOT documentation, what exactly are you looking for? The Stallion rep said there was a "cradle to grave" manifesting system for the brine from when it leaves the well site until disposal. I don't know how that ties into DOT records. And do you want a few example records, or every record? Do you want to contact Patriot and/or Stallion directly?

Donna

Donna J. Kniss
Ohio Environmental Protection Agency
Division of Surface Water
Northeast District Office

2110 East Aurora Road
Twinsburg, Ohio 44087
330-963-1285
fax 330-487-0769

donna.kniss@epa.state.oh.us

>>> Chuck McCracken <Chuck.McCracken@odh.ohio.gov> 3/2/2010 12:31 PM >>>
03.02.2010

Donna:

A question about transportation of the brine into Ohio came up at a meeting our internal TNORM working group held this morning.

Can you please find out what type of DOT shipping paperwork is being completed for each of these truckloads of brine from PA into Ohio.
An if possible, can you request that copies of the paperwork for each truckload (manifests, bill of ladings, etc…) be sent to you.
We would like a copy when you get it.

If you have questions, please call.

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McCracken, Chuck

From: Robert Leidy
Sent: Friday, March 12, 2010 12:22 PM
To: Stephen Helmer
Cc: Kenneth Barnhart; Chuck McCracken
Subject: FW: Warren WWTP Brine

Steve,

I just spoke to Donna and we are tentatively schedule to go to Warren the morning of Wednesday the 17th. She will get back to me on a time and location address. The current plan is I will meet up with EPA at their office in Twinsburg and will be a passenger in their truck up to Warren. It may be a very early day as it seems they may want to be there by 7:00am.

What I really need to know is what specific information the Bureau wants me to obtain while there.
Sample results or survey results, shipping documents?

She did indicate that it will be a whole day.

I'll touch base with you while I'm at Euclid Hospital.

From: Robert Leidy
Sent: Friday, March 12, 2010 9:53 AM
To: Stephen Helmer
Subject: RE: Warren WWTP Brine

Steve,

I have left a voice mail for Donna and will let you know when I hear from her.

From: Stephen Helmer
Sent: Thursday, March 11, 2010 1:48 PM
To: Robert Leidy
Subject: FW: Warren WWTP Brine

Rob,

See what you can do to work with OEPA North East District Office (NEDO).
Let me know when you make contact/arrangements.

Stephen Helmer
Program Administrator
Bureau of Radiation Protection
Phone: 614-728-3611

From: Chuck McCracken
Sent: Thursday, March 11, 2010 1:03 PM
To: Stephen Helmer
Subject: FW: Warren WWTP Brine

Steve:

Now you can see if Rob Leidy is available.
Have him work with Donna as she requests.

Chuck

From: Donna Kniss [mailto:donna.kniss@epa.state.oh.us]
Sent: Thursday, March 11, 2010 12:43 PM
To: Chuck McCracken
Cc: Virginia Wilson
Subject: Re: Warren WWTP Brine

Yes, someone from the Akron district could come; that would be great. We were going to leave from NEDO, and were going to take a meter to do pH, dissolved oxygen, conductivity, and have the capability to collect samples if we decide it's necessary. You can have the Akron person contact me and we will work out travel arrangements.

I forwarded your additions to the monitoring table to Warren the day they said they were restarting. One of the things we'll check is if they are doing those and the other analyses.

Donna

Donna J. Kniss
Ohio Environmental Protection Agency
Division of Surface Water
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087
330-963-1285
fax 330-487-0769

donna.kniss@epa.state.oh.us

>>> Chuck McCracken <Chuck.McCracken@odh.ohio.gov> 3/11/2010 12:32 PM >>>
03.11.2010

Donna:

Someone here will contact Stallion directly.

As far as a site visit - As you should recall, ODH asked that the required analysis be updated to include weekly analysis of the 001 effluent discharge for ALL radiological parameters. ODH would be interested in seeing these weekly effluent results.

Additionally, would you have any objections to one of our staff from our the Akron District office accompanying you to the site?

Please advise.

Thanks,

Charles D. McCracken
Supervisor, Bureau of Radiation Protection
Ohio Department of Health
Ph: 614.466.5136

From: Donna Kniss [mailto:donna.kniss@epa.state.oh.us]
Sent: Thursday, March 11, 2010 10:49 AM
To: Chuck McCracken
Subject: Re: FW: Brine transportation documentation

Chuck:

Sorry about not returning your call; it's been crazy.

Regarding the DOT paperwork:
Andy Blocksom, Patriot, 330-853-9321
Mark Wimsatt, Stallion Oilfield, 330-760-4248

From our January meeting, Stallion is actually transporting the brine from the drill site to the Warren WWTP, or at least coordinates it.

We are planning on visiting Warren next week. Is there anything in particular you want me to ask or look for? I am going to look at the records they have been keeping on what they're getting and how it's going into their WWTP.

Donna

Donna J. Kniss
Ohio Environmental Protection Agency
Division of Surface Water
Northeast District Office
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330-963-1285
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McCracken, Chuck

From: Chuck McCracken
Sent: Tuesday, March 02, 2010 12:31 PM
To: donna.kniss@epa.state.oh.us
Subject: Brine transportation documentation

03.02.2010

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Charles D. McCracken

Supervisor, Bureau of Radiation Protection
Ohio Department of Health
Ph: 614.466.5136
Fx: 614.466.0381

McCracken, Chuck

From: Robert Owen
Sent: Thursday, February 11, 2010 3:46 PM
To: Michele Shipp; Roger Suppes; Robert Jennings; Anita Fete
Cc: Michael Snee; Stephen Helmer; Chuck McCracken
Subject: HOT TOPIC - Request from Ohio EPA

The BRP held a conference call with Ohio Environmental Protection Agency (OEPA) staff on a request to send brine (wastewater) from natural gas drilling operations in Pennsylvania to wastewater treatments plants in Ohio. The drilling operations in Marcella shale generate enormous quantities of natural gas but also generate four times the amount of wastewater than previous drilling operations. This wastewater is overwhelming the treatment capacities in Pennsylvania.

OEPA is requesting the BRP provide guidance on regulatory issues associated with the naturally occurring radioactive material (NORM) component of the wastewater and the possible affect that processing the water may have on the treatment plant sludge. A pilot project is starting at the Warren wastewater treatment plant that will treat 100,000 gallons per day.

We will be forming an ODH/OEPA working group to address joint regulatory issues. However, right now we are in the process of obtaining more information. As soon as the path becomes clearer for ODH's role and input into the process, I will be in a better position to brief you on the entire project. More to come. Thanks.

Bob

Robert E. Owen, Chief
Bureau of Radiation Protection

McCracken, Chuck

From: Chuck McCracken
Sent: Wednesday, January 06, 2010 10:39 AM
To: Donna.Kniss@epa.state.oh.us
Subject: FW: Oil and gas well wastewater
Attachments: NYSGEIS App 13 rad data.pdf; Director's 070609 letter.pdf; 1987 Report rad discussion.pdf

Donna:

The letter should be address to:

Robert E. Owen, Chief
Bureau of Radiation Protection
Ohio Department of Health
246 N. High Street – 7th Floor 35 Bldg.
Columbus, OH 43215

Thanks,

Charles D. McCracken

Supervisor, Bureau of Radiation Protection
Ohio Department of Health
Ph: 614.466.5136
Fx: 614.466.0381

From: Donna Kniss [mailto:Donna.Kniss@epa.state.oh.us]
Sent: Wednesday, January 06, 2010 10:14 AM
To: Chuck McCracken
Subject: Oil and gas well wastewater

Chuck:

As we discussed Monday, I have attached the rad info I have encountered while researching the potential impacts of oil and gas well wastewater discharges to waters of the state. The first PDF is a paragraph from a 1987 report I found when I was searching USEPA's archives. The second PDF is an appendix from the New York Supplemental Generic Environmental Impact Statement, which can be found at

http://www.dec.ny.gov/energy/47554.html

The third PDF is Director Korleski's letter to the entities we knew were involved in the various proposals. We intend to post this, and supplemental info, on the OEPA website.

I am working on the letter requesting ODH's assistance in evaluating TENORM. Should I address it to Dr. Jackson? I searched the Radiation Protection Program pages, and the Table of Organization on the website, but they didn't list anyone's name other than the Director, Dr. Jackson.

Thank you for taking the time to discuss this issue with us on Monday.

Donna

Environmental
Protection Agency

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New York State

DEC

Division of Mineral Resources

Appendix 13

NYS Marcellus Radiological Data From Production Brine

Draft Supplemental Generic Environmental Impact Statement

NYS Marcellus Radiological Data from Production Brine

Well	API #	Date Collected	Town (County)	Parameter	Result +/- Uncertainty
Maxwell 1C	31-101-22963-03-01	10/7/2008	Caton (Steuben)	Gross Alpha	17,940 +/- 8,634 pCi/L
				Gross Beta	4,765 +/- 3,829 pCi/L
				Cesium-137	-2.26 +/- 5.09 pCi/L
				Cobalt-60	-0.748 +/- 4.46 pCi/L
				Ruthenium-106	9.27 +/- 46.8 pCi/L
				Zirconium-95	37.8 +/- 21.4 pCi/L
				Radium-226	2,472 +/- 484 pCi/L
				Radium-228	874 +/- 174 pCi/L
				Thorium-228	53.778 +/- 8.084 pCi/L
				Thorium-230	0.359 +/- 0.221 pCi/L
				Thorium-232	0.065 +/- 0.103 pCi/L
				Uranium-234	0.383 +/- 0.349 pCi/L
				Uranium-235	0.077 +/- 0.168 pCi/L
				Uranium-238	0.077 +/- 0.151 pCi/L
Frost 2	31-097-23856-00-00	10/8/2008	Orange (Schuyler)	Gross Alpha	14,530 +/-3,792 pCi/L
				Gross Beta	4,561 +/- 1,634 pCi/L
				Cesium-137	2.54 +/- 4.64 pCi/L
				Cobalt-60	-1.36 +/- 3.59 pCi/L
				Ruthenium-106	-9.03 +/- 36.3 pCi/L
				Zirconium-95	31.6 +/- 14.6 pCi/L
				Radium-226	2,647 +/- 494 pCi/L
				Radium-228	782 +/- 157 pCi/L
				Thorium-228	47.855 +/- 9.140 pCi/L
				Thorium-230	0.859 +/- 0.587 pCi/L
				Thorium-232	0.286 +/- 0.328 pCi/L
				Uranium-234	0.770 +/- 0.600 pCi/L
				Uranium-235	0.113 +/- 0.222 pCi/L
				Uranium-238	0.431 +/- 0.449 pCi/L
Webster T1	31-097-23831-00-00	10/8/2008	Orange (Schuyler)	Gross Alpha	123,000 +/- 23,480 pCi/L
				Gross Beta	12,000 +/- 2,903 pCi/L
				Cesium-137	1.32 +/- 5.76 pCi/L
				Cobalt-60	-2.42 +/- 4.76 pCi/L
				Ruthenium-106	-18.3 +/- 44.6 pCi/L
				Zirconium-95	34.5 +/- 15.6 pCi/L
				Radium-226	16,030 +/- 2,995 pCi/L
				Radium-228	912 +/- 177 pCi/L
				Thorium-228	63.603 +/- 9.415 pCi/L
				Thorium-230	0.783 +/- 0.286 pCi/L
				Thorium-232	0.444 +/- 0.213 pCi/L
				Uranium-234	0.232 +/- 0.301 pCi/L
				Uranium-235	0.160 +/- 0.245 pCi/L
				Uranium-238	-0.016 +/- 0.015 pCi/L

Well	API #	Date Collected	Town (County)	Parameter	Result +/- Uncertainty
Calabro T1	31-097-23836-00-00	3/26/2009	Orange (Schuyler)	Gross Alpha	18,330 +/- 3,694 pCi/L
				Gross Beta	-324.533 +/- 654 pCi/L
				Cesium-137	3.14 +/- 7.19 pCi/L
				Cobalt-60	0.016 +/- 5.87 pCi/L
				Ruthenium-106	17.0 +/- 51.9 pCi/L
				Zirconium-95	24.2 +/- 13.6 pCi/L
				Radium-226	13,510 +/- 2,655 pCi/L
				Radium-228	929 +/- 179 pCi/L
				Thorium-228	45.0 +/- 8.41 pCi/L
				Thorium-230	2.80 +/- 1.44 pCi/L
				Thorium-232	-0.147 +/- 0.645 pCi/L
				Uranium-234	1.91 +/- 1.82 pCi/L
				Uranium-235	0.337 +/- 0.962 pCi/L
				Uranium-238	0.765 +/- 1.07 pCi/L
Maxwell IC	31-101-32963-03-01	4/1/2009	Caton (Steuben)	Gross Alpha	3,968 +/- 1,102 pCi/L
				Gross Beta	618 +/- 599 pCi/L
				Cesium-137	-0.443 +/- 3.61 pCi/L
				Cobalt-60	-1.840 +/- 2.81 pCi/L
				Ruthenium-106	17.1 +/- 29.4 pCi/L
				Zirconium-95	26.4 +/- 8.38 pCi/L
				Radium-226	7,885 +/- 1,568 pCi/L
				Radium-228	234 +/- 50.5 pCi/L
				Thorium-228	147 +/- 23.2 pCi/L
				Thorium-230	1.37 +/- 0.918 pCi/L
				Thorium-232	0.305 +/- 0.425 pCi/L
				Uranium-234	1.40 +/- 1.25 pCi/L
				Uranium-235	0.254 +/- 0.499 pCi/L
				Uranium-238	0.508 +/- 0.708 pCi/L
Haines I	31-101-14872-00-00	4/1/2009	Avoca (Steuben)	Gross Alpha	54.6 +/- 37.4 pCi/L
				Gross Beta	59.3 +/- 58.4 pCi/L
				Cesium-137	0.476 +/- 2.19 pCi/L
				Cobalt-60	-0.166 +/- 2.28 pCi/L
				Ruthenium-106	7.15 +/- 19.8 pCi/L
				Zirconium-95	0.982 +/- 4.32 pCi/L
				Radium-226	0.195 +/- 0.162 pCi/L
				Radium-228	0.428 +/- 0.335 pCi/L
				Thorium-228	0.051 +/- 0.036 pCi/L
				Thorium-230	0.028 +/- 0.019 pCi/L
				Thorium-232	0.000 +/- 0.007 pCi/L
				Uranium-234	0.000 +/- 0.014 pCi/L
				Uranium-235	0.000 +/- 0.005 pCi/L
				Uranium-238	-0.007 +/- 0.006 pCi/L

Well	API #	Date Collected	Town (County)	Parameter	Result +/- Uncertainty
Haines 2	31-101-16167-00-00	4/1/2009	Avoca (Steuben)	Gross Alpha	70.0 +/- 47.8 pCi/L
				Gross Beta	6.79 +/- 54.4 pCi/L
				Cesium-137	2.21 +/- 1.64 pCi/L
				Cobalt-60	1.42 +/- 2.83 pCi/L
				Ruthenium-106	5.77 +/- 15.2 pCi/L
				Zirconium-95	2.43 +/- 3.25 pCi/L
				Radium-226	0.163 +/- 0.198 pCi/L
				Radium-228	0.0286 +/- 0.220 pCi/L
				Thorium-228	0.048 +/- 0.038 pCi/L
				Thorium-230	0.040 +/- 0.022 pCi/L
				Thorium-232	-0.006 +/- 0.011 pCi/L
				Uranium-234	0.006 +/- 0.019 pCi/L
				Uranium-235	0.006 +/- 0.013 pCi/L
				Uranium-238	-0.013 +/- 0.009 pCi/L
Carpenter 1	31-101-26014-00-00	4/1/2009	Troupsburg (Steuben)	Gross Alpha	7,974 +/- 1,800 pCi/L
				Gross Beta	1,627 +/- 736 pCi/L
				Cesium-137	2.26 +/- 4.97 pCi/L
				Cobalt-60	-0.500 +/- 3.84 pCi/L
				Ruthenium-106	49.3 +/- 38.1 pCi/L
				Zirconium-95	30.4 +/- 11.0 pCi/L
				Radium-226	5,352 +/- 1,051 pCi/L
				Radium-228	138 +/- 37.3 pCi/L
				Thorium-228	94.1 +/- 14.9 pCi/L
				Thorium-230	1.80 +/- 0.946 pCi/L
				Thorium-232	0.240 +/- 0.472 pCi/L
				Uranium-234	0.000 +/- 0.005 pCi/L
				Uranium-235	0.000 +/- 0.005 pCi/L
				Uranium-238	-0.184 +/- 0.257 pCi/L
Zinck 1	31-101-26015-00-00	4/1/2009	Woodhull (Steuben)	Gross Alpha	9,426 +/- 2,065 pCi/L
				Gross Beta	2,780 +/- 879 pCi/L
				Cesium-137	5.47 +/- 5.66 pCi/L
				Cobalt-60	0.547 +/- 4.40 pCi/L
				Ruthenium-106	-16.600 +/- 42.8 pCi/L
				Zirconium-95	48.0 +/- 15.1 pCi/L
				Radium-226	4,049 +/- 807 pCi/L
				Radium-228	826 +/- 160 pCi/L
				Thorium-228	89.1 +/- 14.7 pCi/L
				Thorium-230	0.880 +/- 1.23 pCi/L
				Thorium-232	0.000 +/- 0.705 pCi/L
				Uranium-234	-0.813 +/- 0.881 pCi/L
				Uranium-235	-0.325 +/- 0.323 pCi/L
				Uranium-238	-0.488 +/- 0.816 pCi/L

Well	API #	Date Collected	Town (County)	Parameter	Result +/- Uncertainty
Schiavone 2	31-097-23226-00-01	4/6/2009	Reading (Schuyler)	Gross Alpha	16,550 +/- 3,355 pCi/L
				Gross Beta	1,323 +/- 711 pCi/L
				Cesium-137	1.46 +/- 5.67 pCi/L
				Cobalt-60	-2.550 +/- 5.11 pCi/L
				Ruthenium-106	20.6 +/- 42.7 pCi/L
				Zirconium-95	30.6 +/- 12.1 pCi/L
				Radium-226	15,140 +/- 2,989 pCi/L
				Radium-228	957 +/- 181 pCi/L
				Thorium-228	38.7 +/- 7.45 pCi/L
				Thorium-230	1.68 +/- 1.19 pCi/L
				Thorium-232	0.153 +/- 0.301 pCi/L
				Uranium-234	3.82 +/- 2.48 pCi/L
				Uranium-235	0.354 +/- 0.779 pCi/L
				Uranium-238	0.354 +/- 0.923 pCi/L
Parker 1	31-017-26117-00-00	4/2/2009	Oxford (Chenango)	Gross Alpha	3,914 +/- 813 pCi/L
				Gross Beta	715 +/- 202 pCi/L
				Cesium-137	4.12 +/- 3.29 pCi/L
				Cobalt-60	-1.320 +/- 2.80 pCi/L
				Ruthenium-106	-9.520 +/- 24.5 pCi/L
				Zirconium-95	1.39 +/- 6.35 pCi/L
				Radium-226	1,779 +/- 343 pCi/L
				Radium-228	201 +/- 38.9 pCi/L
				Thorium-228	15.4 +/- 3.75 pCi/L
				Thorium-230	1.25 +/- 0.835 pCi/L
				Thorium-232	0.000 +/- 0.385 pCi/L
				Uranium-234	1.82 +/- 1.58 pCi/L
				Uranium-235	0.304 +/- 0.732 pCi/L
				Uranium-238	0.304 +/- 0.732 pCi/L
WGI 10	31-097-23930-00-00	4/6/2009	Dix (Schuyler)	Gross Alpha	10,970 +/- 2,363 pCi/L
				Gross Beta	1,170 +/- 701 pCi/L
				Cesium-137	1.27 +/- 5.17 pCi/L
				Cobalt-60	0.960 +/- 4.49 pCi/L
				Ruthenium-106	14.5 +/- 37.5 pCi/L
				Zirconium-95	15.2 +/- 8.66 pCi/L
				Radium-226	6,125 +/- 1,225 pCi/L
				Radium-228	516 +/- 99.1 pCi/L
				Thorium-228	130 +/- 20.4 pCi/L
				Thorium-230	2.63 +/- 1.39 pCi/L
				Thorium-232	0.444 +/- 0.213 pCi/L
				Uranium-234	0.000 +/- 0.702 pCi/L
				Uranium-235	1.17 +/- 1.39 pCi/L
				Uranium-238	0.389 +/- 1.01 pCi/L

Well	API #	Date Collected	Town (County)	Parameter	Result +/- Uncertainty
WGI 11	31-097-23949-00-00	4/6/2009	Dix (Schuyler)	Gross Alpha	20,750 +/- 4,117 pCi/L
				Gross Beta	2,389 +/- 861 pCi/L
				Cesium-137	4.78 +/- 6.95 pCi/L
				Cobalt-60	-0.919 +/- 5.79 pCi/L
				Ruthenium-106	-19.700 +/- 49.8 pCi/L
				Zirconium-95	9.53 +/- 11.8 pCi/L
				Radium-226	10,160 +/- 2,026 pCi/L
				Radium-228	1,252 +/- 237 pCi/L
				Thorium-228	47.5 +/- 8.64 pCi/L
				Thorium-230	1.55 +/- 1.16 pCi/L
				Thorium-232	-0.141 +/- 0.278 pCi/L
				Uranium-234	0.493 +/- 0.874 pCi/L
				Uranium-235	0.000 +/- 0.540 pCi/L
				Uranium-238	-0.123 +/- 0.172 pCi/L

Ohio EPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
Lazarus Government Center
50 W. Town St., Suite 700
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184
www.epa.state.oh.us

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

July 6, 2009

Andy Blocksom
Patriot Energy Partners
7716 Depot Road #1
Lisbon, Ohio 44432

Re: Oil and Gas Well Wastewater Discharges to POTWs in Ashtabula, Jefferson, Mahoning, Trumbull and Washington Counties

Dear Mr. Blocksom:

Ohio EPA has received a number of requests to discharge wastewater generated during oil and gas well drilling, development, and production to publically owned treatment works (POTWs) or centralized waste treatment (CWT) facilities which are tributary to a POTW. The reasons given for the requests relate to the anticipated increase in wastewater generated from the drilling into the Marcellus Shale formation, primarily in Pennsylvania and West Virginia. Some of the requests have been for the discharge of lower salinity "flow back" water from the hydraulic fracturing of the shale (described by the industry as less than 50,000 mg/l), while other requests have been for the discharge of higher salinity brines and wastewater.

In a May 13, 2009 letter to the POTWs and CWTs that had made the initial inquiries, Ohio EPA's Northeast District Office stated that discharges of higher salinity brines and wastewater to CWTs and/or POTWs could not be authorized for a number of reasons. Ohio EPA's position regarding high salinity wastewater has not changed – any such wastewater must be injected into deep wells. The purpose of this letter is to discuss in more detail the issues associated with the disposal of the low salinity wastewaters generated during oil and gas (O&G) well drilling, development and production.

POTWs that are considering the acceptance of any low salinity wastewater generated during O&G well drilling, development and production must first request a modification of their NPDES permit as outlined in 40 CFR 122.41(l)(1)(ii). Ohio EPA's delegation of the authority to regulate industrial discharges via an approved pretreatment program does not negate the need to modify the NPDES permit because the POTW discharge will be significantly changed by the addition of dissolved solids that will pass through the POTW. The NPDES permit modification for POTWs that intend to accept O&G waters

must include proposed limits for total dissolved solids (TDS), chlorides and other pollutants that have the reasonable potential to approach or exceed the limits found in Ohio Administrative Code (OAC) 3745-1, Ohio's water quality standards. A review of available information indicates that these pollutants can include sulfates, sulfides, benzene, other toxic organic chemicals, and radium and uranium radioisotopes. Sampling information for these parameters, including gross alpha and gross beta measurements, must be submitted.

The NPDES permit cannot authorize changes in the POTW discharge that exceeds chemical and biological water quality standards that protect wildlife, aquatic life and human health. Therefore, the water quality standards for TDS are not the only consideration. Biomonitoring testing for whole effluent toxicity (WET) for *Ceriodaphnia dubia* has shown cases where toxicity has been observed at TDS concentrations of 800-1000 mg/l. Because the whole effluent toxicity test is a measurement of the synergistic effects of pollutants in an effluent discharge, each POTW must determine the TDS concentration at which toxicity begins to manifest. Also, Ohio EPA has been reevaluating TDS effects on aquatic biology. Periodic biological surveys upstream and downstream of the POTW discharge may be required to demonstrate that the effluent has not significantly impacted the aquatic biological community, resulting in a violation of the numeric biological criteria in Ohio's water quality standards.

Because the NPDES permit modification is due to the addition of an industrial discharge, the modification will be subject to requirements found in OAC 3745-1-05, the antidegradation rule. The POTW must submit the information required by the antidegradation rule, including documentation of the projected water quality impacts downstream and on POTW operations, a determination of the applicability of the provisions of the rule, and the information required by the applicable sections.

One of the reasons given for seeking the discharge of Marcellus Shale gas well wastewater to CWTs and WWTPs is that the drilling of the Marcellus Shale will generate more wastewater than can be disposed of into injection wells. However, numerical projections of wastewater generated vs. injection well capacity have not been provided. In a June 5, 2009 letter, the Ohio Department of Natural Resources-Division of Mineral Resources Management states that they have not been informed of any significant limitations in deep well injection capacity in Ohio. Ohio EPA recognizes that numerical projections of the wastewater generated are estimates based on a set of assumptions. However, these projections, accompanied by the assumptions used to make those projections, must be submitted so that Ohio EPA can evaluate the difference between injection well capacity and wastewater production as part of the review required by the antidegradation rule.

For communities with approved pretreatment programs, the NPDES permit modification request must be accompanied by a request to modify the Sewer Use Ordinance to include local limits for the pollutants of concern. Local limits for industrial discharges

must evaluate potential biological inhibitions in the POTW unit operations and potential operational impacts (e.g., reduced settling due to high sulfate concentrations) that may occur due to the introduction of this wastewater. If radioisotopes with long half lives are detected, their impact on biosolids must also be evaluated.

The installation or modification of any wastewater collection or treatment equipment needed for the acceptance of O&G water at a CWT or POTW would also require an approved permit to install (PTI) from Ohio EPA. As part of the review of the PTI under OAC 3745-42-04(A), Ohio EPA is required to evaluate whether the installation will:

1. Prevent or interfere with the attainment or maintenance of applicable water quality standards contained in Chapter 3745-1 of the Administrative Code;
2. Result in a violation of any applicable laws; and
3. Employ the best available technology.

The first two conditions are discussed above. Best available technology (BAT) is defined for certain industrial sectors when U.S. EPA develops a national categorical pretreatment standard. Ohio EPA evaluates BAT for operations not specifically regulated by national categorical pretreatment standards by using other State rules, similar operations regulated in the categorical standards, and best professional judgment. As noted above, this wastewater is currently deep well injected, not discharged to a POTW. Information supporting the position that discharge to a POTW, rather than deep well injection, is BAT for the proposed O&G water discharge must be provided both for the PTI and antidegradation rule reviews.

If the requested NPDES permit modification and PTI application satisfy the OAC requirements, the POTW's NPDES permit will be modified to require additional monitoring in order to ensure the continued compliance with water quality standards. These could include increased biomonitoring, TDS (and/or conductivity), chlorides, sulfates, organic compounds, gross alpha, gross beta, total radium, total uranium, biological surveys and other pollutants of concern.

I am informed by my Division of Surface Water staff that the State of Pennsylvania experienced serious water quality issues in the Monongahela River due in large part to POTWs accepting excessive amount of wastewater generated in O&G well operations, and required POTWs to reduce the amount accepted. In addition, I am told that West Virginia is aware of proposed discharges to POTWs but has not received any NPDES permit modifications, including information to satisfy West Virginia antidegradation rule requirements. U.S. EPA Region III's draft "frequently asked questions" about O&G well wastewater disposal state that "EPA Headquarters is recommending that POTWs not accept this type of brine wastewater due to its potential to interfere with POTW operations."

So, while Ohio EPA remains supportive of exploring the possibility of disposal of low salinity wastewaters from drilling at POTWs, I am concerned about potential water quality impacts and believe we should all exercise caution and take a judicious approach in evaluating this option, particularly given the long-term prospect of discharging potentially millions of gallons of this wastewater into Ohio's waterways. It is not Ohio EPA's intention to require overly burdensome requirements on POTWs and CWTs, or to prevent the development of new Ohio businesses. However, it is my obligation as director of Ohio EPA to ensure that any proposals comply with the pertinent federal and state laws, and to ensure that the waters of the state are protected.

If you have any questions, please feel free to contact George Elmaraghy, Chief of the Division of Surface Water at (614) 644-2001.

Sincerely,

Chris Korleski
Director

cc: Jen Lynch, Governor's Office
Laurie Stevenson, Ohio EPA, Director's Office
Tom Tomastik, Ohio Department of Natural Resources

530 SW 33003
Management of wastes from the Exploration Development + Production of Crude Oil Natural Gas + Geothermal Energy
Report to Congress 1987

DRILLING-RELATED WASTES

Description of Waste

Drilling wastes include a wide variety of materials, ranging in volume from the thousands of barrels of fluids ("muds") used to drill a well, to the hundreds of barrels of drill cuttings extracted from the borehole, to much smaller quantities of wastes associated with various additives and chemicals sometimes used to condition drilling fluids. A general description of each of these materials is presented in broad terms below.

Drilling Fluids (Muds)

The largest volume drilling-related wastes generated are the spent drilling fluids or muds. The composition of modern drilling fluids or muds can be quite complex and can vary widely, not only from one geographical area to another but also from one depth to another in a particular well as it is drilled.

Muds fall into two general categories: water-based muds, which can be made with fresh or saline water and are used for most types of drilling, and oil-based muds, which can be used when water-sensitive formations are drilled, when high temperatures are encountered, or when it is necessary to protect against severe drill string corrosion in hostile downhole environments. Drilling muds contain four essential parts: (1) liquids, either water or oil; (2) reactive solids, the viscosity- and density-building part of the system, often bentonite clays; (3) inert solids such as barite; and (4) additives to control the chemical, physical, and biological properties of the mud. These basic components perform various functions. For example, clays increase viscosity and

http://nepis.epa.gov/Exe/tiff2png.exe/20012D6Y.PNG?-i+-r+75+-g+7+D%3A%5CZYFIL... 5/21/2009

than 500 ppm chlorides) to allow the water to be used for beneficial purposes such as crop irrigation or livestock watering. More often, salinity levels are considerably higher, ranging from a few thousand parts per million to over 150,000 ppm. Seawater, by contrast, is typically about 35,000 ppm chlorides. Produced water also tends to contain quantities of petroleum hydrocarbons (especially lower molecular weight compounds), higher molecular weight alkanes, polynuclear aromatic hydrocarbons, and metals. It may also contain residues of biocides and other additives used as production chemicals. These can include coagulants, corrosion inhibitors, cleaners, dispersants, emulsion breakers, paraffin control agents, reverse emulsion breakers, and scale inhibitors.

Radioactive materials, such as radium, have been found in some oil field produced waters. Ra-226 activity in filtered and unfiltered produced waters has been found to range between 16 and 395 picocuries/liter; Ra-228 activity may range from 170 to 570 picocuries/liter (USEPA 1985). The ground-water standard for the Maximum Contaminant Level (MCL) for combined Ra-226 and Ra-228 is 5 picocuries/liter (40 CFR, Part 257, Appendix I). No study has been done to determine the percentage of produced water that contains radioactive materials.

Low-Volume Production Wastes

Low-volume production-related wastes include many of the chemical additives discussed above in relation to drilling (see Table III-2), as well as production tank bottoms and scrubber bottoms.

Onsite Management Methods

Onsite management methods for production wastes include subsurface injection, the use of evaporation and percolation pits, discharge of produced waters to surface water, and storage.

http://nepis.epa.gov/Exe/tiff2png.exe/20012D7R.PNG?-i+-r+75+-g+7+D%3A%5CZYFILE... 5/21/2009

McCracken, Chuck

From: Helmer, Stephen
Sent: Wednesday, December 07, 2011 3:08 PM
To: Snee, Michael
Cc: Lipp, David; McCracken, Chuck
Subject: RE: Disposal of Oil & Gas "cuttings" in Municipal Waste Landfills
Attachments: RE: Regarding Your Request to ODH Bureau of Radiation Protection

Importance: High

Mike,

Attached are Waste Management's facilities in Ohio that Jerry Ross (cell #330-340-4714) is representing.
One of these facilities has a radiation alarm.
Mr. Ross is requesting clarification and guidance on how to handle "cuttings" from the Oil & Gas industry.
He indicated today that they have experienced a load being rejected by alarm and DOT exemption returning it to its origin.

There are a number of issues involved and this is my understanding to date.

Ohio EPA (Aaron Shear) indicated that ODNR is less inclined for the Oil & Gas drilling locations to bury "cuttings" on-site.
The sites are directing the "cuttings" be disposed at municipal landfills. I have a call in to confirm with ODNR.
OEPA draft on agency guidance intended for industry is expected to be published within the next few months. OEPA is requesting ODH comment.
OEPA discussed the guidance with Chuck McCracken a number of months ago, but I recommend we take another look at it.
OEPA indicates: On-site burial of cuttings are regulated by ODNR, but Off-site disposal of "cuttings" (solid waste) are regulated by OEPA.
OEPA indicates Oil & Gas drill "cuttings" and associated muds are among several of the industry wastes that are exempted under Subtitle C of RCRA.
However, this does not preclude wastes from control under other state or federal regulations, including Subtitle D of RCRA or OEPA solid waste regulations.

I called PA to get some perspective on how often "cuttings" alarm and how they handle their process into municipal landfills.
PA apparently can only think of one case where "cuttings" alarmed. Apparently they are not experiencing much of a problem with alarms.
Ohio EPA indicated they have been calling other states and finding similar results.

I indicated to Jerry Ross that we are early on in this process and we will need to work together as we move forward.
Jerry indicated that he understood that we are early in this process.
I indicated the he is to maintain their current protocol for alarms (call their 3rd party contractor) for a couple of reasons.
One, we don't expect there to be many alarms.
Two, Ohio Administrative Code 3701:1-43 is not final yet.
He is to take a look at how many trucks are alarming.
Determine if shipping paperwork indicates that they are only hauling "cuttings" and not other wastes.
The radiological exemption for cuttings is expected to allow for disposal.

I indicated that it is likely we will come up with a workable path forward to allow exempt "cuttings" into the landfill.

As for BRP, we will likely be looking at municipal landfills with radiation alarms that may alarm on Oil & Gas "cuttings".

BRP will need to consider guidance/protocols to both the landfill and our licensee's contracted with these landfills.

I'm sure there will be more to come on this.

Steve

From: McCracken, Chuck
Sent: Friday, December 02, 2011 8:32 AM
To: Lipp, David
Cc: Light, Mark; Helmer, Stephen
Subject: FW: NORM wastes

David:

This is Mr. Ross's 2nd follow-up inquiry since we sent him the "we'll get back to you" response.
As you can read, he is becoming impatient.

Have you heard anything from OEPA or ODNR on this issue yet?

Chuck

From: Ross, Jerry [mailto:JRoss8@wm.com]
Sent: Thursday, December 01, 2011 4:03 PM
To: McCracken, Chuck
Cc: Trent, Kathy
Subject: RE: NORM wastes

Mr. McCracken

I know I have opened a can of worm with the NORM waste question, however, as a manager of several Ohio landfills, the issue is becoming more and more pressing and I really need to know how to handle this issue. Each time one of our radiation detection devices goes off in one of our landfills, under our current reaction procedures we must notify your office and request direction. It would be useful to know in advance, what our SOP for this material will be so we can amend our policies and to inform our customers what to expect.
Thank you.

From: Chuck McCracken [mailto:Chuck.McCracken@odh.ohio.gov]
Sent: Monday, November 07, 2011 10:36 AM
To: Ross, Jerry
Cc: David Lipp; Jim Colleli; Mark Light
Subject: FW: NORM wastes

Dear Jerry Ross:

Bureau management discussed this issue this morning and we will be getting back with you within the week with a more precise answer to your question on disposal of oil & gas TENORM in municipal waste landfills. Thank you for your patience.

Sincerely,

Chuck McCracken, Supervisor
Bureau of Radiation Protection
Ohio Department of Health
246 N. High Street - 7th Floor 35 Bldg.
Columbus, OH 43215
(ph) 614.466.5136
(fx) 614.466.0381

From: Ross, Jerry [mailto:]
Sent: Tuesday, November 01, 2011 11:49 AM
To: Jim Colleli
Subject: Re: NORM wastes

Thanks Jim, for your response. However, since Mahoning County mandates their landfills monitor for radiation, many of the drill cuttings will set off the radiation alarms, then our waste exclusion rules kick the problem back to your office. Even if the material is exempt waste under oil and gas exploration rules, the resultant NORM material creates disposal issues unless an exemption or acceptable safe level is given for the radiation properties of the material.

If someone at ODNR has the authority to issue these levels, would you please give me a contact name.

From: Jim Colleli [mailto:Jim.Colleli@odh.ohio.gov]
Sent: Tuesday, November 01, 2011 09:29 AM
To: Ross, Jerry
Cc: Chuck McCracken <Chuck.McCracken@odh.ohio.gov>
Subject: NORM wastes

Jerry,

Thanks for your inquiry yesterday in regard to NORM wastes from OIL and Gas operations in Ohio.

The Ohio Department of Natural Resources are the prime regulator for wastes resultant from oil and gas drilling in Ohio. I would contact them for what the accepted practices are for these types of wastes going forward.

Jim Colleli
Ohio Department of Health
Bureau of Radiation Protection
614-728-0882 direct
Jim.Colleli@odh.ohio.gov

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Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

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McCracken, Chuck

From: Ross, Jerry <JRoss8@wm.com>
Sent: Sunday, December 04, 2011 6:45 PM
To: Helmer, Stephen
Cc: Trent, Kathy
Subject: RE: Regarding Your Request to ODH Bureau of Radiation Protection
Attachments: Waste Management Facilities in Ohio.doc

Stephen,
Attached are Waste Management's facilities in Ohio.

From: Helmer, Stephen [mailto:Stephen.Helmer@odh.ohio.gov]
Sent: Friday, December 02, 2011 2:35 PM
To: Ross, Jerry
Cc: Lipp, David; McCracken, Chuck; Colleli, Jim
Subject: RE: Regarding Your Request to ODH Bureau of Radiation Protection
Importance: High

Jerry,

I believe once I have a discussion with Ohio EPA (your industry regulatory) this will work itself out.

The new ODH rule regarding TENORM is in the process of being approved. It is still several months away from being approved.
TENORM: Technically Enhance Naturally Occurring Radioactive Material
It was put out for public comment and none were received. The process did include a number of meetings with ODH, ODNR and OEPA.
See draft: O.A.C. Rules 3701:1-43 http://www.odh.ohio.gov/rules/drafts/drafts.aspx
Specifically take a look at: 3701:1-43-07 Exemptions (I) and (J).

Our bureau just now realizes both from your email and now a draft document from OEPA that "cuttings" will likely go to Municipal Solid Waste Landfills and not necessarily to Hazardous Waste facilities. This will likely impact those landfills currently using radiation monitors.
The bureau is considering what guidance to provide for trucks manifested with "cuttings" from oil and gas exploration and production wastes that may cause an alarm.
I will look to see what can be done to help resolve your concern of possible alarms for what is to be "exempt" material.

As discussed on the phone please provide a list of the Waste Management facilities you are representing and an estimate of expected volume.
It was good talking with you.

Respectfully,

Stephen Helmer
Program Administrator
Ohio Department of Health
Bureau of Radiation Protection
Office: 614-728-3611
Cell: 614-477-5203

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Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

McCracken, Chuck

From: Baker, Mike <Mike.Baker@epa.state.oh.us>
Sent: Monday, November 07, 2011 8:19 AM
To: Stevenson, Laurie; 'Chris.Perry@dnr.state.oh.us'; 'Heidi Hetzel-Evans'; 'mike.hallfrisch@dnr.state.oh.us'; 'mike.mccormac@dnr.state.oh.us'; 'rick.simmers@dnr.state.oh.us'; 'ted.lozier@dnr.state.oh.us'; 'thomas.tugend@dnr.state.oh.us'; 'tom.tomastik@dnr.state.oh.us'; Shear, Aaron; Cirker, Benjamin; Hall, Brian; Lowe, Chuck; Nygaard, Eric; Goicochea, Joe; Weiss, Kristopher; Burkleca, Lee; Taliaferro, Lindsay; Eggert, Michael; Parsons, Misty; Settles, Mike; Laake, Ryan; Freeman, Tracy; Harcarik, Tom; Nickel, Brian; Kniss, Donna; Underwood, Dan; Adams, Eric; Gomes, Erm; Snell, Fred; Rice, Nancy; Blasick, Rich; DiFranco, Stivo; Saines, Steve; Williams, Steve; Wilson, Virginia; Chuck McCracken; Michael Snee; Rebecca Fugitt; Stephen Helmer; David Lipp; Hopkins, Mike
Subject: October 5, 2011 Shale Team Meeting Summary
Attachments: 10-5-11 Marcellus Shale Meeting.doc

Attached is a draft summary of the October 5 shale team meeting. Please let me know if you have any comments by the end of the week and I will finalize. Also please let me know if there is anyone else who should receive a copy.

Thanks,
Mike

This message was secured by ZixCorp(R).

CDM
Marcellus Shale
Workgroup meeting.

Marcellus Shale Meeting
OEPA/ODNR/ODH
Thursday, October 5
Meeting Summary

Introductions

Drilling Activity

Reports generated from ODNR web page summarizing Marcellus and Utica permit activity were provided. ODNR is adding a spreadsheet to their web page showing weekly drilling permit activity as well as making other report improvements (e.g. adding latitude and longitude data). As of 9-25, 40 horizontal well permits had been issued for the Utica with 11 wells drilled. Eleven horizontal permits had been issued for the Marcellus with 6 drilled to that date. The first required reports on actual production are due March 31, 2012 and will give a better indication of production projections.

ODNR is adding a question on the source of water to be used in their pre-drilling site review checklist.

September Energy Summit

A brief synopsis of the Governor's Energy Summit was provided. Streaming video is now available for on demand viewing: http://www.battelle.org/conferences/ohioenergy/.

Permit Conditions

A final summary of permit conditions related to ground water and drinking water protection was provided. The Division of Oil and Gas will monitor the occurrence of drilling activity over unconsolidated aquifers capable of sustaining 100 gpm for a year and will then, in cooperation with OEPA, assess the need to modify conditions accordingly.

401/404

A general permit for O&G drill sites was public noticed. Public comments were open until October 28.

Wastewater/Brine Management

Warren permit to receive and discharge treated produced water from Patriot is set to expire the end of January. Ohio EPA will not renew the permit as it has been determined this is not an approved disposal alternative. Discharge limits in that permit had been appealed to ERAC.

There are currently 183 permitted Class 2 wells with 8 applications pending. More capacity is needed given the volume of wastewater from Pennsylvania. There was approximately 2.8 million barrels of fluid injected during the second quarter of this year, 54% from out of district. ODNR has received about 30 applications from out of state haulers requesting to get registered to haul in the State of Ohio. ODNR

requested other agency field staff to notify ODNR if they see trucks appearing to haul brine that do not have a UIC sticker on them.

ODNR does not anticipate seeing large centralized wastewater impoundments such as those being constructed in Pennsylvania for treatment and reuse purposes, at least until we see a greater concentration of drilling activity occurring. Some discussion of the regulatory status of such "off-site" impoundments may be warranted.

ODNR is working in cooperation with the OSU Center for Subsurface Energy researching various aspects of shale development.

Air General Permit

Ohio EPA is issued a draft general permit for air discharges associated with oil and gas production activities. They have revised the permit in response to comments. Anticipate issuing formal draft for 30 day comment period in near future. (draft permit was issued for 30 day comment period on October 20). USEPA may also be developing applicable air regulations.

Waste/TENORM Update

ODH reported the public comment period on TENORM rules was completed. ODH will run rules through the Radiation Advisory Council and the Public Health Council. Anticipate introducing to JCARR early in 2012. New rules may impact reclamation of pipe due to scale build up.

Ohio EPA reported they are receiving calls from industry on disposal of solids from drill sites. If in contact with drill muds must go to solid waste landfill. Two landfills in NE Ohio are each currently receiving approximately 100 tons per day (approximately 70 roll off boxes per well).

Outreach/ Education

ODNR still fielding a number of media calls. A lot of interest in general permits.

ODNR/OEPA/ODH leadership conducted series of Government to Government meetings in eastern Ohio. Impact to local infrastructure is the concern most frequently expressed.

ODH reported they have received no negative feedback on well sampling fact sheet. Most homeowners conducting sampling are requesting the full suite of parameters. Supportive of fact sheet as is with some minor edits suggested by Ohio EPA.

Next Meeting

Next meeting set for February 29, 2012 at 1:30 at Ohio EPA.

McCracken, Chuck

From: Stevenson, Laurie <laurie.stevenson@epa.state.oh.us>
Sent: Monday, October 03, 2011 3:03 PM
To: 'Chris.Perry@dnr.state.oh.us'; 'Heidi Hetzel-Evans'; 'mike.hallfrisch@dnr.state.oh.us'; 'mike.mccormac@dnr.state.oh.us'; 'rick.simmers@dnr.state.oh.us'; 'ted.lozier@dnr.state.oh.us'; 'thomas.tugend@dnr.state.oh.us'; 'tom.tomastik@dnr.state.oh.us'; Shear, Aaron; Cirker, Benjamin; Hall, Brian; Lowe, Chuck; Nygaard, Eric; Goicochea, Joe; Weiss, Kristopher; Burkleca, Lee; Taliaferro, Lindsay; Baker, Mike; Eggert, Michael; Parsons, Misty; Settles, Mike; Laake, Ryan; Freeman, Tracy; Harcarik, Tom; Nickel, Brian; Kniss, Donna; Underwood, Dan; Adams, Eric; Gomes, Erm; Snell, Fred; Rice, Nancy; Blasick, Rich; DiFranco, Stivo; Saines, Steve; Williams, Steve; Wilson, Virginia; Chuck McCracken; Michael Snee; Rebecca Fugitt; Stephen Helmer; David Lipp; Hopkins, Mike; Getz, Eric; Nabors, Shannon; Buthker, Bonnie; Robinson, Isaac; Eric Denison
Subject: Draft agenda for 10/5/11 meeting
Attachments: Marcellus Shale10-5-11AgendaFinal.DOC

Hi everyone. Attached is a final agenda for the meeting Wednesday, October 5th from 1:30-4:00 at ODNR (building H-2).

For anyone dialing in, the bridge line number is 614-387-7405 (no passcode).

Thanks.
Laurie

This message was secured by ZixCorp(R).

Marcellus Shale Meeting

OEPA/ODNR/ODH
Wednesday October 5, 2011
1:30 – 4:00 p.m.
Ohio DNR Fountain Square, Building H
2nd floor conference room
AGENDA

Welcome/Introductions	B. Hall
Drilling Activity/Updates	
• Ohio Drilling activity in the Marcellus/Utica – permit and drilling activity update	M. McCormac
September Energy Summit	T. Tugend
Permit conditions to protect GW and other sensitive environments/update	OEPA/ODNR
401/404	
• Development of General Permit/401 authorization	T. Harcarik
Wastewater/Brine Management	
• POTW wastewater management/update	B. Hall
• UIC disposal/capacity update	T. Tomastik
Air	
• General Permit for natural gas drilling/production	M. Hopkins
Waste/TENORM Update	
• Drill cuttings/solids sampling update OEPA-ODH coordination	ODH, OEPA
Outreach/Education/Meetings	
• Media Relations Update	OEPA/ODNR
• Statewide regional shale meetings	ODNR
• Fact sheets/update	OEPA/ODNR
Next Meeting/Agenda Items	OEPA/ODNR
• Set schedule for future meetings/frequency	

McCracken, Chuck

From: Stevenson, Laurie <laurie.stevenson@epa.state.oh.us>
Sent: Friday, September 30, 2011 3:10 PM
To: 'Chris.Perry@dnr.state.oh.us'; 'Heidi Hetzel-Evans'; 'mike.hallfrisch@dnr.state.oh.us'; 'mike.mccormac@dnr.state.oh.us'; 'rick.simmers@dnr.state.oh.us'; 'ted.lozier@dnr.state.oh.us'; 'thomas.tugend@dnr.state.oh.us'; 'tom.tomastik@dnr.state.oh.us'; Shear, Aaron; Cirker, Benjamin; Hall, Brian; Lowe, Chuck; Nygaard, Eric; Goicochea, Joe; Weiss, Kristopher; Burkleca, Lee; Taliaferro, Lindsay; Baker, Mike; Eggert, Michael; Parsons, Misty; Settles, Mike; Laake, Ryan; Freeman, Tracy; Harcarik, Tom; Nickel, Brian; Kniss, Donna; Underwood, Dan; Adams, Eric; Gomes, Erm; Snell, Fred; Rice, Nancy; Blasick, Rich; DiFranco, Stivo; Saines, Steve; Williams, Steve; Wilson, Virginia; Chuck McCracken; Michael Snee; Rebecca Fugitt; Stephen Helmer; David Lipp; Hopkins, Mike; Getz, Eric; Nabors, Shannon; Buthker, Bonnie; Robinson, Isaac
Subject: Draft agenda for 10/5/11 meeting
Attachments: Marcellus Shale10-5-11Agenda Draft.DOC

Hi everyone. Attached is a draft agenda for our meeting next **Wednesday, October 5th** from 1:30-4:00 at ODNR. If someone from ODNR could confirm the conference room location, that would be great.

The general consensus from people responding to my question about the frequency of our meetings was that we go ahead with our meeting next week, but talk about future meeting frequency from here on out at the meeting.

I will not be at the meeting on Weds. Brian Hall and Mike Baker will help facilitate the discussion and take notes. If anyone has revisions/edits to the agenda, please provide these to me by noon on Monday and I'll get the final back out to everyone. I'm still waiting for bridge line confirmation for the districts and will get this number out on Monday.

Thanks.
Laurie

This message was secured by ZixCorp(R).

Marcellus Shale Meeting

OEPA/ODNR/ODH
Wednesday October 5, 2011
1:30 – 4:00 p.m.
Ohio DNR Fountain Square, Building H, 2nd floor conference room
DRAFT AGENDA

Welcome/Introductions	B. Hall
Drilling Activity/Updates	
• Ohio Drilling activity in the Marcellus/Utica – permit and drilling activity update	M. McCormac
September Energy Summit	T. Tugend
Permit conditions to protect GW and other sensitive environments/update	OEPA/ODNR
401/404	
• Development of General Permit/401 authorization	T. Harcarik
Wastewater/Brine Management	
• POTW wastewater management/update	B. Hall
• UIC disposal/capacity update	T. Tomastik
Air	
• General Permit for natural gas drilling/production	M. Hopkins
Waste/TENORM Update	
• Drill cuttings/solids sampling update OEPA-ODH coordination	ODH, OEPA
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• Statewide regional shale meetings	ODNR
• Fact sheets/update	OEPA/ODNR
Next Meeting/Agenda Items	OEPA/ODNR
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McCracken, Chuck

From: Stevenson, Laurie <laurie.stevenson@epa.state.oh.us>
Sent: Friday, September 16, 2011 10:36 AM
To: 'Chris.Perry@dnr.state.oh.us'; 'Heidi Hetzel-Evans'; 'mike.hallfrisch@dnr.state.oh.us'; 'mike.mccormac@dnr.state.oh.us'; 'rick.simmers@dnr.state.oh.us'; 'ted.lozier@dnr.state.oh.us'; 'thomas.tugend@dnr.state.oh.us'; 'tom.tomastik@dnr.state.oh.us'; Shear, Aaron; Cirker, Benjamin; Hall, Brian; Lowe, Chuck; Nygaard, Eric; Goicochea, Joe; Weiss, Kristopher; Burkleca, Lee; Taliaferro, Lindsay; Baker, Mike; Eggert, Michael; Parsons, Misty; Settles, Mike; Laake, Ryan; Freeman, Tracy; Harcarik, Tom; Nickel, Brian; Kniss, Donna; Underwood, Dan; Adams, Eric; Gomes, Erm; Snell, Fred; Rice, Nancy; Blasick, Rich; DiFranco, Stivo; Saines, Steve; Williams, Steve; Wilson, Virginia; Chuck McCracken; Michael Snee; Rebecca Fugitt; Stephen Helmer; David Lipp; Hopkins, Mike
Subject: 7/12 Inter-Agency Shale Team meeting notes/question about next meeting
Attachments: ShaleTeamMeetingNotes7-12-11FINAL.doc

Hi everyone. I'm attaching the final notes from our 7/12 meeting.

Per the notes, we're scheduled to meet again on **Wednesday, October 5th** from 1:30-4:00 at ODNR. I'm doing a quick poll of the group to see if we want to continue with a quarterly meeting. Our discussions thus far have been very productive I think for everyone, however, I do not know if we're to the point where we want to spread our meetings out a bit farther apart.

If we skipped October, this would put our next meeting in January. If people feel that we want to stay on track with the meeting schedule as is, I'm fine with that too.

If you can e-mail your preference to me directly, I'll collect the responses and let everyone know what the general consensus is on future meetings.
If we do decide to move forward with the October meeting, I'll get a draft agenda around to everyone.

Thanks.
Laurie

This message was secured by ZixCorp(R).

Ohio EPA/ODNR/ODH Shale Team Meeting
July 12, 2011 Notes

ODNR UPDATES

ODNR's tracking system is now for horizontal permits. Companies drilling vertical well (stratographic testing) – now removed from their tracking system. Status fields: permitted, drilling, completion, production, expired (never drilled). This should be more helpful/accurate information for interested parties wanting to know about current activity. Could be moving to a GIS based system down the road.

Utica: Buel well is actually producing for Ohio Buckeye Energy. Companies are required to submit an annual statement of activity to ODNR by march 31st. Do not know if it's oil or nat gas predominantly now.

ODNR's Technical Team – Geologic Survey

Technical information will be compiled by the team. Goal of understanding all technical issues related to hydraulic fracturing: chemicals, design, perforations, flowback volumes, production capability, etc. There's a need to get more scientific information out to the public regarding hydraulic fracturing.

UIC Disposal

- 178 permitted wells (6 not drilled yet, 172 active)
- 8 new applications since May (5 permits issued) 3 applications under review.
- Out of state wastes to UICs in Ohio – approximately - Oct-Dec 39% coming from PA. Jan-March 59%.

Permit Conditions (OEPA/ODNR), M. Baker, T. Tugend

In final stages of agreeing upon language that will go into future permits regarding protecting sensitive gw areas. Next steps include letter from OEPA to ODNR. T. Tugend indicates ODNR will follow-up on this.

OEPA UPDATES

401 General Permit, T. Harcarik

OEPA has drafted a 401 general permit which is under internal review in OEPA. Comments came in around 4th. Will be distributed to ODNR for review. Less than .5 acre wetland and less than 1,500 linear ft of stream – qualify for nationwide permit. OEPA is developing a GP which will get through OEPA. If you exceed thresholds, not eligible. Still may need to deal with Army Corps for individual 404 permit.

Once finished internally at OEPA, will submit to ODNR/USACE for review. Also, OEPA is planning outreach to industry and other interested parties. There will also be a public comment/review period.

Warren/Patriot (B. Hall)

No new developments following issuance of the Director's letter from OEPA to ODNR.

Air Permit Update (M. Hopkins)

Air general permit (GP) is being developed for natural gas drilling. Construction/installation sources – most of these are exempt from air permitting because either they are temporary in nature, are exempt by rule or would be classified as de minimis sources. Once completion is done and the site goes into production, these units are regulated – not exempt unless de minimis. GP sent out: several units identified. Met with the Ohio Oil and Gas Association and industry reps. They are preparing additional comments for OEPA.

Next steps: Will get comments, another review to more interested parties. Official 30 day comment period when the draft is issued.

Waste/Solid Waste (D. Lipp, ODH and A. Shear, OEPA)

David Lipp provided an update on ODH's recent site visit to drill site. They did some monitoring via. low level rad meter (nothing found above background). Could not find any evidence of llrw or exposure concerns.

TENORM, D. Lipp

TENORM (Technologically Enhanced Naturally Occurring Radioactive Material) rules approved to go out for public comment. By Weds or Fri of next week, should go on the ODH Website.

MEDIA/OUTREACH (OEPA/ODNR/ODH)

- ODNR receiving many Class II injection well inquiries.
- The group discussed an additional water sampling fact sheet – companion to initial fact sheet. This would focus on the question: What do the results mean? Water sampling factsheet sent out to the local HDs.
- General fact sheet update – ODNR wants to get this out to make available at the State Fair.
- ODNR has completed first line of general fact sheets (5 total). The next ones will focus on Class II injection wells and FAQs.
- OEPA – drillers fact sheet forthcoming.

NEXT MEETING

October 5th (Weds.), 1:30-4:00 at ODNR.

McCracken, Chuck

From: Stevenson, Laurie <laurie.stevenson@epa.state.oh.us>
Sent: Wednesday, August 24, 2011 11:19 AM
To: 'Chris.Perry@dnr.state.oh.us'; 'Heidi Hetzel-Evans'; 'mike.hallfrisch@dnr.state.oh.us'; 'mike.mccormac@dnr.state.oh.us'; 'rick.simmers@dnr.state.oh.us'; 'ted.lozier@dnr.state.oh.us'; 'thomas.tugend@dnr.state.oh.us'; 'tom.tomastik@dnr.state.oh.us'; Shear, Aaron; Cirker, Benjamin; Hall, Brian; Lowe, Chuck; Nygaard, Eric; Goicochea, Joe; Weiss, Kristopher; Burkleca, Lee; Taliaferro, Lindsay; Baker, Mike; Eggert, Michael; Parsons, Misty; Settles, Mike; Laake, Ryan; Freeman, Tracy; Harcarik, Tom; Nickel, Brian; Kniss, Donna; Underwood, Dan; Adams, Eric; Gomes, Erm; Snell, Fred; Rice, Nancy; Blasick, Rich; DiFranco, Stivo; Saines, Steve; Williams, Steve; Wilson, Virginia; Chuck McCracken; Michael Snee; Rebecca Fugitt; Stephen Helmer; David Lipp; Hopkins, Mike
Subject: Draft notes from 7/12 meeting and final fact sheet
Attachments: ShaleTeamMeetingNotes7-12-11.docx; July2011GeneralShale-FactSheetFinal.pdf

Hi everyone. I'm sending out the draft notes from our 7/12 meeting. If you have additions/edits, please give them to me by the end of next week and I'll get the notes finalized.

I'm also passing along the final version of the revised general fact sheet on shale drilling. Many of you have received this electronically, but I wanted to make sure everyone was aware that it's done.

Also, i have not forgotten about the general fact sheet for drillers. As you may recall, we haven't finalized this one yet. Given some significant progress with the development of general permits here (air and 401) I am in the process of another revision to the draft fact sheet to include information on this. I also received ODNR's comments on the past draft that I will be addressing. Given these changes, I will likely send this around to the team again as a revised draft for one last quick review before we go final with it. I just wanted to update folks on where we're at with this one, as several people have asked about it.

As a final note, we're scheduled for our next meeting on Weds., October 5th from 1:30-4:00 at ODNR.

Thanks.
Laurie

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