

ODH – TENORM rules (M. Snee)

Still working on rules. Going slower than anticipated – originally thought would be done with draft by October, but still working.

Since last meeting, have received inquiries about drill cutting disposal from PA.

C. Butler, OEPA talked about a recent meeting between OEPA and Apex landfill about potential new activity. This may include the construction of a solidification pit for frac water/drill cuttings.

Outreach/Education Activity Update (L. Stevenson, OEPA)

Distributed final copy of drilling/regulatory basics fact sheet. Other potential topics:

- Homeowner – water safety. T. Tomastik volunteered to initiate something on this.
- Drilling operations – L. Stevenson will work with OEPA divisions on initial draft.
- Pipeline construction/requirements– an issue for landowners as well

Media relations (OEPA/ODNR) - No significant activity

Frac water sampling - potential for collaboration? Marcellus Shale Coalition has done sampling, so we may be able to get data from them. T. Tomastik will review information received from PA. We should keep this on the radar, but in the future, as we have limited drilling activity. In the interim, let's focus on parameters list. Is it important to do this if others are volunteering information? (C. Butler). Everything on the media indicates flowback water is "toxic." More concrete data would help address concerns and reduce speculation. Add as agenda item for our next meeting. In the meantime, scope out what we would actually be doing.

NEXT MEETING: February 10th 1:30-4:00 at Ohio EPA.

McCracken, Chuck

From: Laurie Stevenson <laurie.stevenson@epa.state.oh.us>
Sent: Monday, December 06, 2010 12:26 PM
To: Chris.Perry@dnr.state.oh.us; Heidi.Hetzel-Evans; john.husted@dnr.state.oh.us;
mike.mccormac@dnr.state.oh.us; rick.simmers@dnr.state.oh.us;
tom.tomastik@dnr.state.oh.us; tom.tugend@dnr.state.oh.us; Aaron Shear; Bill Skowronski;
Brian Hall; Charlotte Hickcox; Chuck Lowe; Dan Underwood; Donna Kniss; Eric Adams; Eric
Nygaard; Erm Gomes; Fred Snell; Joe Goicochea; Keith Riley; Kristopher Weiss; Lindsay
Taliaferro; Michael Eggert; Mike Baker; Mike Settles; Nancy Rice; Rich Blasick; Steve Saines;
Steve Williams; Stivo DiFranco; Tom Harcarik; Tracy Freeman; Virginia Wilson; Chuck
McCracken; Michael Snee; Rebecca Fugitt; Robert Owen; Stephen Helmer
Cc: Craig Butler
Subject: Shale Team Meeting on 12/9 - Final Agenda
Attachments: Marcellus Shale12-9final_agenda.DOC

Hello everyone. I'm attaching our final agenda for this Thursday's meeting here at Ohio EPA, Central Office. We're scheduled from 2:00-4:00.

For Ohio EPA SEDO and NEDO, if you can make reservations on your end for videoconferencing equipment, I'll do the same here.

If you have any questions or need anything before Thursday, let me know.

Thanks,
Laurie

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constitutes a public record.

Marcellus Shale Meeting
OEPA/ODNR/ODH

Thursday, December 9, 2010
2:00 – 4:00 p.m.

Ohio EPA
Conference Room A, Main Conference Center

AGENDA

Welcome/Introductions

C. Butler, L. Stevenson, OEPA

Highlights from the ODNR visit to PA

ODNR

NY Moratorium on Drilling

J. Goicochea, OEPA

Drilling/Wastewater Updates

- Drilling activity in the Marcellus/Utica - update
- Wastewater/POTW update
- Mustang Engineering Meeting (pipeline proposal)

T. Tomastik, R. Simmers, ODNR
B. Hall, OEPA
L. Stevenson/T. Harcarik

Regulatory Update

- SB 165/Rules
- TENORM Rules update
- Drilling permit conditions to protect GW and other sensitive environments

T. Tugend, ODNR
M. Snee, ODH
M. Baker, C. Butler, OEPA

Public Outreach/Education

- OEPA fact sheet finalized
 - Ideas for additional fact sheet topics
- Web site/status update
- Media Relations Update

L. Stevenson/All
M. Settles, OEPA
OEPA/ODNR

Next Steps

All

McCracken, Chuck

From: Laurie Stevenson <laurie.stevenson@epa.state.oh.us>
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Brian Hall; Charlotte Hickcox; Chuck Lowe; Dan Underwood; Donna Kniss; Eric Adams; Eric
Nygaard; Erm Gomes; Fred Snell; Joe Goicochea; Keith Riley; Kristopher Weiss; Lindsay
Taliaferro; Michael Eggert; Mike Baker; Mike Settles; Nancy Rice; Rich Blasick; Steve Saines;
Steve Williams; Stivo DiFranco; Tom Harcarik; Tracy Freeman; Virginia Wilson; Chuck
McCracken; Michael Snee; Robert Owen; Stephen Helmer
Cc: Craig Butler
Subject: Next Inter-Agency Shale Team Meeting on 12/9 - Draft Agenda
Attachments: Marcellus Shale12-9draftagenda.DOC

Hello everyone. Just a friendly reminder that we have our next inter-agency meeting on Thursday, December 9th here at Ohio EPA, Central Office.

I'm attaching a draft agenda for your review. If you have any edits, additions, etc., please get these to me by COB Monday and I'll finalize this. Also, due to some conflicts, I am proposing a meeting time of 2:00-4:00 (instead of 1:00-3:00 as originally proposed). If this poses any significant problems, let me know.

OEPA districts, we'll get out more details to you early next week on either a bridge line or video conference option.

Thanks!
Laurie

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All

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L. Stevenson/T. Harcarik

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- Web site/status update
- Media Relations Update

L. Stevenson/All
M. Settles, OEPA
OEPA/ODNR

Next Steps

All

McCracken, Chuck

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tom.tomastik@dnr.state.oh.us; tom.tugend@dnr.state.oh.us; Aaron Shear; Bill Skowronski;
Brian Hall; Charlotte Hickcox; Chuck Lowe; Donna Kniss; Eric Nygaard; Erm Gomes; Fred
Snell; Joe Goicochea; Keith Riley; Kristopher Weiss; Lindsay Taliaferro; Michael Eggert; Mike
Baker; Mike Settles; Randy Bournique; Rich Blasick; Steve Saines; Steve Williams; Tracy
Freeman; Virginia Wilson; Chuck McCracken; Michael Snee; Robert Owen; Stephen Helmer
Craig Butler
Cc:
Subject: Marcellus Shale Meeting/Notes and Revised Contact List
Attachments: Marcellus Shale Workgroup List10-19-10.PDF; Shale Meeting10-19NotesFinal.PDF

Hello everyone. Craig and I would like to again extend our thanks for a productive meeting on Tuesday. I'm passing along the notes from our discussion and an updated workgroup/contact list. If you have any questions or corrections on the notes, let me know and I'll revise accordingly.

We look forward to continuing our discussions at the next meeting, scheduled for December 9th. In addition, we'll be in touch with each other on any respective action items needing more immediate attention before the 9th.

I'm also planning to get our draft fact sheet out here shortly to ODNR and ODH for review/comment under separate cover.

If there's anything else you need, let us know.

Laurie

Ohio Environmental Protection Agency
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Marcellus Shale

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Marcellus Shale

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OEPA/ODNR/ODH Marcellus Shale Meeting Notes

October 19, 2010

Introductions

Revised attendee/workgroup list (see attached)

GWPC Meeting Recap

T. Tomastik (ODNR). Two major observations from meeting:

1. Heard data regarding flow-back recovery of around 10-15% water out of a total of 2-3 million gallons used on average per frac job. Commented that flow-back recovery is not as significant as we've been hearing.
2. Heard a speaker on emerging technology for isotope identification of gas contaminants.

L. Stevenson (OEPA). Two key issues related to water which warrant further discussion in Ohio:

1. Water withdrawal – Is this an issue for Ohio from ODNR's perspective? Should we (OEPA) also be looking at this issue from a water quality standpoint, particularly in areas where water could potentially be withdrawn from areas of low flow. How does this change the characteristics of water quality? A couple states at the conference talked about a watershed/regional approach to water withdrawal and approval through their authorization process. What should Ohio be doing to address this issue?
2. POTW disposal is going to be a significant issue for Ohio, as other states look for disposal options. What policy considerations do we need to make at OEPA to protect water resources? Should we be considering some limitations on POTW disposal based on plant capacity, receiving water body, etc? What's our legal authority to do so.

On-site recycling and treatment: Although this is in practice, does not seem to be widespread. How do we encourage more recycling activity, particularly as drilling picks up in Ohio?

ODNR Update

Tom T. commented on the relative pricing for wastewater management options. Current average for Ohio is approximately \$5-5.50 for injection in Ohio. It's historically been cheaper to come to UIC disposal in Ohio than to dispose of at POTWs in other states.

Sampling flow-back wastewater. ODNR is considering random sampling of flow-back. In general, flow-back is typically 99.95% freshwater and sand w/some additives, however, there's an interest in knowing more about what constituents are present. If ODNR moves forward on this, there's an opportunity to coordinate with OEPA. T. Tomastik

Someone posed the question on additives in production water. Is there a consistent mix that's used industry-wide. Tom indicates that is may vary based on service companies. He said sampling may help determine what's coming back and what's detectable. Data related to flow-back wastewater may also help the public better understand this issue and address perception issues related to risk.

SB 165 passed in June requires posting MSDS sheets based on invoice for completed jobs. T. Tugend ODNR has some general information on this, however, many MSDS sheets reference to "mixture" w/o CAS numbers, so it's difficult to identify all constituents present in additives. PA's regulations require: frac fluid reporting, permit review, surface casing. OH is ahead of companies in most of these areas.

Marcellus/Utica Drilling Update (M. McCormac, T. Tomastik, ODNR)

2 pending applications in Belmont County (horizontal Marcellus). Will go 5,500 ft., adjacent to each other about 1,300 feet apart. 2nd/3rd true long horizontal Marcellus wells. One other well drilled with 17 stage frac.

Utica Shale – Unsure as to amount of water needed for production. But, it's out there. Behind all the current Marcellus leasing is the Utica Shale. Company in Jefferson Cty., Marquette Exploration. Drilling a test well with core – may be 300 feet of Utica. 3 acres with lots of equipment on site. Vertical strat well to collect data. Drilled a well ½ mile away which was plugged (vertical). Will go back to this well to start horizontal drilling. Early in drilling phase.

Strat test in Belmont Cty (C&X). Looking originally for disposal well, but 1.5 million cubic feet of gas showing. Production zone discovered when they were looking for disposal zone. Thinks this will peak interest in more drilling.

David Hill drilling well in Belmont Cty for disposal purposes, but may also hit Utica. 2100-3500 feet down currently in drilling process.

East Resources leasing (Stallion), moving into Ohio first quarter of 2011. No basin is really too deep in PA or other states, but Ohio is appealing. 500 frac tanks to be brought up from Texas. Oklahoma rigs coming after first of year. Chesapeake wants to have 20 rigs operating in Ohio.

Lease activity in Monroe County by Beck Energy.

UIC Update (ODNR, T. Tomastik)

170 active Class II wells (ODNR)

4 applications under review (Richland Cty)., for facility with rail spur. Mt. Simon disposal, 4-5,000 bpd disposal capacity. ODNR is getting weekly inquiries about UIC well installation. Smaller companies asking about on-site disposal. Major players: C&X, D&L Energy.

Q: What are ODNR's projections regarding Ohio's injection capacity, particularly if there's a lot of interest from other states in sending wastewater here? Injection capacity is primarily based on ability to permit wells. Does not see a limit on capacity in Ohio. Western area of state is a good area for future wells, particularly as rail transport becoming an option.

Q: What's the current UIC disposal capacity in PA? 8 wells in PA total. Some limitations geologically in PA with ability for deep well disposal in large volume. 1-2 years to get a permit in PA because they do not have primary. In Ohio (w/primacy) 30-35 days to get a permit. **Q: What are the public notice/comment opportunities during ODNR's permit issuance process?** Opportunity for public comment. Need is determined based on assessment of threat to human health. Not currently seeing a significantly greater interest from the public in commenting on permitting actions, however, interest could increase with more media attention on shale drilling activities.

Q: What is the problem at UIC wells with lower salinity frac wastewater? Lower salinity water increases pressure at wellhead. Some can mix fluids prior to injection to address this issue. Others don't want to deal with this issue. Requirement to maintain maximum injection pressure and lower TDS can interfere with this.

ODNR indicates that because of the additional burden in handling low salinity TDS wastewaters at UIC facilities, they usually charge a premium for disposal (impact on injection pressures). Larger well diameters help address this issue. 4-5 inch casing – 3 ½ - 4 ½ diameter injection shaft will help. Larger commercial facilities with more tanks can also mix lower salinity and high salinity wastewater together prior to injection. There are options to address this issue and facilitate more disposal (in the future) of lower salinity wastewater at UIC facilities. .

POTW Update (B. Hall, OEPA, DSW)

CWT permit-to-install for Patriot issued by OEPA in August. It's been appealed on two grounds: (1) standard condition (2) 100,000 gpd limit. at max TDS at 50,000 mg/l. This is also the maximum proposed for Warren. City of Warren modification for NPDES permit 600-650,000 gpd requested. NPDES permit for Warren is now out for public comment (comment period ends Nov. 8th). There are monitoring reqs. and limits have been driven by concerns regarding PA water quality standards and a drinking water intake level of 500 mg/l. Beaver Falls provides inlet for drinking water supply – drinking water supply area zones require 500 mg/l limit.

Q: If other alternatives exist, is disposal at POTWs something that should be allowed, or under more controlled circumstances? (C. Butler). Maybe between staff in group, we should be considering recommendations to our Directors.

TDS standard on the books for a long time...currently in process of revising this (DSW, B. Hall). Ohio EPA, NEDO commented on how the PA rules are structured. Different chapters, similar to an industrial sector-specific approach. Gas well related. Almost a state variation on categorical standards in PA. Question as to whether Ohio could legally take a similar approach.

Question: Have we done a comparative pricing on disposal? Historically averages have been around 5-5.50 per barrel for UIC in Ohio and around \$9 per barrel in PA. POTW disposal fees in PA were higher than in Ohio. In the past, companies such as Virgin Oil were only charging \$1 per barrel.

Q (C. Butler): As a next step, is there an opportunity to think/talk about how we're going to allow wastewater management to go forward before we're over-run with requests? Key issues: POTW capacity preservation, WQ issues, desire to have UIC be primary disposal option for environmental protection.

Pipeline/Transmission Update (B. Hall, OEPA): Two major pipeline projects in the queue at OEPA. No major updates.

Water use/Withdrawal Discussion (All)

Q: Where do we think water will come from? It is hard to predict this. (T. Tugend) However can make some assumptions on volume given average number of rigs – 280 wells per year - 3 million gallons per well. How large of an area this will spread over will be important in water withdrawal issues. If it's a 2-3 county area, for example, this may have substantial impact. Regional considerations in water withdrawal management. Drilling activity also depends on rig availability – only so many rigs available at any given time. ODNR can investigate dewatering complaints

Q: How can we get ahead of the curve on the water withdrawal issue? (L. Stevenson). Per discussion at GWPC meeting, some states have looked at water withdrawal on a regionalized approach, based on watershed. They're looking in particular at low flow areas/conditions and how withdrawal may impact water quality in those areas. We need to discuss this in Ohio.

SB 165 Rule Discussion (All)

ODNR is focusing on two key areas right now related to rules under 165: (1) drilling unit configuration and (2) noise. They need to focus on statutory intent of SB 165; don't want to open up the entire chapter on current rules regarding drilling. Other elements of rules include frac/well construction, horizontal well permits, and general pit design criteria.

B. Hall. On-site lagoons are not legally exempt from Ohio EPA's regulations. We don't, however, necessarily want to implement the PTI requirements if these units are already covered under ODNR's regulations. If there's an opportunity to put some exemption language in ODNR's rules regarding these units, we should consider this.

Question about regulatory status of sediments from pits. Per ODNR, these qualify for a RCRA exemption, while within oil/gas waste stream. ODNR's current rules allows for sediments to be buried on-site. No GW monitoring. Free fluids needs to be removed from the pit and disposed of. Solidification materials added to unit to allow for reuse. (R. Simmers, ODNR). Law specifies that site cannot cause contamination.

Q: Is waste managed by a third-party on another site still eligible for RCRA-related exemption? Under consideration by ODNR. Waiting for USEPA's determination. Outside normal treatment activity on-site.

Q. With the increase in size in lagoons, will there be additional requirements for liners, etc.? Current standards for pit liner.

TDS update (B. Hall, OEPA, DSW)

State permit for surface mining on hold/reworking this now. Criteria in general permits to address contaminants such as sulfates, chlorides. Want to develop our own standards in Ohio. USEPA paying close attention to TDS. Several layers to TDS issue. Proposed new general permit for surface mining coming.

TENORM Update (M. Snee, ODH)

ODH is still planning to get their draft rules to members of the workgroup when they are ready. ODH is concerned about radiological materials that accumulate with sludges and the scale build-up in piping. In process of developing rules now. They are seeing more interest from environmental groups. By end of month, advance copy of rules should be available for review/feedback. ODH does not have an issue with radium in deep well injection.

Q: Between ODH and ODNR, what agency primarily responds to citizen concerns/questions regarding private well contamination? This would be primarily handled by ODNR and questions should be referred to them. They have requirements for well testing within certain radius prior to drilling (ODNR requirements). Urban area testing (township with 5,000 or more). **Q: Has there been any consideration for expanding testing requirements for rural areas?** Not off the table for consideration (J. Husted). BMP testing for methodology on ODNR's Web site. Have lab services for analytical work. Public water supply impacts would be under OEPA's jurisdiction.

Public Outreach/Education Update

Still a collective interest in making connections as agencies to help education the public about drilling, etc.

Bolas Meeting Recap: Around 500 in attendance. Leasing a big component. From ODNR's experience, the following issues are common raised during public forums regarding drilling.

- (1) Water/withdrawal and safety
- (2) Property values
- (3) Infrastructure

Local gov'ts concerned about impacts to infrastructure and withdrawal. PA has done a really good job in outreach (Penn State). Perhaps works with Ohio University. Co-sponsor information sessions for public. Done a really nice job in getting information out to the public. ODNR will get some examples of PA's materials out to the workgroup. (R. Simmers)

ODNR raised issue that people do not maintain water wells and this is a primary problem (bacteria). In addition, water well drilling and construction problems can cause a problem (e.g. natural shallow deposits of gas that get hit during drilling).

OEPA has developed a general fact sheet on Marcellus Shale drilling. We will get fact sheet out to ODNR and ODH for review.

M. Settles (OEPA) and H. Hetzel-Evans (ODNR) summarized media inquiries received on the subject. Heidi commented on the recent focus related to trucking issues and spills at drill sites. Also receiving inquiries related to any oil and gas drilling. Questions about leasing. ODNR put together a general info. letter on this from Dir. Logan. This may be good information for a general fact sheet on this topic as well.

Donna Kniss, talked with Asst. Director in WVA. They have authorized no existing dischargers for gas well wastewater at POTWs there. They have a different approach in assimilative capacity determination. Does not expect applications for POTW disposal in near future.

Next Steps:

Continue coordination on rulemaking between ODNR, OEPA and ODH.

OEPA to get draft fact sheet out to ODNR for review.

ODNR to get PA education/outreach materials out to workgroup.

Continue discussion on POTW discharge strategy/options for Ohio and water withdrawal issues.

Next Meeting: December 9th, at 1:00 at Ohio EPA.

McCracken, Chuck

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Subject: Fwd: Marcellus Shale 10-19FinalAgenda
Attachments: Marcellus Shale 10-19FinalAgenda.DOC; Marcellus Shale Group List.PDF; 8-3-10 Marcellus
Shale Meeting Notes-Final.PDF

Please see the attachments.

>>> Craig Butler 10/8/2010 1:56 PM >>>
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Subject: Marcellus Shale Meeting and Video Conference
Attachments: Marcellus Shale 10-19FinalAgenda.DOC; 8-3-10 Marcellus Shale Meeting Notes-Final.PDF;
Marcellus Shale Group List.PDF

All:

Please remember we are scheduled for our second joint agency Marcellus Shale meeting tomorrow from 1-4 PM. As all the Ohio EPA conference rooms were booked, ODNR has graciously found an appropriately sized room with video conference capability. The Ohio EPA, Southeast and Northeast District Office IT staff have the IP addresses necessary to call in to the E-Tech Ohio "room" reserved for this meeting.

The final agenda is attached. I did not get any suggestions for additional topics or the need to eliminate or modify anything listed. So, we will go with this and ask if anyone has any issues to add as we get started.

I've attached an updated staff listing and a copy of last meeting's minutes for your review.

Let's going on. Lots to share. See you all tomorrow.

Please forward to anyone that I have inadvertently missed or would like this information.

For those coming to ODNR, Fountain Square is made up of nine buildings (buildings A through I) and accessible from Morse Road.

Directions:

2045 Morse Road, Columbus, OH 43229-6693 Take I-71 exit 116 (Sinclair & Morse Road) Drive east on Morse Road Pass Karl Road Pass Northland Park Turn right at Heaton Road light Make an immediate left on access road Turn right at the 2045 ODNR entrance.

A map of the complex is listed at the below link.

<http://www.dnr.state.oh.us/tabid/10761/Default.aspx>

Craig

Craig Butler, Chief
Southeast District Office
Ohio Environmental Protection Agency
(740) 380-5202
craig.butler@epa.state.oh.us

Ohio Environmental Protection Agency

Unless otherwise provided by law,
this communication and any response to it constitutes a public record.
.....

McCracken, Chuck

From: Shelton, Mike <Mike.Shelton@dnr.state.oh.us>
Sent: Thursday, October 07, 2010 1:22 PM
To: Craig Butler; Perry, Chris; McCormac, Mike; Milleson, Rich; Simmers, Rick; Tomastik, Tom; Chuck McCracken; jen.house@odh.ohio.gov; Michael Snee; Stephen Helmer
Cc: Laurie Stevenson
Subject: RE: Marcellus Shale 10-19 agenda

Craig - how many are expected?

I've tentatively reserved our large conference room in Building D, 3rd Floor, which has video conference capability. Our video conference can connect to another ODNR location (Athens Wildlife office, Old Woman Creek office or our Sandusky Coastal office) - or potentially a non-DNR video conference (though that may take some IT wizardry and I make no promises).

Our large conference room can fit 14 around a table and an additional 20-30 in chairs around the room.

Let me know. -mike.

Mike Shelton
Chief, External Affairs
Ohio Department of Natural Resources
(614) 265-6891
(614) 261-9601 - fax
mike.shelton@dnr.state.oh.us

This message and any response to it may constitute a public record and thus may be publicly available to anyone who requests it.

-----Original Message-----

From: Craig Butler [mailto:Craig.Butler@epa.state.oh.us]
Sent: Thursday, October 07, 2010 11:31 AM
To: Perry, Chris; McCormac, Mike; Shelton, Mike; Milleson, Rich; Simmers, Rick; Tomastik, Tom; chuck.mccracken@odh.ohio.gov; jen.house@odh.ohio.gov; michael.snee@odh.ohio.gov; stephen.helmer@odh.ohio.gov
Cc: Laurie Stevenson
Subject: Marcellus Shale 10-19 agenda

To our Marcellus friends at ODNR and ODH;

Attached is the near final agenda for our scheduled October 19th meeting on Marcellus Shale issues. Please review the agenda and comment to Laurie and I if you have any last minute additions or changes.

We do need your possible assistance in finding a room to host the meeting. It appears all of our suitable rooms at the Lazarus Government Center are being used. Question to the group is Do any of you have a room available that would fit the group? More difficult question would you also have video conference capabilities so we could again minimize travel of our district staff for the meeting.

Craig Butler, Chief
Southeast District Office
Ohio Environmental Protection Agency
(740) 380-5202
craig.butler@epa.state.oh.us

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This message was secured by ZixCorp(R).

McCracken, Chuck

From: Craig Butler <Craig.Butler@epa.state.oh.us>
Sent: Thursday, October 07, 2010 11:31 AM
To: chris.perry@dnr.state.oh.us; mike.mccormac@dnr.state.oh.us; mike.shelton@dnr.state.oh.us;
Rich.Milleson@dnr.state.oh.us; nick.simmers@dnr.state.oh.us;
Tom.Tomastik@dnr.state.oh.us; Chuck McCracken; jen.house@odh.ohio.gov; Michael Snee;
Cc: Stephen Helmer
Subject: Laurie Stevenson
Attachments: Marcellus Shale 10-19 agenda
Marcellus Shale 10-19draftagenda.DOC

To our Marcellus friends at ODNR and ODH;

Attached is the near final agenda for our scheduled October 19th meeting on Marcellus Shale issues. Please review the agenda and comment to Laurie and I if you have any last minute additions or changes.

We do need your possible assistance in finding a room to host the meeting. It appears all of our suitable rooms at the Lazarus Government Center are being used. Question to the group is Do any of you have a room available that would fit the group? More difficult question would you also have video conference capabilities so we could again minimize travel of our district staff for the meeting.

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Warren Test - Rad Data

Final Effluent 001

Date	Alpha, pCi/L Note A	Beta, pCi/L Note A	U-natural, pCi/l	Ra-226, pCi/L	Ra-228, pCi/L
2.10.10					
2.11.10					
2.12.10	<3	9.2 +/- 4.3			
2.16.10					
2.17.10					
2.18.10					
2.19.10					
2.23.10*					
2.24.10					
2.25.10					
2.26.10					
3.1.10			Note B	Note B	Note B
3.2.10					
3.3.10					
3.4.10					
3.5.10	<3	<4	<1	<1	<1
3.8.10					
3.9.10					
3.10.10					
3.11.10					
3.12.10	<3	<4	<1	<1	<1
3.15.10					
3.16.10					
3.17.10					
3.18.10					
3.19.10	<3	6.6 +/- 2.9	<1	<1	<1
3.22.10					
3.23.10					
3.24.10					
3.25.10					
3.26.10	<3	4.4 +/- 2.5	<1	<1	1.08 +/- 1.00
3.29.10					
3.30.10					
3.31.10					
4.1.10					
4.2.10	<3	<4	<1	<1	2.14 +/- 0.79
4.5.10					
4.6.10					
4.7.10					
4.8.10					
4.9.10	<3	9.0 +/- 4.0		Note C	
4.12.10					
4.13.10					
4.14.10					
4.15.10					
4.16.10	<3	9.2 +/- 3.3	0.13 +/- 0.08	<1	<1

Notes

- A requirement for weekly gross alpha and beta not communicated until 2/10/10
- B requirement for specific isotopes not communicated until 3/1/10
- C See 4/29 e-mail from A. Blocksom: lab states Th not run unless gross alpha is over threshold

Warren Test - Rad Data

Sludge

Date	Gamma Scan	Alpha, pCi/g	Beta, pCi/L	U-natural, pCi/l	Ra-226, pCi/L	Ra-228, pCi/L
2.10.10						
2.11.10						
2.12.10						
2.16.10						
2.17.10	< LLD					
2.18.10						
2.19.10						
2.23.10*						
2.24.10						
2.25.10						
2.26.10						
3.1.10						
3.2.10						
3.3.10						
3.4.10						
3.5.10						
3.8.10						
3.9.10						
3.10.10						
3.11.10						
3.12.10						
3.15.10						
3.16.10						
3.17.10						
3.18.10						
3.19.10						
3.22.10						
3.23.10						
3.24.10						
3.25.10						
3.26.10						
3.29.10						
3.30.10						
3.31.10						
4.1.10						
4.2.10						
4.5.10						
4.6.10						
4.7.10						
4.8.10						
4.9.10						
4.12.10						
4.13.10						
4.14.10						
4.15.10						
4.16.10	< LLD					

Warren Test - Rad Data

Copied from Warren's spreadsheet

Final Effluent 001

Final	Tot. Alpha Radiation	Tot. Beta Radiation	tot. Uranium	Tot. Radium	Tot. Thorium
frequency code	W, T, B	W, T, B	W, T, B	W, T, B	W, T, B
units	pCi/l	pCi/l	pCi/l	pCi/l	pCi/l
date 24 or 8hr					
2.10.10					
2.11.10					
2.12.10	<3	9.2 +/-4.3			
2.16.10					
2.17.10					
2.18.10					
2.19.10					
2.23.10*					
2.24.10					
2.25.10					
2.26.10					
3.1.10					
3.2.10					
3.3.10					
3.4.10					
3.5.10	<3	<4			
3.8.10					
3.9.10					
3.10.10					
3.11.10					
3.12.10	<3	<4			
3.15.10					
3.16.10					
3.17.10					
3.18.10					
3.19.10					
3.22.10					
3.23.10					
3.24.10					
3.25.10					
3.26.10					
3.29.10					
3.30.10					
3.31.10					
4.1.10					
4.2.10					
4.5.10					
4.6.10					
4.7.10					
4.8.10					
4.9.10					
4.12.10					
4.13.10					
4.14.10					
4.15.10					
4.16.10					

Copied from Warren's spreadsheet

Sludge

Gamma Scan	K-40
pCi/L	pCi/L
<LLD	2.6E+02 +/- 2.6E+01

[illegible]

City of Warren Patriot Brine 8-week study

Downstream samples

City of Warren Patriot Brine

Downstream samples

Downstream frequency code units date: 24 or 8hr	Conductivity D, A mg/L	TDS W, A mg/L	Chloride W, A mg/L	pH W su	Sulfide T, A mg/L	TSS T, A mg/L	Alkalinity T, A mg/L	Fluorides T, A mg/L	Sulfates T, A mg/L	total Phosphor us T, A mg/L	HEM oil & grease T mg/L	SGT-HEM oil & grease T mg/L	Barium W mg/L	Strontium W mg/L	Downstream frequency code units date: 24 or 8hr	Acute Tox, C. Dubia W TU a	Chronic Tox, C. Dubia W TU c	Acute Tox, P. Promelas W TuA	Chronic Tox, P. Promelas W TuA	Barium mg/L	Strontium mg/L	Calcium mg/L
2.9.10		376		8.3	0.007																	
2.12.10		392	160	8.3	0.008																	
2.16.10		396	120	8.7	0.004																	
2.17.10	490	416	140	8.3	0.004																	
2.19.10	490	448	160	8.2	0.007																	
2.23.10*	792	552	200	8.2	0.008																	
2.24.10	715	488	200	8	0.011		34	0.22	64.3						2.19.10	AA	AA					
2.26.10	594	364	140	8.6	0.012	20																
3.1.10	563	392	140	8.3	0.008	12																
3.2.10	562	440	120	8.5	0.008	12																
3.5.10	593	388	160	8.3	0.01																	
3.8.10	544	384	120	8.5	0.007																	
3.9.10	474	308	100	8.7	0.015										3.5.10	AA	AA					
3.12.10	306	204	100	8.1	0.047																	
3.15.10	283	192	100	8.2	0.058	32	20.4	0.13	27	0.46					3.12.10	AA	AA					
3.17.10	403	260	80	8.1	0.024																	
3.19.10	516	344	100	8.3	0.012																	
3.22.10	480	356	80	8.1	0.01	12	27.2	0.16	60.7	0.08					3.19.10	AA	AA					
3.24.10	379	272	100	7.8	0.04																	
3.26.10	479	344	100	8.2	0.015																	
3.29.10	480	344	80	8.1	0.022																	
3.31.10	460	304	80	8.8	0.019										3.26.10	AA	AA					
4.2.10	495	328	80	8.3	0.016																	
4.5.10	499	356	80	8.7	0.011																	
4.6.10	554	368	120	8.6	0.007										4.2.10	AA	AA					
4.9.10	603	364	140	8.5	0.013																	
4.12.10	594	380	120	8.2	0.012																	
4.14.10	601	412	140	8.1	0.006										4.9.10	AA	AA					
4.16.10	559	392	120	8.8	0.009	8	34		61.2	0.15	<2	<2			4.16.10	AA	AA	2%	8%	1.19	13.8	200
Total	13508	10564	3380	241.8	0.43	96	115.6	0.51	213.2	0.69	0	0	0	0	Total	0	0	0.02	0.08	1.19	13.8	200
Max	792	552	200	8.8	0.058	32	34	0.22	64.3	0.46	0	0	0	0	Max	0	0	0.02	0.08	1.19	13.8	200
Average	519.5385	364.2759	120.7143	8.337931	0.014828	16	28.9	0.17	53.3	0.23	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Average	#DIV/0!	#DIV/0!	0.02	0.08	1.19	13.8	200
Minimum	283	192	80	7.8	0.004	8	20.4	0.13	27	0.08	0	0	0	0	Minimum	0	0	0.02	0.08	1.19	13.8	200

ek study

[illegible]

City of Warren Patriot Brine 8-week Study

City of Warren Patriot Brine 8-1

[illegible]

1e 8-week study

-les

[illegible]

City of Warren Patriot Brine 8-week study

City of Warren Patriot Brine

City of Warren Patriot Brine																Downstream samples					
Niles Far Downstream samples																					
Niles River far downstream	Conductivity	TDS	Chloride	pH	Sulfide	TSS	Alkalinity	Flourides	Sulfates	total Phosphor us	HEM oil & grease	SGT-HEM oil & grease	Barium	Strontium	Downstream	Acute Tox, Dubia	Chronic Tox, Dubia	Acute Tox, Pimephal es	Chronic Tox, Pimephal es		
frequency code	D, A	W, A	W, A	W	T, A	T, A	T, A	T, A	T, A	T, A	T	T	W	W	frequency code	W	W	W	W		
units	mg/L	mg/L	mg/L	su	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	units	TuA	TuA	TuA	TuA		
date: 24 or 8hr															date: 24 or 8hr						
3.1.10	592	416	160	8.4	0.011	20															
3.2.10	627	408	180	8.4	0.006																
3.5.10	648	436	160	8.5	0.008																
3.8.10	607	396	160	8.5	0.006																
3.9.10	528	320	140	8.6	0.014																
3.12.10	330	288	100	8.5	0.031																
3.15.10	330	216	100	7.9	0.043	16	20.4	0.13	27.2	0.15											
3.17.10	418	292	100	8	0.023																
3.19.10	496	328	100	8.3	0.011																
3.22.10	487	364	100	8.2	0.011	12	27.2	0.17	60.7	0.09											
3.24.10	413	244	100	7.8	0.03																
3.26.10	495	344	80	8.3	0.02																
3.29.10	485	304	100	8.1	0.017																
3.31.10	434	304	80	8.7	0.018																
4.2.10	490	336	100	8.4	0.015																
4.5.10	503	384	100	9.2	0.013																
4.6.10	506	348	100	9.1	0.01																
4.9.10	641	324	180	8.7	0.013																
4.12.10	577	404	140	8.4	0.013																
4.14.10	672	444	180	8.1	0.008																
4.16.10	595	392	120	8.6	0.009	8	27.2														

Week Study

25

[illegible]

City of Warren Patriot Brine 8-week study

City of Warren Patriot Brine 8-week study												City of Warren Patriot Brine 8-week									
Brine	Wk	Conductivity	TDS	Chloride	pH	Sulfide	TSS	Alkalinity	Fluorides	Sulfates	total Phosphorus	Brine	Aluminum	Antimony	Barium	Beryllium	Cadmium	Total Chromium	Copper	Iron	Lead
frequency code		D. A	W. A	W. A	W	T. A	T. A	T. A	T. A	T. A	T. A	frequency code									
units		mS	mg/L	mg/L	su	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
date: 24 or 8hr												date: 24 or 8hr									
2.10.10	1		40,184	21,000	8.3	0.396						1.27.10	0.4	<0.2	9.6	<0.01	<0.01	0.25	0.11	6.6	<0.05
2.11.10	1		54,316	19,500	8.2	0.283															
2.12.10	1		30,816	18,000	8.2	0.26															
2.16.10	1		39,400	31,000	7.8	0.237															
2.17.10	1	38.8	28,156	14,000	7.2	0.379	708														
2.18.10	1	9.1	6,040	4,000	12.3	0.14	1612														
2.19.10		n/a	n/a	n/a	n/a	n/a															
2.23.10*		n/a	n/a	n/a	n/a	n/a															
2.24.10		n/a	n/a	n/a	n/a	n/a															
2.25.10		n/a	n/a	n/a	n/a	n/a															
2.26.10		n/a	n/a	n/a	n/a	n/a															
3.1.10	2	12.2	8,324	5,000	8.9	0.377	272														
3.2.10	2	11.3	11,880	7,000	9	0.335															
3.3.10	2	12.2	7,588	7,000	8.5	0.415															
3.4.10	2	11.7	7,996	6,500	8.8	0.402															
3.5.10	2	10.8	7,968	7,500	8.7	0.328															
3.8.10	3	20.1	13,532**	10,000	9.7	over range															
3.9.10	3	17.5	13,650	8,500	10.2	over range															
3.10.10	3	23.7	19,100	10,000	8.2	over range															
3.11.10	3	33.0	29,720	15,500	7.6	over range															
3.12.10	3	58.7	51,360	22,000	9.2	over range															
3.15.10	4	45.1	34,690	18,500	8.3	0.446	8980	40.8			9.4										
3.16.10	4	30.9	12,964	15,000	7.4	0.421	860														
3.17.10	4	43.9	21,740	19,000	7.1	0.607	320														
3.18.10	4	40.1	13,675	17,500	7.5	0.511	340														
3.19.10	4	31.2	28,780	14,000	7.1	0.334	190														
Total		450	468,348	290,500	178.2	5.871	13282	40.8	0	0	9.4	0	0	0	0	0	0	0.25	0.11	6.6	0
Max		59	54,316	31,000	12.3	0.607	8980	40.8	0	0	9.4	0	0	0	0	0	0	0.25	0.11	6.6	0
Average		26	23,417	13,833	8.485714	0.366938	1660.25	40.8	#DIV/0!	#DIV/0!	9.4	#DIV/0!	#DIV/0!	9.6	#DIV/0!	#DIV/0!	0	0.25	0.11	6.6	0
Minimum		9	6,040	4,000	7.1	0.14	190	40.8	0	0	9.4	0	0	0	9.6	0	0	0.25	0.11	6.6	0

City of Warren Patriot Brine 8-week study

Brine	Wk	Conductivity	TDS	Chloride	pH	Sulfide	TSS	Alkalinity	Fluorides	Sulfates	total Phosphorus
frequency code		D. A	W. A	W. A	W	T. A	T. A	T. A	T. A	T. A	T. A
units		mS	mg/L	mg/L	su	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
date: 24 or 8hr											
3.22.10	5	48.4	67,770	21,000	6.8	0.41	780	47.6			
3.23.10	5	34.3	34,340	18,000	6.6	0.419	320				
3.24.10	5	21.2	20,640	12,000	6.8	0.216	160				
3.25.10	5	58.3	71,150	21,500	7.4	over range	450				
3.26.10	5	56.7	59,640	24,000	7.8	over range	250				
3.29.10	6	21.2	23,860	12,500	6.9	0.203	90				

City of Warren Patriot Brine 8-week study

Influent (before return streams and brine water addition)

City of Warren Patriot Brine

Raw Influent

RAW	Conductivity	TDS	TDS	Chloride	pH	Sulfide	TSS	Alkalinity	Fluorides	Sulfates	total Phosphorus	HEM oil & grease	SGT-HEM oil & grease	Barium	Strontium	Raw	Calcium	Magnesium	Potassium	Sodium		
frequency code	D, A	W, A	W, A	W, A	W	T, A	T, A	T, A	T, A	T, A	T, A	T	T	W	W	frequency code						
units	us	mg/L	mg/L	mg/L	su	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	units	mg/L	mg/L	mg/L	mg/L		
date: 24 or 8hr		24 hr	8hr													date: 24 or 8hr						
2.10.10		na	632	220	7.6	0.088																
2.11.10		572	620	200	7.7	0.121																
2.12.10	1100	684	na	260	7.7	0.107																
2.16.10		644	na	220	7.7	0.092				96.4												
2.17.10	1330	752	820	280	7.9	0.08								0.09	0.54							
2.18.10	840	796	784	320		0.074																
2.19.10	1050	912	na	400	7.8	0.082																
2.23.10*	1050	872	na	380	8.2	0.052																
2.24.10		784	na	280	8	0.04		47.6	0.77	78.9												
2.24.10		720	na	320																		
2.25.10	1060	720	na	260	8.4	0.034																
2.26.10		960	na																			
3.1.10	1180	796	792	280	8.1	0.029																
3.2.10	1276	800	764	360	8.3	0.048																
3.3.10	1427	872	760	320	8	0.046																
3.4.10	1230	772	708	280	7.8	0.044																
3.5.10	1247	704	772	260	7.9	0.048																
3.8.10	1449	656	696	260	8	0.04																
3.9.10	990	612	676	220	8.4	0.036																
3.10.10	1175	732	620	260	7.6	0.012																
3.11.10	970	596	624	200	7.7	0.037																
3.12.10	1075	580	560	200	8.3	0.028																
3.15.10	1151	564	944	260	7.9	0.021																
3.16.10	990	648	660	200	8.1	0.033		40.8	0.93	85	1.3											
3.17.10	1120	648	684	220	7.7	0.035																
3.18.10	1359	708	652	220	8	0.035																
3.19.10	1433	656	648	200	7.7	0.043																
Total	24502	18760	13416	6880	190.5	1.305	0	88.4	1.7	260.3	1.3	0	0	0.09	0.8	Total	0	0	0	0	0	0
Max	1449	960	944	400	8.4	0.121	0	47.6	0.93	96.4	1.3	0	0	0.09	0.54	Max	0	0	0	0	0	0
Average	1166.7619	721.54	706.1	264.615	7.938	0.0522	#DIV/0!	44.2	0.85	86.76667	1.3	#DIV/0!	#DIV/0!	0.09	0.4	Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Minimum	840	564	560	200	7.6	0.012	0	40.8	0.77	78.9	1.3	0	0	0.09	0.26	Minimum	0	0	0	0	0	0

City of Warren Patriot Brine 8-week study

Influent (before return streams and brine water addition)

City of Warren Patriot Brine

Raw Influent

RAW	Conductivity	TDS	TDS	Chloride	pH	Sulfide	TSS	Alkalinity	Fluorides	Sulfates	total Phosphorus	HEM oil & grease	SGT-HEM oil & grease	Barium	Strontium	Raw	Calcium	Magnesium	Potassium	Sodium		
frequency code	D, A	W, A	W, A	W, A	W	T, A	T, A	T, A	T, A	T, A	T, A	T	T	W	W	frequency code						
units	us	mg/L	mg/L	mg/L	su	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	units	mg/L	mg/L	mg/L	mg/L		
date: 24 or 8hr		24 hr	8hr													date: 24 or 8hr						
3.22.10	1025	680	604	180	7.5	0.09										3.22.10						
3.23.10	959	504	592	200	7.4	0.035		54.4	1.04	101	1.73					3.23.10						
3.24.10	870	564	680	180	7.6	0.027										3.24.10						
3.25.10	976	652	664	180	7.6	0.026										3.25.10						
3.26.10	1078	644	620	200	7.7	0.033										3.26.10						
3.29.10	852	576	560	160	7.6	0.032								0.7	3.00	3.29.10						

City of Warren Patriot Brine 8-week study

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City of Warren Patriot Brine 8-week study

001 Final Effluent														City of Warren Patriot Brine 8-week study								
Final	Conductivity	TDS	TDS	Chloride	pH	Acute Tox, Dubia	chronic Tox, Dubia	Sulfide	TSS	Alkalinity	Flourides	Sulfates	total Phosphorus	Final	Tot. Alpha Radiation	Tot. Beta Radiation	tot. Uranium	Tot. Radium	Tot. Thorium	HEM oil & oil & T	SGT-HEM T	Barium
frequency code	D, A	W, A	W, A	W, A	W	W	W	T, A	T, A	T, A	T, A	T, A	T, A	frequency code	W, T, B	W, T, B	W, T, B	W, T, B	W, T, B	T	T	W
units	us	mg/L	mg/L	mg/L	su	TUa	TU c	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	units	pCi/l	pCi/l	pCi/l	pCi/l	pCi/l	mg/L	mg/L	mg/L
date: 24 or 8hr		24 hr	8hr											date: 24 or 8hr								
2.10.10		424	620	180	7.4			0														
2.11.10		688	648	260	7.7			0.003														
2.12.10		680	na	260	7.7			0.001														
2.16.10		756	na	200	8			0.002														
2.17.10	910	680	792	240	8.1			0.001														
2.18.10	840	754	852	340				0.005														
2.19.10	840	792	896	280	7.7	AA <0.2	AA	0.003														
2.23.10*	980	896	na	400	8			0.002														
2.24.10		800	na	300	8			0.005		34	0.84	79.5										
2.25.10		736	na	320																		
2.26.10	1119	764	na	260	8.5			0.003														
3.1.10	1105	792	844	280	8.2			0.003														
3.2.10	1213	LA	848	360	8.1			0.003														
3.3.10	1193	872	780	320	8.4			0.001														
3.4.10	1141	768	744	180	7.8			0.002														
3.5.10	1152	752	724	260	7.8	AA <0.2	AA	0.003														
3.8.10	949	608	632	220	7.8			0														
3.9.10	983	660	664	240	8.5			0.001														
3.10.10	1014	676	624	240	7.8			0.001														
3.11.10	971	712	640	280	7.6			0.001														
3.12.10	1080	692	632	260	8.3	AA <0.2	AA	0.009														
3.15.10	928	564	516	220	7.8			0.004														
3.16.10	1276	860	736	320	8			0		34	0.68	80	0.48									
3.17.10	1347	864	776	300	7.8			0.003														
3.18.10	1323	852	748	220	8.1			0.005														
3.19.10	1277	860	780	280	7.8	AA <0.2	AA	0.002						3.19.10								0.1
Total	21641	18502	14496	7020	190.9	0	0	0.063	0	68	1.52	159.5	0.48	Total	0	0	0	0	0	0	0	0.1
Max	1347	896	896	400	8.5	0	0	0.009	0	34	0.84	80	0.48	Max	0	0	0	0	0	0	0	0.1
Average	1082.05	740.1	724.8	270	7.9542	#DIV/0!	#DIV/0!	0.00252	#DIV/0!	34	0.76	79.75	0.48	Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.1
Minimum	840	424	516	180	7.4	0	0	0	0	34	0.68	79.5	0.48	Minimum	0	0	0	0	0	0	0	0.1

City of Warren Patriot Brine 8-week study

001 Final Effluent																						
Final	Conductivity	TDS	TDS	Chloride	pH	Acute Tox, Dubia	chronic Tox, Dubia	Sulfide	TSS	Alkalinity	Flourides	Sulfates	total Phosphorus	Final	Tot. Alpha Radiation	Tot Beta Radiation	tot. Uranium	Tot. Radium	Tot. Thorium	HEM oil & grease	SGT-HEM oil & grease	Barium
frequency code	D, A	W, A	W, A	W, A	W	W	W	T, A	T, A	T, A	T, A	T, A	T, A	frequency code	W, T, B	W, T, B	W, T, B	W, T, B	W, T, B	T	T	W
units	us	mg/L	mg/L	mg/L	su	TUA	TuA	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	units	pCi/l	pCi/l	pCi/l	pCi/l	pCi/l	mg/L	mg/L	mg/L
date: 24 or 8hr		24 hr	8hr											date: 24 or 8hr								
3.22.10		944	744	684	200	7.9		0.004		40.8	1.05	98	0.59	3.22.10								
3.23.10		985	644	560	240	7.6		0.004						3.23.10								
3.24.10		875	636	924	240	7.9		0						3.24.10								
3.25.10		1369	928	852	300	8		0.004						3.25.10								
3.26.10		1465	1020	872	400	7.7	AA	0.001						3.26.10								
3.29.10		850	620	568	180	7.7		0.003						3.29.10								

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Week study

City of Warren Patriot Brine 8-week study

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City of Warren Patriot Brine 8-week study

City of Warren Patriot Brine 8-week study																							
001 Final Effluent																							
Strontium	low level Mercury	Hex Chromium	TOC	CBOD5	COD	Final	Tot. Nitrogen	Ammonia Nitrogen	Nitrate Nitrite N	Organic Ammonia	MBAS	Volatile OC	Base Neutral O C	Acid OC	pesticides	tot. Phenols	Aluminum	Acute Tox, pimephales	Chronic Tox, Pimephales	Antimony			
W	T	T	T	T	T	frequency code	T	T	T	T	T	T	T	T	T	T	T	T	T	T			
mg/L	ng/L	mg/L	mg/L	mg/L	mg/L	units	mg/L	mg/L	mg/L	mg/L													
						date: 24 or 8hr															Final		
						3.22.10															frequency code		
						3.23.10															units		
						3.24.10															mg/L		
						3.25.10															mg/L		
						3.26.10																	
						3.29.10																	
														</									

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City of Warren Patriot Brine 8-week study
001 Final Effluent

001 Final Effluent

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City of Warren Patriot Brine 8-week study

001 Final Effluent

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5.06	45.2									
		<0.01	<2.5	<0.01	0.02	0.01	0.18	<0.05	<0.05	<0.01
5.06	45.2	0	0	0	0.02	0.01	0.18	0	0	0
5.06	45.2	0	0	0	0.02	0.01	0.18	0	0	0
5.06	45.2	#DIV/0!	#DIV/0!	#DIV/0!	0.02	0.01	0.18	0	0	0
5.06	45.2	0	0	0	0.02	0.01	0.18	0	0	0