

**Email correspondence between the West Virginia Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division; the Kentucky Division of Waste Management, Solid Waste Branch, and the Kentucky Radiation Health Branch occurring between the dates of January 28, 2016 and February 5, 2016.**

Email Chain # 1

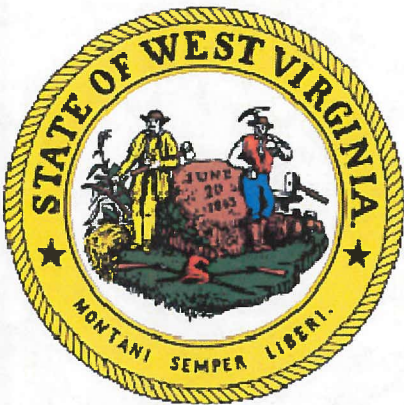
**Partridge, George (EEC)**

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**From:** Frame, Jason R <Jason.R.Frame@wv.gov>  
**Sent:** Thursday, January 28, 2016 11:09 AM  
**To:** Partridge, George (EEC)  
**Subject:** FW: TNORM disposal in KY

**Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program**

Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division  
350 Capitol Street, Room 313  
Charleston, West Virginia 25301  
Office: (304)356-4303  
Fax: (304) 558-0524  
Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



---

**From:** Pendergrass, Curt (CHFS DPH) [mailto:Curt.Pendergrass@ky.gov]  
**Sent:** Tuesday, January 19, 2016 4:33 PM  
**To:** Frame, Jason R  
**Cc:** McKinley, Matthew W (CHS-PH); Brock, Stephanie C (CHS-PH)  
**Subject:** RE: TNORM disposal in KY

Hello Mr. Frame,

Thank you for the follow-up e-mail on the purported disposition of WV TENORM wastes here in KY by Advanced TENORM Services of Liberty, KY (<http://advtenorm.com/>). We will follow up with the company's president, Cory Hoskins, and ascertain the nature and extent of their activities. We will also reach out to our colleagues in the Energy and Environment Cabinet Division of Waste Management since they regulate landfills here in KY.

Thanks again for reaching out to me regarding this matter.

Curt Pendergrass PhD  
Supervisor, Radioactive Materials Section  
Kentucky Radiation Health Branch  
275 East Main Street  
Mailstop HS1C-A  
Frankfort, KY 40621

Tel: 502-564-3700 ext. 4183

Fax: 502-564-1492

E-mail: [curt.pendergrass@ky.gov](mailto:curt.pendergrass@ky.gov)

Website: <http://www.chfs.ky.gov/dph/radioactive.htm>

Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)

Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>

Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



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**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]

**Sent:** Tuesday, January 19, 2016 12:51 PM

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**Cc:** Webb, April (EEC); [George.Patridge@ky.gov](mailto:George.Patridge@ky.gov); Loyselle, Maridely (EEC); Keffer, Christopher (CHFS Rad Hlth)

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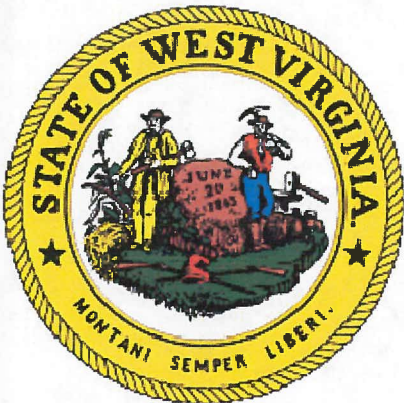
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Regards,

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Radiation Health Branch  
275 East Main Street  
Mailstop HS1C-A  
Frankfort, KY 40621  
Telephone: 502-564-3700 ext. 4183  
Fax: 502-564-1492

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If you have any input on this matter please contact Mr. Frame at the e-mail address provided ([jason.r.frame@wv.gov](mailto:jason.r.frame@wv.gov)).

**Christopher J. Keffer**  
**Radiation Health Specialist III**  
**Radioactive Materials Section**  
**275 East Main Street, HS1C-A**  
**Frankfort, KY 40601**  
**Ph: 502-564-3700 x4179**

**Cell: 502 330-7662**  
**FAX: 502-564-1492**

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Email Chain # 2

**Partridge, George (EEC)**

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**From:** Partridge, George (EEC)  
**Sent:** Thursday, January 28, 2016 11:40 AM  
**To:** 'Frame, Jason R'  
**Cc:** Pendergrass, Curt (CHFS DPH)  
**Subject:** RE: TNORM disposal in KY

Jason;

Thank you for being so generous with your time and providing the helpful information as I seek to understand better the TENORM issues affecting Kentucky.,

I looked at the email that you copied me on and my name is misspelled. The first "R" is left out of my name and I never saw this.

I am so glad you have my correct email address.

I look forward to us keeping in touch.

Thank you,

George

*George P. Partridge Jr.*

Department for Environmental Protection  
KY Division of Waste Management  
200 Fair Oaks Lane; 2nd Floor (SWB)  
Frankfort, KY 40601  
(502) 564-6716 ext. 4651

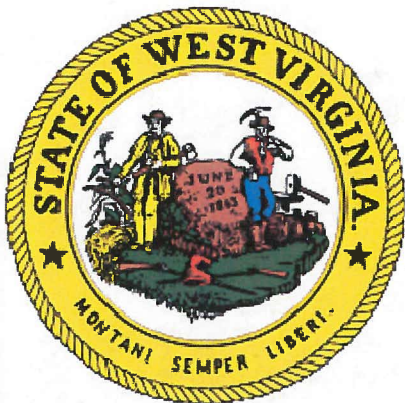


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Website: <http://www.chfs.ky.gov/dph/radioactive.htm>  
Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)  
Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>  
Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



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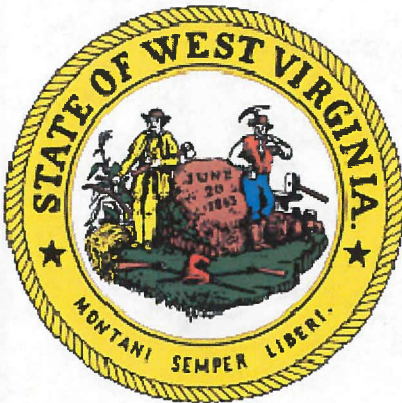
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Radiation Health Branch  
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Mailstop HS1C-A  
Frankfort, KY 40621  
Telephone: 502-564-3700 ext. 4183

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**Partridge, George (EEC)**

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**From:** Partridge, George (EEC)  
**Sent:** Friday, January 29, 2016 3:48 PM  
**To:** 'Frame, Jason R'  
**Cc:** Pendergrass, Curt (CHFS DPH)  
**Subject:** RE: TNORM disposal in KY

Jason;

I will be joining our field inspectors at landfills and waste sites in Eastern Kentucky to investigate our concerns regarding TENORM disposal.

If you could provide additional information related to our conversation about the shipments by Advanced TENORM Services to Kentucky that would be helpful.

As much detail as possible will be helpful as we review manifests, etc. at the landfills.

Information such as:

- Number and type of trucks/ volume, etc. of the wastes.
- Dates and time period the shipments were sent.
- The form or appearance of the waste when it was shipped (before solidification). What does it look like?
- Level of radioactivity.
- Name of company in Fairmont along with County that contracted with Advanced TENORM Services.
- Any knowledge where it was sent for solidification in Ashland, KY (?) prior to being sent to the landfill.

I know some of the above items we discussed in our conversation but I was so floored with the news I want to be sure I confirmed the understanding we have of the situation before we move forward with site visits.

Also our Assistance Director for the DWM is aware of the situation along with our Hazardous Waste Branch.

I appreciate all you and Curt do for our respective states.

Thanks again for all the time you devoted to corresponding and following up with us.

Look forward to hearing from you!

George

*George P. Partridge Jr., PhD, P.E., QEP*

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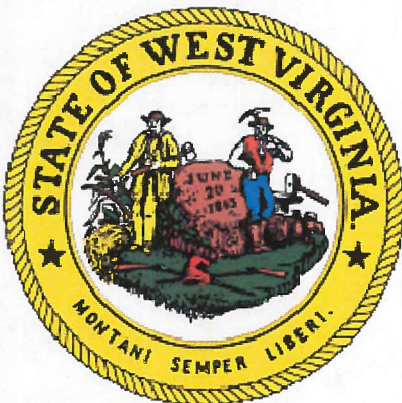
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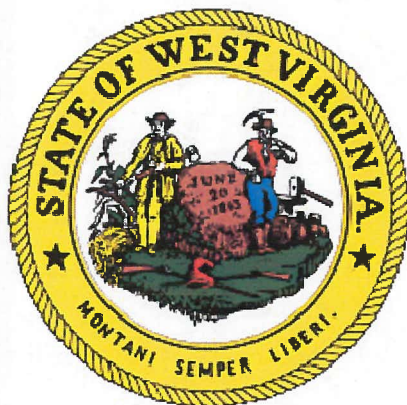
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**Attachments:** Fairmont Brine plan.pdf

- Number and type of trucks/ volume, etc. of the wastes. 35 vac boxes, unsure of volume but tractor trailer size.
- Dates and time period the shipments were sent. Shipments occurred during August 2015.
- The form or appearance of the waste when it was shipped (before solidification). What does it look like? Varied but typically a brown sludge, with a water layer on top.
- Level of radioactivity. Exposure rates were between 500 uR/hr and 2 mR/hr
- Name of company in Fairmont along with County that contracted with Advanced TENORM Services. Fairmont Brine
- Any knowledge where it was sent for solidification in Ashland, KY (?) prior to being sent to the landfill. See attachment

**Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program**

Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division  
350 Capitol Street, Room 313  
Charleston, West Virginia 25301  
Office: (304)356-4303  
Fax: (304) 558-0524  
Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



---

**From:** Partridge, George (EEC) [mailto:George.Partridge@ky.gov]  
**Sent:** Friday, January 29, 2016 3:48 PM  
**To:** Frame, Jason R  
**Cc:** Pendergrass, Curt (CHFS DPH)  
**Subject:** RE: TNORM disposal in KY

Jason;

I will be joining our field inspectors at landfills and waste sites in Eastern Kentucky to investigate our concerns regarding TENORM disposal.

If you could provide additional information related to our conversation about the shipments by Advanced TENORM Services to Kentucky that would be helpful.

As much detail as possible will be helpful as we review manifests, etc. at the landfills.

Information such as:

- Number and type of trucks/ volume, etc. of the wastes.
- Dates and time period the shipments were sent.
- The form or appearance of the waste when it was shipped (before solidification). What does it look like?
- Level of radioactivity.
- Name of company in Fairmont along with County that contracted with Advanced TENORM Services.
- Any knowledge where it was sent for solidification in Ashland, KY (?) prior to being sent to the landfill.

I know some of the above items we discussed in our conversation but I was so floored with the news I want to be sure I confirmed the understanding we have of the situation before we move forward with site visits.

Also our Assistance Director for the DWM is aware of the situation along with our Hazardous Waste Branch.

I appreciate all you and Curt do for our respective states.

Thanks again for all the time you devoted to corresponding and following up with us.

Look forward to hearing from you!

George

*George P. Partridge Jr., PhD, P.E., QEP*

Department for Environmental Protection  
KY Division of Waste Management  
200 Fair Oaks Lane; 2nd Floor (SWB)  
Frankfort, KY 40601  
(502) 564-6716 ext. 4651



---

**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]

**Sent:** Thursday, January 28, 2016 11:09 AM

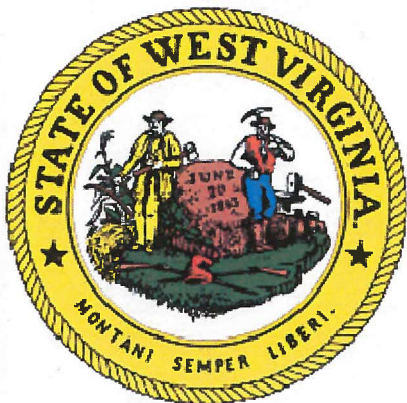
**To:** Partridge, George (EEC)

**Subject:** FW: TNORM disposal in KY

**Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program**

Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division  
350 Capitol Street, Room 313

Charleston, West Virginia 25301  
Office: (304)356-4303  
Fax: (304) 558-0524  
Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



---

**From:** Pendergrass, Curt (CHFS DPH) [<mailto:Curt.Pendergrass@ky.gov>]  
**Sent:** Tuesday, January 19, 2016 4:33 PM  
**To:** Frame, Jason R  
**Cc:** McKinley, Matthew W (CHS-PH); Brock, Stephanie C (CHS-PH)  
**Subject:** RE: TNORM disposal in KY

Hello Mr. Frame,

Thank you for the follow-up e-mail on the purported disposition of WV TENORM wastes here in KY by Advanced TENORM Services of Liberty, KY (<http://advtenorm.com/>). We will follow up with the company's president, Cory Hoskins, and ascertain the nature and extent of their activities. We will also reach out to our colleagues in the Energy and Environment Cabinet Division of Waste Management since they regulate landfills here in KY.

Thanks again for reaching out to me regarding this matter.

Curt Pendergrass PhD  
Supervisor, Radioactive Materials Section  
Kentucky Radiation Health Branch  
275 East Main Street  
Mailstop HS1C-A  
Frankfort, KY 40621  
Tel: 502-564-3700 ext. 4183  
Fax: 502-564-1492  
E-mail: [curt.pendergrass@ky.gov](mailto:curt.pendergrass@ky.gov)  
Website: <http://www.chfs.ky.gov/dph/radioactive.htm>  
Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)  
Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>  
Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



---

**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]  
**Sent:** Tuesday, January 19, 2016 12:51 PM  
**To:** Pendergrass, Curt (CHFS DPH)

**Cc:** Webb, April (EEC); [George.Patridge@ky.gov](mailto:George.Patridge@ky.gov); Loyselle, Maridely (EEC); Keffer, Christopher (CHFS Rad Hlth)  
**Subject:** RE: TNORM disposal in KY

Mr. Pendergrass,

I apologize for digging up this old email, but I don't believe I received any further response. I believe a company operating as "Advanced TENORM Services" is continuing to facilitate the disposal of WV waste in KY landfills. Please advise on this issue. Thanks

**Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program**

Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division

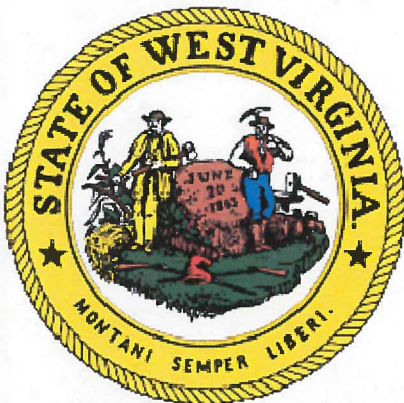
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Office: (304)356-4303

Fax: (304) 558-0524

Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



---

**From:** Pendergrass, Curt (CHFS DPH) [<mailto:Curt.Pendergrass@ky.gov>]

**Sent:** Tuesday, July 21, 2015 9:45 PM

**To:** Frame, Jason R

**Cc:** Webb, April (EEC); [George.Patridge@ky.gov](mailto:George.Patridge@ky.gov); Loyselle, Maridely (EEC); Keffer, Christopher (CHFS Rad Hlth)

**Subject:** RE: TNORM disposal in KY

Hello Mr. Frame,

While KY does not currently have any regulations dealing with the control and disposal of NORM/TENORM waste generated in the oil and gas industry from hydraulic fracturing, we do have statutes on the books establishing the Central Midwest Interstate Low Level Radioactive Waste Compact of which KY is a member with IL. The compact strictly forbids the disposal of any and all radioactive materials generated outside of IL and KY anywhere in our states. This obviously includes fracking wastes generated in West Virginia. I am Cc'ing my colleagues in the Division of Solid Waste on this e-mail since disposal of wastes containing hazardous materials including NORM/TENORM in landfills here in KY is their regulatory purview. Ohio and Pennsylvania both have regulations addressing the disposal of NORM/TENORM contaminated waste so Advanced TENORM Services might want to check with the authorities in those states to see what is required.

Regards,

Curt Pendergrass, Ph.D.  
Supervisor, Radioactive Materials Section  
Radiation Health Branch  
275 East Main Street  
Mailstop HS1C-A

Frankfort, KY 40621  
Telephone: 502-564-3700 ext. 4183  
Fax: 502-564-1492

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---

**From:** Keffer, Christopher (CHFS Rad Hlth)  
**Sent:** Tuesday, July 21, 2015 1:19 PM  
**To:** Pendergrass, Curt (CHFS DPH)  
**Cc:** [jason.r.frame@wv.gov](mailto:jason.r.frame@wv.gov)  
**Subject:** TNORM disposal in KY

Dr. Pendergrass,

I was contacted this morning by Mr. Jason R. Frame; a member of the West Virginia radiation program. He was inquiring about a West Virginia company's intent to dispose of TNORM from a "fracking" operation here in Kentucky by using the services provided by Advanced TENORM Services L.L.C. ( [https://app.sos.ky.gov/ftshow/\(S\(30yqolkfdaebcz4hporeemp4\)\)/default.aspx?path=ftsearch&id=0904260&ct=06&cs=99999](https://app.sos.ky.gov/ftshow/(S(30yqolkfdaebcz4hporeemp4))/default.aspx?path=ftsearch&id=0904260&ct=06&cs=99999) ). From Mr. Frames understanding, Advanced TENORM Services L.L.C. (located in West Liberty, KY) will be solidifying the "facking" sludge in Ashland, KY and then sending it to a Class D landfill in Irvine, KY. Mr. Fame's question was in regards to whether or not we would allow the disposal of TMORN from other states in the state of Kentucky or send it back to the materials origins. I informed Mr. Frame that our office does not currently have regulation regarding TNORM in place and that each landfill may have their own limits on what they except or turn away in regards to radiation levels.

If you have any input on this matter please contact Mr. Frame at the e-mail address provided ([jason.r.frame@wv.gov](mailto:jason.r.frame@wv.gov)).

**Christopher J. Keffer**  
**Radiation Health Specialist III**  
**Radioactive Materials Section**  
**275 East Main Street, HS1C-A**  
**Frankfort, KY 40601**  
**Ph: 502-564-3700 x4179**  
**Cell: 502 330-7662**  
**FAX: 502-564-1492**

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Fairmont Brine plan.pdf  
Attachment 2-1-16 11:30 am

Date: July 16<sup>th</sup>, 2015

To: West Virginia Office of Environmental Health Services  
Radiation, Toxics and Indoor Air Division  
Attn: Jason R. Frame, Chief Radiological Health Program  
350 Capitol Street, Room 313  
Charleston, WV 25301

Re: **Sludge Disposal Plan**

Dear Mr. Frame,

The purpose of this correspondence is in reference to the West Virginia Office of Environmental Health Services' (OEHS) request that Fairmont Brine Processing (FBP) submit a plan for the disposal of its sludge. The West Virginia Department of Environmental Protection (WVDEP) has received and processed FBP's Notification of Regulated Waste Activity Form. As a result, FBP was assigned a U.S. Environmental Protection Agency (US EPA) Identification Number (WVR000521948).

FBP will contract the removal of all sludge through Advanced TENORM Services (ATS). Based out of West Liberty, Kentucky, ATS is comprised of dedicated professionals with top level Ph.D. nuclear physicists, health physicists, engineers, and geologists who have decades of experience with sludge management.

On July 20<sup>th</sup>, 2015, via DOT compliant trucks, ATS will transport 35 sealed containers from FBP's location in Fairmont, WV to Ashland, KY. **There will be no waste handling, solidification, or tank transfer taking place in WV.** All material will be solidified to pass the paint filter test. Upon completion of solidification and as a special waste per 40 CFR 261.4(b)(5), the material will be disposed of in a Subtitle D landfill located in Irvine, Kentucky. In order to track the disposal of each container, a manifest tracking log will be maintained throughout the duration of the project. Before containers are returned for service, they will be cleaned and issued a certificate. Any residue generated during the tank cleaning process will be solidified and disposed of at the same Subtitle D landfill and documented in the manifest tracking log.

If you have any questions or comments, please don't hesitate to contact me.

Sincerely,

A handwritten signature in blue ink that reads "B. Kalt".

**Brian Kalt**  
GM  
Fairmont Brine Processing, LLC  
412-680-6244  
bkalt@fairmontbrine.com

**Partridge, George (EEC)**

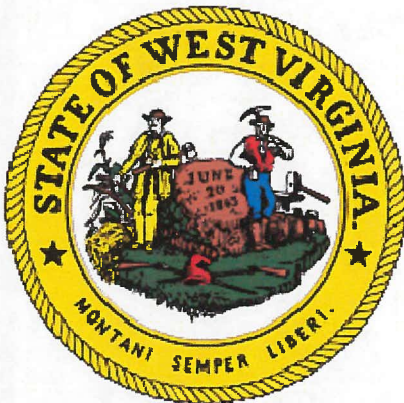
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**From:** Frame, Jason R <Jason.R.Frame@wv.gov>  
**Sent:** Friday, February 05, 2016 11:10 AM  
**To:** Pendergrass, Curt (CHFS DPH)  
**Cc:** Keffer, Christopher (CHFS Rad Hlth); Partridge, George (EEC)  
**Subject:** RE: TNORM disposal in KY  
**Attachments:** FairmontBrineRadchem.pdf

These results were provided to me by Waste Management while they were involved with the project. The said this was a combined average of the loads, but I did not specify the sampling methods so can't speak too that.

**Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program**

Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division  
350 Capitol Street, Room 313  
Charleston, West Virginia 25301  
Office: (304)356-4303  
Fax: (304) 558-0524  
Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



---

**From:** Pendergrass, Curt (CHFS DPH) [mailto:Curt.Pendergrass@ky.gov]  
**Sent:** Friday, February 05, 2016 10:36 AM  
**To:** Frame, Jason R  
**Cc:** Keffer, Christopher (CHFS Rad Hlth); Partridge, George (EEC)  
**Subject:** RE: TNORM disposal in KY

Thanks Jason. That is exactly what I was hoping to hear. A WV regulation referencing a drive through radiation portal alarm of 2X background and 5 pCi/g Ra-226/228 above background, would be great if you can send me a link. Also, actual radiochemical data on the loads in questions would be extremely helpful. Does WV actually make companies like Fairmont Brine conduct radiological surveys and radiochemical analysis of oil and gas production fluids? I know that Republic Services operates many landfills here in KY and it is a company policy that all Republic landfills have drive through radiation portal monitors. We get our share of alarms for medical wastes in sewage sludge, usually long-lived isotopes such as I-131 which has a 8 day half-life. We even had a Republic landfill outside Ashland KY get a medical isotope alarm in a waste load from Huntington, WV not too long ago. That load was found to contain Tc-99m which meant that with a 6 hour half-life, the wastes was pretty fresh.

Thanks again for all your assistance.

Curt Pendergrass PhD  
Supervisor, Radioactive Materials Section  
Kentucky Radiation Health Branch  
275 East Main Street  
Mailstop HS1C-A  
Frankfort, KY 40621  
Tel: 502-564-3700 ext. 4183  
Fax: 502-564-1492  
E-mail: [curt.pendergrass@ky.gov](mailto:curt.pendergrass@ky.gov)  
Website: <http://www.chfs.ky.gov/dph/radioactive.htm>  
Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)  
Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>  
Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



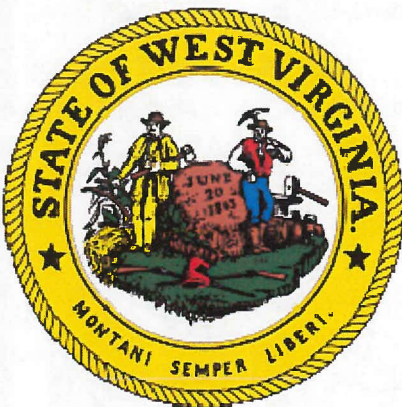
---

**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]  
**Sent:** Friday, February 05, 2016 10:18 AM  
**To:** Pendergrass, Curt (CHFS DPH)  
**Cc:** Keffer, Christopher (CHFS Rad Hlth); Partridge, George (EEC)  
**Subject:** RE: TNORM disposal in KY

WV DEP is not involved in any type of radiological permitting. I believe you are referring to the drill cuttings disposal regs that we developed with WVDEP which set gate alarms of 2x background and then 5 pCi/g radium 226/228 above local background analytical limits. I may already have data for the loads. Will check.

**Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program**

Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division  
350 Capitol Street, Room 313  
Charleston, West Virginia 25301  
Office: (304)356-4303  
Fax: (304) 558-0524  
Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



---

**From:** Pendergrass, Curt (CHFS DPH) [<mailto:Curt.Pendergrass@ky.gov>]  
**Sent:** Friday, February 05, 2016 10:05 AM  
**To:** Frame, Jason R  
**Cc:** Keffer, Christopher (CHFS Rad Hlth); Partridge, George (EEC)  
**Subject:** RE: TNORM disposal in KY

Hello Jason,

I have huge favor to ask of you. Is there any way that you can contact Fairmont Brine Processing in Fairmont WV and ask them for actual data on these loads as to the activity concentration of Ra-226 + Ra-228 plus daughter products? I would presume the driving force behind FBP notifying your office of a regulated waste activity and being assigned a US EPA ID number was the radioanalytical analysis of this wastes and not the fact the wastes read 0.5-2.0 mR/hr, I presume on contact with the waste containers.

## sludge. The West Virginia Department of Environmental Protection processed FBP's Notification of Regulated Waste Activity Form. As Environmental Protection Agency (US EPA) Identification Number

Also, I remember seeing something in the lay press about WV issuing new regulations regarding TENORM. However, I can't seem to find anything on the web other this blurb below which references 185 Bq/kg or 5 pCi/g above natural background. I am assuming FBP analyzed the loads in question and determined they exceeded this WV limit. Also, I am assuming this limit is based on protecting public and health and safety of the citizens of WV but what I saw seemed to be more of a proposed rule and not an actual regulation

(<http://apps.sos.wv.gov/adlaw/csr/readfile.aspx?DocId=8395&Format=PDF>). I am hoping that you can share copy or a link to the actual WV regulation which references this TENORM limit for disposal in WV. I believe OH chose to use this 5 pCi/g Ra-226 + Ra-228 plus daughter products as well as their limit for disposal in the regular waste stream.

### *16.4. Exemptions.*

*16.4.a. Persons who receive, own, possess, use, process, transfer, distribute, or dispose of TENORM are exempt from the requirements of this Section with respect to any combination of 226Ra and 228 Ra if the materials contain, or are contaminated at, concentrations less than one hundred eighty five (185) bequerel per kilogram (five [5] pCi/gm) excluding natural background. This does not apply to consumer or retail products which are discussed in Subdivision 16.12.c. and Subsection 16.13. Using purposeful dilution to render TENORM waste exempt shall not be allowed without prior agency approval.*

Just to let you know, while KY lacks specific regs addressing TENORM, our Central Midwest Interstate Low-Level Waste Compact of which KY is a member along with IL, specifically prohibits the disposal of out-of-compact wastes here in KY. See below. How that ties in with the EPA's determination that "Wastes generated during the exploration, development, and production of crude oil, natural gas, and geothermal energy are categorized by EPA as "special wastes" and are exempt from federal hazardous waste regulations under Subtitle C of the Resource Conservation and Recovery Act (RCRA)" will be question for my colleagues in the Energy and Environment Cabinet to answer. But if you actual radioanalytic data on these loads from FBP that you could share with us, we would be extremely grateful.

Thanks,  
Curt

### **211.863 Control of commerce of low-level radioactive waste in and out of Kentucky -- Prohibitions -- Exemption. <http://www.lrc.ky.gov/statutes/statute.aspx?id=8502>**

(3) Naturally-occurring radioactive material (NORM) as defined in KRS 211.862(8) shall be the exclusive regulatory responsibility of the states, **except that no person shall import naturally occurring radioactive material (NORM) from outside the**

region for disposal in Kentucky, or dispose of such imported material in Kentucky, if the imports or disposal are inconsistent with policies of the commission.

**211.869 Penalties.** <http://www.lrc.ky.gov/statutes/statute.aspx?id=8505>

(1) Any person who fails to comply with any provision of KRS 211.859 or 211.863, or with any administrative regulations promulgated pursuant to KRS 211.859 or 211.865, or fails to comply with any order of the cabinet issued pursuant to KRS 211.859 or KRS 211.863 and 211.865 shall be assessed a civil penalty not less than ten thousand dollars (\$10,000) nor more than one hundred thousand dollars (\$100,000). Each day of the violation or noncompliance shall constitute a separate offense.

**211.862 Definitions for KRS 211.861 to 211.869.**

**<http://www.lrc.ky.gov/statutes/statute.aspx?id=8501>**

(8) "Naturally-occurring radioactive material" (NORM) means naturally occurring materials not regulated under the Atomic Energy Act of 1954, as amended, whose radionuclide concentrations have been increased by or as a result of human practices. Naturally occurring radioactive material does not include the natural radioactivity of rocks or soils, or background radiation, but instead refers to materials whose radioactivity is technologically enhanced by controllable practices (or by past human practices);

Curt Pendergrass PhD  
Supervisor, Radioactive Materials Section  
Kentucky Radiation Health Branch  
275 East Main Street  
Mailstop HS1C-A  
Frankfort, KY 40621  
Tel: 502-564-3700 ext. 4183  
Fax: 502-564-1492  
E-mail: [curt.pendergrass@ky.gov](mailto:curt.pendergrass@ky.gov)  
Website: <http://www.chfs.ky.gov/dph/radioactive.htm>  
Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)  
Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>  
Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



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**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]

**Sent:** Monday, February 01, 2016 11:30 AM

**To:** Partridge, George (EEC)

**Cc:** Pendergrass, Curt (CHFS DPH)

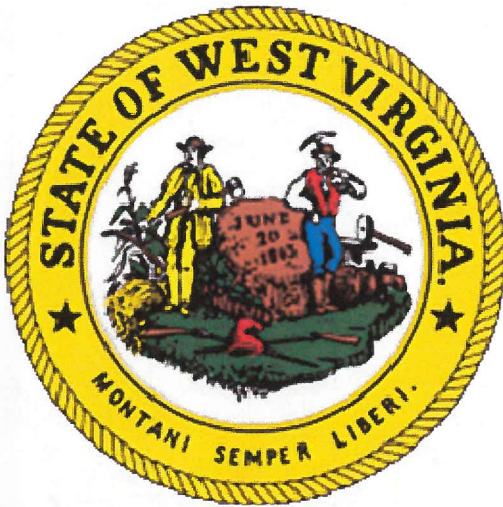
**Subject:** RE: TNORM disposal in KY

- Number and type of trucks/ volume, etc. of the wastes. 35 vac boxes, unsure of volume but tractor trailer size.
- Dates and time period the shipments were sent. Shipments occurred during August 2015.
- The form or appearance of the waste when it was shipped (before solidification). What does it look like? Varied but typically a brown sludge, with a water layer on top.
- Level of radioactivity. Exposure rates were between 500 uR/hr and 2 mR/hr

- Name of company in Fairmont along with County that contracted with Advanced TENORM Services. **Fairmont Brine**
- Any knowledge where it was sent for solidification in Ashland, KY (?) prior to being sent to the landfill. **See attachment**

**Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program**

Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division  
350 Capitol Street, Room 313  
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Office: (304)356-4303  
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Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



---

**From:** Partridge, George (EEC) [<mailto:George.Partridge@ky.gov>]  
**Sent:** Friday, January 29, 2016 3:48 PM  
**To:** Frame, Jason R  
**Cc:** Pendergrass, Curt (CHFS DPH)  
**Subject:** RE: TNORM disposal in KY

Jason;

I will be joining our field inspectors at landfills and waste sites in Eastern Kentucky to investigate our concerns regarding TENORM disposal.

If you could provide additional information related to our conversation about the shipments by Advanced TENORM Services to Kentucky that would be helpful.

As much detail as possible will be helpful as we review manifests, etc. at the landfills.

Information such as:

- Number and type of trucks/ volume, etc. of the wastes.
- Dates and time period the shipments were sent.
- The form or appearance of the waste when it was shipped (before solidification). What does it look like?
- Level of radioactivity.
- Name of company in Fairmont along with County that contracted with Advanced TENORM Services.

- Any knowledge where it was sent for solidification in Ashland, KY (?) prior to being sent to the landfill.

I know some of the above items we discussed in our conversation but I was so floored with the news I want to be sure I confirmed the understanding we have of the situation before we move forward with site visits.

Also our Assistance Director for the DWM is aware of the situation along with our Hazardous Waste Branch.

I appreciate all you and Curt do for our respective states.

Thanks again for all the time you devoted to corresponding and following up with us.

Look forward to hearing from you!

George

*George P. Partridge Jr., PhD, P.E., QEP*

Department for Environmental Protection  
KY Division of Waste Management  
200 Fair Oaks Lane; 2nd Floor (SWB)  
Frankfort, KY 40601  
(502) 564-6716 ext. 4651



---

**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]

**Sent:** Thursday, January 28, 2016 11:09 AM

**To:** Partridge, George (EEC)

**Subject:** FW: TNORM disposal in KY

**Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program**

Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division

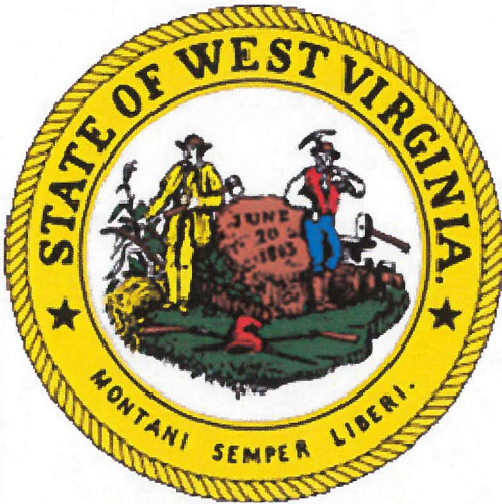
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Fax: (304) 558-0524

Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



---

**From:** Pendergrass, Curt (CHFS DPH) [<mailto:Curt.Pendergrass@ky.gov>]  
**Sent:** Tuesday, January 19, 2016 4:33 PM  
**To:** Frame, Jason R  
**Cc:** McKinley, Matthew W (CHS-PH); Brock, Stephanie C (CHS-PH)  
**Subject:** RE: TNORM disposal in KY

Hello Mr. Frame,

Thank you for the follow-up e-mail on the purported disposition of WV TENORM wastes here in KY by Advanced TENORM Services of Liberty, KY (<http://advtenorm.com/>). We will follow up with the company's president, Cory Hoskins, and ascertain the nature and extent of their activities. We will also reach out to our colleagues in the Energy and Environment Cabinet Division of Waste Management since they regulate landfills here in KY.

Thanks again for reaching out to me regarding this matter.

Curt Pendergrass PhD  
Supervisor, Radioactive Materials Section  
Kentucky Radiation Health Branch  
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E-mail: [curt.pendergrass@ky.gov](mailto:curt.pendergrass@ky.gov)  
Website: <http://www.chfs.ky.gov/dph/radioactive.htm>  
Pay your fees on line at [https://prd.chfs.ky.gov/rad\\_epay/](https://prd.chfs.ky.gov/rad_epay/)  
Be notified of proposed regulation changes <https://secure.kentucky.gov/Regwatch/>  
Dispose of unwanted sources <http://www.crcpd.org/StateServices/SCATR.aspx>



---

**From:** Frame, Jason R [<mailto:Jason.R.Frame@wv.gov>]  
**Sent:** Tuesday, January 19, 2016 12:51 PM  
**To:** Pendergrass, Curt (CHFS DPH)  
**Cc:** Webb, April (EEC); [George.Patridge@ky.gov](mailto:George.Patridge@ky.gov); Loyselle, Maridely (EEC); Keffer, Christopher (CHFS Rad Hlth)  
**Subject:** RE: TNORM disposal in KY

Mr. Pendergrass,

I apologize for digging up this old email, but I don't believe I received any further response. I believe a company operating as "Advanced TENORM Services" is continuing to facilitate the disposal of WV waste in KY landfills. Please advise on this issue. Thanks

**Jason R. Frame B.S. R.T. (R), Chief Radiological Health Program**

Office of Environmental Health Services/Radiation, Toxics and Indoor Air Division

350 Capitol Street, Room 313

Charleston, West Virginia 25301

Office: (304)356-4303

Fax: (304) 558-0524

Email: [Jason.R.Frame@WV.gov](mailto:Jason.R.Frame@WV.gov)



---

**From:** Pendergrass, Curt (CHFS DPH) [<mailto:Curt.Pendergrass@ky.gov>]

**Sent:** Tuesday, July 21, 2015 9:45 PM

**To:** Frame, Jason R

**Cc:** Webb, April (EEC); [George.Patridge@ky.gov](mailto:George.Patridge@ky.gov); Loyselle, Maridely (EEC); Keffer, Christopher (CHFS Rad Hlth)

**Subject:** RE: TNORM disposal in KY

Hello Mr. Frame,

While KY does not currently have any regulations dealing with the control and disposal of NORM/TENORM waste generated in the oil and gas industry from hydraulic fracturing, we do have statutes on the books establishing the Central Midwest Interstate Low Level Radioactive Waste Compact of which KY is a member with IL. The compact strictly forbids the disposal of any and all radioactive materials generated outside of IL and KY anywhere in our states. This obviously includes fracking wastes generated in West Virginia. I am Cc'ing my colleagues in the Division of Solid Waste on this e-mail since disposal of wastes containing hazardous materials including NORM/TENORM in landfills here in KY is their regulatory purview. Ohio and Pennsylvania both have regulations addressing the disposal of NORM/TENORM contaminated waste so Advanced TENORM Services might want to check with the authorities in those states to see what is required.

Regards,

Curt Pendergrass, Ph.D.  
Supervisor, Radioactive Materials Section  
Radiation Health Branch  
275 East Main Street  
Mailstop HS1C-A

Frankfort, KY 40621  
Telephone: 502-564-3700 ext. 4183  
Fax: 502-564-1492

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**From:** Keffer, Christopher (CHFS Rad Hlth)  
**Sent:** Tuesday, July 21, 2015 1:19 PM  
**To:** Pendergrass, Curt (CHFS DPH)  
**Cc:** [jason.r.frame@wv.gov](mailto:jason.r.frame@wv.gov)  
**Subject:** TNORM disposal in KY

Dr. Pendergrass,

I was contacted this morning by Mr. Jason R. Frame; a member of the West Virginia radiation program. He was inquiring about a West Virginia company's intent to dispose of TNORM from a "fracking" operation here in Kentucky by using the services provided by Advanced TENORM Services L.L.C. ([https://app.sos.ky.gov/ftshow/\(S\(30yqolkfdaebcz4hporemp4\)\)/default.aspx?path=ftsearch&id=0904260&ct=06&cs=99999](https://app.sos.ky.gov/ftshow/(S(30yqolkfdaebcz4hporemp4))/default.aspx?path=ftsearch&id=0904260&ct=06&cs=99999)). From Mr. Frame's understanding, Advanced TENORM Services L.L.C. (located in West Liberty, KY) will be solidifying the "fracking" sludge in Ashland, KY and then sending it to a Class D landfill in Irvine, KY. Mr. Frame's question was in regards to whether or not we would allow the disposal of TNORM from other states in the state of Kentucky or send it back to the materials origins. I informed Mr. Frame that our office does not currently have regulation regarding TNORM in place and that each landfill may have their own limits on what they accept or turn away in regards to radiation levels.

If you have any input on this matter please contact Mr. Frame at the e-mail address provided ([jason.r.frame@wv.gov](mailto:jason.r.frame@wv.gov)).

**Christopher J. Keffer**  
**Radiation Health Specialist III**  
**Radioactive Materials Section**  
**275 East Main Street, HS1C-A**  
**Frankfort, KY 40601**  
**Ph: 502-564-3700 x4179**  
**Cell: 502 330-7662**  
**FAX: 502-564-1492**

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Fairmont Brine  
Radchem .pdf  
A Hachment

2-5-16 11:10 am  
31 total pages

June 16, 2015

Rick Quinn  
Waste Management  
1488 Dawson Drive  
Suite 102  
Bridgeport, WV 26330

RE: Project: Fairmont Brine - Sludge Pit CI  
Pace Project No.: 30150255

Dear Rick Quinn:

Enclosed are the analytical results for sample(s) received by the laboratory on June 09, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Timothy Reed  
timothy.reed@pacelabs.com  
Project Manager

Enclosures

cc: Joni Edgells-Smith, Waste Management



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

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### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ACLASS DOD-ELAP Accreditation #: ADE-1544  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California/TNI Certification #: 04222CA  
Colorado Certification  
Connecticut Certification #: PH-0694  
Delaware Certification  
Florida/TNI Certification #: E87683  
Guam/PADEP Certification  
Hawaii/PADEP Certification  
Idaho Certification  
Illinois/PADEP Certification  
Indiana/PADEP Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: 90133  
Louisiana DHH/TNI Certification #: LA140008  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: PA00091  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification  
Missouri Certification #: 235

Montana Certification #: Cert 0082  
Nebraska Certification #: NE-05-29-14  
Nevada Certification  
New Hampshire/TNI Certification #: 2976  
New Jersey/TNI Certification #: PA 051  
New Mexico Certification  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Oregon/TNI Certification #: PA200002  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
South Dakota Certification  
Tennessee Certification #: TN2867  
Texas/TNI Certification #: T104704188  
Utah/TNI Certification #: PA014572014-4  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 460198  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin/PADEP Certification  
Wyoming Certification #: 8TMS-Q

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### SAMPLE SUMMARY

Project: Fairmont Brine - Sludge Pit CI  
Pace Project No.: 30150255

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
30150255001	Fairmont Brine - Sludge Pit CI	Solid	06/08/15 09:25	06/09/15 15:45

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### SAMPLE ANALYTE COUNT

Project: Fairmont Brine - Sludge Pit CI  
Pace Project No.: 30150255

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30150255001	Fairmont Brine - Sludge Pit CI	EPA 6010B	RAC	11	PASI-PA
		EPA 7470A	RAC	1	PASI-PA
		EPA 8270C	DJL	18	PASI-PA
		EPA 8260B	CLG	13	PASI-PA
		ASTM D2974-87	TAW	1	PASI-PA
		EPA 901.1	MAH	10	PASI-PA
		EPA 1010	DEH	1	PASI-PA
		EPA 160.4	DEH	1	PASI-PA
		EPA 9045C	DEH	1	PASI-PA
		EPA 9071B	DLH	1	PASI-PA
		EPA 9095A	DEH	1	PASI-PA
		SW-846 7.3.4.2	KAS	1	PASI-PA
		EPA 9012A	BMS	1	PASI-PA

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### ANALYTICAL RESULTS

Project: Fairmont Brine - Sludge Pit CI  
 Pace Project No.: 30150255

Sample: Fairmont Brine - Sludge Pit CI Lab ID: 30150255001 Collected: 06/08/15 09:25 Received: 06/09/15 15:45 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report			Prepared	Analyzed	CAS No.	Qual
			Limit	MDL	DF				
<b>6010 MET ICP, TCLP</b>									
Analytical Method: EPA 6010B Preparation Method: EPA 3005A									
Leachate Method/Date: EPA 1311; 06/11/15 15:23 Initial pH: 7.92; Final pH: 4.9									
Arsenic	ND	mg/L	0.050	0.0045	1	06/12/15 14:03	06/15/15 15:35	7440-38-2	
Barium	ND	mg/L	1.0	0.00080	1	06/12/15 14:03	06/15/15 15:35	7440-39-3	
Cadmium	ND	mg/L	0.050	0.00055	1	06/12/15 14:03	06/15/15 15:35	7440-43-9	
Chromium	ND	mg/L	0.050	0.00073	1	06/12/15 14:03	06/15/15 15:35	7440-47-3	
Copper	ND	mg/L	0.050	0.0020	1	06/12/15 14:03	06/15/15 15:35	7440-50-8	
Lead	ND	mg/L	0.050	0.0036	1	06/12/15 14:03	06/15/15 15:35	7439-92-1	
Nickel	0.12	mg/L	0.10	0.0017	1	06/12/15 14:03	06/15/15 15:35	7440-02-0	
Selenium	ND	mg/L	0.10	0.0046	1	06/12/15 14:03	06/15/15 15:35	7782-49-2	
Silver	ND	mg/L	0.050	0.00082	1	06/12/15 14:03	06/15/15 15:35	7440-22-4	
Strontium	65.9	mg/L	0.50	0.0052	10	06/12/15 14:03	06/15/15 16:43	7440-24-6	
Zinc	0.21	mg/L	0.20	0.0027	1	06/12/15 14:03	06/15/15 15:35	7440-66-6	
<b>7470 Mercury, TCLP</b>									
Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Leachate Method/Date: EPA 1311; 06/11/15 15:23 Initial pH: 7.92; Final pH: 4.9									
Mercury	ND	ug/L	1.0	0.022	1	06/12/15 13:23	06/15/15 09:57	7439-97-6	
<b>8270 MSSV TCLP</b>									
Analytical Method: EPA 8270C Preparation Method: EPA 3535A									
Leachate Method/Date: EPA 1311; 06/11/15 15:23 Initial pH: 7.92; Final pH: 4.9									
1,4-Dichlorobenzene	ND	ug/L	500	9.0	1	06/15/15 09:35	06/15/15 16:49	106-46-7	
2,4-Dinitrotoluene	ND	ug/L	100	35.3	1	06/15/15 09:35	06/15/15 16:49	121-14-2	
Hexachloro-1,3-butadiene	ND	ug/L	100	7.9	1	06/15/15 09:35	06/15/15 16:49	87-68-3	
Hexachlorobenzene	ND	ug/L	100	13.5	1	06/15/15 09:35	06/15/15 16:49	118-74-1	
Hexachloroethane	ND	ug/L	500	15.1	1	06/15/15 09:35	06/15/15 16:49	67-72-1	
2-Methylphenol(o-Cresol)	ND	ug/L	2000	16.8	1	06/15/15 09:35	06/15/15 16:49	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	2000	39.9	1	06/15/15 09:35	06/15/15 16:49		
Nitrobenzene	ND	ug/L	100	13.0	1	06/15/15 09:35	06/15/15 16:49	98-95-3	
Pentachlorophenol	ND	ug/L	5000	45.3	1	06/15/15 09:35	06/15/15 16:49	87-86-5	M1
Pyridine	ND	ug/L	500	17.6	1	06/15/15 09:35	06/15/15 16:49	110-86-1	
2,4,5-Trichlorophenol	ND	ug/L	5000	21.9	1	06/15/15 09:35	06/15/15 16:49	95-95-4	
2,4,6-Trichlorophenol	ND	ug/L	100	21.7	1	06/15/15 09:35	06/15/15 16:49	88-06-2	
<b>Surrogates</b>									
Nitrobenzene-d5 (S)	80	%	38-129		1	06/15/15 09:35	06/15/15 16:49	4165-60-0	
2-Fluorobiphenyl (S)	74	%	49-105		1	06/15/15 09:35	06/15/15 16:49	321-60-8	
Terphenyl-d14 (S)	56	%	10-101		1	06/15/15 09:35	06/15/15 16:49	1718-51-0	
Phenol-d6 (S)	83	%	48-121		1	06/15/15 09:35	06/15/15 16:49	13127-88-3	
2-Fluorophenol (S)	89	%	51-128		1	06/15/15 09:35	06/15/15 16:49	367-12-4	
2,4,6-Tribromophenol (S)	90	%	64-115		1	06/15/15 09:35	06/15/15 16:49	118-79-6	
<b>8260 MSV TCLP</b>									
Analytical Method: EPA 8260B Leachate Method/Date: EPA 1311; 06/11/15 18:34									
Benzene	192	ug/L	50.0	0.16	1		06/12/15 14:26	71-43-2	
2-Butanone (MEK)	ND	ug/L	5000	2.4	1		06/12/15 14:26	78-93-3	
Carbon tetrachloride	ND	ug/L	50.0	0.22	1		06/12/15 14:26	56-23-5	
Chlorobenzene	ND	ug/L	1000	0.13	1		06/12/15 14:26	108-90-7	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

Sample: Fairmont Brine - Sludge Pit Cl Lab ID: 30150255001 Collected: 06/08/15 09:25 Received: 06/09/15 15:45 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV TCLP</b>									
Analytical Method: EPA 8260B Leachate Method/Date: EPA 1311; 06/11/15 18:34									
Chloroform	ND	ug/L	500	0.19	1		06/12/15 14:26	67-66-3	
1,2-Dichloroethane	ND	ug/L	50.0	0.36	1		06/12/15 14:26	107-06-2	
1,1-Dichloroethene	ND	ug/L	50.0	0.26	1		06/12/15 14:26	75-35-4	
Tetrachloroethene	ND	ug/L	50.0	0.29	1		06/12/15 14:26	127-18-4	
Trichloroethene	ND	ug/L	50.0	0.33	1		06/12/15 14:26	79-01-6	
Vinyl chloride	ND	ug/L	50.0	0.20	1		06/12/15 14:26	75-01-4	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	84-124		1		06/12/15 14:26	17060-07-0	
Toluene-d8 (S)	105	%	79-118		1		06/12/15 14:26	2037-26-5	
4-Bromofluorobenzene (S)	102	%	84-113		1		06/12/15 14:26	460-00-4	
<b>Percent Moisture</b>									
Analytical Method: ASTM D2974-87									
Percent Moisture	55.0	%	0.10	0.10	1		06/15/15 17:41		
<b>1010 Flashpoint,Closed Cup</b>									
Analytical Method: EPA 1010									
Flashpoint	>200	deg F	60.0		1		06/10/15 14:30		
<b>160.4 Total Volatile Solids</b>									
Analytical Method: EPA 160.4									
Total Volatile Solids	10.2	% (w/w)	10.0	10.0	1		06/10/15 14:37		
<b>9045 pH Soil</b>									
Analytical Method: EPA 9045C									
pH at 25 Degrees C	5.9	Std. Units	1.0	1.0	1		06/09/15 23:23		
<b>9071 Oil and Grease/TPH</b>									
Analytical Method: EPA 9071B Preparation Method: EPA 9071B									
Oil and Grease	26900	mg/kg	222	24.9	1	06/12/15 12:00	06/15/15 08:00		
<b>9095 Paint Filter Liquid Test</b>									
Analytical Method: EPA 9095A									
Free Liquids	FAIL		1.0	1.0	1		06/10/15 15:00		
<b>735S Reactive Sulfide</b>									
Analytical Method: SW-846 7.3.4.2									
Sulfide, Reactive	ND	mg/kg	22.1	22.1	1		06/10/15 18:00		
<b>9012 Cyanide, Total</b>									
Analytical Method: EPA 9012A Preparation Method: EPA 9012A									
Cyanide	ND	mg/kg	1.1	0.17	1	06/15/15 18:00	06/15/15 21:47	57-12-5	M1,R1

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

QC Batch: MERP/6597 Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury TCLP  
Associated Lab Samples: 30150255001

METHOD BLANK: 906820 Matrix: Water  
Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	1.0	06/15/15 09:12	

LABORATORY CONTROL SAMPLE: 906821

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	1	1.0	100	85-115	

MATRIX SPIKE SAMPLE: 906823

Parameter	Units	30149653002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	1.0 U	2.5	2.6	104	80-120	

MATRIX SPIKE SAMPLE: 906825

Parameter	Units	30149957001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	0.000022U mg/L	2.5	2.8	111	80-120	

SAMPLE DUPLICATE: 906822

Parameter	Units	30149653002 Result	Dup Result	RPD	Max RPD	Qualifiers
Mercury	ug/L	1.0 U	ND		20	

SAMPLE DUPLICATE: 906824

Parameter	Units	30149957001 Result	Dup Result	RPD	Max RPD	Qualifiers
Mercury	ug/L	0.000022U mg/L	ND		20	

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### QUALITY CONTROL DATA

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

QC Batch: MPRP/15754 Analysis Method: EPA 6010B  
QC Batch Method: EPA 3005A Analysis Description: 6010 MET TCLP  
Associated Lab Samples: 30150255001

METHOD BLANK: 906876 Matrix: Water  
Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	ND	0.050	06/15/15 15:56	
Barium	mg/L	ND	1.0	06/15/15 15:56	
Cadmium	mg/L	ND	0.050	06/15/15 15:56	
Chromium	mg/L	ND	0.050	06/15/15 15:56	
Copper	mg/L	ND	0.050	06/15/15 15:56	
Lead	mg/L	ND	0.050	06/15/15 15:56	
Nickel	mg/L	ND	0.10	06/15/15 15:56	
Selenium	mg/L	ND	0.10	06/15/15 15:56	
Silver	mg/L	ND	0.050	06/15/15 15:56	
Strontium	mg/L	ND	0.050	06/15/15 15:56	
Zinc	mg/L	ND	0.20	06/15/15 15:56	

LABORATORY CONTROL SAMPLE: 906877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	.5	0.49	99	80-120	
Barium	mg/L	.5	.49J	98	80-120	
Cadmium	mg/L	.5	0.51	103	80-120	
Chromium	mg/L	.5	0.52	105	80-120	
Copper	mg/L	.5	0.49	98	80-120	
Lead	mg/L	.5	0.50	99	80-120	
Nickel	mg/L	.5	0.50	101	80-120	
Selenium	mg/L	.5	0.50	101	80-120	
Silver	mg/L	.25	0.25	100	80-120	
Strontium	mg/L	.5	0.49	99	80-120	
Zinc	mg/L	.5	0.53	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 906879 906880

Parameter	Units	30149653002		MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.								
Arsenic	mg/L	0.050 U	.5	.5	0.53	0.54	106	107	75-125	0	20		
Barium	mg/L	0.61J	.5	.5	1.1	1.2	108	110	75-125	1	20		
Cadmium	mg/L	0.050 U	.5	.5	0.53	0.53	106	107	75-125	1	20		
Chromium	mg/L	0.00077J	.5	.5	0.49	0.50	99	100	75-125	2	20		
Copper	mg/L	0.0088J	.5	.5	0.51	0.51	100	101	75-125	1	20		
Lead	mg/L	0.013J	.5	.5	0.51	0.51	99	99	75-125	0	20		
Nickel	mg/L	0.0055J	.5	.5	0.45	0.46	89	90	75-125	1	20		

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 906879 906880

Parameter	Units	30149653002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
			Spike Conc.	Spike Conc.	MS Result	MSD Result					
Selenium	mg/L	0.0063J	.5	.5	0.56	0.56	110	111	75-125	1	20
Silver	mg/L	0.050 U	.25	.25	0.27	0.27	107	109	75-125	2	20
Strontium	mg/L	0.15	.5	.5	0.65	0.66	101	103	75-125	1	20
Zinc	mg/L	0.038J	.5	.5	0.52	0.53	96	98	75-125	2	20

MATRIX SPIKE SAMPLE: 906882

Parameter	Units	30149957001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	0.0049J	.5	0.56	112	75-125	
Barium	mg/L	0.77J	.5	1.3	107	75-125	
Cadmium	mg/L	0.00055U	.5	0.57	113	75-125	
Chromium	mg/L	0.0012J	.5	0.51	101	75-125	
Copper	mg/L	0.0020U	.5	0.53	107	75-125	
Lead	mg/L	0.0036U	.5	0.51	103	75-125	
Nickel	mg/L	0.0042J	.5	0.46	92	75-125	
Selenium	mg/L	0.0094J	.5	0.59	117	75-125	
Silver	mg/L	0.00082U	.25	0.29	117	75-125	
Strontium	mg/L	1.9	.5	2.4	113	75-125	
Zinc	mg/L	0.0073J	.5	0.50	100	75-125	

SAMPLE DUPLICATE: 906878

Parameter	Units	30149653002 Result	Dup Result	RPD	Max RPD	Qualifiers
Arsenic	mg/L	0.050 U	.0047J		20	
Barium	mg/L	0.61J	.6J		20	
Cadmium	mg/L	0.050 U	ND		20	
Chromium	mg/L	0.00077J	ND		20	
Copper	mg/L	0.0088J	.0083J		20	
Lead	mg/L	0.013J	.011J		20	
Nickel	mg/L	0.0055J	.0066J		20	
Selenium	mg/L	0.0063J	.0056J		20	
Silver	mg/L	0.050 U	ND		20	
Strontium	mg/L	0.15	0.15	1	20	
Zinc	mg/L	0.038J	.039J		20	

SAMPLE DUPLICATE: 906881

Parameter	Units	30149957001 Result	Dup Result	RPD	Max RPD	Qualifiers
Arsenic	mg/L	0.0049J	ND		20	
Barium	mg/L	0.77J	.78J		20	
Cadmium	mg/L	0.00055U	ND		20	

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

SAMPLE DUPLICATE: 906881

Parameter	Units	30149957001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium	mg/L	0.0012J	ND		20	
Copper	mg/L	0.0020U	ND		20	
Lead	mg/L	0.0036U	ND		20	
Nickel	mg/L	0.0042J	.005J		20	
Selenium	mg/L	0.0094J	.01J		20	
Silver	mg/L	0.00082U	ND		20	
Strontium	mg/L	1.9	1.9	0	20	
Zinc	mg/L	0.0073J	.0075J		20	

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### QUALITY CONTROL DATA

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

QC Batch: MSV/23797 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV TCLP  
Associated Lab Samples: 30150255001

METHOD BLANK: 906715 Matrix: Water  
Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1-Dichloroethene	ug/L	ND	50.0	06/12/15 11:26	
1,2-Dichloroethane	ug/L	ND	50.0	06/12/15 11:26	
2-Butanone (MEK)	ug/L	ND	5000	06/12/15 11:26	
Benzene	ug/L	ND	50.0	06/12/15 11:26	
Carbon tetrachloride	ug/L	ND	50.0	06/12/15 11:26	
Chlorobenzene	ug/L	ND	1000	06/12/15 11:26	
Chloroform	ug/L	ND	500	06/12/15 11:26	
Tetrachloroethene	ug/L	ND	50.0	06/12/15 11:26	
Trichloroethene	ug/L	ND	50.0	06/12/15 11:26	
Vinyl chloride	ug/L	ND	50.0	06/12/15 11:26	
1,2-Dichloroethane-d4 (S)	%	95	84-124	06/12/15 11:26	
4-Bromofluorobenzene (S)	%	103	84-113	06/12/15 11:26	
Toluene-d8 (S)	%	102	79-118	06/12/15 11:26	

LABORATORY CONTROL SAMPLE: 906716

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethene	ug/L	200	213	107	58-126	
1,2-Dichloroethane	ug/L	200	195	98	66-124	
2-Butanone (MEK)	ug/L	200	215J	108	69-126	
Benzene	ug/L	200	241	120	69-123	
Carbon tetrachloride	ug/L	200	234	117	52-133	
Chlorobenzene	ug/L	200	233J	116	72-121	
Chloroform	ug/L	200	209J	105	63-123	
Tetrachloroethene	ug/L	200	230	115	62-131	
Trichloroethene	ug/L	200	228	114	66-125	
Vinyl chloride	ug/L	200	207	104	58-131	
1,2-Dichloroethane-d4 (S)	%			88	84-124	
4-Bromofluorobenzene (S)	%			101	84-113	
Toluene-d8 (S)	%			105	79-118	

MATRIX SPIKE SAMPLE: 906750

Parameter	Units	30149813001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethene	ug/L	ND	200	179	90	58-126	
1,2-Dichloroethane	ug/L	ND	200	189	95	66-124	
2-Butanone (MEK)	ug/L	ND	200	190J	95	69-126	
Benzene	ug/L	ND	200	181	91	69-123	

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

MATRIX SPIKE SAMPLE:		906750						
Parameter	Units	30149813001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers	
Carbon tetrachloride	ug/L	ND	200	197	98	52-133		
Chlorobenzene	ug/L	ND	200	178J	89	72-121		
Chloroform	ug/L	ND	200	181J	91	63-123		
Tetrachloroethene	ug/L	ND	200	187	93	62-131		
Trichloroethene	ug/L	ND	200	182	91	66-125		
Vinyl chloride	ug/L	ND	200	172	86	58-131		
1,2-Dichloroethane-d4 (S)	%				105	84-124		
4-Bromofluorobenzene (S)	%				103	84-113		
Toluene-d8 (S)	%				99	79-118		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		906751			906752							
Parameter	Units	30150424001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
1,1-Dichloroethene	ug/L	ND	200	200	223	151	112	75	58-126	39	30	R1
1,2-Dichloroethane	ug/L	ND	200	200	241	151	120	75	66-124	46	30	R1
2-Butanone (MEK)	ug/L	ND	200	200	226J	159J	113	79	69-126		30	
Benzene	ug/L	ND	200	200	236	150	118	75	69-123	45	30	R1
Carbon tetrachloride	ug/L	ND	200	200	259	165	130	83	52-133	44	30	R1
Chlorobenzene	ug/L	ND	200	200	238J	150J	119	75	72-121		30	
Chloroform	ug/L	ND	200	200	232J	147J	116	73	63-123		30	
Tetrachloroethene	ug/L	ND	200	200	224	149	112	74	62-131	40	30	R1
Trichloroethene	ug/L	ND	200	200	238	150	119	75	66-125	45	30	R1
Vinyl chloride	ug/L	ND	200	200	191	154	95	77	58-131	21	30	
1,2-Dichloroethane-d4 (S)	%						103	116	84-124			
4-Bromofluorobenzene (S)	%						98	100	84-113			
Toluene-d8 (S)	%						102	99	79-118			

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### QUALITY CONTROL DATA

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

QC Batch: OEXT/24026      Analysis Method: EPA 8270C  
QC Batch Method: EPA 3535A      Analysis Description: 8270 TCLP MSSV  
Associated Lab Samples: 30150255001

METHOD BLANK: 907395      Matrix: Water  
Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dichlorobenzene	ug/L	ND	500	06/15/15 10:48	
2,4,5-Trichlorophenol	ug/L	ND	5000	06/15/15 10:48	
2,4,6-Trichlorophenol	ug/L	ND	100	06/15/15 10:48	
2,4-Dinitrotoluene	ug/L	ND	100	06/15/15 10:48	
2-Methylphenol(o-Cresol)	ug/L	ND	2000	06/15/15 10:48	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	2000	06/15/15 10:48	
Hexachloro-1,3-butadiene	ug/L	ND	100	06/15/15 10:48	
Hexachlorobenzene	ug/L	ND	100	06/15/15 10:48	
Hexachloroethane	ug/L	ND	500	06/15/15 10:48	
Nitrobenzene	ug/L	ND	100	06/15/15 10:48	
Pentachlorophenol	ug/L	ND	5000	06/15/15 10:48	
Pyridine	ug/L	ND	500	06/15/15 10:48	
2,4,6-Tribromophenol (S)	%	82	64-115	06/15/15 10:48	
2-Fluorobiphenyl (S)	%	74	49-105	06/15/15 10:48	
2-Fluorophenol (S)	%	88	51-128	06/15/15 10:48	
Nitrobenzene-d5 (S)	%	85	38-129	06/15/15 10:48	
Phenol-d6 (S)	%	83	48-121	06/15/15 10:48	
Terphenyl-d14 (S)	%	58	10-101	06/15/15 10:48	

METHOD BLANK: 907400      Matrix: Water  
Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dichlorobenzene	ug/L	ND	500	06/15/15 11:28	
2,4,5-Trichlorophenol	ug/L	ND	5000	06/15/15 11:28	
2,4,6-Trichlorophenol	ug/L	ND	100	06/15/15 11:28	
2,4-Dinitrotoluene	ug/L	ND	100	06/15/15 11:28	
2-Methylphenol(o-Cresol)	ug/L	ND	2000	06/15/15 11:28	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	2000	06/15/15 11:28	
Hexachloro-1,3-butadiene	ug/L	ND	100	06/15/15 11:28	
Hexachlorobenzene	ug/L	ND	100	06/15/15 11:28	
Hexachloroethane	ug/L	ND	500	06/15/15 11:28	
Nitrobenzene	ug/L	ND	100	06/15/15 11:28	
Pentachlorophenol	ug/L	ND	5000	06/15/15 11:28	
Pyridine	ug/L	ND	500	06/15/15 11:28	
2,4,6-Tribromophenol (S)	%	80	64-115	06/15/15 11:28	
2-Fluorobiphenyl (S)	%	74	49-105	06/15/15 11:28	
2-Fluorophenol (S)	%	89	51-128	06/15/15 11:28	
Nitrobenzene-d5 (S)	%	83	38-129	06/15/15 11:28	

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### QUALITY CONTROL DATA

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

METHOD BLANK: 907400 Matrix: Water

Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phenol-d6 (S)	%	83	48-121	06/15/15 11:28	
Terphenyl-d14 (S)	%	56	10-101	06/15/15 11:28	

LABORATORY CONTROL SAMPLE: 907396

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	500	357J	71	49-85	
2,4,5-Trichlorophenol	ug/L	500	437J	87	63-117	
2,4,6-Trichlorophenol	ug/L	500	419	84	61-110	
2,4-Dinitrotoluene	ug/L	500	409	82	51-113	
2-Methylphenol(o-Cresol)	ug/L	500	411J	82	64-109	
3&4-Methylphenol(m&p Cresol)	ug/L	1000	853J	85	64-113	
Hexachloro-1,3-butadiene	ug/L	500	322	64	43-95	
Hexachlorobenzene	ug/L	500	246	49	33-80	
Hexachloroethane	ug/L	500	347J	69	44-93	
Nitrobenzene	ug/L	500	433	87	61-126	
Pentachlorophenol	ug/L	500	512J	102	40-111	
Pyridine	ug/L	500	139J	28	10-63	
2,4,6-Tribromophenol (S)	%			82	64-115	
2-Fluorobiphenyl (S)	%			71	49-105	
2-Fluorophenol (S)	%			86	51-128	
Nitrobenzene-d5 (S)	%			83	38-129	
Phenol-d6 (S)	%			82	48-121	
Terphenyl-d14 (S)	%			52	10-101	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 907398 907399

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		30150255001 Result	Spike Conc.	Spike Conc.	MS Result							
1,4-Dichlorobenzene	ug/L	ND	500	500	395J	417J	79	83	49-85		46	
2,4,5-Trichlorophenol	ug/L	ND	500	500	448J	477J	90	95	63-117		38	
2,4,6-Trichlorophenol	ug/L	ND	500	500	433	471	87	94	61-110	8	36	
2,4-Dinitrotoluene	ug/L	ND	500	500	415	451	83	90	51-113	8	43	
2-Methylphenol(o-Cresol)	ug/L	ND	500	500	418J	454J	81	89	64-109		33	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	1000	1000	849J	927J	85	93	64-113		33	
Hexachloro-1,3-butadiene	ug/L	ND	500	500	367	389	73	78	43-95	6	49	
Hexachlorobenzene	ug/L	ND	500	500	287	330	57	66	33-80	14	62	
Hexachloroethane	ug/L	ND	500	500	301J	322J	60	64	44-93		53	
Nitrobenzene	ug/L	ND	500	500	429	461	86	92	61-126	7	38	
Pentachlorophenol	ug/L	ND	500	500	562J	603J	112	121	40-111		46	M1
Pyridine	ug/L	ND	500	500	108J	132J	22	26	10-63		51	
2,4,6-Tribromophenol (S)	%						90	97	64-115			

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

Parameter	Units	907398		907399		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		30150255001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result					
2-Fluorobiphenyl (S)	%					77	80	49-105		
2-Fluorophenol (S)	%					90	96	51-128		
Nitrobenzene-d5 (S)	%					84	90	38-129		
Phenol-d6 (S)	%					84	91	48-121		
Terphenyl-d14 (S)	%					69	84	10-101		

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit CI  
Pace Project No.: 30150255

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QC Batch: PMST/5395                      Analysis Method: ASTM D2974-87  
QC Batch Method: ASTM D2974-87                      Analysis Description: Dry Weight/Percent Moisture  
Associated Lab Samples: 30150255001

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SAMPLE DUPLICATE: 907855

Parameter	Units	30149555001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	20.2	20.7	2	20	

SAMPLE DUPLICATE: 907856

Parameter	Units	30149555004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	23.8	14.5	48	20	D6

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

QC Batch: WET/28683      Analysis Method: EPA 1010  
QC Batch Method: EPA 1010      Analysis Description: 1010 Flash Point, Closed Cup  
Associated Lab Samples: 30150255001

METHOD BLANK: 905329      Matrix: Water  
Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Flashpoint	deg F	>200	60.0	06/10/15 14:30	

SAMPLE DUPLICATE: 905330

Parameter	Units	30150184001 Result	Dup Result	RPD	Max RPD	Qualifiers
Flashpoint	deg F	>200	>200			

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit CI  
Pace Project No.: 30150255

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QC Batch: WET/28679                      Analysis Method: EPA 160.4  
QC Batch Method: EPA 160.4              Analysis Description: 160.4 Total Volatile Solids  
Associated Lab Samples: 30150255001

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METHOD BLANK: 905316                      Matrix: Solid  
Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Volatile Solids	% (w/w)	ND	10.0	06/10/15 14:37	

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SAMPLE DUPLICATE: 905317

Parameter	Units	30150256001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Volatile Solids	% (w/w)	76.7	79.5	4	20	

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

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QC Batch: WET/28670	Analysis Method: EPA 9045C
QC Batch Method: EPA 9045C	Analysis Description: 9045 pH
Associated Lab Samples: 30150255001	

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SAMPLE DUPLICATE: 904979

Parameter	Units	30150256001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.3	8.3	0	10	

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### QUALITY CONTROL DATA

Project: Fairmont Brine - Sludge Pit CI  
Pace Project No.: 30150255

QC Batch: WET/28732      Analysis Method: EPA 9071B  
QC Batch Method: EPA 9071B      Analysis Description: 9071 ASE, Oil and Grease/TPH  
Associated Lab Samples: 30150255001

METHOD BLANK: 907040      Matrix: Solid  
Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/kg	ND	98.6	06/15/15 08:00	

LABORATORY CONTROL SAMPLE: 907041

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/kg	1590	1530	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 907042      907043

Parameter	Units	30150383001		MS		MSD		% Rec Limits	Max RPD	Qual	
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result				% Rec
Oil and Grease	mg/kg	358	1630	1630	2080	2040	106	104	85-115	2	20

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

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QC Batch:	WET/28682	Analysis Method:	EPA 9095A
QC Batch Method:	EPA 9095A	Analysis Description:	9095 PAINT FILTER LIQUID TEST
Associated Lab Samples:	30150255001		

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SAMPLE DUPLICATE: 905328

Parameter	Units	30150223001 Result	Dup Result	RPD	Max RPD	Qualifiers
Free Liquids		PASS	PASS			

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit CI  
Pace Project No.: 30150255

QC Batch: WETA/20267      Analysis Method: SW-846 7.3.4.2  
QC Batch Method: SW-846 7.3.4.2      Analysis Description: 734S Reactive Sulfide  
Associated Lab Samples: 30150255001

METHOD BLANK: 905434      Matrix: Solid  
Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide, Reactive	mg/kg	ND	10	06/10/15 18:00	

SAMPLE DUPLICATE: 905672

Parameter	Units	30149951001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Reactive	mg/kg	9.9U	ND		20	

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**QUALITY CONTROL DATA**

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

QC Batch: WETA/20310 Analysis Method: EPA 9012A  
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide  
Associated Lab Samples: 30150255001

METHOD BLANK: 907831 Matrix: Solid  
Associated Lab Samples: 30150255001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.60	06/15/15 21:47	

LABORATORY CONTROL SAMPLE: 907832

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	5	5.2	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 907833 907834

Parameter	Units	30150255001 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Cyanide	mg/kg	ND	5.6	5.3	4.9	3.9	73	57	90-110	22	20	M1,R1		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Fairmont Brine - Sludge Pit CI  
Pace Project No.: 30150255

Sample: Fairmont Brine - Sludge Pit CI Lab ID: 30150255001 Collected: 06/08/15 09:25 Received: 06/09/15 15:45 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Antimony-124	EPA 901.1	0.000 ± 0.674 (2.037) C:NA T:NA	pCi/g	06/15/15 16:51	14683-10-4	
Cobalt-60	EPA 901.1	0.000 ± 0.565 (1.683) C:NA T:NA	pCi/g	06/15/15 16:51	10198-40-0	
Iridium-192	EPA 901.1	0.000 ± 0.634 (1.680) C:NA T:NA	pCi/g	06/15/15 16:51	14694-69-0	
Potassium-40	EPA 901.1	26.630 ± 19.036 (17.130) C:NA T:NA	pCi/g	06/15/15 16:51	13966-00-2	
Radium-226	EPA 901.1	1453.500 ± 200.780 (44.630) C:NA T:NA	pCi/g	06/15/15 16:51	13982-63-3	
Radium-228	EPA 901.1	303.750 ± 40.774 (7.817) C:NA T:NA	pCi/g	06/15/15 16:51	15262-20-1	
Scandium-46	EPA 901.1	1.268 ± 1.784 (1.774) C:NA T:NA	pCi/g	06/15/15 16:51	13967-63-0	
Silver-110M	EPA 901.1	2.381 ± 1.567 (1.549) C:NA T:NA	pCi/g	06/15/15 16:51	14391-76-5	
Thorium-232	EPA 901.1	162.200 ± 392.170 (478.000) C:NA T:NA	pCi/g	06/15/15 16:51	7440-29-1	
Uranium-238	EPA 901.1	94.336 ± 17.406 (17.780) C:NA T:NA	pCi/g	06/15/15 16:51		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

QC Batch: RADC/24797 Analysis Method: EPA 901.1  
QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec  
Associated Lab Samples: 30150255001

METHOD BLANK: 906067 Matrix: Solid  
Associated Lab Samples: 30150255001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Antimony-124	0.000 ± 0.033 (0.159) C:NA T:NA	pCi/g	06/11/15 13:35	
Cobalt-60	0.003 ± 0.106 (0.135) C:NA T:NA	pCi/g	06/11/15 13:35	
Iridium-192	0.042 ± 0.058 (0.097) C:NA T:NA	pCi/g	06/11/15 13:35	
Potassium-40	0.028 ± 1.455 (1.615) C:NA T:NA	pCi/g	06/11/15 13:35	
Radium-226	0.454 ± 1.910 (2.506) C:NA T:NA	pCi/g	06/11/15 13:35	
Radium-228	0.093 ± 0.172 (0.554) C:NA T:NA	pCi/g	06/11/15 13:35	
Scandium-46	0.000 ± 0.015 (0.131) C:NA T:NA	pCi/g	06/11/15 13:35	
Silver-110M	0.043 ± 0.073 (0.080) C:NA T:NA	pCi/g	06/11/15 13:35	
Thorium-232	0.000 ± 23.005 (78.470) C:NA T:NA	pCi/g	06/11/15 13:35	
Uranium-238	0.000 ± 0.888 (1.950) C:NA T:NA	pCi/g	06/11/15 13:35	

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Act - Activity  
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).  
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)  
(MDC) - Minimum Detectable Concentration  
Trac - Tracer Recovery (%)  
Carr - Carrier Recovery (%)  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

D6 The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.  
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.  
R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Fairmont Brine - Sludge Pit Cl  
Pace Project No.: 30150255

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 3005A	MPRP/15754	EPA 6010B	ICP/14949
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 7470A	MERP/6597	EPA 7470A	MERC/6295
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 3535A	OEXT/24026	EPA 8270C	MSSV/7735
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 8260B	MSV/23797		
30150255001	Fairmont Brine - Sludge Pit Cl	ASTM D2974-87	PMST/5395		
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 901.1	RADC/24797		
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 1010	WET/28683		
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 160.4	WET/28679		
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 9045C	WET/28670		
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 9071B	WET/28732	EPA 9071B	WET/28733
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 9095A	WET/28682		
30150255001	Fairmont Brine - Sludge Pit Cl	SW-846 7.3.4.2	WETA/20267		
30150255001	Fairmont Brine - Sludge Pit Cl	EPA 9012A	WETA/20310	EPA 9012A	WETA/20313

### REPORT OF LABORATORY ANALYSIS

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30150255

**David Pichette - Fairmont Brine samples sent in yesterday**

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**From:** "Quinn, Richard" <rquinn2@wm.com>  
**To:** David Pichette <David.Pichette@pacelabs.com>, Kirk Eastham <kirk.eastham...>  
**Date:** 6/10/2015 9:42 AM  
**Subject:** Fairmont Brine samples sent in yesterday

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Can we add Cobalt 60 and silver 110?

**Rick Quinn**  
Environmental Protection Specialist  
[rquinn2@wm.com](mailto:rquinn2@wm.com)

**Waste Management**  
**Energy Services**  
1488 Dawson Dr, STE 102  
Bridgeport, WV 26330  
Cell [304-844-1580](tel:304-844-1580)

**Energy Services Dispatch 24/7**  
Tel [681-456-6971](tel:681-456-6971)  
eFax [866-863-4769](tel:866-863-4769)  
[OilfieldDispatch@wm.com](mailto:OilfieldDispatch@wm.com)

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Sample Condition Upon Receipt

Client Name: Wm

Project # 30150255

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no Biological Tissue Is Frozen: Yes No

Packing Material: Bubble Wrap  Bubble Bags \_\_\_\_\_ None \_\_\_\_\_ Other \_\_\_\_\_

Thermometer Used B Type of Ice:  Wet  Blue  None  Samples on Ice, cooling process has begun

Cooler Temp.: Observed Temp.: 2.1 °C Correction Factor: +0.1 °C Final Temp: 2.2 °C

Date and Initials of person

examining contents: Ann  
6/9/15

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. no ID - sample says: Fairmont Brine Box vB1447
-Includes date/time/ID/Analysis Matrix: <u>SL</u>		
All containers needing preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
exceptions: VOA, coliform, TOC, O&G, Phenols	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed <u>Ann</u> Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: The sample is the correct sample

Project Manager Review: \_\_\_\_\_

Pickens

Date: \_\_\_\_\_

6/9/15 2011

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

30150255

Project Number:

Client Name: WM



Item No.	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500 )	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y	O & G (1L)	TPH (1L)	VOA (40 ml 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubtainer (500 ml / 4L)	Ziploc	Other	Other
100	75	Y																						