Weissbach, Annette E - DNR

From: Killian, James - DNR
Sent: Wednesday, March 28, 2012 12:22 PM
To: Stanforth, Robert
Cc: Weissbach, Annette E - DNR; Sellwood, Alyssa; Bougie, Cheryl - DNR
Subject: RE: Comments from Jim Killian on Stanforth memorandum

Thank you, Bob. Yes, I forgot about the ferric iron addition being acidic; I know that was discussed in the plan memo last fall.

My only remaining concern is the potential for the Fe-bound arsenic particles to be transported across the site via the surface water sloughs. Monitoring of those sloughs will tell us what is happening seasonally and over time at the site.

Thanks again,

Jim

From: Stanforth, Robert [mailto:RStanforth@trcsolutions.com]
Sent: Wednesday, March 28, 2012 09:56 AM
To: Weissbach, Annette E - DNR; Sellwood, Alyssa
Cc: Vickman, Kimberly M - DNR; Killian, James - DNR
Subject: RE: Comments from Jim Killian on Stanforth memorandum

Jim

To address your questions:

1. The pH is slightly acidic because of the ferric iron that was used in the remediation. Ferric iron is about as acidic as phosphoric acid, and will take the pH down to the 2-3 range if not buffered (as in acid mine drainage). The calcium carbonate was added to neutralize the acid from the iron, and bring the pH towards neutral. The neutralization process generates bicarbonate, and so the water should have a high bicarbonate concentration. The organic material from the marsh (fulvic and humic acids, tannins, or whatever you want to call it) could possibly contribute to the acidity of the sample, but there contribution would be uniform throughout the marsh, and most of the marsh is pretty neutral. Over time, limestone will raise the pH to the slightly alkaline values that we associate with hard water, but the reaction is quite slow.
2. See attached.
3. It is possible that very fine particulates will move with the groundwater, but given the slow groundwater flow rates at the site it is very unlikely. Generally particulates either settle or are filtered out of groundwater as it moves through the soil, and I would expect the same to be true here. If the particulates were injected, the arsenic would most likely still be toxic. Having the arsenic in the particulate form would affect its mobility but not its toxicity. If the arsenic has settled out of the groundwater after the six months or so since the remediation, then it will not

move far in the groundwater.

Bob

From: Weissbach, Annette E - DNR [mailto:Annette.Weissbach@Wisconsin.gov]
Sent: Wednesday, March 28, 2012 8:55 AM
To: Sellwood, Alyssa; Stanforth, Robert
Cc: Vickman, Kimberly M - DNR; Killian, James - DNR
Subject: Comments from Jim Killian on Stanforth memorandum

I Alyssa,
We're good on the sampling plan; no additional comments. So please finalize and give us some potential dates.
I'd prefer to avoid the week of April 23-27, if possible?

I've been talking with SLOH on the .02 filters, not a problem.
Kim and I can work on getting bottles, preservatives, paperwork, etc. lined up.

Now to Jims comments below. I know we're beyond scope on this but could we have a conference call to talk about it? And if Bob wouldn't mind answering in writing -- that would be awesome!

I'm tied up the rest of the week and M, T, W of next week, however, the week of April 9th looks good for both Jim and I for a call

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From: Killian, James - DNR
Sent: Sunday, March 25, 2012 10:22 AM
To: Weissbach, Annette E - DNR; Bougie, Cheryl - DNR
Cc: Galarneau, Stephen G - DNR
Subject: RE: Reply requested: Kewaunee Phase II Baseline Sampling Proposal

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Comments re: the memorandum:

Once again, Bob has done a decent job of explaining complex issues of environmental chemistry in laymen's terms. I have a few comments that I think would help me better understand the situation at the hot-spot:

1) Assuming "the water should have significant bicarbonate concentration that will limit ferrous concentrations..", why then aren't pH values tending towards the basic, rather than acidic range? Are the organic tannins that much more acidic? Or is there more ferrous being generated than initially thought?

2) For the (pre-remediation) cross section, it would be helpful to have that x-section plotted on the post-remedy. figure 2, as I'm not sure where A and A' are located with reference to the remedial cells and wells.

3) So the modified sampling plan is to test the hypothesis that the arsenic is not dissolved in the water, but rather, "associated" with the fine ferric particles. I get it, but I don't understand why that association minimizes mobility of the As (Other than limiting its ability to dissolve in water). Is there a possibility that the iron-bound arsenic can move laterally across the marsh as a solid particle in water? What does the Fe-As association mean in terms of human and ecological health risks? How does it change (ingested) toxicity?

Perhaps a short phone call with Bob and anyone else interested would be the best way to handle the

response.

- jk

From: Weissbach, Annette E - DNR
Sent: Monday, March 19, 2012 08:24 AM
To: Bougie, Cheryl - DNR; Killian, James - DNR; Young Eagle, Jonathan - DNR
Cc: Vickman, Kimberly M - DNR; Chronert, Roxanne N - DNR
Subject: Reply requested: Kewaunee Phase II Baseline Sampling Proposal

Hi Cheryl and Jim,
for your review attached is a proposal for a phase II baseline sampling effort focused only on the three new well nests and MW04-9.

Why? The initial (phase I) baseline sampling conducted in November 2011 had unexpectedly high arsenic concentrations within the treatment area (especially for those wells screened directly in the treated material, MW11-1 and MW11-2). See the attached groundwater memo PDF.

Thus this proposal seeks to conduct a phase II baseline effort and look at various options of collecting and filtering samples. The main questions we want answered before establishing the two year semi-annual sampling effort:

- are colloids in the collected sample skewing the arsenic concentration in water
- what type of filters should be used
- should the existing dedicated bailers be used or instead use low flow sampling with peristaltic pumps

Ted OConnell, TRC, will be the field Hydro from TRC and Kim Vickman, Ted and I will use their and our sampling equipment. The samples will be sent to SLOH. We will also collect unfiltered samples from the wells and standing surface water.

Based on the results of this Phase II effort, we'll establish the two year semi-annual sampling plan that Kim will implement.

So, please take a look. if you have any comments or suggestions please email to all by March 23. We'd like to get this signed and ready to go as soon as possible.

Jonathan, this would be a "Goods and Services" contract.

thanks in advance!
Annette Weissbach
WDNR Remediation & Redevelopment Program
phone: (920) 662-5165

From: Sellwood, Alyssa [mailto:ASellwood@trcsolutions.com]
Sent: Friday, March 16, 2012 08:48 AM
To: Weissbach, Annette E - DNR
Cc: O'Connell, Theodore
Subject: Kewaunee Phase II Baseline Sampling Proposal

Annette

Hope you are enjoying this summer like weather. Can we hope this means that a spring sampling

at Kewaunee will be snow free?

I have attached a draft of the proposal for the Phase II Baseline sampling event for your review. Let me know if you have any changes, and if it is okay to finalize.

Also, FYI, the final Source Area Documentation report was sent out yesterday, and you should be receiving it in today's mail.

Alyssa Sellwood, P.E.
Project Engineer

708 Heartland Trail, Suite 3000 Madison, WI 53717
T: 608.826.3658 | F: 608.826.3941 | C: 608.234.8001
asellwood@trcsolutions.com
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