

**United States Army Corps of Engineers – New England District
Cold Regions Research and Engineering Laboratory (CRREL)
Restoration Advisory Board**

Minutes of Meeting #18

**Wednesday, May 17th, 2017
Richmond Middle School (RMS) Library
Hanover, New Hampshire**

Attending: Jeff Pickett - Amec Foster Wheeler – Jeffrey.Pickett@amecfw.com
Rod Rustad - Amec Foster Wheeler – Rod.Rustad@amecfw.com
Scott Calkin - Amec Foster Wheeler – Scott.Calkin@amecfw.com
Darrell Moore (Chair) – USACE - Darrell.A.Moore@usace.army.mil
Tim McNamara (Chair)- Dartmouth College– Timothy.j.mcnamara@dartmouth.org
Ken Richards – NHDES – Kenneth.Richards@des.nh.gov
Roelof Versteeg – Community Member – Roelof.versteeg@gmail.com
Glen Gordon - Amec Foster Wheeler – Glen.Gordon@amecfw.com
Michael Murphy Amec Foster Wheeler Micheal.j.murphy@amecfw.com
Chief Martin McMillan – Hanover Fire Dept. Martin.McMillan@hanovernh.org
(came in at end of meeting)

Observing: Jack Besse - Amec Foster Wheeler – Jack.Besse@amecfw.com
Bryan Ambrust– USACR-ERDC – Bryan.R.ambrust.civ@mail.mil
Robin Mongeon – NHDES Robin.Mongeon@des.nh.gov
Terry Harwood – CRREL– bartlett.harwood@usace.army.mil
Amy Quintin Amec Foster Wheeler amy.quintin@amecfw.com
Gary Pasternak – CRREL

Agenda:

- 1) Review/Accept January 11, 2017 Meeting Minutes
 - 2) Connecticut River Sampling Update
 - 3) Soil Vapor Extraction Pilot at AOC 9 and AOC 2
 - 4) Upcoming Work
 - 5) Draft Final Remedial Investigation Report
 - 6) Schedule Next Meeting
 - 7) Adjourn
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- 1) Review and approval of Jan 2017 meeting minutes as supplied by Amec Foster Wheeler. Restoration Advisory Board (RAB) member's moves to and accepted January 11, 2017 meeting minutes.
 - 2) United States Army Corps of Engineers New England District (COE NAE) Chair begins leading the discussion with the RAB and reviews the agenda items
 - 3) There are copies of the remedial investigation (RI) report that will be review in the RAB tonight as well as a few other agenda items.
 - 4) COE NAE would like to get together in the next few weeks to do thorough review into the RI Report with the RAB.

- 5) Amec Foster Wheeler begins the review of the work and findings from the Connecticut (CT) River work. Investigations in the river (borings and coring) located an area of till containing dissolved TCE about 20ft below the bottom of the river and located on the western side of the CT River.
- 6) Amec Foster Wheeler reviewed the geology including bedrock outcrop and till that overlies the bedrock. that was encountered during the CT river bottom borehole investigation
- 7) Amec Foster Wheeler shows a figure of the bathymetry and the cross section showing geology beneath the CT River. The figure also shows where rock core samples were collected beneath the sediment in the CT River.
- 8) Matrix of the rock core was non-detect or (ND) for TCE contamination which is good news and means the rock matrix is not a continuing source of TCE contamination to the wells in VT.
- 9) Bedrock core was quite broken up and the fractures were along bedding planes. Bedrock is not a continuing source of TCE to the VT wells. However, the TCE is likely getting into the deep VT wells via the fractures with in the bedrock wells.
- 10) NHDES inquiring if COE is planning to do additional work in VT and what the timing of that work may be in the near future?
 - a. COE NAE (Chair) indicates that additional work is dependent on future funding and may be able to do a couple of additional wells if there is a need. VTDEC has also expressed need to the COE NAE to also meet with town of Norwich VT to review the CSM.
- 11) Next overview will be on the pilot SVE systems at CRREL by Glen Gordon of Amec Foster Wheeler.
- 12) Amec Foster Wheeler reviews the history of soil vapor pilot testing at CRREL at Area of Concern (AOC) 2 and AOC 9.
- 13) AOC 9 Soil Vapor Extraction (SVE) Pilot test was moved from AOC 2 in Jan 2017 to AOC 9.
- 14) AOC 2 shallow well with carbon treatment was restarted in April 2017.
- 15) AOC 9 shallow well flow are quite low at about 10 cfm and about 100 CFM at AOC 2 treating with carbon.
- 16) After moving to AOC 9 the GEO C3 the system was started in March. System has removed about 60 gallons of TCE out of the AOC 9 subsurface since it was started.
- 17) SVE pilot system data being used to allow Amec Foster Wheeler and COE NAE to design a larger interim system. The SVE pilot also is providing data to determine the effects on the sub slab depressurization systems installed beneath the floor systems of the CRREL Main Laboratory building.
- 18) Amec Foster Wheeler provides a review of the graphical results from the AOC 2 SVE Pilot system vs Multipurpose Room (MPR) sub slab depressurization system at the North end of the CRREL Main Lab Building.

- 19) There is also a review of the graphs for the SVE Pilot at AOC 9 system vs the Main lab addition sub slab depressurization system.
- 20) Appears from the data that Amec Foster Wheeler and the COE NAE is collecting that there are some positive affects as a result of operation of the SVE Pilot systems at AOC 2 and AOC 9.
- 21) Is it possible that there may be some additional shallow sources at AOC 9? Geology and shallow soils in AOC 9 area much tighter only getting about 5 cfm of vapor /air flow out of shallow soils at AOC 9.
- 22) Amec Foster Wheeler provides a review of potential SVE Pilot effects on GW at the site. Data seems to indicate a positive effect on MW107 and GW concentrations at MW 107 located just to the northeast of the AOC 2 pilot test extraction wells. After starting the test at AOC 2 the concentrations in groundwater at MW 107 dropped several orders of magnitude and have remained low since the test was terminated at AOC 2.
- 23) Amec Foster Wheeler personnel indicate that we are not seeing a large rebound of TCE in the soil vapor at AOC 2 after termination of the pilot test at AOC 2. It is likely TCE did not migrate to the groundwater table and reducing the mass in the soil gas has resulted in decreasing concentrations in groundwater.
- 24) Amec Foster Wheeler personnel describe the likely release mechanism of free product into the varved and unsaturated soils. The historical DNAPL releases were likely dispersed throughout the varved soils and absorbed by the soils column without reaching the water table as free product.
- 25) Amec Foster Wheeler reviews the goals of the SVE pilot study and testing. See wrap up slide tracking AOC 9 testing and effects of the sub slab depressurization systems also tracking effects to groundwater. The Army will continue to run AOC 2 and AOC 9 SVE Pilot systems and track the effects over the next several months
- 26) COE NAE (Co Chair) reviews the upcoming and continuing work at CRREL. The work includes continuing hapsite indoor air sampling and analysis, more robust aquifer test, and additional off post soil gas implants in June on the Rivercrest property.
- 27) Indoor air sampling event in August at CRREL buildings. Also, another indoor air and sub slab sampling event at Richmond Middle School (RMS). Dr. Bass superintendent of the school system has indicated to COE NAE that he would like another presentation for the School Board members and may ask for reduced indoor Air program at FRMS possibly limited to 2 times per year.
- 28) Amec Foster Wheeler is continuing to work on the feasibility (FS) with concurrent review by COE and the larger army wide review.
- 29) Amec Foster wheeler and COE NAE will continue to run AOC 2 and AOC 9 SVE Pilot tests. The Army may switch to a carbon-based system at AOC 9 if concentrations continue to be reduced.
- 30) Amec Foster Wheeler will be working to finalize the RI in the Sept /Oct time frame. This allows NHDES for an approximately 45 days of review time frame.

- 31) Question about optimizing the SVE systems. When Amec Foster Wheeler and COE NAE have enough data from the SVE pilot systems, we will need to move into an EE/CA to scope and justify an interim system and design.
- 32) Question from the RAB regarding review of the Remedial Investigation Report. Who or what groups have reviewed the report and comments and responses?
- 33) NAE COE, Omaha CX, AEC, CRREL Army Public Health Command all reviewed and commented on the RI report over the last several months, and their comments have been formally addressed.
- 34) COE NAE and Amec Foster Wheeler would like to work with RAB to get a date for a deeper review session of the RI. Session would be good to highlight and review the key points of the CRREL RI report.
- 35) NHDES is disappointed with the VT work. NHDES feels that the CRREL and the existing and any future VT work should all be included in the existing RI Report.
- 36) VT piece of the work involves exposures and potential Human Health risks and NHDES is concerned that the VT properties are not be investigated and the work in VT is not moving forward fast enough.
- 37) NHDES indicates how the NH Deed and use restrictions work in NH. NHDES does not believe that similar VT process is not happening as fast or in concert with VT and CRREL work.
- 38) NHDES would like to see a work plan for future work in VT.
- 39) Amec Foster Wheeler provides a discussion of the status of the 3 wells sampled previously in VT. 2 of the 3 wells reviewed do not now have pumps in the wells therefore there is limited access to water from those two wells. NHDES wants to see use restrictions on the use of groundwater and wells in VT.
- 40) COE NAE believes that a conceptual site model (CSM) needs to be delivered and discussed with VTDEC before moving forward with any additional work in VT.
- 41) The comments on the RI report from internal army have already been responded to by COE and AMEC. Approximately 30% of the comments were related to the use of HAPSITE® data in the RI report and risk assessment use of HAPSITE® data.
- 42) NHDES would not have an approvable RI without the perfluorinated compounds (PFAS) evaluations in groundwater. COE NAE and NHDES need to have an offline discussion. There is currently no likely source of PFAS on site at CRREL.
- 43) Amec Foster Wheeler and COE NAE have not initiated the PFOA and PFAS investigation at CRREL as of this week.
- 44) NHDES is advocating that the Army go out and sample immediately for PFOAS and PFAS.

- 45) Have NHDES put the request for PFOA and PFAS sampling in writing to the Army.
- 46) AMEC Foster Wheeler describes the RI report and Process the development of the RI closely follow the CERCLA process.
- 47) Amec Foster Wheeler provides a review of the HH Risk summary from the RI report see the slide package for the HH and eco risk summary.
- 48) COE NAE reviews the Items that will be addressed in the FS for the CRREL site.
- 49) The individual review session will be to assist people in reviewing the RI report in detail.
- 50) Amec Foster Wheeler has also included a blank comment file on each thumb drive if RAB personnel would like to review and add comments.
- 51) Additional comment from NHDES, four people are missing from tonight's RAB meetings. May need additional folks for the RAB. Challenge to get all the RAB Members involved in the RAB due to schedule conflicts.
- 52) Meeting adjourned at 5:45 pm.