

From: Ziegelbauer, Heather/MKE <Heather.Ziegelbauer@jacobs.com>
Sent: Friday, October 18, 2019 4:53 PM
To: Dodds, Jennifer; Carey, Angela J - DNR
Cc: Jeffrey Howard Danko; Joseph Janeczek; Ryan Suennen; Finney, David/BOS; Mitchell, David/BOS
Subject: Tyco - Arsenic Migrations Pathways Evaluation - Drilling Update and Proposed Changes

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Reference

Jennifer and Angie,

Here is an update on the drilling effort at the Tyco Fire Products LP site in Marinette. Wanted to update you on our progress and challenges we are encountering during this event.

- We had a late start this week due to lightning on Tuesday and had to stop work at VP-101 that had only advanced 1 foot and on Wednesday completed no work because of high winds.
- Thursday we started at location VP-101 and collected split spoon samples from 0.0 to 3.0-ft below glacial till surface. We did not get a visual confirmation of bedrock in split spoon sampler: however 3-in split spoon was “bouncing,” then hollow stem auger was unable to advance, followed up with 2-in split spoon which also “bounced” and then abandoned the borehole.
- We set up at VP-102 next and collected split spoon samples from 0.0 to 6.1-ft below glacial till surface; taking about 4-hrs time. The last split spoon refused at 90+ blow counts at 0.4-ft. Split spoon sampling in the glacial till is time consuming and due to amount of gravel and cobbles, offsetting is not considered a viable option (would likely have same refusal); we also anticipate sampling time will be longer at depth due to harder material and longer core runs. With the slow going and repeated refusal, we attempted to collect the remaining samples with a rock core; we were able to tag bedrock, but unable to collect glacial till samples due to washout during the core advancement/retrieval. Bedrock at VP-102 was about ~12 -ft below glacial till surface at elevation 540.77. Samples were not obtained from 6.1 to 12 feet below the top of the glacial till at this location.
- Friday we set up at VP-103 with a new approach of using the Denison sampler to see if it proved better than the split spoon. The Denison made it into till about 0.3-ft then hit refusal. We are switching back to the split spoon sampling for now to see how it goes at VP-103 (anticipated to be similar to or more thickness than VP-102). The Denison sampler may still work for the geotechnical samples, based on discussions with the lab we need a minimum volume of 1-inch diameter and 6 inches long.

Items yet to try:

- Driller is bringing a soil core bit to use with the core barrel that may allow for the core approach to retrieve samples with these dense soils.
- Brass liner for split spoon could be used for Geotech samples if Denison sampler proves not to provide enough volume.

Based on our progress to date we would like to make the following immediate changes from our work plan:

- Initial estimates of glacial till material were thought to be 3 to 8 feet of thickness and we had proposed a 6-inch soil sample interval. In areas where there is greater than 6 feet of till thickness, a soil sample interval of 1 foot is proposed instead of the 6 inches. We believe this will provide sufficient data for our vertical soil concentration profiles.
- With the hardness of the glacial till, the driller does not think the Geoprobe sampling system will work for collecting groundwater samples. Therefore instead of collecting groundwater samples every 2 feet, we are proposing to instead collect groundwater samples at up to two depth intervals, if till thickness allows, using a temporary well (1 inch diameter PVC well, with filter pack and bentonite seal to the top of till, would let sit for bentonite to hydrate for about 30 minutes to create a seal and then sample). One depth interval would be at the bottom of the borehole above bedrock and one at the midpoint interval of the glacial till. At some locations (like VP-101), due to limited till thickness, only 1 sample will be able to be collected.

Possible Concerns/Changes:

- The glacial till material that has been pulled does not appear to be saturated and we are concerned that no or very minimal groundwater will be produced and there won't be enough volume for a sample. We should be able to confirm this after the first temporary well location attempt.
- We are looking at other options for the collection of samples but may not find an appropriate replacement approach.

Overall so far what we have found is good, in that the glacial till is thicker than anticipated in some areas and it is very dense and not fully saturated. However, because these soils are so dense, we are not able to move forward as proposed in the work plan and need to make adjustments and may need additional adjustments depending on how things go the rest of the day today and possibly tomorrow.

Please let us know if you have any questions and if you are ok with the changes in the 3rd set of bullets (proposed immediate changes) that we have proposed.

Thanks,

Heather Ziegelbauer, PE*

Jacobs

Project Manager | Global Environmental Solutions

+ 1.262.644.6167

+ 1.312.933.1017 mobile

heather.ziegelbauer@jacobs.com

www.jacobs.com

1610 N. 2nd Street, Suite 201

Milwaukee, WI 53212

US

www.jacobs.com

*Wisconsin

NOTICE - This communication may contain confidential and privileged information that is for the sole use of the intended recipient. Any viewing, copying or distribution of, or reliance on this message by unintended recipients is strictly prohibited. If you have received this message in error, please notify us immediately by replying to the message and deleting it from your computer.