

## Larsen, Sarah

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**From:** Stock, Paul  
**Sent:** Wednesday, May 31, 2006 12:00 PM  
**To:** Larsen, Sarah  
**Subject:** Leak #3534, Junction Food-N-Fuel, Hermantown, MN

RE: my review of TPT's 12.6.05 "Annual Monitoring Report Guidance Document 4-08 (April 2005)".

The report is meant to be responsive to our 6.30.05 RAW letter. The report contains data on discussion on the following main items of new work:

- Limited MW GW monitoring (2 events).
- Limited on-site and nearby water well sampling (1 event).
- LIF investigation (35 DPs).
- Limited VIA (4 soil gas samples).
- Spatial Data Reporting Form.
- CCAD Worksheet recommending AS & SVE.
- Recommendation to: 1) install a air sparge system with vertical sparging points and a SVE system with shallow horizontal pipes (see CCAD); 2) quarterly ground water monitoring; and 3) annual sampling of nearby potable water wells including continuing efforts to sample PW4621.

The report has errors and omissions. For example, there are no Methods and Procedures, especially discussing VIA soil gas sampling. There is no site map showing the locations of the soil gas sample borings, however, I rec'd a faxed map from TCT upon my direct request.

TPT does not provide their own rigorous evaluation of the LIF data but a very useful in-depth review of the logs is provided by Dakota Technologies. The extent of subsurface NAPL is not well delineated to the W of LIFs 6 and 8, to the S of LIFs 6, 16, 18, 19 and 32, to E of LIFs 31 and 32, and to the N of LIFs 25 and 31 and one could argue that it is not well delineated vertically either. Even more unfortunate in my view, TPT does not use the data to inform about corrective action options, for example, why not consider excavation? Interestingly, the LIF data show 2 more or less separate NAPL layers with the upper layer, where it occurs, found around 4 to 6 ft bgs and often located "stratigraphically" near or within a peat layer whose natural organic material displays a fluorescence response that interferes with the PAH (i.e., NAPL) signal or that may even result in a false positive. The deeper NAPL layer is typically found around or deeper than 10 ft bgs. LIF 5 shows both these layers rather clearly. I note the presence of the shallow NAPL zone in LIFs 1, 2, 3, 5, 6, 7, 14, 18, 20 and 25 although this interpretation is not clear at LIFs 18 and 20. It is questionable whether the observed responses at LIFs 12, 13, 28 and 33 are petroleum related. I note the presence of the deeper NAPL zone in LIFs 1, 2, 5, 6 (trace?), 8, 17, 18, 19, 22, 31, 32, however, LIFs 7, 24, 33 and 34 were probably not advanced deep enough to encounter the deeper NAPL. Given the location of NAPL LIF borings 1,2,3 and 7 just in front of the building I continue that NAPL extends at least partway under the S end of the building, suggesting the potential for vapor intrusion. I also note that, if TPT's observation of "petroleum sheen" (p. 5) on surface water to the NE are correct, that suggests that NAPL extends all the way to the wetland. However, the concentration of dissolved petroleum in MW8 samples is not indicative of proximal (fresh?) NAPL in my opinion?

We had asked that a VIA be conducted in accordance with (then) new GD 4-01a, focusing on the on-site building but to include sub-slab sampling, mainly because of the inferred existence of NAPL under the building. However, due to lack of discussion of the results and no methods and procedures documented, I am not sure what pattern TPT was trying to accomplish with the 4 soil gas samples they did collect, but they did NOT collect the requested sub-slab sample. I would characterize the location of VS4 as a probably a rather poorly located source area soil gas sample (collected adjacent to a soil excavation area) with the VS's 1 - 3 representing radial soil gas samples but none of these representing building-specific radial gas samples (i.e., directly adjacent to the building). Moreover, if VS4 is the source area soil gas sample location, the radial samples were not collected in all directions within 100 ft. Nonetheless, I reviewed the sample results for standard petroleum parameters (e.g., BTEX, the TMB isomers and Naphthalene, along with the additives MTBE, 12DCA and EDB). Benzene was not even detected in the presumably worst case sample VS4, however, the TMB and Xylene isomers standards were easily exceeded. No petroleum parameters exceeded the applicable standards in the VS1 sample. Surprisingly, the highest concentrations of petroleum related parameters were found in the VS2 sample, N of the store and farthest from the presumed source area, and the applicable Benzene, Xylene and TMB isomers' standards were far exceeded. Only the 124TMB standard was exceeded in the sample from VS3.

TPT again recommends AS and SVE sparge systems but has modified their proposal to include (25) standard vertical AS points installed to a depth of 15 ft below the water table. They do not discuss operational strategy (such as operating all

points together and continuously, or selected points or fields of points on a rotating basis). They have also modified the horizontal SVE system with shorter screen lengths. Since this is not a detailed CAD, there are many required items missing. However, there are two items of most importance at this time: 1) TPT appears to be targeting the AS area based on dissolved contamination as much or more than NAPL occurrence and 2) they are recommending a full-scale system without completing pilot tests.

## RECOMMENDATION

You should forward a copy of the Spatial Data Reporting Form and applicable maps to Rebecca Gorney-MPCA St. Paul.

Send a RAW letter including the following suggested language:

Continue ground water monitoring and visual observation for petroleum sheens on surface water on a quarterly schedule and annual sampling of selected nearby water supply wells, including attempts to collect samples from PW4621, however, annual sampling of PW2 may be discontinued. Provided no petroleum contamination is detected, annual sampling PWs 5492, 5497, 5506A and 5506B may be discontinued after 4 events have been completed but at least 2 sampling events must be completed at PW4621. Ground water samples must be analyzed for BTEX, MTBE and GRO. Samples collected from water wells must be analyzed for VOCs and GRO.

The LIF boring investigation identified one major shallower NAPL zone and one deeper NAPL zone while not providing complete delineation of NAPL extent, however, the LIF boring and other investigation and sampling data strongly suggest that significant contamination extends underneath the on-site building. Therefore, as previously requested, collect a sub-slab soil gas sample from underneath the south half of the on-site building. Also as previously requested, collect indoor (and appropriate outdoor) air samples if indicated by the sub-slab sampling results. We also reiterate that you instruct your consultant to carefully review and follow MPCA Guidance Document 4.01a *Vapor Intrusion Assessment Performed During Site Investigations*. MPCA staff note that vapor intrusion assessment methods and procedures must be carefully documented.

An Annual Monitoring Report Guidance Document 4-08 documenting ground water monitoring, surface water observations, water well sampling, and vapor intrusion assessment results must be submitted within 180 days of this letter. Inclusion of a cumulative and updated table documenting visual observations of surface water clearly corresponding to locations identifiable on the site map is suggested. In addition, the AMR Report Form Guidance Document 4-06 to document additional investigation activities.

Although MPCA staff feel that all risks at the site should be investigated prior to making a comprehensive site management decision including corrective action, we agree that corrective action to specifically address surface water impacts is warranted, especially due to the observation of petroleum sheens on surface water despite continued fluctuations in dissolved concentrations above and below surface water standards at MW8. However, it is important to note that risks to nearby water wells and vapor intrusion risks have not been adequately evaluated yet and may require focused corrective action. Regarding remediation to address impacts to surface water, MPCA staff suggest that excavation of NAPL soils be considered. If the MPCA can be convinced that NAPL soils - which are the ultimate present source of contamination - are adequately identified and targeted for removal, and subsequent excavation shows successful removal of the majority of the NAPL soils, the MPCA has been willing to consider excavation as adequate risk reduction and approve file closure once contaminated soil treatment and disposal has also been adequately documented.

The MPCA is now requiring detailed Pilot Test Work Plan and Pilot Test Results reports be submitted prior to MPCA approval to conduct the pilot testing and preparation of a detailed CAD report, respectively. Regarding the proposed air sparging and soil vapor extraction systems, submit a Pilot Test Work Plan report within 60 days of the date of this letter, however, do not proceed with pilot test implementation until approved by the MPCA.

Pilot testing must be done using a configuration (e.g., injection and extraction well design, flow rates, etc.) consistent with the conceptual design for the full-scale system and MPCA staff note that reducing dissolved contamination across the site to Minnesota Department of Health Risk Limits for drinking water may not only be an impractical site remediation goal, it may be unnecessary if demonstrated mass reduction and ultimate but timely achievement of surface water standards at compliance points is the goal. We reiterate our concern about sparging radius of influence extending under the building (within presumed footings and foundation walls) where pressurization could occur causing serious vapor intrusion to the building and any final design will have to actively address this concern.

Among other background information, the following elements must be clearly and adequately discussed or documented in a Pilot Test Work Plan report in order for MPCA staff to provide necessary approval to proceed.

- Identification and three dimensional layout of the subsurface target zone (e.g., petroleum mass) including various phases of the contamination (e.g., absorbed NAPL, adsorbed to soil, dissolved in water, dissolved in air), geology and

migration pathways. Also include a description of the processes by which the proposed technology will eliminate or remove contamination.

- Identification of the main mechanical elements of the pilot test including injection, extraction and or monitoring well design, wellhead modifications, and location; major equipment such as compressors and vacuum pumps; monitoring and measurement equipment, location and accuracy; sample collection locations and methods; analytical methods; etc.
- Identification of what specific data will be collected, how that data is relevant, how and when that data will be collected and how it will be documented and evaluated. This evaluation must consider clear and measurable site remediation goals (e.g., mass removal, compliance monitoring points) and what measurable criteria will be used to demonstrate feasibility with feasibility defined as ability to reach measurable site remediation goals within an estimated specific time frame. This element must also discuss what specific criteria will be used to determine duration of the pilot test. Finally, this element must also clearly document how specific data will be used for full-scale design criteria.
- Identification of the personnel who designed the pilot test, implemented the pilot test, and will evaluate the pilot test data and their detailed qualifications including training and experience directly related to the technology being pilot tested. The quality of the report will also be considered.
- Health and Safety issues.
- Schedule for completion of major pilot test milestones including submission of a Pilot Test Results Report.

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I am returning the file to you today via interoffice mail/Speedee Delivery. Let me know if you have any questions. Thanks!

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Make sure to follow MPCA Guidance Document