State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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May 22, 2003

Mr. Ted Jankowski
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P.O. Box 591
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Subject: Review of Site Investigation Workplan
Former Johnson Controls facility, 3238 N. Bremen, Milwaukee
FID#241233740, BRRTs#02-41-150484

Dear Mr. Jankowski:

The Wisconsin Department of Natural Resources, working with the Wisconsin Department of Health and Family Services, has completed a review of the workplan submitted by your consultant, Earth Tech Inc./Weston Solutions, Inc., for continued investigation of the former Johnson Controls facility at 3238 N. Bremen in Milwaukee. The plan, dated April 17, 2003, proposes to supplement existing site data with soil gas, groundwater and soil sample collection points, in order to better define the extent of soil and groundwater contamination and assess whether completed soil vapor pathways to potential receptors exist. The WDNR received your $500 review fee on May 20, 2003. The environmental health scientists at WDHFS have been asked to provide input on the soil vapor migration assessment process, and comments in this letter reflect their expertise and perspective.

A. Vapor migration assessment proposal – As we have discussed, vapor migration can occur directly from a vadose zone source, with lateral movement away from such a source in directions that may be unrelated to contaminated groundwater movement. Vapor migration should also be expected to occur from contaminated groundwater, moving upward from the water table and laterally within the vadose zone. Vapor phase movement will be affected by many factors, such as the existence of preferential pathways, including utility backfill. It does appear likely that some vadose zone source areas remain at the site, adjacent to the formerly excavated areas. Site information already collected also indicates that groundwater contamination has moved off the site into the Bremen Street right of way and towards the south under the alley adjacent to the site. There also appears to be some groundwater contamination in the eastern part of the facility.

1. It is obvious that you are devoting significant effort and expense to this investigation. The workplan would have been somewhat easier to review had it provided more specific justification for the various sampling points, and an explanation of how the proposed sampling is intended to advance the development of the site conceptual model. The investigation evaluation that is conducted after gathering the proposed data needs to provide a clear explanation of the site conceptual model and how each mode of contaminant transport has been evaluated.
2. It is not clear how much of a vadose zone source remains at the site, so it is difficult to determine whether the proposed vapor sampling will be adequate to investigate the movement of vapor away from the vadose zone source(s). Your evaluation of the data you will collect should take this into consideration and attempt to determine whether vapor migration from a vadose source is significant. You may also wish to refine the proposed site interior vapor sampling locations to better target the known or suspected areas of residual soil contamination.

3. It does not appear that the investigation will be adequate to establish whether vapor migration is occurring along the storm/sanitary sewer backfill within Bremen Street or the laterals that connect to the sewer. It would be useful to determine whether the sewer actually drains groundwater above it, and this would probably best be accomplished with geoprobes directly above or adjacent to the sewer. If such an investigation cannot be conducted, you may attempt to model hydrologic conditions using information obtained from monitor wells near the sewer, and may also consider an attempt at sampling directly next to sewer laterals within the residential properties west of Bremen. If the sewer drains groundwater, and evidence of vapor or groundwater contamination is found next to the sewer, then it should be presumed that movement of vapors could occur along the laterals' backfill. In that case, direct sub-slab measurements may be needed to rule out a completed vapor pathway, if it is not possible to sample within the laterals' backfill.
4. We assume that the vapor sampling points located west of Bremen Street are intended to assess general vapor movement away from the vadose zone source or groundwater contamination. Your consultant and I have discussed the possibility of locating the "seasonal" groundwater/vapor sampling points closer to existing laterals in order to investigate that preferential pathway. While these points may be able to pick up vapor detections due to migration along laterals, it is unlikely, due to the area soil characteristics, and it would be very difficult to rule out migration along the laterals using these nearby soil points. As stated above, sampling directly within the lateral backfill, or alternatively, conducting sub-slab sampling, would better for the purpose of determining vapor movement along this preferential pathway.
5. The work plan proposes to test for the presence of VOCs within the combined storm/sanitary sewer in Bremen Street, by sampling the airspace within the sewer pipe (accessing the sewer via the manhole). We expect that this information will have limited value in identifying source areas or in tracing VOC movement to receptors, although it may serve as a rough indicator for purposes of planning further investigation. The proposed method should include details that account for gas disequilibration caused by entry into the manholes. As stated above, better information about the vapor pathway can be obtained by testing within the sewer backfill.
6. The work plan proposes to analyze bulk soil samples. Although these results will be useful in the overall assessment of the extent and degree of contamination, they should not be used for predicting the potential for vapor intrusion, due to the alterations that occur during sample collection. The US EPA, in their technical guidance (Draft Guidance for Evaluating Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, 2002) recommends against using bulk soil sample results for estimating vapor intrusion impacts to homes.
7. The purpose of soil gas sampling points within the eastern part of the JCI property is unclear. If the purpose is to predict vapor intrusion effects to Weil Street residences, these sampling locations are too far from the houses to make useful predictions. If the purpose is to investigate the property itself, we note that contaminant sources have not been defined, and that it will be very difficult, if not impossible, to correlate sampling results with sources, or to draw conclusions about those sources.
8. In order to make the best use of soil gas sampling, JCI's consultants are reminded to place probes, whenever possible, at the depth of the basement slab (above groundwater), in native soil or in the most permeable soil layer. JCI and their consultants should be aware of factors that typically make the use of soil gas attenuation factors inappropriate (see EPA, 2002, page 26). Since these factors are building-specific, this information could be obtained informally from property owners at the same time they are approached for permission to enter yards to place soil probes.
9. If there is frequent water entry into basements near sources of VOC contamination, it will be difficult to rule out vapor intrusion merely by comparing soil gas samples to screening values. If frequent water entry into basements is identified, then it may be necessary to also test shallow groundwater or indoor air. If building specific factors make the use of soil gas attenuation factors (and thus EPA screening values) inappropriate, it would be more effective to obtain direct

evidence of soil gas impacts to Auer Avenue residences through sub slab gas probes. Although obtaining this information involves the barrier of entry into houses, the direct information obtained does not require modeling or extrapolation to interpret.

10. At least one additional permanent groundwater monitor well is needed to the south of the facility to better establish the extent of groundwater contamination. A useful location for such sampling would likely be further into the yard of the second house east of Bremen Street. The proposed permanent points in this area were placed in locations that are likely to have contaminant detections within the groundwater, and we will also need to establish where no further detections occur, especially if groundwater is ever intersecting the basements in these homes. Such a point will also be useful in determining locations for additional permanent vapor monitoring points, if the data to be obtained warrant it.

B. General site investigation proposal – The workplan proposes several soil and groundwater sampling locations within the Johnson Controls property boundary, intended to improve the general characterization of sitewide soil and groundwater quality as well as stratigraphy.
   1. If you intend to proceed towards the Voluntary Party Liability Exemption (VPLE), you should apply for this review process, and make a comprehensive assessment of how the existing information meets the VPLE requirement to complete a Phase I and Phase II Environmental Site Assessment. We will then review your assessments within the VPLE process framework, which includes additional internal peer review.
   2. The proposed near surface soil samples would apparently be collected from the 0-2 feet depth. It is difficult to determine whether this depth interval is appropriate at this time, because the site has been re-graded, with additional soil added, after the building and pavement areas were removed. Do you have any information as to what amount, if any, of soil was brought to the site and how the final (current) site grade compares to the pre-demolition site grade? Also, it is difficult to assess whether the proposed locations would be appropriate to fully satisfy VPLE requirements, because you have not provided a comprehensive analysis of the previous environmental assessments.
   3. It is difficult to determine whether the proposed on-site soil boring locations will be adequate to define the extent and degree of remaining contamination, because we do not have a comprehensive analysis of the site data. However, that does not appear to be the goal for these borings, rather they are apparently intended to verify the information obtained in the geophysical survey. We expect that your next analysis should identify whether there are data gaps in the definition of the extent and degree of residual soil and groundwater contamination.

We realize that this is a lengthy commentary on your proposal. The comments here should make it apparent that we need to have a comprehensive analysis of all the site data, and the development of the site conceptual model. Without this analysis, we find ourselves in the position of having to do our own interpretation and then guess whether your consultant has made a similar interpretation. Several of our comments are intended to help your consultant provide a useful analysis after gathering the proposed data. Some of the comments should be seriously considered before commencing field work as they may affect how you actually carry out the work. Some of these comments reflect our opinion that additional data points may be needed to rule out the vapor pathway. We would be happy to meet with you and your consultant to further discuss the plan and our comments prior to the field work. We'd also like to be notified about 5 days in advance of the anticipated field work, to allow us the opportunity to observe the vapor sampling point installation and sample collection, if possible.

Mr. Ted Jankowski
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We appreciate your serious efforts towards this investigation process, and hope our comments help you develop information that will provide a clearer picture of the vapor migration issue. If you would like to discuss this letter or schedule a meeting, please contact Pam at (414) 263-8758.

Sincerely,

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