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August 2, 2000

Mr. Alex Koenig
Economic Development Specialist
City of South Bend Department of
Community and Economic Development
227 W. Jefferson Blvd. – Floor 12
South Bend, IN 46601

RE: Review and Comment on Phase I and Phase II Environmental Site Assessment Reports for the Former Oliver Plow Works Facility, 533 South Chapin Street, South Bend, IN (Site). SBI004.200.0002

Dear Mr. Koenig:

This letter has been prepared pursuant to a June 13, 2000 proposal by Hull & Associates, Inc. (HAI) to review and prepare comments on Phase I and Phase II Environmental Site Assessment reports for the above referenced Site (HAI Document # SBI003.200.0002). HAI reviewed the following documents that were provided by the City of South Bend:

1. Phase I Environmental Site Assessment – Oliver Plow Works (Vacant), Envirocorp Services and Technology, Inc., July 1998; and

2. Phase II Site Assessment – Former Oliver Plow Works, Envirocorp Services and Technology, Inc., November 1999.

HAI also conducted a windshield survey of the Site on June 14, 2000.

This letter report summarizes HAI's findings based on review of the Phase I and Phase II assessment reports, identifies potential data gaps that remain at the Site, and evaluates whether conclusions and recommendations provided in the Phase I and Phase II reports are supportive of apparent site conditions. HAI also provides recommendations on additional investigative activities under the assumption that the City intends to formally enter the Site into Indiana's Voluntary Remediation Program (VRP).

Summary of Findings

Phase I Environmental Site Assessment

During 1997 and 1998, when Envirocorp Services and Technology, Inc. (Envirocorp) conducted the Phase I Environmental Site Assessment (ESA), the Site consisted of three parcels owned by Allied Products Corporation. A total of 29 buildings currently occupy the Site, although 59 buildings were present at one time or another. At the time of the Phase I ESA, two buildings were used by Jamil Packaging Corporation for warehouse space and another building was used by the

St. Joseph County Department of Welfare Services.[1] The focus of the Phase I ESA was, as described by Envirocorp, to identify Recognized Environmental Conditions at the Site in accordance with the American Society for Testing and Materials Standard Practice (ASTM) E1527-97.

Envirocorp identified manufacturing activities at the Site between 1868 and 1984. Although not stated in the report, it is evident that the primary industry at the Site was the manufacture of farm equipment.

The following provides selected observations made by HAI after reviewing Envirocorp's Phase I ESA:

Records Review
Envirocorp reviewed all records listed in ASTM E1527-97. However, the RCRIS CORRACTS database was reviewed at a radius of ½ mile and the Non-CORRACTS database was reviewed at 1 mile. Per ASTM E1527-97, the search distances should have been reversed.

Although not specifically required by ASTM, well logs in the vicinity of the Site were apparently not reviewed. To the extent that such well logs are available, local hydrogeologic information such as aquifer thickness could have been identified.

Site Reconnaissance
Envirocorp's Site reconnaissance appears to have been thorough in the context of a Phase I ESA.

Interviews
Based on review of the report's bibliography, interviews were conducted with a representative of the St. Joseph County Health Department and the South Bend Department of Economic Development, although there are no notations within the text of the report attributing information to persons interviewed. Envirocorp's efforts to interview former employees of industries at the Site are not known. It is HAI's experience that former employees can provide valuable information on past waste handling procedures, spills, chemical storage, etc., and efforts to identify Recognized Environmental Conditions are often more complete following employee interviews.

Recommendations
Envirocorp's recommendations appear to and address the Recognized Environmental Conditions identified in the Phase I ESA report.

In the report's summary of previous investigations, Envirocorp summarized findings by Roy F. Weston, Inc. (Weston) as a result of 1988 and 1990 Environmental Liabilities Assessments. Among other issues, Weston mentioned the potential for hazardous contaminants to be present in the existing or disconnected wastewater system, and that residual sediments should be collected for analysis. HAI would add to this recommendation that integrity testing of sewers should be conducted to identify areas of potential releases.

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[1] The building occupied by the St. Joseph County Department of Welfare Services was not included in the Phase I ESA.

Envirocorp also mentioned the presence of drywells, located primarily in the vicinity of parking lots. It has been HAI's experience that drywells often have source areas beneath them. We therefore recommend that the drywells at the Site be located and sampled, to the extent possible, particularly near areas where waste handling occurred.

Envirocorp noted that the presence of regulated underground storage tanks at the Site should be identified. If not already completed, a determination should be made before enrolling the Site in the VRP.

Phase II Environmental Site Assessment

Envirocorp conducted Phase II field investigations at the Site in September and October 1999. The investigation included:

1. installation of 41 soil borings;
2. installation of nine groundwater monitoring wells;
3. chemical analysis of 37 soil samples collected from various depths;
4. chemical analysis of water samples collected from the monitoring wells; and
5. completion of an assessment for potential asbestos-containing building materials in various structures on the Site.

In general, investigations completed by Envirocorp were well documented in the Phase II ESA Report. The level of effort for the work was consistent with an initial phase of investigation for a property having the acreage, complexity and history of the Site discussed herein. HAI cannot comment on rationale for soil boring and monitoring well placement, as this information was presumably developed in a scope of services not submitted to HAI.

The following provides selected observations made by HAI after reviewing Envirocorp's Phase II ESA:

Soil Boring and Monitoring Well Placement

It is evident that many of the borings were placed near former drum storage areas, as identified through review of aerial photographs during the Phase I ESA. Other soil borings were installed near former and existing fuel storage tanks. A subset of borings was installed in a vacant portion of the Site to identify background concentrations of selected metals in soils. Monitoring wells were installed in consideration of a southwest to northeast regional direction of groundwater flow, with two wells installed near upgradient property lines, three monitoring wells installed in the interior of the Site, and four wells installed near the downgradient property line.

It is unclear whether Envirocorp installed borings near sumps, outfalls, dry wells, floor drains or potentially leaking sewers. In HAI's experience at other old industrial facilities, these locations commonly act as release points for contaminants that enter the ground over an extended period. To

the extent that these potential release mechanisms were not identified or investigated by Envirocorp, they should be addressed in future efforts.

Findings from Soil Borings

With the exception of lead, soil samples did not contain chemicals of concern that exceeded relevant standards. Lead in surface soils exceeded Indiana Department of Environmental Management's (IDEM's) Risk Integrated System of Closure (RISC) Tier I Industrial Commercial default value in two locations.

Chlorinated compounds were detected in soils at several locations during Weston's 1990 Phase II investigation. Envirocorp also detected Tetrachloroethene (PCE) near the southwest corner of the Site in soil boring OP-25.[2] PCE in soils may be related to PCE detected in groundwater in the southwest portion of the Site, as described in the following section.

To the extent that the City is interested in obtaining a Site-wide covenant not to sue, additional confirmatory soil samples will need to be collected and analyzed. HAI cannot provide recommendations as to the number and locations of the confirmatory samples without having completed a detailed Site inspection (including an evaluation of sewer integrity) and conducting interviews with past facility employees (as available).

Findings from Groundwater Analysis

PCE was detected in an upgradient well (MW-1) in excess of its VRP Tier II non-residential default closure level. The relatively high concentration of PCE (at 4,700 ug/L) indicates that MW-1 may have been installed in the vicinity of a source area. Envirocorp noted that the upgradient location of the MW-1 (with respect to buildings at the Site indicates that the source of PCE may be from off-site. However, the presence of PCE in unsaturated soils near MW-1 and the fact that land use upgradient of MW-1 is primarily residential indicates that the source could be on the Site.

Envirocorp indicated that chemicals of concern in downgradient wells are below their respective non-residential closure levels. However, concentrations of chlorinated compounds exceed *residential* Tier II default closure levels in wells near a downgradient property line that abuts residences.[3] It is probable that concentrations exceed Tier II residential levels beneath these residences, and that the perimeter of compliance, as defined by IDEM, would therefore require off-Site control. Furthermore, additional monitoring wells will need to be installed north of the Site to define the lateral extent of groundwater contamination.

Chlorinated compounds detected in the wells can result in dense non-aqueous phase liquid (DNAPL) at or near their release point. DNAPL has a tendency to migrate through an aquifer and pool above a confining layer, leaving a "trail" of residual product in aquifer interstices. For this reason, dissolved concentrations are sometimes higher and contaminants more widely dispersed near the bottom of an

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[2] PCE was also detected in soils collected from OP-26. The location of OP-26 is not shown on maps or described in text of Envirocorp's Phase II Report.

[3] Trichloroethene, a common biodegradation product of PCE, was detected in downgradient monitoring wells MW-3, MW-6 and MW-9 at concentrations exceeding Health-Based Criteria for residential land use.

aquifer than seen near the water table. Monitoring wells installed by Envirocorp are screened across the water table and do not adequately define the vertical and lateral extent of groundwater contamination. Additional monitoring wells should be installed below existing wells. Selected new wells should have screens the base of the aquifer: potentially 20 feet or more below the bottoms of the existing well screens.

During a windshield survey of the Site, HAI noted a monitoring well on RIS Paper Company property, just south of the Site and southwest of MW-1. Assuming the well has been sampled for volatile organic compounds, access to data from the well (or accessing the well for sampling) could provide information on the source of contamination and/or the distribution of chlorinated compounds near the southwest portion of the Site.

Recommendations

Notwithstanding additional recommendations made by HAI in this letter, Envirocorp's recommendations were valid considering their findings from the Phase II ESA. Envirocorp did recommend performing "...exploratory excavations and soil sampling in areas (identified by sources) where paints, solvents, and oils were allegedly dumped in the past during plant operations." HAI could find no reference to the "sources" in the Phase I or Phase II reports, nor could we find text or maps referring to the dumping locations. If information is available, these locations should be identified.

Summary of HAI's Recommendations

The following provides a summary of HAI's recommendations to address apparent data gaps based on review of Envirocorp's Phase I and Phase II ESA reports. These recommendations are in addition to those made by Envirocorp in their reports:

1. To the extent they can be obtained, logs for wells in the vicinity of the Site should be reviewed.

2. Former employees of industries occupying the Site should be interviewed. If available, information on dumping should be obtained from "sources" referenced by Envirocorp in the Phase II ESA Report.

3. A determination of the presence or absence of regulated USTs should be completed.

4. A detailed Site inspection should be conducted, with a focus on identifying potential release mechanisms and locations (i.e., sewers [including integrity evaluations], sumps, drywells, etc.).

5. Soil samples and (potentially) water samples should be collected from beneath potential release locations.

6. Additional monitoring wells should be installed:

- for source identification/delineation in the vicinity of MW-1 or other potential source areas identified through subsequent investigations;
- as couplets or nests near selected existing wells to more fully evaluate the nature and extent of groundwater contamination; and
- downgradient of the Site to identify the lateral extent of groundwater contamination.

7. Efforts should be made to obtain data from the monitoring well on RIS Paper Company property.

As you are probably aware, addressing the above data gaps could require more than one phase of investigation. However, once completed and documented in a Final Phase II ESA Report, the information could be used to support preparation of a Remediation Work Plan following submittal of the Voluntary Remediation Agreement.

Feel free to contact me with any questions about findings from our review of the Phase I and Phase II ESA Reports.

Sincerely,

W. Lance Turley

W. Lance Turley, P.G., Sr. Hydrogeologist

WLT/kf