

July 26, 2011

City of South Bend
Department of Economic Development
County-City Building, Suite 1200
227 W. Jefferson Blvd.
South Bend, Indiana

Attention: Mr. Dave Relos

**RE: REPORT OF GROUND PENETRATING RADAR SURVEY, 601-605 W.
WASHINGTON STREET, SOUTH BEND, INDIANA**

Dear Mr. Relos:

Wightman Petrie recently completed a Phase I Environmental Site Assessment of the site, located at 601-605 W. Washington Street, for which a historical Recognized Environmental Condition was identified. The historical record had indicated that prior to construction of the existing commercial office building; the subject site was occupied by a gasoline service station. Given that there were no requirements for the registration or closure sampling at the time of demolition of the filling station and re-development as an office building (mid - 1950s), there were no readily available records to confirm the physical removal of the UST systems. Although it is reasonable to assume that the UST systems had been removed as a part of the re-development process; Wightman Petrie recommended a Ground Penetrating Radar Survey as a means of verifying that the UST systems did not remain in place at the subject site. Such concern was focused on the area of the former USTs as identified from the 1949 Historical Sanborn Fire Insurance Map as being the southeast corner of the property (near intersection of Washington and Taylor Street). In addition, Wightman Petrie also performed a Ground Penetrating Radar Survey for the existing paved parking area at the rear of the subject site for the presence of additional UST systems and possible placement of demolition debris (See Figure 1 for GPR Survey Locations).



WIGHTMAN PETRIE

SURVEYING ENGINEERING ENVIRONMENTAL LANDSCAPE ARCHITECTURE

412 S. Lafayette Blvd. • South Bend, IN 46601 p: 574.232.4388 f: 574.232.4333

Kenneth K. Jones, PLS
Kenneth K. Jones, Jr., PLS
Beryl M. Jones, PLS
Peter H. Schnaars, PLS
Jeffrey S. Barnes, PLS
Mikel D. Currier, PLS
John G. Kamer, PLS

Mark E. Wilson, PE
Joshua W. Weaver, PE
Stephen H. Fralish, PE MS
Nicholas D. LaCroix, PE, PTOE
Matthew D. Glass, PE
Brian B. Konarski, PE
Thomas A. Deneau, PE MS

Chris Chockley, ASLA, LEED AP
Christopher J. Brayak, AIA
Eric A. Zell, LEED AP

The following presents the results of the Ground Penetrating Radar Survey.

GPR BACKGROUND AND THEORY

GPR is a geophysical method that uses radar pulses to record images of subsurface features. GPR uses a transmitting antenna that sends high frequency pulses or waves into the ground. When those waves encounter a buried object, or surface with a different dielectric constant, the signal is reflected back up to the antenna, and an image is recorded. Dielectric constant refers to the velocity that the radar energy has to move to pierce material underground. For example, the dielectric constant for dry concrete is 5.5, which means radar can move quite freely through dry concrete. On the other hand, water has a dielectric value of 81, meaning the radar will have a difficult time passing through. This principle is very important when locating subsurface features. If the initial set-up of the instrument's dielectric constant is good, then detection of subsurface objects is easily performed. When the high frequency pulses encounter metal (i.e., steel tank of a UST system), PVC, or any other underground feature with a drastically different dielectric constant, the image is reflected back to the antenna. The antenna then feeds the information to a computer screen where real time images are generated as a hyperbola.

SITE SURVEY DISCUSSION

On July 12, 2011, Wightman Petrie mobilized resources to the subject site for the purpose of conducting the Ground Penetrating Radar (GPR) Survey. Wightman Petrie was briefed as to the site history and the basis for the assumption of the presence of UST systems. A copy of the historical Sanborn Fire Insurance Map (1949) of the subject site, indicating the location of the gasoline station along the Washington Street side of the parcel, was provided as a general reference. After the site discussion Wightman Petrie set up the SIR-3000 and began deriving a plan to scan the area using a standard grid survey approach.

The survey began in the southeast corner of the subject site. Initial scans were completed from north to south, at intervals of approximately five (5) feet across the subject site, followed by like scans from east to west (refer to Figure 1 for presentation of the survey area). Similar methods were used for the assessment of the paved parking area, north of the existing building. As presented in Figure 1, areas of the parking lot show dark banding indicative of either pockets of air, most likely due to soil disturbance, or pockets of water, again, due to some sort of soil disturbance. An unidentified pipe was detected along the southern edge of the property, running parallel to a marked water line. The pipe is assumed to be a municipal water line. Similarly, indications of the presence of anomalies consistent with subsurface piping (potentially remnant or utility related) were also identified at the southeast corner of the property.

After completion of the grid survey, Wightman Petrie could not present any evidence consistent with the presence of a UST through interpretation of the graphical information obtained. A large area of disturbed soil was detected towards the center of the paved parking area, below a shallow depression. However, there was no indication that any tank system remained in-place at this location.

CONCLUSIONS

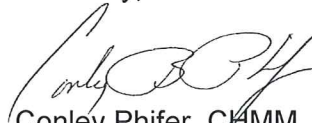
Based upon the results of the GPR survey of the subject site; there does not appear to be any remnant UST systems remaining from historical gasoline service station operations (i.e., removed from the ground). The presence of certain anomalies consistent with disturbed or

Mr. Dave Relos
July 26, 2011
Page 3 of 3

backfilled soils identified by the GPR may indicate areas consistent with the former location of UST systems (i.e., loose backfill placed within the former tank pits).

It should be noted that the GPR survey is a method for determining the presence of absence of anomalies consistent with that of UST systems and/or their former location on the subject site. The survey does not relate to the possible presence or absence of contamination associated with such historical UST systems. However, if deemed necessary, intrusive soil and or groundwater sampling could be performed to make a finite determination as to the presence or absence of impact to the subsurface environment.

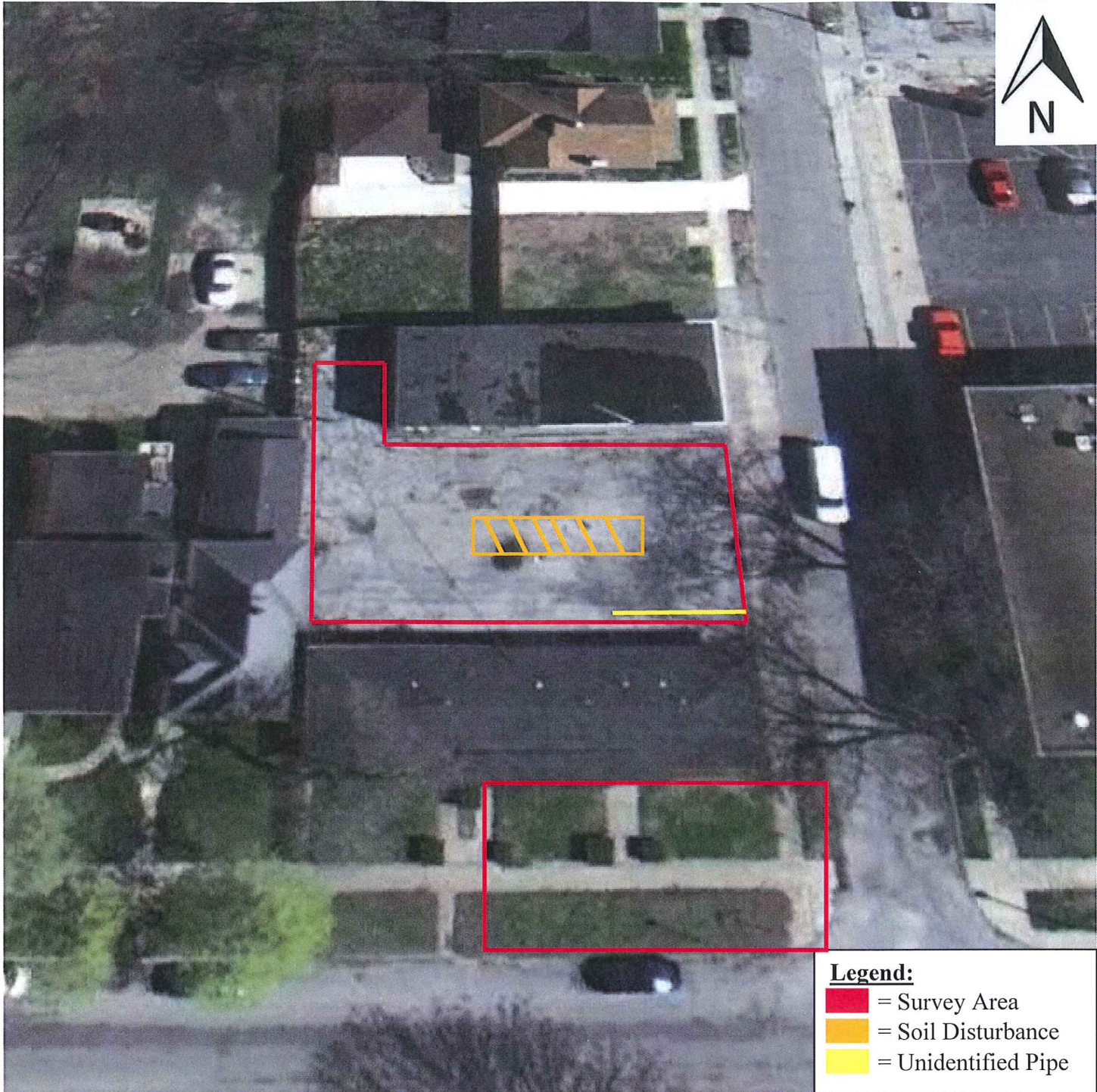
Sincerely,

A handwritten signature in black ink, appearing to read "Conley Phifer". The signature is fluid and cursive, with the first name "Conley" written in a smaller, more compact script than the last name "Phifer".

Conley Phifer, CHMM
Environmental Department Manager

Enclosures

H:\2011 Projects\2011-5055\GPR_Survey_7-26-11.docx



- Legend:**
- = Survey Area
 - = Soil Disturbance
 - = Unidentified Pipe

Date: July 18, 2011	Project: Washington and Taylor GPR Survey	Drawn By: AJS
Scale: Not Shown		Approved By: CBP
Source: Google Earth	Project No. 2011-5055	Figure 1 – GPR Survey



412 S. Lafayette Blvd
 South Bend, IN 46601
 Telephone 574-232-4388
 Fax 574-232-4333