SIGMA
ENVIRONMENTAL SERVICES INC.

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July 8, 2003

Project Reference #8069

Mr. Andy Boettcher
c/o Ms. Victoria Stovall, Program Assistant
Remediation & Redevelopment Program
Wisconsin Department of Natural Resources
2300 N. Martin Luther King Jr. Drive
Milwaukee, WI 53212

Subject: **DRAFT Site Investigation Work Plan**
Former Crane Manufacturing – 6000 S. Buckhorn Avenue, Cudahy, WI 53110
WDNR FID #241079410
WDNR BRRTS #06-41-472389

Dear Mr. Boettcher:

Sigma Environmental Services, Inc. (Sigma) has prepared this Site Investigation Work Plan on behalf of TBM Seven LLC, the potential purchaser of the above-referenced property (hereinafter the "Site"). As you are aware, on behalf of TBM Seven LLC, Sigma submitted the application for the Voluntary Party Liability Exemption (VPLE) program in mid-June 2003. Therefore, Sigma has prepared this DRAFT Site Investigation Work Plan for approval by the Wisconsin Department of Natural Resources (WDNR). If any revisions to this work plan are necessary, Sigma will incorporate changes into a final work plan document.

Site Investigation Scope of Work

The site investigation work elements described below are based on work activities recently completed at the site, including Phase I and Phase II Environmental Site Assessments (ESAs)[1,2] and a geotechnical exploration program[3]. Copies of these documents were forwarded to the WDNR on June 19, 2003 with the VPLE application. In summary, the following environmental conditions were identified in the documents:

- Five soil borings (B100 through B500) were installed by Northern Environmental Technologies, Inc. (Northern) in 1993 at areas near the west and south property lines (as shown in **Figure 1**). Laboratory analysis of volatile organic compounds (VOCs) in four soil samples collected from the site indicated trace amounts of VOCs (including both chlorinated and petroleum compounds). Foundry sand fill was also identified in borings B300 and B400 in the southern end of the site.

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[1] *"Report of a Phase I Environmental Site Assessment, 6000 South Buckhorn Avenue, Cudahy, Wisconsin"* report by Sigma (May 2003)
[2] *"Pre-Purchase and Pre-Demolition Due Diligence Results, Conclusions, and Associated Cost Estimate; Crane Manufacturing Redevelopment, Cudahy"* letter by Sigma (May 12, 2003)
[3] *"Geotechnical Exploration Program, Crane Manufacturing Site, Cudahy, Wisconsin"* report by GESTRA Engineering, Inc. (May 20, 2003)

- A 1,000-gallon underground storage tank (UST) for unleaded gasoline, which was formerly located near the northeast corner of the main building (see **Figure 1**), was closed/removed in July 1990. However, no closure assessment documentation is available for this UST.

- Foundry sand was identified on the site in environmental and geotechnical boreholes; most of this fill material was limited to the southern portion of the site.

- An approximately 250-gallon aboveground storage tank (AST) for diesel fuel is present near the central portion of the site, just south of the main building (see **Figure 1**). Staining apparently from the AST was present at the ground surface.

- Eight soil samples collected by Sigma from eight soil borings (SB-1/TB-1 through SB-8/TB-8) across the site in May 2003 were submitted for laboratory analysis of diesel range organics (DRO) and VOCs; four samples were also submitted for analysis of RCRA metals. Minimal DRO impacts (below NR 720 standards) were reported in three of the soil samples. All VOC concentrations were reported below the laboratory detection limits in all of the soil samples, with the exception of naphthalene in one soil sample at a concentration of 0.060 milligrams per kilogram. Metals concentrations were reported below applicable NR 720 generic Residual Contaminant Levels (RCLs), except for arsenic; arsenic concentrations were indicative of background concentrations and not likely a specific release to the environment.

Soil Assessment. Based on the potential for low level impacts across the site due to historical manufacturing operations (indoor and outdoor activities) and the presence of foundry sand fill across portions of the site, as well as the possibility of specific petroleum hydrocarbon releases from the former UST/existing AST systems, the site investigation activities are grouped into two categories: (1) fill material evaluation, and (2) point sources evaluation.

1. Soil borings and monitoring wells will be installed in a grid pattern across the site to evaluate volume and chemical characteristics of the foundry sand fill material:

    - 26 soil borings will be installed on an approximately 150-foot grid pattern as shown in **Figure 1.**

    - 21 of 26 soil borings will be completed by direct-push (Geoprobe®) drilling techniques at least four feet into the underlying native soil – estimated completion depths might range between 6 and 18 feet below ground surface (bgs).

    - 5 of 26 soil borings will be completed by hollow stem auger (HSA) drilling techniques to an estimated completion depth of 20 feet bgs to facilitate the installation of NR 141-compliant groundwater monitoring wells.

- 13 discreet soil samples (one sample from every other soil boring to be spatially distributed across site) from the shallow fill material will be submitted for laboratory analysis of VOCs (Method 8260), RCRA metals, and polynuclear aromatic hydrocarbons (PAHs, Method 8310) to assess the chemical characteristics of the fill material(s). Additionally, one composite sample of the fill material will be submitted for Protocol B analysis.

- 13 discreet soil samples (one sample from every other soil boring to be spatially distributed across site) from the underlying native soil (below the fill material) will be submitted for laboratory analysis of VOCs (Method 8260), PAHs (Method 8310), and RCRA metals.

2. Additional soil borings and monitoring wells will be installed to confirm and/or evaluate chemical characteristics of potential point sources:

   - Four soil borings (3 Geoprobe®, 1 HSA), one of which will be converted into a NR 141-compliant groundwater monitoring well upon completion, will be installed in the vicinity of the former UST as shown in **Figure 1**. The central soil boring to be converted into a monitoring well will be completed to a depth of approximately 20 feet bgs; the remaining three perimeter borings will extend at least two feet into the interpreted water table. Two soil samples per boring will be submitted for laboratory analysis of PVOCs.

   - Four soil borings (3 Geoprobe®, 1 HSA), one of which will be converted into a NR 141-compliant groundwater monitoring well upon completion, will be installed in the vicinity of the AST as shown in **Figure 1**. The central soil boring to be converted into a monitoring well will be completed to a depth of approximately 20 feet bgs; the remaining three perimeter borings will extend at least two feet into the interpreted water table. Two soil samples per boring will be submitted for laboratory analysis of PVOCs and PAHs.

   - Four soil borings (3 Geoprobe®, 1 HSA), one of which will be converted into a NR 141-compliant groundwater monitoring well upon completion, will be installed in the vicinity of the borings B100 and B200 (as completed by Northern) as shown in **Figure 1** to confirm the VOC impacts previously reported in this area. The central soil boring to be converted into a monitoring well will be completed to a depth of approximately 20 feet bgs; the remaining three perimeter borings will extend a depth of approximately 8 feet bgs to delineate possible surface impacts. One soil sample per boring will be submitted for laboratory analysis of VOCs.

   - Three Geoprobe® soil borings will be installed in the vicinity of the boring B500 (as completed by Northern) as shown in **Figure 1** to confirm the VOC impacts previously reported in this area. Each soil boring will be completed at a depth of approximately 8 feet bgs to delineate possible surface impacts. One soil sample per boring will be submitted for laboratory analysis of VOCs.

All soil borings will be continuously sampled to the completion depth of each borehole; split portions of each sample interval will be screened in the field with a photoionization detector (PID) to assist evaluating for the presence of VOC impacts to the soil. Sigma field personnel will describe log the soil conditions in general accordance with the Unified Soil Classification System, as well as record sampling intervals, PID measurements, and other observations. Boreholes that are not completed as NR 141-compliant groundwater monitoring wells (see below) will be abandoned with bentonite chips. Soil boring logs and borehole abandonment forms (as applicable) will be completed for each soil boring location.

Groundwater Assessment. Due to time constraints associating with this site investigation (and therefore the necessity to expedite the work activities), a groundwater assessment will be completed in conjunction with the soil assessment activities. As described above and shown in **Figure 1**, eight shallow groundwater monitoring wells will be installed at the site. Following well development activities, one round of groundwater samples from the monitoring well network will be analyzed for VOCs (Method 8260), PAHs (Method 8310), and dissolved RCRA metals. QA/QC samples will also be analyzed for VOCs.

Methane/Vapor Assessment. Due to the developer's anticipated plans (to date) of managing the identified fill at the site by removing this material beneath the condominium development areas, Sigma does not recommend a subsurface methane evaluation, nor do we anticipate potential risks to human health via vapor migration from other potential sources. Similarly, it is not expected that a Chapter NR 506 exemption to build on a historic fill site will be necessary if the fill material at the site is removed. If, however, the developer's plans change with respect to the management of the fill material or construction plans, a methane/vapor assessment and/or Chapter NR 506 exemption from the WDNR may be required prior to site development.

Documentation/Reporting. Following the completion of the field activities and receipt of laboratory analytical reports for soil and groundwater samples, Sigma will prepare a site investigation report in accordance with Chapter NR 716 requirements. Due to the intention to establish an Environmental Tax Incremental Financing (TIF) district for the site and the need for a WDNR-approved site investigation report and remedial action plan, Sigma will also prepare a remedial action plan for the site, as appropriate.

Project Schedule

Due to the established property closing date of September 1, 2003, and the Environmental TIF, Sigma and TBM Seven LLC respectfully request that the WDNR approve this work plan the week of July 7, 2003 or as soon as possible. Sigma will implement the work plan immediately after your approval and forward the site investigation report and remedial action plan for you review as soon as possible after the field work is completed. It is desired to have the WDNR approve these documents by August 12, 2003, as the Cudahy City Council meets on August 18th. At that time, the City Council will address the Environmental TIF issue. Upon the City Council's approval, the Environmental TIF will be forwarded to the Joint Review Board for approval by September 1st. It is understood that the Joint Review Board's approval will be sufficient to allow the property closing to occur on September 1; the Environmental TIF will actually be enacted by the Department of Revenue at a later date.

If there is any thing else Sigma can provide to assist in your review of this work plan, please do not hesitate to contact us at (414) 768-7144. We look forward to hearing from you soon.

Sincerely,

SIGMA ENVIRONMENTAL SERVICES, INC.

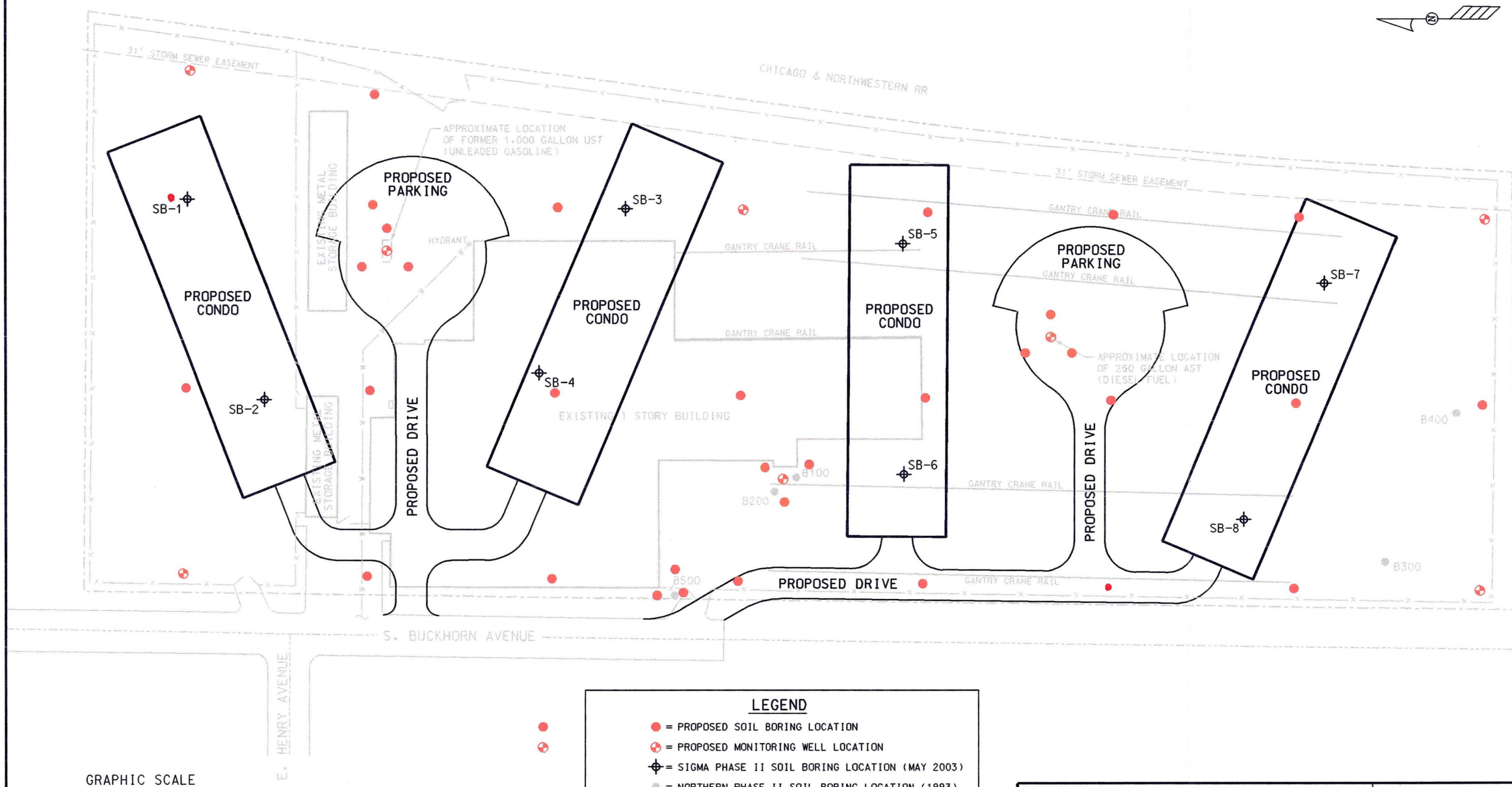
Adam J. Roder, P.E.
Project Engineer

Joshua J. Neudorfer, CHMM
Senior Project Manager/Hydrogeologist

Randy E. Boness, P.G.
Geosciences Group Leader

Enclosure: Figure 1 – Site Plan Map

cc: Mr. Tom Beaudry, TBM Seven LLC
Mr. Mike Dilworth, TBM Seven LLC
Mr. Mike Corbett, Crane Manufacturing



LEGEND

- = PROPOSED SOIL BORING LOCATION
- = PROPOSED MONITORING WELL LOCATION
- = SIGMA PHASE II SOIL BORING LOCATION (MAY 2003)
- = NORTHERN PHASE II SOIL BORING LOCATION (1993)
- = FENCE
- = UNDERGROUND WATER LINE
- = PROPERTY LINE

GRAPHIC SCALE

0′ 40′ 80′ 160′

NOTE:
DIMENSIONS DEPICTED ON MAP ARE FOR REFERENCE ONLY - SITE HAS NOT BEEN SURVEYED.

FORMER CRANE MANUFACTURING
6000 S. BUCKHORN AVE., CUDAHY, WI

SIGMA ENVIRONMENTAL SERVICES INC.

DATE: 7-2-03	DR. BY: BEB	DR.# 8069-003	SCALE: 1″ = 80′

SITE PLAN MAP

FIGURE 1