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December 19, 2018

Mr. Eric Ogden
Oak Creek Rawson Industrial, LLC
100 S. Wacker Drive, Suite 950
Chicago, IL 60606

SUBJECT: Review of Site Investigation Summary, Work Plan and Conceptual Remedial Action Plan
Biogenesis (Former), 610 W. Rawson Avenue, Oak Creek, WI
DNR BRRTS # 02-41-578473 FID # 241020010

Dear Mr. Ogden:

On August 7, 2018, the Wisconsin Department of Natural Resources (DNR) received the *Summary of Site Investigation, Work Plan for Additional Investigation & Conceptual Remedial Action Plan to Support Voluntary Party Liability Exemption Application* (Report), dated August 3, 2018, by The Sigma Group, Inc. (Sigma) for the site referenced above. In the Report, Sigma summarizes the environmental work conducted to date, including activities conducted by Natural Resource Technology, Inc. (NRT) from 1991 to 1996, proposes additional activities to complete the site investigation (SI) and proposes a conceptual remedial action plan (RAP) to address identified contamination. The SI portion of the report was reviewed for compliance with Wis. Admin. Code ch. NR 716 and the conceptual RAP was reviewed for compliance with Wis. Admin. Code ch. NR 724.

The DNR recognizes that Sigma has conducted a significant amount of investigative work to characterize the contamination at the site, and that additional activities proposed by Sigma are necessary to complete the investigation. The DNR's comments, as presented below, include recommendations for additional analytical parameters, and additional areas for investigation. The results of the site investigation are used to evaluate remedial options. The DNR is unable to approve the conceptual RAP as presented at this time. Additional discussion is provided below.

**Background**

The site is comprised of two parcels (formerly 610 West Rawson Avenue and 7045 South 6th Street) that have been combined into one property with the address of 610 West Rawson Avenue (the Property). The Property was used as a bulk fuel storage, mixing and distribution facility from approximately 1955 to the mid-1980s, which included the use of numerous underground and aboveground storage tanks (USTs and ASTs). The USTs and ASTs were registered with the State as containing #6 fuel oil, leaded gasoline, waste oil and new oil. These petroleum products were delivered to the Property via a railroad spur that cut across the lower midsection of the Property from the railroad along the western Property line. Previous releases include a product spill that was observed floating in the tributary to the north in 1986. There is no documentation of the investigation or remediation of that release. The eastern parcel is a leaking UST site that was reported in 1990 and closed by the DNR in 1996, after investigation of petroleum releases and remediation that included soil excavation and groundwater removal and disposal for the former fuel operation facility.

Biogenesis/BioVersal bought the Property in 1990 and used the facilities for mobile soil and sediment washing treatment processes and for manufacturing chemicals until approximately 2015. The Safety Data Sheets (SDSs) included in the Report identified chemicals used at the Property as including, but not limited to, alcohols, acetates, glycols, caustics and acids made into propriety blends such as surfactants/dispersants, fire suppressants, and odor

control products. Most ASTs and USTs were removed by 1992, with the last ASTs removed by 2005. This contamination site was opened in 1995 after the DNR completed a site inspection that documented numerous areas of surface spillage around the large ASTs and the southwest building, and other leaking ASTs and containers.

At the time the Report was submitted to the DNR, the approximately 10.5-acre vacant Property included three buildings, containers with liquid fertilizers, molasses and petroleum/water mixes, many improperly stored 55-gallon drums and totes of unknown contents inside buildings and along the southwest and western portions of the Property, asphalt and concrete pavement, a mill scale (steel by-product) pile, and heavily vegetated areas on the peripheries.

**Site Investigation Completeness to Date**

Soil borings have been advanced across much of the Property, including in former UST and AST locations, and existing and historical drum and tote storage locations. The highest levels of chlorinated volatile organic compound (CVOC) contamination is associated with the drums and totes along the western Property line and southwest corner of the Property. Petroleum volatile organic compound (PVOC) contamination is present in CVOC areas, and further east, primarily associated with the former petroleum dispensers. Polycyclic aromatic hydrocarbons (PAHs) have been detected along the north, south and east portions of Property. Polychlorinated biphenyls (PCBs) have been detected in the areas with drums and totes, as well as further north, and in petroleum contamination areas to the east. An elevated arsenic concentration was detected in one of the test pit samples in the former AST area.

**SI Work Plan**

DNR agrees with Sigma's work plan proposal that includes additional soil investigation activities per Wis. Admin Code § NR 716.11(3) requirements to define the degree and extent of soil and groundwater contamination in the west and southwest portion of the Property, beneath the three buildings and mill scale pile after removal, and along the northern portion of the Property after vegetation is removed. Sigma identified the known sources in "Table 1 – Former Biogenesis Known and Potential Sources of Contamination" in the Report, described the investigation completed to date in each area, and concluded whether additional investigation is needed for definition of contamination in each area. Locations identified in "Table 1" are referenced in the DNR comments below.

For completion of the investigation, a description must be provided for how the analytes selected for the soil, groundwater, sediment and vapor investigation activities are appropriate based on the waste characterization analyses of the waste drums, totes, etc., and for the previous usage of the Property. "Table 1" should be revised to clearly state all sources, and all analyses used to define each area of contamination.

As a VPLE site, the investigation cannot be considered complete until all areas of the Property are investigated for all potential historical releases, per Wis. Stat. § 292.15(2). Considering Biogenesis' known history of improperly storing and discarding drums on the Property, the spacing of soil borings over 100 feet apart is not sufficient to define the degree and extent of known and potential releases on the northern, northeast, or southeast portion of the Property.

DNR is providing specific comments and concerns below for completion of the site investigation. However, the site investigation can be an iterative process. Future sampling may indicate that further assessment is needed to define the degree and extent of contamination in all affected media.

***Soil Investigation***

Soil samples collected from a depth of only 0 to 1 foot across large areas of the Property may not be sufficient to rule out contamination in these areas. Considering that years have passed since many of these discharges occurred, the near-surface impacts may have weathered or volatilized, with higher concentrations possible at depths greater than 1 foot below ground surface (bgs). This is apparent since some test pit and soil boring logs indicate photoionization detector (PID) meter spikes at depths greater than 2 feet bgs with no indication of less shallow contamination. Therefore, a representative number of deeper samples must be collected in areas where borings were advanced to only 1 foot bgs. Deeper samples may be collected in currently overgrown areas after grubbing has occurred.

DNR does not agree with Sigma's conclusion that the extent of petroleum contamination has been defined to the east of the "dispensing area south of AST area," as stated in "Table 1." NRT data from 1995 indicated petroleum contamination was present within borings GP7, GP8, GP22 and GP25, based on PID readings and observations recorded during drilling. Laboratory analysis of these samples was limited to gasoline and diesel range organic compounds, rather than specific petroleum compounds. The PVOC soil contaminant plume must be defined.

Sigma did not identify the product release that contaminated the tributary to the north in 1986 in "Table 1." DNR is concerned that because there was a known migration path from the site to the tributary, there could be a history of contaminants that migrated off-site to the tributary. Additional investigation is required in the north-northeast to determine whether residual contamination remains in soil, groundwater and potentially in tributary sediment as a result of the 1986 product release and other potential releases. Describe if this migration pathway is still present or how it has been removed. Sigma identified the current location of a storm water culvert on a revised figure. A discussion of the new location in relation to the previous pathway should be included in the investigation report.

The proposed soil sampling within and around the southwest building footprint should be used to determine the source(s) of the chlorinated contamination in groundwater north of the southwest building. No soil contamination above residual contaminant levels (RCLs) was identified on *Figure 8B, Soil Quality Map-CVOCs*, dated August 1, 2018, although there is a groundwater plume in this area outlined on *Figure 9B Groundwater Quality Map-CVOCs*, dated August 1, 2018.

No additional investigation is proposed for the southeast building, based on the former heating oil UST investigation. However, this building was identified as a research and development building for Biogenesis, which would indicate chemical usage in that area. If chemical usage in this building cannot be ruled out, PVOC and CVOC sources and impacts to soil and potentially groundwater must be investigated in that area. At a minimum, soil samples should be collected beneath the building, and specifically in subsurface piping/drain system locations, as is proposed beneath the other two buildings, to identify potential contaminant sources for the soil and groundwater contamination.

***Groundwater Investigation***

Definition of the groundwater contaminant plumes should be considered as the soil investigation is completed. The DNR does not agree with Sigma's conclusion that the degree and extent of the PVOC and CVOC groundwater contaminant plumes are defined, as depicted on the PVOC and CVOC groundwater quality maps. Additional rounds of groundwater monitoring and additional monitoring wells are required to establish representative groundwater conditions before the investigation can be considered complete.

Petroleum impacts to groundwater in the southern AST area, previously identified as primarily associated with former dispenser locations, have not been adequately defined. During the NRT investigation in the early 1990s, the highest petroleum groundwater concentration (benzene at 1,000 micrograms per liter) was detected at monitoring well MW-14, which appears to have been at least 50 feet southeast and potentially downgradient of

current well MW-7. In 1995, the groundwater flow direction appeared to be easterly, with both northeasterly and southeasterly flow components. The PVOC groundwater plume map indicates that the extent is not yet defined to the north and east.

An evaluation of the relevance of soil and groundwater data collected in the 1990s to investigate petroleum contamination should be included in the final SI Report, per Wis. Admin. Code § 716.15. If concentrations are such that the new data are not comparable to the old, due to weathering or degradation, the old data may not be pertinent to the presentation of soil and groundwater plume maps.

The CVOC plume has not been defined to the north and northwest of MW-30. In addition, the vertical extent of the CVOC plume must be defined, especially for contamination detected north of the southwest building. At least two additional piezometers should be considered to define the non-petroleum contaminant plumes and to determine the deeper groundwater flow direction. DNR recommends nesting a piezometer with MW-28, and at least one additional piezometer further east. Evaluate whether more wells are needed, based on the contaminants detected and the apparent flow direction.

***Vapor Investigation***
All environmental media affected or potentially affected by contamination, including vapor, must be assessed during the investigation, per Wis. Admin. Code § NR 716.07(4). An evaluation of the volatile constituents and their concentrations in the proposed building area should be included in the final investigation report. A discussion of the vapor risk associated with locations of the highest residual contaminant concentrations, depths and proximity to the new building and utilities must be included.

***Sediment Investigation***
Wis. Admin. Code § NR 716.07(7) requires that responsible parties evaluate the potential or known impacts to receptors. An investigation of contamination from the Property to the tributary to the northeast is required, as at least one known discharge of petroleum product to the tributary occurred. With this known pathway to that waterway, it is possible that other contaminants may have been discharged to that waterway, considering the history of poor containment of materials on the Property. The investigation within the waterway should be determined based on contaminants detected in soil.

***Emerging Contaminants of Concern***
The DNR recommends that several samples collected from contaminated areas be laboratory analyzed for per- and polyfluoroalkyl compounds (PFAS), as previous Property usage reportedly included the manufacture of fire suppressants, surfactants, and cleaning compounds, which are commonly associated with PFAS. In addition, soil and groundwater samples should include analysis of 1,4-dioxane in any area where T-Maz® 20 Polysorbate 20 was mixed or stored, as the SDS for this product states that 1,4-dioxane is a component.

Before proceeding with additional investigation activities that include PFAS and 1,4-dioxane sampling and analysis, please submit a work plan with the sampling plan for DNR review. The rationale for each sampling location and media selected for these analyses should be included.

**General Investigation Report Comments**
After completion of the additional investigation activities, a site investigation report that addresses the above comments must be submitted for review and approval, as this site proceeds through the VPLE process. The following comments are provided to assist in the clear presentation of data that supports your recommendations and conclusions, and which will make the DNR's review more efficient.

1. Wis. Admin. Code § NR 716.15(4) requires that the site investigation report include tables and figures to clarify and support results and interpretations.
    a. Site figures should include soil and groundwater data on the figures, such that the degree and extent of the contamination are clearly shown.
    b. Soil boring locations where no analytical samples were collected should be removed from the soil contaminant plume maps for the constituents being depicted. For example, it is misleading to depict the limits of the arsenic soil plume with all the soil boring locations included, as none of the boring locations included arsenic analysis and are not applicable to the definition of arsenic that was detected in test pit STP-7.
    c. Soil and groundwater isoconcentration maps are required to depict the horizontal and vertical extent of contamination. Consider preparing maps for the main contaminants of concern, such as one or two CVOCs and one or two PVOCs, if those contaminants accurately convey the degree and extent of the overall contaminant plumes.
2. "Table 1 – Former Biogenesis Known and Potential Sources of Contamination" should be revised to clearly identify each recognized environmental condition (REC), such that the PVOC and/or CVOC usage/storage/discharge, for each area investigated is clear.
3. Each REC identified in "Table 1," previous bullet, should be clearly identified on an associated figure, per Wis. Admin. Code § 716.15, so that the soil borings and monitoring wells for each contaminant source are clear for the definition of each area. Sigma did provide a revised Figure 10 that depicted most of the RECs. Other sources, such as the former dispenser locations south of the ASTs, and the migration pathway to the tributary should be included in the final SI Report.
4. Per Wis. Admin. Code § NR 716.14(2), sampling results must be reported to the DNR within 10 days of receiving the data.

**Small-Diameter Monitoring Well Approval**

The DNR approves Sigma's request for a variance to Wis. Admin. Code ch. NR 141 for the use of small diameter wells for additional groundwater investigation activities, if the wells are constructed in accordance with the specific requirements of Wis. Admin. Code ch. NR 141, with the exception of a smaller borehole and casing diameter than required by Wis. Admin. Code § NR 141.19 and Wis. Admin. Code § NR 141.07(1). Supporting documentation for the proper installation, construction and development of these wells must be provided.

**Conceptual Remedial Action Plan**

Sigma's remedial approach includes a proposal to excavate two areas with high contaminant concentrations in soil. Sigma did not identify the criteria used to determine the volume of soil for excavation in these two areas. Identifying the criteria for removal is important, considering that it is not yet known what levels of contamination are present beneath the buildings that were used for storing and mixing chemicals. These currently uninvestigated areas could potentially be highly contaminated and are located beneath the proposed building footprint.

NRT previously concluded that high PVOC-contaminated soil in the former dispenser locations should be excavated to remove the highest concentrations detected during the investigation of the petroleum releases. Describe why that excavation is no longer necessary at the site, using current data that supports the new remedial proposal.

Contamination that is not actively remediated before construction must be adequately evaluated after construction to verify that there is no vapor risk for the future use. The proposed vapor system's effectiveness will have to be evaluated after construction.

In summary, a remedial action approach should be provided that better describes the criteria for excavation, such that it will be apparent what level of effort will be needed to address contamination that has yet to be defined.

Include details about the specific contaminants and concentrations that were used to determine the volume of soil that meet the hazardous characterization for disposal.

**Schedule**

In consideration of administrative code requirements, the DNR is requesting implementation of the following schedule:

- Per Wis. Admin. Code § NR 716.09(1), the DNR is requesting the submittal of a supplemental site investigation work plan for the investigation of emerging contaminants identified above, within 60 days of the date of this letter, by February 20, 2019. The work plan must comply with Wis. Admin. Code § NR 716.09(2).
- Per Wis. Admin. Code § NR 716.11(2g), the additional site investigation activities must begin within 90 days of the submittal of the work plan.
- Per Wis. Admin. Code § NR 716.15(1), a site investigation report shall be submitted within 60 days after completion of the field investigation.
- NR 700 semi-annual progress reports are required until the case is closed.

Thank you for your efforts to protect Wisconsin's environment. If you have any questions, please contact me in writing at the letterhead address or by telephone at (414) 263-8757.

Sincerely,

Linda Michalets
Hydrogeologist
Remediation and Redevelopment Program

cc: Mr. Joshua Neudorfer and Mr. Stephen Meer, The Sigma Group