Michael Schmoller  
Wisconsin Department of Natural Resources  
South Central Region  
3911 Fish Hatchery Road  
Fitchburg, WI 53711  

Subject:  
Rain Garden Investigation and Remedial Strategy,  
Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.  
Facility ID No. 113125320, BRRTS No. 02-13-001569  

Dear Mr. Schmoller:  

On behalf of the Madison-Kipp Corporation, a Site Investigation and Interim Actions Report, February 2012 – January 2013 (SI Report) was submitted to the Wisconsin Department of Natural Resources (WDNR) on March 15, 2013, for the facility located at 201 Waubesa Street (Site) (ARCADIS, 2013). The WDNR prepared a response letter to the SI Report dated June 20, 2013 (WDNR, 2013). On July 8, ARCADIS met with you to discuss the response letter and clarify the expected deliverable related to the rain garden. As requested by you at the July 8 meeting, this letter has been prepared in lieu of an investigatory work plan and provides a summary of rain garden location and description, soil investigation activities and soil analytical results from the rain garden, as well as the recommended approach to address residual soil impacts.

Rain Garden Location and Description  

The city of Madison constructed a “rain garden” in 2006 on city property near the northeast corner of the Site (Figure 1). The parcel is currently zoned by the city of Madison as limited manufacturing. The rain garden was a demonstration project completed by the city of Madison to illustrate how runoff of precipitation in an urban setting can be reduced through the use of vegetated areas. The rain garden captures precipitation runoff from the adjoining bike path and from the Site’s north parking lot. A topographic survey of the rain garden was completed on May 6, 2013, by North Shore Engineering located in Mequon, Wisconsin. The rain garden is approximately 2 feet deep based on the topographic contours presented on Figure 1.

In 2005, CGC, Inc. of Madison, Wisconsin was contracted by the city of Madison to complete a geotechnical exploration program in preparation for the “Kipp Rain Garden” (CGC, 2005). The geotechnical exploration program included the advancement of three direct push soil borings (B-1 through B-3) to 12 feet below land...
surface (bls) at the location of the proposed rain garden and an estimate of infiltration potentials. Clayey soils were observed in the soil borings with estimated infiltration potentials ranging from 0.24 to 0.5 inches per hour. Groundwater was encountered between 9 to 10 feet bls. According to the Geotechnical Exploration Report prepared by CGC, the area at the time of the investigation was a grassy ditch or drainage way with a few small trees. Construction of the rain garden was to include the excavation of approximately 2 to 4 feet of the existing soils and backfilling with soil consisting of sand, topsoil, and compost. A copy of the CGC report is presented in Appendix A.

The city of Madison did not prepare a construction report to document the final construction of the rain garden.

Soil Investigation

On June 1, 2013, ARCADIS advanced one hand auger soil boring (B-23) to 4 feet bls through the base of the rain garden (Figure 2). The soil was described as clay with little silt and sand. Soil samples were collected and submitted for laboratory analyses, including volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), Resource Conservation Recovery Act metals, and total cyanide from samples collected 0 to 1 and 2 to 4 feet bls. Soil analytical results are summarized in Table 1 and presented on Figure 2. Below is a brief summary of the soil analytical results.

- VOC concentrations were reported below laboratory detection limits.

- PCB concentrations were reported above the industrial residual contaminant level (RCL) of 0.744 milligrams per kilogram (mg/kg) from 0 to 1 foot bls (0.82 mg/kg) and from 2 to 4 feet bls (2.5 mg/kg) for Aroclor 1248. Total detected PCBs were reported above the U.S. Environmental Protection Agency high occupancy cleanup level of 1 mg/kg from 2 to 4 feet.

- PAH concentrations were reported below the industrial RCLs.

- Arsenic concentrations were reported above the industrial RCL of 1.59 mg/kg from 0 to 1 foot bls (3.8 mg/kg) and from 2 to 4 feet bls (8.7 mg/kg). However, as presented in the SI Report, arsenic concentrations were found widespread on and off Site within a narrow range of concentrations. The presence of arsenic in the rain garden appears to represent naturally occurring background conditions.

- Total cyanide concentrations were reported below the industrial RCL.
Recommendations

As discussed with you during the July 8 meeting, the residual PCB-impacted soil in the rain garden will be managed in accordance with an approved Materials Handling Plan, and placed on the WDNR's Soil Geographic Information System Registry. A copy of the Materials Handling Plan is presented in Appendix B for review. A copy of the Materials Handling Plan will be provided to the city of Madison following review by the WDNR.

References


ARCADIS U.S., Inc.

Toni Schoen
Senior Scientist

Jennine Trask, PE
Project Manager

Copies:
David Crass - Michael, Best, & Friedrich LLP
Mark Meunier - Madison-Kipp Corporation
Robert J. Nauta - RJN Environmental Services LLC (electronic)
Steve Tinker - Wisconsin Department of Justice (electronic)
Table 1. Rain Garden Soil Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Soil to Groundwater Pathway RCL</th>
<th>Non-Industrial Direct Contact RCL</th>
<th>Industrial Direct Contact RCL</th>
<th>EPA High Occupancy Cleanup Level</th>
<th>TSCA Disposal Limit</th>
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<th>B-23</th>
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<td>VOCs (mg/kg)</td>
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<td>NE</td>
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<td>&lt;0.0052</td>
<td>&lt;0.0045</td>
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PAHs (mg/kg)

| 1-Methylnaphthalene | NE | NE | NE | NE | NE | <0.12 | <0.021 |
| 2-Methylnaphthalene | NE | 229 | 368 | NE | NE | <0.31 | <0.054 |
| Acenaphthene | NE | 3,440 | 33,000 | NE | NE | <0.071 | <0.013 |
| Acenaphthylene | NE | 487 | 487 | NE | NE | <0.054 | <0.0096 |
| Anthracene | 196.74 | 17,200 | 100,000 | NE | NE | <0.055 | 0.017 J |
| Benzo(a)anthracene | NE | 0.148 | 2.11 | NE | NE | 0.1 J | 0.072 |
| Benzo(a)pyrene | 0.47 | 0.0148 | 0.211 | NE | NE | 0.18 J | 0.061 |

Footnotes on Page 3.
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<th>TSCA Disposal Limit</th>
<th>0-1 2-4</th>
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<td>RCL</td>
<td>RCL</td>
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<td>PAHs (mg/kg) (continued)</td>
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<td>NE</td>
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<td>0.15 J</td>
<td>0.038 J</td>
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<td>21.1</td>
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<td>NE</td>
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<td>0.033 J</td>
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<td>Chrysene</td>
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<td>NE</td>
<td>NE</td>
<td>0.17 J</td>
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<td>Fluorene</td>
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<td>Phenanthrene</td>
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<td>&lt;0.1</td>
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<td>Arsenic</td>
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Footnotes on Page 3.
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<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Soil to Groundwater Pathway RCL</th>
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<th>TSCA Disposal Limit</th>
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<tr>
<td>Sample Date Pathway</td>
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<td>Sample Interval (feet bls)</td>
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<td>613</td>
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<td>NE</td>
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Only detected constituents are noted. Please refer to laboratory reports for a complete list of constituents and results.

| Exceeds the WDNR's non-industrial direct contact residual contaminant level. |
| Exceeds the WDNR's soil to groundwater pathway residual contaminant level. |
| Exceeds the EPA's self-implementing high-occupancy cleanup level with no site restrictions. |
| Laboratory control spike or laboratory control spike duplicate exceeds the control limits. |
| Constituent not detected above noted laboratory detection limit. |
| Laboratory instrument related quality control limits exceeded. |

**Constituent not detected above noted laboratory detection limit.**
**Laboratory control spike or laboratory control spike duplicate exceeds the control limits.**

**Constituent concentration is an approximate value.**
**Compound was found in the blank and sample.**
**Below land surface.**
**Milligrams per kilogram.**
**Not analyzed.**
**Criteria not established.**
**Polycyclic Aromatic Hydrocarbons.**
**Polychlorinated Biphenyls.**
**Residual contaminant level.**
**Resource Conservation Recovery Act.**
**Toxic Substance Control Act.**
**United States Environmental Protection Agency.**
**Volatile Organic Compounds.**
All locations are approximate.

Legend:
- Monitoring well
- Topographic contour
- Estimated extent of rain garden
- Parcels
- Building footprints

Location of Rain Garden

FIGURE 1
RAIN GARDEN SOIL ANALYTICAL RESULTS

**LEGEND**
- SOIL BORING LOCATION
- MONITORING WELL
- PARCELS
- BUILDING FOOTPRINTS

ALL LOCATIONS ARE APPROXIMATE.

**Sample Interval (feet bls)**

<table>
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<tr>
<th>Sample Interval (feet bls)</th>
<th>0-1</th>
<th>2-4</th>
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<tr>
<td>Tetrachloroethene</td>
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<td>Trichloroethene</td>
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<td>&lt;0.012</td>
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<td>Benz(a)pyrene</td>
<td>0.18 J</td>
<td>0.061</td>
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<td>Benzo(b)fluoranthene</td>
<td>0.31</td>
<td>0.085</td>
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<td>Chrysene</td>
<td>0.17 J</td>
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<td>2.5</td>
</tr>
<tr>
<td>Arsenic</td>
<td>3.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.35</td>
<td>&lt;0.06</td>
</tr>
<tr>
<td>Selenium</td>
<td>&lt;0.41</td>
<td>0.80 J</td>
</tr>
</tbody>
</table>

**Note:**
- Exceeds the WDNR's non-industrial direct contact residual contaminant level.
- Exceeds the WDNR's industrial direct contact residual contaminant level.
- Laboratory instrument related quality control limits exceeded.
- Constituent concentration is an approximate value.
- All concentrations posted are in milligrams per kilogram.
- bls Below land surface
Appendix A

Geotechnical Exploration Report
November 11, 2005
C5941-12

Ms. Genesis Richanich
Water Resources Specialist I
City of Madison
Dep. of Engineering
City-County Building, Room 115
210 Martin Luther King, Jr. Boulevard
Madison, WI 53705

Re: Geotechnical Exploration Report
Kipp Rain Gardens
Madison, Wisconsin

Dear Ms. Richanich:

Construction Geotechnical Consultants, Inc. (CGC) has completed the geotechnical exploration program for the project referenced above. The purpose of this exploration program was to evaluate the subsurface conditions within the proposed rain gardens and to provide geotechnical recommendations regarding infiltration potential. Two copies of this report are provided for your use, and additional copies can be provided upon request.

PROJECT DESCRIPTION

We understand that rain gardens are proposed for a piece of land at the north end of South Marquette Street and southeast of the Capital City Bike Path. We understand that the rain gardens will be constructed by excavating approximately 2 to 4 ft of the existing soils and backfilling with a blended soil consisting of sand, topsoil and compost.

SITE CONDITIONS

The site is located north of the Kipp Company factory between South Marquette and Washten Streets. As mentioned above, the rain gardens are proposed on a small parcel of land on the southeast side of the Capital City Bike Path and west of private residences. The existing site appears to be a ditch or drainageway and is primarily covered in long grass with a few small trees.

SUBSURFACE CONDITIONS

Subsurface conditions on site were explored by drilling a total of three geoprobe soil borings to depths of 12 ft below existing grade at locations selected and located in the field by CGC using a map provided by the City of Madison. The area of the proposed rain gardens was marked in the field by others prior to locating the borings. The borings were drilled on September 30, 2003 by Krason Environmental Services (under subcontract to CGC) using a truck-mounted geoprobe drill rig. The boring locations are shown in plan on the Soil Boring Location Map attached in Appendix B.
The subsurface profile at the boring locations is quite uniform and can generally be described by the following layers (in descending order):

- 1.8 to 2.5 ft of topsoil, over
- 4.5 to 7.2 ft of very soft to stiff silty to lean clay, followed by
- Silty sand, sandy silt, and sand with significant amounts of silt and various amounts of gravel to the maximum depth explored.

Exceptions to the above profile include a 2-ft thick silty clay layer between sand layers in Boring 2 and a 1-ft thick silty to lean clay layer below the sandy silt layer and above the sand layer in Boring 3.

Groundwater was encountered in the borings at depths below the ground surface ranging from 9 to 10 ft during or shortly after drilling. Groundwater levels are expected to fluctuate with seasonal variations in precipitation, infiltration, evapotranspiration, and other factors. A more detailed description of the site soil and groundwater conditions is presented on the Soil Boring Logs attached in Appendix B.

INFECTION POTENTIAL - DISCUSSION AND RECOMMENDATIONS

As mentioned above, we understand that rain gardens are planned for this development. The exact locations and sizes of rain gardens have yet to be finalized. Clayey soils were generally observed in the infiltration areas below the topsoil with scattered sand and silt layers also encountered at greater depths. The clayey soils were generally classified as silty clay loam, and the sand and silt soils were generally classified as sandy loam and loam according to the United States Department of Agriculture (USDA) classification system. The following parameters should be considered as basin development progresses:

- **Infiltration Potential**: The following infiltration parameters were estimated using Table 2 of the WTPA Conservation Practice Standard 1902, Site Evaluation for Storm Water Infiltration. The estimated infiltration potentials are as follows:
  - Loam to sandy loam: 0.24 - 0.5 in./hr.
  - Silty clay loam: 0.04 in./hr.

Note that the infiltration rates should be considered very approximate.

- **Groundwater**: Groundwater was encountered in the borings at depths of 9 to 10 ft below the ground surface during or shortly after drilling. Seasonal fluctuations in the groundwater level should be expected, as previously discussed.

- **Bedrock**: Bedrock was not detected in the borings to the maximum depth explored.
Based on the relatively thick layer of low permeability clay encountered in the borings, this site does not appear suitable to infiltrate significant quantities of stormwater.

*****

It has been a pleasure to serve you on this project. If you have any questions or need additional consultation, please contact us.

Sincerely,

CGC, Inc.

David Staab, P.E.
Geotechnical Engineer

William W. Wuehlner, P.E.
Senior Geotechnical Engineer

Encl.: Appendix A - Field Exploration
       Appendix B - Soil Boring Location Map
                      Logs of Test Borings (3)
                      Log of Test Boring-General Notes
                      Unified Soil Classification System
       Appendix C - Document Qualifications
APPENDIX A

FIELD EXPLORATION
APPENDIX A

FIELD EXPLORATION

Subsurface conditions on site were explored by drilling a total of three geoprobe soil borings to depths of 12 ft below existing site grades at locations selected and located in the field by CGC using a map provided by the City of Madison. The borings were drilled on September 30, 2005 by Kitson Environmental Services (under subcontract to CGC) using a geoprobe drill rig. The boring locations are shown in plan on the Soil Boring Locations Map attached in Appendix B. The specific procedures used for drilling and sampling are described below.

Continuous soil sample are collected by pushing a 2-1/2 in. diameter, 4-ft long plastic casing. The sampler is advanced to the end of the 4-ft increment, the first sleeve is removed, and a new plastic sleeve is inserted prior to advancing a subsequent increments. The ends of the plastic tube samples are sealed and delivered to CGC’s geotechnical laboratory.

During the field exploration, the driller visually classified the soil and prepared a field log. Field screening of the soil samples for possible environmental contaminants was not conducted by the drillers as environmental site assessment activities were not part of CGC’s work scope. Water level observations were made in each boring during and after drilling and are shown at the top of each boring log. Upon completion of drilling, the borings were backfilled with bentonite (where required) to satisfy WDNR regulations and the soil samples were delivered to our laboratory for visual classification and laboratory testing. The soils were visually classified by a geotechnical engineer using the Unified Soil Classification System. The final logs were prepared by the engineer and a description of the Unified Soil Classification System are presented in Appendix B.
APPENDIX B

SOIL BORING LOCATION MAP
LOGS OF TEST BORINGS (3)
LOG OF TEST BORING-GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM
Notes:

2. Base map provided by the City of Madison.
3. Boring locations are approximate.
## Soil Boring Log Information

**Project Name:** Kings St. Rain Gardens  
**License/Permit/Monitoring Number:** B-1  
**Boring Number:** B-1

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth in Feet</th>
<th>Soil/rock Description And Geologic Origin For Each Major Unit</th>
<th>USCS</th>
<th>Graphite</th>
<th>Vane</th>
<th>Index</th>
<th>Strength Class</th>
<th>Strength</th>
<th>Cubic Feet Per Day</th>
<th>Permeability</th>
<th>P 200</th>
<th>Grain Size %</th>
<th>Knarr</th>
<th>Length of Drill</th>
<th>Total Feet</th>
<th>Rake Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 GP</td>
<td>48</td>
<td>Dark Gray Slight Organic Sandy Silt (ML - topsoil)</td>
<td>ML</td>
<td>ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>1.75</td>
<td>1.0</td>
<td>0.25</td>
<td>0.25</td>
<td>1.0</td>
<td>1.0</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>2 GP</td>
<td>48</td>
<td>Very Soft to Stiff, Brown to Gray Silty to Lean CLAY, Trace to Little Sand USDA: 7.5YR 4/4 to 5YR 5/1 Silty Clay Loam</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>1.0</td>
<td>0.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>3 GP</td>
<td>48</td>
<td>Scattered Silty Fine Sand Seams near 8 ft</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>CL-ML</td>
<td>0.25</td>
<td>0.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>Brown Silty Fine SAND to Sandy Silt USDA: 7-5YR 4/4 Sandy Loam to Lean</td>
<td>SM/ML</td>
<td>SM/ML</td>
<td>SM/ML</td>
<td>SM/ML</td>
<td>SM/ML</td>
<td>SM/ML</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>Brown Fine to Medium SAND, Some Silts, Little to Some Gravel USDA 7.5YR 4/4 Sandy Loam and Boring at 72 ft</td>
<td>SM</td>
<td>SM</td>
<td>SM</td>
<td>SM</td>
<td>SM</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>48</td>
<td></td>
</tr>
</tbody>
</table>

I hereby certify that the information on this form is true and correct to the best of my knowledge.

**Signature:**

**Phone:** 608-288-4100  
**Fax:** 608-218-7847

**Notes:**

- This form is authorized by Chapter 283, 283, 283, 200, 203, 293, 295, 299, and 399, Wis. Stats. Completion of this form is mandatory. Failure to file this form in full in fortiety of between $10 and $25,000, or imprisonment for up to one year, depending on the progress and conduct involved. Personal identification information on this form is not intended to be used for any other purpose. NOTE: 5 for instructions for more information, in filing where the completed fo shall be sent.
<table>
<thead>
<tr>
<th>Number</th>
<th>Depth to Feet</th>
<th>Soil/Block Description</th>
<th>Apo Geologic Origin For Each Major Unit</th>
<th>Soil Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 GP</td>
<td>48</td>
<td>Dark Gray Silt Organic Sandy Silt (ML - Topsoil)</td>
<td>ML</td>
<td>Qp = 1.25</td>
</tr>
<tr>
<td>2 GP</td>
<td>48</td>
<td>Medium Silt to Silt, Brown to Brownish Gray Silty to Lean CLAY USDA: 7.5YR 4/4 Silty Clay Loam</td>
<td>CL-M</td>
<td>Qp = 0.75</td>
</tr>
<tr>
<td>3 GP</td>
<td>34</td>
<td>Brown Fine to Medium SAND, Some Sil, Little to Some Gravel USDA: 7.5YR 4/4 Sandy Loam</td>
<td>CL-M</td>
<td>Qp = 2.25</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>End Boring at 12 ft</td>
<td>Borehole backfilled with bentonite chips</td>
<td></td>
</tr>
</tbody>
</table>

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm: COC, Inc.

Tel: 508-288-4900
Fax: 508-288-7387

This form is authorized by Chapter 281, 283, 289, 292, 293, 295, and 299, Wis. Stat. Completion of this form is mandatory. Failure to file this form as required is a violation of between $10 and $25,000, or imprisonment for up to one year, depending on the projects and context involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.
### SOIL BORING LOG INFORMATION

**Form 4-00-122**  
**Rev. 7-94**

<table>
<thead>
<tr>
<th>Facility/Project Name</th>
<th>License/Permit/Monitoring Number</th>
<th>Boring Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Koger St. Rain Gardens</td>
<td>1</td>
<td>B-3</td>
</tr>
</tbody>
</table>

**Drilling Details:**  
- **Boring Date:** 9/30/2005  
- **Drilling Method:** Direct Push

**Drill Hole Information:**  
- **Well ID No.:** B-3  
- **Common Well Name:**  
- **End Soil Water Level:** 10.0 Feet  
- **Drilled Diameter:** 2.50 inches

**Local Grid Origin:**  
- **State Plane:** E  
- **Local UTM Location:**  
- **Foot X S:** N  
- **Foot Y E:** E

**Sample Information:**  
- **Sample No.:**  
- **Sample Code:**  
- **County:**  
- **City of Madison:**  
- **Sample Date:**

<table>
<thead>
<tr>
<th>Depth in Feet</th>
<th>Soil/Soil Description</th>
<th>Soil Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.20</td>
<td>Dark Gray Silt loam (ML)</td>
<td>Clay, Fine, High Cation Exchange capacity</td>
</tr>
<tr>
<td>2.40</td>
<td>Stiff brown silt loam (ML)</td>
<td>Clay, Low Cation Exchange capacity</td>
</tr>
<tr>
<td>3.60</td>
<td>Brown sandy loam (ML)</td>
<td>Clay, Low Cation Exchange capacity</td>
</tr>
<tr>
<td>4.80</td>
<td>Sand (ML)</td>
<td>Clay, Low Cation Exchange capacity</td>
</tr>
<tr>
<td>6.00</td>
<td>Medium SAND, some silt, Little to None Gravel</td>
<td>Clay, Low Cation Exchange capacity</td>
</tr>
<tr>
<td>7.20</td>
<td>End Boring at 12 ft</td>
<td>End Boring at 12 ft</td>
</tr>
</tbody>
</table>

### Notes
- Sample No. 1: 68  
- Sample No. 2: 44  
- Sample No. 3: 46  
- Sample No. 4: 48  
- Sample No. 5: 48

---

I hereby certify that the information on this form is true and correct to the best of my knowledge.

**Signature:**

**Date:**

---

This form is required by Chapters 251, 253, 254, 257, 258, 259, and 260 of the Wisconsin Administrative Code and the Wisconsin Department of Natural Resources for the purpose of compliance with applicable regulations. This form is to be used by the professionals who conduct the work to document the results of the work. It is recommended that the completed form be retained with the work records for a minimum of five years. This form is not to be used for any other purpose. N.C.R.: See instructions for more information, including where the completed form should be sent.
<table>
<thead>
<tr>
<th>Physical Characteristics</th>
<th>RELATIVE DENSITY</th>
<th>CONSISTENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color, mineral, grain shape, firmness, etc.</td>
<td>Term</td>
<td>9” Cube</td>
</tr>
<tr>
<td>Major Constituents</td>
<td>Loose</td>
<td>4-10</td>
</tr>
<tr>
<td>clay, silt, sand, gravel, structure</td>
<td>Medium Dense</td>
<td>10-30</td>
</tr>
<tr>
<td>Laminated, cored, fibrous, stratified, cemented, fissured, etc.</td>
<td>Dense</td>
<td>30-50</td>
</tr>
<tr>
<td>Geologic Origin</td>
<td>Very Dense</td>
<td>Over 50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RELATIVE PROPORTIONS OF ORGANIC CONTENT BY COMBUSTION METHOD</th>
<th>PLASTICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportional Defining Range by Term Weight</td>
<td>Plastic Index</td>
</tr>
<tr>
<td>Trace</td>
<td>0.25 to 0.50</td>
</tr>
<tr>
<td>Little</td>
<td>0.50 to 1.0</td>
</tr>
<tr>
<td>Some</td>
<td>1.0 to 2.0</td>
</tr>
<tr>
<td>And</td>
<td>2.0 to 4.0</td>
</tr>
<tr>
<td>High</td>
<td>Over 4.0</td>
</tr>
</tbody>
</table>

### GENERAL TERMINOLOGY

<table>
<thead>
<tr>
<th>Soil Fraction</th>
<th>Part Size</th>
<th>U.S. Standard Screen Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boulders</td>
<td>Larger than 12”</td>
<td>Larger than 12”</td>
</tr>
<tr>
<td>Coarse</td>
<td>3” to 12”</td>
<td>3” to 12”</td>
</tr>
<tr>
<td>Gravel</td>
<td>3/4” to 3”</td>
<td>3/4” to 3”</td>
</tr>
<tr>
<td>Fine</td>
<td>4.76 mm to 3/4”</td>
<td>#4 to #6</td>
</tr>
<tr>
<td>Sand</td>
<td>2.00 mm to 4.76 mm</td>
<td>#10 to #4</td>
</tr>
<tr>
<td>Medium</td>
<td>0.42 mm to 2.00 mm</td>
<td>#40 to #10</td>
</tr>
<tr>
<td>Silt</td>
<td>0.074 mm to 0.42 mm</td>
<td>#200 to #40</td>
</tr>
<tr>
<td>Clay</td>
<td>0.009 mm to 0.074 mm</td>
<td>Smaller than #400</td>
</tr>
</tbody>
</table>

| Clay clay, organic, residual, etc. | Smaller than 0.005 mm | Smaller than #200 |

Plasticity characteristics differentiate between silt and clay.

### WATER LEVEL MEASUREMENT

- **V** — Water level at a given point
- **Wv** — Water level at center
- **Wl** — Water level at the bottom
- **B** — Before cementing removal
- **ACR** — After cementing removal
- **C** — Cure
- **C&M** — Cured and moist

Note: Water level measurements shown on the boring logs require conditions at the time indicated and may not reflect static levels, especially in cohesive soils.
**COARSE-GRAINED SOILS**

(More than half of material is larger than No. 200 sieve size.)

<table>
<thead>
<tr>
<th>GRAVELS</th>
</tr>
</thead>
</table>
| GW | Well-graded gravel, gravel-sand mixtures, or gravelly sand
| GP | Poorly graded gravel, gravelly sand, or gravelly silty sand
| GC | Clayey gravel, gravel-sandy mixtures

<table>
<thead>
<tr>
<th>SANDS</th>
</tr>
</thead>
</table>
| Clean Sands | Little or no fines
| SW | Well-graded sand, gravelly sand, or no fines
| SP | Poorly graded sands, gravelly sand, or silty sand
| SM | Silty sand, sandy-silt mixtures
| SC | Clayey sands, sandy-clay mixtures

(More than half of material is smaller than No. 200 sieve size.)

<table>
<thead>
<tr>
<th>SILTS AND CLAYS</th>
</tr>
</thead>
</table>
| ML | Inorganic silts and very fine sands, silt, or clayey fine sands or clayey silts with slight plasticity
| CL | Inorganic clays of low or medium plasticity, sandy clays, silt, or clayey silts, and clay
| OL | Organic silts and organic silt clay of low plasticity

<table>
<thead>
<tr>
<th>5/15 AND CLAYS</th>
</tr>
</thead>
</table>
| MH | Inorganic silt, thickness of silty clay, or silty sand, slightly plastic
| CH | Inorganic clays of high plasticity, fat clays
| OH | Organic silts of medium to high plasticity, high plastic clays

<table>
<thead>
<tr>
<th>HIGHLY ORGANIC SOILS</th>
</tr>
</thead>
</table>
| PT | Peat and other highly organic soils

**LABORATORY CLASSIFICATION CRITERIA**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>GW</td>
<td>G, = greater than 3, G, = between 1 and 3</td>
<td>For GW soil classification, G, = G, = between 1 and 3.</td>
</tr>
<tr>
<td>GP</td>
<td>GP soil meeting all gradation requirements for GW</td>
<td></td>
</tr>
<tr>
<td>GM</td>
<td>Attaching limits below A line on F.S. less than 4</td>
<td>Above &quot;A&quot; line with F.S. between 4 and 7 are empirical cases requiring use of full symbols.</td>
</tr>
<tr>
<td>GC</td>
<td>Attaching limits above A line with F.S. greater than 1</td>
<td></td>
</tr>
<tr>
<td>SW</td>
<td>C, = = greater than 6, C, = between 1 and 3</td>
<td></td>
</tr>
<tr>
<td>SP</td>
<td>Not meeting all gradation requirements for SW</td>
<td></td>
</tr>
<tr>
<td>SM</td>
<td>Attaching limits below A line on F.S. less than 4</td>
<td>Limits plotting in hatchet zone with F.S. between 4 and 7 are borderline cases requiring use of full symbols.</td>
</tr>
<tr>
<td>SC</td>
<td>Attaching limits above A line on F.S. greater than 1</td>
<td></td>
</tr>
</tbody>
</table>

**PLASTICITY CHART**

- For classification of fine-grained soils and fine fraction of coarse-grained soils.
- Attenborough Limits in hatched area are based on classification without requiring use of full symbols.
- Equation of Attenborough Limit: F.S. = 1.37C - 25
APPENDIX C

DOCUMENT QUALIFICATIONS
I. GENERAL RECOMMENDATIONS/LIMITATIONS

COC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. COC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. COC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

II. IMPORTANT INFORMATION

ABOUT YOUR

GEOTECHNICAL ENGINEERING REPORT

GEOENGINEERING structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. And no one except you should apply the report for any purpose or project except the one originally contemplated.

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected element: only.

A GEOENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure; the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can evade the reliability of an existing geotechnical report include those that affect:

- the fraction of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or project ownership.

As a general rule, always inform your geotechnical engineer of project changes - even without your request - and request an assessment of their impact. COC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not informed.

SURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the study was performed. Do not rely on a geotechnical engineering report where adequacy may have been affected by: the passage of time; by man-made events, such as construction or an adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always consult the geotechnical engineer before applying the report to determine if it is still reliable. A subset amount of additional testing or analysis could represent major problems.

MOST GEOENGINEERING FINDINGS ARE PROFESSIONAL OPINIONS

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are
taken. Geotechnical engineers review field and laboratory data and then apply their professional judgement to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide consultation is the most effective method of quantifying the risks associated with unanticipated conditions.

A REPORT’S RECOMMENDATIONS ARE NOT FINAL

Do not over rely on the construction recommendations included in your report. These recommendations are not final, because geotechnical engineers develop them principally from judgement and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. C&C cannot assume responsibility for liability for the report’s recommendations if we do not perform construction observation.

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO INTERPRETATION

Other design teams’ interpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team’s plans and specifications. Contractors can also misunderstand or interpret geotechnical engineering reports. Reduce that risk by having C&C participate in prebid and preconstruction conferences, and by providing construction observation.

DO NOT REDRAW THE ENGINEER’S LOGS

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should never be redrawn for alteration in handwriting or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that imparing logs from the report can elevate risk.

GIVE CONTRACTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent such problems, give contractors the complete geotechnical engineering report, but precede it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report’s accuracy is limited.

encourage them to confer with the geotechnical engineer who prepared the report (in most cases may be required and/or to conduct additional study to obtain specific types of information they need or prefer. A prebid conference can also be valuable. Do not try to shrink engineers used to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

READ RESPONSIBILITY PROVISIONS CLOSELY

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is the last step in other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointment, claims, and disputes. To help reduce such risks, geotechnical engineers commonly include a variety of exculpatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineer’s responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

GEONVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques, and personnel used to perform a geotechnical study differ significantly from those used to perform a geotechnical study. For that reason, a geotechnical engineering report does not usually relate any geonvrenmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or other hazardous materials. Unanticipated environmental problems related to a number of project failures. If you have not yet obtained your own geonvrenmental information, ask your geotechnical consultant for risk management guidance. Do not rely on an environmental report prepared for someone else.

RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in ASFE ensures geotechnical engineers to a wide array of risk management techniques that may be of greatest benefit for everyone involved with a construction project. Consult with C&C, a member of ASFE, for more information.

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ASFE
2111 Calvertville Road, Berne 0 106
Silver Spring, MD 2010

Address: 2111 Calvertville Road, Berne 0 106
Silver Spring, MD 2010
Appendix B

Materials Handling Plan
MATERIALS HANDLING PLAN

City of Madison
Walkways and Bike Paths
Parcel No. 0710-053-0503-4
Madison, Wisconsin

August 2013
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1 Site Location Map, City of Madison Walkways and Bikepaths, Parcel 0710-053-0503-4, Madison, Wisconsin.

2 Site Layout Map, City of Madison Walkways and Bikepaths, Parcel 0710-053-0503-4, Madison, Wisconsin.

3 Areas of Soil and Groundwater Impacts, City of Madison Walkways and Bikepaths, Parcel 0710-053-0503-4, Madison, Wisconsin.
Materials Handling Plan

City of Madison
Walkways and Bike Paths
Parcel No. 0710-053-0503-4
Madison, Wisconsin

Introduction

ARCADIS has prepared this Materials Handling Plan (Plan) for a portion of Parcel Number 0710-053-0503-4, in Madison, Wisconsin (Site). The Site is currently owned by the City of Madison Walkways and Bike Paths (Owner). The Site is located south of the Goodman Community Center and north of Madison-Kipp Corporation. Figure 1 is a Site Location Map and Figure 2 is a Site Layout Map. Figure 3 presents the portion of Parcel Number 0710-053-0503-4 where this Plan is applicable. This Plan describes the future measures to be followed when encountering impacted soil, surface water, and groundwater at the Site.

Investigation activities have been completed at the Site. Residual impacts are present in the soil and groundwater underlying the Site. Due to the residual impacts, precautions will need to be taken if work on the Site will require disturbing underlying soil or groundwater.

A copy of this Plan shall at all times be kept on file in the offices of: (1) the Wisconsin Department of Natural Resources (WDNR); (2) the Owner; and (3) others, as necessary. A copy of this Plan shall be made available by the Owner to contractors, utilities and maintenance personnel, and any other public or private persons or entities authorized to perform work on the parcel.

Environmental Condition Summary

This section presents a brief overview of the Site conditions. An environmental investigation was completed at the Site. Based on the investigation results, the environmental conditions can be summarized as follows:

- Soils underlying the Site consist of brown clay with little silt and sand.

- The depth to groundwater ranges from approximately 6 to 18 feet below land surface (bls).

- The primary contaminants of concern in soil reported above the industrial direct contact residual contaminant levels are polychlorinated biphenyls (PCBs). The PCBs are primarily located in surface soils from a depth of 0 to 4 feet bls. Arsenic was detected but determined to represent naturally occurring background conditions.
Materials Handling Plan

City of Madison
Walkways and Bike Paths
Parcel No. 0710-053-0503-4
Madison, Wisconsin

- The primary contaminants of concern in groundwater are chlorinated volatile organic compounds (VOCs) including tetrachloroethene and trichloroethene. The groundwater impacts are present below the base of the rain garden at a depth greater than 6 feet bgs.

Health and Safety

To address the materials of concern in the soil, surface water, and groundwater at the Site, the following general actions shall be taken. All requirements under this section, both financial and appropriate execution, are the responsibility of the Owner and/or the subcontractors directly hired by the Owner, unless otherwise indicated.

- All consultants, contractors, employees, and others that may disturb or come in contact with any soils, surface water, or groundwater on the Parcel shall have their own health and safety plan to deal with contingencies which may arise. These plans shall reflect applicable standards of care recognized in the trades for performing work in environmentally impacted materials.

- If any soil is excavated below grade and/or below the groundwater table on the Site, personnel shall wear appropriate personal protective equipment to limit exposure to the contaminants and shall follow these guidelines.
  - Personnel shall wear disposable latex or nitrile gloves when contacting soil, surface water, and groundwater. Optionally, a tyvek suit or rubber boots may be worn to minimize contact to clothing and footwear with impacted soils.
  - Boots shall be washed off prior to leaving the parcel for any purpose.
  - Personnel shall refrain from eating, drinking, and smoking while working in the areas of impacted soils or water.

- Control of airborne dust from impacted soil shall be maintained at all times by appropriate methods (e.g., covering of stockpiles, wetting).

- Construction equipment or tools that come in contact with the soils shall be decontaminated prior to leaving the parcel to remove soil through the use of high-powered, hot water pressure washers, steam cleaners or detergents or other method. All wash water shall be contained, tested, managed, and disposed in accordance with all applicable regulations.
Material Handling Plan

The Material Handling Plan specifies the requirements to be followed when performing earth work, surface water, or groundwater management. These activities are generally associated with construction or maintenance of the rain garden.

Activities Requiring WDNR Approval

The WDNR must be notified and approval obtained from WDNR prior to conducting the following activities:

Construction or Installation of Buildings, Structures or Other Improvements

Buildings, structures or other improvements may be constructed or installed on the Site using footings or other foundations that are placed into the area of residual impacts in the following manner:

- The contractor performing the work shall be provided with a copy of this Plan by Owner and shall prepare their own health and safety plan, appropriate to the work being performed.

- Any excavation of soil shall be conducted in accordance with this Plan and the contractor’s health and safety plan. All excavated soil shall be, at a minimum, placed onto plastic sheeting and covered, or placed into a watertight container such as a covered rolloff box.

- Upon completion of the work, previously excavated soil may be used as backfill, provided, however, that the backfilled soil maintains the compaction characteristics of the surrounding soil and is placed above the water table. The soil, as well as any additional clean soil or granular fill material necessary to backfill to grade, shall be backfilled in such a manner as to maintain the original depth of the impacted soil. The backfill area shall be restored in a manner consistent with the original grade. If surface water and/or groundwater are encountered, it shall be collected, sampled, and disposed of in accordance with state and federal requirements.

- A memorandum or report shall be prepared describing the work performed, identifying the person(s) performing the work and the date of the work, and confirming that the Plan was adhered to in completion of the work. A copy of the report shall be kept on file by the Owner and shall be submitted to the WDNR.
Utility Installations or Repairs.

A fiber optic line is currently installed at the Site. No utility repairs or installation of new or replacement utilities shall be conducted on the Site until after the utility and any contractor(s) for the utility have acknowledged receipt of a copy of this Plan. The utility repairs or installation(s) shall be conducted in strict conformance with the standards set forth below with respect to excavations be undertaken in the following manner:

- The contractor performing the work shall be provided with a copy of this Plan by Owner and shall prepare their own health and safety plan, appropriate to the work being performed.

- Any excavation of soil shall be conducted in accordance with this Plan and the contractor’s health and safety plan. All excavated soil shall be, at a minimum, placed onto plastic sheeting and covered, or placed into a watertight container such as a covered rolloff box.

- Upon completion of such work, the excavated soil may be placed back into the excavation, provided, however, that any excavated soil placed back into the excavation shall maintain the compaction characteristics of the surrounding soil and placed above the water table. The area of the excavation shall be restored in a manner consistent with the original grade. If surface water and/or groundwater are encountered, it shall be collected, sampled, and disposed of in accordance with state and federal requirements.

- A memorandum report shall be prepared describing the work performed, identifying the person(s) performing the work and the date of the work, and confirming that the Plan was adhered to in completion of the work. A copy of the report shall be kept on file with the utility, on file by the Owner and shall be submitted to the WDNR.

Emergency Repairs to Underground Utilities

In emergency instances, utility repairs may be made without prior approval from the WDNR. However, the employee/worker notifications, material management procedures, and reporting requirements shall follow those given in the Material Handling Plan.
Off-Site Disposal of Excavated Soils and Water

If it becomes necessary or desirable to dispose of excavated soils, surface water, or groundwater from the allowed construction, repair, and installation activities, the excavation and resulting soils and waters shall be managed in accordance with state and federal requirements.

Request for WDNR Approval

The WDNR shall be notified at least five business days prior to completing work activities that require approval. The WDNR Project Manager at the time of this submittal is Mr. Michael Schmoller. Mr. Schmoller shall be notified by telephone, mail or email. Mr. Schmoller’s contact information follows:

Mr. Michael Schmoller  
Wisconsin Department of Natural Resources  
South Central Region  
3911 Fish Hatchery Road  
Fitchburg, WI 53711  
Telephone: (608) 275-3303  
Fax: (608) 273-5610  
email: michael.schmoller@wisconsin.gov

Request for Deviations

Owner shall not conduct any activities at the Site that are not in compliance with this Plan, unless written approval to do so is obtained from the WDNR.
Parcel Owned by City of Madison
ALL LOCATIONS ARE APPROXIMATE.
Portion of Parcel for Materials Handling Plan

ALL LOCATIONS ARE APPROXIMATE.

LEGEND
- MONITORING WELL
- ESTIMATED EXTENT OF RAIN GARDEN
- PORTION OF PARCEL FOR MATERIALS HANDLING PLAN
- BUILDING FOOTPRINTS
- PARCELS
- ALL LOCATIONS ARE APPROXIMATE.