

## *Hydrostratigraphic Database of West-Central Wisconsin*

---



|                            |   |
|----------------------------|---|
| <b>Site:</b>               | Former Ellsworth Cooperative Bulk Storage Plant |
| <b>Location:</b>           | Ellsworth,<br>Pierce County,<br>Wisconsin       |
| <b>Unit<br/>Evaluated:</b> | Ordovician St. Peter and<br>Prairie du Chien    |

### ***File includes excerpts from:***

Cedar Corporation, 2001, Leaking Aboveground Storage Tank Site Investigation, Consolidated Energy, Former Ellsworth Cooperative Bulk Plant, on file at Wisconsin Department of Natural Resources.

- Text: executive summary and groundwater discussion
- Tables: Water-level elevations
- Figures: site plan, cross-sections, potentiometric surface maps
- Boring logs

Leaking Aboveground Storage Tank  
Site Investigation  
Consolidated Energy  
Former Ellsworth Cooperative Bulk Plant  
Railroad Avenue  
Ellsworth, WI 54011

PECFA Claim No. 54011-9999-00  
BRRTS No. 02-48-190894

April 2001

Completed on Behalf of:

Consolidated Energy  
1088 CTH A  
Hudson, WI 54016

Prepared by:

Cedar Corporation  
604 Wilson Avenue  
Menomonie, WI 54751

Project No. 1870-0004-300-01

PECFA Participation No. 240179

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## EXECUTIVE SUMMARY

Cedar Corporation, on behalf of Consolidated Energy, has completed an Environmental Site Investigation of the former Ellsworth Cooperative, AST Bulk Plant, located on Railroad Avenue in Ellsworth, Wisconsin.

In the spring of 1998 petroleum contaminated soil was identified following a routine AST closure. In accordance with the Wisconsin DNR Spill Statute 292.11, a site investigation was completed to determine the degree and extent of contamination. The investigation evaluated the subsurface geology, local hydrogeology, and the extent and degree of petroleum contamination through the collection of soil samples from eight locations and soil and ground water from five monitoring wells.

The geology at the site is relatively uniform. In general, three distinct lithologies exist at the site, a fat silty clay from 0 to 12 feet, coarse sand to approximately 20 to 24 feet, then bedrock material. The bedrock is sandstone of the St. Peter Formation and is approximately 60 feet thick. Beneath the sandstone is a dolomite of the Prairie du Chien Formation. Ground water is approximately 78 to 88 feet below ground surface with a flow direction to the north-northeast.

Petroleum contamination is present in the soil within the bermed secondary containment area, the bulk load-in/-out area and at the southeast edge of the berm. Contamination was also identified extending through the sandstone bedrock material and into the ground water table. Approximately 5,383 cubic yards of petroleum contaminated soil is present in the unsaturated zone from 0 to 20 feet below ground surface. The total mass of gasoline range organics is 10,702 pounds; diesel range organics, 24,612 pounds; and BETX, 2,093 pounds. A WDNR enforcement standard exceedance of benzene exists in the ground water at one monitoring point, being the downgradient edge of the secondary containment area. Benzene levels in this well have ranged from 3 parts per billion (ppb) to 200 ppb.

To meet flexible closure criteria, it is recommended that an excavation of contaminated soils be completed along with additional ground water monitoring.

Five soil borings were completed as water table observation wells. Monitoring wells were constructed and developed in accordance with Wisconsin Administrative Code ch. NR 141. Well construction forms (Form 4400-113A) and well development forms (Form 4400-113B) are included in Appendix E. Boreholes not constructed into monitoring wells were abandoned in accordance with s. NR 141.25. Boring logs and borehole abandonment forms are included in Appendix D.

Ground water samples were collected from monitoring wells for laboratory analysis of the following compounds:

- WI DRO - Diesel Range Organics
- WI GRO - Gasoline Range Organics
- VOC - Volatile Organic Compounds (Method SW 8260B)
- PVOC - Petroleum Volatile Organic Compounds (Method SW 8020)
- PAH - Polynuclear Aromatic Hydrocarbons (Method SW 8310)
- Pb - Lead (Method EPA 200.9)
- Natural Attenuation - nitrate + nitrite (EPA 355.2), sulfate (EPA 375.2), iron (EPA 236.1)
- Dissolved Oxygen (field analysis)
- Oxidation/Reduction Potential (field analysis)

Prior to purging each well, a water level was acquired to determine the ground water elevation and to define the ground water flow direction.

#### IV. DISCUSSION OF RESULTS

##### A. Geology

Geology at the former Ellsworth Cooperative Bulk AST Plant facility is relatively uniform across the site. In general, three distinct lithologies exist at the site. From surface to approximately 12 feet bgs, fat silty clay is encountered (USCS CH). Beneath the fat clay, a unit of silty to coarse sand exists (USCS SM) to approximately 20 to 24 feet bgs where sandstone bedrock is encountered.

The sandstone bedrock is considered to be the St. Peter Formation and is approximately 60 feet thick. Beneath the St. Peter Formation, is dolomite of the Prairie Du Chien Formation. Noticeable changes in the bedrock competency were documented to exist some 60 feet into the bedrock where ground water is encountered and the dolomite begins. At approximately 80 feet bgs (60 feet in bedrock), the bedrock formation is highly weathered and collapses when being drilled. This is believed to be the contact interface between the two bedrock formations.

## B. Hydrogeology

Depth to water varies from 78 to 88 feet bgs. Four rounds of ground water elevation measurements have been completed to determine ground water flow direction and hydraulic gradients. The following is a summary of ground water hydrogeology for each monitoring event:

| Date    | Monitoring Wells Measured | Ground Water Flow Direction | Hydraulic Gradient |
|---------|---------------------------|-----------------------------|--------------------|
| 7-7-99  | MW-1 to MW-3              | North/Northeast             | .003               |
| 8-24-99 | MW-1 to MW-4              | North/Northeast             | .004               |
| 12-2-99 | MW-1 to MW-4              | North/Northeast             | .008               |
| 8-27-00 | MW-1 to MW-5              | North/Northeast             | .004               |

All four rounds of ground water flow measurements determined a north/northeast flow direction. A ground water hydrograph and table of ground water elevations is presented in Table 2. Figure 5 presents the ground water flow map for August 27, 2000. Ground water flow maps are presented in Appendix F. The maps were developed using Surfer® computer modeling program. Surfer® calculates equal potential lines by krigging. The krigging method considers the slope between two data points to be constant, ie the flow lines between two data points are equal distance apart. While the krigging method for the development of flow lines is acceptable, this method assumes the change in ground water elevation between two data points is divided equally between these points.

In an attempt to determine the aquifer migration rate, the hydraulic conductivity and linear velocity of the aquifer have been estimated. To determine hydraulic conductivity (k), usually a baildown test is completed. However, conducting such a test at 85 feet bgs in an aquifer allowed significant recovery before the depth to water could be measured. Estimates of k of this geological unit are  $1 \times 10^{-3}$  cm/sec. This estimate is made by using data acquired from other sites with similar bedrock. The following information is a summary of the characteristics of this aquifer.

Min. Hydraulic Gradient = 0.003  
Max. Hydraulic Gradient = 0.008  
Ave. Hydraulic Gradient = 0.0055  
Estimated Hydraulic Conductivity (k) =  $1.0 \times 10^{-3}$  cm/sec

Darcy's Law was used to calculate the average linear velocity.

Darcy's Equation:

$$V = \frac{k \text{ (Grad)}}{n} = \frac{(1.0 \times 10^{-3} \text{ cm/sec}) (0.0055)}{(0.25)} = 2.2 \times 10^{-5} \text{ cm/sec.} = 22.8 \text{ ft./yr.}$$

Where V = Average Linear Velocity (cm/sec.)  
k = Estimated Hydraulic Conductivity  $1.0 \times 10^{-3}$  cm/sec.  
Grad. = Ave. Hydraulic Gradient (0.0055)  
n = Porosity (sandstone/dolostone), 25%

The average linear velocity is estimated to be 23 ft./yr. with a range of 12 ft./yr. to 33 ft./yr. over the measured hydraulic gradients.

### C. Soil Contamination

Soil contamination was evaluated using both field screening and laboratory analysis as described in Section III of this report. The field FID readings were used as a screening tool to guide the field investigation. Soil samples were sent to the laboratory for analysis to verify the field FID results and quantify individual contaminants of concern. Field FID results are presented on Table 3 and each soil boring log. Laboratory analytical results for soil are summarized in Tables 4 and 5. Laboratory reports are presented in Appendix G.

Soil "contamination" refers to those soil samples having concentrations of contaminants exceeding the ch. NR 720 Generic Residual Clean-up Levels (RCLs). Where laboratory analysis did not confirm the field FID screening indication of the presence of volatiles, the soil contaminant level is considered to be less than ch. NR 720 Generic RCLs.

#### Unsaturated Zone Soil Contamination

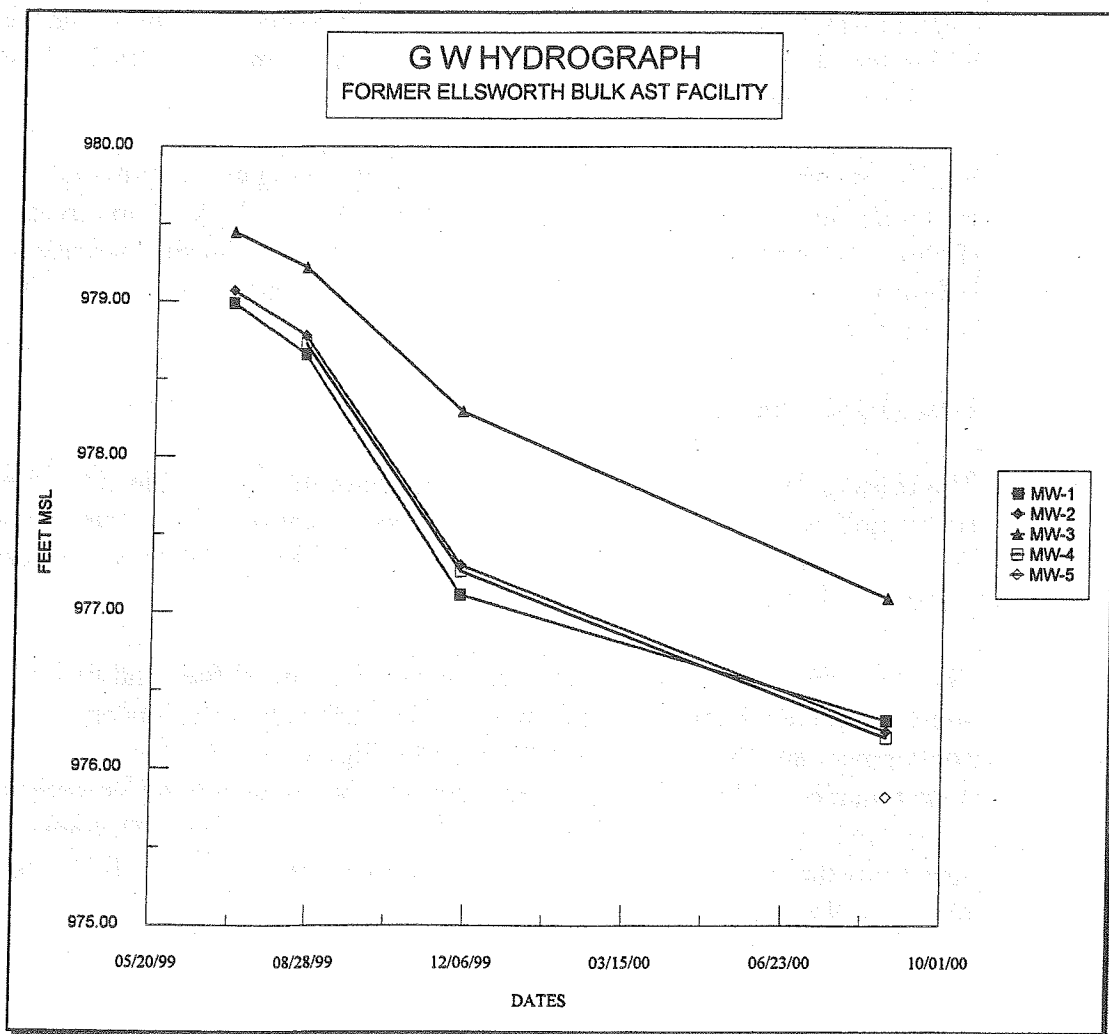
The Unsaturated Zone is defined as that soil above the water table at the time of soil sample collection. Unsaturated soil observed near the water table may at times be submerged during high water table events (and is therefore considered part of the "smear zone").

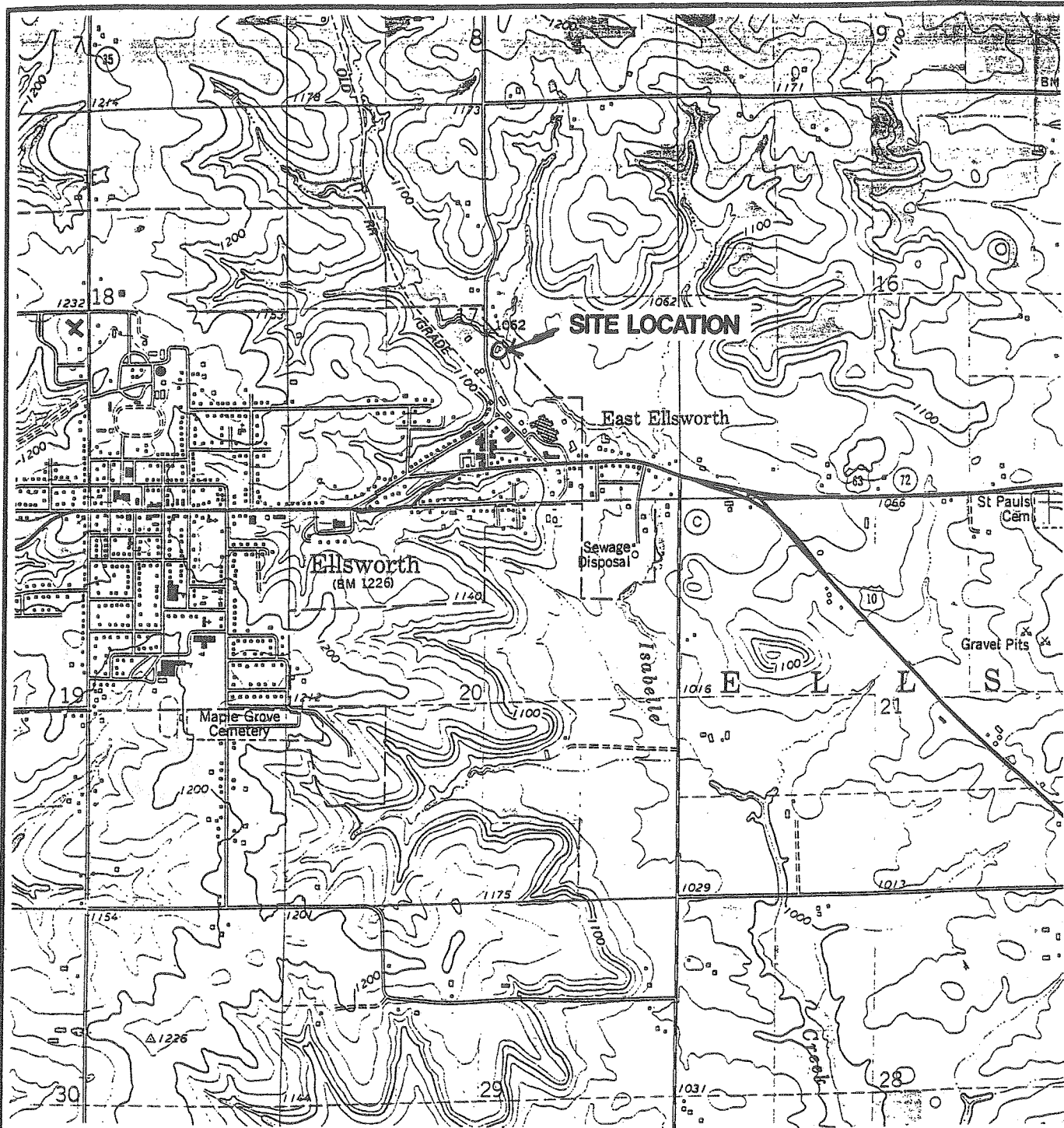
The contaminants identified are typical of gasoline, diesel fuel, and fuel oil sources. Soil contamination encompasses the earthen berm secondary containment and the fuel load in/out location (Figure 6). Petroleum contamination within the bermed area and beneath the former ASTs extends from the ground surface to 15-19 feet where bedrock is encountered. This area represents the most highly contaminated soil identified, with total BETX levels as high as 774 ppm.



**TABLE 2**  
**GROUND WATER ELEVATIONS AND HYDROGRAPH**  
**FORMER ELLSWORTH COOPERATIVE BULK AST FACILITY**  
**ELLSWORTH, WI**

| DATE                       | MW-1    | MW-2    | MW-3    | MW-4    | MW-5    |
|----------------------------|---------|---------|---------|---------|---------|
| 07/07/1999                 | 978.99  | 979.07  | 979.45  |         |         |
| 08/24/1999                 | 978.66  | 978.78  | 979.22  | 978.73  |         |
| 12/02/1999                 | 977.11  | 977.30  | 978.29  | 977.26  |         |
| 08/27/2000                 | 976.31  | 976.24  | 977.09  | 976.20  | 975.82  |
|                            |         |         |         |         |         |
| TOP OF CASING ELEVATION    | 1060.30 | 1057.43 | 1066.65 | 1058.07 | 1059.58 |
| TOP OF SCREEN ELEVATION    | 988.72  | 988.78  | 988.65  | 983.17  | 981.88  |
| BOTTOM OF SCREEN ELEVATION | 973.72  | 973.78  | 973.65  | 968.17  | 966.88  |





# LEGEND

Ellsworth, Wisconsin  
USGS Topographic Quadrangles  
7.5 Minute Series, 1974  
Contour Interval - 20 feet

Sec. 17, T26N, R17W



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TAG

DATE  
08/98

REVISED BY  
TAG  
SCALE

1" = 2000'

## SITE LOCATION

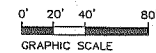
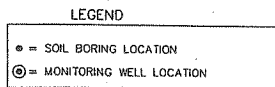
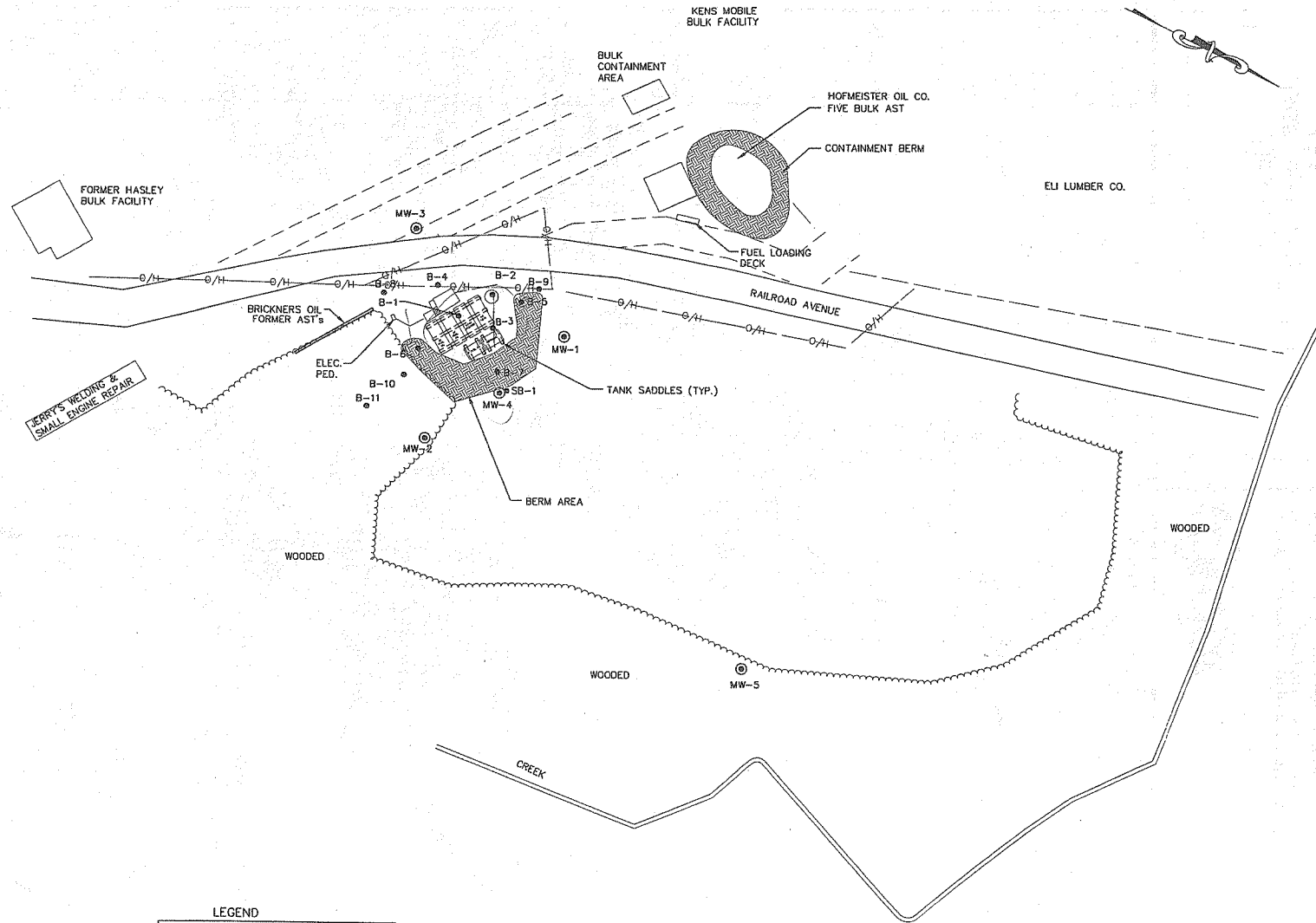
ELLSWORTH FARMERS UNION COOP  
FORMER AST BULK PLANT  
ELLSWORTH, WISCONSIN

CHECKED BY

TAG  
JOB NO.

FIGURE

1



|                |                   |
|----------------|-------------------|
| JOB NO.        | 1870-0004         |
| BOOK NO.       | CEDAR CORP        |
| DRAWN BY       | TAG               |
| CHECKED BY     | TAG               |
| DATE           | NOVEMBER 14, 2000 |
| REVISIONS      |                   |
| REFERENCE FILE | Basedxf.dwg       |
| DRAWING FILE   |                   |
| SITEFEATURE    |                   |

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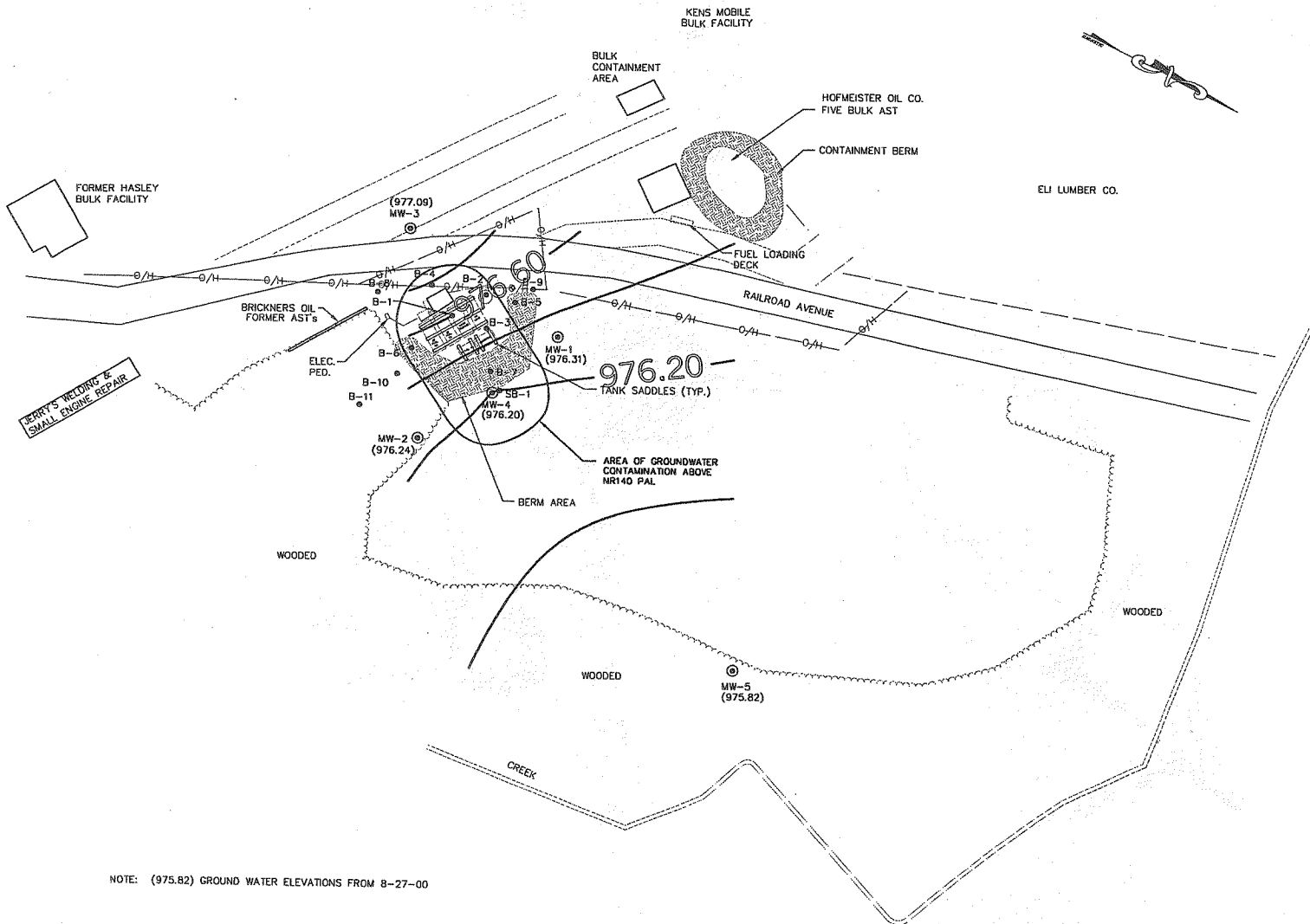
PROJECT

CONSOLIDATED ENERGY  
FORMER ELLSWORTH CO-OP BULK AST  
RAILROAD AVE., ELLSWORTH, WI  
SITE FEATURES MAP

FIGURE

3





| LEGEND |                            |
|--------|----------------------------|
| •      | = SOIL BORING LOCATION     |
| ⊙      | = MONITORING WELL LOCATION |

0' 20' 40' 80'  
GRAPHIC SCALE

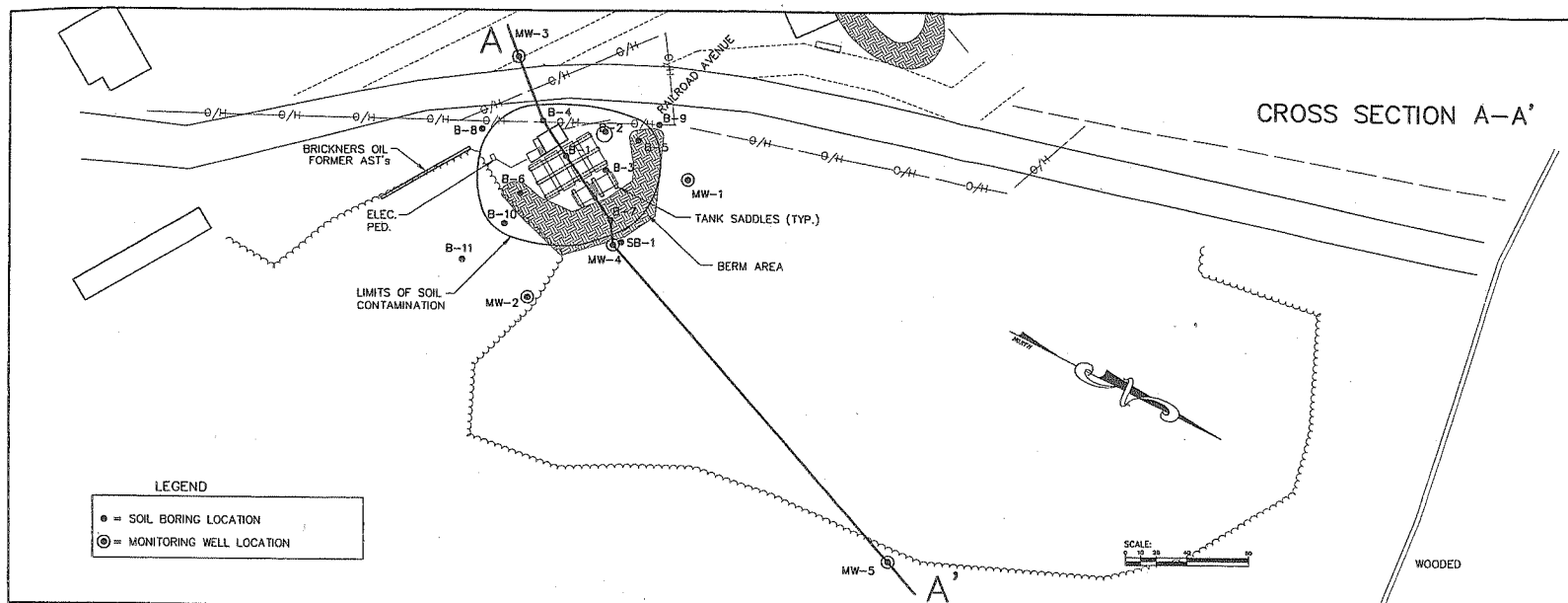
|                |                   |
|----------------|-------------------|
| JOB NO.        | 1870-0004         |
| BOOK NO.       |                   |
| CEDAR CORP     |                   |
| DRAWN BY       | TAG               |
| CHECKED BY     | TAG               |
| DATE           | NOVEMBER 14, 2000 |
| REVISIONS      |                   |
| REFERENCE FILE | Boseckf.dwg       |
| DRAWING FILE   | GWCONT.dwg        |

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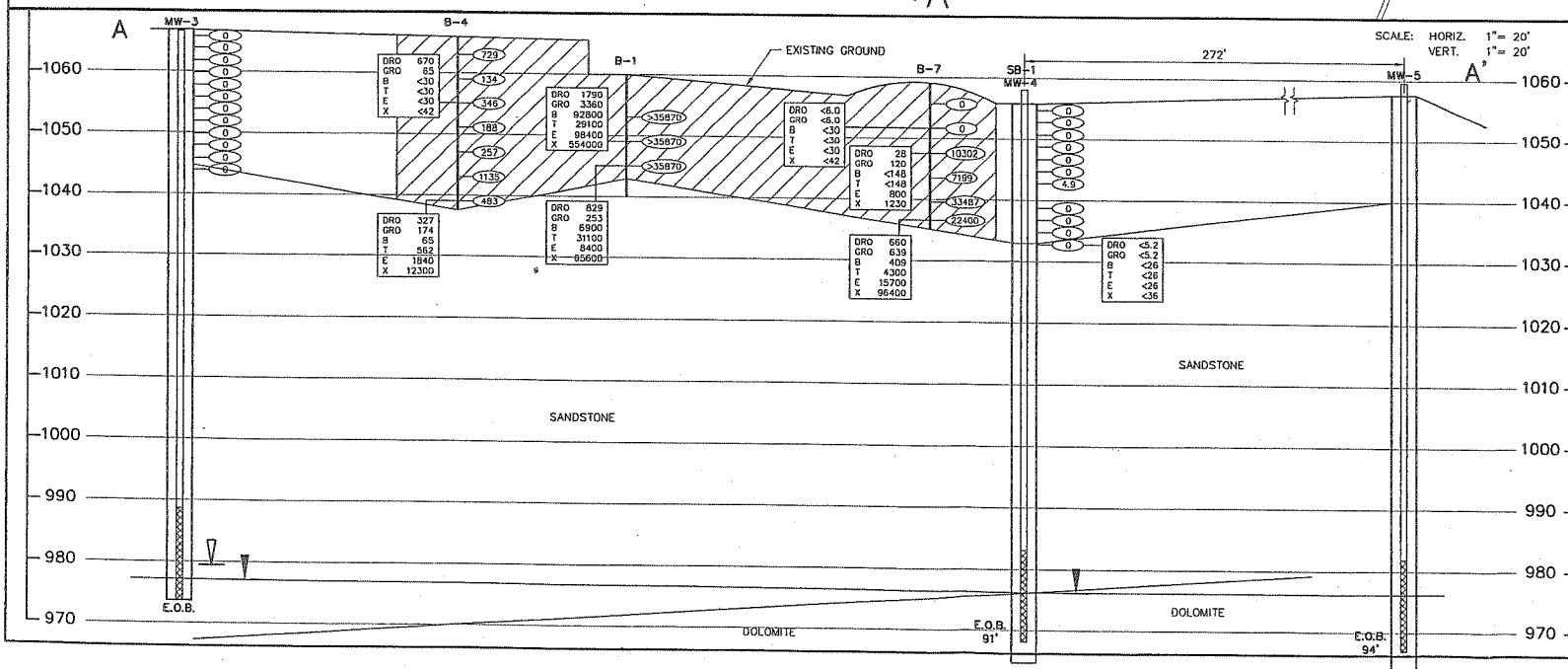
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PROJECT  
CONSOLIDATED ENERGY  
FORMER ELLSWORTH CO-OP BULK AST  
RAILROAD AVE., ELLSWORTH, WI  
GROUND WATER CONTAMINATION MAP & GROUND WATER FLOW



CROSS SECTION A-A'



**ABBREVIATIONS**

F---Fine M---Medium C---Coarse  
 Ws---Weathered So---Sound

**MATERIAL SYMBOLS**

Topsoil Silt Sandstone  
 Sand Peat Limestone  
 Gravel Clay Igneous Rock

**LEGEND OF BORING**

Elevation Boring No. Well Casing  
 Sandy Gravel  
 F. Boulders or Cobbles  
 Top Of Screen  
 Sand  
 Field Screening  
 S.T. -- Instrument Units  
 Silty Clay  
 Bottom Of Screen  
 So  
 Limestone

Shelby Tube -- S.T.

Ground Water Elevation

No Ground Water Observed Above This Elevation

\* GRO and DRO Results Reported in PPM  
 BTEX Results Reported in PPB

**LEGEND**

ESTIMATED AREA OF SOIL CONTAMINATION

GROUNDWATER ELEVATIONS BASED ON JULY 7, 1999 DATA

GROUNDWATER ELEVATIONS BASED ON AUG. 27, 2000 DATA

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**CROSS SECTION A-A'**  
**FIGURE 7**

Drawn By TAG  
 Cadd File XS\_A-A.DWG

Plans Checked TAG  
 Job Number 1870-004

Route To: Watershed/Wastewater ☐ Waste Management ☐  
Remediation/Revelopment ☒ Other ☐

Page 1 of 1

|   |  |   |  |   |  |
|---|--|---|--|---|--|
| Facility/Project Name<br><u>Consolidated Energy / Former Ellsworth Co-op</u>  |  | License/Permit/Monitoring Number<br><u>NA</u>                 |  | Boring Number<br><u>NA</u>                                      |  |
| Boring Drilled By: Name of crew chief (first, last) and Firm<br>First Name: <u>Mike</u> Last Name: <u>Miller</u><br>Firm: <u>Boart Longyear</u> |  | Date Drilling Started<br><u>06/21/1999</u><br>m m d d y y y y |  | Date Drilling Completed<br><u>06/22/1999</u><br>m m d d y y y y |  |
| Drilling Method<br><u>HSA - Air Rotary</u>  |  | Final Static Water Level<br><u>979.07</u> Feet MSL            |  | Surface Elevation<br><u>1057.77</u> Feet MSL                    |  |
| Well Unique Well No. <u>0</u> DNR Well ID No. <u></u>   |  | Well Name<br><u>MW-1</u>                                      |  | Borehole Diameter<br><u>10</u> inches                           |  |
| Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>                   |  | Lat <u>0</u> ' " N  |  | Local Grid Location   |  |
| State Plane <u>N</u> E S/C/N  |  | Long <u>0</u> ' "   |  | <input type="checkbox"/> N <input type="checkbox"/> E           |  |
| UW 1/4 of <u>SE</u> 1/4 of Section <u>17</u> T <u>26</u> N, R <u>17</u> E/W   |  | <input type="checkbox"/> S <input type="checkbox"/> W         |  | Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W |  |
| Facility ID <u></u>   |  | County <u>Pierce</u>  |  | County Code <u>48</u>   |  |
|   |  | Civil Town/City/ or Village<br><u>Ellsworth</u>               |  |   |  |

| Sample Number and Type | Length Att. & Recovered (in) | Blow Counts | Depth in Feet (Below ground surface) | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties      |                  |              |                  |       | RQD/ Comments |
|------------------------|------------------------------|-------------|--------------------------------------|---|------|-------------|--------------|---------|----------------------|------------------|--------------|------------------|-------|---------------|
|                        |                              |             |                                      |   |      |             |              |         | Compressive Strength | Moisture Content | Liquid Limit | Plasticity Index | P 200 |               |
| 1                      | 12"                          |             | 2                                    | Brown Silty Sand - Organics                                   |      |             |              | 0       |                      | D                |              |                  |       |               |
| 2                      | 24"                          |             | 4                                    | Brown Clayey Silt   |      |             |              | 0       |                      | D                |              |                  |       |               |
| 3                      | 14"                          |             | 6                                    |   |      |             |              | 0       |                      | M                |              |                  |       |               |
| 4                      | 18"                          |             | 8                                    |   |      |             |              | 0       |                      | M/W              |              |                  |       |               |
| 5                      | 13"                          |             | 10                                   |   |      |             |              | 0       |                      | W                |              |                  |       |               |
| 6                      | 8"                           |             | 12                                   | Coarse Silty Sand - Brown red                                 |      |             |              | 0       |                      | D                |              |                  |       |               |
| 7                      | 10"                          |             | 14                                   | Coarse Sand and gravel  |      |             |              | 0       |                      | D                |              |                  |       |               |
| 8                      | 16"                          |             | 16                                   | Medium Sand and gravel  |      |             |              | 0       |                      | D                |              |                  |       |               |
| 9                      | 18"                          |             | 18                                   |   |      |             |              | 0       |                      | M                |              |                  |       |               |
| 10                     | 18"                          |             | 20                                   |   |      |             |              | 0       |                      | W                |              |                  |       |               |
|                        |                              |             | 22                                   | Bedrock - 10 Samples  |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 24                                   | White weathered Sandstone                                     |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 26                                   | Drap on top of the Rock                                       |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 28                                   |   |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 30                                   |   |      |             |              |         |                      |                  |              |                  |       |               |

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

Signature Tony A. Laurman Firm Cedar Corporation

| Sample             |                                 | Blow Counts | Depth in Feet | Soil/Rock Description<br>And Geologic Origin For<br>Each Major Unit  | USCS | Graphic<br>Log | Well<br>Diagram | PID/FID | Soil Properties         |                     |                 |                     |       | RQD/<br>Comments |
|--------------------|---------------------------------|-------------|---------------|--|------|----------------|-----------------|---------|-------------------------|---------------------|-----------------|---------------------|-------|------------------|
| Number<br>and Type | Length Att. &<br>Recovered (in) |             |               |  |      |                |                 |         | Compressive<br>Strength | Moisture<br>Content | Liquid<br>Limit | Plasticity<br>Index | P 200 |                  |
|                    |                                 |             | 35            |  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 40            |  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 45            |  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 50            |  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 55            | → Sandstone becomes<br>considerably harder - Air<br>hammer begins working full<br>time   |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 60            |  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 65            | → soft Sandstone - weathered<br>void areas   |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 70            |  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 75            |  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 80            | ▽ water at approximately 80'<br>dust and cuttings are not<br>existing from the hole.<br>Rock becomes very hard - possibly<br>dolostone |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 85            |  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 90            |  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 95            | E.O.B. @ 91.5'   |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                    |                                 |             | 100           |  |      |                |                 |         |                         |                     |                 |                     |       |                  |

Bentonite grout mixture / Bentbrick chips

Well Diagram  
Bentonite grout mixture / Bentbrick chips  
#30 Red Flint #70  
Filler pack #30 Red Flint #70



Route To: Watershed/Wastewater ☐ Waste Management ☐  
Remediation/Revelopment ☒ Other ☐

Page 1 of 1

|   |  |   |  |   |  |
|---|--|---|--|---|--|
| Facility/Project Name<br><u>Consolidated Energy vs / Former Ellsworth Co-op</u>   |  | License/Permit/Monitoring Number<br>_____   |  | Boring Number<br><u>NA</u>                                      |  |
| Boring Drilled By: Name of crew chief (first, last) and Firm<br>First Name: <u>Mike</u> Last Name: <u>Miller</u><br>Firm: <u>Boart Longyear</u> |  | Date Drilling Started<br><u>06/22/1999</u><br>m m d d y y y y   |  | Date Drilling Completed<br><u>06/23/1999</u><br>m m d d y y y y |  |
| Drilling Method<br><u>HSA - Air Rotary</u>  |  | Final Static Water Level<br><u>979.07</u> Feet MSL  |  | Surface Elevation<br><u>1055.08</u> Feet MSL                    |  |
| WI Unique Well No. <u>0</u> DNR Well ID No. _____   |  | Well Name<br><u>MW-2</u>  |  | Borehole Diameter<br><u>10</u> inches                           |  |
| Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>                   |  | State Plane <u>N</u> <u>E</u> <u>S/C/N</u>  |  | Lat <u>0</u> ' <u>"</u>   |  |
| Long <u>0</u> ' <u>"</u>  |  | Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W |  | Feet <u>0</u> Feet <u>0</u>                                     |  |
| NW 1/4 of SE 1/4 of Section <u>17</u> , T <u>26</u> N, R <u>17</u> E/W  |  | County<br><u>Pierce</u>   |  | County Code<br><u>48</u>  |  |
| Facility ID   |  | Civil Town/City/ or Village<br><u>Ellsworth</u>   |  |   |  |

| Sample Number and Type | Length Att. & Recovered (in) | Blow Counts | Depth in Feet (Below ground surface) | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties      |                  |              |                  |       | RQD/ Comments |
|------------------------|------------------------------|-------------|--------------------------------------|---|------|-------------|--------------|---------|----------------------|------------------|--------------|------------------|-------|---------------|
|                        |                              |             |                                      |   |      |             |              |         | Compressive Strength | Moisture Content | Liquid Limit | Plasticity Index | P 200 |               |
| 1                      | 18"                          |             | 2                                    | Brown/Black Silt - trace pebbles                              |      |             |              | 0       |                      | D                |              |                  |       |               |
| 2                      | 14"                          |             | 6                                    | Brown silty clay  |      |             |              | 0       |                      | m                |              |                  |       |               |
| 3                      | 12"                          |             | 8                                    |   |      |             |              | 0       |                      | m                |              |                  |       |               |
| 4                      | 12"                          |             | 10                                   |   |      |             |              | 0       |                      | w                |              |                  |       |               |
| 5                      | 12"                          |             | 12                                   | Brown Sandy Silt - trace gravel                               |      |             |              | 0       |                      | w                |              |                  |       |               |
| 6                      | 8"                           |             | 14                                   | Brown silty Sand and gravel                                   |      |             |              | 0       |                      | m                |              |                  |       |               |
| 7                      | 14"                          |             | 16                                   | Bedrock - Sandstone   |      |             |              | 0       |                      | m                |              |                  |       |               |
|                        |                              |             | 18                                   | No more Samples   |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 20                                   |   |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 22                                   |   |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 24                                   | White small grained Sandstone                                 |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 26                                   |   |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 28                                   |   |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 30                                   |   |      |             |              |         |                      |                  |              |                  |       |               |

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

Signature Tony A. Dawson Firm Cedar Corporation

| Sample             |                                | Blow Counts | Depth in Feet   | Soil/Rock Description<br>And Geologic Origin For<br>Each Major Unit   | USCS | Graphic<br>Log | Well<br>Diagram  | PID/FID | Soil Properties         |                     |                 |                     |       | RQD/<br>Comments |
|--------------------|--------------------------------|-------------|---|---|------|----------------|--|---------|-------------------------|---------------------|-----------------|---------------------|-------|------------------|
| Number<br>and Type | Length Au. &<br>Recovered (in) |             |   |   |      |                |  |         | Compressive<br>Strength | Moisture<br>Content | Liquid<br>Limit | Plasticity<br>Index | P 200 |                  |
|                    |                                |             | <div style="display: flex; align-items: center;"> <div style="width: 20px; text-align: center;">35</div> <div style="width: 20px; text-align: center;">40</div> <div style="width: 20px; text-align: center;">45</div> <div style="width: 20px; text-align: center;">50</div> <div style="width: 20px; text-align: center;">55</div> <div style="width: 20px; text-align: center;">60</div> <div style="width: 20px; text-align: center;">65</div> <div style="width: 20px; text-align: center;">70</div> <div style="width: 20px; text-align: center;">75</div> <div style="width: 20px; text-align: center;">80</div> <div style="width: 20px; text-align: center;">85</div> <div style="width: 20px; text-align: center;">90</div> <div style="width: 20px; text-align: center;">95</div> <div style="width: 20px; text-align: center;">100</div> </div> | <div style="text-align: center;"> <del>Weathered</del><br/> White Small grained<br/> Sandstone Bedrock </div> |      |                | <div style="text-align: center;"> Fine<br/> Chipped Bedrock 3/8 inch<br/> Filter Rock </div> |         |                         |                     |                 |                     |       |                  |

Route To: Watershed/Wastewater ☐ Waste Management ☐  
Remediation/Revelopment ☒ Other ☐

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|   |  |   |  |   |  |
|---|--|---|--|---|--|
| Facility/Project Name<br><u>Consolidated Energy / Former Ellsworth Co-op</u>  |  | License/Permit/Monitoring Number<br>_____                     |  | Boring Number<br><u>NA</u>  |  |
| Boring Drilled By: Name of crew chief (first, last) and Firm<br>First Name: <u>Mike</u> Last Name: <u>Miller</u><br>Firm: <u>Boart Longyear</u> |  | Date Drilling Started<br><u>06/24/1999</u><br>m m d d y y y y |  | Date Drilling Completed<br><u>06/24/1999</u><br>m m d d y y y y   |  |
| Drilling Method<br><u>HSA - Air Rotary</u>  |  | Final Static Water Level<br><u>97.53</u> Feet MSL             |  | Surface Elevation<br><u>1066.84</u> Feet MSL  |  |
| Well Unique Well No.<br>_____   |  | DNR Well ID No.<br>_____                                      |  | Well Name<br><u>MW-3</u>  |  |
| Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>                   |  | State Plane<br><u>N</u> , <u>E</u> S/C/N                      |  | Local Grid Location<br><input type="checkbox"/> N <input type="checkbox"/> E<br><input type="checkbox"/> S <input type="checkbox"/> W |  |
| UW 1/4 of <u>SE</u> 1/4 of Section <u>17</u> , T <u>26</u> N, R <u>17</u> E/W   |  | Lat <u>0</u> ' "  |  | Long <u>0</u> ' "   |  |
| Facility ID<br>_____  |  | County<br><u>Pierce</u>                                       |  | County Code<br><u>48</u>  |  |
| Civil Town/City or Village<br><u>Ellsworth</u>  |  |   |  |   |  |

| Sample Number and Type | Length Att. & Recovered (in) | Blow Counts | Depth in Feet (Below ground surface) | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties      |                  |              |                  |       | RQD/ Comments |
|------------------------|------------------------------|-------------|--------------------------------------|---|------|-------------|--------------|---------|----------------------|------------------|--------------|------------------|-------|---------------|
|                        |                              |             |                                      |   |      |             |              |         | Compressive Strength | Moisture Content | Liquid Limit | Plasticity Index | P 200 |               |
| 1                      | 18"                          |             | 2                                    | Brown Silty Clay  |      |             |              | 0       | D                    |                  |              |                  |       |               |
| 2                      | 24"                          |             | 6                                    | Brown Clayey Silt   |      |             |              | 0       | D                    |                  |              |                  |       |               |
| 3                      | 20"                          |             | 8                                    |   |      |             |              | 0       | M                    |                  |              |                  |       |               |
| 4                      | 20"                          |             | 10                                   | Brown Fat wet Silty Clay                                      |      |             |              | 0       | W                    |                  |              |                  |       |               |
| 5                      | 16"                          |             | 14                                   | Brown Sandy silt and gravel                                   |      |             |              | 0       | M                    |                  |              |                  |       |               |
| 6                      | 14"                          |             | 16                                   |   |      |             |              | 0       | M                    |                  |              |                  |       |               |
| 7                      | 12"                          |             | 18                                   |   |      |             |              | 0       | D                    |                  |              |                  |       |               |
| 8                      | 12"                          |             | 20                                   | Fine White Sand   |      |             |              | 0       | D                    |                  |              |                  |       |               |
| 9                      | 6"                           |             | 24                                   | Sandstone Bedrock   |      |             |              | 0       | D                    |                  |              |                  |       |               |
|                        |                              |             | 26                                   |   |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 28                                   |   |      |             |              |         |                      |                  |              |                  |       |               |
|                        |                              |             | 30                                   |   |      |             |              |         |                      |                  |              |                  |       |               |

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

Signature Tracy A. Lauer Firm Cedar Corporation



Route To: Watershed/Wastewater ☐ Waste Management ☐  
Remediation/Revelopment ☒ Other ☐

Page 1 of 1

|   |  |   |  |   |  |
|---|--|---|--|---|--|
| Facility/Project Name<br><u>Consolidated Energy / Former Ellsworth Co-op</u>  |  | License/Permit/Monitoring Number                              |  | Boring Number<br><u>NA</u>  |  |
| Boring Drilled By: Name of crew chief (first, last) and Firm<br>First Name: <u>Boat Longyear</u> Last Name: <u>Longyear</u>   |  | Date Drilling Started<br><u>07.29.1999</u><br>m m d d y y y y |  | Date Drilling Completed<br><u>07.29.1999</u><br>m m d d y y y y   |  |
| Drilling Method<br><u>HSA - Air Rotary</u>  |  | Final Static Water Level<br>Feet MSL                          |  | Surface Elevation<br>Feet MSL   |  |
| WT Unique Well No.  |  | DNR Well ID No.   |  | Well Name<br><u>MW-4</u>  |  |
| Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/> |  | State Plane <u>N</u> <u>E</u> <u>S/C/N</u>                    |  | Lat <u>0</u> ' " <u>0</u> ' "   |  |
| NW 1/4 of SE 1/4 of Section <u>17</u> , T <u>26</u> N, R <u>17</u> E/W  |  | Long  |  | Local Grid Location<br><input type="checkbox"/> N <input type="checkbox"/> E<br><input type="checkbox"/> S <input type="checkbox"/> W |  |
| Facility ID   |  | County<br><u>Pierce</u>                                       |  | County Code<br><u>48</u>  |  |
|   |  | Civil Town/City/ or Village<br><u>Ellsworth</u>               |  |   |  |

| Sample             |                                 | Blow Counts | Depth in Feet<br>(Below ground surface)                             | Soil/Rock Description<br>And Geologic Origin For<br>Each Major Unit  | USCS | Graphic<br>Log | Well<br>Diagram | PID/FID | Soil Properties         |                     |                 |                     |       | RQD/<br>Comments |
|--------------------|---------------------------------|-------------|---|--|------|----------------|-----------------|---------|-------------------------|---------------------|-----------------|---------------------|-------|------------------|
| Number<br>and Type | Length Att. &<br>Recovered (in) |             |   |  |      |                |                 |         | Compressive<br>Strength | Moisture<br>Content | Liquid<br>Limit | Plasticity<br>Index | P 200 |                  |
|                    |                                 |             | 5<br>10<br>15<br>20<br>25<br>30<br>35<br>40<br>45<br>50<br>55<br>60 | NO Sampling<br><br>See<br><br>SB-1<br><br>Bedrock begins<br><br>Logs |      |                |                 |         |                         |                     |                 |                     |       |                  |

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

Signature Tracy A. Laurson Firm Cedar Corporation

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct 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.

[illegible]

Route To: Watershed/Wastewater ☐ Waste Management ☐  
Remediation/Revelopment ☒ Other ☐

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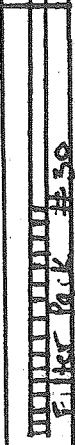
|   |                          |                          |   |   |                                      |
|---|--------------------------|--------------------------|---|---|--------------------------------------|
| Facility/Project Name<br><u>Consolidated Energy / Former Ellsworth Farmers</u>  |                          |                          | License/Permit/Monitoring Number<br>_____                     |   | Boring Number<br><u>None</u>         |
| Boring Drilled By: Name of crew chief (first, last) and Firm<br>First Name: _____ Last Name: _____                            |                          |                          | Date Drilling Started<br><u>08/21/2000</u><br>m m d d y y y y | Date Drilling Completed<br><u>08/21/2000</u><br>m m d d y y y y       | Drilling Method<br><u>Air Rotary</u> |
| Firm: <u>Bergeson Caswell - STS Consultants</u>   |                          |                          |   |   |                                      |
| WI Unique Well No.<br><u>JS-290</u>   | DNR Well ID No.<br>_____ | Well Name<br><u>MW-5</u> | Final Static Water Level<br>Feet MSL<br>_____                 | Surface Elevation<br>Feet MSL<br>_____                                | Borehole Diameter<br><u>6</u> inches |
| Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/> |                          |                          | Local Grid Location   |   |                                      |
| State Plane _____ N. _____ E S/C/N  |                          |                          | Lat _____   | <input type="checkbox"/> N <input type="checkbox"/> E                 |                                      |
| _____ W   |                          |                          | Long _____  | Feet <input type="checkbox"/> S _____ Feet <input type="checkbox"/> W |                                      |
| NW 1/4 of SE 1/4 of Section <u>17</u> , T <u>26</u> N, R <u>17</u> E/W  |                          |                          |   |   |                                      |
| Facility ID<br>_____  |                          | County<br><u>Pierce</u>  | County Code<br><u>48</u>                                      | Civil Town/City/ or Village<br><u>Ellsworth</u>                       |                                      |

| Sample<br>Number<br>and Type | Length Att. &<br>Recovered (in) | Blow Counts | Depth in Feet<br>(Below ground surface) | Soil/Rock Description<br>And Geologic Origin For<br>Each Major Unit | USCS | Graphic<br>Log | Well<br>Diagram | PID/FID | Soil Properties         |                     |                 |                     |       | RQD/<br>Comments |
|------------------------------|---------------------------------|-------------|---|---|------|----------------|-----------------|---------|-------------------------|---------------------|-----------------|---------------------|-------|------------------|
|                              |                                 |             |   |   |      |                |                 |         | Compressive<br>Strength | Moisture<br>Content | Liquid<br>Limit | Plasticity<br>Index | P 200 |                  |
|                              |                                 |             | 5                                       | Hollow Stem Auger   |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 10                                      | Brown silty clay  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 15                                      | trace gravel  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 20                                      | wet   |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 25                                      | Weathered Sandstone   |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 30                                      | Bedrock - white to  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 35                                      | tan in color  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 40                                      |   |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 45                                      |   |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 50                                      | Very Fractured  |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 55                                      |   |      |                |                 |         |                         |                     |                 |                     |       |                  |
|                              |                                 |             | 60                                      |   |      |                |                 |         |                         |                     |                 |                     |       |                  |

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

Signature Way A. Dawansin Firm Cedar Corporation

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct 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.

| Sample             |                                | Blow Counts | Depth in Feet                                 | Soil/Rock Description<br>And Geologic Origin For<br>Each Major Unit                     | USCS | Graphic<br>Log | Well<br>Diagram  | PID/FID | Soil Properties         |                     |                 |                     |       | RQD/<br>Comments |
|--------------------|--------------------------------|-------------|---|---|------|----------------|--|---------|-------------------------|---------------------|-----------------|---------------------|-------|------------------|
| Number<br>and Type | Length Au. &<br>Recovered (in) |             |   |   |      |                |  |         | Compressive<br>Strength | Moisture<br>Content | Liquid<br>Limit | Plasticity<br>Index | P 200 |                  |
|                    |                                |             | 65<br>70<br>75<br>80<br>85<br>90<br>95<br>100 | Weathered Sandstone<br><br>Bedrock<br><br>Hard Doleritic<br>Bedrock<br><br>E.O.B. @ 92' |      |                |  Filter pack #39 |         |                         |                     |                 |                     |       |                  |