From: warren hohn <warrenhohn4919@gmail.com>
Sent: Friday, December 6, 2019 6:00 AM
To: adelforge@reiengineering.com; Beggs, Tauren R - DNR
Subject: New WDNR/Aniwa update
Attachments: Scan WDNR Aniwa Update 12-19.pdf

Substitute this from previous update for upcoming meeting w/REI. Warren Hohn

Town of Aniwa Monitoring Wells Pg 1
Dissolved Arsenic Results (ug/L)

Date	Well #	ug/L As	Top of Well Ft. / Dpth to Water	Gwht.
6-10-19	B-12	230.0	99.64' / 11.05'	86.59'
6-10-19	B-13R / B-13R Dupl	4970.0 / 4850.0	99.28' / 12.25'	87.03'
6-10-19	B-21	41.4	93.67' / 7.50'	86.17'
7-18-19	B-12	460.0	97.64' / 11.30'	86.34'
7-18-19	B-13R	4230.0	99.28' / 12.25'	86.71'
7-18-19	B-21	5.0	93.67' / 7.74'	85.93
3-13-18	B-12	310.0	97.64' / 12.16'	84.48'
3-13-18	B-13R	1000.0	99.28' / 14.32'	84.96'
3-13-18	B-21	7.1	93.67' / 9.50'	84.17'
4-14-18	B-12	220.0	97.64' / 10.16'	87.49'
4-14-18	B-13R	3200.0	99.28' / 11.40'	87.88'
4-14-18	B-21	7.8'	93.67' / 6.56'	87.11'
6-10-18	B-12	No Sample		
6-10-18	B-13R	5300.0	99.28' / 12.24'	87.04'
6-10-18	B-21	11.0	93.67' / 7.64'	86.03
7-22-18	B-12	446.0	97.64' / 11.10'	86.54'
7-22-18	B-13R	4400.0	99.28' / 12.30'	86.98'
7-22-18	B-21	11.9	93.67' / 7.60'	86.08'
8-31-18	B-12	510.0	97.64' / 12.54'	85.10'
8-31-18	B-13R	3300.0	99.28' / 13.29'	85.49'
8-31-18	B-21	13.0	93.67' / 9.16'	84.51'
6-10-19	Timm Well	3.4 ug/L		
6-10-18	Timm Well	6.1 ug/L		

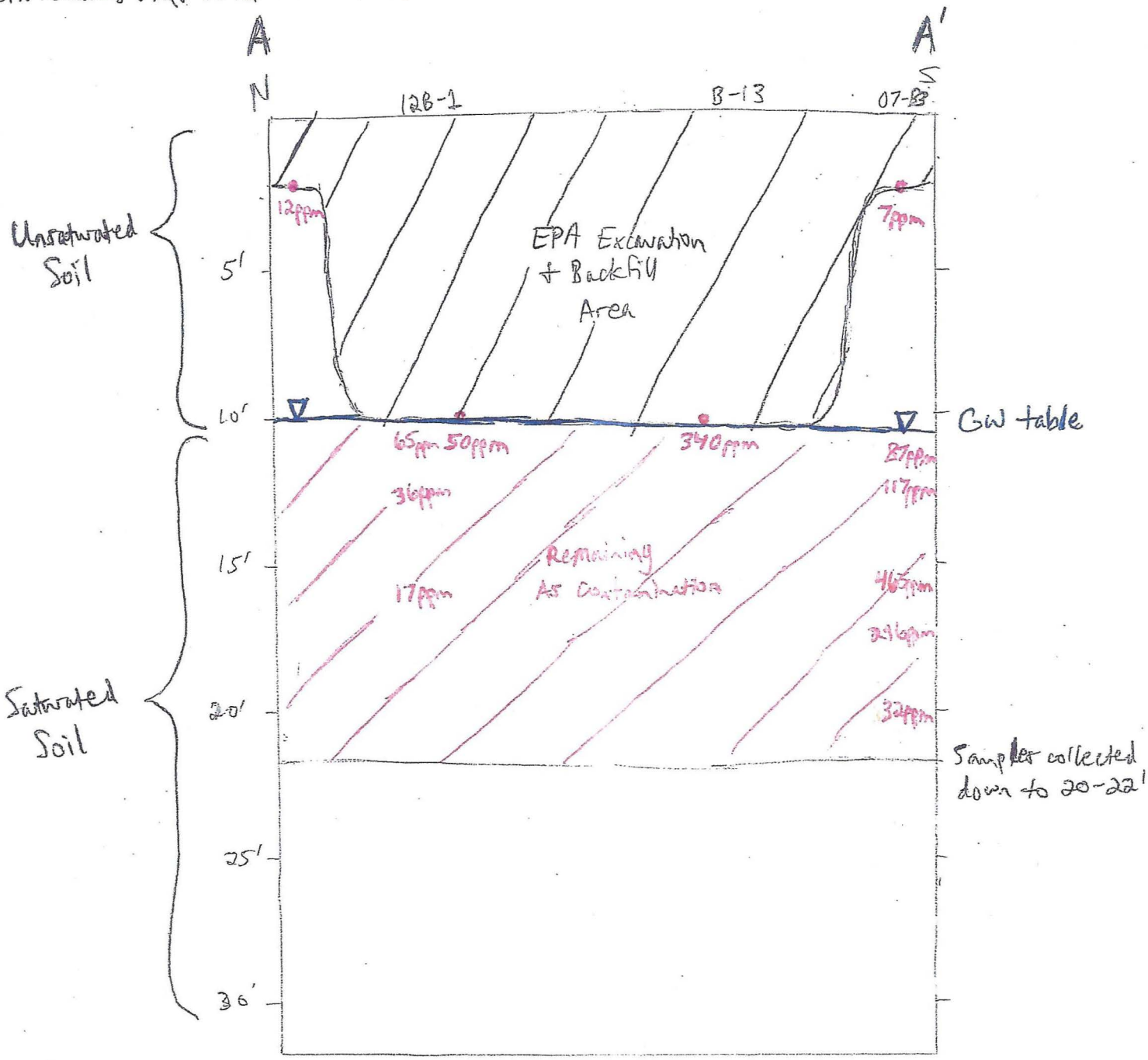
Town of Aniwa Monitoring Wells
Dissolved Arsenic Results (ug/L As)

Date	Well #	ug/L As	Top of Well Ft / Depth to Water	Gw Ht
4-8-17	B-13R	6300.0	99.28' / 11.18'	88.10'
4-8-17	B-21	22.0	93.67' / 6.54'	87.13'
4-22-17	B-12	150.0	97.64' / 8.64'	89.00'
4-22-17	B-13R	8800.0	99.28' / 9.80'	89.48'
4-22-17	B-21	8.5	93.67' / 5.45'	88.22'
4-29-17	B-12	210.0	97.64' / 8.88'	88.76'
4-29-17	B-13r	8200.0	99.28' / 10.06'	89.22'
4-29-17	B-21	3.1	93.67' / 5.56'	88.11'
4-29-17	Timm Well Outside Faucet	3.50 ug/L		
5-30-17	B-12	120.0	97.64' / 9.40'	88.24'
5-30-17	B-13R/Dup	8400.0/8300.0	99.28' / 10.44'	88.84'
5-30-17	B-21	3.9	93.67' / 6.08'	87.59'
5-30-17	Timm Well (Hse)	1.5 ug/L		
6-24-17	B-13R	7700.0	99.28' / 11.16'	88.12'
6-24-17	B-21	4.0	93.67' / 6.50'	87.17'
8-28-17	B-12	530.0	97.64' / 11.64'	86.00'
8-28-17	B-13R	4000.0	99.28' / 13.01'	86.27'
8-28-17	B-21	5.3	93.67' / 8.16'	85.51'
10-17-17	B-12	210.0	97.64' / 12.40'	85.24'
10-17-17	B-13R	3200.0	99.28' / 13.60'	85.68'
10-17-17	B-21	7.7	93.67' / 8.80'	84.87'
10-28-17	B-12	410.0	97.64' / 12.56'	85.08'
10-28-17	B-13R	2400.0	99.28' / 13.78'	85.50'
10-28-17	B-21	7.6	93.67' / 8.99'	84.68'

Town of Aniwa Monitoring Wells
Dissolved Arsenic Results (ug/L As)

Date	Well #	ug/L As	Top of Well (Ft.) / Depth to Water	GW Ht
7-14-16	B-12	490.0	97.64' / 10.80'	86.84'
7-14-16	B-13 R	5400.0	99.28' / 12.01	87.27
	B-13 R	Dupl (5400.0)		
7-14-16	B-21		93.67' / 7.32'	86.35'
7-14-16	Timm Well (Faucet)	1.4 ug/L AS		
	Timm Well (Ext. Hose B.b)	1.5 ug/L AS		
10-10-16	B-12	560.0	97.64' / 12.08'	85.56'
10-10-16	B-13R	2900.0	99.28' / 13.35'	85.93'
10-10-16	B-21	No Sample		
10-29-16	B-12	1000.0	97.64' / 12.61'	85.03'
10-29-16	B-13 R	2700.0	99.28' / 13.98'	85.30'
10-29-16	B-21	1.4	93.67' / 9.00'	84.67'

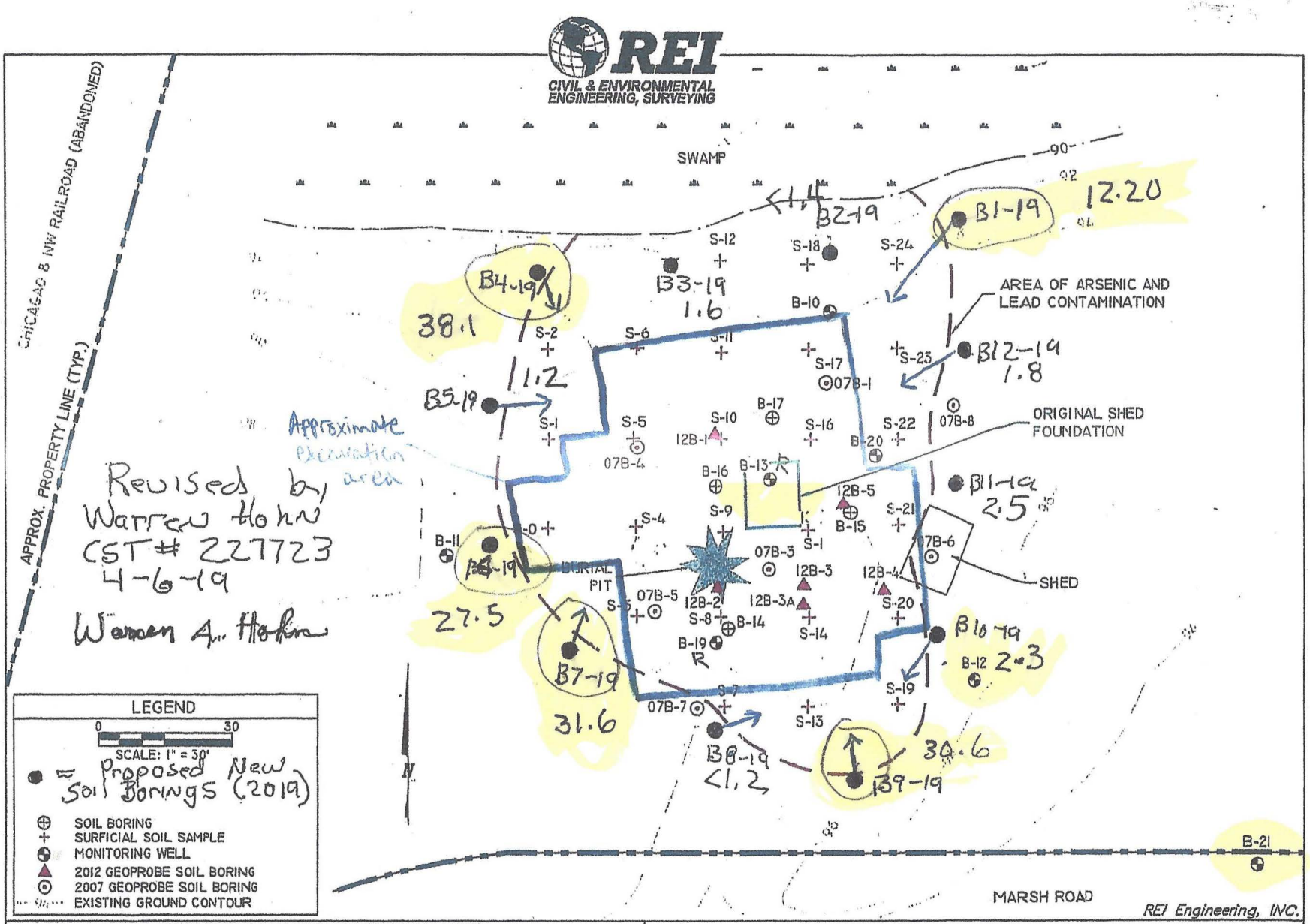
EPA removal criteria = 6 / ppm
removal criteria for this site = 20ppm)
SI State Background Threshold Value (BTV) for As = 8 ppm
EPA removals stops @ the water table



don't abandon wells until closure approved

Soil Sampling (As only) in areas outside of EPA removal area to determine if additional capping is needed

B-10, B-11, B-19 sample for lead to confirm below the ES
B-13, B-12, & B-21 sample once/year; TIMM well & system/post system once/year



TOWN OF ANIWA DISPOSAL SITE
MARSH ROAD NEAR CHICAGO & NW RAILROAD
TOWN OF ANIWA, SHAWANO COUNTY, WI

FIGURE B.2.c :PRE/POST-REMEDIAL SOIL CONTAMINATION

PROJECT NO.	DRAWN BY:	DATE:
6663	TAW	6/17/2014

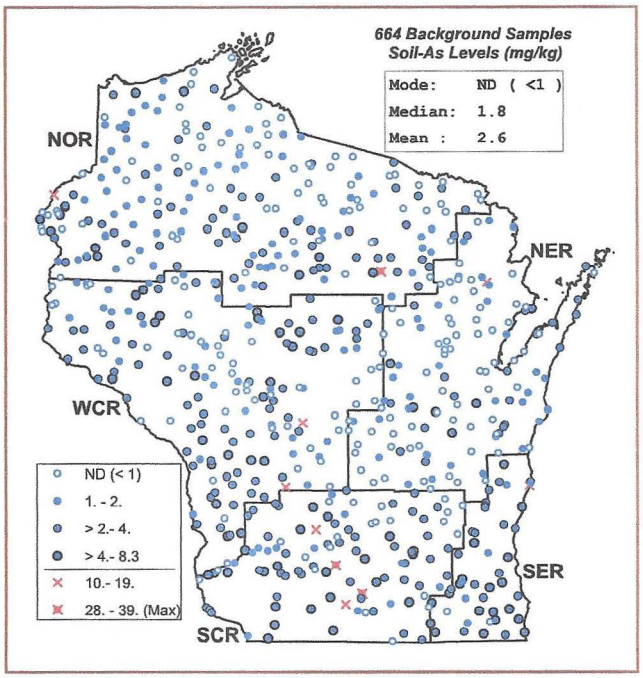
DRAWING FILE: P:\6600-6699\6663-TOWN OF ANIWA - ARSENIC SITE\DWG\6663-SOIL-CONTAM.DWG LAYOUT: PRE-POST PLOTTED: JUN 18, 2014 - 9:32AM PLOTTED BY: TODDW

Wisconsin Statewide Soil-Arsenic Background Threshold Value

Pg 6

July 2013
RR-940

The United States Geological Survey (USGS) has released "Scientific Investigations Report 2011-5202" (pubs.usgs.gov/sir/2011/5202) on naturally occurring arsenic (As) concentrations in surface soils in Wisconsin. See page two for a summary of the report, including data statistics.



DNR's Remediation and Redevelopment (RR) Program has reviewed the report prepared by USGS and concluded that the data set is of sufficient scope and quality to establish a statewide soil-As background threshold value (BTV). The BTV is a level that can be categorically accepted as "not exceeding background." When sufficient soil data have been collected at a site and none exceeds the BTV, then it can be concluded that the observed soil-As levels do not exceed background.

The sampling results and the statistical analysis of the data indicate the highest value obtained that is not considered a statistical outlier is 8 mg/kg (=8ppm) in the USGS report. Based on discussions and feedback from the Wisconsin Department of Health Services and Department of Agriculture, Trade and Consumer Protection, the RR Program intends to use **8 ppm as the statewide soil-As BTV.** It is then reasonable to conclude that any value above 8 ppm could be the result of a hazardous substance discharge.

In situations where soil-As levels exceed 8ppm, the results should be discussed with an RR Project Manager before any additional sampling is conducted as it may be possible that DNR has information that the elevated arsenic levels are consistent with locally high background. If DNR determines that sufficient information on soil-As background concentrations does not exist, Responsible Parties (RP) and their consultants could gather additional soil data for the purpose of establishing a site specific soil-As background level that exceeds 8 ppm. This process is subject to site specific review and approval by an RR Project Manager.

If a site specific background value is being considered, the RR Program recommends the following:

1. A combination of US EPA SW-846 Methods 3050B and 6020A (ICP-MS) to get an MDL of 1 mg/kg or less. The ICP-MS (Inductively Coupled Plasma-Mass Spectrometry) method is a more sensitive test and has less interferences, especially from aluminum, than the ICP-AES procedure that was used in the USGS study.

2. U.S. EPA's statistical ProUCL program which is the same software used in the USGS study. It is useful in evaluating site specific data distribution (normal or non-normal) and in identifying potential outliers. ProUCL is available at: www.epa.gov/osp/hstl/tsc/software.htm.

Wisconsin Department of Natural Resources
P.O. Box 7921, Madison, WI 53707
dnr.wi.gov, search "brownfield"

Summary of the USGS report on surface soil-As concentrations in Wisconsin

In 2006 and 2007, soil scientists from the U.S. Department of Agriculture's Natural Resources Conservation Service collected six-inch deep soil samples at 664 locations across the state. The locations and number of samples were selected to proportionally represent the varied geographic regions covered by the major soil types in the state. Samples were collected from undisturbed areas away from roads, fence lines, disposal sites and construction areas to avoid obvious anthropogenic influences. The University of Wisconsin State Laboratory of Hygiene (SLoH) analyzed the metal content of the samples. A representative sample aliquot was digested in a mixture of hydrochloric and nitric acids and the resulting solution was analyzed by the Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) method. The SLoH ICP-AES procedure resulted in a method detection limit (MDL) for soil-As of 1 mg/kg (1 ppm).

Key findings from the statistical evaluation of the 664 soil-As results:

1. The most frequently observed sampling result (mode) was non-detectable *(i.e.* less than method detection limit (MDL) of 1 ppm). This occurred for nearly one-third (211 out of 664) of the samples. The median value was **1.8 ppm** and the 95th percentile was **6 ppm**.

2. Using all 664 sample results (and assigning a value of 1 ppm for the non-detectable results), the mean was estimated at **2.6 ppm**. The data histogram showed a non-normal data distribution (*i.e.*, no bell curve) precluding the use of typical computational methods to estimate the confidence limits for the mean. Instead, the nonparametric Kaplan-Meier estimation was used to estimate the 95% upper confidence limit (UCL) for the mean (95% UCL). The 95% UCL was estimated at **2.8 ppm**.

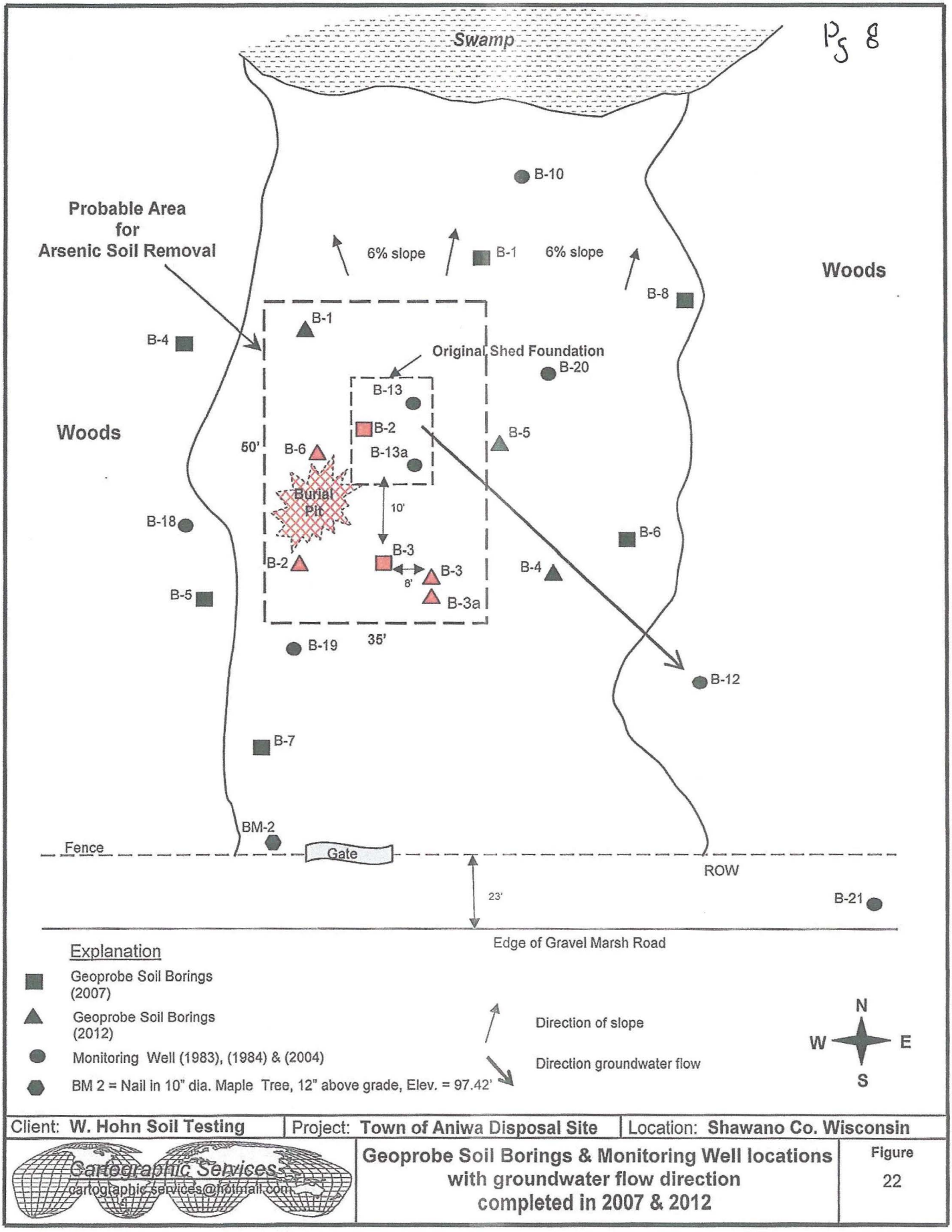
3. Rosner's outlier test was applied to the data set to determine if any of the sampling results were statistical outliers. That analysis indicated that the 10 highest results (values ranging from 10 ppm to 39 ppm) were statistical outliers. The USGS report has summary tables with data statistics after these outliers were dropped. Without the outliers, the mean was estimated at **2.3 ppm**, and the 95% UCL was **2.4 ppm**. The 95th percentile remained the same at **6 ppm**. Without outliers, the maximum soil-As concentration was **8 ppm**.

Summary table of key findings

Statistic	All data - 664 samples	Without outliers - 654 samples
Mode *(most frequently observed result)*	< 1 ppm	< 1 ppm
Median	1.8 ppm	1.8 ppm
95% upper confidence limit for the mean	2.8 ppm	2.4 ppm
95th percentile (to 1 significant figure)	6 ppm	6 ppm
Maximum	39 ppm	8 ppm

Questions?

For questions or futher information contact
Resty Pelayo at: aristeo.pelayo@wisconsin.gov or (608) 267-3539



Client: **W. Hohn Soil Testing**	Project: **Town of Aniwa Disposal Site**	Location: **Shawano Co. Wisconsin**
Cartographic Services cartographic.services@hotmail.com	**Geoprobe Soil Borings & Monitoring Well locations with groundwater flow direction completed in 2007 & 2012**	Figure 22

Table 15. Elevated arsenic soil borings done at the Town of Aniwa Disposal Site on 29 November 2012 and 08 December 2013.

B-1 Northwest of Well B-13

Sample No.	As(mg/Kg)	TCLP(mg/L)
SB1 (0-2 ft)	3.70	
SB1 (2-4 ft.)	59.80	
SB1 (4-6 ft.)	36.20	
SB1 (6-8 ft.)	53.80	
SB1 (8-10 ft.)	54.50	
SB1 (10-12 ft.)	65.40	
SB1 (12-14 ft.)	36.00	
SB1 (14-16 ft.)	1.30	
SB1 (16-18 ft.)	17.40	
SB1 (18-20 ft.)	0.91	

B-3 South of B-13 and B-13a (10 ft. off Old Shed Site)

Sample No.	As(mg/Kg)	TCLP(mg/L)
SB3 (0-2 ft)	3.90	
SB3 (2-4 ft.)	8,360.00	1.50
SB3 (4-6 ft.)	2.90	
SB3 (6-8 ft.)	1.60	
SB3 (8-10 ft.)	2.20	
SB3 (10-12 ft.)	10.70	
SB3 (12-14 ft.)	38.60	
SB3 (14-16 ft.)	7.60	
SB3 (16-18 ft.)	32.00	
SB3 (18-20 ft.)	12.80	
SB3A (0-6") (6 ft. South of SB3)	529.00	0.39

B-6 West of B-13a and Old Shed Site

Sample No.	As(mg/Kg)	TCLP(mg/L)
SB6 (0-2 ft.)	1,410.00	0.28
SB6 (2-4 ft.)	47.70	
SB6 (4-6 ft.)	110.00	0.46
SB6 (6-8 ft.)	7.20	
SB6 (8-10 ft.)	256.00	3.00
SB6 (10-12 ft.)	1.50	
SB6 (12-14 ft.)	74.30	
SB6 (14-16 ft.)	1.70	
SB6 (16-18 ft.)	68.10	
SB6 (18-20 ft.)	1.60	
(TCLP) (11-12 ft.)	1.30	

Table 14. Elevated arsenic soil borings done at the Town of Aniwa Disposal Site on 6 June 2007.

B-2 Between B-13 and B-13a (Old Shed Site)

Sample No.	As(mg/Kg)	Pb(mg/Kg)
S2A(1-2 ft)	1.18	1.42
S2B (3-4 ft.)	281.00	3.20
S2C (4-6 ft.)	232.00	4.75
S2D (7 ft.)	1.84	0.94
S2E (8 ft.)	2.06	2.29
S2F (8-10 ft.)	1.11	3.32
S2G (10-11 ft.)	0.91	2.07
S2H (12-14 ft.)	1.90	2.82
S2I (15 ft.)	N.D.	2.03
S2J (16 ft.)	1.08	1.13
S2K (17-18 ft.)	0.40	1.95
S2L (19-20 ft.)	N.D.	1.79
S2M (22 ft.)	N.D.	0.90

B-3 In Front of Old shed site by test pit

S3A (1-2 ft.)	10.30	6.80
S3B (3-4 ft.)	6.25	3.25
S3C (4-5 ft.)	4.03	5.72
S3D (8 ft.)	0.75	2.00
S3E (9 ft.)	9.32	2.06
S3F (12 ft.)	87.10	1.35
S3G (13-14 ft.)	117.10	1.05
S3H (16 ft.)	465.00	1.67
S3I (17-18 ft.)	296.00	N.D.
S3J (20 ft.)	32.00	1.53

N.D. = No Detection

Boring B-3 in front of the old shed area, 10 feet south of Well B-13a showed a soil arsenic level of 10.30 mg/Kg at 1-2 feet in S3A on 15 June 2007 and a low lead level of 6.80 mg/Kg. From 3 feet to 9 feet the highest soil arsenic level was 9.32 mg/Kg at 9 feet in S3E. At a depth of 12 feet the arsenic soil level increases to 87.1 mg/Kg in S3F and further increases to 117.0 mg/Kg in S3G at a depth of 13-14 feet. A maximum soil arsenic level of 465.0 mg/Kg in S3H is noted in Boring B-3 at 16 feet and decreases to 296.0 mg/Kg in S3I at 17-18 feet. The final sample at 20 feet showed a decreased arsenic soil level of 32.0 mg/Kg in S3J. This boring indicates vertical migration of arsenic in the soil profile possibly due to water table fluctuations. The Town of Aniwa did not have the