

April 10, 2014

Mr. Tauren Beggs  
Hydrogeologist  
Wisconsin Department of Natural Resources  
2984 Shawano Avenue  
Green Bay WI 54313-6727

Subject: **Potable Well Monitoring Work Plan  
Former Town of Newton Gravel Pit, 3130 Hecker Road, Manitowoc, Wisconsin  
WDNR BRRTS No. 02-36-000268  
WDNR FID No. 436104020**

Dear Mr. Beggs:

On behalf of the City of Manitowoc (City), AECOM is providing a potable well monitoring work plan for continued monitoring of private wells near the Former Town of Newton Gravel Pit (Site). The purpose of the monitoring is to evaluate the extent of cis-1,2-dichloroethene and vinyl chloride as contaminants of concern on a quarterly basis over the course of a one year time period. These additional data and sampling efforts are in response to requests from the Wisconsin Department of Natural Resources (WDNR) as outlined below.

Presented below are background information, a proposed sampling schedule, sampling methods, reporting, and a summary of ongoing activities related to the potable well sampling, including a request to the WDNR for additional well information related to the 3320 Hecker Road property.

### **Background Information**

Outlined below is a chronological summary of the potable well sampling events and work plan submittals through the date of this document.

Historically, potable well water sampling and analysis for volatile organic compounds (VOCs) was conducted at 12 private potable wells in 1993 and at one private potable well in 2008. In 1993, the only analyzed VOC that was detected was chloroform, in one potable well (3320 Hecker Rd.) and at a concentration that was below the NR 140 Preventative Action Level (PAL). Analyzed VOCs were not detected in the one private potable well sampled in 2008 (5202 Silver Creek Rd.).

Previous to the current monitoring events, the most recent groundwater monitoring occurred in September 2012<sup>1</sup>. At that time AECOM conducted an annual round of groundwater monitoring for the non-potable groundwater monitoring wells associated with the Western Source Area environmental site investigation.

In an April 8, 2013, correspondence<sup>2</sup>, the WDNR requested an expanded scope of work for the Site. Included in the expanded scope of work was a request to sample private potable wells along Hecker Road and Silver Creek Road. After multiple correspondences with the WDNR to define the scope of work, a work plan was approved and the potable well sampling was scheduled to take place during the site-wide October 2013 groundwater monitoring event.

In general accordance with the WDNR's request, the initial potable well sampling work plan<sup>3</sup> was to collect water samples from 12 wells along Hecker Road that were either side or down-gradient from the Site and have them analyzed for VOCs. This sampling occurred during the week of October 21, 2013,

<sup>1</sup> Former Town of Newton Gravel Pit 2012 Groundwater Monitoring Letter Report, BRRTS No. 02-36-000268, AECOM Project No: 60135471(82518), February 27, 2013.

<sup>2</sup> 2012 Groundwater Monitoring Letter Report and Additional Investigation, WDNR response letter dated April 8, 2013.

<sup>3</sup> Response to WDNR Review of 2012 Groundwater Monitoring Letter Report, AECOM, dated September 30, 2013.

and included the initial 12 potable wells and one additional potable well at 3702 Hecker Road, for a total of 13 well locations.

October 2013 Sampling Addresses	
3114 Hecker Road	3515 Hecker Road
3121 Hecker Road	3518 Hecker Road
3303 Hecker Road	3609 Hecker Road
3320 Hecker Road	3625 Hecker Road
3327 Hecker Road	3627 Hecker Road
3461(3417) Hecker Road	3702 Hecker Road
	3720 Hecker Road

The laboratory analytical results for the initial potable well sampling event were received on Wednesday, November 6, 2013. Based on the results, confirmation sampling (confirm) was conducted on November 7<sup>th</sup>, 8<sup>th</sup> and 12<sup>th</sup>, 2013. As part of this confirmation sampling, two additional potable wells (house and barn) were sampled at 4620 Silver Creek Road. In total, 15 potable wells were sampled during the November 7<sup>th</sup>, 8<sup>th</sup> and 12<sup>th</sup>, 2013, sampling events.

November 7,8,12, 2013 Sampling Addresses	
3114 Hecker Road(confirm)	3515 Hecker Road(confirm)
3121 Hecker Road(confirm)	3518 Hecker Road(confirm)
3303 Hecker Road(confirm)	3609 Hecker Road(confirm)
3320 Hecker Road(confirm)	3625 Hecker Road(confirm)
3327 Hecker Road(confirm)	3627 Hecker Road(confirm)
3461 (3417) Hecker Road(confirm)	3702 Hecker Road(confirm)
4620 Silver Creek Road (house)	3720 Hecker Road(confirm)
4620 Silver Creek Road (barn)	

In a November 15, 2013, correspondence<sup>4</sup> the WDNR requested that the potable wells at two addresses be sampled for Resource Conservation and Recovery Act (RCRA) Metals and polychlorinated biphenyls (PCB) Aroclors. The RCRA Metals and PCB Aroclors sample event was conducted November 22, 2013, at the following addresses.

November 22, 2013 Sampling Addresses	
3515 Hecker Road	3609 Hecker Road

Additionally, the WDNR requested "... a representative potable well VOC sampling and analysis plan for the area surrounding the gravel pits, as well as specifically to the east and southeast of Hecker Road and Silver Lake (sic) Road and also extending east of I-43." On December 2, 2013, after consulting with Ms. Elizabeth Heinen, WDNR Bureau of Drinking Water and Groundwater staff, AECOM submitted a VOC sampling work plan<sup>5</sup> to the WDNR for 12 proposed sample locations. We received concurrence<sup>6</sup> with the work plan from the WDNR on December 3, 2013. Also on December 3, 2013, the WDNR sampled the potable well located at 4609 Silver Creek Road.

<sup>4</sup> Additional Requirements, City of Manitowoc – Town of Newton Gravel Pit, WDNR letter dated November 15, 2013.  
<sup>5</sup> Newton Pit – potable well sampling, email from Dave Henderson (AECOM), Monday, December 02, 2013, 2:06 PM.  
<sup>6</sup> RE: Newton Pit – potable well sampling, email from Elizabeth M Heinen (WDNR), Tuesday, December 03, 2013, 8:16 AM.

On December 4, 2013, the WDNR requested<sup>7</sup> that three additional potable wells be sampled as part of the approved work plan. Concurrent with this request, the WDNR sampled the well at 3609 M&M Lane.

On December 5, 2013, AECOM sampled 11 of the 12 potable wells approved in the work plan. The twelfth well, 4609 Silver Creek Road, was previously sampled by the WDNR on December 3, 2013.

On December 12, 2013, AECOM sampled the additional three potable wells as requested by the WDNR. On December 16, 2013, the WDNR re-sampled the well at 3609 M&M Lane.

Therefore, between December 3 and December 16, 2013, AECOM sampled a total of 14 potable wells and the WDNR sampled two wells.

December 3,4,5,16, 2013 Sampling Addresses	
4159 Silver Crk Road	3504 CTH CR
4314 Silver Crk Road	3626 CTH CR
4315 Silver Crk Road	3627 CTH CR
4609 Silver Crk Road	3904 CTH CR
4752 Silver Crk Road	4024 CTH CR
4808 Silver Crk Road	4127 Thunder Ridge Rd
5202 Silver Crk Road	5107 Viebahn Street
	3107 Fricke Drive
	3609 M&M Lane

Based on the results of the December sampling events the project team determined that additional potable well sampling was necessary. During a conference call with Ms. Heinen on December 19, 2013, the WDNR requested an additional nine new potable wells be sampled and one confirmation sample be obtained at 3504 CTH CR. The WDNR provided email approval of the sampling locations<sup>8</sup>. Additionally, the City identified one location, 4159 Silver Creek Road, for a confirmation sample (previously sampled December 5, 2013). AECOM conducted the sampling on January 3 and January 6, 2014.

January 3,6, 2014 Sampling Addresses	
3120 CTH CR	3504 CTH CR(confirm)
3322 CTH CR	3523 CTH CR
3403 CTH CR	3533 CTH CR
3412 CTH CR	3618 CTH CR
3422 CTH CR	4159 Silver Crk Road(confirm)
4002 Thunder Ridge Rd	

Based on the results of the January 3 and 6, 2014 sampling events the project team determined that additional potable well sampling was necessary. On a January 23, 2014, project team conference call (documented in a Second Additional Requirements Letter<sup>9</sup>) the WDNR requested the submittal of a potable well sampling work plan "... to the north and east of CTH CR to define the plume ..." AECOM

<sup>7</sup> Verbal communication, Elizabeth M Heinen (WDNR) during Newton Town Hall site visit, December 4, 2013.

<sup>8</sup> Suggested additional sampling needed-Man.Newton.Gravel Pit, email from Elizabeth M Heinen (WDNR), Thursday, December 19, 2013 3:05 PM.

<sup>9</sup> Second Additional Requirements Letter, WDNR, dated January 28, 2014.

again worked with Ms. Heinen to identify the sampling locations. In a January 24, 2014, email<sup>10</sup> the WDNR confirmed 13 additional well locations for sampling.

Soon thereafter, AECOM submitted a Potable Well Sampling, Continuing Work Plan<sup>11</sup> memo to the WDNR that incorporated the 13 new well locations and 3 confirmation sample locations, for a total of 16 sample locations. AECOM sampled 14 of the 16 potable wells on February 4 and 5, 2014.

February 4,5, 2014 Sampling Addresses	
2904/2832 CTH CR	3027 Orchard Lane
2916 CTH CR	3128 Orchard Lane
2917 CTH CR	3420 Orchard Lane
3023 CTH CR	3523 Orchard Lane
3120 CTH CR(confirm)	3524 Orchard Lane
3224 CTH CR	3921 Blackhawk Court
3403 CTH CR(confirm)	
3504 CTH CR(confirm)	

During the February 4 and 5, 2014, sampling event, the potable well at 3312 CTH CR was not sampled for safety reasons and the potable well at Parcel 014-007-00 Orchard Lane was not sampled because it is a seasonal well that was shut down for the winter.

On February 26, 2014, Mr. James Blaha, Manitowoc County Health Officer, sampled the potable well at 3312 CTH CR.

February 26, 2014 Sampling Address
3312 CTH CR

As documented in the Second Additional Requirements letter<sup>9</sup>, the WDNR also requested a long term potable well sampling plan. On February 19, 2014, the project team conducted a daylong meeting to review project information and potable well data. During the meeting the project team agreed that the long term sampling work plan should include quarterly sampling for one year<sup>12</sup>.

On February 28, 2014, the City received additional monitoring requirements<sup>13</sup> for the long term monitoring plan from the WDNR.

On March 11, 2014, construction of a replacement well at 3518 Hecker Road was completed and AECOM sampled the new well.

March 11, 2014 Sampling Address
3518 Hecker Road

<sup>10</sup> Request of additional wells to sample, email from Elizabeth M Heinen (WDNR), Friday, January 24, 2014 2:34 PM.

<sup>11</sup> Potable Well Sampling, Continuing Work Plan, AECOM memo dated January 30, 2014.

<sup>12</sup> Former Town of Newton Gravel Pit, Data Gap Meeting Notes, via email from Tauren R Beggs (WDNR), Thursday, February 20, 2104 10:49 AM.

<sup>13</sup> Additional Sampling & Potable Well Monitoring plan – Fmr Newton Tn Gravel Pit, email from Tauren R Beggs, Friday, February 28, 2014 3:14 PM.

The work plan presented below is in response to the WDNR’s request for a long term potable well sampling plan.

**Long Term Potable Well Sampling Plan**

Sampling Schedule

Four quarterly potable well sampling events will occur over a period of one year during the following months:

1. May 2014
2. August 2014
3. November 2014
4. February 2015

No additional potable well sampling events will be conducted prior to the first scheduled quarterly sampling event (May 2014).

Sampling Parameters

The water samples will be analyzed for VOCs consistent with previous sampling events. There is no laboratory fee cost saving achieved by limiting which VOC compounds are analyzed.

Sampling Areas

Upgradient Wells:

- The following up-gradient potable well locations, that have historically been sampled, will not be sampled during this planned time period:

Upgradient Potable Well Addresses	
5107 Viebahn Street	3609 M&M Lane
2925 Fricke Road	3717 M&M Lane
3107 Fricke Road (two wells)	3840 M&M Lane
3610 Gass Lake Road	5202 Silver Creek Road

Target Zone Wells (areas outlined in blue on Figure 1):

- Wells will be sampled on a quarterly basis for one year in May, August, and November 2014, and February 2015. At the completion of the first quarterly sampling event, the potable wells within the Target Zone shown on Figure 1 will have been sampled a minimum of two times.
- Includes wells with detections of cis-1,2-dichloroethene and/or vinyl chloride. Also includes six wells with no detections of VOCs. However, these six wells have wells around them with detections of cis-1,2-dichloroethene and/or vinyl chloride.
- The property located at 3320 Hecker Road is contained within the Target Zone. The WDNR is currently working to determine if there is more than one potable well located at this address. The outcome of that inquiry may increase the number of potable wells to be sampled within the Target Zone.
- The Target Zone includes a total of 21 known wells identified for quarterly sampling as listed in Table 1.

Sentinel Zone Wells (areas outside the Target Zone outlined in yellow on Figure 1):

- Wells will be sampled on an annual basis starting with the first quarterly sampling event in May 2014. At the completion of the first quarterly sampling event, most potable wells within the Sentinel Zone shown on Figure 1 will have been sampled a minimum of two times.
- Includes wells with no detections of VOCs and as such, appear to delineate the extent of the Target Zone.
- Includes a total of 17 wells identified for annual sampling as listed in Table 1.
- If sampling results indicate that a Sentinel Zone well is impacted by cis-1,2-dichloroethene and/or vinyl chloride, the data may be used to redefine the Target Zone and Sentinel Zone. The sampling frequency of the newly impacted well will be adjusted to quarterly, beginning with the next scheduled quarterly sampling event.

Data Gap Wells (red circles shown on Figure 1):

- Wells will be sampled during the first quarterly sampling event in May 2014.
- Includes a total of 15 wells, three of which were added at the suggestion of the WDNR, as listed in Table 1. These wells have not been previously sampled.
- For those Data Gap Wells identified as being within the Sentinel Zone, if the results from the first quarterly sampling event indicate that the wells are not impacted by cis-1,2-dichloroethene and/or vinyl chloride, then those wells will be incorporated into the Sentinel Zone and continue to be sampled on a quarterly basis as part of the this work plan.
- For the three Data Gap Wells identified as being outside of the Sentinel Zone (4212, 4220, 4236 Silver Creek Road), if the results from the first quarterly sampling event indicate that the wells are not impacted by cis-1,2-dichloroethene and/or vinyl chloride, then the sampling requirement for the wells will be removed from this Long Term Potable Well Sampling Plan.
- If sample results indicate that a Data Gap well is impacted by cis-1,2-dichloroethene and/or vinyl chloride, the data may be used to redefine the Target Zone and Sentinel Zone. The sampling frequency of the impacted well will be adjusted to quarterly, beginning with the next scheduled quarterly sampling event. These data may also be used to identify additional Data Gap wells to be incorporated into subsequent quarterly sampling events.

Historically Sampled Wells (purple triangles shown on Figure 1):

- These wells have been historically sampled and the initial sample results indicate that the wells are not impacted by cis-1,2-dichloroethene and/or vinyl chloride. The wells are noted on Figure 1 as being outside the Target and Sentinel Zones and not identified as a Data Gap well.
- Includes a total of 9 wells, all of which were added at the suggestion of the WDNR, as listed in Table 1.
- The wells are included as part of this work plan to obtain a second round of confirmation sampling results. The wells will be sampled during the first quarterly sampling event in May 2014. If the results from the first quarterly sampling event continue to indicate that the wells are not impacted by cis-1,2-dichloroethene and/or vinyl chloride, then the sampling requirement for the wells will be removed from this Long Term Potable Well Sampling Plan.
- If sample results indicate that a Historically Sampled well is impacted by cis-1,2-dichloroethene and/or vinyl chloride, the data may be used to redefine the Target Zone and Sentinel Zone. The sampling frequency of the impacted well will be adjusted to quarterly, beginning with the next scheduled quarterly sampling event.

East of Orchard Lane:

- The eastern extent of potable well sampling is defined by the sampling results along Orchard Lane. Please note that the Manitowoc City Limits east of Orchard Lane are irregular and may be as far as 1.3 miles east of Orchard Lane. No additional potable well sampling east of Orchard Lane is planned for this time period.

### Sampling Methods

Potable well owners will be notified by the City that their well has been chosen to be sampled. The City will then work with AECOM and the owners to schedule an appointment for an AECOM field technician to sample the private wells.

Samples will be collected following purging from a cold water tap or spigot as near to the well as possible, preferably prior to any storage/pressure tanks or physical/chemical treatment system that might be present. The system will be purged for at least 10 minutes immediately prior to sampling. Samples for VOCs will be collected in 40-ml glass vials with Teflon septa. The vials will be filled to the top, leaving no headspace or bubbles then quickly capped. While filling sample containers, water flow will be reduced to a low level to minimize sample disturbance. The samples will be placed on ice in a cooler and picked-up by the laboratory analyzing the vials. The samples will be accompanied with a chain of custody (COC) for each sample.

Potable well water samples for quality control will also be collected. The quality control samples will include field duplicate and matrix spike (MS)/matrix spike duplicate (MSD) samples. The quality control samples will be determined by AECOM field personnel. Laboratory provided trip blanks will accompany the sample containers to evaluate the potential for analytical artifacts associated with container handling in the field and laboratory.

Water samples will be submitted to a Wisconsin Administrative Code (WAC) Chapter NR 149 certified laboratory for analyses of VOCs (EPA Method SW 8260B).

The groundwater analytical results will be compared to the WAC Ch. NR 140.10, Table 1, Public Health Groundwater Quality Standards.

### Reporting

Reporting of laboratory analytical results will be made to both the WDNR and individual potable well owners.

A quarterly potable well sampling letter report will be submitted to the WDNR. The letter report will include a written summary of the sampling event, summarized laboratory results in tabular form, a figure showing the results, and copies of laboratory reports.

Well owner reporting of analytical results will include a cover letter explaining the results with an attached copy of the laboratory report. The WDNR will be copied on the well owner reporting.

### **Ongoing Activities**

Currently all locations with potable wells that have VOC compounds above drinking water standards are receiving bottled water provided by the City. Additionally, the City's well drilling contractor has completed a replacement potable well at 3518 Hecker Road and that well is being tested for VOCs.

The City and AECOM are currently reviewing options for providing safe drinking water to the well owners with potable well impacts above the drinking water standards.

Since it will apply to this work plan, the City requests from the WDNR continues to provide updates concerning the inquiry into the number of potable wells located at 3320 Hecker Road.

If you have any questions or require additional detail, please contact Kathleen M. McDaniel, City Attorney, at 920-686-6990 or [kmcdaniel@manitowoc.org](mailto:kmcdaniel@manitowoc.org) or Dave Henderson at 414-944-6190 or [dave.henderson@aecom.com](mailto:dave.henderson@aecom.com).

Respectfully Submitted,

AECOM



David Henderson, P.E.  
Senior Project Manager

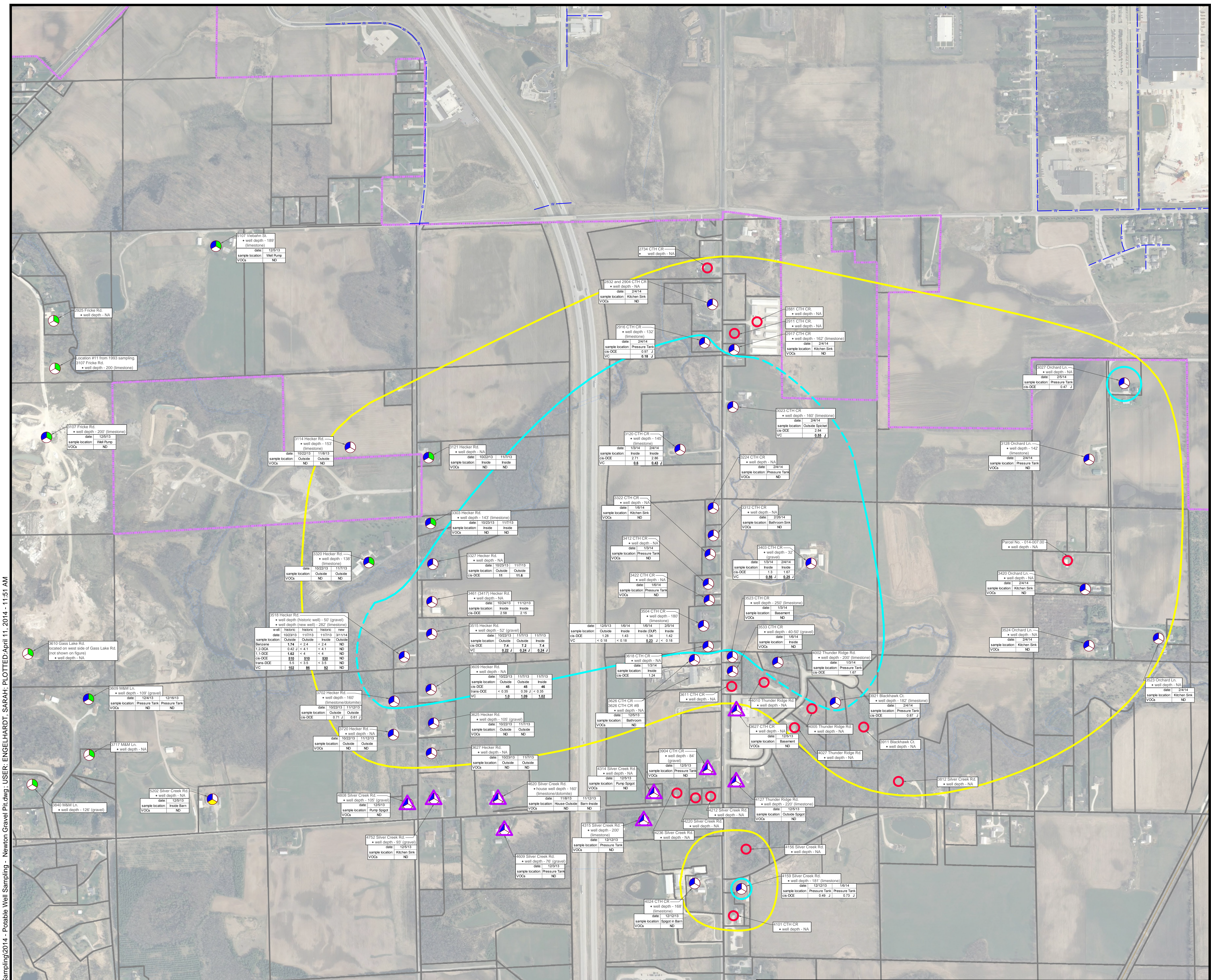
c: Kathleen M. McDaniel, City Attorney, City of Manitowoc  
Dan Koski, Director of Public Infrastructure, City of Manitowoc

Attachments: Figure 1, VOC Sampling Results and Work Plan  
Table 1, Summary of Quarterly Potable Well Sampling



**TABLE 1  
SUMMARY OF QUARTERLY POTABLE WELL SAMPLING  
FORMER TOWN OF NEWTON GRAVEL PIT  
MANITOWOC, WISCONSIN**

Well Address	1st Quarter May 2014	2nd Quarter August 2014	3rd Quarter November 2014	4th Quarter February 2015
<b>Target Zone Wells</b>				
3327 Hecker Rd.	X	X	X	X
3461(3417) Hecker Rd.	X	X	X	X
3515 Hecker Rd.	X	X	X	X
3518 Hecker Rd.	X	X	X	X
3609 Hecker Rd.	X	X	X	X
3702 Hecker Rd.	X	X	X	X
2916 CTH CR	X	X	X	X
3023 CTH CR	X	X	X	X
3120 CTH CR	X	X	X	X
3224 CTH CR	X	X	X	X
3312 CTH CR	X	X	X	X
3322 CTH CR	X	X	X	X
3403 CTH CR	X	X	X	X
3412 CTH CR	X	X	X	X
3422 CTH CR	X	X	X	X
3504 CTH CR	X	X	X	X
3618 CTH CR	X	X	X	X
4002 Thunder Ridge Rd.	X	X	X	X
3921 Black Hawk Ct.	X	X	X	X
4159 Silver Creek Rd.	X	X	X	X
3027 Orchard Ln.	X	X	X	X
<b>Sentinel Zone Wells</b>				
3114 Hecker Rd.	X			
3121 Hecker Rd.	X			
3303 Hecker Rd.	X			
3320 Hecker Rd.	X			
3625 Hecker Rd.	X			
3627 Hecker Rd.	X			
3720 Hecker Rd.	X			
2832 (2904) CTH CR	X			
2917 CTH CR	X			
3523 CTH CR	X			
3626 CTH CR and 3626 CTH CR #B	X			
3533 CTH CR	X			
4024 CTH CR	X			
3128 Orchard Ln.	X			
3420 Orchard Ln.	X			
3523 Orchard Ln.	X			
3524 Orchard Ln.	X			
<b>Data Gap Wells</b>				
2734 CTH CR	X			
2881 CTH CR	X			
2911 CTH CR	X			
3611 CTH CR	X			
4101 CTH CR	X			
014-001-014-007.00Parcel/Orchard Ln.	X			
4005 Thunder Ridge	X			
4010 Thunder Ridge	X			
4027 Thunder Ridge	X			
3911 Blackhawk Ct	X			
3812 Silver Creek	X			
4156 Silver Creek	X			
4212 Silver Creek	X			
4220 Silver Creek	X			
4236 Silver Creek	X			
<b>Historically Sampled Wells</b>				
4314 Silver Creek Rd.	X			
4315 Silver Creek Rd.	X			
4609 Silver Creek Rd.	X			
4620 Silver Creek Rd. (two wells)	X			
4752 Silver Creek Rd.	X			
4808 Silver Creek Rd.	X			
3627 CTH CR	X			
3904 CTH CR	X			
4127 Thunder Ridge Rd.	X			



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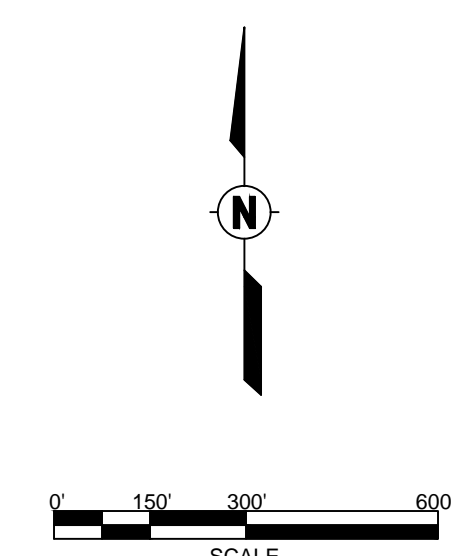
**LEGEND:**

- PROPERTY BOUNDARY
- PROPERTY BOUNDARY - CITY LIMITS
- UTILITIES:**
- W POTABLE WATER SUPPLY (from City of Manitowoc)
- POTABLE WELL SAMPLE LOCATIONS AND SAMPLE DATES (WHITE = NO SAMPLE COLLECTED THAT YEAR)

- VOCs = Volatile Organic Compounds
- cis-DCE = cis-1,2-Dichloroethene
- trans-DCE = trans-1,2-Dichloroethene
- 1,2-DCA = 1,2-Dichloroethane
- 1,1-DCE = 1,1-Dichloroethene
- VC = Vinyl Chloride
- **bold** = PAL exceedance
- **bold and underlined** = ES exceedance
- PAL = Preventive Action Limit
- ES = Enforcement Standard

- TARGET ZONE
- SENTINEL ZONE
- DATA GAP SAMPLE LOCATION
- △ HISTORIC SAMPLE LOCATIONS

- NOTES:**
1. VOCs detected from likely laboratory or sampling cross-contamination not reported on figure.
  2. VOC values for 2013-2014 sampling events reported on figure.
  3. Analytical data presented in µg/L.
  4. All potable wells sampled are outside of the City of Manitowoc limits.



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**FORMER NEWTON GRAVEL PIT**

**2013-2014 POTABLE WELL  
 VOC SAMPLING RESULTS AND WORK PLAN**

Project Number: 60311767	Drawn By: SAE	Date: 4/11/2014
		Figure No. 1

