

# Remedial Action Options Report

Former QuicFrez Site

November 1, 2019

ENGINEERING • ARCHITECTURE • ENVIRONMENTAL



Project #: N2232B19

# Remedial Action Options Report

Former QuicFrez Site

Prepared for

Wisconsin Department of Natural Resources

November 1, 2019

DNR BRRS Number 02-20-118383  
OMNI Project Number N2232B19

# **Remedial Action Options Report**

**Former QuicFrez Site  
105 Oak Place  
Fond du Lac, Wisconsin 54935**

**Prepared by:**

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**November 1, 2019**

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Figure 3 – Extent of Groundwater Contamination Exceeding NR 140 ESs

## List of Acronyms and Abbreviations

bgs	Below ground surface
BRRTS	Bureau for Remediation and Redevelopment Tracking System
CY	Cubic Feet
CVOCS	Chlorinated Volatile Organic Compounds
ES	Enforcement Standard
ft	Feet
HASP	Health and Safety Plan
LF	Linear Feet
Miller	Miller Engineers and Scientists
OMNNI	OMNNI Associates, Inc.
OSHA	Occupational Safety and Health Administration
PAL	Preventive Action Limit
PID	Photoionization Detector
RAOR	Remedial Action Options Report
SY	Square Feet
TCE	Trichloroethene
ug/L	Micrograms per liter
WAC	Wisconsin Administration Code
WisDOT	Wisconsin Department of Transportation
WDNR	Wisconsin Department of Natural Resources

## EXECUTIVE SUMMARY

OMNNI Associates, Inc. (OMNNI) was retained by the Wisconsin Department of Natural Resources (WDNR) to develop the following Remedial Action Options Report (RAOR) for the Former QuicFrez site (Subject Property), located at 105 Oak Place, Fond du Lac, Wisconsin. The Former QuicFrez site is listed on the WDNR Bureau of Remediation and Redevelopment Tracking System (BRRTS) as an Open Environmental Repair Program (ERP), under BRRTS Number 02-20-118383. This RAOR is based on Wisconsin Administration Code (WAC) NR 722, the data obtained from numerous site investigations and monitoring activities previously reported by Miller Engineers and Scientists (Miller) and OMNNI, communications with WDNR, and an on-site visit with representatives from the WDNR and the City of Fond du Lac.

The most recent groundwater sampling results (performed by OMNNI) from July 18, 2018 revealed chlorinated volatile organic compounds (CVOCs) detected in all eight groundwater monitoring wells. Cis-1,2-dichloroethene was detected in MW4R, MW5R, MW14, and MW21 exceeding the WAC NR 140 Groundwater Enforcement Standards (ES). Cis-1,2-dichloroethene was also detected in MW5A exceeding the WAC NR 140 Preventive Action Limit (PAL). Trans-1,2-dichloroethene was detected in MW4R and MW21 exceeding its ES. Chloroform was detected in MW15 exceeding the PAL. Benzene was detected exceeding the ES in MW1RR and MW21. Benzene was also detected in MW5A exceeding its PAL. Vinyl chloride was detected in all eight groundwater monitoring wells exceeding the ES. 1,1-dichloroethene was detected exceeding its ES in MW4R and MW21. Trichloroethylene (TCE) was detected exceeding its ES in MW4R, MW5R, MW14, and MW21. TCE was also detected in MW15 exceeding its PAL (reference Figure 3, Extent of Groundwater Contamination Exceeding NR 140 ESs).

The Subject Property is documented on WDNR BRRTS as having CVOC impacted soil and groundwater. Extensive remedial efforts have been performed previously on the site to prevent the contaminants from mobilizing to the adjacent river. The previous remedial techniques that were explored include a remedial option known as the Lasagna remediation system, and sheet pile wall installation (Miller 2007 and 2008). The Lasagna system used electrolysis to mobilize the CVOCs to pass into iron filling walls, thus reducing the contamination. As a result of this process, approximately 175 feet of sheet pile wall is still in place, extending into the East Branch Fond du Lac River. The sheet pile wall constricts the width of the river by 10-15 feet. The proposed future use of this site is to be included as a park, which will tie into the existing City of Fond du Lac Bike Trail.

Based on the communication with the WDNR, three options for additional remedial activities were explored in accordance with WAC NR 722.07, which includes: Option 1 – Partial Source Removal, Option 2 – Phytoremediation, and Option 3 – Partial Source Removal with Phytoremediation.

OMNNI, in collaboration with the WDNR, recommends Option 3 – Partial Source Removal with Phytoremediation. Option 3 will entail the removal of contaminated materials (soil, groundwater, sediment, gravel, boulders, sheet piling) to approximately 8 feet below ground surface (bgs) as groundwater is anticipated to be between five and six feet bgs, based on the latest groundwater monitoring event. Backfilled materials will consist of clean sand and/or clay, with at least 2 feet of clay acting as a cap and compacted to the Wisconsin Department of

Transportation (WisDOT) compaction and soil testing specifications. At least six inches of new topsoil and mulch will be placed as the surface material, with pre-selected phytoremediation plants planted. This option requires that a Remediation Action Plan outlining the proposed engineering designs; assessment of permits required and the development of those permits; slope stabilization engineering designs; grading designs; erosion control including track-matting and silt curtains; dewatering sediments and soils; and containing and disposing of impacted water be prepared. This remedial option will remove a portion of the presumed source area of contamination, and therefore, will also likely require continuing obligations. This option is: a) proven to be effective; b) will not pose a significant risk of harm to human health, safety, or welfare of the environment, and c) results in the reduction or control of the hazardous substance in compliance with WAC Chapter NR 722.09(2) to (4).

## **BACKGROUND INFORMATION**

### **Project Title**

Remedial Action Options Recommendations, Former QuicFrez Site

### **Project Identification Numbers**

WDNR BRRTS Number: 02-20-118383

OMNNI Project Number: N2232B19

### **Site Address:**

105 Oak Place  
Fond du Lac, Wisconsin 54935

### **Purpose**

This RAOR summarizes the site activities associated with site remediation of contamination on the QuicFrez (Former) site. The purpose of this RAOR is to summarize the background information, remedial action options, and the selected remedial action to further remediate the groundwater plume in accordance with WAC NR 722 and NR 140.

### **Contact Information**

Property            City of Fond du Lac  
Owner:             160 South Mercy Street, Fond du Lac, Wisconsin  
Tel.: (920) 322-3400

Regulatory        Wisconsin Department of Natural Resources, Bureau for Remediation and  
Agency:            Redevelopment  
Sarah Krueger, P.G., Hydrogeologist  
2984 Shawano Avenue, Green Bay, WI 54313-6727  
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Consultant: OMNNI Associates, a Westwood Company  
Dan O'Connell, P.G., Project Manager  
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Tel.: (920)735-6900  
Dan.oconnell@omnni.com

## Site Location/Project Description

The Former QuicFrez project site (Subject Property) is located at 105 Oak Place in the City of Fond du Lac, Fond du Lac County, Wisconsin (reference Figure 1 – Project Location Map). The Subject Property is located on the banks of the East Branch Fond du Lac River, which feeds into Lake Winnebago, approximately two miles to the north. The Subject Property is documented on WDNR BRRS as having CVOC impacted soils and groundwater. Extensive remedial efforts have been performed previously on the site to prevent the contaminants from mobilizing to the adjacent river. The previous remedial techniques that were explored includes a remedial option known as the Lasagna remediation system, and sheet pile wall installation. The Lasagna system uses electrolysis to mobilize the CVOCs to pass into iron filling walls, thus reducing the contamination. As a result of this process, approximately 175 feet of sheet pile wall is still in place, extending into the East Branch Fond du Lac River. The sheet pile wall constricts the width of the river by 10-15 feet (reference Figure 2 – Site Detail Map). The proposed future use of this site is to be included as a park, which will tie into the existing City of Fond du Lac Bike Trail.

OMNNI was retained as consultant for this RAOR in July 2019.

## Previous Site Investigation Reports

Below is a summary of previous Site Investigation and Operation and Maintenance Reports submitted to WDNR BRRS and were reviewed by OMNNI for this RAOR:

- **Site Investigation Report**, dated October 1999. Prepared by Miller Engineers and Scientists.
- **Remedial Actions Report**, dated October 1999. Prepared by Miller Engineers and Scientists.
- **Phase II ESA**, dated October 2002. Prepared by Miller Engineers and Scientists.
- **Remedial Action Report**, dated December 2002. Prepared by Miller Engineers and Scientists.
- **Site Investigation Report**, dated July 2003. Prepared by Miller Engineers and Scientists.
- **Site Investigation Report**, dated June 2004. Prepared by Miller Engineers and Scientists.
- **Remedial Action Design Report**, dated October 2005. Prepared by Miller Engineers and Scientists.
- **Operation and Maintenance Report**, dated June 2007. Prepared by Miller Engineers and Scientists.
- **Operation and Maintenance Report**, dated October 2007. Prepared by Miller Engineers and Scientists.
- **Remedial Action Documentation Report**, dated November 2011. Prepared by Miller Engineers and Scientists.



- **Operation and Maintenance Report**, dated December 2007. Prepared by Miller Engineers and Scientists.
- **Operation and Maintenance Report**, dated March 2008. Prepared by Miller Engineers and Scientists.
- **Operation and Maintenance Report**, dated March 2010. Prepared by Miller Engineers and Scientists.
- **Remedial Action Report**, dated March 2010. Prepared by Miller Engineers and Scientists.
- **Groundwater Monitoring Report**, dated September 14, 2018. Prepared by OMNNI Associates, Inc.

## Nature and Extent of Contamination

Previous reports by Miller have documented contamination extending vertically to 30 feet bgs, and as deep as 45 feet bgs. TCE concentrations in the groundwater prior to the lasagna method were reported to be as high as 880,000 micrograms per liter (ug/L) (at MW-4, 2007). The lasagna and sheet pile wall remedial activities were completed in 2008. Results from the remedial activities concluded a reduction in CVOC concentrations on the order of one magnitude (TCE at MW21), however, groundwater concentrations for TCE during the March 2015 groundwater sampling event were reported at 27,000 micrograms per liter (ug/L) for MW-21.

The most recent groundwater sampling results from July 18, 2018 revealed CVOCs detected in all eight groundwater monitoring wells. Cis-1,2-dichloroethene was detected in MW4R, MW5R, MW14, and MW21 exceeding the WAC NR 140 Groundwater ES. Cis-1,2-dichloroethene was also detected in MW5A exceeding the WAC NR 140 PAL. Trans-1,2-dichloroethene was detected in MW4R and MW21 exceeding its ES. Chloroform was detected in MW15 exceeding the PAL. Benzene was detected exceeding the ES in MW1RR and MW21. Benzene was also detected in MW5A exceeding its PAL. Vinyl chloride was detected in all eight groundwater monitoring wells exceeding the ES. 1,1-dichloroethene was detected exceeding its ES in MW4R and MW21. TCE was detected exceeding its ES in MW4R, MW5R, MW14, and MW21. TCE was also detected in MW15 exceeding its PAL (reference Figure 3, Extent of Groundwater Contamination Exceeding NR 140 ESs).

## Geologic and Hydrogeologic Settings

Previous Site Investigation Reports have indicated that the site-specific subsurface consists of urban fill material (sand, gravel, cinders, wood and metal debris), underlain by fluvial sediments, and then native brown clay from the Kewaunee Formation and below that, of the Horicon Formation. The Kewaunee and Horicon formation are classified as well-drained to somewhat poorly drained soils.

Regional groundwater flow is expected to be to the north towards the Fond du Lac River and then Lake Winnebago. The Fond du Lac River flows to the north towards Lake Winnebago.

## REMEDIAL ACTION OPTIONS

Based on conversations with WDNR, and the previous remedial options (Lasagna remedial technique), OMNNI has explored three options for remedial activity. In addition to the remedial options identified below, an approved detailed WDNR Remedial Action Plan will be required before commencing work. The Remedial Action Plan should include engineering designs and incorporate WDNR and/or WisDOT specifications for slope stabilization engineering, backfilling and compacting, and seeding. A WDNR soil and sediment management plan is also necessary before commencing work. The soil and sediment management plan will need to be approved by the WDNR. Permitting requirements will need to be explored as part of this remedial effort prior to commencing work as well. Permits such as Chapter 30, NR 347, and/or Permits to Remove Sheet Piling will also need to be explored by contacting the WDNR, Army Corps of Engineers, the U.S. EPA, and possibly local permits from the City of Fond du Lac or County of Fond du Lac.

The evaluation process for this RAOR follows WAC NR 722.07(3), which states that this RAOR should be, “used to determine which remedial action option constitutes the most appropriate technology or combination of technologies to restore the environment, to the extent practicable, within a reasonable period of time and to minimize the harmful effects of the contamination to the air, land, or waters of the state, to address the exposure pathways of concern, and effectively and efficiently address the source of the contamination”. The evaluation of the remedial action options is based on the following requirements and in compliance with the requirements of WAC NR 722.09, which incorporates long-term effectiveness, short-term effectiveness, implementability, restoration time frames, and economic feasibility. Three options for remediating the Subject Property are highlighted below.

### **Option One: Partial Source Removal**

Source removal is likely to be the best method for remediation as it involves the physical removal of the contaminated soils from the site. Impacted groundwater and sediment would also need to be included for removal.

During the removal activities, soils will be field screened with a photo-ionization detector (PID) in order to assist with determining the extents of the removal area. The horizontal extents for excavation will be at a minimum, the extents of the groundwater ES extent depicted in Figure 3 – Extent of Groundwater Contamination Exceeding NR 140 ESs. Environmental oversight of the excavation will be necessary to verify in the field the extent of contamination, using a PID. The extent will be determined once PID readings are below Wisconsin Soil Residual Screening Levels. As previously mentioned, the vertical extent of contamination is to at least 30 feet bgs in some areas. However, OMNNI and WDNR both considered excavation to this depth to not be feasible. Instead, excavating contaminated material to eight feet bgs, or at least two feet below the observed water table, will be the most practical (Note: Final designs should be reviewed by the City of Fond du Lac to meet their desired slopes for restoration).

The impacted soils removed from this site will be managed as a special solid waste and disposed of off-site at a licensed landfill (Waste Management’s Valley Trail Disposal Facility in Berlin, Wisconsin). The impacted soils disposed of in this manner will require manifesting and transport by a solid waste collection and transportation service with an operating license under

WAC NR 502.06. Excavated material that is wet will be required to be stockpiled for dewatering. Stockpiled materials must be placed on plastic, bermed, and covered if left overnight. If any soil encountered during removal activities appear to be contaminated with materials or substances other than those previously identified, the soil will be stockpiled on and covered with plastic, pending characterization, prior to disposal.

Sediment along the bank of the Fond du Lac River may also require removal. Sediments that are excavated as part of this option will be stockpiled on plastic, and bermed to allow for dewatering. Once dewatered, the sediment will need to be transported to a sediment disposal facility. The impacted sediments disposed of in this manner will require manifesting and transport by a solid waste collection and transportation service with an operating license under WAC NR 502.06. If any sediment encountered during removal activities appears to be contaminated with materials or substances other than those previously identified, the impacted sediments will be stockpiled on and covered with plastic, pending characterization prior to disposal.

Water that is in contact with contaminated soils will need to be contained and disposed of properly. This includes dewatered waters from soil and sediment stockpiles, as well as encountered groundwater. Water from excavation activities that displays visual impacts such as sheen or has an odor, will be considered impacted. Impacted water (including dewatered water) will be contained on site and transported to a wastewater treatment facility by a Wisconsin licensed transporter.

Site restoration will be completed with clean backfill soils, compacted, and seeded with erosion control matting. Shoreline restoration design (including slope stabilization engineering) should include the input from the City of Fond du Lac and be approved by WDNR. Groundwater monitoring wells will remain intact and unharmed during remediation activities. If any groundwater monitoring well is damaged during remediation activities, the contractor will be responsible for replacing the groundwater monitoring well. Confirmation soil sampling will be collected from each side of the excavation, 50-feet apart, to document residual soil impacts. A continued groundwater monitoring program will document residual groundwater impacts, though not included as part of this remedial effort.

This option will also include the removal of approximately 200 linear feet of sheet-pile retention wall along the East Branch Fond du Lac River and the fill soils and stone that abuts it, at the request of the City of Fond du Lac. Any of these materials that are stained will also be handled as special waste for disposal. The City of Fond du Lac would prefer to restore the shoreline with a riprap covered embankment; therefore, this option includes shoreline reconstruction design consisting of slope stabilization review for construction and post construction conditions. A subsurface geotechnical exploration will be required to validate the slope stability review and shoreline embankment configuration. A site survey will document the area of excavated materials.

It is anticipated clean soil backfill will consist of clean sand and clay soils compacted to the WisDOT soil compaction and testing specifications. Additionally, it is presumed to be necessary to bring the grade two feet above the observed groundwater elevations from the July 2018 groundwater sampling event.

This remedial option, as it includes soil and sediment removal along the East Branch Fond du Lac River, may require waterway permits. Permit requirements will need to be reviewed with WDNR and the United States Army Corp. of Engineers. Permits will/may include Wisconsin Chapter 30 Permit, Sheet Piling Removal Permit, erosion control permitting, and/or wetlands permitting.

This remedial option will reduce some of the source of contamination, and therefore, will likely require some continuing obligations. Therefore, this method is: a) proven to be effective; b) will not pose a significant risk of harm to human health, safety, or welfare of the environment, and c) results in the reduction or control of the hazardous substance in compliance with WAC NR 722.09(2) to (4), a comparison of expected performance in relation to other technically and economically feasible criteria per WAC NR 722.07(4) is not required.

### **Option Two: Phytoremediation**

Phytoremediation can be an effective solution for TCE impacted soils. Phytoremediation offers a potentially effective control and degradation alternative for both soil and groundwater. Studies have shown that deep tap-rooted trees with high evapotranspiration rates will volatilize TCE through the tree and into the atmosphere as a gas, a process called phytovolatilization. Trees, shrubs, and grasses known to effectively volatilize TCE will be planted across the site.

Prior to planting selected vegetation, the existing surface should be free of existing vegetation. Six inches of topsoil and mulch should be placed above the existing grade. Based on OMNNI's phytoremediation success, phytoremediation has been proven to be efficient in both remediation and continuing obligation costs. However, it should be noted that phytoremediation is unlikely to be effective in removing contamination at these depths (30 ft bgs) observed on the Subject Property.

At the request of the City of Fond du Lac, this option will also include the removal of approximately 200 linear feet of sheet-pile retention wall along the East Branch Fond du Lac River and the fill soils and stone that abuts it, at the request of the City of Fond du Lac. Any of these materials that are stained will also be handled as special waste for disposal. The City of Fond du Lac would prefer to restore the shoreline with a riprap covered embankment; therefore, this option includes shoreline reconstruction design consisting of slope stabilization review for construction and post construction conditions. A subsurface geotechnical exploration will be required to validate the slope stability review and shoreline embankment configuration. A site survey will document the area of excavated materials.

This remedial option, as it includes the removal of the sheet pile wall as well, includes soil and sediment removal along the East Branch Fond du Lac River which may require waterway permits. Permit requirements will need to be reviewed with WDNR and the United States Army Corp. of Engineers. Permits will/may include Wisconsin Chapter 30 Permit, Sheet Piling Removal Permit, Erosion Control Permitting, and/or Wetlands Permitting.

This remedial option will likely reduce a partial source of the contamination and will require continuing obligations. This method may not be as effective with the contaminants increasing in depth. The risk to human health, safety, and welfare of the environment may still exist. This method on its own may also not result in substantial reduction or control of the hazardous substance.

### **Option Three: Partial Source Removal Combined with Phytoremediation:**

A combined remedial approach of Option 1 and Option 2, as described above, will yield the greatest results by (partially) removing material in the source area, and still treating any residual impacts on site. Given the extent of CVOCs at the Subject Property, some residual impacts should be anticipated. The vegetation used as phytoremediation will assist in a pro-longed remedial activity on the site after the partial source material has been removed.

This remedial option will reduce the source of contamination, and therefore, will require minimal continuing obligations. Therefore, this method is: a) proven to be effective; b) will not pose a significant risk of harm to human health, safety, or welfare of the environment, and c) results in the reduction or control of the hazardous substance in compliance with WAC NR 722.09(2) to (4), a comparison of expected performance in relation to other technically and economically feasible criteria per WAC NR 722.07(4) is not required.

### **SELECTED REMEDIAL ACTION**

Based on previous remedial activities and conversations with the WDNR, OMNNI recommends Option 3 (Partial Source Removal Combined with Phytoremediation) as the selected remedial action. Option 1 would not necessarily remove all the contaminants. There would likely be residual contaminants near the surface after Option 1 remediation activities, and Option 2 may not provide much impact on its own as phytoremediation is unlikely to remove the entire contaminated stratigraphy. Therefore, Option 3 will likely be the most effective option for site restoration. The source removal will physically remove impacted soil, sediment, and groundwater from the site. Residual impacts, if any will be treated with select vegetation effective in phytoremediation and continued monitoring. Details provided under Option 1 and Option 2 will apply to Option 3. OMNNI recommends excavating to a termination depth of approximately 8 feet below the existing surface, or approximately 2 feet below the anticipated groundwater level.

Discussions with the WDNR and the City of Fond du Lac will be required regarding final grade. Option 3 should include a 2-foot clay cap, underlying six inches of topsoil and mulch used for phytoremediation. Additional consideration will be required such as the previously mentioned WDNR Work Plan, Soil and Sediment Management Plan, permit assessment and development, slope stabilization engineering, and shoreline restoration design.

OMNNI also recommends that existing monitoring wells remain in place. If any groundwater monitoring wells are destroyed as part of this remedial project, the monitoring well would need to be replaced. OMNNI also recommends a continued groundwater monitoring program after remediation is in place to document the effectiveness of the remedial option (this RAOR does not include the costs for the recommended continued groundwater monitoring).

### **SCHEDULE**

The schedule for implementing the selected Option 3, will rely on the timing of the WDNR to authorize work. OMNNI anticipates permit assessment and / or development activities will be

completed by early to mid-2020 and implementing the source removal activities in late fall 2020 – early winter, when groundwater levels are typically at their lowest, but before the ground freezes. Phytoremediation activities should then take place soon after in early Spring 2021.

## APPROXIMATE COSTS

Costs for the tasks associated with the selected remedial activity are approximated and summarized below.

<b>Task</b>	<b>Approximate Cost</b>
Planning (WDNR Remedial Action Plan, Soil and Sediment Management Plan, and Permit Review)	\$50,000
Install Access Gate, 200 LF Silt Fence, Tracking Pad, & 250 LF of Turbidity Curtain	\$20,000
Excavation (contaminated materials)	\$750,000
Excavate & Haul 1,600 CY Clean Material (to city owned site - no tipping fee)	\$35,000
Sheet Pile Wall Removal and Extract 11 dead-man Piles	\$20,000
Backfilling and Compaction	\$150,000
Slope stabilization and Geotechnical Engineering (place up to 600 SY of Type HR Fabric under 300 CY of Rip Rap (light))	\$50,000
Site Restoration (topsoil / seed / mulch)	\$15,000
Phytoremediation Selection and Planting	\$25,000
Site Surveying and Confirmation Sampling	\$10,000
Contingency	\$200,000
<b>Option 1 Total</b>	<b>\$1,300,000</b>
<b>Option 2 Total</b>	<b>\$575,000</b>
<b>Option 3 Total</b>	<b>\$1,325,000</b>

## WORKER HEALTH AND SAFETY

Prior to the start of the field activities, a site-specific Health and Safety Plan (HASP) establishing the health and safety procedures required to minimize potential risk will be developed by the contractor. The provisions of the HASP will apply to the contractor and the contractor's subcontractor personnel who will potentially be exposed to safety and/or health hazards related to the project activities.

The HASP Should comply with the requirements of the Occupational Safety and Health Administration (OSHA) Personal Protective Equipment Standard (29 CFR 1910.132) for tasks where there are potential exposures to contaminants. All activities covered by this HASP should be conducted in complete compliance with the HASP and with all applicable federal, state, and local health and safety regulations.

## CONCLUSIONS AND RECOMMENDATIONS

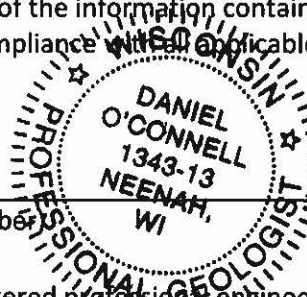
Based on the existing site conditions and discussions with WDNR and the City of Fond du Lac, OMNNI recommends remedial Option 3 (Source Removal and Phytoremediation) be implemented based on effectiveness and financial feasibility. Special considerations will need to be applied when determining permits, slope stabilization engineering, grading, and seeding. In addition to Option 3, an approved detailed WDNR Remedial Action Plan will be required before commencing work. The Remedial Action Plan should include engineering designs and incorporate WDNR and/or WisDOT specifications for slope stabilization engineering, backfilling and compacting, and seeding. A WDNR soil and sediment management plan is also necessary before commencing work. The soil and sediment management plan will need to be approved by the WDNR. Permitting requirements will need to be explored as part of this remedial effort prior to commencing work as well. Permits such as Chapter 30, NR 347, and/or Permits to Remove Sheet Piling will also need to be explored by contacting the WDNR, U.S. EPA, Army Corps of Engineers, and possibly local permits from the City of Fond du Lac or County of Fond du Lac.

## NR 712 CERTIFICATION

"I, Daniel O'Connell, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03(1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."



(Signature, title, P.G. Number)



01/13/2020  
(Date)

"I, Brian Wayner, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-

E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code

*Brian D. Wayner*

(Signature, title, and P.E. Number)







**WDNR BRRTS #:** 0220118383  
**Site Name:** QUICFREZ - LGU SL  
**WDNR Facility ID:** 998314900  
**PLSS:** SE¼ of NW¼ of S15 T15N R17E  
**Parcel No.:** FDL1517152476300, -13161300  
**Lat/Long:** 43° 46' 20.539" N 88° 27' 6.676" W  
**Dec. Long/Lat:** -88.451855 43.772372  
**WTM83(91) (m):** 644,595 367,756  
**County Coord (ft):** 815,718 383,799



  
 ONE SYSTEMS DRIVE PHONE (920) 735-6900  
 APPLETON, WI 54914 FAX (920) 830-6100



**QUICFREZ SITE LOCATION MAP**  
 CITY OF FOND DU LAC, FOND DU LAC COUNTY, WISCONSIN

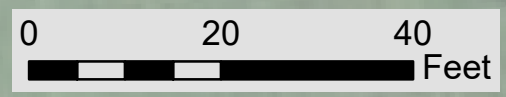
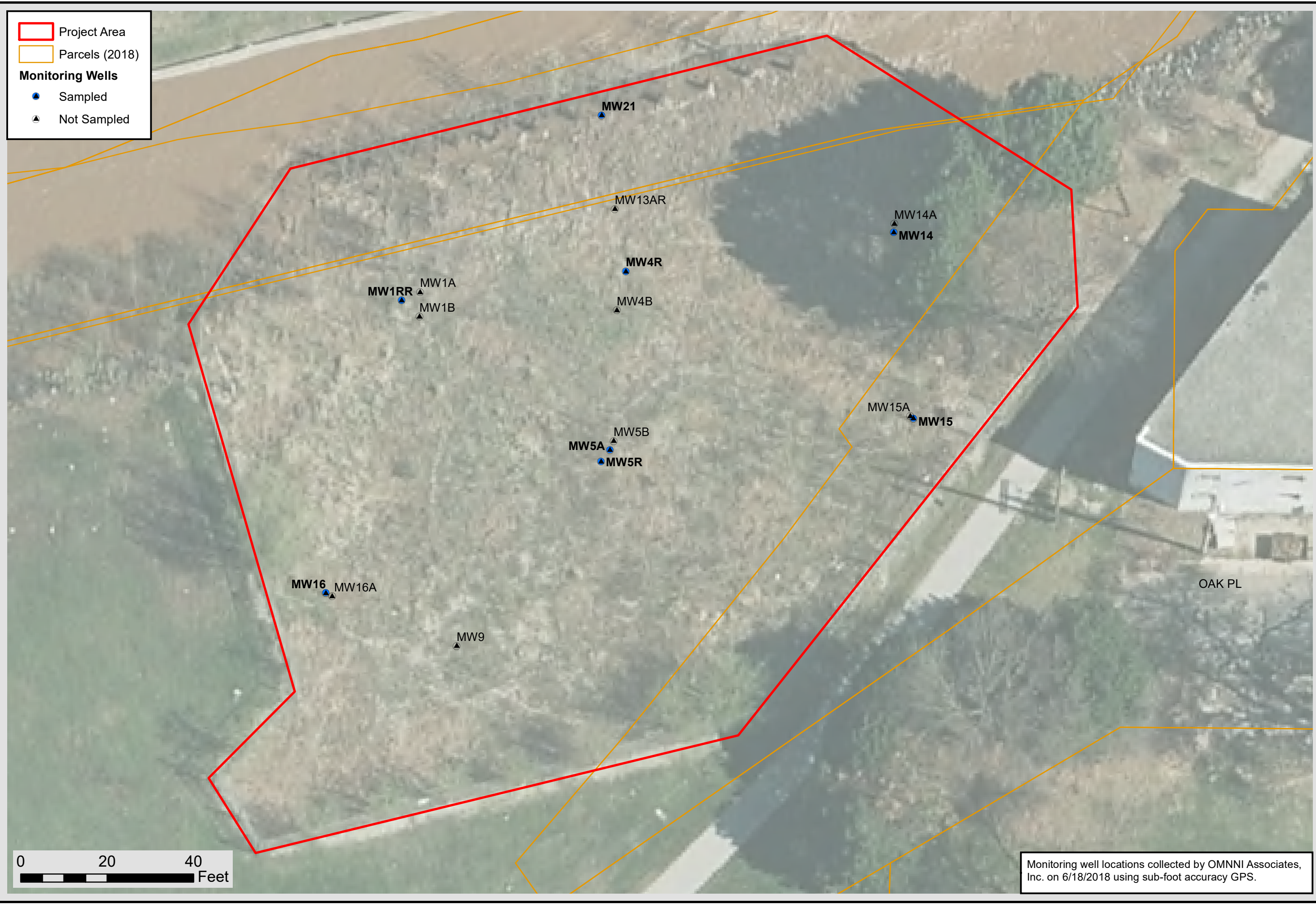
SCALE: AS SHOWN	BRRTS NO. <b>0220118383</b>
Drawn By: JCW	OMNI PROJECT NO. <b>N2232A18</b>
Checked By:	FIGURE NO. <b>1</b>
Date: 10/22/2019	



Project Area  
 Parcels (2018)  
**Monitoring Wells**  
▲ Sampled  
▲ Not Sampled



Project Manager: JCW  
 Project Engineer: JCW  
 Drawn By: JCW  
 Checked By:  
 Date: 10/22/2019



Monitoring well locations collected by OMNNI Associates, Inc. on 6/18/2018 using sub-foot accuracy GPS.

**QUICFREZ SITE  
SITE DETAIL MAP**



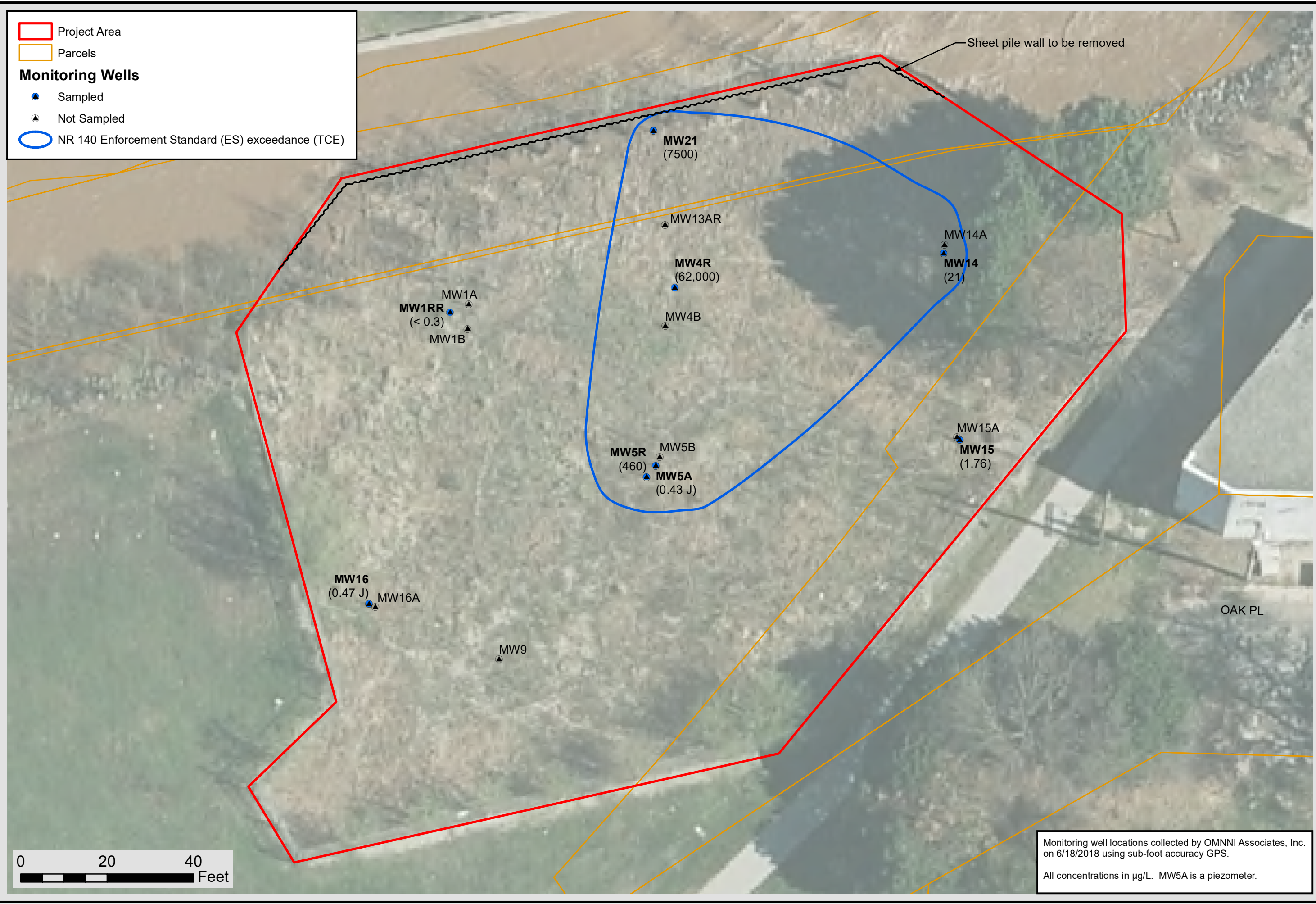
SCALE:  
 1" = 20'  
 PROJECT NO.  
**N2232A18**  
 FIGURE NO.  
**2**

CITY OF FOND DU LAC, FOND DU LAC COUNTY, WISCONSIN

Project Area  
 Parcels  
**Monitoring Wells**  
▲ Sampled  
▲ Not Sampled  
 NR 140 Enforcement Standard (ES) exceedance (TCE)

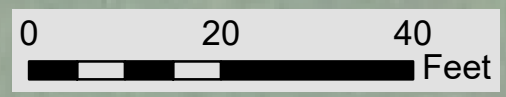


Project Manager: JCW  
 Project Engineer: JCW  
 Drawn By: CJR  
 Checked By: CJR  
 Date: 10/22/2019



Sheet pile wall to be removed

OAK PL



Monitoring well locations collected by OMNNI Associates, Inc. on 6/18/2018 using sub-foot accuracy GPS.  
 All concentrations in µg/L. MW5A is a piezometer.

**QUICFREZ**  
**EXTENT OF GROUNDWATER CONTAMINATION**  
**EXCEEDING NR 140 ENFORCEMENT STANDARDS**  
 CITY OF FOND DU LAC, FOND DU LAC COUNTY, WISCONSIN



SCALE: 1" = 20'  
 PROJECT NO. **N2232A18**  
 FIGURE NO. **3**

ENGINEERING • ARCHITECTURE • ENVIRONMENTAL



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