



Prepared For:

Thermo Fisher Scientific, Inc.



Offsite Investigation Work Plan
Former Hamilton Industries Facility,
Two Rivers, Wisconsin
BRRTS Activity #02-36-578316

November 2017

Environmental Resources Management
700 West Virginia Street
Suite 601
Milwaukee, Wisconsin 53204
www.erm.com



Prepared for: Thermo Fisher Scientific

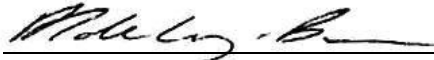
***Offsite Investigation Work Plan
Former Hamilton Industries Facility,
Two Rivers, Wisconsin***

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Project Number: 0383990



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1.0 INTRODUCTION AND PURPOSE

Environmental Resources Management, Inc. (ERM), on behalf of Fisher Scientific International, LLC, a wholly owned subsidiary of Thermo Fisher Scientific, Inc. (the “Client”), prepared this work plan to further investigate soil and groundwater conditions in the vicinity of the former Fisher Hamilton Scientific, Inc. (aka Hamilton Industries Site) (“the Site”) located at 1316 East 18th Street in Two Rivers, Wisconsin (Figure 1). The work plan has been prepared to satisfy the requirements of the (WAC) Section NR 716.09 Site Investigation Work Plan. The Wisconsin Department of Natural Resources (WDNR) requires that a work plan be prepared and submitted to the agency for review and approval prior to initiation of investigation activities.

A number of previous subsurface investigations have been conducted in the vicinity of the Site. Initially, the City of Two Rivers performed off-Site groundwater sampling and detected concentrations of Chlorinated Volatile Organic Compounds (CVOCs) and metals in groundwater that exceeded Chapter NR 140 Enforcement Standard (ES). The City of Two Rivers also performed soil excavation activities on-Site within the water utility right-of-way for the purpose of repairing an underground water-distribution line. Concentrations of one VOC and several metals were observed within the soils collected by the City’s contractor. The City’s contractor expanded their investigation with the installation of five ground water monitoring wells south of the Site on adjacent properties. Results of this investigation revealed the presence of CVOCs in ground water that exceeded one or more Chapter NR 140 ES.

On October 25, 2016 the Client notified the WDNR of the presence of an historical release and on November 18, 2016 WDNR sent a letter of notification to the Client requesting a soil and groundwater investigation to define the nature and extent of impacted media. A Site Investigation Work Plan was submitted to the WDNR in January 2017 to investigate the nature and extent of soil and groundwater impacts. As a result of the investigation groundwater concentrations of trichloroethene (TCE) that exceeded the ES and Preventive Action Limit (PAL) were detected that required additional delineation.

An Additional Investigation Work Plan was submitted to the WDNR in August 2017 to investigate the nature and extent of soil and groundwater impacts to the north of 17th Street. This Work Plan focuses on defining the nature and extent of CVOc impacts to the southwest of the Site on property owned by the City of Two Rivers in order to satisfy the requirements set forth in Chapters NR 700-726 of the WAC.

1.1

SITE LOCATION, CONTACTS, AND DESCRIPTION

The Site is located at 1316 18th Street in Two Rivers, Wisconsin. The Site is located in the east half of Section 1, Township 19 North, Range 24 East in Manitowoc County. The location of the Site is shown on Figure 1, developed from the United States Geological Survey (USGS) 7.5-minute quadrangle for Two Rivers, Wisconsin, dated 1978. Proposed monitoring well locations are shown on Figure 2.

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The Site is located on approximately 11.72 acres of land situated on two irregularly shaped parcels, between Jefferson Street and the East Twin River, north of 15th Street and south of 19th Street in Two Rivers, Wisconsin. The Site is divided into two separate parcels by 17th Street although both parcels are identified by the same PIN number. The Subject Property is currently vacant with the exception of one approximately 300-square foot brick building. The Site buildings were demolished in 2015 and were historically used for a variety of manufacturing operations which reportedly began in the late 1800s. The purpose of this remaining brick building is suspected to be a pump house

associated with City of Two Rivers water or sewer utilities and is located near the northeastern boundary of the Subject Property. Along the shoreline of the East Twin River and north of 17th Street is a broken concrete platform, possibly used at one time for loading and unloading material for shipping via a water route. Along the East Twin River south of 17th street is a steel sheet pile wall along which is in a paved area, and according to historic aerial photographs, was used for the parking of cars during facility operations.

The remainder of the Site is covered with vegetated soil. Three sewer manholes are located on the Site in line with 18th Street. A fire hydrant is located near the would-be intersection of 18th Street and East River Road.

1.2 *PHYSICAL SETTINGS*

1.2.1 *Topography and Hydrology*

The Site is located at an elevation of approximately 590 feet above mean sea level, is generally flat, and slopes slightly to the east towards the nearest surface water body, East Twin River. Likewise, surface water at the Site drains to the east via overland flow to the East Twin River. The Site corresponds with the overall topographic trend of the surrounding area, which also slopes to the east.

According to flood zone and National Wetland Inventory (NWI) data collected, the Site is not located within wetland delineated areas or the 100 or 500-year flood plains. Flood zone and NWI data was obtained by EDR from the Federal Emergency Management Agency (FEMA) and U.S. Fish and Wildlife Services, respectively. The mean elevation of Lake Michigan, the discharge water body of the East Twin River, is approximately 578.66 feet and therefore approximately several feet lower than the Site elevation. The Site is not likely to flood due to high river or lake water levels

1.2.2 *Geology and Hydrogeology*

According to the United States Department of Agriculture Natural Resources Conservation Service web soil survey data for Manitowoc County, the surface soils in the vicinity of the Site are a combination of Oakville loamy fine sand and re-worked fill material consisting of sandy loam. The Oakville Loam is described as a dark brown, excessively drained soil composed of fine to very fine eolian-derived sand. Previous investigations in the vicinity of the Site encountered fill material overlying alluvial or flood plain deposits to at least 33 feet bgs and similar geologic conditions are expected beneath the Site. According to well driller's records in the area, the shallow subsurface is comprised of sand and clay deposits overlying limestone bedrock which is encountered between 100 and 140 feet bgs.

Soil borings advanced by ERM in April 2017 on the southern portion of the Site encountered 9 to 16 feet of fine grained sand with interbedded fine grained clays underlain by a uniform layer of silt and silty clay. The surface of the silt/silty clay, in general, slopes east towards the East Twin River. In general, shallower thicknesses of sand were observed closer to the river.

Groundwater is in direct hydraulic connection with the East Twin River. There are six USGS groundwater wells located within one mile of the Site. Only one of these wells is located within 1/8 mile from the Site. Groundwater depths measured in temporary wells ranged from approximately 4 to 15 feet bgs with shallower depths observed closer to the river, where the topographic surface elevation was lower.

2.0 INVESTIGATION APPROACH

This work plan presents the following proposed activities for the off-Site investigation.

2.1 SUBSURFACE UTILITY CLEARANCE

Prior to initiation of the soil and groundwater investigation, ERM will use a subsurface clearance protocol in attempt to identify any underground infrastructure in the proposed areas of the off-Site wells. This protocol includes studying maps of the underground infrastructure and conducting public and private utility locates to identify underground utilities in areas where proposed intrusive work will be conducted. ERM will request information from the City of Two Rivers and coordinate well locations with the city such that the locations are accepted by the City of Two Rivers.

2.2 SUBSURFACE INVESTIGATION

ERM will retain a licensed drilling contractor to advance 3 soil borings (SB) to be converted into shallow groundwater monitoring wells at locations to support further investigation of identified VOC impacts in soil and groundwater. Proposed well locations are shown on Figure 2.

2.2.1 *Soil Borings for VOC Analysis*

As requested by the WDNR, two soil samples will be collected from the unsaturated interval at each well location. If elevated readings are observed, the interval(s) demonstrating the highest Photo-Ionization Detector (PID) response, or intervals based on visual screening will be sampled. If no elevated PID readings or visual indications of impacts are observed, soil samples will be collected from ~3 feet and ~10 feet below grade. ERM has assumed that a total of 6 soil samples will be collected and submitted to an accredited laboratory for chemical analysis of the full list of VOCs.

2.2.2 *Monitoring Well Installation and Development*

Up to 3 shallow groundwater monitoring wells will be installed, constructed and developed in accordance with Chapter NR 141 of the WAC. The locations of the wells are proposed to be located to the southwest of the Site on the City of Two Rivers properties (Figure 2). The wells will be installed to approximately 25 feet below ground surface (ft bgs). The exact screened intervals and depths will be determined based on the observed groundwater elevation. Surface completion will consist of either flush-mount steel protective well covers or

stick-up well covers depending on the location of the well and preference of the City of Two Rivers.

2.3 *MONITORING WELL SAMPLING AND GAUGING*

Following well installation and development, groundwater samples will be obtained from each of the monitoring wells and the depth to water gauged. Gauging and/or sampling will also be performed at the existing monitoring wells (MW-01 through MW-05) located on City of Two Rivers property. Samples will be collected in laboratory-supplied bottles, stored in cooled packaging and dispatched to the laboratory for analysis of the full list of VOCs (SW-846 Method 8260B). Field parameters including pH, dissolved oxygen, Oxidation-Reduction Potential (ORP) and conductivity will also be collected. ERM will utilize a Wisconsin-certified environmental laboratory with a standard turnaround of 10 business days for all sample analyses. ERM assumes 1 day of field work for each round of groundwater sampling at the off-Site wells.

2.4 *SURVEY*

Upon completion of the soil borings and monitoring wells, each location will be surveyed to establish the relative vertical elevation of each based on a local benchmark. As described, depth to groundwater measurements will be taken in each well in order to provide a preliminary understanding of the groundwater flow direction in the investigation area.

2.5 *INVESTIGATION DERIVED WASTE*

Investigative derived waste (IDW) (e.g. soil cuttings) will be placed in DOT approved drums and retained on City of Two Rivers property for subsequent disposal. Groundwater generated during development and groundwater sampling activities will be disposed of to the sanitary sewer as authorized by the City of Two Rivers. Following receipt of laboratory analytical results, Thermo Fisher Scientific, Inc. will be responsible for disposal of the IDW.

2.6 *QA/QC*

No additional quality assurance/quality control samples will be collected beyond those previously scoped for the overall groundwater sampling. Any samples collected above the budgeted number will be withheld at the laboratory for analyses, if necessary.

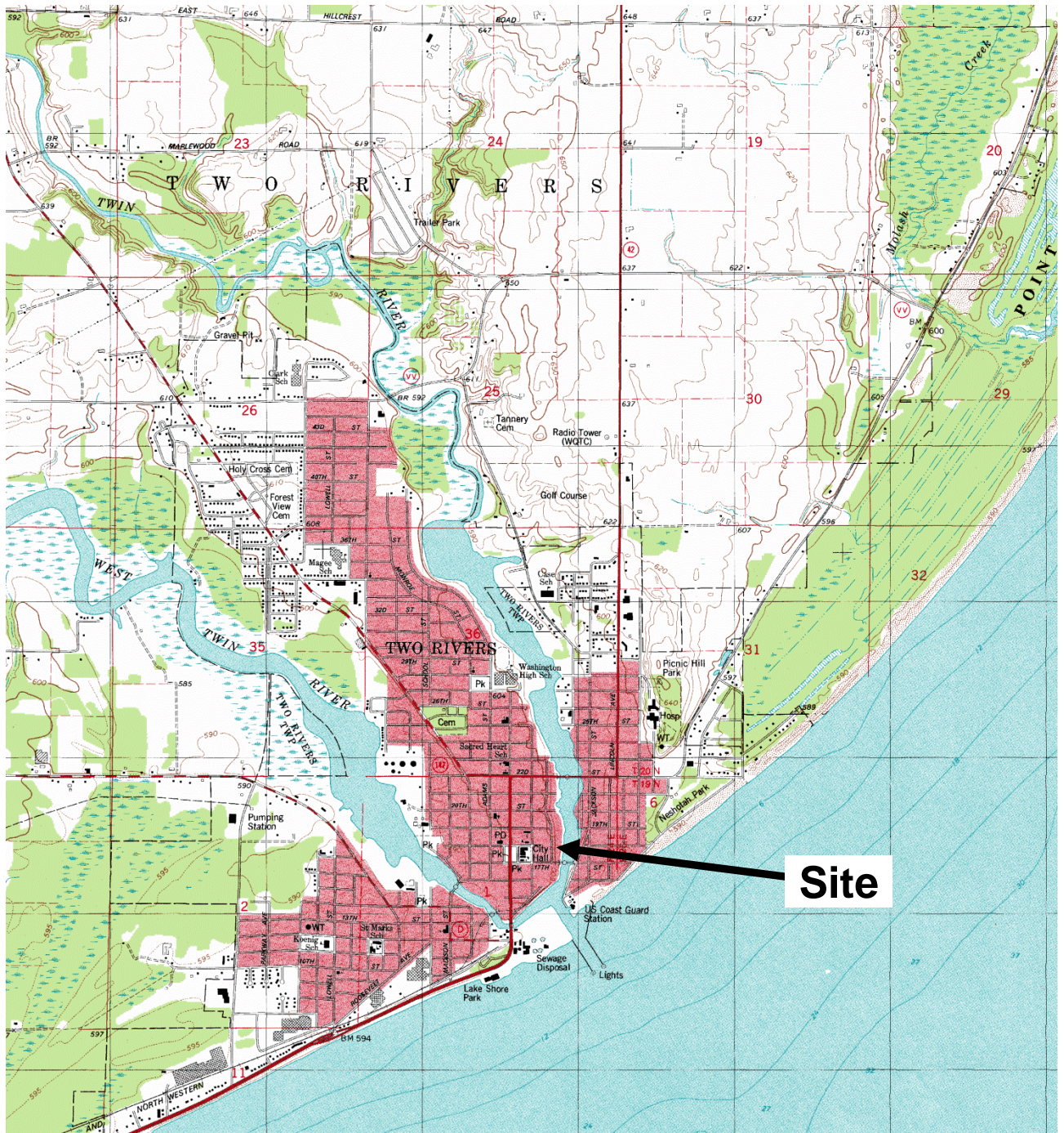
3.0 INVESTIGATION REPORTING AND SCHEDULE

3.1 REPORTING

The Site Investigation Report Addendum will be prepared according to ERM standard report format and WDNR requirements. The report will be submitted within 60 days after the Site investigation and receipt of the laboratory data and will include a description of the Site investigation activities, field work methodologies, and analysis of the findings based on the regulatory framework, and a final evaluation. The final report, appendices, and photos will be provided to the WDNR in hard copy. Within 60 days after submitting the Site Investigation Report, ERM will prepare and submit a Remedial Actions Options Report to WDNR, if warranted. The results of the offsite monitoring well installation, development and sampling are proposed to be included in the previously authorized Site investigation report addendum.

3.2 SCHEDULE

Mobilization for the soil borings monitoring well installation will be initiated once subsurface clearance activities can be completed. Due to the close proximity of the water utilities, subsurface clearance activities may require hand clearing of borings. Monitoring well installation, development, and field sampling activities are expected to take three days. It is anticipated that field activities will be completed in November 2017. ERM will notify the WDNR of any unforeseen delays or conflicts that may impact the schedule as they arise.



SOURCE: Two Rivers, WI 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, 1978

APPROX. SCALE: 1:50,000

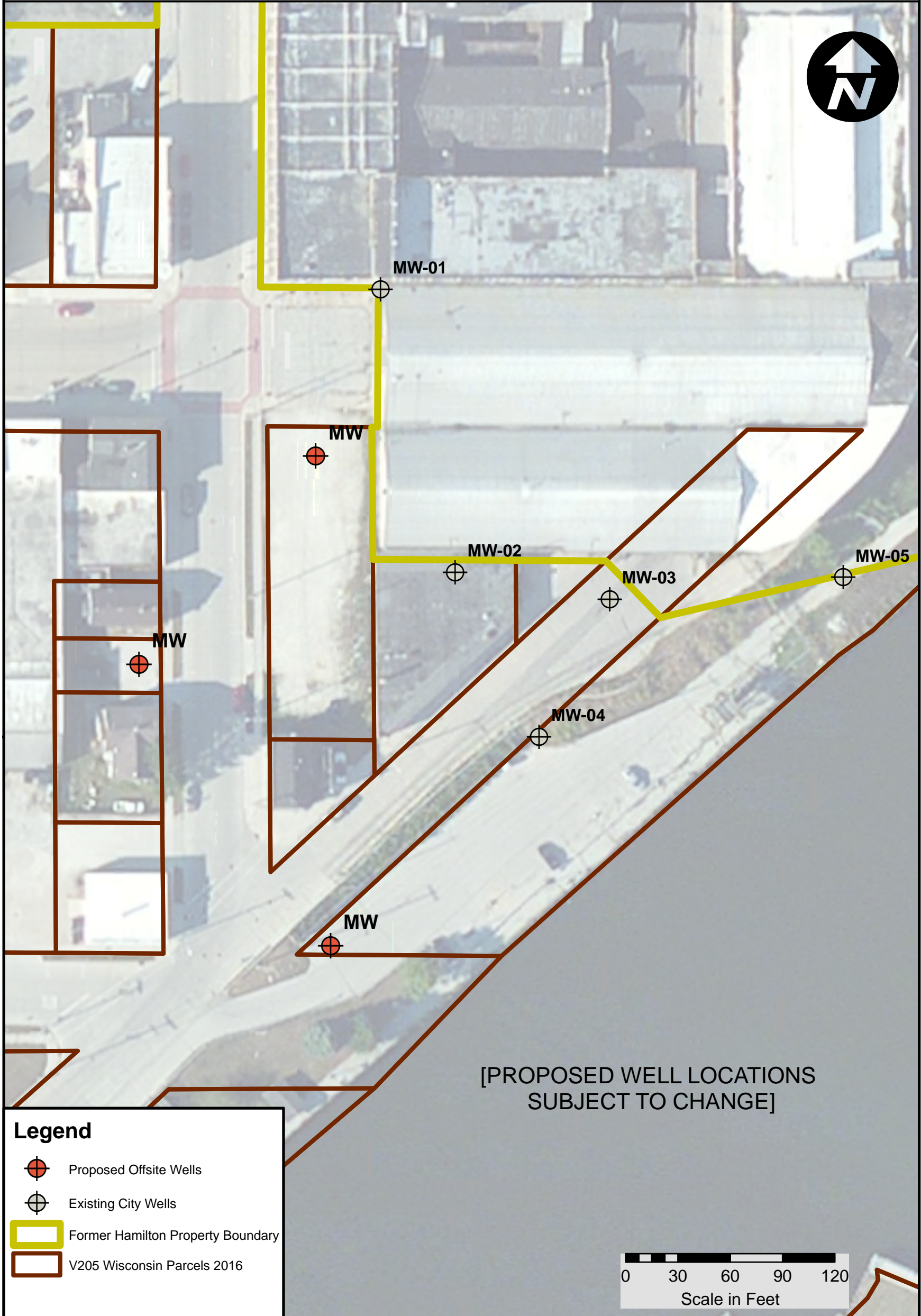


SITE LOCATION MAP
Former Hamilton Industries Facility
1316 18th Street
Two Rivers, Wisconsin





Figure

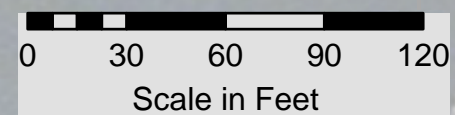
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PROPOSED OFF-SITE WELL LOCATIONS




Legend

-  Proposed Offsite Wells
-  Existing City Wells
-  Former Hamilton Property Boundary
-  V205 Wisconsin Parcels 2016



[PROPOSED WELL LOCATIONS
SUBJECT TO CHANGE]

CADD Review CBS		Former Hamilton Industries Two Rivers, WI	CHK'D BY: DCB
DRAWN BY: CBS			0383990
Date Drawn/Rev'd 9/27/2017		Environmental Resources Management	FIGURE 2