



Memorandum

December 30, 2019

To: Tessy Jose, GLWA

Ref. No.: 012607-T06Y19

From: Chris Meincke/ds/271

Tel: 248-893-3400

Greg Rudloff, USEPA
Rich Conforti, EGLE
Jacob Runge, EGLE
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David Favero, RACER
CC: Tom Kinney, GHD

**Subject: Proposed Area 1 Conceptual Remedy Plan
Eckles Road Site, Livonia, Michigan
GLWA Special Discharge Permit No. SD6-94508**

1. Introduction

GHD Services Inc. (GHD) has prepared this memorandum to summarize the proposed conceptual remedy to manage groundwater impacted with Per- and Polyfluoroalkyl Substances (PFAS) and residual hexavalent chromium and nickel in the vicinity of the former plating area (Area 1) at the Revitalizing Auto Communities Environmental Response Trust (RACER) site located at 12950 Eckles Road in Livonia, Michigan (Site). This submittal has been prepared to fulfill Section E.3 of Great Lakes Water Authority (GLWA) Special Discharge Permit SD6-94508 dated June 3, 2019, which requires submittal of a final report on company's decision on PFAS treatment plans for the elimination of PFAS materials in its groundwater discharge from Site. RACER expects to continue to work with GLWA, the U. S. Environmental Protection Agency (USEPA), and the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to implement a remedy for Area 1.

The following sections present a summary of groundwater extraction operations, monitoring activities, laboratory treatability studies, and conceptual design activities conducted at the Site and a summary of the proposed conceptual remedy.

2. Background

Historically, groundwater flowed from the north portion of Area 1 to a French drain, where the groundwater was extracted and transported to a Groundwater Treatment Plant (GWTP). Groundwater elevations were depressed in the area of the French drain due to the dewatering activities conducted since 1981. Groundwater elevations, contours, and flow directions changed significantly in 2004 when a soil-bentonite barrier wall was installed around Area 1, significantly decreasing pumping required to reduce off-site migration of chromium and nickel-impacted groundwater. In-situ chemical reduction (ISCR) injections were



conducted 2015 through 2017 to reduce the concentrations of nickel and chromium in groundwater. The Area 1 GWTP process was modified in December 2018 based on reduced influent concentrations of chromium and nickel. Based on laboratory pilot study results, a permeable reactive barrier installed as a gate in the Area 1 Barrier Wall was proposed to passively treat residual nickel and chromium in groundwater as water exited the contained area and eliminate the ongoing collection and discharge of groundwater at the Site. PFAS was first detected in groundwater samples collected within Area 1 during January and April 2017 and prevented the installation of the proposed permeable reactive gate (PRG), as PFAS would not be treated by the proposed PRG media (zero-valent iron).

PFAS were also detected in the GWTP influent and effluent discharged to the GLWA sewer system. GLWA requested the development of a best management practice (BMP) plan for PFAS and modified special discharge permits for discharges containing PFAS above specific levels, including plans to reduce the concentration of PFAS in the discharge. Based on the available PFAS results and regulatory levels, perfluorooctane sulfonic acid (PFOS) is the primary PFAS substance detected at concentrations of concern and therefore is the focus of PFAS evaluations and is specifically included in below discussions.

RACER proposed to temporarily shut down groundwater pumping activities in December 2018 and periodically monitor groundwater elevations at select monitoring wells to evaluate the response of groundwater elevations within the containment area and whether pumping is required on a continuous or periodic basis. These activities were conducted to support additional characterization, modeling, and evaluating alternatives being conducted regarding PFAS in and related to Area 1 at the Site. A report summarizing this information was submitted to USEPA and GLWA in September 2019 (Area 1 Groundwater Elevation Monitoring Summary, GHD, September 2019).

Alternatives to address PFAS detected in Area 1 groundwater were developed and included supplementing the proposed PRG with media that would adsorb PFAS before the groundwater exited the Area 1 Barrier Wall, capping Area 1 to reduce infiltration and the amount of groundwater requiring removal, and treating collected groundwater before discharging. Evaluation of the alternatives to adsorb PFAS led to completing a PFAS Laboratory Treatability Study. A treatability study summary report was submitted to USEPA, EGLE and GLWA in September 2019 (Additional Permeable Reactive Barrier Treatability Study, GHD, September 2019).

Groundwater was collected over approximately a two-month period during the spring of 2019 during a period of heavy precipitation events (mid-April 2019 through mid-June 2019) as detailed in the GLWA Special Discharger Permit Semi-Annual Report for the March 2019 through August 2019 period dated October 15, 2019. Groundwater has not been collected or discharged during 2019 other than during those two months.

3. Proposed Long-term Conceptual Area 1 Remedy

Based on consideration of the available information, the proposed long-term remedy to manage impacted groundwater within the Area 1 Barrier Wall includes installation of a cap over the entire area within the Area 1 Barrier Wall to eliminate infiltration of precipitation and eliminate the need to extract groundwater from the existing French drain. The groundwater flow and contaminant transport model has been utilized to predict groundwater elevations, and migration of PFOS, hexavalent chromium, and nickel-impacted groundwater



within the Area 1 Barrier Wall under different capping scenarios. The proposed conceptual long-term remedy is subject to change as further Site evaluation is completed and more details are developed.

The remedy will coincide with proposed redevelopment activities and conceptually will consist of a building with approximately 370,000 square feet concrete floor pad that will serve as a cap over its footprint with the remainder of the area within the Area 1 Barrier Wall being covered by clay and/or paved driveways, parking, and truck ramps. The preliminary Site development plans call for removing and crushing the existing slab and then placing the crushed concrete over the area outside of the building footprint. Clay will be also be placed in the area within the Area 1 Barrier Wall that is outside the building footprint. Additional fill will be placed over the clay and beneath the footprint of the concrete pad as necessary to obtain the desired construction elevations. The exact layering sequence of fill material is still in the process of being worked out.

The proposed building and perimeter asphalt/concrete cover will be constructed to direct precipitation/storm water runoff to a leak-tight storm sewer system and eliminate potential infiltration into the subsurface within the Area 1 Barrier Wall. Based on groundwater elevation monitoring conducted during 2019 and groundwater flow model simulations, groundwater elevations are predicted to equalize at an elevation below the current ground surface, potentially eliminating the need for removing groundwater and discharging to the sanitary sewer.

As a contingency, a shallow French drain collection trench will be installed in the northern portion of the area within the Area 1 Barrier Wall, outside of the known extents of PFAS, hexavalent chromium, and nickel impacts to groundwater. Locating the drain in the area with no PFAS, hexavalent chromium, and nickel impacts to groundwater should allow for any groundwater removed by the drain to be discharged to the sanitary sewer without any treatment. The French drain will be designed to passively allow shallow groundwater to drain if it reaches a specified elevation, and then discharge to the sanitary sewer system, similar to a foundation drain or other passive shallow dewatering system. The preliminary groundwater elevation that will be maintained beneath the cap at the Site is approximately 701 feet above mean sea level (amsl), which is approximately 5 feet below the top of the existing concrete slab. A vault to allow for potential future treatment of passively draining groundwater with granular activated carbon will be installed as part of the French drain discharge line.

Redevelopment and drain installation construction activities will require dewatering to allow for demolition of historical utilities and installation of new utilities below the water table. The volume of water, specific locations of dewatering activities, and the quality of that water is not known at this point in time but RACER and/or the developer would like to discuss specifics for dewatering with GLWA when the information is available. RACER and/or the developer intends to request GLWA authorization to discharge water generated during construction dewatering activities.

The conceptual layout of the proposed redevelopment is presented on Figure 1, along with the preliminary location of the contingency French drain. The conceptual layout of the proposed redevelopment and estimated extents of shallow PFAS-impacted groundwater are presented on Figure 2. The conceptual layout of the proposed redevelopment and the preliminary approximate extents of clay cover are presented on Figure 3. Preliminary monitoring locations are presented in Figure 4.



A monitoring plan will be developed when a specific integrated remediation and redevelopment plan is more defined and redevelopment plans progress. Generally, monitoring is anticipated to include groundwater elevation and quality monitoring upgradient from the contingency French drain and near the southern barrier wall. In addition, discharge observation and sampling is anticipated to be necessary at a frequency to be determined. If groundwater elevations remain below the depth of the contingency French drain, discharge and groundwater monitoring may only be necessary at a reduced frequency.

It is noted that the developer for this project is Ashley Capitol (Ashley), Canton, Michigan. Ashley has successfully completed redevelopment activities for the other areas of the Eckles Road Site in recent years. To date, Ashley has completed geotechnical and environmental testing at the Site to obtain information to be incorporated into design of the redevelopment and have completed a conceptual level design for redevelopment. A Potential Purchaser Agreement with USEPA to obtain liability protection, a topographic survey, a utilities plan, and discussions with the City of Livonia regarding City redevelopment requirements are also in progress. Further coordination between RACER and Ashley will continue in the coming months.

4. Schedule

A detailed project schedule is not available at this time. However, a conceptual schedule includes Site preparation work beginning during the 2nd quarter of 2020, including breaking of the existing concrete slab, abandoning monitoring wells, and placing clay cover and other backfill material. Construction activities for the proposed building, utilities, RACER's contingency French drain, and paved surfaces are anticipated to be performed in 2021, with the project being completed in 18 to 24 months.

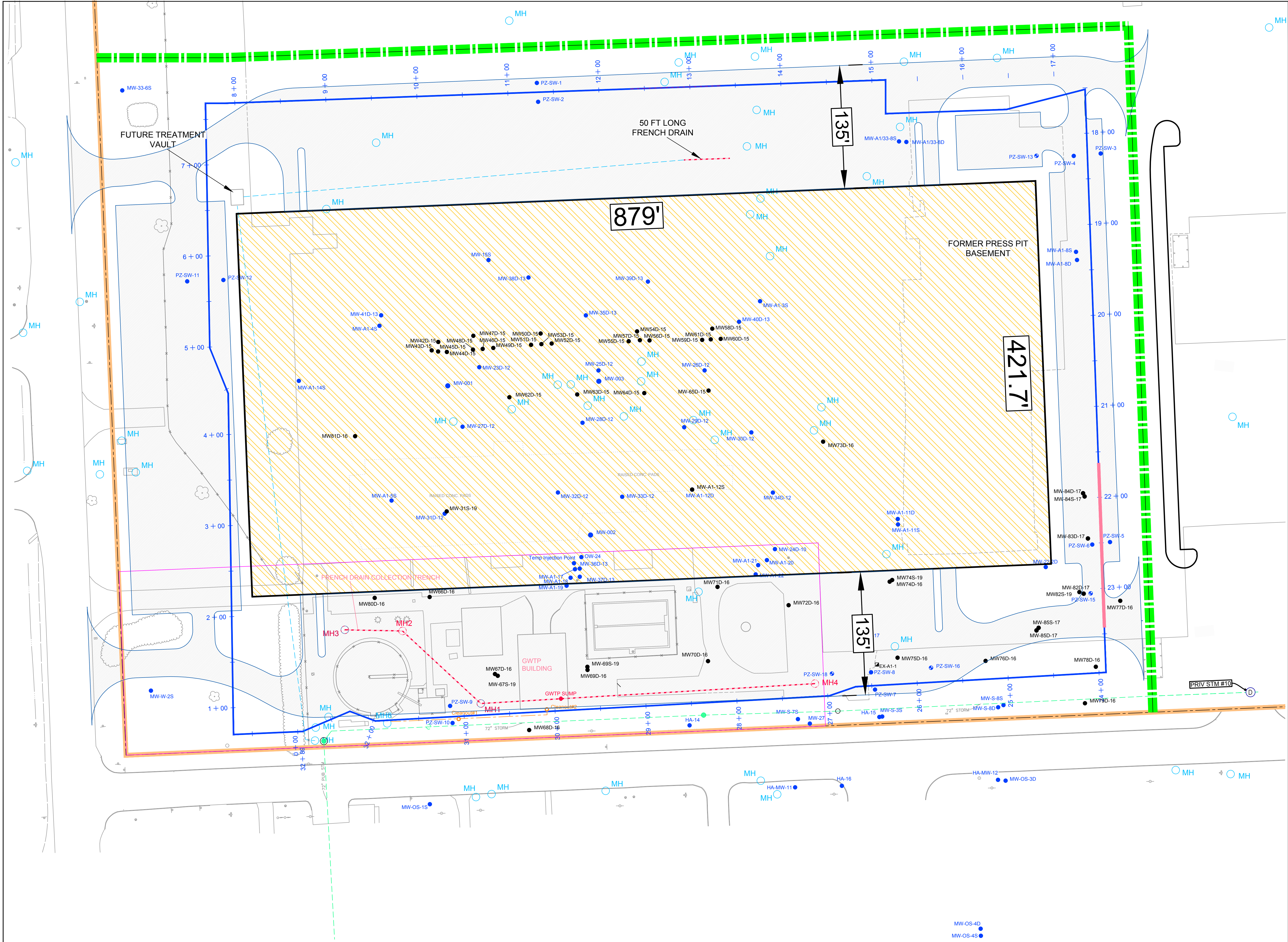
5. Conclusions

The proposed long-term remedy for managing impacted groundwater within the Area 1 Barrier Wall includes installation of a cap as part of an integrated remedy and redevelopment. The cap will be a combination of a concrete building floor slab, clay, general fill, and paved surfaces. The proposed conceptual long-term remedy is subject to change as further Site evaluation is completed and more details are developed.

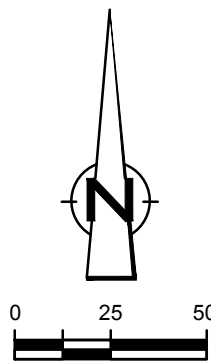
After the cap is placed, groundwater elevations are predicted to stabilize at an elevation that will not require active ongoing dewatering activities. As a contingency a new, shallow French drain will be installed in the northern portion of the area within the Area 1 Barrier Wall where there are no known PFAS, hexavalent chromium, and nickel groundwater impacts, to allow for groundwater to passively gravity drain and discharge to the sanitary sewer if groundwater levels rise to a pre-determined elevation (preliminarily an elevation of 701 feet amsl). The target groundwater elevation will be dependent on final grading plan for redevelopment at the Site. This contingency also includes a vault as part of the discharge piping from the French drain that will allow placing carbon treatment units for treating passively drained groundwater, should treatment be necessary. The proposed remedy will eliminate or minimize the ongoing discharge of groundwater and any discharge is expected to have concentrations below the GLWA target of 60 ng/L for PFOS. A monitoring plan will be developed to allow for verifying groundwater quality and elevation.



RACER will continue to coordinate with the developer to refine plans and will provide GLWA, USEPA, and EGLE with quarterly progress updates by April 15, July 15, October 15, and January 15 of 2020.



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LEGEND
AREA BARRIER WALL
FRENCH DRAIN
GWTP DISCHARGE LINE
STORMWATER SEWER LINE
SANITARY LINE
SITE BOUNDARY
FENCE
MW-A2-2S EXISTING MONITORING WELL
EX-A1-1 EXTRACTION WELL

Client
RACER TRUST

Project
**13000 ECKLES ROAD SITE
LIVONIA, MICHIGAN**

No.	Issue	Drawn	Approved	Date
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Drawn	DRAWN	Designer
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Drafting Check	Design Check
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Project Manager	CM	Date	Dec 30, 2019
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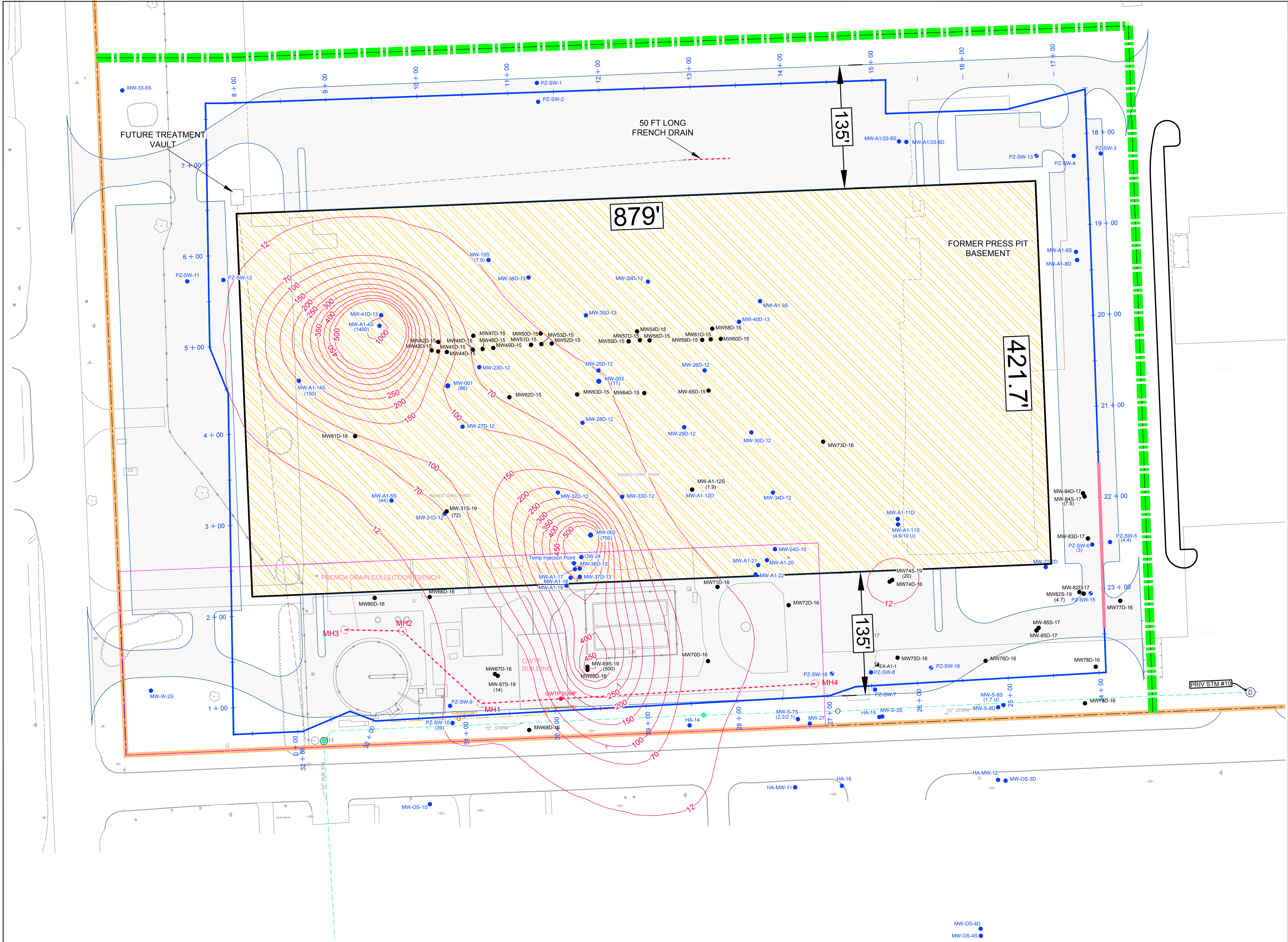
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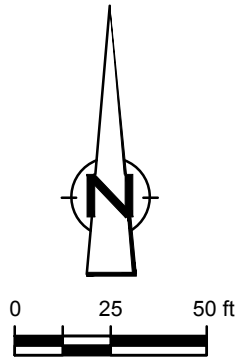
Title	ECKLES ROAD SITE AREA 1 POTENTIAL REDEVELOPMENT
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Sheet No.	
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FIGURE 1



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- LEGEND
- AREA BARRIER WALL
 - FRENCH DRAIN
 - GWTP DISCHARGE LINE
 - STORMWATER SEWER LINE
 - SANITARY LINE
 - SITE BOUNDARY
 - FENCE
 - MW-A2-2S EXISTING MONITORING WELL
 - EX-A1-1 EXTRACTION WELL
 - 12 SHALLOW ZONE (~5-15 FT BGS)/CONTOUR PFOS CONCENTRATION (NGL)
 - MW-A2-2S (700) SHALLOW GROUNDWATER SAMPLE PFOS CONCENTRATION (NGL)

Client
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Project
**13000 ECKLES ROAD SITE
LIVONIA, MICHIGAN**

No.	Issue	Drawn	Approved	Date
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Project Manager	CM	Date	Dec 30, 2019	
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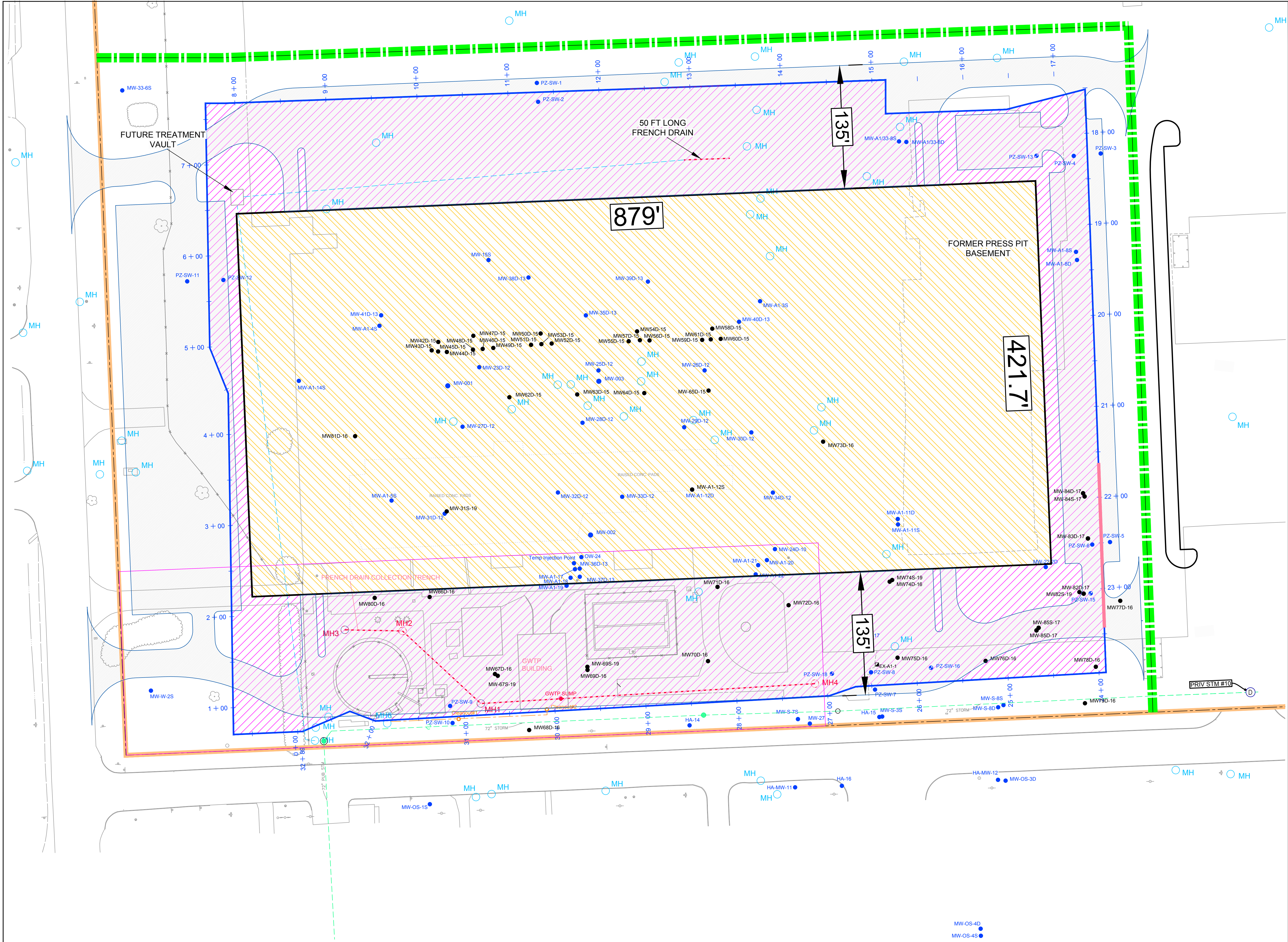
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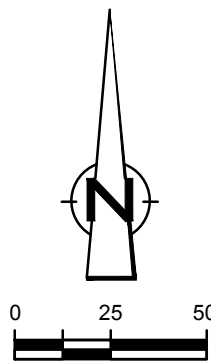
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**ESTIMATED EXTENTS OF PFOS
SHALLOW GROUNDWATER SAMPLES**

Sheet No.

FIGURE 2



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 - STORMWATER SEWER LINE
 - SANITARY LINE
 - SITE BOUNDARY
 - FENCE
 - MW-A2-2S EXISTING MONITORING WELL
 - EX-A1-1 EXTRACTION WELL
 - CLAY FILL AREA

Client
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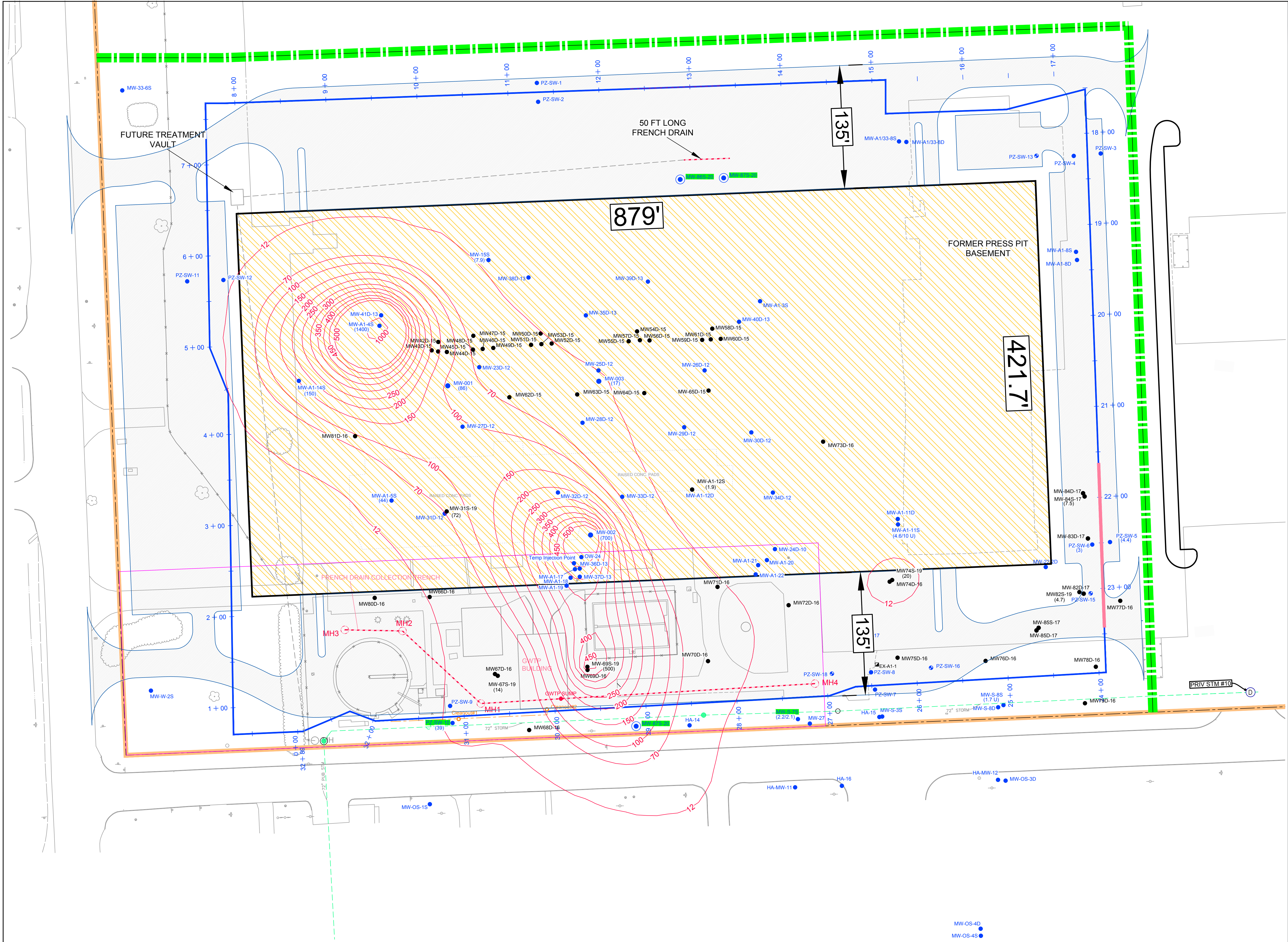
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Drafting Check		Design Check
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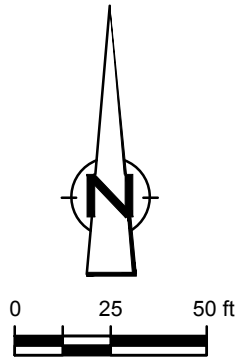
Title
**EXTENTS OF PROPOSED
CLAY FILL**

Sheet No.

FIGURE 3



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 - SITE BOUNDARY
 - FENCE
 - MW-A2-25 EXISTING MONITORING WELL
 - EX-A1-1 EXTRACTION WELL
 - MW-A2-25 SHALLOW ZONE (-8-15 FT BGS) CONTOUR PFOS CONCENTRATION (NG/L)
 - MW-A2-25 SHALLOW GROUNDWATER SAMPLE PFOS CONCENTRATION (NG/L)
 - PROPOSED NEW MONITORING WELL/ MONITORING LOCATION

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Drafting Check		Design Check		
Project Manager	CM	Date	Dec 30, 2019	
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**PROPOSED MONITORING LOCATIONS
AREA 1 CAP AND MONITORING PLAN**

Sheet No.

FIGURE 4