MEMO

ARCADIS Design & Consultancy for natural and built assets

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Date:

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Arcadis Project No.:

30121887.01907

Subject:

Summary of LNAPL Recoverability Assessment Results

RACER Trust, Buick City, Flint, Michigan

On behalf of RACER Trust, Arcadis of Michigan, LLC (Arcadis) has prepared this memo to present the results of light non-aqueous-phase liquid (LNAPL) recoverability assessment activities conducted in 2022 at the Buick City Site (site) in Flint, Michigan.

Background and Objectives

LNAPL removal was an early focus of US Environmental Protection Agency (USEPA)-directed remedial activity at the site when the 2010 Remediation Cost Estimate Summary was prepared. This focus on LNAPL was in large part because, under GM's management, oil releases to the Flint River were a common and persistent problem.

When RACER assumed the site in 2011, efforts to better control or terminate oil/petroleum releases to the Flint River were the primary focus of remedial work, leading to bulkheading of multiple storm water sewer laterals on the site. To date 30 bulkheads have been installed to prevent migration of LNAPL to surface water. In the past several years outfall inspections have found little to no LNAPL releases attributable to site storm sewers. Therefore, with the releases to the river successfully managed, the focus shifted to assessing the stability of existing LNAPL areas, identifying any potential migration of LNAPL impacts, and evaluating potential remedial actions.

An LNAPL-focused Remedy Recommendation Report was prepared and submitted to USEPA in 2014 and updated in February 2016. Recommendations were based on an LNAPL management decision tree developed jointly by RACER, Arcadis, and GHD, and approved by USEPA. The decision tree uses ITRC

and ASTM LNAPL guidance documents to establish a consistent and science-based NAPL management strategy for RACER sites. LNAPL transmissivity was established in the decision tree as a metric for LNAPL recoverability and an indication of potential benefit that could be achieved through implementation of LNAPL removal measures. Seven areas of potentially recoverable LNAPL were identified with transmissivity levels supporting LNAPL removal. An example of that process and the related detailed supporting analysis is included in **Attachment 1**.

In the meantime, the reroute of the Outfall 003 storm sewer in 2020 and 2021 eliminated concerns regarding LNAPL migration and movement in five LNAPL areas because the only route of migration (old Outfall 003 storm sewer) was eliminated. Consequently, in 2022 an evaluation was performed to assess any remaining potential concerns related to LNAPL recoverability and to update previous remedial recommendations. This memo documents that assessment and discusses its results. The overall conclusion of these activities was that most LNAPL impacts presented little risk to receptors and warranted no remedial action beyond Natural Source Zone Depletion (NSZD) and use of site management tools such as institutional controls. LNAPL in two locations meets the threshold justifying possible removal. That removal, as described below is scheduled to be implemented in Q1 2023.

LNAPL Transmissivity

LNAPL recoverability at the site has been evaluated using measurements of LNAPL transmissivity. LNAPL transmissivity represents the volumetric rate of LNAPL flow through a unit width of porous media per unit time under a hydraulic gradient. LNAPL transmissivity is well-suited for assessing LNAPL recoverability, inherently accounting for the combined effects of aquifer matrix permeability, LNAPL physical properties, and the relative proportion of pore space occupied by LNAPL within a specified vertical interval of aquifer material. LNAPL transmissivity values of less than 0.5 square feet per day (ft^2/d) indicate that LNAPL is not practically recoverable through hydraulic means based on Michigan Department of Environment, Great Lakes, and Energy (EGLE) guidance.

An ASTM International (ASTM) standard for LNAPL transmissivity measurement (ASTM E2856, 2013) provides standardized methods for LNAPL measuring transmissivity. The ASTM standard is intended to establish consistency between practitioners for field data collection and analysis procedures, facilitating wider adoption of LNAPL transmissivity as a metric for assessing practicality of LNAPL recovery. The field activities conducted as part of this assessment were completed in accordance with the ASTM standard practices. LNAPL baildown tests were performed as described in the ASTM standard.

LNAPL baildown tests are analogous to rising-head slug tests that are typically employed to estimate the average hydraulic conductivity of saturated geologic formation materials proximal to the screened portion of a groundwater well under prevailing ambient test conditions. LNAPL is removed during a single event from the test well, in a relatively short period of time, and then fluid levels within the well are monitored to measure LNAPL recharge to the well and track LNAPL drawdown.

Test Well Selection and Test Initiation

Based on recent LNAPL gauging events, LNAPL baildown tests were completed in LNAPL Areas #1, 3, 4, 6, 7, 8, 10, 11, 12, 13, and 14. A summary of which Area of Interest (AOI) is associated with each LNAPL area is included in **Attachment 1**. The location of, and well network within, each LNAPL area is shown in **Figures 1 - 13.**

Where feasible, at least one well was selected for transmissivity testing in each area of known LNAPL impacts. Test wells were generally selected to focus on locations of relatively large historical in-well

LNAPL thickness and relatively high historical LNAPL transmissivity values where possible. Transmissivity testing was not completed in LNAPL Areas #2, 5, and 9 due to damaged or inaccessible monitoring wells and/or a lack of historic indications of potentially recoverable LNAPL. For example, at well RFI-83/84-07 approximately 1 ft of LNAPL was present in 2022, but past transmissivity testing completed in 2013 had a result of 0.03 ft^2/day. A summary of the historical data reviewed for each area, as well as gauging and test locations selected for 2022 based on that historical data, is included in **Table 1**.

Transmissivity testing results discussed in this memo were completed between June 27-29, 2022, July 11-12, 2022 and October 17-18, 2022. Based on in-well LNAPL thicknesses and observed LNAPL recharge rates, LNAPL baildown tests were conducted on wells listed in **Table 2**. Test locations are shown in **Figures 1-13**.

LNAPL baildown tests were conducted using the following procedures:

- Initial LNAPL and water levels were measured within the test well.
- LNAPL was rapidly removed from the test well using a peristaltic pump, and the volume of LNAPL and water (if any) removed was measured and recorded.
- Fluid levels in the well were monitored after removal is completed, with the goal of documenting recharge of LNAPL to the initial thickness observed in the test well.

Results

In general, and as described further within **Table 1**, the number of locations where identified LNAPL requires further action has decreased substantially since 2014. Seven LNAPL areas were previously identified as potentially requiring LNAPL recovery; following ongoing natural source zone depletion and completion of remedial measures, including the Outfall 003 reroute, currently, only two areas now warrant further efforts.

LNAPL baildown tests were analyzed using the American Petroleum Institute (API) Transmissivity Workbook (API 2012) and in accordance with the recommendations of ASTM E-2856 (2013), using the Bouwer & Rice, Cooper & Jacob/Jacob & Lohmann, and Cooper-Bredhoeft-Papadopulos solutions contained within the API workbook.

LNAPL transmissivity values calculated from the transmissivity tests conducted in 2022, and historical results are summarized in **Table 2**. The select tests conducted at MW-10-12 (LNAPL Area #3), TW-DH-RW-02-07 (LNAPL Area #6), TW-70-103-11 (LNAPL Area #7), RFI-86-03 (LNAPL Area #8), MW-83/84-12 (LNAPL Area #10), and RFI-83/84-53 (LNAPL Area #10) could not be quantitatively analyzed due to fluctuating LNAPL and water levels over the course of the tests that complicated analysis. While a quantitative LNAPL transmissivity could not be calculated from these tests, the test observations in context (including data from surrounding locations and previous events) indicate that LNAPL at these locations is unlikely to present a risk related to migration or mobility.

In general, LNAPL transmissivity values observed were low, and within or below the range of 0.1 to 0.8 ft^2/d associated with the lower limits of practicality for hydraulic LNAPL recovery. The highest LNAPL transmissivity values observed during testing activities were 4.15 ft^2/d at 20-FP8 located in LNAPL Area

#3 (**Figure 4**) and 1.42 ft^2/d at RFI-86-03 located in LNAPL Area #8 (**Figure 8**), conducted on October 17, 2022. Analyses are presented in the worksheets included in **Attachment 2.**

In addition, LNAPL Area #10 was further evaluated because the LNAPL appears to extend offsite into the Industrial Avenue Right-of-Way. LNAPL transmissivity is very low in LNAPL Area #10, with recent test results near the roadway showing an LNAPL transmissivity of less than 0.1 ft^2/d (**Table 2**). Low transmissivity indicates recovery efforts are not practical in this area. Further, migration potential due to utility corridors is minimal, as utilities are located predominantly outside of the existing LNAPL smear zone. The storm sewer present in Industrial Avenue is above the elevation of the LNAPL smear zone. The sanitary sewer is located near or within the smear zone; however, the sanitary sewer conveys effluent to the POTW for treatment and does not connect directly to surface water or other receptors. A cross section depicting LNAPL and utilities in this area is presented in **Figure 14**.

LNAPL Area #10 LNAPL analytical data collected in 2013 and 2014 from MW-83/84-7, MW-83/84-12, and MW-83/84-34 show that there is little concern regarding LNAPL composition and PCBs were below laboratory detection limits (<1 ppm) in all three samples. In addition, soil gas samples collected from two probes (SGP-01 and SGP-02) installed west of LNAPL Area #10 (on the west side of Industrial Avenue) were compared to the LNAPL analytical data from MW-83/84-12. Soil gas samples did not detect 2-methylnaphthalene, which was the only VOC detected above reporting limits in the LNAPL sample.

Conclusions

Included for your reference in **Table 1** are the conclusions, a summary of the completed interim measures, and recommended remedies from the 2016 Remedy Recommendations Report, the conclusions from the 2017 LNAPL Summary Memo, and conclusions from the 2022 evaluation.

Based on the LNAPL transmissivity test results obtained through this assessment, LNAPL in Areas #1, 4, 6, 7, 10, 11, 12, 13, and 14 exhibit a low degree of recoverability, and hydraulic recovery efforts (e.g., skimming, pumping, or vacuum extraction) are not expected to result in a significant reduction in LNAPL mass within these areas. Although transmissivity results from LNAPL Area #7 (0.8 ft^2/d) and #13 (0.5 ft^2/d) are not less than 0.5 ft^2/d, LNAPL in these areas generally poses little to no risk to receptors. A management-in-place approach for these LNAPL areas is recommended, with ongoing NSZD providing remedial benefit in terms of hydrocarbon mass destruction.

Higher LNAPL transmissivity results in LNAPL Area #3 (4.15 ft^2/d) and Area #8 (1.42 ft^2/d) indicate that LNAPL removal may be desirable as a remedial action. These LNAPL bodies do not, based on the available data, pose a substantial risk to any current receptors, and are not migrating or expanding. LNAPL removal via pumping may provide some remedial benefit through acceleration of overall reduction of hydrocarbon mass. This removal could be achieved through manual bailing, periodic attended pumping, operation of an automated skimming system, or periodic vacuum truck evacuation of the well. Of these options, LNAPL skimming using an automated pneumatic pump is expected to be most favorable from a cost-benefit perspective, because it supports long term evaluation of LNAPL transmissivity and sustainable LNAPL recovery rates (unlike simple periodic bailing) while requiring relatively little energy input (unlike vacuum truck operations). LNAPL removal via an automated skimming system will be conducted at monitoring well 20-FP8 in LNAPL Area #3 and monitoring well RFI-86-03 in LNAPL Area #8. This LNAPL removal will support a closer evaluation of longer-term feasible LNAPL recovery rates, or sustainable LNAPL yield, and support evaluation of the cost-benefit relationship of such recovery efforts via the established LNAPL Decision Tree logic.

Figures

Tables

Attachments

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X-SITE BASE-2023
X-BDR-RC-LA
X-SAMPLE NETWORK
X-BDR F34x22

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2023.01.09 Proposed Boring Locations.jpg

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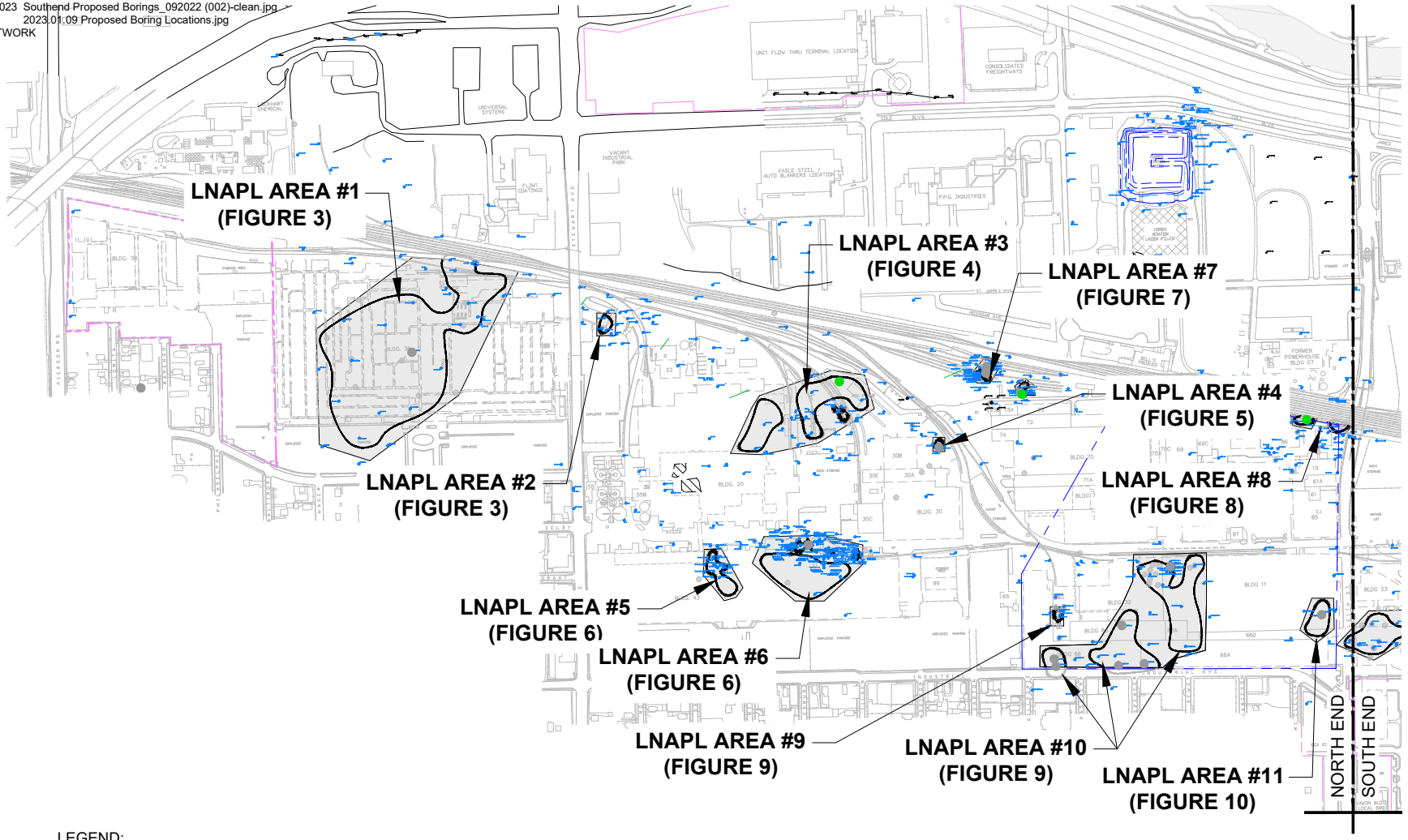

LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- EXTENT OF PROPOSED RESTRICTED AREA
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT^2/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT^2/DAY

0 800' 1600'

APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN
RESTRICTIVE COVENANT

2022 TRANSMISSIVITY TESTING LOCATIONS AND PROPOSED EXTENTS FOR RESTRICTED COVENANTS - NORTHEND

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FIGURE
1

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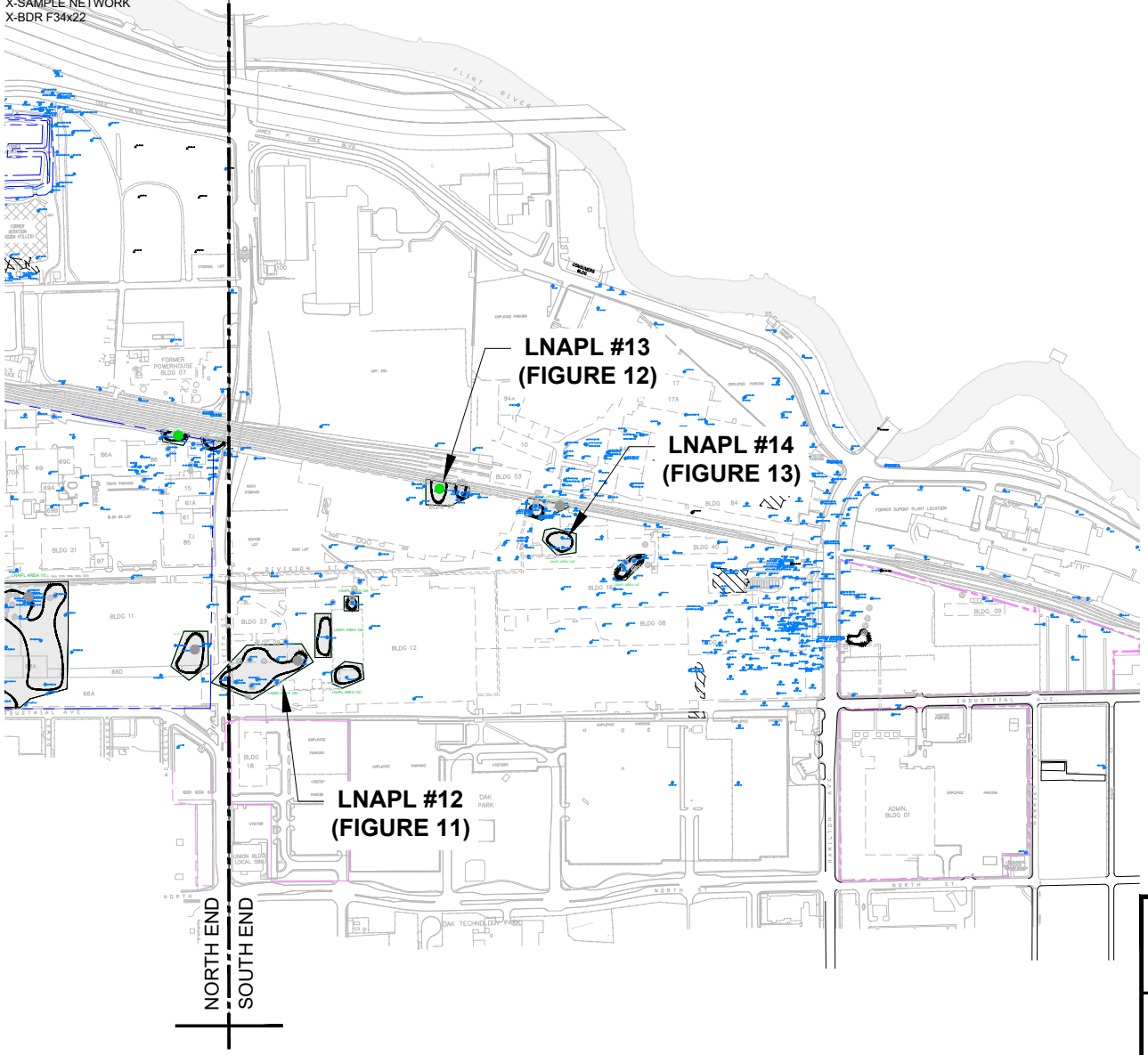

LEGEND:

- PROPERTY BOUNDARY
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- EXTENT OF PROPOSED RESTRICTED AREA
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT^2/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT^2/DAY

0 800' 1600'

APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN
RESTRICTIVE COVENANT

2022 TRANSMISSIVITY TESTING LOCATIONS AND PROPOSED EXTENTS FOR RESTRICTED COVENANTS - SOUTHEND

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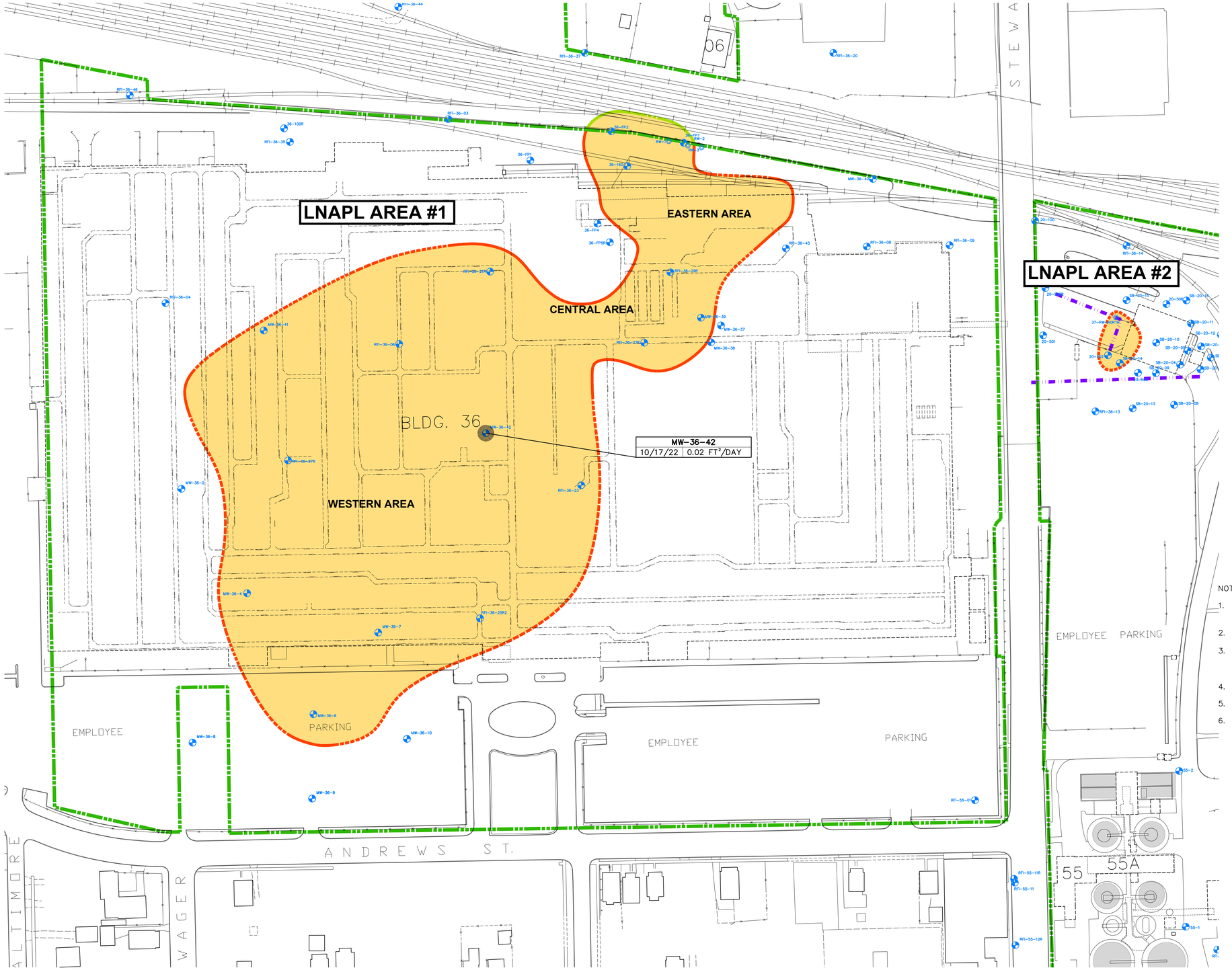
FIGURE
2



LEGEND:

- RACER PROPERTY BOUNDARY
- ACTIVE MONITORING WELL
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT²/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT²/DAY

NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY BMJ, INC. DATED APRIL 2001, AT A SCALE OF 1:100. AERIAL IMAGE FROM ARCGIS 10 ONLINE MAPPING, ACCESSED 6/12/2013.
2. BASED ON INFORMATION AVAILABLE AS OF 11/16/2022.
3. LNAPL TRANSMISSIVITY OF 0.5 FT²/DAY (SQUARE FEET PER DAY) IS LOWER BOUND THRESHOLD WHERE LNAPL RECOVERY USING HYDRAULIC METHODS IS NOT TYPICALLY PRACTICABLE (MDEQ, 2014).
4. ALL RESULTS ARE LNAPL TRANSMISSIVITY, TN (FT²/DAY)
5. LNAPL = LIGHT NON-AQUEOUS PHASE LIQUID.
6. TRANSMISSIVITY RESULTS ARE BASED ON BOUWER AND RICE AND COOPER AND JACOB TRANSMISSIVITY DETERMINATION METHODS.

0 80' 160'
APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

LNAPL AREA #1 & #2 TRANSMISSIVITY RESULTS

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FIGURE
3

LEGEND:

- RACER PROPERTY BOUNDARY
- ACTIVE MONITORING WELL
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- RECOVERY TRENCH
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT²/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT²/DAY

NOTES:

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0 40' 80'
APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

LNAPL AREA #3 TRANSMISSIVITY RESULTS

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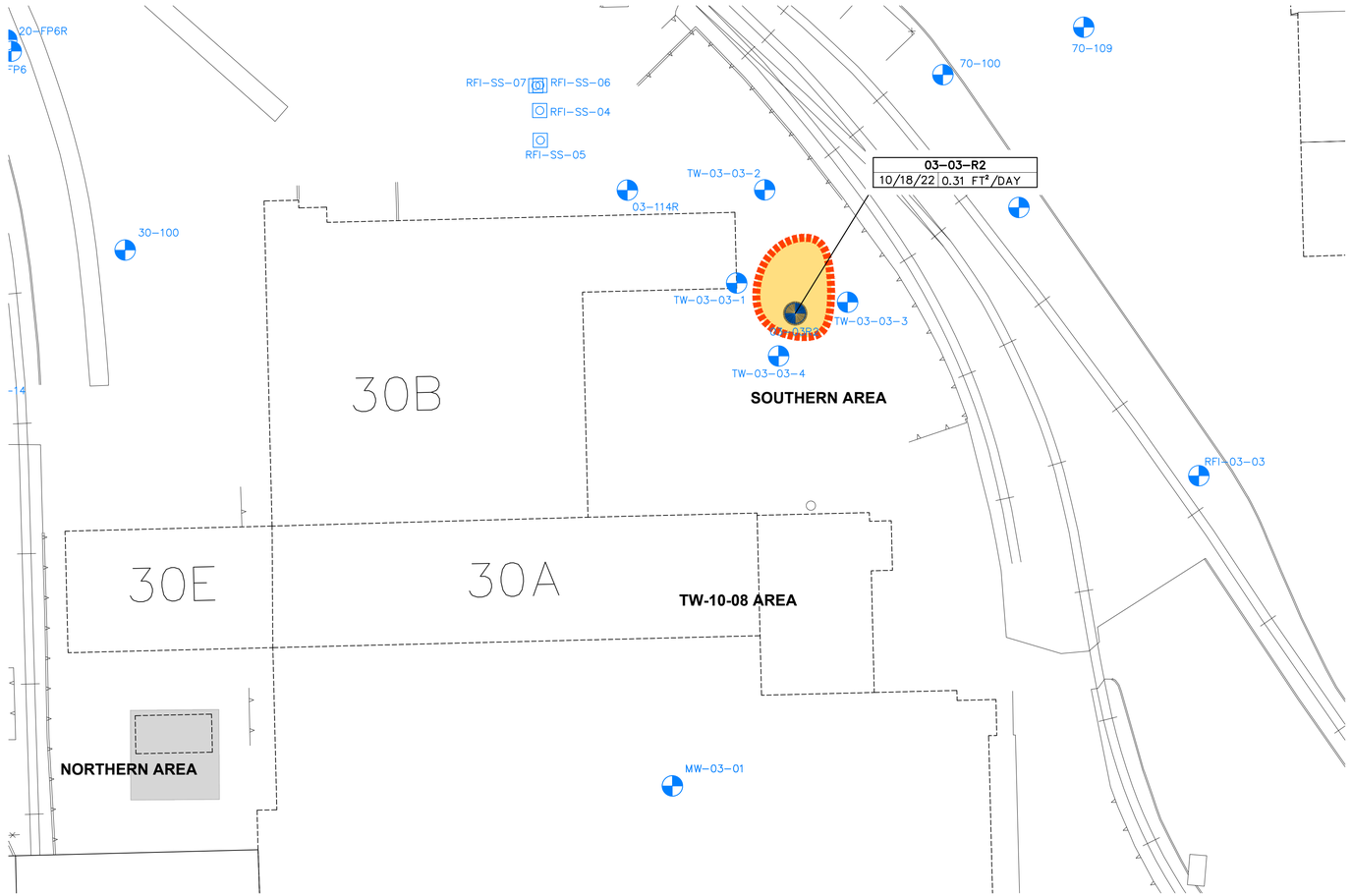
FIGURE
4



LEGEND:

- RACER PROPERTY BOUNDARY
- ACTIVE MONITORING WELL
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- RECOVERY TRENCH
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT²/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT²/DAY

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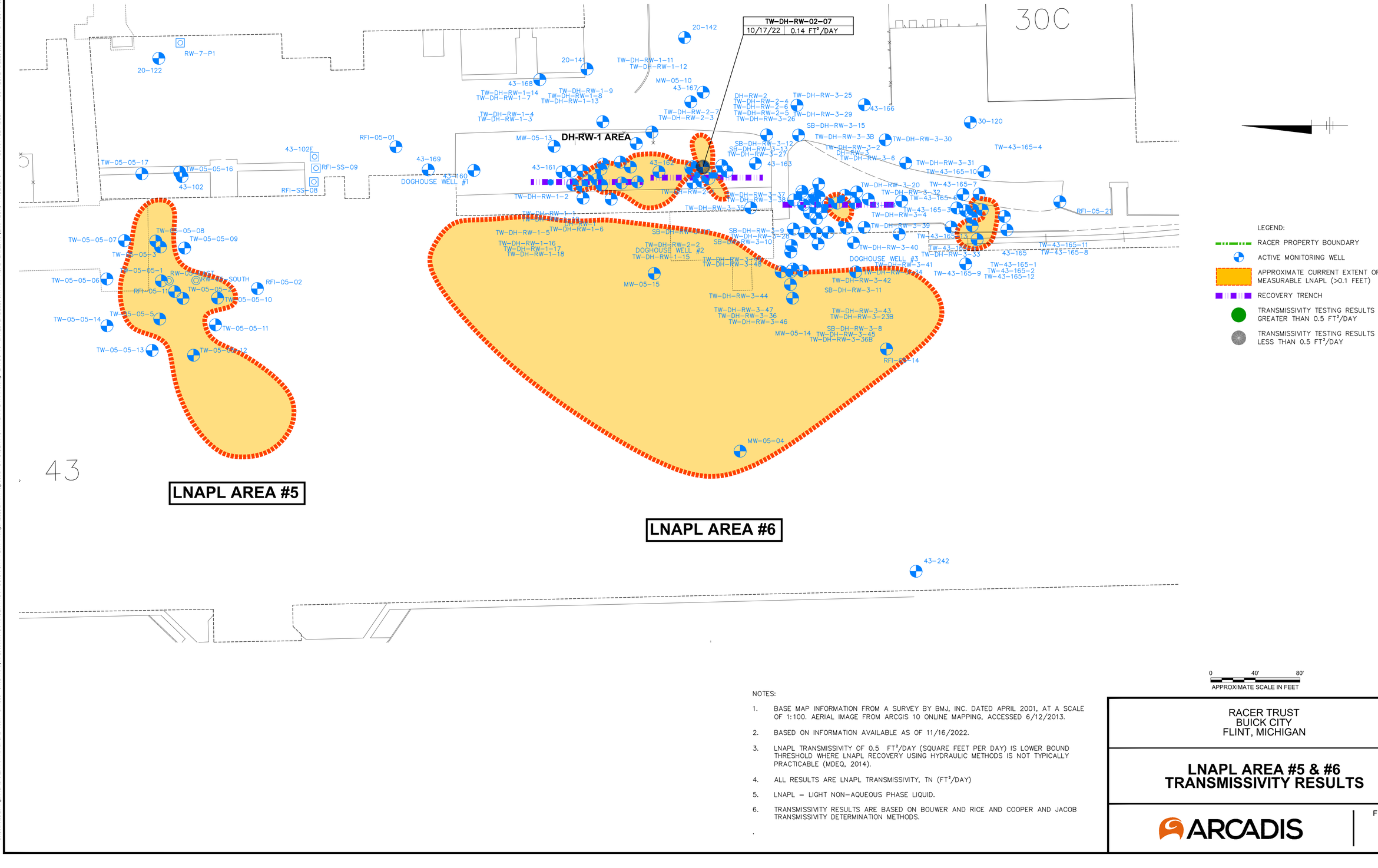
0 40' 80'
APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

LNAPL AREA #4 TRANSMISSIVITY RESULTS

ARCADIS

FIGURE
5



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LNAPL AREA #5 & #6 TRANSMISSIVITY RESULTS

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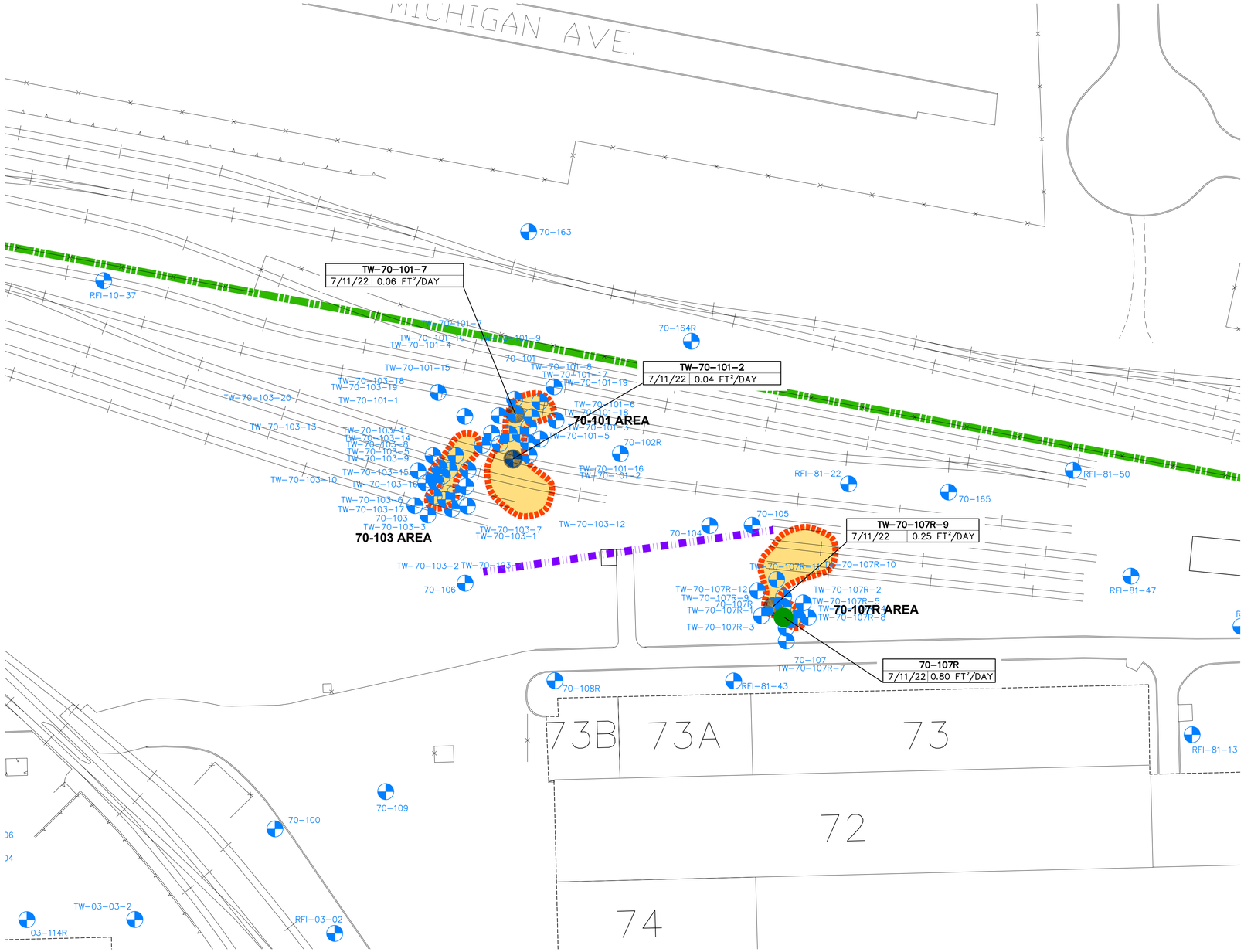
FIGURE
6



LEGEND:

- RACER PROPERTY BOUNDARY
- ACTIVE MONITORING WELL
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- RECOVERY TRENCH
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT²/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT²/DAY

NOTES:

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0 40' 80'
APPROXIMATE SCALE IN FEET

RACER TRUST
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FLINT, MICHIGAN

LNAPL AREA #7 TRANSMISSIVITY RESULTS

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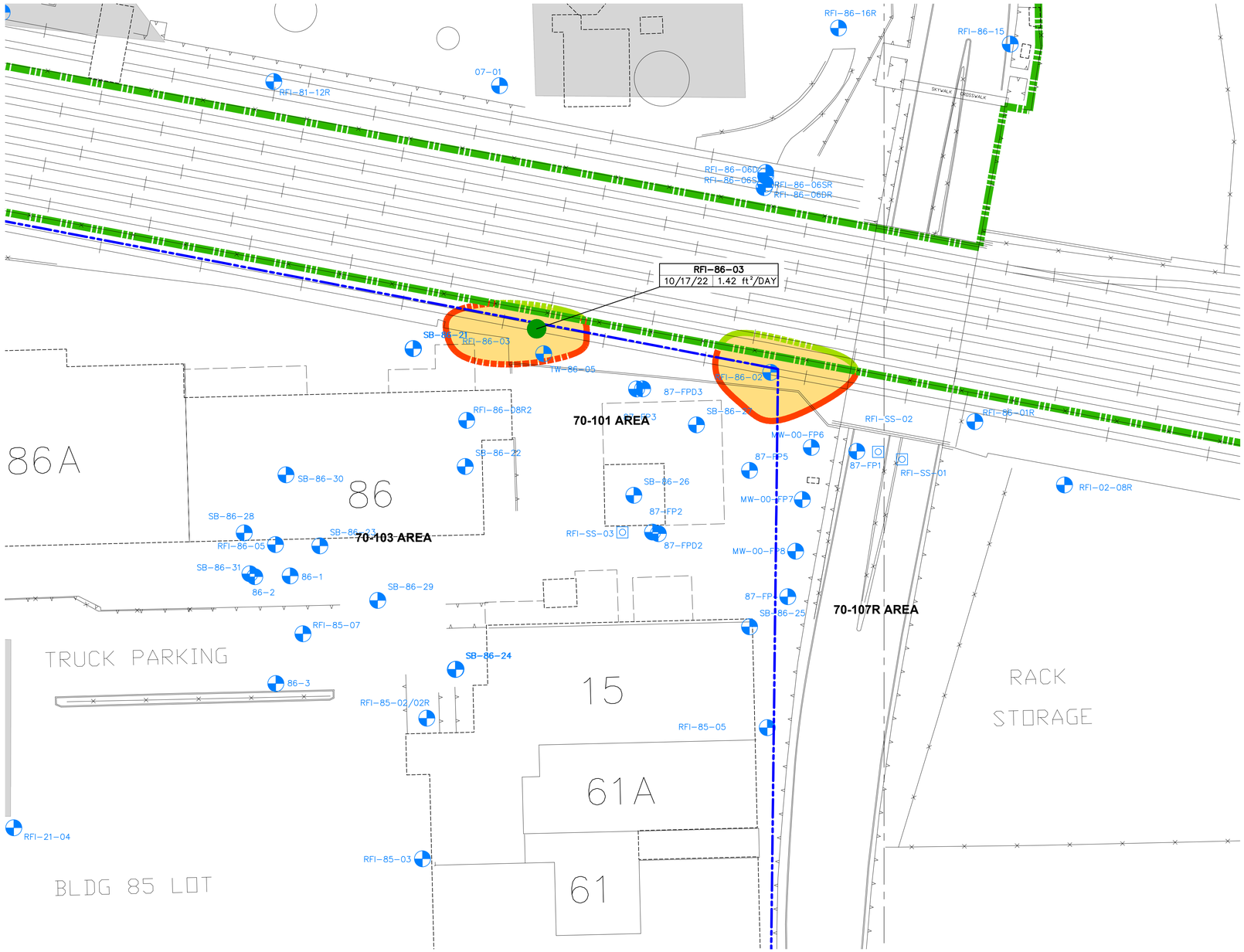
FIGURE 7



LEGEND:

- RACER PROPERTY BOUNDARY
- ACTIVE MONITORING WELL
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- RECOVERY TRENCH
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT²/DAY
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0 40' 80'
APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

LNAPL AREA #8 TRANSMISSIVITY RESULTS

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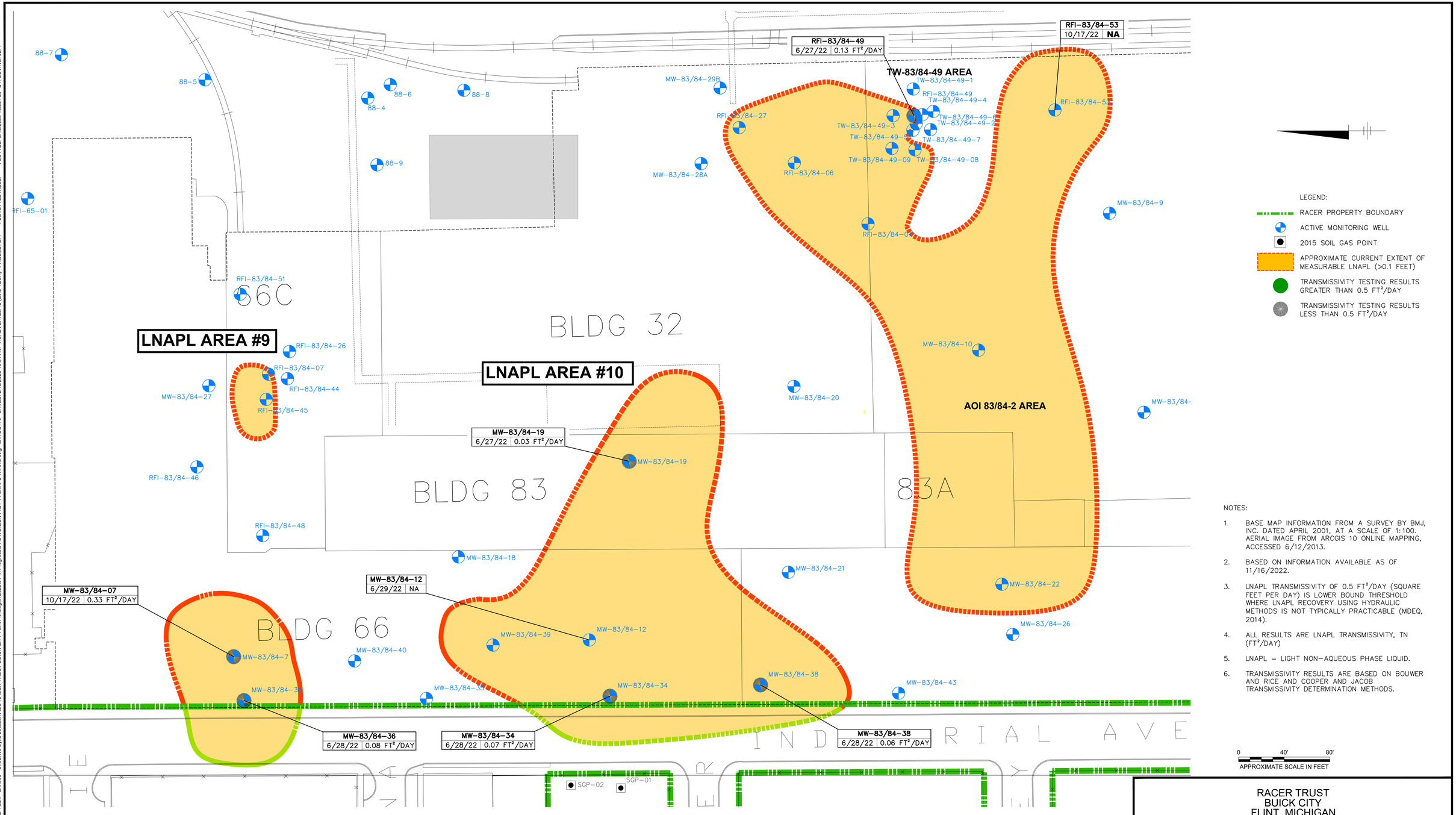
FIGURE
8



LEGEND:

- RACER PROPERTY BOUNDARY
- ACTIVE MONITORING WELL
- 2015 SOIL GAS POINT
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT²/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT²/DAY

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0 40' 80'
APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

LNAPL AREA #9 & #10 TRANSMISSIVITY RESULTS

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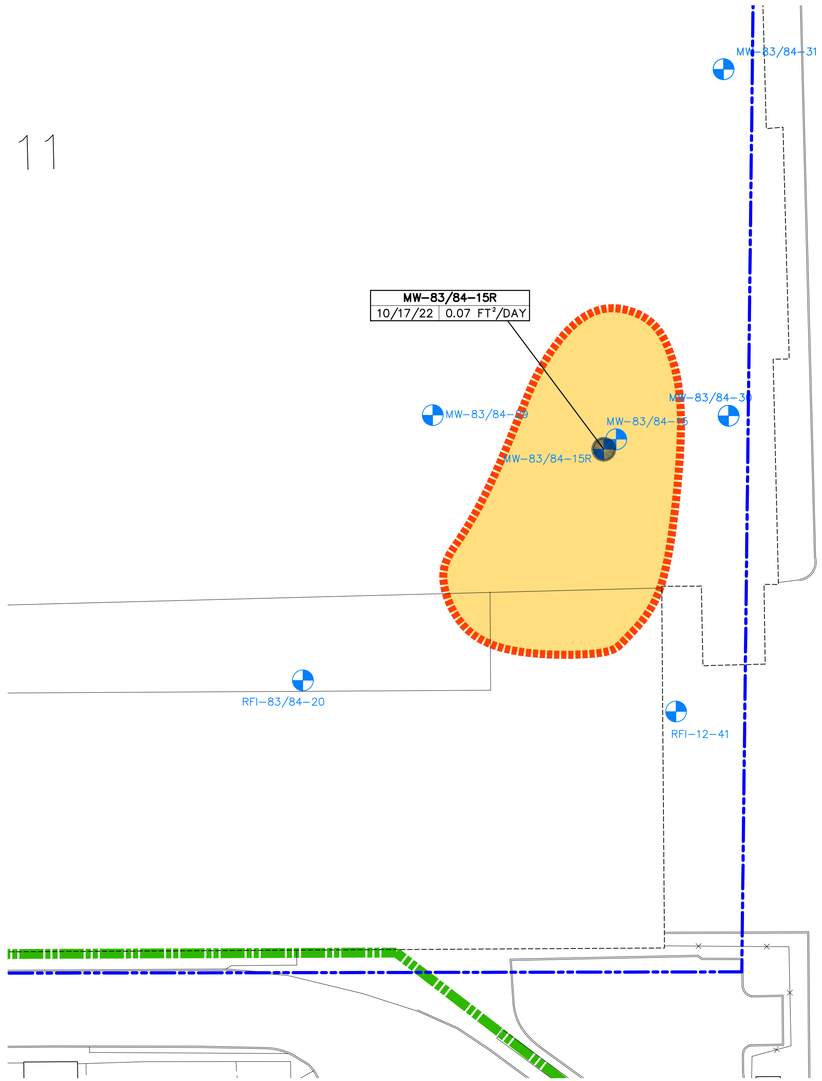
FIGURE 9

11



LEGEND:

- RACER PROPERTY BOUNDARY
- ACTIVE MONITORING WELL
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT²/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT²/DAY

NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY BMJ, INC. DATED APRIL 2001, AT A SCALE OF 1:100. AERIAL IMAGE FROM ARCGIS 10 ONLINE MAPPING, ACCESSED 6/12/2013.
2. BASED ON INFORMATION AVAILABLE AS OF 11/16/2022.
3. LNAPL TRANSMISSIVITY OF 0.5 FT²/DAY (SQUARE FEET PER DAY) IS LOWER BOUND THRESHOLD WHERE LNAPL RECOVERY USING HYDRAULIC METHODS IS NOT TYPICALLY PRACTICABLE (MDEQ, 2014).
4. ALL RESULTS ARE LNAPL TRANSMISSIVITY, TN (FT²/DAY)
5. LNAPL = LIGHT NON-AQUEOUS PHASE LIQUID.
6. TRANSMISSIVITY RESULTS ARE BASED ON BOUWER AND RICE AND COOPER AND JACOB TRANSMISSIVITY DETERMINATION METHODS.

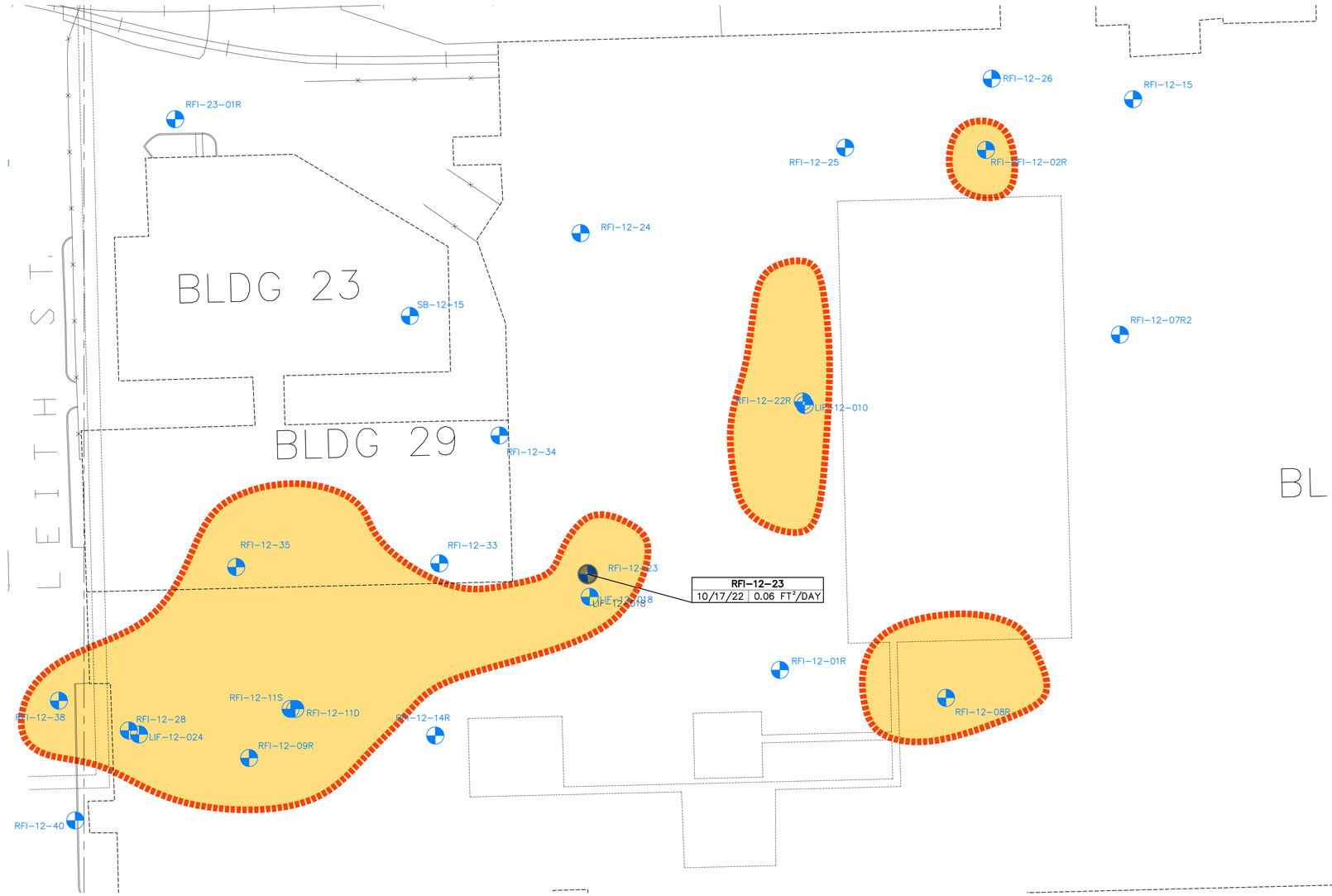
0 40' 80'
APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

LNAPL AREA #11 TRANSMISSIVITY RESULTS

ARCADIS

FIGURE
10



LEGEND:

- RACER PROPERTY BOUNDARY
- ACTIVE MONITORING WELL
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT²/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT²/DAY

NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY BMJ, INC. DATED APRIL 2001, AT A SCALE OF 1:100. AERIAL IMAGE FROM ARCGIS 10 ONLINE MAPPING, ACCESSED 6/12/2013.
2. BASED ON INFORMATION AVAILABLE AS OF 11/16/2022.
3. LNAPL TRANSMISSIVITY OF 0.5 FT²/DAY (SQUARE FEET PER DAY) IS LOWER BOUND THRESHOLD WHERE LNAPL RECOVERY USING HYDRAULIC METHODS IS NOT TYPICALLY PRACTICABLE (MDEQ, 2014).
4. ALL RESULTS ARE LNAPL TRANSMISSIVITY, TN (FT²/DAY)
5. LNAPL = LIGHT NON-AQUEOUS PHASE LIQUID.
6. TRANSMISSIVITY RESULTS ARE BASED ON BOUWER AND RICE AND COOPER AND JACOB TRANSMISSIVITY DETERMINATION METHODS.

0 40' 80'
APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

LNAPL AREA #12
TRANSMISSIVITY RESULTS

ARCADIS

FIGURE
11

LEGEND:

- RACER PROPERTY BOUNDARY
- ACTIVE MONITORING WELL
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT²/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT²/DAY

NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY BMJ, INC. DATED APRIL 2001, AT A SCALE OF 1:100. AERIAL IMAGE FROM ARCGIS 10 ONLINE MAPPING, ACCESSED 6/12/2013.
2. BASED ON INFORMATION AVAILABLE AS OF 11/16/2022.
3. LNAPL TRANSMISSIVITY OF 0.5 FT²/DAY (SQUARE FEET PER DAY) IS LOWER BOUND THRESHOLD WHERE LNAPL RECOVERY USING HYDRAULIC METHODS IS NOT TYPICALLY PRACTICABLE (MDEQ, 2014).
4. ALL RESULTS ARE LNAPL TRANSMISSIVITY, TN (FT²/DAY)
5. LNAPL = LIGHT NON-AQUEOUS PHASE LIQUID.
6. TRANSMISSIVITY RESULTS ARE BASED ON BOUWER AND RICE AND COOPER AND JACOB TRANSMISSIVITY DETERMINATION METHODS.

0 40' 80'
APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

LNAPL AREA #13 TRANSMISSIVITY RESULTS

ARCADIS

FIGURE
12

LEGEND:

- RACER PROPERTY BOUNDARY
- ACTIVE MONITORING WELL
- APPROXIMATE CURRENT EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- TRANSMISSIVITY TESTING RESULTS GREATER THAN 0.5 FT²/DAY
- TRANSMISSIVITY TESTING RESULTS LESS THAN 0.5 FT²/DAY

NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY BMJ, INC. DATED APRIL 2001, AT A SCALE OF 1:100. AERIAL IMAGE FROM ARCGIS 10 ONLINE MAPPING, ACCESSED 6/12/2013.
2. BASED ON INFORMATION AVAILABLE AS OF 11/16/2022.
3. LNAPL TRANSMISSIVITY OF 0.5 FT²/DAY (SQUARE FEET PER DAY) IS LOWER BOUND THRESHOLD WHERE LNAPL RECOVERY USING HYDRAULIC METHODS IS NOT TYPICALLY PRACTICABLE (MDEQ, 2014).
4. ALL RESULTS ARE LNAPL TRANSMISSIVITY, TN (FT²/DAY)
5. LNAPL = LIGHT NON-AQUEOUS PHASE LIQUID.
6. TRANSMISSIVITY RESULTS ARE BASED ON BOUWER AND RICE AND COOPER AND JACOB TRANSMISSIVITY DETERMINATION METHODS.

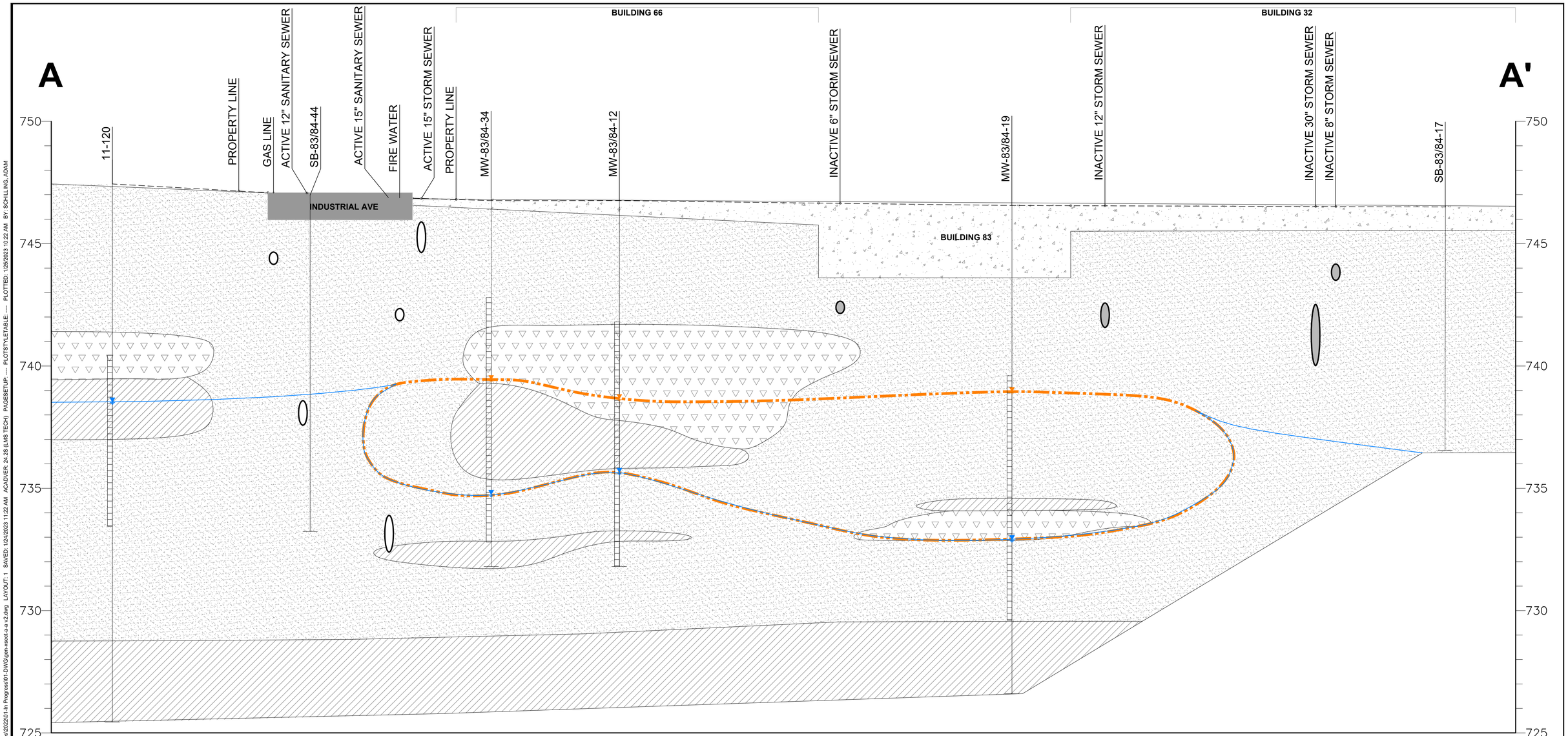
0 40' 80'
APPROXIMATE SCALE IN FEET

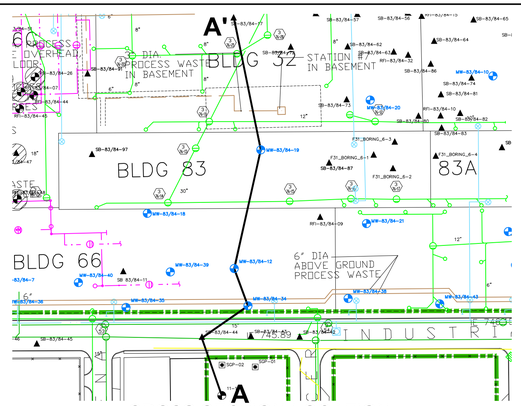
RACER TRUST
BUICK CITY
FLINT, MICHIGAN

LNAPL AREA #14 TRANSMISSIVITY RESULTS

ARCADIS

FIGURE 13





CROSS SECTION LOCATION

LEGEND:

- APPROXIMATE LNAPL EXTENTS
- ROAD
- CONCRETE AND ASPHALT
- SANDS AND GRAVEL
- SILTS AND CLAYS
- SAND AND SILT
- ACTIVE UTILITY
- BULKHEADED/INACTIVE UTILITY
- SOIL BORING
- GROUNDWATER ELEVATION
- SCREENED INTERVAL
- TOP OF LNAPL

0 40' 80'
GRAPHIC SCALE

NOTES:

1. VERTICAL EXAGGERATION = 10x
2. SCREENED INTERVALS ARE SHOWN ADJACENT TO LOGGED BORING LOCATIONS.
3. GROUNDWATER ELEVATION AND LNAPL (GWE) SHOWN REPRESENT MOST RECENT GAUGING DATA/OBSERVATION AT EACH LOCATION.
4. UTILITY DEPTH AND SIZE ARE APPROXIMATE.

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

HYDROGEOLOGIC CROSS SECTION
LNAPL AREA #10

ARCADIS Design & Consultancy for natural and built assets

FIGURE
14

Table 1. Summary of LNAPL Areas, Recent Data Collection, and Recommendations
RACER Buick City Site, Flint, Michigan.

LNAPL Area	AOI Area	2016 RRR Conclusions	2016 RRR - Completed Interim Measures and Recommended Remedies	2017 LNAPL Summary Memo Conclusions	Previous Transmissivity Estimates (date) *highest result if multiple areas	Scope of Work Completed in 2022	2022 Transmissivity Results	Current Recommendations	LNAPL Decision Tree Status*
1	36-1/36-2	LNAPL in northwestern portion of LNAPL area indicated recovery not practical. LNAPL recovery will not result in beneficial reduction in overall LNAPL mass or exposure risk.	1 - Factory 36 LNAPL recovery system along CSX property boundery **(IM completed)** 2 - Outfall 001 and 002 infiltration pathway elimination **(IM completed)** 3 - 002 recovery trench monitoring **(IM completed)** 4 - Multi-phase extraction system **(Pilot test completed, MPE not recommended)** 5 - Surface cover **(IM completed)** 6 - Institutional controls **(In progress)**	LNAPL not recoverable	36-FP7 - 0.2 ft^2/day (4/25/2013)	Gauged wells 36-FP7, RFI-36-07R, MW-36-42, MW-36-6 Baildown test at well MW-36-42	MW-36-42 - 0.02 ft^2/d	No further action at this time due to low LNAPL transmissivity; potential benefit of LNAPL recovery is not expected to outweigh costs. Manage in place with NSZD and controls.	LNAPL is mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.
2	36-5	LNAPL recovery system operated at plume for ~20 years; partial and effective LNAPL recovery already been completed and transition to institutional controls appropriate	1 - Tank farm (source area) excavated **(IM completed)** 2 - Passive recovery trenches ~20 years of LNAPL recovery **(IM completed)** 3 - Outfall 002 storm sewer bulkhead **(IM completed)** 4 - 002 passive recovery trench monitoring **(IM completed)** 5 - Institutional controls **(In progress)**	LNAPL area not included in evaluation	2014 RRR - Transmissivity testing has not been completed as there is insufficient LNAPL present to conduct	None	None	No further action at this time; area is interpreted to be low-risk and further assessment is not worthwhile given access/feasibility constraints. If conditions change, consider follow-up monitoring to update data set.	LNAPL is either immobile or mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.
3	10-1/10-4	LNAPL found to not be migrating, but mobile and infiltrating Outfall 003 storm sewer. Transmissivity testing at 20-FP7 indicated LNAPL recoverable, but recovery system operated at this plume for ~13 years with declining rate of success.	1 - ~13 years of LNAPL removal **(IM completed)** 2 - Storm sewer laterals bulkhead to eliminate LNAPL migration pathway **(IM completed)** 3 - Outfall 003 pathway elimination **(IM completed)** 4 - 003 recovery trench monitoring 5 - Target excavation **(IM completed)** 6 - Maintain surface cover **(IM completed)** 7 - Institutional controls **(In progress)**	LNAPL may be recoverable in Southern area, but not recoverable in Northern area and TW-10-08	20-FP7 - 1.0 ft^2/day (4/25/2013)	Gauged wells 20-FP7, 20-FP8, MW-10-12 Baildown test at well 20-FP8, MW-10-12	20-FP8- 4.15 ft^2/d MW-10-12 - NA	Conduct follow-up skimming at well 20-FP8.	LNAPL is mobile/flowable within a stable perimeter, and appears readily recoverable. Conduct recovery and continue to evaluate cost-benefit aspect of recovery efforts.
4	AOI 03-1	Historic IM addressed partial and effective LNAPL removal already completed.	1 - A recovery sump addressed the suspected source area for this plume **(IM completed)** 2 - Institutional controls **(In progress)**	LNAPL area not included in evaluation	2014 RRR - Transmissivity testing has not been completed as there is insufficient LNAPL present to conduct	Gauged wells 03-03-R2, TW-03-03-2, TW-03-03-3 Baildown test at well 03-03-R2	03-03-R2 - 0.31 ft^2/d	No further action at this time due to low LNAPL transmissivity; potential benefit of LNAPL recovery is not expected to outweigh costs. Manage in place with NSZD and controls.	LNAPL is mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.
5 and 6	05-1/05-5	LNAPL found to not be migrating, but mobile and infiltrating Outfall 003 storm sewer. Historic IM's indicate past LNAPL has been recoverable.	1 - 15 years of LNAPL removal from passive recovery trenches at AOI 05-1 **(IM completed)** 2 - ~5 years of LNAPL removal from recovery wells at AOI 05-5 **(IM completed)** 3 - Outfall 003 pathway elimination **(IM completed)** 4 - Targeted excavation **(IM completed)**[1] 5 - Institutional controls **(In progress)**	LNAPL may be recoverable in AOI 05-5, DH-RW-1, DH-RW-2, and DH-RW-3, but not recoverable at AOI 05-1, Western area, and 43-165	TW-DH-RW-01-01 - 0.74 ft^2/day (11/1/2016) TW-DH-RW-03-36 - 0.76 ft^2/day (2/23/2016)	Gauged wells TW-05-05-01, TW-05-05-02, TW-43-165-7, TW-DH-RW-01-01, TW-DH-RW-02-07 Baildown test at well TW-DH-RW-02-07	TW-DH-RW-02-07 - 0.14 ft^2/d	No further action at this time due to low transmissivity result. Manage in place with NSZD. Note Area 5 not assessed as part of this evaluation; area is interpreted to be low-risk and further assessment not warranted.	LNAPL is mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.
7	81-2	LNAPL found to not be migrating or infiltrating Outfall 003. LNAPL recovery system with passive recovery trench and well operated for ~17 years.	1 - Passive recovery trench ~17 years of LNAPL removal **(IM completed)** 2 - Targeted excavation **(Partially completed, IM being re-evaluated due to the presence of PFAS)**[1] 3 - Institutional controls **(In progress)**	LNAPL may be recoverable in 70-101 area, but not recoverable in 70-103 and 70-107R areas	TW-70-101-02 - 1.5 ft^2/day (11/1/2016)	Gauged wells TW-70-101-2, TW-70-101-7, TW-70-103-11, TW-70-107R, TW-70-107R-9 Baildown test at well TW-70-101-2, TW-70-101-7, TW-70-103-11, TW-70-107R, TW-70-107R-9	TW-70-101-2 - 0.04 ft^2/d TW-70-101-7 - 0.06 ft^2/d TW-70-103-11 - NA TW-70-107R - 0.80 ft^2/d TW-70-107R-9 - 0.25 ft^2/d	No further action at this time due to low transmissivity results; 107R result is above 0.5 ft^2/d but removal is not anticipated to have a significant effect on potential risk or to be cost-effective. Manage in place with NSZD.	LNAPL is mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.
8	86-1	LNAPL found to not be migrating, but mobile and infiltrating Outfall 004 storm sewer.	1 - Tank farm (source area) excavated **(IM completed)** 2 - Two recovery wells ~5 years of LNAPL removal **(IM completed)** 3 - LNAPL bailing and monitoring ~4 years **(IM completed)** 4 - Outfall 004 infiltration pathway elimination **(IM completed)** 5 - 004 recovery trench monitoring **(IM completed)** 6 - Institutional controls **(In progress)**	LNAPL area not included in evaluation	2014 RRR - Transmissivity testing has not been completed as there is insufficient LNAPL present to conduct	Gauged wells RFI-86-02, RFI-86-03 Baildown test at well RFI-86-03	RFI-86-03 - 1.42 ft^2/d	Conduct follow-up skimming at well RFI-86-03.	LNAPL is mobile/flowable within a stable perimeter, and appears readily recoverable. Conduct recovery and continue to evaluate cost-benefit aspect of recovery efforts.
9	83/84-4	LNAPL is not migrating or readily recoverable.	1 - Institutional controls **(In progress)**	LNAPL not recoverable	RFI-83/84-07 - 0.03 ft^2/day (4/24/2013)	Gauged wells RFI-83/84-07, RFI-83/84-45	NA	No further action at this time due to low transmissivity results; potential benefit of LNAPL recovery is not expected to outweigh costs. Manage in place with NSZD and controls.	LNAPL is either immobile or mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.
10	83/84-2 and 83/84-5	**83/84-2** LNAPL may be recoverable in southern portion of plume. Outfall 003 and 005 bulkheaded in this portion of site so no mobility concerns. **83/84-5** LNAPL may be readily recoverable in portion of LNAPL area.	**AOI 83/84-2** 1 - Building 32 recovery well **(IM completed)** 2 - Bulkheaded sections of outfall 003 and 005 to eliminate GSI pathway **(IM completed)** 3 - Maintain surface cover to address particulate soil inhalation and direct contact in soil concerns **(IM Completed)** 4 - Targeted excavation of PCB impacts **(IM re-evaluated, recommendation eliminated)**[1] 5 - Institutional controls **(In progress)** **AOI 83/84-5** 1 - Storm sewer lateral bulkhead to eliminate LNAPL migration pathway **(IM completed)** 2 - LNAPL recovery **(Evaluated in 2022, recovery not feasible)**[1] 3 - Institutional controls **(In progress)**	**83/84-2** and **83/84-5** LNAPL may be recoverable	RFI-83/84-53 - 4.1 ft^2/day (4/24/2013) MW-83/84-07 - 1.6 ft2/day (8/6/2013)	Gauged wells MW-83/84-22, RFI-83/84-49, RFI-83/84-53, MW-83/84-07, MW-83/84-12, MW-83/84-19, MW-83/84-34, MW-83/84-36, MW-83/84-38 Baildown test at well RFI-83/84-49, RFI-83/84-53, MW-83/84-07, MW-83/84-12, MW-83/84-19, MW-83/84-34, MW-83/84-36, MW-83/84-38	RFI-83/84-49 - 0.13 ft^2/d RFI-83/84-53 - NA MW-83/84-07 - 0.33 ft2/d MW-83/84-12 - NA MW-83/84-19 - 0.03 ft2/d MW-83/84-34 - 0.07 ft2/d MW-83/84-36 - 0.08 ft2/d MW-83/84-38 - 0.06 ft2/d	No further action at this time due to low LNAPL transmissivity; potential benefit of LNAPL recovery is not expected to outweigh costs. Manage in place with NSZD and controls.	LNAPL is mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.
11	83/84-1	LNAPL is not migrating, but is mobile and likely infiltrating Outfall 004. LNAPL may not be readily recoverable.	1 - Outfall 004 infiltration pathway elimination **(IM completed)** 2 - 004 passive recovery trench monitoring **(IM completed)** 3 - Institutional controls **(In progress)**	LNAPL may be recoverable	MW-83/84-15 - 0.71 ft^2/day (6/11/2015)	Gauged wells MW-83/84-15R Baildown test at well MW-83/84-15R	MW-83/84-15R - 0.07 ft^2/d	No further action at this time due to low LNAPL transmissivity; potential benefit of LNAPL recovery is not expected to outweigh costs. Manage in place with NSZD and controls.	LNAPL is mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.
12	12-A, 12-B, 12-C	LNAPL is mobile and infiltrating Outfall 004. LNAPL not readily recoverable.	1 - LNAPL recovery was attempted at two recovery wells (RFI-12-02/02R and RFI-12-11-D) for ~2 years; however, removal was not successful **(IM Completed)** 2 - Outfall 004 pathway elimination **(IM completed)** 3 - 004 recovery trench monitoring **(IM completed)** 4 - Maintain surface cover **(IM completed)** 5 - Institutional controls **(In progress)**	LNAPL area not included in evaluation	RFI-12-23 - 0.4 ft^2/day (9/19/2012)	Gauged wells RFI-12-09R, RFI-12-22R, RFI-12-23, RFI-12-35, RFI-12-38 Baildown test at well RFI-12-23	RFI-12-23 - 0.06 ft^2/d	No further action at this time due to low LNAPL transmissivity; potential benefit of LNAPL recovery is not expected to outweigh costs. Manage in place with NSZD and controls.	LNAPL is mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.
13	02-B	LNAPL is not migrating and Outfall 006 that services area has been bulkheaded. LNAPL not readily recoverable.	1 - Institutional controls **(In progress)**	LNAPL area not included in evaluation	2014 RRR - LNAPL too viscous to accurately measure	Gauged wells RFI-02-15, RFI-02-19 Baildown test at well RFI-02-19	RFI-02-19 - 0.50 ft^2/d	No further action at this time due to low LNAPL transmissivity; potential benefit of LNAPL recovery is not expected to outweigh costs. Manage in place with NSZD and controls.	LNAPL is mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.
14	40-A, 40-B, 16-C	LNAPL is not migrating or infiltrating Outfall 009 or 010. Historical IM's include LNAPL bailing program.	1 -LNAPL bailing and recovery **(IM completed)** 2 - Outfall 009 and 010 bulkhead installation **(IM completed)** 3 - Institutional controls **(In progress)**	LNAPL area not included in evaluation	RFI-40-7R2 - 1.9 ft^2/day (6/12/2012)	Gauged wells RFI-40-14R, SB-40-23, RFI-16-08, RFI-16-10 Baildown test at well RFI-40-14R	RFI-40-14R - 0.08 ft^2/d	No further action at this time due to low LNAPL transmissivity; potential benefit of LNAPL recovery is not expected to outweigh costs. Manage in place with NSZD and controls.	LNAPL is mobile/flowable within a stable perimeter, but not readily recoverable. Manage via NSZD and controls.

Footnotes:
1 - Select IMs proposed in the 2016 RRR were modified or eliminated following additional testing, investigation and/or evaluation of Site conditions.

Notes:
RRR: Remedy Recommendation Report
ft^2/d: square feet per day. A value of 0.5 ft^2/d or less is used by EGLE as an indication that recovery efforts have reached the extent practicable.
NSZD: Natural source zone depletion

Table 2
LNAPL Transmissivity Evaluation Results
RACER Buick City
Flint, MI

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LNAPL Area	AOI Area	Well ID	Date	Initial LNAPL Thickness (ft)	Test Duration (min)	Final LNAPL Thickness (ft)	LNAPL Transmissivity, T_n (ft^2/day)					Comments
							Bouwer & Rice	Cooper & Jacob / Jacob & Lohman	Cooper, Bredhoeft & Papadopulos	Confined LNAPL Solution	Interpreted Result	
1	36-1/36-2	MW-36-42	11/2/2016	0.56	2,807	0.39	0.03	0.24	--	--	**0.14**	
1	36-1/36-2	MW-36-42	10/17/2022	9.04	8,354	4.30	0.02	0.02	0.03	--	**0.02**	
3	10-1/10-4	20-FP8	10/17/2022	0.72	55	0.81	2.75	6.77	2.93	--	**4.15**	
3	10-1/10-4	MW-10-12	10/18/2022	0.45	5,695	0.63	--	--	--	--	**--**	NA - fluctuating LNAPL and water levels over the course of the tests
4	AOI 03-1	03-03-R2	10/18/2022	1.15	1,385	1.10	0.19	0.33	0.40	--	**0.31**	
6	05-1/05-5	TW-DH-RW-02-07	11/1/2016	0.64	2,579	0.34	0.10	0.55	--	--	**0.33**	
6	05-1/05-5	TW-DH-RW-02-07	10/17/2022	0.86	210	0.15	--	--	--	--	**0.14**	Thiem solution used due to variable fluid levels
7	81-2	TW-70-101-2	11/1/2016	1.21	4,316	0.80	0.85	1.50	--	--	**1.18**	
7	81-2	TW-70-101-2	7/11/2022	1.80	5,710	1.08	--	--	--	0.04	**0.04**	
7	81-2	TW-70-101-7	11/1/2016	4.53	2,835	0.71	0.42	0.54	--	--	**0.48**	
7	81-2	TW-70-101-7	7/12/2022	1.47	4,475	0.95	--	--	--	0.06	**0.06**	
7	81-2	TW-70-103-11	2/29/2016	2.93	1,379	0.97	0.03	0.03	--	--	**0.03**	
7	81-2	TW-70-103-11	7/12/2022	1.02	1,380	1.00	--	--	--	--	**--**	NA - fluctuating LNAPL and water levels over the course of the tests
7	81-2	TW-70-107R	7/11/2022	2.68	5,865	2.33	--	--	--	0.80	**0.80**	
7	81-2	TW-70-107R-9	2/29/2016	4.01	1,521	1.43	0.08	0.09	--	--	**0.08**	
7	81-2	TW-70-107R-9	7/11/2022	1.60	4,505	1.48	0.16	0.23	0.35	--	**0.25**	
8	86-1	RFI-86-03	10/17/2022	0.49	75	0.24	0.60	2.65	1.02	--	**1.42**	
8	86-1	RFI-86-03	10/18/2022	0.49	8,684	0.34	--	--	--	--	**--**	NA - fluctuating LNAPL and water levels over the course of the tests
10	83/84-5	MW-83/84-07	8/6/2013	2.18	1,777	1.35	1.60	--	--	--	**1.60**	
10	83/84-5	MW-83/84-07	7/7/2020	3.10	4,431	1.62	0.04	0.15	0.04	--	**0.08**	
10	83/84-5	MW-83/84-07	6/27/2022	2.99	5,560	2.18	0.06	0.13	0.12	--	**0.10**	
10	83/84-5	MW-83/84-07	10/17/2022	2.42	1,175	1.57	0.24	0.44	0.30	--	**0.33**	
10	83/84-5	MW-83/84-12	6/8/2015	6.08	335	5.91	0.43	0.14	--	--	**0.29**	
10	83/84-5	MW-83/84-12	7/7/2020	1.00	4,315	0.58	0.01	0.03	0.02	--	**0.02**	
10	83/84-5	MW-83/84-12	6/29/2022	0.98	160	3.03	--	--	--	--	**--**	NA - fluctuating LNAPL and water levels over the course of the tests
10	83/84-5	MW-83/84-19	8/6/2013	2.85	4,132	3.20	0.08	--	--	--	**0.08**	
10	83/84-5	MW-83/84-19	7/7/2020	3.80	4,235	3.00	0.01	0.01	0.01	--	**0.01**	
10	83/84-5	MW-83/84-19	6/27/2022	5.83	5,690	3.62	0.03	0.04	0.03	--	**0.03**	
10	83/84-5	MW-83/84-34	6/8/2015	6.50	185	6.01	0.50	0.59	--	--	**0.55**	
10	83/84-5	MW-83/84-34	7/7/2020	5.02	4,225	3.74	0.09	0.11	0.06	--	**0.09**	
10	83/84-5	MW-83/84-34	6/28/2022	4.51	4,204	3.74	--	--	--	0.07	**0.07**	
10	83/84-5	MW-83/84-36	6/9/2015	1.68	4,703	0.89	0.51	1.00	--	--	**0.76**	
10	83/84-5	MW-83/84-36	7/7/2020	2.63	4,415	1.94	0.05	0.14	0.05	--	**0.08**	
10	83/84-5	MW-83/84-36	6/28/2022	2.40	4,220	1.68	0.06	0.10	0.08	--	**0.08**	
10	83/84-5	MW-83/84-38	6/9/2015	3.08	3,359	2.51	0.16	0.25	--	--	**0.21**	
10	83/84-5	MW-83/84-38	7/7/2020	5.26	4,255	3.57	0.03	0.02	0.06	--	**0.04**	
10	83/84-5	MW-83/84-38	6/28/2022	7.52	4,095	4.46	--	--	--	0.06	**0.06**	
10	83/84-5	MW-83/84-39	7/7/2020	0.21	4,335	0.17	0.01	0.06	0.07	--	**0.05**	
10	83/84-2	RFI-83/84-49	3/1/2016	4.69	236	2.07	1.10	1.00	--	--	**1.05**	
10	83/84-2	RFI-83/84-49	6/27/2022	3.59	5,795	2.68	0.06	0.19	0.13	--	**0.13**	
10	83/84-2	RFI-83/84-53	4/24/2013	2.60	2,607	2.41	4.10	--	--	--	**4.10**	
10	83/84-2	RFI-83/84-53	10/17/2022	0.68	304	0.60	--	--	--	--	**--**	NA - fluctuating LNAPL and water levels over the course of the tests
11	83/84-1	MW-83/84-15R	8/14/2015	4.90	358	2.73	0.34	0.34	--	--	**0.34**	
11	83/84-1	MW-83/84-15R	10/17/2022	2.58	10,146	2.55	0.06	0.12	0.03	--	**0.07**	
12	12-A, B & C	RFI-12-23	10/17/2022	4.70	8,656	3.18	0.01	0.10	0.08	--	**0.06**	
13	02-B	RFI-02-19	10/17/2022	6.16	9,970	4.45	0.41	0.59	0.51	--	**0.50**	
14	40-A, B & 16-C	RFI-40-14R	10/17/2022	10.70	1,675	3.12	0.08	0.10	0.05	--	**0.08**	

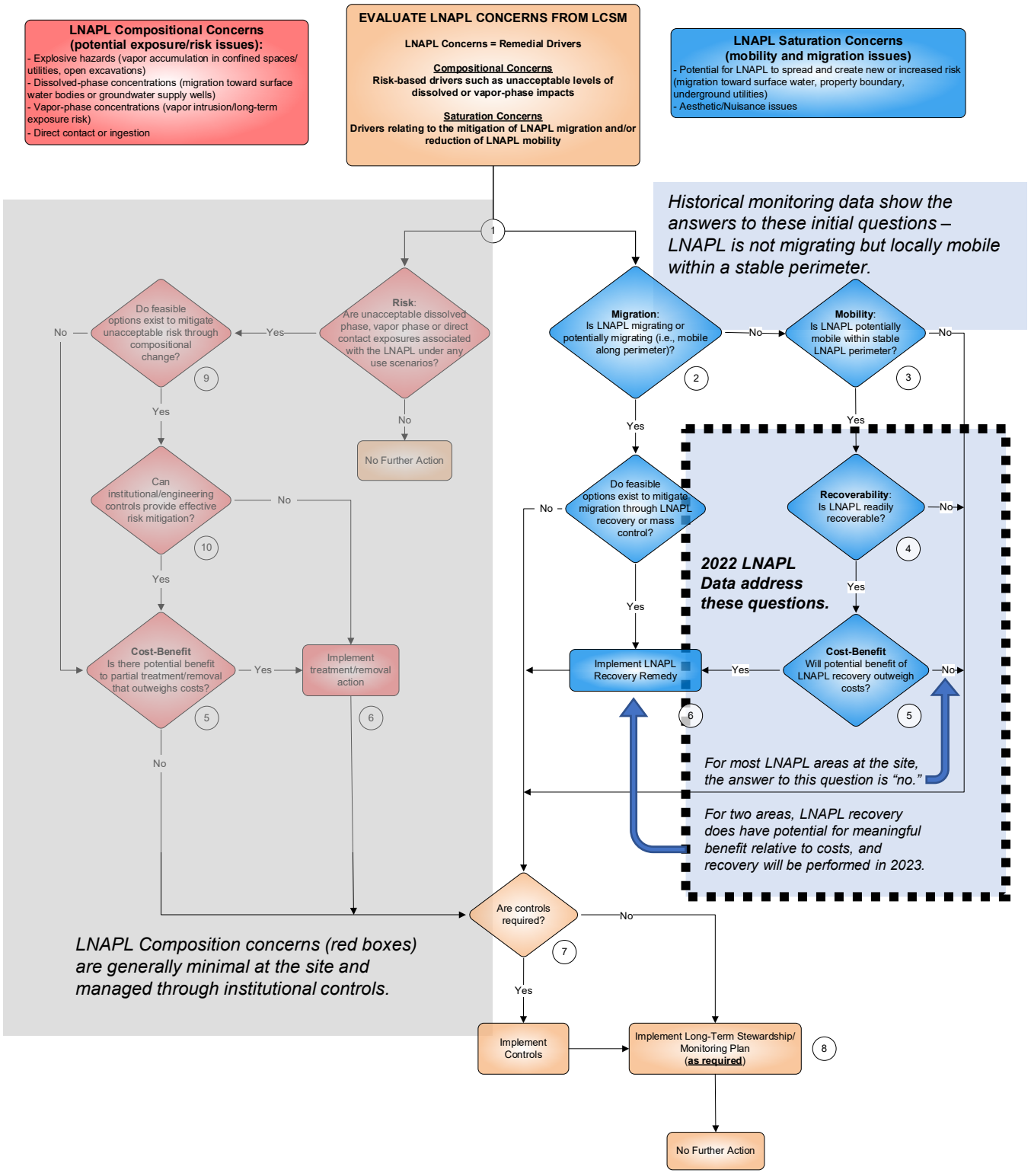
Notes:

area of interest	AOI
feet	ft
square feet per	ft^2/day
light nonaqueou	LNAPL
minute	min
not analyzed	NA
LNAPL Transmi	T_n
test not analyze	--

Attachment 1

Annotated LNAPL Decision Tree and LNAPL to AOI Cross Reference Table

Attachment 1
Annotated Example of RACER LNAPL Decision Tree



Attachment 1
LNAPL Area to AOI Cross-Reference Table

Area	Matrix	Area
LNAPL Area #1	LNAPL	AOI 36-1/36-2 Area
LNAPL Area #2	LNAPL	AOI 36-5 Fuel Oil Area
LNAPL Area #3	LNAPL	AOIs 10-1/10-4 Hydraulic Oil Areas
LNAPL Area #4	LNAPL	AOI 03-1 Quench Oil Area
LNAPL Area #5	LNAPL	AOI 05-5 Cutting Oil Area
LNAPL Area #6	LNAPL	AOI 05-1 Cutting Oil Area
LNAPL Area #7	LNAPL	AOI 81-2 Cutting Oil Area
LNAPL Area #8	LNAPL	AOI 86-1 Fuel Oil Area[2]
LNAPL Area #9	LNAPL	AOI 83/84-4 Cutting Oil Area
LNAPL Area #10	LNAPL	AOI 83/84-2 Cutting Oil Area
LNAPL Area #10	LNAPL	AOI 83/84-5 Cutting Oil Area
LNAPL Area #11	LNAPL	AOI 83/84-1 Cutting Oil Area
LNAPL Area #12	LNAPL	AOIs 12-A, B, & C Hydraulic Oil Areas[2]
LNAPL Area #13	LNAPL	AOI 02-B Hydraulic Oil Area
LNAPL Area #14	LNAPL	AOI 40-A,B and 16-C Fuel Oil Areas

Attachment 2

LNAPL Transmissivity Workbooks

LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	MW-83/84-07
Date and Time In	6/27/2022 15:35	Date and Time Out	7/1/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.832	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.445	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	17.06	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	7	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	7.96	Test Date	06/27/22
Static Depth to Water (feet)	10.95	Start Time	15:35:00
LNAPL Thickness (feet)	2.99	Initial LNAPL Volume in Well (gallons)	

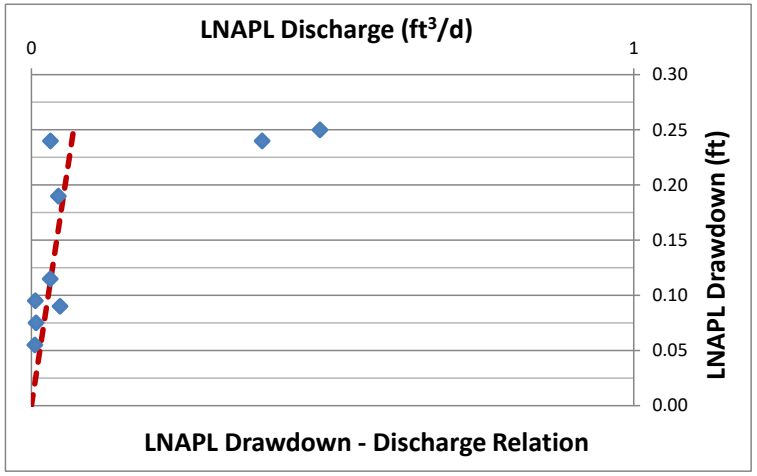
LNAPL Removal Information

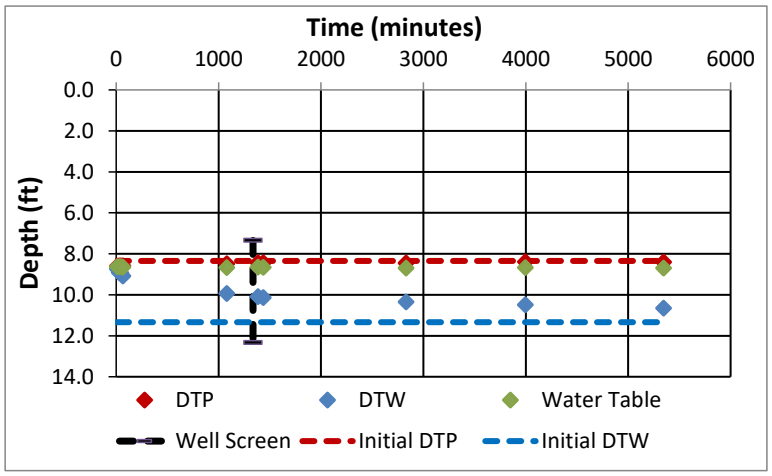
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	15:35
Volume of LNAPL Removed (gallons)	0.47	Time LNAPL Removal is Completed (time)	15:55
Volume of Groundwater Removed (gallons)	NA	Time to Remove LNAPL (minutes)	20.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
06/27/22	3:35:00 PM	-20.00	7.96	10.95	2.99	Initial Fluid Levels/Removal starts
06/27/22	3:55:00 PM	0.00	None	8.25	0.00	Test Starts
06/27/22	4:05:00 PM	10.00	8.22	8.35	0.13	
06/27/22	4:25:00 PM	30.00	8.20	8.53	0.33	
06/27/22	4:40:00 PM	45.00	8.20	8.54	0.34	
06/27/22	5:00:00 PM	65.00	8.20	8.70	0.50	
06/28/22	9:55:00 AM	1080.00	8.10	9.55	1.45	
06/28/22	3:00:00 PM	1385.00	8.05	9.70	1.65	
06/28/22	3:50:00 PM	1435.00	8.05	9.75	1.70	
06/29/22	11:30:00 AM	2615.00	8.08	10.08	2.00	
06/29/22	1:55:00 PM	2760.00	8.06	9.72	1.66	
06/29/22	3:05:00 PM	2830.00	8.06	9.96	1.90	
06/30/22	10:30:00 AM	3995.00	8.01	10.10	2.09	
06/30/22	3:20:00 PM	4285.00	8.00	9.95	1.95	
07/01/22	9:00:00 AM	5345.00	8.02	10.27	2.25	
07/01/22	12:35:00 PM	5560.00	8.04	10.22	2.18	

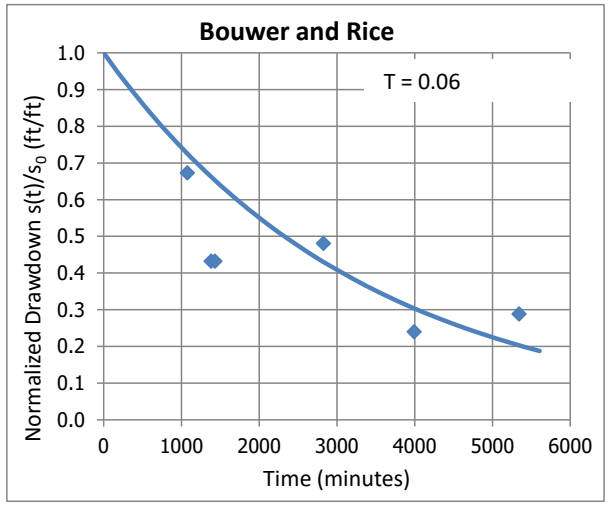
MW-83/84-07 06/27/2022

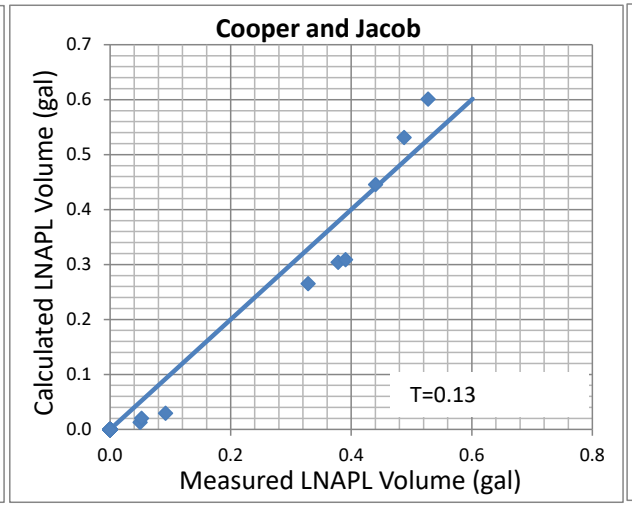


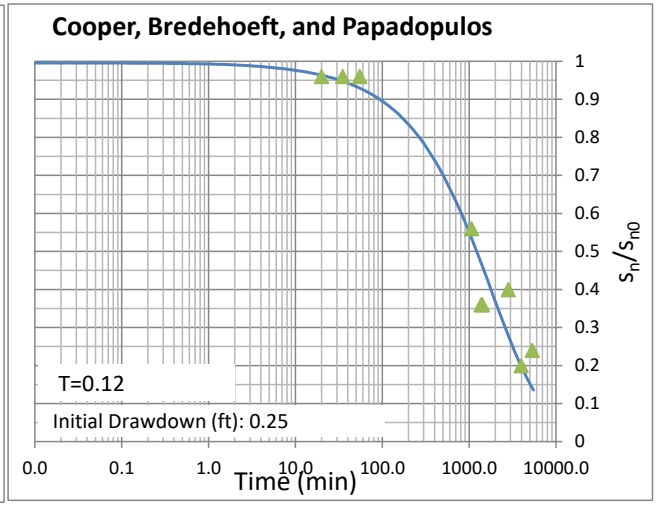


Abbreviations:

d = day
DTP = depth to product
DTW = depth to water
ft = feet
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	MW-83/84-07
Date and Time In	6/27/2022 15:35	Date and Time Out	7/1/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.832	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.445	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	17.06	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	7	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	7.96	Test Date	06/27/22
Static Depth to Water (feet)	10.95	Start Time	15:35:00
LNAPL Thickness (feet)	2.99	Initial LNAPL Volume in Well (gallons)	

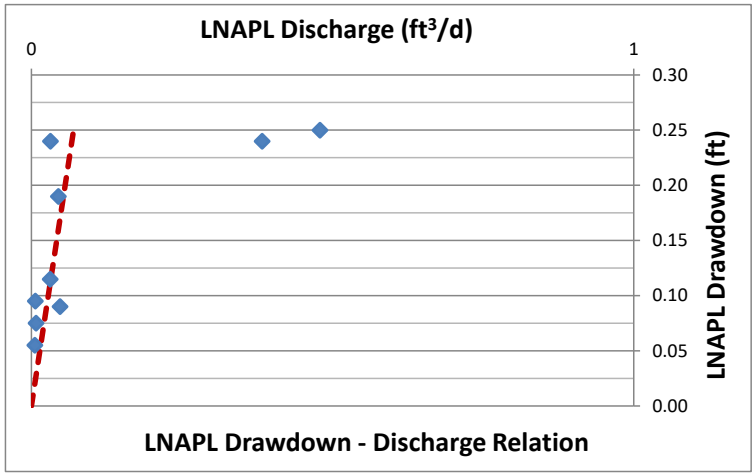
LNAPL Removal Information

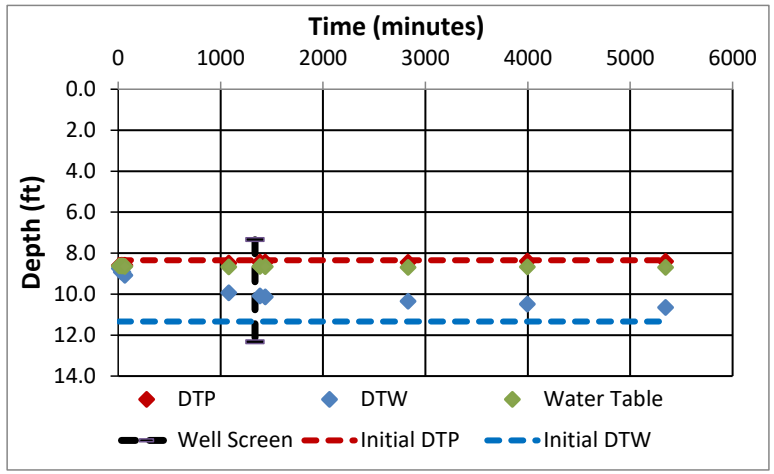
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	15:35
Volume of LNAPL Removed (gallons)	0.47	Time LNAPL Removal is Completed (time)	15:55
Volume of Groundwater Removed (gallons)	NA	Time to Remove LNAPL (minutes)	20.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
06/27/22	3:35:00 PM	-20.00	7.96	10.95	2.99	Initial Fluid Levels/Removal starts
06/27/22	3:55:00 PM	0.00	None	8.25	#VALUE!	Test Starts
06/27/22	4:05:00 PM	10.00	8.22	8.35	0.13	
06/27/22	4:25:00 PM	30.00	8.20	8.53	0.33	
06/27/22	4:40:00 PM	45.00	8.20	8.54	0.34	
06/27/22	5:00:00 PM	65.00	8.20	8.70	0.50	
06/28/22	9:55:00 AM	1080.00	8.10	9.55	1.45	
06/28/22	3:00:00 PM	1385.00	8.05	9.70	1.65	
06/28/22	3:50:00 PM	1435.00	8.05	9.75	1.70	
06/29/22	11:30:00 AM	2615.00	8.08	10.08	2.00	
06/29/22	1:55:00 PM	2760.00	8.06	9.72	1.66	
06/29/22	3:05:00 PM	2830.00	8.06	9.96	1.90	
06/30/22	10:30:00 AM	3995.00	8.01	10.10	2.09	
06/30/22	3:20:00 PM	4285.00	8.00	9.95	1.95	
07/01/22	9:00:00 AM	5345.00	8.02	10.27	2.25	
07/01/22	12:35:00 PM	5560.00	8.04	10.22	2.18	

MW-83/84-07 06/27/2022





Abbreviations:

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DTW = depth to water
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LNAPL = light non-aqueous phase liquid
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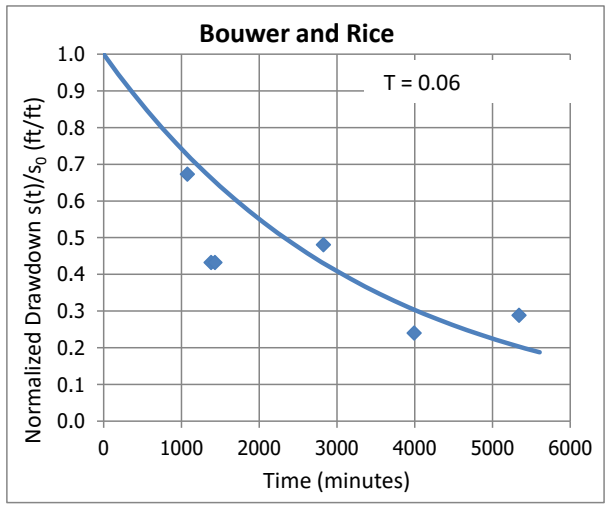
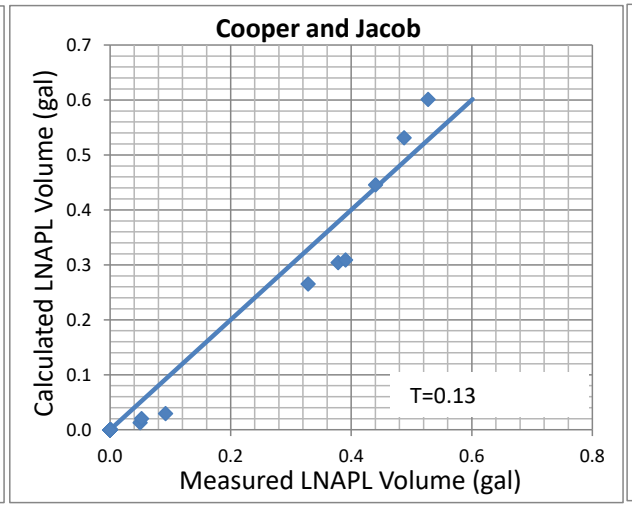
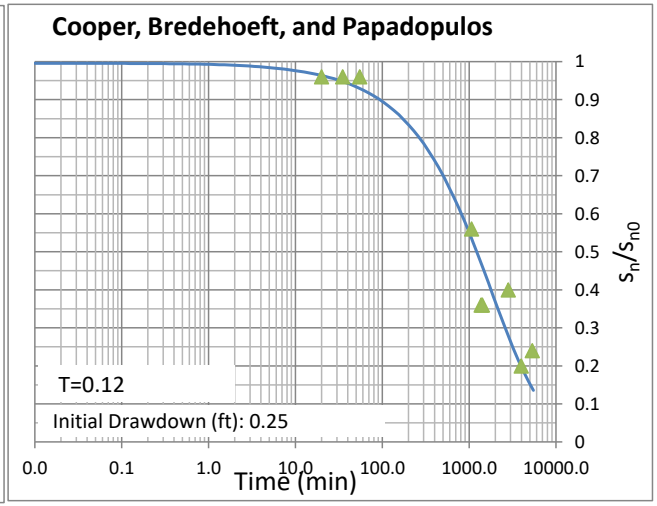
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	MW-83/84-19
Date and Time In	6/27/2022 13:10	Date and Time Out	7/1/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.585	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.274	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	16.95	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	7	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	6

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	7.63	Test Date	06/27/22
Static Depth to Water (feet)	13.46	Start Time	13:10:00
LNAPL Thickness (feet)	5.83	Initial LNAPL Volume in Well (gallons)	

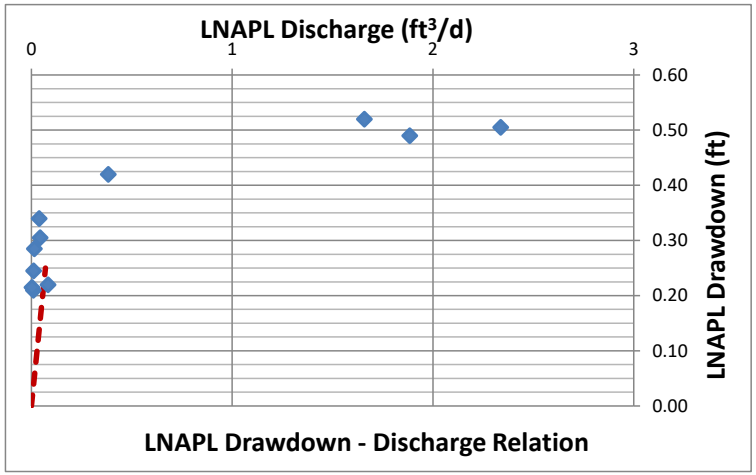
LNAPL Removal Information

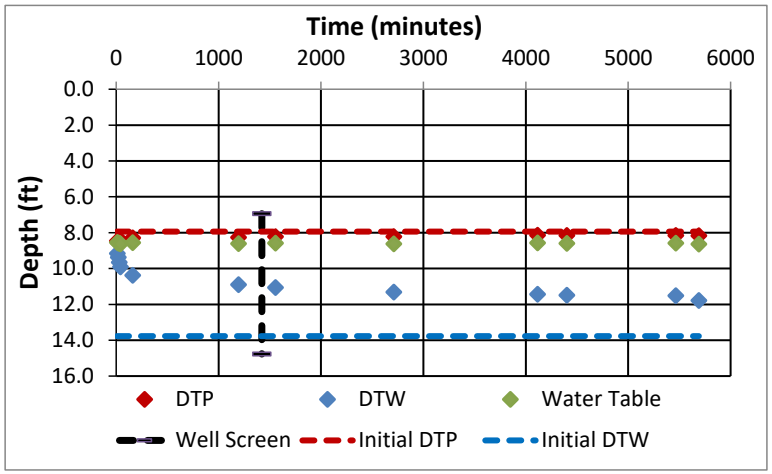
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	13:10
Volume of LNAPL Removed (gallons)	0.93	Time LNAPL Removal is Completed (time)	13:35
Volume of Groundwater Removed (gallons)	NA	Time to Remove LNAPL (minutes)	25.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
06/27/22	1:10:00 PM	-25.00	7.63	13.46	5.83	Initial Fluid Levels/Removal starts
06/27/22	1:35:00 PM	0.00	None	8.25	0.00	Test Starts
06/27/22	1:45:00 PM	10.00	8.15	8.85	0.70	
06/27/22	1:55:00 PM	20.00	8.15	9.07	0.92	
06/27/22	2:05:00 PM	30.00	8.12	9.35	1.23	
06/27/22	2:15:00 PM	40.00	8.12	9.60	1.48	
06/27/22	4:15:00 PM	160.00	7.98	10.07	2.09	
06/28/22	9:30:00 AM	1195.00	7.96	10.59	2.63	
06/28/22	3:30:00 PM	1555.00	7.91	10.75	2.84	
06/29/22	10:45:00 AM	2710.00	7.92	11.00	3.08	
06/29/22	1:45:00 PM	2890.00	7.93	10.90	2.97	
06/29/22	3:15:00 PM	2980.00	7.92	10.72	2.80	
06/30/22	10:10:00 AM	4115.00	7.83	11.12	3.29	
06/30/22	2:55:00 PM	4400.00	7.85	11.18	3.33	
07/01/22	8:40:00 AM	5465.00	7.84	11.21	3.37	
07/01/22	12:25:00 PM	5690.00	7.86	11.48	3.62	

MW-83/84-19 06/27/2022





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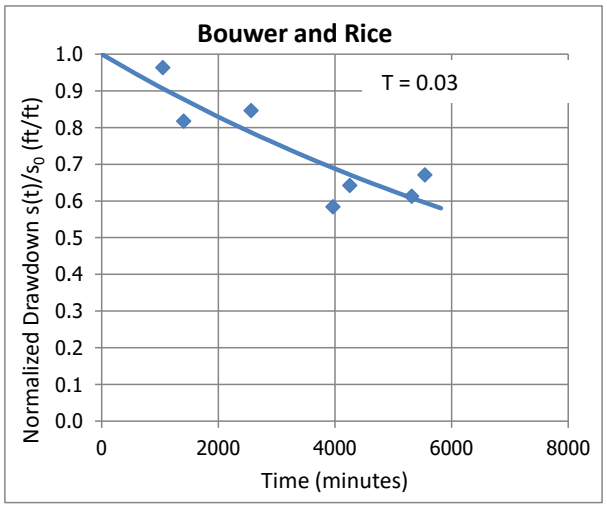
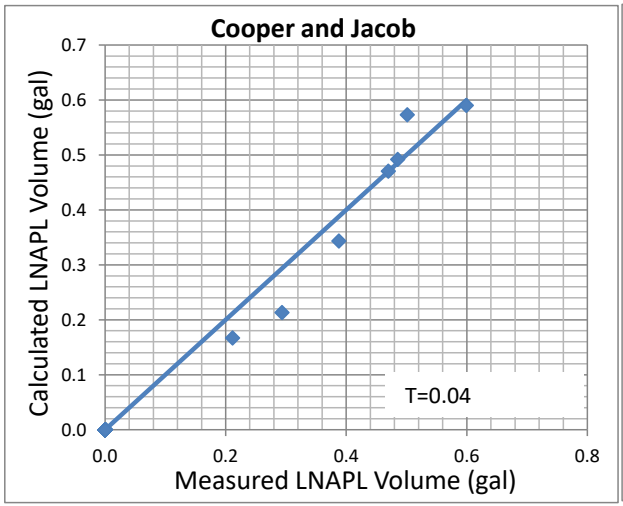
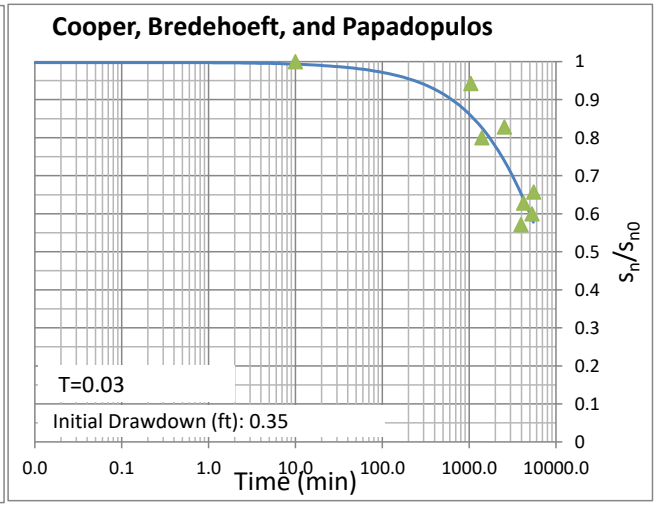






LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	MW-83/84-34
Date and Time In	6/28/2022 14:05	Date and Time Out	7/1/2022
Personnel	Madison Olender	Weather	12:30

Well Construction Details

Ground Surface Elevation (feet amsl)	746.925	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.497	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	14.11	Filter Pack Type	Global #1 Filterpack Sand
Depth to Top of Screen (feet)	4	Depth to Bottom of Screen (feet)	14
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	7.45	Test Date	06/28/22
Static Depth to Water (feet)	1146.00	Start Time	14:05:00
LNAPL Thickness (feet)	4.51	Initial LNAPL Volume in Well (gallons)	

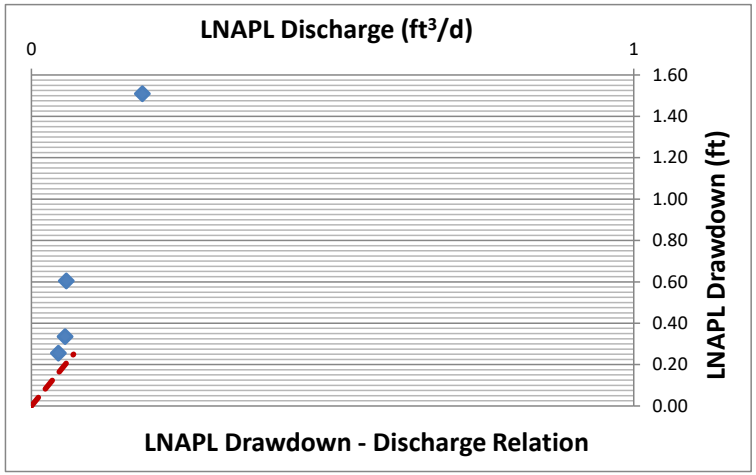
LNAPL Removal Information

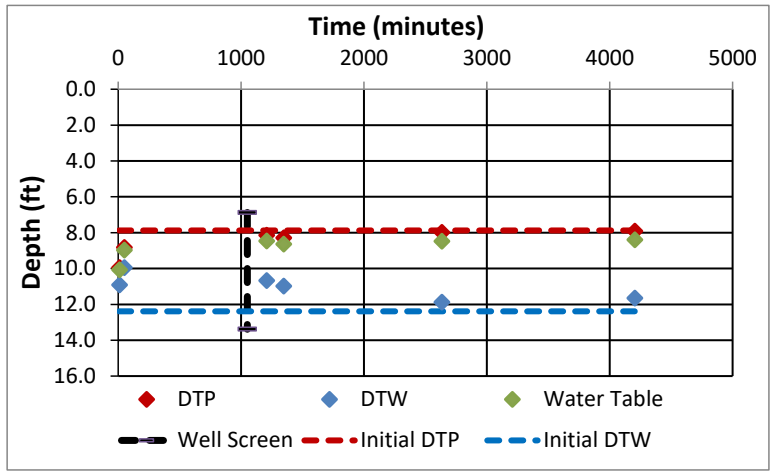
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	14:05
Volume of LNAPL Removed (gallons)	0.72	Time LNAPL Removal is Completed (time)	14:25
Volume of Groundwater Removed (gallons)	NA	Time to Remove LNAPL (minutes)	20.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
06/28/22	2:05:00 PM	-21.00	7.45	11.96	4.51	Initial Fluid Levels/Removal starts
06/28/22	2:26:00 PM	0.00	None	11.10	#VALUE!	Test Starts
06/28/22	2:36:00 PM	10.00	9.52	10.49	0.97	
06/28/22	3:05:00 PM	39.00	8.57	9.48	0.91	
06/28/22	3:15:00 PM	49.00	8.40	9.52	1.12	
06/28/22	3:25:00 PM	59.00	8.36	9.45	1.09	
06/29/22	10:35:00 AM	1209.00	7.71	10.24	2.53	
06/29/22	12:52:00 PM	1346.00	7.86	10.55	2.69	
06/29/22	3:00:00 PM	1474.00	7.75	10.30	2.55	
06/30/22	10:20:00 AM	2634.00	7.55	11.45	3.90	
06/30/22	3:10:00 PM	2924.00	7.55	11.15	3.60	
07/01/22	8:50:00 AM	3984.00	7.46	11.13	3.67	
07/01/22	12:30:00 PM	4204.00	7.49	11.23	3.74	

MW-83/84-34 06/28/2022





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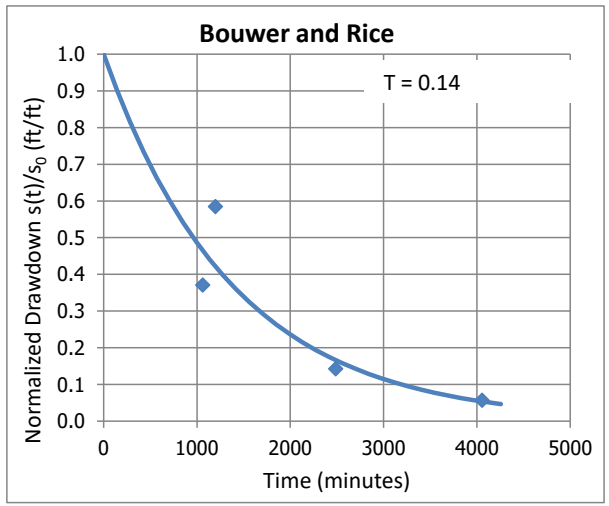
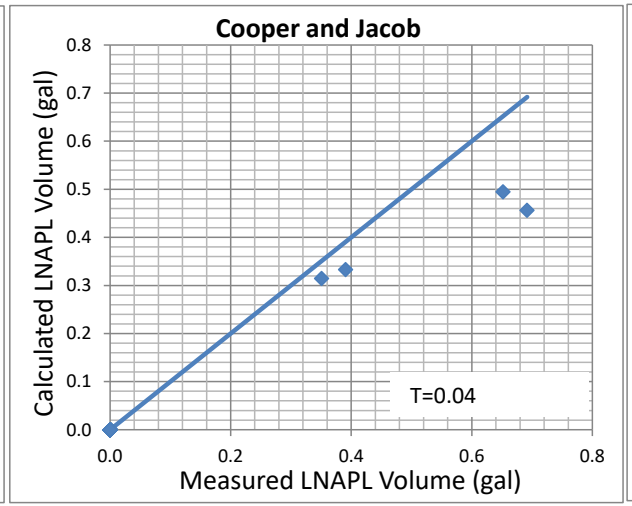
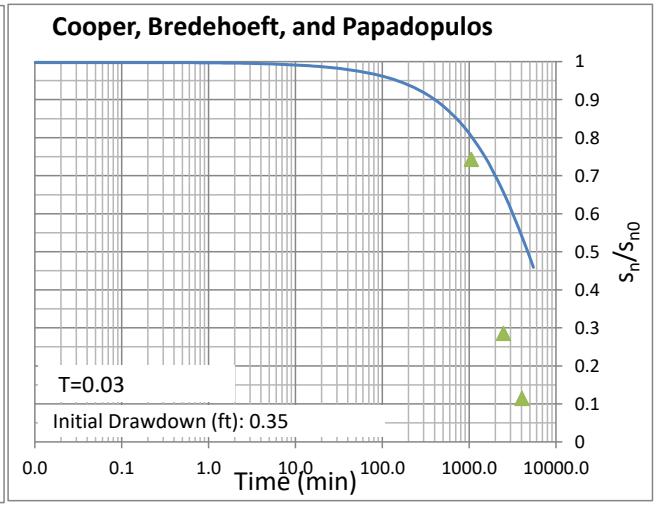
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	MW-83/84-36
Date and Time In	6/28/2022 14:00	Date and Time Out	7/1/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.865	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.284	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	14.33	Filter Pack Type	Global #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	15
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	7.22	Test Date	06/28/22
Static Depth to Water (feet)	10.12	Start Time	14:00:00
LNAPL Thickness (feet)	2.40	Initial LNAPL Volume in Well (gallons)	

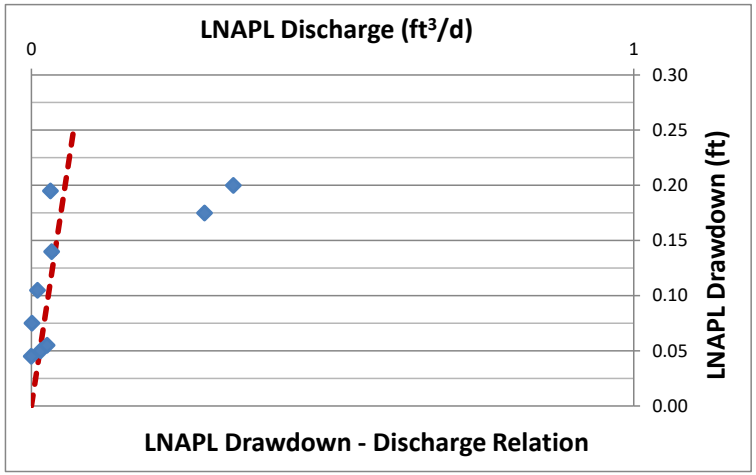
LNAPL Removal Information

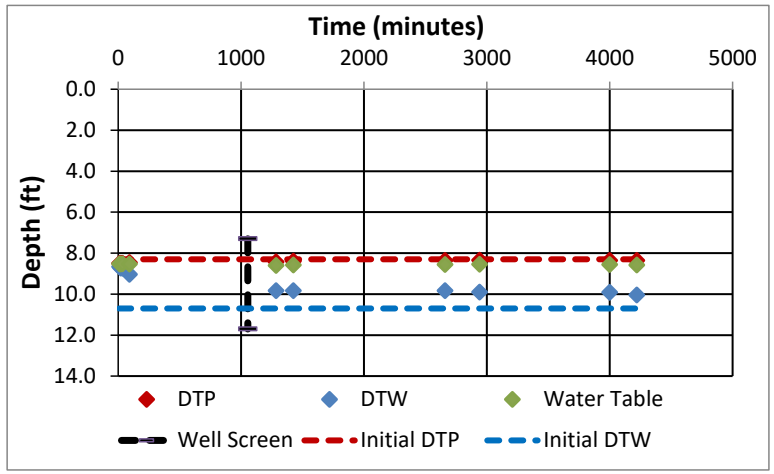
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	14:00
Volume of LNAPL Removed (gallons)	0.38	Time LNAPL Removal is Completed (time)	14:15
Volume of Groundwater Removed (gallons)	None	Time to Remove LNAPL (minutes)	15.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
06/28/22	2:00:00 PM	-15.00	7.72	10.12	2.40	Initial Fluid Levels/Removal starts
06/28/22	2:15:00 PM	0.00	None	7.94	#VALUE!	Test Starts
06/28/22	2:25:00 PM	10.00	7.92	8.08	0.16	
06/28/22	2:35:00 PM	20.00	7.92	8.15	0.23	
06/28/22	2:50:00 PM	35.00	7.91	8.15	0.24	
06/28/22	3:45:00 PM	90.00	7.88	8.45	0.57	
06/29/22	11:40:00 AM	1285.00	7.84	9.25	1.41	
06/29/22	2:00:00 PM	1425.00	7.81	9.25	1.44	
06/29/22	3:00:00 PM	1485.00	7.81	9.20	1.39	
06/30/22	10:35:00 AM	2660.00	7.78	9.25	1.47	
06/30/22	3:15:00 PM	2940.00	7.76	9.32	1.56	
07/01/22	8:55:00 AM	4000.00	7.77	9.33	1.56	
07/01/22	12:35:00 PM	4220.00	7.78	9.46	1.68	

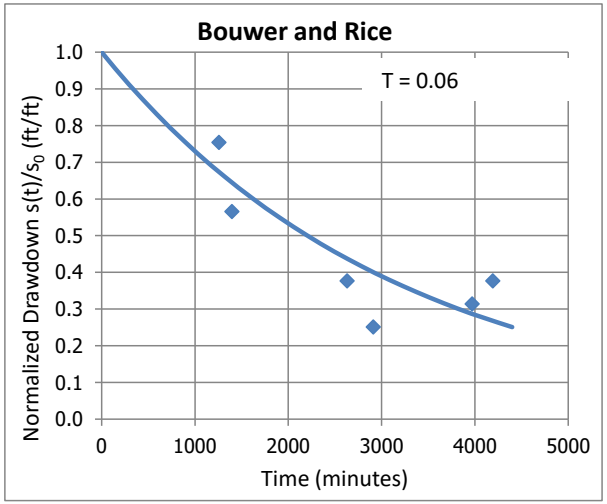
MW-83/84-36 06/28/2022

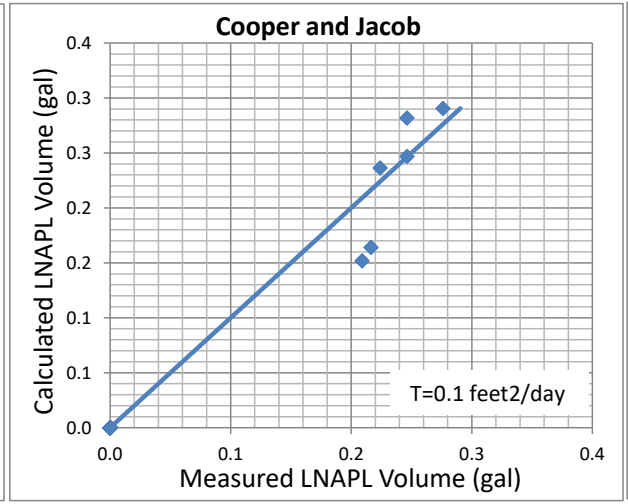


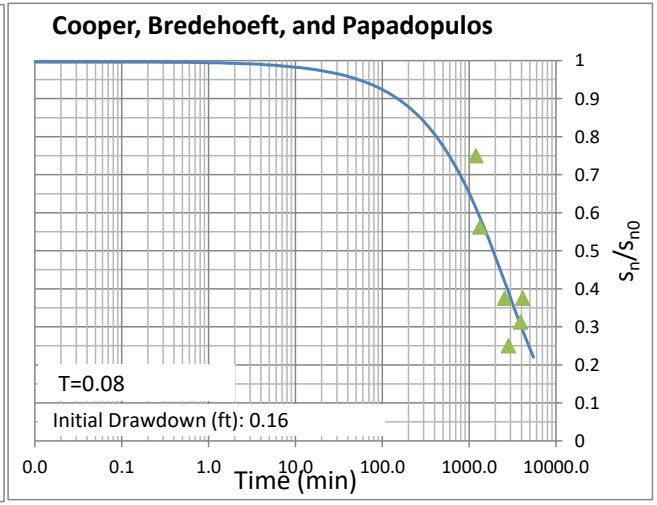


Abbreviations:

d = day
DTP = depth to product
DTW = depth to water
ft = feet
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	MW-83/84-38
Date and Time In	6/28/2022 15:55	Date and Time Out	7/1/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.48	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.48	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	14.6	Filter Pack Type	Sand Filter Pack
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	15
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	6.80	Test Date	06/28/22
Static Depth to Water (feet)	14.32	Start Time	15:55:00
LNAPL Thickness (feet)	7.83	Initial LNAPL Volume in Well (gallons)	

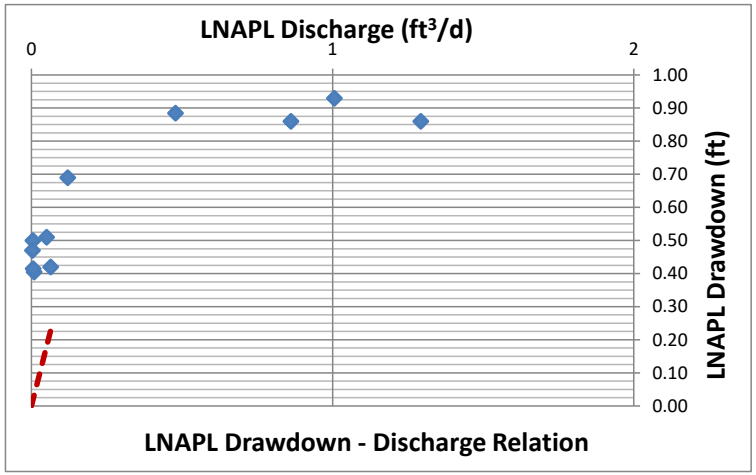
LNAPL Removal Information

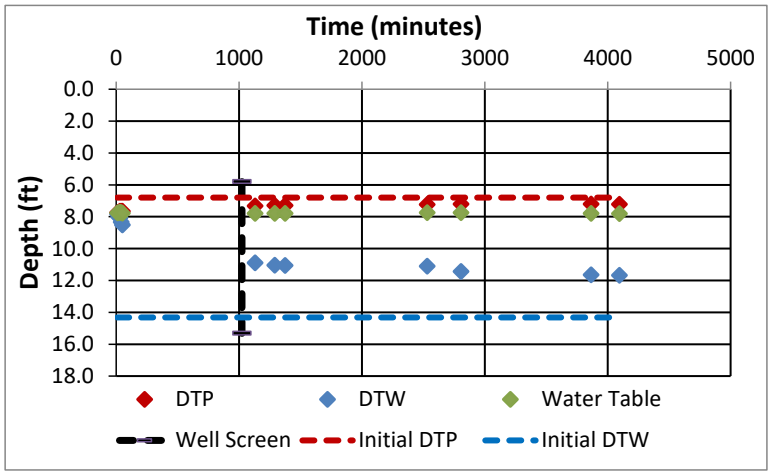
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	15:55
Volume of LNAPL Removed (gallons)	1.25	Time LNAPL Removal is Completed (time)	15:15
Volume of Groundwater Removed (gallons)	NA	Time to Remove LNAPL (minutes)	20.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
06/28/22	3:55:00 PM	-20.00	6.80	14.32	7.52	Initial Fluid Levels/Removal starts
06/28/22	4:15:00 PM	0.00	None	8.00	#VALUE!	Test Starts
06/28/22	4:25:00 PM	10.00	7.75	7.85	0.10	
06/28/22	4:35:00 PM	20.00	7.71	8.02	0.31	
06/28/22	4:45:00 PM	30.00	7.66	8.07	0.41	
06/28/22	4:55:00 PM	40.00	7.66	8.34	0.68	
06/28/22	5:05:00 PM	50.00	7.66	8.52	0.86	
06/29/22	11:05:00 AM	1130.00	7.32	10.90	3.58	
06/29/22	1:45:00 PM	1290.00	7.30	11.05	3.75	
06/29/22	3:10:00 PM	1375.00	7.30	11.06	3.76	
06/30/22	10:25:00 AM	2530.00	7.24	11.10	3.86	
06/30/22	3:00:00 PM	2805.00	7.20	11.43	4.23	
07/01/22	8:40:00 AM	3865.00	7.21	11.64	4.43	
07/01/22	12:30:00 PM	4095.00	7.22	11.68	4.46	

MW-83/84-38 06/28/2022





Abbreviations:

d = day

DTP = depth to product

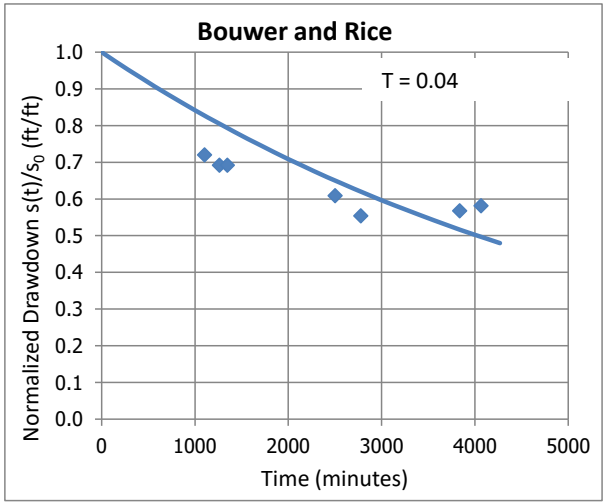
DTW = depth to water

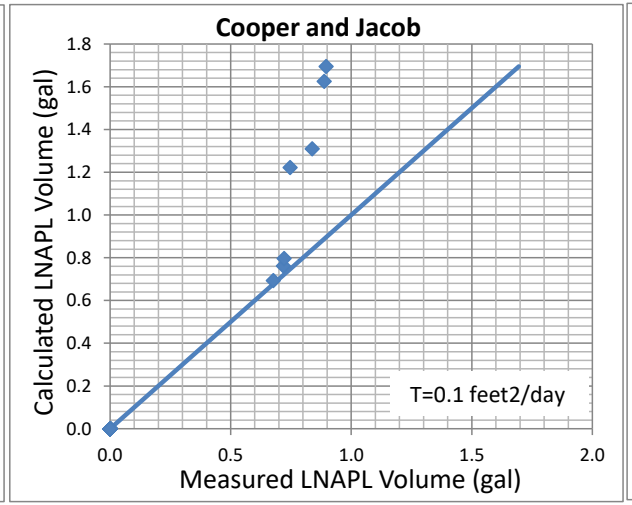
ft = feet

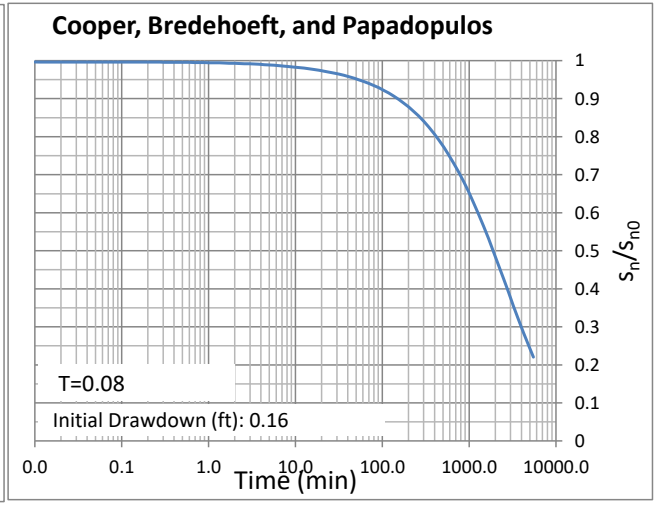
LNAPL = light non-aqueous phase liquid

s = drawdown

T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	RFI-83/84-49
Date and Time In	6/27/2022 11:20	Date and Time Out	7/1/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.925	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.497	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	14.11	Filter Pack Type	Global #1 Filterpack Sand
Depth to Top of Screen (feet)	4	Depth to Bottom of Screen (feet)	14
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	7.61	Test Date	06/27/22
Static Depth to Water (feet)	11.20	Start Time	11:20:00
LNAPL Thickness (feet)	3.59	Initial LNAPL Volume in Well (gallons)	

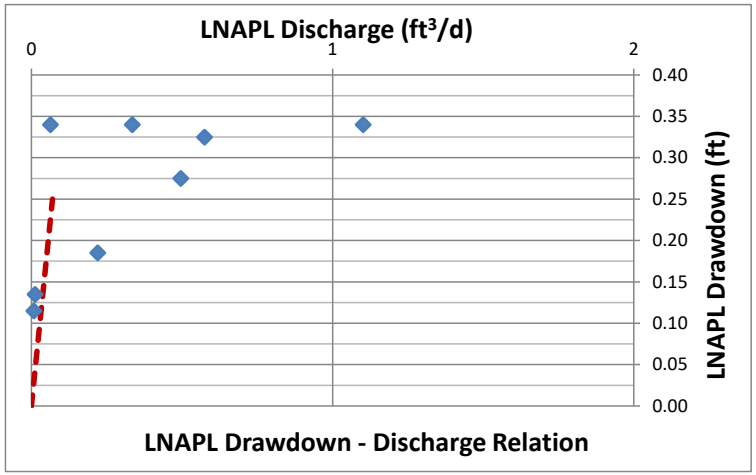
LNAPL Removal Information

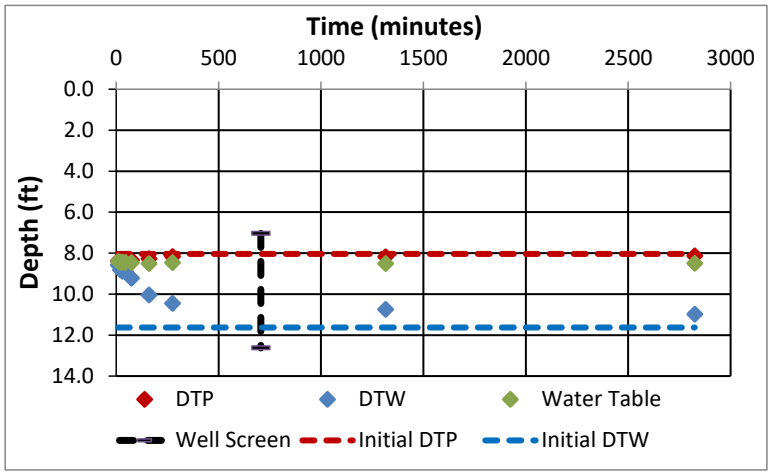
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	11:20
Volume of LNAPL Removed (gallons)	0.57	Time LNAPL Removal is Completed (time)	11:45
Volume of Groundwater Removed (gallons)	NA	Time to Remove LNAPL (minutes)	25.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
06/27/22	11:20:00 AM	-25.00	7.61	11.20	3.59	Initial Fluid Levels/Removal starts
06/27/22	11:45:00 AM	0.00	None	8.00	#VALUE!	Test Starts
06/27/22	11:55:00 AM	10.00	7.95	8.15	0.20	
06/27/22	12:05:00 PM	20.00	7.95	8.38	0.43	
06/27/22	12:15:00 PM	30.00	7.95	8.45	0.50	
06/27/22	12:30:00 PM	45.00	7.95	8.47	0.52	
06/27/22	1:00:00 PM	75.00	7.92	8.80	0.88	
06/27/22	2:25:00 PM	160.00	7.85	9.61	1.76	
06/27/22	4:20:00 PM	275.00	7.74	10.03	2.29	
06/28/22	9:40:00 AM	1315.00	7.75	10.32	2.57	
06/28/22	3:40:00 PM	1675.00	7.64	10.18	2.54	
06/29/22	10:50:00 AM	2825.00	7.70	10.55	2.85	
06/29/22	1:30:00 PM	2985.00	7.75	10.35	2.60	
06/29/22	3:15:00 PM	3090.00	7.66	10.35	2.69	
06/30/22	9:50:00 AM	4205.00	7.66	10.30	2.64	
06/30/22	2:50:00 PM	4505.00	7.69	10.30	2.61	
07/01/22	8:30:00 AM	5565.00	7.69	10.37	2.68	
07/01/22	12:20:00 PM	5795.00	7.69	10.37	2.68	

RFI-83/84-49 06/27/2022





Abbreviations:

d = day

DTP = depth to product

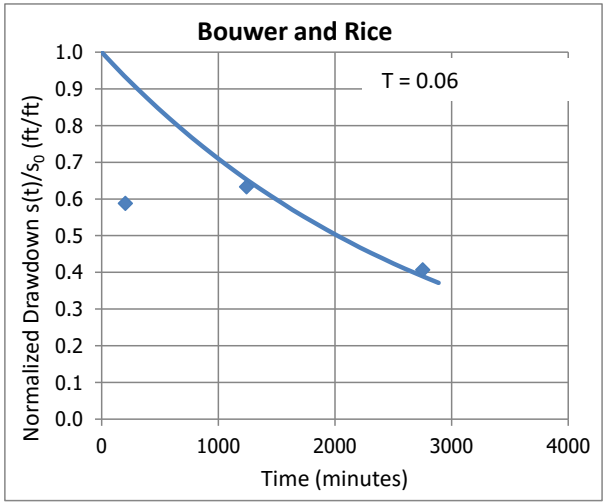
DTW = depth to water

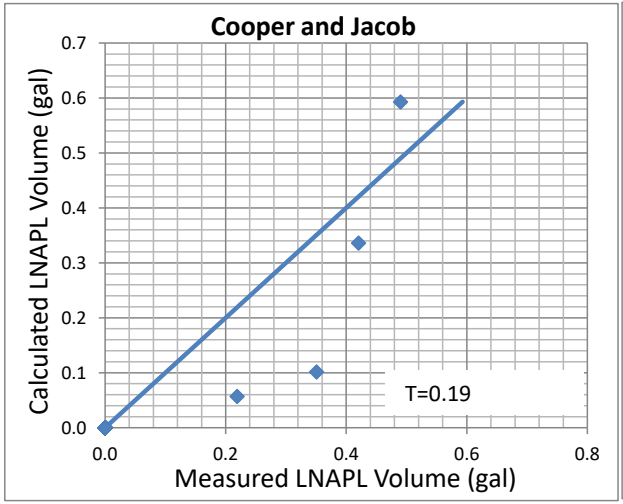
ft = feet

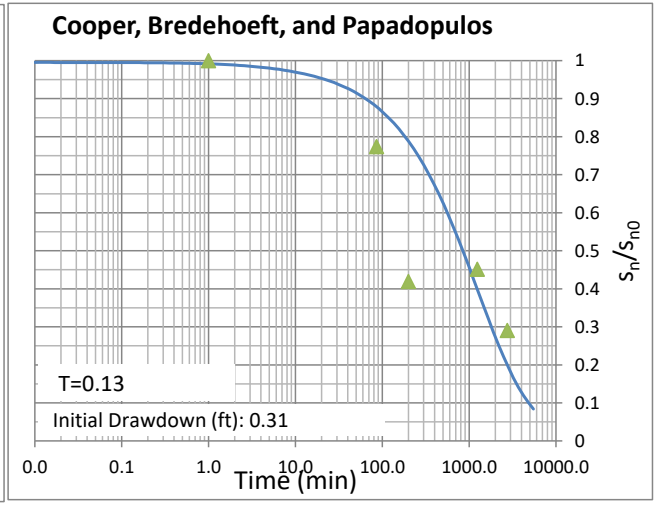
LNAPL = light non-aqueous phase liquid

s = drawdown

T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	TW-70-101-2
Date and Time In	7/11/2022 14:25	Date and Time Out	7/15/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.753	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.455	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	14.37	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	15
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	7.70	Test Date	07/11/22
Static Depth to Water (feet)	9.50	Start Time	14:25:00
LNAPL Thickness (feet)	1.80	Initial LNAPL Volume in Well (gallons)	

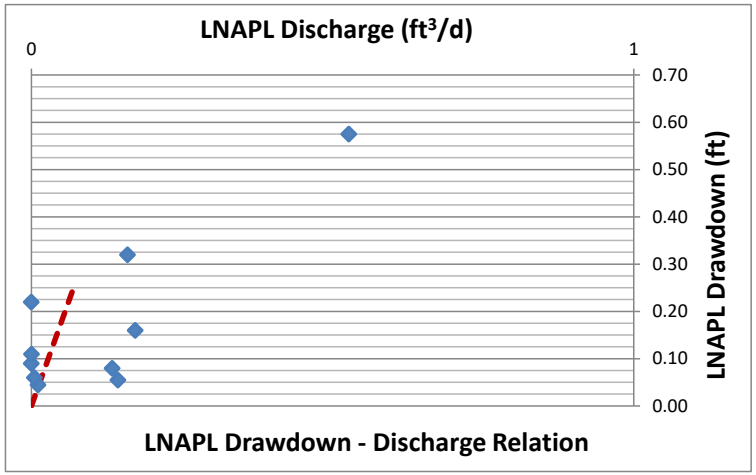
LNAPL Removal Information

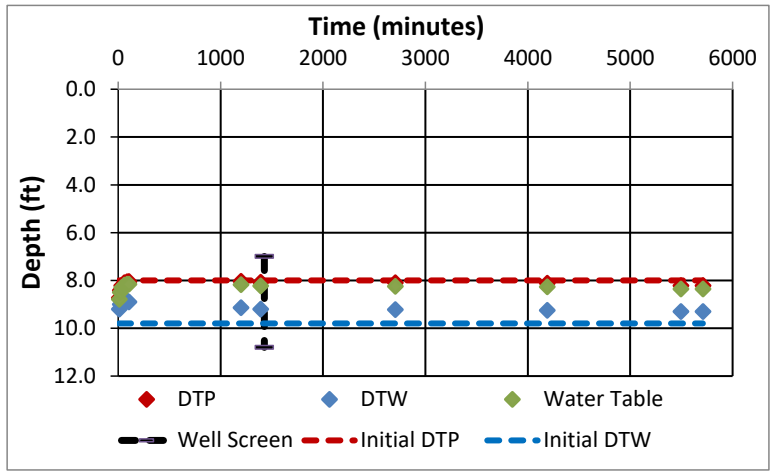
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	14:25
Volume of LNAPL Removed (gallons)	0.29	Time LNAPL Removal is Completed (time)	14:45
Volume of Groundwater Removed (gallons)	None	Time to Remove LNAPL (minutes)	20.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
07/11/22	2:25:00 PM	-20.00	7.70	9.50	1.80	Initial Fluid Levels/Removal starts
07/11/22	2:45:00 PM	0.00	None	9.96	0.00	Test Starts
07/11/22	2:55:00 PM	10.00	8.43	8.90	0.47	
07/11/22	3:05:00 PM	20.00	8.12	8.70	0.58	
07/11/22	3:20:00 PM	35.00	7.92	8.55	0.63	
07/11/22	3:45:00 PM	60.00	7.80	8.52	0.72	
07/11/22	4:10:00 PM	85.00	7.76	8.55	0.79	
07/11/22	4:30:00 PM	105.00	7.75	8.60	0.85	
07/12/22	10:45:00 AM	1200.00	7.74	8.84	1.10	
07/12/22	1:55:00 PM	1390.00	7.78	8.90	1.12	
07/12/22	3:35:00 PM	1490.00	7.78	8.85	1.07	
07/13/22	11:50:00 AM	2705.00	7.80	8.92	1.12	
07/14/22	12:35:00 PM	4190.00	7.82	8.95	1.13	
07/14/22	3:50:00 PM	4385.00	7.87	8.95	1.08	
07/15/22	10:20:00 AM	5495.00	7.92	9.00	1.08	
07/15/22	1:55:00 PM	5710.00	7.92	9.00	1.08	

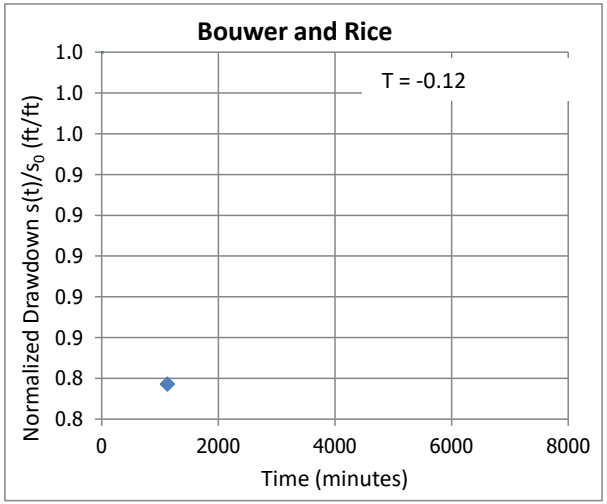
TW-70-101-2 07/11/2022

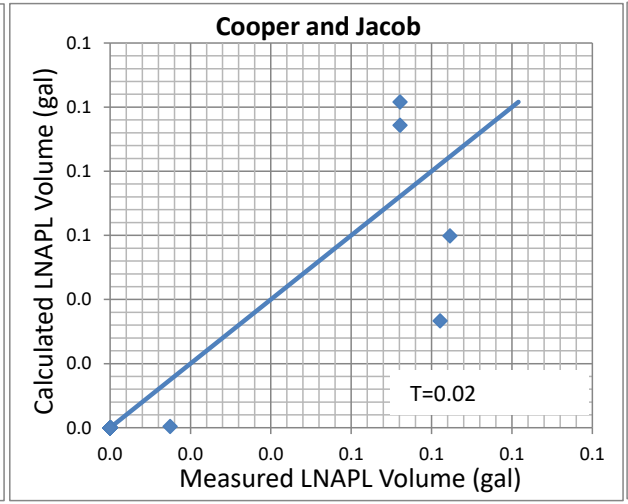


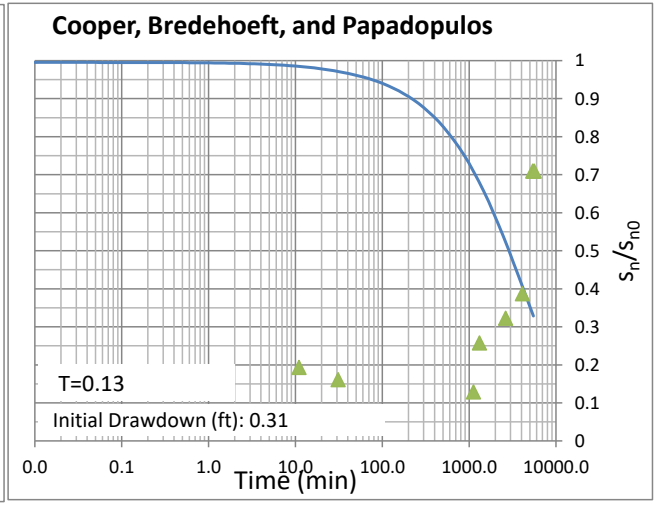


Abbreviations:

d = day
DTP = depth to product
DTW = depth to water
ft = feet
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	TW-70-101-7
Date and Time In	7/12/2022 11:00	Date and Time Out	7/15/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.753	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.455	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	14.37	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	15
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	5.18	Test Date	07/12/22
Static Depth to Water (feet)	6.65	Start Time	11:00:00
LNAPL Thickness (feet)	1.47	Initial LNAPL Volume in Well (gallons)	

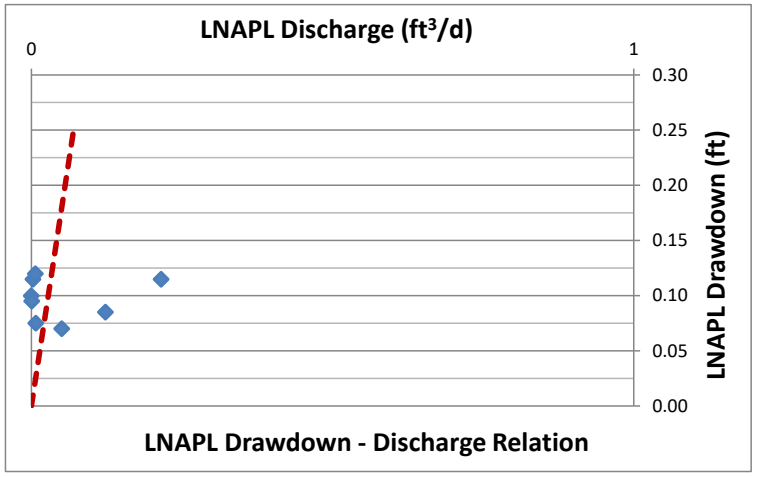
LNAPL Removal Information

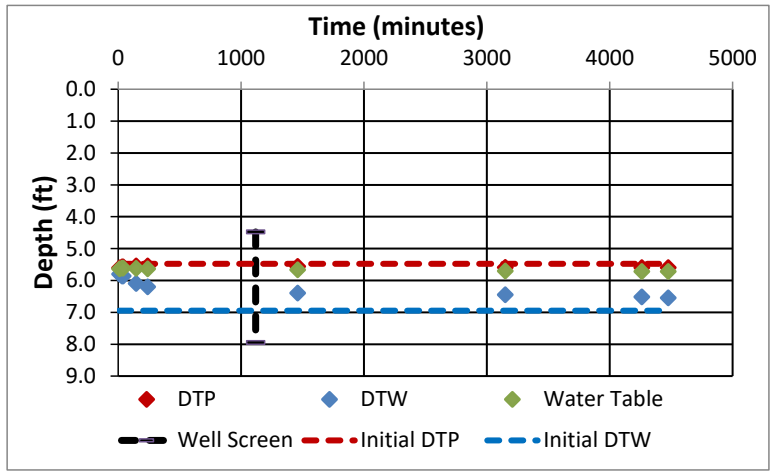
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	11:00
Volume of LNAPL Removed (gallons)	0.23	Time LNAPL Removal is Completed (time)	11:25
Volume of Groundwater Removed (gallons)	None	Time to Remove LNAPL (minutes)	25.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
07/12/22	11:00:00 AM	-25.00	5.18	6.65	1.47	Initial Fluid Levels/Removal starts
07/12/22	11:25:00 AM	0.00	None	5.80	0.00	Test Starts
07/12/22	11:35:00 AM	10.00	5.31	5.50	0.19	
07/12/22	11:45:00 AM	20.00	5.28	5.45	0.17	
07/12/22	11:55:00 AM	30.00	5.28	5.56	0.28	
07/12/22	12:05:00 PM	40.00	5.28	5.56	0.28	
07/12/22	1:50:00 PM	145.00	5.25	5.80	0.55	
07/12/22	3:25:00 PM	240.00	5.25	5.90	0.65	
07/13/22	11:45:00 AM	1460.00	5.26	6.10	0.84	
07/14/22	12:30:00 PM	2945.00	5.30	6.20	0.90	
07/14/22	3:55:00 PM	3150.00	5.29	6.15	0.86	
07/15/22	10:25:00 AM	4260.00	5.30	6.22	0.92	
07/15/22	2:00:00 PM	4475.00	5.30	6.25	0.95	

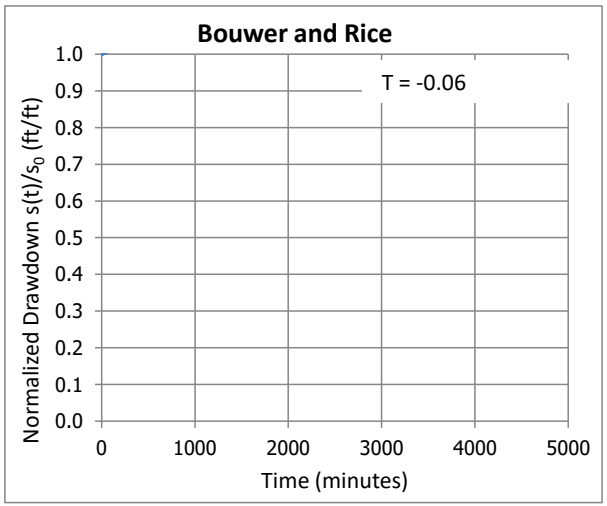
TW-70-101-7 07/12/2022

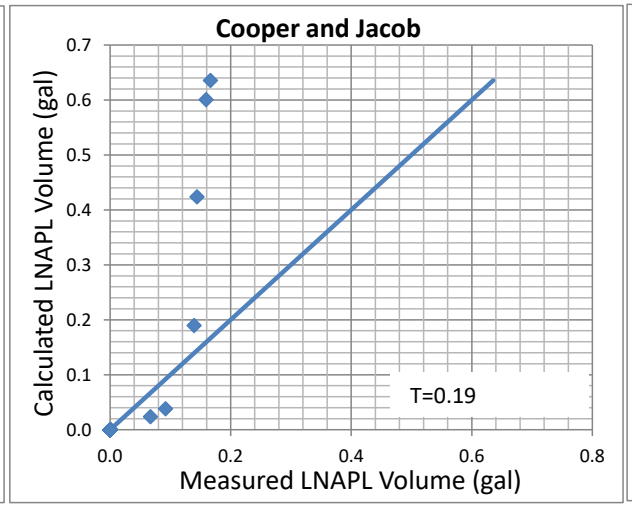


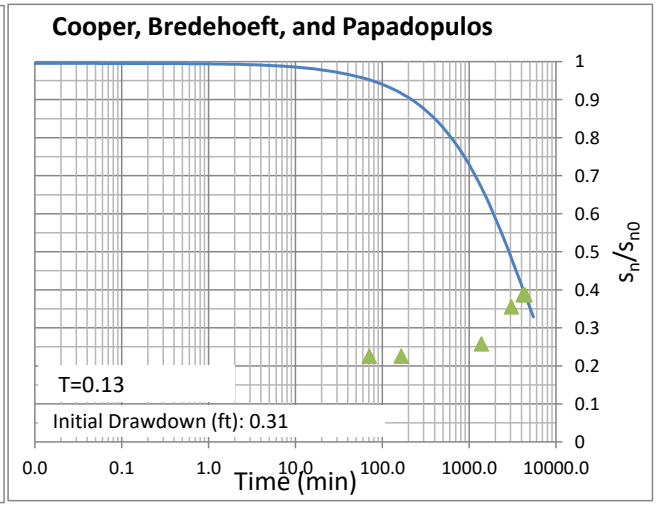


Abbreviations:

d = day
DTP = depth to product
DTW = depth to water
ft = feet
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	TW-70-103-11
Date and Time In	7/12/2022 12:35	Date and Time Out	7/13/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.753	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.455	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	14.37	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	15
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	5.25	Test Date	07/12/22
Static Depth to Water (feet)	6.27	Start Time	12:35:00
LNAPL Thickness (feet)	1.02	Initial LNAPL Volume in Well (gallons)	

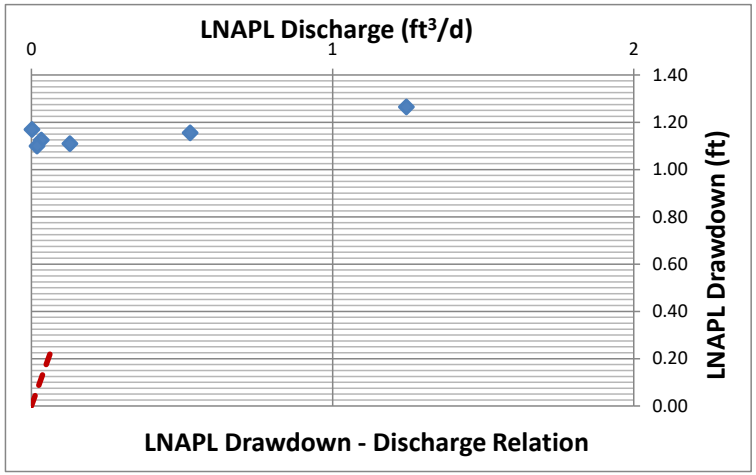
LNAPL Removal Information

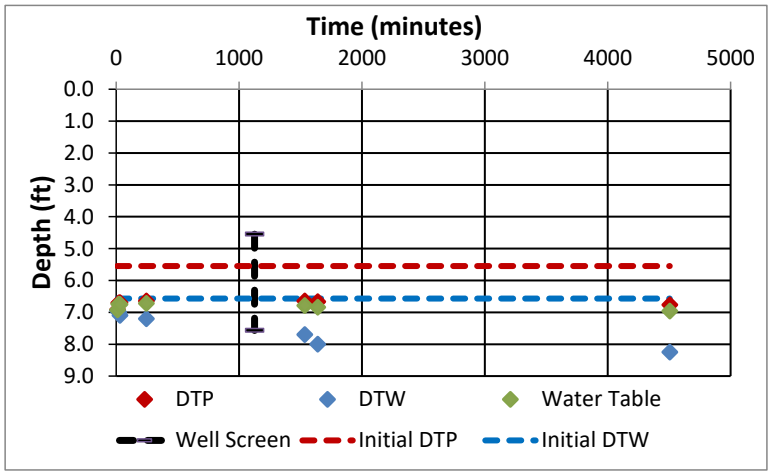
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	12:35
Volume of LNAPL Removed (gallons)	0.16	Time LNAPL Removal is Completed (time)	12:55
Volume of Groundwater Removed (gallons)	None	Time to Remove LNAPL (minutes)	20.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
07/12/22	12:35:00 PM	-20.00	5.25	6.27	1.02	Initial Fluid Levels/Removal starts
07/12/22	12:55:00 PM	0.00	None	6.45	0.00	Test Starts
07/12/22	1:05:00 PM	10.00	6.42	6.65	0.23	
07/12/22	1:15:00 PM	20.00	6.41	6.70	0.29	
07/12/22	1:25:00 PM	30.00	6.40	6.80	0.40	
07/12/22	1:35:00 PM	40.00	6.40	6.82	0.42	
07/12/22	1:45:00 PM	50.00	6.40	6.88	0.48	
07/12/22	3:20:00 PM	145.00	6.38	7.20	0.82	
07/13/22	11:55:00 AM	1380.00	6.40	7.40	1.00	

TW-70-103-11 07/12/2022





Abbreviations:

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DTW = depth to water
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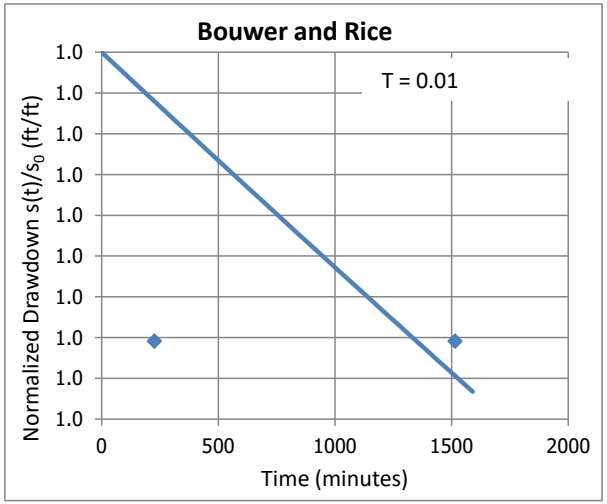
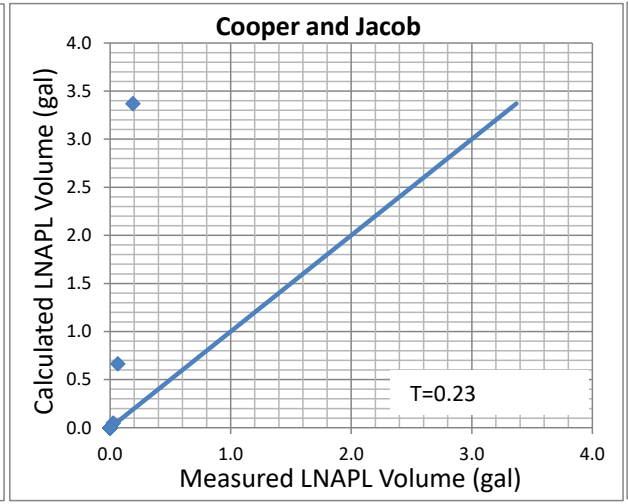
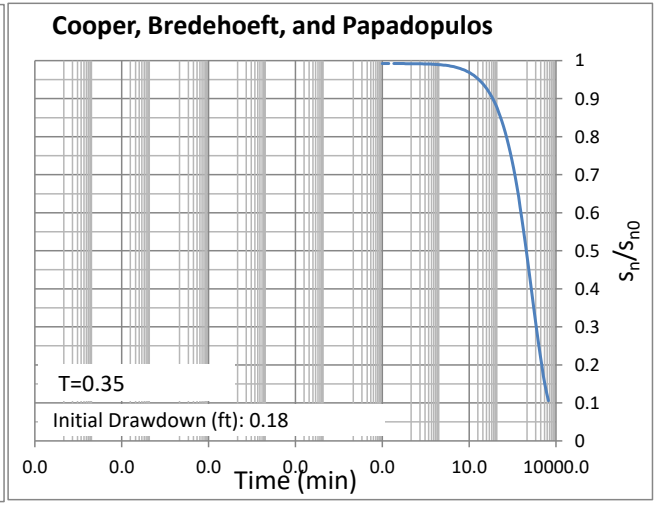
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	70-107R
Date and Time In	7/11/2022 11:25	Date and Time Out	7/15/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.753	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.455	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	14.37	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	15
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	4.52	Test Date	07/11/22
Static Depth to Water (feet)	7.20	Start Time	11:25:00
LNAPL Thickness (feet)	2.68	Initial LNAPL Volume in Well (gallons)	

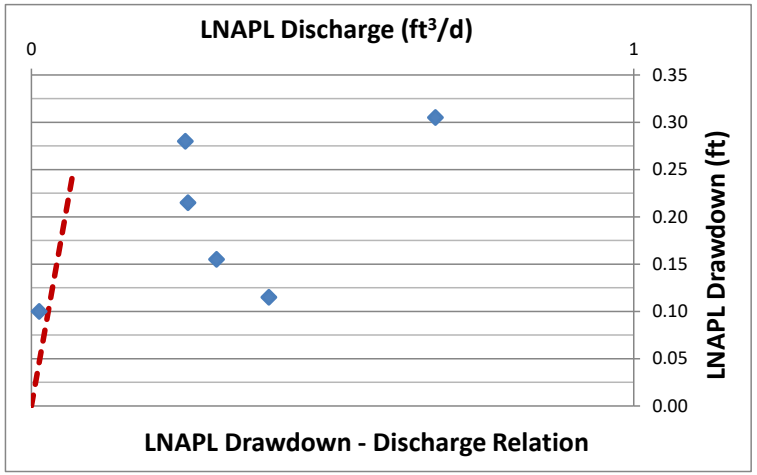
LNAPL Removal Information

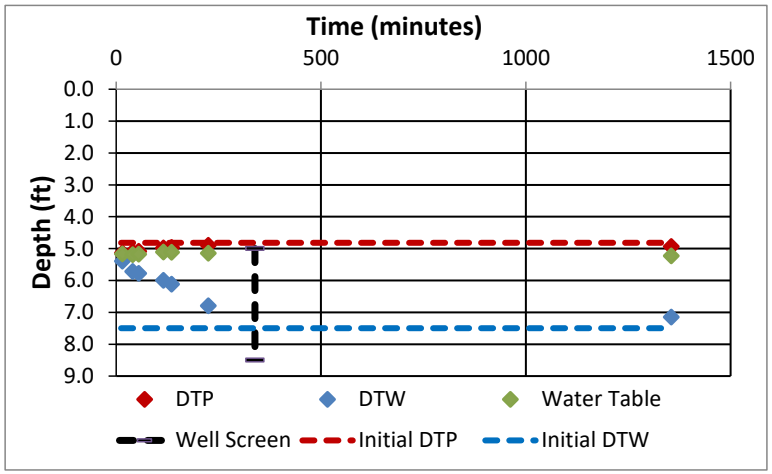
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	11:25
Volume of LNAPL Removed (gallons)	0.42	Time LNAPL Removal is Completed (time)	12:00
Volume of Groundwater Removed (gallons)	None	Time to Remove LNAPL (minutes)	35.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
07/11/22	11:25:00 AM	-35.00	4.52	7.20	2.68	Initial Fluid Levels/Removal starts
07/11/22	12:00:00 PM	0.00	None	5.00	0.00	Test Starts
07/11/22	12:15:00 PM	15.00	4.84	5.10	0.26	
07/11/22	12:25:00 PM	25.00	4.80	5.55	0.75	
07/11/22	12:40:00 PM	40.00	4.81	5.42	0.61	
07/11/22	12:55:00 PM	55.00	4.79	5.48	0.69	
07/11/22	1:55:00 PM	115.00	4.68	5.70	1.02	
07/11/22	2:15:00 PM	135.00	4.67	5.82	1.15	
07/11/22	3:45:00 PM	225.00	4.60	6.50	1.90	
07/12/22	10:35:00 AM	1355.00	4.64	6.85	2.21	
07/12/22	2:15:00 PM	1575.00	4.64	6.95	2.31	
07/12/22	3:45:00 PM	1665.00	4.64	6.95	2.31	
07/13/22	11:30:00 AM	2850.00	4.70	6.90	2.20	
07/14/22	11:15:00 AM	4275.00	4.75	7.07	2.32	
07/14/22	3:35:00 PM	4535.00	4.75	7.05	2.30	
07/15/22	10:05:00 AM	5645.00	4.78	7.10	2.32	
07/15/22	1:45:00 PM	5865.00	4.75	7.08	2.33	

70-107R 07/11/2022





Abbreviations:

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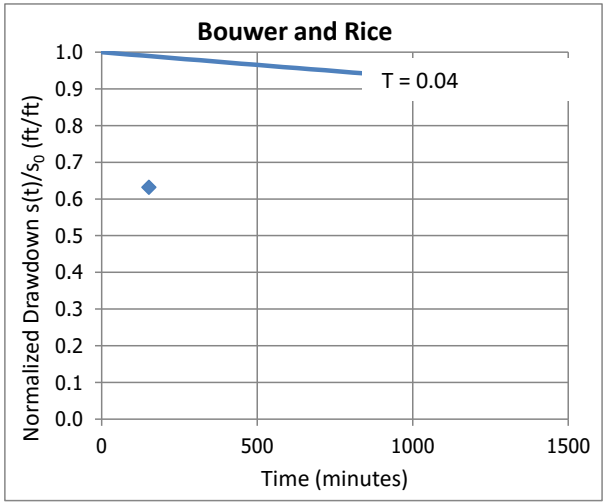
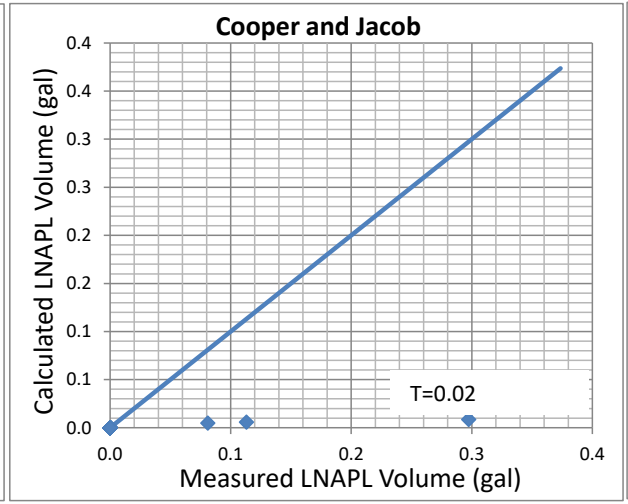
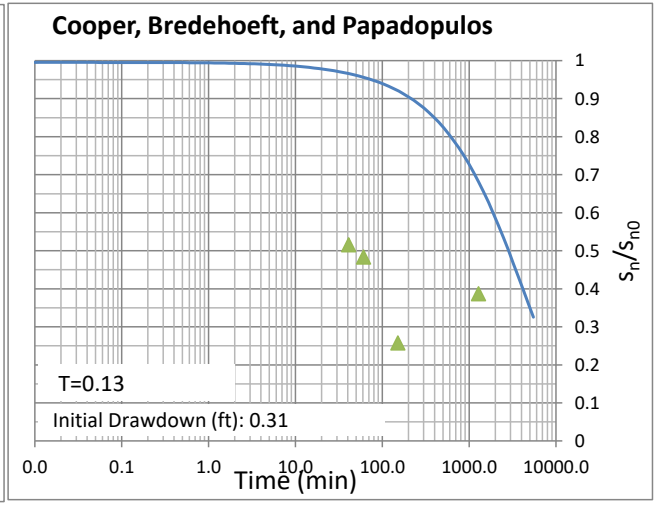
DTW = depth to water
ft = feet
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	TW-70-107R-9
Date and Time In	7/11/2022 12:20	Date and Time Out	7/14/2022
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	746.753	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	746.455	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	14.37	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	15
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	4

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.87

Initial Test Conditions

Static Depth to LNAPL (feet)	6.27	Test Date	07/11/22
Static Depth to Water (feet)	7.87	Start Time	12:20:00
LNAPL Thickness (feet)	1.60	Initial LNAPL Volume in Well (gallons)	

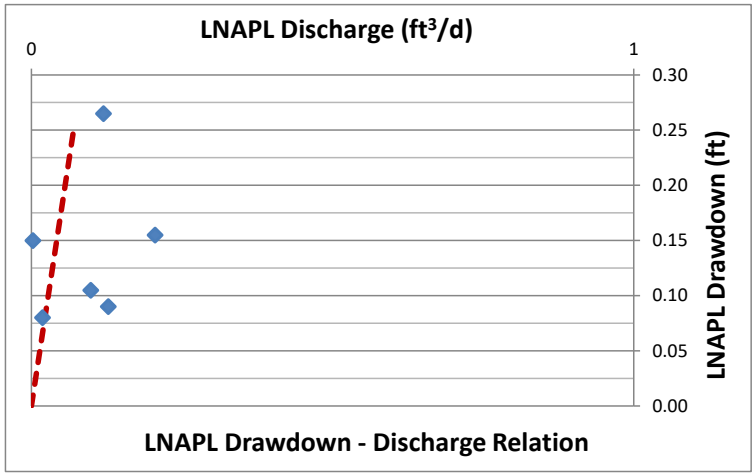
LNAPL Removal Information

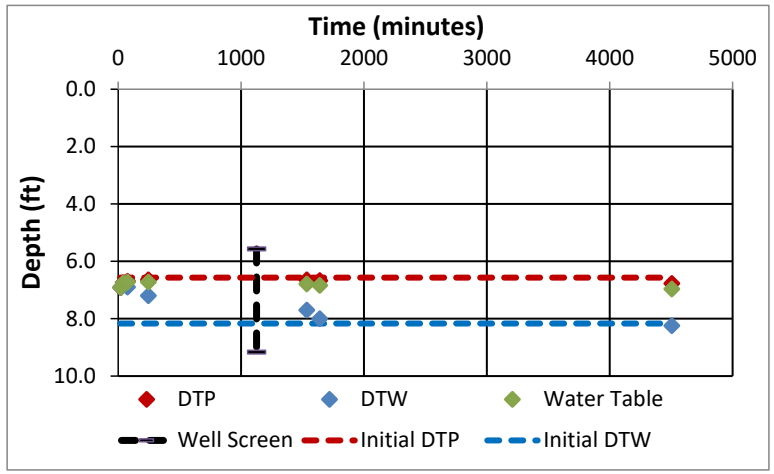
LNAPL Removal Method/Equipment	Bailer	LNAPL Removal Begins (time)	12:20
Volume of LNAPL Removed (gallons)	0.26	Time LNAPL Removal is Completed (time)	12:35
Volume of Groundwater Removed (gallons)	None	Time to Remove LNAPL (minutes)	15.00

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
07/11/22	12:20:00 PM	-15.00	6.27	7.87	1.60	Initial Fluid Levels/Removal starts
07/11/22	12:35:00 PM	0.00	None	7.55	0.00	Test Starts
07/11/22	12:55:00 PM	20.00	None	6.62	0.00	
07/11/22	1:15:00 PM	40.00	6.45	6.50	0.05	
07/11/22	1:50:00 PM	75.00	6.40	6.60	0.20	
07/11/22	2:10:00 PM	95.00	6.45	6.63	0.18	
07/11/22	4:40:00 PM	245.00	6.35	6.90	0.55	
07/12/22	10:30:00 AM	1315.00	6.36	7.75	1.39	
07/12/22	2:10:00 PM	1535.00	6.35	7.40	1.05	
07/12/22	3:55:00 PM	1640.00	6.37	7.70	1.33	
07/13/22	11:25:00 AM	2810.00	6.42	7.65	1.23	
07/14/22	11:20:00 AM	4245.00	6.47	7.75	1.28	
07/14/22	3:40:00 PM	4505.00	6.47	7.95	1.48	

TW-70-107R-9 07/11/2022





Abbreviations:

d = day
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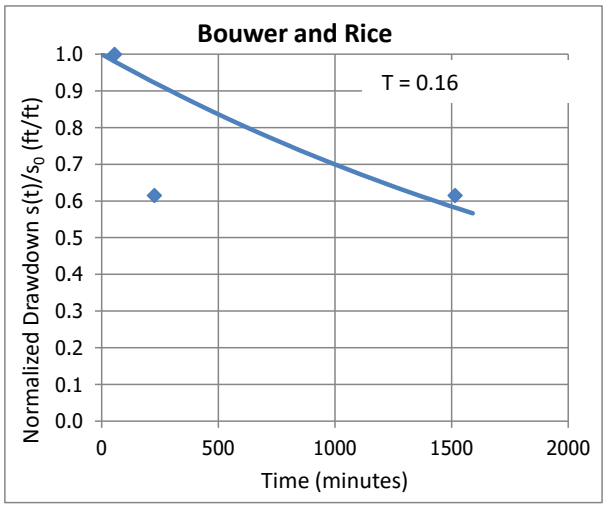
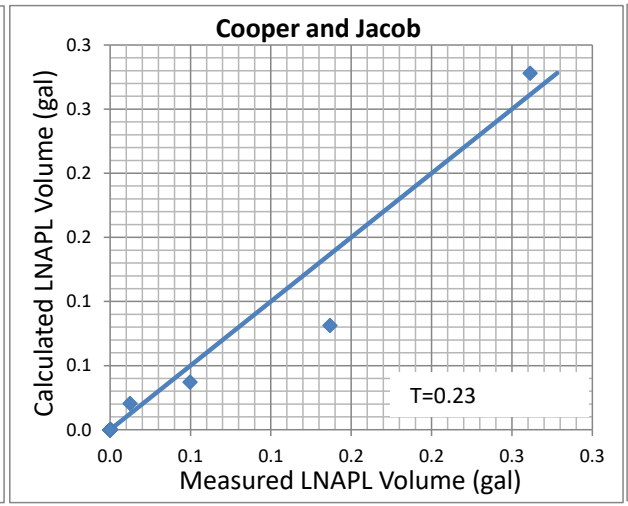
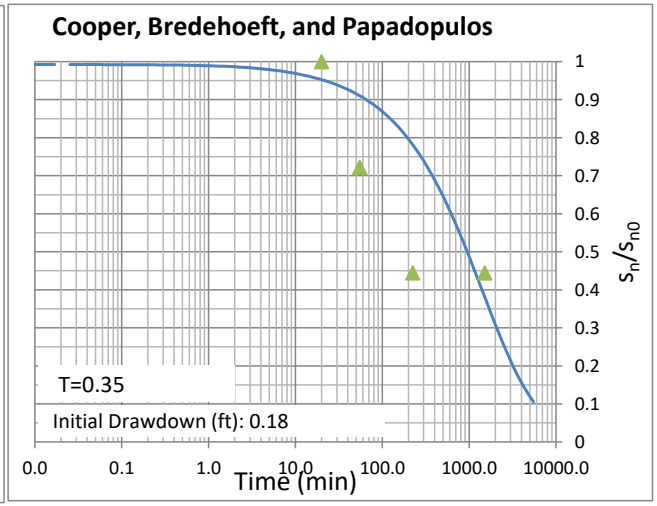
DTW = depth to water
ft = feet
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	03-03-R2
Date and Time In	10/18/2022 10:25	Date and Time Out	10/19/2022 10:00
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	100	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	100	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	18.5	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	8

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.85

Initial Test Conditions

Static Depth to LNAPL (feet)	10.15	Test Date	10/18/22
Static Depth to Water (feet)	11.30	Start Time	
LNAPL Thickness (feet)	1.15	Initial LNAPL Volume in Well (gallons)	

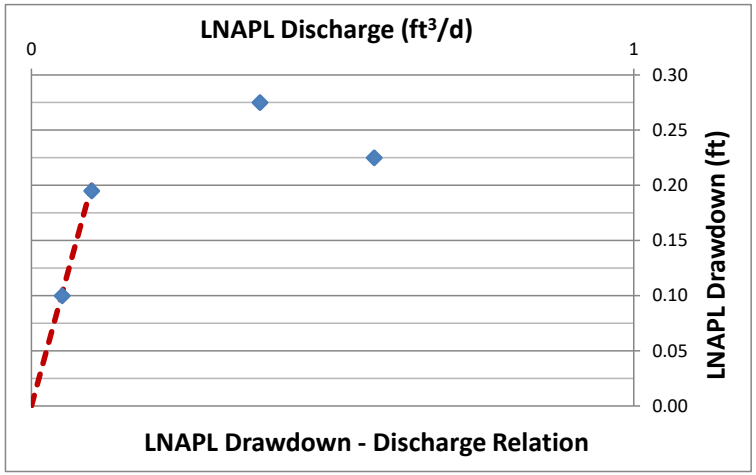
LNAPL Removal Information

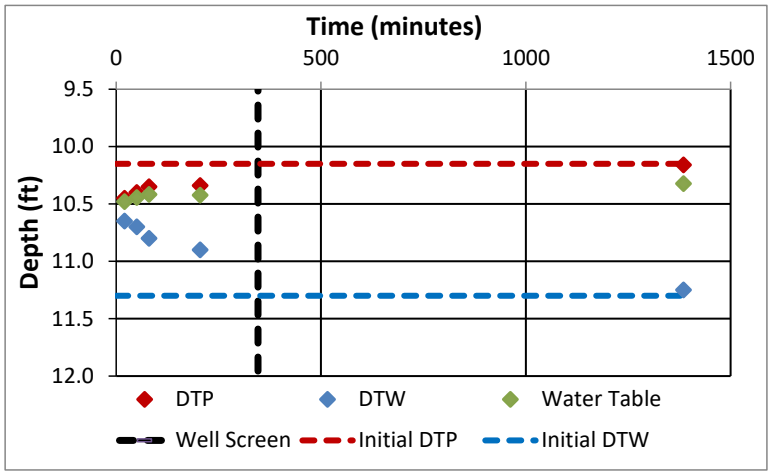
LNAPL Removal Method/Equipment		LNAPL Removal Begins (time)	
Volume of LNAPL Removed (gallons)		Time LNAPL Removal is Completed (time)	
Volume of Groundwater Removed (gallons)		Time to Remove LNAPL (minutes)	

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
10/18/22	10:25:00 AM	-30.00	10.15	11.30	1.15	Initial Fluid Levels/Removal starts
10/18/22	10:55:00 AM	0.00	11.50	11.50	0.00	Test Starts
10/18/22	11:15:00 AM	20.00	10.45	10.65	0.20	
10/18/22	11:45:00 AM	50.00	10.40	10.70	0.30	
10/18/22	12:15:00 PM	80.00	10.35	10.80	0.45	
10/18/22	2:20:00 PM	205.00	10.34	10.90	0.56	
10/19/22	10:00:00 AM	1385.00	10.16	11.25	1.09	

03-03-R2 10/18/2022





Abbreviations:

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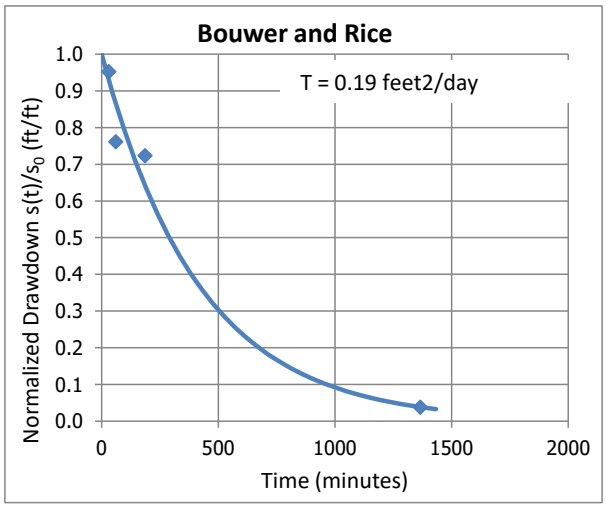
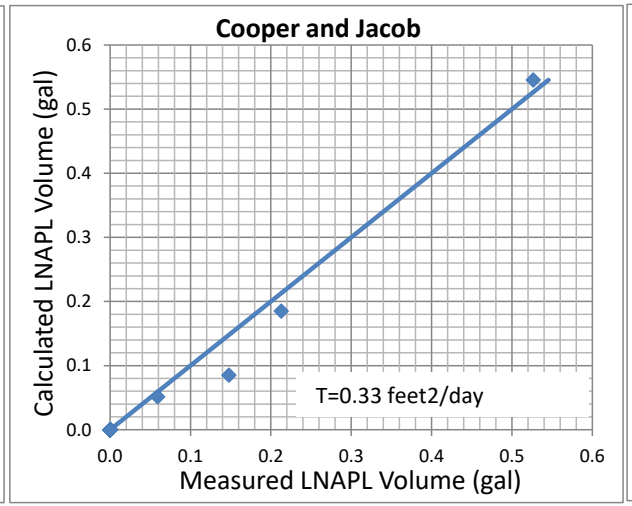
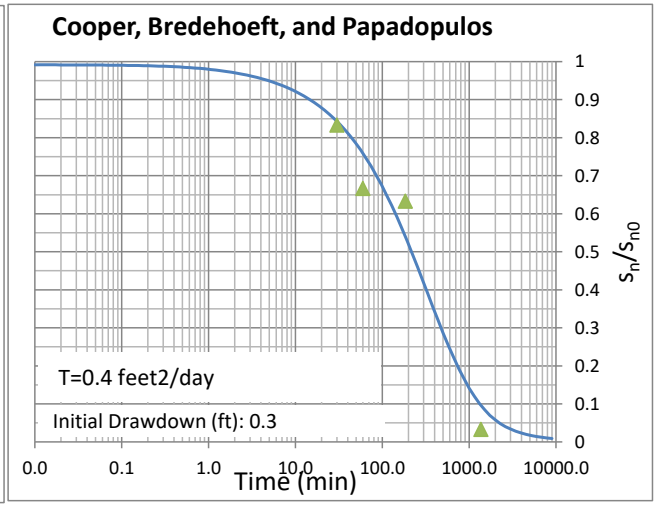
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	20-FP8
Date and Time In	10/17/2022 1:15	Date and Time Out	10/17/2022 2:20
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	100	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	100	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	18.5	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	8

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.85

Initial Test Conditions

Static Depth to LNAPL (feet)	8.38	Test Date	10/17/22
Static Depth to Water (feet)	9.10	Start Time	
LNAPL Thickness (feet)	0.72	Initial LNAPL Volume in Well (gallons)	

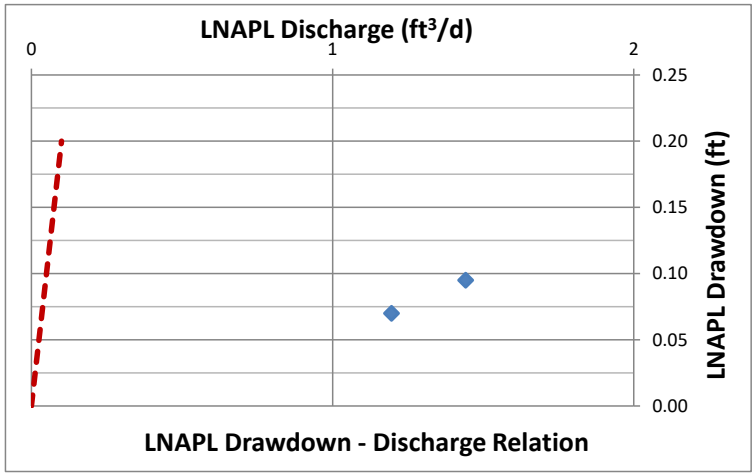
LNAPL Removal Information

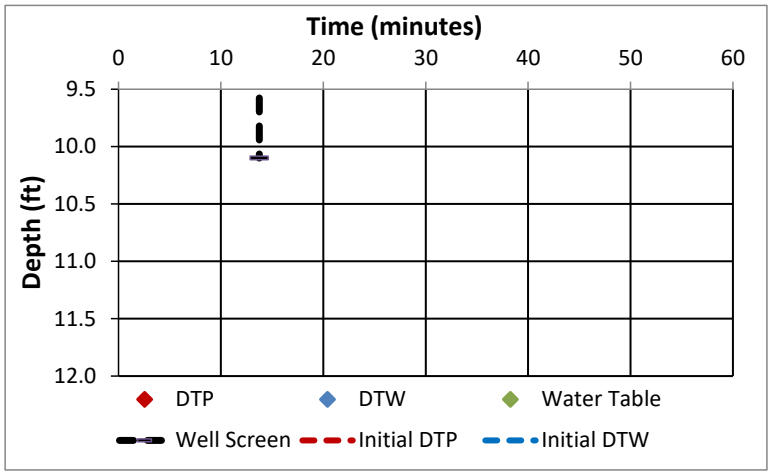
LNAPL Removal Method/Equipment		LNAPL Removal Begins (time)	
Volume of LNAPL Removed (gallons)		Time LNAPL Removal is Completed (time)	
Volume of Groundwater Removed (gallons)		Time to Remove LNAPL (minutes)	

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
10/17/22	1:15:00 PM	-10.00	8.38	9.10	0.72	Initial Fluid Levels/Removal starts
10/17/22	1:25:00 PM	0.00	8.53	8.53	0.00	Test Starts
10/17/22	1:45:00 PM	20.00	8.49	8.90	0.41	
10/17/22	2:00:00 PM	35.00	8.46	9.06	0.60	
10/17/22	2:20:00 PM	55.00	8.44	9.25	0.81	

20-FP8 10/17/2022





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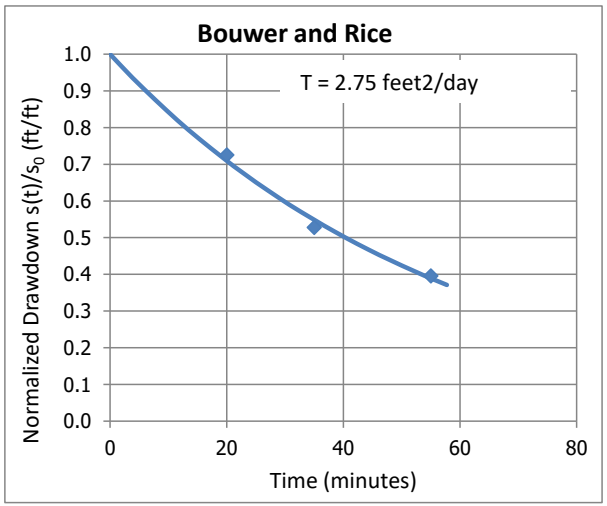
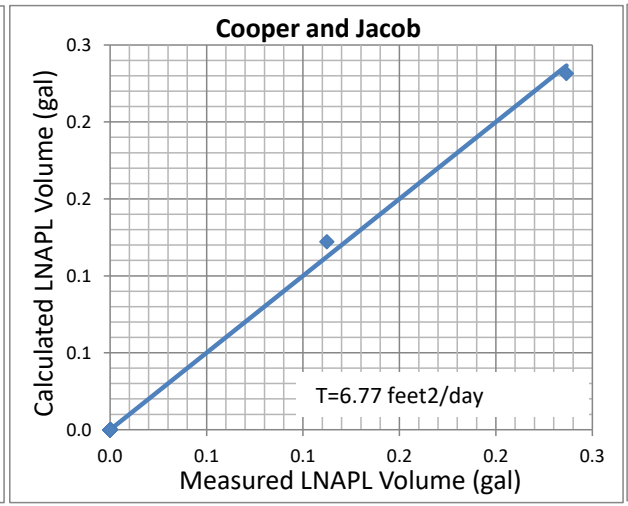
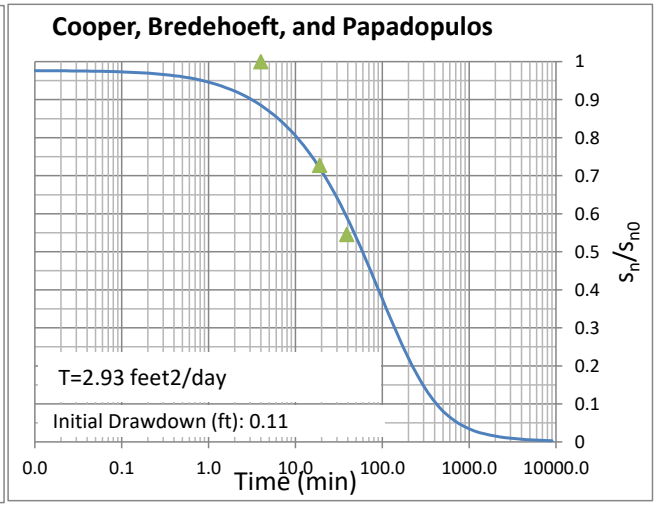






LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	MW-36-42
Date and Time In	10/18/2022 2:05	Date and Time Out	10/24/2022 10:09
Personnel	Samantha Szpaichler	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	100	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	100	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	18.5	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	8

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.85

Initial Test Conditions

Static Depth to LNAPL (feet)	9.04	Test Date	10/17/22
Static Depth to Water (feet)	17.80	Start Time	
LNAPL Thickness (feet)	8.76	Initial LNAPL Volume in Well (gallons)	

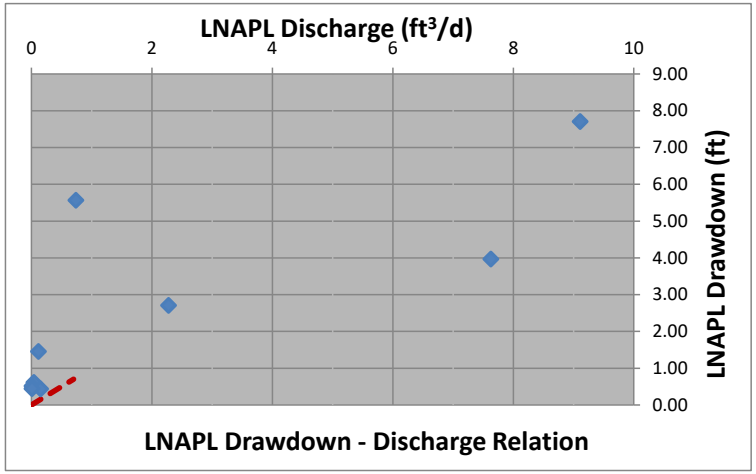
LNAPL Removal Information

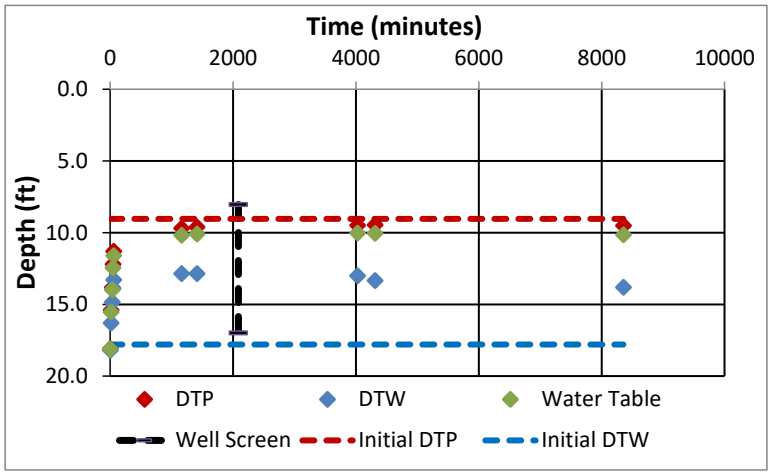
LNAPL Removal Method/Equipment		LNAPL Removal Begins (time)	
Volume of LNAPL Removed (gallons)		Time LNAPL Removal is Completed (time)	
Volume of Groundwater Removed (gallons)		Time to Remove LNAPL (minutes)	

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
10/18/22	2:05:00 PM	-50.00	9.04	17.80	8.76	Initial Fluid Levels/Removal starts
10/18/22	2:55:00 PM	0.00	18.20	18.20	0.00	Test Starts
10/18/22	3:00:00 PM	5.00	18.10	18.20	0.10	
10/18/22	3:10:00 PM	15.00	15.40	16.30	0.90	
10/18/22	3:30:00 PM	35.00	13.82	14.85	1.03	
10/18/22	3:40:00 PM	45.00	12.20	13.90	1.70	
10/18/22	3:55:00 PM	60.00	11.30	13.30	2.00	
10/19/22	10:20:00 AM	1165.00	9.70	12.85	3.15	
10/19/22	2:30:00 PM	1415.00	9.61	12.85	3.24	
10/21/22	10:00:00 AM	4025.00	9.50	13.00	3.50	
10/21/22	2:45:00 PM	4310.00	9.46	13.35	3.89	
10/24/22	10:09:00 AM	8354.00	9.51	13.81	4.30	

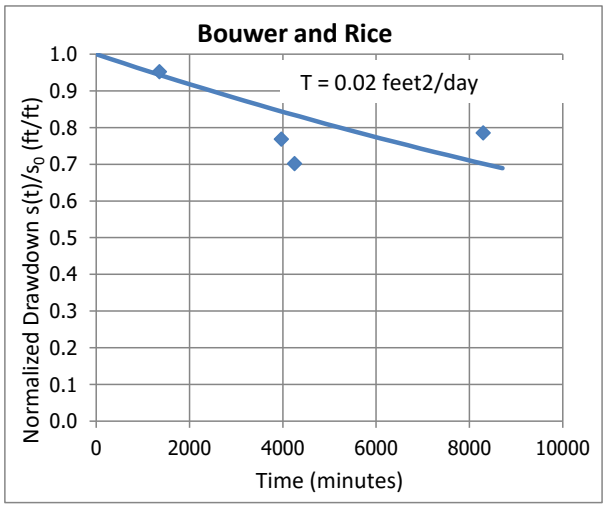
MW-36-42 10/18/2022

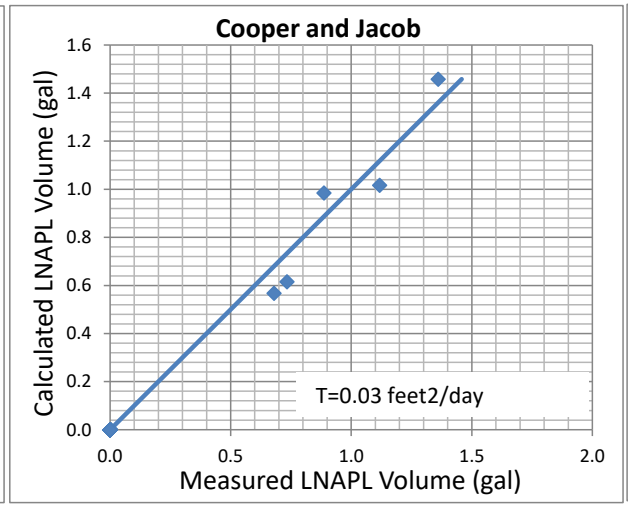


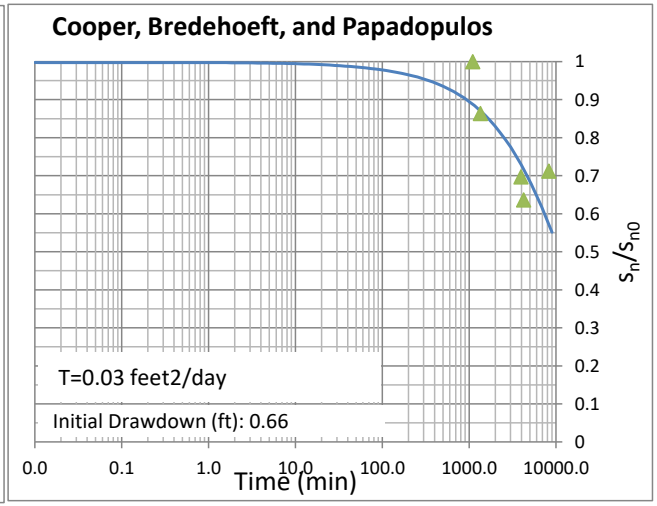


Abbreviations:

d = day
DTP = depth to product
DTW = depth to water
ft = feet
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	MW-83/84-7
Date and Time In	10/17/2022 1:40	Date and Time Out	10/18/2022 9:30
Personnel	Sommer Guy	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	100	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	100	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	18.5	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	8

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.85

Initial Test Conditions

Static Depth to LNAPL (feet)	8.18	Test Date	10/17/22
Static Depth to Water (feet)	10.60	Start Time	
LNAPL Thickness (feet)	2.42	Initial LNAPL Volume in Well (gallons)	

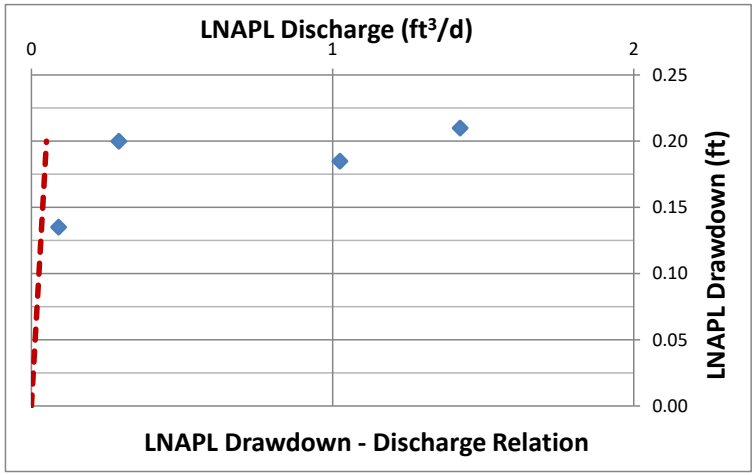
LNAPL Removal Information

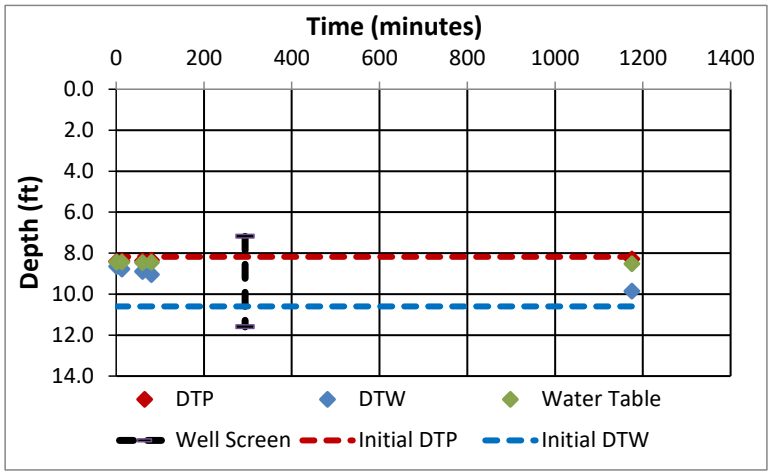
LNAPL Removal Method/Equipment		LNAPL Removal Begins (time)	
Volume of LNAPL Removed (gallons)		Time LNAPL Removal is Completed (time)	
Volume of Groundwater Removed (gallons)		Time to Remove LNAPL (minutes)	

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
10/17/22	1:40:00 PM	-15.00	8.18	10.60	2.42	Initial Fluid Levels/Removal starts
10/17/22	1:55:00 PM	0.00	8.65	8.65	0.00	Test Starts
10/17/22	1:56:00 PM	1.00	8.40	8.65	0.25	
10/17/22	2:08:00 PM	13.00	8.38	8.78	0.40	
10/17/22	2:55:00 PM	60.00	8.38	8.90	0.52	
10/17/22	3:15:00 PM	80.00	8.35	9.05	0.70	
10/18/22	9:30:00 AM	1175.00	8.28	9.85	1.57	

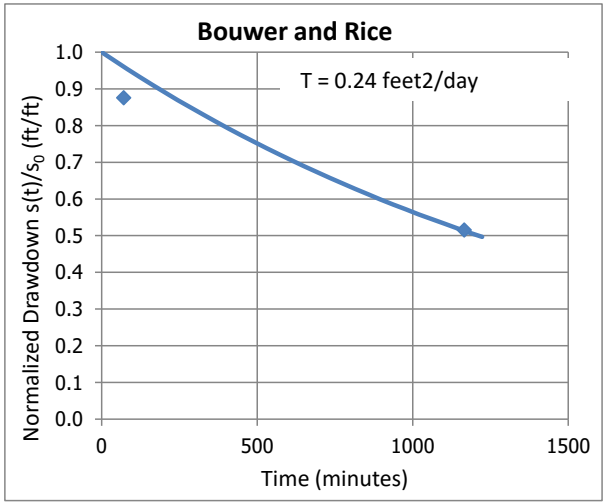
MW-83/84-7 10/17/2022

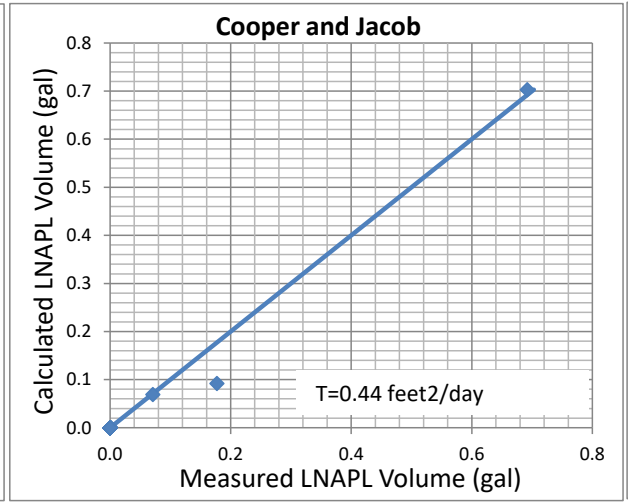


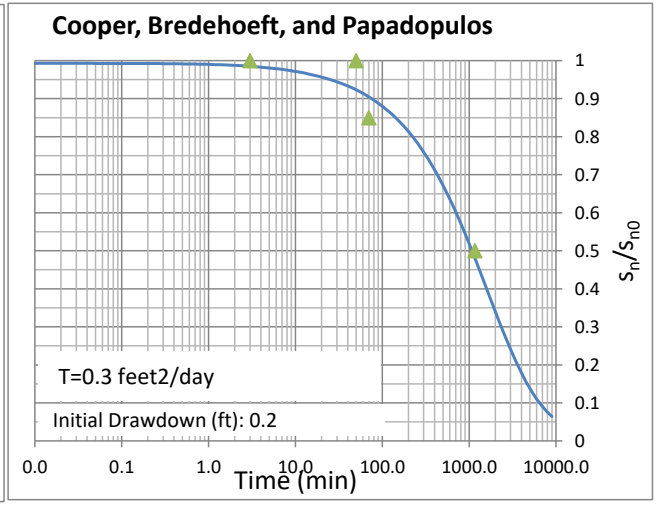


Abbreviations:

d = day
DTP = depth to product
DTW = depth to water
ft = feet
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	MW-83/84-15R
Date and Time In	10/17/2022 10:00	Date and Time Out	10/24/2022 11:12
Personnel	Sommer Guy	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	100	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	100	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	18.5	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	8

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.85

Initial Test Conditions

Static Depth to LNAPL (feet)	6.25	Test Date	10/17/22
Static Depth to Water (feet)	8.83	Start Time	
LNAPL Thickness (feet)	2.58	Initial LNAPL Volume in Well (gallons)	

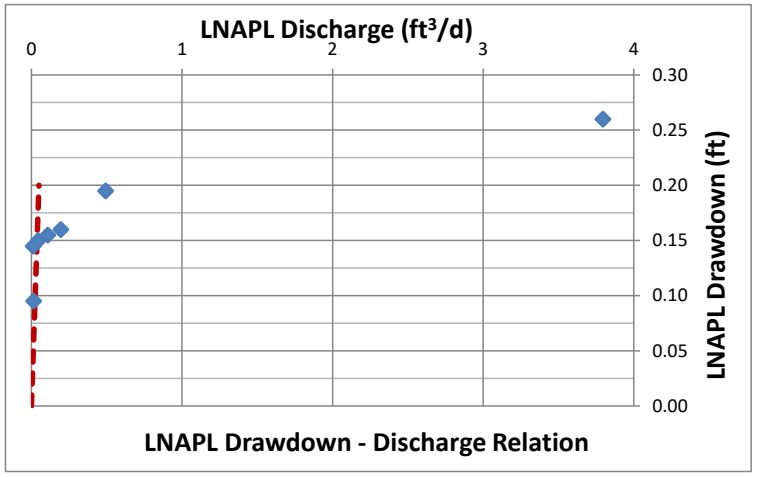
LNAPL Removal Information

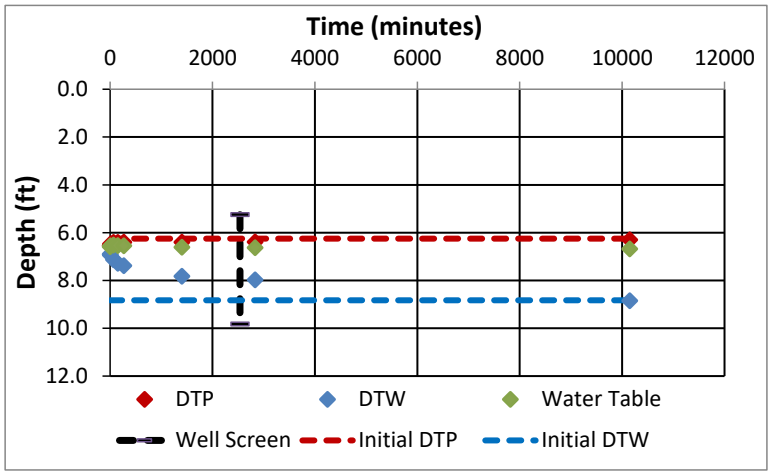
LNAPL Removal Method/Equipment		LNAPL Removal Begins (time)	
Volume of LNAPL Removed (gallons)		Time LNAPL Removal is Completed (time)	
Volume of Groundwater Removed (gallons)		Time to Remove LNAPL (minutes)	

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
10/17/22	10:00:00 AM	-6.00	6.25	8.83	2.58	Initial Fluid Levels/Removal starts
10/17/22	10:06:00 AM	0.00	6.90	6.90	0.00	Test Starts
10/17/22	10:07:00 AM	1.00	6.54	6.90	0.36	
10/17/22	10:10:00 AM	4.00	6.48	6.94	0.46	
10/17/22	11:10:00 AM	64.00	6.41	7.13	0.72	
10/17/22	12:37:00 PM	151.00	6.41	7.28	0.87	
10/17/22	2:32:00 PM	266.00	6.40	7.38	0.98	
10/18/22	9:25:00 AM	1399.00	6.40	7.83	1.43	
10/19/22	9:15:00 AM	2829.00	6.39	7.98	1.59	
10/24/22	11:12:00 AM	10146.00	6.30	8.85	2.55	

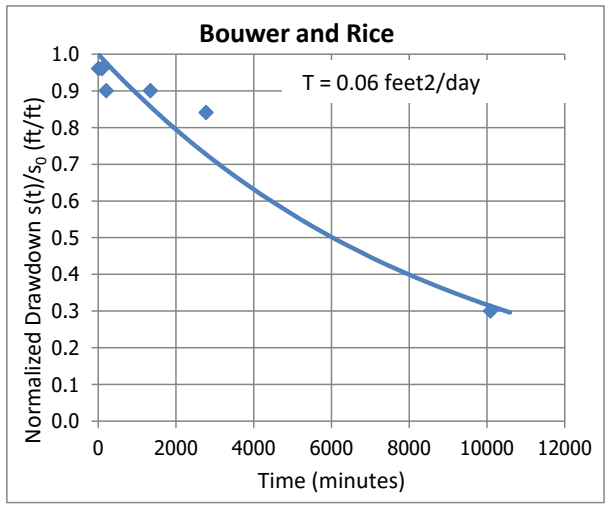
MW-83/84-15R 10/17/2022

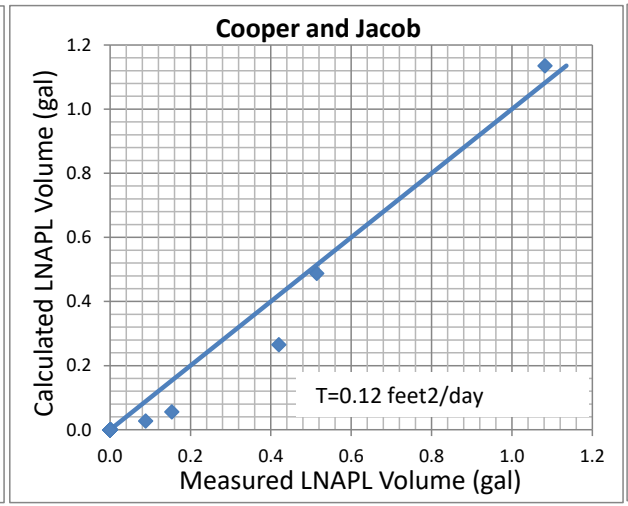


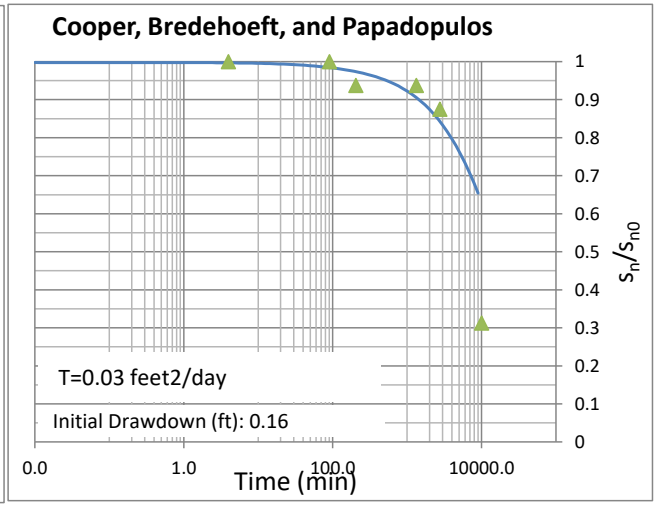


Abbreviations:

d = day
DTP = depth to product
DTW = depth to water
ft = feet
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	RFI-02-19
Date and Time In	10/17/2022 1:34	Date and Time Out	10/24/2022 12:07
Personnel	Cooper Osgood	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	100	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	100	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	25	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	8

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.85

Initial Test Conditions

Static Depth to LNAPL (feet)	5.43	Test Date	10/17/22
Static Depth to Water (feet)	11.59	Start Time	
LNAPL Thickness (feet)	6.16	Initial LNAPL Volume in Well (gallons)	

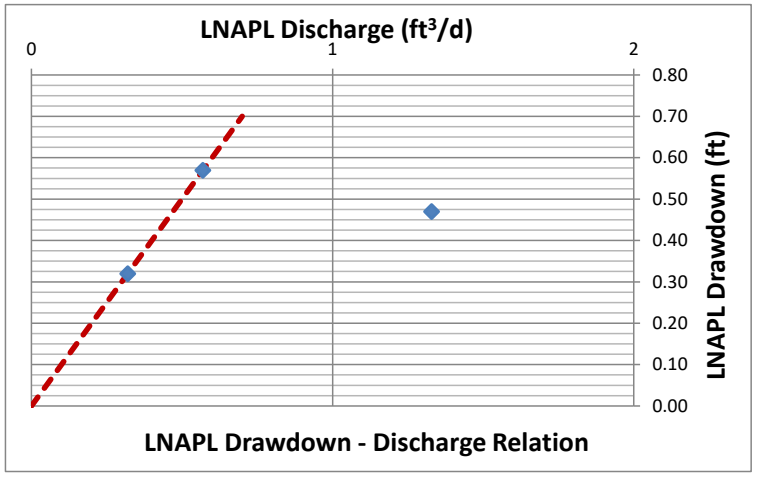
LNAPL Removal Information

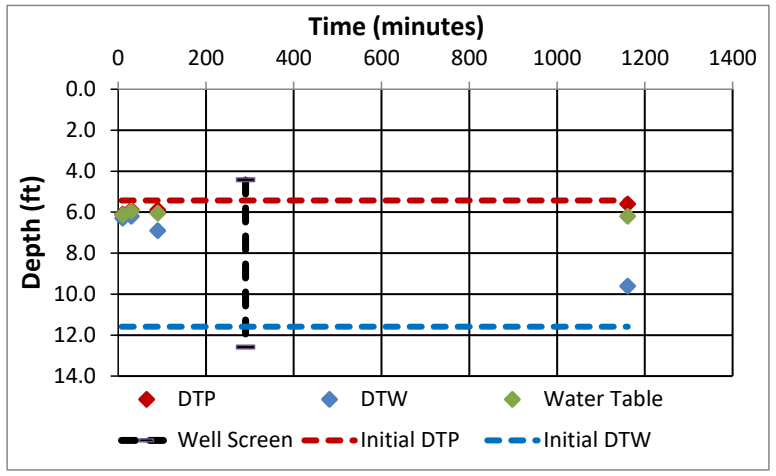
LNAPL Removal Method/Equipment		LNAPL Removal Begins (time)	
Volume of LNAPL Removed (gallons)		Time LNAPL Removal is Completed (time)	
Volume of Groundwater Removed (gallons)		Time to Remove LNAPL (minutes)	

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
10/17/22	1:34:00 PM	-23.00	5.43	11.59	6.16	Initial Fluid Levels/Removal starts
10/17/22	1:57:00 PM	0.00	6.33	6.33	0.00	Test Starts
10/17/22	2:07:00 PM	10.00	6.10	6.30	0.20	
10/17/22	2:27:00 PM	30.00	5.90	6.20	0.30	
10/17/22	3:27:00 PM	90.00	5.90	6.90	1.00	
10/18/22	9:18:00 AM	1161.00	5.60	9.61	4.01	
10/18/22	1:25:00 PM	1408.00	5.45	9.70	4.25	
10/24/22	12:07:00 PM	9970.00	5.25	9.70	4.45	

RFI-02-19 10/17/2022





Abbreviations:

d = day
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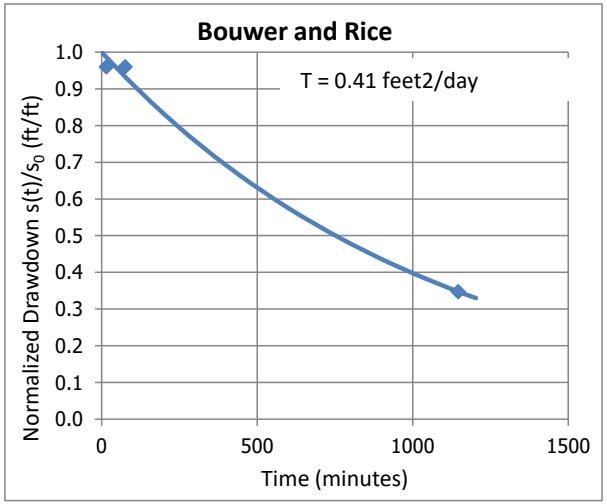
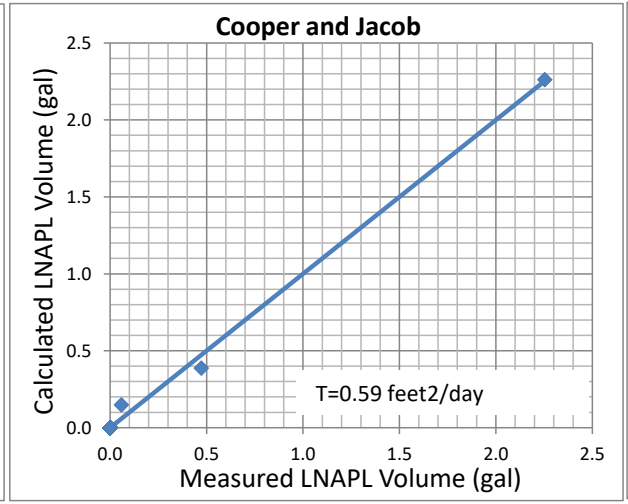
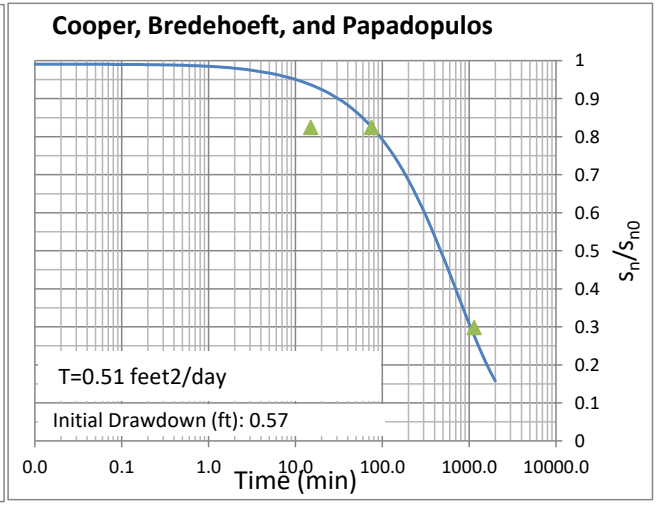
DTW = depth to water
ft = feet
LNAPL = light non-aqueous phase liquid
s = drawdown
T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	RFI-12-23
Date and Time In	10/18/2022 10:45	Date and Time Out	10/24/2022 11:41
Personnel	Cooper Osgood	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	100	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	100	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	18.5	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	8

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.85

Initial Test Conditions

Static Depth to LNAPL (feet)	10.70	Test Date	10/17/22
Static Depth to Water (feet)	15.40	Start Time	
LNAPL Thickness (feet)	4.70	Initial LNAPL Volume in Well (gallons)	

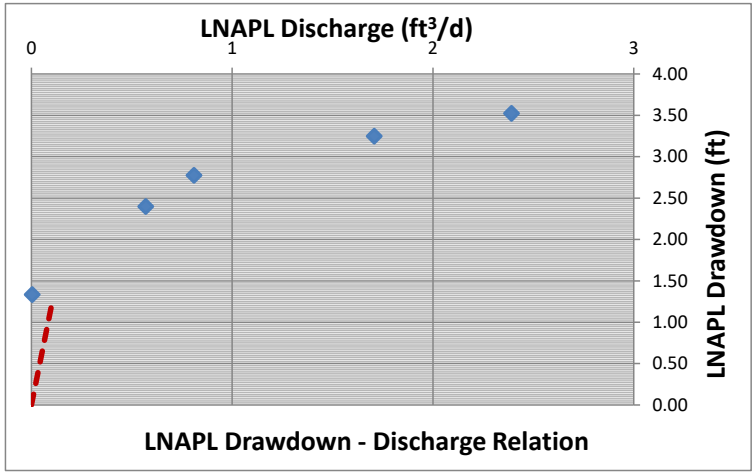
LNAPL Removal Information

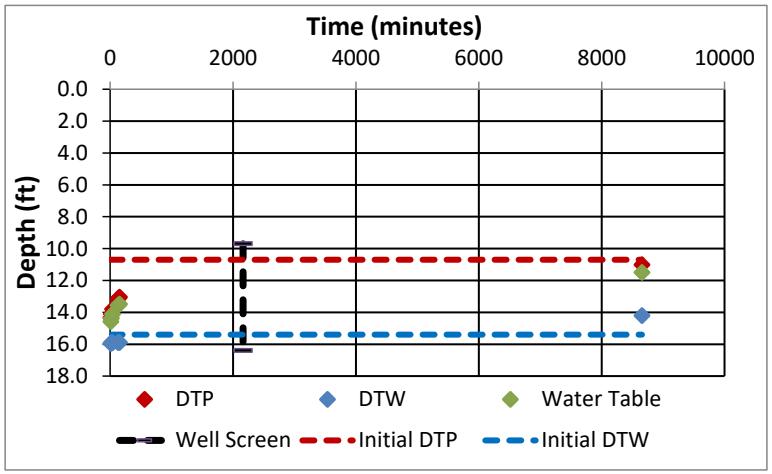
LNAPL Removal Method/Equipment		LNAPL Removal Begins (time)	
Volume of LNAPL Removed (gallons)		Time LNAPL Removal is Completed (time)	
Volume of Groundwater Removed (gallons)		Time to Remove LNAPL (minutes)	

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
10/18/22	10:45:00 AM	-40.00	10.70	15.40	4.70	Initial Fluid Levels/Removal starts
10/18/22	11:25:00 AM	0.00	16.02	16.02	0.00	Test Starts
10/18/22	11:35:00 AM	10.00	14.35	15.95	1.60	
10/18/22	11:45:00 AM	20.00	14.10	15.91	1.81	
10/18/22	12:05:00 PM	40.00	13.80	15.91	2.11	
10/18/22	1:35:00 PM	130.00	13.15	15.90	2.75	
10/18/22	1:55:00 PM	150.00	13.05	15.90	2.85	
10/24/22	11:41:00 AM	8656.00	11.02	14.20	3.18	

RFI-12-23 10/18/2022





Abbreviations:

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DTP = depth to product

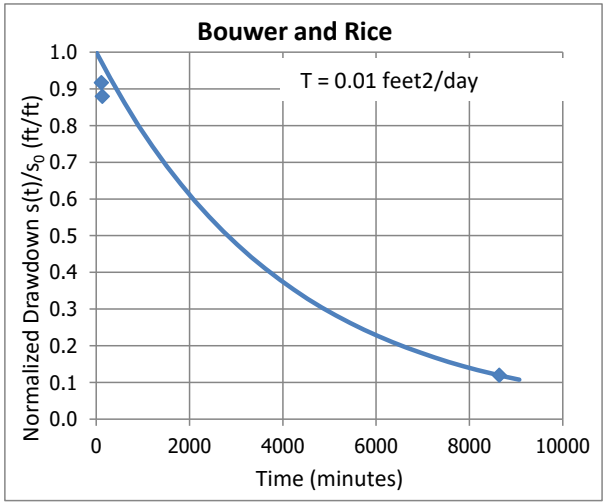
DTW = depth to water

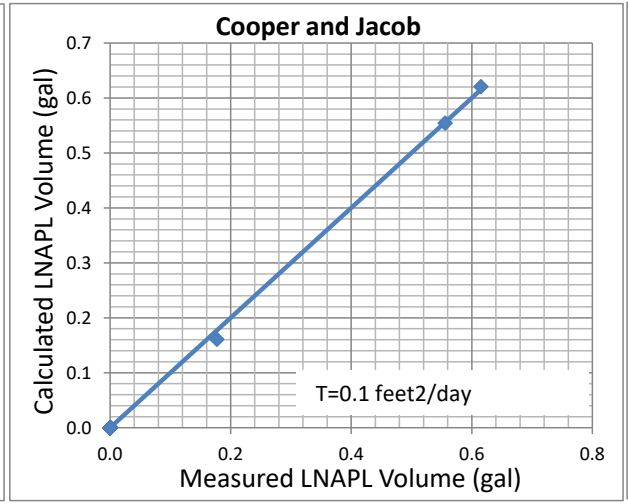
ft = feet

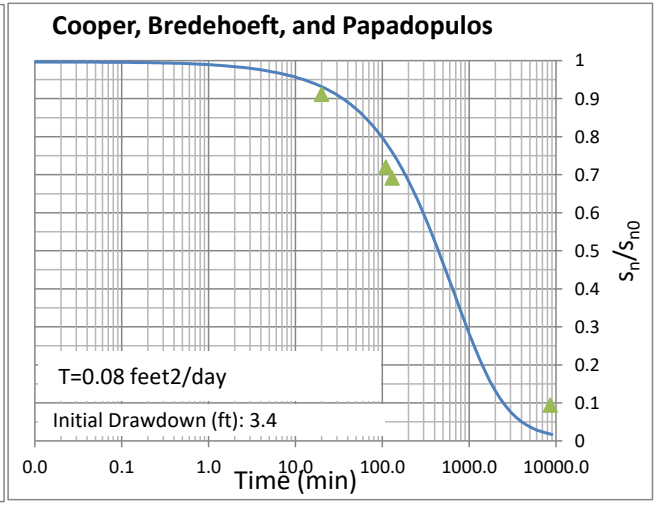
LNAPL = light non-aqueous phase liquid

s = drawdown

T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	RFI-40-14R
Date and Time In	10/17/2022 9:50	Date and Time Out	10/18/2022 2:30
Personnel	Donnie Richmond	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	100	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	100	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	18.5	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	8

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.85

Initial Test Conditions

Static Depth to LNAPL (feet)	9.55	Test Date	10/17/22
Static Depth to Water (feet)	20.25	Start Time	
LNAPL Thickness (feet)	10.70	Initial LNAPL Volume in Well (gallons)	

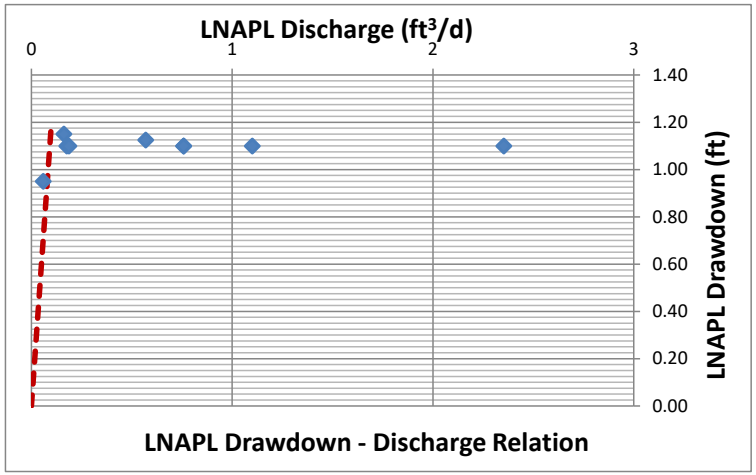
LNAPL Removal Information

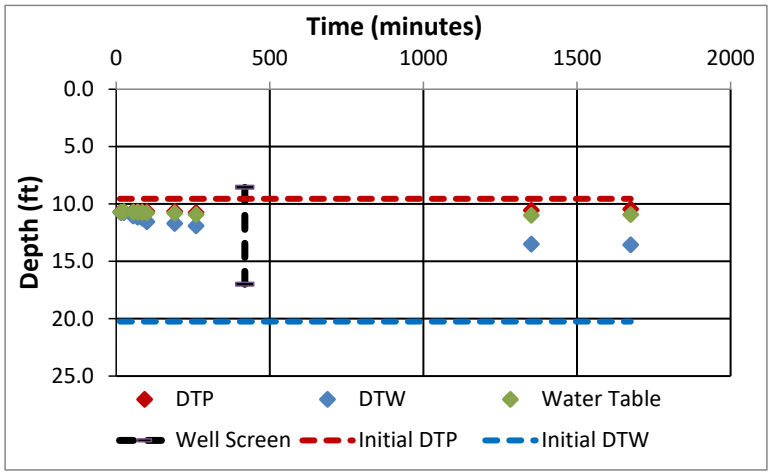
LNAPL Removal Method/Equipment		LNAPL Removal Begins (time)	
Volume of LNAPL Removed (gallons)		Time LNAPL Removal is Completed (time)	
Volume of Groundwater Removed (gallons)		Time to Remove LNAPL (minutes)	

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
10/17/22	9:50:00 AM	-45.00	9.55	20.25	10.70	Initial Fluid Levels/Removal starts
10/17/22	10:35:00 AM	0.00	10.70	10.70	0.00	Test Starts
10/17/22	10:50:00 AM	15.00	10.70	10.76	0.06	
10/17/22	11:00:00 AM	25.00	10.65	10.76	0.11	
10/17/22	11:30:00 AM	55.00	10.65	11.05	0.40	
10/17/22	11:45:00 AM	70.00	10.65	11.15	0.50	
10/17/22	12:00:00 PM	85.00	10.65	11.25	0.60	
10/17/22	12:15:00 PM	100.00	10.65	11.56	0.91	
10/17/22	1:45:00 PM	190.00	10.65	11.70	1.05	
10/17/22	2:55:00 PM	260.00	10.75	11.90	1.15	
10/18/22	9:06:00 AM	1351.00	10.55	13.50	2.95	
10/18/22	2:30:00 PM	1675.00	10.45	13.57	3.12	

RFI-40-14R 10/17/2022





Abbreviations:

d = day

DTP = depth to product

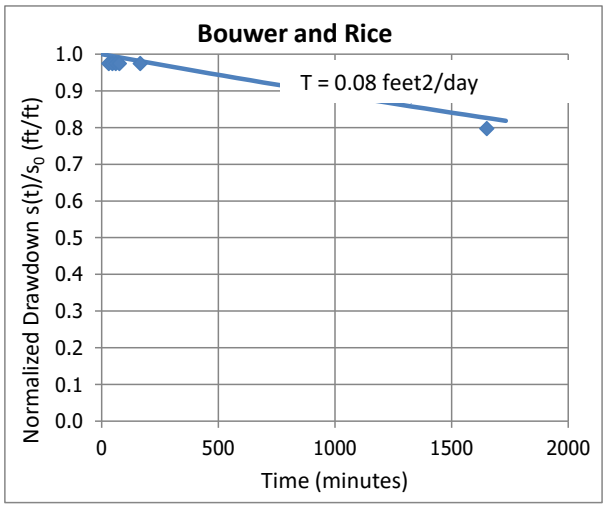
DTW = depth to water

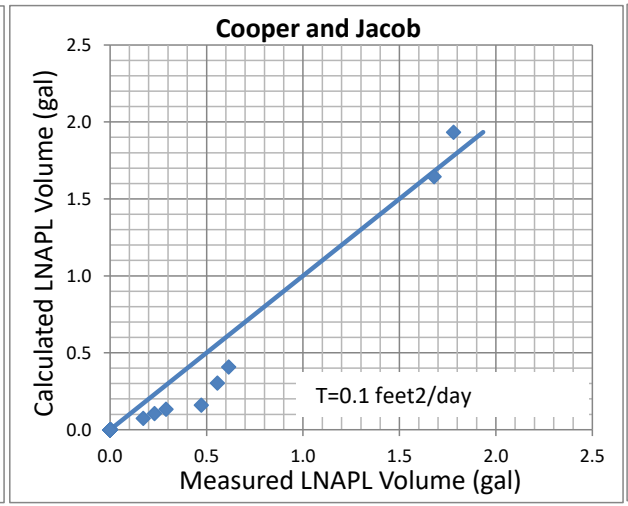
ft = feet

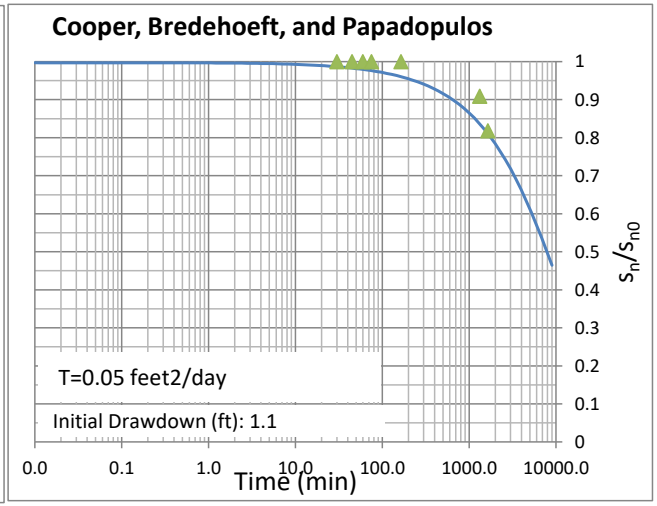
LNAPL = light non-aqueous phase liquid

s = drawdown

T = LNAPL transmissivity







LNAPL BAILDOWN TEST LOG

LNAPL Baildown Test Standard Operating Procedures

Site Name	RACER Buick City	Test Well ID	RFI-86-03
Date and Time In	10/18/2022 9:40	Date and Time Out	10/18/2022 11:05
Personnel	Sommer Guy	Weather	

Well Construction Details

Ground Surface Elevation (feet amsl)	100	Screen Slot Diameter (inches)	
Top of Casing Elevation (feet amsl)	100	Screen Slot Size (inches)	0.1
Total Well Depth (feet)	18.5	Filter Pack Type	K&E #1 Filterpack Sand
Depth to Top of Screen (feet)	5	Depth to Bottom of Screen (feet)	17
Well Casing Diameter (inches)	2	Borehole Diameter (inches)	8

LNAPL Properties

LNAPL Specific Yield, S_y:	0.175	LNAPL Density Ratio, ρ_r:	0.85

Initial Test Conditions

Static Depth to LNAPL (feet)	6.53	Test Date	10/17/22
Static Depth to Water (feet)	7.02	Start Time	
LNAPL Thickness (feet)	0.49	Initial LNAPL Volume in Well (gallons)	

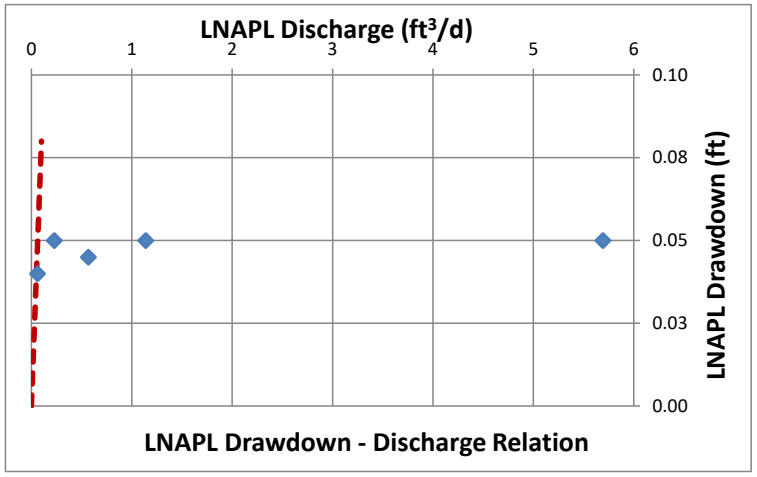
LNAPL Removal Information

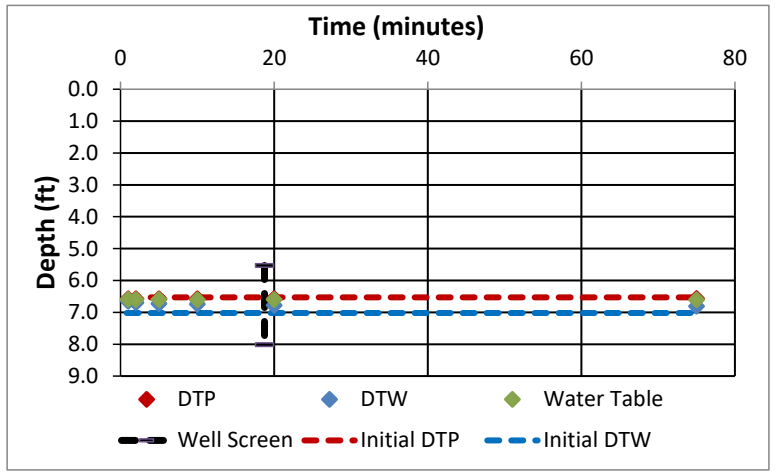
LNAPL Removal Method/Equipment		LNAPL Removal Begins (time)	
Volume of LNAPL Removed (gallons)		Time LNAPL Removal is Completed (time)	
Volume of Groundwater Removed (gallons)		Time to Remove LNAPL (minutes)	

Bailddown Test Data

Date	Time (HH:MM:SS)	Elapsed Time (minutes)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Observations
10/18/22	9:40:00 AM	-10.00	6.53	7.02	0.49	Initial Fluid Levels/Removal starts
10/18/22	9:50:00 AM	0.00	6.62	6.62	0.00	Test Starts
10/18/22	9:51:00 AM	1.00	6.58	6.65	0.07	
10/18/22	9:52:00 AM	2.00	6.58	6.70	0.12	
10/18/22	9:55:00 AM	5.00	6.58	6.73	0.15	
10/18/22	10:00:00 AM	10.00	6.58	6.74	0.16	
10/18/22	10:10:00 AM	20.00	6.57	6.78	0.21	
10/18/22	11:05:00 AM	75.00	6.57	6.81	0.24	
					0.00	
					0.00	

RFI-86-03 10/18/2022





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