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From:

Buick City Team

Date:

November 29, 2021

Arcadis Project No.:

30075935

Subject:

Building 04 Tracer Injection Test Work Plan
RACER Buick City Site

On behalf of Revitalizing Auto Communities Environmental Response (RACER) Trust, Arcadis of Michigan, LLC (Arcadis) has prepared this work plan to evaluate groundwater transport in the Building 04 Area located at the Southend of the Buick City Site (the Site) in Flint, Michigan (**Figure 1**). The purpose of this work plan is to provide information required to obtain Michigan Department of Environment, Great Lakes, and Energy (EGLE) approval to perform a tracer injection test at the Site.

Soil and groundwater sampling conducted in the Building 04 Area has identified elevated concentrations of per- and polyfluoroalkyl substances (PFAS) in soils, groundwater, the sanitary sewer, and the Outfall 010 and 011 storm sewers located in Hamilton Avenue, which is adjacent to the Building 04 Area (**Figure 2**). The primary constituent of concern (COC) in the Building 04 Area is perfluorooctane sulfonate (PFOS), where the concentrations exceed the groundwater surface water interface (GSI) criterion (12 nanograms per liter [ng/L]). PFOS soil and groundwater concentrations have exceeded 1,000,000 nanograms per kilogram (ng/kg) and ng/L, respectively at a few select locations and groundwater concentrations exceed 1,000 ng/L of PFOS over approximately 3 acres in the Building 04 Area. PFOS concentrations in groundwater in the Building 04 Area are varied without apparent explanation and exhibit rapid declines in concentration over short distances (sometimes 2 to 3 orders of magnitude in 50 feet). The aquifer tracer injection testing is intended to evaluate hydraulic and transport parameters in the Building 04 Area and aid in understand these changes in concentration.

The tracer injection test will be completed in two locations in the vicinity of the Building 04 Area (**Figure 2**) to quantitatively estimate groundwater flow velocities, to confirm groundwater flow direction, and to measure aquifer and soluble transport properties. The data generated as part of the tracer injection test will be used to help inform the selected remedy for soils and groundwater in this area of the Site.

TEST OBJECTIVES, AND OVERVIEW

A tracer injection test is the most direct method to measure certain characteristics of an aquifer, such as the magnitude of the groundwater velocities (i.e., transport and bulk), the potential for nonideal transport, and hydraulic parameters (Payne et al., 2008). It is important to carefully match the design of the tracer injection test to the targeted objectives. The overall goal of the proposed tracer injection test is to evaluate groundwater flow and aquifer soluble transport properties in the vicinity of the Building 04 Area. To accomplish this goal, the following specific technical objectives have been established.

1. Establish the injected volume to radial distribution relationship.

The injection volume to radial distribution relationship describes the volume of injected solution required to achieve a targeted concentration of the tracer at a specific radial distance from the point of injection. This measurement is based upon observing the tracer concentration profile at a dose response well during the injection. A dose response well is a monitoring well located at a specific distance from the point of injection and used to observe the tracer concentration during the injection to establish a breakthrough curve. To fully understand the relationship of the injected solution and the radial distribution, the breakthrough curve is typically developed until a stabilized maximum tracer concentration is achieved at the dose response well(s). After the injection, the tracer concentration response is correlated to the injection volume to calculate the mobile porosity, or that percentage of the total porosity through which the tracer is migrating from the injection point to the dose response well(s). Therefore, the true mobile porosity is scalable to the desired tracer response, and it is critical to inject a sufficient volume as to achieve a stabilized maximum tracer response at the identified dose response wells.

2. Quantitatively estimate the transport and bulk groundwater velocities.

To quantitatively estimate the transport and bulk groundwater velocities, known volumes and concentrations of multiple conservative (i.e., nondegradable, non-adsorptive) tracers are proposed to be injected into specific depths within the aquifer and then monitored as a function of time. The initial detection of a tracer in a downgradient monitoring well (also referred to as a drift well) will be used to indicate the transport velocity, or the velocity that represents groundwater movement through the most permeable and connected pore space. After observing the tracer concentration profile at the drift well as a function of time, the bulk (or average) groundwater velocity can be calculated. The bulk groundwater velocity is represented by a cumulative mass distribution of the tracer as a function of time. A ratio of the transport and bulk groundwater velocities can provide insight as to the potential for nonideal transport, or groundwater retardation due to interactions with the connected and disconnected pore space (i.e., a form of dilution).

3. Evaluate the potential for non-dilution-based retardation mechanisms.

The use of a conservative tracer and accomplishing Objectives 1 and 2 will provide direct measurement of groundwater movement with respect to the mobile (i.e., continuous) and immobile (i.e., discontinuous) porosity. Transport of a conservative tracer with respect to the ratio of the mobile and immobile porosity represents a form of dilution as the injected tracer immediately occupies the mobile porosity and eventually equilibrates within the total porosity. To measure non-dilution-based retardation mechanisms, push-pull tests are proposed to compare the equilibrium behavior of the conservative tracer to PFAS. By establishing a localized condition where PFAS have been diluted in favor of the conservative tracer via injection (i.e., the “push”) and then attempting to revert to ambient conditions via extraction (i.e., the “pull”), a direct comparison of the recovered conservative tracer and the PFAS response will provide information as to non-dilution-based retardation mechanisms.

The remainder of this work plan presents the scope of work designed to achieve these specific technical objectives with more information around the sensitive test parameters. To optimize the data output of the proposed tracer injection test, a certain amount of flexibility will be necessary to adapt to field conditions and the field adjusted scope of work described herein may deviate accordingly.

SCOPE OF WORK

The scope of work includes installation of injection wells and dose response wells, baseline groundwater sampling, tracer injection test equipment set-up, baseline tracer sampling, tracer injection testing, tracer injection monitoring, tracer test equipment breakdown, and continued tracer monitoring and sampling over an estimated six-to-eight-month period, which may be adjusted based on data collected during the drift phase.

Four injection wells will be installed prior to beginning the tracer injection test. Two shallow/deep injection well pairs will be installed in separate boreholes in the two areas shown on **Figure 2**. The two different areas were selected based on the apparent differences in groundwater flow direction. The groundwater flow direction of Area 2 is more southerly than the groundwater flow of Area 1. Downgradient and side gradient monitoring will be conducted at existing site monitoring wells where appropriate, but additional monitoring wells may be strategically installed to accomplish the specific technical objectives, depending on hydraulic conductivity data and calculated estimates of groundwater travel times that will be collected prior to the installation of the wells. The proposed layout of the injection well network is shown in **Figure 3**.

There will be three distinct phases of the tracer injection test.

- Phase 1 will be the push-pull test, which is an abbreviated test conducted specifically at the injection wells.
- Phase 2 will be the injection portion of the tracer injection test.
- Phase 3 will be the post-injection monitoring portion of the tracer injection test.

Tracer Identification

Fluorescent dyes (tracers) are conservative applied tracers that are readily available, relatively easy to use, practical, and convenient. There are four tracers proposed for the completion of this tracer injection test: fluorescein, eosine, rhodamine WT, and sulforhodamine B, which will each be assigned to a single injection well. These fluorescent tracers are proposed due to their established history as hydrogeological tracers, their conservative properties, their quantitation to parts per quadrillion, and their significant signal to noise ratio. There is extensive technical literature (Field et al., 1995) demonstrating that these dyes present no health or environmental problems at concentrations five orders of magnitude or more above the method detection limits (Aley 2019). The tracers and subsequent analysis will be sourced from Ozark Underground Laboratory in Protom, Missouri and copies of their safety data sheets (SDS) are included as **Appendix A**.

Another advantage of these fluorescent tracers is their distinct colors, which directly corresponds to their mass concentration. Therefore, serial dilutions in the field will be created (approximately 10X, 100X, 500X, and 1,000X dilutions of the injection concentrations) to compare field observations and inform those samples selected for laboratory analysis.

The selected concentrations of the respective tracers are as follows: 20 milligrams per liter (mg/L) for fluorescein, 40 mg/L for eosine, 80 mg/L for rhodamine WT, and 80 mg/L for sulforhodamine B. Based on an assumed 20-foot radius of influence, up to 15,000 gallons of tracer solution will be injected into each well corresponding to approximately 1.7, 3.3, 6.7, and 6.7 pounds of fluorescein, eosine, rhodamine WT, and sulforhodamine B, respectively.

Well Installation

Four injection wells will be installed in the locations shown in **Figure 3**. Two injection wells (IW-04-01 and IW-04-02) will be installed at different depths in the vicinity of existing temporary wells SB-04-60 and SB-04-59, and two injection wells (IW-04-03 and IW-04-04) will be installed in the vicinity of SB-04-17 and SB-04-34. The two depths at which the injection wells will be installed represent higher permeability zones and are likely the primary contaminant transport pathways in groundwater.

The injection wells will be installed using mud rotary or similar methods and will be constructed in an 8-inch diameter borehole using 4-inch diameter Schedule 80 polyvinyl chloride (PVC) casing with 5-foot wire-wrapped 0.010-inch slotted stainless steel screens. The anticipated screened intervals are shown on **Table 1** below. The final screened intervals will be based on the lithology recorded from a borehole drilled adjacent to the injection wells.

Dose response wells will be installed downgradient of the injection wells in a radial pattern at approximately 10 feet from the injection well. Approximate locations of the dose response wells are shown on **Figure 3**. The actual number of dose response wells, their precise locations, and their distances from the injection wells will be adjusted based on the baseline data described in the following section that will be collected prior to the start of well installation. Drift wells were selected from existing temporary and permanent monitoring wells in approximately the same depth intervals and the similar lithology (permeable soil) as the injection wells. Relevant boring logs are included as **Appendix B**. Additional drift wells may be installed, if needed. Dose response and drift wells will be screened in the same lithologic unit targeted for the injection wells based on the lithologic data observed in the field. These wells will be constructed of 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing with 5-foot long 0.010-inch slotted PVC screens.

Table 1: Injection, Dose Response and Drift Wells

Injection Well	Proposed Dose Response Wells	Anticipated Screen Interval (ft bgs)	Drift Wells	Sewer Monitoring Points
IW-04-01	DR-04-01, DR-04-02, DR-04-03	4-9	SB-04-59(4-9); SB-04-60(4-9); SB-04-25(4-9); SB-04-26(5-10); SB-04-28(5-10); SB-04-81(5-10)	MH 11-6, MH 10-1A, MH-E
IW-04-02	DR-04-04, DR-04-05, DR-04-06	12-17	SB-04-59(12-17); SB-04-60(15-20); SB-04-25(12-17); SB-04-61(11-16); SB-04-28(15-20); SB-04-160(15-22); SB-04-81(19-24); SB-04-49(6.5-11.5)	MH 11-6, MH 10-1A, MH-E
IW-04-03	DR-04-07, DR-04-08, DR-04-09	7-12	SB-04-17(5-10); SB-04-34(4-9); SB-04-48(7-12); SB-04-50(4-9); SB-04-19(8-13); SB-04-47(4-9); SB-04-18(5-10); SB-04-04(2.5-12.5); SB-04-20(10-15); SB-04-46(4-9)	MH 11-6, MH 10-1A, MH-E
IW-04-04	DR-04-10, DR-04-11, DR-04-12	18-23	SB-04-17(19-24); SB-04-34(18-23); SB-04-48(20-25); SB-04-50(15-20); SB-04-47(14-19); SB-04-49(20-25); SB-04-18(16-21); SB-04-64(19-24)	MH 11-6, MH 10-1A, MH-E

ft – feet

bgs -below ground surface

Baseline Groundwater Sampling and Monitoring

Baseline groundwater monitoring will be conducted at all newly installed well locations and at the existing monitoring wells selected for drift observation. Each baseline groundwater sample will be analyzed for PFAS and for each tracer used in the area. Due to variability observed in PFAS concentrations over time in the Building 04 area, multiple baseline PFAS samples may be collected for select wells to establish an average concentration prior to beginning the tracer testing. Low flow pumping tests or slug tests will also be conducted during the baseline groundwater sampling at select locations and the results will be used to estimate hydraulic conductivity. Groundwater measurements will be collected at each well, groundwater elevations and hydraulic gradients will be calculated, and groundwater flow direction and velocities will be evaluated to verify assumptions and if necessary, refine the monitoring plan for the tracer test.

Newly installed injection wells may be sampled more than once for PFAS to understand the variability as it relates to the push-pull test described below.

Push-Pull Test

The proposed push-pull test is designed to achieve the specific technical objective of understanding non-dilution-based retardation mechanisms (such as gas-liquid partitioning, hydrophobic and/or electrostatic adsorption, and fluorine-phase interactions). While the push-pull test will not ascertain the dominating non-dilution-based retardation mechanism, the data will distinguish PFAS-related retardation from the conservative tracer retardation providing a cumulative empirical measurement of non-dilution-based retardation.

At each of the newly installed injection wells, a water sample will be collected and analyzed for PFAS at the beginning of the test. Following the collection of the groundwater samples, approximately 250 to 500 gallons of a known concentration of a distinct conservative fluorescent tracer will be injected while periodically confirming the injection concentration. The injection concentration will be confirmed by collecting samples from a sampling port on the injection conveyance line. The purpose of understanding the injection concentration is that the observed response of the tracer during the extraction portion will be normalized to the injected concentration. The actual injected volume will be determined in the field and will be based upon the achievable injection flow rate. The goal of the injection portion of the push-pull test is not to achieve tracer response at a surrounding dose response well, but rather to ensure the injection well borehole and immediately surrounding area has been sufficiently flushed to establish a large difference between the pre- and post-injection PFAS concentration.

At the conclusion of the injection portion of the push-pull test, the extraction portion will begin immediately. A PFAS-free submersible groundwater extraction pump will be used to convey extracted groundwater into an appropriately sized holding tank within a secondary containment. At a minimum, twice the injected volume will be extracted and may range between 500 and 1,000 gallons. The ultimate extraction volume will be based upon the recovered response of the conservative fluorescent tracer in comparison to serial dilutions of the injected concentration. During extraction, groundwater samples will be collected from the injection wells for analysis of both the conservative tracer and PFAS. The sampling frequency will be based upon the rate of groundwater extraction and the observed color change of the conservative tracer and will be based on the volume extracted not the time of groundwater extraction. For example, samples may be collected every 50 to 100 gallons extracted, screened for visual tracer presence against the serial dilutions, and used to pick which samples will be submitted to an analytical laboratory for PFAS analysis. More samples may be collected than will be submitted for laboratory analysis and observations in the field will dictate the actual sampling frequency.

Once the extraction portion of the test is complete, the push-pull test will be finished, and the tracer injection test may begin. The extracted water from the push-pull test will be used to create the injection solution for the tracer injection test. The analytical results of the groundwater samples collected during the extraction will be used to evaluate the conservative tracer and PFAS response. An idealized depiction of what the conservative tracer and PFAS response may look like is presented below.



The above figure provides a conceptual depiction of push-pull response at the newly installed injection wells. The variable responses of PFOS indicate predicted empirically determined retardation mechanisms that would be different than dilution-based retardation acting upon the conservative tracer response. Because of the well-established conservative behavior of the selected fluorescent dyes for this test through the hydrogeological industry, it is assumed that dilution is the only retardation mechanism acting upon the conservative tracer response.

Tracer Injection Test

The proposed tracer injection test and post-injection monitoring is designed to achieve the specific technical objectives of quantitatively estimating the magnitude of the transport and bulk groundwater velocities and understanding the injection volume to radial distribution relationship.

At each of the newly installed injection wells, up to 15,000 gallons of a known concentration of a distinct fluorescent tracer will be injected. The actual injected volume will be determined in the field based upon the observed tracer at the dose response wells. The estimated injection volume is based upon the following.

$$V_{inj} = \pi \times ROI^2 \times h_{inj} \times \theta_m \times 7.48$$

where V_{inj} is the estimated injection volume in gallons, ROI is the radius of influence (assumed to be 20 feet), h_{inj} is the injection interval (5 feet), θ_m is the estimated mobile porosity (maximum assumption to be 30%), and 7.48 is the conversion from cubic feet to gallons. The smallest injection volume necessary to achieve a stabilized maximum tracer response at the dose response wells will be injected, and the estimated

15,000 gallons equates to a worst-case scenario. It is critical that the tracer is not under-injected with respect to achieving the specific technical objectives.

The injection flow rates will be established in the field per an applied injection pressure step test. A balance between a productive injection flow rate and a safe injection pressure will be established through incremental increases of 0.5 pounds per square inch (psi) applied at the injection well head until the optimal injection flow rate is determined. Given the comparatively shallow nature of the tracer injection test (maximum depth of 22 feet below ground surface), the applied injection pressure is not anticipated to exceed 5 psi. The injection wells will be constructed with neat cement seals capable of withstanding the applied injection pressures. During the injection, manual depth to water measurements will be collected periodically from the surrounding dose response wells to observe the vertical accommodation of the groundwater to the injected solution. As groundwater mounding localized around the injection wells is anticipated, the vertical accommodation will be monitored to ensure surfacing of the injected solution does not occur.

Tracer Injection Test Monitoring

There are two components of monitoring associated with the tracer injection test. The first occurs during the injection and includes the observed tracer response at the dose response wells. The well column within a dose response well will be mixed prior to collecting grab groundwater samples using a peristaltic pump and compared visually in the field to a set of serial dilutions to bias which samples are sent to Ozark Underground Laboratory for analysis. As the injected fluid will move through the porous media according to the gradation of permeability, there is a potential that over a 5-ft monitoring well screen injected solution could arrive at a specific interval (i.e., inches thick). As the goals of this specific tracer injection test do not include vertical discretization of permeability within the injected interval, homogenizing the monitoring well column will normalize out “preferential flow paths” or those seams of greater permeability with respect to the surrounding geology. This will be accomplished by moving the tubing up and down the well screen during sampling to ensure collection of groundwater throughout the screened interval. Initially, composite grab groundwater samples will be collected from the dose response wells every few hundred gallons injected to capture any potential for immediate tracer response. If tracer response is not observed after the first several rounds of sample collection, the frequency will be adjusted to larger volume increments. In addition to composite grab groundwater samples for tracer evaluation, field parameters (specifically pH, specific conductivity, oxidation reduction potential, dissolved oxygen, and temperature) and manual depth to water measurements will be collected during the injection.

The second component of monitoring associated with the tracer injection test is the post-injection monitoring. Post-injection monitoring will primarily focus on the downgradient drift monitoring wells that were uninfluenced during the injection but will also include dose response wells. The frequency of monitoring will be based on hydraulic conductivity estimates measured in the dose response wells prior to the start of the injection phase and the hydraulic gradient. The monitoring frequency will be adjusted based on actual data obtained. Critical components of the post-injection monitoring include capturing the initial arrival of tracer and the potentially asymptotic tail of tracer washout as the injected tracer mass passes through the drift well. Therefore, the timing of the post-injection monitoring must extend long enough to capture the potential asymptotic tail, which could be several months post injection. Predictive models will be used to expedite analysis, but the analytical data will ultimately dictate the accuracy of the model.

SCHEDULE

The installation of injection wells and downgradient monitoring wells, as needed, will begin after EGLE approval is obtained, currently estimated for January 2022. Well installation will be followed by baseline sampling as described above. The injection test parameters will be determined based on the results of the groundwater flow direction and estimated hydraulic conductivities obtained during the baseline sampling.

REFERENCES

Aley. 2019. The Ozark Underground Laboratory's Groundwater Tracing Handbook.

Field, Malcolm S.; Ronald G. Wilhelm; James F. Quinlan; and Thomas J. Aley. 1995. An assessment of the potential adverse properties of fluorescent tracer dyes used for groundwater tracing. Environmental Monitoring and Assessment, Vol. 38. Kluwer Academic Publishers. Pp. 75-96

Payne, F.C., Quinnan, J.A., Potter, S.T. 2008. Remediation Hydraulics, CRC Press, Boca Raton, FL.

Attachments:

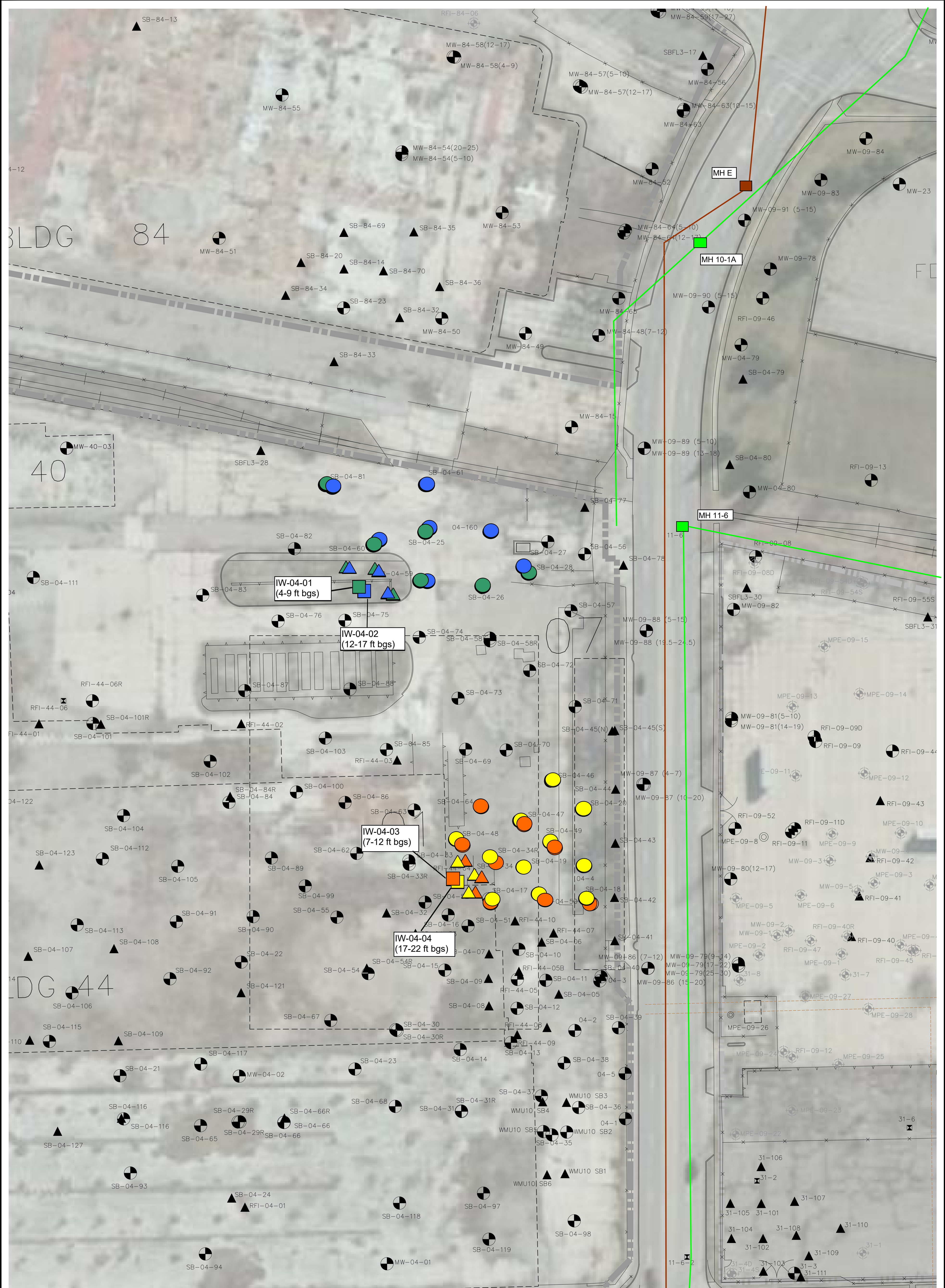
Figures

- 1 Site Location Map
- 2 Tracer Testing Areas – Hamilton Ave.
- 3 Proposed Aquifer Tracer Testing Locations – Hamilton Ave.

Appendices

- 1 Safety Data Sheets
- 2 Boring Logs

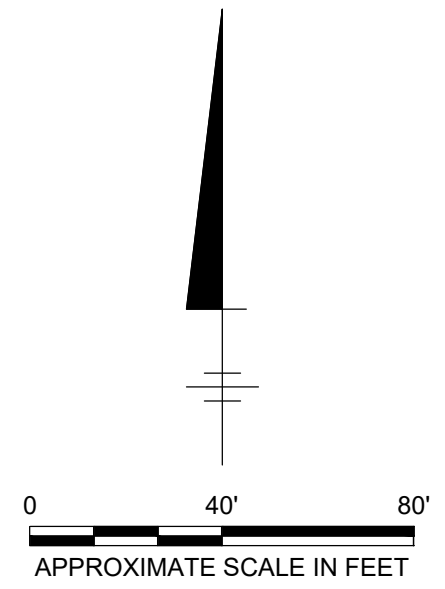
Figures



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LEGEND:

- ▲ SOIL BORING
- ⊗ MONITORING WELL (ACTIVE)
- RACER TRUST PROPERTY
- - - FORMER RACER TRUST PROPERTY
- STORM SEWER
- SANITARY SEWER
- (4-9 ft bgs) (PROPOSED WELL SCREEN INTERVAL FEET BELOW GROUND SURFACE)
- IW-04-01 INJECTION WELL
- ▲ DOSE RESPONSE WELL (NOT ALL WELLS ARE DEPICTED)
- DRIFT WELL
- IW-04-02 INJECTION WELL
- ▲ DOSE RESPONSE WELL (NOT ALL WELLS ARE DEPICTED)
- DRIFT WELL
- IW-04-03 INJECTION WELL
- ▲ DOSE RESPONSE WELL (NOT ALL WELLS ARE DEPICTED)
- DRIFT WELL
- IW-04-04 INJECTION WELL
- ▲ DOSE RESPONSE WELL (NOT ALL WELLS ARE DEPICTED)
- DRIFT WELL



RACER TRUST
 BUICK CITY
 FLINT, MICHIGAN

**PROPOSED AQUIFER TRACER
 TESTING LOCATIONS**

ARCADIS Design & Consultancy
 for natural and
 built assets

FIGURE
3

Appendix A

Safety Data Sheets



SAFETY DATA SHEET (SDS)
REVISION DATE: 03/03/2016

HUE CORPORATION

Color your everything, may your Hue come true

SECTION I. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

PRODUCT IDENTIFIER:

PRODUCT NAME **HUE URANINE CONC** (Also known as Fluorescein)
 PRODUCT NUMBER 1-C8-073PC
 COLOR INDEX NAME ACID YELLOW 073
 COLOR INDEX NO 45350
 C. A. S. # 518-47-8
 CHEMICAL FAMILY..... XANTHENE

INTENDED USE OF THE PRODUCT:

FELT TIP, MARKER INKS, WATER BASED COATINGS AND LEAK DETECTION

NAME, ADDRESS AND TELEPHONE OF RESPONSIBLE PARTY:

HUE CORPORATION	TELEPHONE	714-389-3130
P.O. BOX 509	FAX	714-389-9731
TUSTIN, CA 92781	EMAIL	SUPPORT@HUECORPORATION.COM

EMERGENCY TELEPHONE NUMBER:

CHEMTREC (USA)	1-800-424-9300
CHEMTREC (OUTSIDE USA)	1-703-527-3887

SECTION 2. HAZARD(S) IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE:

GHS-US
 ACUTE TOX. - INHALATION (CATEGORY 5)
 EYE DAM./IRRITATION (CATEGORY 2B)
 SKIN CORR./IRRITATION (CATEGORY 3)

GHS LABELING:

HAZARD PICTOGRAMS (GHS-US): NO SYMBOL

SIGNAL WORD WARNING

HAZARD STATEMENT(S)	H333 - MAY BE HARMFUL IF INHALED H320 - CAUSES EYE IRRITATION H316 - CAUSES MILD SKIN IRRITATION
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PRECAUTIONARY STATEMENTS	P305 + 351 + P338 - IF IN EYES: RINSE CAUTIOUSLY WITH WATER FOR SEVERAL MINUTES. REMOVE CONTACT LENSES IF PRESENT AND EASY
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TO DO. CONTINUE RINSING.
 P337 + P313 - IF EYE IRRITATION OCCURS/PERSISTS:
 GET MEDICAL ADVICE AND ATTENTION.
 P261 - AVOID BREATHING DUST/FUMES/GAS/MIST/VAPORS/SPRAY
 P264 - WASH FACE THOROUGHLY AFTER HANDLING.
 P322 + P313 - IF SKIN IRRITATION OCCURS: GET MEDICAL ADVICE/
 ATTENTION.
 P304 + 312 - IF INHALED: CALL A POISON CENTER/DOCTOR/PHYSICIAN
 IF YOU FEEL UNWELL

OTHER HAZARDS NO DATA AVAILABLE
 UNKNOWN ACUTE TOXICITY NO DATA AVAILABLE

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

DESCRIPTION OF MIXTURE: PROPRIETARY MIXTURE OF DYES.

SUBSTANCE:

NAME	C.A.S.#	WEIGHT 100%	GHS-US CLASSIFICATION
ACID YELLOW 073	518-47-8	100%	ACUTE TOX. - INHALATION (CATEGORY 5) EYE DAM./IRRITATION (CATEGORY 2B) SKIN CORR./IRRITATION (CATEGORY 3)

SECTION 4. FIRST AID MEASURES

FIRST AID MEASURES GENERAL:

INHALATION: REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, GIVE OXYGEN AND GET IMMEDIATE MEDICAL ATTENTION.

SKIN: WASH WITH MILD SOAP AND WATER. IF IRRITATION OCCURS GET MEDICAL ATTENTION. IF CLOTHING IS CONTAMINATED, RE-MOVE AND WASH BEFORE REUSE.

EYES: FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES, HOLDING EYELIDS APART FOR THOROUGH IRRIGATION. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION: INDUCE VOMITING - SEEK IMMEDIATE MEDICAL ATTENTION.

MOST IMPORTANT SYMPTOMS AND EFFECTS, ACUTE AND DELAYED:

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY HAZARDOUS COMMUNICATION STANDARD. HOWEVER, AS WITH ALL CHEMICAL; HANDLE WITH CARE, AVOID EYE AND SKIN CONTACT, AVOID INHALATION OF DUSTS OR VAPORS. WASH THOROUGHLY AFTER HANDLING. KEEP CONTAINERS CLOSED.

SECTION 5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA:

WATER, DRY CHEMICAL, CARBON DIOXIDE, FOAM.

SPECIAL HAZARDS ARISING FROM SUBSTANCE OR MEDIA:

FIREFIGHTERS SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS TO GUARD AGAINST POTENTIALLY TOXIC AND IRRITATING FUMES. AVOID DUSTING. DUST CAN FORM EXPLOSIVE MIXTURES WITH AIR.

PROTECTION/ADVICE FOR FIREFIGHTER(S):

BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

REMOVE PERSONS FROM DANGER AREA.

ENVIROMENTAL PRECAUTIONS:

AVOID ANY UNCONTROLLED RELEASE OF MATERIAL. DO NOT EMPTY INTO DRAINS OR THE AQUATIC ENVIRONMENT.

EMERGENCY PROCEDURES:

NO ADDITIONAL INFORMATION

METHODS AND MATERIALS FOR CONTAMINENT AND CLEANING UP:

WHERE SPILLS ARE POSSIBLE, A COMPREHENSIVE SPILL RESPONSE PLAN SHOULD BE DEVELOPED AND IMPLEMENTED. AVOID ANY UNCONTROLLED RELEASE OF MATERIAL.

UTILIZE RECOMMENDED PROTECTIVE CLOTHING AND EQUIPMENT (SEE SECTION 8). SPILLS SHOULD BE SWEEPED UP USING AN ABSORBENT DUST CONTROL PRODUCT AND PLACED IN CONTAINERS. SPILL AREA CAN BE WASHED WITH WATER. COLLECT WATER FOR APPROVED DISPOSAL. IN THE EVENT OF UNCONTROLLED RELEASE OF THIS MATERIAL, THE USER SHOULD DETERMINE IF THE RELEASE IS REPORTABLE UNDER APPLICABLE LAWS AND REGULATIONS.

SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:

HANDLE WITH CARE. AVOID OVER EXPOSURE. USE NIOSH/OSHA APPROVED RESPIRATOR, WORK GLOVES, AND CLOTHING. WASH AFTER HANDLING. SENSITIVE INDIVIDUALS MAY EXPERIENCE RESPIRATORY ALLERGIES. MAY CAUSE SKIN IRRITATION. USE WITH LOCAL VENTILATION.

CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES:

USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION OR OTHER ENGINEERING CONTROLS TO KEEP AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS.

KEEP AWAY FROM HEAT. KEEP AWAY FROM SOURCES OF IGNITION.

KEEP AWAY FROM STRONG OXIDIZING AND REDUSING AGENTS.

SPECIFIC END USES:

FELT TIP, MARKER INKS, WATER BASED COATINGS AND LEAK DETECTION

SECTION 8. EXPOSURE CONTROLS /PERSONAL PROTECTION

CONTROL PARAMETERS:

INGREDIENTS WITH LIMIT VALUES THAT REQUIRE MONITORING AT THE WORKPLACE - NOT REQUIRED

EXPOSURE CONTROLS:

APPROPRIATE ENGINEERING CONTROLS - THE USUAL PRECAUTIONARY MEASURES ARE TO BE ADHERED TO WHEN HANDLING CHEMICALS.

PERSONAL PROTECTIVE EQUIPMENT:



HAND PROTECTION
EYE PROTECTION
SKIN AND BODY

WEAR IMPERMEABLE RUBBER OR PLASTIC GLOVES
TIGHTLY SEALED SAFETY GOGGLES OR FULL FACE SIDE SHIELDS.
APRON, COVERALLS AND NON-LEATHER SOLED WORK SHOES.
WASH DYE CONTAMINATED CLOTHES AND SKIN WITH MILD SOAP AND DETERGENTS.

RESPIRATORY
HYGIENE MEASURES

WEAR OSHA/NIOSH APPROVED DUST MASK/RESPIRATOR
HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. WASH HANDS AFTER HANDLING MATERIAL.

OTHER PROTECTION

DELUGE SAFETY SHOWER AND EYE WASH STATION SHOULD BE LOCATED NEAR WORK AREA.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES :

APPEARANCE, COLOR, ODOR	YELLOW POWDER, NO ODOR
pH	8.0 - 9.0
MELTING POINT/FREEZING POINT	ND
INITIAL BOILING POINT/BOILING RANGE	0.00
FLASHPOINT	NORMALLY STABLE, NOT COMBUSTIBLE NOR FLAMMABLE
EVAPORATION RATE	NO DATA
FLAMMABILITY (SOLID,GAS)	NORMALLY STABLE, NOT COMBUSTIBLE NOR FLAMMABLE
UPPER EXPLOSIVE LIMITS	NA
LOWER EXPLOSIVE LIMITS	NA
VAPOR PRESSURE	NA
VAPOR DENSITY	NA
RELATIVE DENSITY	NA
SOLUBILITY IN WATER	SOLUBLE
PARTITION COEFFICIENT N-OCTANOL/WATER	NO DATA

AUTO-IGNITION TEMPERATURE	NO DATA
DECOMPOSITION TEMPERATURE	NO DATA
VISCOSITY, DYNAMIC	NO DATA
VISCOSITY, CINEMATIC	NO DATA
EXPLOSIVE PROPERTIES	N/A
OXIDIZING PROPERTIES	NA
OTHER INFORMATION	NA

SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY	STABLE UNDER NORMAL STORAGE AND HANDLING CONDITIONS.
CONDITIONS TO AVOID	OXIDIZING & REDUCING AGENTS MAY DESTROY COLOR.
INCOMPATIBLE MATERIALS	OXIDIZING & REDUCING AGENTS MAY DESTROY COLOR.
HAZARDOUS DECOMPOSITION PRODUCTS	CO, CO ₂ , OXIDES OF NITROGEN AND OTHER POTENTIALLY TOXIC FUMES.

SECTION 11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL EFFECTS :

ORAL (ANIMAL)	GREATER THAN 7,000 MG/KG - RAT	
DERMAL (ANIMAL)	NA	
EFFECTS TO EYES (ANIMAL)	EYES - RABBIT, NOT IRRITATING	
SKIN IRRITATION (ANIMAL)	SKIN - RABBIT, SLIGHT IRRITANT	
SKIN CORROSION/IRRITATION	NOT CLASSIFIED	
SERIOUS EYE DAMAGE/IRRITATION	CAUSES EYE IRRITATION	
RESPIRATORY OR SKIN SENSITIZATION	NOT CLASSIFIED	
GERM CELL MUTAGENICITY	NOT CLASSIFIED	
CARCINOGENICITY	NOT CLASSIFIED	
REPRODUCTIVE TOXICITY	NOT CLASSIFIED	
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE)	MAY CAUSE DROWSINESS OR DIZZINESS.	
ASPIRATION HAZARD	NOT CLASSIFIED	
INHALATION	MAY CAUSE DROWSINESS OR DIZZINESS.	
EYE CONTACT	CAUSES SERIOUS EYE IRRITATION.	
INGESTION	INGESTION MAY CAUSE NAUSEA, VOMITING AND DIARRHEA	

SECTION 12. ECOLOGICAL INFORMATION

TOXICITY	NA	
PERSISTENCE AND DEGRADABILITY	NA	
BIOACCUMULATIVE POTENTIAL	NA	
MOBILITY IN SOIL	LC-50 (LETHAL CONCENTRATION) UG = MICROGRAMS/LITER CHANNEL CATFISH - 2,267,000 UG/LITER RAINBOW TROUT - 1,372,000 UG/LITER BLUEGILL - 3,433,000 UG/LITER	
OTHER ADVERSE EFFECTS	NA	

SECTION 13. DISPOSAL CONSIDERATION

TSCA STATUS IN COMPLIANCE
 E C CLASSIFICATION (67/548/EEC - 88/379/EEC) N/A
 EINECS NUMBER
 REACH CLASSIFICATION
 R PHRASES
 ADDITIONAL REGULATORY INFORMATION

 SECTION 16. OTHER INFORMATION

INDICATION OF CHANGES:

NA

OTHER INFORMATION:

NA

GHS FULL TEXT PHRASES:

MAY BE HARMFUL IF INHALED	H333
CAUSES EYE IRRITATION	H320
CASUES MILD SKIN IRRITATION	H316

	HEALTH	FLAMMABILITY	REACTIVITY	PERSONAL PROT
H. M. I. S. CLASSIFICATION:	1	0	0	D

HMIS CODE: 4 - SEVERE HAZARD, 3 - SERIOUS HAZARD, 2 - MODERATE HAZARD, 1 - SLIGHT HAZARD, 0 - MINIMAL HAZARD

SAFETY DATA SHEET (SDS)
 REVISION DATE: 03/03/2016

 ALL INFORMATION AND DATA APPEARING ON THIS SDS ARE BELIEVED TO BE RELIABLE AND ACCURATE.
 HOWEVER, IT IS THE USER' S RESPONSIBILITY TO DETERMINE THE SAFETY, TOXICITY, AND SUITABILITY
 FOR USE OF THE PRODUCT DESCRIBED. SINCE THE ACTUAL USE BY OTHERS IS BEYOND OUR CONTROL,
 NO GUARANTEE, EXPRESSED OR IMPLIED, IS MADE BY HUE CORPORATION.
 USER ASSUMES ALL RISK AND RESPONSIBILITY.



SAFETY DATA SHEET (SDS)
REVISION DATE: 03/03/2016

HUE CORPORATION

Color your everything, may your Hue come true

SECTION I. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

PRODUCT IDENTIFIER:

PRODUCT NAME **HUE EOSINE EX CONC**
 PRODUCT NUMBER 1-C6-087-XPC
 COLOR INDEX NAME ACID RED 087
 COLOR INDEX NO 45380
 C. A. S. # 17372-87-1
 CHEMICAL FAMILY..... XANTHENE DYE

INTENDED USE OF THE PRODUCT:

FELT TIP, MARKER INKS, WATER BASED COATINGS AND SPECIALTY INKS, PRINTING ON NYLON, SILK AND WOOL.

NAME, ADDRESS AND TELEPHONE OF RESPONSIBLE PARTY:

HUE CORPORATION	TELEPHONE	714-389-3130
P.O. BOX 509	FAX	714-389-9731
TUSTIN, CA 92781	EMAIL	SUPPORT@HUECORPORATION.COM

EMERGENCY TELEPHONE NUMBER:

CHEMTREC (USA)	1-800-424-9300
CHEMTREC (OUTSIDE USA)	1-703-527-3887

SECTION 2. HAZARD(S) IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE:

GHS-US
 ACUTE TOX. - INHALATION (CATEGORY 5)
 EYE DAM./IRRITATION (CATEGORY 2B)
 SKIN CORR./IRRITATION (CATEGORY 3)

GHS LABELING:

HAZARD PICTOGRAMS (GHS-US): NO SYMBOL

SIGNAL WORD WARNING

HAZARD STATEMENT(S)	H333 - MAY BE HARMFUL IF INHALED H320 - CAUSES EYE IRRITATION H316 - CAUSES MILD SKIN IRRITATION
---------------------	--

PRECAUTIONARY STATEMENTS	P305 + 351 + P338 - IF IN EYES: RINSE CAUTIOUSLY WITH WATER FOR
--------------------------	---

SEVERAL MINUTES. REMOVE CONTACT LENSES IF PRESENT AND EASY TO DO. CONTINUE RINSING.

P337 + P313 - IF EYE IRRITATION OCCURS/PERSISTS:
GET MEDICAL ADVICE AND ATTENTION.

P261 - AVOID BREATHING DUST/FUMES/GAS/MIST/VAPORS/SPRAY

P264 - WASH FACE THOROUGHLY AFTER HANDLING.

P322 + P313 - IF SKIN IRRITATION OCCURS: GET MEDICAL ADVICE/
ATTENTION.

P304 + 312 - IF INHALED: CALL A POISON CENTER/DOCTOR/PHYSICIAN
IF YOU FEEL UNWELL

P501 - DISPOSE OF CONTENTS/ CONTAINER IN ACCORDANCE WITH
LOCAL/ REGIONAL/ NATIONAL INTERNATIONAL REGULATIONS.

OTHER HAZARDS
UNKNOWN ACUTE TOXICITY

NO DATA AVAILABLE
NO DATA AVAILABLE

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

DESCRIPTION OF MIXTURE: PROPRIETARY MIXTURE OF DYES.

SUBSTANCE:

NAME	C.A.S.#	WEIGHT 100%	GHS-US CLASSIFICATION
ACID RED 087	17372-87-1	100%	ACUTE TOX. - INHALATION (CATEGORY 5) EYE DAM./IRRITATION (CATEGORY 2B) SKIN CORR./IRRITATION (CATEGORY 3)

SECTION 4. FIRST AID MEASURES

FIRST AID MEASURES GENERAL:

INHALATION: REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, GIVE OXYGEN AND GET IMMEDIATE MEDICAL ATTENTION.

SKIN: WASH WITH MILD SOAP AND WATER. IF IRRITATION OCCURS GET MEDICAL ATTENTION. IF CLOTHING IS CONTAMINATED, RE-MOVE AND WASH BEFORE REUSE.

EYES: FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES, HOLDING EYELIDS APART FOR THOROUGH IRRIGATION. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION: INDUCE VOMITING - SEEK IMMEDIATE MEDICAL ATTENTION.

MOST IMPORTANT SYMPTOMS AND EFFECTS, ACUTE AND DELAYED:

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY HAZARDOUS COMMUNICATION STANDARD. HOWEVER, AS WITH ALL CHEMICAL; HANDLE WITH CARE, AVOID EYE AND SKIN CONTACT, AVOID INHALATION OF DUSTS OR VAPORS. WASH THOROUGHLY AFTER HANDLING. KEEP CONTAINERS CLOSED.

SECTION 5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA:

WATER, DRY CHEMICAL, CARBON DIOXIDE, FOAM.

SPECIAL HAZARDS ARISING FROM SUBSTANCE OR MEDIA:

FIREFIGHTERS SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS TO GUARD AGAINST POTENTIALLY TOXIC AND IRRITATING FUMES. AVOID DUSTING. DUST CAN FORM EXPLOSIVE MIXTURES WITH AIR.

PROTECTION/ADVICE FOR FIREFIGHTER(S):

BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

REMOVE PERSONS FROM DANGER AREA.

ENVIROMENTAL PRECAUTIONS:

AVOID ANY UNCONTROLLED RELEASE OF MATERIAL. DO NOT EMPTY INTO DRAINS OR THE AQUATIC ENVIRONMENT.

EMERGENCY PROCEDURES:

NO ADDITIONAL INFORMATION

METHODS AND MATERIALS FOR CONTAMINENT AND CLEANING UP:

WHERE SPILLS ARE POSSIBLE, A COMPREHENSIVE SPILL RESPONSE PLAN SHOULD BE DEVELOPED AND IMPLEMENTED. AVOID ANY UNCONTROLLED RELEASE OF MATERIAL.

UTILIZE RECOMMENDED PROTECTIVE CLOTHING AND EQUIPMENT (SEE SECTION 8). SPILLS SHOULD BE SWEEPED UP USING AN ABSORBENT DUST CONTROL PRODUCT AND PLACED IN CONTAINERS. SPILL AREA CAN BE WASHED WITH WATER. COLLECT WATER FOR APPROVED DISPOSAL. IN THE EVENT OF UNCONTROLLED RELEASE OF THIS MATERIAL, THE USER SHOULD DETERMINE IF THE RELEASE IS REPORTABLE UNDER APPLICABLE LAWS AND REGULATIONS.

SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:

HANDLE WITH CARE. AVOID OVER EXPOSURE. USE NIOSH/OSHA APPROVED RESPIRATOR, WORK GLOVES, AND CLOTHING. WASH AFTER HANDLING. SENSITIVE INDIVIDUALS MAY EXPERIENCE RESPIRATORY ALLERGIES. MAY CAUSE SKIN IRRITATION. USE WITH LOCAL VENTILATION.

CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES:

USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION OR OTHER ENGINEERING CONTROLS TO KEEP AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS.

KEEP AWAY FROM HEAT. KEEP AWAY FROM SOURCES OF IGNITION.

KEEP AWAY FROM STRONG OXIDIZING AND REDUSING AGENTS.

SPECIFIC END USES:

FELT TIP, MARKER INKS, WATER BASED COATINGS AND SPECIALTY INKS, PRINTING ON NYLON, SILK AND WOOL.

SECTION 8. EXPOSURE CONTROLS /PERSONAL PROTECTION

CONTROL PARAMETERS:

INGREDIENTS WITH LIMIT VALUES THAT REQUIRE MONITORING AT THE WORKPLACE - NOT REQUIRED

EXPOSURE CONTROLS:

APPROPRIATE ENGINEERING CONTROLS - THE USUAL PRECAUTIONARY MEASURES ARE TO BE ADHERED TO WHEN HANDLING CHEMICALS.

PERSONAL PROTECTIVE EQUIPMENT:



HAND PROTECTION

WEAR IMPERMEABLE RUBBER OR PLASTIC GLOVES

EYE PROTECTION

TIGHTLY SEALED SAFETY GOGGLES OR FULL FACE SIDE SHIELDS.

SKIN AND BODY

APRON, COVERALLS AND NON-LEATHER SOLED WORK SHOES.
WASH DYE CONTAMINATED CLOTHES AND SKIN WITH MILD SOAP AND DETERGENTS.

RESPIRATORY

WEAR OSHA/NIOSH APPROVED DUST MASK/RESPIRATOR

HYGIENE MEASURES

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. WASH HANDS AFTER HANDLING MATERIAL.

OTHER PROTECTION

DELUGE SAFETY SHOWER AND EYE WASH STATION SHOULD BE LOCATED NEAR WORK AREA.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES :

APPEARANCE, COLOR, ODOR	POWDER, NO ODOR
pH	7.0 - 8.5
MELTING POINT/FREEZING POINT	ND
INITIAL BOILING POINT/BOILING RANGE	0.00
FLASHPOINT	NOT APPLICABLE
EVAPORATION RATE	NO DATA
FLAMMABILITY (SOLID,GAS)	NORMALLY STABLE, NOT COMBUSTIBLE NOR FLAMMABLE
UPPER EXPLOSIVE LIMITS	NA
LOWER EXPLOSIVE LIMITS	NA
VAPOR PRESSURE	NA
VAPOR DENSITY	NA
RELATIVE DENSITY	NA

SOLUBILITY IN WATER	SOLUBLE
PARTITION COEFFICIENT N-OCTANOL/WATER	NO DATA
AUTO-IGNITION TEMPERATURE	NO DATA
DECOMPOSITION TEMPERATURE	NO DATA
VISCOSITY, DYNAMIC	NO DATA
VISCOSITY, CINEMATIC	NO DATA
EXPLOSIVE PROPERTIES	N/A
OXIDIZING PROPERTIES	NA
OTHER INFORMATION	NA

SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY	STABLE UNDER NORMAL STORAGE AND HANDLING CONDITIONS.
CONDITIONS TO AVOID	OXIDIZING & REDUCING AGENTS MAY DESTROY COLOR.
INCOMPATIBLE MATERIALS	OXIDIZING & REDUCING AGENTS MAY DESTROY COLOR.
HAZARDOUS DECOMPOSITION PRODUCTS	CO, CO ₂ , OXIDES OF NITROGEN AND OTHER POTENTIALLY TOXIC FUMES.

SECTION 11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL EFFECTS :

ORAL (ANIMAL)	GREATER THAN 2000 MG/KG - RAT
DERMAL (ANIMAL)	NO DATA AVAILABLE
EFFECTS TO EYES (ANIMAL)	NO DATA AVAILABLE
SKIN IRRITATION (ANIMAL)	NO DATA AVAILABLE
SKIN CORROSION/IRRITATION	NOT CLASSIFIED
SERIOUS EYE DAMAGE/IRRITATION	CAUSES SERIOUS EYE IRRITATION
RESPIRATORY OR SKIN SENSITIZATION	NOT CLASSIFIED
GERM CELL MUTAGENICITY	NOT CLASSIFIED
CARCINOGENICITY	NOT CLASSIFIED
REPRODUCTIVE TOXICITY	NOT CLASSIFIED
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE)	MAY CAUSE DROWSINESS OR DIZZINESS.
ASPIRATION HAZARD	NOT CLASSIFIED
INHALATION	MAY CAUSE DROWSINESS OR DIZZINESS.
EYE CONTACT	CAUSES SERIOUS EYE IRRITATION.
INGESTION	INGESTION MAY CAUSE NAUSEA, VOMITING AND DIARRHEA

SECTION 12. ECOLOGICAL INFORMATION

TOXICITY	NA
PERSISTENCE AND DEGRADABILITY	NA
BIOACCUMULATIVE POTENTIAL	NA
MOBILITY IN SOIL	NA
OTHER ADVERSE EFFECTS	NA

SECTION 13. DISPOSAL CONSIDERATION

TSCA STATUS	IN COMPLIANCE
E C CLASSIFICATION	(67/548/EEC - 88/379/EEC) N/A
EINECS NUMBER	
REACH CLASSIFICATION	
R PHRASES	
ADDITIONAL REGULATORY INFORMATION	CONTAINS:
	<11PPM BENZENE, (CAS#71-43-2)
	<11PPM TOLUENE, (CAS#108-88-3)
	<11PPM XYLENES, (CAS#1330-20-7)

SECTION 16. OTHER INFORMATION

INDICATION OF CHANGES:

NA

OTHER INFORMATION:

NA

GHS FULL TEXT PHRASES:

MAY BE HARMFUL IF INHALED	H333
CAUSES EYE IRRITATION	H320
CASUES MILD SKIN IRRITATION	H316

	HEALTH	FLAMMABILITY	REACTIVITY	PERSONAL PROT
H. M. I. S. CLASSIFICATION:	1	0	0	D
HMIS CODE: 4 - SEVERE HAZARD, 3 - SERIOUS HAZARD, 2 - MODERATE HAZARD, 1 - SLIGHT HAZARD, 0 - MINIMAL HAZARD				

SAFETY DATA SHEET (SDS)
REVISION DATE: 03/03/2016

ALL INFORMATION AND DATA APPEARING ON THIS SDS ARE BELIEVED TO BE RELIABLE AND ACCURATE.
HOWEVER, IT IS THE USER' S RESPONSIBILITY TO DETERMINE THE SAFETY, TOXICITY, AND SUITABILITY
FOR USE OF THE PRODUCT DESCRIBED. SINCE THE ACTUAL USE BY OTHERS IS BEYOND OUR CONTROL,
NO GUARANTEE, EXPRESSED OR IMPLIED, IS MADE BY HUE CORPORATION.
USER ASSUMES ALL RISK AND RESPONSIBILITY.

Safety Data Sheet

INTRACID RHODAMINE WT LIQUID

Safety Data Sheet dated: 5/13/2015 - version 1

Date of first edition: 5/13/2015

1. IDENTIFICATION

Product identifier

Mixture identification:

Trade name: INTRACID RHODAMINE WT LIQUID

Other means of identification:

Trade code: A45171566

Recommended use of the chemical and restrictions on use

Recommended use: Industrial color additive

Restrictions on use: Not Determined

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Sensient Colors LLC

2515 N. Jefferson

63106 St. Louis, MO (USA)

Phone: 1 800-325-8110

Emergency Number(CHEMTREC): 1-800-424-9300

2. HAZARD(S) IDENTIFICATION

The identity of the individual components of this product is proprietary information and is considered a trade secret pursuant to 29 CFR 1910.1200

Hazardous components as defined in the OSHA Hazard Communication Standard: components with a HEALTH hazard (carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, etc..) and/or a PHYSICAL hazard (a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive, etc.)



Classification of the chemical

Skin Irrit. 2 Causes skin irritation.

Eye Irrit. 2B Causes eye irritation

Label elements

Symbols:



Warning

Code Description

H315 Causes skin irritation.

H320 Causes eye irritation

Code Description

P264 Wash ... Thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302+P352 IF ON SKIN: Wash with plenty of water/...

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P321 Specific treatment (see ... On this label).

P332+P313 If skin irritation occurs: Get medical advice/attention.

P337+P313 If eye irritation persists: Get medical advice/attention.

P362+P364 Take off contaminated clothing and wash it before reuse.

Ingredient(s) with unknown acute toxicity:

None

Hazards not otherwise classified identified during the classification process:

None

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances

Not Determined

Mixtures

Hazardous components within the meaning of 29 CFR 1910.1200 and related classification:

List of components

Qty	Name	Ident. Numb.	Classification	Registration Number
10-12.5 %	RHODAMINE LIQUID	CAS:65392-81-6 EC:265-730-6	Skin Irrit. 2, H315; Eye Irrit. 2B, H320	
10-12.5 %	RHODAMINE LIQUID	CAS:75701-30-3 EC:278-292-6	Skin Irrit. 2, H315; Eye Irrit. 2B, H320	
1-3 %	TRIMELLITIC ACID	CAS:528-44-9 EC:208-432-3	Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335	

4. FIRST AID MEASURES

Description of first aid measures

In case of skin contact:

- Immediately take off all contaminated clothing and shoes.
- Immediately remove any contaminated clothing, shoes or stockings.
- After contact with skin, wash immediately with soap and plenty of water.

In case of eye contact:

- Wash immediately and thoroughly with running water, keeping eyelids regularly raised, for at least 15 minutes. Cold water may be used. Check for and remove any contact lenses at once. OBTAIN A MEDICAL EXAMINATION.
- Protect the eyes with a sterile gauze or a clean, dry handkerchief.

In case of ingestion:

- Do not induce vomiting, get medical attention showing the MSDS and label hazardous.

In case of inhalation:

- Remove casualty to fresh air and keep warm and at rest.

Most important symptoms/effects, acute and delayed

- Eye irritation
- Eye damages
- Skin Irritation
- Erythema

Indication of any immediate medical attention and special treatment needed

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media:

- Water, CO2, foam, chemical powders, according to the materials involved in the fire.
- In case of fire, use foam, dry chemical, CO2.

Unsuitable extinguishing media:

None in particular.

Specific hazards arising from the chemical

- Do not inhale explosion and combustion gases.
- Burning produces heavy smoke.
- Hazardous combustion products: Not Determined
- Explosive properties: Not Determined
- Oxidising properties: Not Determined

Special protective equipment and precautions for fire-fighters

- Use suitable breathing apparatus .
- Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
- Move undamaged containers from immediate hazard area if it can be done safely.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

- Wear personal protection equipment.
- Remove persons to safety.
- See protective measures under point 7 and 8.

Methods and material for containment and cleaning up

- Suitable material for taking up: dry and inert absorbing material (e.g. vermiculite, sand, earth).
 - Wash with plenty of water.
-

7. HANDLING AND STORAGE

Precautions for safe handling

- Avoid contact with skin and eyes, inhalation of vapours and mists.
- Don't use empty container before they have been cleaned.
- Before making transfer operations, assure that there aren't any incompatible material residuals in the containers.
- Contaminated clothing should be changed before entering eating areas.
- Do not eat or drink while working.
- See also section 8 for recommended protective equipment.

Conditions for safe storage, including any incompatibilities

- Storage temperature: Not Determined
 - Incompatible materials:
 - None in particular.
 - Instructions as regards storage premises:
 - Adequately ventilated premises.
-

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

No Data Available

Appropriate engineering controls: Not Determined

Individual protection measures

Eye/face protection:

Use close fitting safety goggles, don't use eye lens.

Skin protection:

Use clothing that provides comprehensive protection to the skin, e.g. cotton, rubber, PVC or viton.

Hand protection:

Use protective gloves that provide comprehensive protection, e.g. P.V.C., neoprene or rubber.

Respiratory protection:

Not Determined

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

- Physical State Liquid
- Appearance: Liquid,
- Odour: Not Determined
- Odour threshold: Not Determined
- pH: 10.50
- Melting point/ range: Not Determined
- Boiling point/ range: Not Determined
- Flash point: > 100°C / 212°F
- Evaporation rate: Not Determined
- Upper/lower flammability or explosive limits: Not Determined
- Vapour density: Not Determined
- Vapour pressure: Not Determined
- Density: Not Determined
- Water solubility: Not Determined
- Lipid solubility: Not Determined
- Partition coefficient (n-octanol/water): Not Determined
- Auto-ignition temperature: Not Determined
- Decomposition temperature: Not Determined
- Viscosity: Not Determined
- Explosive properties: Not Determined
- Oxidising properties: Not Determined
- Flammability (Solid, Gas): Not Determined

Other information

Substance group relevant properties: Not Determined

Miscibility: Not Determined

Fat Solubility: Not Determined

Conductivity: Not Determined

10. STABILITY AND REACTIVITY

Reactivity

Stable under normal conditions.

Chemical stability

Data not Available.

Possibility of hazardous reactions

Burning produces carbon monoxide and/or carbon dioxide.

Conditions to avoid

Stable under normal conditions of temperature and pressure.

Incompatible materials

Avoid strong oxidizing agents, peroxides, acids, alkali metals.

Hazardous decomposition products

Burning produces carbon monoxide and/or carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Toxicological information of the product: No Data Available

Substance(s) listed on the IARC Monographs:

None

Substance(s) listed as OSHA Carcinogen(s):

None

Substance(s) listed as NIOSH Carcinogen(s):

None

Substance(s) listed on the NTP report on Carcinogens:

None

12. ECOLOGICAL INFORMATION

Toxicity

Adopt good working practices, so that the product is not released into the environment.

Eco-toxicity:

List of Eco-Toxicological properties of the product

No Data Available

Persistence and degradability

Not Determined

Bioaccumulative potential

Not Determined

Mobility in soil

Not Determined

Other adverse effects

Not Determined

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Recover if possible. In so doing, comply with the local and national regulations currently in force.

14. TRANSPORT INFORMATION

UN number

ADR-UN number: N/A

DOT-UN Number: N/A

IATA-Un number: N/A

IMDG-Un number: N/A

UN proper shipping name

ADR-Shipping Name: N/A
DOT Proper Shipping Name: N/A
IATA-Technical name: N/A
IMDG-Technical name: N/A

Transport hazard class(es)

ADR-Class: N/A
DOT Hazard Class: N/A
IATA-Class: N/A
IMDG-Class: N/A

Packing group

ADR-Packing Group: N/A
Exempted for ADR: N/A
IATA-Packing group: N/A
IMDG-Packing group: N/A

Environmental hazards

Marine pollutant: No
Environmental Pollutant: Not Determined

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Determined

Special precautions

Department of Transportation (DOT):

DOT-Special Provision(s): N/A
DOT Label(s): N/A
DOT Symbol: N/A
DOT Cargo Aircraft: N/A
DOT Passenger Aircraft: N/A
DOT/TDG Bulk: N/A
DOT Non-Bulk: N/A

Road and Rail (ADR-RID):

ADR-Label: N/A
ADR-Upper number: N/A
ADR Tunnel Restriction Code: N/A

Air (IATA):

IATA-Passenger Aircraft: N/A
IATA-Cargo Aircraft: N/A
IATA-Label: N/A
IATA-Sub Risk: N/A
IATA-Erg: N/A
IATA-Special Provisioning: N/A

Sea (IMDG):

IMDG-Stowage Code: N/A
IMDG-Stowage Note: N/A
IMDG-Sub Risk: N/A
IMDG-Special Provisioning: N/A
IMDG-Page: N/A
IMDG-Label: N/A
IMDG-EMS: N/A
IMDG-MFAG: N/A

15. REGULATORY INFORMATION**USA - Federal regulations****TSCA - Toxic Substances Control Act****TSCA inventory:**

All the components are listed on the TSCA inventory

TSCA listed substances:

RHODAMINE LIQUID	is listed in TSCA Section 8b
RHODAMINE LIQUID	is listed in TSCA Section 8b
TRIMELLITIC ACID	is listed in TSCA Section 8b, Section 5

SARA - Superfund Amendments and Reauthorization Act

Section 302 - Extremely Hazardous Substances:

no substances listed

Section 304 - Hazardous substances:

no substances listed

Section 313 - Toxic chemical list:

no substances listed

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

Substance(s) listed under CERCLA:

no substances listed

CAA - Clean Air Act

CAA listed substances:

no substances listed

CWA - Clean Water Act

CWA listed substances:

no substances listed

USA - State specific regulations

California Proposition 65

Substance(s) listed under California Proposition 65:

no substances listed

Massachusetts Right to know

Substance(s) listed under Massachusetts Right to know:

no substances listed

Pennsylvania Right to know

Substance(s) listed under Pennsylvania Right to know:

no substances listed

New Jersey Right to know

Substance(s) listed under New Jersey Right to know:

no substances listed

16. OTHER INFORMATION

Code	Description
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H320	Causes eye irritation
H335	May cause respiratory irritation.

Safety Data Sheet dated: 5/13/2015 - version 1

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality. The information relates only to the specific material and may not be valid for such material used in combination with any other material or in any process.

This document was prepared by a competent person who has received appropriate training.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

This MSDS cancels and replaces any preceding release.

Legend to abbreviations and acronyms used in the safety data sheet:

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.

RID: Regulation Concerning the International Transport of Dangerous Goods by Rail

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulation by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

GHS: Globally Harmonized System of Classification and Labeling of Chemicals
CLP: Classification, Labeling, Packaging
EINECS: European Inventory of Existing Commercial Chemical Substances
INCI: International Nomenclature of Cosmetic Ingredients
CAS: Chemical Abstracts Service (division of the American Chemical Society)
GefStoffVO: Ordinance on Hazardous Substances, Germany
LC50: Lethal concentration, for 50 percent of test population
LD50: Lethal dose, for 50 percent of test population
DNEL: Derived No Effect Level
PNEC: Predicted No Effect Concentration
TLV: Threshold Limiting Value
TWATLV: Threshold Limiting Value for the Time Weighted Average 8 hour day.(ACGIH Standard)
STEL: Short Term Exposure limit
STOT: Specific Target Organ Toxicity
WGK: German Water Hazard Class
KSt: Explosion coefficient
y for the damage.



SAFETY DATA SHEET (SDS)
REVISION DATE: 03/25/2015

HUE CORPORATION

Color your everything, may your Hue come true

SECTION I. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

PRODUCT IDENTIFIER:

PRODUCT NAME **HUE RHODAMINE A PSA 2** (Sulforhodamine B)
 PRODUCT NUMBER 1-C6-052PSA2
 COLOR INDEX NAME ACID RED 052
 C. A. S. # 3520-42-1
 CHEMICAL FAMILY..... XANTHENE

INTENDED USE OF THE PRODUCT:

INKS, COATINGS.

NAME, ADDRESS AND TELEPHONE OF RESPONSIBLE PARTY:

HUE CORPORATION	TELEPHONE	714-389-3130
P.O. BOX 509	FAX	714-389-9731
TUSTIN, CA 92781	EMAIL	SUPPORT@HUECORPORATION.COM

EMERGENCY TELEPHONE NUMBER:

CHEMTREC (USA)	1-800-424-9300
CHEMTREC (OUTSIDE USA)	1-703-527-3887

SECTION 2. HAZARD(S) IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE:

GHS-US
 ACUTE TOX. - INHALATION (CATEGORY 5)
 EYE DAM./IRRITATION (CATEGORY 2B)
 SKIN CORR./IRRITATION (CATEGORY 3)
 ACUTE TOX. - ORAL (CATEGORY 4)

GHS LABELING:

HAZARD PICTOGRAMS (GHS-US):



SIGNAL WORD

WARNING

HAZARD STATEMENT(S)

H302 - HARMFUL IF SWALLOWED
 H320 - CAUSES EYE IRRITATION
 H316 - CAUSES MILD SKIN IRRITATION

H333 - MAY BE HARMFUL IF INHALED

PRECAUTIONARY STATEMENTS

P301 + P304 + P312 - IF SWALLOWED OR INHALED: CALL A POISON CENTER/ DOCTOR/PHYSICIAN IF YOU FEEL UNWELL.
 P330 - RINSE MOUTH
 P264 - WASH FACE THOROUGHLY AFTER HANDLING.
 P270 - DO NOT EAT, DRINK OR SMOKE WHEN USING THIS PRODUCT
 P305 + 351 + P338 - IF IN EYES: RINSE CAUTIOUSLY WITH WATER FOR SEVERAL MINUTES. REMOVE CONTACT LENSES IF PRESENT AND EASY TO DO. CONTINUE RINSING.
 P280 - WEAR PROTECTIVE GLOVES/ EYE PROTECTION/ FACE PROTECTION
 P337 + P332 + P313 - IF EYE OR SKIN IRRITATION OCCURS/PERSISTS: GET MEDICAL ADVICE/ATTENTION
 P501 - DISPOSE OF CONTENTS/ CONTAINER IN ACCORDANCE WITH LOCAL/ REGIONAL/ NATIONAL INTERNATIONAL REGULATIONS.

OTHER HAZARDS

NO DATA AVAILABLE

UNKNOWN ACUTE TOXICITY

NO DATA AVAILABLE

 SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

SUBSTANCE:

NAME	C.A.S.#	WEIGHT 100%	GHS-US CLASSIFICATION
ACID RED 052	3520-42-1	100%	ACUTE TOX. - INHALATION 5 EYE DAM./IRRITATION 2B SKIN CORR./IRRITATION 3 ACUTE TOX. - ORAL 4

HAZARDOUS INGREDIENTS:

CHEMICAL DESIGNATION	C.A.S.#	WEIGHT 100%	GHS-US CLASSIFICATION
NO HAZARDOUS COMPONENTS FOUND UNDER APPLICABLE REGULATIONS	NONE	NONE	-

 SECTION 4. FIRST AID MEASURES

FIRST AID MEASURES GENERAL:

INHALATION: REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, GIVE OXYGEN AND GET IMMEDIATE MEDICAL ATTENTION.

SKIN: WASH WITH MILD SOAP AND WATER. IF IRRITATION OCCURS GET MEDICAL ATTENTION. IF CLOTHING IS CONTAMINATED, RE-MOVE AND WASH BEFORE REUSE.

EYES: FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES, HOLDING EYELIDS APART FOR THOROUGH IRRIGATION. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION: INDUCE VOMITING - SEEK IMMEDIATE MEDICAL ATTENTION.

MOST IMPORTANT SYMPTOMS AND EFFECTS, ACUTE AND DELAYED:

THIS PRODUCT IS EINICS LISTED: 222-529-8

SECTION 5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA:

WATER, DRY CHEMICAL, CARBON DIOXIDE, FOAM.

SPECIAL HAZARDS ARISING FROM SUBSTANCE OR MEDIA:

FIREFIGHTERS SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS TO GUARD AGAINST POTENTIALLY TOXIC AND IRRITATING FUMES. AVOID DUSTING. DUST CAN FORM EXPLOSIVE MIXTURES WITH AIR.

PROTECTION/ADVICE FOR FIREFIGHTER(S):

BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

REMOVE PERSONS FROM DANGER AREA.

ENVIROMENTAL PRECAUTIONS:

AVOID ANY UNCONTROLLED RELEASE OF MATERIAL. DO NOT EMPTY INTO DRAINS OR THE AQUATIC ENVIRONMENT.

EMERGENCY PROCEDURES:

AVOID ANY UNCONTROLLED RELEASE OF MATERIAL.

METHODS AND MATERIALS FOR CONTAMINENT AND CLEANING UP:

WHERE SPILLS ARE POSSIBLE, A COMPREHENSIVE SPILL RESPONSE PLAN SHOULD BE DEVELOPED AND IMPLEMENTED. AVOID ANY UNCONTROLLED RELEASE OF MATERIAL.

UTILIZE RECOMMENDED PROTECTIVE CLOTHING AND EQUIPMENT (SEE SECTION 8).

SPILLS SHOULD BE SWEEPED UP USING AN ABSORBENT DUST CONTROL PRODUCT AND PLACED IN CONTAINERS. SPILL AREA CAN BE WASHED WITH WATER. COLLECT WATER FOR APPROVED DISPOSAL. IN THE EVENT OF UNCONTROLLED RELEASE OF THIS MATERIAL, THE USER SHOULD DETERMINE IF THE RELEASE IS REPORTABLE UNDER APPLICABLE LAWS AND REGULATIONS.

SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:

ACID RED 52 HAS BEEN FOUND TO BE MUTAGENIC IN HAMSTER CELL TESTS IN VITRO. THE RELEVANCE TO HUMANS IS NOT KNOWN. MAY CAUSE SKIN SENSITIZATION OR OTHER ALLERGIC

RESPONSES. AVOID OVEREXPOSURE.

CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES:

HANDLE WITH CARE. AVOID OVER EXPOSURE. USE NIOSH/OSHA APPROVED RESPIRATOR, WORK GLOVES, AND CLOTHING. WASH AFTER HANDLING. SENSITIVE INDIVIDUALS MAY EXPERIENCE RESPIRATORY ALLERGIES. MAY CAUSE SKIN IRRITATION. USE WITH LOCAL VENTILATION.

USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION OR OTHER ENGINEERING CONTROLS TO KEEP AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS.

KEEP AWAY FROM HEAT. KEEP AWAY FROM SOURCES OF IGNITION.

KEEP AWAY FROM STRONG OXIDIZING AND REDUSING AGENTS.

SPECIFIC END USES:

HOUSEHOLD ITEMS, MARKER INKS, WATER BASED COATINGS AND SPECIALTY INKS.

SECTION 8. EXPOSURE CONTROLS /PERSONAL PROTECTION

CONTROL PARAMETERS:

INGREDIENTS WITH LIMIT VALUES THAT REQUIRE MONITORING AT THE WORKPLACE - NOT REQUIRED

EXPOSURE CONTROLS:

APPROPRIATE ENGINEERING CONTROLS - THE USUAL PRECAUTIONARY MEASURES ARE TO BE ADHERED TO WHEN HANDLING CHEMICALS.

PERSONAL PROTECTIVE EQUIPMENT:



HAND PROTECTION
EYE PROTECTION
SKIN AND BODY

WEAR IMPERMEABLE RUBBER OR PLASTIC GLOVES
TIGHTLY SEALED SAFETY GOGGLES OR FULL FACE SIDE SHIELDS.
APRON, COVERALLS AND NON-LEATHER SOLED WORK SHOES.
WASH DYE CONTAMINATED CLOTHES AND SKIN WITH MILD SOAP AND DETERGENTS.

RESPIRATORY
HYGIENE MEASURES

WEAR OSHA/NIOSH APPROVED DUST MASK/RESPIRATOR
HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. WASH HANDS AFTER HANDLING MATERIAL.

OTHER PROTECTION

DELUGE SAFETY SHOWER AND EYE WASH STATION SHOULD BE LOCATED NEAR WORK AREA.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES :

APPEARANCE, COLOR, ODOR	GREENISH RED POWDER, NO ODOR
pH	NA
MELTING POINT/FREEZING POINT	NA
INITIAL BOILING POINT/BOILING RANGE	0.00
FLASHPOINT	NORMALLY STABLE, NOT COMBUSTIBLE NOR FLAMMABLE.
EVAPORATION RATE	NO DATA
FLAMMABILITY (SOLID,GAS)	NORMALLY STABLE, NOT COMBUSTIBLE NOR FLAMMABLE.
UPPER EXPLOSIVE LIMITS	NA
LOWER EXPLOSIVE LIMITS	NA
VAPOR PRESSURE	NA
VAPOR DENSITY	NA
RELATIVE DENSITY	NA
SOLUBILITY IN WATER	SOLUBLE
PARTITION COEFFICIENT N-OCTANOL/WATER	NO DATA
AUTO-IGNITION TEMPERATURE	NO DATA
DECOMPOSITION TEMPERATURE	NO DATA
VISCOSITY, DYNAMIC	NO DATA
VISCOSITY, CINEMATIC	NO DATA
EXPLOSIVE PROPERTIES	N/A
OXIDIZING PROPERTIES	NA
OTHER INFORMATION	NA

SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY	STABLE UNDER NORMAL STORAGE AND HANDLING CONDITIONS.
CONDITIONS TO AVOID	OXIDIZING & REDUCING AGENTS MAY DESTROY COLOR.
INCOMPATIBLE MATERIALS	OXIDIZING & REDUCING AGENTS MAY DESTROY COLOR.
HAZARDOUS DECOMPOSITION PRODUCTS - CO, CO ₂ , OXIDES OF NITROGEN AND OTHER POTENTIALLY TOXIC FUMES.	

SECTION 11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL EFFECTS :

ORAL (ANIMAL)	GREATER THAN 5,000 MG/KG - RAT	
DERMAL (ANIMAL)	NA	
EFFECTS TO EYES (ANIMAL)	NOT IRRITATING	
SKIN IRRITATION (ANIMAL)	SLIGHTLY IRRITATING	
SKIN CORROSION/IRRITATION	NOT CLASSIFIED	
SERIOUS EYE DAMAGE/IRRITATION	CAUSES EYE IRRITATION	
RESPIRATORY OR SKIN SENSITIZATION	NOT CLASSIFIED	
GERM CELL MUTAGENICITY	NOT CLASSIFIED	
CARCINOGENICITY	NOT CLASSIFIED	
REPRODUCTIVE TOXICITY	NOT CLASSIFIED	
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE)	MAY CAUSE DROWSINESS OR DIZZINESS.	
ASPIRATION HAZARD	NOT CLASSIFIED	
INHALATION	MAY CAUSE DROWSINESS OR DIZZINESS.	
EYE CONTACT	CAUSES EYE IRRITATION.	
INGESTION	INGESTION MAY CAUSE NAUSEA, VOMITING AND DIARRHEA	

 SECTION 12. ECOLOGICAL INFORMATION

TOXICITY	LC/50 = 1000 MG/L [96 HR] [BLUE GILL]
PERSISTENCE AND DEGRADABILITY	NA
BIOACCUMULATIVE POTENTIAL	NA
MOBILITY IN SOIL	NA
OTHER ADVERSE EFFECTS	NA

 SECTION 13. DISPOSAL CONSIDERATION

WASTE DISPOSAL RECOMMENDATION :

EMPTY BAGS THOROUGHLY. CARRY OUT THE PROPER RECYLING, REUSAGE OR DISPOSAL.
 PLEASE REFER TO THE RELEVANT EU REGULATIONS, IN PARTICULAR THE GUIDELINES/DECISIONS OF
 THE COUNCIL REGARDING HANDLING OF WASTES (E.G. 75/442/EEC, 91/689/EEC, 94/67/EC, 94/904/EC)
 AS IMPLEMENTED IN NATIONAL REGULATIONS.

REGIONAL RECOMMENDATION :

BURY OR INCINERATE ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

CONTAINERS SHOULD NOT BE REUSED WITHOUT PROFESSIONAL CLEANING AND RECONDITIONING.
 OBSERVE ALL LABELED SAFEGUARDS UNTIL CLEANED, RECONDITIONED OR DESTROYED.

PLEASE REFER TO SECTION 8 (EXPOSURE CONTROLS /PERSONAL PROTECTION) OF THIS SDS.

 SECTION 14. TRANSPORTATION INFORMATION

UN NUMBER	NONE
UN PROPER SHIPPING NAME	NONE

DEPARTMENT OF TRANSPORTATION (DOT) :

TRANSPORT HAZARD CLASS(ES)

HAZARD LABLES (DOT) :

PACKING GROUP (DOT)	NA
DOT SPECIAL PROVISIONS	NA

ADDITIONAL INFORMATION:

OVERLAND TRANSPORT	NONE
TRANSPORT BY SEA	NONE
AIR TRANSPORT	NONE
DOT QUANTITY LIMITATIONS PASSENGER AIRCRAFT	NA
DOT QUANTITY LIMITATIONS CARGO AIRCRAFT	NA

 SECTION 15. REGULATORY INFORMATION

US FEDERAL REGULATIONS:

TSCA STATUS: THIS SUBSTANCE IS LISTED ON UNITED STATES TSCA (TOXIC SUBSTANCE CONTROL ACT) INVENTORY.

US STATE REGULATIONS:

NONE

CHEMICAL IDENTITY:

3520-42-1	TSCA	DSL	NDSL	EINECS	ELINCS	ENCS	CHINA	KECL	PICCS	AICS
	X	-	-	-	-	-	-	-	-	-

TSCA STATUS	IN COMPLIANCE
E C CLASSIFICATION	(67/548/EEC - 88/379/EEC) N/A
EINECS NUMBER	
REACH CLASSIFICATION	
R PHRASES	

ADDITIONAL REGULATORY INFORMATION:

SECTION 16. OTHER INFORMATION

INDICATION OF CHANGES:

NA

OTHER INFORMATION:

NA

GHS FULL TEXT PHRASES:

MAY BE HARMFUL IF INHALED	H333
CAUSES EYE IRRITATION	H320
CASUES MILD SKIN IRRITATION	H316
HARMFUL IF SWALLOWED	H302

	HEALTH	FLAMMABILITY	REACTIVITY	PERSONAL PROT
H. M. I. S. CLASSIFICATION:	1	0	0	D
HMIS CODE: 4 - SEVERE HAZARD, 3 - SERIOUS HAZARD, 2 - MODERATE HAZARD, 1 - SLIGHT HAZARD, 0 - MINIMAL HAZARD				

SAFETY DATA SHEET (SDS)
REVISION DATE: 03/25/2015

ALL INFORMATION AND DATA APPEARING ON THIS SDS ARE BELIEVED TO BE RELIABLE AND ACCURATE. HOWEVER, IT IS THE USER' S RESPONSIBILITY TO DETERMINE THE SAFETY, TOXICITY, AND SUITABILITY FOR USE OF THE PRODUCT DESCRIBED. SINCE THE ACTUAL USE BY OTHERS IS BEYOND OUR CONTROL, NO GUARANTEE, EXPRESSED OR IMPLIED, IS MADE BY HUE CORPORATION.
USER ASSUMES ALL RISK AND RESPONSIBILITY.

Appendix B

Boring Logs

Date Start/Finish: 3/9/00 / 3/9/00 Drilling Company: RAU Drilling Driller's Name: Rick Rau Drilling Method: Hollow Stem Auger Auger Size: 4.25" ID Rig Type: CME 55 Sampling Method: Split Spoon Hammer Weight: 140 lb.	Borehole Depth: 14.0 feet Geologist: Matt Stuk	Well No: 04-4 Client: General Motors Corporation Location: GM NAO Flint Site Building 04 Area
--	---	---

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
									GROUND SURFACE		
		(0-2')		3 5 8 10	13	1.67	0.0		Asphalt. Black Sand FILL, dry, no odor.		
		(2-4')		7 11 14 19	25	2.0	0.1				
5		(4-6')		8 13 14 22	27	2.0	7.6				
		(6-8')		6 16 22 28	38	1.67	1.0		Wet.		
		(8-10')		4 6 4 4	10	1.83	0.0		Brown Sandy lean CLAY, some fine to coarse Sand, moist, no odor.		
10		(10-12')		3 2 1 2	3	0.83	0.0		Brown Clayey GRAVEL, wet.		
		(12-14')		8 50 - -	NA	0.33	0.0		Auger refusal at 12.5' bgs.		
5									End of boring at 14.0' bgs.		

	Remarks: bgs - below ground surface. NA - Not Available. Soil sample collected from 4-6' bgs for VOCs, metals, SVOCs, and PCBs.	Water Levels		
		Date / Time	Elevation	Depth

Project Name: GM-NAO FLINT OPERATIONS
 Project Number: 041057F001
 Location: T.7N R.7E 7
 T R SEC QTR QTR
 Northing: _____ Easting: _____
 Ground Surface Elev.: 730.42
 Property Owner/Contact: GENERAL MOTORS

Date(s) Drilled: 10/10/95
 Logged By: DARRYL BARRICKLOW
 Contractor: SOMAT ENGINEERING
 Drill Rig/Method: HOLLOW STEM AUGER
 Sampling Method: SPLIT SPOON
 Borehole Diam.: 8" Drilling Fluid: NONE
 Depth to Water: 14.02 Total Depth: 22.0'
 Application: MONITORING WELL INSTALLATION

Depth (ft)	Lithology	Samples	Color	Org. Vapor (ppm)	Sample ID	Recovery %	USCS Code	Lithologic Description
0.0-0.6'								ASPHALT AND CONCRETE.
0.7-3.3'							SP	SAND AND CINDER, BLACK/BROWN, DRY TO SLIGHTLY MOIST.
3.3-4.9'							CL	CLAY WITH SOME SILT, TRACE SAND AND GRAVEL, OLIVE/BROWN, SLIGHTLY MOIST.
4.9-6.0'								SAND WITH TRACE SILT AND FINE GRAVEL, BROWN/ORANGE, SLIGHTLY MOIST, FINE GRAINED.
6.0-9.3'							SP	S.A.A.: FINE SAND TO FINE GRAVEL. MOIST TO WET.
9.3-10.2'							CL	CLAY AND SILT, BROWN, SLIGHTLY MOIST.
10.2-12.0'							CH	CLAY WITH VARYING SILT AND SAND LENSES, GRAY, MOIST TO WET.
12.0-16.8'							CL	CLAY WITH SILT TO COARSE GRAVEL, GRAY, DRY, HARD.
16.8-17.8'							SP	SAND (FINE GRAINED) TO COARSE GRAVEL, GRAY, WET.
17.8-18.3'							ML	SILT WITH SOME CLAY, GRAY, SLIGHTLY MOIST.
18.3-19.0'							SM	SILT AND FINE SAND WITH SOME GRAVEL, GRAY, MOIST.
19.0-19.8'							CL	CLAY WITH SOME SILT AND GRAVEL, GRAY, SLIGHTLY MOIST.
19.8-20.0'							SM	SILT WITH SOME SAND, GRAY, WET.
20.0-22.0'							CL	CLAY WITH SOME SILT TO GRAVEL, GRAY, STIFF TO HARD. SILT SEAMS.
								TOTAL DEPTH DRILLED = 22.0 FEET
								WELL SET FROM 15.0 TO 22.0'
								GROUNDWATER SAMPLE COLLECTED FROM 15.0 TO 20.0'

Comments: COLOR CODE- GEOLOGICAL SOCIETY OF AMERICA ROCK COLOR CHART

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/29/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 05/29/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 67°F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1				SB-04-17(1-1.5) _052920 @ 0820	0.0	(0.0-0.2') TOPSOIL, grass.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing (0.3-3.0' bgs) Bentonite (3.0-12.0' bgs) Filter Pack Sand		
2			0.0		(0.2-1.0') CONCRETE.				
3		72		SB-04-17(4.5-5) _052920 @ 0825	0.0	(1.0-4.0') SAND, fine to medium, subangular to subrounded; trace granules to small pebbles, subangular to subrounded; poorly sorted; loose; moist; brown (10YR 5/3). FILL. Note: Little gravel, angular to subangular at 2.0'bgs. FILL.			
4			0.0						
5			0.0						
6				SB-04-17(8-8.5) _052920 @ 0830	0.0	(4.0-7.0') CLAY, medium to high plasticity; some fine to medium sand, subangular to subrounded; little small pebbles, subangular to subrounded; trace gravel, subangular to subrounded; poorly sorted; stiff to very stiff; moist to wet; brown (10YR 5/3) to dark gray (10YR 4/1). Note: Wet from 6-9' bgs.	(5.0-10.0' bgs) 2" PVC 10-Slot Well Screen		
7			0.0						
8		48		SB-04-17(12.5-13) _052920 @0835	0.0	(7.0-8.5') SAND, very fine to medium, subangular to subrounded; trace granules; trace silt, rapid dilatancy; loose to dense; wet; black (10YR 2/1).			
9			0.0						
10				SB-04-17(16.5-17) _052920 @ 0840	0.0	(8.5-13.0') CLAY, high plasticity, no dilatancy; little fine to medium sand, subangular to subrounded; trace granules to small pebbles, subangular to subrounded; medium stiff to stiff; moist to wet; grayish brown (10YR 5/2) to brown (10YR 5/3).			
11			0.0						
12			0.0						
13		60		SB-04-17(18.5-19) _052920 @ 0845	0.0	(13.0-18.5') CLAY, medium plasticity, no dilatancy to slow dilatancy; little silt to very fine to medium sand, subangular to subrounded; trace small to medium pebbles, subangular to subrounded; poorly sorted; medium stiff to very stiff; moist; gray (10YR 5/1).	(12.0-17.0' bgs) Bentonite		
14			0.1						
15				SB-04-17(18.5-19) _052920 @ 0845	0.1				
16			0.0						
17		60		SB-04-17(18.5-19) _052920 @ 0845	0.0	(18.5-19.0') SAND, fine to very coarse; trace granules; loose to medium dense; moist; gray (10YR 5/1).	(17.0-25.0' bgs) Filter Pack Sand		
18			0.0						
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: Core Barrel
 Driller: Dave Gordon Sampling Interval: Continuous
 Drilling Method: Hand Auger / Sonic Drilling Water Level Start (ft. bgs.): 6.0
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: Temporary wells installed. bgs = below ground surface; NA = not applicable; btoc = below top of casing; ft = feet; NM= not measured. Converted to Well: Yes No
 Surface Elev.: 734.3
 North Coord.: 560421.1
 East Coord.: 13305359.7

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/28/2020 Logger: E. Redner
 Project Number: 30075935 Date Completed: 05/28/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 72°F, Overcast

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			0				(0.0-1.0') CONCRETE. Note: No recovery.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing (0.3-3.0' bgs) Bentonite (3.0-10.5' bgs) Filter Pack Sand	
2			60	SB-04-18(1-1.5) _052820 @ 0950	0.0		(1.0-5.0') SAND, fine to medium, subrounded to subangular; trace granules to small pebbles, subrounded to subangular; well sorted; very loose; dry to moist; black (10YR 2/1). FILL.		
3					0.0				
4				SB-04-18(4.5-5) _052820 @ 0955	0.0		Note: Wet at 5.0' bgs.		
5									
6					0.9		(5.0-6.5') SAND, very fine to small PEBBLE, subrounded; some silt; little clay, nonplastic, rapid dilatancy; poorly sorted; moist to wet; black (10YR 2/1). FILL.		
7			60	SB-04-18(8-8.5) _052820 @ 0958	2.2		(6.5-10.0') SAND, very fine to fine; some silt; some clay, low to medium plasticity, slow to rapid dilatancy; trace granules to small pebbles, subrounded; well sorted; moist to dry; medium dense; dark gray (10YR 4/1) to grayish brown (10YR 5/2). FILL.	(5.0-10.0' bgs) 2" PVC 10-Slot Well Screen	
8					0.3				
9					0.5				
10					0.2				
11			0		0.0		(10-16') CONCRETE.		
12					0.0			(10.5-14.0' bgs) Bentonite	
13					0.0				
14			41		0.0				
15					0.0			(14.0-22.0' bgs) Filter Pack Sand	
16					0.0				
17				SB-04-18(16.5-17) _052820 @ 1020	0.0		(16.0-18.5') SAND, very fine to medium, subrounded to subangular; some silt; little to trace little granules to medium pebble, subrounded; poorly sorted; medium dense; moist to wet; gray (10YR 5/1). Note: Wet at 16.5' bgs.		
18			48	SB-04-18(18.5-19) _052820 @ 1028	0.0			(16.0-21.0' bgs) 2" PVC 10-Slot Well Screen	
19					0.0				
20					0.0		(18.5-25.0') SAND, very fine to fine; and SILT; trace granules to medium pebbles, subrounded to rounded; well sorted; dry, very dense; gray (10YR 5/1) to gray (10YR 6/1).		

Drilling Co.: Cascade Sampling Method: Core Barrel
 Driller: Dave Gordon Sampling Interval: Continuous
 Drilling Method: Hand Auger / Sonic Drilling Water Level Start (ft. bgs.): 5.0
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: Temporary wells installed. bgs = below ground surface; NA = not applicable; btoc = below top of casing; ft = feet; NM= not measured. Converted to Well: Yes No
 Surface Elev.: 730.2
 North Coord.: 560336.7
 East Coord.: 13305359.6

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/28/2020 Logger: E. Redner
 Project Number: 30075935 Date Completed: 05/28/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 72°F, Overcast

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0		(18.5-25.0') SAND, very fine to fine; and SILT; trace granules to medium pebbles, subrounded to rounded; well sorted; dry, very dense; gray (10YR 5/1) to gray (10YR 6/1).	(22.0-25.0' bgs) Bentonite	
22			SB-04-18(22-22.5)	0.0					
23		60	_052820 @ 1035	0.0					
24				0.0					
25			SB-04-18(24.5-25)	0.0					
				_052820 @ 1040					
26							End of boring at 25.0' bgs.		
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/28/2020 Logger: E. Redner
 Project Number: 30075935 Date Completed: 05/28/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 78°F, Rainy, overcast

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			0				(0.0-1.0') CONCRETE.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing	
2				SB-04-19(1-1.5) _052820 @1230	0.0		(1.0-2.5') SAND, fine to granules, subangular to subrounded; little small pebbles to medium pebbles, subrounded; dry; loose to medium dense; very dark grayish brown (10YR 3/2) to light brownish gray (10YR 6/2).	(0.3-6.0' bgs) Bentonite	
3			48		0.0		(2.5-7.5') SAND, very fine to coarse, subangular to subrounded; little silt; moist to wet; medium dense; dark grayish brown (10YR 4/2).		
4				SB-04-19(4-4.5) _052820 @1233	0.0				
5					0.0		Note: A little wet at 5.5' bgs		
6					0.0				
7					0.0			(6.0-14.0' bgs) Filter Pack Sand	
8			60	SB-04-19(8-8.5) _052820 @1240	0.0		(7.5-8.5') CLAY, medium plasticity, slow to rapid dilatancy; some silt; little very fine to fine sand; trace granules to small pebbles, subangular to subrounded; moist; stiff; olive brown (2.5YR 4/3). Note: Wet at 8.5' bgs.		
9					0.0		(8.5-10.0') SILT; some very fine to fine sand; little clay; nonplastic to low plasticity, rapid dilatancy; well sorted; wet; medium dense; light olive brown (2.5YR 5/4).	(8.0-13.0' bgs) 2"	
10					0.0		(10.0-20.0') SAND, very fine to coarse, subangular; some silt; poorly sorted; moist to wet; loose to dense; gray (10YR 6/1). Note: Wet at 10.5' bgs.	PVC 10-Slot Well Screen	
11					0.0				
12					0.0				
13			60	SB-04-19(12.5-13) _052820 @1255	0.0				
14					0.0				
15					0.0				
16				SB-04-19(16.5-17) _052820 @1258	0.0				
17					0.0				
18			60	SB-04-19(18.5-19) _052820 @1300	0.0			(14.0-25.0' bgs) Bentonite	
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: Core Barrel
 Driller: Dave Gordon Sampling Interval: Continuous
 Drilling Method: Hand Auger / Sonic Drilling Water Level Start (ft. bgs.): 5.5
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: Temporary well installed. bgs = below ground Converted to Well: Yes No
surface; NA = not applicable; btoc = below top of Surface Elev.: 731.3
casing; ft = feet; NM= not measured. North Coord.: 560390.7
 East Coord.: 13305387.4

SOIL BORING LOG - 2013 C:\USERS\HUMPHREY\DESKTOP\NEW BUICK CITY LOGS\BUICK CITY MASTER 4.26.2021.GPJ ARCADIS - 2019.GDT 4/28/21

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/28/2020 Logger: E. Redner
 Project Number: 30075935 Date Completed: 05/28/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 78°F, Rainy, overcast

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	[Diamond symbol]		60	SB-04-19(22-22.5) _052820 @1310	0.0		(20.0-25.0') SILT; some very fine to fine sand; some clay, nonplastic, rapid dilatancy; trace granules, subangular; well sorted; dry; very dense; dark gray (10YR 5/4) to gray (10YR 5/1)	(14.0-25.0' bgs) Bentonite	[Black box]
22					0.0				
23					0.0				
24					0.0				
25				SB-04-19(24.5-25) _052820 @1315					
26							End of boring at 25.0' bgs.		
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks: _____

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/28/2020 Logger: E. Redner
 Project Number: 30075935 Date Completed: 05/28/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 72°F

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			0				(0.0-1.0') CONCRETE. Note: No recovery.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing	
2				SB-04-20(1-1.5) _052820 @ 0755	0.0		(1.0-6.5') SAND, fine to medium, subrounded; trace very coarse sand to medium pebble, subrounded; poorly sorted; dry to moist; very loose; black (10YR 2/1).		
3			48		0.0				
4				SB-04-20(4.5-5.0) _052820 @ 0800	0.0			(0.3-8.0' bgs) Bentonite	
5									
6					1.3 0.3				
7					0.1 2.0		(6.5-7.0') SAND, fine to large pebble, subrounded; poorly sorted; dry to moist; loose; very dark gray (10YR 3/1) to white (10YR 8/1).		
8			60	SB-04-20(8-8.5) _052820 @ 0810	0.8		(7.0-7.5') SAND, medium to coarse, subangular, some granules to medium pebbles; wet; black (10YR 2/1). Note: Wet at 7.5' bgs.		
9					0.6 0.2		(7.5-10.0') CLAY, medium to low plasticity, moderate dilatancy; little very fine to very coarse sand, subangular to subrounded; medium stiff; moist; gray (10YR 5/1). Note: Wet at 11.0' bgs.	(8.0-16.0' bgs) Filter Pack Sand	
10									
11					0.0		(10.0-11.0') CLAY, nonplastic to low plasticity, rapid dilatancy; and SAND, very fine to medium, subrounded; poorly sorted; moist to wet; soft to medium stiff; gray (10YR 5/1).		
12					0.0				
13			60	SB-04-20(12.5-13) _052820 @ 0815	0.0		(11.0-16.0') SAND, very fine to coarse, subangular to subrounded; little to some silt, rapid dilatancy; little clay, low plasticity; poorly sorted; moist to wet; loose to medium dense; gray (10YR 6/1).	(10.0-15.0' bgs) 2" PVC 10-Slot Well Screen	
14					0.0				
15					0.0				
16					0.0				
17				SB-04-20(16.5-17.0) _052820 @ 0830	0.0		(16.0-20.0') SAND, very fine to fine; some silt; some clay, nonplastic, rapid dilatancy; trace granules to small pebbles, subrounded to rounded; poorly sorted; dry; dense; gray (10YR 5/1).		
18			60		0.0				
19				SB-04-20(18.5-19) _052820 @ 0835	0.0				
20					0.0			(16.0-25.0' bgs) Bentonite	

Drilling Co.: Cascade Sampling Method: Core Barrel
 Driller: Dave Gordon Sampling Interval: Continuous
 Drilling Method: Hand Auger / Sonic Drilling Water Level Start (ft. bgs.): 7.5
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: Temporary well installed. bgs = below ground Converted to Well: Yes No
surface; NA = not applicable; btoc = below top of casing; ft = feet; NM= not measured. Surface Elev.: 730.0
 North Coord.: 560339.6
 East Coord.: 13305437.7

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/28/2020 Logger: E. Redner
 Project Number: 30075935 Date Completed: 05/28/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 72°F

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	-		60	SB-04-20(22-22.5) _052820 @ 0840	0.3	SP	(20.0-21.5') SAND, very fine to fine; and SILT; well sorted; very dense; dry; gray (10YR 6/1).	(16.0-25.0' bgs) Bentonite	█
22					0.7				
23					0.3	SM	(21.5-25.0') SAND, very fine to fine; some silt; little to some clay, nonplastic, rapid dilatancy; trace granule to small pebble, subrounded; well sorted; very dense; dry; gray (10YR 5/1).		
24	0.2								
25				SB-04-20(24.5-25) _052820 @ 0845	0.0				
26							End of boring at 25.0' bgs.		
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/27/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 05/27/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 84°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			18		0.0		(0.0-1.5') CONCRETE.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing	
2				SB-04-25(1.5-2.5) _052720 @1505	0.0		(1.5-2.5') SAND, fine to coarse, subangular to subrounded; and GRANULES to medium PEBBLES, subangular to subrounded; some gravel, subangular to subrounded; little large pebbles, subangular to subrounded; poorly sorted; moist; black (10YR 2/1) to gray (10YR 5/1). FILL.	(0.3-3.0' bgs) Bentonite	
3					0.0				
4			54		0.0		(2.5-8.0') SAND, fine to very coarse, subangular to subrounded; and GRANULES to medium PEBBLES, subangular to subrounded; some small to medium cobbles, subangular to subrounded; trace gravel, subangular to subrounded; trace silt; poorly sorted; moist to wet; very dark grayish brown (10YR 3/2) to brown (10YR 5/3). FILL.	(3.0-10.0' bgs) Filter Pack Sand	
5				SB-04-25(4.5-6.5) _052720 @1515	0.0				
6					0.0			(4.0-9.0' bgs) 2" PVC 10-Slot Well Screen	
7					0.0		(8.0-23.0') CLAY, low to medium plasticity; and SILT, slow to medium dilatancy; trace granules to medium pebbles, subangular to subrounded; trace fine to medium sand, subangular to subrounded; stiff to very stiff; moist to wet. FILL. Note: Wet from 6-8' bgs and 10-17' bgs.		
8			48		0.0				
9					0.0				
10					0.0				
11					0.0			(10.0-11.0' bgs) Bentonite	
12					0.0			(11.0-19.0' bgs) Filter Pack Sand	
13			60		0.0				
14					0.0			(12.0-17.0' bgs) 2" PVC 10-Slot Well Screen	
15					0.0				
16				SB-04-25(15-17) _052720 @1530	0.0				
17					0.0				
18			60		0.0				
19					0.0				
20					0.0			(19.0-25.0' bgs) Bentonite	

Drilling Co.: Cascade Sampling Method: Core Barrel
 Driller: Dave Gordon Sampling Interval: Continuous
 Drilling Method: Hand Auger / Sonic Drilling Water Level Start (ft. bgs.): 6.0
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: Temporary wells installed. bgs = below ground surface; NA = not applicable; btoc = below top of casing; ft = feet; NM= not measured. Converted to Well: Yes No
 Surface Elev.: 729.8
 North Coord.: 560476.1
 East Coord.: 13305677.0

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/27/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 05/27/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 84°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	[Diamond symbol]		60		0.0	[Diagonal hatching]	(8.0-23.0') CLAY, low to medium plasticity; and SILT, slow to medium dilatancy; trace granules to medium pebbles, subangular to subrounded; trace fine to medium sand, subangular to subrounded; stiff to very stiff; moist to wet. FILL. Note: Wet from 6-8' bgs and 10-17' bgs.	(19.0-25.0' bgs) Bentonite	[Black bar]
22					0.0				
23					0.0				
24					0.0	[Dotted pattern]	(23.0-25.0') CONCRETE; and GRAVEL, subangular; gray (10YR 5/1).		
25					0.0				
26						End of boring at 25.0' bgs.			
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks: _____

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/27/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 05/27/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 74°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			12				(0.0-1.0') CONCRETE.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing (0.3-3.0' bgs)	
2			60	SB-04-26(1-2.5) _052720 @0830	0.0		(1.0-4.0') SAND, medium to fine, subangular to subrounded; little granules to small pebbles, subangular to subrounded; trace medium pebbles, subangular; poorly sorted; moist; black (10YR 2/1). Note: Little medium pebbles to small cobbles, subangular to subrounded at 3.0' bgs.	Bentonite (3.0-11.0' bgs) Filter Pack Sand	
3					0.0				
4					0.0				
5				SB-04-26(4.5-6.5) _052720 @1005	0.0		(4.0-6.5') SAND, medium to fine, subangular to subrounded; and GRANULES to medium PEBBLES, subangular to subrounded; some large pebbles, subangular to subrounded; little small cobbles, subangular to subrounded. Note: Wet at 6.0' bgs.		
6					0.0				
7					0.7		(6.5-7.0') SILT, slow dilatancy; some clay, low to medium plasticity; stiff; wet; grayish brown (10YR 5/2).	(5.0-10.0' bgs)	
8			45		0.1		(7.0-8.0') SAND, fine to medium, subangular to subrounded; little granules to medium pebbles, subangular to subrounded; trace silt; poorly sorted; wet; black (10YR 2/1) to brown (10YR 5/3). Note: Brick fragments from 8.0-8.2' bgs.	2" PVC 10-Slot Well Screen	
9					0.1				
10					0.1		(8.0-25.0') CLAY, high plasticity, no dilatancy; some fine to medium sand, subangular; little granules to medium pebbles, subangular to subrounded; poorly sorted; moist to wet; gray (10YR 5/1). Note: Moist at 15.0' bgs.		
11					0.2				
12					0.1				
13			60		0.1				
14					0.1				
15					0.1				
16				SB-04-26(15-17) _052720 @1020	0.1			(11.0-25.0' bgs) Bentonite	
17					0.1				
18			60		0.1				
19					0.1				
20					0.1				

Drilling Co.: Cascade Sampling Method: Core Barrel
 Driller: Dave Gordon Sampling Interval: Continuous
 Drilling Method: Hand Auger / Sonic Drilling Water Level Start (ft. bgs.): 6.0
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: Temporary well installed. bgs = below ground surface; NA = not applicable; btoc = below top of casing; ft = feet; NM= not measured. Converted to Well: Yes No
 Surface Elev.: 729.5
 North Coord.: 560426.6
 East Coord.: 13305629.2

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/27/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 05/27/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 74°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21			60		0.1		(8.0-25.0') CLAY, high plasticity, no dilatancy; some fine to medium sand, subangular; little granules to medium pebbles, subangular to subrounded; poorly sorted; moist to wet; gray (10YR 5/1). Note: Moist at 15.0' bgs.	(11.0-25.0' bgs) Bentonite	
22					0.1				
23					0.1				
24					0.1				
25					0.8				
26							End of boring at 25.0' bgs.		
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks: _____

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/27/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 05/27/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 81°F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			18		0.0	(0.0-1.5') CONCRETE.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing (0.3-3.0' bgs) Bentonite (3.0-12.0' bgs) Filter Pack Sand		
2				SB-04-28(1.5-2.5) _052720 @1130	0.0	(1.5-3.0') SAND, fine to very coarse, subrounded to subangular; and large PEBBLES to medium COBBLES, subangular to subrounded; little granules to small pebbles, subangular to subrounded; poorly sorted; moist; black (10YR 2/1) to brown (10YR 5/3).			
3			10		0.0	(3.0-6.0') SAND, fine to coarse, subangular to subrounded; trace granules to small pebbles, subangular to subrounded; poorly sorted; moist; brown (10YR 5/3). Note: Wet from 5.0 - 17.0' bgs			
4			12		0.0				
5				SB-04-28(4.5-6.5) _052720 @1135	0.0				
6					0.0	(6.0-25.0') CLAY, medium to high plasticity, no dilatancy; little fine to coarse sand, subangular to subrounded; trace granules to medium pebbles, subangular to subrounded; medium stiff to very stiff; wet to moist; gray (10YR 5/1).	(5.0-10.0' bgs) 2" PVC 10-Slot Well Screen		
7					0.0				
8			48		0.0				
9					0.0				
10					0.0				
11					0.0				
12					0.0				
13			57		0.0		(12.0-13.0' bgs) Bentonite		
14					0.0		(13.0-22.0' bgs) Filter Pack Sand		
15					0.0				
16				SB-04-27(15-17) _052720 @1140	0.0				
17					0.0				
18			60		0.0		(15.0-20.0' bgs) 2" PVC 10-Slot Well Screen		
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: Core Barrel
 Driller: Dave Gordon Sampling Interval: Continuous
 Drilling Method: Hand Auger / Sonic Drilling Water Level Start (ft. bgs.): 5
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: Temporary wells installed. bgs = below ground surface; NA = not applicable; btoc = below top of casing; ft = feet; NM= not measured. Converted to Well: Yes No
 Surface Elev.: 729.1
 North Coord.: 560386.3
 East Coord.: 13305641.9

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 05/27/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 05/27/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 81°F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	[Diamond symbol]		60		0.0	[Diagonal lines]	(6.0-25.0') CLAY, medium to high plasticity, no dilatancy; little fine to coarse sand, subangular to subrounded; trace granules to medium pebbles, subangular to subrounded; medium stiff to very stiff; wet to moist; gray (10YR 5/1). Note: Moisture change to dry to moist at 20.0' bgs.	(22.0-25.0' bgs) Bentonite	[Stippled pattern]
22					0.0				[Stippled pattern]
23					0.0				[Stippled pattern]
24					0.0				[Stippled pattern]
25					0.0				[Stippled pattern]
26							End of boring at 25.0' bgs.		
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks: _____

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/28/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 07/28/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 81°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1				SB-04-34(1.5-2.5) _072820 @ 1405	0.0	(0.0-0.2') TOPSOIL/GRASS.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing (0.3-2.0' bgs) Bentonite (2.0-10.0' bgs) Filter Pack Sand		
2			0.0		(0.2-2.5') SAND, fine to medium; and GRAVEL, subangular to subrounded; some small to medium pebbles, subangular to subrounded; little small to medium cobbles, subangular to subrounded; poorly sorted; dry; grayish brown (10YR 5/2). FILL. Note: Plastic/PVC and metal peices observed at 1.0' bgs.				
3			60		0.0	(2.5-3.0') CONCRETE.			
4					0.0	(3.0-5.0') NO RECOVERY.			
5					0.0				
6				SB-04-34(9.5-10) _072820 @ 1410	0.0	(5.0-6.0') SAND, fine to medium; and GRAVEL, subangular to subrounded; some small to medium pebbles, subangular to subrounded; little small to medium cobbles, subangular to subrounded; poorly sorted; wet; grayish brown (10YR 5/2). FILL.	(4.0-9.0' bgs) 2" PVC 10-Slot Well Screen		
7			60		0.0	(6.0-7.5') SAND, fine to medium; some clay; poorly sorted; wet; medium stiff; brown (10YR 5/2) to black (10YR 2/1).			
8					0.0	(7.5-9.0') SAND, fine to medium; wet; black (10YR 2/1).			
9					0.0				
10					0.0	(9.0-18.5') CLAY, high plasticity; little silt; little pebbles, subangular to subrounded; trace fine to medium sand; poorly sorted; moist; stiff to very stiff; brown (10YR 5/3) to gray (10YR 5/1). Note: Wet from 10.0' to 23.0' bgs.	(10.0-16.0' bgs) Bentonite		
11					0.0				
12					0.0				
13			60		0.0				
14					0.0				
15					0.0		(16.0-25.0' bgs) Filter Pack Sand		
16					0.0				
17					0.0				
18			60		0.0				
19					0.0	(18.5-23.0') SAND, fine to very coarse, subangular to subrounded; little granules to small pebbles, subangular to subrounded; poorly sorted; wet; gray (10YR 5/1).	(18.0-23.0' bgs) 2" PVC 10-Slot Well Screen		
20					0.0				

Drilling Co.: Cascade Sampling Method: 5.0' Macrocore
 Driller: R. Gordon Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): 5.0
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not Surface Elev.: 734.0
measured. Temporary wells screened from 4-9' and North Coord: 560421.5
18-23' bgs. East Coord: 13305394.3

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/28/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 07/28/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 81°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	[Diamond symbol]		60	SB-04-34(24.5-25) _072820 @ 1415	0.0	[Dotted pattern]	(18.5-23.0') SAND, fine to very coarse, subangular to subrounded; little granules to small pebbles, subangular to subrounded; poorly sorted; wet; gray (10YR 5/1).	(18.0-23.0' bgs) 2" PVC 10-Slot Well Screen	[Well diagram]
22					0.0	[Dotted pattern]			
23					0.0	[Dotted pattern]			
24					0.0	[Diagonal lines pattern]	(23.0-25.0') CLAY, high plasticity; little silt; little pebbles, subangular to subrounded; trace fine to medium sand; poorly sorted; dry; stiff to very stiff; brown (10YR 5/3) to gray (10YR 5/1).		
25					0.0	[Diagonal lines pattern]			
26							End of boring at 25.0' bgs.		
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks: _____

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 01/14/2021 Logger: E. Redner
 Project Number: 30075935 Date Completed: 01/14/2021 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 36°F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1	[Diamond symbol]	36		SB-04-34R(0-2)	0.0	[Organics symbol]	(0.0-0.2') ORGANICS.	(0.0-3.0' bgs) Backfilled with bentonite.	[Black box]
2				011421 @ 1110 and	0.0	[Sand symbol]	(0.2-2.2') SAND, very fine to small cobbles, subangular to rounded; poorly sorted; dry to moist; grayish brown (10YR 5/2). FILL. Note: Backfill, construction material observed from 0.2-3.0' bgs.		
3				1120	0.0	[Concrete symbol]	(2.2-2.5') CONCRETE.		
4							(2.5-3.0') SAND, very fine to small cobbles, subangular to rounded; poorly sorted; dry to moist; very dark gray (10YR 3/1).		
5							End of boring at 3.0' bgs.		
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Drilling Co.: Cascade Sampling Method: Core Barrel
 Driller: Chris Barden Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA
 Drilling Fluid: Water Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not Surface Elev.: 734.2
measured. Hand augering the first 5.0' bgs could not North Coord: 560419.7
be completed due to concrete cobbles. Shelby tube East Coord: 13305396.5

sample collected from 0-2' bgs.

Soil Boring Log

Project Name: RACER Trust - Buick City
 Project Number: 30043300
 Project Location: Flint, MI

Date Started: 07/30/2020 Date Completed: 07/30/2020
 Logger: M. Olender Editor: M. Humphrey
 Weather Conditions: 67°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			6		0.0		(0.0-0.5') CONCRETE.	(0.0-2.0' bgs) 2" Sch 40 PVC Well Casing (2.0-10.0' bgs) Filter Pack Sand	
2			SB-04-46(1-1.5) _073020 @ 0825	0.0		(0.5-6.0') SAND, fine to medium; little coarse to very coarse sand, subangular to subrounded; trace granules, subangular to subrounded; poorly sorted; moist; brown (10YR 5/3) to black (10YR 2/1). FILL.			
3			54		0.0				
4				0.0					
5				0.0					
6					0.6		Note: Wet at 5.5' bgs.	(4.0-9.0' bgs) 2" PVC 10-Slot Well Screen	
7				3.6		(6.0-9.0') SAND, fine to very coarse, subangular to subrounded; and small to large COBBLES, subangular to subrounded; some granules to large pebbles, subangular to subrounded; little clay; poorly sorted; wet; gray (10YR 5/1). FILL.			
8			60	1.0		Note: Concrete chunks observed throughout.			
9				4.0					
10					NA		(9.0-10.0') CONCRETE.		
11					0.0		(10.0-11.0') SAND, fine to very coarse, subangular to subrounded; and small to large COBBLES, subangular to subrounded; some granules to large pebbles, subangular to subrounded; little clay; poorly sorted; wet; gray (10YR 5/1). FILL.		
12					NA		(11.0-14.0') CONCRETE.		
13			60		0.0				
14					0.0				
15				SB-04-46(14-14.5) _072020 @ 0915	0.0		(14.0-25.0') CLAY, low to medium plasticity; and SAND, fine to medium; little silt; little granules to small pebbles, subangular to subrounded; medium stiff; gray (10YR 5/1).	(10.0-25.0' bgs) Bentonite	
16					0.0				
17				SB-04-46(16.5-17) _073020 @ 0920	0.0				
18			60		0.0				
19				SB-04-46(18.5-19) _073020 @ 0925	0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: 5.0' Macrocore
 Driller: R. Gordon Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): 5.5
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not measured. Temporary well screened from 4-9' bgs. Surface Elev.: 730.7
 North Coord.: 560367.5
 East Coord.: 13305461.6

SOIL BORING LOG - 2013 C:\USERS\HUMPHREY\DESKTOP\NEW BUICK CITY LOGS\BUICK CITY MASTER 11.9.2020.GPJ ARCADIS 2019.GDT 11/10/20

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/30/2020 Logger: M. Olender
 Project Number: 30043300 Date Completed: 07/30/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 67°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21			60	SB-04-46(22-22.5)	0.0		(14.0-25.0') CLAY, low to medium plasticity; and SAND, fine to medium; little silt; little granules to small pebbles, subangular to subrounded; medium stiff; gray (10YR 5/1).	(10.0-25.0' bgs) Bentonite	
22				_073020 @ 0930	0.0				
23					0.0				
24				SB-04-46(24.5-25)	0.0				
25				_073030 @ 0935	0.0				
26						End of boring at 25.0' bgs.			
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
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Remarks: _____

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/30/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 07/30/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 77°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			6		0.0		(0.0-0.5') CONCRETE.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing	
2				SB-04-47(1-1.5) _073020 @ 1310	0.0		(0.5-3.0') SAND, fine to very coarse, subangular to subrounded; and GRAVEL, subangular to subrounded; poorly sorted; dry to moist; grayish brown (10YR 5/2).	(0.3-205' bgs) Bentonite (2.0-10.0' bgs) Filter Pack Sand	
3			54		0.0		(3.0-5.0') SAND, fine to medium; trace silt; trace coarse sand to granules, subangular to subrounded; poorly sorted; moist; black (10YR 2/1) to brown (10YR 5/3).		
4				SB-04-47(4-4.5) _073030 @ 1315	0.0				
5					0.0		(5.0-6.0') SAND, fine to very coarse, subangular to subrounded; and GRAVEL, subangular to subrounded; poorly sorted; dry to moist; grayish brown (10YR 5/2).	(4.0-9.0' bgs) 2" PVC 10-Slot Well Screen	
6					0.0		(6.0-7.0') SAND, fine to medium; trace silt; trace coarse sand to granules, subangular to subrounded; poorly sorted; moist; black (10YR 2/1) to brown (10YR 5/3). Note: Wood fragments observed. Note: Wet from 6.0-9.0' bgs.		
7			60		0.0		(7.0-9.0') SAND, fine to very coarse, subangular to subrounded; and GRAVEL, subangular to subrounded; some small pebbles to medium cobbles, subangular to subrounded; poorly sorted; wet; grayish brown (10YR 5/2).		
8				SB-04-47(9-9.5) _073020 @ 1320	0.0				
9					0.0		(9.0-15.0') CLAY, low to medium plasticity; and SILT, slow dilatancy; little fine to medium sand; trace granules to small pebbles, subangular to subrounded; poorly sorted; moist; medium stiff to stiff; grayish brown (10YR 5/2).	(10.0-12.0' bgs) Bentonite	
10					0.0				
11			60		0.0			(12.0-25.0' bgs) Filter Pack Sand	
12					0.0				
13					0.0				
14					0.0				
15					0.0				
16			60		0.0		(15.0-19.0') SAND, fine to coarse, subangular to subrounded; some very coarse sand, subangular to subrounded; trace granules, subangular to subrounded; little silt; poorly sorted.	(14.0-19.0' bgs) 2" PVC 10-Slot Well Screen	
17					0.0				
18					0.0				
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: 5.0' Macrocore
 Driller: R. Gordon Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): 6.0
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not measured. Temporary wells screened from 4-9' and 14-19' bgs. Surface Elev.: 731.4
 North Coord.: 560393.4
 East Coord.: 13305428.1

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/30/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 07/30/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 77°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21			60		0.0		(19.0-25.0') CLAY, low to medium plasticity; and SILT, slow dilatancy; little fine to medium sand; trace granules to small pebbles, subangular to subrounded; poorly sorted; moist; medium stiff to stiff; grayish brown (10YR 5/2).		
22				SB-04-47(22-22.5)	0.0				
23				_073020 @ 1335	0.0				
24				SB-04-47(24.5-25)	0.0				
25				_073020 @ 1350	0.0				
26						End of boring at 25.0' bgs.			
27									
28									
29									
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36									
37									
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41									

Remarks: _____

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 08/03/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 08/03/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 75°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1				SB-04-48(1.5-2) _080320 @ 1450	0.0	(0.0-0.5') TOPSOIL; grass.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing (0.3-5.0' bgs) Bentonite		
2			0.0		(0.5-1.0') SAND, fine to coarse, subangular to subrounded; and GRAVEL, angular to subangular; poorly sorted; moist; dark brown (10YR 3/3). FILL.				
3		60	0.0		(1.0-1.5') CONCRETE.				
4				SB-04-48(4-4.5) _080320 @ 1455	0.0	(1.5-7.5') SAND, fine to medium; little clay; high plasticity; trace coarse sand to granules, subangular to subrounded; poorly sorted; moist to wet; medium stiff; gray (10YR 5/1) to yellowish brown (10YR 5/4).			
5			0.0						
6				SB-04-48(8-8.5) _080320 @ 1500	3.6	Note: Wet from 7.0-7.5' bgs.	(5.0-13.0' bgs) Filter Pack Sand		
7			0.0						
8		60	0.0						
9				SB-04-48(12.5-13) _080320 @ 1505	0.0	(7.5-10.0') CLAY, high plasticity; trace fine sand to granules, subangular to subrounded; poorly sorted; moist; stiff; yellowish brown (10YR 5/4).	(7.0-12.0' bgs) 2" PVC 10-Slot Well Screen		
10			0.0						
11				SB-04-48(16.5-17) _080320 @ 080320 @ 1510	0.0	(10.0-12.0') SAND, fine to medium; little clay; high plasticity; trace coarse sand to granules, subangular to subrounded; poorly sorted; moist to wet; medium stiff; gray (10YR 5/1) to yellowish brown (10YR 5/4). Note: Wet from 10.0-12.0' bgs	(13.0-18.0' bgs) Bentonite		
12			0.0						
13		60	0.0						
14				SB-04-48(18.5-19) _080320 @ 1515	0.0	(12.0-14.0') CLAY, high plasticity; trace fine sand to granules, subangular to subrounded; poorly sorted; moist; stiff; yellowish brown (10YR 5/4).			
15			0.0						
16				SB-04-48(18.5-19) _080320 @ 1515	0.0	(14.0-15.0') CLAY, low to medium plasticity; and SILT, no dilatancy to slow dilatancy; little fine to medium sand; stiff to very stiff; dry; gray (10YR 5/1).			
17			0.0						
18		60	0.0						
19				SB-04-48(18.5-19) _080320 @ 1515	0.0	(15.0-16.0') SAND, fine to medium; little clay; high plasticity; trace coarse sand to granules, subangular to subrounded; poorly sorted; moist to wet; medium stiff; gray (10YR 5/1) to yellowish brown (10YR 5/4).	(18.0-20.0' bgs) Filter Pack Sand		
20			0.0						
					0.0	(16.0-20.0') CLAY, low to medium plasticity; and SILT, no dilatancy to slow dilatancy; little fine to medium sand; stiff to very stiff; dry; gray (10YR 5/1). Note: Reddish brown (5YR 4/3) streak observed from 17.5-18.0' bgs. .			

Drilling Co.: Cascade Sampling Method: 5.0' Macrocore
 Driller: J. Greer Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): 7
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not measured. Temporary wells screened from 7-12' and 20-25' bgs among the boring and step out location. Surface Elev.: 734.1
 North Coord.: 560450.5
 East Coord.: 13305411.0

SOIL BORING LOG - 2013 C:\USERS\HUMPHREY\DESKTOP\NEW BUICK CITY LOGS\BUICK CITY MASTER 4.26.2021.GPJ - ARCADIS - 2019.GDT 4/28/21

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 08/03/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 08/03/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 75°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21			60	SB-04-48(22-22.5)	0.0		(20.0-25.0') CLAY, medium to high plasticity; some fine to medium sand; little silt; trace coarse sand to granules, subangular to subrounded; poorly sorted; moist to wet; medium stiff to very stiff; gray (10YR 5/1).	(20.0-25.0' bgs) 2" PVC 10-Slot Well Screen	
22				_080320 @ 1535	0.0				
23					0.0				
24				SB-04-48(24.5-25)	0.0				
25				_080320 @ 1540	0.0				
26						End of boring at 25.0' bgs.			
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
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39									
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41									

Remarks: _____

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/30/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 07/30/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 70°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
0.0			6				(0.0-0.5') CONCRETE.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing (0.3-4.5' bgs) Bentonite	
1.0				SB-04-49(1-1.5) _073020 @ 1005	0.0		(0.5-7.0') SAND, fine to medium; little coarse sand to very coarse sand, subangular to subrounded; trace granules, subangular; poorly sorted; moist; very dark brown (10YR 2/2) to black (10YR 2/1). FILL.		
2.0					0.0				
3.0			54		0.0				
4.0				SB-04-49(4-4.5) _073020 @ 1010	0.0				
5.0					0.0				
6.0				SB-04-49(6-6.5) _073020 @ 1015	0.7			(4.5-13.0' bgs) Filter Pack Sand	
7.0					0.8				
8.0			60		14.1		(7.0-8.5') CONCRETE COBBLES, small to medium, subangular to subrounded; some sand, medium to very coarse, subangular to subrounded; some small to medium pebbles, subangular to subrounded; wet; poorly sorted; black (10YR 2/1) to gray (10YR 5/1) to brown (10YR 5/3). FILL.	(6.5-11.5' bgs) 2" PVC 10-Slot Well Screen	
9.0					432				
10.0					35.9		(8.5-10.0') CONCRETE.		
11.0					5.5		(10.0-11.5') CLAY, medium to high plasticity; some medium sand to medium cobbles, subangular to subrounded; poorly sorted; wet; gray (10YR 6/1). FILL. Note: Wood and metal chunks observed from 10-11.5' bgs.		
12.0					629				
13.0			60		0.3		(11.5-15.0') CONCRETE.		
14.0					0.3				
15.0					0.1				
16.0					0.0		(15.0-18.0') SAND, fine to medium; some clay; little coarse sand to granules, subangular to subrounded; poorly sorted; wet; gray (10YR 5/1).	(13.0-18.0' bgs) Bentonite	
17.0					0.2				
18.0					0.0				
19.0				SB-04-49(18.5-19) _073020 @ 1030	0.0		(18.0-20.0') CLAY, low to medium plasticity; some silt, no dilatancy to slow dilatancy; little fine to medium sand; poorly sorted; dry to moist; very stiff; gray (10YR 5/1).	(18.0-25.0' bgs) Filter Pack Sand	
20.0					0.0				

Drilling Co.: Cascade Sampling Method: 5.0' Macrocore
 Driller: R. Gordon Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): 7.0
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not measured. Temporary wells screened from 6.5-11.5', Surface Elev.: 731.1
13-18', and 20-25' bgs among the boring and step North Coord: 560368.0
out location. East Coord: 13305410.1

SOIL BORING LOG - 2013 C:\USERS\HUMPHREY\DESKTOP\NEW BUICK CITY LOGS\BUICK CITY MASTER 4.26.2021.GPJ - ARCADIS - 2019.GDT 4/28/21

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/30/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 07/30/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 70°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0		(20.0-20.5') PEBBLES, small to large, subangular to subrounded; some fine to very coarse sand, subangular to subrounded; wet; poorly sorted; gray (10YR 5/1).	(20.0-25.0' bgs) 2" PVC 10-Slot Well Screen	
22			SB-04-49(22-22.5) _073020 @ 1035	0.0		(20.5-23.0') CLAY, low to medium plasticity; some silt, no dilatancy to slow dilatancy; little fine to medium sand; poorly sorted; dry; very stiff; gray (10YR 5/1).			
23		60		0.0		(23.0-24.0') SAND, fine to coarse, subangular to subrounded; some clay, medium plasticity; poorly sorted; wet; medium stiff; gray (10YR 5/1).			
24			SB-04-49(24.5-25) _073020 @ 1040	0.0		(24.0-25.0') CLAY, low to medium plasticity; some silt, no dilatancy to slow dilatancy; little fine to medium sand; poorly sorted; dry to moist; very stiff; gray (10YR 5/1).			
25					0.0				
26							End of boring at 25.0' bgs.		
27									
28									
29									
30									
31									
32									
33									
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41									

Remarks:

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 08/03/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 08/03/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 74°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
0.0 - 0.5			6				(0.0-0.5') CONCRETE.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing	
0.5 - 3.0				SB-04-50(1-1.5) _080320 @ 1320	0.0		(0.5-3.0') SAND, fine to very coarse, subangular to subrounded; and GRAVEL, angular to subangular; some granules to small pebbles, subangular to subrounded; poorly sorted; dry to moist; brown (10YR 5/3).		
3.0 - 10.0			54	SB-04-50(4-4.5) _080320 @ 1325	0.0, 1.8, 9.4		(3.0-10.0') CLAY, high plasticity; little fine to medium sand; trace granules; poorly sorted; moist to wet; medium stiff to stiff; brown (10YR 5/3) to black (10YR 2/1).	(0.3-2.0' bgs) Bentonite (2.0-10.0' bgs) Filter Pack Sand	
10.0 - 14.0			60	SB-04-50(10.5-11) _080320 @ 1330	1.3, 2.4, 614.3, 2.9, 1.7		(10.0-14.0') CLAY, low to medium plasticity; and SILT, no dilatancy to slow dilatancy; trace fine to medium sand to granules, subangular to subrounded; moist to wet; medium stiff to stiff; gray (10YR 5/1). Note: Wet from 6.0-9.0' bgs.	(4.0-9.0' bgs) 2" PVC 10-Slot Well Screen	
14.0 - 16.0			60		1.1, 1.6, 36.2, 10.1		(14.0-16.0') CLAY, low to medium plasticity; and SILT, no dilatancy to slow dilatancy; trace fine to medium sand to granules, subangular to subrounded; moist to wet; medium stiff to stiff; gray (10YR 5/1).	(10.0-13.0' bgs) Bentonite	
16.0 - 14.5					6.3		(14.0-14.5') SAND, fine to medium, subangular to subrounded; little silt; trace clay; poorly sorted; wet; gray (10YR 5/1) to dark gray (10YR 4/1).	(15.0-21.0' bgs) Filter Pack Sand	
14.5 - 16.0					578		(14.5-16.0') CLAY, low to medium plasticity; and SILT, no dilatancy to slow dilatancy; trace fine to medium sand to granules, subangular to subrounded; moist to wet; medium stiff to stiff; gray (10YR 5/1).		
16.0 - 25.0			60		2.1, 1.4, 0.4, 0.5		(16.0-25.0') SAND, fine to medium; some silt; little clay, slow to rapid dilatancy; little granules to medium cobbles, subangular to subrounded; poorly sorted; wet; gray (10YR 5/1).	(15.0-20.0' bgs) 2" PVC 10-Slot Well Screen	

Drilling Co.: Cascade Sampling Method: 5.0' Macrocore
 Driller: J. Greer Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): 6.0
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; btoc = below top of casing; ft = feet; NM= not measured. Temporary wells screened from 4-9', and 15-20' bgs among the boring and step out location. Converted to Well: Yes No
 Surface Elev.: 731.0
 North Coord: 560378.1
 East Coord: 13305364.5

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 08/03/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 08/03/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 74°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21			60		1.7		(16.0-25.0') SAND, fine to medium; some silt; little clay, slow to rapid dilatancy; little granules to medium cobbles, subangular to subrounded; poorly sorted; wet; gray (10YR 5/1).	(21.0-25.0' bgs) Bentonite.	
22					0.8				
23					0.4				
24					1.0				
25					0.5				
26							End of boring at 25.0' bgs.		
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/29/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 07/29/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 80°F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			9.5			(0.0-0.8') CONCRETE.		(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing (0.3-2.0' bgs) Bentonite (2.0-10.0' bgs) Filter Pack Sand	
2				SB-04-59(2-2.5) _072920 @ 1350	0.0	(0.8-3.5') SAND, fine to coarse, subangular to subrounded; some granules to small pebbles, subangular to subrounded; poorly sorted; moist to wet; brown (10YR 5/3). Note: Wet from 0.8-2.0' bgs.			
3			50.5		0.0				
4				SB-04-59(4-4.5) _072920 @ 1355	0.0	(3.5-7.0') SAND, fine to medium; trace coarse sand to granules, subangular to subrounded; moist; poorly sorted; black (10YR 2/1).			
5					4.9				
6					0.0			(4.0-9.0' bgs) 2" PVC 10-Slot Well Screen	
7					0.0		Note: Wet from 6.0-8.0' bgs.		
8			60	SB-04-59(8-8.5) _072920 @ 1400	0.0	(7.0-14.0') CLAY, medium plasticity; some silt, slow dilatancy; little fine to coarse sand to small pebbles, subangular to subrounded; moist to stiff to very stiff; wet; gray (10YR 5/1).			
9					0.0				
10					0.0		Note: Wet from 9.5-18.0' bgs.		
11					0.0			(10.0-11.0' bgs) Bentonite (11.0-18.0' bgs) Filter Pack Sand	
12			60		0.0				
13					0.0				
14					0.0			(12.0-17.0' bgs) 2" PVC 10-Slot Well Screen	
15					0.0	(14.0-18.0') CLAY, medium to high plasticity; some fine to coarse sand, subangular to subrounded; little silt; poorly sorted; medium stiff to stiff; wet; gray (10YR 5/1).			
16					0.0				
17			60		0.0				
18					0.0				
19				SB-04-59(18.5-19) _072920 @ 1405	0.0	(18.0-25.0') CLAY, medium plasticity; some silt, slow dilatancy; little fine to coarse sand to small pebbles, subangular to subrounded; moist to wet; stiff to very stiff; gray (10YR 5/1).		(18.0-25.0' bgs) Bentonite	
20					0.0				

Drilling Co.: Cascade Sampling Method: 5.0' Macrocore
 Driller: R. Gordon Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not measured. Temporary wells screened from 4-9' and 12-17' bgs. Surface Elev.: 730.2
 North Coord.: 560480.6
 East Coord.: 13305634.4

SOIL BORING LOG - 2013 C:\USERS\HUMPHREY\DESKTOP\NEW BUICK CITY LOGS\BUICK CITY MASTER 4.26.2021.GPJ - ARCADIS - 2019.GDT 4/28/21

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/29/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 07/29/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 80°F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21			60	SB-04-59(24.5-25) _072920 @ 1410	0.0		(18.0-25.0') CLAY, medium plasticity; some silt, slow dilatancy; little fine to coarse sand to small pebbles, subangular to subrounded; moist to wet; stiff to very stiff; gray (10YR 5/1).	(18.0-25.0' bgs) Bentonite	
22					0.0				
23					0.0				
24					0.0				
25					0.0				
26							End of boring at 25.0' bgs.		
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/29/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 07/29/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 84°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			6		0.0	(0.0-0.5') CONCRETE.		(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing	
2			54	SB-04-60(2-2.5) _072920 @ 1500	0.0	(0.5-1.0') SAND, fine to coarse, subangular to subrounded; and GRAVEL, subangular to subrounded; poorly sorted; wet; brown (10YR 5/3). (1.0-2.0') SAND, fine to medium; some coarse sand to granules, subangular to subrounded; trace pebbles, subangular; poorly sorted; moist; brown (10YR 5/3). Note: Wet from 1.0-2.0' bgs.	(0.3-2.0' bgs) Bentonite		
3					0.0	(2.0-5.0') CLAY, high plasticity; little sand, fine to medium; trace small pebbles, subangular to subrounded; moist to wet; medium stiff; grayish brown (10YR 5/2). Note: Wet from 4.0-9.0' bgs.	(2.0-10.0' bgs) Filter Pack Sand		
4					0.0				
5					0.0				
6			60	SB-04-60(9.5-10) _072920 @ 1520	0.0	(5.0-7.0') SAND, fine to very coarse, subangular to subrounded; some granules, subangular to subrounded; little small pebbles, subangular to subrounded; poorly sorted; wet; brown (10YR 5/3). (7.0-16.0') CLAY, medium plasticity; some silt, slow dilatancy; little fine to coarse sand, subangular to subrounded; trace small pebbles, subangular to subrounded; moist to wet; stiff; gray (10YR 5/1). Note: Wet from 10.0-23.0' bgs.	(4.0-9.0' bgs) 2" PVC 10-Slot Well Screen		
7					0.0				
8					0.0				
9			60		0.0				
10					0.0				
11					0.0				
12			60		0.0		(10.0-13.0' bgs) Bentonite		
13					0.0				
14					0.0				
15					0.0		(13.0-21.0' bgs) Filter Pack Sand		
16					0.0				
17			60		0.0	(16.0-19.0') SAND, medium to very coarse, subangular to subrounded; some granules to small pebbles, subangular to subrounded; little clay; poorly sorted; wet; gray (10YR 5/1).	(15.0-20.0' bgs) 2" PVC 10-Slot Well Screen		
18					0.0				
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: 5.0' Macrocore
 Driller: R. Gordon Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not measured. Temporary wells screened from 4-9' and 15-20' bgs. Surface Elev.: 730.3
 North Coord.: 560522.2
 East Coord.: 13305665.1

SOIL BORING LOG - 2013 C:\USERS\HUMPHREY\DESKTOP\NEW BUICK CITY LOGS\BUICK CITY MASTER 4.26.2021.GPJ ARCADIS - 2019.GDT 4/28/21

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/29/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 07/29/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 84°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21			60	SB-04-60(24.5-25) _072920 @ 1525	0.0		(19.0-25.0') CLAY, medium plasticity; some silt, slow dilatancy; little fine to coarse sand, subangular to subrounded; trace small pebbles, subangular to subrounded; poorly sorted; dry to wet; stiff; gray (10YR 5/1).	(21.0-25.0' bgs) Bentonite	
22					0.0				
23					0.0				
24					0.0				
25					0.0				
26						End of boring at 25.0' bgs.			
27									
28									
29									
30									
31									
32									
33									
34									
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41									

Remarks:

Soil Boring Log

Project Name: RACER Trust - Buick City
 Project Number: 30043300
 Project Location: Flint, MI

Date Started: 07/28/2020 Date Completed: 07/28/2020
 Logger: M. Olender Editor: M. Humphrey
 Weather Conditions: 72°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			6		0.0		(0.0-0.5') CONCRETE.	(0.0-1.4' bgs) 2" Sch 40 PVC Well Casing	
2			SB-04-61(2-2.5) _072820 @ 0930	0.0		(0.5-3.0') SAND, fine to coarse, subangular to subrounded; and GRAVEL, subangular to subrounded; some very coarse sand to small pebbles, subangular to subrounded; little silt; poorly sorted; moist; black (10YR 2/1) to brown (10YR 5/3).			
3		54		0.0		(3.0-5.0') SAND, medium to coarse, subangular to subrounded; some very coarse sand to granules, subangular to subrounded; little small to medium pebbles, angular to subangular; poorly sorted; moist; brown (10YR 5/3).			
4				SB-04-61(4-4.5) _072820 @ 0932	0.0		(5.0-9.0') CLAY, medium to high plasticity; little silt, no dilatancy to slow dilatancy; medium stiff; moist; well sorted; gray (10YR 5/1).	(0.3-9.0' bgs) Bentonite	
5				0.0		(9.0-9.2') SAND, medium to very coarse, subangular to subrounded; and GRANULES to small PEBBLES, subrounded to subangular; little clay; poorly sorted; moist to wet; gray (10YR 5/1).			
6		60		0.0		(9.2-11.0') CLAY, medium to high plasticity; little silt, no dilatancy to slow dilatancy; medium stiff; moist; well sorted; gray (10YR 5/1).			
7				SB-04-61(8-8.5) _072820 @ 0934	0.0		(11.0-25.0') CLAY, medium plasticity; some silt, no dilatancy to slow dilatancy; little small pebbles, subangular to subrounded; trace fine to medium sand; poorly sorted; wet; gray (10YR 5/1). Note: Wet from 11.0-17.5' bgs. Note: Dry from 19.0-25.0' bgs.	(9.0-17.0' bgs) Filter Pack Sand	
8				0.0					
9				0.0					
10					0.0			(11.0-16.0' bgs) 2" PVC 10-Slot Well Screen	
11		60		0.0					
12				0.0					
13					0.0			(17.0-25.0' bgs) Bentonite	
14				0.0					
15				0.0					
16					0.0				
17					0.0				
18				SB-04-61(18.5-19) _072820 @ 0936	0.0				
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: 5.0' Macrocore
 Driller: R. Gordon Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not measured. Temporary well screened from 11-16' bgs. Surface Elev.: 729.1
 North Coord.: 560474.9
 East Coord.: 13305719.0

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 07/28/2020 Logger: M. Olender
 Project Number: 30043300 Date Completed: 07/28/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 72°F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21			60	SB-04-61(22-22.5) _072820 @ 0938	0.0		(11.0-25.0') CLAY, medium plasticity; some silt, no dilatancy to slow dilatancy; little small pebbles, subangular to subrounded; trace fine to medium sand; poorly sorted; wet; gray (10YR 5/1). Note: Wet from 11.0-17.5' bgs. Note: Dry from 19.0-25.0' bgs.	(17.0-25.0' bgs) Bentonite	
22									
23									
24				SB-04-61(24.5-25) _072820 @ 0940	0.0				
25									
26						End of boring at 25.0' bgs.			
27									
28									
29									
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31									
32									
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35									
36									
37									
38									
39									
40									
41									

Remarks:

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 08/06/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 08/06/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1				SB-04-64(0-1) _080620 @ 1400	0.0		(0.0-0.2') TOPSOIL; grass.	(0.0-25' bgs) Filter Pack Sand	Well
2			SB-04-64(1-2) _080620 @ 1405	0.0		(0.0-4.0') SAND, fine to coarse, subangular to subrounded; some small pebbles to small cobbles, subangular to subrounded; poorly sorted; dry to moist; brown (10YR 5/3) to light brownish gray (10YR 6/2). FILL.			
3			SB-04-64(2-3) _080620 @ 1410	0.0					
4			SB-04-64(3-4) _080620 @ 1415	0.0					
5			SB-04-64(4-5) _080620 @ 1420	0.0		(4.0-6.0') SAND, fine to medium, subangular to subrounded; trace coarse sand to granules, subangular to subrounded; poorly sorted; moist; black (10YR 2/1). FILL.			
6			SB-04-64(5-6) _080620 @ 1425	0.0					
7			SB-04-64(6-7) _080620 @ 1430	0.0		(6.0-7.0') CLAY, medium to high plasticity; and SAND, fine to coarse, subangular to subrounded; little small pebbles, subangular to subrounded; poorly sorted; moist to wet; medium stiff; gray (10YR 5/1) to black (10YR 2/1). FILL.			
8			SB-04-64(7-8) _080620 @ 1435	8.6		(7.0-8.5') SAND, fine to medium, subangular to subrounded; trace coarse sand to granules, subangular to subrounded; poorly sorted; moist; black (10YR 2/1). FILL.			
9			SB-04-64(8-9) _080620 @ 1440	0.0		(8.5-9.5') SAND, fine to very coarse, subangular to subrounded; some gravel, subangular to subrounded; poorly sorted; moist; very dark brown (10YR 2/2) to black (10YR 2/1). FILL.			
10				0.0		Note: Glass chunks throughout interval.			
11				0.0		(9.5-11.0') CONCRETE as cobbles, small to medium; subangular to subrounded; trace fine to medium sand.			
12				1.7		(11.0-16.0') SAND, fine to medium, subangular to subrounded; and SILT, slow to rapid dilatancy; some clay, medium to high plasticity; trace coarse sand to granules, subangular to subrounded.			
13			SB-04-64(12.5-13) _080620 @ 1445	0.0					
14				0.0					
15				0.0					
16				0.0					
17			SB-04-64(16.5-17) _080620 @ 1450	0.0		(16.0-17.0') SAND, fine to very coarse, subangular to subrounded; and COBBLES, subangular to subrounded; some clay, medium plasticity; poorly sorted; wet; gray (10YR 5/1).			
18				0.0		(17.0-20.0') SAND, fine to medium, subangular to subrounded; and SILT, slow to rapid dilatancy; some clay, medium to high plasticity; trace coarse sand to granules, subangular to subrounded.			
19			SB-04-64(18.5-19) _080620 @1455	0.0					
20				0.0					

Drilling Co.: Cascade Sampling Method: 5.0' Macrocore
 Driller: J. Greer Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): 6.5
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not measured. Temporary well screened from 19-24' Surface Elev.: 733.5
bgs. North Coord: 560429.1
 East Coord: 13305439.7

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 08/06/2020 Logger: M. Olender
 Project Number: 30075935 Date Completed: 08/06/2020 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21				SB-04-64(22-22.5) _080620 @ 1500	0.0		(20.0-24.0') SAND, fine to coarse, subangular to subrounded; some pebbles, subangular to subrounded; small to medium; little silt - clay; poorly sorted; wet; gray (10YR 5/1).	(19.0-24.0' bgs) 2" PVC 10-Slot Well Screen	
22					0.0				
23					0.0				
24				SB-04-64(24.5-25) _080620 @ 1505	0.0		(24.0-25.0') SAND, fine to medium, subangular to subrounded; and SILT, slow to rapid dilatancy; some clay, medium to high plasticity; trace coarse sand to granules, subangular to subrounded.	(24.0-25.0' bgs) Bentonite.	
25					0.0				
26							End of boring at 25.0' bgs.		
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
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40									
41									

Remarks:

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 01/08/2021 Logger: E. Redner
 Project Number: 30075935 Date Completed: 01/08/2021 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 28°F, Overcast

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			8		0.0	(0.0-1.0') CONCRETE.		(0.3-4.0' bgs) Bentonite	
2			12		0.0	(1.0-2.0') SAND, very fine to medium; little coarse sand to small pebbles, subangular to subrounded; poorly sorted; moist; black (10YR 2/1). FILL.		(0.0-5.0' bgs) 1" Sch 40 PVC Well Casing	
3					0.0	(2.0-2.5') CONCRETE.			
4					0.0	(2.5-4.0') SAND, fine to medium; trace granules, subangular to subrounded; well sorted; moist; black (10YR 2/1).			
5			40	SB-04-81(4-6) _010821 @ 0810	0.0	(4.0-8.0') SAND, fine to coarse, subangular to rounded; some very coarse sand to large pebbles, subangular to rounded; little silt; little clay, nonplastic to low plasticity, rapid dilatancy; poorly sorted; moist to wet; brownish yellow (10YR 6/6).		(4.0-12.0' bgs) Filter Pack Sand	
6					0.0	Note: Wet at 6.0' bgs.			
7					0.0				
8					0.0			(5.0-10.0' bgs) 1" PVC 10-Slot Well Screen	
9				SB-04-81(9-10) _010821 @ 0820	0.0	(8.0-14.5') CLAY; little silt, high plasticity, slow dilatancy; litte very fine sand to granules, subangular to subrounded; moist to wet; medium stiff to stiff; gray (10YR 6/1).			
10					0.0				
11					0.0				
12			120		0.0	Note: A 2" seam was observed at 11.5' bgs of very fine to coarse sand, subangular to subrounded; moist.			
13					0.0				
14					0.0			(12.0-17.0' bgs) Bentonite	
15				SB-04-81(14-15) _010821 @ 0830	0.0	(14.5-19.5') CLAY; some silt, medium plasticity, rapid dilatancy; little very fine sand to granules, subangular to rounded; dry to moist; medium stiff; gray (10YR 6/1).			
16					0.0				
17					0.0				
18					0.0			(0.0-19.0' bgs) 1" Sch 40 PVC Well Casing	
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: Core Barrel
 Driller: Chris Barden Sampling Interval: Continuous
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): 6.0
 Drilling Fluid: Water Water Level Finish (ft. btoc.): NA
 Remarks: bgs = below ground surface; NA = not applicable; Converted to Well: Yes No
btoc = below top of casing; ft = feet; NM= not measured. Hand augering the first 5.0' bgs could not be completed due to concrete and lose sands. Surface Elev.: 730.5
 North Coord.: 560562.3
 East Coord.: 13305718.5

Temporary wells screened from 5.0-10.0' and 19-24' bgs.

Soil Boring Log

Project Name: RACER Trust - Buick City Date Started: 01/08/2021 Logger: E. Redner
 Project Number: 30075935 Date Completed: 01/08/2021 Editor: M. Humphrey
 Project Location: Flint, MI Weather Conditions: 28°F, Overcast

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21				SB-04-81(19-21) _010821 @ 0840	0.0	[USCS Class Symbols]	(19.5-23.0') SILT; little clay, nonplastic to low plasticity, rapid dilatancy; some fine sand to small pebbles, subangular to subrounded; wet; soft; gray (10YR 6/1). Note: Wet at 19.5' bgs. Note: A 2" seam was observed 21.0' bgs of medium to very coarse sand; subangular; wet.	(19.0-24.0' bgs) 1" PVC 10-Slot Well Screen	
22		120	0.0						
23			0.0						
24			0.0						
25			0.0						
26			0.0						
27					0.0	(23.0-27.0') CLAY; some silt, medium plasticity, rapid dilatancy; little to trace very fine sand to granules, subangular to subrounded; dry; very stiff to hard; gray (10YR 6/1).	(17.0-27.0' bgs) Filter Pack Sand		
28							End of boring at 27.0' bgs.		
29									
30									
31									
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41									

Remarks:
