ADDENDUM NO. 1 11 January 2017

RE: MILLER PARK DISTRICT PHASE 1
Contract no. R-14-011-201

FROM: Spackman Mossop Michaels/ Eskew+Dumez+Ripple, Joint Venture
365 Canal Street, Suite 3150
New Orleans, Louisiana 70130
(504) 561-8686

TO: Prospective Bidders

This Addendum forms a part of the Contract Documents and modifies the original Procurement Documents dated December 12, 2016 as noted below. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

This Addendum consists of Four (4) Pages in addition to the enumerated specification sections and drawing sheets.

PRIOR APPROVALS

The following manufacturers, materials, products or equipment have been submitted for approval. Items listed are approved for use on the Project if all requirements of the Documents are satisfied (except those indicated as "Not Approved")

1. SECTION 07 25 00 – WEATHER BARRIERS

   Georgia-Pacific Gypsum; DensElement Barrier System.
   W.R. Meadows, Air-Shield LMP.

CHANGES TO INTRODUCTORY INFORMATION

2. SECTION 00 01 01 – TABLE OF CONTENTS: Modify the section numbers and titles of individual sections as indicated below:
   A. SECTION 00201 – INSTRUCTION TO BIDDERS: Re-number as "00200".
   B. Add SECTION 00201 – CONTRACTOR'S INDENTIFICATION to the Table of Contents. It appears in the project manual but not the TOC.
   C. Change Title of Section 01035 – WEATHER DAYS TO "WEATHER DELAYS".
   D. SECTION 01220 – PROJECT MEETING: Re-number as "01200".
   E. SECTION 32 94 51 – SOIL CELL: Re-number as "32 94 50".

3. EXISTING CONDITION INFORMATION: The following Documents are attached to the end of this Addendum for informational purposes in the preparation of bids. The information was furnished by the Owner and was not generated by the Consultant; therefore the Consultant is not responsible for their content.

   Attachment 1 – Report of Geotechnical Exploration, Miller Park District, dated November 25, 2015
   Attachment 2 – Report of Limited Phase II Environmental Site Assessment, Miller Park, dated December 10, 2015.

CHANGES TO PROCUREMENT REQUIREMENTS

4. The sign-in sheet from the pre-bid meeting held December, 21, 2016 is attached to the end of this Addendum.

CHANGES TO CONTRACTING REQUIREMENTS

5. DOCUMENT 00301 – BID SCHEDULE: Delete the six-page Bid Schedule included in the Project Manual and Replace with the Bid Schedule attached to the end of this Addendum. The following items have been added, removed or clarified:
   A. 01010-1: Addition
   B. 311000-23: Clarification
   C. 321400-1: Clarification
   D. 321400-2: Clarification
   E. 321000-1: Clarification
   F. 331000-3: Removal of Item and Clarification/Re-number of Item 4
   G. 333000-9: Removal
   H. 334000-19: Clarification of quantity
   I. 334000-26: Removal
   J. SI-003-2: Clarification
   K. SI-003-4: Addition
   L. SI-004: Addition of line items 1 thru 3
   M. SI-005: Addition of line item 1
   N. Clarification of Alternates.

6. DOCUMET 00500 – CONTRACT: delete this document in its entirety and replace with the version attached to the end of this Addendum.

CHANGES TO SPECIFICATIONS

7. The following Section(s) have not previously been issued and are introduced as Procurement Documents as part this Addendum, attached herein:

   SECTION 08 44 13 – GLAZED ALUMINUM CURTAIN WALL SYSTEMS

8. The following Section(s) are hereby replaced as Procurement Documents as part of this Addendum, attached herein:

   SECTION 01010 – SUMMARY OF WORK

CHANGES TO DRAWINGS

9. The following Drawings Sheet(s) are hereby replaced as Procurement Documents as part of this Addendum, attached herein:

   A. SHEET C001: Added general notes 32 and 33 regarding temporary fences and capping contaminated soil. Added detail for City Typical Detail for pavement cut and repair.

   B. SHEET C101: Revised limits of pavement cut and repairs at Georgia Ave. Show gutter for curb connection at northwest side of Cherry Street.

C. SHEET C201: Revised limits of pavement cut and repairs at Georgia Ave. Add note for existing steps to remain east side of Cherry Street. Revised note regarding existing pedestrian street lights along MLK Blvd.

D. SHEET C401: Add Additional 4" underdrain on north side of Cherry Street, Show revised locations of utilities to service stage pavilion.

E. SHEET C402: Add Additional 4" underdrain on north side of Cherry Street and add invert elevation for underdrain to Structure #D1

F. SHEET C501:
   1. Revised sewer service route. Revised Irrigation Backflow location and type.
   2. Label Conduit Bank as for EPB and Telephone. Adding additional note refereeing the irrigation plan for irrigation conduit locations. This sheet is to only direct attention to that sheet, not to show the full irrigation system nor all irrigation conduits.

G. SHEET C503: Show updated utility locations and revised pavement cuts in Georgia Ave.

H. SHEET C611:, Add note regarding egress access from One Central Plaza doorway.

I. SHEET L5.0 - IRRIGATION PLAN: Irrigation Plan has been updated

J. SHEET L5.1- IRRIGATION DETIALS: Added Detail 9/L5.1: Backflow Preventer Detail

K. SHEET A1.4: Added dimensions for building to locate relative to grid lines and property lines.

L. SHEET A2.1:
   3. Revised the graphic representation of the hand sinks to more accurately represent the specified individual wall mount sinks in lieu of a counter with integral undermount basins.
   4. Added graphic symbols for specified toilet accessories.
   5. Added door tags 101B, 109 and 110. These doors were listed in the door schedule.

M. SHEET A2.2:
   1. Revised the graphic representation of the hand sinks to more accurately represent the specified individual wall mount sinks in lieu of a counter with integral undermount basins.
   2. Removed basement grid lines from first floor for graphic clarity.

N. SHEET A3.1:
   1. Added detail #3: Door Jamb @ Brick
   2. Revised door numbering to reflect the doors tagged on Sheet A2.1.

O. SHEET A4.1: Added notes indicating removable sections of roof framing.

P. SHEET A5.2: Removed basement grid lines from first floor for graphic clarity.

10. Architectural Drawings: In general, delete any references to Aluminum Storefront (08 43 13). All glazing systems shall be provided under Aluminum Curtain Wall, Section 08 44 13.

ATTACHMENTS

Specifications

- Revised Bid Schedule, Contract and two (2) Sections and as stated above

Drawings

- 16 Sheets as stated above

Additional Information

- Pre-Bid Meeting Sign-in Sheet
- Report of Geotechnical Exploration (separately attached)
- Limited Phase II Environmental Site Assessment Report (separately attached)

END OF ADDENDUM

BID SCHEDULE
MILLER PARK DISTRICT + CONNECTIVITY IMPROVEMENTS
CONTRACT NUMBER R-14-011-101
City of Chattanooga, Tennessee

				Contractor Name	
Item No.	**Description**	**Estimated Qty.**	**Unit**	**Unit Price**	**Total Price**
01010	**General Conditions**				
01010-1	General Conditions, including mobilization, management, temporary facilities and controls, and all overhead expenses required to supervise and complete the Work.	1	LS		
033000	**Steel and Concrete Retaining Wall**				
033000-1	Steel and Concrete Retaining Wall along 10th Street at stage	83	LF		
044300	**Stone Masonry**				
044300-1	Stone Monumental Steps over Concrete Foundation	1,725	SF		
044300-2	Stone Steps over Concrete Foundation	2,387	SF		
044300-3	Stone Steps at Stage	154	SF		
044300-4	Stone Transitional Steps	9	EA		
044300-5	Stone Transitional Steps at Stage	4	EA		
044300-6	Flush Granite Curb	680	LF		
055213	**Pipe & Tube Railings & Bike Racks**				
055213-1	Handrail A	1	EA		
055213-2	Handrail B/ C	2	EA		
055213-3	Handrail E	1	EA		
055213-4	Handrail F	1	EA		
055213-5	Steel Guardrail	63	LF		
055213-6	Steel Bike Rack	15	EA		
055800	**Formed Metal Fabrications**				
055800-1	Powder Coated Steel- 18"	443	LF		
055800-2	Powder Coated Steel- 22"	143	LF		
055800-3	Powder Coated Steel- 24"	33	LF		
055800-4	Powder Coated Steel- 30"	96	LF		
055800-5	Powder Coated Steel- 36"	22	LF		
055800-6	Curved Steel, Powder Coated	127	LF		
129300	**Site Furnishings**				
129300-1	Bottle Filler	1	EA		
129300-2	Drinking Fountain	1	EA		
129300-3	Steel Bollard	88	EA		
129300-3	Excess Steel Bollard, No Installation	10	EA		
129300-4	3" Round Roadway Reflector	88	EA		
260500	**Common Work Results for Electrical**				
260500-1	New Traffic Signal Pole, Heads,	1	EA		
260500-2	Secondary Power	400	LF		

BID SCHEDULE
MILLER PARK DISTRICT + CONNECTIVITY IMPROVEMENTS
CONTRACT NUMBER R-14-011-101
City of Chattanooga, Tennessee

				Contractor Name	
Item No.	**Description**	**Estimated Qty.**	**Unit**	**Unit Price**	**Total Price**
265600	**Exterior Lighting**				
265600-1	In Grade Power Outlets	20	EA		
265600-2	USB Chargers for Step Seating Area	7	EA		
265600-3	Power and USB Pedestals	7	EA		
265600-4	Food Truck Power Stations	5	EA		
265600-5	New City Streetscape Poles	16	EA		
265600-6	Ped Light Pole Pull Box	16	EA		
265600-7	In-ground Lighting	5	EA		
265600-8	LED Light Strip	691	LF		
265600-9	Recessed Linear In-Grade Fixture	5	EA		
265600-10	Relocated City Streetscape Poles	4	EA		
265600-11	Underground Electric for Street lights	225	LF		
NIC	Pole Mounted WiFi WAP by EPB	14	EA		
NIC	Building Mounted WiFi WAP by EPB	2	EA		
NIC	Traffic Signal WiFi Hub by EPB	2	EA		
311000	**Site Clearing & Demolition**				
311000-1	Demolition of existing site elements including sidewalks, asphalt, pavers, utilities, flag poles, signs or other man-made items shown on plans, include removal, disposal and saw	1	LS		
311000-2	Concrete Fill Existing Pipes to remain	3	CY		
311000-3	Bus Stop Removal	1	LS		
311000-4	Remove existing fountain pumps	1	LS		
311000-5	Relocate Bike Share Station	1	LS		
311000-6	Remove and store items shown as salvaged, such a site furniture and signs.	1	LS		
311100-7	Silt Fencing, TYPE C	375	LF		
311000-8	Inlet Protection w/ Waddle	11	EA		
311000-9	Outlet Protection at sediment traps	1	EA		
311000-10	Undercut Chamber Area as Sediment Trap	210	CY		
311000-11	Temporary Stone Filter Dam	1	EA		
311000-12	Construction Entrance	2	EA		
311000-12	Diversion Swales W/ matting	280	LF		
311000-13	Monitoring	1	LS		
311000-14	Temporary Seeding/Mulch	1	LS		
311000-15	Silt Waddle	175	LF		
311000-16	Concrete Washout	1	EA		
311000-17	Maintenance of BMPs	1	LS		

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MILLER PARK DISTRICT + CONNECTIVITY IMPROVEMENTS
CONTRACT NUMBER R-14-011-101
City of Chattanooga, Tennessee

				Contractor Name	
Item No.	**Description**	**Estimated Qty.**	**Unit**	**Unit Price**	**Total Price**
311000-18	Tree Protection	1	LS		
311000-19	Temporary Traffic Control, phase 1A	1	LS		
311000-20	Temporary Traffic Control, phase 1B	1	LS		
311000-21	Temporary Traffic Control, phase 2	1	LS		
311000-22	Temporary Traffic Control, phase 3	1	LS		
311000-23	6' Tall Temporary Site Security Fence (adjust locations as needed)	2000	LF		
312000	**Earthwork**				
312000-1	Common and/or Borrow Excavation and placement compacted in place	1	LS		
312000-2	Mass Rock Excavation	20	CY		
312000-3	Trench Rock Excavation	10	CY		
312000-4	Undercut below subgrade as directed by testing agency	190	CY		
312000-5	Backfill undercut areas with crushed stone as directed	150	CY		
312000-6	Backfill undercut areas with offsite	40	CY		
321216	**Hot-Mix Asphalt Paving**				
321216-1	Pavement Cut and replacement Georgia Ave for utility/drainage cuts, per SD700.01	2170	SF		
321216-2	Pavement Cut and replacement at North End of Cherry St.	450	SF		
321216-3	Mill Asphalt Topping <1" as need	200	SF		
321313	**Portland Cement Concrete Paving**				
321313-1	Concrete Curb & Gutter Type A	535	LF		
321313-2	Concrete Drop Curb for Curb Ramps & Speed Table Transitions	210	LF		
321313-3	Concrete Rolled Curb and Gutter	14	LF		
321313-4	Flush Curb at Crosswalks	318	LF		
321400	**Unit Paving**				
321400-1	Vehicular Paving System (including asphalt base and stone subbase)	19,060	SF		
321400-2	Pedestrian Paving System (including concrete base and stone subbase)	37,489	SF		
321400-3	Truncated Dome Paver	171	SF		
321400-4	Directional Bar Paver	1,468	SF		
321400-5	4' x 4' Pavergrate	37	Ea		
321400-6	6' x 6' Pavergrate	29	Ea		
321400-7	Paver Edge Restraint	11,360	LF		
321500	**Aggregate Surfacing**				

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City of Chattanooga, Tennessee

				Contractor Name	
Item No.	**Description**	**Estimated Qty.**	**Unit**	**Unit Price**	**Total Price**
321500-1	Stabilized Decomposed Granite	104	SF		
321500-2	Steel Landscape Edging	58	LF		
324000	**Stone Outcrop**				
324000-1	Stone Outcrop	1	LS		
328400	**Planting Irrigation**				
328400-1	Drip Irrigation System	2,587	SF		
328400-2	Root Watering System	240	EA		
328400-3	Subsurface Irrigation Mat	25,500	SF		
328400-4	Temporary Lawn Irrigation System	25,500	SF		
328400-5	Irrigation Controller	1	EA		
328400-6	Irrigation Piping, valves	1	LS		
329100	**Planting Soils**				
329100-1	Engineered Lawn Soil	1	LS		
329100-2	Planting Soil	1	LS		
329100-3	Silva Cell Soil	1	LS		
329200	**Turf and Grasses**				
329200-1	Sod	25,500	SF		
329300	**Plants**				
329300-1	*Amelanchier x grandiflora* 'Autumn Briliance'- 3" Cal.	7	EA		
329300-2	*Carpinus caroliniana* - 3" Cal.	2	EA		
329300-3	*Cladrastis kentucke* a- 4" Cal.	13	EA		
329300-4	*Hamamelis virginiana* - 8-10' Ht	3	EA		
329300-5	*Liriodendron tulipifera* - 4" Cal.	13	EA		
329300-6	*Liriodendron tulipifera* 'Arnold'- 4" Cal.	7	EA		
329300-7	*Nyssa sylvatica* 'Wildfire'-4" Cal.	6	EA		
329300-8	*Oxydendron arboreum* - 4" Cal.	4	EA		
329300-9	*Quercus bicolo* r- 4" Cal.	7	EA		
329300-10	*Quercus lyrata* - 4" Cal.	22	EA		
329300-11	Perennials- QT.	1,224	EA		
329300-12	Shrubs - 5 gallon	17	EA		
329300-13	Perennials- Plugs	893	EA		
329451	**Soil Cells**				
329451-1	Two-Layer Soil Cell System and all required components	1,634	EA		
331000	**Water Distribution System**				
331000-1	2" Water Tap (including all fees)	2	EA		
331000-2	2" Copper Service	115	LF		
331000-3	Backflow Preventer Irrigation and Hot Box for Irrigation	1	EA		

BID SCHEDULE
MILLER PARK DISTRICT + CONNECTIVITY IMPROVEMENTS
CONTRACT NUMBER R-14-011-101
City of Chattanooga, Tennessee

				Contractor Name	
Item No.	**Description**	**Estimated Qty.**	**Unit**	**Unit Price**	**Total Price**
333300	**Sanitary Sewer System**				
333000-1	Connect to Existing Manhole	3	EA		
333000-2	Repair Existing Manholes	2	EA		
333000-3	Manholes (10' to 12' Deep) (installed in place)	3	EA		
333000-4	18" PVC Sewer Line (8' to 10' Deep) (installed in place)	265	LF		
333000-5	3" Copper Sewer (installed in place)	30	LF		
333000-6	Backwater Valve from sump pump in basement (installed in place)	1	EA		
333000-7	Tap Existing Sewer Main	1	EA		
333000-8	4" PVC Sewer Service (installed in place)	86	LF		
333000-9	not used				
333000-10	Sewer Cleanout (installed in place)	4	EA		
333000-11	Grease Trap & Lids (installed in place)	1	EA		
333000-12	As-built Survey Sewer System	1	LS		
333000-13	Testing	1	LS		
333000 /334000-14	Adjust Existing Utility Box and Manhole Lid's Elevation , including a concrete collar below paver grade	11	EA		
334000	**Storm Drainage**				
334000-1	Concrete Junction Boxes (installed in place)	3	EA		
334000-2	Catch Basins - 24"x24" Grate (installed in place)	4	EA		
334000-3	Catch Basins - 18"x36" Grate (installed in place)	6	EA		
334000-4	Inline Drain 6" & Grate (installed in place)	2	EA		
334000-5	Inline Drain 8" & Grate (installed in place)	2	EA		
334000-6	Drain Basin 8" & Grate (installed in place)	7	EA		
334000-7	Drain Basin 10" & Grate (installed in place)	1	EA		
334000-8	Drain Basin 15" & Grate (installed in place)	1	EA		

BID SCHEDULE
MILLER PARK DISTRICT + CONNECTIVITY IMPROVEMENTS
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City of Chattanooga, Tennessee

				Contractor Name	
Item No.	**Description**	**Estimated Qty.**	**Unit**	**Unit Price**	**Total Price**
334000-9	12"x"6" French Drain (installed in place)	340	LF		
334000-10	Underground Chamber System - including stone foundation, backfill, and manifold pipes	1	LS		
334000-11	Water Quality Unit , FD-4 (installed in place)	1	EA		
334000-12	Pump Out Water Quality Unit at Project Completion	1	EA		
334000-13	Storm Water Clean-outs (Non-Traffic Areas)	2	EA		
334000-14	Brick slot Drain (installed in place)	60	LF		
334000-15	As-built Survey of Drainage	1	LS		
334000-16	Pavement Cut / Replacement	700	SF		
334000-17	Infiltration Testing prior to Chamber Installation	6	EA		
334000-18	15" Dia. Reinforced Concrete Pipe (installed in place)	350	LF		
334000-19	4" Dia. HDPE Pipe (Underdrain)	1,740	LF		
334000-20	6" Dia. HDPE Pipe (installed in place)	166	LF		
334000-21	8" Dia. HDPE Pipe (installed in place)	256	LF		
334000-22	12" Dia. HDPE Pipe (installed in	73	LF		
334000-23	15" Dia. HDPE Pipe (installed in	202	LF		
334000-24	12" Elbow (installed in place)	1	EA		
334000-25	6"x4" Tee (installed in place)	1	EA		
334000-26	not used				
334000-27	Gravel French Drain in lawn (installed in place)	725	LF		
SI	**SUPPLEMENTAL INFORMATION**				
SI-001	**Stage Pavilion**				
SI-001-1	Stage Pavilion	1	LS		
SI-001-2	Projection Screen	1	LS		
SI-001-3	Building Signage	1	LS		
SI-001-4	Toilet Accessories	1	LS		
SI-001-5	Projection Equipment	1	LS		
SI-002	**Fountain**				
SI-002-1	Fountain	1	LS		
SI-003	**Roadway**				
SI-003-1	Traffic Control Signage, including poles and installation	2	EA		

BID SCHEDULE
MILLER PARK DISTRICT + CONNECTIVITY IMPROVEMENTS
CONTRACT NUMBER R-14-011-101
City of Chattanooga, Tennessee

				Contractor Name	
Item No.	**Description**	**Estimated Qty.**	**Unit**	**Unit Price**	**Total Price**
SI-003-2	Pavement Striping (including milling of old stripping as necessary)	1	LS		
SI-003-3	Store, Clean, and Reset Bus Stop	1	EA		
SI-003-4	Mobilization for Base Bid Phasing as indicated in Section 01010, 1.3, A	1	LS		
SI-004	**Special Waste**				
SI-004-1	Haul supsected special waste material to City site <4 miles (to pe paid per scale ticket)	270	TN		
SI-004-2	Containment and cover of suspected special waste material.	1	LS		
SI-004-3	Load and Haul special waste material to permitted special waste landfill (to be paid per scale ticket)	270	TN		
SI-005	**Incentive Payment**				
SI-005-1	Incentive Payment for completion of roadwork prior to 120 days per Section 01010 of Project Manual	15	EA	$1,500	$ 22,500.00
	CONTRACT R-14-011-101 SUBTOTAL				

ALT-001	**Add Alternate No. 1**				
ALT-001-1	Delete Item SI-003-4 and replace with the following: Mobilization for Alternate 1 phasing as indicated in Section 01010, 1.3, A.	1	EA		
	CONTRACT SUBTOTAL WITH ALTERNATE 1				

ALT-002	**Add Alternate No. 2**				
ALT-002-1	Delete Item 01010-1 and replace with the following: Mobilization for Alternate 2 phasing as indicated in Section 01010, 1.3, A.	1	EA		
	CONTRACT SUBTOTAL WITH ALTERNATE 2				

NOTE: Alternates 1 and 2 shall be considered individually and are note cumulative.

CONTRACT

ARTICLES OF AGREEMENT entered into this _____ day of _____, 2016, between the CITY OF CHATTANOOGA, TENNESSEE, hereinafter called the City, and _____, Contractor, of the City of Chattanooga, State of Tennessee, hereinafter called the Contractor.

ARTICLE I. The Contractor hereby contracts and agrees to furnish all supervision, labor, materials and equipment and execute in a thorough and workmanlike manner, complete in every respect, in accordance with the Drawings, Specifications and other Contract Documents made therefor and hereto attached, and to the satisfaction of the City of Chattanooga, or its successor, all of the Work shown, specified and otherwise required in these contract documents, to-wit:

MILLER PARK DISTRICT & CONNECTIVITY IMPROVEMENTS – PHASE I
CONTRACT NUMBER R-14-011-201

ARTICLE II. The prices shown in the Bid Schedule shall be the amount of the compensation to the Contractor for the proper and satisfactory completion of the work specified herein, including all contingencies, in full conformity with the Contract Documents. This compensation shall be full payment for the performance of the work and the furnishing of labor, materials, transportation, supplies, tools, equipment, taxes, employee benefits, incidentals, services, and other items necessary or convenient for completion of the work in a satisfactory and acceptable manner, and within the intent of these Contract Documents.

ARTICLE III. The Contractor agrees that he has informed himself fully of the conditions relating to the construction and labor under which the work will be or is now being performed, and this Contractor must employ, so far as possible, such methods and means in the carrying out of his work as will not cause any interruption or interference with any other contractor.

ARTICLE IV. All work and material required under this Contract shall be in such quantities, kinds and qualities, and in such places, and of such dimensions and forms as may be designated by the plans and specifications, or by the working plans provided by the Engineer.

ARTICLE V. The purchase of all materials, the delivery of same, and all incidental expenses which may arise during the construction and finishing of said work above specified, shall be at the sole cost and expense of the Contractor.

ARTICLE VI. All materials which the said Contractor may procure or deliver upon or in the vicinity of said work herein specified to be incorporated in and become a part of said improvement, shall, from the time of such procurement or delivery become the property of the City of Chattanooga, except any surplus which shall remain over the final completion of this Contract.

ARTICLE VII. The Contractor hereunder contracts and agrees to complete the whole of the work contemplated *in accordance to each Phase as defined in SECTION 01010 – SUMMARY OF WORK, 1.3, A.* Time of the completion of the work is the essence of the Contract, and the Contractor is prepared to make completion of the work in such quantity and on such dates as are herein specified, and the parties having agreed, after estimates, that the sum of ***One Thousand, Five Hundred dollars and no cents ($1,500.00)*** per day would be liquidated damages in case of

the Contractor's failure to perform *on each Phase individually*, now, therefore, the aforementioned sum per day, not as a penalty but to be considered and taken as liquidated damages suffered by the City of each day's delay in completion of this Contract.

Liquidated Damages for each phase not completed within the specified time as described above will be imposed concurrently. The Contractor hereby agrees that said sum(s) listed above shall be deducted from amounts due the Contractor under the Contractor, if no amount is due the Contractor, the Contractor hereby agrees to pay to the Owner as liquidated damages such total sum as shall be due for such delay, computed as aforesaid.

ARTICLE VIII. It is agreed that the Contractor will not assign, transfer, or sublet the said work or any part thereof without the written consent of the City of Chattanooga.

ARTICLE IX. Estimates shall be made every thirty (30) days during the progress of the work by the Contractor and submitted to the Engineer for his approval. When, in the Engineer's judgment, the estimate shall represent a fair value of such work done in accordance with the provisions of this contract, the Contractor shall be paid ninety-five (95%) percent with five (5%) percent being retained as collateral security, said five (5%) percent to be paid within ninety (90) days after completion of such work or within ninety (90) days after substantial completion of the project for work completed, whichever occurs first.

ARTICLE X. An omission to disapprove the work badly done, at the time of a monthly or other estimate, by the Engineer shall not be construed into an acceptance of any defective work.

All documents bound herein and all other documents not bound herein but given to Contractor in connection with the work shall be and are hereby made a part of this contract. These contract documents shall include, but not be limited to, the following: the Contract, Advertisement for Bids, Instructions to Bidders, Bid Proposal and Proposal Documents, Bid Bond, Performance Bond, Payment Bond, Certificates, General Provisions, Supplementary General Provisions, Specifications, Drawings, Addenda, Change Orders, Notice to Proceed, and Specifications, Drawings, and Engineering Data furnished to the Contractor.

IN TESTIMONY WHEREOF, the said parties have hereunto set their hands and seals the day and year first above written.

Attest: CITY OF CHATTANOOGA

_____ By: _____

City Finance Officer Public Works Administrator

CONTRACTOR

_____

Name

Attest:

_____ By:_____

_____
Title

CITY FINANCE OFFICER'S CERTIFICATE

I do hereby certify that the funds required to be paid by the City under this contract have been appropriated or a loan authorized and have been encumbered and will be available as needed for payment.

This _____ day of _____, 2016.

_____
City Finance Officer

CITY ATTORNEY'S APPROVAL

This contract approved as to form and legality this the ____ day of _____, 2016.

_____
City Attorney

END OF DOCUMENT

SECTION 01010
SUMMARY OF WORK

PART 1 – GENERAL

1.1 Section Includes

A. Description of Work

B. Items regulating the execution of the Work

1.2 Description of the Work

A. The work covered by this Contract consists of: The redesign of the existing 1.5 acre Miller Park and the repaving and restriping of a section of M.L.King Blvd adjacent to the park. The new park includes *one new pavilion*. New paving a large lawn, a water feature, new lighting and stormwater management.

B. The Contractor shall furnish all materials, power, equipment, tools, labor, transportation and other items necessary or convenient to the Contractor for the installation of equipment, materials and products specified or described in these Contract Documents and called for on the Plans and for the completion of all work to be performed by the Contractor as specified herein.

C. The City Engineer reserves the right to substitute, add, delete, increase, decrease in any form or fashion as necessary the scope of work under the provisions of this Contract, including the projects noted above.

D. This project shall be assigned a unique project number by the Engineer. The Contractor shall execute this project in complete compliance with the requirements of this contract. All records of the Contractor shall conspicuously identify them to be associated with the unique project number assigned by the Engineer.

E. The work covered under this project shall consist of furnishing all materials, equipment and labor for the full depth reclamation of designated streets including but not limited to mobilization, parking sign placement, public notification, placement of traffic control devices per MUTCD, cleaning and conditioning of the roadways, repair of base failures as needed, the adjustment of sanitary manholes and other publicly owned structures as required, milling as directed, cement and water addition, grading, compaction, saw cutting and installation of traffic signal loop wires where required and placement of temporary and permanent pavement markings as required.

F. The Engineer shall provide a set of standard City details, as needed, which shall be applicable to this project. The Contractor shall be called in for a Pre-Construction meeting at which time the Engineer shall issue notice to proceed. The Contractor shall have ten (10) days or an agreed to start date to start construction.

1.3 Scheduling of the Work

A. Project Phases and Alternates

The following dates are scheduled based on the Contractor receiving their Notice of Award from the City of Chattanooga on February 22nd, 2017. Phases below corresponded to Phasing Plan, Sheets C610 and C611 of Drawings.

PHASE 1A AND 1B – WORK WITHIN MILLER PARK

Pavilion Stage and Basement** – The Contractor shall complete the whole of the work regarding the Pavilion Stage and Basement in **318 calendar days** from the dates of March 20th, 2017 to February 1st, 2018 (3/20/17-2/1/18). The Contractor will be required to submit a Certificate of Occupancy to the City of Chattanooga for Phase 1 to be considered complete. Failure to do so will result in a penalty of **Liquidated Damages** to the sum of **one thousand five hundred dollars and no cents ($1,500.00)** per calendar day **to be implemented should the work for Pavilion Stage and Basement not be completed in the specified time. No incentive payments will be made regarding this Scope of Work.

Miller Park Improvements** – The Contractor shall complete the remainder of the work, excluding roadway improvements within the Limits of Construction. The bulk of this work will be the construction and installation of the fountain, irrigation system, rock outcropping installation, flat work, storm drainage elements, and the remaining trees and shrubs. Phase 1 will be completed in **318 calendar days** from the dates of March 20th, 2017 to February 1st, 2018 (3/20/17-2/1/18). **Liquidated Damages** to the sum of **one thousand five hundred dollars and no cents ($1,500.00)** per calendar day **to be implemented should the work for Miller Park Improvements not be completed in the specified time. There will be no incentive payments associated with this Scope of Work.

PHASE 2 AND 3 ROADWAY IMPROVEMENTS

The Contractor shall provide Base Bid and Alternates for the Roadwork as indicated below:

BASE BID

Phase 2** – The Contractor shall complete the center portion of the roadway improvements along MLK Blvd, from Georgia Ave to Market St. This work shall include the placement of all utilities and trees along MLK Blvd that may impact, or be impacted by, the roadway, in addition to the installation of the radius returns at the East and West ends of the Limits of Construction, as indicated on Sheet C611. Completion of Phase 2 will be accepted pending a substantial completion walkthrough of this portion of the site. Phases 2 and 3 shall be completed in **120 calendar days** from the date March 20th to July 18th, 2017 (3/20/17-7/18/17). **Liquidated Damages** to the sum of **one thousand five hundred dollars and no cents ($1,500.00)** per calendar day **to be implemented should the work for Phase 2 not be completed in the specified time.

Phase 3 *– The Contractor shall complete the remaining work on the north and south sides of MLK Blvd and in Miller Park Plaza, as well as the whole of the work along Cherry St and the placement of the traffic pole at the corner of Cherry St. and Georgia Ave, as indicated on Sheet C611. All work for Phase 3 will be completed in* ***60 calendar days*** *from May 19h to July 18th, 2017 (5/19/17-7/18/17).* ***Liquidated Damages*** *to the sum of* ***one thousand five hundred dollars and no cents ($1,500.00)*** *per calendar day* ***to be implemented should the work for Phase 3 not be completed in the specified time.*** *Phase 3 will be considered complete pending a substantial completion walkthrough and approval of the specified portion of the site.*

Total Duration for Phases 2 and 3 shall not exceed 120 calendar days. If both Phases are completed before the date stipulated in this Section, an incentive payment of one thousand five hundred dollars and no cents ($1,500.00) *per calendar day,* ***for a maximum of fifteen (15) days****, will be made* ***for each calendar day in which all work for Phases 2 and 3 is completed prior to the specified completion time.***

Liquidated Damages for each phase not completed within the specified time as described above will be implemented concurrently.

ALTERNATE NO. 1

The Contractor shall complete all roadway improvements, Phases 2 and 3 concurrently, with the roadway shut down and traffic re-routed per Traffic Control Plans indicated in Drawings on Sheet C700. Completion of Phases 2 and 3 will be accepted pending a substantial completion walkthrough of this portion of the site. This phase shall be completed in ***90 calendar days*** *from the date March 20th to June 18th, 2017 (3/20/17-6/18/17).* ***Liquidated Damages*** *to the sum of* ***one thousand five hundred dollars and no cents ($1,500.00)*** *per calendar day* ***to be implemented should the work for Phases 2 and 3 not be completed in the specified time. An incentive payment of one thousand five hundred dollars and no cents ($1,500.00)*** *per calendar day,* ***for a maximum of fifteen (15) days****, will be made* ***for each calendar day in which all work for Phases 2 and 3 is completed prior to the specified completion time.***

Liquidated Damages for each phase not completed within the specified time as described above will be implemented concurrently.

ALTERNATE NO. 2

The Contractor shall Complete Phases 2 and 3 per the Base Bid durations, however no roadway work shall commence until August 28, 2017 (8/28/17). Terms of Liquidated Damages and Incentive Payments shall be the same as provided in the Base Bid.

Phase 2 *shall be completed in* ***120 calendar days*** *from the date August 28 to December 19th, 2017 (8/28/17-12/19/17).*

Phase 3 *shall be completed in* ***60 calendar days*** *from the date October 20th to December 19th, 2017 (10/20/17-12/19/17).*

Liquidated Damages for each phase not completed within the specified time as described above will be implemented concurrently.

B. The roadways and sidewalks of Martin Luther King Boulevard, Georgia Ave, and Market Street shall remain open to vehicular and pedestrian traffic for the following events and dates:

Armed Forces Day Parade	*Friday, May 5, 2017*	*On Market Street*
Nightfall	*May 5 - August 25*	*On ML King Blvd and Market St*
Bessie Smith Strut	*Monday, June 12, 2017*	*On ML King Blvd*
River Gorge Omnium	*August 25 - 27*	*On ML King Blvd, Market St, and Georgia Ave*
Rucknooga	*mid-October*	*On ML King Blvd*
Causeway One Table	*Monday before Thanksgiving*	*On ML King Blvd*
MLK Day Parade	*Monday, January 15, 2018*	*On ML King Blvd*

The following dates may experience heavier than usual traffic due to detours associated with other events around the Chattanooga area:

Riverside Spring Meetup	*April 14th, 2017*
Scenic City Art Car Parade	*Late April 2017*
Market Street Mile	*May 6th, 2017*
IRONMAN 70.3	*May 21st, 2017*
Riverbend 2017	*June 9th -June 17th*
Waterfront Triathlon	*June 25th, 2017*
Sports Barn Sprint Triathlon	*August 6th, 2017*
IRONMAN - World Championships 70.3	*September 9th & 10th, 2017*
IRONMAN	*September 24th, 2017*

Additional dates for which these roadways must remain open may be determined at a later date and the contractor shall coordinate construction activities as necessary.

1.4 Items regulating the Execution of the Work.

A. Attention to Work

For this project, the Contractor shall give his personal attention to and shall supervise the work to the end that it shall be prosecuted faithfully; and, when he is not personally present on the work, he shall at all times be represented by a competent superintendent or foreman who shall be present at the work and who shall receive and obey all instruction or orders given under this Contract, and who shall have full authority to execute the same, and to supply materials, tools and labor without delay, and who shall be the legal representative of the Contractor.

The Contractor shall be liable for the faithful observance of any instructions delivered to him or to his authorized representatives.

B. Access to Work

The Contractor shall at all times provide proper facilities for access and inspection of the work by representatives of the Owner and of such official Governmental agencies as may be designated by the Owner as having jurisdictional rights to inspect the work.

C. No Parking Signs

The Contractor shall place "NO PARKING" signs 48 hours prior to beginning work at a project location. The Contractor shall notify the City's designated Inspector/ Project Manager when the signs have been placed and if vehicles have not been moved at such time as work is scheduled to begin. No additional cost shall be paid to the Contractor while the Owner is making arrangements to get the vehicle moved or towed.

D. Work on State Highway

Where the work on this project encroaches upon the right-of-way of any State or Interstate Highway right-of-way, the owner will execute a contract with proper authorities for the proposed work.

The Contractor shall notify the proper authorities prior to entering upon such right-of-way and shall be responsible for all damage and for satisfying the requirements of these authorities.

E. Work on Private Property

Where the work on this project encroaches upon private property, the Owner shall provide easements and/or right-of-entry in or onto said property. Work performed in such easements is subject to the provisions of the easement agreement on file with the City of Chattanooga Engineering Department.

The Contractor shall be responsible for obtaining any additional agreements which may be deemed necessary for the storage of equipment or materials outside of public easements or rights of ways for this project. The Contractor shall obtain a written agreement between the Contractor and Land Owner and forward it to the Engineer prior to use of said property.

The Contractor shall be responsible for the preservation of and shall use every precaution to prevent damage to all trees, shrubbery, fences, culverts, mailboxes, bridges, pavements, driveways, sidewalks, houses or building and all water, sewer, gas, telephone and electric lines thereto and all other private and public property along or adjacent to the work.

Any damage that occurs will be restored to a like condition as existed prior to construction, in the Contract Documents, unless otherwise indicated or specified.

Forty-eight (48) hours prior to construction on any easement or streets the Contractor shall notify in writing the affected property owners in the area. This

notification shall include the Contractor's name and the name and phone number of the contact person.

F. Monthly Job Site Meetings

Once a month, on a date mutually agreed upon by the Contractor and the Engineer, a job site meeting shall be held for review of the Project, including, but not limited to: The construction schedule, traffic control, pending submittals, and any other issues that may arise. This meeting shall be used to review the contractor's monthly applications for payment.

G. Contract Working Hours

All work shall be performed during regular working hours unless mutually agreed upon and approved in writing by the City Engineer. The Contractor will not permit overtime work or the performance of work on Sunday or any legal holiday without the Owner's written consent given after prior 24 hour written notice to the Engineer. Saturday work shall also require prior 24 hour written notice. Regular working hours are Monday through Saturday from 7:00 A.M. to 8:00 P.M. The actual costs of the Owner's and Engineer's inspection of the work performed outside of regular working hours will be billed to the Contractor and deducted from the Contractor's application for payment as they occur.

END OF DOCUMENT

SECTION 08 44 13
GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 Summary

A. Section Includes: Basis of Design: Kawneer Architectural Aluminum Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of curtain wall framing.
   1. Types of Kawneer Aluminum Curtain Wall include:
   a.
      600 Wall System™1 Curtain Wall – 2-1/2" (63.5), outside glazed pressure plate format.
      1) Standard System depth: 7-1/2" (190.5) for 1" (25.4) insulating glazing
      2) Veneer System depth: 2 ½" for 1/4" (6.3) monolithic glazing.

B. Related Sections:
   1. 072700 "Air Barriers"
   2. 079200 "Joint Sealants"
   3. 088000 "Glazing"

1.3 Definitions

A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufactures Association (AAMA) – AAMA Glossary (AAMA AG).

1.4 Performance Requirements

A. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads. Failure also includes the following:
      a. Thermal stresses transferring to building structure.
      b. Glass breakage.
      c. Loosening or weakening of fasteners, attachments, and other components.
      d. Failure of operating units.

B. Delegated Design: Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Wind loads: Provide Curtain Wall system; include anchorage, capable of withstanding wind load design pressures of local applicable wind load pressures.

D. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft^2 (0.3 l/s · m^2) at a static air pressure differential of 6.24 psf (300 Pa).

E. Water Resistance, (static): The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a static air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.

F. Water Resistance, (dynamic): The test specimen shall be tested in accordance with AAMA 501.1. There shall be no leakage at an air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.

G. Uniform Load: A static air design load of 40 psf (1915 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member at design load. At structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

H. Seismic: When tested to AAMA 501.4, system must meet design displacement of 0.010 x the story height and ultimate displacement of 1.5 x the design displacement.

I. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.66 (clear) or

J. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 66frame and 60glass (clear)

K. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.43 (HP glass).

L. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 71frame and 71glass (HP glass).

M. Sound Transmission Loss: When tested to ASTM E90 and ASTM E1425, the Sound Transmission Class (STC) and Outdoor/Indoor Transmission Class (OITC) shall not be less than:
STC 31 or OITC 26 based upon 1" (25.4) insulating glass (1/4", 1/2" AS, 1/4"),
STC 37 or OITC 30 based upon 1" (25.4) laminated glass (1/4" laminated, 1/2" AS, 1/4" laminated).

N. Windborne-Debris-Impact Resistance Performance: Shall be tested in accordance with ASTM E1886, information in ASTM E1996, and TAS 201/203.
1. Large – Missile Impact: For aluminum-framed systems located within 30 feet (9.1 m) of grade.
2. Small – Missile Impact: For aluminum-framed systems located above 30 feet (9.1 m) of grade.

O. Blast Mitigation performance: Shall be tested or proven through analysis to meet ASTM F1642, GSA-TS01, and UFC 04-010.01 performance criteria.

To meet UFC 04-010-01, B-3.1 Standard 10 for Windows and Skylights, the following options are available:
1. Section B-3.1.1 Dynamic analysis
2. Section B-3.1.2 Testing
3. Section B-3.1.3 ASTM F2248 Design Approach

1.5 Submittals

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For glazed aluminum curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified pre-construction testing agency, for glazed aluminum curtain walls, indicating compliance with performance requirements.

F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed curtain wall systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following:
   1. Joinery
   2. Glazing

1.6 Quality Assurance

A. Installer Qualifications: Installer who has had successful experience with installation of the same or similar systems required for the project and other projects of similar size and scope.

B. Manufacturer Qualifications: A manufacturer capable of fabricating glazed aluminum curtain walls that meet or exceed performance requirements.

C. Source Limitations: Obtain aluminum curtain wall system through one source from a single manufacturer.

D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
   1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Build mockups for type(s) of curtain wall elevation(s) indicated, in location(s) shown on Drawings.

F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section “Project Management and Coordination”.

1.7 Project Conditions

A. Field Measurements: Verify actual locations of structural supports for glazed aluminum curtain walls by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 Warranty

A. Manufacturer’s Warranty: Submit, for Owner’s acceptance, manufacturer’s standard warranty.
   1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PART 2 - PRODUCTS

2.1 Manufacturers

A. Basis-of-Design Product:
   1. Kawneer Company Inc.
      a.
         600 Wall System™1 Curtain Wall – 2-1/2" (63.5), outside glazed pressure plate format.
         1) System depth: 6" (152.4) or 7-1/2" (190.5) for 1" (25.4) insulating glazing and 1/4" (6.3) monolithic glazing.

B. Submit substitutions to architect for approval. Refer to Substitutions Section for procedures and submission requirements

2.2 Materials

A. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.78) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.

B. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.

C. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.

D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

E. Pressure Plate: Pressure plate shall be aluminum and fastened to the mullion with stainless steel screws.

F. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

G. Sealant: For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

H. Thermal Barrier: Thermal separator shall be extruded of a silicone compatible elastomer that provides a minimum 1/4" (6.3) separation.

I. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 Curtain Wall Framing

A. Framing Members: Manufacturer's standard extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
   Glazing System: 4 sided captured.
   Glazing Plane: Front.

B. Glass: 1" (25.4) insulating glass option.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

D. Framing Sealants: Shall be suitable for glazed aluminum curtain wall as recommended by sealant manufacturer.

E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.

F. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

G. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

H. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle curtain wall material and components to avoid damage. Protect curtain wall material against damage from elements, construction activities, and other hazards before, during and after installation.

2.4 Glazing

A. Glazing: Comply with Division 08 Section “Glazing”. Following glazing options are available.
1. 1600 Wall System™1 Curtain Wall.
2. System depth: 7-1/2" (190.5) for 1" (25.4) insulating glazing

B. Glazing Gaskets: Gaskets to meet the requirements of ASTM C864.

C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

E. Glazing Sealants: As recommended by manufacturer for joint type.

2.5 Operable Units

A. Doors: Comply with Division 08 Section “Aluminum-Framed Entrances and Storefronts”.

B. Windows: Comply with Division 08 Section “Aluminum Windows”.

2.6 Accessory Materials

A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762 mm) thickness per coat.

2.7 Fabrication

A. Form or extrude aluminum shapes before finishing.

B. Fabricate components that, when assembled, have the following characteristics:
Profiles that are sharp, straight, and free of defects or deformations.
Accurately fitted joints.
Physical and thermal isolation of glazing from framing members.
Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
Provisions for field replacement of glazing from exterior.
Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
Internal weeping system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

C. Curtain Wall Framing: Fabricate components for assembly using shear block system following manufacturer's standard installation instructions.

D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 Aluminum Finishes

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Factory Finishing:
Kawneer Permanodic™ AA-M10C21A44 / AA-M45C22A44, AAMA 611, Architectural Class I Color Anodic Coating (Color: Submit full range of colors to architect for selection.).

PART 3 - EXECUTION

3.1 Examination

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Installation

A. General: Install curtain wall systems plumb, level, and true to line, without warp or rack of frames with manufacturer’s prescribed tolerances and installation instructions. Provide support and anchor in place.

B. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.

C. Glazing: Glass shall be outside glazed and held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners spaced no greater than 9" (228.6) on center.

D. Water Drainage: Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.

E. Related Products Installation Requirements:
Sealants (Perimeter): Refer to Joint Treatment (Sealants) Section.
Glass: Refer to Glass and Glazing Section.
a. Reference: ANSI Z97.1, CPSC 16 CFR 1201 and GANA Glazing Manual.

3.3 Field Quality Control

A. Field Tests: Architect shall select curtain wall units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
1. Testing: Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements.
a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft^2, whichever is greater.
b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 8 psf (383 Pa).

B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 Adjusting, Cleaning and Protection

A. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum curtain wall system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

B. Cleaning: Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 084413

ATTENDING PRE-BID CONFERENCE

Bid/Proposal Number: 147376

Miller Park District & Connectivity Improvements – Phase I

Opening Date: 01/26/17

Pre-Bid Date: 12/21/16

Name & Company	Email
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Emily Bullock	SMMENR	emily@smm.studio
Jenny Park	City	jpark@chattanooga.go

GENERAL NOTES:

1 THESE DRAWINGS DO NOT PURPORT TO LOCATE ALL UTILITIES.
2 ALL UTILITY LOCATIONS TO BE FIELD VERIFIED BY PROPER AGENCIES BEFORE BEGINNING CONSTRUCTION. UNDERGROUND UTILITIES ARE NOT FIELD LOCATED NOR ARE ALL PURPORTED TO BE SHOWN. INFORMATION SHOWN SHOULD BE CONSIDERED APPROXIMATE. CONTRACTOR TO CONTACT ALL UTILITY COMPANIES TO HAVE UTILITIES FIELD LOCATED BEFORE EXCAVATION OR DEMOLITION WORK BEGINS.
3 THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES WITHIN THE WORKING AREA BEFORE COMMENCING WORK & AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE & PRESERVE ANY & ALL UNDERGROUND UTILITIES.
4 THE CONTRACTOR SHALL COORDINATE LOCATION & INSTALLATION OF ALL UNDERGROUND UTILITIES & APPURTENANCES TO MINIMIZE DISTURBING CURB & GUTTER, PAVING, EXISTING UTILITIES & COMPACTED SUBGRADE.
5 CONTRACTOR SHALL VERIFY EXISTING UTILITY LINE OR EXISTING INFRASTRUCTURE PRIOR TO BEGINNING WORK. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE DRAWING OR IN THE FIELD BEFORE BEGINNING WORK OR DURING CONSTRUCTION.
6 CONTRACTOR TO COORDINATE ALL WORK WITH OTHER UTILITY INSTALLATIONS NOT COVERED IN THESE PLANS (ELECTRIC, TELEPHONE, GAS, CABLE, ETC.) & ALLOW FOR THEIR OPERATIONS & CONSTRUCTION TO BE PREPARED.
7 THE CONTRACTOR SHALL IMMEDIATELY INFORM THE OWNERS REPRESENTATIVE OR ENGINEER OF ANY DISCREPANCIES OR ERRORS HE DISCOVERS IN THE PLAN.
8 DEVIATION FROM THESE PLANS & NOTES WITHOUT THE PRIOR CONSENT OF THE OWNERS REPRESENTATIVE MAY BE CAUSE FOR THE WORK TO BE UNACCEPTABLE.
9 ALL WORK SHALL COMPLY WITH APPLICABLE STATE, FEDERAL, AND LOCAL CODES, & ALL NECESSARY LICENSES & PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AT HIS EXPENSE UNLESS PREVIOUSLY OBTAINED BY THE OWNER/DEVELOPER.
10 FOR THE WORK ON THE STATE OR CITY RIGHT-OF-WAY, THE CONTRACTOR SHALL:
   A. NOT STORE MATERIAL, EXCESS DIRT OR EQUIPMENT ON THE SHOULDERS OF PAVEMENT IN CASE OF MULTI-LANE HIGHWAYS, IN THE MEDIAN STRIPS. THE PAVEMENT SHALL BE KEPT FREE FROM ANY MUD OR EXCAVATION WASTE FROM TRUCKS OR OTHER EQUIPMENT. ON COMPLETION OF THE WORK ALL EXCESS MATERIAL SHALL BE REMOVED FROM THE R/W.
   B. SHALL PROVIDE ALL NECESSARY & ADEQUATE SAFETY PRECAUTIONS SUCH AS SIGNS, FLAGS, LIGHTS, BARRICADES & FLAG MEN AS REQUIRED BY THE LOCAL AUTHORITIES & IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR & HOLD HARMLESS THE STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION, THE CITY OF CHATTANOOGA & THE OWNER FROM ANY CLAIMS FOR DAMAGE DONE TO EXISTING PRIVATE PROPERTY, PUBLIC UTILITIES, OR TO THE TRAVELING PUBLIC.
   C. SHALL COMPLETE THE WORK TO THE SATISFACTION OF THE CITY OF CHATTANOOGA OR DOT AND OBTAIN A LETTER FROM THE DEPARTMENT STATING THAT THE WORK IS ACCEPTABLE.
   D. POST NECESSARY BONDS AS REQUIRED BY THE CITY AND/OR STATE.
11 ALL WORK & MATERIALS SHALL COMPLY WITH CITY OF CHATTANOOGA REGULATIONS & CODES OF O.S.H.A. STANDARDS.
12 A MINIMUM CLEARANCE OF TWO FEET SHALL BE MAINTAINED BETWEEN THE FACE OF CURB & ANY PART OF A TRAFFIC SIGNAL OR LIGHT POLE.
13 NECESSARY & SUFFICIENT BARRICADES, LIGHTS, SIGNS & OTHER TRAFFIC CONTROL MEASURES AS MAY BE NECESSARY FOR THE PROTECTION AND SAFETY OF THE PUBLIC SHALL BE PROVIDED & MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
14 CONTRACTORS SHOULD NOT BE DOING ANY OPEN BURNING OF CONSTRUCTION MATERIALS OR DEBRIS WITHOUT A PERMIT FROM THE DEPARTMENT OF AIR POLLUTION CONTROL OR LOCAL AUTHORITY. IF A CONTRACTOR DESIRES TO PERFORM OPEN BURNING, HE MUST BE RESPONSIBLE FOR OBTAINING ANY PERMITS AND IS RESPONSIBLE FOR ANY VIOLATION OF THE AIR POLLUTION LAWS.
15 CONTRACTOR SHALL BE RESPONSIBLE DURING CONSTRUCTION FOR THE CONTINUOUS MAINTENANCE OF SEDIMENT & EROSION CONTROL MEASURES AS CALLED FOR ON THE DRAWINGS.
16 EROSION CONTROL MEASURES ARE TO BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION (SEE GRADING & DRAINAGE PLAN AND/OR SEDIMENT & EROSION CONTROL PLAN).
17 EXISTING DRAINAGE STRUCTURES TO BE INSPECTED, REPAIRED AS NEEDED & CLEANED OUT TO REMOVE ALL SILT & DEBRIS.
18 THE CONTRACTOR SHALL REPAIR OR REPLACE IN-KIND ANY DAMAGE THAT OCCURS TO PROPERTY AS RESULT OF HIS WORK.
19 ALL PIPE LENGTHS & DISTANCES BETWEEN STRUCTURES ARE MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE ALONG A HORIZONTAL PLANE.
20 THE CONTRACTOR SHALL PROVIDE ALL THE MATERIALS & APPURTENANCES NECESSARY FOR THE COMPLETE INSTALLATION OF THE STORM DRAINAGE, SEWER, WATER & UTILITY SYSTEMS. ALL PIPE & FITTINGS SHALL BE INSPECTED BY THE UTILITY DEPARTMENT INSPECTOR PRIOR TO BEING COVERED. THE INSPECTOR MUST ALSO BE PRESENT DURING PRESSURE TESTING & DISINFECTION OF LATERALS & HIS SIGNATURE OF APPROVAL IS REQUIRED.
21 THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE LOCAL UTILITY AUTHORITIES FOR CONNECTION TO THE EXISTING MAINS & PAY ALL APPLICABLE FEES.
22 UTILITY COORDINATION & COSTS SHALL BE INCLUDED IN THE PROJECT SCHEDULE & IT IS THE EXPLICIT RESPONSIBILITY OF THE CONTRACTOR TO ASSURE THAT THE PROJECT SCHEDULE INCLUDES THE NECESSARY RELOCATION. THE CONTRACTOR WILL NOT BE PAID ADDITIONALLY FOR THIS COORDINATION. THE CONTRACTOR SHOULD SEEK ASSISTANCE FROM ALL UTILITY COMPANIES TO LOCATE & PROTECT THEIR FACILITIES.
23 CONTRACTOR SHALL OBTAIN ALL PERMITS BEFORE CONSTRUCTION BEGINS.
24 DIMENSIONS ON BUILDINGS ARE FOR GRADING PURPOSES ONLY & ARE NOT TO BE USED TO LAYOUT FOOTINGS. REFER TO THE STRUCTURAL DRAWINGS FOR FOUNDATION INFORMATION.
25 ALL DIMENSIONS SHOWN ARE TO FACE OF CURB OR EDGE OF S/W UNLESS NOTED OTHERWISE.
26 CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO BEGINNING CONSTRUCTION.
27 JOINTS OR SCORE MARKS ARE TO BE SHARP & CLEAN WITHOUT SHOWING EDGES OF JOINT TOOL.
28 THE CONTRACTOR SHALL PROVIDE FOR ANY NECESSARY BONDS AS REQUIRED BY GOVERNING AGENCIES.
29 AN AUTO CAD BASE PLAN MAY BE PROVIDED TO THE CONTRACTOR FOR CONSTRUCTION PURPOSES.
30 TEMPORARY BENCHMARK: TO BE ESTABLISHED PRIOR TO CONSTRUCTION.
31 TOPOGRAPHIC & BOUNDARY SURVEY BY OWNER DIRECTLY. NO PROFESSIONAL SURVEY PROVIDED.
32 CONTRACTOR SHALL PROVIDE A TEMPORARY 6' CHAIN LINK FENCE AROUND WORK ZONES WITH IN THE PARK, ADJUST LOCATION AS NECESSARY THROUGH THE PROJECT. (1)
33 CONTRACTOR SHALL SEE PHASE II ENVIRONMENTAL STUDY FOR REQUIREMENTS REGARDING CAPPING AND EXPOSED CONTAMINATED SOILS. CONTAMINATED SOILS SHALL BE CAPPED WITH MIN 18" OF CLEAN SOIL OR HARDSCAPE ABOVE.

SITE NOTES:

1 CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE BEGINNING CONSTRUCTION.
2 FOR EXACT BUILDING DIMENSIONS SEE ARCHITECTURAL PLANS.
3 DIMENSIONS ON BUILDINGS ARE FOR GRADING PURPOSES ONLY & ARE NOT TO BE USED TO LAYOUT FOOTINGS. REFER TO THE STRUCTURAL DRAWINGS FOR FOUNDATION INFORMATION.
4 ALL DIMENSIONS SHOWN ARE TO FACE OF CURB, EDGE OF SIDEWALK, OR FACE OF BUILDING UNLESS NOTED OTHERWISE.
5 A 1' CURB TAPER SHALL BE FORMED AT ALL PLACES WHERE CURB & GUTTER MEETS AN ADJACENT CONCRETE SIDEWALK OR PARKING AREA WHICH IS 0.5' LOWER THAN THE TOP OF CURB ELEVATION.
6 CONTRACTOR TO MAINTAIN 6-FT SITE SECURITY FENCE AROUND WORK ZONES.
7 REFER ALSO TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.

DEMOLITION NOTES:

1 THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING DEMOLITION PERMITS AS WELL AS OTHER ASSOCIATED PERMITS PRIOR TO CONSTRUCTION.
2 DIMENSIONS ON BUILDINGS ARE FOR GRADING PURPOSES ONLY & ARE NOT TO BE USED TO LAYOUT FOOTINGS. REFER TO THE STRUCTURAL DRAWINGS FOR FOUNDATION INFORMATION.
3 ALL DEMOLITION DIMENSIONS SHOWN ARE APPROXIMATE & SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
4 THE CONTRACTOR SHALL SAW-CUT TIE-INS AT EXISTING PAVEMENT OR CONC. AREAS AS NECESSARY TO ENSURE SMOOTH TRANSITIONS. THE CONTRACTOR SHALL SAW-CUT AND TRANSITION TO MEET EXISTING PAVEMENT AS NECESSARY & AS DIRECTED BY THE INSPECTOR TO ENSURE POSITIVE DRAINAGE (TYPICAL AT ALL INTERSECTIONS). INSTALL EXPANSION JOINTS AT ALL CONC. SAW-CUT TIE-INS.
5 ALL EXISTING TREES, VEGETATION & ORGANIC TOPSOIL SHALL BE STRIPPED & REMOVED FROM THE CONSTRUCTION AREA, AS REQUIRED.
6 EXISTING STRUCTURES WITHIN CONSTRUCTION LIMITS ARE TO BE ABANDONED, REMOVED, OR RELOCATED AS REQUIRED. COORDINATE WITH PROPER AUTHORITIES AND/OR UTILITY COMPANIES.
7 REFER ALSO TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.

DRAINAGE & GRADING NOTES:

1 CONTRACTOR SHALL OBTAIN ALL PERMITS BEFORE CONSTRUCTION BEGINS.
2 NEW FINISHED CONTOURS SHOWN ARE TOP OF NEW PAVING IN AREAS TO RECEIVE PAVEMENT & TOP OF TOPSOIL IN AREAS TO BE SEEDED.
3 PROPOSED CONTOUR INTERVALS ARE AS LABELED. ALL PROPOSED CONTOURS ARE FINISHED GRADE.
4 CONTRACTOR SHALL NOTIFY & COOPERATE WITH ALL UTILITY COMPANIES OR FIRMS HAVING FACILITIES ON OR ADJACENT TO THE SITE BEFORE DISTURBING, ALTERING, REMOVING, RELOCATING, ADJUSTING OR CONNECTING TO SAID FACILITIES. CONTRACTOR SHALL PAY ALL COSTS IN CONNECTION WITH THE ALTERNATION OF OR RELOCATION OF THE FACILITIES. CONTRACTOR SHALL RAISE OR LOWER TOPS OF EXISTING MANHOLES AS REQUIRED TO MATCH FINISHED GRADES.
5 A QUALIFIED SOILS LABORATORY SHALL DETERMINE THE SUITABILITY OF THE EXISTING SUB-GRADE & EXISTING ON SITE MATERIAL PRIOR TO BEGINNING ANY FILLING OPERATION.
6 ALL WASTE RESULTING FROM DEMOLITION, CLEARING & GRUBBING SHALL BE DISPOSED OF OFF SITE BY THE CONTRACTOR AT AN APPROVED LOCATION.
7 BEFORE ANY MACHINE WORK IS DONE, CONTRACTOR SHALL STAKE OUT & MARK THE ITEMS ESTABLISHED BY THE SITE PLAN. CONTROL POINTS SHALL BE PRESERVED AT ALL TIMES DURING THE COURSE OF THE PROJECT. LACK OF PROPER WORKING POINTS AND GRADE STAKES MAY REQUIRE CESSATION OF OPERATIONS UNTIL SUCH POINTS & GRADES HAVE BEEN PLACED TO THE OWNER'S SATISFACTION.
8 COMPACTION OF THE BACK FILL OF ALL TRENCHES SHALL BE COMPACTED TO THE DENSITY OF 95% OF THEORETICAL MAXIMUM DRY DENSITY (ASTM D698). BACK FILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS, OR OTHER FOREIGN DEBRIS & SHALL BE PLACED AT OR NEAR OPTIMUM MOISTURE. CORRECTION OF ANY TRENCH SETTLEMENT WITHIN A YEAR FROM THE DATE OF APPROVAL WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
9 ALL FILL MATERIAL TO BE UTILIZED ON THE PROJECT SHALL BE FREE OF ORGANIC OR OTHERWISE DELETERIOUS MATERIALS & COMPACTED TO MINIMUM DRY DENSITIES CORRESPONDING TO 95% OF MAXIMUM DRY DENSITY AS OBTAINED BY STANDARD PROCTOR, ASTM D698 & AT LEAST 98% OF STANDARD PROCTOR WITHIN 1 FOOT BELOW PAVEMENT SUBGRADE. FILL SHALL BE PLACED IN LIFTS NO TO EXCEED 6 INCHES IN COMPACTED FILL THICKNESS. A REPORT FROM A GEOTECHNICAL ENGINEER MAY BE REQUIRED BY THE OWNER.
10 THE CONTRACTOR WILL INSURE THAT POSITIVE & ADEQUATE DRAINAGE IS MAINTAINED AT ALL TIMES WITHIN THE PROJECT LIMITS. THIS MAY INCLUDE, BUT NOT BE LIMITED TO, REPLACEMENT OR RECONSTRUCTION OF EXISTING DRAINAGE STRUCTURES THAT HAVE BEEN DAMAGED OR REMOVED OR RECONSTRUCTED AS REQUIRED BY THE ENGINEER, EXCEPT FOR THOSE DRAINAGE ITEMS SHOWN AT SPECIFIC LOCATIONS IN & HAVING SPECIFIC PAY ITEMS IN THE DETAILED ESTIMATE. NO SEPARATE PAYMENT WILL BE MADE AT ANY COSTS INCURRED TO COMPLY WITH THIS REQUIREMENT.
11 THE CONTRACTOR SHALL PROVIDE ANY EXCAVATION & MATERIAL SAMPLES NECESSARY TO CONDUCT REQUIRED SOIL TESTS. ALL ARRANGEMENTS & SCHEDULING FOR THE TESTING SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
12 PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL VERIFY EXISTING GRADES ESPECIALLY WITHIN & ALONG DRAINAGE WAYS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF WORK.
13 MAXIMUM EMBANKMENT SLOPES TO BE AS FOLLOWS: CUT AREA – 3:1; FILL AREAS 3:1 (UNLESS NOTED OTHERWISE).
14 IT IS THE INTENT OF THIS PROJECT FOR THE CONTRACTOR TO VERIFY & MATCH EXISTING CONDITIONS UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY ITEMS THAT DO NOT EXIST AS SHOWN.
15 STORM DRAIN PIPE TO BE CLASS III REINFORCED CONCRETE CONFORMING TO ASTM C-76, OR ADS N-12 WITH SOIL TIGHT GASKET AS SHOWN ON DRAWINGS.
16 PRE CAST STRUCTURES MAY BE USED AT THE CONTRACTORS OPTION. ALL CONCRETE TO HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 P.S.I.
17 CONTRACTOR SHALL BLEND ALL SLOPES WITH THE SURROUNDING ENVIRONMENT.
18 THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER FOR ANY FIELD GRADE ADJUSTMENTS NEEDED DUE TO ACTUAL TOPOGRAPHY VARYING FROM THE TOPOGRAPHIC SURVEY.
19 REFER ALSO TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.

CITY OF CHATTANOOGA STORM WATER NOTES & CLARIFICATIONS:

IN ADDITION TO ALL EXISTING REQUIREMENTS THE FOLLOWING ITEMS WILL BE ENFORCED EFFECTIVE IMMEDIATELY. THESE REQUIREMENTS ARE ALREADY AUTHORIZED BY CITY CODE SECTION 31. PLEASE BE AWARE THAT THESE REQUIREMENTS ARE CITY REQUIREMENTS. STATE OF TENNESSEE NPDES PERMIT REQUIREMENTS MAY BE DIFFERENT.

1. ALL PERMIT APPLICATIONS AND REPORTS MUST BE SIGNED AS FOLLOWS:
   A. CORPORATION: A PRESIDENT, SECRETARY, TREASURER, OR VICE PRESIDENT OF THE CORPORATION OR OTHER PERSON WHO PERFORMS SIMILAR POLICY- OR DECISION-MAKING FUNCTIONS FOR THE CORPORATION.
   B. PARTNERSHIP OR SOLE PROPRIETORSHIP: BY A GENERAL PARTNER OR THE PROPRIETOR.
   C. PUBLIC FACILITY: A PRINCIPAL EXECUTIVE OFFICER OR THE CHIEF EXECUTIVE OFFICER OF THE AGENCY OR A SENIOR EXECUTIVE OFFICER HAVING RESPONSIBILITY FOR THE OVERALL OPERATIONS OF A PRINCIPAL GEOGRAPHIC UNIT OF THE AGENCY.

   SIGNATURES WILL BE ACCEPTED ONLY FROM PROPERTY OWNERS AND/OR THE GENERAL CONTRACTORS. IN CASE OF A FILL PERMIT, WRITTEN AUTHORIZATION FROM THE PROPERTY OWNER MUST BE INCLUDED WITH THE APPLICATION. ALL ENFORCEMENT RESULTING FROM PERMIT OR POLLUTION VIOLATIONS WILL BE JOINTLY APPLIED TO BOTH THE PROPERTY OWNER AND GENERAL CONTRACTOR.

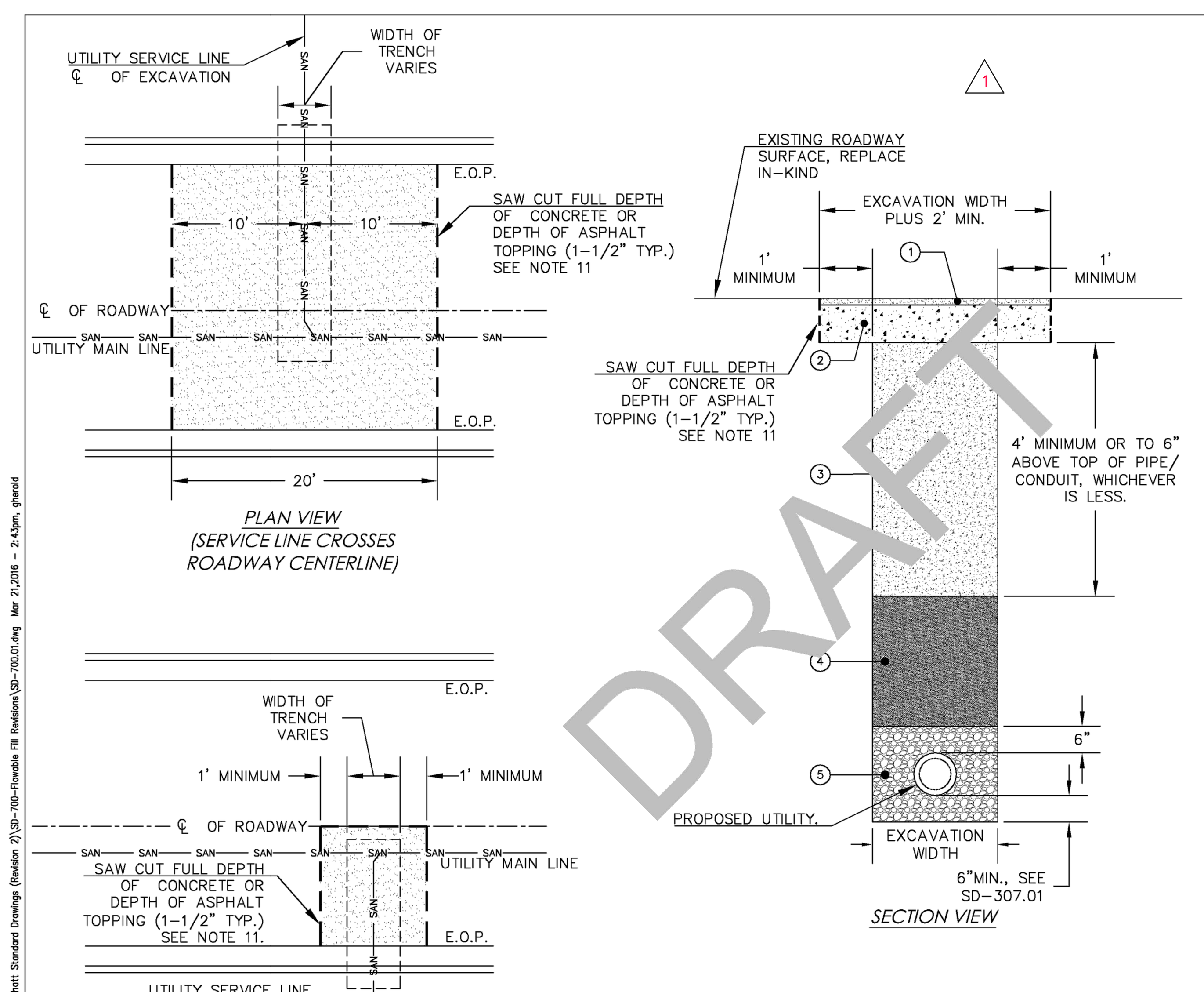
1 THE APPLICANT MUST SUBMIT THE NAME AND ADDRESS OF THE CONTRACTOR AND ANY SUBCONTRACTORS WHO SHALL PERFORM THE LAND DISTURBING ACTIVITY AND WHO SHALL IMPLEMENT THE EROSION CONTROL PLAN.
2 ON SITES WHERE A NPDES PERMIT IS REQUIRED, A NOTICE OF INTENT MUST BE SUBMITTED BEFORE A LAND DISTURBING PERMIT CAN BE ISSUED. A NOTICE OF COVERAGE MUST BE FAXED TO THE STORM WATER OFFICE BEFORE GRADING WORK IS AUTHORIZED TO BEGIN.
3 ON SITES THAT DISCHARGE INTO SINKHOLES, WRITTEN APPROVAL FROM THE TDEC OFFICE OF WATER SUPPLY MUST BE SUBMITTED BEFORE A LAND DISTURBING PERMIT IS ISSUED.
4 ALL OUTFALLS MUST BE NOTED ON THE SUBMITTED EROSION CONTROL PLAN. DISCHARGE FROM ANY ADDITIONAL OUTFALLS WILL BE CONSIDERED A PERMIT VIOLATION.
5 A LOCATION MUST BE NOTED ON THE PLANS FOR CONCRETE TRUCK WASH AREAS. THE DISCHARGE OF CONCRETE CHUTE WASH WATER AND ALL OTHER NON-STORM WATER DISCHARGES SUCH AS PAINT BRUSH WASH WATER ARE AN ILLEGAL DISCHARGE.
6 PERIMETER EROSION AND SEDIMENT CONTROL MEASURES MUST BE IN PLACE AND FUNCTIONAL BEFORE EARTH MOVING OPERATIONS BEGIN.
7 ANY DISTURBED AREAS THAT ARE TO REMAIN BARE FOR LONGER THAN 15-DAYS MUST BE TEMPORARILY STABILIZED. (1)
8 A SPECIFIC INDIVIDUAL SHALL BE DESIGNATED TO BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS ON EACH SITE. THIS PERSON MUST BE IDENTIFIED, ALONG WITH A PHONE NUMBER, IN THE APPLICATION FOR LAND DISTURBANCE PERMIT.
9 AT A MINIMUM, ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE CHECKED AND, IF NECESSARY REPAIRED, WEEKLY AND WITHIN 24-HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5-INCHES. THE PERMITTEE SHALL MAINTAIN RECORD OF SUCH CHECKS AND REPAIRS. THESE RECORDS MUST BE KEPT ON-SITE OR IN THE OFFICE OF THE RESPONSIBLE PERSON AND AVAILABLE FOR REVIEW AT ANY TIME BY STORM WATER PERSONNEL. THESE RECORDS MUST BE SUBMITTED TO THE STORM WATER OFFICE ON A YEARLY BASIS. PROJECTS PERMITTED UNDER THE STATE NPDES PERMIT PROGRAM MUST FOLLOW ITS REQUIREMENTS. USE OF THAT INSPECTION FORM IS PERMITTED INSTEAD OF CITY SELF-INSPECTION FORM.
10 UPON COMPLETION OF THE REQUIRED IMPROVEMENTS, AND PRIOR TO FINAL ACCEPTANCE BY THE CITY ENGINEER, THE DEVELOPER/CONTRACTOR WILL FURNISH "AS BUILT" DRAWINGS OF ALL SANITARY SEWER AND STORMWATER STRUCTURES. THE DEVELOPER/CONTRACTOR WILL HAVE A REGISTERED LAND SURVEYOR CERTIFY THAT THE INFORMATION FURNISHED IS A TRUE AND COMPLETE REPRESENTATION OF THE IMPROVEMENTS THAT WERE CONSTRUCTED. THE ENGINEER WILL REVIEW THE CERTIFIED "AS BUILT" DRAWINGS FOR COMPLIANCE WITH THE ORIGINAL CONSTRUCTION DOCUMENTS. THE "AS BUILT" DRAWINGS SHALL BE PROVIDED PER CITY OF CHATTANOOGA STANDARDS AND SPECIFICATIONS.

UTILITY NOTES:

1 EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW PIPELINES.
2 ALL SERVICE LATERALS SHALL BE MARKED WITH MAGNETIC TAPE.
3 LINES UNDERGROUND SHALL BE INSTALLED, TESTED & APPROVED BEFORE BACKFILLING. PRESSURE & LEAKAGE TESTS SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT AWWA STANDARD C600 AND/OR MANUFACTURER'S PROCEDURE.
4 PRE CAST STRUCTURES MAY BE USED AT THE CONTRACTORS OPTION.
5 ALL CONCRETE TO HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 P.S.I. UNLESS OTHERWISE NOTED
6 THE SITE UTILITY CONTRACTOR SHALL COOPERATE & WORK WITH OTHER CONTRACTORS PERFORMING WORK ON THIS PROJECT TO INSURE PROPER & TIMELY COMPLETION OF THIS PROJECT.
7 LUBRICANTS SHALL BE NON-TOXIC & SHALL NOT PROMOTE BIOLOGICAL GROWTH SOLVENT CEMENTED JOINTS NOT PERMITTED.
8 WHERE PROPOSED WATER LINE EXTENDS UNDER ANY PAVED SURFACED, THE TRENCH MUST BE BACK FILLED WITH APPROVED STONE.
9 ALL VALVES (G.V.) SHALL BE GATE VALVES WITH CAST IRON BOXES.
10 WATER INSTALLATION SHALL BE IN ACCORDANCE WITH "TEN STATES STANDARDS" & TENNESSEE AMERICAN WATER COMPANY STANDARDS & REGULATIONS.
11 CONNECTION TO THE EX WATER MAIN SHALL BE MADE UNDER THE SUPERVISION OF THE LOCAL WATER UTILITY.
12 RADIUS (DEFLECT) WATER LINES IN LIEU OF FITTINGS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
13 ALL WATER LINES SHALL HAVE A MINIMUM COVER OF 36".
14 WHERE WATER PIPING CROSSES THE SANITARY SEWER LINE, THE WATER SERVICE WITHIN 10-FEET OF THE POINT OF CROSSING SHALL BE AT LEAST 18-INCHES ABOVE THE TOP OF THE SEWER LINE. THE SEWER LINE SHALL BE OF DUCTILE IRON WITH MECHANICAL JOINTS AT LEAST 10 FEET ON BOTH SIDES OF THE CROSSING.
15 WATER MUST BE CONSTRUCTED BY A LICENSED MUNICIPAL UTILITY CONTRACTOR (CLASSIFICATION MU).
16 ALL MATERIALS SHALL BE UI LISTED & FACTORY MUTUAL APPROVED UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
17 THRUST BLOCKS SHALL BE PROVIDED AT ALL TEES, ELBOW & BENDS OF SUFFICIENT SIZE TO COMPLY WITH MINIMUM STANDARDS OF N.F.P.A. #24 – EXISTING SOIL CONDITIONS.
18 THE CONTRACTOR SHALL NOTIFY THE WATER, SEWER, UTILITY & THE ENGINEER PRIOR TO BEGINNING CONSTRUCTION.
19 A CONCRETE ANCHOR BLOCK AS SHOWN ON THE UTILITY DETAIL SHEET SHALL BE POURED AROUND THE FIRST BELL & SPIGOT PIPE JOINT RESTRAINT FROM THE END OF THE WATERLINE. THE MECHANICAL RESTRAINT SECURING THE JOINT SHALL BE WRAPPED WITH PLASTIC PRIOR TO THE POURING OF THE CONCRETE. THE INTENT OF THE CONCRETE ANCHOR BLOCK WILL HELP KEEP THE JOINTS FROM SEPARATING NEAR THE END OF THE WATERLINE.
20 ALL DUCTILE IRON PIPE TO BE AWWA C-151-81, CLASS 50
21 ALL UNDERGROUND FITTINGS TO BE MECH JOINT AWWA C110/A21.10, CLASS 250
22 ALL UNDERGROUND VALVES TO BE MECH JOINT AWWA C509, CLASS 250
23 ALL UNDERGROUND JOINTS TO BE TESTED & FLUSHED AS PER NFPA #24
24 THE CONTRACTOR SHALL ADJUST LOCATION OF PROPOSED WATER LINES AS REQUIRED TO AVOID CONFLICTS WITH STORM & OTHER UTILITIES.
25 PROCEDURE FOR DISINFECTING POTABLE WATER LINES SHALL CONFORM TO THE REQUIREMENTS OF AWWA C601.
26 ALL PIPING FROM THE "POINT OF SERVICE" INCLUDING UNDERGROUND USED FOR SPRINKLER OR STANDPIPE SYSTEM MUST BE INSTALLED BY A TENNESSEE REGISTERED SPRINKLER CONTRACTOR. [RULE 0780-2-7-08]
27 REFER ALSO TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.

ADDITIONAL SANITARY SEWER SYSTEM NOTES:

1 EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW PIPELINES.
2 ALL SERVICE LATERALS SHALL BE MARKED WITH MAGNETIC TAPE.
3 LINES UNDERGROUND SHALL BE INSTALLED, TESTED & APPROVED BEFORE BACKFILLING.
4 ALL MANHOLES REQUIRE "KOR-N-SEAL" OR EQUAL RUBBER SEALS. SEWER PIPE SHALL HAVE GRAVEL BEDDING IN ACCORDANCE WITH CITY SANITARY SEWER TRENCH DETAILS.
5 PRE CAST STRUCTURES MAY BE USED AT THE CONTRACTORS OPTION.
6 CONCRETE RELATED TO SANITARY SEWER CONSTRUCTION TO HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4000 P.S.I.
7 THE SITE UTILITY CONTRACTOR SHALL COOPERATE & WORK WITH OTHER CONTRACTORS PERFORMING WORK ON THIS PROJECT TO INSURE PROPER & TIMELY COMPLETION OF THIS PROJECT.
8 CONCENTRIC MANHOLES ONLY ARE TO BE USED ON THIS PROJECT. NO ECCENTRIC MANHOLES ARE TO BE INSTALLED.
9 LUBRICANTS SHALL BE NON-TOXIC & SHALL NOT PROMOTE BIOLOGICAL GROWTH SOLVENT CEMENTED JOINTS NOT PERMITTED.
10 ALL SERVICE LATERALS SHALL BE MARKED WITH MAGNETIC TAPE.
11 THE SANITARY SEWER SYSTEM INSTALLATION SHALL BE IN ACCORDANCE WITH TDEC STANDARDS & REGULATIONS & THE CITY OF CHATTANOOGA/ HAMILTON COUNTY STANDARD DETAILS & SPECIFICATIONS.
12 SANITARY SEWER SERVICE LINES SHOWN AS 6" P.V.C. (UNLESS NOTED TO BE D.I.P.) & SHALL BE LAID ON A MINIMUM SLOPE OF 1.10%.
13 SANITARY SEWER SERVICE LINES SHOWN AS 4" P.V.C. (UNLESS NOTED TO BE D.I.P.) & SHALL BE LAID ON A MINIMUM SLOPE OF 1.10%.
14 NO MANHOLE COVERS OR CLEANOUTS ARE TO BE LOCATED IN THE CURB & GUTTER.
15 REFER ALSO TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.



DRAWING NOTES

(1) 1-1/2" GRADE 'E' ASPHALTIC CONCRETE TOPPING, APPLY TACK COAT PRIOR TO PLACEMENT.

(2) FOR CONCRETE ROADWAY: 8" MIN.(MATCH EXISTING) CLASS 'A' CONCRETE (4,000 P.S.I. MIN.), COURSE BROOM FINISH. CONCRETE SHALL BE COLORED, STAMPED AND TEXTURED TO MATCH ADJACENT SURFACE.

(3) FLOWABLE FILL (COMPRESSIVE STRENGTH 200-250 P.S.I. IN 48 HOURS), 4 FOOT MINIMUM OR TO WITHIN 6 INCHES ABOVE TOP OF PIPE. CONCRETE ROADWAYS: FILL TO THE BOTTOM OF THE EXISTING CONCRETE ROADBED. ASPHALT ROADWAYS: FILL TO WITHIN 1-1/2" OF FINISHED GRADE.

(4) 1/4" LIME DUST, 1/8" MINUS, MANUFACTURED SAND OR 1/2" WASHED STONE.

(5) BEDDING MATERIAL - SEE SD-307.01.

GENERAL REQUIREMENTS

1. ALL STREET CUTS MUST BE BACKFILLED WITH FLOWABLE FILL WITH A COMPRESSIVE STRENGTH OF 200-250 PSI IN 48 HOURS.
2. FLOWABLE FILL SHALL BE IN PLACE FOR A MINIMUM OF 48 HOURS PRIOR TO PLACING ASPHALT OR CONCRETE TOPPING.
3. WHERE IT IS IMPRACTICAL TO USE FLOWABLE FILL DUE TO TERRAIN, SLOPE, WIDTH OF TRENCH, OR OTHER SITUATIONS, THE MATERIAL FOR THE BACKFILL IN THE ROADWAY AREAS MAY BE CEMENT TREATED (5% BY UNIT WEIGHT) AGGREGATE BASE AT THE SOLE DISCRETION OF THE CITY TRANSPORTATION ENGINEER/STREETCUT INSPECTOR. BACKFILL SHALL BE PLACED IN 8" LIFTS AND SHALL BE THOROUGHLY COMPACTED BY MEANS OF A MECHANICAL TAMP.
4. WHERE LONGITUDINAL CUTS ARE MADE, THE OWNER RESERVES THE RIGHT TO REQUIRE ADDITIONAL RESURFACING BEYOND THE LIMITS OF THE REPAIR TO ENSURE THE PROPER RIDING CHARACTERISTICS AND THE STABILITY OF THE PAVEMENT.
5. BACKFILL OF TRENCHES WITHIN THE SIDEWALK AREAS SHALL BE COMPACTED GRADED AGGREGATE BASE (NOT LOOSE WASHED STONE). BACKFILL SHALL BE PLACED IN 8" LIFTS AND SHALL BE THOROUGHLY COMPACTED BY MEANS OF A MECHANICAL TAMP.
6. IF A PERPENDICULAR CUT TRENCH REACHES THE CENTERLINE OF THE ROADWAY, THE ASPHALT MUST BE REPLACED FROM CURB TO CURB AND BE A MINIMUM OF TEN (10) FEET ON EACH SIDE OF THE CENTERLINE OF EXCAVATION. (SEE PLAN VIEW DETAIL, THIS SHEET)
7. ALL REFERENCES TO MATERIALS ARE DESCRIBED IN DETAIL IN THE CITY OF CHATTANOOGA'S STANDARD SPECIFICATIONS. THESE SPECIFICATIONS MUST BE USED AS A REFERENCE WHEN ORDERING MATERIALS.
8. ANY SUBSTITUTIONS TO THE MATERIALS REFERENCED HEREON MUST BE APPROVED BY THE CITY TRANSPORTATION ENGINEER OR STREETCUT INSPECTOR PRIOR TO INSTALLATION.
9. EXISTING CONCRETE STREETS THAT HAVE BEEN OVERLAID WITH ASPHALT SHALL BE REPAIRED WITH CONCRETE HAVING A DEPTH EQUAL TO THE EXISTING CONCRETE PLUS THE ADJACENT EXISTING ASPHALT OVERLAY.
10. WHERE EXISTING CONSTRUCTION AND EXPANSION JOINTS ARE ENCOUNTERED IN CONCRETE PAVEMENT CUTS, THE ENGINEER/INSPECTOR SHALL DESIGNATE LOCATION, SIZE, AND MATERIALS TO CONSTRUCT JOINTS IN THE NEW CONCRETE SURFACE.
11. ALL STREETCUTS SHALL BE SAWCJT THE FULL DEPTH OF CONCRETE OR DEPTH OF ASPHALT TOPPING (1-1/2" TYP.) PRIOR TO ANY OTHER DEMOLITION METHODS BEING USED.

NO.	REVISION	DATE
0	INITIAL ISSUE	11/25/15

CITY OF CHATTANOOGA AND HAMILTON COUNTY

REPAIR DETAILS (ROADWAYS)

DATE OF ORIGINAL ISSUE: MARCH 10, 2016

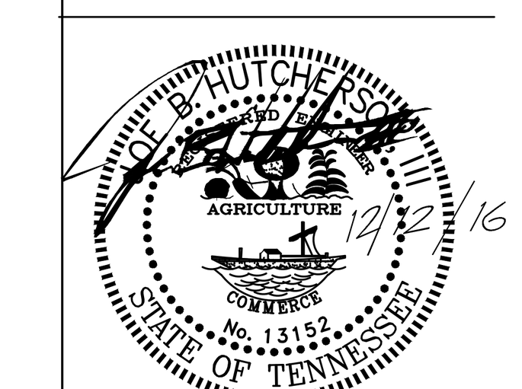
STANDARD NUMBER : **SD-700.01**

SMMEDR
SPACKMAN MOSSOP MICHAELS
ESKEW+DUMEZ+RIPPLE
A Joint Venture

MILLER PARK DISTRICT PHASE I
CONTRACT NO. R-14-011-201
CHATTANOOGA, TN

Date: 12 DEC 2016

REVISIONS
1 01-06-17 ADDENDUM 1



100% CONSTRUCTION DOCUMENTS

EDR No: 15003

Drawn By:

Drawing Title: **GENERAL NOTES**

March Adams & Associates, Consulting Engineers
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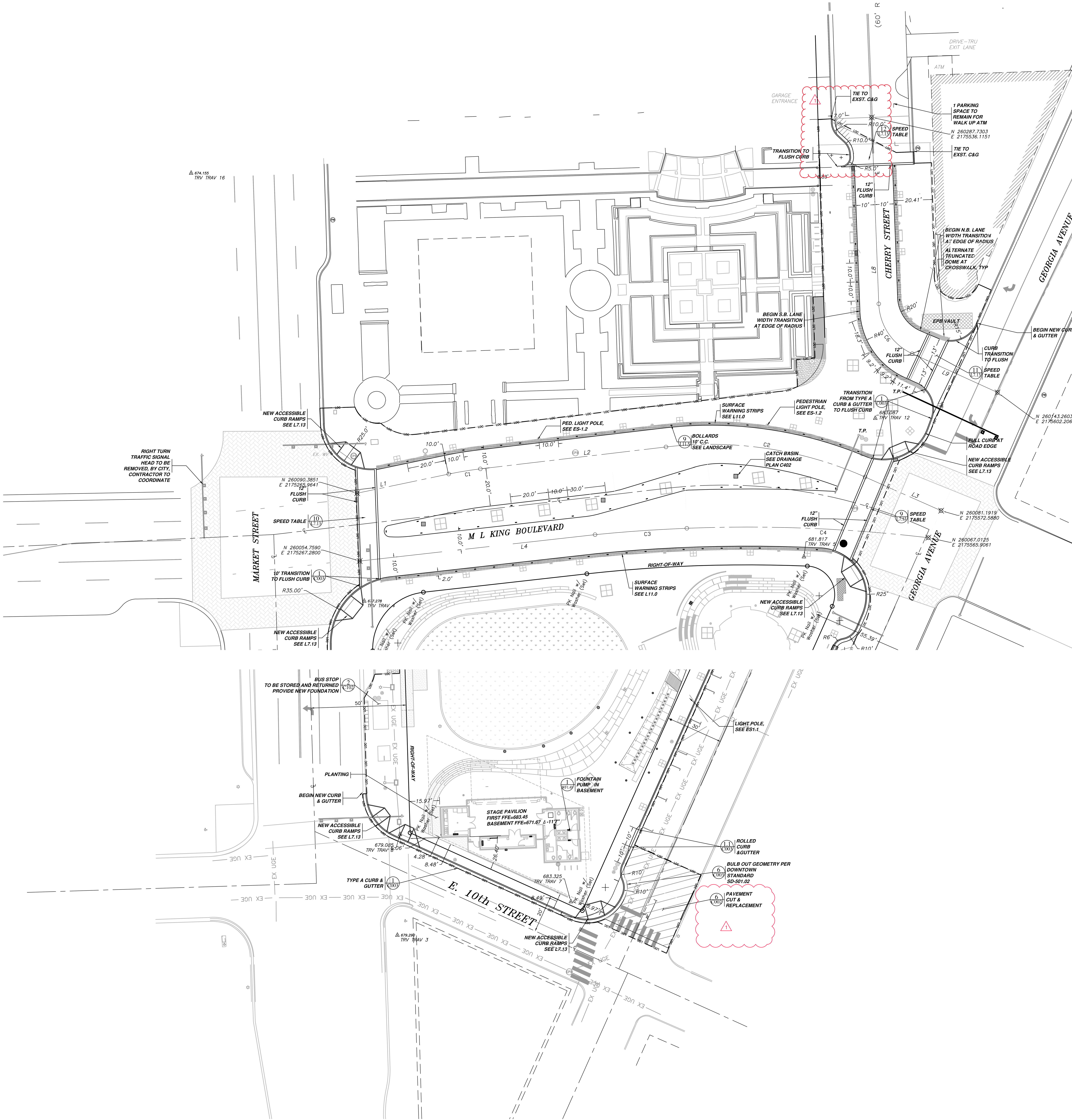
P.O. Box 3689
Chattanooga, Tennessee 37404
PH: (423)698-6675
MAA #: 15370

Sheet No: C001



LEGEND

- Ex. Curb
- Ex. Centerline
- Ex. Fence
- EX W — Ex. Water Line
- Ex. Fire Line
- EX IRR — Ex. Irrigation Line
- EX SD — Ex. Storm Drainage Line
- EX SS — Ex. Sanitary Sewer Line
- EX FM — Ex. Sanitary Sewer Force Main
- Ex. Swale Centerline
- Ex. Ditch Centerline
- EX G — Ex. Gas Line
- EX OHE — Ex. Overhead Elect. or Utility Line
- EX UGE — Ex. Underground Electrical
- EX UGTV — Ex. Underground Cable TV
- EX UGFO — Ex. Underground Fiber Optics
- EX UGT — Ex. Underground Telephone
- PROPERTY LINE
- BUILDING LINE
- EASEMENT LINE
- BUILDING SETBACK LINE
- LANDSCAPE BUFFER LINE
- LOT LINE
- ROW LINE
- CURB
- CENTERLINE
- SPLIT ZONING LINE (w/in PROPERTY)
- PROP. FENCE LINE
- SF — PROP. SILT FENCE
- LOC — PROP. LIMITS OF CONSTRUCTION
- TF — PROPOSED TREE PROTECTION
- PROPOSED SWALE CENTERLINE
- PROPOSED DITCH CENTERLINE
- W — PROP. WATER LINE
- DFL — PROP. DRY FIRE LINE
- FL — PROP. FIRE LINE
- IRR — PROP. IRRIGATION LINE
- G — PROP. GAS LINE
- SD — PROP. STORM DRAINAGE LINE
- PERFORATED PIPE
- SS — PROP. SANITARY SEWER LINE
- FM — PROP. SANITARY SEWER FORCE MAIN
- OHE — PROP. OVERHEAD ELECT. OR UTILITY LINE
- UGE — PROP. UNDERGROUND ELECTRICAL
- UGTV — PROP. UNDERGROUND CABLE TV
- UGFO — PROP. UNDERGROUND FIBER OPTICS
- UGT — PROP. UNDERGROUND TELEPHONE

ABBREVIATIONS:
TS – ELEVATION OF TOP STEP TREAD
BS – ELEVATION AT BOTTOM OF LOWEST STEP RISER
RCP – REINFORCED CONCRETE PIPE
PM – PARKING METER
FYSB – FRONT YARD SETBACK
SYSB – SIDE YARD SETBACK
RYSB – REAR YARD SETBACK
FFE – FINISHED FLOOR ELEVATION
TW – FINISH GRADE AT TOP OF RETAINING WALL
BW – FINISHED GROUND GRADE AT BOTTOM OF RETAINING WALL (GRASS GRADE)
SDCO / SSCO – STORM DRAINAGE / SANITARY SEWER CLEAN-OUT
DS – ROOF DOWNSPOUT CONNECTION
SSWL – SINGLE SOLID WHITE LINE
SBWL – SINGLE BROKEN WHITE LINE
SSYL – SINGLE SOLID YELLOW LINE
DSYL – DOUBLE SOLID YELLOW LINE

Line Table

Line #	Length	Direction
L1	49.113	N78° 11′ 02.09″E
L2	98.155	N83° 15′ 29.73″E
L3	43.684	S66° 05′ 24.87″E
L4	124.371	S83° 36′ 13.24″W
L8	97.985	N2° 11′ 05.05″W
L9	49.230	N65° 31′ 31.98″W

Curve Table

Curve #	Length	Radius	Delta
C1	16.827	190.000	5.0743
C2	106.994	200.000	30.6515
C3	48.263	809.233	3.4172
C4	127.117	808.913	9.0038
C6	33.165	30.000	63.3408

TRANSPORTATION NOTES:

1 PEDESTRIAN LIGHTS SHALL BE ORDERED BY THE CONTRACTOR AT LEAST THREE MONTHS IN ADVANCE OF THE SCHEDULED INSTALLATION DATE. CONTACT BRANDON SUTTON AT THE CITY OF CHATTANOOGA (423–643–5919) IN ORDER TO PLACE AND COORDINATE THE PARTNERSHIP AGREEMENT WITH THE CITY.

2 CONTRACTOR SHALL INSTALL THE STREETSCAPE, INCLUDING ALL CONDUIT AND FOUNDATIONS PER CITY OF CHATTANOOGA STANDARD SD–507.01. CONTRACTOR SHALL ALSO INSTALL PULL BOXES WHICH ARE PROVIDED BY EPB. AFTER THE CONTRACTOR HAS INSTALLED PULL BOXES, CONDUIT, AND FOUNDATIONS, EPB WILL THEN INSTALL THE POLES, FIXTURES, AND PULL THE WIRE.

3 CONTRACTOR SHALL REFER TO THE CITY OF CHATTANOOGA STANDARD DETAILS FOR ALL APPLICABLE CONSTRUCTION STANDARDS. SD–200 SERIES SHOULD BE USED FOR ALL ROADWAY AND DRIVEWAY DETAILS. SD–500 SERIES SHOULD BE USED FOR ALL STREETSCAPE STANDARDS.

4 IF APPLICABLE TO THE PROJECT, THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF CHATTANOOGA AND ALL LOCAL UTILITY COMPANIES FOR THE UNDERGROUND RELOCATION OF ANY UTILITY LINES.

5 CONTRACTOR SHALL MATCH EXISTING SIDEWALK GRADES WHEREVER PROPOSED CONSTRUCTION MEETS EXISTING.

6 CONTRACTOR SHALL COORDINATE WITH TOMMY TROTTER 423–643–5958 ttrotter@chattanooga.gov FOR PLACEMENT AND TIMING OF REVISIONS TO EXISTING TRAFFIC SIGNAL POLES.

NORTH

20' 0 20' 40'
Scale 1" = 20'

MAA CIVIL CONTACT: JOSEPH L. PARKS, PE
DIRECT LINE: 423-664-1482

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PH: (423)698-6675
MAA #: 15370

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MILLER PARK DISTRICT PHASE I

CONTRACT NO. R-14-011-201

CHATTANOOGA, TN

Date: 12 DEC 2016

REVISIONS
1 01-06-17 ADDENDUM 1

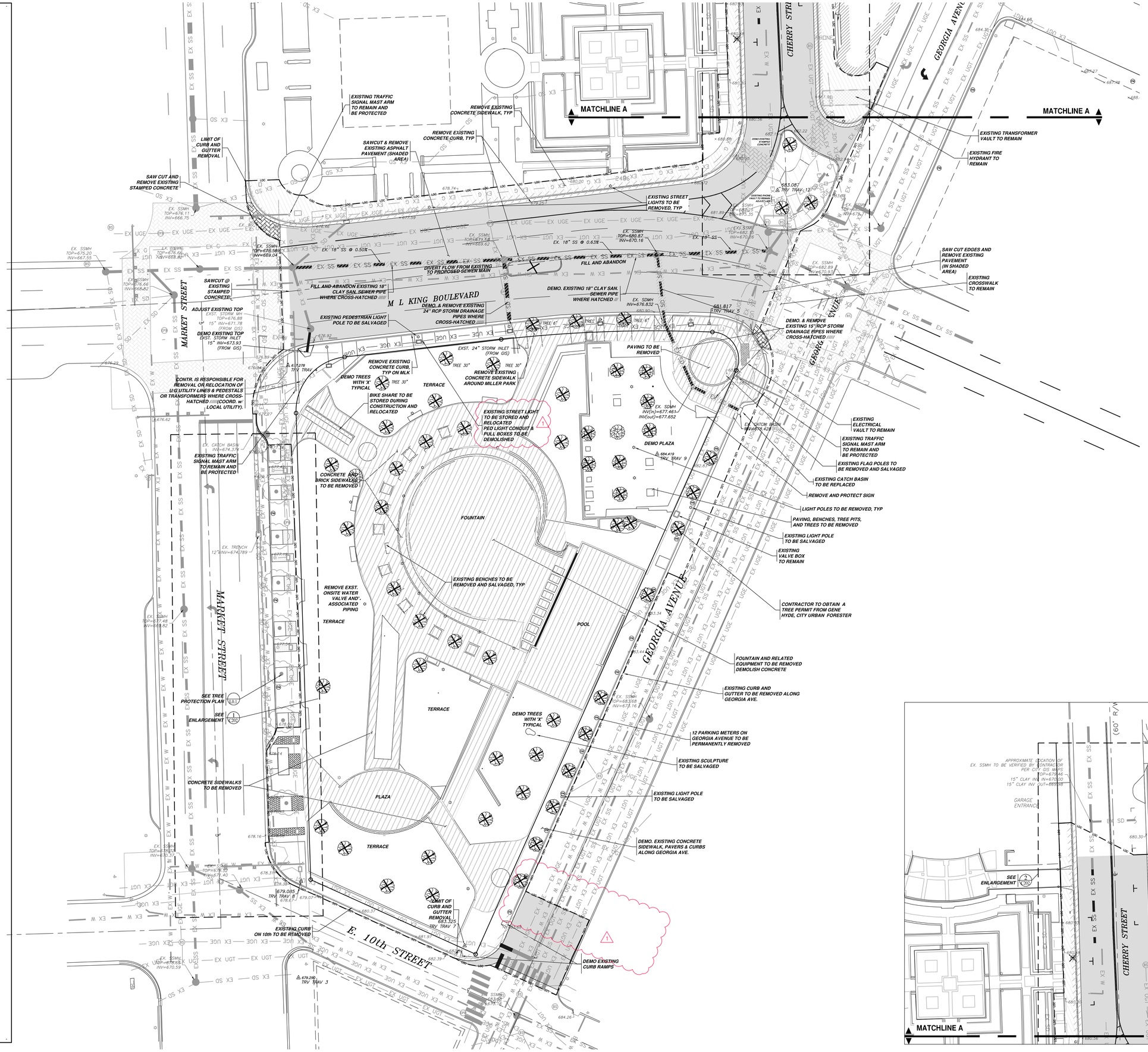
100% CONSTRUCTION DOCUMENTS

EDR No: 15003

Drawn By: JP

Drawing Title: ROADWAY STAKING PLAN

Sheet No: C101



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- EX UGFO — Ex. Underground Fiber Optics
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BW – FINISHED GROUND GRADE AT BOTTOM OF RETAINING WALL (GRASS GRADE)
SCO – FLUSH TO GROUND CONNECTION / SANITARY SEWER CLEAN-OUT
DCO – FLUSH TO GROUND CONNECTION
SSWL – SINGLE SOLID WHITE LINE
SBWL – SINGLE BROKEN WHITE LINE
SSYL – SINGLE SOLID YELLOW LINE
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TRANSPORTATION NOTES:

1 PUMP, BENCHES, AND TRASH CANS TO BE SAVED. COORDINATE PICK-UP WITH CITY PARKS DEPARTMENT.

2 ALL EXISTING INFASTRUCTURE WITHIN LIMITS OF CONSTRUCTION TO BE REMOVED UNLESS OTHERWISE NOTED.

3 SEE ALSO TREE PROTECTION PLAN L0.1 AND L4.6.

SPECIAL NOTE: ***EXISTING UNDERGROUND UTILITIES AS SHOWN ARE APPROXIMATE. EXISTING UNDERGROUND UTILITIES (NOT SHOWN ON THESE DRAWINGS) MAY BE PRESENT IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EXCAVATION. SHOULD THE CONTRACTOR UNCOVER UNKNOWN UTILITIES, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE SOURCE AND DISCHARGE OF THE UNKNOWN UTILITIES AND CONTACT THE OWNER AND ENGINEER PRIOR TO CONTINUING CONSTRUCTION.***

Know what's **below.** **Call** before you dig.

NORTH

20' 0 20' 40'

Scale 1" = 20'

MAA CIVIL CONTACT: JOSEPH L. PARKS, PE
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MAA #: 15370

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MILLER PARK DISTRICT PHASE I

CONTRACT NO. R-14-011-201

CHATTANOOGA, TN

Date: 12 DEC 2016

REVISIONS
1 01-06-17 ADDENDUM 1

100% CONSTRUCTION DOCUMENTS

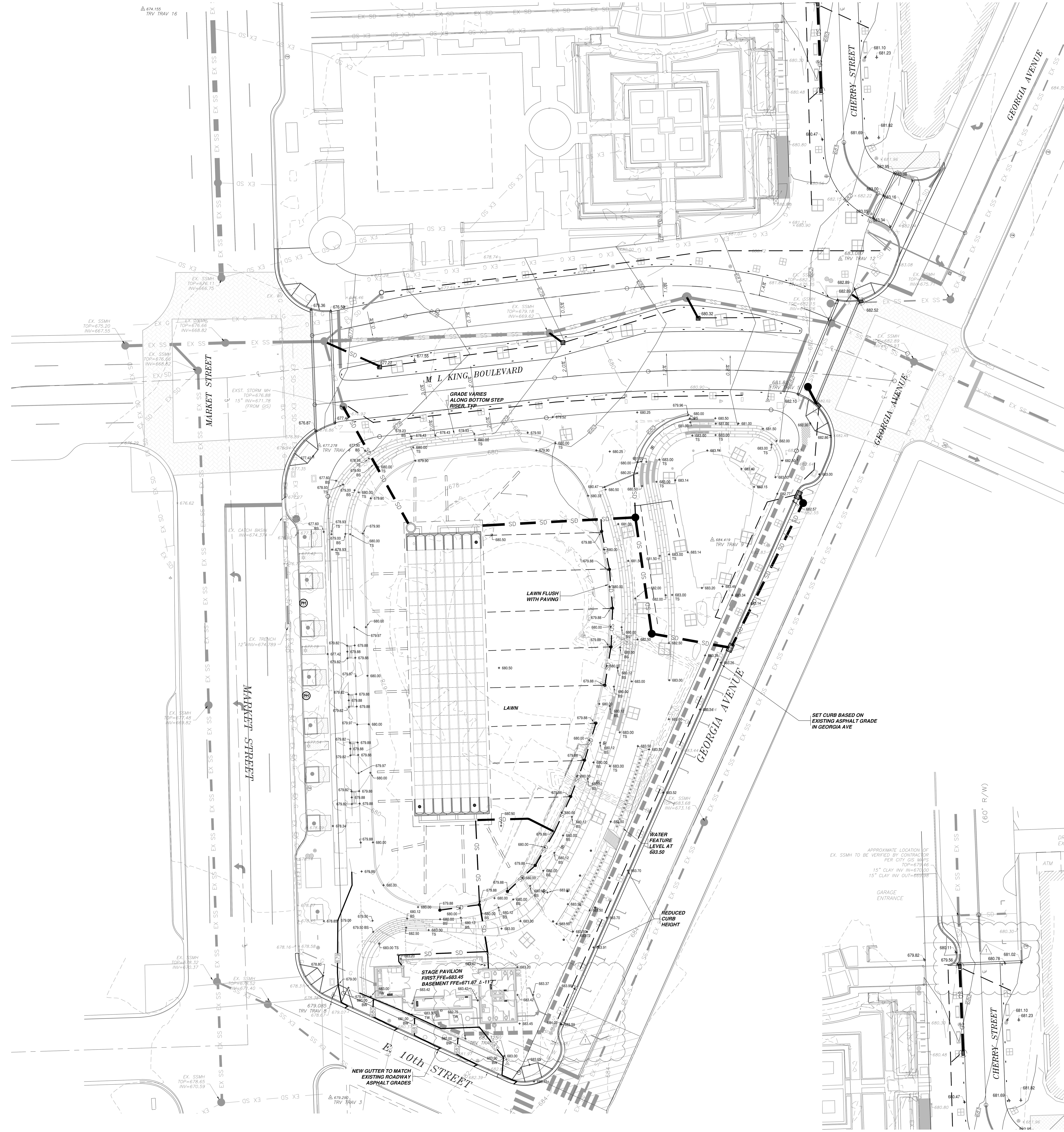
EDR No: 15003

Drawn By: JP

Drawing Title:

EXISTING CONDITIONS AND DEMOLITION

Sheet No: C201



LEGEND

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PRIOR TO FINAL ACCEPTANCE BY THE CITY ENGINEER AND/OR ISSUANCE OF ANY **CERTIFICATE OF OCCUPANCY**, THE OWNER OR OWNER'S AGENT SHALL:

- SUBMIT AN INVENTORY OF THE CONSTRUCTED STORMWATER DRAINAGE SYSTEM, WHETHER PUBLIC OR PRIVATE, TO THE CITY OF CHATTANOOGA IN ELECTRONIC FORMAT. ELECTRONIC AS-BUILT DRAWINGS SHALL BE SUBMITTED IN AUTOCAD AND .PDF FORMAT AND SHALL SHOW PLAINLY THE APPROVED AND CONSTRUCTED LAYOUT OF THE STORMWATER SYSTEMS. THE AS-BUILT DRAWING SHALL INCLUDE ALL STORMWATER FEATURES, WHETHER NEW OR EXISTING, INCLUDING THE OUTFALL TO THE CITY DRAINAGE SYSTEM (EX: CATCH BASINS, CONDUITS, HYDROLOGIC FEATURES INCLUDING PONDS, CHAMBER SUBGRADE, STREAMS, CULVERT INLETS AND OUTFALLS, AND ALL PERVIOUS SURFACES, ETC.).
- COMPLY WITH ALL PERMANENT LANDSCAPING REQUIREMENTS AND SCHEDULE A LANDSCAPE INSPECTION WITH KARNA LEVITT, THE CITY'S LANDSCAPE ARCHITECT. MS. LEVITT CAN BE REACHED AT 423.643.5885.
- ALL EROSION AND SEDIMENT CONTROL PRACTICES MUST COMPLY WITH THE CURRENT EDITION OF THE TN EROSION & SEDIMENT CONTROL MANUAL, THE CITY OF CHATTANOOGA BMP MANUAL, AND THE TDEC CONSTRUCTION GENERAL PERMIT (TDEC CGP IS NOT APPLICABLE DUE TO COMBINED SEWER).
- CONTRACTOR SHALL NOTIFY SURVEYOR & CITY STORMWATER INSPECTOR ATLEAST 48 HRS PRIOR TO ANY COVER PLACED ON UNDERGROUND SYSTEMS.
-
- IN VEHICULAR PAVER AREA, CONTRACTOR SHALL AS-BUILT SURVEY THE TOP OF ASPHALT BEFORE BEGINNING INSTALLATION OF PAVERS. GRADES SHALL BE WITHIN 1/2" TOLERANCE TO DESIGN GRADES, PER EARTHWORK SPEC.
- SEE SHEET C001 FOR GENERAL AND GRADING AND DRAINAGE NOTES.

NORTH

Scale 1" = 20'

MAA CIVIL CONTACT: JOSEPH L. PARKS, PE
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PH: (423)698-6675
MAA #: 15370

SMM EDR
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MILLER PARK DISTRICT PHASE I

CONTRACT NO. R-14-011-201

CHATTANOOGA, TN

Date: 12 DEC 2016

REVISIONS
1 01-06-17 ADDENDUM1

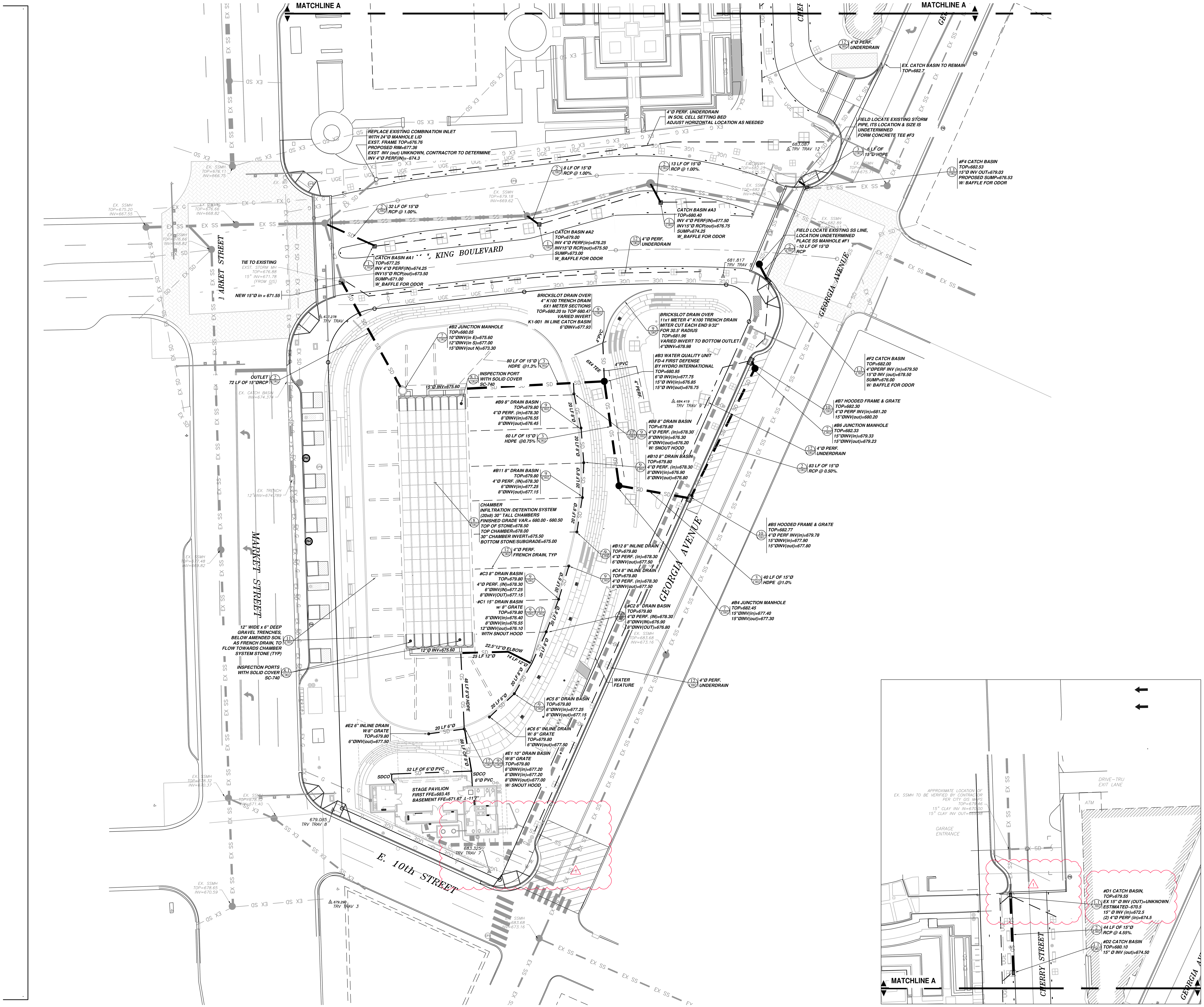
100% CONSTRUCTION DOCUMENTS

EDR No: 15003

Drawn By: JP

Drawing Title:
GRADING PLAN

Sheet No: C401



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MILLER PARK DISTRICT PHASE I
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REVISIONS
1 01-06-17 ADDENDUM 1

100% CONSTRUCTION DOCUMENTS

EDR No: 15003
Drawn By: JP
Drawing Title:
DRAINAGE PLAN

March Adams & Associates
Consulting Engineers
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P.O. Box 3689
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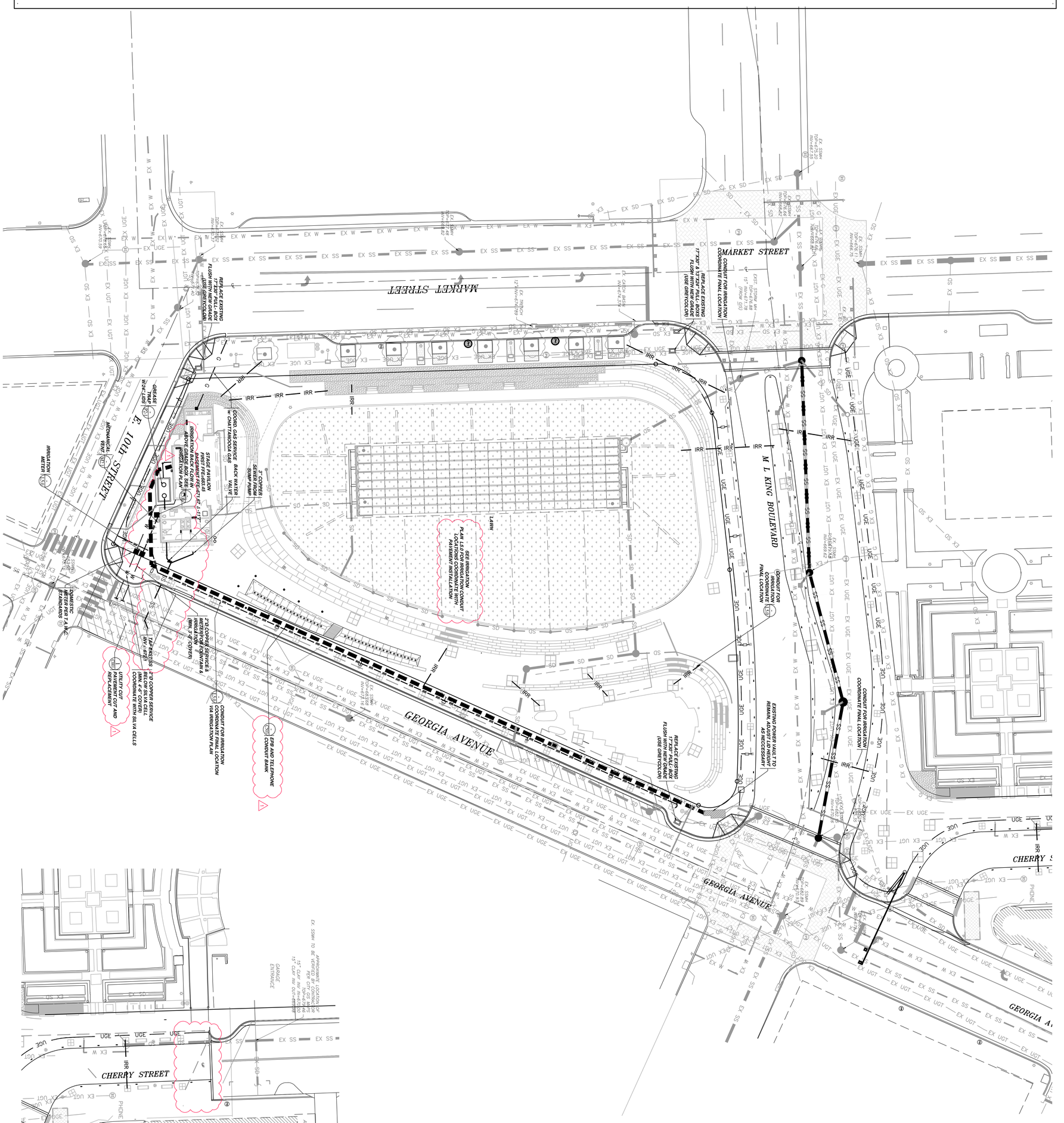
PH: (423)698-6675
MAA #: 15370

Sheet No: C402



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- PROP. UNDERGROUND TELEPHONE
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ABBREVIATIONS
- BS - BOTTOM OF STRUCTURE
- EL - ELEVATION AT BOTTOM OF STRUCT. STEP REQD
- FF - FINISH FLOOR
- RIP - RIPRAP
- SPPS - SDR 35 PVC PIPE
- SS - SANITARY SEWER
- TW - TOP OF RETAINING WALL
- TOG - TOP OF GRATE OF CATCH BASIN
- TOP - TOP OF PIPE
- TOS - TOP OF STRUCTURE
- SSMH - SANITARY SEWER MANHOLE
- SSMH - STORM DRAINAGE STRUCTURE
- SSMH - SANITARY SEWER MANHOLE
- SSMH - SINGLE GRATE INLET
- SSMH - DOUBLE GRATE INLET
- SSMH - SINGLE CURB INLET
- SSMH - DOUBLE CURB INLET

March Adams & Associates
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PH: (423)698-6775
MA & A Pr. 15070

Scale 1" = 20'
0 20' 40'
NORTH

MA&A CIVIL CONTACT: JOSEPH L. PARKS, PE
DIRECT LINE: 423-664-1402

Date: 12 DEC 2016

REVISIONS
1 01-06-17 ADDENDUM 1

100% CONSTRUCTION DOCUMENTS

EDR No: 15003

Drawn By: JP

Drawing Title:
SITE UTILITIES

Sheet No: C501

MILLER PARK DISTRICT PHASE I

CONTRACT NO. R-14-011-201

CHATTANOOGA, TN

SMM EDR
SPACKMAN MOSSOP MICHAELS ESKEW+DUMEZ+RIPPLE
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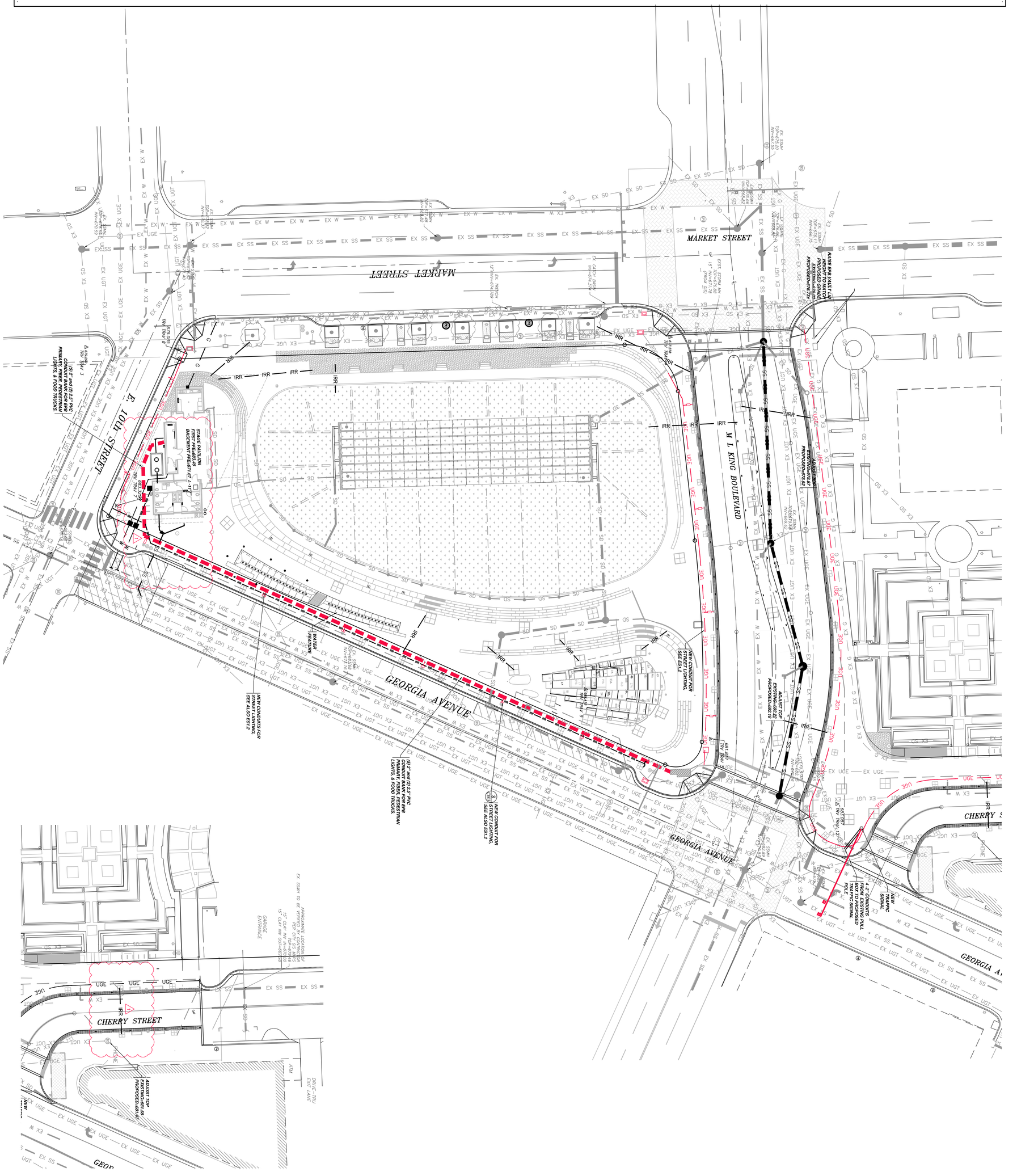
MARKET STREET
E. 10th STREET
M L KING BOULEVARD
GEORGIA AVENUE
CHERRY STREET
STAGE PAVILION
WATER FEATURE
NEW CONDUIT FOR STREET LIGHTING. SEE ALSO ES1.2
NEW CONDUITS FOR STREET LIGHTING. SEE ALSO ES1.2
(6) 2" and (2) 2.5" PVC CONDUIT BANK FOR EPB PRIMARY FIBER, PEDESTRIAN LIGHTS, & FOOD TRUCKS.
NEW TRAFFIC SIGNAL
ADJUST TOP EXISTING=581.49 PROPOSED=581.49
DRIVE-THRU EXIT LANE
ATM
GARAGE ENTRANCE
EX. SSMH TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION PER CITY OF CHATTANOOGA STD. DWG. 15" CLAY INV. IN=670.00 15" CLAY INV. OUT=669.88
LEGEND
PROPERTY LINE
EASEMENT LINE
BUILDING SETBACK LINE
STREAMSIDE BUFFER LINE
LOT LINE
ROW LINE
CURB
CENTERLINE
PROP. SILT FENCE
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Scale 1" = 20'
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MA&A March Adams & Associates
310 Dodds Ave. P.O. Box 3689 Chattanooga, Tennessee 37404 PH: (423)698-6775 MA&A #: 1503
MAA CIVIL CONTACT: JOSEPH L. PARKS, PE DIRECT LINE: 423.664.1482
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Date: 12 DEC 2016
REVISIONS
1 01-06-17 ADDENDUM 1
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EDR No: 15003
Drawn By: JP
Drawing Title: SITE CONDUIT
Sheet No: C503
MILLER PARK DISTRICT PHASE I
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CHATTANOOGA, TN
SMM EDR
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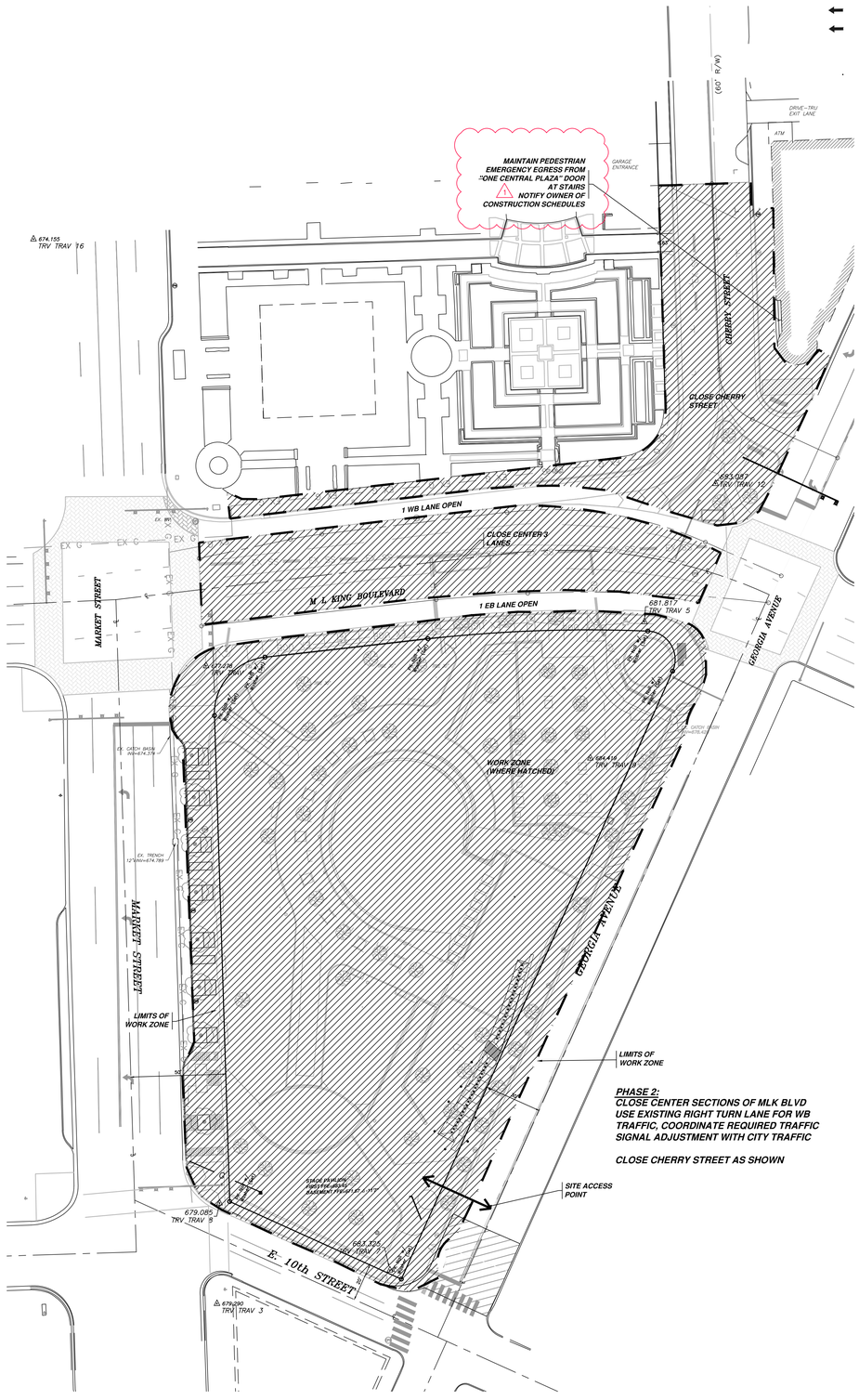
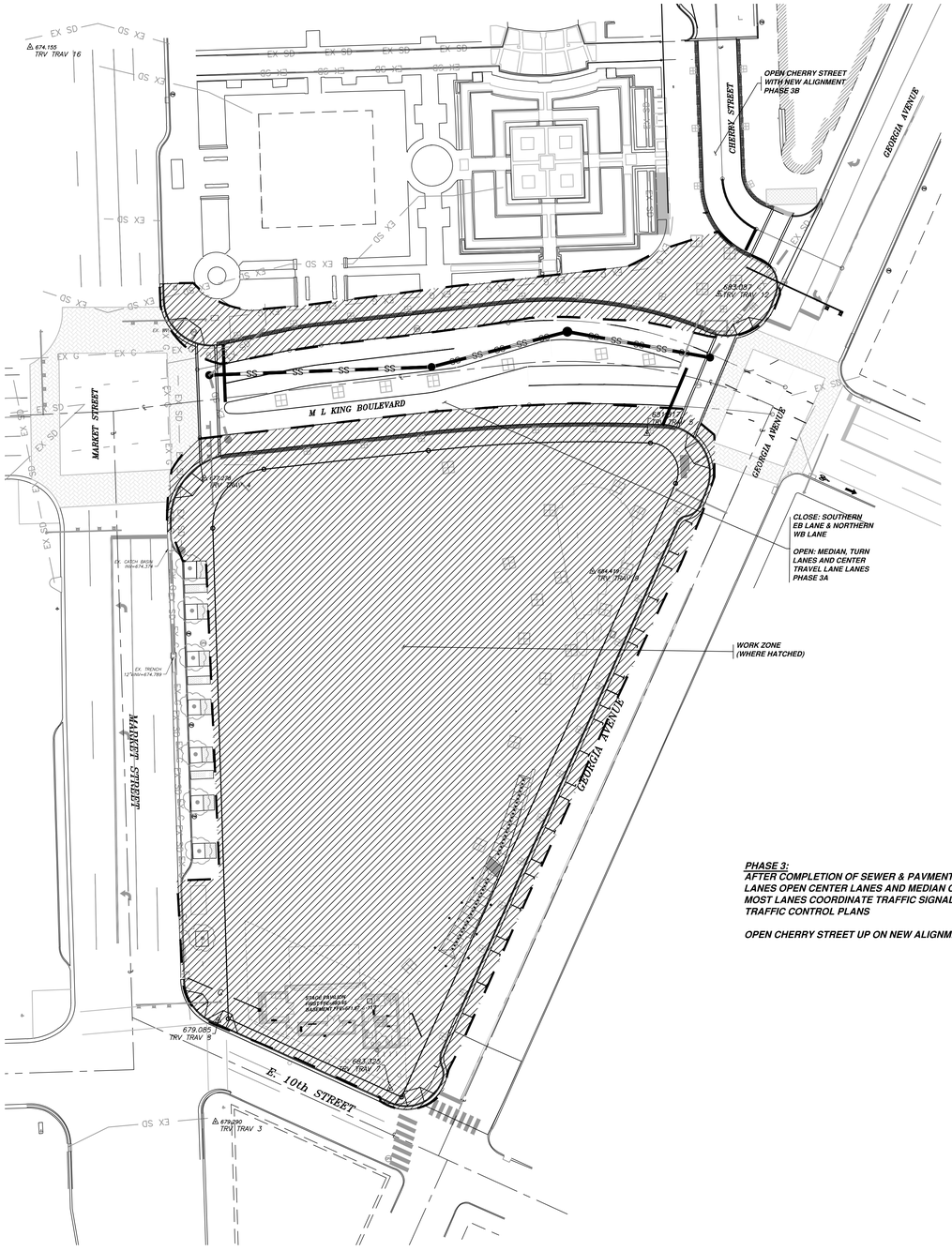


PHASE 2:
CLOSE CENTER SECTIONS OF MLK BLVD
USE EXISTING RIGHT TURN LANE FOR WB TRAFFIC, COORDINATE REQUIRED TRAFFIC SIGNAL ADJUSTMENT WITH CITY TRAFFIC

CLOSE CHERRY STREET AS SHOWN

PHASE 2



PHASE 3:
AFTER COMPLETION OF SEWER & PAVMENT/ LANDSCAPE WORK IN MLK CENTER LANES OPEN CENTER LANES AND MEDIAN CLOSE SOUTHERN AND NORTHERN MOST LANES COORDINATE TRAFFIC SIGNAL ADJUSTMENT WITH CITY TRAFFIC SEE TRAFFIC CONTROL PLANS

OPEN CHERRY STREET UP ON NEW ALIGNMENT ONCE PAVEMENT IS COMPLETE

PHASE 3

LEGEND

- Ex. Curb
- Ex. Centerline
- Ex. Fence
- Ex. Water Line
- Ex. Fire Line
- Ex. Irrigation Line
- Ex. Storm Drainage Line
- Ex. Sanitary Sewer Line
- Ex. Sanitary Sewer Force Main
- Ex. Swale Centerline
- Ex. Ditch Centerline
- Ex. Gas Line
- Ex. Overhead Elect. or Utility Line
- Ex. Underground Electrical
- Ex. Underground Cable TV
- Ex. Underground Fiber Optics
- Ex. Underground Telephone
- PROPERTY LINE
- BUILDING LINE
- EASEMENT LINE
- BUILDING SETBACK LINE
- LANDSCAPE BUFFER LINE
- LOT LINE
- ROW LINE
- CURB
- CENTERLINE
- SPLIT ZONING LINE (w/in PROPERTY)
- PROP. FENCE LINE
- PROP. SILT FENCE
- PROP. LIMITS OF CONSTRUCTION
- PROPOSED TREE PROTECTION
- PROPOSED SWALE CENTERLINE
- PROPOSED DITCH CENTERLINE
- PROP. WATER LINE
- PROP. DRY FIRE LINE
- PROP. FIRE LINE
- PROP. IRRIGATION LINE
- PROP. GAS LINE
- PROP. STORM DRAINAGE LINE
- PERFORATED PIPE
- PROP. SANITARY SEWER LINE
- PROP. SANITARY SEWER FORCE MAIN
- PROP. OVERHEAD ELECT. OR UTILITY LINE
- PROP. UNDERGROUND ELECTRICAL
- PROP. UNDERGROUND CABLE TV
- PROP. UNDERGROUND FIBER OPTICS
- PROP. UNDERGROUND TELEPHONE

ABBREVIATIONS:
TS – ELEVATION OF TOP STEP TREAD
BS – ELEVATION AT BOTTOM OF LOWEST STEP RISER
RCP – REINFORCED CONCRETE PIPE
HW – HANDRAIL WIDTH
SYSB – SIDE YARD SETBACK
SYSB – SIDE YARD SETBACK
RYSB – REAR YARD SETBACK
FFE – FINISHED FLOOR ELEVATION
TW – FINISH GRADE AT TOP OF RETAINING WALL
BW – FINISHED GROUND GRADE AT BOTTOM OF RETAINING WALL (GRASS GRADE)
SSCO – SANITARY SEWER CLEAN-OUT TO FINISH GRADE
SDD – FLOOR DOWNSPOUT CONNECTION
SSWL – SINGLE SOLID WHITE LINE
SBWL – SINGLE BROKEN WHITE LINE
SSYL – SINGLE SOLID YELLOW LINE
DSYL – DOUBLE SOLID YELLOW LINE

NORTH

30' 0 30' 60'

Scale 1" = 30'

MAA CIVIL CONTACT: JOSEPH L. PARKS, PE
DIRECT LINE: 423-664-1482

SMMEDR
SPACKMAN MOSSOP MICHAELS ESKEW+DUMEZ+RIPPLE
A Joint Venture

MILLER PARK DISTRICT PHASE I

CONTRACT NO. R-14-011-201

CHATTANOOGA, TN

Date: 12 DEC 2016

REVISIONS
1 01-06-17 ADDENDUM 1

100% CONSTRUCTION DOCUMENTS

EDR No: 15003

Drawn By: JP

Drawing Title:

PHASING PLAN PHASES 2 & 3

March Adams & Associates Consulting Engineers
310 Dodds Ave.
P.O. Box 3689
Chattanooga, Tennessee 37404
PH: (423)698-6675
MAA #: 15370

Sheet No: C611

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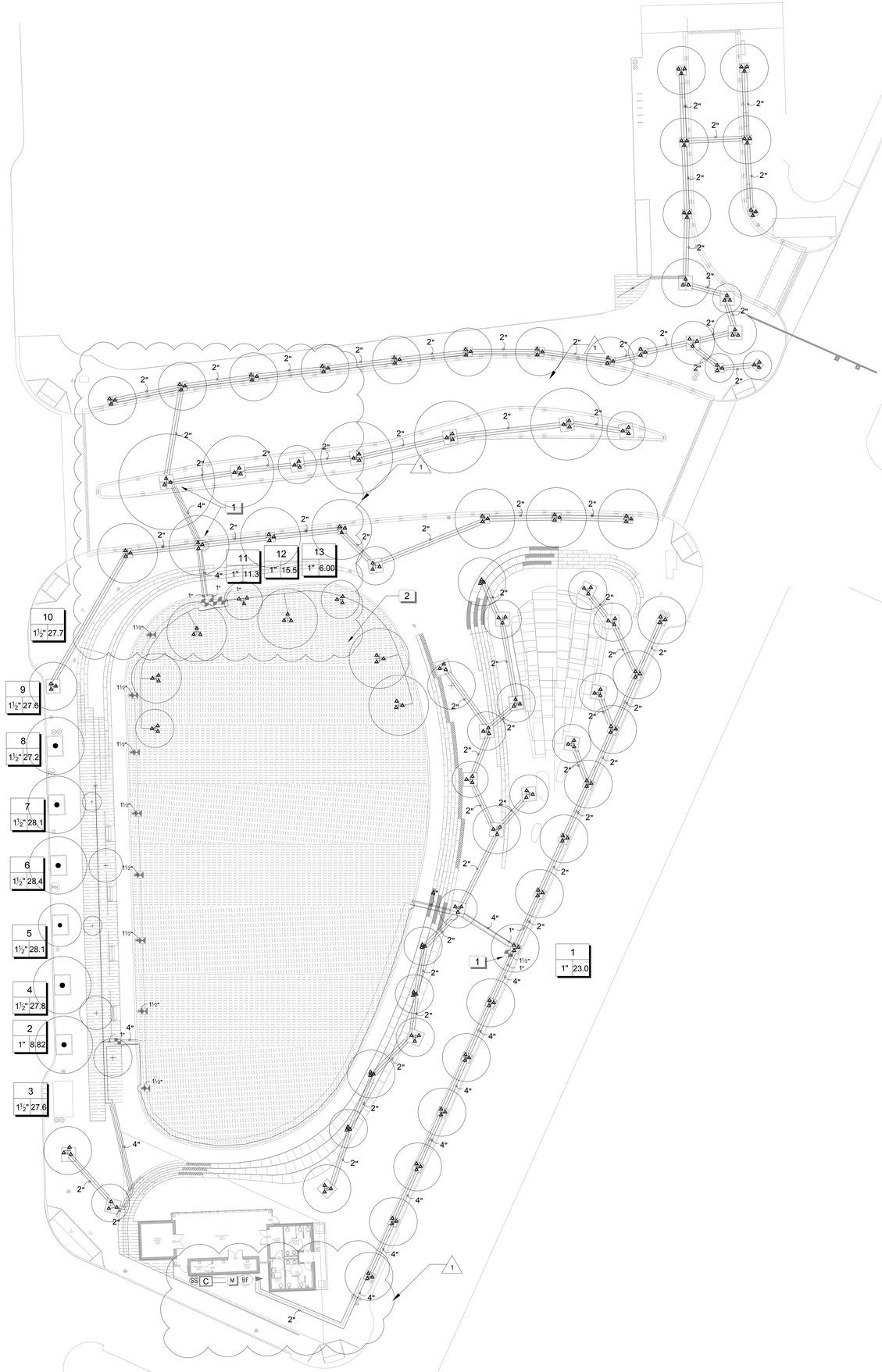
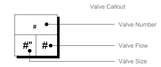


IRRIGATION_SCHEDULE

SYMBOL	MANUFACTURER/MODEL
0.25	HUNTER RZWS-18-CV ROOT ZONE WATERING SYSTEM

SYMBOL	MANUFACTURER/MODEL
	HUNTER ICZ-101-40 DRIP VALVE
	HUNTER ICZ-151-40 DRIP VALVE
	PIPE/DRIP TRANSITION POINT ABOVE GRADE
	AREA TO RECEIVE DRIPLINE HUNTER ECO-MAT SUBSURFACE. PROVIDE TEMPORARY OVERHEAD IRRIGATION TO LAWN AREA UNTIL GRASS ROOTS CAN BE IRRIGATED BY SUB SURFACE MAT.
	AREA TO RECEIVE DRIPLINE HUNTER PLD-06-18 (24)

SYMBOL	MANUFACTURER/MODEL
	HUNTER PGV-100G RCV
	GATE VALVE (MAINLINE SIZE)
BF	FEBCO 825Y RPZ BACKFLOW PREVENTER 1"
C	HUNTER I-CORE CONTROLLER
SS	HUNTER WSS WIRELESS SOLAR SYNC
M	WATER METER 1"
	IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21
	IRRIGATION MAINLINE- 1 ½": PVC CLASS 200 SDR 21
	PIPE SLEEVE: PVC SCHEDULE 40



REFERENCE NOTES SCHEDULE

SYMBOL	DESCRIPTION
1	PIPING AND EQUIPMENT SHOWN TO THE SIDE FOR CLARITY
2	CONTRACTOR TO SUPPLY TEMPORARY OVERHEAD IRRIGATION DURING ESTABLISHMENT OF TURF GRASS

IRRIGATION NOTES (32 84 00)

1. IRRIGATION SYSTEM DESIGN BASED ON 30 GPM AT 70 PSI.
2. IRRIGATION DESIGN IS FROM THE POINT OF CONNECTION(POC)ONLY. THE DESIGN IS BASED ON GALLONS PER MINUTE(GPM)AND POUNDS PER SQUARE INCH(PSI)FURNISHED BY OTHERS.
3. IRRIGATION CONTRACTOR IS TO VERIFY POINT OF CONNECTION IN THE FIELD. INSTALLER IS TO CONFIRM THE MINIMUM DISCHARGE REQUIREMENTS OF THE POINT OF CONNECTION AS INDICATED ON THE LEGEND PRIOR TO INSTALLATION.
4. THE PRESSURE REQUIREMENT AT THE POINT OF CONNECTION IS BASED ON NO MORE THAN 5-FEET OF ELEVATION CHANGE IN THE AREAS OF IRRIGATION.
5. ALL PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ACCORDING TO LOCAL BUILDING, ELECTRICAL AND PLUMBING CODES.
6. IRRIGATION CONTRACTOR WILL ARRANGE INSPECTIONS REQUIRED BY LOCAL AGENCIES AND ORDINANCES DURING THE COURSE OF CONSTRUCTION AS REQUIRED. ALL WIRING TO BE PER LOCAL CODE. BACKFLOW PREVENTION PER LOCAL CODE.
7. LOCATION OF IRRIGATION COMPONENTS SHOWN ON DRAWINGS IS APPROXIMATE. ACTUAL PLACEMENT MAY VARY SLIGHTLY AS REQUIRED TO ACHIEVE FULL, EVEN COVERAGE.
8. ALL SPRINKLER HEADS SHALL BE INSTALLED PERPENDICULAR TO FINISH GRADES, EXCEPT AS OTHERWISE INDICATED.
9. INSTALL IRRIGATION MAINS WITH A MINIMUM 18" OF COVER BASED ON FINISH GRADES. INSTALL IRRIGATION LATERAL WITH A MINIMUM 12" OF COVER BASED ON FINISH GRADES.
10. PIPE LOCATIONS ARE DIAGRAMATIC. VALVES AND MAINLINE SHOWN IN PAVED AREAS ARE FOR GRAPHIC CLARITY ONLY.
11. THE IRRIGATION CONTRACTOR SHALL COMPLY WITH PIPE SIZES AS INDICATED.
12. ALL WIRE SPLICES OR CONNECTIONS SHALL BE MADE WITH APPROVED WATERPROOF WIRE CONNECTORS AND BE IN A VALVE OR SPLICE BOX.
13. ALL CONTROL WIRING DOWNSTREAM OF THE CONTROLLER IS TO BE 14AWG, UL APPROVED DIRECT BURY.
14. SURGE PROTECTION TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATION.
15. THE DESIGN IS BASED ON THE SITE INFORMATION AND/OR DRAWING SUPPLIED WITH THE DESIGN CRITERIA BEING SET(AREA TO BE IRRIGATED, EQUIPMENT MANUFACTURER AND MODEL TO BE USED, WATER SOURCE INFORMATION, ELECTRICAL POWER AVAILABILITY, ETC...). SITEONE LANDSCAPE SUPPLY BEARS NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS IN DESIGN OR INSTALLATION THAT ARISE DUE TO INACCURACIES IN THE ABOVE REFERENCED INFORMATION SUPPLIED TO SITEONE LANDSCAPE SUPPLY IN RELATION TO THIS PROJECT, UNLESS OTHERWISE NOTED.
16. CONTACT BRANDON COX AT 423-238-7273 FOR COMPLETE MATERIAL LIST AND QUOTE.

811 Know what's below. Call before you dig.

SCALE 1" = 20'
0' 10' 20' 40'

SiteOne Project Services
PROJECT NUMBER: 113763
FOR MORE INFORMATION PLEASE CONTACT 1-843-873-4062 OR VISIT OUR WEBSITE AT www.SITEONE.com

SMMEDR
SPACKMAN MOSSOP MICHAELS ESKEW+DUMEZ+RIPPLE
A Joint Venture

MILLER PARK DISTRICT PHASE I
CONTRACT NO. R-14-011-201
CHATTANOOGA, TN

Date:	12 DEC 2016
REVISIONS	
1	06 JAN 2017

KENNETH MICHAEL MOSSOP
TENNESSEE No. 346
LICENSED LANDSCAPE ARCHITECT

100% CONSTRUCTION DOCUMENTS

EDR No:	15003
Drawn By:	CLC
Drawing Title:	

IRRIGATION PLAN

Sheet No: L5.0

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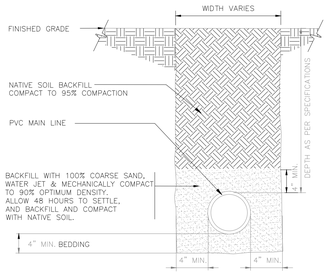
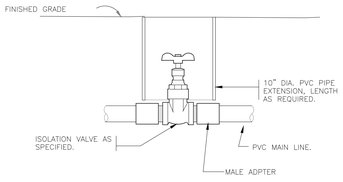


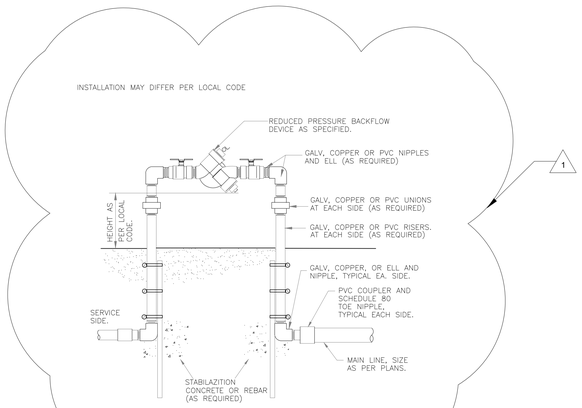
11 SLEEVE AT ROAD

S1-MI-01

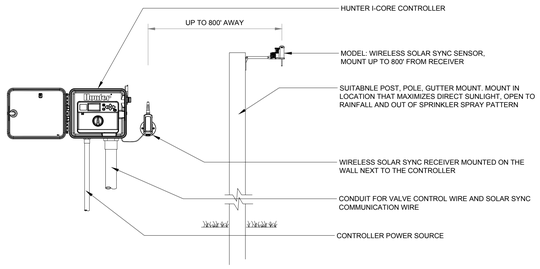


10 ISOLATION GATE VALVE

S1-MI-02

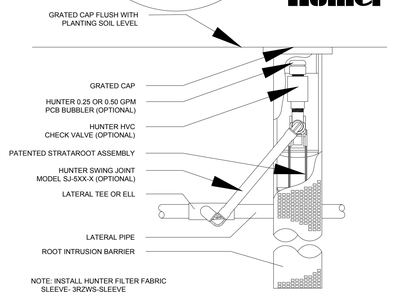


9 REDUCED PRESSURE BACKFLOW DEVICE STANDARD



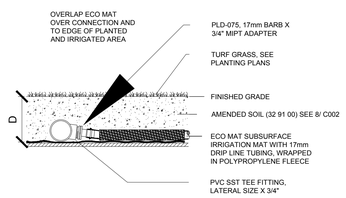
8 WIRELESS SOLAR SYNC SYSTEM WITH I-CORE

NTS S1-CO-HUN-10



7 18" AND 36" ROOT ZONE WATERING SYSTEM

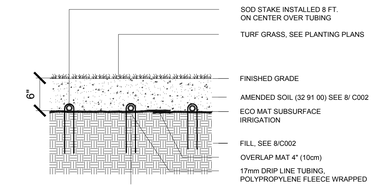
3" = 1'-0" DETAIL-FILE



D - ECO MAT DEPTH PER PLANS

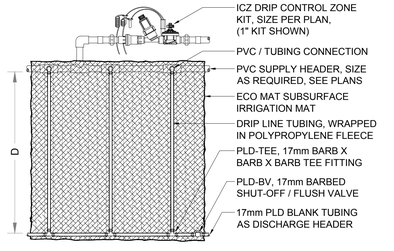
6 ECO MAT CONNECTION - BARB X 3/4" MIPT ADAPTER

NOT TO SCALE DETAIL-FILE



5 ECO MAT-SECTION

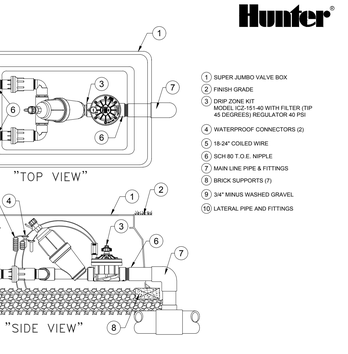
1 1/2" = 1'-0" DETAIL-FILE



NOTE: SEE CATALOG FOR ALLOWABLE LENGTH OF TUBING RUN (D).
PVC SUPPLY HEADER AND POLY DISCHARGE HEADER.

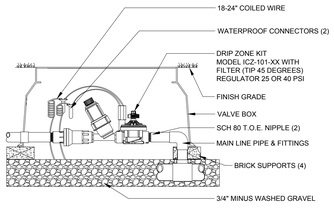
4 ECO MAT-PLAN 1A

NOT TO SCALE FX-IR-HUNT-MICR-01



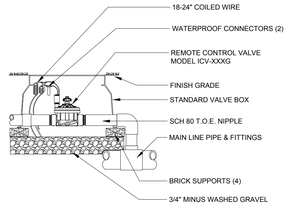
3 ICZ-151-40 DRIP CONTROL KIT

1 1/2" = 1'-0" FX-IR-HUNT-DRIP-20



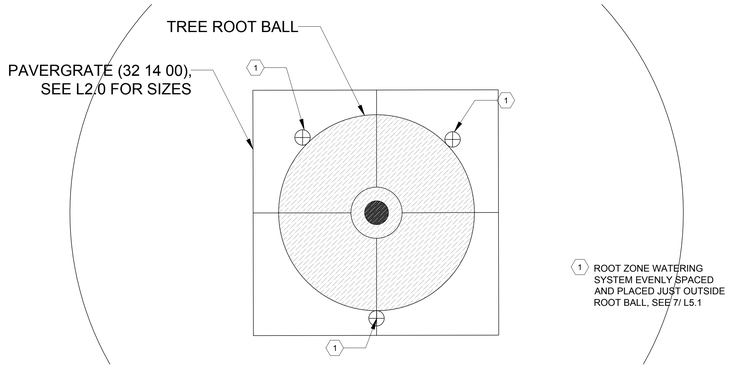
2 ICZ-101 DRIP CONTROL ZONE

NTS S1-DR-HUN-02



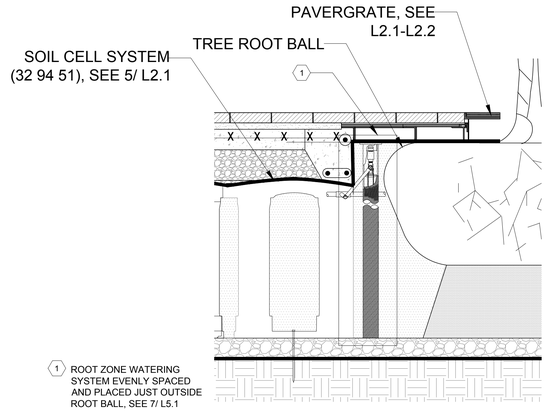
1 ICV GLOBE VALVE

NTS S1-VA-HUN-03



13 PLAN OF 18" AND 36" ROOT ZONE WATERING SYSTEM

1"=1'



12 DETAIL OF 18" AND 36" ROOT ZONE WATERING SYSTEM WITHIN SOIL CELL SYSTEM

1"=1'

IRRIGATION_SCHEDULE

SYMBOL	MANUFACTURER/MODEL
0.25	HUNTER RZWS-18-CV ROOT ZONE WATERING SYSTEM

SYMBOL	MANUFACTURER/MODEL
	HUNTER ICZ-101-40 DRIP VALVE
	HUNTER ICZ-151-40 DRIP VALVE
	PIPE/DRIP TRANSITION POINT ABOVE GRADE
	AREA TO RECEIVE DRIPLINE HUNTER ECO-MAT SUBSURFACE
	AREA TO RECEIVE DRIPLINE HUNTER PLD-06-18 (24)

SYMBOL	MANUFACTURER/MODEL
	HUNTER PGV-100G RCV
	GATE VALVE (MAINLINE SIZE)
BF	FEBCO 825Y RPZ BACKFLOW PREVENTER 1"
C	HUNTER I-CORE CONTROLLER
SS	HUNTER WSS WIRELESS SOLAR SYNC
M	WATER METER 1"
	IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21
	IRRIGATION MAINLINE- 1-1/2": PVC CLASS 200 SDR 21
	PIPE SLEEVE: PVC SCHEDULE 40

Valve Callout: # Valve Number; #" #◆ Valve Flow; Valve Size

REFERENCE NOTES SCHEDULE

SYMBOL	DESCRIPTION
1	PIPING AND EQUIPMENT SHOWN TO THE SIDE FOR CLARITY
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15. THE DESIGN IS BASED ON THE SITE INFORMATION AND/OR DRAWING SUPPLIED WITH THE DESIGN CRITERIA BEING SET(AREA TO BE IRRIGATED, EQUIPMENT MANUFACTURER AND MODEL TO BE USED, WATER SOURCE INFORMATION, ELECTRICAL POWER AVAILABILITY, ETC...), SITEONE LANDSCAPE SUPPLY BEARS NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS IN DESIGN OR INSTALLATION THAT ARISE DUE TO INACCURACIES IN THE ABOVE REFERENCED INFORMATION SUPPLIED TO SITEONE LANDSCAPE SUPPLY IN RELATION TO THIS PROJECT, UNLESS OTHERWISE NOTED.
16. CONTACT BRANDON COX AT 423-238-7273 FOR COMPLETE MATERIAL LIST AND QUOTE.

811 Know what's below. Call before you dig.

SCALE 1" = 20'

0' 10' 20' 40'

SMMEDR
SPACKMAN MOSSOP MICHAELS ESKEW+DUMEZ+RIPPLE
A Joint Venture

MILLER PARK DISTRICT PHASE I
CONTRACT NO. R-14-011-201
CHATTANOOGA, TN

Date: 12 DEC 2016

REVISIONS
1 06 JAN 2017

100% CONSTRUCTION DOCUMENTS

EDR No: 15003
Drawn By: CLC
Drawing Title:

IRRIGATION DETAILS

Sheet No: L5.1

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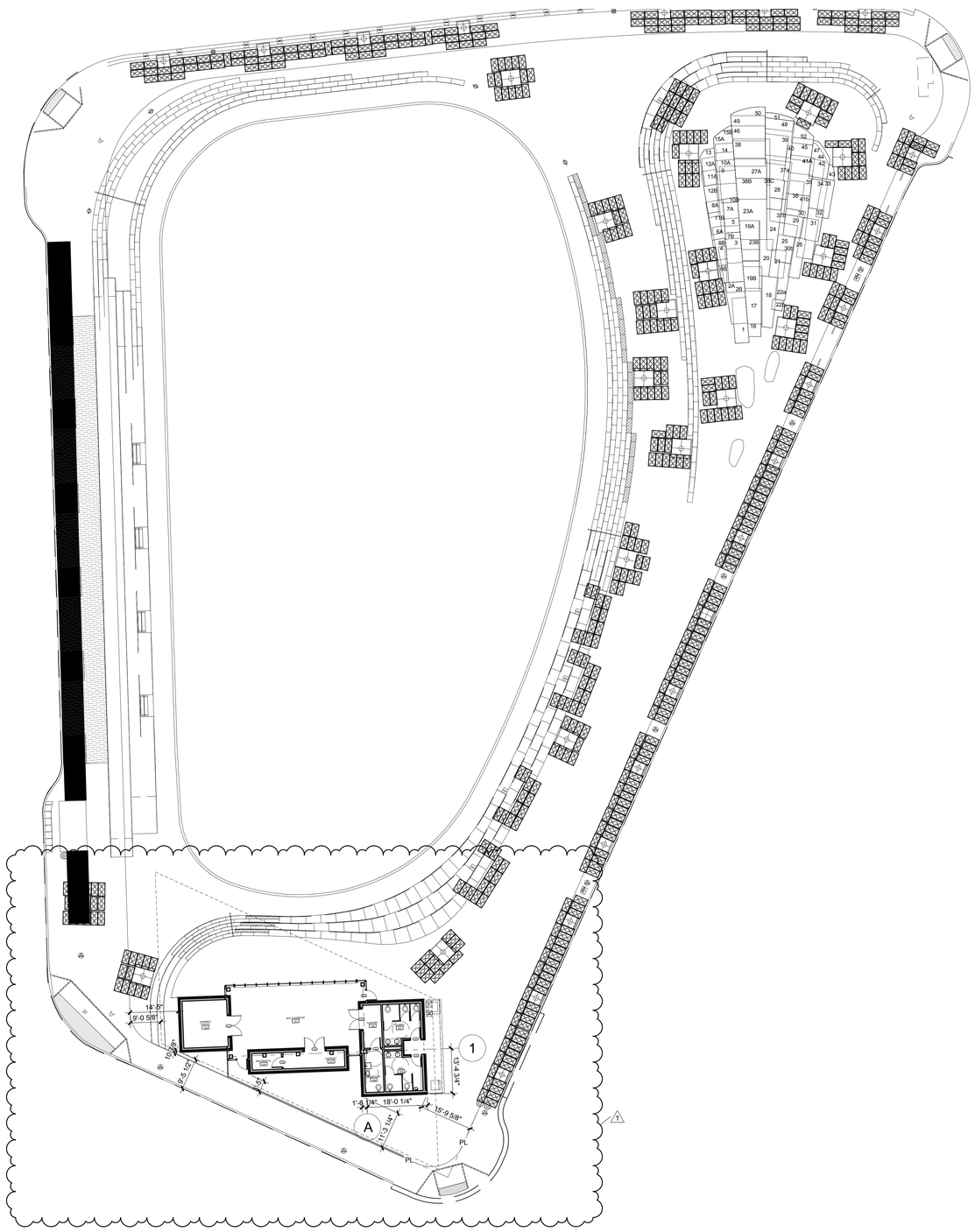
NOTE: THIS SURVEY WAS FURNISHED BY THE OWNER FOR USE ON THIS PROJECT AND WAS NOT PREPARED BY THE ARCHITECT WHO IS THEREFORE NOT RESPONSIBLE FOR ITS CONTENT.

CLARIFICATION OF REFERENCE DESIGNATIONS



1 A5.1 | A1.4 **SITE PLAN**
1/16" = 1'-0"

TRUE NORTH

SMMEDR
SPACKMAN MOSSOP MICHAELS ESKEW+DUMEZ+RIPPLE
A Joint Venture

MILLER PARK DISTRICT PHASE I
CONTRACT NO. R-14-011-201
CHATTANOOGA, TN

Date: 12 DEC 2016

REVISIONS
1 6 JAN 2017

11-7-16

100% CONSTRUCTION DOCUMENTS

EDR No: 15003

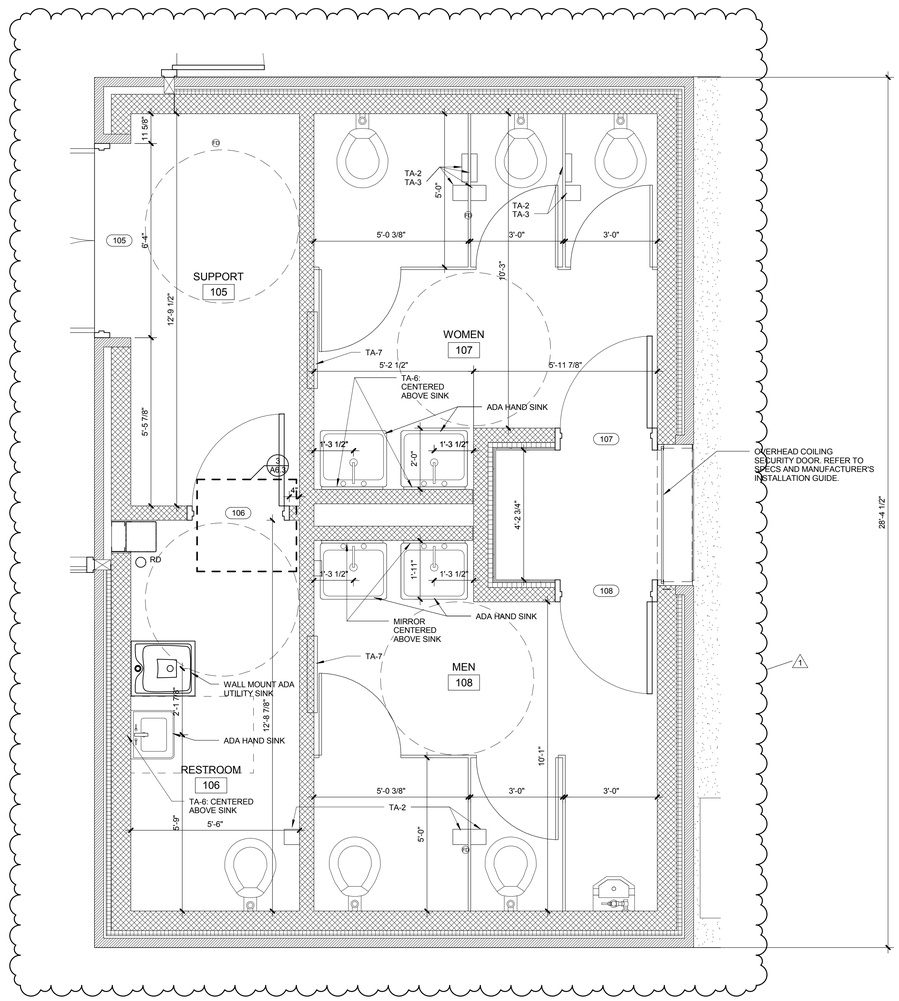
Drawn By:

Drawing Title:
SITE PLAN

Sheet No:
A1.4

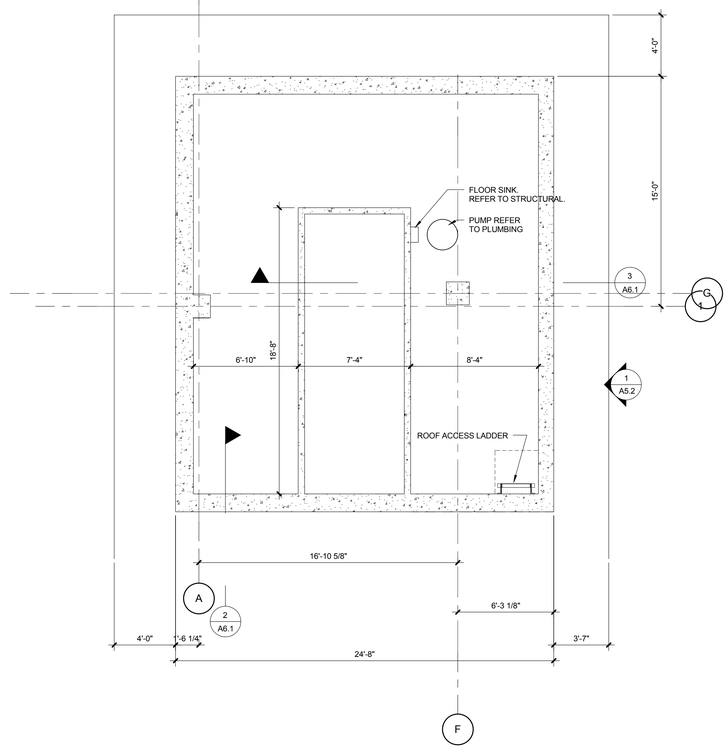
9/30/2015 12:47:27 PM

REFERENCE NUMBER	ITEM DESCRIPTION	MANUFACTURER	
		NAME	MODEL NUMBER
TA-1	ELECTRIC HAND DRYER	BRADLEY	2921-S
TA-2	TOILET PAPER DISPENSER	BOBRICK	B2888
TA-3	SANITARY NAPKIN DISPOSAL	BOBRICK	B254
TA-4	COAT HOOK	BOBRICK	B233
TA-5	SOAP DISPENSER	BOBRICK	B-8263
TA-6	MIRROR	BOBRICK	B-165-2448
TA-7	BABY CHANGING STATION	KOALA KARE	KB111-SSWM
TA-10	GRAB BAR - SATIN FINISH	BOBRICK	B-5806 SERIES
TA-11	GRAB BAR - SATIN FINISH	BOBRICK	B-5806 SERIES
TA-12	GRAB BAR - SATIN FINISH	BOBRICK	B-5806 SERIES



2 A2.1 **FIRST FLOOR PLAN - ENLARGED RESTROOM**

1/2" = 1'-0"



1 A5.3 A2.1 **BASEMENT FLOOR PLAN**

1/4" = 1'-0"

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SMM EDR
SPACKMAN MOSSOP MICHAELS ESKEW+DUMEZ+RIPPLE
A Joint Venture

MILLER PARK DISTRICT PHASE I

CONTRACT NO. R-14-011-201

CHATTANOOGA, TN

Date: 12 DEC 2016

REVISIONS

1 6 JAN 2017

11-7-16

100% CONSTRUCTION DOCUMENTS

EDR No: 15003

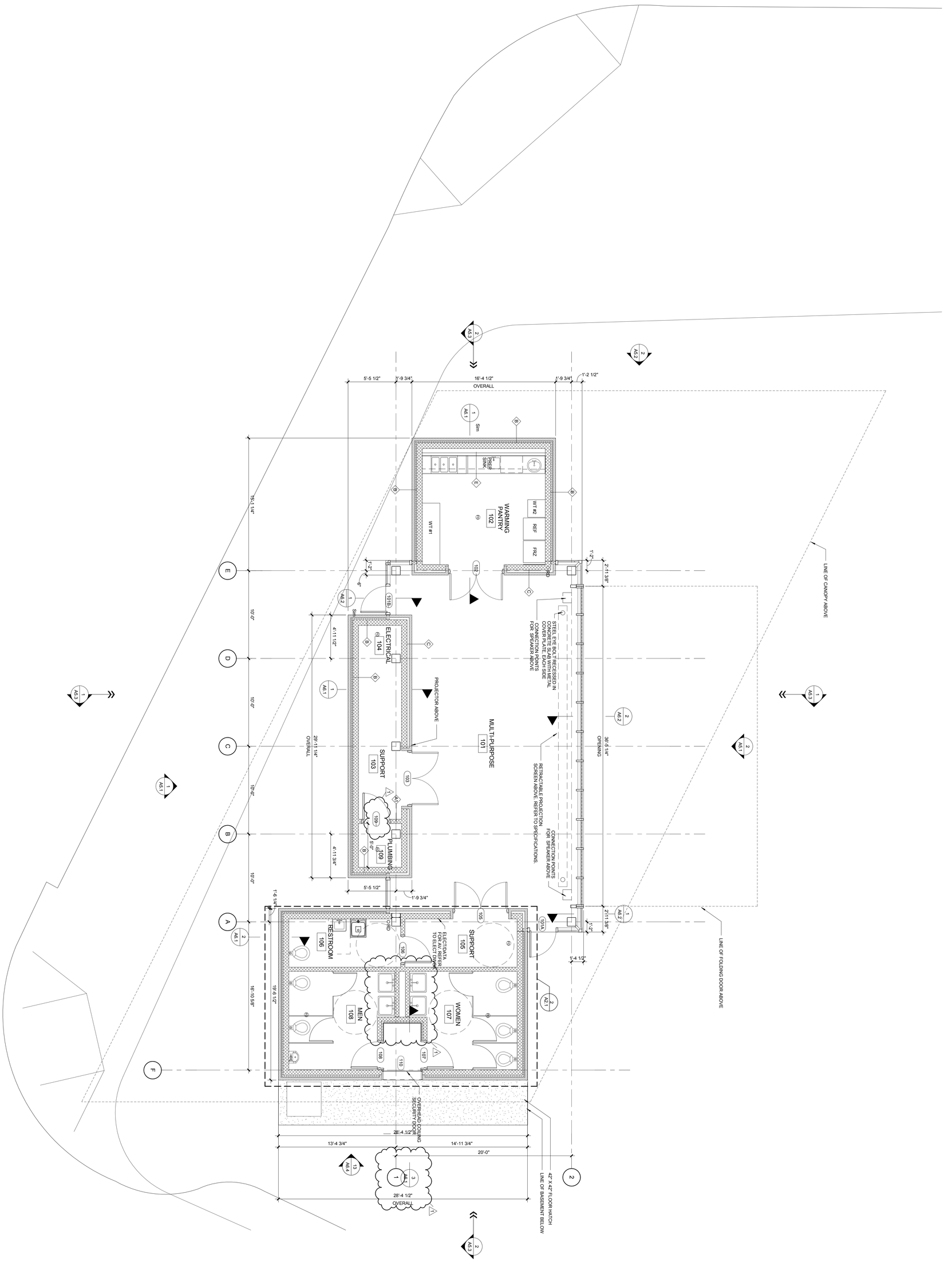
Drawn By:

Drawing Title:

BASEMENT FLOOR PLAN
ENLARGED RESTROOM PLAN
TOILET ACCESSORY SCHEDULE

Sheet No:

A2.1



1 A2.2 **FIRST FLOOR PLAN - STAGE PAVILION**
1/4" = 1'-0"

N

Sheet No: A2.2

100% CONSTRUCTION DOCUMENTS
EDR No: 15003
Drawn By:
Drawing Title: FIRST FLOOR PLAN

	REVISIONS	Date: 12 DEC 2016
5	6 JAN 2017	

MILLER PARK DISTRICT PHASE I

CONTRACT NO. R-14-011-201

CHATTANOOGA, TN

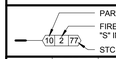
SMM EDR
SPACKMAN MOSSOP MICHAELS ESKEW+DUMEZ+RIPPLE
A Joint Venture

GENERAL NOTES PERTAINING TO INTERIOR PARTITIONS

UNLESS OTHERWISE INDICATED IN THE FOLLOWING "CLARIFICATION OF REFERENCE DESIGNATIONS FOR INTERIOR PARTITIONS" OR OTHERWISE INDICATED ELSEWHERE ON THE "DRAWINGS", ALL INTERIOR PARTITIONS ARE GYPSUM BOARD AND METAL STUDS AND ARE TO BE CONSTRUCTED AS LISTED BELOW.

1. ALL METAL STUDS SHALL BE 3 5/8" DEEP AND MINIMUM 25 GAUGE. (FOR PARTITIONS REQUIRING HEAVIER GAUGE STUDS, SEE SPEC. SECTION 092116).
2. ALL METAL STUDS SHALL BE SPACED 16" O.C.
3. ALL METAL STUDS SHALL EXTEND FROM FLOOR STRUCTURE ABOVE.
4. ALL METAL STUDS SHALL HAVE ONE LAYER OF GYPSUM BOARD ON EACH SIDE OF STUD.
5. ALL GYPSUM BOARD SHALL BE MOLD-RESISTANT, TYPE X AND 5/8" THICK.
6. ALL GYPSUM BOARD, ON WALLS, SHALL TERMINATE AT THE UNDERSIDE OF GYPSUM BOARD CEILINGS AND MINIMUM OF 6" ABOVE OTHER TYPE CEILINGS. WHERE CEILINGS DO NOT OCCUR, GYPSUM BOARD SHALL EXTEND TO THE STRUCTURE ABOVE.
7. ALL COMPONENTS OF FIRE RATED, SMOKE BARRIER, OR STC RATED PARTITION SYSTEMS SHALL EXTEND TO THE STRUCTURE ABOVE.
8. PARTITION SYSTEMS INDICATED TO HAVE STC-RATINGS MAY INCORPORATE SOUND ATTENUATION BLANKETS AND ACOUSTIC SEALANT TO ACHIEVE THE REQUIRED RATING. REFERENCE SPEC. SECTION 092116
9. IF CONCRETE MASONRY UNITS ARE INDICATED, UNITS SHALL BE 7 5/8" THICK AND SHALL EXTEND FROM FLOOR TO STRUCTURE ABOVE.
10. THE THICKNESS OF PARTITIONS SHOWN ARE FINISH SURFACE TO FINISH SURFACE EXCLUDING THIN-SET CERAMIC TILE.
11. REFER TO SPECIFICATION SECTION 09 21 16 FOR GLASS MAT-FACED GYPSUM BOARD REQUIREMENTS IN WET AREAS. WET AREAS WILL BE DEFINED AS: WALLS SUPPORTING SINKS, TOILETS AND URINALS, AND SHOWER AND TUB SURROUNDS, INCLUDING SHOWER CEILING.
12. WHERE A REFERENCE DESIGNATION IS NOT INDICATED ON THE FLOOR PLANS, THE PARTITION TYPE SHALL BE TYPE 10.0.

CLARIFICATION OF REFERENCE DESIGNATIONS FOR INTERIOR PARTITIONS



TYPE	FIRE RATING	STC Rating	Acoustic Test	DEPTH	DESCRIPTION
24	0			6 5/8"	ONE LAYER OF GYPSUM BOARD ON ONE SIDE OF 6" METAL STUDS, EXPOSED STUDS THE OTHER SIDE
A1	0			5 5/8"	6" NOMINAL CONCRETE MASONRY UNIT

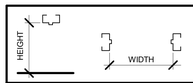
FINISH LEGEND

MARK	MATERIAL	SPEC. REF
P-1	PAINT	
P-2	PAINT	
ST-1	STONE TILE	
WB-1	WOOD BASE	

FINISH SCHEDULE

NO.	ROOM NAME	FLOOR	BASE	WALL	ACCENT WALL	CEILING	COMMENTS
Not Placed							
B101	PUMP ROOM	CC-01	(none)	(none)		(none)	
FIRST FLOOR							
101	MULTI-PURPOSE	CC-01	(none)	(none)		(none)	
102	WARMING PANTRY	CC-01	RB-01	PT-01		PT-01	
103	SUPPORT	CC-01	RB-01	PT-01		PT-01	
104	ELECTRICAL	CC-01	RB-01	PT-01		PT-01	
105	SUPPORT	CC-01	RB-01	PT-01		PT-01	
106	RESTROOM	CC-01	RB-01	TL-01		PT-01	
107	WOMEN	CC-01	MULTIPLE	ST-01		PT-01	
108	MEN	CC-01	RB-01	TL-01		PT-01	
109	PLUMBING	(none)	(none)	(none)		(none)	

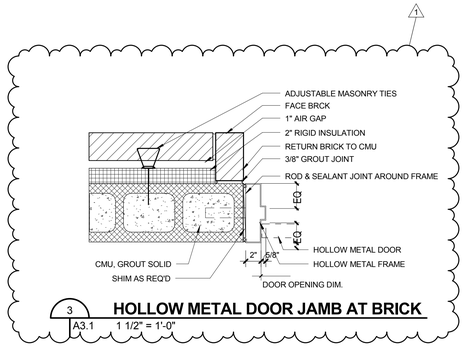
FRAME AND DOOR SCHEDULE



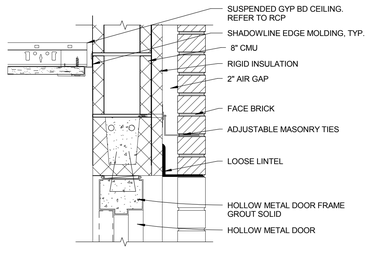
NOTES: 1. UNLESS OTHERWISE NOTED, ALL DOORS SHALL BE 1-3/4" THICK AND ALL FRAMES SHALL BE HOLLOW METAL.

2. FOR UNDERCUTTING AND/OR DOOR GRILLS, REFER TO HVAC FLOOR PLANS.

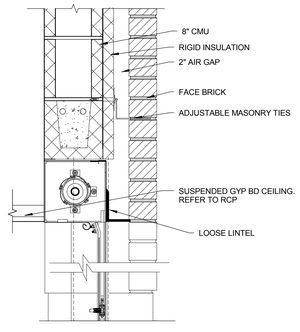
	FRAME					DOOR							
	OPENING												
MARK	WIDTH	HEIGHT	MATERIAL	FINISH	TYPE	DOOR (OR OPENING) DESCRIPTION	MATERIAL	FINISH	DETAIL NUMBER	FIRE RATING	STC RATING	HARDWARE SET	REMARKS
101A	3'-0"	8'-0"			D	ALUMINUM AND GLASS ENTRANCE							
101B	3'-0"	8'-0"			D	ALUMINUM AND GLASS ENTRANCE							
102	6'-0"	7'-0"			B	FLUSH HOLLOW METAL							
103	6'-0"	7'-0"			B	FLUSH HOLLOW METAL							
105	6'-0"	7'-0"			B	FLUSH HOLLOW METAL							
106	3'-0"	6'-10"			A	FLUSH HOLLOW METAL							
107	3'-0"	6'-10"			A	FLUSH HOLLOW METAL							
108	3'-0"	6'-10"			A	FLUSH HOLLOW METAL							
109	3'-0"	6'-10"			A	FLUSH HOLLOW METAL							
110	4'-7 1/4"	9'-0"			109	Built to order metal slatted rolling doors secure openings above counters. Can fully close to the floor.							



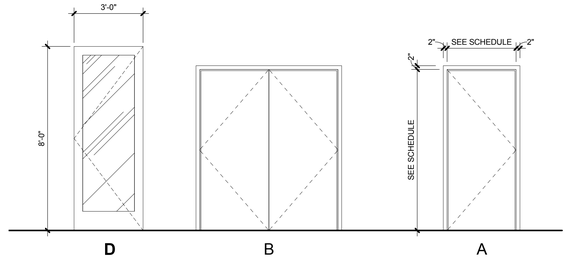
3 A3.1 **HOLLOW METAL DOOR JAMB AT BRICK** 1 1/2" = 1'-0"



5 A3.1 **HOLLOW METAL DOOR HEAD** 1 1/2" = 1'-0"



2 A3.1 **SECURITY SHUTTER DOOR HEAD** 1 1/2" = 1'-0"



1 A3.1 **DOOR TYPES** 3/8" = 1'-0"

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MILLER PARK DISTRICT PHASE I

CONTRACT NO. R-14-011-201

CHATTANOOGA, TN

Date: 12 DEC 2016

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1 6 JAN 2017

11-7-16

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EDR No: 15003

Drawn By:

Drawing Title:

FINSH SCHEDULE
DOOR SCHEDULE
DOOR DETAILS

Sheet No:

A3.1

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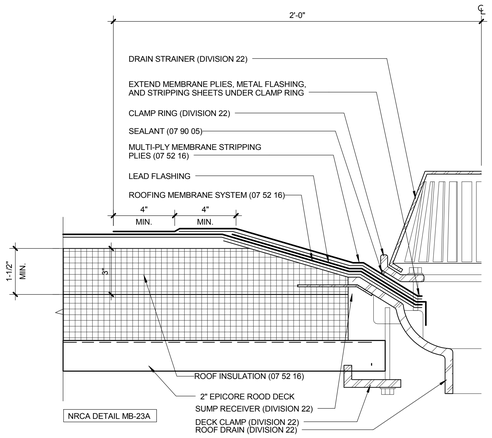
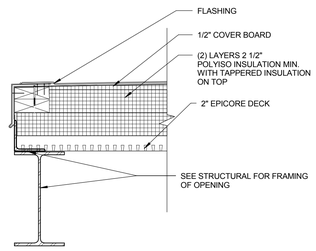
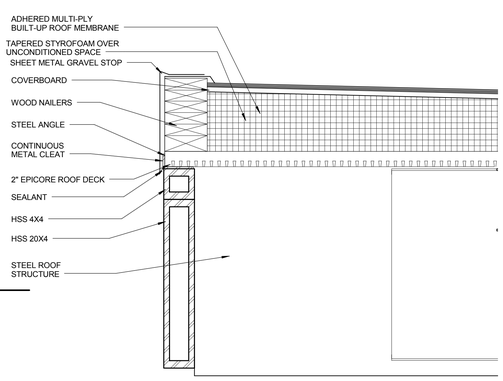


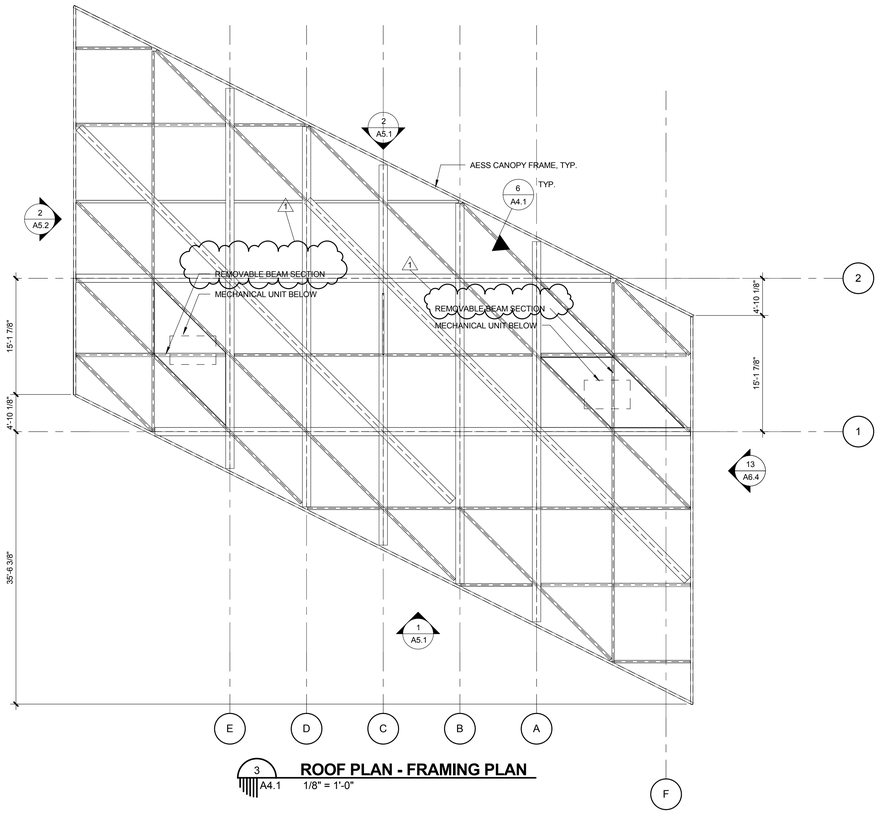
9 A4.1 **SECTION THRU ROOF AT ROOF DRAIN** 3" = 1'-0"



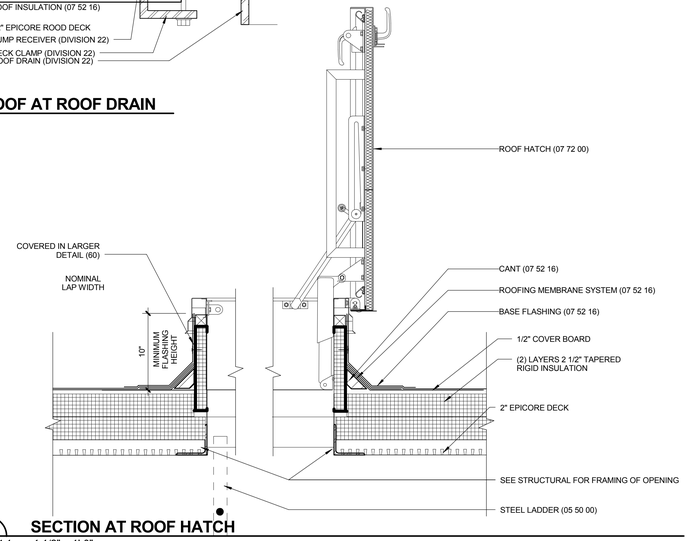
5 A4.1 **ROOF EDGE AT ROOF OPENING** 1 1/2" = 1'-0"



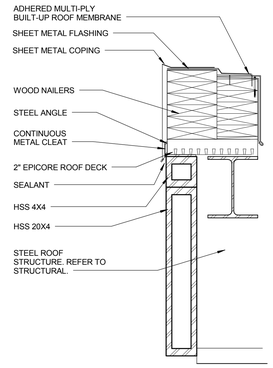
6 A4.1 A4.1 **TYPICAL ROOF EDGE** 1 1/2" = 1'-0"



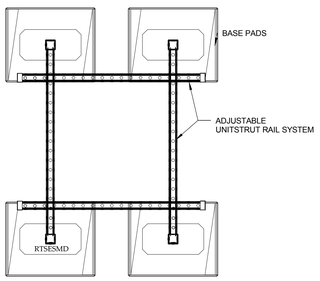
3 A4.1 **ROOF PLAN - FRAMING PLAN** 1/8" = 1'-0"



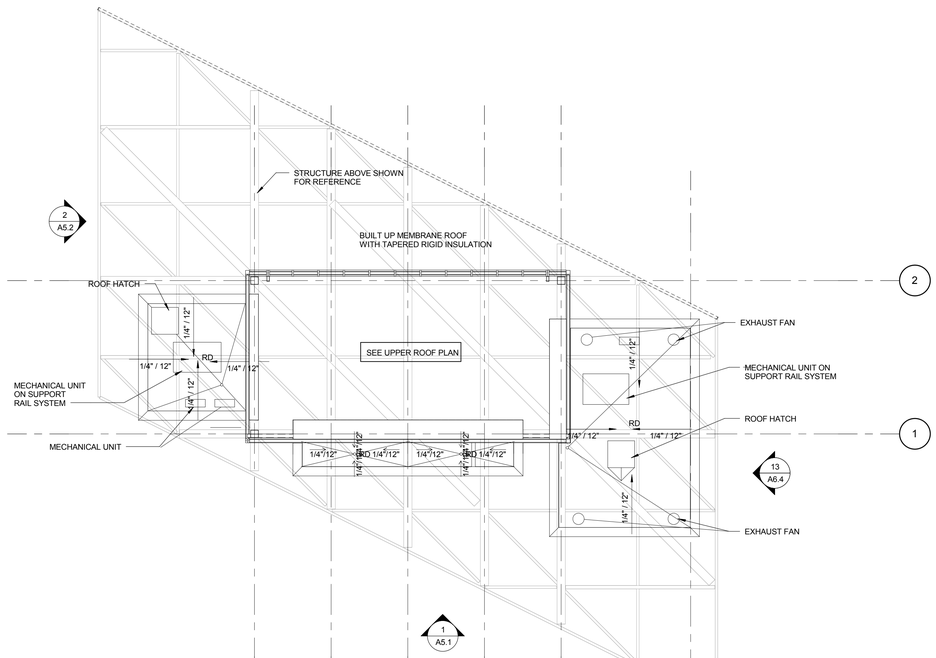
8 A4.1 **SECTION AT ROOF HATCH** 1 1/2" = 1'-0"



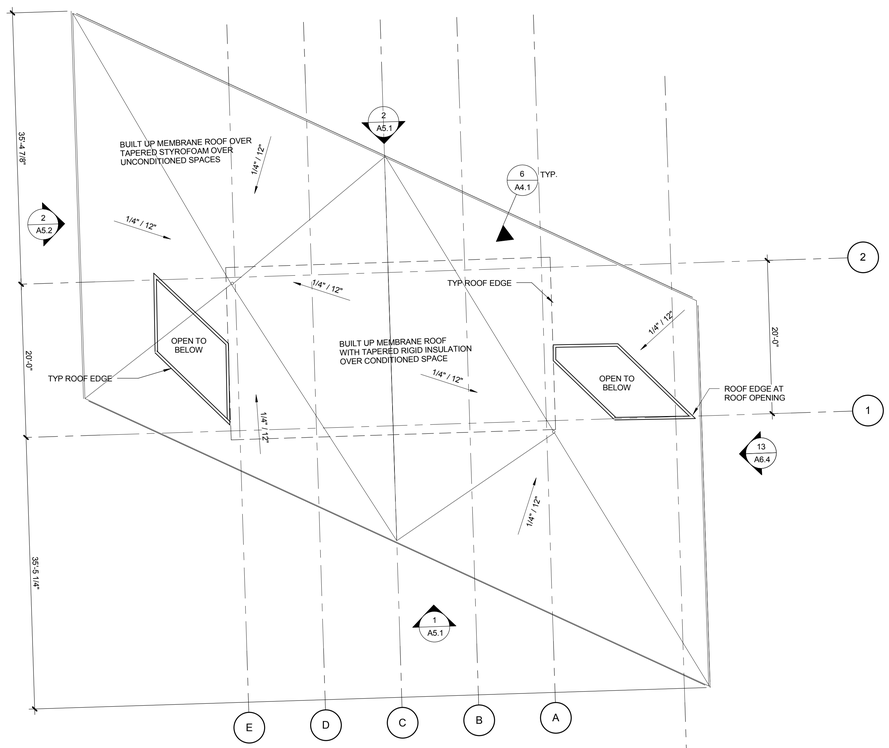
4 A4.1 **ROOF EDGE AT ROOF OPENING** 1 1/2" = 1'-0"



7 A4.1 **MECHNICAL UNIT SUPPORT RAILS** 1" = 1'-0"



2 A4.1 **LOWER ROOF PLAN - STAGE PAVILION** 1/8" = 1'-0"



1 A4.1 **UPPER ROOF PLAN - STAGE PAVILION** 1/8" = 1'-0"

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MILLER PARK DISTRICT PHASE I

CONTRACT NO. R-14-011-201

CHATTANOOGA, TN

Date:	12 DEC 2016

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EDR No:	15003
Drawn By:	
Drawing Title:	

ROOF PLANS AND DETAILS

Sheet No: A4.1

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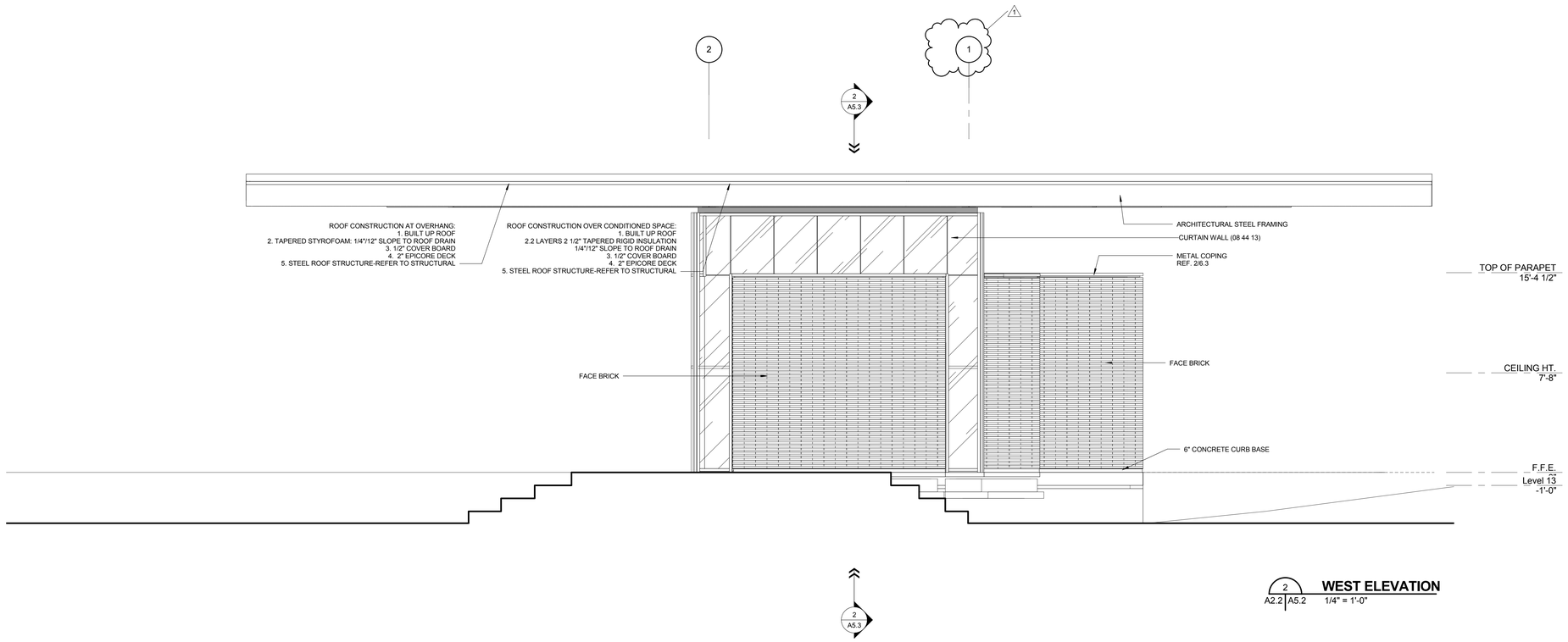
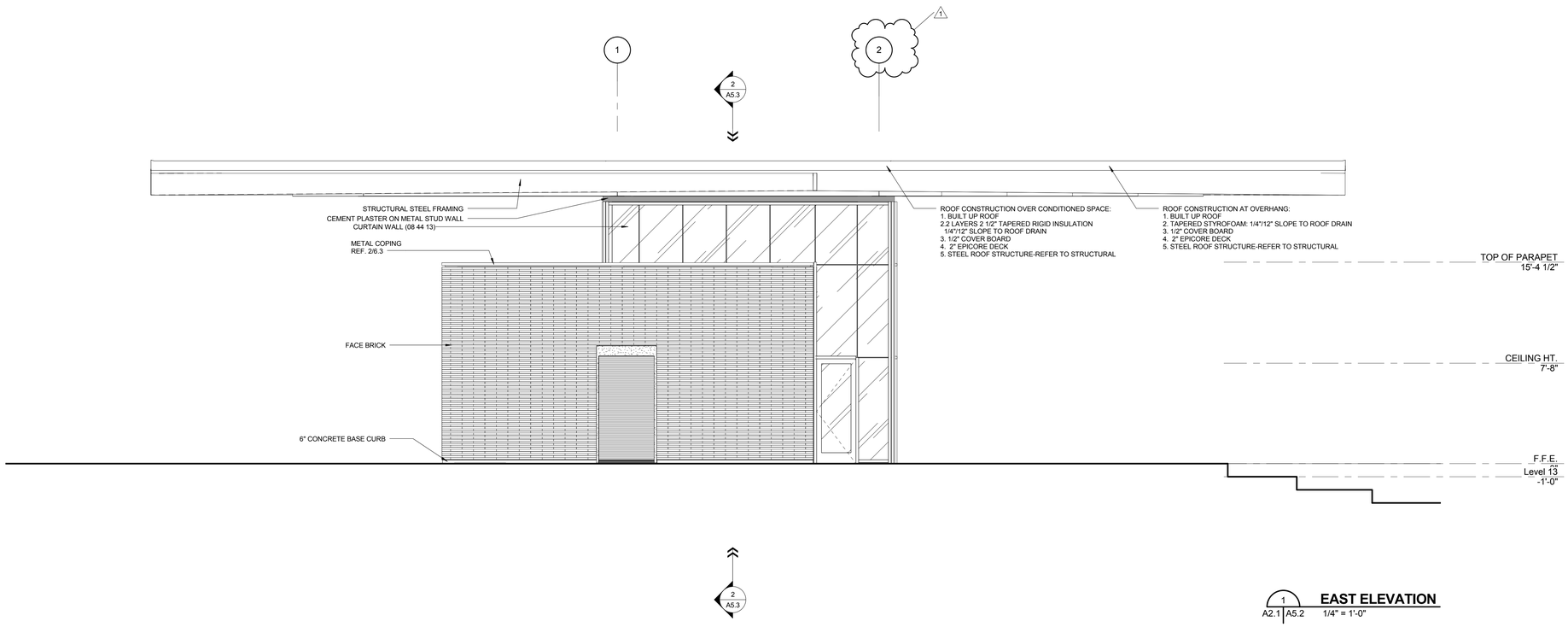


2 **WEST ELEVATION**
A2.2 | A5.2 1/4" = 1'-0"



1 **EAST ELEVATION**
A2.1 | A5.2 1/4" = 1'-0"

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MILLER PARK DISTRICT PHASE I
CONTRACT NO. R-14-011-201
CHATTANOOGA, TN

Date: 12 DEC 2016

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EDR No: 15003

Drawn By:

Drawing Title:
EXTERIOR ELEVATIONS

Sheet No:
A5.2

Report of Geotechnical Exploration
Miller Park District
Chattanooga, Tennessee
S&ME Project No. 1281-15-066

Prepared for:
City of Chattanooga
Division of Engineering Services
1250 Market Street, Suite 2100
Chattanooga, Tennessee 37402-2713

Prepared by:
S&ME, Inc.
4291 Highway 58, Suite 101
Chattanooga, TN 37416

November 25, 2015

November 25, 2015

City of Chattanooga
Division of Engineering Services
1250 Market Street, Suite 2100
Chattanooga, Tennessee 37402-2713

Attention: Mr. Eric Booker

Reference: Report of Geotechnical Exploration
Miller Park District
Chattanooga, Tennessee
S&ME Project No. 1281-15-066

Dear Mr. Booker:

This report presents the results of the geotechnical exploration for the Miller Park District site in Chattanooga, Tennessee. Our work was performed in general accordance with S&ME Proposal No. 121500520, dated October 19, 2015.

This report describes our understanding of the project, presents the results of the field exploration and laboratory testing, and discusses our conclusions and recommendations. S&ME appreciates this opportunity to be of service to you. Please call if you have questions concerning this report or any of our services.

Sincerely,

S&ME, Inc.

Drew Reed, PE
Project Engineer

James P. McGirl, PE
Principal Engineer

Table of Contents

Appendices

1.0 Executive Summary

This summary is presented for the convenience of the reader. The full report text should be studied and understood before preparing an estimation of quantities or preparing designs based on this report, as it contains important information and recommendations that are not included in this brief summary.

1. The geotechnical exploration included drilling and sampling of six test borings. The samples collected during our exploration were returned to our Chattanooga laboratory where they were further evaluated by a professional engineer.

2. Natural moisture content and Atterberg limits laboratory tests were performed on selected samples to aid our soil classification and to evaluate the on-site soil's volume change potential.

3. Subsurface conditions generally consisted of fill soils overlying residual soils. Fill soils were typically composed of silty clay, clayey silt, and foundry derived waste. Auger refusal was encountered in four of the test borings before penetrating the fill. Residual soils were encountered below the fill in borings B-4 and B-6 before encountering auger refusal. The residual soils were composed of stiff to very stiff clayey silt and silty clay with limestone fragments.

4. Auger refusal was encountered in each of the test borings at depths ranging from about 1½ to 12½ feet.

5. Groundwater was not encountered in the test borings at the time of drilling. We do not expect groundwater control will be necessary during construction.

6. The site is adaptable for the proposed structures provided that necessary steps are taken during construction. This includes proper foundation preparation, site preparation and construction testing as outlined in this report.

7. If the foundations are prepared in accordance with Section 7.2 of this report, shallow foundations bearing on existing or newly placed fill may be used to support the pavilions. The bearing conditions at each of the foundation excavations should be observed by the geotechnical engineer. The purpose of these observations is to evaluate whether the bearing conditions are suitable for the design bearing pressure or if remedial measures will be required.

8. Due to its variable composition and unknown origin, the on-site fill soil is not acceptable for re-use as compacted soil fill.

2.0 Introduction

S&ME, Inc. has completed the geotechnical exploration at the Miller Park District in Chattanooga, Tennessee. Our work was performed in general accordance with S&ME Proposal Number 121500520 dated October 19, 2015. Our services were authorized by Mr. Dennis Malone of the City of Chattanooga on October 28, 2015.

The purpose of our work was to explore the subsurface soil conditions and groundwater level, provide feasible shallow foundation recommendations and provide applicable earthwork recommendations. This report describes our understanding of the project, presents the results of the field exploration and laboratory testing, and discusses our conclusions and recommendations relative to the above considerations.

A Site Location Plan and a Boring Location Plan are included in Appendix I. A discussion of the field investigative procedures, a legend of soil classification and symbols, and the Test Boring Records are included in Appendix II. Appendix III contains a discussion of the laboratory testing procedures and the laboratory test results. Appendix IV contains a copy of the ACI 302.1R-04 Guide for Concrete Floor and Slab Construction and a document titled "Important Information about Your Geotechnical Engineering Report".

3.0 Site and Project Description

Our understanding of the project is based on our discussions with Mr. Eric Booker and Mr. Dennis Malone of the City of Chattanooga. We were provided architectural drawings in the form of a 30 Percent Design Package prepared by Spackman Mossop and Michaels Landscape Architects, dated October 2, 2015. In addition, we have reviewed the geology underlying the project site and have visited the site.

3.1 Site Description

The project site is located in downtown Chattanooga between Georgia Avenue and Market Street, to the east and west, respectively, and between Martin Luther King Boulevard and East 10th Street, to the north and south, respectively.

The project site is relatively flat with about 5 to 6 feet of relief across the site. The northeast quadrant of the site is characterized by hardscaping in the form of brick paved and concrete sidewalks, walkways and steps. The central portion of the site is occupied by a large pond and fountain. The southern and eastern portion of the project site is characterized by a grass field and several large trees. Several planters are dispersed across the site.

3.2 Project Description

The project involves the construction of two new pavilions in conjunction with new renovations to the Miller Plaza District. The Café Pavilion is an approximately 4,300 square foot, triangular structure that will be located at the southwest corner of Georgia Avenue and Martin Luther King Jr. Boulevard. This pavilion will be comprised of an enclosed café and covered outdoor seating. The Stage Pavilion will be located at the southern perimeter of the site, between Market Street and Georgia Avenue, and to the north of E 10th Street. The Stage Pavilion will be comprised of a covered stage and an enclosed 450 square foot mechanical room and kiosk.

Project information relative to type of construction or foundation loading has not been developed. Based on the provided drawings, we expect both pavilions will have steel frames, grade supported concrete slabs, and shallow soil supported foundations. Maximum column and wall loads of 100 kips and 3 kips per linear foot are estimated based on the type of construction.

Spot elevation data was provided on sheet L2.1 of the provided drawings. Based on the provided information, it appears cut and fill depths in the proposed pavilion areas will be less than about 3 feet.

4.0 Regional Geology

Chattanooga, Tennessee is located in the Valley and Ridge Physiographic Province. Elongated ridges that trend in a northeast-southwest direction characterize this province. The ridges are typically formed on highly resistant sandstones and shales, while the valleys and rolling hills are formed on less resistant limestone, dolomite, and shales.

Based on our review of the Geologic Map of the Chattanooga Quadrangle, dated 1964, undifferentiated bedrock of the Knox Group underlies the site. The Knox Group is composed of various dolomite and siliceous limestone members. The rock is generally medium to dark gray, very hard, fine to coarsely crystalline rock. Residual soils derived from the Knox Group are typically red-brown to yellow-brown clays with locally heavy amounts of chert fragments. The strata of the Knox formations weather to form a thick cherty overburden typically in excess of 40 feet thick.

Limestone and dolomite, such as the strata underlying this site, are of great geologic age and have been subject to solution weathering over geologic time. Rainwater falling onto the surface and percolating downward through the soil and into cracks and fissures gradually dissolves the rock, producing insoluble impurities such as chert and clay. Since limestone and dolomite vary greatly in their resistance to weathering, the soil/bedrock contact may be extremely irregular. More soluble bedrock develops a thicker soil cover and a more irregular bedrock surface with pinnacles and slots, and less soluble bedrock usually develops a thinner soil cover and a less irregular soil-bedrock surface.

These large variations in bedrock depth are greatly enhanced by the presence of fractures, bedding planes, and faults, which provide an increased opportunity for a greater influx of percolating water. The weaknesses may form clay-filled cavities or enlarge into caves and may be connected by a network of passageways. If a cave forms close to the bedrock surface, its roof may collapse and the overlying soils may erode into the cave. Once the weight of the overlying soil exceeds the soil's arching strength, the soil collapses and an open hole or depression may appear at the ground surface. Such a feature is termed a sinkhole.

There is always some risk associated with developing any site underlain by carbonate bedrock. However, we have reviewed the USGS quadrangle map for this area. The map does not show a pattern of closed depressions that would indicate past sinkhole activity in near proximity to the site. We also observed successful development in the surrounding area. Therefore, we believe the risk of sinkhole development for this project is no greater than for surrounding successfully developed sites.

5.0 Subsurface Conditions

5.1 Field Exploration Procedures

The procedures used by S&ME, Inc. for field sampling and testing are in general accordance with ASTM procedures and established engineering practice in the State of Tennessee. Appendix II contains brief descriptions of the procedures used in this exploration.

S&ME, Inc. drilled six soil test borings to obtain subsurface information at the project site. Members of our engineering staff established the boring locations in the field by measuring distances and estimating right angles relative to on-site landmarks. Boring elevations were obtained from GIS aerial imagery. Therefore, both boring locations shown on Figure 2 – Boring Location Plan in Appendix I, and the elevations shown on the Test Boring Records in Appendix II, should be considered approximate.

The borings were advanced using hollow stem auguring techniques coupled with Standard Penetration Test (SPT) split-spoon sampling. After each boring was completed, we measured the groundwater level, if present. The borings were then backfilled with auger cuttings before leaving the site.

Our field representative packaged the soil samples in sealed containers, labeled them for identification, and returned them to the Chattanooga office where a geotechnical engineer further examined them. We visually classified the soils according to the Unified Soil Classification System (ASTM D 2488). The resulting soil descriptions are shown on the Test Boring and Test Pit Records in Appendix II. Samples were then selected for laboratory testing. A general description of the subsurface conditions encountered at the test boring locations is provided in the following report sections.

5.2 Soil Stratification

The results of our field testing program are summarized in the following paragraphs, and are shown on the Test Boring Records in Appendix II. These records present our interpretation of the subsurface conditions at specific boring locations at the time of our exploration. The stratification lines represent the approximate boundary between soil types. The actual transitions may be more gradual than implied.

SURFACE MATERIALS

Surface material consisting of about four to seven inches of topsoil was encountered at the ground surface in each of the borings with the exception of boring B-2. Brick pavers, the upper layer of which was removed prior to drilling, were encountered from the ground surface to a depth of about 1 foot in boring B-2.

FILL

Below the ground cover, fill was encountered in each of the borings to depths ranging from about 1½ to 12½ feet. Fill is material that has been transported to its present location by man. The fill was generally composed of silty clay (CL), clayey silt (ML), or foundry derived waste materials. Standard Penetration Test (SPT) N values in the fill ranged from 3 to greater than 50 blows per foot, indicating a soft to hard soil consistency in the fine grained soils and a dense to very dense relative density in the coarse grained soils.

RESIDUUM

Residual soils were encountered below the fill in borings B-4 and B-6 at a depth of 3 and 4 feet, respectively. Residual soil forms from the in-place weathering of the underlying bedrock. The residual soils encountered were composed of yellow-brown and brown clayey silt with limestone fragments. SPT N values for these soils ranged from 14 to 26 blows per foot, indicating a stiff to very stiff soil consistency.

AUGER REFUSAL

Auger refusal was encountered in each of the borings at depths ranging from about 1½ to 12½ feet. Only borings B-4 and B-6 penetrated the fill prior to encountering auger refusal.

5.3 Water Levels

The boreholes were observed for the presence of groundwater at the termination of boring. Groundwater was not observed in any of the borings. We do not expect groundwater to present any site development problems.

6.0 Laboratory Testing

Laboratory tests were performed on representative split-spoon samples obtained during the field exploration phase of this project. We conducted moisture content and Atterberg limits tests on selected samples to aid our soil classification and to evaluate the relative volume change potential of on-site soils. The resulting soil descriptions are shown on the Test Boring Records in Appendix II.

7.0 Assessment

On the basis of this geotechnical exploration, we conclude that this site is adaptable for the proposed construction. In order to develop and adapt this site, a few items should be addressed during the planning, design, and construction phases of the project.

Site preparation should include the stripping of topsoil and hardscaping from the construction areas. Structural areas that are to receive fill should be thoroughly proofrolled after the completion of stripping. Proofrolling should be performed using a fully loaded tandem axle dump truck or a similar piece of equipment. Areas deflecting under the weight of the proofroll should be undercut to suitable soil as recommended by the geotechnical engineer. Areas where undercutting is performed should be backfilled as specified in the Section 8.2 of this report.

The existing fill is composed of a variety of materials including foundry derived waste, and the fill appears to have been placed with variable compactive effort. Ideally, undercutting of the fill and replacement with compacted soil fill is the preferred solution to reduce the City's risk relative to excessive differential settlement. However, considering the foundry derived waste will likely be classified as special waste and will have to be disposed of in a regulated landfill, this option will be very expensive. If the City is willing to accept some additional risk relative to excessive differential settlement, the pavilions can be supported on the existing fill using shallow foundations if the foundation excavations are evaluated as described in Section 7.2 of this report.

We recommend the need to undercut foundations, or perform other remedial measures, be assessed at the time of construction. Foundation excavations should be observed by the geotechnical engineer or his representative prior to placing concrete. Floor slabs for the new structure may be supported on newly placed and compacted structural fill.

8.0 Design Recommendations

8.1 Limitations of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based on applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, expressed or implied, is made.

The analyses and recommendations submitted herein are based, in part, on the data obtained from the subsurface exploration. The nature and the extent of variations between the widely-spaced borings will not become evident until the time of construction. If variations appear evident, then we will re-evaluate the recommendations of this report. In the event any changes in the nature, overall design, or finished floor elevations, grades, structural loads, or location of the building or parking areas are planned, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and the conclusions verified or modified in writing.

We recommend S&ME be provided the opportunity to review the final design plans and specifications in order that earthwork and other recommendations are properly interpreted and implemented. The recommendations in this report are contingent on S&ME, Inc.'s observation and monitoring of grading and construction activities.

8.2 Foundations

SHALLOW SPREAD FOOTINGS

The subsurface exploration revealed that fill soils are present at the probable foundation bearing depths. Fill, such as that encountered in the subsurface investigation, does not provide a consistent bearing capacity for shallow spread foundation support because of the variability of fill material and inconsistent compactive effort. If the City is willing to accept additional risk relative to excessive differential settlement that can manifest as cracks in floor slabs or masonry walls, the pavilions can be supported on shallow fill supported foundations. The alternative to this approach is to undercut the existing fill to expose residual soils or rock.

If the City elects to support the pavilions on the existing fill, we recommend that foundation excavations be inspected by an experienced geotechnical engineer at the time of construction. The engineer will use a probe rod to assess the stiffness of the bearing soils and dynamic cone penetrometer (DCP) testing to assess the bearing capacity. The engineer will also perform hand auger borings or excavate test pits to further assess the foundation bearing conditions. Based on these observations, foundation preparation recommendations will provided. We recommend a contingency budget be established to account for undercutting about 3 feet of fill from beneath 50 percent of the foundations and backfilling the excavations with compacted soil fill. The recommendations in this report are contingent on S&ME observing and evaluating the foundation excavations prior to placing concrete.

If the site is prepared as described above and in accordance with Section 8.1 of this report, spread footings for the structures will bear on a combination of existing fill and newly placed and compacted soil fill. Assuming the city elects to leave the existing fill in place, we recommend shallow foundations bearing on existing or newly placed fill be designs using a reduced bearing pressure of 1,500 psf. A reduced bearing pressure is recommended to reduce foundation undercutting costs.

Shallow refusal was encountered in several of the borings. We were unable to determine the makeup of the refusal material. Based on the site geology, and based on deeper borings drilled during our environmental investigation, we believe that refusal may have been encountered on debris within the fill, or on subsurface structural elements of demolished buildings which occupied the site previously.

Although computed footing dimensions may be less, we recommend that continuous footings be a minimum of 18 inches wide and isolated spread footings be a minimum of 36 inches wide to reduce the possibility of a localized punching shear failure. Foundations should be placed a minimum of 18 inches below subgrade to protect against frost penetration and to provide adequate confinement.

Foundation excavations should be backfilled with concrete the same day they are opened. Footings should be poured "neat" to the excavation so that water cannot collect behind forms before backfilling. If soils exposed in the foundation excavations experience moisture variations prior to concrete placement, the affected bearing materials should be undercut as recommended by our geotechnical engineer. A 2- to 3-inch thick mud-mat of lean concrete may be used to protect the exposed support materials if the opened excavations cannot be backfilled with concrete the same day.

Undercut foundation excavations should be backfilled using either soil fill compacted to at least 95 percent of the standard Proctor (ASTM D 698) maximum dry density or a suitable material recommended by the geotechnical engineer. The foundation subgrade should be relatively level or suitably benched and free of loose soil or rock at the time of our observations.

8.3 Floor Slabs

The floor slab-on-grade should be supported on compacted select fill material. Prior to placement of the aggregate base, the exposed surface should be observed and proofrolled with a loaded, tandem-axle, dump truck, or rubber-tired construction equipment approved by the geotechnical engineer. Proofrolling should be observed by the geotechnical engineer. Areas that pump, rut, or deflect excessively under the loads of the proofroll should be undercut to suitable soils and replaced with compacted structural fill or crushed stone. A stiff subgrade is essential to good floor slab performance.

A four-inch thick (minimum) granular leveling course, preferably graded aggregate base, should be placed between the floor slab and subgrade. The granular layer will promote curing and help distribute concentrated floor slab loads as well as add uniformity and serve as a capillary barrier. The use of a vapor barrier should meet ACI 302 guidelines. We have included these guidelines in Appendix IV. Expansion/contraction and construction joints should be used to isolate the floor slab from load bearing walls and/or isolated columns and should conform to ACI guidelines.

To prevent the subgrade from drying or excessively wetting, we recommend protecting the subgrade before concrete is placed. Protection of the subgrade can be achieved by leaving the floor subgrade several inches above grade, and then making the final cut to subgrade shortly before floor construction.

The soil subgrade for the slabs should be crowned and sloped to drain toward the perimeter of the building. Positive site surface drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slab and pavement areas. Surface drainage should be collected and discharged such that the water is not permitted to infiltrate the backfill and floor slab.

8.4 Groundwater

Groundwater was not encountered in the soil test borings during our drilling activities. Therefore, we do not anticipate that groundwater control will be necessary during construction.

9.0 Construction Considerations

9.1 Site Preparation

DEMOLITION

A number of existing structures and hardscaping will be demolished prior to construction. Abandoned utilities should be removed and replaced with compacted fill. Active utilities should be relocated outside of the construction area. If pipes are not removed from beneath the proposed construction, they may serve as conduits for subsurface erosion that could result in the formation of voids or depressions, with adverse effects on the foundations and floor slabs. Based on the results of our subsurface investigation, it is possible that some unknown existing structural elements of previous constructions may be encountered during the excavation of the foundations. The need to remove any existing structural elements should be determined by the engineer at the time of construction.

STRIPPING AND UNDERCUTTING

After completion of demolition, asphalt, gravel, concrete and topsoil should be stripped from the construction area and disposed of off-site. The depth of the topsoil encountered in the borings ranged from about four to seven inches. However, we expect the topsoil intervals may be greater in unexplored areas.

GENERAL

After completion of stripping in areas to receive fill, and once grade is achieved in cut areas, we recommend proofrolling the exposed surface of the subgrade soils. The purpose of proofrolling is to locate pockets of soft or unstable soils. Proofrolling should be performed using a fully loaded dump truck or other heavy equipment approved by our geotechnical engineer. The proofrolling operation should traffic the site with parallel passes of the vehicle starting at one side of the building pad and continuing to the other. Each pass should overlap the preceding pass to ensure complete coverage.

An engineer from S&ME should be present to observe the proofrolling operations and to provide recommendations should unstable soils be encountered. In general, unstable materials in the building areas should be undercut until stable materials are exposed. Backfill should consist of compacted soil as described in Section 8.2 of this report. After proofrolling and prior to placing fill on the site, the upper surface soils should be scarified and properly compacted.

Subgrade repair can be expected to be more extensive if grading operations are performed during wet periods of the year. The onsite soils are moisture sensitive and will be softened by rubber-tired construction traffic when wet. Once areas that need remediation have been repaired, the site may be brought to grade with structural fill. Depending on climatic conditions and the speed of contractor activities during the grading phase of this project, proofrolling may be required on multiple occasions.

9.2 Fill Placement

MATERIALS

Fill soils should consist of low to moderately plastic clay or silt with a plasticity index of less than thirty (PI<30) and a standard Proctor maximum dry density greater than 95 pounds per cubic foot. The fill should contain no rock fragments larger than 4 inches in any dimension, and no organic matter. Due to the variable nature of the existing fill encountered, onsite soils are not acceptable for use as engineered fill.

Soil fill operations should not begin until representative samples of proposed fill soils are collected and tested. The test results will be used to assess whether the proposed fill material meets the previously discussed plasticity and density criteria, and for quality control during grading. Please allow at least 3 to 5 days for testing before the fill operations begin.

COMPACTION

Fill should be placed in thin lifts with a maximum loose thickness of 8 inches, then compacted to 95 percent of the standard Proctor maximum dry density, with a moisture content within 3 percent of the optimum moisture content, depending on the shape of the Proctor curve. Wetting or drying of these soils may be required, depending on the time of year site grading is performed. We recommend the top one foot below grade supported slabs, and the top 2 feet beneath pavements be compacted to 100 percent standard Proctor compaction. The edge of the compacted fill should extend at least 10 feet beyond the outside building edge, and at least 5 feet beyond the outside edge of pavements before sloping. A representative of S&ME should test the density and moisture content of each lift before placing additional lifts.

In confined areas such as utility trenches, portable compaction equipment and thin lifts of 3 to 4 inches may be required to achieve specified degrees of compaction.

We recommend that fill placements be observed by one of S&ME's qualified soils technicians on a full time basis. Frequent fill density and moisture tests should be performed to evaluate that the specified degree of compaction is being achieved. However, the actual testing frequency should be determined by the geotechnical engineer based on the type of soil being placed, the equipment being used, and the time of year the fill is being placed. More frequent testing should be performed in confined areas. Any areas that do not meet the compaction specification should be re-compacted to achieve compliance.

9.3 Drainage and Runoff Concerns

In the Tennessee Valley Region, frequent and sometimes substantial rainfalls occur from November through May. These rainy months can greatly influence the cost and schedule of construction projects, particularly earthwork and work in confined excavations. The clay soils present at the site will be difficult

to work in periods of wet weather. Construction traffic repeatedly crossing exposed wet soil subgrades can damage the subgrades to the point that over-excavation may be required.

The contractor should be prepared to provide adequate methods to control the infiltration of surface water into open excavations. We recommend subgrades be sufficiently sloped to provide rapid drainage. Water that collects in excavations should be removed as soon as possible to prevent softening the subgrade soils.

Maintenance of the exposed subgrade surface will be important to achieve moisture control and to prevent softening of the surface soils due to rainwater infiltration. We recommend keeping the ground surface free from depressions or ruts that would hold water, and sealing the surface using rubber tired equipment to reduce water infiltration.

10.0 Follow-Up Services

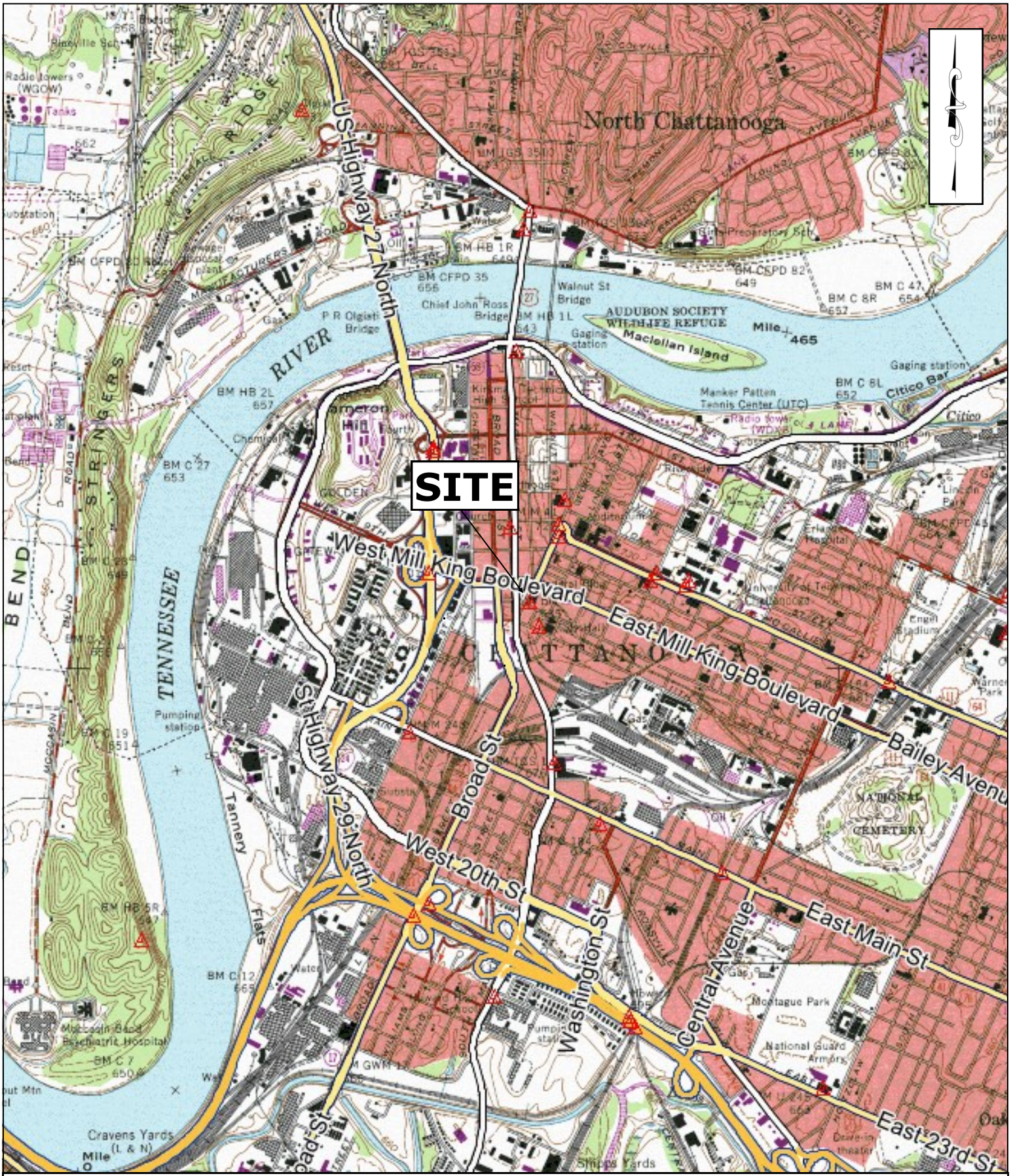
Our services should not end with the submission of this geotechnical report. S&ME should be kept involved throughout the design and construction process to maintain continuity and to determine if our recommendations are properly interpreted and implemented. To achieve this, we should review project plans and specifications with the designers to see that our recommendations are fully incorporated and have not been misinterpreted. We also should be retained by the owner to monitor and test the site preparation and foundation construction.

S&ME's familiarity with the site and foundation recommendations makes us a valuable part of your construction quality assurance team. S&ME recommends that we be retained by the owner on a full time basis to observe earthwork and foundation construction. Our personnel are uniquely qualified to recognize unanticipated ground conditions and can offer responsive remedial recommendations should these unanticipated conditions occur.

Appendix I -

Figure 1 - Site Location Plan

Figure 2 - Boring Location Plan

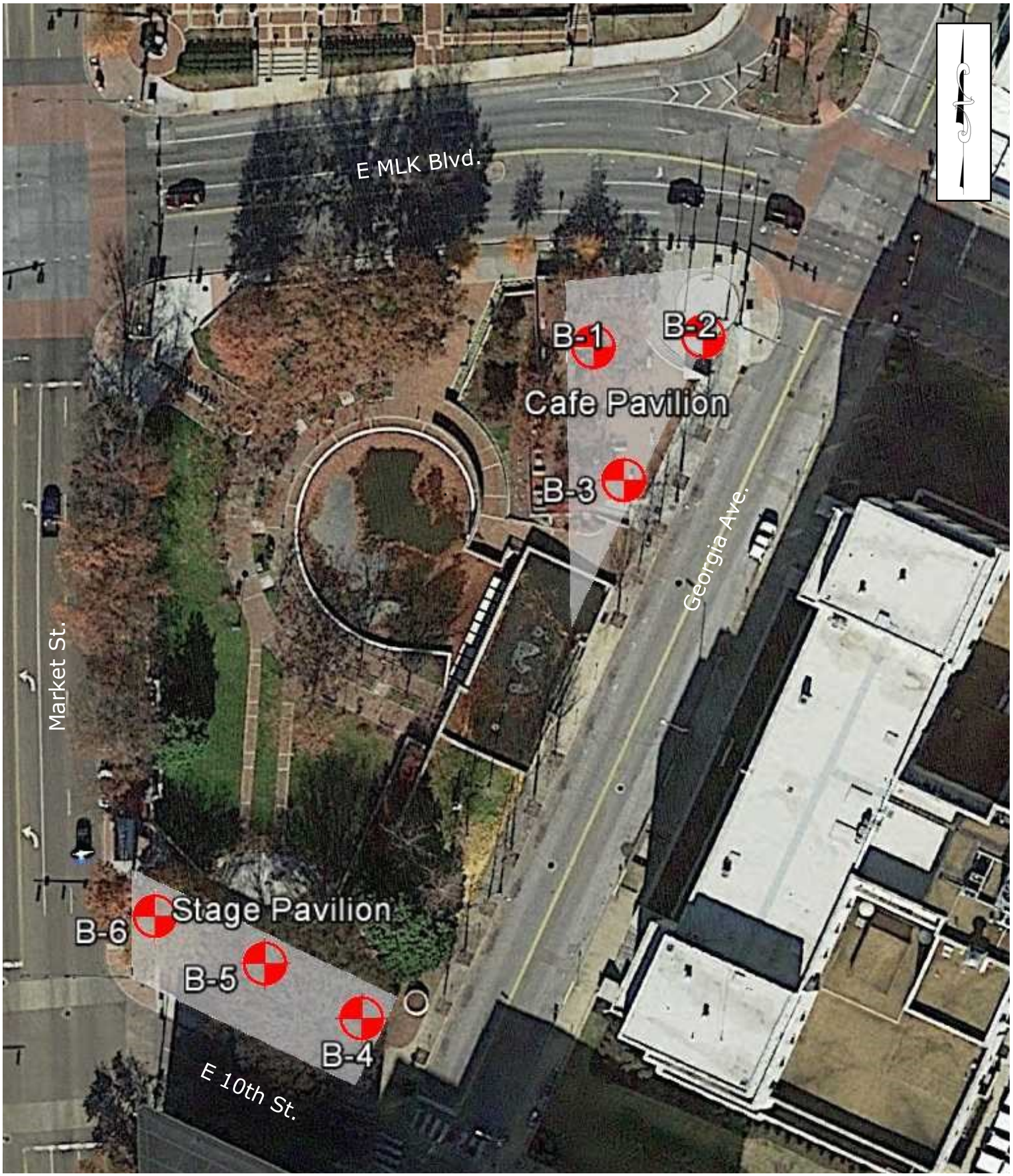


SOURCE: USGS 7.5 Minute Topographic Map — CHATTANOOGA, TENNESSEE (1976)
DRAWING FOR ILLUSTRATION PURPOSES ONLY

S&ME

SITE LOCATION PLAN
MILLER PARK DISTRICT
CHATTANOOGA, TENNESSEE

JOB NUMBER:	1281-15-066	**APPROXIMATE SCALE:**	1"=2,000'
DRAWN BY:	JLN	**CHECKED BY:**	DR
DATE:	11/23/2015	**FIGURE:**	1



SOURCE: Google Earth Aerial Imagery (Nov.27,2013)

S&ME

BORING LOCATION PLAN
Miller Park District
Chattanooga, Tennessee

JOB NUMBER:	1281-15-066	**APPROXIMATE SCALE:**	1"=50'
DRAWN BY:	DR	**CHECKED BY:**	JPM
DATE:	November 23, 2015	**FIGURE:**	2

Appendix II

Field Exploration Procedures

Test Boring Record Legend

Test Boring Records

HOLLOW STEM AUGERING PROCEDURES
WITH STANDARD PENETRATION RESISTANCE TESTING
ASTM D 1586

The borings were advanced using auger drilling techniques. At regular intervals, soil samples were obtained with a standard 1.4-inch I.D., 2.0-inch O.D., split-tube sampler. The sampler was initially seated 6 inches to penetrate any loose cuttings and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is the standard penetration resistance. Standard penetration resistance, when properly evaluated, is an index to the soil's strength and density. The criteria used during this exploration are presented on the Test Boring Record Legend.

Representative portions of the soil samples, thus obtained, were placed in sealed containers and transported to the laboratory. The engineer selected samples for laboratory testing. The Test Boring Records in this Appendix provide the soil descriptions and penetration resistances.

Soil drilling and sampling equipment may not be capable of penetrating hard cemented soils, thin rock seams, large boulders, waste materials, weathered rock, or sound continuous rock. Refusal is the term applied to materials that cannot be penetrated with soil drilling equipment or where the standard penetration resistance exceeds 100 blows per foot. Core drilling is needed to determine the character and continuity of the refusal materials.

TEST BORING/PIT RECORD LEGEND

FINE AND COARSE GRAINED SOIL INFORMATION

COARSE GRAINED SOILS (SANDS & GRAVELS)

N	Relative Density
0-4	Very Loose
5-10	Loose
11-20	Firm
21-30	Very Firm
31-50	Dense
Over 50	Very Dense

FINE GRAINED SOILS (SILTS & CLAYS)

N	Consistency	Qu, KSF Estimated
0-1	Very Soft	0-0.5
2-4	Soft	0.5-1
5-8	Firm	1-2
9-15	Stiff	2-4
16-30	Very Stiff	4-8
Over 31	Hard	8+

PARTICLE SIZE

Boulders	Greater than 300 mm (12 in)
Cobbles	75 mm to 300 mm (3 to 12 in)
Gravel	4.74 mm to 75 mm (3/16 to 3 in)
Coarse Sand	2 mm to 4.75 mm
Medium Sand	0.425 mm to 2 mm
Fine Sand	0.075 mm to 0.425 mm
Silts & Clays	Less than 0.075 mm

The **STANDARD PENETRATION TEST** as defined by ASTM D 1586 is a method to obtain a disturbed soil sample for examination and testing and to obtain relative density and consistency information. A standard 1.4-inch I.D./2-inch O.D. split-barrel sampler is driven three 6-inch increments with a 140 lb. hammer falling 30 inches. The hammer can either be of a trip, free-fall design, or actuated by a rope and cathead. The blow counts required to drive the sampler the final two increments are added together and designate the N-value defined in the above tables.

ROCK PROPERTIES

ROCK QUALITY DESIGNATION (RQD)

Percent RQD	Quality
0-25	Very Poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

ROCK HARDNESS

Very Hard:	Rock can be broken by heavy hammer blows
Hard:	Rock cannot be broken by thumb pressure, but can be broken by moderate hammer blows.
Moderately Hard:	Small pieces can be broken off along sharp edges by considerable hard thumb pressure; can be broken with light hammer blows.
Soft:	Rock is coherent but breaks very easily with thumb pressure at sharp edges and crumbles with firm hand pressure.
Very Soft:	Rock disintegrates or easily compresses when touched; can be hard to very hard soil.

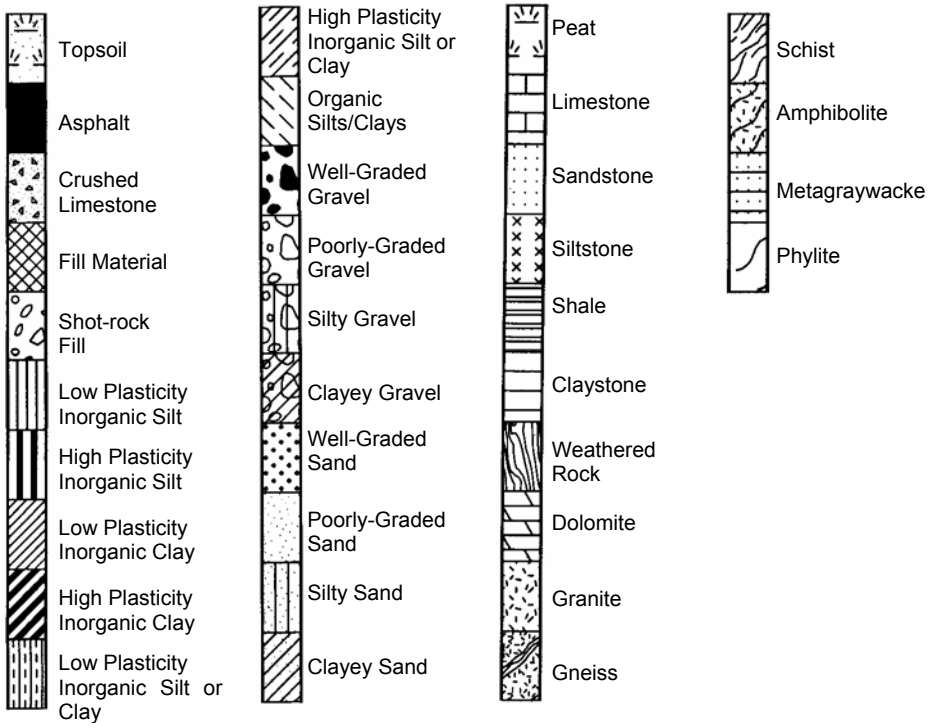
$$\text{RQD} = \frac{\text{Sum of 4 in. and longer Rock Pieces Recovered}}{\text{Length of Core Run}} \times 100 = \frac{43\ \text{RQD}}{\text{NQ}}$$

$$\text{Recovery} = \frac{\text{Length of Rock Core Recovered}}{\text{Length of Core Run}} \times 100 = \frac{\text{NQ}}{63\ \text{REC}}$$

Core Diameter	Inches
BQ	1-7/16
NQ	1-7/8
HQ	2-1/2

SYMBOLS

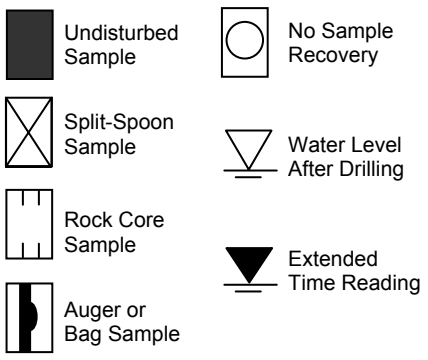
KEY TO MATERIAL TYPES



SOIL PROPERTY SYMBOLS

N:	Standard Penetration, BPF
M:	Moisture Content, %
LL:	Liquid Limit, %
PI:	Plasticity Index, %
Qp:	Pocket Penetrometer Value, TSF
Qu:	Unconfined Compressive Strength Estimated Qu, TSF
γ_D:	Dry Unit Weight, PCF
F:	Fines Content

SAMPLING SYMBOLS



S&ME
4291 Highway 58, Suite 101
Chattanooga, Tennessee 37416

TEST BORING RECORD

BORING NO.: B-1

PROJECT: Miller Park District		JOB NO: 1281-15-066	SHEET 1 OF 1
PROJECT LOCATION: Chattanooga, Tennessee			
ELEVATION: 686 feet ±	BORING STARTED: 11/10/2015	RIG TYPE: Geo-Probe	BORING DIA. (IN): 2¼
DRILLING METHOD: Hollow-Stem Augers	BORING COMPLETED: 11/10/2015	HAMMER: Automatic	

GROUNDWATER:
Dry ATD

Remarks:

G	ELEV. (FT.)	DEPTH (FT.)	MATERIAL DESCRIPTION	L	S	R	M	PI	STANDARD PENETRATION RESISTANCE (N) 0 10 20 30 40 50 60 70 80 90 100	BLOWS/6"
	686.0	0								
	685.6		0.4' TOPSOIL							
	685.0		1' GRAVEL							
			SILTY CLAY (CL) with gravel, sand, organics and foundry derived waste, yellow-brown and dark brown, firm to stiff	FILL					5	1 - 2 - 3 **(5)**
		5							5	2 - 3 - 2 **(5)**
									15	3 - 6 - 9 **(15)**
	678.5		7.5' FOUNDRY SAND (SW), black, dense						38	12 - 16 - 22 **(38)**
		10								
	673.4		*Auger refusal at 12.6 feet, boring terminated*							
		15								
		20								

BORING RECORD S&ME 1281-15-066.GPJ S&ME 12-12-2012.GDT 11/25/15

Borehole ID: B-1

Project Manager: D. Reed, PE

S&ME
4291 Highway 58, Suite 101
Chattanooga, Tennessee 37416

TEST BORING RECORD

BORING NO.: B-2

PROJECT: Miller Park District		JOB NO: 1281-15-066	SHEET 1 OF 1
PROJECT LOCATION: Chattanooga, Tennessee			
ELEVATION: 684 feet ±	BORING STARTED: 11/10/2015	RIG TYPE: Geo-Probe	BORING DIA. (IN): 2¼
DRILLING METHOD: Hollow-Stem Augers	BORING COMPLETED: 11/10/2015	HAMMER: Automatic	

GROUNDWATER:
Dry ATD

Remarks:

G	ELEV. (FT.)	DEPTH (FT.)	MATERIAL DESCRIPTION	L	S	R	M	PI	STANDARD PENETRATION RESISTANCE (N) 0 10 20 30 40 50 60 70 80 90 100 BLOWS/6"
	684.0	0	BRICKS						
	683.0	1'	SILTY CLAY (CL) with gravel, sand, brick fragments and foundry derived waste, brown, hard	FILL					>> 50/3 **(50+)**
	682.4		*Auger refusal at 1.6 feet, boring terminated*						
		5							
		10							
		15							
		20							

BORING RECORD S&ME 1281-15-066.GPJ S&ME 12-12-2012.GDT 11/25/15

Borehole ID: B-2

Project Manager: D. Reed, PE

S&ME
4291 Highway 58, Suite 101
Chattanooga, Tennessee 37416

TEST BORING RECORD

BORING NO.: B-3

PROJECT: Miller Park District		JOB NO: 1281-15-066	SHEET 1 OF 1
PROJECT LOCATION: Chattanooga, Tennessee			
ELEVATION: 686 feet ±	BORING STARTED: 11/10/2015	RIG TYPE: Geo-Probe	BORING DIA. (IN): 2¼
DRILLING METHOD: Hollow-Stem Augers	BORING COMPLETED: 11/10/2015	HAMMER: Automatic	

GROUNDWATER:
Dry ATD

Remarks:

G	ELEV. (FT.)	DEPTH (FT.)	MATERIAL DESCRIPTION	L	S	R	M	PI	STANDARD PENETRATION RESISTANCE (N) BLOWS/6"
	686.0	0							
	685.6		0.4' TOPSOIL						
			CLAYEY SILT (ML) with fine sand and gravel, dark brown, very moist to wet, soft to firm	FILL					1 - 2 - 1 **(3)**
		5							2 - 2 - 3 **(5)**
	680.0		6' FOUNDY SAND (SW), black, dense to very dense						11 - 16 - 17 **(33)**
		10							11 - 46 - 28 **(74)**
	673.3		*Auger refusal at 12.7 feet, boring terminated*						
		15							
		20							

0 10 20 30 40 50 60 70 80 90 100

BORING RECORD S&ME 1281-15-066.GPJ S&ME 12-12-2012.GDT 11/25/15

Borehole ID: B-3

Project Manager: D. Reed, PE

S&ME
4291 Highway 58, Suite 101
Chattanooga, Tennessee 37416

TEST BORING RECORD

BORING NO.: B-4

PROJECT: Miller Park District		JOB NO: 1281-15-066	SHEET 1 OF 1
PROJECT LOCATION: Chattanooga, Tennessee			
ELEVATION: 684 feet ±	BORING STARTED: 11/10/2015	RIG TYPE: Geo-Probe	BORING DIA. (IN): 2¼
DRILLING METHOD: Hollow-Stem Augers	BORING COMPLETED: 11/10/2015	HAMMER: Automatic	

GROUNDWATER:
Dry ATD

Remarks:

G	ELEV. (FT.)	DEPTH (FT.)	MATERIAL DESCRIPTION	L	S	R	M	PI	STANDARD PENETRATION RESISTANCE (N) 0 10 20 30 40 50 60 70 80 90 100	BLOWS/6"
	684.0	0	TOPSOIL							
	683.4	0.6'	SILTY CLAY (CL) with sand, gravel, brick fragments, roots and some foundry derived waste, yellow-brown and dark brown, stiff	FILL					14	4 - 7 - 7 **(14)**
	681.0	3'	CLAYEY SILT (ML), yellow-brown and brown, stiff to very stiff	RESIDUUM					14	7 - 8 - 6 **(14)**
		5							17	5 - 7 - 10 **(17)**
	675.6		*Auger refusal at 8.4 feet, boring terminated*							
		10								
		15								
		20								

BORING RECORD S&ME 1281-15-066.GPJ S&ME 12-12-2012.GDT 11/25/15

Borehole ID: B-4

Project Manager: D. Reed, PE

S&ME
4291 Highway 58, Suite 101
Chattanooga, Tennessee 37416

TEST BORING RECORD

BORING NO.: B-5

PROJECT: Miller Park District		JOB NO: 1281-15-066	SHEET 1 OF 1
PROJECT LOCATION: Chattanooga, Tennessee			
ELEVATION: 683 feet ±	BORING STARTED: 11/10/2015	RIG TYPE: Geo-Probe	BORING DIA. (IN): 2¼
DRILLING METHOD: Hollow-Stem Augers	BORING COMPLETED: 11/10/2015	HAMMER: Automatic	

GROUNDWATER:
Dry ATD

Remarks:

G	ELEV. (FT.)	DEPTH (FT.)	MATERIAL DESCRIPTION	L	S	R	M	PI	STANDARD PENETRATION RESISTANCE (N) BLOWS/6"
	683.0	0	TOPSOIL						
	682.4	0.6'	SILTY CLAY (CL) with gravel and sand, yellow-brown, stiff	FILL					3 - 4 - 7 **(11)**
	680.0	3'	SILTY CLAY (CL) with sand, gravel and foundry derived waste, yellow-brown and dark brown, hard						15 - 22 - 17 **(39)**
	677.7	5	*Auger refusal at 5.3 feet, boring terminated*						

Borehole ID: B-5

Project Manager: D. Reed, PE

S&ME
4291 Highway 58, Suite 101
Chattanooga, Tennessee 37416

TEST BORING RECORD

BORING NO.: B-6

PROJECT: Miller Park District		JOB NO: 1281-15-066	SHEET 1 OF 1
PROJECT LOCATION: Chattanooga, Tennessee			
ELEVATION: 681 feet ±	BORING STARTED: 11/10/2015	RIG TYPE: Geo-Probe	BORING DIA. (IN): 2¼
DRILLING METHOD: Hollow-Stem Augers	BORING COMPLETED: 11/10/2015	HAMMER: Automatic	

GROUNDWATER:
Dry ATD

Remarks:

G	ELEV. (FT.)	DEPTH (FT.)	MATERIAL DESCRIPTION	L	S	R	M	PI	STANDARD PENETRATION RESISTANCE (N) 0 10 20 30 40 50 60 70 80 90 100	BLOWS/6"
	681.0	0	TOPSOIL							
	680.4	0.6'	SILTY CLAY (CL) with gravel, sand and brick fragments, brown and yellow-brown, very stiff — FILL						16	4 - 7 - 9 **(16)**
	677.0	4'	CLAYEY SILT (ML) and LIMESTONE FRAGMENTS, brown and gray, very stiff — RESIDUUM						26	4 - 11 - 15 **(26)**
	675.2	5	*Auger refusal at 5.8 feet, boring terminated*							
		10								
		15								
		20								

BORING RECORD S&ME 1281-15-066.GPJ S&ME 12-12-2012.GDT 11/25/15

Borehole ID: B-6

Project Manager: D. Reed, PE

Appendix III

Laboratory Test Procedures

Laboratory Test Results

NATURAL MOISTURE
ASTM D 2216, EM 1110-2-1906

The moisture content of soils is an indicator of various physical properties, including strength and compressibility. Selected samples obtained during exploratory drilling were taken from their sealed containers. Each sample was weighed and then placed in an oven heated to 110oC + 5o. The sample remained in the oven until the free moisture had evaporated. The dried sample was removed from the oven, allowed to cool, and re-weighed. The moisture content was computed by dividing the weight of evaporated water by the weight of the dry sample. The results, expressed as a percent, are shown on the attached Laboratory Test Results Summary.

ATTERBERG LIMITS DETERMINATION
ASTM D 4318/AASHTO T89/T90

Representative samples were subjected to Atterberg limits testing to determine the soil's plasticity characteristics. The plasticity index (PI) is the range of moisture content over which the soil deforms as a plastic material. The liquid limit (LL) marks the transition from the plastic state to the liquid state. The plastic limit (PL) marks the transition from the plastic state to the solid state.

To determine the liquid limit, a soil specimen is wetted until it is in a viscous fluid state. A portion of this soil is then placed in a brass cup of standardized dimensions, and a groove made through the middle of the soil specimen with a grooving tool of standardized dimensions. The cup is attached to a cam that lifts the cup 10 mm, and then allows the cup to fall and strike a rubber base of standardized hardness. The cam is rotated at about 2 drops per second until the two halves of the soil specimen come in contact at the bottom of the groove along a distance of 13 mm. The number of blows required to make this degree of contact is recorded, and a portion of the specimen is subjected to a moisture content determination. Additional water is added to the remainder of the specimen, and the grooving process and cam action process repeated. This testing sequence is repeated until the soil flows as a heavy viscous fluid. The number of blows vs. moisture content is then plotted on semi-logarithmic graph paper, and the moisture content corresponding to 25 blows is designated the liquid limit.

The plastic limit is the lowest moisture content at which the soil is sufficiently plastic to be manually rolled into threads 3 mm in diameter. It is determined by taking a pat of soil remaining from the liquid limit test, and repeatedly rolling, kneading, and air drying the specimen until the soil breaks into threads about 3 mm in diameter and 3 to 10 mm long. The moisture content of these soil threads is then determined, and is designated the plastic limit. The results of these tests are presented on the Laboratory Test Results Summary.

Miller Park District
Chattanooga, Tennessee
S&ME Project No. 1281-15-066

Laboratory Test Results Summary

Boring Number	Sample Type	Sample Depth (ft)	Moisture Content (%)	ATTERBERG LIMITS		
				Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
B-1	SPT	1	22.2			
B-1	SPT	3½	20.8	39	23	16
B-1	SPT	6	17.1			
B-1	SPT	8½	12.5			
B-4	SPT	1	15.7			
B-4	SPT	3½	16.1	32	19	13
B-4	SPT	6	17.4			
B-5	SPT	1	17.2			
B-5	SPT	3½	12.6			

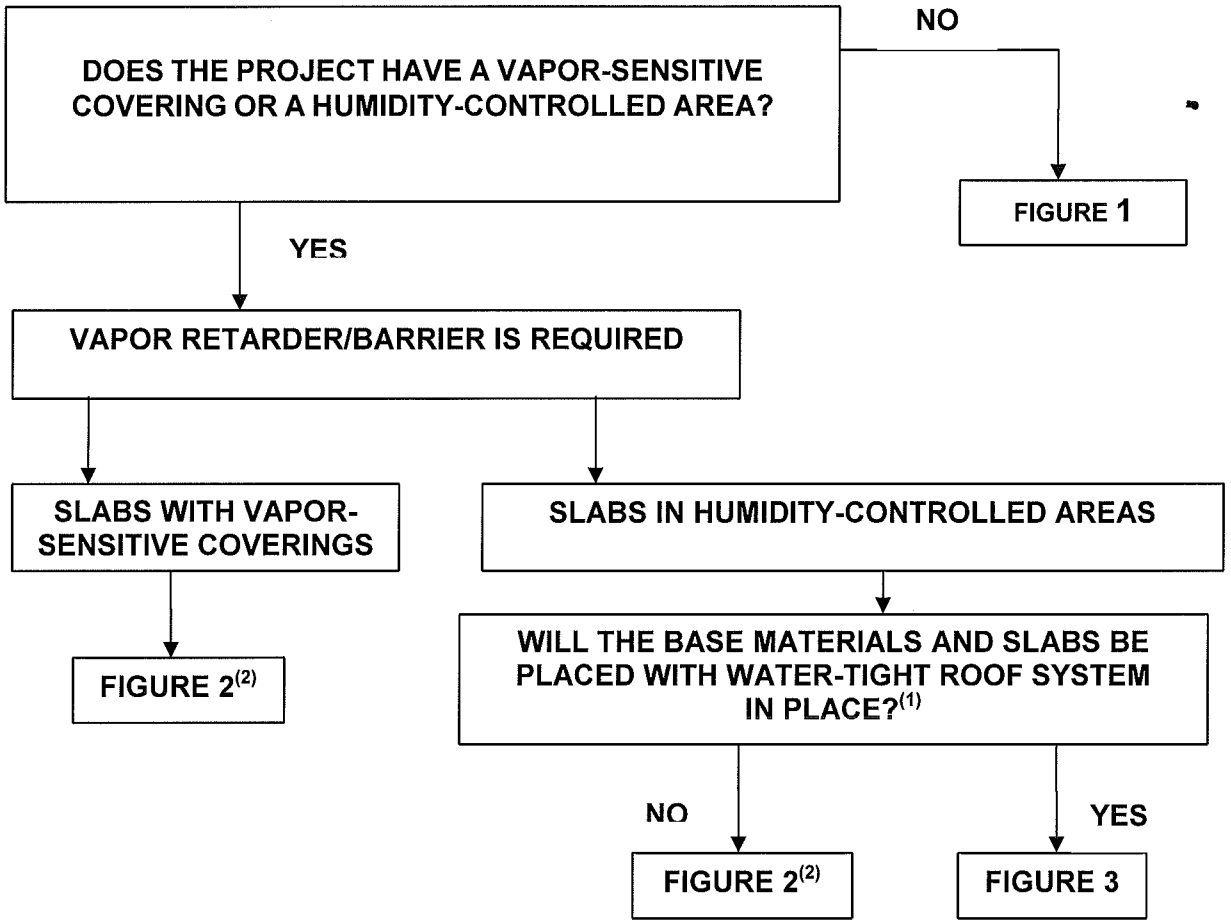
SPT – Standard Penetration Test Sample

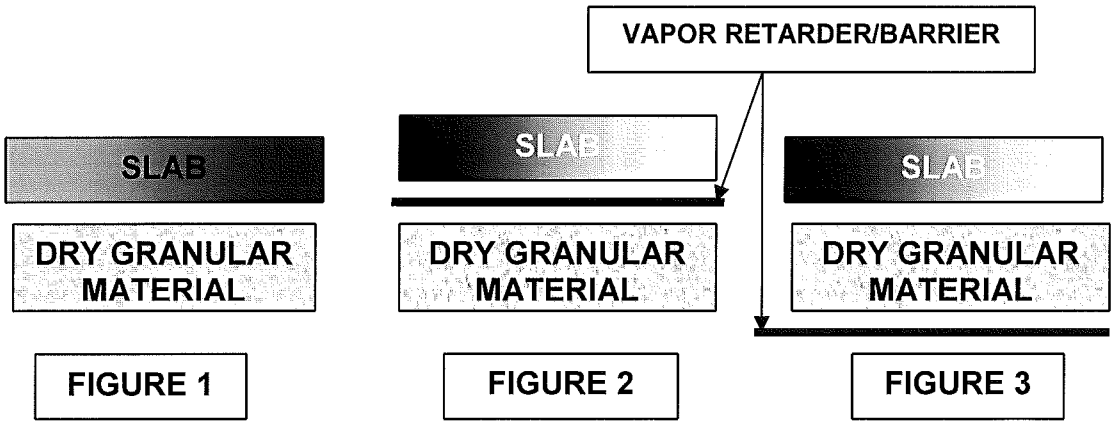
Appendix IV

ACI 302.1R-04 Guide for Concrete Floor and Slab Construction

Important Information about Your Geotechnical Engineering Report

ACI 302.1R-04
DECISION FLOW CHART FOR LOCATION OF VAPOR RETARDER/BARRIER





NOTES:

(1) IF GRANULAR MATERIAL IS SUBJECT TO FUTURE MOISTURE INFILTRATION, USE FIGURE 2.

(2) IF FIGURE 2 IS USED, A REDUCED JOINT SPACING, A LOW SHRINKAGE MIX DESIGN, OR OTHER MEASURES TO MINIMIZE SLAB CURL WILL LIKELY BE REQUIRED.

Important Information About Your Geotechnical Engineering Report

Variations in subsurface conditions can be a principal cause of construction delays, cost overruns and claims. The following information is provided to assist you in understanding and managing the risk of these variations.

Geotechnical Findings Are Professional Opinions

Geotechnical engineers cannot specify material properties as other design engineers do. Geotechnical material properties have a far broader range on a given site than any manufactured construction material, and some geotechnical material properties may change over time because of exposure to air and water, or human activity.

Site exploration identifies subsurface conditions at the time of exploration and only at the points where subsurface tests are performed or samples obtained. Geotechnical engineers review field and laboratory data and then apply their judgment to render professional opinions about site subsurface conditions. Their recommendations rely upon these professional opinions. Variations in the vertical and lateral extent of subsurface materials may be encountered during construction that significantly impact construction schedules, methods and material volumes. While higher levels of subsurface exploration can mitigate the risk of encountering unanticipated subsurface conditions, no level of subsurface exploration can eliminate this risk.

Scope of Geotechnical Services

Professional geotechnical engineering judgment is required to develop a geotechnical exploration scope to obtain information necessary to support design and construction. A number of unique project factors are considered in developing the scope of geotechnical services, such as the exploration objective; the location, type, size and weight of the proposed structure; proposed site grades and improvements; the construction schedule and sequence; and the site geology.

Geotechnical engineers apply their experience with construction methods, subsurface conditions and exploration methods to develop the exploration scope. The scope of each exploration is unique based on available project and site information. Incomplete project information or constraints on the scope of exploration increases the risk of variations in subsurface conditions not being identified and addressed in the geotechnical report.

Services Are Performed for Specific Projects

Because the scope of each geotechnical exploration is unique, each geotechnical report is unique. Subsurface conditions are explored and recommendations are made for a specific project. Subsurface information and recommendations may not be adequate for other uses. Changes in a proposed structure location, foundation loads, grades, schedule, etc. may require additional geotechnical exploration, analyses, and consultation. The geotechnical engineer should be consulted to determine if additional services are required in response to changes in proposed construction, location, loads, grades, schedule, etc.

Geo-Environmental Issues

The equipment, techniques, and personnel used to perform a geo-environmental study differ significantly from those used for a geotechnical exploration. Indications of environmental contamination may be encountered incidental to performance of a geotechnical exploration but go unrecognized. Determination of the presence, type or extent of environmental contamination is beyond the scope of a geotechnical exploration.

Geotechnical Recommendations Are Not Final

Recommendations are developed based on the geotechnical engineer's understanding of the proposed construction and professional opinion of site subsurface conditions. Observations and tests must be performed during construction to confirm subsurface conditions exposed by construction excavations are consistent with those assumed in development of recommendations. It is advisable to retain the geotechnical engineer that performed the exploration and developed the geotechnical recommendations to conduct tests and observations during construction. This may reduce the risk that variations in subsurface conditions will not be addressed as recommended in the geotechnical report.

Report of
Limited Phase II Environmental
Site Assessment
Miller Park
928 South Market Street
Chattanooga, Tennessee
S&ME Project No. 4181-15-036A

Prepared for:
City of Chattanooga-Department of Public Works-Engineering Division
274 East 10th Street
Chattanooga, Tennessee 37402

Prepared by:
S&ME, Inc.
4291 Highway 58, Suite 101
Chattanooga, TN 37416

December 10, 2015

December 10, 2015

City of Chattanooga-Department of Public Works-Engineering Division
274 East 10th Street
Chattanooga, Tennessee 37402

Attention: Mr. Dennis Malone

Reference: **Report of Limited Phase II Environmental Site Assessment**
Miller Park – 928 Market Street
Chattanooga, Tennessee
S&ME Project No. 4181-15-036A

Dear Mr. Malone:

S&ME, Inc. (S&ME) is pleased to submit this report of the Limited Phase II Environmental Site Assessment (ESA) for the Miller Park located 928 Market Street in Chattanooga, Hamilton County, Tennessee. This report discusses background information, assessment purpose and scope of services, execution of work, conclusions, and recommendations for the subject property.

This report is intended for the use of the City of Chattanooga-Department of Public Works, only. The services reported in this Limited Phase II ESA were performed in general accordance with S&ME Proposal No. 41-1500390 CO1R, dated October 27, 2015 and formally authorized by Mr. Dennis Malone of City of Chattanooga-Department of Public Works on October 28, 2015.

Mr. Malone, we appreciate your selection of S&ME for this project and look forward to assisting you on future projects. If you have any questions, please do not hesitate to contact either of the undersigned.

Sincerely,

S&ME, Inc.

Pat Gribben, PG
Staff Geologist

Johanna Heywood, PE, PG
Senior Environmental Engineer

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Appendices

Appendix A

Soil Boring Logs with Well Construction Details, Groundwater Data Sheets, and Soil Gas Field Log

Appendix B

Laboratory Analytical Results and Chain of Custody Documentation

Executive Summary

The City of Chattanooga-Department of Public Works has authorized S&ME, Inc. (S&ME) to perform a Limited Phase II Environmental Site Assessment (ESA) for Miller Park, "subject property", located at 928 Market Street in Chattanooga, Hamilton County, Tennessee (subject property). We understand these activities were requested to reduce uncertainty regarding previously identified onsite and offsite *recognized environmental conditions* prior to commencement of planned improvements at the subject property.

The subject property consists of Miller Park, located at 928 South Market Street, and includes the five lanes of West Martin Luther King Boulevard to the north. The subject property is bound to the north by Miller Plaza; to the east by Georgia Avenue; to the south by East 10th Street; and to the west by South Market Street. Surrounding properties are consistent with downtown settings, and primarily include multi-story, private and government office buildings, with occasional multi-story, residential structures.

Historical information reviewed indicates that the subject property parcels have been commercially developed since at least the late 1800s. Review of available historical sources identified numbers *recognized environmental conditions* based on the historical operations of dry cleaners on the subject property and adjoining the subject property to the north, west, and south. Additional subject property use included several exterminating companies and a gas tank. Additional surrounding properties of concern included historical petroleum-related operations to the east, south and southwest.

S&ME's Phase I ESA concluded that additional information, including subsurface exploration, was warranted to better understand the potential presence of petroleum or hazardous substances associated with or attributable to the identified *recognized environmental conditions*.

Based on the Phase I ESA findings and recommendations, together with the communicated objectives provided by the City of Chattanooga, S&ME proposed and was authorized to conduct a Limited Phase II ESA. The authorized scope of assessment included installation of eight soil borings and conversion of up to three soil borings to temporary monitoring wells to allow for collection of soil and groundwater samples as well as the installation of seven soil gas sampling points to allow for active collection of soil gas.

S&ME's conclusions, based on the results of field activities and laboratory analytical results documented in this Limited Phase II ESA and in consideration of our understanding of your objectives, are summarized as follows:

This assessment, has identified the presence of petroleum-related or hazardous substances in soil, groundwater, and soil gas. Site conditions as defined by this assessment are not unexpected conditions, given the history (over a century of developed use) and nature of historical dry cleaning operations at and nearby the subject property. Given the history of the site (early developed use and varied commercial uses) as well as limitations related to boring locations (no borings within the street right of way), it should not be unexpected that areas of higher concentrations may be encountered in other locations not sampled.

Soil

No VOCs, PAHs, EPH or pesticides were identified in excess of the corresponding comparison criteria in the eight soil samples submitted for analysis. With the exception of arsenic detected in in each of the eight soil samples (B-2, B-4, B-5, B-6, B-7, B-8, B1(GEO), and B3(GEO)) analyzed for RCRA metals, detected concentrations did not exceed corresponding comparison criteria.

- In the case of arsenic, while above the corresponding commercial screening level, the detected concentrations are within the range of concentrations typically considered representative of naturally occurring concentrations in Hamilton County, Tennessee.
- Based on the observation of foundry sand in geotechnical borings installed in the northeastern region of the site, future disturbance of this area should be managed under the observation of an environmental professional and using best management practices, including implementation of measures that will reduce the potential for contact with foundry sand such as placement under 18 to 24 inches of clean soil cap, or below hardscaping. If foundry derived material is intended for offsite disposal, foundry derived material and soil commingled with foundry derived materials will require approval to dispose as Special Waste. Additional analysis may be necessary to determine actual concentrations within a stockpiled volume. Once redevelopment plans and final grading plans have been completed, a soil management plan should be prepared to outline best management practices to address disposal and minimize worker exposure in the event these areas are disturbed.

Groundwater

No detectable concentrations of VOCs or PAHs were identified in excess of the laboratory detection limit. Three RCRA metals (barium, lead and mercury) were identified in the excess of the laboratory detection limit in groundwater samples collected from B-1C and B-3. With the exception of mercury, none of the detected constituents exceeded the corresponding comparison criteria.

- In the case of mercury, the detected concentration exceeded the corresponding RSLtap but not the MCL.

Soil Gas

With the exception of two volatile organic compounds (VOCs), benzene and chloroform, detected in two of seven soil gas samples (SG-5 and SG-7), detected concentrations did not exceed corresponding comparison criteria. In each case where detected above a corresponding comparison criteria, the detected concentration exceeded the corresponding residential screening level, but was below the corresponding commercial screening level.

Based on the magnitude of detected concentrations and our understanding that intended use as a park with commercial-type use of structures (excludes residential use), analytical results do not indicate vapor intrusion risk above 1×10^{-6} under a commercial use scenario. Additional assessment of soil gas does not appear warranted. Should the City's redevelopment objectives change, to allow for residential use, additional evaluation would be warranted.

This summary is for convenience only and should not be relied upon without first reading the full contents of this report, including the appendix materials.

1.0 INTRODUCTION

1.1 Purpose

S&ME understands these activities were requested prior to commencement of planned renovations and redevelopment of the subject property. The purpose of this Phase II ESA was to reduce uncertainty regarding the potential presence of petroleum products or hazardous substances associated with certain specified recognized environmental conditions and/or business environmental risk[1] in connection with the subject property. With respect to the former, this assessment was intended to assist the user in satisfying the applicable standard of "all appropriate inquiry" by providing information that may help to support one of the threshold criteria for satisfying one or more defenses to Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) landowner liability protections (LLPs[2]). With respect to the latter, this assessment was also intended to assist the user in gathering reliable information about the environmental condition of the subject property to guide the user's business decisions.

1.2 Client's Objectives

S&ME understands the objective of the Limited Phase II ESA is to reduce uncertainty regarding the potential presence of petroleum and/or hazardous substances at the subject property resulting from the *recognized environmental conditions* identified above.

S&ME's understanding of project is based on information provided by Mr. Eric Booker and Mr. Dennis Malone via email correspondence July 20, 2015 and during a telephone conversation with Ms. Johanna Heywood of S&ME on July 31, 2015. Mr. Malone indicated that the City of Chattanooga is in the planning stages of designing improvements for Miller Park. The proposed project involves the construction of two new pavilions in conjunction with new renovations to the Miller Plaza District. The Café Pavilion is an approximately 4,300 square foot, triangular structure that will be located at the southwest corner of Georgia Avenue and Martin Luther King Jr. Boulevard. This pavilion will be comprised of an enclosed café and covered outdoor seating. The Stage Pavilion will be located at the southern perimeter of the district, between Market Street and Georgia Avenue, and to the north of E 10th Street. The Stage Pavilion will be comprised of a covered stage and an enclosed 450 square foot mechanical room and kiosk.

The objective of the Limited Phase II Environmental Site Assessment (ESA) is to reduce uncertainty regarding the potential for impact to the subject property resulting from the *recognized environmental conditions* identified above. S&ME further understands that depending on the findings of the Limited Phase II ESA, the City of Chattanooga may desire to enroll the property into the Tennessee Department of Environment and Conservation (TDEC) Brownfield Voluntary Program.

[1] These terms are defined by the American Society for Testing and Materials (ASTM) Designation E1527-13. It is assumed that the user is familiar with these terms and has access to both referenced standards 1527 and 1903. If copies are required, they may be secured from S&ME upon request.
[2] Innocent landowner, contiguous property owner, or bona fide prospective purchaser, see CERCLA (1980), SARA (1986), "Lender Liability Act" (1996), and "Brownfields Amendments" (2001).

1.3 Special Terms and Conditions

The services included in this Limited Phase II ESA were performed in general accordance with S&ME Proposal No. 41-1500390 CO1R, dated October 27, 2015 and formally authorized by Mr. Dennis Malone of City of Chattanooga-Department of Public Works on October 28, 2015.

1.4 Limitations and Exceptions of Assessment

This report and the assessment activities on which it is based were intended for the purposes set out in Section 1.1 and are specific to the objectives and approach presented in Sections 1.2 and 1.3. This work does not necessarily include the level of specificity required of technical standards that govern full characterization of the environmental conditions of the subject property. Moreover, the assessment objectives were specific to those identified by the City of Chattanooga-Department of Public Works and may not be appropriate to the needs or business objectives of others. Furthermore, this scope did not include (and was not intended to include) the level of detail and assessment effort (and corresponding cost) necessary to meet the specific requirements of environmental regulatory authorities that may have jurisdiction over the subject property.

1.5 Limiting Conditions and Methodology Used

This report is an instrument of service of S&ME. The report was prepared for and is intended for the exclusive use of the City of Chattanooga-Department of Public Works. The report contents may not be relied upon by any party other than the City of Chattanooga-Department of Public Works without the express written permission of S&ME. The scope of services was not intended to provide the information needed to completely establish the quantity or extent of impacted media present at the site or to determine the cost of remediating the site. The scope of services S&ME implemented was based, in part, on rules and regulations that S&ME understood to be current or expected at the time S&ME developed its proposal. Changes in regulations, interpretations, and/or enforcement policies may occur at any time and such changes could affect the need for and extent of remediation, if required. Any additional information about this site that becomes available should be provided to S&ME for its review, so S&ME can modify its recommendations as necessary.

The findings and conclusions presented in this report are based on conditions encountered at the locations sampled on the dates of S&ME's investigations and should not be relied upon to precisely represent conditions at any other time. S&ME's findings and conclusions included in this report are based on S&ME's observations of existing site conditions and the results of a limited program of subsurface exploration, sample screening, and chemical testing. Except as may have been measured by groundwater elevation or other quantifiable data; the primary direction of groundwater flow was assumed to be dictated by topography. Additionally, except as may have been measured by lateral delineation based on quantifiable data, the groundwater flow direction was assumed to control the distribution of impact, if present. The concentration of contaminants measured may not be representative of conditions between locations sampled. Recognize that conditions may change at any sampled or un-sampled location as a function of time in response to natural conditions, chemical reactions, and/or other events, including but not limited to altering site grades and other redevelopment activities. Boring locations were limited by active driving lanes of Martin Luther King Boulevard, and the facility and utility configuration and layout. Conclusions about site conditions under no circumstances comprise a warranty that conditions in all areas within the site are of the same condition as those sampled.

S&ME's professional services have been performed using that degree of care and skill ordinarily exercised, under similar conditions, by reputable environmental consultants undertaking similar studies and practicing in this locality. No other warranty; express or implied, is intended or made with respect to this report or S&ME's services. This assessment was not exhaustive and users of this report should consider the scope and limitations of, and related to, these services when developing their opinions as to environmental risks associated with the subject property.

2.0 Background

The subject property, identified as Tax Parcel 145DD A 002, consists of Miller Park, located at 928 South Market Street, and includes 1.3 acres of municipal parkland and the five lanes of West Martin Luther King Boulevard to the north. The subject property is bound to the north by Miller Plaza; to the east by Georgia Avenue; to the south by East 10th Street; and to the west by South Market Street. Surrounding properties are consistent with downtown settings, and primarily include multi-story, private and government office buildings, with occasional multi-story, residential structures. Figure 1 depicts the location of the subject property on a USGS topographic map.

The City of Chattanooga is currently in the planning stages of designing improvements for Miller Park. The proposed project involves the construction of two new pavilions in conjunction with new renovations to the Miller Plaza District. The Café Pavilion is an approximately 4,300 square foot, triangular structure that will be located at the southwest corner of Georgia Avenue and Martin Luther King Jr. Boulevard. This pavilion will be comprised of an enclosed café and covered outdoor seating. The Stage Pavilion will be located at the southern perimeter of the district, between Market Street and Georgia Avenue, and to the north of E 10th Street. The Stage Pavilion will be comprised of a covered stage and an enclosed 450 square foot mechanical room and kiosk.

S&ME's Phase I ESA dated September 2015 identified the following as *recognized environmental conditions:*

Subject Property

- Historical operation of a dry cleaning facility (Handcraft One Hour Cleaners) located at 904 Market Street, from at least 1960 to 1970.
- Historical operation of Exterminating Companies on subject property.
  - Chattanooga Exterminating Co. / Terminix located at 912 Market Street from at least 1938 to 1945.
  - Orkin Exterminating Co. located on subject property at 924 Market Street from at least 1938 to 1945.
- Historical operation of printing company (Long Printing Co.) located at 906 Market Street in at least 1938.
- Historical operation of gas tank on subject property at former City Water Co., located at 928 Market Street in at least 1917.

Surrounding Properties

- Historical offsite land use west and southwest of the subject property to include:
  - Former Civic Forum Redevelopment site located at 1001 Market Street, identified in the US Brownfields and FINDS databases.
  - The Former One Hour Valet (dry cleaning) site located at 921 Market Street, identified in the VCP and Priority Cleaners databases.
- Historical offsite land use north of the subject property.
  - Former George's Cleaners facility located at 838 Market Street from at least 1950 to 1955.
- Historical offsite land use east of the subject property.
  - Historical operations on east adjoining property including rail activities and gas tank at Chattanooga Transfer & Storage Co., in at least 1917.
  - Chattanooga Communications / AT&T facility located at 919 Lindsay Street, identified in the LUST, HIST LUST, UST, HIST UST, and RCRA-NonGen databases.
  - Volunteer Garage facility located at 822-24 Lindsay Street, identified in the LUST, UST, and HIST UST databases.
  - Former Top Hat Cleaners facility located at 200 East 9th Street/East M.L. King Blvd. from at least 1960 to 1973.
- Historical offsite land use south of the subject property.
  - Former Model Dry Cleaning Co. located at 1004 Market Street from at least 1938 to 1941.

S&ME concluded that additional information, including subsurface exploration, was warranted to better understand the potential presence of petroleum or hazardous substances associated with or attributable to the identified *recognized environmental conditions*. S&ME proposed and was authorized to perform a Limited Phase II ESA at the subject property. Figure 2, referenced as Site Location with Identified RECs is included following the text of this report.

2.1 Physical Setting

2.1.1 Surface Drainage

S&ME reviewed the United States Geological Survey (USGS) 7.5-minute series Chattanooga Tennessee topographic quadrangle map, dated 1976 and photo revised from 1969, to examine the topography and drainage of the subject property and vicinity. Figure 1, following the text of this report, depicts the subject property with a slight downslope to the west consistent with surrounding properties to the north, east, and south. The surrounding properties to the west appear to slope to the southwest toward the Tennessee River/Nickajack Reservoir, located approximately 1-mile west of the subject property. The surface elevation of the subject property is approximately 680 feet above the National Geodetic Vertical Datum presented on the topographic map reviewed. Based on observations during the site visit, surface drainage around the subject property appears to drain to the west-northwest.

2.1.2 Geologic Setting

Chattanooga, Tennessee is located in the Appalachian Valley and Ridge Physiographic Province. Elongated ridges that trend in a northeast-southwest direction characterize this province. The ridges are

typically formed on highly resistant sandstones and shales, while the valleys and rolling hills are formed on less resistant limestone, dolomite, and shales.

Based on our review of the Geologic Map of the Chattanooga Quadrangle, dated 1964, undifferentiated bedrock of the Knox Group underlies the site. The Knox Group is composed of various dolomite and siliceous limestone members. The rock is generally medium to dark gray, very hard, fine to coarsely crystalline rock. Residual soils derived from the Knox Group are typically red-brown to yellow-brown clays with locally heavy amounts of chert fragments. The strata of the Knox formations weather to form a thick cherty overburden typically in excess of 40 feet thick.

Limestone and dolomite, such as the strata underlying this site, are of great geologic age and have been subject to solution weathering over geologic time. Rainwater falling onto the surface and percolating downward through the soil and into cracks and fissures gradually dissolves the rock, producing insoluble impurities such as chert and clay. Since limestone and dolomite vary greatly in their resistance to weathering, the soil/bedrock contact may be extremely irregular. More soluble bedrock develops a thicker soil cover and a more irregular bedrock surface with pinnacles and slots, and less soluble bedrock usually develops a thinner soil cover and a less irregular soil-bedrock surface.

These large variations in bedrock depth are greatly enhanced by the presence of fractures, bedding planes, and faults, which provide an increased opportunity for a greater influx of percolating water. The weaknesses may form clay-filled cavities or enlarge into caves and may be connected by a network of passageways. If a cave forms close to the bedrock surface, its roof may collapse and the overlying soils may erode into the cave. Once the weight of the overlying soil exceeds the soil's arching strength, the soil collapses and an open hole or depression may appear at the ground surface. Such a feature is termed a sinkhole.

There is always some risk associated with developing any site underlain by carbonate bedrock. However, we have reviewed the USGS quadrangle map for this area. The map does not show a pattern of closed depressions that would indicate past sinkhole activity in near proximity to the site. We also observed successful development in the surrounding area. Therefore, we believe the risk of sinkhole development for this project is no greater than for surrounding successfully developed sites.

Soils encountered at the time of drilling activities at shallow and near surface intervals generally were observed to be fill soils characterized as orange brown silty clays and clayey silts with rock fragments and minor amounts of brick and concrete debris and traces of coal. Native residual soils characterized as brown, orange brown and yellow brown silty clays with limestone fragments generally were observed at depths ranging from near surface to 11.5 feet below ground surface transitioning to weathered limestone bedrock. Boring refusal was encountered in each of the soil borings at depths ranging from 2.6 to 20 feet below ground surface (bgs).

2.1.3 Groundwater

The soils in East Tennessee, including the site, generally are of insufficient thickness or permeability to provide a drinking water source. Perched ground water is often trapped at the soil/rock interface, but is generally of insufficient quantity or quality for domestic purposes. It is important to note that groundwater in the Valley and Ridge Physiographic Province is most often confined to cracks and fissures

in the limestone bedrock. Therefore, absolute flow direction cannot be determined without extensive investigation of depths to ground water at a particular site.

Shallow groundwater generally flows in directions sub-parallel to the ground surface slopes and under the influence of gravity toward points of discharge such as creeks, swamps, drainage swales, or pumped groundwater wells. Based upon review of the topographic map, it appeared that the groundwater flow direction in the uppermost water-bearing unit across the subject property is generally to the west-northwest toward the Tennessee River / Nickajack Lake. As noted, the determination of actual groundwater flow direction requires the collection of site-specific groundwater elevation data, which is beyond the scope of this assessment.

Shallow ("perched") groundwater often is encountered at or near the top of bedrock but, as a result of low permeability, typically is not used as a source of drinking water. Perched water levels will vary and will depend upon seasonal moisture fluctuations and local waterway levels. However, shallow groundwater may not be representative of conditions encountered in deeper groundwater found in bedrock.

Five of thirteen boring locations (B-1C, B-2, B-3, B-4, and B-7) were converted to temporary monitoring wells during Limited Phase II ESA activities. Static water-level readings were collected at the time of and following completion activities. Measurable groundwater was encountered in three of five temporary monitoring wells installed. Depth to water at temporary well locations ranged from 7.3 feet bgs at B-1C (northwest portion of the site near the intersection of West Martin Luther King Boulevard and Market Street) to 11.8 feet bgs at B-7 (along the eastern site boundary at Georgia Avenue).

Groundwater was encountered at the time of drilling at B-6 (south-central portion of the site) at approximately 5 feet bgs; however, based on the saturated soils conditions in the area of the boring at the time of field activities this is likely representative of shallow soil saturation from recent rain events.

3.0 Limited Phase II ESA Activities

3.1 Scope of the Assessment

Based on the identified conditions and in consideration of the Client's stated objectives, S&ME proposed to assess the *recognized environmental conditions* identified in Section 2 by subsurface exploration. Soil borings, temporary monitoring wells, and soil gas sample location points were installed to allow for sampling and analysis of environmental media at the subject property at locations in proximity to current and historical operations/features identified as representing *recognized environmental conditions*. On-site assessment is intended to identify the presence and general magnitude of the presence of petroleum and hazardous substances in soil and groundwater and volatile organic compounds in soil gas at concentrations exceeding corresponding Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) for detected chemical concentrations in soil, groundwater, and soil gas.

The scope of work developed for this task is based on our previously-stated understanding of client objectives, as described below:

- Written Health and Safety Plan;
- Installation of thirteen soil borings;
- Conversion of five of the soil borings to temporary monitoring wells;

- Installation and sample collection from seven soil gas sample location points;
- Collection and laboratory analysis of soil, groundwater, and/or soil gas samples as presented in Table 1 below;
- Preparation of a written report documenting the field activities and results of analysis.

Deviations, if encountered during the course of this assessment and material to and/or changes to the scope of work presented above, are presented in Section 3.1.4.

3.1.1 Health and Safety and Utilities

Prior to the field activities reported herein, S&ME prepared a project specific Health and Safety Plan. That plan contains specific standard work practices and precautions intended to prevent or minimize exposures to S&ME's personnel and to the general public. In accordance with that plan, S&ME exercised caution to prevent damage to or resulting from encountering subsurface structures, utilities, or other obstacles that were identified to us.

We contacted local public utility providers through a standard state-required one-call system and advised onsite contact personnel of our planned boring locations for their approval prior to the subsurface exploration.

3.1.2 Conceptual Site Model and Sampling Plan

S&ME proposed a Limited Phase II sampling plan based on the conceptual site model summarized below in order to identify the detectable presence of suspect contaminants in environmental media, if present.

Historical onsite land uses of concern consisted of historical operations of dry cleaners, printers, USTs and exterminators, while historical offsite land uses of concern consisted of historical operations of rail yards, filling stations, and bus depots to the west and southwest; rail yards, USTs and dry cleaners to the east; and dry cleaners to the south). The subject property and surrounding properties areanticipated to be underlain by shallow groundwater. Therefore, a potential release of petroleum and hazardous substances from on-site was considered most likely to be detectable in soil below or in the immediate vicinity of features of concern or in shallow groundwater. A potential and/or petroleum and hazardous substances migrating from off-site facilities was considered most likely to have migrated through (and be detectable in) shallow groundwater or soil gas at the boundary nearest the facility of concern and the subject property. We note that based on the physical and chemical characteristics of halogenated solvent-based compounds, which are heavier than water, contamination resulting from operations using solvents are typically found near the soil/rock or soil/other confining layer interface. Potential impact to shallow groundwater and soil source impacts at onsite and adjoining historical facilities of concern have the potential to result in a vapor encroachment condition. Additionally, given the historical uses of foundry-derived waste as shallow fill materials in the downtown Chattanooga area, the potential exists for foundry waste to be present in shallow fill soils at the subject property.

S&ME proposed a sampling plan to detect the potential presence of petroleum products and hazardous substances in shallow soil, soil gas, and groundwater at the sampling locations listed in the table below. The laboratory analyses and method numbers for the soil and groundwater sampling approved for the subject property, along with the corresponding sample IDs and depths, as submitted to the laboratory are summarized in the tables below.

Summary of Sample Locations and Rationale					
Boring ID	**No. and type of samples**	**Location**	**Analyses**	**Sample Depth**	**Comments/ Rationale**
B-1C	1 soil	Northwest portion of the subject property	VOCs, PAHs and EPH	5 to 8.2 feet	Assess potential soil and groundwater impact for onsite and offsite historical dry cleaner and filling station operations
	1 groundwater		VOCs, PAHs and RCRA metals	N/A	
B-2	1 soil	Along the western site boundary	VOCs, PAHs, EPH and RCRA metals	17.5 to 20 feet	Assess potential impact to soil from historical onsite operations of printers and historical offsite operations of dry cleaners
B-3	1 soil		VOCs, PAHs and EPH	5 to 7.5 feet	Assess potential impact to soil and groundwater from historical onsite operations of exterminators and historical offsite operations of dry cleaners
	1 groundwater		VOCs, PAHs and RCRA metals	N/A	
B-4	1 soil	Southwest corner of the subject property	VOCs, PAHs, EPH and RCRA metals	17.5-18.1 feet	Assess historical onsite operations of USTs and historical offsite dry cleaners to the south
B-5	1 soil	Southeast corner of the subject property	VOCs, PAHs, EPH and RCRA metals	0.3 to 2.6 feet	
B-6	1 soil	South-central portion of the property	VOCs, PAHs, EPH and RCRA metals	0.5 to 5.3 feet	Assess for potential shallow soil impact from historical onsite operation of the former City Water Company
B-7	1 soil	Along the eastern site boundary	VOCs, PAHs, EPH, Pesticides and RCRA metals	10 to 12.5 feet	Assess for potential soil and groundwater impact from historical onsite operations of exterminators and historical offsite rail yards, USTs, and dry cleaners
	1 groundwater		VOCs	N/A	
B-8	1 soil	North-central portion of the subject property	VOCs, PAHs, EPH and RCRA metals	0.8 to 2.5 feet	Assess for potential shallow soil impact
B1 (GEO) [1]	1 soil	Northeastern portion of the subject property	RCRA metals	8.5 to 10 feet	Assess potential for impacted foundry-derived waste fill identified in geotechnical soil borings
B3 (GEO) [1]	1 soil			6 to 7.5 feet	
SG-1	7 exterior soil gas	Northwestern and southwestern portions of the site	TO-15	0.5 to 3 feet	Assess potential for soil gas impact from historical onsite operations of dry cleaners and printers and offsite dry cleaners
SG-2					
SG-3		Southern and southeastern portions of the site			Assess potential for soil gas impact from historical onsite operations of USTs and historical offsite dry cleaners
SG-4					
SG-5		Eastern portion of the site			Assess potential for soil gas impact from historical onsite exterminators and car rental service and historical offsite rail yards and USTs
SG-6					
SG-7					

[1] Based on the observation of foundry sand at the time of drilling, additional samples were submitted from B1 (GEO) from 8.5 to 10 feet and B3 (GEO) from 6 to 7.5 feet to assess potential impact associated with foundry-derived waste fill.

Sampled media were analyzed for some combination of analyses as identified in the table above by the following methodology:

Summary of Analytes						
Analyte	**VOCs**		**PAHs**	**RCRA Metals**	**EPH**	**Pesticides**
Method Number	SW-846 8260B/ EPA 624	TO-15	SW-846/ EPA 8270C SIM	EPA Method 6010B	Extractable Petroleum Hydrocarbons	SW-846 EPA 8081
Type of Sample	Soil Groundwater	Soil gas	Soil Groundwater	Soil Groundwater	Soil	Soil

These sample parameters were selected based on the types of petroleum and solvent-related compounds expected to have been stored and used in historical onsite and offsite operations as well as typical impacts associated with foundry-derived waste fill (see discussion in Section 3.1.3).

3.1.3 Deviations from the Scope

An additional analysis for pesticides was submitted at B-7 (along the eastern site boundary) for determination of potential impact based on olfactory observations in the 10 to 12.5 feet interval and based on historical past land uses in the vicinity of the soil boring location.

Black, sandy suspect soils resembling foundry-derived waste were observed in geotechnical soil borings installed in the northeastern portion of the subject property from approximately 7.5 to 12.6 feet at B-1 (geotechnical) and 6 to 12.7 feet at B-3 (geotechnical). The findings of the geotechnical investigation are reported under a separate cover. Each representative sample (B1 (GEO) 8.5 to 10 feet and B3 (GEO) 6 to 7.5 feet) was collected from the geotechnical sample bags and submitted for analysis of RCRA metals. Since the geotechnical borings were not installed using environmental sampling protocol, no petroleum–related analyses were conducted.

Due to insufficient groundwater infiltration at temporary well locations B-2 and B-4, groundwater samples were collected only from B-1C, B-3, and B-7.

No other deviations from the approved scope of work were noted or intentionally made.

3.2 Subsurface Assessment Activities

3.2.1 Soil Borings

On November 9 and 10, 2015, S&ME personnel observed a subcontracted direct push drilling contractor install thirteen soil borings (B-1 through B-8, including five offset borings (B-1A, B-1B, B-1C, B-1D and B-5A) across the site in an effort to encounter subsurface materials of interest, as depicted on Figure 3-Boring Location Map. The drilling crew used a GeoProbe 7822 DT (direct push drilling methods) to install [2 ¾-inch] outside diameter (O.D.) direct push borings.

Soils encountered at the time of drilling activities at shallow and near surface intervals generally were observed to be fill soils characterized as orange brown silty clays and clayey silts with rock fragments and minor amounts of brick and concrete debris and traces of coal. Native residual soils characterized as brown, orange brown and yellow brown silty clays with limestone fragments generally were observed at depths ranging from near surface to 11.5 feet below ground surface transitioning to weathered limestone bedrock. Boring refusal was encountered in each of the soil borings at depths ranging from 2.6 feet bgs at B-5 to 20 feet bgs at B-2. Refusal materials generally were observed as light gray and gray, partially weathered limestone and silty clay with limestone fragments. Groundwater was encountered at the time of drilling at B-6 (south-central portion of the site) at approximately 5 feet bgs; however, based on the saturated soils conditions in the area of the boring at the time of field activities this is likely representative of shallow soil saturation from recent rain events.

Field headspace screening of the soil cores was performed for VOCs using a calibrated photoionization detector (PID). No indications of VOCs were detected at the time of field activities. Slight odors potentially indicative of pesticides were noted at B-7 in the 10 to 12.5 feet interval. Field indicators and PID readings from each of the borings are recorded on the boring logs, which are included as Appendix A.

Consistent with authorized scope of work, S&ME personnel collected one soil sample from each of eight environmental soil borings, based upon field observations, PID readings, proximity to the water table, or proximity to the bottom of the boring. Additionally, based on the observation of foundry sand, two samples were collected from geotechnical soil borings (See section 3.1.2). Samples selected for laboratory analysis were transferred to laboratory-supplied containers, labeled and placed in a cooler chilled to about 4 degrees Celsius. New, disposable latex or Nitrile gloves will be used for each interval when transferring samples to containers. Samples will be shipped or delivered to a qualified laboratory under strict chain-of-custody.

3.2.2 Temporary Monitoring Well Installation

Upon completion of the soil boring and sampling activities, temporary groundwater monitoring wells were installed in five of thirteen soil borings: B-1C (installed to 8.35 feet bgs); B-2 (installed to 19.6 feet bgs); B-3 (installed to 12.5 feet bgs); B-4 (installed to 17.7 feet bgs); and B-7 (installed to 14 feet bgs). Each of the monitoring wells was constructed with 1-inch diameter, Schedule 40 PVC. In general, 5 to 10 feet of machine-slotted PVC screen was installed at the bottom of the borehole, with solid riser extending from the top of the screen to 1 to 2 feet above ground surface. In each temporary monitoring well, the annulus was filled with a 20/30 grade silica sand filter pack to a depth of about 2 feet above the top of the screened interval. The filter pack interval was sealed to ground surface from the top of the filter pack at intervals using hydrated bentonite chips at each location. The top of each well casing was capped with a plastic monitor well cap and secured to discourage tampering. Monitoring well construction details are included on the prepared boring logs provided in Appendix A.

Static water-level readings were collected at the time of and following completion activities on November 10, 2015 using a properly decontaminated water-level indicator. Measurable groundwater was encountered in three of five temporary monitoring wells installed (B-1C, B-3 and B-7). Depth to water at temporary well locations ranged from 7.3 feet bgs at B-1C (northwest portion of the site near the intersection of West Martin Luther King Boulevard and Market Street) to 11.8 feet bgs at B-7 (along the eastern site boundary at Georgia Avenue). No measureable groundwater was observed at the time of drilling, or during delayed water level measurements (24 to 48 hours after well installation), at temporary

well locations B-2 and B-4 located along the western site boundary and the southwest corner of the subject property respectively.

Prior to sampling, two of three temporary monitoring wells exhibiting measurable groundwater (B-3 and B-7) were developed using a peristaltic pump and dedicated polyethylene tubing to remove at least three well casing volumes of groundwater or by purging the well dry and allowing it to recharge to original static water level. This process was intended to remove groundwater disturbed during well installation, reduce turbidity, and facilitate the collection of representative groundwater samples from the formation. Groundwater samples were collected from each of the temporary wells, labeled, placed on ice and submitted to ESC Lab Sciences in Mt. Juliet, Tennessee accompanied by completed chain-of-custody for some combination of analysis of VOCs and PAHs. Temporary wells B-1C and B-3 were allowed to recharge overnight to facilitate collection of a sample for analysis of RCRA metals. Representative groundwater samples were collected from temporary wells B-1C and B-3 on November 11, 2015, within 24-hrs of initial purging, and submitted for analysis of RCRA metals.

Copies of groundwater sampling forms are included in Appendix A.

3.2.3 Soil Gas Sampling

On November 5, 2015, S&ME personnel completed the installation of seven exterior soil gas sampling points (SG-1 through SG-7). The locations of the soil gas sampling points were selected in effort to obtain representative soil gas data to identify potential onsite soil gas impact attributable to onsite and offsite historical land uses of concern.

- Samples SG-1 and SG-2 were collected at locations along the western and southwestern portions of subject property to correspond with historical onsite locations of dry cleaners and printers and adjoining historical offsite operations of dry cleaners and filling stations on Market Street to the west;
- Samples SG-3 and SG-4 were collected at locations in the southern portion of the subject property to correspond with historical onsite operations of USTs and adjoining historical offsite operations of a dry cleaner to the south;
- Samples SG-5 through SG-7 were collected at locations along the eastern portion of the site to corresponding with adjoining historical offsite operations of rail yards and USTs to the east.

Each of the samples (SG-1 through SG-7) was collected from a depth ranging from 0.5 to three (3) feet bgs. At the time of soil gas collection, S&ME personnel also recorded observations, including the probing locations, depth, and soil characteristics. Sampling probe installation was conducted using an a soil vapor probe rod and electric rotary hammer drill, stainless steel expendable points, and post-run tubing as described below:

- At each of the locations, SG-1, SG-3 and SG-4, an electric hammer drill was used to drive an expendable stainless steel probe point connected to a hollow stainless steel drive rod to a depth of approximately 3 feet bgs. Based on the presence of hardscaping, locations SG-2 and SG-5 through SG-7 were installed consistent with sub-slab soil gas sample collection methodology; an electric hammer drill was used to drive an expendable stainless steel probe point connected to a hollow stainless steel drive rod to a depth of 6 to 14 inches, with the goal to be in the subbase material.
-

- At each location, the expendable point was connected to a ¼-inch outer diameter (O.D.) nylon tube threaded through the drive rod. At the target depth, the drive rod was extracted from the hole leaving the expendable point and sample train at the target depth.

- The sample train tubing was fitted with push-to-connect valves to enhance the integrity of the sampling system and provide an outlet for purging ambient air. Hydrated bentonite was used to create a surface seal between the ground surface and the sample train tubing.

- The sample train was connected to a 6-liter SUMMA canister and vacuum-tested using a hand held vacuum pump at a vacuum of at least 20 inches Hg for two minutes to test that a sufficient seal between the tubing and sample train fittings had been established.

- The total volume of the borehole, sample train tubing, and valves was calculated and converted to liters. A total of three volumes of ambient air were purged from the sample train using a low-volume air sampling pump calibrated to a flow of 0.187 L/min.

- Prior to sample collection, a paper towel treated with 70% isopropyl alcohol (2-propanol) was placed loosely on the bentonite ground seal. The 2-propanol was utilized as a tracer compound to verify the integrity of the closed sampling system (TDEC-DUST Technical Guidance Document 018).

Upon completion of the installation and initial testing of each soil vapor train system, the soil gas was sampled using 6-liter SUMMA canisters at each selected location. Each canister comes from the laboratory at a preset vacuum of approximately -30 inches of Hg.

Each canister was equipped with a pre-set vacuum regulator. This mechanism was factory-set to allow for the sample to be drawn into the canister over a period of 30 minutes. Start and end times for sample collection and vacuum pressures were recorded for each sample. Field data collected from the soil gas sampling activities are documented in the Soil Gas Field Log, included in Appendix A.

Following the soil gas sampling event, the seven sample canisters (SG-1 through SG-7) were sealed, packed, and shipped under chain of custody to ESC Lab Sciences in Mt. Juliet, Tennessee for laboratory analyses of volatile organic compounds (VOCs) by EPA Method TO-15.

3.3 Verification of the Conceptual Site Model

Refusal depths were consistent with published geologic information. However, refusal depths were shallower than anticipated based on review of TDEC file information on the west adjoining property (EPB/former One-Hour Valet Cleaners) beyond Market Street to the west. The conditions identified in subsurface exploration otherwise generally corresponded with published information and the conceptual site model.

3.4 Other Field Procedures

Before and after installation of each of the soil borings, drilling equipment, sampler barrels, and soil gas equipment were decontaminated by scrubbing in a non-phosphate detergent solution followed by a double tap water rinse.

Soil borings not converted to temporary monitoring wells were backfilled using soil cuttings and bentonite chips and capped with asphalt patch in paved areas. Soil borings converted to temporary monitoring wells will be abandoned upon issuance of this report and receipt of your authorization by removing the well pipe and backfilling to the surface with bentonite chips.

4.0 Analytical Results

Constituent concentrations detected in the soil were compared to the November 2015 USEPA Regional Screening Levels (RSLs) (TR=1x10^{-6} and THQ=0.1) for Residential (RSLres) and Commercial (RSLind) land use. The RSLs are risk based numerical criteria used for generic screening values, not de facto cleanup standards. Comparison criteria for groundwater default to RSLs for tap water (RSLtap) and in some cases the Maximum Contaminant Limit (MCL), if established, based on drinking water standards. The exterior soil gas results were compared to Residential (RSLres) and Commercial RSLs (RSLind) for indoor air adjusted to account for attenuation of vapor concentrations from the sample collection depth to the above the ground surface using an attenuation factor of 0.03 as typically accepted by TDEC.

Detected concentrations of EPH in soil have been compared to the Tennessee Department of Environment and Conservation (TDEC) Division of Solid Waste (DSW) threshold for Special Waste (petroleum) of 100 milligrams per kilogram (mg/kg). TDEC-DSW considers soils having concentrations of EPH in excess of 100 mg/kg Special Waste, which requires regulatory permitting prior to disposal.

Results of the laboratory analyses are discussed below. Detected constituents as compared to corresponding comparison criteria are summarized in Tables 1 through 3 following the text of this report. Copies of analytical reports and custody documentation are included as Appendix B. For the purpose of discussion, sample results generally have been grouped according to their respective physical locations and historical operations within the overall site.

4.1 Soil Analytical Results

Soil samples were selected from eight environmental soil borings: B-1C and B-2 through B-8) and two geotechnical soil borings (B1 (GEO) and B3 (GEO)). Each of the samples was submitted for some combination of analysis for VOCs, PAHs, EPH, Pesticides and RCRA metals as presented in Section 3.1.2. Samples denoted "GEO" were submitted for analysis of RCRA metals only. Table 1, following the text of this report, presents the results of detected and non-detect constituents as compared to corresponding comparison criteria as discussed in Section 4.0. We note that the VOC compounds presented on Table 1 represent only a partial list of the compounds analyzed. The listed compounds presented are representative of constituents typically associated with the known historical onsite and offsite operations.

4.1.1 Volatile Organic Compounds (VOCs)

One soil sample was selected from each of the eight environmental borings for analysis of VOCs. VOCs were identified at a concentration in excess of the laboratory detection limit in one of eight soil samples submitted for analysis. In the soil sample B-8 (0.8 to 2.5 feet), collected in the north-central portion of the subject property, two VOCs (1,2,4-trimethylbenzene and 1,2,3-trimethylbenzene) were identified , at a concentration of 0.00985 and 0.00565 milligrams per kilogram (mg/kg), respectively. In each case, the detected compound was below the corresponding RSLs for residential and commercial sites. No VOCs

were detected in excess of the laboratory detection limit in the remaining soil samples submitted for analysis.

4.1.2 Polycyclic Aromatic Hydrocarbons (PAHs)

One soil sample was selected from each of the eight environmental borings for analysis of PAHs. PAHs were identified at a concentration in excess of the laboratory detection limit in two of eight soil samples submitted for analysis (B-7 (10 to 12.5 feet) and B-8 (0.8 to 2.5 feet); borings located generally in the northeastern region of the site. Fluoranthene, detected at concentrations ranging from 0.0348 mg/kg (B-8(0.8 to 2.5 feet)) to 0.0506 mg/kg (B-7(10 to 12.5 feet)), was below the corresponding RSLs for both residential and commercial sites. Pyrene, detected at concentrations ranging from 0.00335 mg/kg (B-8(0.8 to 2.5 feet)) to 0.0472 mg/kg (B-7(10 to 12.5 feet)), was below the corresponding RSLs for both residential and commercial sites. No PAH compounds were detected in excess of the laboratory detection limit in the remaining soil samples submitted for analysis. We note that the laboratory detection limit for two PAH compounds, benzo(a)pyrene and dibenz(a,h)anthracene, exceeded the corresponding RSLs for residential sites.

4.1.3 Extractable Petroleum Hydrocarbons (EPH)

One soil sample was selected from each of the eight environmental borings for analysis of EPH. EPH was identified at a concentration in excess of the laboratory detection limit in three of eight soil samples submitted for analysis (B-3 (5 to 7.5 feet), B-5 (0.3 to 2.6 feet), and B-6 (0.5 to 5.3 feet)) at concentrations ranging from 6.66 to 19.6 mg/kg. In each case, the detected concentration was below the corresponding TDEC-DSW threshold for Special Waste of 100 mg/kg. EPH was not detected in excess of the laboratory detection limit in the remaining soil samples submitted for analysis.

4.1.4 Pesticides

One of eight soil samples (B-7 (10 to 12.5 feet)) was submitted for analysis of pesticides. No pesticides were detected in excess of the laboratory detection limit.

4.1.5 RCRA metals

One soil sample was selected from each of six environmental borings and two geotechnical borings for analysis of RCRA metals. RCRA metals (arsenic, barium, chromium, and lead, and one of either cadmium or mercury) were identified in excess of the laboratory detection limit eight soil samples submitted for analysis [B-2 (17.5 to 20 feet), B-4 (17.5 to 18.1 feet), B-5 (0.3 to 2.6 feet), B-6 (0.5 to 5.3 feet), B-7 (10 to 12.5 feet), B-8 (0.8 to 2.5 feet), B1(GEO) (8.5 to 10 feet), and B3(GEO) (6 to 7.5 feet)].

Of the detected inorganics, arsenic exceeded the corresponding comparison criteria in each of the soil samples. Arsenic was detected at concentrations ranging from 2.04 mg/kg to 6.74 mg/kg. In each case, the detected concentration exceeded the corresponding RSLres of 0.68 mg/kg. With the exception of the sample collected from B-7 (10 to 12.5 feet), the detected concentration also exceeded the corresponding RSLind of 3 mg/kg.

4.2 Groundwater Analytical Results

Three groundwater samples were submitted from temporary well locations B-1C, B-3, and B-7. Samples collected from locations B-1C and B-3 were submitted for analysis of VOCs, PAHs, and RCRA metals. The sample collected from B-7 was submitted for analysis of VOCs only. Table 2, following the text of this report, presents the results of detected and non-detect constituents as compared to the respective comparison criteria (RSLs for tap water or MCL, where established). We note that the VOC compounds presented on Table 1 represent only a partial list of the compounds analyzed. The listed compounds presented are representative constituents typically associated with the known historical onsite and offsite operations.

VOCs

No VOCs were identified in excess of the laboratory detection limit in the three groundwater samples submitted for analysis. We note that the detection limit for VOCs, benzene, naphthalene, trichloroethylene, and vinyl chloride, exceeded the corresponding RSLs. However, the detection limits for these compounds did not exceed the corresponding MCL, where established.

PAHs

In the sample collected from B-3, six PAH compounds (acenaphthene, acenaphthylene, fluoranthene, fluorene, phenanthrene, and pyrene) were identified at a concentration in excess of the laboratory detection limit in the groundwater sample submitted. In each case, the detected compound was below the corresponding comparison criteria. No PAHs were identified above laboratory detection limits in the sample collected from B-2. We note that the detection limits for PAH compounds benzo(a)anthracene, benzo(a)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded the corresponding RSLtap but were below the corresponding MCL, where established.

RCRA Metals

Three of eight RCRA metals were identified in excess of the laboratory detection limit in groundwater samples submitted from B-1C and B-3.

- Barium was identified in groundwater samples submitted from B-1C and B-3 at 0.0566 milligrams per liter (mg/L) and 0.134 mg/L, respectively. The detected concentrations of barium were below both the corresponding RSL tap (0.380 mg/L) and the MCL (2 mg/L).
- Lead, identified in the groundwater sample collected from B-3 at a concentration of 0.0135 mg/L, was below the corresponding RSLtap and MCL of 0.015 mg/L;
- Mercury, identified in the groundwater sample collected at B-3 at a concentration of 0.000490 mg/L, exceeded the corresponding RSLtap of 0.000063 mg/L but not the MCL of 0.002 mg/L.

4.3 Soil Gas Analytical Results

Seven exterior soil gas samples were submitted from SG-1 (northwest portion of the site), SG-2 (southwest corner of the site), SG-3 (southern site boundary), SG-4 (southeast corner of the site), and SG-5 through SG-7 (eastern portion of the site) for analysis of VOCs by EPA Method TO-15. Table 3, following the text of this report, presents the results of detected and non-detect constituents as compared to the respective comparison criteria based on a Target Carcinogenic Risk (TCR) of $1x10^{-6}$, Target Hazard

Quotient (THQ) of 0.1. As noted in Section 4.0, the comparison criteria included in Table 3 are the residential and commercial air RSL values, adjusted to account for a soil gas to ambient air attenuation using a factor of 0.03 (ratio of 1/0.03 soil gas to ambient air concentration).

Thirty-one (31) of 68 VOCs compounds (acetone, benzene, carbon disulfide, chlorobenzene, chloroform, chloromethane, cyclohexane, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 1,4-dioxane, ethanol, ethylbenzene, dichlorodifluoromethane, trichlorofluoromethane, heptane, n-hexane, methylene chloride, methyl ethyl ketone (2-butanone), methyl methacrylate, 2-propanol (tracer compound), propene (propylene), styrene, tetrachloroethylene, tetrahydrofuran, toluene, trichloroethylene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 2,2,4-trimethylpentane, m&p-xylenes, and o-xylenes) were identified at a concentration in excess of the laboratory detection limit in at least one sample. Two of the 31 detected VOC compounds (benzene and chloroform), exceeded the corresponding attenuation-adjusted RSLres, but were below their corresponding RSLind.

- Benzene, detected at SG-7 at a concentration of 26.4 ug/m^3, exceeded the corresponding attenuation-adjusted RSLres of 12 ug/m^3 but not the corresponding attenuation-adjusted RSLind of 53.3 ug/m^3;
- Chloroform, detected at SG-5 at a concentration of 7.03 ug/m^3, exceeded the corresponding attenuation-adjusted RSLres of 4 ug/m^3 but not the corresponding attenuation-adjusted RSLind of 17.7 ug/m^3;

Six of the detected compounds (ethanol, heptane, 2-propanol, 1,3,5-trimethylbenzene, 2,2,4-trimethylpentane and m&p-xylenes) have no established comparison criteria. The detected concentrations of 2-propanol (a tracer compound for leak testing purposes) were compared to the acceptable value of less than 10,000,000 ug/m^3 for tracer compounds as documented in Tennessee Department of Environment and Conservation, Division of Underground Storage Tanks, Technical Guidance Document-018. Detected concentrations reported for 2-propanol were significantly below the corresponding comparison value.

The laboratory detection limits exceeded the corresponding attenuation–adjusted RSL target soil gas concentrations for residential land use, for the following five (5) compounds in at least one sample criteria: 1,3-butadiene, 1,2-dibromomethane, hexachloro-1,3-butadiene, naphthalene, and 1,1,2-trichloroethane. In the case of 1,2-dibromoethane, laboratory detection limits also exceeded the corresponding adjusted screening values for industrial land use. Based on our review of the available information regarding TO-15 analytical suite laboratory detection limits provided by ESC Lab Sciences, the detection limits exceeding the corresponding comparison criteria for some compounds appears to be function of the limitations of the analytical method and not the result of additional sample dilutions. However, in the case where the detection limits of certain compounds did exceed the corresponding comparison criteria, it cannot be confirmed whether these compounds are present at levels above the corresponding comparison criteria.

5.0 Findings

5.1 Soil

Volatile Organic Compounds (VOCs)

Detectable concentrations of two VOCs (1,2,4-trimethylbenzene and 1,2,3-trimethylbenzene) were identified in excess of the laboratory detection limit in one (B-8 (0.8 to 2.5 feet)) of eight soil samples submitted for analysis. The detected VOCs were below the corresponding comparison criteria for both residential and commercial land use.

Polycyclic Aromatic Hydrocarbons (PAHs)

Detectable concentrations of two PAHs (fluoranthene and pyrene) were identified in two (B-7 (10 to 12.5 feet and, B-8 (0.8 to 2.5 feet)) of eight soil samples submitted for analysis. The detected PAHs were below the corresponding comparison criteria for both residential and commercial land use.

Extractable Petroleum Hydrocarbon (EPH)

EPH was identified at a concentration in excess of the laboratory detection limit in three of eight soil samples (B-3 (5 to 7.5 feet), B-5 (0.3 to 2.6 feet), and B-6 (0.5 to 5.3 feet)) submitted for analysis. The detected concentrations (ranging from 6.66 mg/kg to 19.6 mg/kg) were below the corresponding TDEC-DSW threshold for Special Waste of 100 mg/kg.

Pesticides

No pesticides were detected in excess of the laboratory detection limit in the one soil sample (B-7 (10 to 12.5 feet) submitted for analysis of pesticides.

RCRA Metals

Detectable concentrations of RCRA metals (inorganics) were identified at a concentration in excess of the laboratory detection limit in each of the eight (B-2 (17.5 to 20 feet), B-4 17.5 to 18.1 feet), B-5 (0.3 to 2.6 feet), B-6 (0.5 to 5.3 feet), B-7 (10 to 12.5 feet), B-8 (0.8 to 2.5 feet), B1(GEO) (8.5 to 10 feet), and B3(GEO) (6 to 7.5 feet)) soil samples submitted for analysis. Of the detected inorganics, only arsenic, detected at concentrations ranging from 3.93 to 6.96 mg/kg exceeded the corresponding comparison criteria (RSLres = 0.68 mg/kg and RSLind = 3 mg/kg). However, the detected concentrations are within the range of concentrations that are considered to represent naturally occurring levels for soil in Hamilton County, according to the *Tennessee Department of Environment and Conservation Division of Geology Report of Investigations No. 49, titled "Hazardous Trace Elements in Tennessee Soils and Regolith",* published in 2001. We note that TDEC generally considers a concentration of 10 mg/kg or less to be representative of naturally-occurring arsenic in Hamilton County soils.

5.2 Groundwater

No VOCs or PAHs were identified in excess of the laboratory detection limit. Detectable concentrations of three RCRA metals, barium, lead, and mercury, were identified at concentrations in excess of the

laboratory detection limit in the groundwater samples collected at B-1C and B-3 in the northwestern portion of the subject property. Of the detected inorganics, mercury exceeded the corresponding RSLtap but not the corresponding MCL. None of the remaining detected compounds exceeded the corresponding comparison criteria.

5.3 Soil Gas

Thirty-one of 68 VOC were identified at concentrations in excess of the laboratory detection limit in exterior soil gas samples (SG-1 through SG-7) collected across the subject property. Of the thirty-one detected compounds, two compounds, benzene (SG-7) and chloroform (SG-5) were identified in excess of corresponding attenuation-adjusted RSLs for residential sites, but were below the attenuation-adjusted RSLs for commercial land use.

6.0 Conclusions

This assessment, has identified the presence of petroleum-related or hazardous substances in soil, groundwater, and soil gas. Site conditions as defined by this assessment are not unexpected conditions, given the history (over a century of developed use) and nature of historical dry cleaning operations at and nearby the subject property. Given the history of the site (early developed use and varied commercial uses) as well as limitations related to boring locations (no borings within the street right of way), it should not be unexpected that areas of higher concentrations may be encountered in other locations not sampled.

Soil

No VOCs, PAHs, EPH or pesticides were identified in excess of the corresponding comparison criteria in the eight soil samples submitted for analysis. With the exception of arsenic detected in in each of the eight soil samples (B-2, B-4, B-5, B-6, B-7, B-8, B1(GEO), and B3(GEO)) analyzed for RCRA metals, detected concentrations did not exceed corresponding comparison criteria.

- In the case of arsenic, while above the corresponding commercial screening level, the detected concentrations are within the range of concentrations typically considered representative of naturally occurring concentrations in Hamilton County, Tennessee.
- Based on the observation of foundry sand in geotechnical borings installed in the northeastern region of the site, future disturbance of this area should be managed under the observation of an environmental professional and using best management practices, including implementation of measures that will reduce the potential for contact with foundry sand such as placement under 18 to 24 inches of clean soil cap, or below hardscaping. If foundry derived material is intended for offsite disposal, foundry derived material and soil commingled with foundry derived materials will require approval to dispose as Special Waste. Additional analysis may be necessary to determine actual concentrations within a stockpiled volume. Once redevelopment plans and final grading plans have been completed, a soil management plan should be prepared to outline best management practices to address disposal and minimize worker exposure in the event these areas are disturbed.

Groundwater

No detectable concentrations of VOCs or PAHs were identified in excess of the laboratory detection limit. Three RCRA metals (barium, lead and mercury) were identified in the excess of the laboratory detection limit in groundwater samples collected from B-1C and B-3. With the exception of mercury, none of the detected constituents exceeded the corresponding comparison criteria.

- In the case of mercury, the detected concentration exceeded the corresponding RSLtap but not the MCL.

Soil Gas

With the exception of two volatile organic compounds (VOCs), benzene and chloroform, detected in two of seven soil gas samples (SG-5 and SG-7), detected concentrations did not exceed corresponding comparison criteria. In each case where detected above a corresponding comparison criteria, the detected concentration exceeded the corresponding residential screening level, but was below the corresponding commercial screening level.

Based on the magnitude of detected concentrations and our understanding that intended use as a park with commercial-type use of structures (excludes residential use), analytical results do not indicate vapor intrusion risk above 1×10^{-6} under a commercial use scenario. Additional assessment of soil gas does not appear warranted. Should the City's redevelopment objectives change, to allow for residential use, additional evaluation would be warranted.

7.0 References and Sources of Information

Phase I Environmental Site Assessment, Miller Park, 928 South Market Street, Chattanooga, Tennessee, dated September 1, 2015, prepared by S&ME;

United States Environmental Protection Agency (USEPA) Regional Screening Level (RSL) table, dated November 2015.

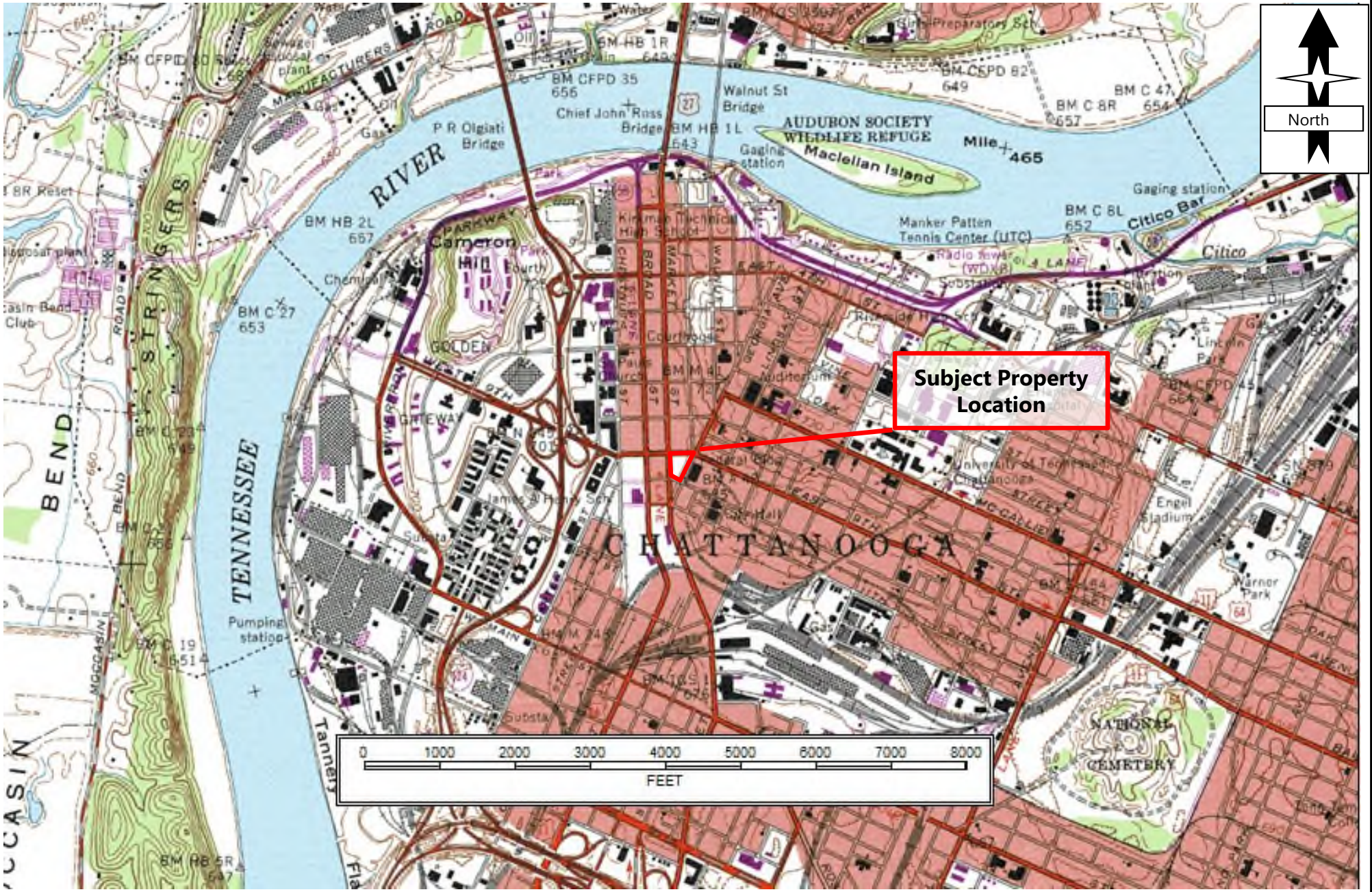
Tennessee Department of Environment and Conservation Division of Geology Report of Investigations No. 49, titled "Hazardous Trace Elements in Tennessee Soils and Regolith", published in 2001.

Figures

Figure 1- Site Vicinity Map

Figure 2-Site Location with Identified RECs

Figure 3-Boring Location Map



Scale: As shown	S&ME	**SITE VICINITY MAP** **City of Chattanooga Miller Park** Chattanooga, TN- USGS Topographic Map 1976, photo revised from 1969	Figure 1
Contour Interval = 20 feet			
Date: 8/29/15		**Project No. 4181-15-036A**	

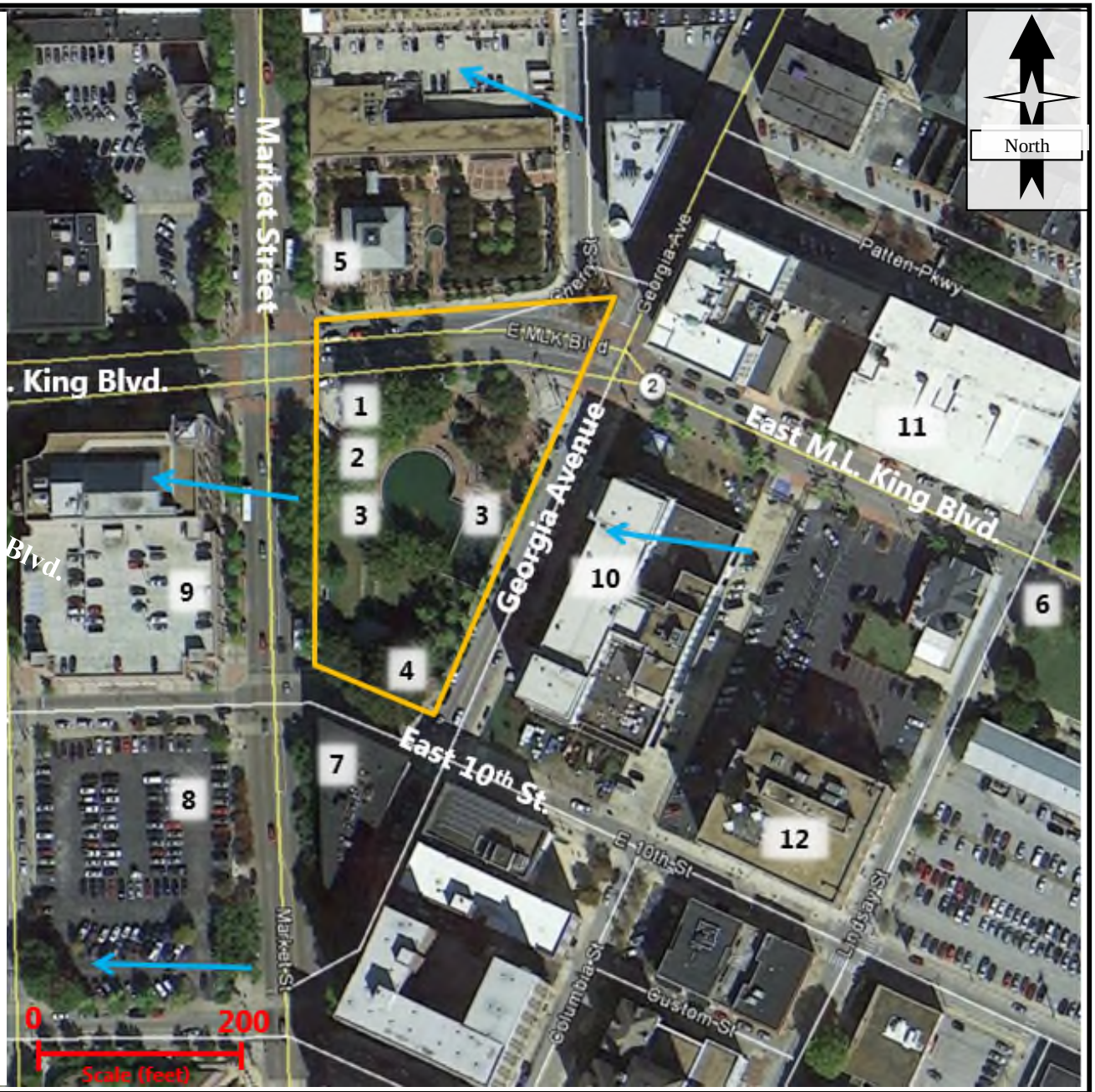
LOCATION OF IDENTIFIED REC'S

1. **Former Handcraft One Hour Cleaners (904 Market St.); from at least 1960 to 1970.**
2. **Former Long Printing Co. (906 Market St); in at least 1938.**
3. **Former Chattanooga Exterminating Co. / Terminex (912 Market St.)- from at least 1938 to 1945; and Former Chattanooga Transportation Company / Jolly Cabs / Yellow Cabs / Hertz Driveurself System Co. / Rent-A Ford Co. – from at least 1917 to 1945.**
4. **Former City Water Co. (928 Market St.); from at least 1885 to 1933. Gas tank depicted on 1917 HFI map.**
5. **Former George's Cleaners (838 Market St.); from at least 1950 to 1955.**
6. **Former Top Hat Cleaners (200 East 9th St.); from at least 1960 to 1973.**
7. **Former Model Dry Cleaning (1004 Market St.); from at least 1938 to 1941.**
8. **Civic Forum Redevelopment-Formerly two filling stations and greyhound bus terminal onsite (1001 Market St.);**
9. **One Hour Valet – drycleaner (921 Market St.); from at least 1960 to 1980.**
10. **Former Chattanooga Transfer and Storage Co. (926-28 Georgia Ave.); gas tank depicted on property in 1917 HFI map.**
11. **Former Volunteer Garage (822-24 Lindsay St.);**
12. **Chattanooga Communications/AT&T (919 Lindsay St.);**

Legend:

Inferred groundwater flow direction

Approximate Subject Property Boundary



Scale: As shown	S&ME	**Site Location with Identified RECs** City of Chattanooga Miller Park 928 South Market Street Chattanooga, Tennessee
Checked by: VJH		Figure 2
Date: 10/22/2015		**Project No. 4181-15-036A**

Scale: As shown	S&ME	**Boring Location Map** City of Chattanooga Miller Park 928 South Market Chattanooga, Tennessee	Figure 3
Checked by: VJH			
Date: 12/2/2015		**Project No. 4181-15-036A**	

Tables

Table 1: Summary of Detected Compounds and Results of Soil Analysis

Table 2: Summary of Detected Compounds and Results of Groundwater Analysis

Table 3: Summary of Detected Compounds and Results of Soil Gas Analysis

SOIL (concentrations presented in miligrams per kilogram (mg/kg))												
Boring Number	**B1C**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**B1 (GEO)**	**B3 (GEO)**	**Comparison Criteria Regional Sreeening Levels (RSLs)**	
Boring Location	Northwest portion of the site	Along the western site boundary		Southwest corner of the site	Southeast corner of the site	South-central portion of the site	Along the eastern site boundary	North-central portion of the site	Soils exhibiting characteristics of foundry waste collected from geotechnical borings in the northeast portion of the site			
(sample depth)	5-8.2 feet	17.5-20 feet	5-7.5 feet	17.5-18.1 feet	0.3-2.6 feet	0.5-5.3 feet	10-12.5 feet	0.8-2.5 feet	8.5-10 feet	6-7.5 feet	Residential	Industrial
VOCs												
Benzene	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	NA	NA	1.2	5.1
Ethylbenzene	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	NA	NA	5.8	25
Methyl Tert-Butyl Ether	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	NA	NA	47	210
Naphthalene	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	NA	NA	3.8	17
Tetrachloroethylene	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	NA	NA	8.1	39
Toluene	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	NA	NA	490	4,700
Trichloroethylene	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	NA	NA	0.41	1.9
1,2,4-Trimethylbenzene	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	0.00985	NA	NA	5.8	24
1,2,3-Trimethylbenzene	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	0.00565	NA	NA	4.9	21
1,3,5-Trimethylbenzene	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	NA	NA	78	1200
Total Xylenes	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	NA	NA	65	280
Vinyl Chloride	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	NA	NA	0.059	1.7
PAHs												
Acenaphthene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	360	4,500
Acenaphthylene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	None established	
Anthracene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	1,800	23,000
Benzo(a)anthracene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	0.16	2.9
Benzo(b)fluoranthene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	0.16	2.9
Benzo(k)fluoranthene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	1.6	29
Benzo(g,h,i)perylene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	None established	
Benzo(a)pyrene	**<0.0330**	**<0.0330**	**<0.0330**	**<0.0330**	**<0.0330**	**<0.0330**	**<0.0330**	**<0.0330**	NA	NA	**0.016**	0.29
Chrysene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	16	290
Dibenz(a,h)anthracene	**<0.0330**	**<0.0330**	**<0.0330**	**<0.0330**	**<0.0330**	**<0.0330**	**<0.0330**	**<0.0330**	NA	NA	**0.016**	0.29
Fluoranthene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	0.0506	0.0348	NA	NA	240	3,000
Fluorene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	240	3,000
Indeno(1,2,3-cd)pyrene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	0.16	2.9
Naphthalene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	3.8	17
Phenanthrene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	NA	NA	None established	
Pyrene	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	0.0472	0.0335	NA	NA	180	2,300
TN-EPH [1]												
	<4.00	<4.00	6.66	<4.00	19.6	8.89	<4.00	<4.00	NA	NA	100 [1]	
Pesticides												
Aldrin	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	0.039	0.18
Alpha BHC	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	0.086	0.36
Beta BHC	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	0.30	1.3
Delta BHC	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	None established	
Gamma BHC	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	0.57	2.5
Chlordane	NA	NA	NA	NA	NA	NA	<0.200	NA	NA	NA	1.7	7.5
4,4-DDD	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	2.3	9.6
4,4-DDE	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	2	9.3
4,4-DDT	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	1.9	8.5
Dieldrin	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	0.034	0.14
Endosulfan I	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	47	700
Endosulfan II	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	None established	
Endosulfan sulfate	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	None established	
Endrin	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	1.9	25
Endrin aldehyde	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	None established	
Endrin ketone	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	None established	
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	0.21	0.96
Heptachlor	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	0.13	0.63
Heptachlor epoxide	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	0.07	0.33
Methoxychlor	NA	NA	NA	NA	NA	NA	<0.0200	NA	NA	NA	32	410
Toxaphene	NA	NA	NA	NA	NA	NA	<0.400	NA	NA	NA	0.49	2.1
RCRA metals												
Mercury	NA	0.124	NA	0.0629	0.0747	0.0632	0.0820	0.0355	<0.0200	0.0467	1.1	4.6
Arsenic [2]	NA	**3.64**	NA	**3.35**	**6.74**	**3.24**	**2.04**	**3.19**	**4.96**	**5.80**	**0.68** [2]	**3** [2]
Barium	NA	52.5	NA	54.1	200	89.2	44.1	40.4	32.7	38.5	1,500	22,000
Cadmium	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500	<0.500	0.832	0.600	7.1	98
Chromium	NA	18.3	NA	19.6	23.6	18.4	13.4	25.5	34.7	34.5	12,000	180,000
Lead	NA	7.96	NA	10.4	39.5	7.49	14.7	15.2	43.6	88.9	400 [3]	800 [3]
Selenium	NA	<2.00	NA	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	39	580
Silver	NA	<1.00	NA	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	39	580

Notes:

Checked By: VJH

Soil samples collected between November 10 and 11, 2015

Gray shading indicated detected compound

Bold text indicates concentration detected or MDL is greater than a comparison criterion-November 2015 EPA RSLs

Analytical methods as presented in text of report, and attached laboratory results.

< = Below Method Detection Limit, not detected at Estimated Quantitation Limit (EQL).

See analytical reports.

NA - Not Analyzed

[1] The TDEC DSW threshhold for disposal as Special Waste is 100 mg/kg. TDEC DUST threshold requiring groundwater investigation is 500 mg/kg

[2] We note that TDEC generally recognizes concentrations of 10 mg/kg or less to be representative of naturally-occuring arsenic

[3] We note that lead concentrations ranging from 80 to 100 mg/kg approach 20 times the corresponding TCLP threshold of 5 parts per million and may require additional analysis if disturbed

Table 1
Summary Detected Compounds and Results of Soil Analysis
Miller Park
Chattanooga, Tennessee
Project No. 4181-15-036A

GROUNDWATER (Concentrations in milligrams per Liter (mg/L))				
Temporary Well ID	**B1C**	**B3**	**B7**	**Comparison Criteria - Regional Screening Levels Tap Water or (MCL)**
Temporary Well Location	Northwest portion of the site (Market Street and MLK Boulevard)	Along the western site boundary (Market Street)	Along the eastern site boundary (Georgia Avenue)	
VOCs				
Benzene	**<0.00100**	**<0.00100**	**<0.00100**	**0.00045** (0.005)
Ethylbenzene	<0.00100	<0.00100	<0.00100	0.0015 (0.7)
Methyl tert-Butyl Ether	<0.00100	<0.00100	<0.00100	0.014
Naphthalene	**<0.00500**	**<0.00500**	**<0.00500**	**0.00017**
Tetrachloroethylene	<0.00100	<0.00100	<0.00100	0.0041 (0.005)
Toluene	<0.00500	<0.00500	<0.00500	0.11 (1)
Trichloroethylene	**<0.00100**	**<0.00100**	**<0.00100**	**0.00028** (0.005)
Vinyl Chloride	**<0.00100**	**<0.00100**	**<0.00100**	**0.000019** (0.002)
Total Xylenes	<0.00300	<0.00300	<0.00300	0.019 (10)
PAHs				
Acenaphthene	<0.0000500	0.000146	NA	0.053
Acenaphthylene	<0.0000500	0.000166	NA	None established
Anthracene	<0.0000500	<0.0000500	NA	0.180
benzo(a)anthracene	**<0.0000500**	**<0.0000500**	NA	**0.000012**
Benzo(b)fluoranthene	<0.0000500	<0.0000500	NA	**0.000034**
Benzo(k)fluoranthene	<0.0000500	<0.0000500	NA	0.00034
Benzo(g,h,i)perylene	<0.0000500	<0.0000500	NA	None established
Benzo(a)pyrene	**<0.0000500**	**<0.0000500**	NA	**0.0000034** (0.0002)
Chrysene	<0.0000500	<0.0000500	NA	0.0034
Dibenz(a,h)anthracene	**<0.0000500**	**<0.0000500**	NA	**0.0000034**
Fluoranthene	<0.0000500	0.000155	NA	0.080
Fluorene	<0.0000500	0.000103	NA	0.029
Indeno(1,2,3-cd)pyrene	**<0.0000500**	**<0.0000500**	NA	**0.000034**
Naphthalene	<0.0000500	<0.0000500	NA	0.00017
Phenanthrene	<0.0000500	0.000508	NA	None established
Pyrene	<0.0000500	0.0000977	NA	0.012
RCRA metals				
Arsenic	**<0.0100**	**<0.0100**	NA	**0.000052** (0.010)
Barium	0.0566	0.134	NA	0.380 (2)
Cadmium	**<0.00200**	**<0.00200**	NA	**0.00092** (0.005)
Chromium	<0.0100	<0.0100	NA	0.10
Lead	<0.00500	0.0135	NA	0.015
Mercury	**<0.000200**	**0.000490**	NA	**0.000063** (0.002)
Selenium	<0.0100	<0.0100	NA	0.010 (0.050)
Silver	<0.00500	<0.00500	NA	0.0094

Notes:

Checked By: VJH

Gray shading indicated detected compound

Bold text indicates concentration detected or RDL/ MDL greater than a comparison criterion-November 2015 EPA RSLs

Analytical methods as presented in text of report, and attached laboratory results.

< = Below Method Detection Limit, not detected at Estimated Quantitation Limit (EQL).

See analytical reports.

N/A- Not Analyzed

Temporary monitoring wells B-2 and B-4 were dry at the time of sampling and therefore not sampled

Table 2
Summary of Detected Compounds and Results of Groundwater Analysis
Miller Park
Chattanooga, Tennessee
Project No. 4181-15-036A

Soil Gas Concentrations (micrograms per cubic meter (ug/m^3))									
General Area of Assessment	Western site boundary (along Market Street)		Southern portion of the site		Eastern site boundary			Adjusted EPA Regional Screening Levels (Risk = 1 x 10^{-6} and THQ= 0.1) Attenuation Factor (0.03)	
	Vicinity of former onsite dry cleaner	East of former offsite drycleaner	North of former offsite drycleaner	Vicinity of former UST operations (City Water Co.)	Vicinity of former cab and rent-a-car company	West of former offsite UST operations (Chattanooga Transfer and Storage)			
Sample Location ID	**SG-1**	**SG-2**	**SG-3**	**SG-4**	**SG-5**	**SG-6**	**SG-7**	**Residential**	**Commercial**
Sample Depth	**3 feet**	**6 inches**	**3 feet**	**3 feet**	**14 inches**	**6 inches**	**6 inches**		
VOCs (TO-15)									
Acetone	93.4	32.4	9.63	22.4	19.0	34.3	46.2	106,666.7	466,666.7
Allyl Chloride	<0.626	<0.626	<0.626	<0.626	<0.626	<0.626	<0.626	3.3	14.7
Benzene	7.57	5.26	**16.4**	4.17	7.58	5.31	**26.4**	**12**	53.3
Benzyl Chloride	<1.04	<1.04	<1.04	<1.04	<1.04	<1.04	<1.04	1.9	8.3
Bromodichloromethane	<1.34	<1.34	<1.34	<1.34	<1.34	<1.34	<1.34	2.5	11
Bromoform	<6.21	<6.21	<6.21	<6.21	<6.21	<6.21	<6.21	86.7	366.7
Bromomethane	<0.776	<0.776	<0.776	<0.776	<0.776	<0.776	<0.776	17.3	73.3
1,3-Butadiene	**<4.43**	**<4.43**	**<4.43**	**<4.43**	**<4.43**	**<4.43**	**<4.43**	**3.1**	13.7
Carbon disulfide	4.28	3.77	7.68	4.27	1.51	2.29	7.50	2,433.3	10,333.3
Carbon tetrachloride	<1.26	<1.26	<1.26	<1.26	<1.26	<1.26	<1.26	15.7	66.7
Chlorobenzene	2.41	2.94	1.76	2.38	3.42	3.45	4.29	173.3	733.3
Chloroethane (ethyl chloride)	<0.528	<0.528	<0.528	<0.528	<0.528	<0.528	<0.528	33,333.3	146,666.7
Chloroform	2.12	1.59	1.71	1.14	**7.03**	2.35	2.35	4	17.7
Chloromethane	1.33	0.484	<0.413	0.705	<0.413	<0.413	0.512	313.3	1,300
2-Chlorotoluene	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	None established	
Cyclohexane	2.40	1.49	1.57	<0.689	4.87	<0.689	19.1	21,000	86,666.7
Dibromochloromethane	<1.70	<1.70	<1.70	<1.70	<1.70	<1.70	<1.70	3.3	15
1,2-Dibromoethane	**<1.54**	**<1.54**	**<1.54**	**<1.54**	**<1.54**	**<1.54**	**<1.54**	**0.2**	**0.7**
1,2-Dichlorobenzene	1.39	1.48	<1.20	1.33	1.87	1.70	1.91	700	2,933.3
1,3-Dichlorobenzene	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	None established	
1,4-Dichlorobenzene	1.77	1.96	1.56	1.81	2.31	2.37	2.61	8.7	36.7
1,2-Dichloroethane	<0.810	<0.810	<0.810	<0.810	<0.810	<0.810	<0.810	3.7	15.7
1,1-Dichloroethane	<0.802	<0.802	<0.802	<0.802	<0.802	<0.802	<0.802	60	256.7
1,1-Dichloroethene	<0.793	<0.793	<0.793	<0.793	<0.793	<0.793	<0.793	700	2,933.3
cis 1,2-Dichloroethene	<0.793	<0.793	<0.793	<0.793	<0.793	<0.793	<0.793	None established	
trans-1,2-Dichloroethene	<0.793	<0.793	<0.793	<0.793	<0.793	<0.793	<0.793	None established	
1,2-Dichloropropane	<0.924	<0.924	<0.924	<0.924	<0.924	<0.924	<0.924	9.3	40
1,3-Dichloropropene (cis & trans)	<0.908	<0.908	<0.908	<0.908	<0.908	<0.908	<0.908	23.3	103.3
1,4-Dioxane	2.19	<0.721	<0.721	<0.721	<0.721	<0.721	<0.721	18.7	83.3
Ethanol	40.9	32.7	11.8	15.4	17.5	136	67.5	None established	
Ethylbenzene	1.42	1.20	<0.867	<0.867	1.67	<0.867	2.59	36.7	163.3
4-Ethyltoluene	<0.982	<0.982	<0.982	<0.982	<0.982	<0.982	<0.982	None established	
Dichlorodifluoromethane	2.12	2.61	1.97	2.37	2.08	1.61	3.14	333.3	1,466.7
Trichlorofluoromethane	1.64	1.72	1.58	1.65	4.04	2.02	1.87	2,433.3	10,333.3
1,2-Dichlorotetratrifluoroethane	<1.40	<1.40	<1.40	<1.40	<1.40	<1.40	<1.40	None established	
Heptane	11.6	1.60	4.12	<0.818	4.93	<0.818	31.9	None established	
Hexachloro-1,3-butadiene	**<6.73**	**<6.73**	**<6.73**	**<6.73**	**<6.73**	**<6.73**	**<6.73**	**4.3**	18.7
n-Hexane	9.60	3.82	2.68	0.946	6.17	0.734	55.7	2,433.3	10,333.3
Isopropylbenzene (Cumene)	<0.983	<0.983	<0.983	<0.983	<0.983	<0.983	<0.983	1,400	6,000
Methylene Chloride	0.807	1.92	<0.694	<0.694	<0.694	<0.694	<0.694	2,100	8,666.7
Methyl Butyl Ketone	<5.11	<5.11	<5.11	<5.11	<5.11	<5.11	<5.11	103.3	433.3
2-Butanone (MEK)	20.0	4.21	<3.69	7.01	4.35	<3.69	7.51	17,333.3	73,333.3
4-Methyl-2-pentanone	<5.12	<5.12	<5.12	<5.12	<5.12	<5.12	<5.12	10,333.3	43,333.3
Methyl methacrylate	1.25	<0.819	<0.819	1.01	1.37	0.944	<0.819	2,433.3	10,333.3
Methyl tert butyl ether	<0.721	<0.721	<0.721	<0.721	<0.721	<0.721	<0.721	366.7	1,566.7
Naphthalene	**<3.30**	**<3.30**	**<3.30**	**<3.30**	**<3.30**	**<3.30**	**<3.30**	**2.8**	12
2-Propanol (tracer)	4.26	4.33	3.20	<3.07	<3.07	5.66	7.18	10,000,000*	
Propene (Propylene)	32.0	<0.689	4.87	7.35	11.5	<0.689	4.95	10,333.3	43,333.3
Styrene	1.02	<0.851	<0.851	<0.851	1.28	<0.851	0.976	3,333.3	14,666.7
1,1,2,2-Tetrachloroethane	<1.37	<1.37	<1.37	<1.37	<1.37	<1.37	<1.37	1.6	7.0
Tetrachloroethylene	11.5	21.6	80.5	<1.36	9.13	15.2	2.68	140	600
Tetrahydrofuran	1.05	<0.590	<0.590	<0.590	<0.590	<0.590	<0.590	7,000	29,333.3
Toluene	21.2	17.8	9.96	12.5	24.2	17.4	41.2	17,333.3	73,333.3
1,2,4-Trichlorobenzene	<4.66	<4.66	<4.66	<4.66	<4.66	<4.66	<4.66	7	29.3
1,1,1-Trichloroethane	<1.09	<1.09	<1.09	<1.09	<1.09	<1.09	<1.09	17,333.3	73,333.3
1,1,2-Trichloroethane	**<1.09**	**<1.09**	**<1.09**	**<1.09**	**<1.09**	**<1.09**	**<1.09**	**0.7**	2.9
Trichloroethylene	1.76	<1.07	<1.07	<1.07	<1.07	<1.07	<1.07	7	29.3
1,2,4-Trimethylbenzene	2.43	1.72	<0.982	<0.982	2.07	<0.982	5.70	24.3	103.3
1,3,5 Trimethylbenzene	<0.982	1.22	<0.982	<0.982	<0.982	<0.982	2.42	None established	
2,2,4-Trimethylpentane	2.38	<0.934	<0.934	<0.934	<0.934	<0.934	<0.934	None established	
Vinyl chloride	<0.511	<0.511	<0.511	<0.511	<0.511	<0.511	<0.511	5.7	93.3
Vinyl bromide	<0.875	<0.875	<0.875	<0.875	<0.875	<0.875	<0.875	2.9	12.7
Vinyl acetate	<0.704	<0.704	<0.704	<0.704	<0.704	<0.704	<0.704	700	2,933.3
m&p-xylenes	6.24	8.07	2.58	<1.73	6.25	3.61	12.6	None established	
o-xylene	2.82	2.75	1.33	1.15	3.93	1.55	4.68	333.3	1,466.7
Total xylenes	9.06	10.82	3.91	1.15	10.18	5.16	17.28	333.3	1,466.7

Notes:

Checked by: VJH

Gray shaded cells indicate a concentration identified above the laboratory detection limit

Bold text indicates concentration detected or detection limit exceeding the corresponding comparison criteria

Comparison Criteria: Adjusted values obtained from the November 2015 EPA RSLs

Analytical methods as presented in text of report, and attached laboratory results.

< = Below Method Detection Limit, not detected at Estimated Quantitation Limit (EQL).

See analytical reports.

*** TDEC-DUST limits established to evaluate sample train integrity using tracer compound-70% Isopropanol**

Table 3
Summary of Soil Gas Analytical Results
Miller Park
Chattanooga, Tennessee
Project No. 4181-15-036A

Appendix A

Soil Boring Logs with Well Construction Details,

Groundwater Data Sheets, and Soil Gas Field Log

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-1

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: No sample collected	Start Time/Date: 11/9/2015 11:25 AM Finish Time/Date: 11/9/2015 11:30 AM	Date / Water Level
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	ATD / Not encountered

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
	Well not installed		0	TOPSOIL				**Sample No. 1** - 0' to 5' No odors	
				SILTY CLAY (CH) with rock fragments, orange-brown, moist - FILL			15		0.0
			5				100	**Sample No. 2** - 5' to 6' No odors	0.0
				Boring refusal encountered at 6 feet.					
			10						
			15						
			20						

ENVIRONMENTAL LOG SIMPLE 4281-15-036A.GPJ S&ME 1-18-2012.GDT 12/8/15

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-1A

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Boring offset from B-1 approximately 5 feet south. No sample collected.	Start Time/Date: 11/9/2015 11:42 AM Finish Time/Date: 11/9/2015 11:50 AM	Date: Water Level ATD: Not encountered
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
	Well not installed		0	TOPSOIL				**Sample No. 1** - 0' to 5' No odors	
				SILTY CLAY (CH) with rock fragments and pebbles, orange-brown, moist - FILL			35		0.0
			5					**Sample No. 2** - 5' to 9' No odors	
							40		0.0
				Boring refusal encountered at 9 feet.					
			10						
			15						
			20						

ENVIRONMENTAL LOG SIMPLE 4281-15-036A.GPJ S&ME 1-18-2012.GDT 12/8/15

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-1B

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Boring offset from B-1 approximately 10 feet northeast. No sample collected	Start Time/Date: 11/9/2015 12:00 PM Finish Time/Date: 11/9/2015 12:05 PM	Date: — Water Level: — ATD: Not encountered
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
	Well not installed		0	TOPSOIL SILTY CLAY (CH) with trace round pebbles, orange-brown, moist - FILL			40	**Sample No. 1** - 0' to 3.3' No odors	0.0
				Boring refusal encountered at 3.3 feet.					
			5						
			10						
			15						
			20						

ENVIRONMENTAL LOG SIMPLE 4281-15-036A.GPJ S&ME 1-18-2012.GDT 12/8/15

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-1C

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Boring offset from B-1 approximately 30 feet east-southeast. Soil sample collected from 5 to 8.2 feet	Start Time/Date: 11/9/2015 12:15 PM Finish Time/Date: 11/9/2015 12:30 PM	Date / Water Level ATD / Not encountered 11/10/15 / 7.3 ft
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
			0	TOPSOIL					
				SILTY CLAY (CH) with rock and brick fragments, orange-brown, moist - FILL			30	**Sample No. 1** - 0.7' to 5' No odors	0.0
			5	SILTY CLAY (CH) with weathered limestone fragments, orange-brown, moist - RESIDUUM					
				SAPROLITE, light yellow - RESIDUUM				**Sample No. 2** - 5' to 8.2' No odors	
				Fractured, gray LIMESTONE, dry - RESIDUUM			35		0.0
▼				SILTY CLAY (CH), orange-brown, moist - RESIDUUM					
				Boring refusal encountered at 8.2 feet.					
			10						
			15						
			20						

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-1D

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Boring offset from B-1 approximately 20 feet northwest. No sample collected	Start Time/Date: 11/10/2015 12:10 PM Finish Time/Date: 11/10/2015 12:15 PM	Date: Water Level ATD: Not encountered
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
	Well not installed		0	TOPSOIL					
				SILTY CLAY (CH) with scattered rounded pebbles, orange and yellow - FILL			100	**Sample No. 1** - 0.9' to 2.5' No odors	0.0
							100	**Sample No. 2** - 2.5' to 5' No odors	0.0
			5	SILTY CLAY (CL) with scattered limestone fragments, brown, moist - RESIDUUM					
				Weathered LIMESTONE, gray, dry - RESIDUUM					
				Boring refusal encountered at 5.5 feet.					
			10						
			15						
			20						

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-2

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Soil sample collected from 17.5 to 20 feet	Start Time/Date: 11/9/2015 12:43 PM Finish Time/Date: 11/9/2015 1:15 PM	Date: ATD 11/10/15 — Water Level: Not encountered
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
			0	TOPSOIL					
				SILTY CLAY (CH), orange-brown, moist - FILL			85	**Sample No. 1** - 0.5' to 2.5' No odors	0.0
				SILTY CLAY-CLAYEY SILT (CL-ML) with rounded sandstone pebbles, brick fragments and sand, orange-brown, damp - FILL			85	**Sample No. 2** - 2.5' to 5' No odors	0.0
			5				60	**Sample No. 3** - 5' to 7.5' No odors	0.0
				SILTY CLAY-CLAYEY SILT (CL-ML) with scattered weathered limestone fragments and black oxide staining, yellow-brown, moist - RESIDUUM			60	**Sample No. 4** - 7.5' to 10' No odors	0.0
			10	SILTY CLAY (CH) with scattered limestone fragments and black oxide staining, yellow-brown, moist - RESIDUUM			95	**Sample No. 5** - 10' to 12.5' No odors	0.0
							95	**Sample No. 6** - 12.5' to 15' No odors	0.0
			15				100	**Sample No. 7** - 15' to 17.5' No odors	0.0
							100	**Sample No. 8** - 17.5' to 20' No odors	0.0
			20	Boring refusal encountered at 20 feet.					

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-3

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Soil sample collected from 5 to 7.5 feet	Start Time/Date: 11/9/2015 1:55 PM Finish Time/Date: 11/9/2015 2:15 PM	Date / Water Level ATD 12 ft 11/10/15 10.45 ft
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
			0	TOPSOIL CLAYEY SILT (MH) with rock and brick fragments and trace coal, yellow-brown, moist - FILL			70	**Sample No. 1** - 0.3' to 2.5' No odors	0.0
							70	**Sample No. 2** - 2.5' to 5' No odors	0.0
			5				100	**Sample No. 3** - 5' to 7.5' No odors	0.0
							100	**Sample No. 4** - 7.5' to 10' No odors	0.0
▼			10	BRICK AND LIMESTONE FRAGMENTS, dry - FILL				**Sample No. 5** - 10' to 12.5' No odors	
▽				SILTY CLAY (CH) with limestone fragments from 12-12.5 feet, yellow brown, very moist to moist - RESIDUUM			80		0.0
				Boring refusal encountered at 12.5 feet.					
			15						
			20						

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-4

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Soil sample collected from 17.5-18.1 feet	Start Time/Date: 11/9/2015 3:15 PM Finish Time/Date: 11/10/2015 10:15 AM	Date: ATD 11/10/15 — Water Level: Not encountered
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
			0	TOPSOIL					
				CLAYEY SILT (ML) with rock and concrete fragments, brown and yellow-brown, damp - FILL			60	**Sample No. 1** - 0.6' to 2.5' No odors	0.0
							60	**Sample No. 2** - 2.5' to 5' No odors	0.0
			5	SILTY CLAY (CH) with scattered weathered black nodules and weathered limestone at 9-9.5 feet, 11.6-12 feet, and 14.9-15 feet, yellow brown, moist - RESIDUUM			90	**Sample No. 3** - 5' to 7.5' No odors	0.0
							90	**Sample No. 4** - 7.5' to 10' No odors	0.0
			10				100	**Sample No. 5** - 10' to 12.5' No odors	0.0
							100	**Sample No. 6** - 12.5' to 15' No odors	0.0
			15				90	**Sample No. 7** - 15' to 17.5' No odors	0.0
				Weathered LIMESTONE. light gray, dry - RESIDUUM			90	**Sample No. 8** - 17.5' to 18.1' No odors	0.0
				Boring refusal encountered at 18.1 feet.					
			20						

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-5

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Soil sample collected from 0.3 to 2.6 feet	Start Time/Date: 11/10/2015 10:29 AM Finish Time/Date: 11/10/2015 10:30 AM	Date: Water Level ATD: Not encountered
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
	Well not installed		0	SILTY CLAY (CH) with rock fragments and trace coal, orange and dark brown, moist - FILL				**Sample No. 1** - 0.3' to 2.6' No odors	
				SILTY CLAY (CL), yellow brown, damp - RESIDUUM			95		0.0
				Weathered LIMESTONE, light gray, dry - RESIDUUM					
				Boring refusal encountered at 2.6 feet.					
			5						
			10						
			15						
			20						

ENVIRONMENTAL LOG SIMPLE 4281-15-036A.GPJ S&ME 1-18-2012.GDT 12/8/15

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-5A

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Boring offset from B-5 approximately 5 feet west. No sample collected	Start Time/Date: 11/10/2015 10:35 AM Finish Time/Date: 11/10/2015 10:40 AM	Date: — Water Level: — ATD: Not encountered
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
	Well not installed		0	TOPSOIL and mulch, brown, damp					
				SILTY CLAY (CL) with scattered rock fragments and roots, orange brown, dry - FILL			75	**Sample No. 1** - 1' to 2.5' No odors	0.0
							75	**Sample No. 2** - 2.5' to 5' No odors	0.0
			5	SILTY CLAY (CL-CH) with scattered limestone fragments, black -stained nodules, and black oxide staining, yellow brown, damp - RESIDUUM			100	**Sample No. 3** - 5' to 7.5' No odors	0.0
				Weathered LIMESTONE, light gray, dry - RESIDUUM					
				Boring refusal encountered at 7.5 feet.					
			10						
			15						
			20						

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-6

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Soil sample collected from 0.5 to 5.3 feet	Start Time/Date: 11/9/2015 2:35 PM Finish Time/Date: 11/9/2015 2:40 PM	Date: — Water Level: —
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	▽ ATD: 5 ft

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
	Well not installed		0	TOPSOIL, dark brown, moist					
				SILTY CLAY (CH) with rock fragments, yellow brown, moist - FILL			30	**Sample No. 1** - 0.5' to 5' No odors	0.0
▽			5	SILTY CLAY (CH) with scattered limestone fragments, yellow brown, wet - RESIDUUM			100	**Sample No. 2** - 5' to 5.3' No odors	0.0
				Weathered LIMESTONE, light gry, fissile, wet - RESIDUUM					
				Boring refusal encountered at 5.7 feet.					
			10						
			15						
			20						

ENVIRONMENTAL LOG SIMPLE 4281-15-036A.GPJ S&ME 1-18-2012.GDT 12/8/15

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-7

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Soil sample collected from 10 to 12.5 feet	Start Time/Date: 11/10/2015 11:00 AM Finish Time/Date: 11/10/2015 11:15 AM	Date / Water Level ATD 11/10/15 — Not encountered 11.8 ft
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
			0	Brick hardscaping					
				SAND (SP), gray and yellow brown, medium-grained, moist - FILL					
				SILTY CLAY (CH) with rock and brick fragments, brown and orange brown, moist - FILL			95	**Sample No. 1** - 0.8' to 2.7' No odors	0.0
				CLAYEY SILT (MH) with scattered round pebbles, orange brown with black oxide staining, moist - ALLUVIUM			95	**Sample No. 2** - 2.7' to 5' No odors	0.0
			5				100	**Sample No. 3** - 5' to 7.5' No odors	0.0
				SILTY CLAY (CH), yellow brown and orange, very moist - RESIDUUM			100	**Sample No. 4** - 7.5' to 10' No odors	0.0
			10				100	**Sample No. 5** - 10' to 12.5' Possible pesticide odor at 11-11.4	0.0
▼				Weathered LIMESTONE (seam), gray, very moist - RESIDUUM					
				SILTY CLAY (CH), yellow brown and orange, very moist - RESIDUUM			100	**Sample No. 6** - 12.5' to 14' No odors	0.0
				Weathered LIMESTONE, gray, moist - RESIDUUM					
			15	Boring refusal encountered at 14 feet.					
			20						

ENVIRONMENTAL BORING RECORD

Miller Park District

Chattanooga, Tennessee

S&ME Job No. 418115036A

BORING NO. B-8

SHEET 1 of 1

Logged by: P. Gribben, PG	Elevation: Not surveyed	GROUNDWATER
Remarks: Soil sample collected from 0.8 to 2.5 feet	Start Time/Date: 11/10/2015 11:55 AM Finish Time/Date: 11/10/2015 12:00 PM	Date: Water Level ATD: Not encountered
	Detector: PID Rig Type: Geo-Probe Drilling Method: Direct Push	

G	Well Detail	Elev. (ft.)	Depth (ft.)	Material Description	Lith.	S	R	Sample Remarks	Detector Reading
	Well not installed		0	TOPSOIL, dark brown, moist					
				SILTY CLAY (CH), yellow brown, moist - RESIDUUM			100	**Sample No. 1** - 0.8' to 2.5' No odors	0.0
				Weathered LIMESTONE, gray, dry - RESIDUUM			100	**Sample No. 2** - 2.5' to 5' No odors	0.0
				SILTY CLAY-CLAYEY SILT (CL-ML), brown, damp - RESIDUUM					
			5				100	**Sample No. 3** - 5' to 6.7' No odors	0.0
				Weathered LIMESTONE, light gray, dry - RESIDUUM					
				Boring refusal encountered at 6.7 feet.					
			10						
			15						
			20						

S&ME

Project Number: 4181-15-036A

WATER SAMPLE DATA SHEET

Client: City of Chattanooga
Location: Miller Park
Event: Limited Phase II ESA
Date: 11/10/15
Weather: Clear

Well ID: B-1C
Sample ID:
Personnel: Pat Gribben

Total Depth: 8.35 FT.(BTOC)
Depth to water: 7.3 FT.(BTOC)
Water Column: 1.05 FT.
Well Diameter 0.041 GAL/FT.
Well Volume: 0.043 GAL.
Total Purge Volume: N/A GAL.
Purge Device: Peristaltic pump with dedicated polyethylene tubing

Measuring Device: Solinst Water Level Meter
Date and Time: 11/10/15 @ 1307

WELL DIAMETER
[(**2**" DIA.= .163 GAL/FT.) (**4**" DIA. = .653 GAL/FT.)]
(**1**" DIA.= .041 GAL/FT.) (**1 1/4** " DIA.= .064 GAL/FT.)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Well Development Observations
		Not observed

Sample information: method, container number, size, and type, preservative used.
Sample analysis: VOCs, PAHs RCRA metals

Development time: Not performed - grab samples
Development device:

Sample Time VOCs + PAHs 11/10/15 @ 1315 ; RCRA metals 11/11/15 @ 1015
Sample Appearance (clarity, etc.) Clear no odors

Notes:

Signed by: Pat Gribben 11/11/15
Date

S&ME

Project Number: 4181-15-036A

WATER SAMPLE DATA SHEET

Client: City of Chattanooga
Location: Miller Park
Event: Limited Phase II ESA
Date: 11/10/15
Weather: Clear

Well ID: B-2
Sample ID:
Personnel: Pat Gribben

Total Depth: 19.6 FT.(BTOC)
Depth to water: Dry FT.(BTOC)
Water Column: FT.
Well Diameter GAL/FT.
Well Volume: GAL.
Total Purge Volume: GAL.
Purge Device: Peristaltic pump with dedicated polyethylene tubing

Measuring Device: Solinst Water Level Meter
Date and Time: 11/10/15 @ 1419

WELL DIAMETER
[(**2**" DIA.= .163 GAL/FT.) (**4**" DIA. = .653 GAL/FT.)]
(**1**" DIA.= .041 GAL/FT.) (**1 1/4** " DIA.= .064 GAL/FT.)

FIELD PARAMETERS		
Time	Purge Vol. (gals)	Well Development Observations

Sample information: method, container number, size, and type, preservative used.
Sample analysis:

Development time:
Development device:

Sample Time
Sample Appearance (clarity, etc.)

Notes:

Signed by: Pat Gribben 11/10/15
Date

S&ME

Project Number: 4181-15-036A

WATER SAMPLE DATA SHEET

Client: City of Chattanooga
Location: Miller Park
Event: Limited Phase II ESA
Date: 11/10/15
Weather: Clear

Well ID: B-3
Sample ID:
Personnel: Pat Gribben

Total Depth: 12.5 FT.(BTOC)
Depth to water: 10.45 FT.(BTOC)
Water Column: 2.05 FT.
Well Diameter 0.041 GAL/FT.
Well Volume: 0.084 GAL.
Total Purge Volume: 0.25 GAL.
Purge Device: Peristaltic pump with dedicated polyethylene tubing

Measuring Device: Solinst Water Level Meter
Date and Time: 11/10/15 @ 1326

WELL DIAMETER
[(**2**" DIA.= .163 GAL/FT.) (**4**" DIA. = .653 GAL/FT.)]
(**1**" DIA.= .041 GAL/FT.) (**1 1/4** " DIA.= .064 GAL/FT.)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Well Development Observations
1514	0.25	cloudy to clear

Sample information: method, container number, size, and type, preservative used.

Sample analysis: VOCs, PAHs, RCRA metals

Development time: 1514-1522
Development device: peristaltic pump + polyethylene tubing

Sample Time: VOCs + PAHs 11/10/15 @ 1525; RCRA metals 11/11/15 @ 1010
Sample Appearance (clarity, etc.): Slightly stained brown

Notes:

Signed by: Pat [signature] 11/11/15
Date

S&ME

Project Number: 4181-15-036A

WATER SAMPLE DATA SHEET

Client: City of Chattanooga
Location: Miller Park
Event: Limited Phase II ESA
Date: 11/10/15
Weather: Clear

Well ID: B-4
Sample ID:
Personnel: Pat Gribben

Total Depth: 17.7 FT.(BTOC)
Depth to water: Dry FT.(BTOC)
Water Column: FT.
Well Diameter GAL/FT.
Well Volume: GAL.
Total Purge Volume: GAL.
Purge Device: Peristaltic pump with dedicated polyethylene tubing

Measuring Device: Solinst Water Level Meter
Date and Time: 11/10/15 @ 1330

WELL DIAMETER
[(**2**" DIA.= .163 GAL/FT.) (**4**" DIA. = .653 GAL/FT.)]
(**1**" DIA.= .041 GAL/FT.) (**1 1/4** " DIA.= .064 GAL/FT.)

FIELD PARAMETERS		
Time	Purge Vol. (gals)	Well Development Observations

Sample information: method, container number, size, and type, preservative used.
Sample analysis:

Development time:
Development device:

Sample Time
Sample Appearance (clarity, etc.)

Notes:

Signed by: Pat Gribben 11/10/15
Date

S&ME

Project Number: 4181-15-036A

WATER SAMPLE DATA SHEET

Client: City of Chattanooga
Location: Miller Park
Event: Limited Phase II ESA
Date: 11/11/15
Weather: Clear

Well ID: B-7
Sample ID:
Personnel: Pat Gribben

Total Depth: 14.0 FT.(BTOC)
Depth to water: 11.8 FT.(BTOC)
Water Column: 2.2 FT.
Well Diameter 0.040 GAL/FT.
Well Volume: 0.090 GAL.
Total Purge Volume: 0.27 GAL.
Purge Device: Peristaltic pump with dedicated polyethylene tubing

Measuring Device: Solinst Water Level Meter
Date and Time: 11/11/15 @ 1335
WELL DIAMETER
[(**2**" DIA.= .163 GAL/FT.) (**4**" DIA. = .653 GAL/FT.)]
(**1**" DIA.= .041 GAL/FT.) (**1 1/4** " DIA.= .064 GAL/FT.)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Well Development Observations
1505	0.25	Near dryness, slightly stained yellow

Sample information: method, container number, size, and type, preservative used.
Sample analysis: VOCs

Development time: 1459 - 1505
Development device: peristaltic pump + dedicated polyethylene tubing

Sample Time 11/11/15 @ 0958
Sample Appearance (clarity, etc.) slightly stained yellow, no odors

Notes:

Signed by: Pat Gribben 11/11/15
Date

SOIL GAS FIELD LOG								
Field Parameter	**Units**	**Soil Gas Location and Corresponding Values**						
Sample ID		**SG-1**	**SG-2**	**SG-3**	**SG-4**	**SG-5**	**SG-6**	**SG-7**
Physical Location		Northwest portion of the site (along Market Street)	Southwest portion of the site (along Market Street)	South site boundary (along East 10th Street)	Southeast portion of the site	Along the eastern site boundary (south of fountain)	Along the eastern site boundary (north of fountain)	Northeast portion of the site
Lab canister #	#	1032	1170	1425	482	1050	1540	1691
Flow controller pre-set	Minutes/ Hours	30 minutes	30 minutes	30 minutes	30 minutes	30 minutes	30 minutes	30 minutes
Sample Depth	Feet/ Inches	3 feet	6 inches	3 feet	3 feet	14 inches	6 inches	6 inches
Sample train purge volume	Liters	1.48	0.23	1.48	1.48	0.54	0.23	0.23
Peak PID reading	PPM	TEST NOT PERFORMED	TEST NOT PERFORMED	TEST NOT PERFORMED	TEST NOT PERFORMED	TEST NOT PERFORMED	TEST NOT PERFORMED	TEST NOT PERFORMED
Vacuum test (initial)	Inches Hg	20	20	20	20	20	20	20
Vacuum test (final)	Inches Hg	20	20	20	20	20	20	20
Sample start	Time	9:03 AM	9:52 AM	9:46 AM	10:19 AM	11:07 AM	11:15 AM	11:29 AM
Sample stop	Time	9:34 AM	10:22 AM	10:16 AM	10:51 AM	11:37 AM	11:47 AM	11:59 AM
Canister vacuum (initial)	Inches Hg	28.5	28.5	29.5	29.5	28	28.5	29.5
Canister vacuum (final)	Inches Hg	3	3	3.5	1.5	2	2	3.0
Total sample time	Minutes	31	30	30	32	30	32	30
Date collected	Date	11/5/2015	11/5/2015	11/5/2015	11/5/2015	11/5/2015	11/5/2015	11/5/2015

Formula for calculating pre-sample purge volume:

(radius of the tubing (in))^2 (length of sample train (in)) (3.1416) + (radius of the borehole (in))^2 (depth of borehole (in)) (3.1416)

Tubing size: 0.180 inches I.D.

Diameter of the borehole: 1 inch

Purge Device Flow (L/min): 0.187 L/min

1 cubic inch = 0.0164 Liters

Appendix B

Laboratory Analytical Results and Chain of Custody Documentation

ANALYTICAL REPORT

November 13, 2015

S&ME Inc. - Hixson TN.

Sample Delivery Group:	L799444
Samples Received:	11/06/2015
Project Number:	4181-15-036A
Description:	Miller Park Limited Phase II

Report To:

Mr. Pat Gribben
4291 HWY 58 Suite 101
Chattanooga, TN 37416

Entire Report Reviewed By:

Tom Mellette
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

SG-1 3FT L799444-01 Air

Collected by: Pat Gribben | Collected date/time: 11/05/15 09:03 | Received date/time: 11/06/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG828146	1	11/11/15 22:16	11/11/15 22:16	DWR
Volatile Organic Compounds (MS) by Method TO-15	WG828951	1	11/13/15 15:11	11/13/15 15:11	SNH

SG-2 6IN L799444-02 Air

Collected by: Pat Gribben | Collected date/time: 11/05/15 09:52 | Received date/time: 11/06/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG828146	1	11/11/15 23:10	11/11/15 23:10	DWR

SG-3 3FT L799444-03 Air

Collected by: Pat Gribben | Collected date/time: 11/05/15 09:46 | Received date/time: 11/06/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG828146	1	11/12/15 00:04	11/12/15 00:04	DWR

SG-4 3FT L799444-04 Air

Collected by: Pat Gribben | Collected date/time: 11/05/15 10:19 | Received date/time: 11/06/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG828146	1	11/12/15 00:58	11/12/15 00:58	DWR
Volatile Organic Compounds (MS) by Method TO-15	WG828951	2	11/13/15 15:56	11/13/15 15:56	SNH

SG-5 14IN L799444-05 Air

Collected by: Pat Gribben | Collected date/time: 11/05/15 11:07 | Received date/time: 11/06/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG828146	1	11/12/15 01:52	11/12/15 01:52	DWR
Volatile Organic Compounds (MS) by Method TO-15	WG828674	2	11/12/15 16:35	11/12/15 16:35	DWR

SG-6 6IN L799444-06 Air

Collected by: Pat Gribben | Collected date/time: 11/05/15 11:15 | Received date/time: 11/06/15 09:00

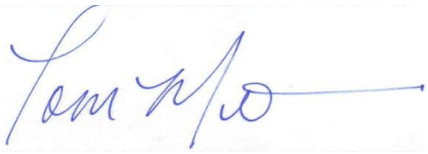
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG828146	1	11/12/15 02:48	11/12/15 02:48	DWR

SG-7 6IN L799444-07 Air

Collected by: Pat Gribben | Collected date/time: 11/05/15 11:29 | Received date/time: 11/06/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG828674	1	11/12/15 17:31	11/12/15 17:31	DWR

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Tom Mellette
Technical Service Representative

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	39.3	93.4		1	WG828146
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG828146
Benzene	71-43-2	78.10	0.200	0.639	2.37	7.57		1	WG828146
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG828146
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG828146
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG828146
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG828146
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG828146
Carbon disulfide	75-15-0	76.10	0.200	0.622	1.38	4.28		1	WG828146
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG828146
Chlorobenzene	108-90-7	113	0.200	0.924	0.522	2.41		1	WG828146
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG828146
Chloroform	67-66-3	119	0.200	0.973	0.436	2.12		1	WG828146
Chloromethane	74-87-3	50.50	0.200	0.413	0.642	1.33		1	WG828146
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG828146
Cyclohexane	110-82-7	84.20	0.200	0.689	0.697	2.40		1	WG828146
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG828146
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG828146
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	0.231	1.39		1	WG828146
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG828146
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	0.295	1.77		1	WG828146
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG828146
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG828146
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG828146
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG828146
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG828146
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG828146
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG828146
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG828146
1,4-Dioxane	123-91-1	88.10	0.200	0.721	0.607	2.19		1	WG828146
Ethanol	64-17-5	46.10	0.630	1.19	21.7	40.9		1	WG828146
Ethylbenzene	100-41-4	106	0.200	0.867	0.328	1.42		1	WG828146
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG828146
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.291	1.64		1	WG828146
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.429	2.12		1	WG828146
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG828146
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG828146
Heptane	142-82-5	100	0.200	0.818	2.84	11.6		1	WG828146
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG828146
n-Hexane	110-54-3	86.20	0.200	0.705	2.72	9.60		1	WG828146
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG828146
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.232	0.807		1	WG828146
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG828146
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	6.77	20.0		1	WG828146
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG828146
Methyl methacrylate	80-62-6	100.12	0.200	0.819	0.305	1.25		1	WG828146
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG828146
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG828146
2-Propanol	67-63-0	60.10	1.25	3.07	1.73	4.26		1	WG828146
Propene	115-07-1	42.10	0.400	0.689	18.6	32.0		1	WG828951
Styrene	100-42-5	104	0.200	0.851	0.241	1.02		1	WG828146
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG828146
Tetrachloroethylene	127-18-4	166	0.200	1.36	1.70	11.5		1	WG828951
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	0.355	1.05		1	WG828146
Toluene	108-88-3	92.10	0.200	0.753	5.62	21.2		1	WG828146
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG828146
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG828146
Trichloroethylene	79-01-6	131	0.200	1.07	0.328	1.76		1	WG828951
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.496	2.43		1	WG828146
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG828146
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	0.509	2.38		1	WG828146
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG828146
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG828146
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG828146
m&p-Xylene	1330-20-7	106	0.400	1.73	1.44	6.24		1	WG828146
o-Xylene	95-47-6	106	0.200	0.867	0.650	2.82		1	WG828146
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*104*				WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv	ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	13.6	32.4		1	WG828146
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG828146
Benzene	71-43-2	78.10	0.200	0.639	1.65	5.26		1	WG828146
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG828146
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG828146
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG828146
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG828146
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG828146
Carbon disulfide	75-15-0	76.10	0.200	0.622	1.21	3.77		1	WG828146
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG828146
Chlorobenzene	108-90-7	113	0.200	0.924	0.636	2.94		1	WG828146
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG828146
Chloroform	67-66-3	119	0.200	0.973	0.326	1.59		1	WG828146
Chloromethane	74-87-3	50.50	0.200	0.413	0.234	0.484		1	WG828146
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG828146
Cyclohexane	110-82-7	84.20	0.200	0.689	0.433	1.49		1	WG828146
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG828146
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG828146
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	0.246	1.48		1	WG828146
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG828146
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	0.326	1.96		1	WG828146
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG828146
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG828146
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG828146
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG828146
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG828146
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG828146
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG828146
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG828146
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG828146
Ethanol	64-17-5	46.10	0.630	1.19	17.3	32.7		1	WG828146
Ethylbenzene	100-41-4	106	0.200	0.867	0.277	1.20		1	WG828146
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG828146
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.306	1.72		1	WG828146
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.528	2.61		1	WG828146
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG828146
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG828146
Heptane	142-82-5	100	0.200	0.818	0.392	1.60		1	WG828146
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG828146
n-Hexane	110-54-3	86.20	0.200	0.705	1.08	3.82		1	WG828146
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG828146
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.552	1.92		1	WG828146
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG828146
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	1.43	4.21		1	WG828146
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG828146
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG828146
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG828146
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG828146
2-Propanol	67-63-0	60.10	1.25	3.07	1.76	4.33		1	WG828146
Propene	115-07-1	42.10	0.400	0.689	ND	ND		1	WG828146
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG828146
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG828146
Tetrachloroethylene	127-18-4	166	0.200	1.36	3.18	21.6		1	WG828146
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG828146
Toluene	108-88-3	92.10	0.200	0.753	4.73	17.8		1	WG828146
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG828146
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG828146
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG828146
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.351	1.72		1	WG828146
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	0.248	1.22		1	WG828146
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG828146
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG828146
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG828146
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG828146
m&p-Xylene	1330-20-7	106	0.400	1.73	1.86	8.07		1	WG828146
o-Xylene	95-47-6	106	0.200	0.867	0.635	2.75		1	WG828146
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*101*				WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv	ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	4.05	9.63		1	WG828146
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG828146
Benzene	71-43-2	78.10	0.200	0.639	5.14	16.4		1	WG828146
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG828146
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG828146
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG828146
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG828146
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG828146
Carbon disulfide	75-15-0	76.10	0.200	0.622	2.47	7.68		1	WG828146
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG828146
Chlorobenzene	108-90-7	113	0.200	0.924	0.381	1.76		1	WG828146
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG828146
Chloroform	67-66-3	119	0.200	0.973	0.352	1.71		1	WG828146
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG828146
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG828146
Cyclohexane	110-82-7	84.20	0.200	0.689	0.456	1.57		1	WG828146
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG828146
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG828146
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG828146
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG828146
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	0.259	1.56		1	WG828146
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG828146
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG828146
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG828146
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG828146
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG828146
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG828146
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG828146
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG828146
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG828146
Ethanol	64-17-5	46.10	0.630	1.19	6.28	11.8		1	WG828146
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG828146
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG828146
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.282	1.58		1	WG828146
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.398	1.97		1	WG828146
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG828146
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG828146
Heptane	142-82-5	100	0.200	0.818	1.01	4.12		1	WG828146
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG828146
n-Hexane	110-54-3	86.20	0.200	0.705	0.761	2.68		1	WG828146
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG828146
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG828146
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG828146
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG828146
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG828146
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG828146
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG828146
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG828146
2-Propanol	67-63-0	60.10	1.25	3.07	1.30	3.20		1	WG828146
Propene	115-07-1	42.10	0.400	0.689	2.83	4.87		1	WG828146
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG828146
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG828146
Tetrachloroethylene	127-18-4	166	0.200	1.36	11.9	80.5		1	WG828146
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG828146
Toluene	108-88-3	92.10	0.200	0.753	2.65	9.96		1	WG828146
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG828146
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG828146
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG828146
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG828146
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG828146
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG828146
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG828146
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG828146
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG828146
m&p-Xylene	1330-20-7	106	0.400	1.73	0.595	2.58		1	WG828146
o-Xylene	95-47-6	106	0.200	0.867	0.307	1.33		1	WG828146
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*102*				WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv	ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	9.44	22.4		1	WG828146
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG828146
Benzene	71-43-2	78.10	0.200	0.639	1.30	4.17		1	WG828146
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG828146
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG828146
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG828146
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG828146
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG828146
Carbon disulfide	75-15-0	76.10	0.200	0.622	1.37	4.27		1	WG828146
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG828146
Chlorobenzene	108-90-7	113	0.200	0.924	0.516	2.38		1	WG828146
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG828146
Chloroform	67-66-3	119	0.200	0.973	0.233	1.14		1	WG828146
Chloromethane	74-87-3	50.50	0.200	0.413	0.341	0.705		1	WG828146
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG828146
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG828146
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG828146
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG828146
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	0.221	1.33		1	WG828146
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG828146
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	0.301	1.81		1	WG828146
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG828146
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG828146
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG828146
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG828146
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG828146
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG828146
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG828146
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG828146
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG828146
Ethanol	64-17-5	46.10	0.630	1.19	8.17	15.4		1	WG828146
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG828146
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG828146
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.294	1.65		1	WG828146
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.479	2.37		1	WG828146
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG828146
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG828146
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG828146
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG828146
n-Hexane	110-54-3	86.20	0.200	0.705	0.268	0.946		1	WG828146
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG828146
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG828146
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG828146
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	2.38	7.01		1	WG828146
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG828146
Methyl methacrylate	80-62-6	100.12	0.200	0.819	0.248	1.01		1	WG828146
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG828146
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG828146
2-Propanol	67-63-0	60.10	1.25	3.07	ND	ND		1	WG828146
Propene	115-07-1	42.10	0.800	1.38	4.27	7.35		2	WG828951
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG828146
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG828146
Tetrachloroethylene	127-18-4	166	0.200	1.36	ND	ND		1	WG828146
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG828146
Toluene	108-88-3	92.10	0.200	0.753	3.32	12.5		1	WG828146
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG828146
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG828146
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG828146
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG828146
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG828146
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG828146
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG828146
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG828146
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG828146
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG828146
o-Xylene	95-47-6	106	0.200	0.867	0.266	1.15		1	WG828146
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*103*				WG828146

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	8.01	19.0		1	WG828146
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG828146
Benzene	71-43-2	78.10	0.200	0.639	2.37	7.58		1	WG828146
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG828146
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG828146
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG828146
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG828146
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG828146
Carbon disulfide	75-15-0	76.10	0.200	0.622	0.484	1.51		1	WG828146
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG828146
Chlorobenzene	108-90-7	113	0.200	0.924	0.739	3.42		1	WG828146
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG828146
Chloroform	67-66-3	119	0.200	0.973	1.44	7.03		1	WG828146
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG828146
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG828146
Cyclohexane	110-82-7	84.20	0.200	0.689	1.41	4.87		1	WG828146
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG828146
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG828146
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	0.311	1.87		1	WG828146
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG828146
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	0.384	2.31		1	WG828146
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG828146
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG828146
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG828146
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG828146
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG828146
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG828146
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG828146
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG828146
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG828146
Ethanol	64-17-5	46.10	0.630	1.19	9.28	17.5		1	WG828146
Ethylbenzene	100-41-4	106	0.200	0.867	0.384	1.67		1	WG828146
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG828146
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.718	4.04		1	WG828146
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.420	2.08		1	WG828146
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG828146
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG828146
Heptane	142-82-5	100	0.200	0.818	1.20	4.93		1	WG828146
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG828146
n-Hexane	110-54-3	86.20	0.200	0.705	1.75	6.17		1	WG828146
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG828146
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG828146
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG828146
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	1.47	4.35		1	WG828146
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG828146
Methyl methacrylate	80-62-6	100.12	0.200	0.819	0.333	1.37		1	WG828146
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG828146
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG828146
2-Propanol	67-63-0	60.10	1.25	3.07	ND	ND		1	WG828146
Propene	115-07-1	42.10	0.800	1.38	6.66	11.5		2	WG828674
Styrene	100-42-5	104	0.200	0.851	0.301	1.28		1	WG828146
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG828146
Tetrachloroethylene	127-18-4	166	0.200	1.36	1.35	9.13		1	WG828146
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG828146
Toluene	108-88-3	92.10	0.200	0.753	6.43	24.2		1	WG828146
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG828146
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG828146
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG828146
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.421	2.07		1	WG828146
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG828146
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG828146
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG828146
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG828146
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG828146
m&p-Xylene	1330-20-7	106	0.400	1.73	1.44	6.25		1	WG828146
o-Xylene	95-47-6	106	0.200	0.867	0.907	3.93		1	WG828146
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*106*				WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv	ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	14.4	34.3		1	WG828146
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG828146
Benzene	71-43-2	78.10	0.200	0.639	1.66	5.31		1	WG828146
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG828146
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG828146
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG828146
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG828146
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG828146
Carbon disulfide	75-15-0	76.10	0.200	0.622	0.737	2.29		1	WG828146
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG828146
Chlorobenzene	108-90-7	113	0.200	0.924	0.747	3.45		1	WG828146
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG828146
Chloroform	67-66-3	119	0.200	0.973	0.484	2.35		1	WG828146
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG828146
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG828146
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG828146
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG828146
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG828146
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	0.283	1.70		1	WG828146
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG828146
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	0.395	2.37		1	WG828146
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG828146
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG828146
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG828146
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG828146
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG828146
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG828146
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG828146
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG828146
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG828146
Ethanol	64-17-5	46.10	0.630	1.19	72.4	136	E	1	WG828146
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG828146
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG828146
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.360	2.02		1	WG828146
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.325	1.61		1	WG828146
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG828146
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG828146
Heptane	142-82-5	100	0.200	0.818	ND	ND		1	WG828146
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG828146
n-Hexane	110-54-3	86.20	0.200	0.705	0.208	0.734		1	WG828146
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG828146
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG828146
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG828146
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG828146
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG828146
Methyl methacrylate	80-62-6	100.12	0.200	0.819	0.231	0.944		1	WG828146
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG828146
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG828146
2-Propanol	67-63-0	60.10	1.25	3.07	2.30	5.66		1	WG828146
Propene	115-07-1	42.10	0.400	0.689	ND	ND		1	WG828146
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG828146
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG828146
Tetrachloroethylene	127-18-4	166	0.200	1.36	2.23	15.2		1	WG828146
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG828146
Toluene	108-88-3	92.10	0.200	0.753	4.63	17.4		1	WG828146
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG828146
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG828146
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG828146
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	ND	ND		1	WG828146
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG828146
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG828146
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG828146
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG828146
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG828146
m&p-Xylene	1330-20-7	106	0.400	1.73	0.833	3.61		1	WG828146
o-Xylene	95-47-6	106	0.200	0.867	0.357	1.55		1	WG828146
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*103*				WG828146

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	19.4	46.2		1	WG828674
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG828674
Benzene	71-43-2	78.10	0.200	0.639	8.27	26.4		1	WG828674
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG828674
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG828674
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG828674
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG828674
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG828674
Carbon disulfide	75-15-0	76.10	0.200	0.622	2.41	7.50		1	WG828674
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG828674
Chlorobenzene	108-90-7	113	0.200	0.924	0.929	4.29		1	WG828674
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG828674
Chloroform	67-66-3	119	0.200	0.973	0.483	2.35		1	WG828674
Chloromethane	74-87-3	50.50	0.200	0.413	0.248	0.512		1	WG828674
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG828674
Cyclohexane	110-82-7	84.20	0.200	0.689	5.56	19.1		1	WG828674
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG828674
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG828674
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	0.318	1.91		1	WG828674
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG828674
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	0.435	2.61		1	WG828674
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG828674
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG828674
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG828674
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG828674
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG828674
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG828674
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG828674
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG828674
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG828674
Ethanol	64-17-5	46.10	0.630	1.19	35.8	67.5		1	WG828674
Ethylbenzene	100-41-4	106	0.200	0.867	0.597	2.59		1	WG828674
4-Ethyltoluene	622-96-8	120	0.200	0.982	ND	ND		1	WG828674
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.332	1.87		1	WG828674
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.634	3.14		1	WG828674
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG828674
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG828674
Heptane	142-82-5	100	0.200	0.818	7.81	31.9		1	WG828674
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG828674
n-Hexane	110-54-3	86.20	0.200	0.705	15.8	55.7		1	WG828674
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG828674
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG828674
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG828674
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	2.55	7.51		1	WG828674
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG828674
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG828674
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG828674
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG828674
2-Propanol	67-63-0	60.10	1.25	3.07	2.92	7.18		1	WG828674
Propene	115-07-1	42.10	0.400	0.689	2.87	4.95		1	WG828674
Styrene	100-42-5	104	0.200	0.851	0.229	0.976		1	WG828674
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG828674
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.395	2.68		1	WG828674
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG828674
Toluene	108-88-3	92.10	0.200	0.753	10.9	41.2		1	WG828674
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG828674

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG828674
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG828674
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG828674
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	1.16	5.70		1	WG828674
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	0.494	2.42		1	WG828674
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG828674
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG828674
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG828674
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG828674
m&p-Xylene	1330-20-7	106	0.400	1.73	2.91	12.6		1	WG828674
o-Xylene	95-47-6	106	0.200	0.867	1.08	4.68		1	WG828674
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.5*				WG828674

Method Blank (MB)

(MB) 11/11/15 10:09

Analyte	MB Result ppb	MB Qualifier	MB RDL ppb
Acetone	ND		1.25
Allyl Chloride	ND		0.200
Benzene	ND		0.200
Benzyl Chloride	ND		0.200
Bromodichloromethane	ND		0.200
Bromoform	ND		0.600
Bromomethane	ND		0.200
1,3-Butadiene	ND		2.00
Carbon disulfide	ND		0.200
Carbon tetrachloride	ND		0.200
Chlorobenzene	ND		0.200
Chloroethane	ND		0.200
Chloroform	ND		0.200
Chloromethane	ND		0.200
2-Chlorotoluene	ND		0.200
Cyclohexane	ND		0.200
Dibromochloromethane	ND		0.200
1,2-Dibromoethane	ND		0.200
1,2-Dichlorobenzene	ND		0.200
1,3-Dichlorobenzene	ND		0.200
1,4-Dichlorobenzene	ND		0.200
1,2-Dichloroethane	ND		0.200
1,1-Dichloroethane	ND		0.200
1,1-Dichloroethene	ND		0.200
cis-1,2-Dichloroethene	ND		0.200
trans-1,2-Dichloroethene	ND		0.200
1,2-Dichloropropane	ND		0.200
cis-1,3-Dichloropropene	ND		0.200
trans-1,3-Dichloropropene	ND		0.200
1,4-Dioxane	ND		0.200
Ethylbenzene	ND		0.200
4-Ethyltoluene	ND		0.200
Trichlorofluoromethane	ND		0.200
Dichlorodifluoromethane	ND		0.200
1,1,2-Trichlorotrifluoroethane	ND		0.200
1,2-Dichlorotetrafluoroethane	ND		0.200

Method Blank (MB)

(MB) 11/11/15 10:09

Analyte	MB Result ppb	MB Qualifier	MB RDL ppb
Heptane	ND		0.200
Hexachloro-1,3-butadiene	ND		0.630
n-Hexane	ND		0.200
Isopropylbenzene	ND		0.200
Methylene Chloride	ND		0.200
Methyl Butyl Ketone	ND		1.25
2-Butanone (MEK)	ND		1.25
4-Methyl-2-pentanone (MIBK)	ND		1.25
Methyl Methacrylate	ND		0.200
MTBE	ND		0.200
Naphthalene	ND		0.630
2-Propanol	ND		1.25
Propene	ND		0.400
Styrene	ND		0.200
1,1,2,2-Tetrachloroethane	ND		0.200
Tetrachloroethylene	ND		0.200
Tetrahydrofuran	ND		0.200
Toluene	ND		0.200
1,2,4-Trichlorobenzene	ND		0.630
1,1,1-Trichloroethane	ND		0.200
1,1,2-Trichloroethane	ND		0.200
Trichloroethylene	ND		0.200
1,2,4-Trimethylbenzene	ND		0.200
1,3,5-Trimethylbenzene	ND		0.200
2,2,4-Trimethylpentane	ND		0.200
Vinyl chloride	ND		0.200
Vinyl Bromide	ND		0.200
Vinyl acetate	ND		0.200
m&p-Xylene	ND		0.400
o-Xylene	ND		0.200
Ethanol	ND		0.630
(S) 1,4-Bromofluorobenzene	*94.6*		*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/11/15 08:24 • (LCSD) 11/11/15 09:16

Analyte	Spike Amount ppb	LCS Result ppb	LCSD Result ppb	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	4.39	4.14	117	110	34.3-167			5.92	25
Propene	3.75	4.57	4.69	122	125	53.9-143			2.66	25
Dichlorodifluoromethane	3.75	4.18	4.02	111	107	56.7-140			3.79	25
1,2-Dichlorotetrafluoroethane	3.75	4.18	4.25	112	113	70.0-130			1.48	25
Chloromethane	3.75	4.14	4.22	110	113	70.0-130			1.93	25
Vinyl chloride	3.75	4.28	4.27	114	114	70.0-130			0.170	25
1,3-Butadiene	3.75	4.38	4.13	117	110	70.0-130			5.87	25
Bromomethane	3.75	4.40	4.10	117	109	70.0-130			6.99	25
Chloroethane	3.75	4.47	4.11	119	110	70.0-130			8.40	25
Trichlorofluoromethane	3.75	4.42	4.14	118	110	70.0-130			6.46	25
1,1,2-Trichlorotrifluoroethane	3.75	4.27	4.13	114	110	70.0-130			3.33	25
1,1-Dichloroethene	3.75	4.20	4.08	112	109	70.0-130			2.93	25
1,1-Dichloroethane	3.75	4.25	4.21	113	112	70.0-130			0.950	25
Acetone	3.75	3.99	4.06	106	108	70.0-130			1.77	25
2-Propanol	3.75	3.85	4.10	103	109	50.4-152			6.06	25
Carbon disulfide	3.75	4.14	4.05	110	108	70.0-130			2.32	25
Methylene Chloride	3.75	3.92	3.81	105	102	70.0-130			2.93	25
MTBE	3.75	4.10	4.08	109	109	70.0-130			0.400	25
trans-1,2-Dichloroethene	3.75	4.12	4.09	110	109	70.0-130			0.770	25
n-Hexane	3.75	4.26	4.20	114	112	70.0-130			1.26	25
Vinyl acetate	3.75	4.06	4.33	108	116	70.0-130			6.46	25
Methyl Ethyl Ketone	3.75	4.15	4.27	111	114	70.0-130			2.87	25
cis-1,2-Dichloroethene	3.75	4.13	4.16	110	111	70.0-130			0.810	25
Chloroform	3.75	4.22	4.21	112	112	70.0-130			0.110	25
Cyclohexane	3.75	4.28	4.29	114	114	70.0-130			0.160	25
1,1,1-Trichloroethane	3.75	4.21	4.20	112	112	70.0-130			0.220	25
Carbon tetrachloride	3.75	4.21	4.19	112	112	70.0-130			0.400	25
Benzene	3.75	4.35	4.27	116	114	70.0-130			1.80	25
1,2-Dichloroethane	3.75	4.23	4.15	113	111	70.0-130			1.87	25
Heptane	3.75	4.39	4.41	117	118	70.0-130			0.370	25
Trichloroethylene	3.75	4.23	4.19	113	112	70.0-130			0.920	25
1,2-Dichloropropane	3.75	4.29	4.26	114	113	70.0-130			0.820	25
1,4-Dioxane	3.75	4.16	4.26	111	114	48.0-156			2.56	25
Bromodichloromethane	3.75	4.22	4.28	112	114	70.0-130			1.44	25
cis-1,3-Dichloropropene	3.75	4.31	4.27	115	114	70.0-130			0.890	25
4-Methyl-2-pentanone (MIBK)	3.75	4.26	4.18	114	111	55.3-154			1.83	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/11/15 08:24 • (LCSD) 11/11/15 09:16

Analyte	Spike Amount ppb	LCS Result ppb	LCSD Result ppb	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Toluene	3.75	4.30	4.34	115	116	70.0-130			0.950	25
trans-1,3-Dichloropropene	3.75	4.27	4.19	114	112	70.0-130			1.76	25
1,1,2-Trichloroethane	3.75	4.21	4.22	112	113	70.0-130			0.350	25
Tetrachloroethylene	3.75	4.26	4.30	114	115	70.0-130			0.930	25
Methyl Butyl Ketone	3.75	4.35	4.44	116	118	47.9-165			2.02	25
Dibromochloromethane	3.75	4.24	4.32	113	115	70.0-130			1.93	25
1,2-Dibromoethane	3.75	4.12	4.18	110	111	70.0-130			1.48	25
Chlorobenzene	3.75	4.16	4.20	111	112	70.0-130			1.03	25
Ethylbenzene	3.75	4.25	4.22	113	113	70.0-130			0.590	25
m&p-Xylene	7.50	8.35	8.32	111	111	70.0-130			0.380	25
o-Xylene	3.75	4.32	4.29	115	114	70.0-130			0.800	25
Styrene	3.75	4.32	4.33	115	115	70.0-130			0.120	25
Bromoform	3.75	4.23	4.28	113	114	70.0-130			1.24	25
1,1,2,2-Tetrachloroethane	3.75	4.13	4.12	110	110	70.0-130			0.260	25
4-Ethyltoluene	3.75	4.28	4.27	114	114	70.0-130			0.300	25
1,3,5-Trimethylbenzene	3.75	4.03	4.15	107	111	70.0-130			2.99	25
1,2,4-Trimethylbenzene	3.75	4.26	4.25	114	113	70.0-130			0.130	25
1,3-Dichlorobenzene	3.75	4.19	4.29	112	114	70.0-130			2.14	25
1,4-Dichlorobenzene	3.75	4.28	4.38	114	117	70.0-130			2.33	25
Benzyl Chloride	3.75	4.31	4.43	115	118	55.6-160			2.68	25
1,2-Dichlorobenzene	3.75	4.13	4.19	110	112	70.0-130			1.38	25
1,2,4-Trichlorobenzene	3.75	3.94	4.39	105	117	53.6-154			10.8	25
Hexachloro-1,3-butadiene	3.75	3.96	4.07	106	109	62.1-143			2.84	25
Naphthalene	3.75	4.15	4.53	111	121	52.0-158			8.64	25
Allyl Chloride	3.75	4.22	4.12	113	110	70.0-130			2.54	25
2-Chlorotoluene	3.75	4.21	4.16	112	111	70.0-130			1.24	25
Methyl Methacrylate	3.75	3.91	3.93	104	105	70.0-130			0.580	25
Tetrahydrofuran	3.75	4.21	4.23	112	113	65.0-140			0.390	25
2,2,4-Trimethylpentane	3.75	4.34	4.32	116	115	70.0-130			0.280	25
Vinyl Bromide	3.75	4.44	4.12	118	110	70.0-130			7.63	25
Isopropylbenzene	3.75	4.32	4.26	115	114	70.0-130			1.35	25
(S) 1,4-Bromofluorobenzene				*102*	*99.5*	*60.0-140*				

Method Blank (MB)

(MB) 11/12/15 12:12

Analyte	MB Result ppb	MB Qualifier	MB RDL ppb
Acetone	ND		1.25
Allyl Chloride	ND		0.200
Benzene	ND		0.200
Benzyl Chloride	ND		0.200
Bromodichloromethane	ND		0.200
Bromoform	ND		0.600
Bromomethane	ND		0.200
1,3-Butadiene	ND		2.00
Carbon disulfide	ND		0.200
Carbon tetrachloride	ND		0.200
Chlorobenzene	ND		0.200
Chloroethane	ND		0.200
Chloroform	ND		0.200
Chloromethane	ND		0.200
2-Chlorotoluene	ND		0.200
Cyclohexane	ND		0.200
Dibromochloromethane	ND		0.200
1,2-Dibromoethane	ND		0.200
1,2-Dichlorobenzene	ND		0.200
1,3-Dichlorobenzene	ND		0.200
1,4-Dichlorobenzene	ND		0.200
1,2-Dichloroethane	ND		0.200
1,1-Dichloroethane	ND		0.200
1,1-Dichloroethene	ND		0.200
cis-1,2-Dichloroethene	ND		0.200
trans-1,2-Dichloroethene	ND		0.200
1,2-Dichloropropane	ND		0.200
cis-1,3-Dichloropropene	ND		0.200
trans-1,3-Dichloropropene	ND		0.200
1,4-Dioxane	ND		0.200
Ethylbenzene	ND		0.200
4-Ethyltoluene	ND		0.200
Trichlorofluoromethane	ND		0.200
Dichlorodifluoromethane	ND		0.200
1,1,2-Trichlorotrifluoroethane	ND		0.200
1,2-Dichlorotetrafluoroethane	ND		0.200

Method Blank (MB)

(MB) 11/12/15 12:12

Analyte	MB Result ppb	MB Qualifier	MB RDL ppb
Heptane	ND		0.200
Hexachloro-1,3-butadiene	ND		0.630
n-Hexane	ND		0.200
Isopropylbenzene	ND		0.200
Methylene Chloride	ND		0.200
Methyl Butyl Ketone	ND		1.25
2-Butanone (MEK)	ND		1.25
4-Methyl-2-pentanone (MIBK)	ND		1.25
Methyl Methacrylate	ND		0.200
MTBE	ND		0.200
Naphthalene	ND		0.630
2-Propanol	ND		1.25
Propene	ND		0.400
Styrene	ND		0.200
1,1,2,2-Tetrachloroethane	ND		0.200
Tetrachloroethylene	ND		0.200
Tetrahydrofuran	ND		0.200
Toluene	ND		0.200
1,2,4-Trichlorobenzene	ND		0.630
1,1,1-Trichloroethane	ND		0.200
1,1,2-Trichloroethane	ND		0.200
Trichloroethylene	ND		0.200
1,2,4-Trimethylbenzene	ND		0.200
1,3,5-Trimethylbenzene	ND		0.200
2,2,4-Trimethylpentane	ND		0.200
Vinyl chloride	ND		0.200
Vinyl Bromide	ND		0.200
Vinyl acetate	ND		0.200
m&p-Xylene	ND		0.400
o-Xylene	ND		0.200
Ethanol	ND		0.630
(S) 1,4-Bromofluorobenzene	*94.0*		*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/12/15 09:35 • (LCSD) 11/12/15 10:26

Analyte	Spike Amount ppb	LCS Result ppb	LCSD Result ppb	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	4.54	3.89	121	104	34.3-167			15.4	25
Propene	3.75	4.46	4.31	119	115	53.9-143			3.46	25
Dichlorodifluoromethane	3.75	4.25	3.94	113	105	56.7-140			7.51	25
1,2-Dichlorotetrafluoroethane	3.75	4.18	3.90	111	104	70.0-130			6.81	25
Chloromethane	3.75	4.12	3.83	110	102	70.0-130			7.21	25
Vinyl chloride	3.75	4.22	3.92	112	105	70.0-130			7.29	25
1,3-Butadiene	3.75	4.38	3.92	117	105	70.0-130			11.0	25
Bromomethane	3.75	4.24	3.87	113	103	70.0-130			8.95	25
Chloroethane	3.75	4.33	3.84	115	102	70.0-130			12.0	25
Trichlorofluoromethane	3.75	4.26	3.84	114	102	70.0-130			10.4	25
1,1,2-Trichlorotrifluoroethane	3.75	4.19	3.86	112	103	70.0-130			8.25	25
1,1-Dichloroethene	3.75	4.16	3.86	111	103	70.0-130			7.58	25
1,1-Dichloroethane	3.75	4.23	3.91	113	104	70.0-130			7.94	25
Acetone	3.75	4.06	3.80	108	101	70.0-130			6.61	25
2-Propanol	3.75	4.00	3.81	107	102	50.4-152			4.87	25
Carbon disulfide	3.75	4.16	3.79	111	101	70.0-130			9.38	25
Methylene Chloride	3.75	3.93	3.62	105	96.6	70.0-130			8.09	25
MTBE	3.75	4.14	3.81	110	102	70.0-130			8.19	25
trans-1,2-Dichloroethene	3.75	4.16	3.77	111	100	70.0-130			9.77	25
n-Hexane	3.75	4.32	3.94	115	105	70.0-130			9.20	25
Vinyl acetate	3.75	4.22	3.96	112	106	70.0-130			6.24	25
Methyl Ethyl Ketone	3.75	4.29	3.91	115	104	70.0-130			9.47	25
cis-1,2-Dichloroethene	3.75	4.18	3.86	112	103	70.0-130			7.88	25
Chloroform	3.75	4.18	3.86	111	103	70.0-130			8.05	25
Cyclohexane	3.75	4.30	3.95	115	105	70.0-130			8.28	25
1,1,1-Trichloroethane	3.75	4.18	3.87	111	103	70.0-130			7.74	25
Carbon tetrachloride	3.75	4.22	3.86	112	103	70.0-130			8.97	25
Benzene	3.75	4.30	3.96	115	106	70.0-130			8.18	25
1,2-Dichloroethane	3.75	4.19	3.84	112	102	70.0-130			8.80	25
Heptane	3.75	4.45	4.03	119	107	70.0-130			10.1	25
Trichloroethylene	3.75	4.18	3.84	112	102	70.0-130			8.64	25
1,2-Dichloropropane	3.75	4.25	3.89	113	104	70.0-130			8.81	25
1,4-Dioxane	3.75	4.21	3.82	112	102	48.0-156			9.79	25
Bromodichloromethane	3.75	4.23	3.90	113	104	70.0-130			8.09	25
cis-1,3-Dichloropropene	3.75	4.22	3.92	113	104	70.0-130			7.54	25
4-Methyl-2-pentanone (MIBK)	3.75	4.12	3.87	110	103	55.3-154			6.25	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/12/15 09:35 • (LCSD) 11/12/15 10:26

Analyte	Spike Amount ppb	LCS Result ppb	LCSD Result ppb	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Toluene	3.75	4.27	3.91	114	104	70.0-130			8.58	25
trans-1,3-Dichloropropene	3.75	4.18	3.86	111	103	70.0-130			7.93	25
1,1,2-Trichloroethane	3.75	4.13	3.85	110	103	70.0-130			6.94	25
Tetrachloroethylene	3.75	4.22	3.88	113	103	70.0-130			8.39	25
Methyl Butyl Ketone	3.75	4.37	4.03	116	108	47.9-165			7.99	25
Dibromochloromethane	3.75	4.21	3.92	112	105	70.0-130			7.04	25
1,2-Dibromoethane	3.75	4.17	3.83	111	102	70.0-130			8.49	25
Chlorobenzene	3.75	4.16	3.81	111	102	70.0-130			8.71	25
Ethylbenzene	3.75	4.23	3.89	113	104	70.0-130			8.47	25
m&p-Xylene	7.50	8.31	7.64	111	102	70.0-130			8.45	25
o-Xylene	3.75	4.30	3.92	115	104	70.0-130			9.22	25
Styrene	3.75	4.37	3.95	116	105	70.0-130			10.0	25
Bromoform	3.75	4.28	3.90	114	104	70.0-130			9.34	25
1,1,2,2-Tetrachloroethane	3.75	4.14	3.72	110	99.1	70.0-130			10.8	25
4-Ethyltoluene	3.75	4.27	3.88	114	103	70.0-130			9.60	25
1,3,5-Trimethylbenzene	3.75	4.12	3.71	110	99.0	70.0-130			10.5	25
1,2,4-Trimethylbenzene	3.75	4.28	3.85	114	103	70.0-130			10.5	25
1,3-Dichlorobenzene	3.75	4.25	3.83	113	102	70.0-130			10.6	25
1,4-Dichlorobenzene	3.75	4.30	3.87	115	103	70.0-130			10.5	25
Benzyl Chloride	3.75	4.36	3.84	116	102	55.6-160			12.8	25
1,2-Dichlorobenzene	3.75	4.13	3.71	110	98.8	70.0-130			10.9	25
1,2,4-Trichlorobenzene	3.75	4.27	3.97	114	106	53.6-154			7.33	25
Hexachloro-1,3-butadiene	3.75	4.00	3.65	107	97.2	62.1-143			9.16	25
Naphthalene	3.75	4.46	4.03	119	107	52.0-158			10.2	25
Allyl Chloride	3.75	4.28	3.94	114	105	70.0-130			8.32	25
2-Chlorotoluene	3.75	4.24	3.79	113	101	70.0-130			11.1	25
Methyl Methacrylate	3.75	3.86	3.57	103	95.3	70.0-130			7.72	25
Tetrahydrofuran	3.75	4.18	3.79	111	101	65.0-140			9.76	25
2,2,4-Trimethylpentane	3.75	4.38	4.06	117	108	70.0-130			7.55	25
Vinyl Bromide	3.75	4.31	3.96	115	106	70.0-130			8.56	25
Isopropylbenzene	3.75	4.33	3.89	115	104	70.0-130			10.7	25
(S) 1,4-Bromofluorobenzene				*102*	*102*	*60.0-140*				

Method Blank (MB)

(MB) 11/13/15 11:28

Analyte	MB Result	MB Qualifier	MB RDL
	ppb		ppb
Propene	ND		0.400
Tetrachloroethylene	ND		0.200
Trichloroethylene	ND		0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/13/15 10:42 • (LCSD) 11/13/15 12:35

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ppb	ppb	ppb	%	%	%			%	%
Propene	3.75	4.06	3.99	108	106	53.9-143			1.69	25
Trichloroethylene	3.75	4.41	4.34	118	116	70.0-130			1.50	25
Tetrachloroethylene	3.75	4.54	4.45	121	119	70.0-130			2.15	25

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).

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Kentucky [2]	16
Louisiana	AI30792
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086
Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico	TN00003
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [2]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	221
South Carolina	84004
South Dakota	n/a
Tennessee [1 4]	2006
Texas	T 104704245-07-TX
Texas [5]	LAB0152
Utah	6157585858
Vermont	VT2006
Virginia	109
Washington	C1915
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

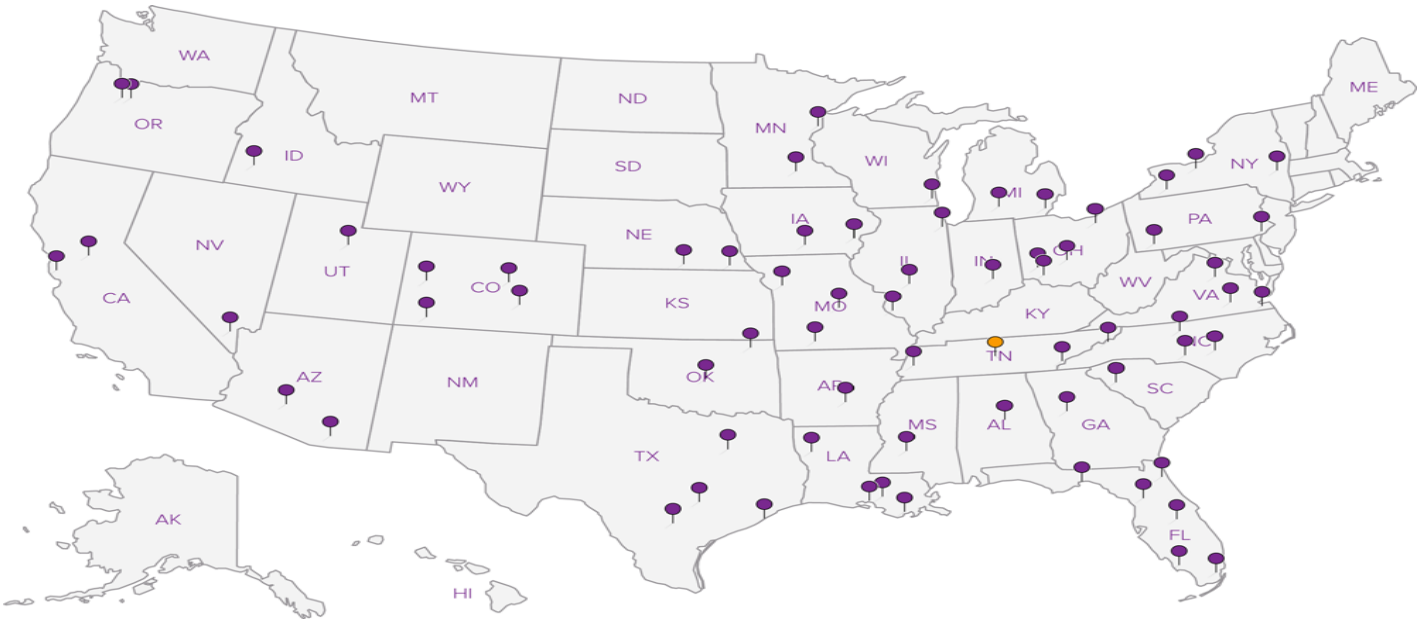
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003
AIHA	100789
DOD	1461.01
USDA	S-67674

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



S&ME Inc. - Hixson TN.
4291 HWY 58 Suite 101
Chattanooga, TN 37416

Billing Information:
Accounts Payable
4291 HWY 58 Suite 101
Chattanooga, TN 37416

Report to: **Mr. Pat Gribben**

Email To: **pgribben@smeinc.com**

Project Description: **Miller Park Limited Phase II**

City/State Collected: Chattanooga TN

Phone: **423-499-0957**
Fax:

Client Project # **4181-15-036A**

Lab Project # **SMETHN-4181-15-036A**

Collected by (print): Pat Gribben

Site/Facility ID #

P.O. #

Collected by (signature): Pat

Immediately Packed on Ice N/A Y___

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: 5 day turn

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TO-15 Summa	Rem./Contaminant	Sample # (lab only)
SG-1	Grab	Air	3'	11/5/15	0903	1	X		-01
SG-2		Air	6"		0952	1	X		-02
SG-3		Air	3'		0946	1	X		-03
SG-4		Air	3'		1019	1	X		-04
SG-5		Air	14"		1107	1	X		-05
SG-6		Air	6"		1115	1	X		-06
SG-7	↓	Air	6"	↓	1129	1	X		-07

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Pat	11/5/15	1510	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Dave

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ____
Temp: 1.4 °C Bottles Received: 7
Date: 11-6-15 Time: 0900

Hold #

Condition: FCx7 OK (lab use only)

COC Seal Intact: ____Y ____N ____NA

pH Checked: NCF:

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 2799444
Table# ON RACK
Acctnum: SMEHTN
Template: T107077
Prelogin: P530228
TSR: 690 - Tom Mellette
PB: 84K 11-3-15
Shipped Via: FedEX Standard

ANALYTICAL REPORT

November 19, 2015

S&ME Inc. - Hixson TN.

Sample Delivery Group:	L800673
Samples Received:	11/12/2015
Project Number:	4181-15-036A
Description:	Miller Park Limited Phase II

Report To:

Mr. Pat Gribben
4291 HWY 58 Suite 101
Chattanooga, TN 37416

Entire Report Reviewed By:

Tom Mellette
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

B1C 5-8.2FT L800673-01 Solid

Collected by: Pat Gribben
Collected date/time: 11/10/15 16:20
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG828715	1	11/13/15 20:45	11/16/15 03:14	KMP
Semi-Volatile Organic Compounds (GC) by Method EPH	WG829444	1	11/16/15 17:27	11/16/15 23:59	AAT
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828758	5	11/13/15 00:24	11/14/15 16:05	DAH

B2 17.5-20FT L800673-02 Solid

Collected by: Pat Gribben
Collected date/time: 11/10/15 07:15
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG828700	1	11/13/15 19:00	11/14/15 09:57	TRB
Metals (ICP) by Method 6010B	WG829272	1	11/18/15 22:48	11/19/15 08:48	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG828715	1	11/13/15 20:45	11/16/15 03:35	KMP
Semi-Volatile Organic Compounds (GC) by Method EPH	WG829444	1	11/16/15 17:27	11/17/15 00:41	AAT
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828758	5	11/13/15 00:24	11/14/15 16:29	DAH

B3 5-7.5FT L800673-03 Solid

Collected by: Pat Gribben
Collected date/time: 11/10/15 16:25
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG828715	1	11/13/15 20:45	11/16/15 04:39	KMP
Semi-Volatile Organic Compounds (GC) by Method EPH	WG829444	1	11/16/15 17:27	11/17/15 00:55	AAT
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828758	5	11/13/15 00:24	11/14/15 16:53	DAH

B4 17.5-18.1FT L800673-04 Solid

Collected by: Pat Gribben
Collected date/time: 11/11/15 16:15
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG828700	1	11/13/15 19:00	11/14/15 10:00	TRB
Metals (ICP) by Method 6010B	WG829272	1	11/18/15 22:48	11/19/15 08:51	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG828715	1	11/13/15 20:45	11/16/15 05:01	KMP
Semi-Volatile Organic Compounds (GC) by Method EPH	WG829444	1	11/16/15 17:27	11/17/15 01:08	AAT
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828758	5	11/13/15 00:24	11/14/15 17:17	DAH

B5 .3-2.6FT L800673-05 Solid

Collected by: Pat Gribben
Collected date/time: 11/10/15 16:40
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG828700	1	11/13/15 19:00	11/14/15 10:03	TRB
Metals (ICP) by Method 6010B	WG829272	1	11/18/15 22:48	11/19/15 08:54	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG828715	1	11/13/15 20:45	11/16/15 05:22	KMP
Semi-Volatile Organic Compounds (GC) by Method EPH	WG829444	1	11/16/15 17:27	11/17/15 01:22	AAT
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828758	5	11/13/15 00:24	11/14/15 10:51	DAH

B6 .5-5.3FT L800673-06 Solid

Collected by: Pat Gribben
Collected date/time: 11/10/15 07:40
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG828700	1	11/13/15 19:00	11/14/15 10:06	TRB
Metals (ICP) by Method 6010B	WG829272	1	11/18/15 22:48	11/19/15 08:57	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG828715	1	11/13/15 20:45	11/16/15 05:43	KMP
Semi-Volatile Organic Compounds (GC) by Method EPH	WG829444	1	11/16/15 17:27	11/17/15 01:36	AAT
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828758	5	11/13/15 00:24	11/14/15 17:41	DAH

B7 10-12.5FT L800673-07 Solid

Collected by: Pat Gribben
Collected date/time: 11/10/15 16:50
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG828700	1	11/13/15 19:00	11/14/15 10:15	TRB
Metals (ICP) by Method 6010B	WG829272	1	11/18/15 22:48	11/19/15 08:28	LTB
Pesticides (GC) by Method 8081	WG828716	1	11/16/15 06:25	11/16/15 20:28	ADF
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG828715	1	11/13/15 20:45	11/16/15 06:05	KMP
Semi-Volatile Organic Compounds (GC) by Method EPH	WG829444	1	11/16/15 17:27	11/17/15 01:50	AAT
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828758	5	11/13/15 00:24	11/14/15 18:05	DAH

B8 .8-2.5FT L800673-08 Solid

Collected by: Pat Gribben
Collected date/time: 11/10/15 17:00
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG828700	1	11/13/15 19:00	11/14/15 10:18	TRB
Metals (ICP) by Method 6010B	WG829272	1	11/18/15 22:48	11/19/15 09:00	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG828715	1	11/13/15 20:45	11/16/15 06:26	KMP
Semi-Volatile Organic Compounds (GC) by Method EPH	WG829444	1	11/16/15 17:27	11/17/15 02:04	AAT
Volatile Organic Compounds (GC/MS) by Method 8260B	WG830101	5	11/18/15 18:44	11/19/15 05:53	ACG

B1 (GEO) 8.5-10FT L800673-09 Solid

Collected by: Pat Gribben
Collected date/time: 11/11/15 16:25
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG828700	1	11/13/15 19:00	11/14/15 10:21	TRB
Metals (ICP) by Method 6010B	WG829272	1	11/18/15 22:48	11/19/15 09:03	LTB
Total Solids by Method 2540 G-2011	WG829022	1	11/13/15 21:23	11/14/15 15:35	MEL

B3 (GEO) 6-7.5FT L800673-10 Solid

Collected by: Pat Gribben
Collected date/time: 11/11/15 16:30
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG828700	1	11/13/15 19:00	11/14/15 10:23	TRB
Metals (ICP) by Method 6010B	WG829272	1	11/18/15 22:48	11/19/15 09:06	LTB
Total Solids by Method 2540 G-2011	WG829022	1	11/13/15 21:23	11/14/15 15:34	MEL

B-1 C L800673-11 GW

Collected by: Pat Gribben
Collected date/time: 11/10/15 13:15
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG828643	1	11/12/15 22:26	11/13/15 12:33	FMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828976	1	11/14/15 03:39	11/14/15 03:39	BMB

B-3 L800673-12 GW

Collected by: Pat Gribben
Collected date/time: 11/10/15 15:25
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG828643	1	11/12/15 22:26	11/13/15 12:54	FMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828976	1	11/14/15 03:58	11/14/15 03:58	BMB

B-7 L800673-13 GW

Collected by: Pat Gribben
Collected date/time: 11/11/15 09:58
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828976	1	11/14/15 04:18	11/14/15 04:18	BMB

B-1 C L800673-14 GW

Collected by: Pat Gribben
Collected date/time: 11/11/15 10:15
Received date/time: 11/12/15 09:00

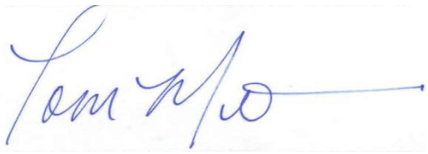
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG828703	1	11/13/15 10:53	11/13/15 17:19	TRB
Metals (ICP) by Method 6010B	WG829262	1	11/17/15 16:02	11/17/15 22:37	ST

B-3 L800673-15 GW

Collected by: Pat Gribben
Collected date/time: 11/11/15 10:10
Received date/time: 11/12/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG828703	1	11/13/15 10:53	11/13/15 17:21	TRB
Metals (ICP) by Method 6010B	WG829262	1	11/17/15 16:02	11/17/15 22:40	ST

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Tom Mellette
Technical Service Representative

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Acetone	ND		0.250	5	11/14/2015 16:05	WG828758
Acrylonitrile	ND		0.0500	5	11/14/2015 16:05	WG828758
Benzene	ND		0.00500	5	11/14/2015 16:05	WG828758
Bromobenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
Bromodichloromethane	ND		0.00500	5	11/14/2015 16:05	WG828758
Bromoform	ND		0.00500	5	11/14/2015 16:05	WG828758
Bromomethane	ND		0.0250	5	11/14/2015 16:05	WG828758
n-Butylbenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
sec-Butylbenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
tert-Butylbenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
Carbon tetrachloride	ND		0.00500	5	11/14/2015 16:05	WG828758
Chlorobenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
Chlorodibromomethane	ND		0.00500	5	11/14/2015 16:05	WG828758
Chloroethane	ND		0.0250	5	11/14/2015 16:05	WG828758
2-Chloroethyl vinyl ether	ND		0.250	5	11/14/2015 16:05	WG828758
Chloroform	ND		0.0250	5	11/14/2015 16:05	WG828758
Chloromethane	ND		0.0125	5	11/14/2015 16:05	WG828758
2-Chlorotoluene	ND		0.00500	5	11/14/2015 16:05	WG828758
4-Chlorotoluene	ND		0.00500	5	11/14/2015 16:05	WG828758
1,2-Dibromo-3-Chloropropane	ND		0.0250	5	11/14/2015 16:05	WG828758
1,2-Dibromoethane	ND		0.00500	5	11/14/2015 16:05	WG828758
Dibromomethane	ND		0.00500	5	11/14/2015 16:05	WG828758
1,2-Dichlorobenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
1,3-Dichlorobenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
1,4-Dichlorobenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
Dichlorodifluoromethane	ND		0.0250	5	11/14/2015 16:05	WG828758
1,1-Dichloroethane	ND		0.00500	5	11/14/2015 16:05	WG828758
1,2-Dichloroethane	ND		0.00500	5	11/14/2015 16:05	WG828758
1,1-Dichloroethene	ND		0.00500	5	11/14/2015 16:05	WG828758
cis-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 16:05	WG828758
trans-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 16:05	WG828758
1,2-Dichloropropane	ND		0.00500	5	11/14/2015 16:05	WG828758
1,1-Dichloropropene	ND		0.00500	5	11/14/2015 16:05	WG828758
1,3-Dichloropropane	ND		0.00500	5	11/14/2015 16:05	WG828758
cis-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 16:05	WG828758
trans-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 16:05	WG828758
2,2-Dichloropropane	ND		0.00500	5	11/14/2015 16:05	WG828758
Di-isopropyl ether	ND		0.00500	5	11/14/2015 16:05	WG828758
Ethylbenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
Hexachloro-1,3-butadiene	ND		0.00500	5	11/14/2015 16:05	WG828758
Isopropylbenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
p-Isopropyltoluene	ND		0.00500	5	11/14/2015 16:05	WG828758
2-Butanone (MEK)	ND		0.0500	5	11/14/2015 16:05	WG828758
Methylene Chloride	ND		0.0250	5	11/14/2015 16:05	WG828758
4-Methyl-2-pentanone (MIBK)	ND		0.0500	5	11/14/2015 16:05	WG828758
Methyl tert-butyl ether	ND		0.00500	5	11/14/2015 16:05	WG828758
Naphthalene	ND		0.0250	5	11/14/2015 16:05	WG828758
n-Propylbenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
Styrene	ND		0.00500	5	11/14/2015 16:05	WG828758
1,1,1,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 16:05	WG828758
1,1,2,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 16:05	WG828758
1,1,2-Trichlorotrifluoroethane	ND		0.00500	5	11/14/2015 16:05	WG828758
Tetrachloroethene	ND		0.00500	5	11/14/2015 16:05	WG828758
Toluene	ND		0.0250	5	11/14/2015 16:05	WG828758
1,2,3-Trichlorobenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
1,2,4-Trichlorobenzene	ND		0.00500	5	11/14/2015 16:05	WG828758

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	ND		0.00500	5	11/14/2015 16:05	WG828758
1,1,2-Trichloroethane	ND		0.00500	5	11/14/2015 16:05	WG828758
Trichloroethene	ND		0.00500	5	11/14/2015 16:05	WG828758
Trichlorofluoromethane	ND		0.0250	5	11/14/2015 16:05	WG828758
1,2,3-Trichloropropane	ND		0.0125	5	11/14/2015 16:05	WG828758
1,2,4-Trimethylbenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
1,2,3-Trimethylbenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
Vinyl chloride	ND		0.00500	5	11/14/2015 16:05	WG828758
1,3,5-Trimethylbenzene	ND		0.00500	5	11/14/2015 16:05	WG828758
Xylenes, Total	ND		0.0150	5	11/14/2015 16:05	WG828758
(S) Toluene-d8	*105*		*88.7-115*		*11/14/2015 16:05*	WG828758
(S) Dibromofluoromethane	*93.8*		*76.3-123*		*11/14/2015 16:05*	WG828758
(S) 4-Bromofluorobenzene	*102*		*69.7-129*		*11/14/2015 16:05*	WG828758

Semi-Volatile Organic Compounds (GC) by Method EPH

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Extractable Petroleum Hydrocarbon	ND		4.00	1	11/16/2015 23:59	WG829444
(S) o-Terphenyl	*106*		*50.0-150*		*11/16/2015 23:59*	WG829444

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0330	1	11/16/2015 03:14	WG828715
Acenaphthene	ND		0.0330	1	11/16/2015 03:14	WG828715
Acenaphthylene	ND		0.0330	1	11/16/2015 03:14	WG828715
Benzo(a)anthracene	ND		0.0330	1	11/16/2015 03:14	WG828715
Benzo(a)pyrene	ND		0.0330	1	11/16/2015 03:14	WG828715
Benzo(b)fluoranthene	ND		0.0330	1	11/16/2015 03:14	WG828715
Benzo(g,h,i)perylene	ND		0.0330	1	11/16/2015 03:14	WG828715
Benzo(k)fluoranthene	ND		0.0330	1	11/16/2015 03:14	WG828715
Chrysene	ND		0.0330	1	11/16/2015 03:14	WG828715
Dibenz(a,h)anthracene	ND		0.0330	1	11/16/2015 03:14	WG828715
Fluoranthene	ND		0.0330	1	11/16/2015 03:14	WG828715
Fluorene	ND		0.0330	1	11/16/2015 03:14	WG828715
Indeno(1,2,3-cd)pyrene	ND		0.0330	1	11/16/2015 03:14	WG828715
Naphthalene	ND		0.0330	1	11/16/2015 03:14	WG828715
Phenanthrene	ND		0.0330	1	11/16/2015 03:14	WG828715
Pyrene	ND		0.0330	1	11/16/2015 03:14	WG828715
(S) Nitrobenzene-d5	*86.3*		*28.3-148*		*11/16/2015 03:14*	WG828715
(S) 2-Fluorobiphenyl	*87.3*		*41.4-134*		*11/16/2015 03:14*	WG828715
(S) p-Terphenyl-d14	*74.0*		*35.8-140*		*11/16/2015 03:14*	WG828715

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.124		0.0200	1	11/14/2015 09:57	WG828700

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.64		2.00	1	11/19/2015 08:48	WG829272
Barium	52.5		0.500	1	11/19/2015 08:48	WG829272
Cadmium	ND		0.500	1	11/19/2015 08:48	WG829272
Chromium	18.3		1.00	1	11/19/2015 08:48	WG829272
Lead	7.96		0.500	1	11/19/2015 08:48	WG829272
Selenium	ND		2.00	1	11/19/2015 08:48	WG829272
Silver	ND		1.00	1	11/19/2015 08:48	WG829272

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acetone	ND		0.250	5	11/14/2015 16:29	WG828758
Acrylonitrile	ND		0.0500	5	11/14/2015 16:29	WG828758
Benzene	ND		0.00500	5	11/14/2015 16:29	WG828758
Bromobenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
Bromodichloromethane	ND		0.00500	5	11/14/2015 16:29	WG828758
Bromoform	ND		0.00500	5	11/14/2015 16:29	WG828758
Bromomethane	ND		0.0250	5	11/14/2015 16:29	WG828758
n-Butylbenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
sec-Butylbenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
tert-Butylbenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
Carbon tetrachloride	ND		0.00500	5	11/14/2015 16:29	WG828758
Chlorobenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
Chlorodibromomethane	ND		0.00500	5	11/14/2015 16:29	WG828758
Chloroethane	ND		0.0250	5	11/14/2015 16:29	WG828758
2-Chloroethyl vinyl ether	ND		0.250	5	11/14/2015 16:29	WG828758
Chloroform	ND		0.0250	5	11/14/2015 16:29	WG828758
Chloromethane	ND		0.0125	5	11/14/2015 16:29	WG828758
2-Chlorotoluene	ND		0.00500	5	11/14/2015 16:29	WG828758
4-Chlorotoluene	ND		0.00500	5	11/14/2015 16:29	WG828758
1,2-Dibromo-3-Chloropropane	ND		0.0250	5	11/14/2015 16:29	WG828758
1,2-Dibromoethane	ND		0.00500	5	11/14/2015 16:29	WG828758
Dibromomethane	ND		0.00500	5	11/14/2015 16:29	WG828758
1,2-Dichlorobenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
1,3-Dichlorobenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
1,4-Dichlorobenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
Dichlorodifluoromethane	ND		0.0250	5	11/14/2015 16:29	WG828758
1,1-Dichloroethane	ND		0.00500	5	11/14/2015 16:29	WG828758
1,2-Dichloroethane	ND		0.00500	5	11/14/2015 16:29	WG828758
1,1-Dichloroethene	ND		0.00500	5	11/14/2015 16:29	WG828758
cis-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 16:29	WG828758
trans-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 16:29	WG828758
1,2-Dichloropropane	ND		0.00500	5	11/14/2015 16:29	WG828758
1,1-Dichloropropene	ND		0.00500	5	11/14/2015 16:29	WG828758
1,3-Dichloropropane	ND		0.00500	5	11/14/2015 16:29	WG828758
cis-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 16:29	WG828758
trans-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 16:29	WG828758
2,2-Dichloropropane	ND		0.00500	5	11/14/2015 16:29	WG828758
Di-isopropyl ether	ND		0.00500	5	11/14/2015 16:29	WG828758
Ethylbenzene	ND		0.00500	5	11/14/2015 16:29	WG828758

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexachloro-1,3-butadiene	ND		0.00500	5	11/14/2015 16:29	WG828758
Isopropylbenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
p-Isopropyltoluene	ND		0.00500	5	11/14/2015 16:29	WG828758
2-Butanone (MEK)	ND		0.0500	5	11/14/2015 16:29	WG828758
Methylene Chloride	ND		0.0250	5	11/14/2015 16:29	WG828758
4-Methyl-2-pentanone (MIBK)	ND		0.0500	5	11/14/2015 16:29	WG828758
Methyl tert-butyl ether	ND		0.00500	5	11/14/2015 16:29	WG828758
Naphthalene	ND		0.0250	5	11/14/2015 16:29	WG828758
n-Propylbenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
Styrene	ND		0.00500	5	11/14/2015 16:29	WG828758
1,1,1,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 16:29	WG828758
1,1,2,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 16:29	WG828758
1,1,2-Trichlorotrifluoroethane	ND		0.00500	5	11/14/2015 16:29	WG828758
Tetrachloroethene	ND		0.00500	5	11/14/2015 16:29	WG828758
Toluene	ND		0.0250	5	11/14/2015 16:29	WG828758
1,2,3-Trichlorobenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
1,2,4-Trichlorobenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
1,1,1-Trichloroethane	ND		0.00500	5	11/14/2015 16:29	WG828758
1,1,2-Trichloroethane	ND		0.00500	5	11/14/2015 16:29	WG828758
Trichloroethene	ND		0.00500	5	11/14/2015 16:29	WG828758
Trichlorofluoromethane	ND		0.0250	5	11/14/2015 16:29	WG828758
1,2,3-Trichloropropane	ND		0.0125	5	11/14/2015 16:29	WG828758
1,2,4-Trimethylbenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
1,2,3-Trimethylbenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
Vinyl chloride	ND		0.00500	5	11/14/2015 16:29	WG828758
1,3,5-Trimethylbenzene	ND		0.00500	5	11/14/2015 16:29	WG828758
Xylenes, Total	ND		0.0150	5	11/14/2015 16:29	WG828758
(S) Toluene-d8	*105*		*88.7-115*		*11/14/2015 16:29*	WG828758
(S) Dibromofluoromethane	*95.9*		*76.3-123*		*11/14/2015 16:29*	WG828758
(S) 4-Bromofluorobenzene	*102*		*69.7-129*		*11/14/2015 16:29*	WG828758

Semi-Volatile Organic Compounds (GC) by Method EPH

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Extractable Petroleum Hydrocarbon	ND		4.00	1	11/17/2015 00:41	WG829444
(S) o-Terphenyl	*105*		*50.0-150*		*11/17/2015 00:41*	WG829444

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0330	1	11/16/2015 03:35	WG828715
Acenaphthene	ND		0.0330	1	11/16/2015 03:35	WG828715
Acenaphthylene	ND		0.0330	1	11/16/2015 03:35	WG828715
Benzo(a)anthracene	ND		0.0330	1	11/16/2015 03:35	WG828715
Benzo(a)pyrene	ND		0.0330	1	11/16/2015 03:35	WG828715
Benzo(b)fluoranthene	ND		0.0330	1	11/16/2015 03:35	WG828715
Benzo(g,h,i)perylene	ND		0.0330	1	11/16/2015 03:35	WG828715
Benzo(k)fluoranthene	ND		0.0330	1	11/16/2015 03:35	WG828715
Chrysene	ND		0.0330	1	11/16/2015 03:35	WG828715
Dibenz(a,h)anthracene	ND		0.0330	1	11/16/2015 03:35	WG828715
Fluoranthene	ND		0.0330	1	11/16/2015 03:35	WG828715
Fluorene	ND		0.0330	1	11/16/2015 03:35	WG828715
Indeno(1,2,3-cd)pyrene	ND		0.0330	1	11/16/2015 03:35	WG828715
Naphthalene	ND		0.0330	1	11/16/2015 03:35	WG828715
Phenanthrene	ND		0.0330	1	11/16/2015 03:35	WG828715

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Pyrene	ND		0.0330	1	11/16/2015 03:35	WG828715
(S) Nitrobenzene-d5	*84.1*		*28.3-148*		*11/16/2015 03:35*	WG828715
(S) 2-Fluorobiphenyl	*85.1*		*41.4-134*		*11/16/2015 03:35*	WG828715
(S) p-Terphenyl-d14	*69.3*		*35.8-140*		*11/16/2015 03:35*	WG828715

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acetone	ND		0.250	5	11/14/2015 16:53	WG828758
Acrylonitrile	ND		0.0500	5	11/14/2015 16:53	WG828758
Benzene	ND		0.00500	5	11/14/2015 16:53	WG828758
Bromobenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
Bromodichloromethane	ND		0.00500	5	11/14/2015 16:53	WG828758
Bromoform	ND		0.00500	5	11/14/2015 16:53	WG828758
Bromomethane	ND		0.0250	5	11/14/2015 16:53	WG828758
n-Butylbenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
sec-Butylbenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
tert-Butylbenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
Carbon tetrachloride	ND		0.00500	5	11/14/2015 16:53	WG828758
Chlorobenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
Chlorodibromomethane	ND		0.00500	5	11/14/2015 16:53	WG828758
Chloroethane	ND		0.0250	5	11/14/2015 16:53	WG828758
2-Chloroethyl vinyl ether	ND		0.250	5	11/14/2015 16:53	WG828758
Chloroform	ND		0.0250	5	11/14/2015 16:53	WG828758
Chloromethane	ND		0.0125	5	11/14/2015 16:53	WG828758
2-Chlorotoluene	ND		0.00500	5	11/14/2015 16:53	WG828758
4-Chlorotoluene	ND		0.00500	5	11/14/2015 16:53	WG828758
1,2-Dibromo-3-Chloropropane	ND		0.0250	5	11/14/2015 16:53	WG828758
1,2-Dibromoethane	ND		0.00500	5	11/14/2015 16:53	WG828758
Dibromomethane	ND		0.00500	5	11/14/2015 16:53	WG828758
1,2-Dichlorobenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
1,3-Dichlorobenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
1,4-Dichlorobenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
Dichlorodifluoromethane	ND		0.0250	5	11/14/2015 16:53	WG828758
1,1-Dichloroethane	ND		0.00500	5	11/14/2015 16:53	WG828758
1,2-Dichloroethane	ND		0.00500	5	11/14/2015 16:53	WG828758
1,1-Dichloroethene	ND		0.00500	5	11/14/2015 16:53	WG828758
cis-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 16:53	WG828758
trans-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 16:53	WG828758
1,2-Dichloropropane	ND		0.00500	5	11/14/2015 16:53	WG828758
1,1-Dichloropropene	ND		0.00500	5	11/14/2015 16:53	WG828758
1,3-Dichloropropane	ND		0.00500	5	11/14/2015 16:53	WG828758
cis-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 16:53	WG828758
trans-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 16:53	WG828758
2,2-Dichloropropane	ND		0.00500	5	11/14/2015 16:53	WG828758
Di-isopropyl ether	ND		0.00500	5	11/14/2015 16:53	WG828758
Ethylbenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
Hexachloro-1,3-butadiene	ND		0.00500	5	11/14/2015 16:53	WG828758
Isopropylbenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
p-Isopropyltoluene	ND		0.00500	5	11/14/2015 16:53	WG828758
2-Butanone (MEK)	ND		0.0500	5	11/14/2015 16:53	WG828758
Methylene Chloride	ND		0.0250	5	11/14/2015 16:53	WG828758
4-Methyl-2-pentanone (MIBK)	ND		0.0500	5	11/14/2015 16:53	WG828758
Methyl tert-butyl ether	ND		0.00500	5	11/14/2015 16:53	WG828758
Naphthalene	ND		0.0250	5	11/14/2015 16:53	WG828758
n-Propylbenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
Styrene	ND		0.00500	5	11/14/2015 16:53	WG828758
1,1,1,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 16:53	WG828758
1,1,2,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 16:53	WG828758
1,1,2-Trichlorotrifluoroethane	ND		0.00500	5	11/14/2015 16:53	WG828758
Tetrachloroethene	ND		0.00500	5	11/14/2015 16:53	WG828758
Toluene	ND		0.0250	5	11/14/2015 16:53	WG828758
1,2,3-Trichlorobenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
1,2,4-Trichlorobenzene	ND		0.00500	5	11/14/2015 16:53	WG828758

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	ND		0.00500	5	11/14/2015 16:53	WG828758
1,1,2-Trichloroethane	ND		0.00500	5	11/14/2015 16:53	WG828758
Trichloroethene	ND		0.00500	5	11/14/2015 16:53	WG828758
Trichlorofluoromethane	ND		0.0250	5	11/14/2015 16:53	WG828758
1,2,3-Trichloropropane	ND		0.0125	5	11/14/2015 16:53	WG828758
1,2,4-Trimethylbenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
1,2,3-Trimethylbenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
Vinyl chloride	ND		0.00500	5	11/14/2015 16:53	WG828758
1,3,5-Trimethylbenzene	ND		0.00500	5	11/14/2015 16:53	WG828758
Xylenes, Total	ND		0.0150	5	11/14/2015 16:53	WG828758
(S) Toluene-d8	*105*		*88.7-115*		*11/14/2015 16:53*	WG828758
(S) Dibromofluoromethane	*96.1*		*76.3-123*		*11/14/2015 16:53*	WG828758
(S) 4-Bromofluorobenzene	*99.1*		*69.7-129*		*11/14/2015 16:53*	WG828758

Semi-Volatile Organic Compounds (GC) by Method EPH

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Extractable Petroleum Hydrocarbon	6.66		4.00	1	11/17/2015 00:55	WG829444
(S) o-Terphenyl	*98.2*		*50.0-150*		*11/17/2015 00:55*	WG829444

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0330	1	11/16/2015 04:39	WG828715
Acenaphthene	ND		0.0330	1	11/16/2015 04:39	WG828715
Acenaphthylene	ND		0.0330	1	11/16/2015 04:39	WG828715
Benzo(a)anthracene	ND		0.0330	1	11/16/2015 04:39	WG828715
Benzo(a)pyrene	ND		0.0330	1	11/16/2015 04:39	WG828715
Benzo(b)fluoranthene	ND		0.0330	1	11/16/2015 04:39	WG828715
Benzo(g,h,i)perylene	ND		0.0330	1	11/16/2015 04:39	WG828715
Benzo(k)fluoranthene	ND		0.0330	1	11/16/2015 04:39	WG828715
Chrysene	ND		0.0330	1	11/16/2015 04:39	WG828715
Dibenz(a,h)anthracene	ND		0.0330	1	11/16/2015 04:39	WG828715
Fluoranthene	ND		0.0330	1	11/16/2015 04:39	WG828715
Fluorene	ND		0.0330	1	11/16/2015 04:39	WG828715
Indeno(1,2,3-cd)pyrene	ND		0.0330	1	11/16/2015 04:39	WG828715
Naphthalene	ND		0.0330	1	11/16/2015 04:39	WG828715
Phenanthrene	ND		0.0330	1	11/16/2015 04:39	WG828715
Pyrene	ND		0.0330	1	11/16/2015 04:39	WG828715
(S) Nitrobenzene-d5	*93.7*		*28.3-148*		*11/16/2015 04:39*	WG828715
(S) 2-Fluorobiphenyl	*86.7*		*41.4-134*		*11/16/2015 04:39*	WG828715
(S) p-Terphenyl-d14	*73.9*		*35.8-140*		*11/16/2015 04:39*	WG828715

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.0629		0.0200	1	11/14/2015 10:00	WG828700

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	3.35		2.00	1	11/19/2015 08:51	WG829272
Barium	54.1		0.500	1	11/19/2015 08:51	WG829272
Cadmium	ND		0.500	1	11/19/2015 08:51	WG829272
Chromium	19.6		1.00	1	11/19/2015 08:51	WG829272
Lead	10.4		0.500	1	11/19/2015 08:51	WG829272
Selenium	ND		2.00	1	11/19/2015 08:51	WG829272
Silver	ND		1.00	1	11/19/2015 08:51	WG829272

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Acetone	ND		0.250	5	11/14/2015 17:17	WG828758
Acrylonitrile	ND		0.0500	5	11/14/2015 17:17	WG828758
Benzene	ND		0.00500	5	11/14/2015 17:17	WG828758
Bromobenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
Bromodichloromethane	ND		0.00500	5	11/14/2015 17:17	WG828758
Bromoform	ND		0.00500	5	11/14/2015 17:17	WG828758
Bromomethane	ND		0.0250	5	11/14/2015 17:17	WG828758
n-Butylbenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
sec-Butylbenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
tert-Butylbenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
Carbon tetrachloride	ND		0.00500	5	11/14/2015 17:17	WG828758
Chlorobenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
Chlorodibromomethane	ND		0.00500	5	11/14/2015 17:17	WG828758
Chloroethane	ND		0.0250	5	11/14/2015 17:17	WG828758
2-Chloroethyl vinyl ether	ND		0.250	5	11/14/2015 17:17	WG828758
Chloroform	ND		0.0250	5	11/14/2015 17:17	WG828758
Chloromethane	ND		0.0125	5	11/14/2015 17:17	WG828758
2-Chlorotoluene	ND		0.00500	5	11/14/2015 17:17	WG828758
4-Chlorotoluene	ND		0.00500	5	11/14/2015 17:17	WG828758
1,2-Dibromo-3-Chloropropane	ND		0.0250	5	11/14/2015 17:17	WG828758
1,2-Dibromoethane	ND		0.00500	5	11/14/2015 17:17	WG828758
Dibromomethane	ND		0.00500	5	11/14/2015 17:17	WG828758
1,2-Dichlorobenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
1,3-Dichlorobenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
1,4-Dichlorobenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
Dichlorodifluoromethane	ND		0.0250	5	11/14/2015 17:17	WG828758
1,1-Dichloroethane	ND		0.00500	5	11/14/2015 17:17	WG828758
1,2-Dichloroethane	ND		0.00500	5	11/14/2015 17:17	WG828758
1,1-Dichloroethene	ND		0.00500	5	11/14/2015 17:17	WG828758
cis-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 17:17	WG828758
trans-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 17:17	WG828758
1,2-Dichloropropane	ND		0.00500	5	11/14/2015 17:17	WG828758
1,1-Dichloropropene	ND		0.00500	5	11/14/2015 17:17	WG828758
1,3-Dichloropropane	ND		0.00500	5	11/14/2015 17:17	WG828758
cis-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 17:17	WG828758
trans-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 17:17	WG828758
2,2-Dichloropropane	ND		0.00500	5	11/14/2015 17:17	WG828758
Di-isopropyl ether	ND		0.00500	5	11/14/2015 17:17	WG828758
Ethylbenzene	ND		0.00500	5	11/14/2015 17:17	WG828758

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexachloro-1,3-butadiene	ND		0.00500	5	11/14/2015 17:17	WG828758
Isopropylbenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
p-Isopropyltoluene	ND		0.00500	5	11/14/2015 17:17	WG828758
2-Butanone (MEK)	ND		0.0500	5	11/14/2015 17:17	WG828758
Methylene Chloride	ND		0.0250	5	11/14/2015 17:17	WG828758
4-Methyl-2-pentanone (MIBK)	ND		0.0500	5	11/14/2015 17:17	WG828758
Methyl tert-butyl ether	ND		0.00500	5	11/14/2015 17:17	WG828758
Naphthalene	ND		0.0250	5	11/14/2015 17:17	WG828758
n-Propylbenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
Styrene	ND		0.00500	5	11/14/2015 17:17	WG828758
1,1,1,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 17:17	WG828758
1,1,2,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 17:17	WG828758
1,1,2-Trichlorotrifluoroethane	ND		0.00500	5	11/14/2015 17:17	WG828758
Tetrachloroethene	ND		0.00500	5	11/14/2015 17:17	WG828758
Toluene	ND		0.0250	5	11/14/2015 17:17	WG828758
1,2,3-Trichlorobenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
1,2,4-Trichlorobenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
1,1,1-Trichloroethane	ND		0.00500	5	11/14/2015 17:17	WG828758
1,1,2-Trichloroethane	ND		0.00500	5	11/14/2015 17:17	WG828758
Trichloroethene	ND		0.00500	5	11/14/2015 17:17	WG828758
Trichlorofluoromethane	ND		0.0250	5	11/14/2015 17:17	WG828758
1,2,3-Trichloropropane	ND		0.0125	5	11/14/2015 17:17	WG828758
1,2,4-Trimethylbenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
1,2,3-Trimethylbenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
Vinyl chloride	ND		0.00500	5	11/14/2015 17:17	WG828758
1,3,5-Trimethylbenzene	ND		0.00500	5	11/14/2015 17:17	WG828758
Xylenes, Total	ND		0.0150	5	11/14/2015 17:17	WG828758
(S) Toluene-d8	*98.9*		*88.7-115*		*11/14/2015 17:17*	WG828758
(S) Dibromofluoromethane	*98.7*		*76.3-123*		*11/14/2015 17:17*	WG828758
(S) 4-Bromofluorobenzene	*102*		*69.7-129*		*11/14/2015 17:17*	WG828758

Semi-Volatile Organic Compounds (GC) by Method EPH

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Extractable Petroleum Hydrocarbon	ND		4.00	1	11/17/2015 01:08	WG829444
(S) o-Terphenyl	*96.6*		*50.0-150*		*11/17/2015 01:08*	WG829444

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0330	1	11/16/2015 05:01	WG828715
Acenaphthene	ND		0.0330	1	11/16/2015 05:01	WG828715
Acenaphthylene	ND		0.0330	1	11/16/2015 05:01	WG828715
Benzo(a)anthracene	ND		0.0330	1	11/16/2015 05:01	WG828715
Benzo(a)pyrene	ND		0.0330	1	11/16/2015 05:01	WG828715
Benzo(b)fluoranthene	ND		0.0330	1	11/16/2015 05:01	WG828715
Benzo(g,h,i)perylene	ND		0.0330	1	11/16/2015 05:01	WG828715
Benzo(k)fluoranthene	ND		0.0330	1	11/16/2015 05:01	WG828715
Chrysene	ND		0.0330	1	11/16/2015 05:01	WG828715
Dibenz(a,h)anthracene	ND		0.0330	1	11/16/2015 05:01	WG828715
Fluoranthene	ND		0.0330	1	11/16/2015 05:01	WG828715
Fluorene	ND		0.0330	1	11/16/2015 05:01	WG828715
Indeno(1,2,3-cd)pyrene	ND		0.0330	1	11/16/2015 05:01	WG828715
Naphthalene	ND		0.0330	1	11/16/2015 05:01	WG828715
Phenanthrene	ND		0.0330	1	11/16/2015 05:01	WG828715

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Pyrene	ND		0.0330	1	11/16/2015 05:01	WG828715
(S) Nitrobenzene-d5	*92.0*		*28.3-148*		*11/16/2015 05:01*	WG828715
(S) 2-Fluorobiphenyl	*92.0*		*41.4-134*		*11/16/2015 05:01*	WG828715
(S) p-Terphenyl-d14	*74.5*		*35.8-140*		*11/16/2015 05:01*	WG828715

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.0747		0.0200	1	11/14/2015 10:03	WG828700

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	6.74		2.00	1	11/19/2015 08:54	WG829272
Barium	200		0.500	1	11/19/2015 08:54	WG829272
Cadmium	ND		0.500	1	11/19/2015 08:54	WG829272
Chromium	23.6		1.00	1	11/19/2015 08:54	WG829272
Lead	39.5		0.500	1	11/19/2015 08:54	WG829272
Selenium	ND		2.00	1	11/19/2015 08:54	WG829272
Silver	ND		1.00	1	11/19/2015 08:54	WG829272

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Acetone	ND		0.250	5	11/14/2015 10:51	WG828758
Acrylonitrile	ND		0.0500	5	11/14/2015 10:51	WG828758
Benzene	ND		0.00500	5	11/14/2015 10:51	WG828758
Bromobenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
Bromodichloromethane	ND		0.00500	5	11/14/2015 10:51	WG828758
Bromoform	ND		0.00500	5	11/14/2015 10:51	WG828758
Bromomethane	ND		0.0250	5	11/14/2015 10:51	WG828758
n-Butylbenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
sec-Butylbenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
tert-Butylbenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
Carbon tetrachloride	ND		0.00500	5	11/14/2015 10:51	WG828758
Chlorobenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
Chlorodibromomethane	ND		0.00500	5	11/14/2015 10:51	WG828758
Chloroethane	ND		0.0250	5	11/14/2015 10:51	WG828758
2-Chloroethyl vinyl ether	ND		0.250	5	11/14/2015 10:51	WG828758
Chloroform	ND		0.0250	5	11/14/2015 10:51	WG828758
Chloromethane	ND		0.0125	5	11/14/2015 10:51	WG828758
2-Chlorotoluene	ND		0.00500	5	11/14/2015 10:51	WG828758
4-Chlorotoluene	ND		0.00500	5	11/14/2015 10:51	WG828758
1,2-Dibromo-3-Chloropropane	ND		0.0250	5	11/14/2015 10:51	WG828758
1,2-Dibromoethane	ND		0.00500	5	11/14/2015 10:51	WG828758
Dibromomethane	ND		0.00500	5	11/14/2015 10:51	WG828758
1,2-Dichlorobenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
1,3-Dichlorobenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
1,4-Dichlorobenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
Dichlorodifluoromethane	ND		0.0250	5	11/14/2015 10:51	WG828758
1,1-Dichloroethane	ND		0.00500	5	11/14/2015 10:51	WG828758
1,2-Dichloroethane	ND		0.00500	5	11/14/2015 10:51	WG828758
1,1-Dichloroethene	ND		0.00500	5	11/14/2015 10:51	WG828758
cis-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 10:51	WG828758
trans-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 10:51	WG828758
1,2-Dichloropropane	ND		0.00500	5	11/14/2015 10:51	WG828758
1,1-Dichloropropene	ND		0.00500	5	11/14/2015 10:51	WG828758
1,3-Dichloropropane	ND		0.00500	5	11/14/2015 10:51	WG828758
cis-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 10:51	WG828758
trans-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 10:51	WG828758
2,2-Dichloropropane	ND		0.00500	5	11/14/2015 10:51	WG828758
Di-isopropyl ether	ND		0.00500	5	11/14/2015 10:51	WG828758
Ethylbenzene	ND		0.00500	5	11/14/2015 10:51	WG828758

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexachloro-1,3-butadiene	ND		0.00500	5	11/14/2015 10:51	WG828758
Isopropylbenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
p-Isopropyltoluene	ND		0.00500	5	11/14/2015 10:51	WG828758
2-Butanone (MEK)	ND		0.0500	5	11/14/2015 10:51	WG828758
Methylene Chloride	ND		0.0250	5	11/14/2015 10:51	WG828758
4-Methyl-2-pentanone (MIBK)	ND		0.0500	5	11/14/2015 10:51	WG828758
Methyl tert-butyl ether	ND		0.00500	5	11/14/2015 10:51	WG828758
Naphthalene	ND		0.0250	5	11/14/2015 10:51	WG828758
n-Propylbenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
Styrene	ND		0.00500	5	11/14/2015 10:51	WG828758
1,1,1,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 10:51	WG828758
1,1,2,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 10:51	WG828758
1,1,2-Trichlorotrifluoroethane	ND		0.00500	5	11/14/2015 10:51	WG828758
Tetrachloroethene	ND		0.00500	5	11/14/2015 10:51	WG828758
Toluene	ND		0.0250	5	11/14/2015 10:51	WG828758
1,2,3-Trichlorobenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
1,2,4-Trichlorobenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
1,1,1-Trichloroethane	ND		0.00500	5	11/14/2015 10:51	WG828758
1,1,2-Trichloroethane	ND		0.00500	5	11/14/2015 10:51	WG828758
Trichloroethene	ND		0.00500	5	11/14/2015 10:51	WG828758
Trichlorofluoromethane	ND		0.0250	5	11/14/2015 10:51	WG828758
1,2,3-Trichloropropane	ND		0.0125	5	11/14/2015 10:51	WG828758
1,2,4-Trimethylbenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
1,2,3-Trimethylbenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
Vinyl chloride	ND		0.00500	5	11/14/2015 10:51	WG828758
1,3,5-Trimethylbenzene	ND		0.00500	5	11/14/2015 10:51	WG828758
Xylenes, Total	ND		0.0150	5	11/14/2015 10:51	WG828758
(S) Toluene-d8	*104*		*88.7-115*		*11/14/2015 10:51*	WG828758
(S) Dibromofluoromethane	*95.1*		*76.3-123*		*11/14/2015 10:51*	WG828758
(S) 4-Bromofluorobenzene	*99.9*		*69.7-129*		*11/14/2015 10:51*	WG828758

Semi-Volatile Organic Compounds (GC) by Method EPH

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Extractable Petroleum Hydrocarbon	19.6		4.00	1	11/17/2015 01:22	WG829444
(S) o-Terphenyl	*86.3*		*50.0-150*		*11/17/2015 01:22*	WG829444

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0330	1	11/16/2015 05:22	WG828715
Acenaphthene	ND		0.0330	1	11/16/2015 05:22	WG828715
Acenaphthylene	ND		0.0330	1	11/16/2015 05:22	WG828715
Benzo(a)anthracene	ND		0.0330	1	11/16/2015 05:22	WG828715
Benzo(a)pyrene	ND		0.0330	1	11/16/2015 05:22	WG828715
Benzo(b)fluoranthene	ND		0.0330	1	11/16/2015 05:22	WG828715
Benzo(g,h,i)perylene	ND		0.0330	1	11/16/2015 05:22	WG828715
Benzo(k)fluoranthene	ND		0.0330	1	11/16/2015 05:22	WG828715
Chrysene	ND		0.0330	1	11/16/2015 05:22	WG828715
Dibenz(a,h)anthracene	ND		0.0330	1	11/16/2015 05:22	WG828715
Fluoranthene	ND		0.0330	1	11/16/2015 05:22	WG828715
Fluorene	ND		0.0330	1	11/16/2015 05:22	WG828715
Indeno(1,2,3-cd)pyrene	ND		0.0330	1	11/16/2015 05:22	WG828715
Naphthalene	ND		0.0330	1	11/16/2015 05:22	WG828715
Phenanthrene	ND		0.0330	1	11/16/2015 05:22	WG828715

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Pyrene	ND		0.0330	1	11/16/2015 05:22	WG828715
(S) Nitrobenzene-d5	*84.5*		*28.3-148*		*11/16/2015 05:22*	WG828715
(S) 2-Fluorobiphenyl	*78.5*		*41.4-134*		*11/16/2015 05:22*	WG828715
(S) p-Terphenyl-d14	*69.7*		*35.8-140*		*11/16/2015 05:22*	WG828715

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0632		0.0200	1	11/14/2015 10:06	WG828700

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.24		2.00	1	11/19/2015 08:57	WG829272
Barium	89.2		0.500	1	11/19/2015 08:57	WG829272
Cadmium	ND		0.500	1	11/19/2015 08:57	WG829272
Chromium	18.4		1.00	1	11/19/2015 08:57	WG829272
Lead	7.49		0.500	1	11/19/2015 08:57	WG829272
Selenium	ND		2.00	1	11/19/2015 08:57	WG829272
Silver	ND		1.00	1	11/19/2015 08:57	WG829272

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acetone	ND		0.250	5	11/14/2015 17:41	WG828758
Acrylonitrile	ND		0.0500	5	11/14/2015 17:41	WG828758
Benzene	ND		0.00500	5	11/14/2015 17:41	WG828758
Bromobenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
Bromodichloromethane	ND		0.00500	5	11/14/2015 17:41	WG828758
Bromoform	ND		0.00500	5	11/14/2015 17:41	WG828758
Bromomethane	ND		0.0250	5	11/14/2015 17:41	WG828758
n-Butylbenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
sec-Butylbenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
tert-Butylbenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
Carbon tetrachloride	ND		0.00500	5	11/14/2015 17:41	WG828758
Chlorobenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
Chlorodibromomethane	ND		0.00500	5	11/14/2015 17:41	WG828758
Chloroethane	ND		0.0250	5	11/14/2015 17:41	WG828758
2-Chloroethyl vinyl ether	ND		0.250	5	11/14/2015 17:41	WG828758
Chloroform	ND		0.0250	5	11/14/2015 17:41	WG828758
Chloromethane	ND		0.0125	5	11/14/2015 17:41	WG828758
2-Chlorotoluene	ND		0.00500	5	11/14/2015 17:41	WG828758
4-Chlorotoluene	ND		0.00500	5	11/14/2015 17:41	WG828758
1,2-Dibromo-3-Chloropropane	ND		0.0250	5	11/14/2015 17:41	WG828758
1,2-Dibromoethane	ND		0.00500	5	11/14/2015 17:41	WG828758
Dibromomethane	ND		0.00500	5	11/14/2015 17:41	WG828758
1,2-Dichlorobenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
1,3-Dichlorobenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
1,4-Dichlorobenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
Dichlorodifluoromethane	ND		0.0250	5	11/14/2015 17:41	WG828758
1,1-Dichloroethane	ND		0.00500	5	11/14/2015 17:41	WG828758
1,2-Dichloroethane	ND		0.00500	5	11/14/2015 17:41	WG828758
1,1-Dichloroethene	ND		0.00500	5	11/14/2015 17:41	WG828758
cis-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 17:41	WG828758
trans-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 17:41	WG828758
1,2-Dichloropropane	ND		0.00500	5	11/14/2015 17:41	WG828758
1,1-Dichloropropene	ND		0.00500	5	11/14/2015 17:41	WG828758
1,3-Dichloropropane	ND		0.00500	5	11/14/2015 17:41	WG828758
cis-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 17:41	WG828758
trans-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 17:41	WG828758
2,2-Dichloropropane	ND		0.00500	5	11/14/2015 17:41	WG828758
Di-isopropyl ether	ND		0.00500	5	11/14/2015 17:41	WG828758
Ethylbenzene	ND		0.00500	5	11/14/2015 17:41	WG828758

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexachloro-1,3-butadiene	ND		0.00500	5	11/14/2015 17:41	WG828758
Isopropylbenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
p-Isopropyltoluene	ND		0.00500	5	11/14/2015 17:41	WG828758
2-Butanone (MEK)	ND		0.0500	5	11/14/2015 17:41	WG828758
Methylene Chloride	ND		0.0250	5	11/14/2015 17:41	WG828758
4-Methyl-2-pentanone (MIBK)	ND		0.0500	5	11/14/2015 17:41	WG828758
Methyl tert-butyl ether	ND		0.00500	5	11/14/2015 17:41	WG828758
Naphthalene	ND		0.0250	5	11/14/2015 17:41	WG828758
n-Propylbenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
Styrene	ND		0.00500	5	11/14/2015 17:41	WG828758
1,1,1,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 17:41	WG828758
1,1,2,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 17:41	WG828758
1,1,2-Trichlorotrifluoroethane	ND		0.00500	5	11/14/2015 17:41	WG828758
Tetrachloroethene	ND		0.00500	5	11/14/2015 17:41	WG828758
Toluene	ND		0.0250	5	11/14/2015 17:41	WG828758
1,2,3-Trichlorobenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
1,2,4-Trichlorobenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
1,1,1-Trichloroethane	ND		0.00500	5	11/14/2015 17:41	WG828758
1,1,2-Trichloroethane	ND		0.00500	5	11/14/2015 17:41	WG828758
Trichloroethene	ND		0.00500	5	11/14/2015 17:41	WG828758
Trichlorofluoromethane	ND		0.0250	5	11/14/2015 17:41	WG828758
1,2,3-Trichloropropane	ND		0.0125	5	11/14/2015 17:41	WG828758
1,2,4-Trimethylbenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
1,2,3-Trimethylbenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
Vinyl chloride	ND		0.00500	5	11/14/2015 17:41	WG828758
1,3,5-Trimethylbenzene	ND		0.00500	5	11/14/2015 17:41	WG828758
Xylenes, Total	ND		0.0150	5	11/14/2015 17:41	WG828758
(S) Toluene-d8	*106*		*88.7-115*		*11/14/2015 17:41*	WG828758
(S) Dibromofluoromethane	*98.3*		*76.3-123*		*11/14/2015 17:41*	WG828758
(S) 4-Bromofluorobenzene	*105*		*69.7-129*		*11/14/2015 17:41*	WG828758

Semi-Volatile Organic Compounds (GC) by Method EPH

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Extractable Petroleum Hydrocarbon	8.89		4.00	1	11/17/2015 01:36	WG829444
(S) o-Terphenyl	*88.7*		*50.0-150*		*11/17/2015 01:36*	WG829444

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0330	1	11/16/2015 05:43	WG828715
Acenaphthene	ND		0.0330	1	11/16/2015 05:43	WG828715
Acenaphthylene	ND		0.0330	1	11/16/2015 05:43	WG828715
Benzo(a)anthracene	ND		0.0330	1	11/16/2015 05:43	WG828715
Benzo(a)pyrene	ND		0.0330	1	11/16/2015 05:43	WG828715
Benzo(b)fluoranthene	ND		0.0330	1	11/16/2015 05:43	WG828715
Benzo(g,h,i)perylene	ND		0.0330	1	11/16/2015 05:43	WG828715
Benzo(k)fluoranthene	ND		0.0330	1	11/16/2015 05:43	WG828715
Chrysene	ND		0.0330	1	11/16/2015 05:43	WG828715
Dibenz(a,h)anthracene	ND		0.0330	1	11/16/2015 05:43	WG828715
Fluoranthene	ND		0.0330	1	11/16/2015 05:43	WG828715
Fluorene	ND		0.0330	1	11/16/2015 05:43	WG828715
Indeno(1,2,3-cd)pyrene	ND		0.0330	1	11/16/2015 05:43	WG828715
Naphthalene	ND		0.0330	1	11/16/2015 05:43	WG828715
Phenanthrene	ND		0.0330	1	11/16/2015 05:43	WG828715

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Pyrene	ND		0.0330	1	11/16/2015 05:43	WG828715
(S) Nitrobenzene-d5	*87.7*		*28.3-148*		*11/16/2015 05:43*	WG828715
(S) 2-Fluorobiphenyl	*92.2*		*41.4-134*		*11/16/2015 05:43*	WG828715
(S) p-Terphenyl-d14	*75.2*		*35.8-140*		*11/16/2015 05:43*	WG828715

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.0820		0.0200	1	11/14/2015 10:15	WG828700

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	2.04		2.00	1	11/19/2015 08:28	WG829272
Barium	44.1		0.500	1	11/19/2015 08:28	WG829272
Cadmium	ND		0.500	1	11/19/2015 08:28	WG829272
Chromium	13.4		1.00	1	11/19/2015 08:28	WG829272
Lead	14.7		0.500	1	11/19/2015 08:28	WG829272
Selenium	ND		2.00	1	11/19/2015 08:28	WG829272
Silver	ND		1.00	1	11/19/2015 08:28	WG829272

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Acetone	ND		0.250	5	11/14/2015 18:05	WG828758
Acrylonitrile	ND		0.0500	5	11/14/2015 18:05	WG828758
Benzene	ND		0.00500	5	11/14/2015 18:05	WG828758
Bromobenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
Bromodichloromethane	ND		0.00500	5	11/14/2015 18:05	WG828758
Bromoform	ND		0.00500	5	11/14/2015 18:05	WG828758
Bromomethane	ND		0.0250	5	11/14/2015 18:05	WG828758
n-Butylbenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
sec-Butylbenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
tert-Butylbenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
Carbon tetrachloride	ND		0.00500	5	11/14/2015 18:05	WG828758
Chlorobenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
Chlorodibromomethane	ND		0.00500	5	11/14/2015 18:05	WG828758
Chloroethane	ND		0.0250	5	11/14/2015 18:05	WG828758
2-Chloroethyl vinyl ether	ND		0.250	5	11/14/2015 18:05	WG828758
Chloroform	ND		0.0250	5	11/14/2015 18:05	WG828758
Chloromethane	ND		0.0125	5	11/14/2015 18:05	WG828758
2-Chlorotoluene	ND		0.00500	5	11/14/2015 18:05	WG828758
4-Chlorotoluene	ND		0.00500	5	11/14/2015 18:05	WG828758
1,2-Dibromo-3-Chloropropane	ND		0.0250	5	11/14/2015 18:05	WG828758
1,2-Dibromoethane	ND		0.00500	5	11/14/2015 18:05	WG828758
Dibromomethane	ND		0.00500	5	11/14/2015 18:05	WG828758
1,2-Dichlorobenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
1,3-Dichlorobenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
1,4-Dichlorobenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
Dichlorodifluoromethane	ND		0.0250	5	11/14/2015 18:05	WG828758
1,1-Dichloroethane	ND		0.00500	5	11/14/2015 18:05	WG828758
1,2-Dichloroethane	ND		0.00500	5	11/14/2015 18:05	WG828758
1,1-Dichloroethene	ND		0.00500	5	11/14/2015 18:05	WG828758
cis-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 18:05	WG828758
trans-1,2-Dichloroethene	ND		0.00500	5	11/14/2015 18:05	WG828758
1,2-Dichloropropane	ND		0.00500	5	11/14/2015 18:05	WG828758
1,1-Dichloropropene	ND		0.00500	5	11/14/2015 18:05	WG828758
1,3-Dichloropropane	ND		0.00500	5	11/14/2015 18:05	WG828758
cis-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 18:05	WG828758
trans-1,3-Dichloropropene	ND		0.00500	5	11/14/2015 18:05	WG828758
2,2-Dichloropropane	ND		0.00500	5	11/14/2015 18:05	WG828758
Di-isopropyl ether	ND		0.00500	5	11/14/2015 18:05	WG828758
Ethylbenzene	ND		0.00500	5	11/14/2015 18:05	WG828758

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexachloro-1,3-butadiene	ND		0.00500	5	11/14/2015 18:05	WG828758
Isopropylbenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
p-Isopropyltoluene	ND		0.00500	5	11/14/2015 18:05	WG828758
2-Butanone (MEK)	ND		0.0500	5	11/14/2015 18:05	WG828758
Methylene Chloride	ND		0.0250	5	11/14/2015 18:05	WG828758
4-Methyl-2-pentanone (MIBK)	ND		0.0500	5	11/14/2015 18:05	WG828758
Methyl tert-butyl ether	ND		0.00500	5	11/14/2015 18:05	WG828758
Naphthalene	ND		0.0250	5	11/14/2015 18:05	WG828758
n-Propylbenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
Styrene	ND		0.00500	5	11/14/2015 18:05	WG828758
1,1,1,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 18:05	WG828758
1,1,2,2-Tetrachloroethane	ND		0.00500	5	11/14/2015 18:05	WG828758
1,1,2-Trichlorotrifluoroethane	ND		0.00500	5	11/14/2015 18:05	WG828758
Tetrachloroethene	ND		0.00500	5	11/14/2015 18:05	WG828758
Toluene	ND		0.0250	5	11/14/2015 18:05	WG828758
1,2,3-Trichlorobenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
1,2,4-Trichlorobenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
1,1,1-Trichloroethane	ND		0.00500	5	11/14/2015 18:05	WG828758
1,1,2-Trichloroethane	ND		0.00500	5	11/14/2015 18:05	WG828758
Trichloroethene	ND		0.00500	5	11/14/2015 18:05	WG828758
Trichlorofluoromethane	ND		0.0250	5	11/14/2015 18:05	WG828758
1,2,3-Trichloropropane	ND		0.0125	5	11/14/2015 18:05	WG828758
1,2,4-Trimethylbenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
1,2,3-Trimethylbenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
Vinyl chloride	ND		0.00500	5	11/14/2015 18:05	WG828758
1,3,5-Trimethylbenzene	ND		0.00500	5	11/14/2015 18:05	WG828758
Xylenes, Total	ND		0.0150	5	11/14/2015 18:05	WG828758
(S) Toluene-d8	*104*		*88.7-115*		*11/14/2015 18:05*	WG828758
(S) Dibromofluoromethane	*96.5*		*76.3-123*		*11/14/2015 18:05*	WG828758
(S) 4-Bromofluorobenzene	*98.7*		*69.7-129*		*11/14/2015 18:05*	WG828758

Semi-Volatile Organic Compounds (GC) by Method EPH

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Extractable Petroleum Hydrocarbon	ND		4.00	1	11/17/2015 01:50	WG829444
(S) o-Terphenyl	*94.0*		*50.0-150*		*11/17/2015 01:50*	WG829444

Pesticides (GC) by Method 8081

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0200	1	11/16/2015 20:28	WG828716
Alpha BHC	ND		0.0200	1	11/16/2015 20:28	WG828716
Beta BHC	ND		0.0200	1	11/16/2015 20:28	WG828716
Delta BHC	ND		0.0200	1	11/16/2015 20:28	WG828716
Gamma BHC	ND		0.0200	1	11/16/2015 20:28	WG828716
Chlordane	ND		0.200	1	11/16/2015 20:28	WG828716
4,4-DDD	ND		0.0200	1	11/16/2015 20:28	WG828716
4,4-DDE	ND	J4	0.0200	1	11/16/2015 20:28	WG828716
4,4-DDT	ND		0.0200	1	11/16/2015 20:28	WG828716
Dieldrin	ND		0.0200	1	11/16/2015 20:28	WG828716
Endosulfan I	ND		0.0200	1	11/16/2015 20:28	WG828716
Endosulfan II	ND		0.0200	1	11/16/2015 20:28	WG828716
Endosulfan sulfate	ND		0.0200	1	11/16/2015 20:28	WG828716
Endrin	ND		0.0200	1	11/16/2015 20:28	WG828716
Endrin aldehyde	ND		0.0200	1	11/16/2015 20:28	WG828716

Pesticides (GC) by Method 8081

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Endrin ketone	ND		0.0200	1	11/16/2015 20:28	WG828716
Hexachlorobenzene	ND		0.0200	1	11/16/2015 20:28	WG828716
Heptachlor	ND		0.0200	1	11/16/2015 20:28	WG828716
Heptachlor epoxide	ND		0.0200	1	11/16/2015 20:28	WG828716
Methoxychlor	ND		0.0200	1	11/16/2015 20:28	WG828716
Toxaphene	ND		0.400	1	11/16/2015 20:28	WG828716
(S) Decachlorobiphenyl	*120*		*10.0-143*		*11/16/2015 20:28*	WG828716
(S) Tetrachloro-m-xylene	*119*		*29.2-144*		*11/16/2015 20:28*	WG828716

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0330	1	11/16/2015 06:05	WG828715
Acenaphthene	ND		0.0330	1	11/16/2015 06:05	WG828715
Acenaphthylene	ND		0.0330	1	11/16/2015 06:05	WG828715
Benzo(a)anthracene	ND		0.0330	1	11/16/2015 06:05	WG828715
Benzo(a)pyrene	ND		0.0330	1	11/16/2015 06:05	WG828715
Benzo(b)fluoranthene	ND		0.0330	1	11/16/2015 06:05	WG828715
Benzo(g,h,i)perylene	ND		0.0330	1	11/16/2015 06:05	WG828715
Benzo(k)fluoranthene	ND		0.0330	1	11/16/2015 06:05	WG828715
Chrysene	ND		0.0330	1	11/16/2015 06:05	WG828715
Dibenz(a,h)anthracene	ND		0.0330	1	11/16/2015 06:05	WG828715
Fluoranthene	0.0506		0.0330	1	11/16/2015 06:05	WG828715
Fluorene	ND		0.0330	1	11/16/2015 06:05	WG828715
Indeno(1,2,3-cd)pyrene	ND		0.0330	1	11/16/2015 06:05	WG828715
Naphthalene	ND		0.0330	1	11/16/2015 06:05	WG828715
Phenanthrene	ND		0.0330	1	11/16/2015 06:05	WG828715
Pyrene	0.0472		0.0330	1	11/16/2015 06:05	WG828715
(S) Nitrobenzene-d5	*85.2*		*28.3-148*		*11/16/2015 06:05*	WG828715
(S) 2-Fluorobiphenyl	*90.7*		*41.4-134*		*11/16/2015 06:05*	WG828715
(S) p-Terphenyl-d14	*78.0*		*35.8-140*		*11/16/2015 06:05*	WG828715

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0355		0.0200	1	11/14/2015 10:18	WG828700

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.19		2.00	1	11/19/2015 09:00	WG829272
Barium	40.4		0.500	1	11/19/2015 09:00	WG829272
Cadmium	ND		0.500	1	11/19/2015 09:00	WG829272
Chromium	25.5		1.00	1	11/19/2015 09:00	WG829272
Lead	15.2		0.500	1	11/19/2015 09:00	WG829272
Selenium	ND		2.00	1	11/19/2015 09:00	WG829272
Silver	ND		1.00	1	11/19/2015 09:00	WG829272

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acetone	ND		0.250	5	11/19/2015 05:53	WG830101
Acrylonitrile	ND		0.0500	5	11/19/2015 05:53	WG830101
Benzene	ND		0.00500	5	11/19/2015 05:53	WG830101
Bromobenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
Bromodichloromethane	ND		0.00500	5	11/19/2015 05:53	WG830101
Bromoform	ND		0.00500	5	11/19/2015 05:53	WG830101
Bromomethane	ND		0.0250	5	11/19/2015 05:53	WG830101
n-Butylbenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
sec-Butylbenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
tert-Butylbenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
Carbon tetrachloride	ND		0.00500	5	11/19/2015 05:53	WG830101
Chlorobenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
Chlorodibromomethane	ND		0.00500	5	11/19/2015 05:53	WG830101
Chloroethane	ND		0.0250	5	11/19/2015 05:53	WG830101
2-Chloroethyl vinyl ether	ND	J4	0.250	5	11/19/2015 05:53	WG830101
Chloroform	ND		0.0250	5	11/19/2015 05:53	WG830101
Chloromethane	ND		0.0125	5	11/19/2015 05:53	WG830101
2-Chlorotoluene	ND		0.00500	5	11/19/2015 05:53	WG830101
4-Chlorotoluene	ND		0.00500	5	11/19/2015 05:53	WG830101
1,2-Dibromo-3-Chloropropane	ND		0.0250	5	11/19/2015 05:53	WG830101
1,2-Dibromoethane	ND		0.00500	5	11/19/2015 05:53	WG830101
Dibromomethane	ND		0.00500	5	11/19/2015 05:53	WG830101
1,2-Dichlorobenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
1,3-Dichlorobenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
1,4-Dichlorobenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
Dichlorodifluoromethane	ND		0.0250	5	11/19/2015 05:53	WG830101
1,1-Dichloroethane	ND		0.00500	5	11/19/2015 05:53	WG830101
1,2-Dichloroethane	ND		0.00500	5	11/19/2015 05:53	WG830101
1,1-Dichloroethene	ND		0.00500	5	11/19/2015 05:53	WG830101
cis-1,2-Dichloroethene	ND		0.00500	5	11/19/2015 05:53	WG830101
trans-1,2-Dichloroethene	ND		0.00500	5	11/19/2015 05:53	WG830101
1,2-Dichloropropane	ND		0.00500	5	11/19/2015 05:53	WG830101
1,1-Dichloropropene	ND		0.00500	5	11/19/2015 05:53	WG830101
1,3-Dichloropropane	ND		0.00500	5	11/19/2015 05:53	WG830101
cis-1,3-Dichloropropene	ND		0.00500	5	11/19/2015 05:53	WG830101
trans-1,3-Dichloropropene	ND		0.00500	5	11/19/2015 05:53	WG830101
2,2-Dichloropropane	ND		0.00500	5	11/19/2015 05:53	WG830101
Di-isopropyl ether	ND		0.00500	5	11/19/2015 05:53	WG830101
Ethylbenzene	ND		0.00500	5	11/19/2015 05:53	WG830101

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexachloro-1,3-butadiene	ND		0.00500	5	11/19/2015 05:53	WG830101
Isopropylbenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
p-Isopropyltoluene	ND		0.00500	5	11/19/2015 05:53	WG830101
2-Butanone (MEK)	ND		0.0500	5	11/19/2015 05:53	WG830101
Methylene Chloride	ND		0.0250	5	11/19/2015 05:53	WG830101
4-Methyl-2-pentanone (MIBK)	ND		0.0500	5	11/19/2015 05:53	WG830101
Methyl tert-butyl ether	ND		0.00500	5	11/19/2015 05:53	WG830101
Naphthalene	ND		0.0250	5	11/19/2015 05:53	WG830101
n-Propylbenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
Styrene	ND		0.00500	5	11/19/2015 05:53	WG830101
1,1,1,2-Tetrachloroethane	ND		0.00500	5	11/19/2015 05:53	WG830101
1,1,2,2-Tetrachloroethane	ND		0.00500	5	11/19/2015 05:53	WG830101
1,1,2-Trichlorotrifluoroethane	ND		0.00500	5	11/19/2015 05:53	WG830101
Tetrachloroethene	ND		0.00500	5	11/19/2015 05:53	WG830101
Toluene	ND		0.0250	5	11/19/2015 05:53	WG830101
1,2,3-Trichlorobenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
1,2,4-Trichlorobenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
1,1,1-Trichloroethane	ND		0.00500	5	11/19/2015 05:53	WG830101
1,1,2-Trichloroethane	ND		0.00500	5	11/19/2015 05:53	WG830101
Trichloroethene	ND		0.00500	5	11/19/2015 05:53	WG830101
Trichlorofluoromethane	ND		0.0250	5	11/19/2015 05:53	WG830101
1,2,3-Trichloropropane	ND		0.0125	5	11/19/2015 05:53	WG830101
1,2,4-Trimethylbenzene	0.00985		0.00500	5	11/19/2015 05:53	WG830101
1,2,3-Trimethylbenzene	0.00565		0.00500	5	11/19/2015 05:53	WG830101
Vinyl chloride	ND		0.00500	5	11/19/2015 05:53	WG830101
1,3,5-Trimethylbenzene	ND		0.00500	5	11/19/2015 05:53	WG830101
Xylenes, Total	ND		0.0150	5	11/19/2015 05:53	WG830101
(S) Toluene-d8	*102*		*88.7-115*		*11/19/2015 05:53*	WG830101
(S) Dibromofluoromethane	*99.0*		*76.3-123*		*11/19/2015 05:53*	WG830101
(S) 4-Bromofluorobenzene	*104*		*69.7-129*		*11/19/2015 05:53*	WG830101

Semi-Volatile Organic Compounds (GC) by Method EPH

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Extractable Petroleum Hydrocarbon	ND		4.00	1	11/17/2015 02:04	WG829444
(S) o-Terphenyl	*117*		*50.0-150*		*11/17/2015 02:04*	WG829444

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0330	1	11/16/2015 06:26	WG828715
Acenaphthene	ND		0.0330	1	11/16/2015 06:26	WG828715
Acenaphthylene	ND		0.0330	1	11/16/2015 06:26	WG828715
Benzo(a)anthracene	ND		0.0330	1	11/16/2015 06:26	WG828715
Benzo(a)pyrene	ND		0.0330	1	11/16/2015 06:26	WG828715
Benzo(b)fluoranthene	ND		0.0330	1	11/16/2015 06:26	WG828715
Benzo(g,h,i)perylene	ND		0.0330	1	11/16/2015 06:26	WG828715
Benzo(k)fluoranthene	ND		0.0330	1	11/16/2015 06:26	WG828715
Chrysene	ND		0.0330	1	11/16/2015 06:26	WG828715
Dibenz(a,h)anthracene	ND		0.0330	1	11/16/2015 06:26	WG828715
Fluoranthene	0.0348		0.0330	1	11/16/2015 06:26	WG828715
Fluorene	ND		0.0330	1	11/16/2015 06:26	WG828715
Indeno(1,2,3-cd)pyrene	ND		0.0330	1	11/16/2015 06:26	WG828715
Naphthalene	ND		0.0330	1	11/16/2015 06:26	WG828715
Phenanthrene	ND		0.0330	1	11/16/2015 06:26	WG828715

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Pyrene	0.0335		0.0330	1	11/16/2015 06:26	WG828715
(S) Nitrobenzene-d5	*88.4*		*28.3-148*		*11/16/2015 06:26*	WG828715
(S) 2-Fluorobiphenyl	*85.8*		*41.4-134*		*11/16/2015 06:26*	WG828715
(S) p-Terphenyl-d14	*74.7*		*35.8-140*		*11/16/2015 06:26*	WG828715

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	87.1		1	11/14/2015 15:35	WG829022

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0200	1	11/14/2015 10:21	WG828700

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	4.96		2.00	1	11/19/2015 09:03	WG829272
Barium	32.7		0.500	1	11/19/2015 09:03	WG829272
Cadmium	0.832		0.500	1	11/19/2015 09:03	WG829272
Chromium	34.7		1.00	1	11/19/2015 09:03	WG829272
Lead	43.6		0.500	1	11/19/2015 09:03	WG829272
Selenium	ND		2.00	1	11/19/2015 09:03	WG829272
Silver	ND		1.00	1	11/19/2015 09:03	WG829272

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	86.8		1	11/14/2015 15:34	WG829022

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.0467		0.0200	1	11/14/2015 10:23	WG828700

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	5.80		2.00	1	11/19/2015 09:06	WG829272
Barium	38.5		0.500	1	11/19/2015 09:06	WG829272
Cadmium	0.600		0.500	1	11/19/2015 09:06	WG829272
Chromium	34.5		1.00	1	11/19/2015 09:06	WG829272
Lead	88.9		0.500	1	11/19/2015 09:06	WG829272
Selenium	ND		2.00	1	11/19/2015 09:06	WG829272
Silver	ND		1.00	1	11/19/2015 09:06	WG829272

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	ND		0.0500	1	11/14/2015 03:39	WG828976
Acrolein	ND		0.0500	1	11/14/2015 03:39	WG828976
Acrylonitrile	ND		0.0100	1	11/14/2015 03:39	WG828976
Benzene	ND		0.00100	1	11/14/2015 03:39	WG828976
Bromobenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
Bromodichloromethane	ND		0.00100	1	11/14/2015 03:39	WG828976
Bromoform	ND		0.00100	1	11/14/2015 03:39	WG828976
Bromomethane	ND		0.00500	1	11/14/2015 03:39	WG828976
n-Butylbenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
sec-Butylbenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
tert-Butylbenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
Carbon tetrachloride	ND		0.00100	1	11/14/2015 03:39	WG828976
Chlorobenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
Chlorodibromomethane	ND		0.00100	1	11/14/2015 03:39	WG828976
Chloroethane	ND		0.00500	1	11/14/2015 03:39	WG828976
2-Chloroethyl vinyl ether	ND	J4	0.0500	1	11/14/2015 03:39	WG828976
Chloroform	ND		0.00500	1	11/14/2015 03:39	WG828976
Chloromethane	ND		0.00250	1	11/14/2015 03:39	WG828976
2-Chlorotoluene	ND		0.00100	1	11/14/2015 03:39	WG828976
4-Chlorotoluene	ND		0.00100	1	11/14/2015 03:39	WG828976
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	11/14/2015 03:39	WG828976
1,2-Dibromoethane	ND		0.00100	1	11/14/2015 03:39	WG828976
Dibromomethane	ND		0.00100	1	11/14/2015 03:39	WG828976
1,2-Dichlorobenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
1,3-Dichlorobenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
1,4-Dichlorobenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
Dichlorodifluoromethane	ND		0.00500	1	11/14/2015 03:39	WG828976
1,1-Dichloroethane	ND		0.00100	1	11/14/2015 03:39	WG828976
1,2-Dichloroethane	ND		0.00100	1	11/14/2015 03:39	WG828976
1,1-Dichloroethene	ND		0.00100	1	11/14/2015 03:39	WG828976
cis-1,2-Dichloroethene	ND		0.00100	1	11/14/2015 03:39	WG828976
trans-1,2-Dichloroethene	ND		0.00100	1	11/14/2015 03:39	WG828976
1,2-Dichloropropane	ND		0.00100	1	11/14/2015 03:39	WG828976
1,1-Dichloropropene	ND		0.00100	1	11/14/2015 03:39	WG828976
1,3-Dichloropropane	ND		0.00100	1	11/14/2015 03:39	WG828976
cis-1,3-Dichloropropene	ND		0.00100	1	11/14/2015 03:39	WG828976
trans-1,3-Dichloropropene	ND		0.00100	1	11/14/2015 03:39	WG828976
2,2-Dichloropropane	ND		0.00100	1	11/14/2015 03:39	WG828976
Di-isopropyl ether	ND		0.00100	1	11/14/2015 03:39	WG828976
Ethylbenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
Hexachloro-1,3-butadiene	ND		0.00100	1	11/14/2015 03:39	WG828976
Isopropylbenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
p-Isopropyltoluene	ND		0.00100	1	11/14/2015 03:39	WG828976
2-Butanone (MEK)	ND		0.0100	1	11/14/2015 03:39	WG828976
Methylene Chloride	ND		0.00500	1	11/14/2015 03:39	WG828976
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	11/14/2015 03:39	WG828976
Methyl tert-butyl ether	ND		0.00100	1	11/14/2015 03:39	WG828976
Naphthalene	ND		0.00500	1	11/14/2015 03:39	WG828976
n-Propylbenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
Styrene	ND		0.00100	1	11/14/2015 03:39	WG828976
1,1,1,2-Tetrachloroethane	ND		0.00100	1	11/14/2015 03:39	WG828976
1,1,2,2-Tetrachloroethane	ND		0.00100	1	11/14/2015 03:39	WG828976
1,1,2-Trichlorotrifluoroethane	ND		0.00100	1	11/14/2015 03:39	WG828976
Tetrachloroethene	ND		0.00100	1	11/14/2015 03:39	WG828976
Toluene	ND		0.00500	1	11/14/2015 03:39	WG828976
1,2,3-Trichlorobenzene	ND		0.00100	1	11/14/2015 03:39	WG828976

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2,4-Trichlorobenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
1,1,1-Trichloroethane	ND		0.00100	1	11/14/2015 03:39	WG828976
1,1,2-Trichloroethane	ND		0.00100	1	11/14/2015 03:39	WG828976
Trichloroethene	ND		0.00100	1	11/14/2015 03:39	WG828976
Trichlorofluoromethane	ND		0.00500	1	11/14/2015 03:39	WG828976
1,2,3-Trichloropropane	ND		0.00250	1	11/14/2015 03:39	WG828976
1,2,4-Trimethylbenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
1,2,3-Trimethylbenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
1,3,5-Trimethylbenzene	ND		0.00100	1	11/14/2015 03:39	WG828976
Vinyl chloride	ND		0.00100	1	11/14/2015 03:39	WG828976
Xylenes, Total	ND		0.00300	1	11/14/2015 03:39	WG828976
(S) Toluene-d8	*103*		*90.0-115*		*11/14/2015 03:39*	WG828976
(S) Dibromofluoromethane	*101*		*79.0-121*		*11/14/2015 03:39*	WG828976
(S) 4-Bromofluorobenzene	*102*		*80.1-120*		*11/14/2015 03:39*	WG828976

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Acenaphthene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Acenaphthylene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Benzo(a)anthracene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Benzo(a)pyrene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Benzo(b)fluoranthene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Benzo(g,h,i)perylene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Benzo(k)fluoranthene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Chrysene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Dibenz(a,h)anthracene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Fluoranthene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Fluorene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Indeno(1,2,3-cd)pyrene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Naphthalene	ND		0.000250	1	11/13/2015 12:33	WG828643
Phenanthrene	ND		0.0000500	1	11/13/2015 12:33	WG828643
Pyrene	ND		0.0000500	1	11/13/2015 12:33	WG828643
(S) Nitrobenzene-d5	*85.5*		*33.8-179*		*11/13/2015 12:33*	WG828643
(S) 2-Fluorobiphenyl	*109*		*55.5-150*		*11/13/2015 12:33*	WG828643
(S) p-Terphenyl-d14	*93.2*		*46.2-163*		*11/13/2015 12:33*	WG828643

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	ND		0.0500	1	11/14/2015 03:58	WG828976
Acrolein	ND		0.0500	1	11/14/2015 03:58	WG828976
Acrylonitrile	ND		0.0100	1	11/14/2015 03:58	WG828976
Benzene	ND		0.00100	1	11/14/2015 03:58	WG828976
Bromobenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
Bromodichloromethane	ND		0.00100	1	11/14/2015 03:58	WG828976
Bromoform	ND		0.00100	1	11/14/2015 03:58	WG828976
Bromomethane	ND		0.00500	1	11/14/2015 03:58	WG828976
n-Butylbenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
sec-Butylbenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
tert-Butylbenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
Carbon tetrachloride	ND		0.00100	1	11/14/2015 03:58	WG828976
Chlorobenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
Chlorodibromomethane	ND		0.00100	1	11/14/2015 03:58	WG828976
Chloroethane	ND		0.00500	1	11/14/2015 03:58	WG828976
2-Chloroethyl vinyl ether	ND	J4	0.0500	1	11/14/2015 03:58	WG828976
Chloroform	ND		0.00500	1	11/14/2015 03:58	WG828976
Chloromethane	ND		0.00250	1	11/14/2015 03:58	WG828976
2-Chlorotoluene	ND		0.00100	1	11/14/2015 03:58	WG828976
4-Chlorotoluene	ND		0.00100	1	11/14/2015 03:58	WG828976
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	11/14/2015 03:58	WG828976
1,2-Dibromoethane	ND		0.00100	1	11/14/2015 03:58	WG828976
Dibromomethane	ND		0.00100	1	11/14/2015 03:58	WG828976
1,2-Dichlorobenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
1,3-Dichlorobenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
1,4-Dichlorobenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
Dichlorodifluoromethane	ND		0.00500	1	11/14/2015 03:58	WG828976
1,1-Dichloroethane	ND		0.00100	1	11/14/2015 03:58	WG828976
1,2-Dichloroethane	ND		0.00100	1	11/14/2015 03:58	WG828976
1,1-Dichloroethene	ND		0.00100	1	11/14/2015 03:58	WG828976
cis-1,2-Dichloroethene	ND		0.00100	1	11/14/2015 03:58	WG828976
trans-1,2-Dichloroethene	ND		0.00100	1	11/14/2015 03:58	WG828976
1,2-Dichloropropane	ND		0.00100	1	11/14/2015 03:58	WG828976
1,1-Dichloropropene	ND		0.00100	1	11/14/2015 03:58	WG828976
1,3-Dichloropropane	ND		0.00100	1	11/14/2015 03:58	WG828976
cis-1,3-Dichloropropene	ND		0.00100	1	11/14/2015 03:58	WG828976
trans-1,3-Dichloropropene	ND		0.00100	1	11/14/2015 03:58	WG828976
2,2-Dichloropropane	ND		0.00100	1	11/14/2015 03:58	WG828976
Di-isopropyl ether	ND		0.00100	1	11/14/2015 03:58	WG828976
Ethylbenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
Hexachloro-1,3-butadiene	ND		0.00100	1	11/14/2015 03:58	WG828976
Isopropylbenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
p-Isopropyltoluene	ND		0.00100	1	11/14/2015 03:58	WG828976
2-Butanone (MEK)	ND		0.0100	1	11/14/2015 03:58	WG828976
Methylene Chloride	ND		0.00500	1	11/14/2015 03:58	WG828976
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	11/14/2015 03:58	WG828976
Methyl tert-butyl ether	ND		0.00100	1	11/14/2015 03:58	WG828976
Naphthalene	ND		0.00500	1	11/14/2015 03:58	WG828976
n-Propylbenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
Styrene	ND		0.00100	1	11/14/2015 03:58	WG828976
1,1,1,2-Tetrachloroethane	ND		0.00100	1	11/14/2015 03:58	WG828976
1,1,2,2-Tetrachloroethane	ND		0.00100	1	11/14/2015 03:58	WG828976
1,1,2-Trichlorotrifluoroethane	ND		0.00100	1	11/14/2015 03:58	WG828976
Tetrachloroethene	ND		0.00100	1	11/14/2015 03:58	WG828976
Toluene	ND		0.00500	1	11/14/2015 03:58	WG828976
1,2,3-Trichlorobenzene	ND		0.00100	1	11/14/2015 03:58	WG828976

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2,4-Trichlorobenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
1,1,1-Trichloroethane	ND		0.00100	1	11/14/2015 03:58	WG828976
1,1,2-Trichloroethane	ND		0.00100	1	11/14/2015 03:58	WG828976
Trichloroethene	ND		0.00100	1	11/14/2015 03:58	WG828976
Trichlorofluoromethane	ND		0.00500	1	11/14/2015 03:58	WG828976
1,2,3-Trichloropropane	ND		0.00250	1	11/14/2015 03:58	WG828976
1,2,4-Trimethylbenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
1,2,3-Trimethylbenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
1,3,5-Trimethylbenzene	ND		0.00100	1	11/14/2015 03:58	WG828976
Vinyl chloride	ND		0.00100	1	11/14/2015 03:58	WG828976
Xylenes, Total	ND		0.00300	1	11/14/2015 03:58	WG828976
(S) Toluene-d8	*102*		*90.0-115*		*11/14/2015 03:58*	WG828976
(S) Dibromofluoromethane	*101*		*79.0-121*		*11/14/2015 03:58*	WG828976
(S) 4-Bromofluorobenzene	*103*		*80.1-120*		*11/14/2015 03:58*	WG828976

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Anthracene	0.000146		0.0000500	1	11/13/2015 12:54	WG828643
Acenaphthene	0.000166		0.0000500	1	11/13/2015 12:54	WG828643
Acenaphthylene	ND		0.0000500	1	11/13/2015 12:54	WG828643
Benzo(a)anthracene	ND		0.0000500	1	11/13/2015 12:54	WG828643
Benzo(a)pyrene	ND		0.0000500	1	11/13/2015 12:54	WG828643
Benzo(b)fluoranthene	ND		0.0000500	1	11/13/2015 12:54	WG828643
Benzo(g,h,i)perylene	ND		0.0000500	1	11/13/2015 12:54	WG828643
Benzo(k)fluoranthene	ND		0.0000500	1	11/13/2015 12:54	WG828643
Chrysene	ND		0.0000500	1	11/13/2015 12:54	WG828643
Dibenz(a,h)anthracene	ND		0.0000500	1	11/13/2015 12:54	WG828643
Fluoranthene	0.000155		0.0000500	1	11/13/2015 12:54	WG828643
Fluorene	0.000103		0.0000500	1	11/13/2015 12:54	WG828643
Indeno(1,2,3-cd)pyrene	ND		0.0000500	1	11/13/2015 12:54	WG828643
Naphthalene	ND		0.000250	1	11/13/2015 12:54	WG828643
Phenanthrene	0.000508		0.0000500	1	11/13/2015 12:54	WG828643
Pyrene	0.0000977		0.0000500	1	11/13/2015 12:54	WG828643
(S) Nitrobenzene-d5	*126*		*33.8-179*		*11/13/2015 12:54*	WG828643
(S) 2-Fluorobiphenyl	*109*		*55.5-150*		*11/13/2015 12:54*	WG828643
(S) p-Terphenyl-d14	*93.0*		*46.2-163*		*11/13/2015 12:54*	WG828643

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	ND		0.0500	1	11/14/2015 04:18	WG828976
Acrolein	ND		0.0500	1	11/14/2015 04:18	WG828976
Acrylonitrile	ND		0.0100	1	11/14/2015 04:18	WG828976
Benzene	ND		0.00100	1	11/14/2015 04:18	WG828976
Bromobenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
Bromodichloromethane	ND		0.00100	1	11/14/2015 04:18	WG828976
Bromoform	ND		0.00100	1	11/14/2015 04:18	WG828976
Bromomethane	ND		0.00500	1	11/14/2015 04:18	WG828976
n-Butylbenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
sec-Butylbenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
tert-Butylbenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
Carbon tetrachloride	ND		0.00100	1	11/14/2015 04:18	WG828976
Chlorobenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
Chlorodibromomethane	ND		0.00100	1	11/14/2015 04:18	WG828976
Chloroethane	ND		0.00500	1	11/14/2015 04:18	WG828976
2-Chloroethyl vinyl ether	ND	J4	0.0500	1	11/14/2015 04:18	WG828976
Chloroform	ND		0.00500	1	11/14/2015 04:18	WG828976
Chloromethane	ND		0.00250	1	11/14/2015 04:18	WG828976
2-Chlorotoluene	ND		0.00100	1	11/14/2015 04:18	WG828976
4-Chlorotoluene	ND		0.00100	1	11/14/2015 04:18	WG828976
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	11/14/2015 04:18	WG828976
1,2-Dibromoethane	ND		0.00100	1	11/14/2015 04:18	WG828976
Dibromomethane	ND		0.00100	1	11/14/2015 04:18	WG828976
1,2-Dichlorobenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
1,3-Dichlorobenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
1,4-Dichlorobenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
Dichlorodifluoromethane	ND		0.00500	1	11/14/2015 04:18	WG828976
1,1-Dichloroethane	ND		0.00100	1	11/14/2015 04:18	WG828976
1,2-Dichloroethane	ND		0.00100	1	11/14/2015 04:18	WG828976
1,1-Dichloroethene	ND		0.00100	1	11/14/2015 04:18	WG828976
cis-1,2-Dichloroethene	ND		0.00100	1	11/14/2015 04:18	WG828976
trans-1,2-Dichloroethene	ND		0.00100	1	11/14/2015 04:18	WG828976
1,2-Dichloropropane	ND		0.00100	1	11/14/2015 04:18	WG828976
1,1-Dichloropropene	ND		0.00100	1	11/14/2015 04:18	WG828976
1,3-Dichloropropane	ND		0.00100	1	11/14/2015 04:18	WG828976
cis-1,3-Dichloropropene	ND		0.00100	1	11/14/2015 04:18	WG828976
trans-1,3-Dichloropropene	ND		0.00100	1	11/14/2015 04:18	WG828976
2,2-Dichloropropane	ND		0.00100	1	11/14/2015 04:18	WG828976
Di-isopropyl ether	ND		0.00100	1	11/14/2015 04:18	WG828976
Ethylbenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
Hexachloro-1,3-butadiene	ND		0.00100	1	11/14/2015 04:18	WG828976
Isopropylbenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
p-Isopropyltoluene	ND		0.00100	1	11/14/2015 04:18	WG828976
2-Butanone (MEK)	ND		0.0100	1	11/14/2015 04:18	WG828976
Methylene Chloride	ND		0.00500	1	11/14/2015 04:18	WG828976
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	11/14/2015 04:18	WG828976
Methyl tert-butyl ether	ND		0.00100	1	11/14/2015 04:18	WG828976
Naphthalene	ND		0.00500	1	11/14/2015 04:18	WG828976
n-Propylbenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
Styrene	ND		0.00100	1	11/14/2015 04:18	WG828976
1,1,1,2-Tetrachloroethane	ND		0.00100	1	11/14/2015 04:18	WG828976
1,1,2,2-Tetrachloroethane	ND		0.00100	1	11/14/2015 04:18	WG828976
1,1,2-Trichlorotrifluoroethane	ND		0.00100	1	11/14/2015 04:18	WG828976
Tetrachloroethene	ND		0.00100	1	11/14/2015 04:18	WG828976
Toluene	ND		0.00500	1	11/14/2015 04:18	WG828976
1,2,3-Trichlorobenzene	ND		0.00100	1	11/14/2015 04:18	WG828976

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2,4-Trichlorobenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
1,1,1-Trichloroethane	ND		0.00100	1	11/14/2015 04:18	WG828976
1,1,2-Trichloroethane	ND		0.00100	1	11/14/2015 04:18	WG828976
Trichloroethene	ND		0.00100	1	11/14/2015 04:18	WG828976
Trichlorofluoromethane	ND		0.00500	1	11/14/2015 04:18	WG828976
1,2,3-Trichloropropane	ND		0.00250	1	11/14/2015 04:18	WG828976
1,2,4-Trimethylbenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
1,2,3-Trimethylbenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
1,3,5-Trimethylbenzene	ND		0.00100	1	11/14/2015 04:18	WG828976
Vinyl chloride	ND		0.00100	1	11/14/2015 04:18	WG828976
Xylenes, Total	ND		0.00300	1	11/14/2015 04:18	WG828976
(S) Toluene-d8	*103*		*90.0-115*		*11/14/2015 04:18*	WG828976
(S) Dibromofluoromethane	*101*		*79.0-121*		*11/14/2015 04:18*	WG828976
(S) 4-Bromofluorobenzene	*102*		*80.1-120*		*11/14/2015 04:18*	WG828976

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/13/2015 17:19	WG828703

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	ND		0.0100	1	11/17/2015 22:37	WG829262
Barium	0.0566		0.00500	1	11/17/2015 22:37	WG829262
Cadmium	ND		0.00200	1	11/17/2015 22:37	WG829262
Chromium	ND		0.0100	1	11/17/2015 22:37	WG829262
Lead	ND		0.00500	1	11/17/2015 22:37	WG829262
Selenium	ND		0.0100	1	11/17/2015 22:37	WG829262
Silver	ND		0.00500	1	11/17/2015 22:37	WG829262

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	0.000490		0.000200	1	11/13/2015 17:21	WG828703

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	ND		0.0100	1	11/17/2015 22:40	WG829262
Barium	0.134		0.00500	1	11/17/2015 22:40	WG829262
Cadmium	ND		0.00200	1	11/17/2015 22:40	WG829262
Chromium	ND		0.0100	1	11/17/2015 22:40	WG829262
Lead	0.0135		0.00500	1	11/17/2015 22:40	WG829262
Selenium	ND		0.0100	1	11/17/2015 22:40	WG829262
Silver	ND		0.00500	1	11/17/2015 22:40	WG829262

Method Blank (MB)

(MB) 11/14/15 15:32

Analyte	MB Result	MB Qualifier	MB RDL
	%		%
Total Solids	0.000600		

L800553-03 Original Sample (OS) • Duplicate (DUP)

(OS) 11/14/15 15:32 • (DUP) 11/14/15 15:33

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	83.8	80.3	1	4.19		5

Laboratory Control Sample (LCS)

(LCS) 11/14/15 15:32

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) 11/13/15 16:26

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Mercury	ND		0.000200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/13/15 16:28 • (LCSD) 11/13/15 16:30

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	0.00289	0.00300	96	100	80-120			4	20

L800507-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/13/15 16:32 • (MS) 11/13/15 16:39 • (MSD) 11/13/15 16:41

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00278	0.00278	93	93	1	75-125			0	20

Method Blank (MB)

(MB) 11/14/15 09:04

Analyte	MB Result	MB Qualifier	MB RDL
	mg/kg		mg/kg
Mercury	ND		0.0200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/14/15 09:07 • (LCSD) 11/14/15 09:10

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Mercury	0.300	0.270	0.284	90	95	80-120			5	20

L800608-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/14/15 09:13 • (MS) 11/14/15 09:16 • (MSD) 11/14/15 09:19

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Mercury	0.300	0.00689	0.291	0.318	95	104	1	75-125			9	20

Method Blank (MB)

(MB) 11/17/15 21:48

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Arsenic	ND		0.0100
Barium	ND		0.00500
Cadmium	ND		0.00200
Chromium	ND		0.0100
Lead	ND		0.00500
Selenium	ND		0.0100
Silver	ND		0.00500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/17/15 21:51 • (LCSD) 11/17/15 21:54

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	1.00	1.06	1.06	106	106	80-120			1	20
Barium	1.00	1.04	1.04	104	104	80-120			0	20
Cadmium	1.00	1.10	1.09	110	109	80-120			1	20
Chromium	1.00	1.05	1.04	105	104	80-120			1	20
Lead	1.00	1.03	1.02	103	102	80-120			1	20
Selenium	1.00	1.09	1.09	109	109	80-120			0	20
Silver	1.00	1.01	0.998	101	100	80-120			1	20

L800625-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/17/15 21:57 • (MS) 11/17/15 22:03 • (MSD) 11/17/15 22:22

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	1.00	0.000417	1.09	1.09	109	109	1	75-125			0	20
Barium	1.00	0.192	1.20	1.22	101	103	1	75-125			1	20
Cadmium	1.00	0.000200	1.10	1.11	110	111	1	75-125			0	20
Chromium	1.00	0.00134	1.04	1.04	104	104	1	75-125			0	20
Lead	1.00	0.00251	1.03	1.03	102	103	1	75-125			0	20
Selenium	1.00	0.00161	1.11	1.12	111	111	1	75-125			0	20
Silver	1.00	ND	1.01	1.02	101	102	1	75-125			1	20

Method Blank (MB)

(MB) 11/19/15 08:11

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Arsenic	ND		2.00
Barium	ND		0.500
Cadmium	ND		0.500
Chromium	ND		1.00
Lead	ND		0.500
Selenium	ND		2.00
Silver	ND		1.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/19/15 08:22 • (LCSD) 11/19/15 08:25

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	99.2	102	99	102	80-120			3	20
Barium	100	101	103	101	103	80-120			3	20
Cadmium	100	98.2	101	98	101	80-120			3	20
Chromium	100	93.8	96.6	94	97	80-120			3	20
Lead	100	99.1	102	99	102	80-120			3	20
Selenium	100	103	107	103	107	80-120			3	20
Silver	100	96.0	99.4	96	99	80-120			3	20

L800673-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/19/15 08:28 • (MS) 11/19/15 08:43 • (MSD) 11/19/15 08:45

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	2.04	97.6	93.9	96	92	1	75-125			4	20
Barium	100	44.1	139	135	95	91	1	75-125			3	20
Cadmium	100	0.0499	96.9	93.0	97	93	1	75-125			4	20
Chromium	100	13.4	103	98.2	89	85	1	75-125			4	20
Lead	100	14.7	115	112	101	97	1	75-125			3	20
Selenium	100	0.763	100	96.3	99	96	1	75-125			4	20
Silver	100	ND	95.0	91.7	95	92	1	75-125			4	20

Method Blank (MB)

(MB) 11/14/15 09:13

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Acetone	ND		0.0500
Acrylonitrile	ND		0.0100
Benzene	ND		0.00100
Bromobenzene	ND		0.00100
Bromodichloromethane	ND		0.00100
Bromoform	ND		0.00100
Bromomethane	ND		0.00500
n-Butylbenzene	ND		0.00100
sec-Butylbenzene	ND		0.00100
tert-Butylbenzene	ND		0.00100
Carbon tetrachloride	ND		0.00100
Chlorobenzene	ND		0.00100
Chlorodibromomethane	ND		0.00100
Chloroethane	ND		0.00500
2-Chloroethyl vinyl ether	ND		0.0500
Chloroform	ND		0.00500
Chloromethane	ND		0.00250
2-Chlorotoluene	ND		0.00100
4-Chlorotoluene	ND		0.00100
1,2-Dibromo-3-Chloropropane	ND		0.00500
1,2-Dibromoethane	ND		0.00100
Dibromomethane	ND		0.00100
1,2-Dichlorobenzene	ND		0.00100
1,3-Dichlorobenzene	ND		0.00100
1,4-Dichlorobenzene	ND		0.00100
Dichlorodifluoromethane	ND		0.00500
1,1-Dichloroethane	ND		0.00100
1,2-Dichloroethane	ND		0.00100
1,1-Dichloroethene	ND		0.00100
cis-1,2-Dichloroethene	ND		0.00100
trans-1,2-Dichloroethene	ND		0.00100
1,2-Dichloropropane	ND		0.00100
1,1-Dichloropropene	ND		0.00100
1,3-Dichloropropane	ND		0.00100
cis-1,3-Dichloropropene	ND		0.00100
trans-1,3-Dichloropropene	ND		0.00100

Method Blank (MB)

(MB) 11/14/15 09:13

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
2,2-Dichloropropane	ND		0.00100
Di-isopropyl ether	ND		0.00100
Ethylbenzene	ND		0.00100
Hexachloro-1,3-butadiene	ND		0.00100
Isopropylbenzene	ND		0.00100
p-Isopropyltoluene	ND		0.00100
2-Butanone (MEK)	ND		0.0100
Methylene Chloride	ND		0.00500
4-Methyl-2-pentanone (MIBK)	ND		0.0100
Methyl tert-butyl ether	ND		0.00100
Naphthalene	ND		0.00500
n-Propylbenzene	ND		0.00100
Styrene	ND		0.00100
1,1,1,2-Tetrachloroethane	ND		0.00100
1,1,2,2-Tetrachloroethane	ND		0.00100
Tetrachloroethene	ND		0.00100
Toluene	ND		0.00500
1,1,2-Trichlorotrifluoroethane	ND		0.00100
1,2,3-Trichlorobenzene	ND		0.00100
1,2,4-Trichlorobenzene	ND		0.00100
1,1,1-Trichloroethane	ND		0.00100
1,1,2-Trichloroethane	ND		0.00100
Trichloroethene	ND		0.00100
Trichlorofluoromethane	ND		0.00500
1,2,3-Trichloropropane	ND		0.00250
1,2,3-Trimethylbenzene	ND		0.00100
1,2,4-Trimethylbenzene	ND		0.00100
1,3,5-Trimethylbenzene	ND		0.00100
Vinyl chloride	ND		0.00100
Xylenes, Total	ND		0.00300
(S) Toluene-d8	*101*		*88.7-115*
(S) Dibromofluoromethane	*96.3*		*76.3-123*
(S) 4-Bromofluorobenzene	*103*		*69.7-129*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/14/15 06:45 • (LCSD) 11/14/15 07:10

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.101	0.106	80.4	84.7	25.3-178			5.19	22.9
Acrylonitrile	0.125	0.118	0.116	94.1	92.7	57.8-143			1.48	20
Benzene	0.0250	0.0234	0.0226	93.7	90.5	72.6-120			3.47	20
Bromobenzene	0.0250	0.0242	0.0249	96.7	99.7	80.3-115			3.13	20
Bromodichloromethane	0.0250	0.0227	0.0229	90.7	91.7	75.3-119			1.12	20
Bromoform	0.0250	0.0251	0.0252	101	101	69.1-135			0.330	20
Bromomethane	0.0250	0.0244	0.0259	97.7	104	23.0-191			6.01	20
n-Butylbenzene	0.0250	0.0246	0.0255	98.3	102	74.2-134			3.53	20
sec-Butylbenzene	0.0250	0.0250	0.0259	99.9	104	77.8-129			3.74	20
tert-Butylbenzene	0.0250	0.0243	0.0266	97.4	106	77.2-129			8.73	20
Carbon tetrachloride	0.0250	0.0236	0.0236	94.5	94.3	69.4-129			0.250	20
Chlorobenzene	0.0250	0.0251	0.0267	101	107	78.9-122			6.03	20
Chlorodibromomethane	0.0250	0.0249	0.0249	99.7	99.8	76.4-126			0.0700	20
Chloroethane	0.0250	0.0235	0.0230	94.1	92.1	47.2-147			2.13	20
2-Chloroethyl vinyl ether	0.125	0.0942	0.0900	75.3	72.0	16.7-162			4.48	23.7
Chloroform	0.0250	0.0231	0.0231	92.2	92.3	73.3-122			0.0600	20
Chloromethane	0.0250	0.0148	0.0150	59.4	60.1	53.1-135			1.23	20
2-Chlorotoluene	0.0250	0.0245	0.0258	98.0	103	74.6-127			5.13	20
4-Chlorotoluene	0.0250	0.0241	0.0254	96.3	101	79.5-123			5.15	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0237	0.0230	94.6	92.1	64.9-131			2.64	20
1,2-Dibromoethane	0.0250	0.0254	0.0247	102	98.7	78.7-123			2.95	20
Dibromomethane	0.0250	0.0256	0.0234	102	93.7	78.5-117			8.76	20
1,2-Dichlorobenzene	0.0250	0.0240	0.0243	95.8	97.3	83.6-119			1.56	20
1,3-Dichlorobenzene	0.0250	0.0243	0.0259	97.3	104	75.9-129			6.31	20
1,4-Dichlorobenzene	0.0250	0.0233	0.0236	93.0	94.4	81.0-115			1.42	20
Dichlorodifluoromethane	0.0250	0.0232	0.0225	92.8	89.9	50.9-139			3.17	20
1,1-Dichloroethane	0.0250	0.0229	0.0226	91.5	90.4	71.7-125			1.18	20
1,2-Dichloroethane	0.0250	0.0211	0.0201	84.3	80.3	67.2-121			4.89	20
1,1-Dichloroethene	0.0250	0.0247	0.0238	99.0	95.2	60.6-133			3.92	20
cis-1,2-Dichloroethene	0.0250	0.0235	0.0232	93.9	92.9	76.1-121			1.10	20
trans-1,2-Dichloroethene	0.0250	0.0240	0.0229	95.8	91.7	70.7-124			4.43	20
1,2-Dichloropropane	0.0250	0.0234	0.0231	93.6	92.4	76.9-123			1.30	20
1,1-Dichloropropene	0.0250	0.0226	0.0218	90.3	87.1	71.2-126			3.61	20
1,3-Dichloropropane	0.0250	0.0231	0.0239	92.2	95.7	80.3-114			3.69	20
cis-1,3-Dichloropropene	0.0250	0.0250	0.0242	100	96.7	77.3-123			3.57	20
trans-1,3-Dichloropropene	0.0250	0.0248	0.0235	99.1	93.8	73.0-127			5.45	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/14/15 06:45 • (LCSD) 11/14/15 07:10

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
2,2-Dichloropropane	0.0250	0.0223	0.0216	89.2	86.6	61.9-132			3.01	20
Di-isopropyl ether	0.0250	0.0216	0.0211	86.4	84.3	67.2-131			2.54	20
Ethylbenzene	0.0250	0.0247	0.0253	98.9	101	78.6-124			2.32	20
Hexachloro-1,3-butadiene	0.0250	0.0241	0.0252	96.4	101	69.2-136			4.27	20
Isopropylbenzene	0.0250	0.0240	0.0249	96.1	99.4	79.4-126			3.41	20
p-Isopropyltoluene	0.0250	0.0244	0.0265	97.7	106	75.4-132			8.12	20
2-Butanone (MEK)	0.125	0.106	0.104	84.8	82.8	44.5-154			2.32	21.3
Methylene Chloride	0.0250	0.0248	0.0240	99.4	96.0	68.2-119			3.46	20
4-Methyl-2-pentanone (MIBK)	0.125	0.115	0.113	91.7	90.3	61.1-138			1.44	20
Methyl tert-butyl ether	0.0250	0.0240	0.0219	96.0	87.6	70.2-122			9.15	20
Naphthalene	0.0250	0.0270	0.0265	108	106	69.9-132			1.95	20
n-Propylbenzene	0.0250	0.0247	0.0246	98.9	98.2	80.2-124			0.650	20
Styrene	0.0250	0.0255	0.0264	102	105	79.4-124			3.35	20
1,1,1,2-Tetrachloroethane	0.0250	0.0247	0.0253	98.9	101	76.7-127			2.47	20
1,1,2,2-Tetrachloroethane	0.0250	0.0263	0.0253	105	101	78.8-124			3.93	20
Tetrachloroethene	0.0250	0.0238	0.0250	95.2	100	71.1-133			4.87	20
Toluene	0.0250	0.0239	0.0228	95.4	91.1	76.7-116			4.62	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0232	0.0235	92.9	93.9	62.6-138			0.980	20
1,2,3-Trichlorobenzene	0.0250	0.0258	0.0258	103	103	72.5-137			0.000	20
1,2,4-Trichlorobenzene	0.0250	0.0260	0.0262	104	105	74.0-137			0.690	20
1,1,1-Trichloroethane	0.0250	0.0226	0.0220	90.3	88.1	69.9-127			2.51	20
1,1,2-Trichloroethane	0.0250	0.0254	0.0245	102	97.9	81.9-119			3.76	20
Trichloroethene	0.0250	0.0238	0.0240	95.2	96.1	77.2-122			0.940	20
Trichlorofluoromethane	0.0250	0.0242	0.0234	96.6	93.5	51.5-151			3.24	20
1,2,3-Trichloropropane	0.0250	0.0251	0.0244	100	97.6	74.0-124			2.85	20
1,2,3-Trimethylbenzene	0.0250	0.0241	0.0247	96.3	98.9	79.4-118			2.73	20
1,2,4-Trimethylbenzene	0.0250	0.0249	0.0264	99.7	106	77.1-124			5.87	20
1,3,5-Trimethylbenzene	0.0250	0.0242	0.0253	96.9	101	79.0-125			4.49	20
Vinyl chloride	0.0250	0.0216	0.0215	86.4	85.9	58.4-134			0.590	20
Xylenes, Total	0.0750	0.0731	0.0775	97.5	103	78.1-123			5.75	20
(S) Toluene-d8				*105*	*102*	*88.7-115*				
(S) Dibromofluoromethane				*96.1*	*93.2*	*76.3-123*				
(S) 4-Bromofluorobenzene				*101*	*101*	*69.7-129*				

L800673-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/14/15 10:51 • (MS) 11/14/15 09:38 • (MSD) 11/14/15 10:02

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	ND	0.517	0.476	82.8	76.2	5	10.0-130			8.34	31.5
Acrylonitrile	0.125	ND	0.542	0.514	86.7	82.2	5	39.3-152			5.33	27.2
Benzene	0.0250	ND	0.105	0.104	84.3	83.0	5	47.8-131			1.49	22.8
Bromobenzene	0.0250	ND	0.103	0.0997	82.0	79.7	5	40.0-130			2.83	27.4
Bromodichloromethane	0.0250	ND	0.110	0.106	88.0	84.6	5	50.6-128			3.92	22.8
Bromoform	0.0250	ND	0.112	0.111	89.3	88.9	5	43.3-139			0.410	25.9
Bromomethane	0.0250	ND	0.129	0.125	103	100	5	5.00-189			2.91	26.7
n-Butylbenzene	0.0250	ND	0.0961	0.0809	76.9	64.7	5	23.6-146			17.2	39.2
sec-Butylbenzene	0.0250	ND	0.101	0.0920	80.6	73.6	5	31.0-142			9.03	34.7
tert-Butylbenzene	0.0250	ND	0.106	0.101	84.5	80.7	5	36.9-142			4.69	31.7
Carbon tetrachloride	0.0250	ND	0.103	0.100	82.6	80.3	5	46.0-140			2.86	27.2
Chlorobenzene	0.0250	ND	0.115	0.111	92.2	88.6	5	44.1-134			4.01	25.7
Chlorodibromomethane	0.0250	ND	0.111	0.111	89.2	88.8	5	49.7-134			0.400	24
Chloroethane	0.0250	ND	0.105	0.120	84.0	95.9	5	5.00-164			13.2	28.4
2-Chloroethyl vinyl ether	0.125	ND	0.439	0.428	70.2	68.4	5	5.00-159			2.61	40
Chloroform	0.0250	ND	0.108	0.106	86.1	85.0	5	51.2-133			1.24	22.8
Chloromethane	0.0250	ND	0.0704	0.0746	56.3	59.7	5	31.4-141			5.81	24.6
2-Chlorotoluene	0.0250	ND	0.104	0.102	83.0	81.5	5	36.1-137			1.79	28.9
4-Chlorotoluene	0.0250	ND	0.101	0.0966	80.7	77.2	5	35.4-137			4.37	29.8
1,2-Dibromo-3-Chloropropane	0.0250	ND	0.106	0.101	84.6	80.6	5	40.4-138			4.80	30.8
1,2-Dibromoethane	0.0250	ND	0.114	0.112	91.1	89.7	5	50.2-133			1.58	23.6
Dibromomethane	0.0250	ND	0.116	0.118	92.5	94.3	5	52.4-128			1.89	23
1,2-Dichlorobenzene	0.0250	ND	0.106	0.0959	85.0	76.7	5	34.6-139			10.2	29.9
1,3-Dichlorobenzene	0.0250	ND	0.105	0.0926	84.3	74.1	5	28.4-142			12.9	31.2
1,4-Dichlorobenzene	0.0250	ND	0.0990	0.0907	79.2	72.6	5	35.0-133			8.66	31.1
Dichlorodifluoromethane	0.0250	ND	0.106	0.103	85.2	82.6	5	31.2-144			3.11	30.2
1,1-Dichloroethane	0.0250	ND	0.104	0.104	83.1	83.2	5	49.1-136			0.0900	22.9
1,2-Dichloroethane	0.0250	ND	0.0967	0.0966	77.4	77.3	5	47.1-129			0.0800	22.7
1,1-Dichloroethene	0.0250	ND	0.109	0.108	87.2	86.8	5	36.1-142			0.520	25.6
cis-1,2-Dichloroethene	0.0250	ND	0.111	0.109	88.5	86.9	5	50.6-133			1.81	23
trans-1,2-Dichloroethene	0.0250	ND	0.108	0.106	86.4	84.5	5	43.8-135			2.24	24.8
1,2-Dichloropropane	0.0250	ND	0.108	0.106	86.6	84.6	5	50.3-134			2.31	22.7
1,1-Dichloropropene	0.0250	ND	0.103	0.102	82.5	81.2	5	43.0-137			1.56	26.4
1,3-Dichloropropane	0.0250	ND	0.111	0.107	88.7	85.6	5	51.4-127			3.59	23.1
cis-1,3-Dichloropropene	0.0250	ND	0.112	0.111	89.3	88.8	5	48.4-134			0.470	23.6
trans-1,3-Dichloropropene	0.0250	ND	0.111	0.108	88.9	86.5	5	46.6-135			2.74	25.3

L800673-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/14/15 10:51 • (MS) 11/14/15 09:38 • (MSD) 11/14/15 10:02

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
2,2-Dichloropropane	0.0250	ND	0.102	0.0985	81.5	78.8	5	45.2-141			3.37	26.6
Di-isopropyl ether	0.0250	ND	0.0984	0.0985	78.7	78.8	5	46.7-140			0.150	23.5
Ethylbenzene	0.0250	ND	0.112	0.103	89.5	82.4	5	44.8-135			8.28	26.9
Hexachloro-1,3-butadiene	0.0250	ND	0.0808	0.0657	64.6	52.5	5	10.0-149			20.7	40
Isopropylbenzene	0.0250	ND	0.105	0.0977	84.2	78.2	5	41.9-139			7.39	29.3
p-Isopropyltoluene	0.0250	ND	0.101	0.0893	80.8	71.4	5	27.3-146			12.4	35.1
2-Butanone (MEK)	0.125	ND	0.522	0.471	83.6	75.4	5	23.9-170			10.3	28.3
Methylene Chloride	0.0250	ND	0.111	0.110	89.1	88.2	5	46.7-125			1.00	22.2
4-Methyl-2-pentanone (MIBK)	0.125	ND	0.543	0.499	86.9	79.9	5	42.4-146			8.44	26.7
Methyl tert-butyl ether	0.0250	ND	0.108	0.105	86.4	84.3	5	50.4-131			2.45	24.8
Naphthalene	0.0250	ND	0.109	0.0986	87.1	78.9	5	18.4-145			9.85	34
n-Propylbenzene	0.0250	ND	0.106	0.0950	84.4	76.0	5	35.2-139			10.5	31.9
Styrene	0.0250	ND	0.111	0.107	88.8	85.5	5	39.7-137			3.77	28.2
1,1,1,2-Tetrachloroethane	0.0250	ND	0.114	0.111	90.9	89.0	5	48.8-136			2.06	25.5
1,1,2,2-Tetrachloroethane	0.0250	ND	0.119	0.116	95.5	92.9	5	45.7-140			2.71	26.4
Tetrachloroethene	0.0250	ND	0.107	0.0978	85.7	78.3	5	37.7-140			9.13	29.2
Toluene	0.0250	ND	0.107	0.108	85.8	86.4	5	47.8-127			0.650	24.3
1,1,2-Trichlorotrifluoroethane	0.0250	ND	0.106	0.102	85.0	81.2	5	35.7-146			4.55	28.8
1,2,3-Trichlorobenzene	0.0250	ND	0.0942	0.0848	75.4	67.9	5	10.0-150			10.5	38.5
1,2,4-Trichlorobenzene	0.0250	ND	0.0923	0.0797	73.9	63.8	5	10.0-153			14.7	39.3
1,1,1-Trichloroethane	0.0250	ND	0.104	0.101	83.0	80.8	5	49.0-138			2.69	25.3
1,1,2-Trichloroethane	0.0250	ND	0.114	0.113	91.3	90.8	5	52.3-132			0.550	23.4
Trichloroethene	0.0250	ND	0.107	0.106	85.8	84.5	5	48.0-132			1.62	24.8
Trichlorofluoromethane	0.0250	ND	0.113	0.114	90.7	91.6	5	12.8-169			0.960	29.7
1,2,3-Trichloropropane	0.0250	ND	0.115	0.110	91.8	88.2	5	44.4-138			4.00	26.3
1,2,3-Trimethylbenzene	0.0250	ND	0.112	0.102	89.6	81.5	5	41.0-133			9.51	27.6
1,2,4-Trimethylbenzene	0.0250	ND	0.108	0.101	86.1	80.7	5	32.9-139			6.46	30.6
1,3,5-Trimethylbenzene	0.0250	ND	0.104	0.0952	83.2	76.2	5	37.1-138			8.77	30.6
Vinyl chloride	0.0250	ND	0.102	0.102	81.2	82.0	5	32.0-146			0.980	26.3
Xylenes, Total	0.0750	ND	0.329	0.322	87.8	85.9	5	42.7-135			2.13	26.6
(S) Toluene-d8					*103*	*106*		*88.7-115*				
(S) Dibromofluoromethane					*96.2*	*98.2*		*76.3-123*				
(S) 4-Bromofluorobenzene					*99.1*	*97.5*		*69.7-129*				

Method Blank (MB)

(MB) 11/13/15 16:11

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Acetone	ND		0.0500
Acrolein	ND		0.0500
Acrylonitrile	ND		0.0100
Benzene	ND		0.00100
Bromobenzene	ND		0.00100
Bromodichloromethane	ND		0.00100
Bromoform	ND		0.00100
Bromomethane	ND		0.00500
n-Butylbenzene	ND		0.00100
sec-Butylbenzene	ND		0.00100
tert-Butylbenzene	ND		0.00100
Carbon tetrachloride	ND		0.00100
Chlorobenzene	ND		0.00100
Chlorodibromomethane	ND		0.00100
Chloroethane	ND		0.00500
2-Chloroethyl vinyl ether	ND		0.0500
Chloroform	ND		0.00500
Chloromethane	ND		0.00250
2-Chlorotoluene	ND		0.00100
4-Chlorotoluene	ND		0.00100
1,2-Dibromo-3-Chloropropane	ND		0.00500
1,2-Dibromoethane	ND		0.00100
Dibromomethane	ND		0.00100
1,2-Dichlorobenzene	ND		0.00100
1,3-Dichlorobenzene	ND		0.00100
1,4-Dichlorobenzene	ND		0.00100
Dichlorodifluoromethane	ND		0.00500
1,1-Dichloroethane	ND		0.00100
1,2-Dichloroethane	ND		0.00100
1,1-Dichloroethene	ND		0.00100
cis-1,2-Dichloroethene	ND		0.00100
trans-1,2-Dichloroethene	ND		0.00100
1,2-Dichloropropane	ND		0.00100
1,1-Dichloropropene	ND		0.00100
1,3-Dichloropropane	ND		0.00100
cis-1,3-Dichloropropene	ND		0.00100

Method Blank (MB)

(MB) 11/13/15 16:11

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
trans-1,3-Dichloropropene	ND		0.00100
2,2-Dichloropropane	ND		0.00100
Di-isopropyl ether	ND		0.00100
Ethylbenzene	ND		0.00100
Hexachloro-1,3-butadiene	ND		0.00100
Isopropylbenzene	ND		0.00100
p-Isopropyltoluene	ND		0.00100
2-Butanone (MEK)	ND		0.0100
Methylene Chloride	ND		0.00500
4-Methyl-2-pentanone (MIBK)	ND		0.0100
Methyl tert-butyl ether	ND		0.00100
Naphthalene	ND		0.00500
n-Propylbenzene	ND		0.00100
Styrene	ND		0.00100
1,1,1,2-Tetrachloroethane	ND		0.00100
1,1,2,2-Tetrachloroethane	ND		0.00100
Tetrachloroethene	ND		0.00100
Toluene	ND		0.00500
1,1,2-Trichlorotrifluoroethane	ND		0.00100
1,2,3-Trichlorobenzene	ND		0.00100
1,2,4-Trichlorobenzene	ND		0.00100
1,1,1-Trichloroethane	ND		0.00100
1,1,2-Trichloroethane	ND		0.00100
Trichloroethene	ND		0.00100
Trichlorofluoromethane	ND		0.00500
1,2,3-Trichloropropane	ND		0.00250
1,2,3-Trimethylbenzene	ND		0.00100
1,2,4-Trimethylbenzene	ND		0.00100
1,3,5-Trimethylbenzene	ND		0.00100
Vinyl chloride	ND		0.00100
Xylenes, Total	ND		0.00300
(S) Toluene-d8	*102*		*90.0-115*
(S) Dibromofluoromethane	*97.8*		*79.0-121*
(S) 4-Bromofluorobenzene	*102*		*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/13/15 14:31 • (LCSD) 11/13/15 14:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.124	0.119	99.3	95.3	28.7-175			4.13	20.9
Acrolein	0.125	0.137	0.134	109	107	40.4-172			1.85	20
Acrylonitrile	0.125	0.134	0.134	108	108	58.2-145			0.0600	20
Benzene	0.0250	0.0251	0.0250	100	100	73.0-122			0.290	20
Bromobenzene	0.0250	0.0254	0.0251	102	100	81.5-115			1.53	20
Bromodichloromethane	0.0250	0.0267	0.0267	107	107	75.5-121			0.0800	20
Bromoform	0.0250	0.0245	0.0241	98.2	96.2	71.5-131			2.00	20
Bromomethane	0.0250	0.0224	0.0218	89.5	87.1	22.4-187			2.66	20
n-Butylbenzene	0.0250	0.0269	0.0272	108	109	75.9-134			1.33	20
sec-Butylbenzene	0.0250	0.0267	0.0265	107	106	80.6-126			0.710	20
tert-Butylbenzene	0.0250	0.0267	0.0262	107	105	79.3-127			2.16	20
Carbon tetrachloride	0.0250	0.0251	0.0248	100	99.3	70.9-129			0.990	20
Chlorobenzene	0.0250	0.0256	0.0249	102	99.6	79.7-122			2.64	20
Chlorodibromomethane	0.0250	0.0261	0.0256	104	102	78.2-124			2.04	20
Chloroethane	0.0250	0.0264	0.0262	105	105	41.2-153			0.750	20
2-Chloroethyl vinyl ether	0.125	0.217	0.215	173	172	23.4-162	J4	J4	0.660	23.5
Chloroform	0.0250	0.0257	0.0257	103	103	73.2-125			0.0800	20
Chloromethane	0.0250	0.0231	0.0228	92.2	91.1	55.8-134			1.21	20
2-Chlorotoluene	0.0250	0.0259	0.0256	104	103	76.4-125			1.22	20
4-Chlorotoluene	0.0250	0.0261	0.0255	105	102	81.5-121			2.27	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0235	0.0234	93.9	93.5	64.8-131			0.490	20
1,2-Dibromoethane	0.0250	0.0255	0.0249	102	99.8	79.8-122			2.24	20
Dibromomethane	0.0250	0.0264	0.0263	106	105	79.5-118			0.440	20
1,2-Dichlorobenzene	0.0250	0.0251	0.0252	100	101	84.7-118			0.600	20
1,3-Dichlorobenzene	0.0250	0.0254	0.0248	102	99.2	77.6-127			2.27	20
1,4-Dichlorobenzene	0.0250	0.0247	0.0249	99.0	99.6	82.2-114			0.590	20
Dichlorodifluoromethane	0.0250	0.0261	0.0254	105	102	56.0-134			2.90	20
1,1-Dichloroethane	0.0250	0.0261	0.0260	104	104	71.7-127			0.120	20
1,2-Dichloroethane	0.0250	0.0258	0.0260	103	104	65.3-126			0.960	20
1,1-Dichloroethene	0.0250	0.0263	0.0265	105	106	59.9-137			0.660	20
cis-1,2-Dichloroethene	0.0250	0.0258	0.0257	103	103	77.3-122			0.190	20
trans-1,2-Dichloroethene	0.0250	0.0256	0.0257	102	103	72.6-125			0.410	20
1,2-Dichloropropane	0.0250	0.0269	0.0265	107	106	77.4-125			1.18	20
1,1-Dichloropropene	0.0250	0.0264	0.0265	106	106	72.5-127			0.0900	20
1,3-Dichloropropane	0.0250	0.0257	0.0250	103	100	80.6-115			2.91	20
cis-1,3-Dichloropropene	0.0250	0.0270	0.0269	108	108	77.7-124			0.460	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/13/15 14:31 • (LCSD) 11/13/15 14:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	0.0245	0.0245	97.8	98.1	73.5-127			0.300	20
2,2-Dichloropropane	0.0250	0.0262	0.0261	105	105	61.3-134			0.410	20
Di-isopropyl ether	0.0250	0.0262	0.0263	105	105	65.1-135			0.200	20
Ethylbenzene	0.0250	0.0241	0.0236	96.4	94.3	80.9-121			2.24	20
Hexachloro-1,3-butadiene	0.0250	0.0248	0.0252	99.0	101	73.7-133			1.89	20
Isopropylbenzene	0.0250	0.0262	0.0257	105	103	81.6-124			1.84	20
p-Isopropyltoluene	0.0250	0.0274	0.0268	110	107	77.6-129			2.15	20
2-Butanone (MEK)	0.125	0.124	0.122	99.0	97.6	46.4-155			1.36	20
Methylene Chloride	0.0250	0.0227	0.0227	90.9	91.0	69.5-120			0.0400	20
4-Methyl-2-pentanone (MIBK)	0.125	0.132	0.132	106	106	63.3-138			0.0300	20
Methyl tert-butyl ether	0.0250	0.0257	0.0260	103	104	70.1-125			1.29	20
Naphthalene	0.0250	0.0238	0.0246	95.0	98.5	69.7-134			3.63	20
n-Propylbenzene	0.0250	0.0247	0.0243	98.9	97.2	81.9-122			1.72	20
Styrene	0.0250	0.0265	0.0260	106	104	79.9-124			1.93	20
1,1,1,2-Tetrachloroethane	0.0250	0.0255	0.0252	102	101	78.5-125			1.29	20
1,1,2,2-Tetrachloroethane	0.0250	0.0255	0.0249	102	99.5	79.3-123			2.44	20
Tetrachloroethene	0.0250	0.0258	0.0248	103	99.4	73.5-130			3.71	20
Toluene	0.0250	0.0250	0.0249	100	99.7	77.9-116			0.500	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0263	0.0238	105	95.1	62.0-141			10.2	20
1,2,3-Trichlorobenzene	0.0250	0.0242	0.0252	96.9	101	75.7-134			4.03	20
1,2,4-Trichlorobenzene	0.0250	0.0255	0.0260	102	104	76.1-136			2.06	20
1,1,1-Trichloroethane	0.0250	0.0262	0.0261	105	105	71.1-129			0.300	20
1,1,2-Trichloroethane	0.0250	0.0255	0.0252	102	101	81.6-120			0.990	20
Trichloroethene	0.0250	0.0260	0.0258	104	103	79.5-121			0.770	20
Trichlorofluoromethane	0.0250	0.0264	0.0259	106	104	49.1-157			1.87	20
1,2,3-Trichloropropane	0.0250	0.0250	0.0245	100	97.9	74.9-124			2.14	20
1,2,3-Trimethylbenzene	0.0250	0.0252	0.0255	101	102	79.9-118			1.24	20
1,2,4-Trimethylbenzene	0.0250	0.0236	0.0232	94.6	92.9	79.0-122			1.75	20
1,3,5-Trimethylbenzene	0.0250	0.0257	0.0257	103	103	81.0-123			0.0100	20
Vinyl chloride	0.0250	0.0264	0.0259	106	104	61.5-134			2.08	20
Xylenes, Total	0.0750	0.0781	0.0765	104	102	79.2-122			2.04	20
(S) Toluene-d8				*101*	*101*	*90.0-115*				
(S) Dibromofluoromethane				*98.4*	*98.4*	*79.0-121*				
(S) 4-Bromofluorobenzene				*104*	*101*	*80.1-120*				

L799424-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/13/15 17:34 • (MS) 11/13/15 17:54 • (MSD) 11/13/15 18:13

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.000976	0.0664	0.0659	52.3	52.0	1	25.0-156			0.680	21.5
Acrolein	0.125	ND	0.135	0.136	108	109	1	34.0-194			0.860	21.5
Acrylonitrile	0.125	ND	0.158	0.159	127	127	1	55.9-161			0.100	20
Benzene	0.0250	ND	0.0254	0.0253	102	101	1	58.6-133			0.390	20
Bromobenzene	0.0250	ND	0.0258	0.0263	103	105	1	70.6-125			1.59	20
Bromodichloromethane	0.0250	ND	0.0280	0.0278	112	111	1	69.2-127			0.680	20
Bromoform	0.0250	ND	0.0260	0.0263	104	105	1	66.3-140			1.02	20
Bromomethane	0.0250	ND	0.0203	0.0205	81.2	81.8	1	16.6-183			0.770	20.5
n-Butylbenzene	0.0250	ND	0.0275	0.0283	110	113	1	64.8-145			2.84	20
sec-Butylbenzene	0.0250	ND	0.0269	0.0278	108	111	1	66.8-139			3.04	20
tert-Butylbenzene	0.0250	ND	0.0268	0.0276	107	110	1	67.1-138			2.84	20
Carbon tetrachloride	0.0250	ND	0.0250	0.0254	100	102	1	60.6-139			1.70	20
Chlorobenzene	0.0250	ND	0.0253	0.0256	101	102	1	70.1-130			1.05	20
Chlorodibromomethane	0.0250	ND	0.0267	0.0271	107	108	1	71.6-132			1.24	20
Chloroethane	0.0250	ND	0.0250	0.0250	99.8	99.9	1	33.3-155			0.0400	20
2-Chloroethyl vinyl ether	0.125	ND	0.0116	0.00615	9.28	4.92	1	5.00-149		J3 J6	61.5	40
Chloroform	0.0250	ND	0.0267	0.0266	107	106	1	66.1-133			0.210	20
Chloromethane	0.0250	ND	0.0200	0.0201	80.0	80.2	1	40.7-139			0.350	20
2-Chlorotoluene	0.0250	ND	0.0260	0.0265	104	106	1	66.9-134			2.02	20
4-Chlorotoluene	0.0250	ND	0.0264	0.0266	106	107	1	66.8-134			0.800	20
1,2-Dibromo-3-Chloropropane	0.0250	ND	0.0267	0.0267	107	107	1	63.9-142			0.0400	20.2
1,2-Dibromoethane	0.0250	ND	0.0264	0.0266	106	107	1	73.8-131			1.01	20
Dibromomethane	0.0250	ND	0.0275	0.0276	110	110	1	72.8-127			0.560	20
1,2-Dichlorobenzene	0.0250	ND	0.0259	0.0263	103	105	1	77.4-127			1.65	20
1,3-Dichlorobenzene	0.0250	ND	0.0258	0.0263	103	105	1	67.9-136			2.05	20
1,4-Dichlorobenzene	0.0250	ND	0.0256	0.0258	102	103	1	74.4-123			0.990	20
Dichlorodifluoromethane	0.0250	ND	0.0222	0.0219	88.7	87.7	1	42.2-146			1.04	20
1,1-Dichloroethane	0.0250	ND	0.0268	0.0269	107	107	1	64.0-134			0.310	20
1,2-Dichloroethane	0.0250	ND	0.0273	0.0275	109	110	1	60.7-132			0.820	20
1,1-Dichloroethene	0.0250	ND	0.0260	0.0257	104	103	1	48.8-144			1.10	20
cis-1,2-Dichloroethene	0.0250	ND	0.0262	0.0262	105	105	1	60.6-136			0.140	20
trans-1,2-Dichloroethene	0.0250	ND	0.0249	0.0250	99.7	100	1	61.0-132			0.440	20
1,2-Dichloropropane	0.0250	ND	0.0277	0.0277	111	111	1	69.7-130			0.140	20
1,1-Dichloropropene	0.0250	ND	0.0261	0.0259	104	103	1	61.5-136			0.980	20
1,3-Dichloropropane	0.0250	ND	0.0265	0.0264	106	106	1	74.3-123			0.440	20
cis-1,3-Dichloropropene	0.0250	ND	0.0275	0.0272	110	109	1	71.1-129			0.810	20

L799424-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/13/15 17:34 • (MS) 11/13/15 17:54 • (MSD) 11/13/15 18:13

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	ND	0.0255	0.0255	102	102	1	66.3-136			0.000	20
2,2-Dichloropropane	0.0250	ND	0.0275	0.0289	110	116	1	54.9-142			4.87	20
Di-isopropyl ether	0.0250	ND	0.0272	0.0277	109	111	1	59.9-140			1.88	20
Ethylbenzene	0.0250	ND	0.0237	0.0242	94.7	97.0	1	62.7-136			2.40	20
Hexachloro-1,3-butadiene	0.0250	ND	0.0254	0.0264	101	106	1	61.1-144			4.05	20.1
Isopropylbenzene	0.0250	ND	0.0262	0.0269	105	108	1	67.4-136			2.48	20
p-Isopropyltoluene	0.0250	ND	0.0275	0.0283	110	113	1	62.8-143			2.90	20
2-Butanone (MEK)	0.125	ND	0.100	0.100	80.0	80.3	1	45.0-156			0.430	20.8
Methylene Chloride	0.0250	ND	0.0231	0.0230	92.3	91.9	1	61.5-125			0.370	20
4-Methyl-2-pentanone (MIBK)	0.125	ND	0.149	0.152	119	121	1	60.7-150			1.62	20
Methyl tert-butyl ether	0.0250	ND	0.0272	0.0282	109	113	1	61.4-136			3.56	20
Naphthalene	0.0250	ND	0.0263	0.0273	105	109	1	61.8-143			3.84	20
n-Propylbenzene	0.0250	ND	0.0248	0.0253	99.2	101	1	63.2-139			2.11	20
Styrene	0.0250	ND	0.0269	0.0269	107	108	1	68.2-133			0.140	20
1,1,1,2-Tetrachloroethane	0.0250	ND	0.0261	0.0266	105	106	1	70.5-132			1.68	20
1,1,2,2-Tetrachloroethane	0.0250	ND	0.0278	0.0284	111	114	1	64.9-145			2.26	20
Tetrachloroethene	0.0250	ND	0.0245	0.0243	98.0	97.1	1	57.4-141			0.930	20
Toluene	0.0250	ND	0.0254	0.0255	101	102	1	67.8-124			0.350	20
1,1,2-Trichlorotrifluoroethane	0.0250	ND	0.0260	0.0267	104	107	1	53.7-150			2.65	20
1,2,3-Trichlorobenzene	0.0250	ND	0.0259	0.0271	104	108	1	65.7-143			4.28	20
1,2,4-Trichlorobenzene	0.0250	ND	0.0267	0.0275	107	110	1	67.0-146			3.14	20
1,1,1-Trichloroethane	0.0250	ND	0.0268	0.0272	107	109	1	58.7-134			1.50	20
1,1,2-Trichloroethane	0.0250	ND	0.0269	0.0269	108	108	1	74.1-130			0.0100	20
Trichloroethene	0.0250	ND	0.0256	0.0256	102	102	1	48.9-148			0.000	20
Trichlorofluoromethane	0.0250	ND	0.0257	0.0258	103	103	1	39.9-165			0.480	20
1,2,3-Trichloropropane	0.0250	ND	0.0277	0.0278	111	111	1	71.5-134			0.440	20
1,2,3-Trimethylbenzene	0.0250	ND	0.0258	0.0265	103	106	1	62.7-133			2.91	20
1,2,4-Trimethylbenzene	0.0250	ND	0.0238	0.0243	95.2	97.3	1	60.5-137			2.13	20
1,3,5-Trimethylbenzene	0.0250	ND	0.0260	0.0268	104	107	1	67.9-134			3.15	20
Vinyl chloride	0.0250	ND	0.0238	0.0238	95.3	95.1	1	44.3-143			0.220	20
Xylenes, Total	0.0750	ND	0.0772	0.0786	103	105	1	65.6-133			1.74	20
(S) Toluene-d8					*102*	*102*		*90.0-115*				
(S) Dibromofluoromethane					*99.9*	*99.9*		*79.0-121*				
(S) 4-Bromofluorobenzene					*101*	*101*		*80.1-120*				

Method Blank (MB)

(MB) 11/19/15 01:02

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Acetone	ND		0.0500
Acrylonitrile	ND		0.0100
Benzene	ND		0.00100
Bromobenzene	ND		0.00100
Bromodichloromethane	ND		0.00100
Bromoform	ND		0.00100
Bromomethane	ND		0.00500
n-Butylbenzene	ND		0.00100
sec-Butylbenzene	ND		0.00100
tert-Butylbenzene	ND		0.00100
Carbon tetrachloride	ND		0.00100
Chlorobenzene	ND		0.00100
Chlorodibromomethane	ND		0.00100
Chloroethane	ND		0.00500
2-Chloroethyl vinyl ether	ND		0.0500
Chloroform	ND		0.00500
Chloromethane	ND		0.00250
2-Chlorotoluene	ND		0.00100
4-Chlorotoluene	ND		0.00100
1,2-Dibromo-3-Chloropropane	ND		0.00500
1,2-Dibromoethane	ND		0.00100
Dibromomethane	ND		0.00100
1,2-Dichlorobenzene	ND		0.00100
1,3-Dichlorobenzene	ND		0.00100
1,4-Dichlorobenzene	ND		0.00100
Dichlorodifluoromethane	ND		0.00500
1,1-Dichloroethane	ND		0.00100
1,2-Dichloroethane	ND		0.00100
1,1-Dichloroethene	ND		0.00100
cis-1,2-Dichloroethene	ND		0.00100
trans-1,2-Dichloroethene	ND		0.00100
1,2-Dichloropropane	ND		0.00100
1,1-Dichloropropene	ND		0.00100
1,3-Dichloropropane	ND		0.00100
cis-1,3-Dichloropropene	ND		0.00100
trans-1,3-Dichloropropene	ND		0.00100

Method Blank (MB)

(MB) 11/19/15 01:02

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
2,2-Dichloropropane	ND		0.00100
Di-isopropyl ether	ND		0.00100
Ethylbenzene	ND		0.00100
Hexachloro-1,3-butadiene	ND		0.00100
Isopropylbenzene	ND		0.00100
p-Isopropyltoluene	ND		0.00100
2-Butanone (MEK)	ND		0.0100
Methylene Chloride	ND		0.00500
4-Methyl-2-pentanone (MIBK)	ND		0.0100
Methyl tert-butyl ether	ND		0.00100
Naphthalene	ND		0.00500
n-Propylbenzene	ND		0.00100
Styrene	ND		0.00100
1,1,1,2-Tetrachloroethane	ND		0.00100
1,1,2,2-Tetrachloroethane	ND		0.00100
Tetrachloroethene	ND		0.00100
Toluene	ND		0.00500
1,1,2-Trichlorotrifluoroethane	ND		0.00100
1,2,3-Trichlorobenzene	ND		0.00100
1,2,4-Trichlorobenzene	ND		0.00100
1,1,1-Trichloroethane	ND		0.00100
1,1,2-Trichloroethane	ND		0.00100
Trichloroethene	ND		0.00100
Trichlorofluoromethane	ND		0.00500
1,2,3-Trichloropropane	ND		0.00250
1,2,3-Trimethylbenzene	ND		0.00100
1,2,4-Trimethylbenzene	ND		0.00100
1,3,5-Trimethylbenzene	ND		0.00100
Vinyl chloride	ND		0.00100
Xylenes, Total	ND		0.00300
(S) Toluene-d8	*102*		*88.7-115*
(S) Dibromofluoromethane	*102*		*76.3-123*
(S) 4-Bromofluorobenzene	*101*		*69.7-129*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/18/15 23:24 • (LCSD) 11/18/15 23:43

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.122	0.112	97.7	89.3	25.3-178			8.97	22.9
Acrylonitrile	0.125	0.143	0.138	114	111	57.8-143			3.07	20
Benzene	0.0250	0.0255	0.0257	102	103	72.6-120			0.730	20
Bromobenzene	0.0250	0.0255	0.0259	102	104	80.3-115			1.67	20
Bromodichloromethane	0.0250	0.0272	0.0276	109	110	75.3-119			1.26	20
Bromoform	0.0250	0.0258	0.0255	103	102	69.1-135			1.49	20
Bromomethane	0.0250	0.0228	0.0228	91.2	91.3	23.0-191			0.120	20
n-Butylbenzene	0.0250	0.0275	0.0281	110	112	74.2-134			2.14	20
sec-Butylbenzene	0.0250	0.0266	0.0270	106	108	77.8-129			1.68	20
tert-Butylbenzene	0.0250	0.0263	0.0269	105	107	77.2-129			1.98	20
Carbon tetrachloride	0.0250	0.0257	0.0260	103	104	69.4-129			1.16	20
Chlorobenzene	0.0250	0.0256	0.0255	102	102	78.9-122			0.400	20
Chlorodibromomethane	0.0250	0.0266	0.0265	106	106	76.4-126			0.290	20
Chloroethane	0.0250	0.0272	0.0270	109	108	47.2-147			0.680	20
2-Chloroethyl vinyl ether	0.125	0.215	0.214	172	171	16.7-162	J4	J4	0.390	23.7
Chloroform	0.0250	0.0260	0.0262	104	105	73.3-122			1.07	20
Chloromethane	0.0250	0.0232	0.0234	92.8	93.4	53.1-135			0.670	20
2-Chlorotoluene	0.0250	0.0259	0.0262	104	105	74.6-127			1.25	20
4-Chlorotoluene	0.0250	0.0255	0.0263	102	105	79.5-123			3.17	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0243	0.0244	97.3	97.7	64.9-131			0.430	20
1,2-Dibromoethane	0.0250	0.0261	0.0258	104	103	78.7-123			0.930	20
Dibromomethane	0.0250	0.0271	0.0274	108	110	78.5-117			1.03	20
1,2-Dichlorobenzene	0.0250	0.0258	0.0262	103	105	83.6-119			1.63	20
1,3-Dichlorobenzene	0.0250	0.0250	0.0255	99.9	102	75.9-129			1.91	20
1,4-Dichlorobenzene	0.0250	0.0255	0.0258	102	103	81.0-115			1.27	20
Dichlorodifluoromethane	0.0250	0.0247	0.0245	98.6	98.1	50.9-139			0.570	20
1,1-Dichloroethane	0.0250	0.0264	0.0265	106	106	71.7-125			0.610	20
1,2-Dichloroethane	0.0250	0.0269	0.0270	108	108	67.2-121			0.540	20
1,1-Dichloroethene	0.0250	0.0261	0.0263	104	105	60.6-133			0.960	20
cis-1,2-Dichloroethene	0.0250	0.0261	0.0261	104	104	76.1-121			0.170	20
trans-1,2-Dichloroethene	0.0250	0.0261	0.0262	105	105	70.7-124			0.380	20
1,2-Dichloropropane	0.0250	0.0272	0.0273	109	109	76.9-123			0.360	20
1,1-Dichloropropene	0.0250	0.0267	0.0268	107	107	71.2-126			0.450	20
1,3-Dichloropropane	0.0250	0.0261	0.0259	104	104	80.3-114			0.870	20
cis-1,3-Dichloropropene	0.0250	0.0277	0.0280	111	112	77.3-123			1.01	20
trans-1,3-Dichloropropene	0.0250	0.0256	0.0257	102	103	73.0-127			0.570	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/18/15 23:24 • (LCSD) 11/18/15 23:43

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
2,2-Dichloropropane	0.0250	0.0274	0.0282	110	113	61.9-132			2.60	20
Di-isopropyl ether	0.0250	0.0268	0.0270	107	108	67.2-131			0.800	20
Ethylbenzene	0.0250	0.0245	0.0244	97.8	97.5	78.6-124			0.300	20
Hexachloro-1,3-butadiene	0.0250	0.0245	0.0248	98.2	99.3	69.2-136			1.11	20
Isopropylbenzene	0.0250	0.0262	0.0264	105	106	79.4-126			0.770	20
p-Isopropyltoluene	0.0250	0.0271	0.0278	108	111	75.4-132			2.48	20
2-Butanone (MEK)	0.125	0.133	0.126	106	101	44.5-154			5.27	21.3
Methylene Chloride	0.0250	0.0235	0.0237	93.8	95.0	68.2-119			1.21	20
4-Methyl-2-pentanone (MIBK)	0.125	0.141	0.139	113	111	61.1-138			1.63	20
Methyl tert-butyl ether	0.0250	0.0271	0.0270	108	108	70.2-122			0.320	20
Naphthalene	0.0250	0.0239	0.0237	95.7	94.7	69.9-132			1.00	20
n-Propylbenzene	0.0250	0.0248	0.0251	99.1	100	80.2-124			1.32	20
Styrene	0.0250	0.0264	0.0268	105	107	79.4-124			1.78	20
1,1,1,2-Tetrachloroethane	0.0250	0.0263	0.0262	105	105	76.7-127			0.160	20
1,1,2,2-Tetrachloroethane	0.0250	0.0263	0.0261	105	104	78.8-124			0.920	20
Tetrachloroethene	0.0250	0.0253	0.0251	101	101	71.1-133			0.710	20
Toluene	0.0250	0.0257	0.0259	103	103	76.7-116			0.600	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0263	0.0252	105	101	62.6-138			4.40	20
1,2,3-Trichlorobenzene	0.0250	0.0229	0.0221	91.6	88.5	72.5-137			3.48	20
1,2,4-Trichlorobenzene	0.0250	0.0243	0.0246	97.4	98.4	74.0-137			1.00	20
1,1,1-Trichloroethane	0.0250	0.0270	0.0270	108	108	69.9-127			0.0100	20
1,1,2-Trichloroethane	0.0250	0.0260	0.0260	104	104	81.9-119			0.210	20
Trichloroethene	0.0250	0.0259	0.0261	104	104	77.2-122			0.920	20
Trichlorofluoromethane	0.0250	0.0264	0.0267	105	107	51.5-151			1.42	20
1,2,3-Trichloropropane	0.0250	0.0257	0.0258	103	103	74.0-124			0.300	20
1,2,3-Trimethylbenzene	0.0250	0.0265	0.0267	106	107	79.4-118			1.01	20
1,2,4-Trimethylbenzene	0.0250	0.0249	0.0249	99.8	99.6	77.1-124			0.140	20
1,3,5-Trimethylbenzene	0.0250	0.0263	0.0266	105	106	79.0-125			1.10	20
Vinyl chloride	0.0250	0.0267	0.0265	107	106	58.4-134			0.610	20
Xylenes, Total	0.0750	0.0810	0.0801	108	107	78.1-123			1.04	20
(S) Toluene-d8				*102*	*102*	*88.7-115*				
(S) Dibromofluoromethane				*99.0*	*99.8*	*76.3-123*				
(S) 4-Bromofluorobenzene				*100*	*101*	*69.7-129*				

L801450-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/19/15 02:40 • (MS) 11/19/15 01:41 • (MSD) 11/19/15 02:01

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.0281	0.520	0.547	78.7	83.0	5	10.0-130			4.99	31.5
Acrylonitrile	0.125	ND	0.596	0.639	95.4	102	5	39.3-152			6.87	27.2
Benzene	0.0250	ND	0.103	0.109	82.7	87.1	5	47.8-131			5.19	22.8
Bromobenzene	0.0250	ND	0.0938	0.0963	75.0	77.1	5	40.0-130			2.66	27.4
Bromodichloromethane	0.0250	ND	0.109	0.116	87.4	92.8	5	50.6-128			6.03	22.8
Bromoform	0.0250	ND	0.101	0.103	80.5	82.5	5	43.3-139			2.54	25.9
Bromomethane	0.0250	ND	0.0910	0.0957	72.8	76.6	5	5.00-189			5.05	26.7
n-Butylbenzene	0.0250	0.000903	0.0850	0.0870	67.3	68.9	5	23.6-146			2.39	39.2
sec-Butylbenzene	0.0250	0.000560	0.0910	0.0911	72.3	72.4	5	31.0-142			0.140	34.7
tert-Butylbenzene	0.0250	0.000724	0.0972	0.0977	77.2	77.5	5	36.9-142			0.490	31.7
Carbon tetrachloride	0.0250	ND	0.0986	0.105	78.9	84.2	5	46.0-140			6.57	27.2
Chlorobenzene	0.0250	ND	0.0990	0.0991	79.2	79.3	5	44.1-134			0.110	25.7
Chlorodibromomethane	0.0250	ND	0.107	0.110	85.6	88.1	5	49.7-134			2.89	24
Chloroethane	0.0250	ND	0.111	0.116	88.6	92.5	5	5.00-164			4.32	28.4
2-Chloroethyl vinyl ether	0.125	ND	0.876	0.922	140	148	5	5.00-159			5.10	40
Chloroform	0.0250	ND	0.107	0.113	85.7	90.7	5	51.2-133			5.63	22.8
Chloromethane	0.0250	ND	0.0937	0.0958	75.0	76.7	5	31.4-141			2.23	24.6
2-Chlorotoluene	0.0250	ND	0.0940	0.0940	75.2	75.2	5	36.1-137			0.0400	28.9
4-Chlorotoluene	0.0250	ND	0.0927	0.0935	74.1	74.8	5	35.4-137			0.890	29.8
1,2-Dibromo-3-Chloropropane	0.0250	ND	0.0957	0.0984	76.5	78.7	5	40.4-138			2.82	30.8
1,2-Dibromoethane	0.0250	ND	0.106	0.108	84.9	86.3	5	50.2-133			1.64	23.6
Dibromomethane	0.0250	ND	0.110	0.115	87.9	92.0	5	52.4-128			4.53	23
1,2-Dichlorobenzene	0.0250	ND	0.0896	0.0917	71.7	73.4	5	34.6-139			2.37	29.9
1,3-Dichlorobenzene	0.0250	ND	0.0887	0.0876	71.0	70.1	5	28.4-142			1.25	31.2
1,4-Dichlorobenzene	0.0250	ND	0.0877	0.0889	70.1	71.1	5	35.0-133			1.40	31.1
Dichlorodifluoromethane	0.0250	ND	0.0939	0.0950	75.2	76.0	5	31.2-144			1.16	30.2
1,1-Dichloroethane	0.0250	ND	0.110	0.117	87.7	93.7	5	49.1-136			6.56	22.9
1,2-Dichloroethane	0.0250	ND	0.107	0.114	85.2	91.3	5	47.1-129			6.92	22.7
1,1-Dichloroethene	0.0250	ND	0.103	0.108	82.7	86.6	5	36.1-142			4.62	25.6
cis-1,2-Dichloroethene	0.0250	ND	0.106	0.113	85.0	90.0	5	50.6-133			5.80	23
trans-1,2-Dichloroethene	0.0250	ND	0.103	0.107	82.4	85.8	5	43.8-135			4.14	24.8
1,2-Dichloropropane	0.0250	ND	0.114	0.119	91.0	95.2	5	50.3-134			4.49	22.7
1,1-Dichloropropene	0.0250	ND	0.0989	0.104	79.1	83.0	5	43.0-137			4.77	26.4
1,3-Dichloropropane	0.0250	ND	0.107	0.110	85.7	88.1	5	51.4-127			2.80	23.1
cis-1,3-Dichloropropene	0.0250	ND	0.111	0.116	88.9	92.9	5	48.4-134			4.44	23.6
trans-1,3-Dichloropropene	0.0250	ND	0.101	0.107	80.8	85.6	5	46.6-135			5.80	25.3

L801450-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/19/15 02:40 • (MS) 11/19/15 01:41 • (MSD) 11/19/15 02:01

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
2,2-Dichloropropane	0.0250	ND	0.116	0.124	93.1	99.0	5	45.2-141			6.15	26.6
Di-isopropyl ether	0.0250	ND	0.111	0.121	88.8	96.8	5	46.7-140			8.57	23.5
Ethylbenzene	0.0250	0.000442	0.0921	0.0933	73.4	74.3	5	44.8-135			1.21	26.9
Hexachloro-1,3-butadiene	0.0250	ND	0.0677	0.0585	54.2	46.8	5	10.0-149			14.5	40
Isopropylbenzene	0.0250	ND	0.0967	0.0985	77.4	78.8	5	41.9-139			1.81	29.3
p-Isopropyltoluene	0.0250	0.000472	0.0922	0.0910	73.4	72.4	5	27.3-146			1.27	35.1
2-Butanone (MEK)	0.125	0.00394	0.523	0.555	83.0	88.2	5	23.9-170			5.94	28.3
Methylene Chloride	0.0250	0.000381	0.0964	0.103	76.8	82.0	5	46.7-125			6.43	22.2
4-Methyl-2-pentanone (MIBK)	0.125	ND	0.567	0.610	90.7	97.6	5	42.4-146			7.29	26.7
Methyl tert-butyl ether	0.0250	ND	0.110	0.119	87.7	95.0	5	50.4-131			7.99	24.8
Naphthalene	0.0250	0.00225	0.0811	0.0779	63.1	60.5	5	18.4-145			4.11	34
n-Propylbenzene	0.0250	0.000566	0.0865	0.0876	68.7	69.6	5	35.2-139			1.30	31.9
Styrene	0.0250	ND	0.100	0.101	80.1	80.4	5	39.7-137			0.380	28.2
1,1,1,2-Tetrachloroethane	0.0250	ND	0.103	0.107	82.5	85.5	5	48.8-136			3.57	25.5
1,1,2,2-Tetrachloroethane	0.0250	ND	0.111	0.114	89.1	91.4	5	45.7-140			2.53	26.4
Tetrachloroethene	0.0250	ND	0.0910	0.0895	72.8	71.6	5	37.7-140			1.56	29.2
Toluene	0.0250	0.000596	0.0990	0.104	78.7	82.4	5	47.8-127			4.53	24.3
1,1,2-Trichlorotrifluoroethane	0.0250	ND	0.0944	0.0989	75.5	79.1	5	35.7-146			4.64	28.8
1,2,3-Trichlorobenzene	0.0250	0.000592	0.0692	0.0618	54.8	48.9	5	10.0-150			11.3	38.5
1,2,4-Trichlorobenzene	0.0250	0.000623	0.0761	0.0695	60.4	55.1	5	10.0-153			9.08	39.3
1,1,1-Trichloroethane	0.0250	ND	0.108	0.114	86.7	91.3	5	49.0-138			5.22	25.3
1,1,2-Trichloroethane	0.0250	ND	0.109	0.111	87.1	88.8	5	52.3-132			1.92	23.4
Trichloroethene	0.0250	ND	0.102	0.104	81.2	82.9	5	48.0-132			2.04	24.8
Trichlorofluoromethane	0.0250	ND	0.104	0.108	83.4	86.6	5	12.8-169			3.71	29.7
1,2,3-Trichloropropane	0.0250	ND	0.103	0.105	82.4	84.4	5	44.4-138			2.43	26.3
1,2,3-Trimethylbenzene	0.0250	0.00114	0.0931	0.0965	73.6	76.3	5	41.0-133			3.56	27.6
1,2,4-Trimethylbenzene	0.0250	0.00244	0.0865	0.0866	67.3	67.3	5	32.9-139			0.0800	30.6
1,3,5-Trimethylbenzene	0.0250	0.000871	0.0924	0.0934	73.2	74.0	5	37.1-138			1.07	30.6
Vinyl chloride	0.0250	ND	0.105	0.110	84.3	87.9	5	32.0-146			4.20	26.3
Xylenes, Total	0.0750	0.00294	0.301	0.303	79.4	79.9	5	42.7-135			0.650	26.6
(S) Toluene-d8					*101*	*102*		*88.7-115*				
(S) Dibromofluoromethane					*97.4*	*99.6*		*76.3-123*				
(S) 4-Bromofluorobenzene					*103*	*102*		*69.7-129*				

Method Blank (MB)

(MB) 11/16/15 23:18

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Extractable Petroleum Hydrocarbon	ND		4.00
(S) o-Terphenyl	*93.9*		*50.0-150*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/16/15 23:31 • (LCSD) 11/16/15 23:45

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Extractable Petroleum Hydrocarbon	60.0	44.1	46.9	73.5	78.2	50.0-100			6.18	20
(S) o-Terphenyl				*93.2*	*96.7*	*50.0-150*				

L800673-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/16/15 23:59 • (MS) 11/17/15 00:13 • (MSD) 11/17/15 00:27

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Extractable Petroleum Hydrocarbon	60.0	2.39	49.3	52.7	78.2	83.8	1	50.0-100			6.69	20
(S) o-Terphenyl					*89.5*	*93.6*		*50.0-150*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) 11/16/15 13:48

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Aldrin	ND		0.0200
Alpha BHC	ND		0.0200
Beta BHC	ND		0.0200
Delta BHC	ND		0.0200
Gamma BHC	ND		0.0200
4,4-DDD	ND		0.0200
4,4-DDE	ND		0.0200
4,4-DDT	ND		0.0200
Dieldrin	ND		0.0200
Endosulfan I	ND		0.0200
Endosulfan II	ND		0.0200
Endosulfan sulfate	ND		0.0200
Endrin	ND		0.0200
Endrin aldehyde	ND		0.0200
Endrin ketone	ND		0.0200
Heptachlor	ND		0.0200
Heptachlor epoxide	ND		0.0200
Hexachlorobenzene	ND		0.0200
Methoxychlor	ND		0.0200
Chlordane	ND		0.200
Toxaphene	ND		0.400
(S) Decachlorobiphenyl	*122*		*10.0-143*
(S) Tetrachloro-m-xylene	*115*		*29.2-144*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/16/15 14:01 • (LCSD) 11/16/15 14:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aldrin	0.0667	0.0659	0.0696	98.8	104	65.8-124			5.43	20
Alpha BHC	0.0667	0.0754	0.0794	113	119	65.7-126			5.20	20
Beta BHC	0.0667	0.0711	0.0752	107	113	57.6-137			5.67	20
Delta BHC	0.0667	0.0752	0.0794	113	119	65.7-124			5.44	20
Gamma BHC	0.0667	0.0669	0.0707	100	106	64.5-121			5.51	20
4,4-DDD	0.0667	0.0565	0.0599	84.7	89.8	65.6-122			5.87	20
4,4-DDE	0.0667	0.0908	0.0948	136	142	61.9-132	J4	J4	4.37	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/16/15 14:01 • (LCSD) 11/16/15 14:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
4,4-DDT	0.0667	0.0595	0.0628	89.1	94.1	57.6-125			5.41	20
Dieldrin	0.0667	0.0623	0.0658	93.5	98.6	64.1-122			5.38	20
Endosulfan I	0.0667	0.0673	0.0711	101	107	62.0-121			5.53	20
Endosulfan II	0.0667	0.0608	0.0642	91.1	96.2	64.2-117			5.45	20
Endosulfan sulfate	0.0667	0.0600	0.0633	90.0	94.9	58.3-128			5.30	20
Endrin	0.0667	0.0609	0.0641	91.3	96.1	53.6-127			5.17	20
Endrin aldehyde	0.0667	0.0476	0.0510	71.3	76.5	37.4-130			6.98	20
Endrin ketone	0.0667	0.0533	0.0566	79.9	84.9	63.0-121			6.09	20
Heptachlor	0.0667	0.0596	0.0637	89.3	95.5	66.4-118			6.72	20
Heptachlor epoxide	0.0667	0.0618	0.0656	92.6	98.4	60.6-132			6.01	20
Hexachlorobenzene	0.0667	0.0738	0.0771	111	116	57.6-131			4.43	20
Methoxychlor	0.0667	0.0545	0.0567	81.7	85.0	54.8-131			3.90	20
(S) Decachlorobiphenyl				*120*	*125*	*10.0-143*				
(S) Tetrachloro-m-xylene				*114*	*119*	*29.2-144*				

L801196-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/16/15 22:08 • (MS) 11/16/15 22:21 • (MSD) 11/16/15 22:33

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aldrin	0.0667	ND	0.0716	0.0754	107	113	1	20.2-150			5.18	20
Alpha BHC	0.0667	ND	0.0766	0.0831	115	125	1	35.3-155			8.16	20
Beta BHC	0.0667	ND	0.0756	0.0804	113	121	1	30.4-160			6.09	20
Delta BHC	0.0667	ND	0.0768	0.0820	115	123	1	27.8-160			6.53	20
Gamma BHC	0.0667	ND	0.0707	0.0755	106	113	1	32.6-149			6.56	20
4,4-DDD	0.0667	ND	0.0719	0.0746	108	112	1	33.0-145			3.59	20
4,4-DDE	0.0667	0.0174	0.0982	0.103	121	128	1	26.3-151			4.53	20
4,4-DDT	0.0667	ND	0.0690	0.0705	103	106	1	11.8-145			2.10	23.8
Dieldrin	0.0667	ND	0.0703	0.0737	105	110	1	24.8-149			4.66	20
Endosulfan I	0.0667	ND	0.0736	0.0768	110	115	1	20.7-152			4.27	20
Endosulfan II	0.0667	ND	0.0746	0.0777	112	116	1	22.1-150			4.07	20
Endosulfan sulfate	0.0667	ND	0.0707	0.0730	106	109	1	24.6-151			3.24	21.5
Endrin	0.0667	ND	0.0725	0.0776	109	116	1	27.3-149			6.77	21.2
Endrin aldehyde	0.0667	ND	0.0725	0.0758	109	114	1	11.0-157			4.50	20
Endrin ketone	0.0667	ND	0.0651	0.0674	97.6	101	1	28.5-148			3.47	20
Heptachlor	0.0667	ND	0.0693	0.0738	104	111	1	26.7-144			6.34	20

L801196-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/16/15 22:08 • (MS) 11/16/15 22:21 • (MSD) 11/16/15 22:33

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Heptachlor epoxide	0.0667	ND	0.0695	0.0734	104	110	1	25.2-155			5.40	20
Hexachlorobenzene	0.0667	ND	0.0690	0.0733	104	110	1	19.0-156			6.03	20
Methoxychlor	0.0667	ND	0.0764	0.0790	115	119	1	10.0-165			3.42	25.4
(S) Decachlorobiphenyl					*119*	*124*		*10.0-143*				
(S) Tetrachloro-m-xylene					*105*	*119*		*29.2-144*				

Method Blank (MB)

(MB) 11/16/15 01:27

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Anthracene	ND		0.0330
Acenaphthene	ND		0.0330
Acenaphthylene	ND		0.0330
Benzo(a)anthracene	ND		0.0330
Benzo(a)pyrene	ND		0.0330
Benzo(b)fluoranthene	ND		0.0330
Benzo(g,h,i)perylene	ND		0.0330
Benzo(k)fluoranthene	ND		0.0330
Chrysene	ND		0.0330
Dibenz(a,h)anthracene	ND		0.0330
Fluoranthene	ND		0.0330
Fluorene	ND		0.0330
Indeno(1,2,3-cd)pyrene	ND		0.0330
Naphthalene	ND		0.0330
Phenanthrene	ND		0.0330
Pyrene	ND		0.0330
(S) Nitrobenzene-d5	*88.4*		*28.3-148*
(S) 2-Fluorobiphenyl	*93.7*		*41.4-134*
(S) p-Terphenyl-d14	*92.4*		*35.8-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/16/15 00:44 • (LCSD) 11/16/15 01:06

Analyte	Spike Amount ppm	LCS Result ppm	LCSD Result ppm	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.400	0.386	0.394	96.4	98.6	50.7-125			2.29	20
Acenaphthylene	0.400	0.387	0.392	96.6	97.9	51.3-126			1.29	20
Anthracene	0.400	0.388	0.402	96.9	100	50.5-130			3.55	20
Benzo(a)anthracene	0.400	0.384	0.387	96.0	96.8	54.1-127			0.820	20
Benzo(b)fluoranthene	0.400	0.361	0.407	90.2	102	56.1-125			12.1	20
Benzo(k)fluoranthene	0.400	0.357	0.398	89.3	99.5	50.9-129			10.8	20
Benzo(g,h,i)perylene	0.400	0.375	0.421	93.7	105	53.3-132			11.6	20
Benzo(a)pyrene	0.400	0.362	0.406	90.6	101	54.8-127			11.3	20
Chrysene	0.400	0.407	0.404	102	101	55.3-126			0.760	20
Dibenz(a,h)anthracene	0.400	0.394	0.429	98.6	107	52.3-133			8.43	20
Fluoranthene	0.400	0.382	0.392	95.6	97.9	50.1-135			2.43	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/16/15 00:44 • (LCSD) 11/16/15 01:06

Analyte	Spike Amount ppm	LCS Result ppm	LCSD Result ppm	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluorene	0.400	0.390	0.393	97.5	98.4	52.3-125			0.910	20
Naphthalene	0.400	0.367	0.382	91.7	95.5	47.8-121			4.07	20
Phenanthrene	0.400	0.375	0.387	93.9	96.9	56.0-122			3.16	20
Pyrene	0.400	0.386	0.385	96.5	96.3	55.6-129			0.200	20
Indeno(1,2,3-cd)pyrene	0.400	0.395	0.433	98.6	108	50.1-135			9.38	20
(S) Nitrobenzene-d5				*87.2*	*91.2*	*28.3-148*				
(S) 2-Fluorobiphenyl				*94.9*	*97.1*	*41.4-134*				
(S) p-Terphenyl-d14				*91.1*	*92.9*	*35.8-140*				

L800673-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/16/15 03:35 • (MS) 11/16/15 03:56 • (MSD) 11/16/15 04:18

Analyte	Spike Amount ppm	Original Result mg/kg	MS Result ppm	MSD Result ppm	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.400	ND	0.370	0.391	92.6	97.8	1	48.3-126			5.56	20
Acenaphthylene	0.400	ND	0.372	0.387	92.9	96.9	1	48.7-128			4.20	20
Anthracene	0.400	ND	0.368	0.394	92.1	98.4	1	41.0-133			6.67	20
Benzo(a)anthracene	0.400	ND	0.358	0.379	89.5	94.7	1	31.6-136			5.61	20
Benzo(b)fluoranthene	0.400	ND	0.394	0.393	98.4	98.3	1	24.0-134			0.100	24.3
Benzo(k)fluoranthene	0.400	ND	0.349	0.371	87.3	92.9	1	30.4-134			6.15	24.7
Benzo(g,h,i)perylene	0.400	ND	0.386	0.396	96.4	99.0	1	19.1-139			2.62	23.4
Benzo(a)pyrene	0.400	ND	0.381	0.391	95.3	97.8	1	28.0-137			2.56	20.5
Chrysene	0.400	ND	0.380	0.403	95.1	101	1	32.4-137			5.74	20
Dibenz(a,h)anthracene	0.400	ND	0.395	0.410	98.8	103	1	30.3-135			3.79	22.5
Fluoranthene	0.400	ND	0.379	0.391	94.7	97.8	1	32.8-139			3.19	20
Fluorene	0.400	ND	0.374	0.397	93.5	99.2	1	43.0-129			5.92	20
Naphthalene	0.400	ND	0.368	0.380	92.1	95.1	1	38.1-135			3.22	20
Phenanthrene	0.400	ND	0.367	0.382	91.9	95.4	1	36.2-134			3.76	20
Pyrene	0.400	0.00508	0.369	0.386	90.9	95.3	1	30.3-144			4.61	21.7
Indeno(1,2,3-cd)pyrene	0.400	ND	0.395	0.409	98.7	102	1	22.3-139			3.52	23.6
(S) Nitrobenzene-d5					*85.4*	*90.0*		*28.3-148*				
(S) 2-Fluorobiphenyl					*88.6*	*95.5*		*41.4-134*				
(S) p-Terphenyl-d14					*79.6*	*86.1*		*35.8-140*				

Method Blank (MB)

(MB) 11/13/15 03:13

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Anthracene	ND		0.0000500
Acenaphthene	ND		0.0000500
Acenaphthylene	ND		0.0000500
Benzo(a)anthracene	ND		0.0000500
Benzo(a)pyrene	ND		0.0000500
Benzo(b)fluoranthene	ND		0.0000500
Benzo(g,h,i)perylene	ND		0.0000500
Benzo(k)fluoranthene	ND		0.0000500
Chrysene	ND		0.0000500
Dibenz(a,h)anthracene	ND		0.0000500
Fluoranthene	ND		0.0000500
Fluorene	ND		0.0000500
Indeno(1,2,3-cd)pyrene	ND		0.0000500
Naphthalene	ND		0.000250
Phenanthrene	ND		0.0000500
Pyrene	ND		0.0000500
(S) Nitrobenzene-d5	*129*		*33.8-179*
(S) 2-Fluorobiphenyl	*110*		*55.5-150*
(S) p-Terphenyl-d14	*90.7*		*46.2-163*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/13/15 02:30 • (LCSD) 11/13/15 02:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	0.00200	0.00203	0.00202	102	101	68.9-153			0.760	20
Acenaphthene	0.00200	0.00181	0.00179	90.3	89.4	67.7-153			1.07	20
Acenaphthylene	0.00200	0.00192	0.00192	96.2	96.2	66.9-141			0.0100	20
Benzo(a)anthracene	0.00200	0.00169	0.00167	84.5	83.6	63.1-147			1.13	20
Benzo(a)pyrene	0.00200	0.00188	0.00178	94.2	89.1	62.2-150			5.50	20
Benzo(b)fluoranthene	0.00200	0.00176	0.00166	87.9	83.1	58.4-148			5.58	20
Benzo(g,h,i)perylene	0.00200	0.00172	0.00164	85.8	82.1	57.4-152			4.31	20
Benzo(k)fluoranthene	0.00200	0.00195	0.00172	97.5	86.0	60.5-154			12.6	20
Chrysene	0.00200	0.00175	0.00177	87.3	88.4	64.8-155			1.23	20
Dibenz(a,h)anthracene	0.00200	0.00183	0.00173	91.5	86.5	53.5-153			5.60	20
Fluoranthene	0.00200	0.00213	0.00211	107	106	68.6-153			0.980	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/13/15 02:30 • (LCSD) 11/13/15 02:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluorene	0.00200	0.00200	0.00199	100	99.3	67.3-141			0.750	20
Indeno(1,2,3-cd)pyrene	0.00200	0.00181	0.00171	90.7	85.5	57.0-155			5.95	20
Naphthalene	0.00200	0.00195	0.00191	97.3	95.6	66.7-135			1.79	20
Phenanthrene	0.00200	0.00174	0.00168	86.8	83.9	64.3-143			3.40	20
Pyrene	0.00200	0.00139	0.00155	69.6	77.5	60.2-154			10.8	20
(S) Nitrobenzene-d5				*130*	*134*	*33.8-179*				
(S) 2-Fluorobiphenyl				*105*	*105*	*55.5-150*				
(S) p-Terphenyl-d14				*78.2*	*86.1*	*46.2-163*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

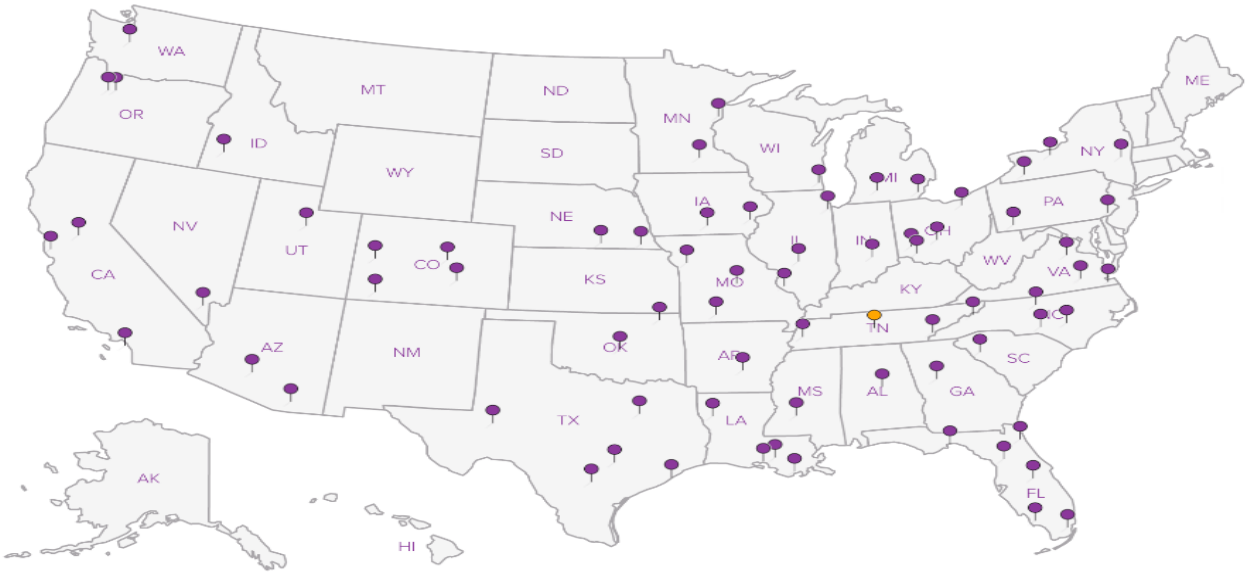
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



S&ME Inc. - Hixson TN.
4291 HWY 58 Suite 101
Chattanooga, TN 37416

Billing Information:
Accounts Payable
4291 HWY 58 Suite 101
Chattanooga, TN 37416

Report to: Mr. Pat Gribben

Email To: pgribben@smeinc.com

Project Description: Miller Park Limited Phase II

City/State Collected: Chattanooga TN

Phone: 423-499-0957
Fax:

Client Project # 4181-15-036A

Lab Project # SMETHN-4181-15-036A

Collected by (print): Pat Gribben

Site/Facility ID #

P.O. #

Collected by (signature): Pat

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: 5-day turn

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	8081 100ml Amb-NoPres	EPHTN,SV8270PAH 4ozClr-NoPres	Metals 2ozClr-NoPres	PAHSIMLVI 40mlAmb-NoPres-WT	RCRA Metals 500mlHDPE-HNO3	SV8081 4ozClr-NoPres	V8260 2ozClr-NoPres	V8260 40mlAmb-HCl	Rem./Contaminant	Sample # (lab only)
~~B1~~	~~Grab~~	~~GW~~	~~NA~~			6				X	X			X		
~~B3~~	~~"~~	~~GW~~	~~"~~			6				X	X			X		
~~B4~~	~~"~~	~~GW~~	~~"~~			6				X	X			X		
—	—	~~GW~~	—			2	X									
B1C	Grab	SS	5-8.2	11/10/15	1620	3		X	[redacted]				X		No metals	-01
B2	"	SS	17.5-20	11/10/15	0715	3		X	X				X			-02
B3	"	SS	5-7.5	11/10/15	1625	3		X	[redacted]				X		No metals	-03
B4	"	SS	17.5-18.5	11/11/15	1615	~~3~~ 2		X	X				X			-04
B5	"	SS	0.3-2.6	11/10/15	1640	3		X	X				X			-05
B6	"	SS	0.5-5.3	11/10/15	0740	3		X	X				X			-06

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Chain of Custody Page 1 of 2

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # L920673
L182

Acctnum: SMEHTN
Template: T107078
Prelogin: P530230
TSR: 690 - Tom Mellette
PB: 11-3-15
Shipped Via: FedEx Ground

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Pat	11/11/15	1645	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
			6529 1903 7666
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 3.8 °C Bottles Received: 40
Date: 11-12-15 Time: 0900

Hold #
Condition: 75 (lab use only)
COC Seal Intact: ✓ Y ___N ___NA
pH Checked: NCF: X

Chain of Custody Page 2 of 2

ESC LABS — YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L800673
Table #
Acctnum: SMEHTN
Template: T107078
Prelogin: P530230
TSR: 690 - Tom Mellette
PB: 11-3-15
Shipped Via: FedEX Ground

S&ME Inc. - Hixson TN.
4291 HWY 58 Suite 101
Chattanooga, TN 37416

Billing Information:
Accounts Payable
4291 HWY 58 Suite 101
Chattanooga, TN 37416

Report to: Mr. Pat Gribben
Email To: pgribben@smeinc.com

Project Description: Miller Park Limited Phase II
City/State Collected: Chattanooga TN
Phone: 423-499-0957
Fax:
Client Project # 4181-15-036A
Lab Project # SMETHN-4181-15-036A
Collected by (print): Pat Gribben
Site/Facility ID #
P.O. #
Collected by (signature): Pat Gribben
Immediately Packed on Ice N___ Y✓
Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
Date Results Needed: 5-day turn
Email? ___No X_Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	8081 100ml Amb-NoPres	EPHTN,SV8270PAH 4ozClr-NoPres	Metals 2ozClr-NoPres	PAHSIMLVI 40mlAmb-NoPres-WT	RCRA Metals 500mlHDPE-HNO3 <2	SV8081 4ozClr-NoPres	V8260 2ozClr-NoPres	V8260 40mlAmb-HCl	Rem./Contaminant	Sample # (lab only)
B7	Grab	SS	10-12.5	11/10/15	1650	4		X	X			X	X			-07
B8	Grab	SS	0.8-2.5	11/10/15	1700	3		X	X				X			-08
B1 (Geo)	Grab	SS	8.5-10	11/11/15	1625	1			X						Metals only	-09
B3 (Geo)	Grab	SS	6-7.5	11/11/15	1630	1			X						Metals only	-10
B1C	Grab	GW	N/A	11/10/15	1315	5				X				X		-11
B-3	↓	↓	↓	↓	1525	5				X				X		-12
B-7				11/11/15	0958	2								X		-13
B-1C				11/11/15	1015	1					X					-14
B-3					1010	1					X					-15

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

pH ____ Temp ____
Flow ____ Other ____

Remarks:

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Pat Gribben	11/11/15	1645	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ____
Temp: 3.8 °C Bottles Received: 40
Date: 11-12-15 Time: 0900

Hold #
Condition: TF (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: 22 NCF: X